



# **MagicWorks HMI User's Manual**

**SHENZHEN CO-TRUST TECHNOLOGY CO., LTD.**

**Releasing Date: 05 / 2013**

**Manual Version: V2.90**

## Copyright

Copyright ©2013

SHENZHEN CO-TRUST TECHNOLOGY CO.,LTD

All rights reserved.

You are not authorized to duplicate、 excerpt these in whole or in part of this document or transfer in any form or by any means without prior written consent of CO-TRUST.

、 TrustPLC、 CoPanel are registered trademarks of CO-TRUST TECHNOLOGY CO.,LTD.

All other registered trademarks in this manual are owned by their respective companies.

The products and options described in this document may be changed or modified at any time in case of the upgrading of product versions or other reasons.

Unless otherwise stated or agreed, this document is for use reference only, all statements, informations and notes in this document does not constitute any express or implied warranty.

## Preface

MagicWorks HMI is powerful and can be easily operated. We hope all the users will be more convenient to use our products via the manual. This manual is suitable for MagicWorks HMI version 3.5.0 and later versions.

## Modifications compared to the previous version

This manual has been revised as follows:

### ◆ **New communication driver: SIMATIC S7 300 protocol**

The communication driver of “Connections” adds SIMATIC S7 300 protocol (Please refer to chapter 5.1 & 5.2 for details).

### ◆ **New Screen type: TP10 (MPI) and TP07 (MPI)**

Adds new screen TP10MPI) and TP07(MPI), which supports the connection with S7-300 PLC, TP10(MPI) and TP07(MPI) can only configure one connection and not allow to switch between other screen types (Please refer to chapter 2.1 for details).

### ◆ **Simple object “Graphics View” adds “Sizing” function**

Simple object “Graphics View” adds “Sizing” function in the General property (Please refer to chapter 6.1.14 for details).

### ◆ **Simple object “Bar” adds “Scale labels” function**

Simple object “Bar” adds “Scale labels” to modify the mark length and decimal places (Please refer to chapter 6.1.18 for details).

# Contents

|                                                                           |           |
|---------------------------------------------------------------------------|-----------|
| Copyright.....                                                            | II        |
| Preface.....                                                              | III       |
| Modifications compared to the previous version.....                       | III       |
| Contents.....                                                             | IV        |
| <b>1 MagicWorks HMI installation.....</b>                                 | <b>1</b>  |
| 1.1 Installing MagicWorks HMI.....                                        | 1         |
| 1.1.1 Hardware and Software Requirements of Computer.....                 | 1         |
| 1.1.2 Installing steps of MagicWorks HMI.....                             | 1         |
| 1.2 Compatibility between MagicWorks HMI and HMI device.....              | 3         |
| 1.3 Installing the driver for USB download line.....                      | 5         |
| 1.4 Introduce the functions of communication port.....                    | 8         |
| 1.5 Communication between Copanel HMI and PLCs.....                       | 10        |
| 1.5.1 Connection between Copanel HMI and Mitsubishi FX series PLC.....    | 10        |
| 1.5.2 Connection between Copanel HMI and S7-200/300、CTSC-100/200 PLC..... | 12        |
| 1.5.3 Connection between Copanel HMI and Omron PLC.....                   | 14        |
| 1.5.4 Connection between Copanel HMI and Panasonic PLC.....               | 16        |
| 1.5.5 Connection between Copanel HMI and DVP PLC.....                     | 16        |
| <b>2 Configuring a simple project.....</b>                                | <b>18</b> |
| 2.1 Create a new project.....                                             | 18        |
| 2.2 Add Connections.....                                                  | 20        |
| 2.3 Create tags.....                                                      | 21        |
| 2.4 Design screens for the project.....                                   | 22        |
| 2.4.1 Create screen.....                                                  | 22        |
| 2.4.2 Configure objects for screens.....                                  | 24        |
| 2.5 Compile and Start Runtime.....                                        | 25        |
| 2.5.1 Operating Compile and Start Runtime.....                            | 26        |
| 2.6 Download Projects.....                                                | 27        |
| <b>3 Introduction of MagicWorks HMI.....</b>                              | <b>31</b> |
| 3.1 Menu bar.....                                                         | 31        |
| 3.1.1 Menu [Project].....                                                 | 31        |
| 3.1.2 Menu [Edit].....                                                    | 39        |
| 3.1.3 Menu [Format].....                                                  | 40        |
| 3.1.4 Menu [View].....                                                    | 41        |
| 3.1.5 Menu [Options].....                                                 | 41        |
| 3.1.6 Menu [Help].....                                                    | 43        |
| 3.2 Toolbar.....                                                          | 45        |

|          |                                                                                    |           |
|----------|------------------------------------------------------------------------------------|-----------|
| 3.3      | Project view.....                                                                  | 47        |
| 3.4      | Work area.....                                                                     | 47        |
| 3.5      | Tool window.....                                                                   | 48        |
| 3.6      | Property view.....                                                                 | 52        |
| 3.7      | Output view.....                                                                   | 52        |
| 3.8      | Simulator.....                                                                     | 53        |
| <b>4</b> | <b>Configuration method of MagicWorks HMI.....</b>                                 | <b>55</b> |
| 4.1      | How to configure a project.....                                                    | 55        |
| 4.2      | How to configure connections.....                                                  | 55        |
| 4.3      | How to configure tags.....                                                         | 57        |
| 4.4      | How to design screens.....                                                         | 61        |
| 4.4.1    | Create Screen.....                                                                 | 61        |
| 4.4.2    | Edit Screen.....                                                                   | 62        |
| 4.4.3    | Create Screen objects.....                                                         | 65        |
| 4.4.4    | Take Number IO Field for example to indicate how to configure screen objects<br>69 |           |
| 4.5      | How to create alarms.....                                                          | 71        |
| 4.5.1    | Create Analog Alarms.....                                                          | 71        |
| 4.5.2    | Create Discrete Alarms.....                                                        | 74        |
| 4.6      | Debug projects.....                                                                | 75        |
| 4.6.1    | How to debug projects.....                                                         | 75        |
| 4.6.2    | Attach compile information.....                                                    | 78        |
| 4.7      | Download projects.....                                                             | 83        |
| 4.8      | Configure project password.....                                                    | 83        |
| 4.9      | Key functions and configuration.....                                               | 84        |
| 4.9.1    | Function and the configuration of the key LED.....                                 | 84        |
| 4.9.2    | Key functions and configuration.....                                               | 86        |
| 4.9.3    | Configure Key permissions.....                                                     | 90        |
| 4.9.4    | Function list of other system keys.....                                            | 91        |
| <b>5</b> | <b>Communication Parameters.....</b>                                               | <b>93</b> |
| 5.1      | Connections.....                                                                   | 93        |
| 5.1.1    | Setup communication parameters.....                                                | 94        |
| 5.1.2    | Point area.....                                                                    | 107       |
| 5.2      | Tags.....                                                                          | 126       |
| 5.2.1    | The properties of tags.....                                                        | 126       |
| 5.2.2    | The import / export function of tag group.....                                     | 136       |
| 5.2.3    | The bulk editing function of tag table.....                                        | 136       |
| 5.2.4    | The filter function of tag table.....                                              | 136       |

|          |                                  |            |
|----------|----------------------------------|------------|
| 5.3      | Cycles.....                      | 136        |
| <b>6</b> | <b>Components of Screen.....</b> | <b>138</b> |
| 6.1      | Simple Objects.....              | 138        |
| 6.1.1    | Line.....                        | 138        |
| 6.1.2    | Polyline.....                    | 139        |
| 6.1.3    | Polygon.....                     | 140        |
| 6.1.4    | Ellipse.....                     | 141        |
| 6.1.5    | Circle.....                      | 142        |
| 6.1.6    | Rectangle.....                   | 143        |
| 6.1.7    | Simple Form.....                 | 143        |
| 6.1.8    | Text Field.....                  | 144        |
| 6.1.9    | Number IO Field.....             | 145        |
| 6.1.10   | String IO Field.....             | 149        |
| 6.1.11   | Date-Time Field.....             | 151        |
| 6.1.12   | Graphic IO Field.....            | 153        |
| 6.1.13   | Symbolic IO Field.....           | 155        |
| 6.1.14   | Graphics View.....               | 157        |
| 6.1.15   | Button.....                      | 158        |
| 6.1.16   | Text Switch.....                 | 160        |
| 6.1.17   | Graphic Switch.....              | 162        |
| 6.1.18   | Bar.....                         | 164        |
| 6.2      | Enhanced Objects.....            | 166        |
| 6.2.1    | Slider.....                      | 166        |
| 6.2.2    | Progress Bar.....                | 169        |
| 6.2.3    | Clock.....                       | 170        |
| 6.2.4    | Gauge.....                       | 171        |
| 6.2.5    | Meter.....                       | 173        |
| 6.2.6    | Knob.....                        | 175        |
| 6.2.7    | User View.....                   | 176        |
| 6.2.8    | Trend View.....                  | 177        |
| 6.2.9    | Recipe View.....                 | 196        |
| 6.2.10   | Alarm View.....                  | 199        |
| 6.2.11   | Alarm Window.....                | 203        |
| 6.2.12   | Alarm Indicator.....             | 206        |
| 6.2.13   | Data View.....                   | 208        |
| 6.2.14   | Timer label.....                 | 210        |
| 6.2.15   | Realtime Bit Trend View.....     | 212        |
| 6.2.16   | Water Flow.....                  | 213        |

|           |                                                   |            |
|-----------|---------------------------------------------------|------------|
| 6.2.17    | Log Trend View.....                               | 214        |
| 6.2.18    | ReFlow Realtime Trend View.....                   | 217        |
| <b>7</b>  | <b>Alarm Management.....</b>                      | <b>221</b> |
| 7.1       | The central components of an alarm.....           | 221        |
| 7.2       | Analog Alarms.....                                | 221        |
| 7.3       | Discrete Alarms.....                              | 224        |
| 7.4       | System events.....                                | 226        |
| 7.5       | Alarm Settings.....                               | 227        |
| 7.5.1     | Alarm Classes.....                                | 227        |
| 7.5.2     | Alarm Groups.....                                 | 230        |
| 7.6       | Example of how to configure and debug alarms..... | 230        |
| <b>8</b>  | <b>Recipes data.....</b>                          | <b>234</b> |
| 8.1       | Function of Recipes.....                          | 234        |
| 8.2       | How to create a recipe.....                       | 234        |
| 8.3       | Configure a recipe in the screen.....             | 239        |
| 8.4       | Upload/Download recipe data.....                  | 240        |
| <b>9</b>  | <b>Historical Data.....</b>                       | <b>243</b> |
| 9.1       | Data Logs.....                                    | 243        |
| 9.1.1     | How to create Data Logs.....                      | 243        |
| 9.1.2     | View data records.....                            | 246        |
| 9.1.3     | Export Data Logs.....                             | 247        |
| 9.2       | Alarm Logs.....                                   | 249        |
| 9.2.1     | How to create Alarm Logs.....                     | 249        |
| 9.2.2     | View the alarm records.....                       | 253        |
| 9.2.3     | Export Alarm Logs.....                            | 254        |
| <b>10</b> | <b>Text Lists and Graphics Lists.....</b>         | <b>257</b> |
| 10.1      | Text Lists.....                                   | 257        |
| 10.1.1    | How to create a text list.....                    | 257        |
| 10.2      | Graphics Lists.....                               | 260        |
| 10.2.1    | How to create a graphics list.....                | 260        |
| <b>11</b> | <b>System functions and Animations.....</b>       | <b>264</b> |
| 11.1      | System functions.....                             | 264        |
| 11.1.1    | Function List and description.....                | 264        |
| 11.1.2    | Events.....                                       | 304        |
| 11.1.3    | Examples of how to use system functions.....      | 306        |
| 11.2      | Animations.....                                   | 311        |
| 11.2.1    | Appearance Change.....                            | 312        |
| 11.2.2    | Enable Object.....                                | 315        |

|           |                                                    |            |
|-----------|----------------------------------------------------|------------|
| 11.2.3    | Diagonal Movement.....                             | 316        |
| 11.2.4    | Horizontal Movement.....                           | 317        |
| 11.2.5    | Vertical Movement.....                             | 318        |
| 11.2.6    | Direct Movement.....                               | 320        |
| 11.2.7    | Custom Movement.....                               | 322        |
| 11.2.8    | Dynamic Movements.....                             | 323        |
| 11.2.9    | Visibility.....                                    | 324        |
| <b>12</b> | <b>Simulator.....</b>                              | <b>326</b> |
| <b>13</b> | <b>Set system parameters for HMI.....</b>          | <b>328</b> |
| <b>14</b> | <b>Script.....</b>                                 | <b>333</b> |
| 14.1      | Quickly Start: How to use a simple script.....     | 333        |
| 14.2      | Script functions.....                              | 335        |
| 14.3      | Application standards of Script.....               | 339        |
| 14.3.1    | Standard.....                                      | 340        |
| 14.3.2    | Grammar.....                                       | 341        |
| 14.4      | Script configuration mode.....                     | 347        |
| 14.5      | Several script samples.....                        | 352        |
| 14.5.1    | Create a script to call system function.....       | 352        |
| 14.5.2    | Create a script to call HMI system clock.....      | 354        |
| 14.5.3    | Example of script Timer.....                       | 357        |
| <b>15</b> | <b>User administration.....</b>                    | <b>361</b> |
| 15.1      | Groups and Group authorizations.....               | 361        |
| 15.2      | Users.....                                         | 363        |
| 15.3      | Example of how to Use the User Administration..... | 364        |
| <b>16</b> | <b>Other features.....</b>                         | <b>369</b> |
| 16.1      | Scheduler and Jobs.....                            | 369        |
| 16.1.1    | Scheduler events.....                              | 369        |
| 16.1.2    | Configure jobs.....                                | 370        |
| 16.2      | Project Texts.....                                 | 372        |
| 16.2.1    | 'Project Texts' editor introduction.....           | 373        |
| 16.2.2    | Configure a project in multiple languages.....     | 373        |
| 16.3      | Device settings.....                               | 375        |
| 16.3.1    | Function of Device settings.....                   | 375        |
| 16.3.2    | Configure Device settings.....                     | 375        |
| 16.3.3    | Convert the Device Type.....                       | 380        |
| 16.4      | Multilanguage.....                                 | 381        |
| 16.5      | HMI Print function.....                            | 381        |
| 16.5.1    | Printer Requirements.....                          | 381        |

|        |                                                             |     |
|--------|-------------------------------------------------------------|-----|
| 16.5.2 | Configuring Printers.....                                   | 381 |
| 16.5.3 | The format of printing content.....                         | 382 |
| 16.5.4 | Print functions of report forms.....                        | 383 |
| 16.5.5 | Print functions of Graphics.....                            | 389 |
| 16.5.6 | Print Prompts.....                                          | 391 |
| 16.6   | Introduction of HMI Input Method.....                       | 391 |
| 16.6.1 | Specification of input method.....                          | 392 |
| 16.6.2 | Specification of soft keyboard.....                         | 392 |
| 16.7   | Updating projects in U disk.....                            | 394 |
| 16.8   | Compatible Version.....                                     | 394 |
| 16.8.1 | Compatible Projects.....                                    | 394 |
| 16.9   | The address mapping relation between Modbus and S7-200..... | 395 |
| 16.10  | MPI protocol.....                                           | 396 |

# 1 MagicWorks HMI installation

## 1.1 Installing MagicWorks HMI

### 1.1.1 Hardware and Software Requirements of Computer

CPU: 1GHz and above.

Hard disks: 40GB and above.

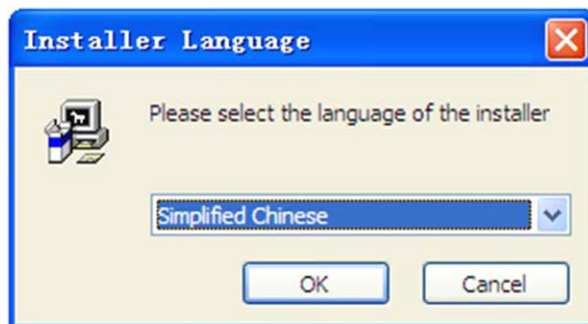
Memory: At least 256MB memory, recommend to use 512MB and higher.

USB: It's available for [Online Simulation] / [Download Project] / [Upload Project].

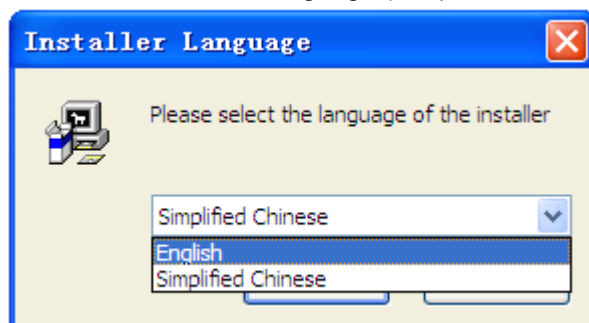
Operating system: Windows XP / Windows 2000 / Windows 7 / Windows Vista.

### 1.1.2 Installing steps of MagicWorks HMI

1. Double-click the installation icon  , show as follows:



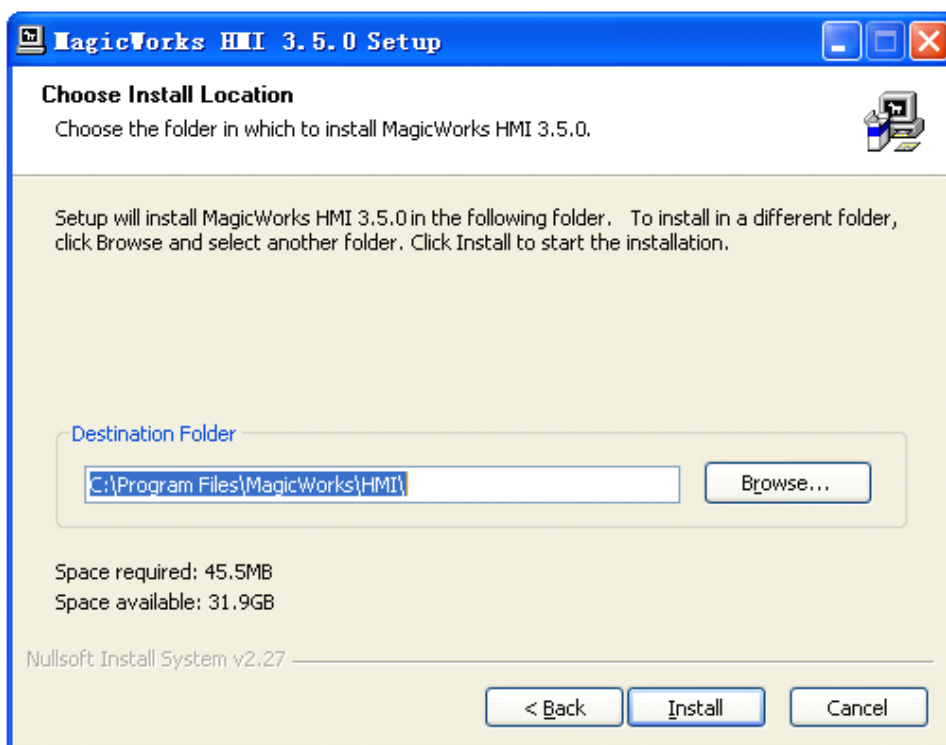
2. Choose an installer language (Simplified Chinese or English):



3. Select 'English' and click 'OK' would pop up following interface:



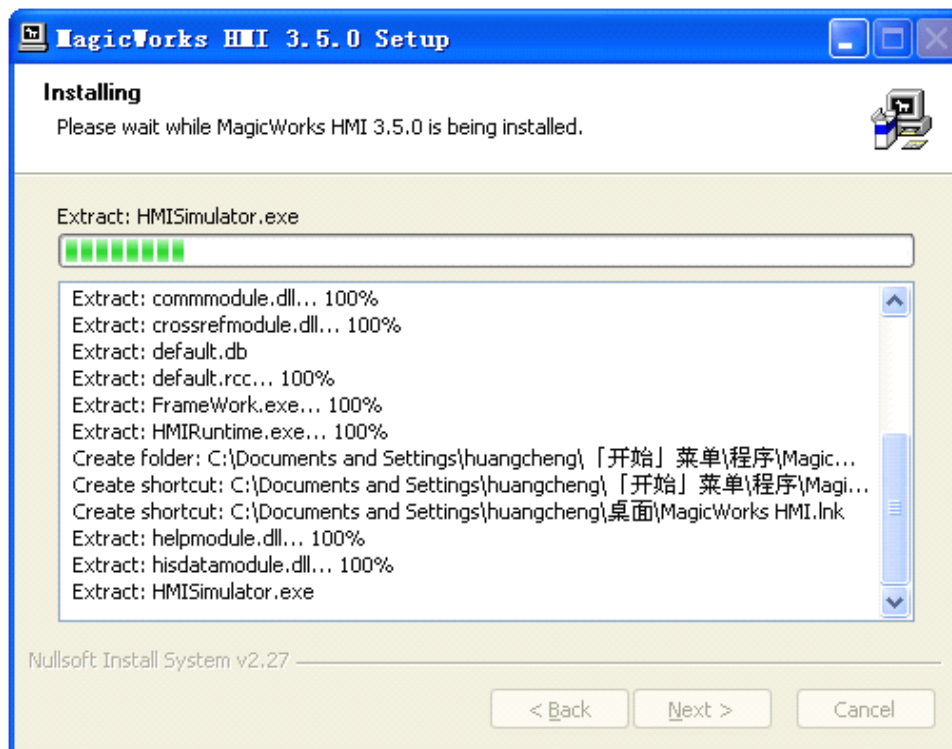
4. Click 'Next' from above dialog, MagicWorks HMI software is installed to the default path. The default path is 'C:\Program Files\MagicWorks\HMI\', see as follows:



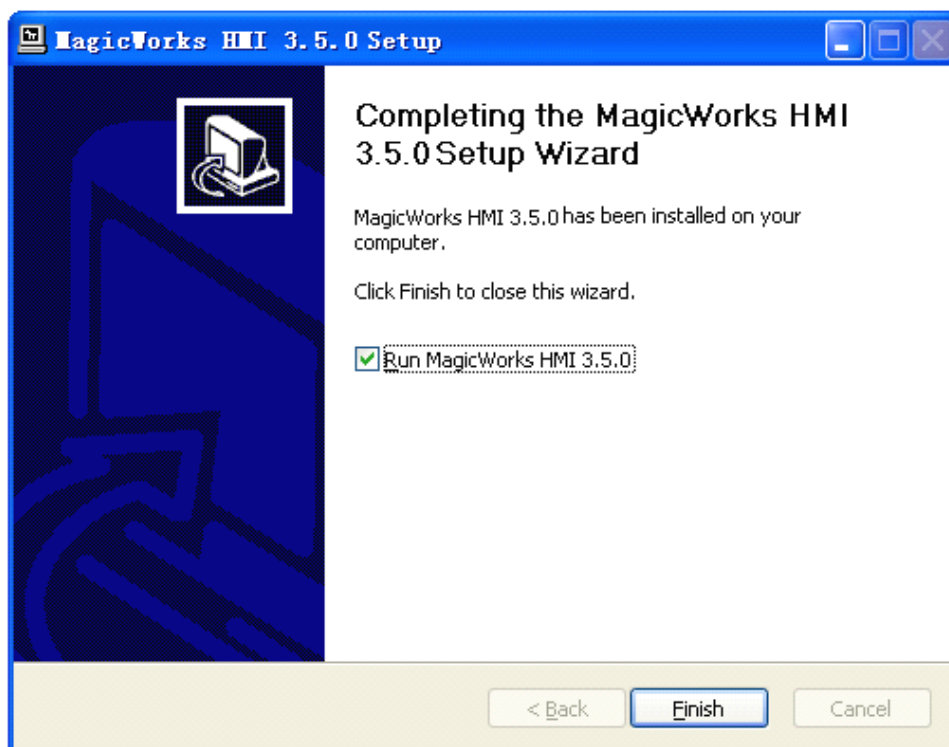
It will create a target folder according to your requirements.

If no problem, then click 'Install' to start the installation. If the default path you set does not exist, the installation program will automatically create the corresponding installation folders. You can click 'Back' to modify the previous operations.

5. Click 'Install' to start the installation, the installing process see as follows:

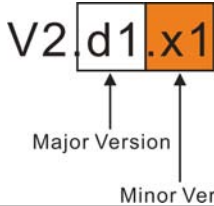
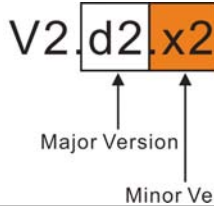


6. About one minute latter, appear following interface, tick the check box before "Run MagicWorks HMI 3.1.0" and click 'Finish' button to complete the installation, it will start the software with the default settings.



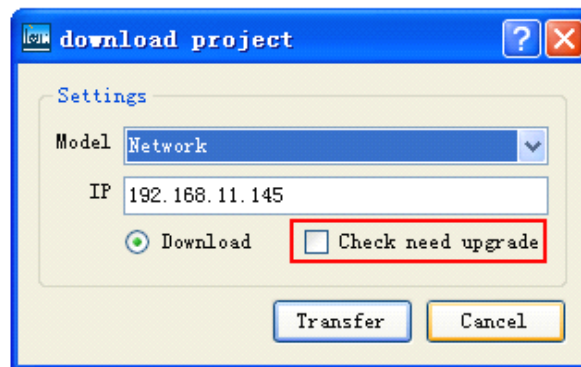
## 1.2 Compatibility between MagicWorks HMI and HMI device

The compatibility between MagicWorks HMI and HMI device see as following table:

| HMI device version                                                                | MagicWorks HMI Version                                                             |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |

**Major Version :** It means this version is modified greatly. When the major version is upgrading, would prompt the users to update the HMI device;

**Minor Version :** It means this version is changed a little, you can download the project under this circumstance. If the minor version is modified, and the user tick "Check need upgrade" during downloading the project, then would prompt the users to update the HMI version, otherwise would no tips.



Note: Only suitable to V2.1.1 and later versions.

Compatibility relation table 1 (The device version and MagicWorks HMI version are higher than V2.0.0)

| The version relationship between HMI device and MagicWorks HMI                                             | Compatibility                                            | Others                                                                         |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------|
| V2.d1.x1 > V2.d2.x2<br>(HMI device version is higher than MagicWorks HMI version)                          | Downloadable,<br>Perfectly Compatible                    |                                                                                |
| V2.d1.x1 = V2.d2.x2<br>(HMI device version is equal to MagicWorks HMI version)                             | Downloadable,<br>Perfectly Compatible                    |                                                                                |
| V2.d1.x1 ≠ V2.d2.x2<br>d1 = d2; x1 < x2<br>(The major version is the same, but minor version is different) | Downloadable, the compatibility depends on the situation | Updating HMI device depends on the situation (Minor version upgrade situation) |
| V2.d1.x1 ≠ V2.d2.x2<br>d1 < d2<br>(The major version is different)                                         | Cannot be downloaded, incompatible                       | Must update the HMI device                                                     |

Compatibility relation table 2 (The HMI device version is lower than V1.45, the MagicWorks HMI version is higher than V2.0.0)

| The version relationship between HMI device and MagicWorks HMI | Compatibility                      | Others                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V1.XX and V2.d2.x2                                             | Cannot be downloaded, incompatible | You must upgrade the HMI device twice.(Operating platform, drive platform)<br>When the HMI device's version is going to upgrade from V1.43 and lower version to V2.00 and higher version, it is recommended to use U disk to upgrade the HMI device, rather than use Software to update. |

The HMI device version is higher than V2.0.0, the MagicWorks HMI version is lower than V1.45:

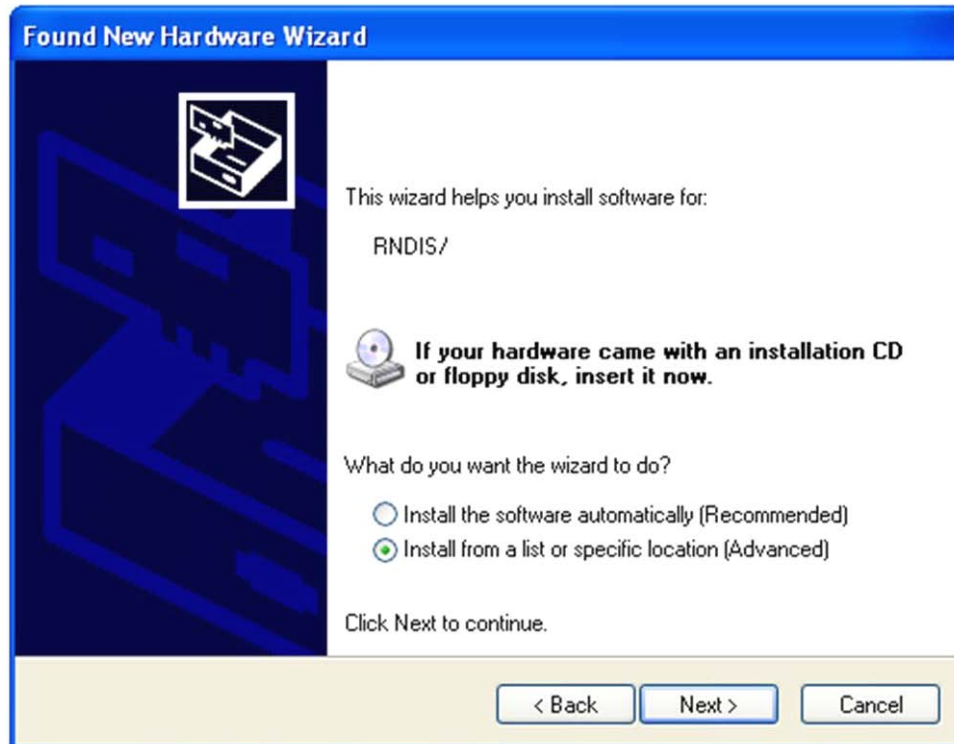
| The version relationship between HMI device and MagicWorks HMI | Compatibility                      | Others                                                                     |
|----------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------|
| V2.d2.x2 and V1.d3.x3                                          | Cannot be downloaded, incompatible | You must upgrade the MagicWorks HMI version to V2.0.0 and higher versions. |

### 1.3 Installing the driver for USB download line

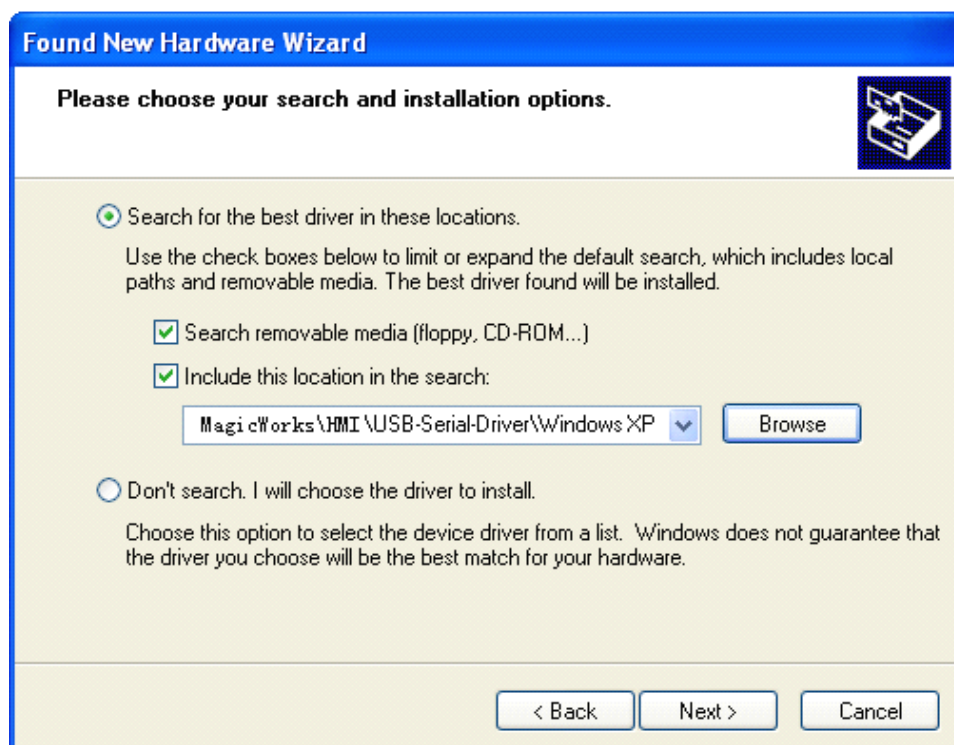
Please install the driver for USB download line after the MagicWorks HMI software installation is completed.

Installation steps see as follows:

1. Provide power to touch screen, using USB cable to connect USB download port(see following figure) and PC, the PC will popup the following dialog, choose 'install from a list or specific location(Advanced)', and click 'Next':



2. Click 'Browse', and select the installation path 'C:\Program Files\MagicWorks\HMI\USB-Serial-Driver\Windows XP', show as below:



3. Click 'Next'.

If the operating system prompt hardware problem dialog box, please turn away from this dialog, and click the 'Continue' button to keep on installing.

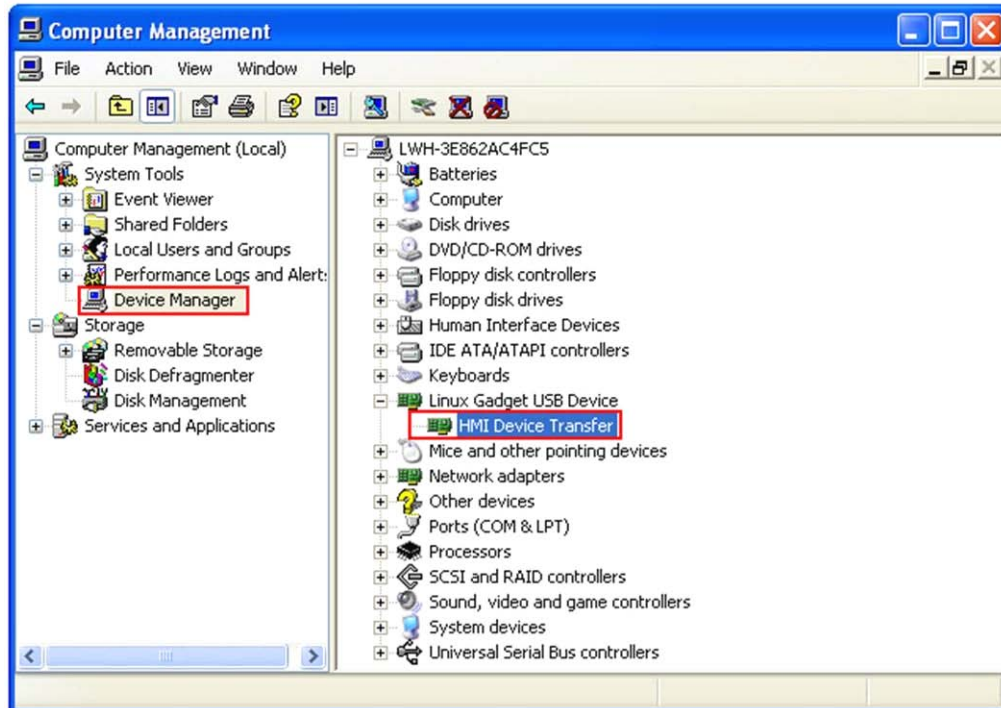
Installation process displays as follows:



4. Click 'Finish' to complete the USB driver installation.



After the installation is completed, right-click "My computer" -> "Manage" -> "Device Manager", then there would be a "HMI Device Transfer" appears, that means the USB download driver is installed successfully.



Note: If the driver cannot be installed under win7 system, first press F8 to select “Advanced startup Option” when win7 system is starting, and then select “Disable driver signature enforcement” mode, press “Enter” that the installation would be performed.

## 1.4 Introduce the functions of communication port

The following is the communication port diagram of MP06、MP07:

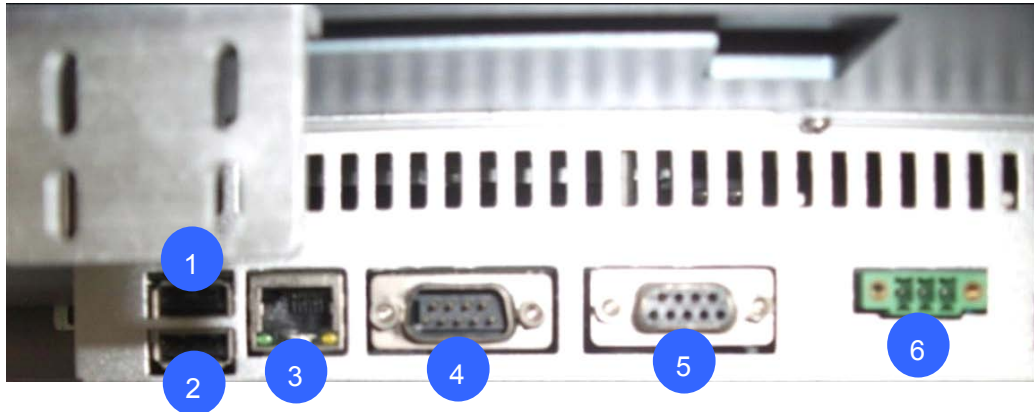


Description of the communication port:

1. USB download port: Slave device interface, connect to PC, support downloading projects and preserving data.
2. USB Communication port: Master device interface, connect to U disk, USB printer, mouse etc.
3. SW dial switch: Whether to use HMI its RS485 terminal resistance to match or not.
4. Reserved.
5. Reserved.
6. RS485 Communication port: Support PPI, MPI, Modbus RT and other communication protocols.

7. Power port: Supply 24 VDC power source.

This is the communication port diagram of KP10H、KP10V、KP06H:



Description of the communication port:

1. USB download port: Slave device interface, connect to PC, support downloading projects and preserving data.
2. USB communication port: Master device interface, connect to U disk, USB printer, mouse etc.
3. Reserved.
4. Reserved.
5. RS485 Communication port: Support PPI, MPI, Modbus RT and other communication protocols.
6. Power port: Supply 24 VDC power source.

USB download cable of MP06、MP07、KP10H、KP10V、KP06H show as below, both of the two ports could connect to the PC or HMI device:



The following is the communication port diagram of TP06、TP10、TP07:



Description of the communication port:

1. USB communication port: Connect to U disk, USB printer, mouse etc, port 2 is not

available at the same time.

2. USB communication port: Connect to U disk, USB printer, mouse etc, port 1 is not available at the same time.

3. USB download port: Support downloading projects.

4. SW dial switch (1->PORT1, 2->PORT0): Whether to use HMI its RS485 terminal resistance to match or not.

5. RS485 communication port (PORT0): Support protocol Modicon Modbus, Omron Hostlink / Multi link, Mitsubishi protocol 4 and Mitsubishi FX, Omron Finslink.

6. RS485 communication port (PORT1): Support protocol SIMATIC S7 200 PPI/MPI, Modicon Modbus, Omron Hostlink/Multi link, Mitsubishi protocol 4, Mitsubishi FX, Omron Finslink.

7. Power port: Supply 24 VDC power source.



#### Note

It is not allowed to use the same protocol at both RS485 communication ports.

eg. If PORT1 has used Modbus protocol, PORT0 can only choose other protocol, rather than Modbus Protocol.

USB download cable of TP06、TP07、TP10 show as below, connect the USB port to the PC, connect the D type port to HMI download port:



USB port

D type port

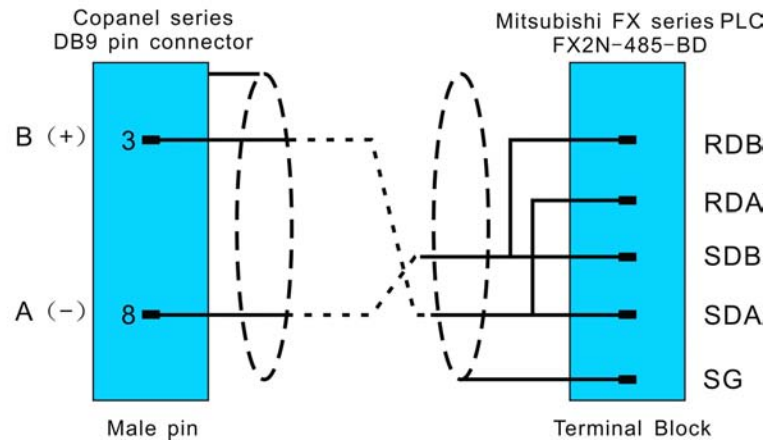
## 1.5 Communication between Copanel HMI and PLCs

### 1.5.1 Connection between Copanel HMI and Mitsubishi FX series PLC

The available protocol between Copanel HMI and Mitsubishi FX series PLC: Mitsubishi protocol 4、Mitsubishi FX.

#### ※ Direct connection of pins

The RS485 port of Copanel series HMI is connecting to the option board of Mitsubishi FX series PLC:



### ※ Connection via Copanel series HMI cable

CTS6 291-TPC20 is a communication cable which used for the connection between Copanel series HMI and Mitsubishi PLC. RS485 and RS232 signal can be converted in realtime, and obtains perfect realtime communication ability. Both ports of this cable are DB9 male pin and circle 8 male pin.

Definition of DB9 pin:

| PIN   | Signal   | Color           | Diagram of DB9 male pin |
|-------|----------|-----------------|-------------------------|
| 1     | -        | -               |                         |
| 2     | -        | -               |                         |
| 3     | RS485_D+ | Red             |                         |
| 4     | -        | -               |                         |
| 5     | -        | -               |                         |
| 6     | -        | -               |                         |
| 7     | -        | -               |                         |
| 8     | RS485_D- | White           |                         |
| 9     | -        | -               |                         |
| Shell | -        | Shielding layer |                         |

Definition of Circle 8 pin :

| PIN   | Signal | Color           | Diagram of MINI DIN 8PIN male pin |
|-------|--------|-----------------|-----------------------------------|
| 1     | RXD-   | Brown           |                                   |
| 2     | RXD+   | Orange          |                                   |
| 3     | VDD    | Black           |                                   |
| 4     | TXD-   | Blue            |                                   |
| 5     | GND    | Red             |                                   |
| 6     | -      | -               |                                   |
| 7     | TXD+   | White           |                                   |
| 8     | -      | -               |                                   |
| Shell | -      | Shielding layer |                                   |

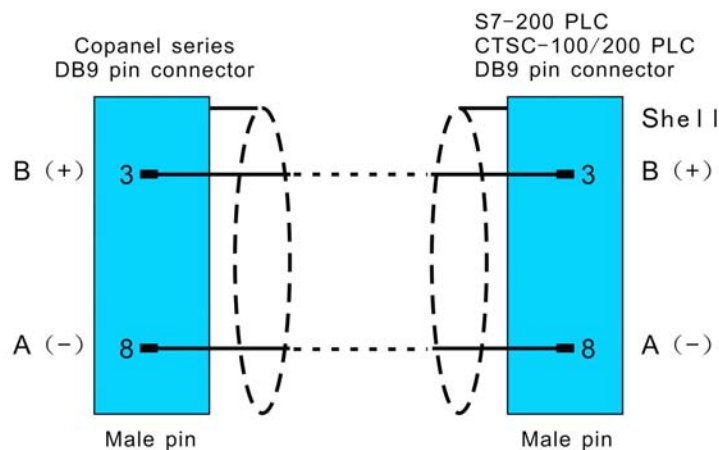
## 1.5.2 Connection between Copanel HMI and S7-200/300、CTSC-100/200 PLC

The available protocol between Copanel HMI and S7-200/300、CTSC-100/200 PLC :  
SIMATIC S7 200 PPI/MPI、SIMATIC S7 300 MPI、Modicon Modbus.

**Note: Only screen type “TP07(MPI)” and “TP10(MPI)” support the connection with S7-300 PLC.**

### ※ Direct connection of pins

The RS485 port of Copanel series HMI is connecting to the programming port of S7-200/300 or CTSC-100/200 PLC:



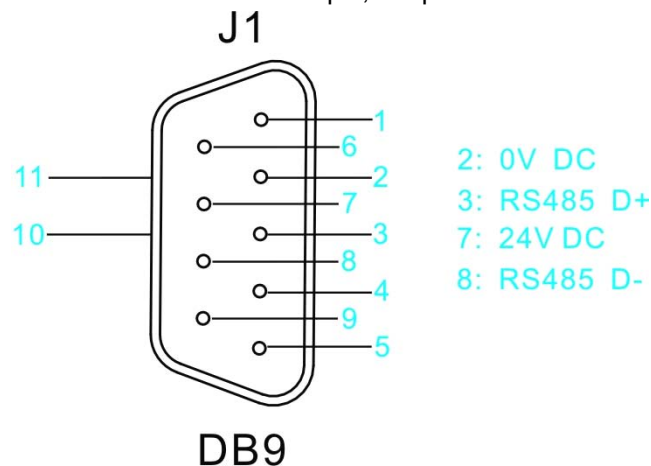
### ※ Connection via Copanel series HMI cable

1) The connection between Copanel series HMI Text screen and S7-200/300 or CTSC-100/200 PLC:

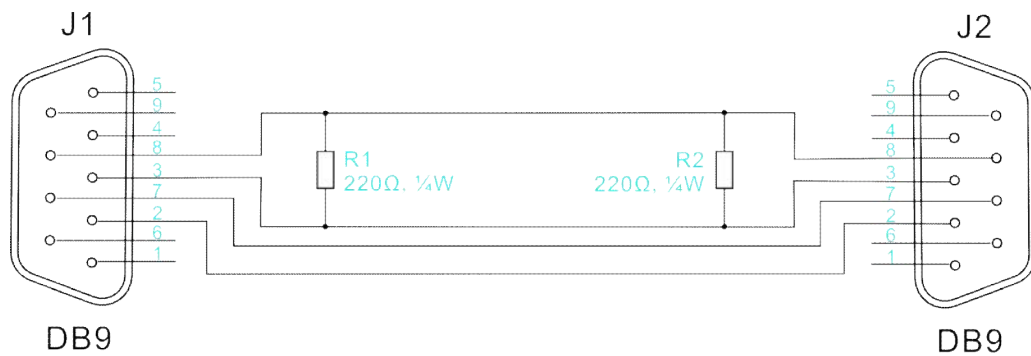
CTS6 291-TDC10 is a communication cable which used for the connection between Copanel series HMI text screens and S7 200/300、CTSC-100/200 PLC.

This cable adopts twisted pair which with well electromagnetic shielding ability, both ends are packaged with terminal resistance. Better electromagnetic shielding ability of this cable can obtain stable communication between HMI and PLC.

Both ends of this cable are DB9 male pin, the pin definition see as follows:



### Connection method



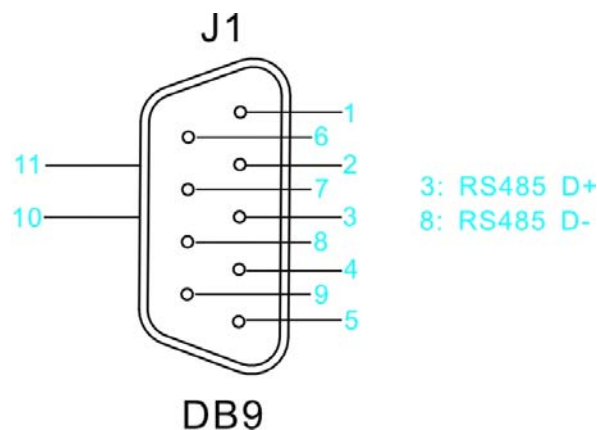
The 2, 3, 7, 8 pins of both ends are connecting directly, and terminal resistance are added to 3, 8 pins of the communication cable. The shell of both ends is connected via the internal braided shielding layer.

Table2 Definition of DB9 Pin

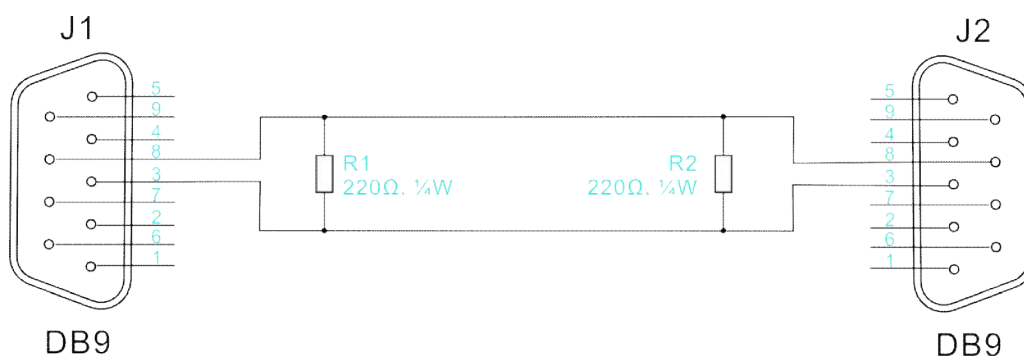
| PIN                        | Signal   | Color        |
|----------------------------|----------|--------------|
| 1                          | -        | -            |
| 2                          | 0V DC    | Black        |
| 3                          | RS485 D+ | Brown        |
| 4                          | -        | -            |
| 5                          | -        | -            |
| 6                          | -        | -            |
| 7                          | +24V DC  | Grey         |
| 8                          | RS485 D- | Blue         |
| 9                          | -        | -            |
| Both shells are connected. |          | Braided mesh |

2) The connection between Copanel series HMI Touch screen and S7-200/300 or CTSC-100/200 PLC:

CTS6 291-TPC11 is a communication cable which used for the connection between Copanel series HMI touch screens and S7 200/300、CTSC-100/200 PLC. Both ends of the cable are DB9 male pin, the pin definition see as follows:



### Connection method



The 3, 8 pins of both ends are connecting directly, and terminal resistance is added to 3, 8 pins of the communication cable. The shell of both ends is connected via the internal braided shielding layer.

Table 2 Definition of DB9 Pin

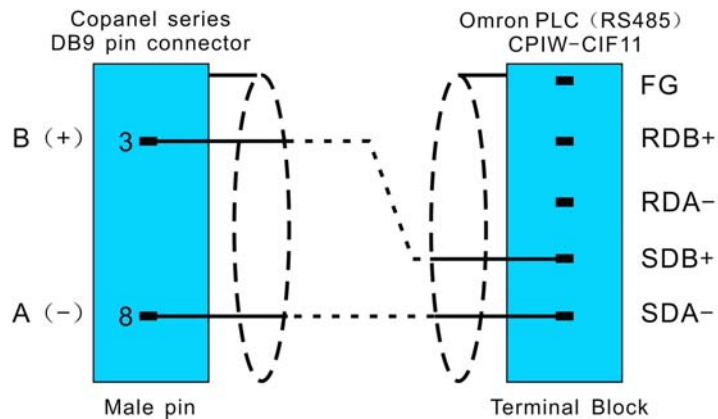
| PIN                        | Signal   | Color        |
|----------------------------|----------|--------------|
| 1                          | -        | -            |
| 2                          | -        | -            |
| 3                          | RS485 D+ | Blue         |
| 4                          | -        | -            |
| 5                          | -        | -            |
| 6                          | -        | -            |
| 7                          | -        | -            |
| 8                          | RS485 D- | Brown        |
| 9                          | -        | -            |
| Both shells are connected. |          | Braided mesh |

### 1.5.3 Connection between Copanel HMI and Omron PLC

The available protocol between Copanel HMI and Omron PLC: Omron Hostlink/ Multi link, Omron Finslink.

#### ※ Direct connection of pins

The RS485 port of Copanel series HMI is connecting to the option board (CPIW-CIF11) of Omron PLC:



### ※ Connection via Copanel series HMI cable

CTS6 291-TPC30 is a communication cable which used for the connection between Copanel series HMI and Omron PLC. RS485 and RS232 signal can be converted in realtime, and obtains perfect realtime communication ability. Both ends of this cable are adopted DB9 male pins.

DB9 pin definition of the communication port that would connect to HMI:

| PIN   | Signal   | Color           | Diagram of DB9 male pin |
|-------|----------|-----------------|-------------------------|
| 1     | -        | -               |                         |
| 2     | -        | -               |                         |
| 3     | RS485_D+ | Red             |                         |
| 4     | -        | -               |                         |
| 5     | -        | -               |                         |
| 6     | -        | -               |                         |
| 7     | -        | -               |                         |
| 8     | RS485_D- | White           |                         |
| 9     | -        | -               |                         |
| Shell | -        | Shielding layer |                         |

DB9 pin definition of the communication port that would connect to Omron PLC:

| PIN   | Signal   | Color           | Diagram of DB9 male pin |
|-------|----------|-----------------|-------------------------|
| 1     | -        | -               |                         |
| 2     | SD (TXD) | Blue            |                         |
| 3     | RD (RXD) | Brown           |                         |
| 4     | -        | -               |                         |
| 5     | -        | -               |                         |
| 6     | 5V       | Red             |                         |
| 7     | -        | -               |                         |
| 8     | -        | -               |                         |
| 9     | SG (0V)  | Black           |                         |
| Shell | -        | Shielding layer |                         |

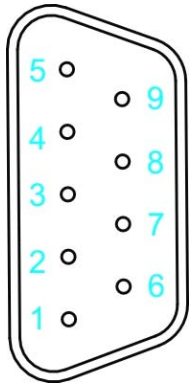
### 1.5.4 Connection between Copanel HMI and Panasonic PLC

The available protocol between Copanel HMI and Panasonic PLC: Panasonic Mewtocol.

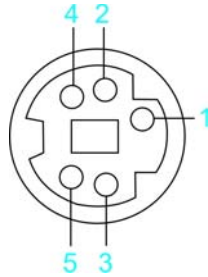
#### ※ Connection via Copanel series HMI cable

CTS6 291-TPC40 is a communication cable which used for the connection between Copanel series HMI and Panasonic PLC. RS485 and RS232 signal can be converted in realtime, and obtains perfect realtime communication ability. The two ports of this cable are DB9 male pin and circle 5 male pin.

DB9 pin definition of the communication port that would connect to HMI:

| PIN   | Signal   | Color           | Diagram of DB9 male pin                                                              |
|-------|----------|-----------------|--------------------------------------------------------------------------------------|
| 1     | -        | -               |  |
| 2     | -        | -               |                                                                                      |
| 3     | RS485_D+ | Red             |                                                                                      |
| 4     | -        | -               |                                                                                      |
| 5     | -        | -               |                                                                                      |
| 6     | -        | -               |                                                                                      |
| 7     | -        | -               |                                                                                      |
| 8     | RS485_D- | White           |                                                                                      |
| 9     | -        | -               |                                                                                      |
| Shell | -        | Shielding layer |                                                                                      |

Circle 5 pin definition of the communication port that would connect to Panasonic PLC:

| PIN   | Signal   | Color           | Diagram of circle 5 male pin                                                          |
|-------|----------|-----------------|---------------------------------------------------------------------------------------|
| 1     | SG (0V)  | Black           |  |
| 2     | SD (TXD) | Blue            |                                                                                       |
| 3     | RD (RXD) | Brown           |                                                                                       |
| 4     | -        | -               |                                                                                       |
| 5     | VDD (5V) | Red             |                                                                                       |
| Shell | -        | Shielding layer |                                                                                       |

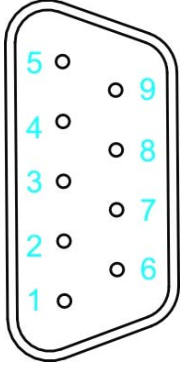
### 1.5.5 Connection between Copanel HMI and DVP PLC

The available protocol between Copanel HMI and DVP PLC: Delta DVP.

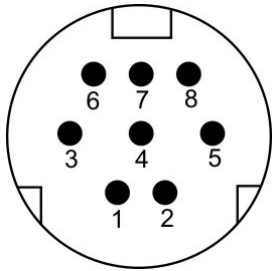
#### ※ Connection via Copanel series HMI cable

CTS6 291-TPC50 is a communication cable which used for the connection between Copanel series HMI and DVP PLC. RS485 and RS232 signal can be converted in realtime, and obtains perfect realtime communication ability. The two ports of this cable are DB9 male pin and circle 8 male pin.

DB9 pin definition of the communication port that would connect to HMI:

| PIN   | Signal   | Color           | Diagram of DB9 Male pin                                                             |
|-------|----------|-----------------|-------------------------------------------------------------------------------------|
| 1     | -        | -               |  |
| 2     | -        | -               |                                                                                     |
| 3     | RS485_D+ | Red             |                                                                                     |
| 4     | -        | -               |                                                                                     |
| 5     | -        | -               |                                                                                     |
| 6     | -        | -               |                                                                                     |
| 7     | -        | -               |                                                                                     |
| 8     | RS485_D- | White           |                                                                                     |
| 9     | -        | -               |                                                                                     |
| Shell | -        | Shielding layer |                                                                                     |

Circle 8 pin definition of the communication port that would connect to DVP PLC:

| PIN   | Signal | Color           | Diagram of MINI DIN 8PIN                                                             |
|-------|--------|-----------------|--------------------------------------------------------------------------------------|
| 1     | RXD-   | Brown           |  |
| 2     | RXD+   | Orange          |                                                                                      |
| 3     | VDD    | Black           |                                                                                      |
| 4     | TXD-   | Blue            |                                                                                      |
| 5     | GND    | Red             |                                                                                      |
| 6     | -      | -               |                                                                                      |
| 7     | TXD+   | White           |                                                                                      |
| 8     | -      | -               |                                                                                      |
| Shell | -      | Shielding layer |                                                                                      |

## 2 Configuring a simple project

The general steps of configuring a simple project:

1. Create a new project.
2. Add connections and choose communication protocol.
3. Add tags.
4. Design the project's screens.
5. Compile and Start Runtime.
6. Download the project to HMI device, start and debug it.

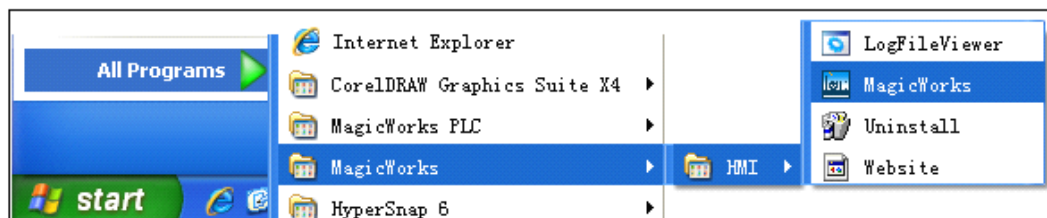
**Instruction:** These steps are not completely independent, in fact, they are often cross.

### 2.1 Create a new project

The steps of creating a new project:

1. After MagicWorks HMI software is installed, choose [Start] / [All programs] /

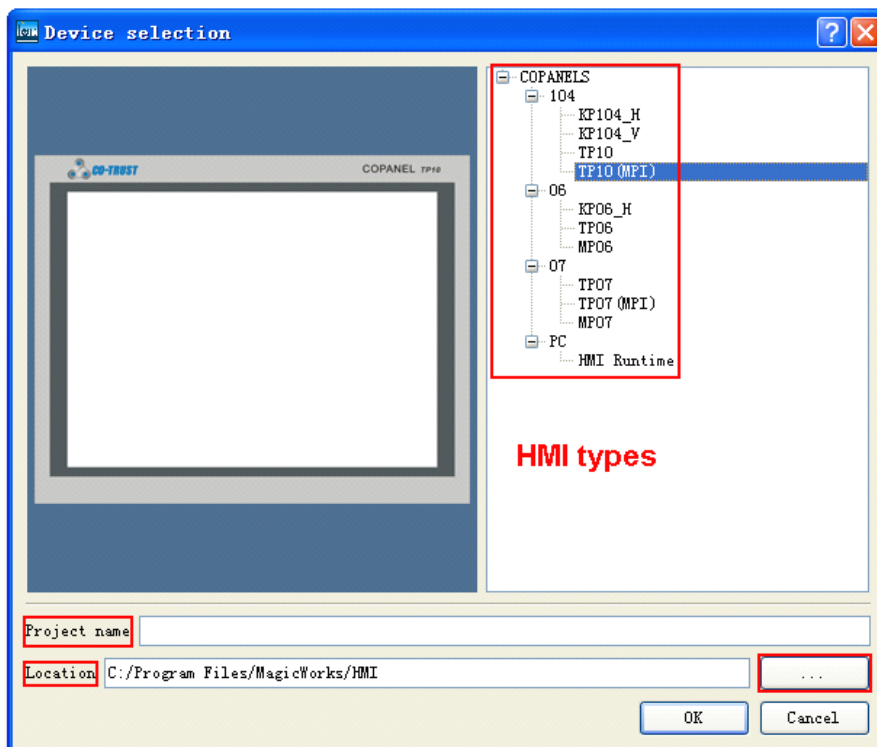
[MagicWorks] / [HMI] / [MagicWorks HMI], or Click MagicWorks HMI icon  from the desktop to start MagicWorks HMI:



2. Choose menu [Project] → [New] or click  button from tool bar to create a new project, see as follows:



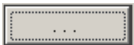
Then it will prompt the 'Device selection' interface, see as follows:



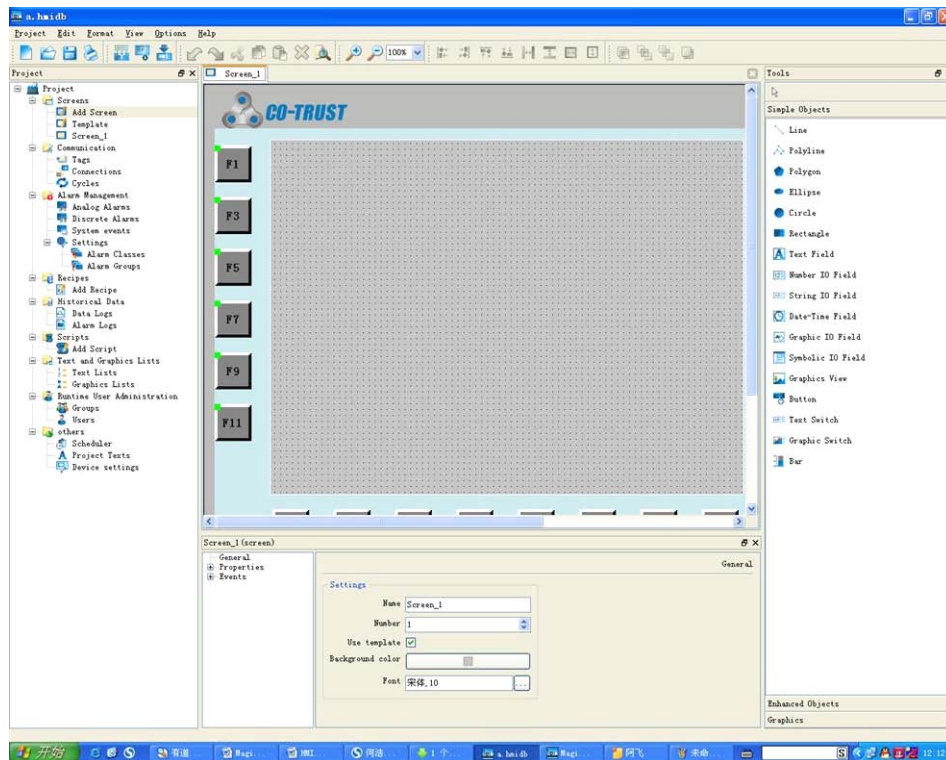
**Tip: Only screen type TP10(MPI) and TP07(MPI) support the connection with S7-300 PLC.**

3. Configure device types, project name and the location for the project.

Click the device name to select an HMI device type in 'HMI types', input the name on the right side of 'Project name', choose the location for the project (we can use the default path,

or Click  button to choose other path).

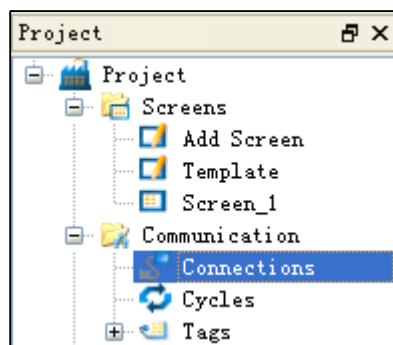
Click 'OK' to complete the new project's creation, show as follows:



4. After the new project is created, choose [Project] -> [Save] from the menu bar, then you can save the new project.

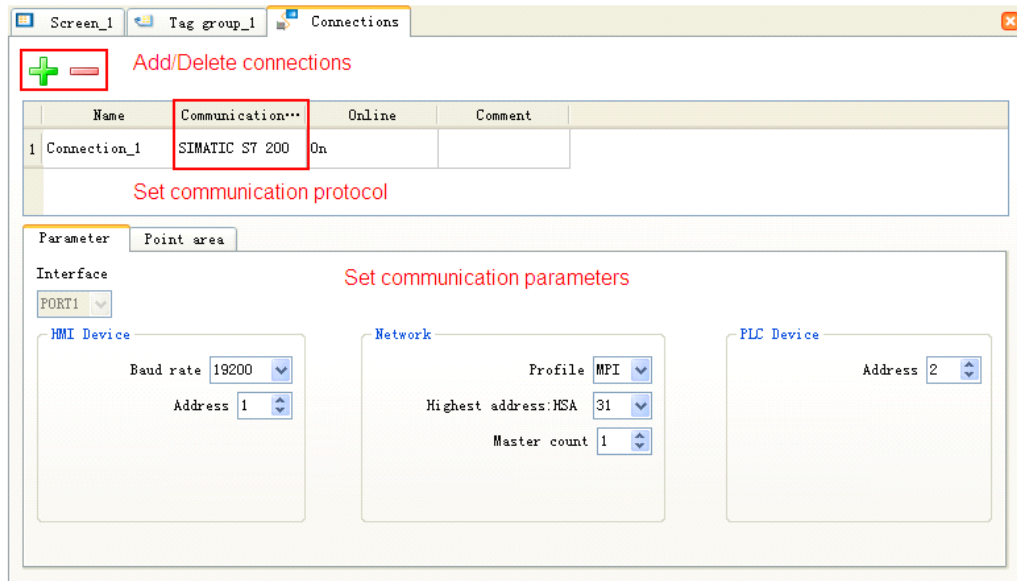
## 2.2 Add Connections

1. Double click 'Connections' in 'Project View' to open the connection editor, see following figure:



2. Click the icon  or right-click the sequence number to add new connections.

3. Select the 'Communication Driver' for the connection, and set other communication parameters in 'Parameter' interface, as follows:



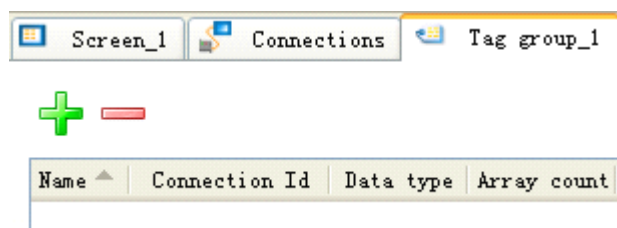
## 2.3 Create tags

The steps of creating tags see as below:

1. Open communication folder in the project view, click "Tags", appear "Add Tag", then

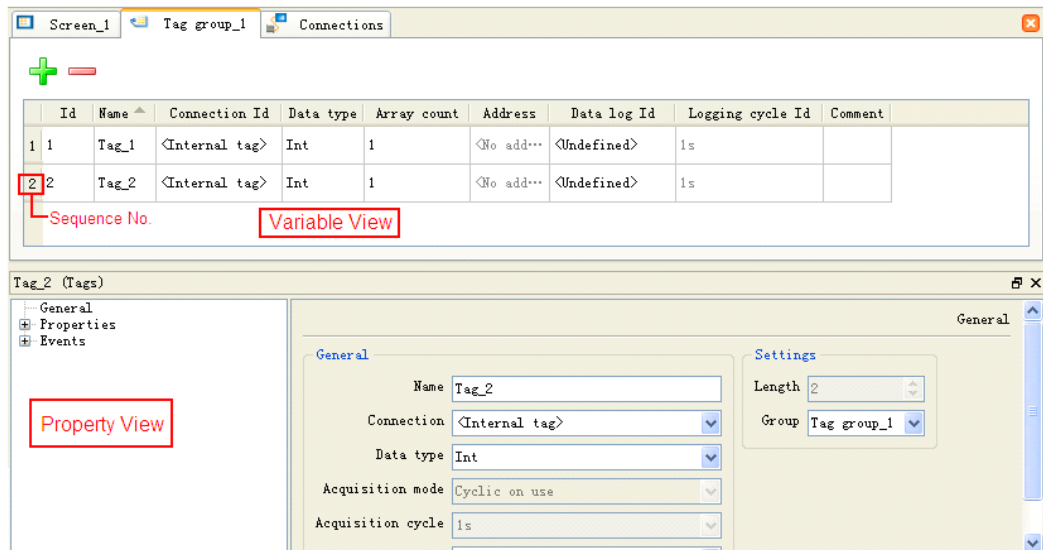


double click "Add Tag" to add a new tag group, and the variable editor will show as following.

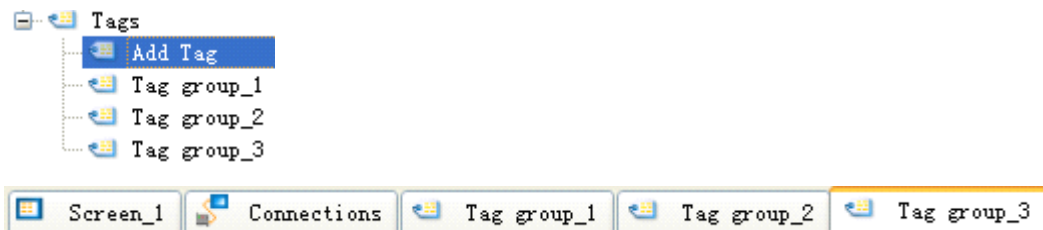


2. Click the  button or right-click on the Sequence Number and choosing 'Add' to create a variable in variable editor.

The new variable parameters and upper ones are basically the same, according to above name and address, the new tag's name and address are arranged in sequential order.



We can create more than one tag groups by double clicking "Add Tags", and every tag group could create several tags for users. See following samples:



3. In variable properties view or variable table we can configure variable properties such as connection, data type, addresses and acquisition cycle etc.

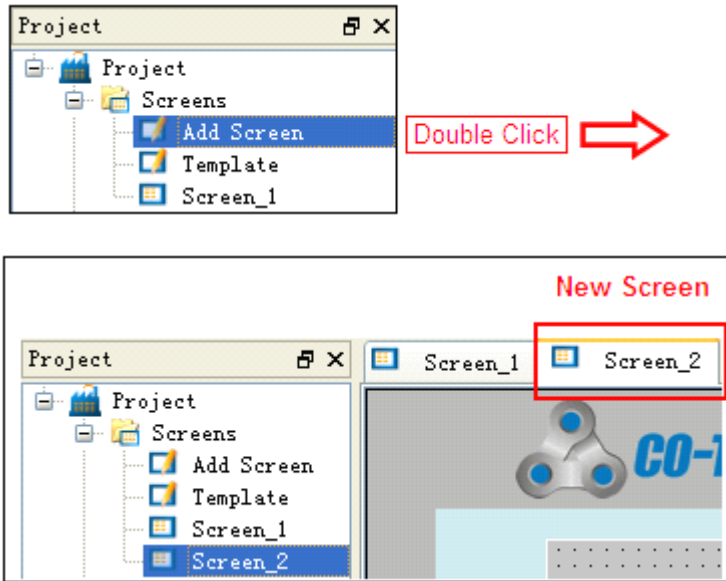
Click the column unit  in "connection Id" section of the variable table, we choose "external variables" for "connection\_1" (HMI equipment is connected with PLC), all the variables of above example are coming from PLC external variables.

Click the column unit  in "Data type" section of the variable, we can select variable data types in the pull-down box. Int is a 16-bit signed integer, Bool is a binary bit which is used for switching value.

## 2.4 Design screens for the project

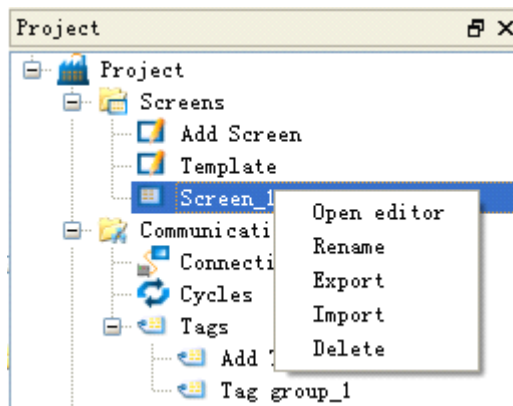
### 2.4.1 Create screen

1. Double click 'Add Screen' in Project view to create a new screen, and it's opened automatically in work area, see as follows:

**Tip**

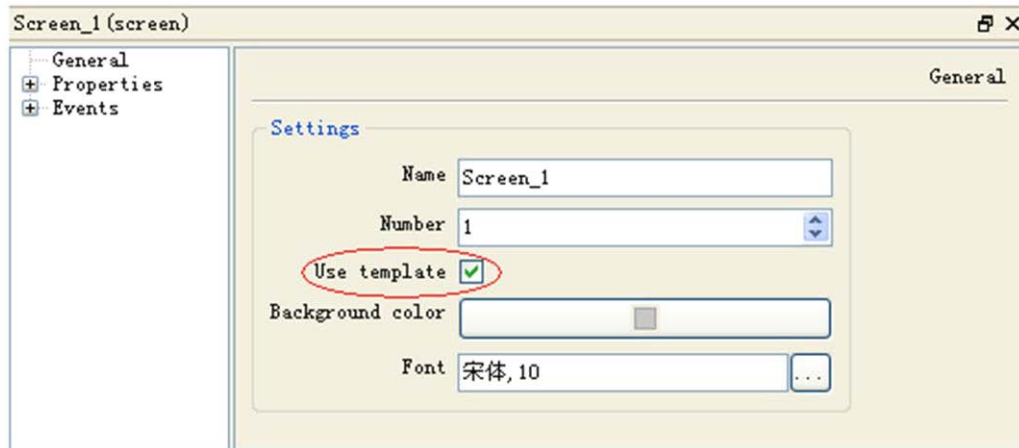
A new screen is generated after you created a project, and the screen name will default to 'screen\_1'.

2. Right-click the screen name in the project view, then you can edit the following options for the screen: 'Open editor', 'Rename', 'Export', 'Import' and 'Delete'.



3. After you opened the new screen, you can set the "General" property from the property view, such as screen Name, screen Number, background color, Font and Use template properties.

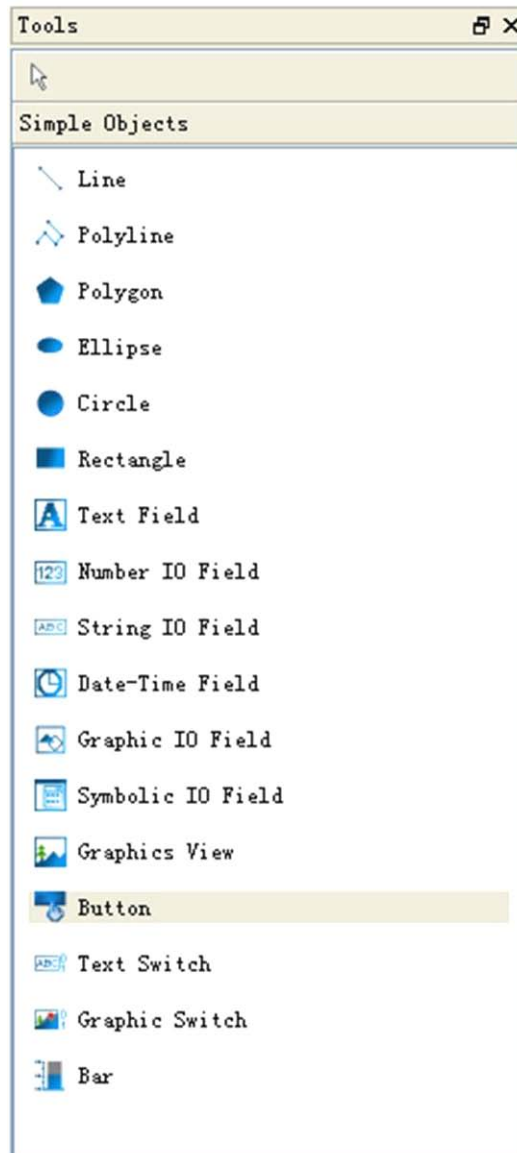
See following figure, if you tick "Use template", the other screens would show the objects that from the template screen, otherwise the screens would not show the template objects.



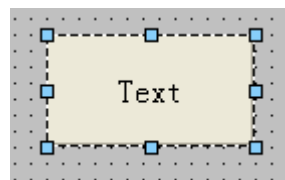
### 2.4.2 Configure objects for screens

The objects you can configure include 'Simple objects', 'Enhanced objects', 'Object Inspector' and 'Graphics' which are in tool view.

Choose the simple object which needs to be configured from tools View. The background of the selected simple object will be darker. Such as the 'button' we selected here.



Move your mouse to the screen, the cursor will become cross shape  , it means that the object can be inserted in the screen. Then click the mouse to insert the object, see as following:



The object which just be inserted is in the selected status. Drag the 8 small cubes can amplify and shrink the objects. Press the mouse and drag it can move objects. Different objects have different properties editor to edit.

## 2.5 Compile and Start Runtime

"Compile" is to execute the lexical analysis and grammar analysis for the designated screen, the output view will prompt information when compiling is finished.

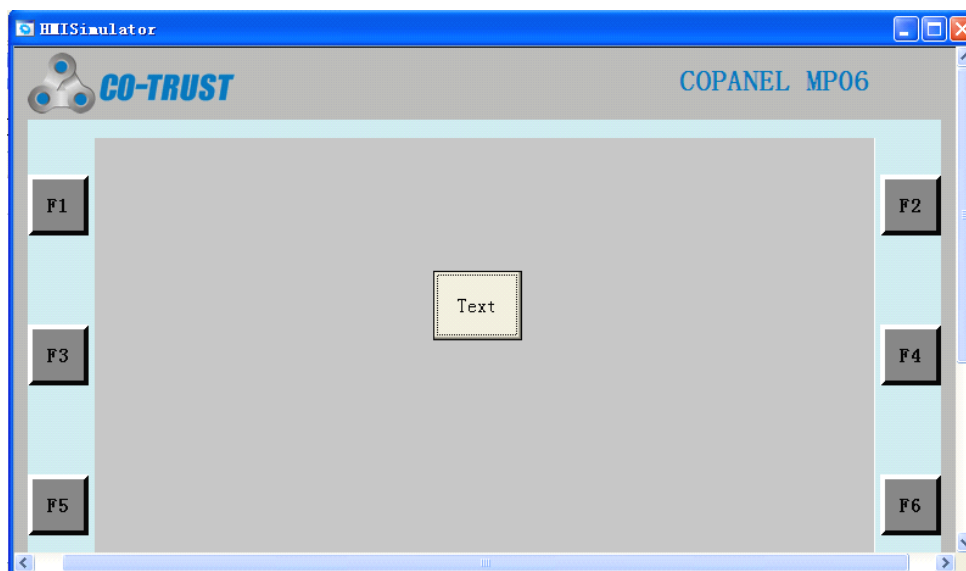
"Start Runtime" is to simulate the specified screen.

### 2.5.1 Operating Compile and Start Runtime

Compile project: Select [Project] / [Compiler] from menu bar, or click the  button from the toolbar, then the compiling result would display in the output view:

| Output |          |                                                                         |          |
|--------|----------|-------------------------------------------------------------------------|----------|
|        | Category | Description                                                             | Time     |
| Info   | :        | Compiling started ...                                                   | 16:54:10 |
| Error  | :        | Communication dirver was changed but the tag's address was not changed. | 16:54:10 |
| Error  | :        | This trend type cannot be used with the currently selected X-axis mode. | 16:54:11 |
| Info   | :        | Compiling finished!                                                     | 16:54:11 |
| Info   | :        | ### FAILED with 2 error(s), 0 warning(s).                               | 16:54:11 |

Start Runtime: Select [Project] / [Start Runtime] from menu bar, or click the  button from the toolbar, then we will see the simulation diagram of the project.



Double-click 'tag' column to show each tag value or directly input tags value in the value column:

| MagicWorks HMI Runtime Simulator |      |           |              |        |                |            |           |          |          |                          |
|----------------------------------|------|-----------|--------------|--------|----------------|------------|-----------|----------|----------|--------------------------|
|                                  | Tag  | Data Type | Current val. | Format | #rite Cycle(s) | Simulation | Set value | MinValue | MaxValue | Cycle                    |
| 1                                | ---- |           |              |        |                |            |           |          |          | <input type="checkbox"/> |

**Tag column**

The project changes from analog form to the simulator to check the variable values of the graphics. Users can observe the changes of objects in the simulator and also can operate the variables values of project in the simulation table.

## 2.6 Download Projects

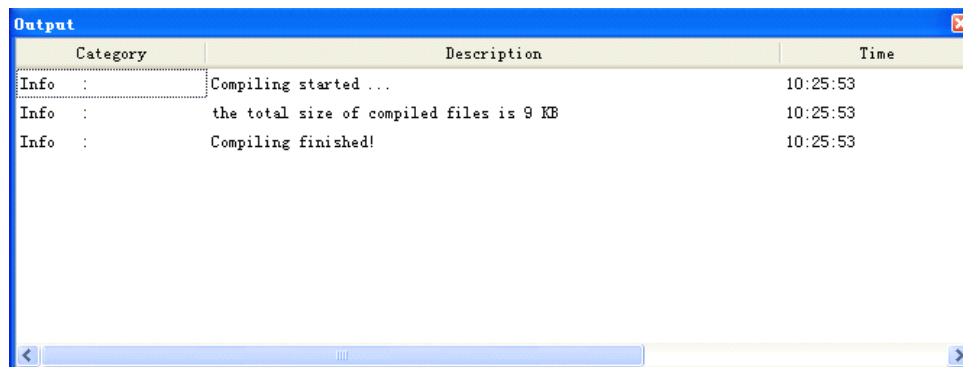
The steps of downloading a project, see as following:

1. Connect the USB port of the Download cable with the USB port of the PC, and connect the D type port of the download cable with the download port of HMI device, see as follows:

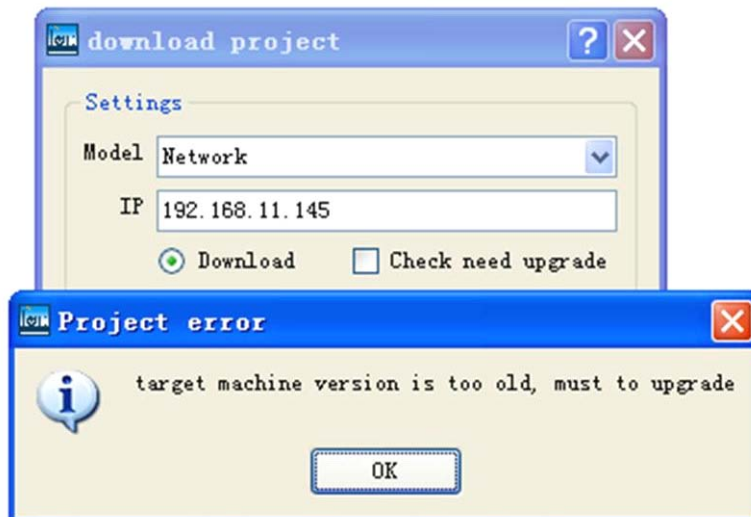


2. Run HMI software, and open the project that you need to download, select "Project" ->

"Compiler" from menu bar or click  button from tool bar to check the 'Output' view.



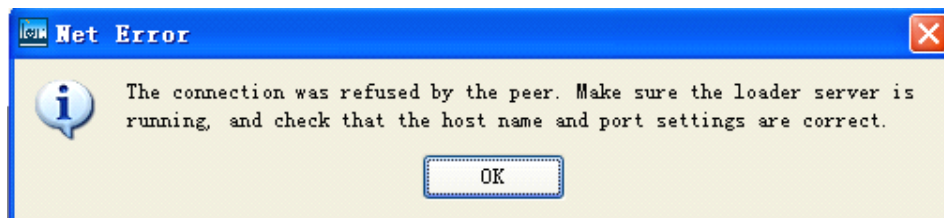
3. If no errors occur after compiling, then enter into downloading section. Before downloading, please make sure the software version of PC and HMI are the same, otherwise the following tips would be prompted:



4. There are two kinds of methods to download the projects according to the software and device version.

**When the software version is lower than or equal to V2.1.1, using following steps to download the project:**

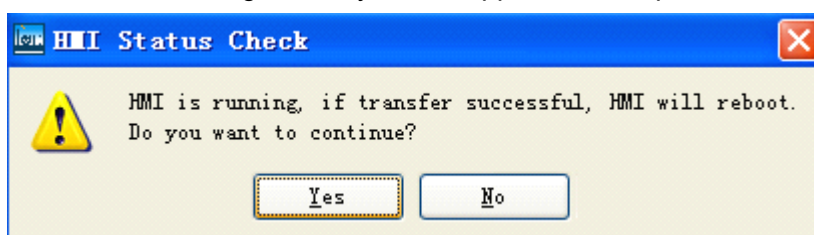
1) Select menu [Project] / [Transfer] or click on  in HMI software, if HMI is starting, below dialog box will popup:



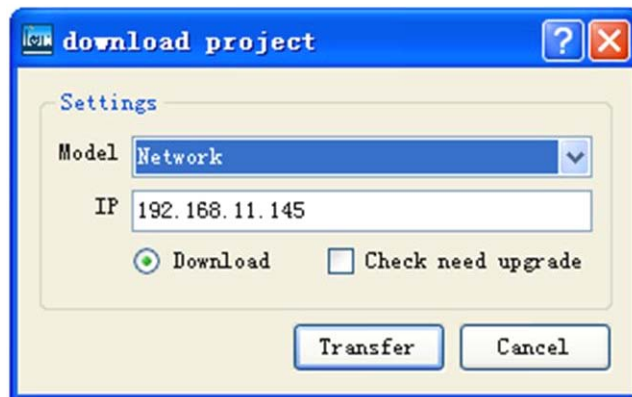
If HMI is launching the project, will popup the following info:



If the HMI is running normally, would appear below tip:



2) Press 'Yes' button to enter in the downloading interface:



'Mode' and 'IP' use the default.

Note: Don't modify the IP, otherwise you will fail to download the project.

Default IP is 192.168.11.145.

3) Press [Transfer] to transfer the project.

4) After "Transfer" is finished, HMI screen would reboot after 5s, and then load the new project, if you press "Cancel" key, the downloaded project would be deleted.

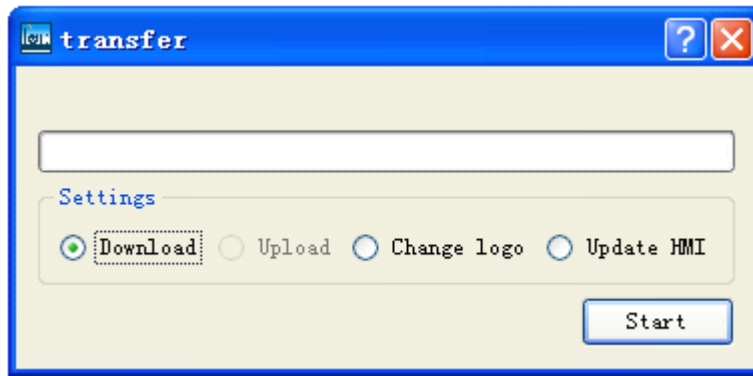


#### Tip

If connection timed out, please check the port and communication cable, etc.

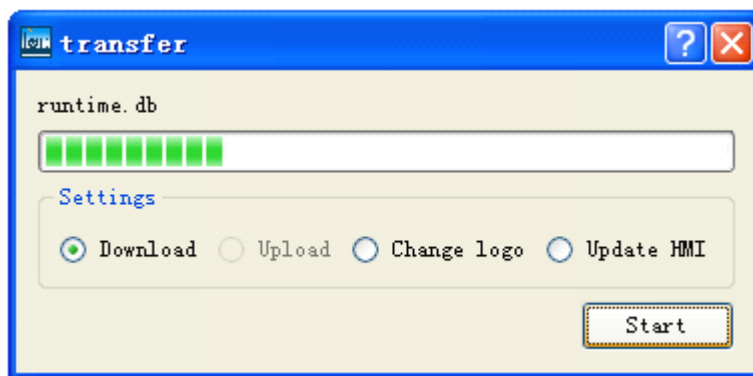
**When the software version & HMI version are higher than or equal to V3.0.0, using following steps to download the project:**

1) Select 【Project】 / 【Transfer】 from menu bar or click  button to enter in transfer interface:



- ▶ Download: Download the project from MagicWorks HMI to target machine;
- ▶ Change Logo: Change the splash screen of HMI device;
- ▶ Update HMI: Upgrade the version of HMI device;

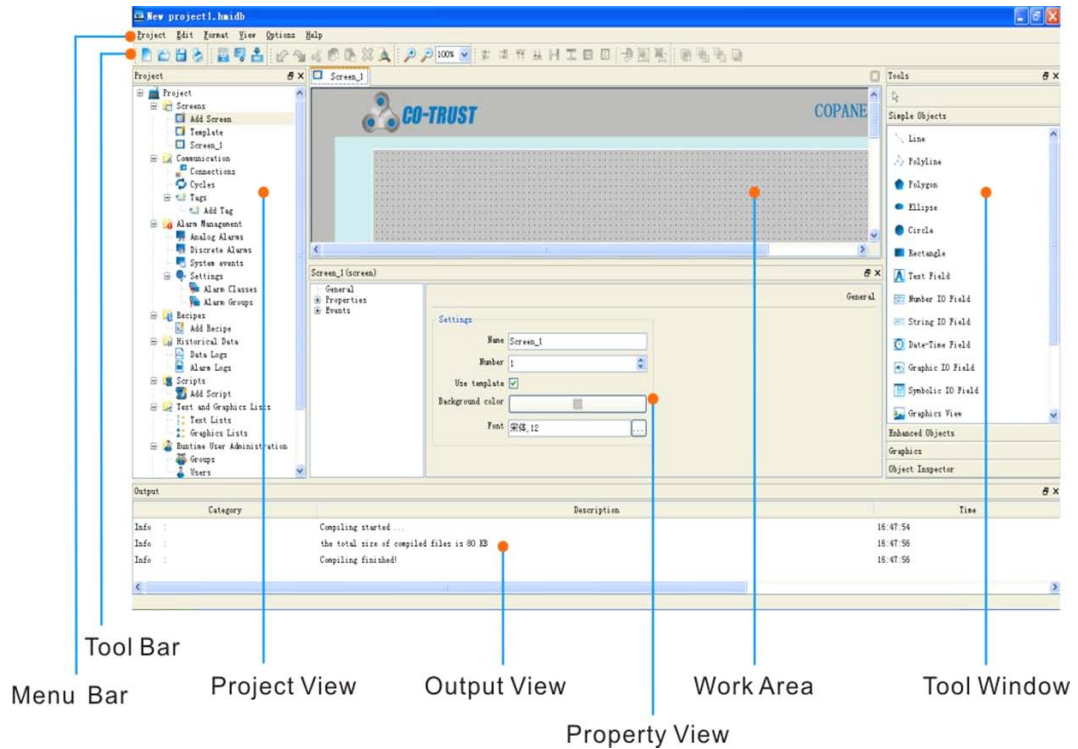
2) Select "Download" and press "Start" to begin the downloading, the downloading process sees as follows:



3) After the downloading process is finished, the HMI enter in running state.

### 3 Introduction of MagicWorks HMI

MagicWorks HMI interface consist of seven parts: Menu bar, toolbar, project view, work area, tool window, property view and output view, see as follows:



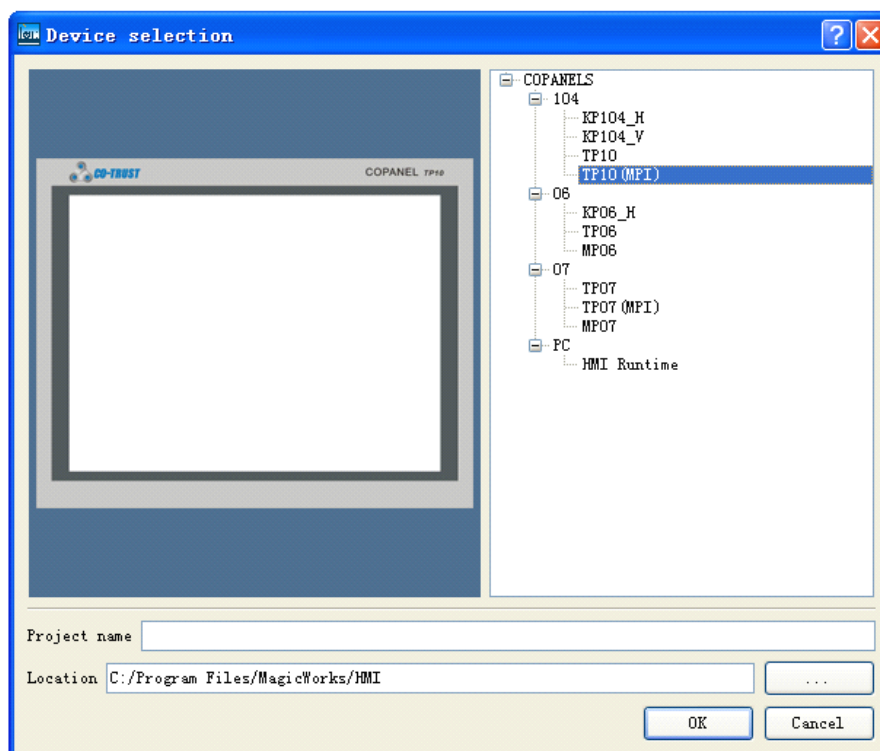
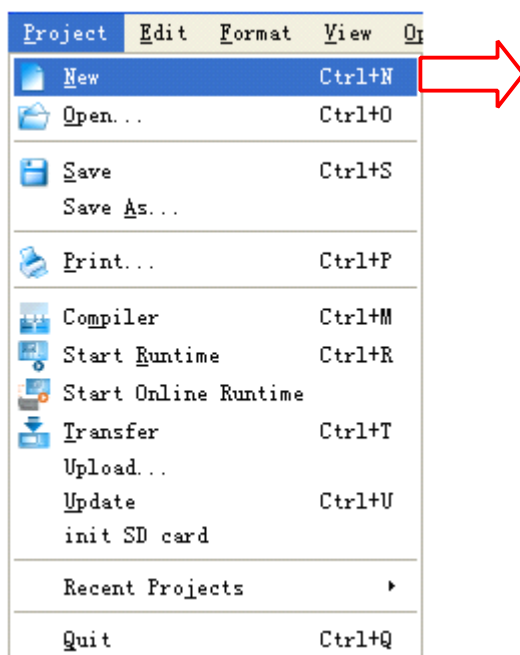
#### 3.1 Menu bar

You can use all of the available functions from MagicWorks HMI menu bar and toolbar, when moves the mouse near any button, it would prompt the corresponding tips.

##### 3.1.1 Menu [Project]

###### [New]

Select menu "Project" -> "New" or click the icon  from toolbar to create a new project.



Press 'OK' after inputted the project name and location, a new project is created.

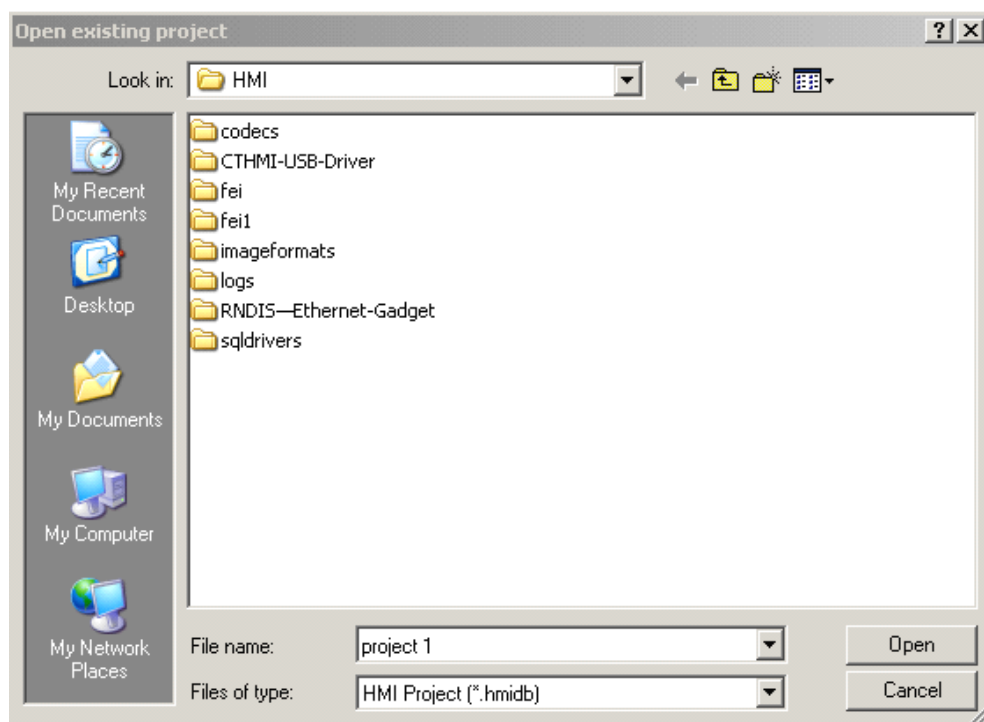
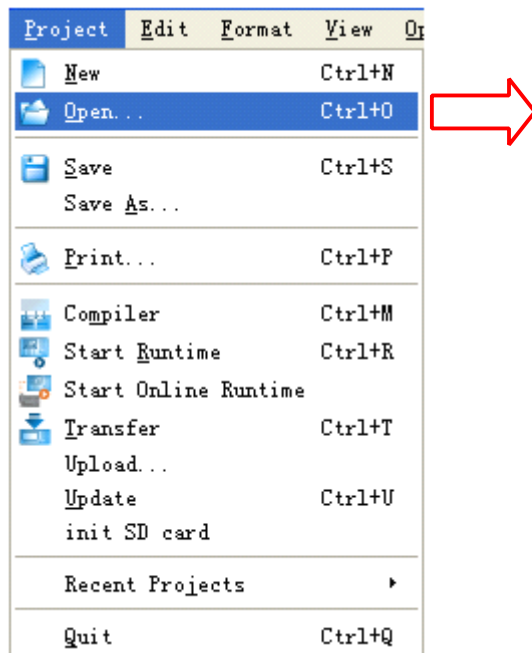


### Tips

- 1) The size of HMI Runtime screen is 1024\*768; Shortcut key F1~F12 which used to configure events would appear in the screen. F1~F12 would hide automatically while the project is under runtime condition, users can achieve the events by keyboard.
- 2) HMI Runtime screen can only configure a connection of s7-200, and cannot switch between other screens.

**[Open]**

Method 1: Select menu "Project" -> "Open" or click the button  from toolbar to open an existing project.



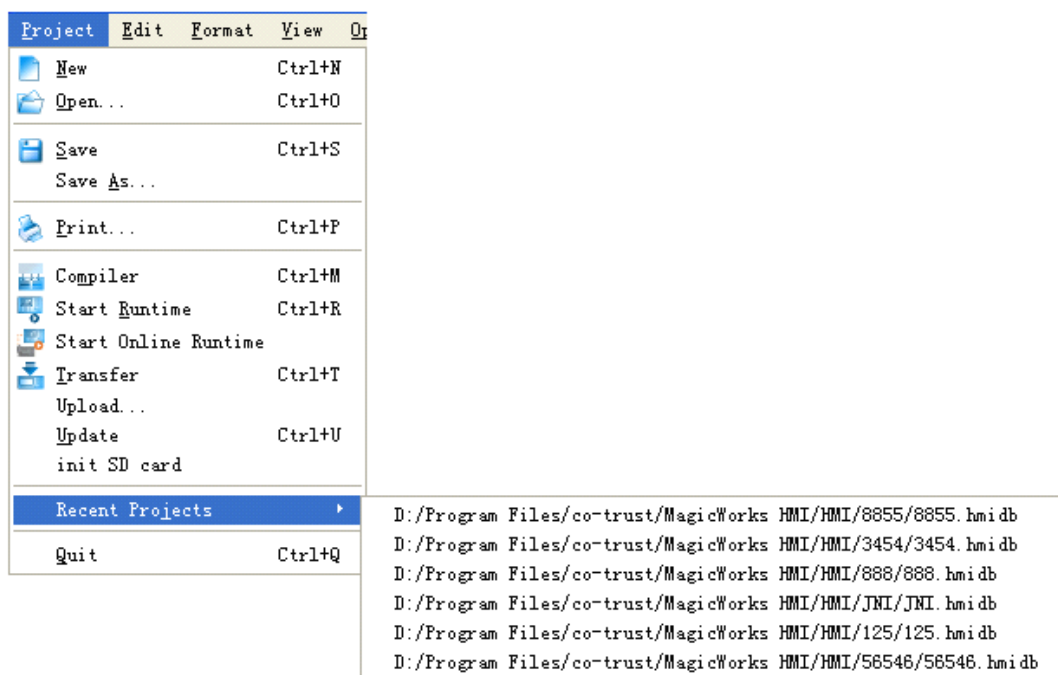
Choose one project, press 'Open' or double-click on the item to open the project.

Method 2: Double click the \*.hmidb file under project file path, that you can open the project directly.

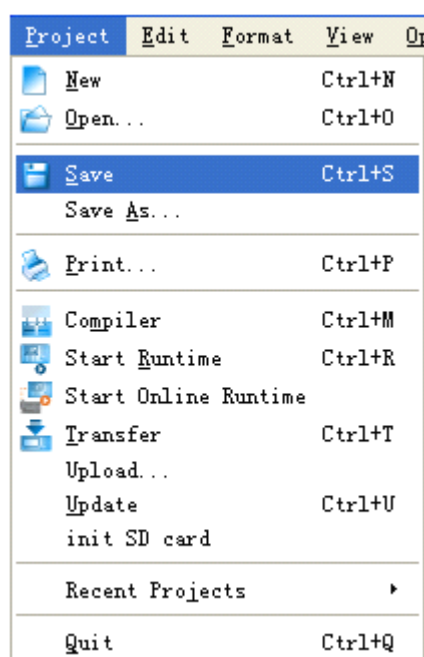
### [Recent Projects]

Select menu "Project" -> "Recent Projects" to open a recent project.

It can display 10 recent projects at most.

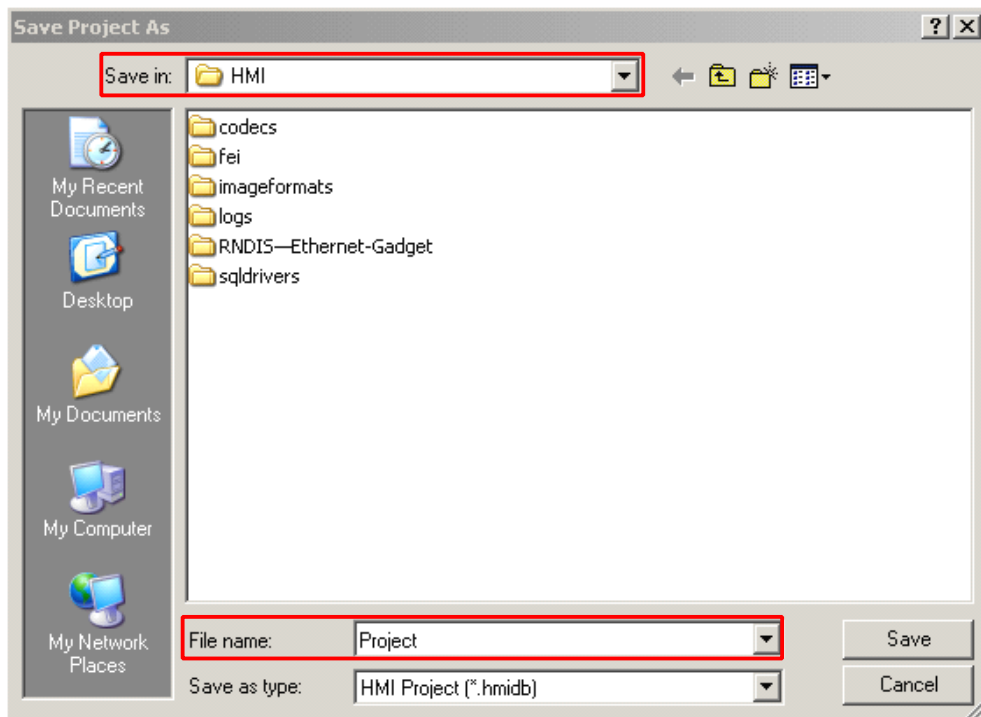
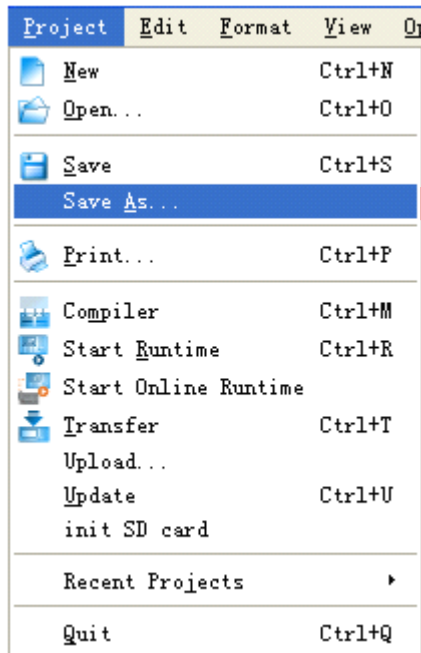
**[Save]**

Select menu "Project"-> "Save" or click the button  from toolbar to save the project.

**[Save As]**

If you want to preserve the project for another name or save to another location, you need to use the 'Save As'.

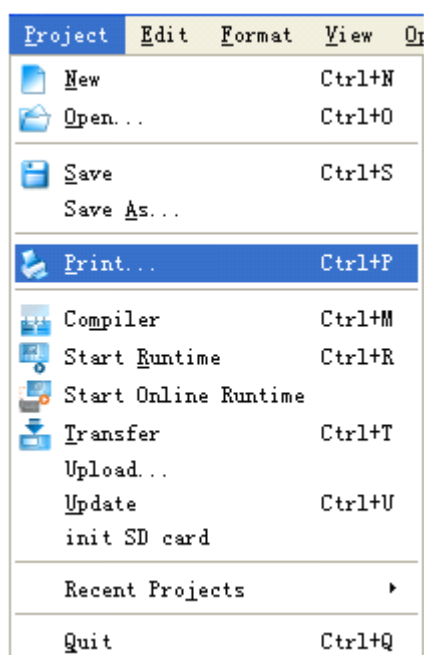
Select "Project"->"Save As" from menu bar to save as the current project.



As you perform "Save As" operation after you saved the project, the file would open the path of current project.

### [Print]

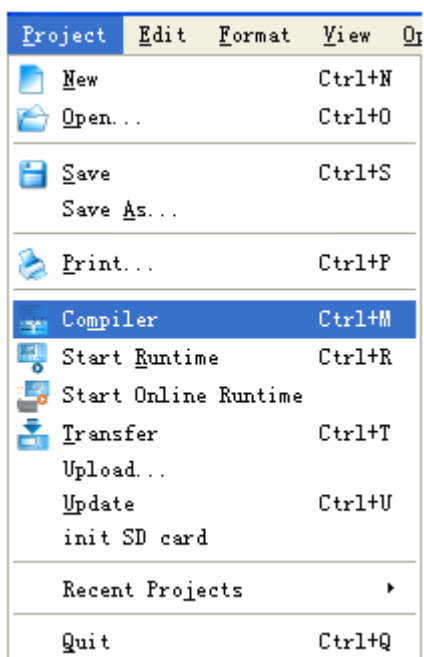
Print the current screen (not including the keys), current alarm view, data view and recipe view, etc..



### [Compiler]

Compile the current project, and display the compiling result in output view.

Select menu "Project" -> "Compiler" or click the button  to compile the current project.



### [Start Runtime]

Offline simulate the current project on PC.

Select menu "Project"-> "Start Runtime" or click the button  from toolbar to simulate the project.

| Project                                                                                                | Edit | Format | View | Or     |
|--------------------------------------------------------------------------------------------------------|------|--------|------|--------|
|  New                  |      |        |      | Ctrl+N |
|  Open...              |      |        |      | Ctrl+O |
|  Save                 |      |        |      | Ctrl+S |
| Save As...                                                                                             |      |        |      |        |
|  Print...             |      |        |      | Ctrl+P |
|  Compiler             |      |        |      | Ctrl+M |
|  Start Runtime        |      |        |      | Ctrl+R |
|  Start Online Runtime |      |        |      |        |
|  Transfer             |      |        |      | Ctrl+T |
| Upload...                                                                                              |      |        |      |        |
| Update                                                                                                 |      |        |      | Ctrl+U |
| init SD card                                                                                           |      |        |      |        |
| Recent Projects ▶                                                                                      |      |        |      |        |
| Quit                                                                                                   |      |        |      | Ctrl+Q |

**[Start Online Runtime]**

Online simulate the current project on PC.

| Project                                                                                                  | Edit | Format | View | Or     |
|----------------------------------------------------------------------------------------------------------|------|--------|------|--------|
|  New                  |      |        |      | Ctrl+N |
|  Open...              |      |        |      | Ctrl+O |
|  Save                 |      |        |      | Ctrl+S |
| Save As...                                                                                               |      |        |      |        |
|  Print...             |      |        |      | Ctrl+P |
|  Compiler             |      |        |      | Ctrl+M |
|  Start Runtime        |      |        |      | Ctrl+R |
|  Start Online Runtime |      |        |      |        |
|  Transfer             |      |        |      | Ctrl+T |
| Upload...                                                                                                |      |        |      |        |
| Update                                                                                                   |      |        |      | Ctrl+U |
| init SD card                                                                                             |      |        |      |        |
| Recent Projects ▶                                                                                        |      |        |      |        |
| Quit                                                                                                     |      |        |      | Ctrl+Q |

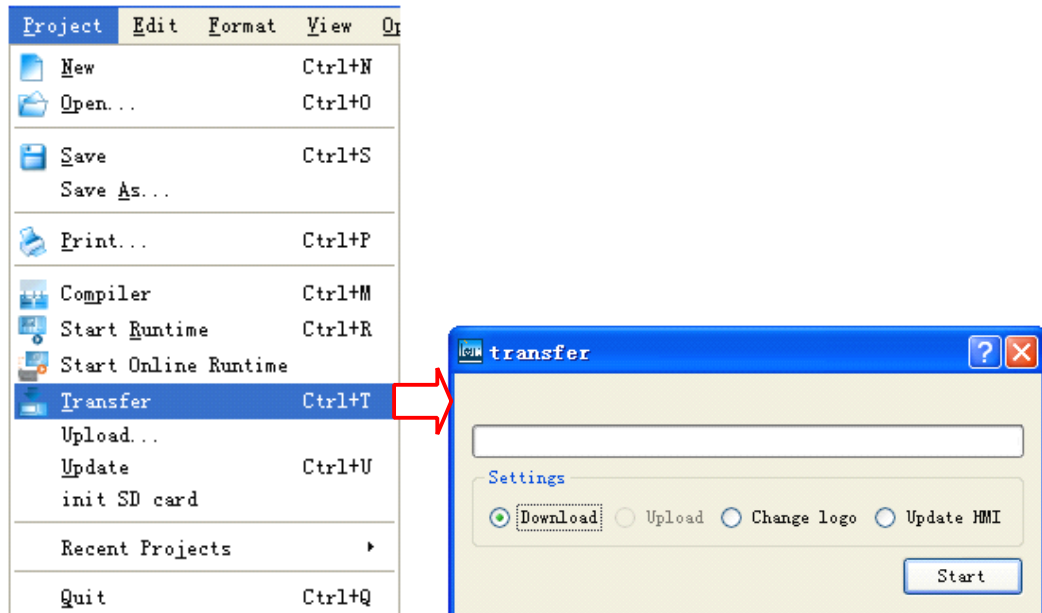
Start online runtime increases communication module on the basis of offline runtime, PPI protocol and COM1 series port is supported at present, and the available baud rate is 9600kbps and 19200kbps.

**Tip**

PORT1 of the connection in Magic HMI indicates the COM1 under online runtime, PORT0 indicates COM2 of the computer, series port cannot be used greater than COM2 (You can modify the COMx which is greater than COM2 to COM1 or COM2, before which you should change the COM1 or COM2 to others, such as COM200 or some other COMs).

**[Transfer]**

Select menu "Project"->"Transfer" or click the button  to download the project to HMI device.



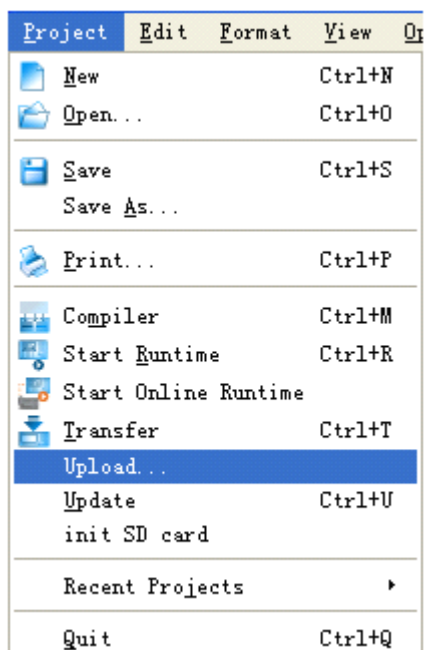
Download: Download the project from MagicWorks HMI to target machine;

Change logo: Change the splash screen of HMI device;

Update HMI: Upgrade the version of HMI device;

**[Upload]**

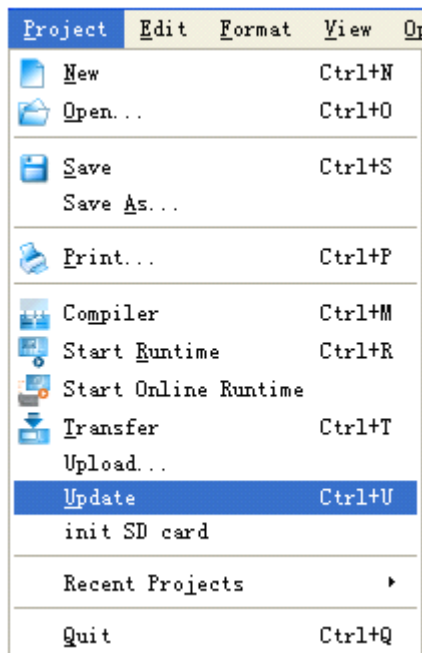
Select "Project"->"Upload" from menu bar to upload the project from HMI device to PC.



Upload: Upload the project of the HMI to upload folder, and named as tmp.hmidb, if the file had contained tmp.hmidb project, the new project would overlap the existing project.

### [Update]

Select "Project"->"Update" from menu bar to update the HMI system version to the MagicWorks HMI version.



Update the HMI system version to the MagicWorks HMI version.



### Tips

- 1) MagicWorks HMI V1.43 and later versions support this function.
- 2) The HMI would be rebooted after updating is finished.

### [Initialize SD card]

Applied to generate database file, data records and alarm records that configured by users. And store the records in the U disk or SD card for HMI device reading and writing.

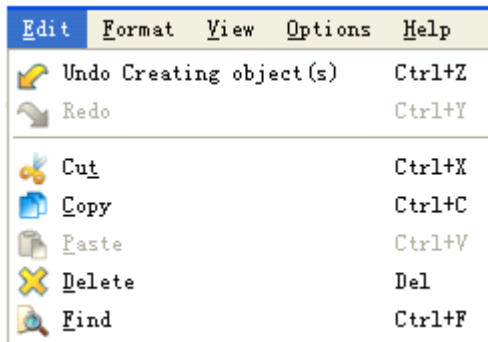
### [Quit]

Close MagicWorks HMI software interface.

### 3.1.2 Menu [Edit]

Menu [Edit] contains the command of the clipboard and search function.

Select menu [Edit], popup the following dialog:



**Undo:** Cancel the operation.

**Redo:** Restore an operation.

**Cut:** Cut the selected objects in the screen.

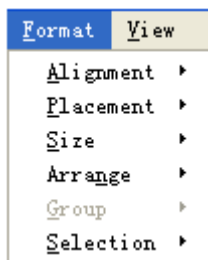
**Copy:** Copy the selected objects in the screen.

**Delete:** Delete the selected objects in the screen.

**Find:** Find the contents you need.

### 3.1.3 Menu [Format]

Select menu[Format] ,Popup the drop-down list:

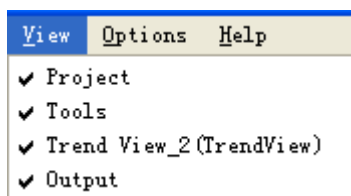


'Format' menu includes the command which organizes and format screen objects, when you adjust the objects' size or align them, the last selected object is the reference object of them.

| Menu      | Introduction                                                                                                                                                                                                                                                                          | Requirement                          |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Alignment | Edge alignment with the reference object you selected. There are six kinds of alignment: Left、Center vertically、Right、Top、Center horizontally、Bottom.                                                                                                                                 | At least two objects are selected.   |
| Placement | Align the interval of the selected objects. Including Horizontally Equal and Vertically Equal. The position of the two objects which has the max position and has the min position in the same direction aren't changed, all other objects in the two objects are evenly distributed. | At least three objects are selected. |
| Size      | According to width and height of the reference object to adjust the other object 's width and height, make them has the same width or height, including Same Width and Same Height.                                                                                                   | At least two objects are selected.   |

|           |                                                                                                                                                                                                                         |                                    |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Lock      | Lock: Lock the selected objects in the screen, and the locked objects would not respond to the drag operation of the mouse.<br>Unlock: Unlock the objects, and the objects would respond to the operation of the mouse. |                                    |
| Arrange   | Arrange the Layer of the selected object, including four kinds of arranges: Bring to Front, Move Forward, Move Backward and Bring to Background.                                                                        |                                    |
| Group     | Group the selected objects into one part.                                                                                                                                                                               | At least two objects are selected. |
| Selection | The selection method of combination objects, including three methods: Select all, select nothing and invert selection.                                                                                                  | At least two objects are selected. |

### 3.1.4 Menu [View]

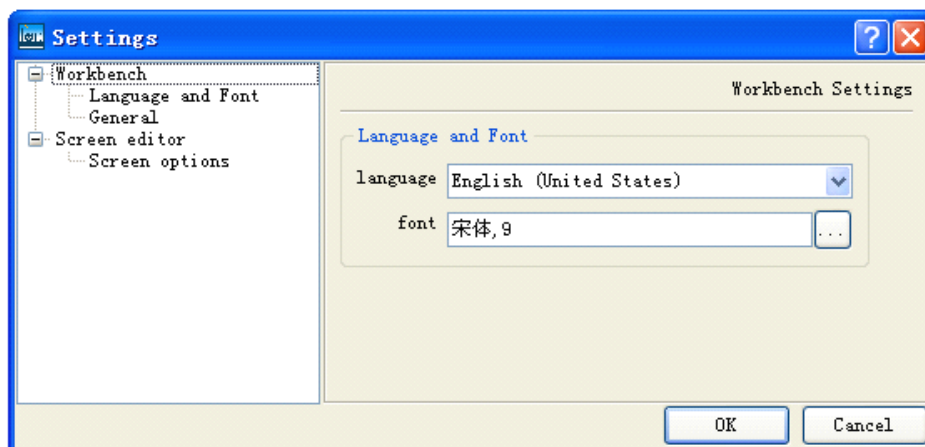


Function: Open or close the Project view, Tool window, Property view and Output view.

If choose some item, it will be marked with ( '✓' ), and open the corresponding view, otherwise it will be closed.

### 3.1.5 Menu [Options]

Select menu [Options], popup below dialog:

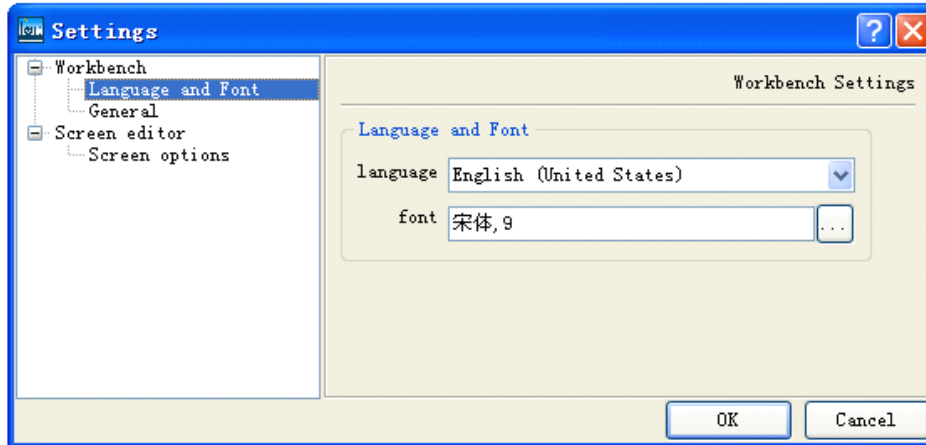


#### [Workbench]

You can set the "Language and font" and "General" of MagicWorks HMI by

configuring 'Workbench settings'.

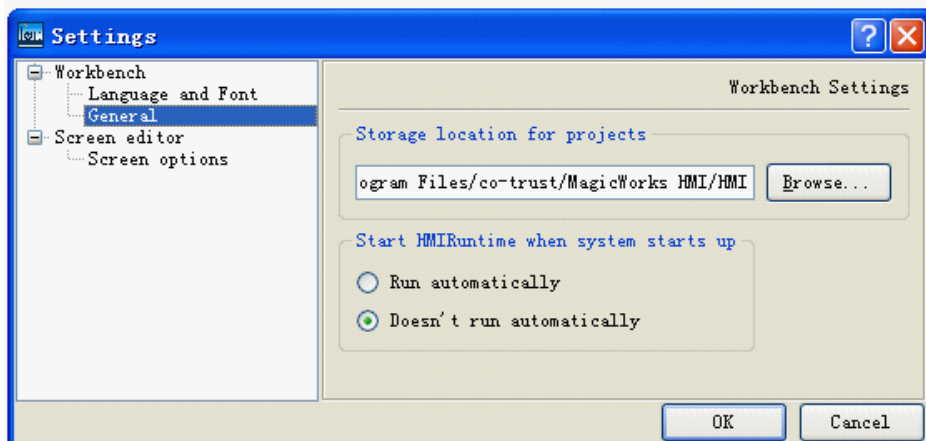
There are two languages to choose: 'English(United States)' and 'Chinese(People's Republic of China)'. Click button  to configure the font. The language and font settings will take effect when this application starts next time.



"General" is used to set the storage location for projects or select the startup of HMIRuntime while system is starting.

"Storage location for projects" is used to set the storage location for projects. After you set the "Storage location for projects", all the operations such as import or export for screens/tags, Logo configuration, open project, create new project would enter to the location. See as follows:

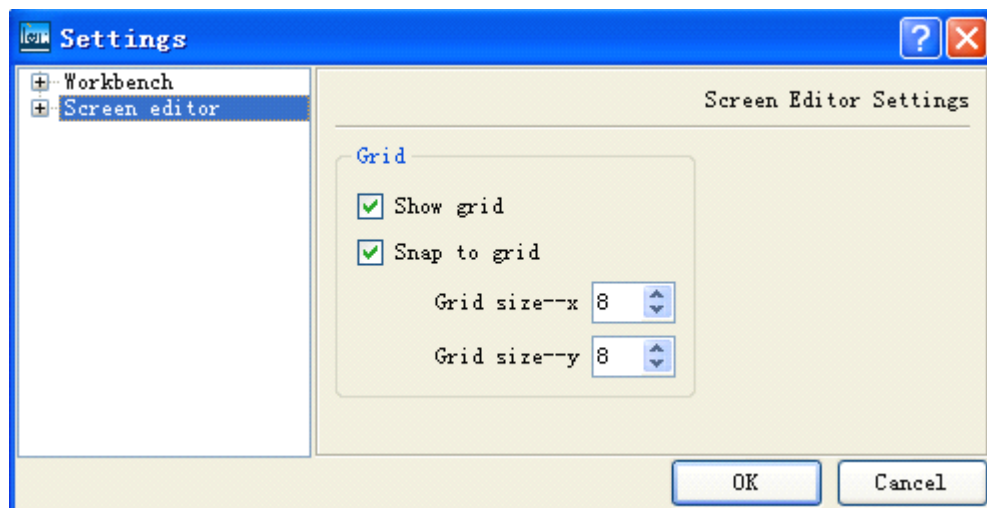
"Start HMIRuntime when system starts up" is used to select whether enable the HMIRuntime software while system is starting. Tick the box before "Run automatically" that the HMIRuntime would be enabled as the system is starting. Tick the box before "Doesn't run automatically" that the HMIRuntime would not be enabled as the system is starting.



### [Screen editor]

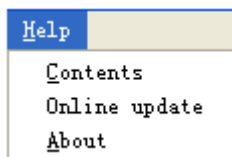
In this editor, you can configure whether to show the grid or not. Also you can set the size of 'Snap to grid' in screens.

Select 'Screen editor', popup below dialog box:



### 3.1.6 Menu [Help]

[Help] command is applied to call the help function.



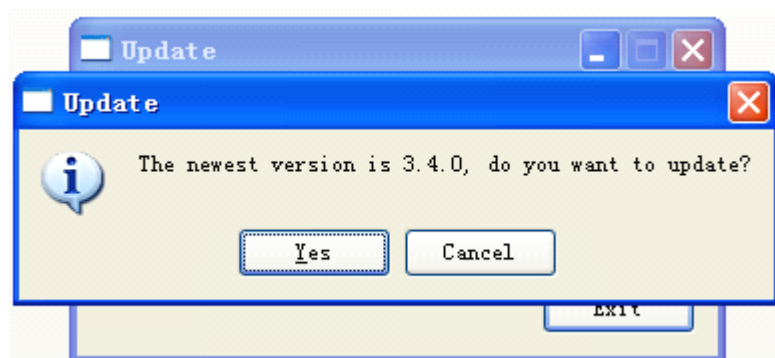
Select **【Help】** -> **【Content】** from the menu bar to transfer to the latest user manual.

Select **【Help】** -> **【Online update】** from the menu bar to update the MagicWorks HMI to the latest version online.

Note: This function is valid for V3.3.0 and later versions.

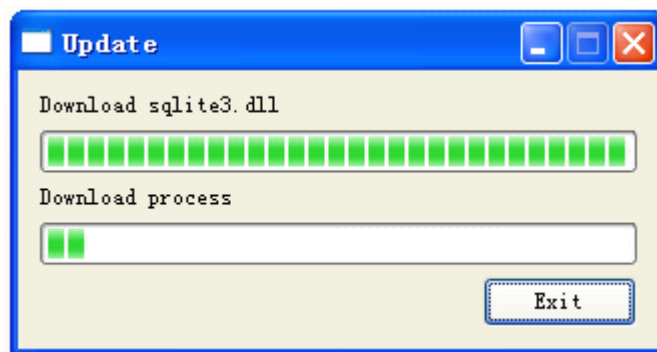
Please follow below steps to update the version online:

Step1: Click [Help]->[Online update] from menu bar, following dialog would appears:

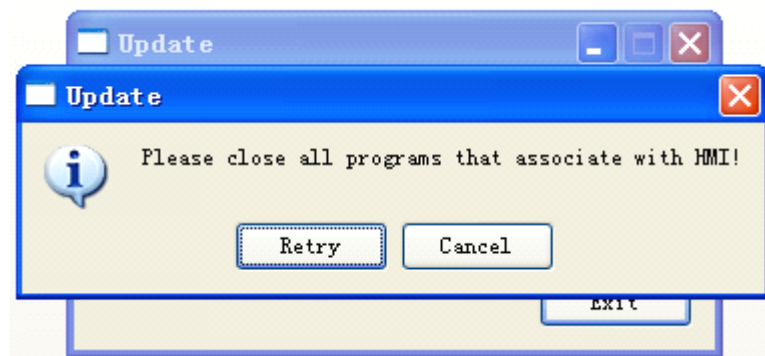




Step2: Click “Yes” from above dialog, the downloading process would be executing:



Step2: After the downloading is finished, below dialog would be prompted, click “Retry” to update, the tip of “Update is successful” as the downloading process is finished.



Note:

- ※ Please do not click “Cancel” while downloading is processing, otherwise all of the downloaded files would be deleted, in such case you need download the files as you are going to update again.
- ※ Please close the related files when downloading is processing or the downloading is finished, otherwise the update would not be completed.
- ※ A file named as “updatedownload” will be created in the install directory during downloading, please do not delete parts or all of the file, otherwise, the updated version would appear abnormalities.

Select 【Help】 -> 【About】 from the menu bar to get the latest software version, including call the help function.

## 3.2 Toolbar

You can quickly access the important functions that used frequently from the toolbar.  
Show as below:



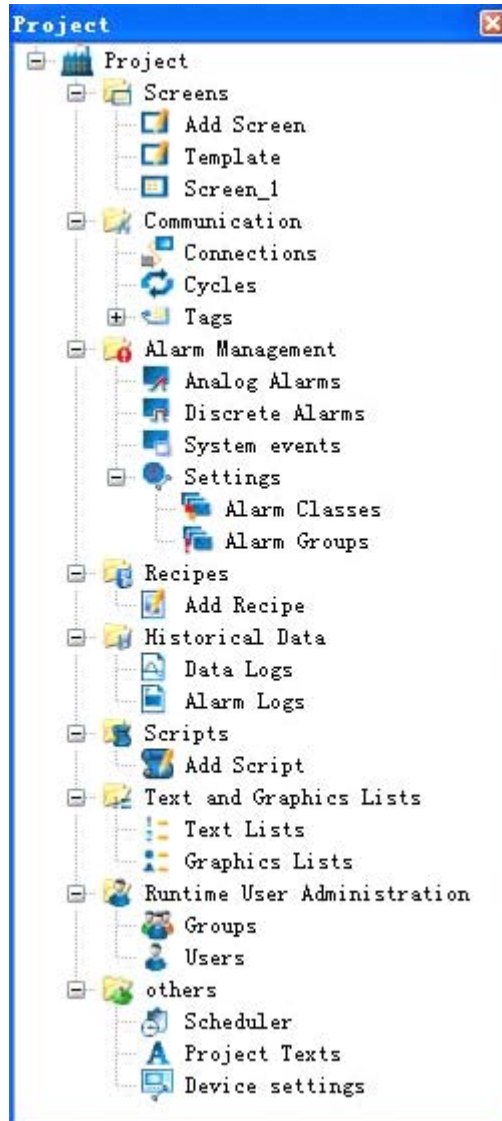
MagicWorks HMI provides the following toolbar options:

|                                                                                     |                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | New command. Use this command to establish a new project.                                                                                                                                                                                     |
|    | Open command. Use this command to open an existing project.                                                                                                                                                                                   |
|    | Save command. Use this command to save the current project.                                                                                                                                                                                   |
|    | Compiler command. Use this command to compile the current project, check whether the configuration is correct or not. The red font in the output view means the configuration errors, double-click "Error" can transfer to the failure place. |
|   | Start Runtime command. Use this command to simulate the project.                                                                                                                                                                              |
|  | Start online runtime command, the designated project would be simulated online (PPI protocol is supported at present).                                                                                                                        |
|  | Download project command. Use this command to download the project.                                                                                                                                                                           |
|  | Undo command. Use this command to cancel the last operation command.                                                                                                                                                                          |
|  | Restore command. Use this command to restore the last operation command.                                                                                                                                                                      |
|  | Cut command. Use this command to cut the graphical object that selected to the clipboard buffer.                                                                                                                                              |
|  | Copy command. Use this command to duplicate the selected graphics object to clipboard buffer.                                                                                                                                                 |
|  | Paste command. Use this command to paste the objects from clipboard buffer.                                                                                                                                                                   |
|  | Delete command. Use this command to delete the selected graphics object from the screen.                                                                                                                                                      |
|  | Print command. Use this command to print the current screen, alarm view, data view and recipe view.                                                                                                                                           |
|  | Find command. Use this command to find the contents you need.                                                                                                                                                                                 |
|  | Zoom in command. Use this command to enlarge the current picture. To keep on enlarging, please continue to execute this command.                                                                                                              |
|  | Zoom out command. Use this command to shrink the current picture. To keep on shrinking, please continue to execute this command.                                                                                                              |

|                                                                                     |                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Center objects vertically. Use this command to center the selected objects(Two or more) vertically.                                                                                                                                                                                     |
|    | Center objects horizontally. Use this command to center the selected objects(Two or more) horizontally.                                                                                                                                                                                 |
|    | Left Justify command. Use this command to justify the selected objects(two or more) to align to the leftmost objects.                                                                                                                                                                   |
|    | Right Justify command. Use this command to justify the selected objects(two or more) to align to the rightmost objects.                                                                                                                                                                 |
|    | Top Justify command. Use this command to justify the selected objects(two or more) to align to the topmost objects.                                                                                                                                                                     |
|    | Bottom Justify command. Use this command to justify the selected objects(two or more) to align to the bottommost objects.                                                                                                                                                               |
|    | Space objects horizontally equal command. Use this command to justify the selected objects(three or more) as the same space horizontally.                                                                                                                                               |
|    | Space objects vertically equal command. Use this command to justify the selected objects (three or more) as the same space vertically.                                                                                                                                                  |
|    | Size objects horizontally equal command. Use this command to justify the selected objects(two or more) to be same size of the longest objects horizontally.                                                                                                                             |
|   | Size objects vertically equal command, Use this command to justify the selected objects(two or more) to be same size of the longest objects vertically.                                                                                                                                 |
|  | Move selection to the front command. Use this command to move the selected objects to the front.                                                                                                                                                                                        |
|  | Move selection forward one level command. Use this command to move the selected objects forward one level.                                                                                                                                                                              |
|  | Move selection backward one level command. Use this command to move the selected objects backward one level.                                                                                                                                                                            |
|  | Move selection to the background command. Use this command to move the selected objects to the background.                                                                                                                                                                              |
|  | Rotate command. Use this command to rotate the selected objects from clockwise rotation direction to 90 degrees.(The objects(Two or more) which had been grouped also can be rotated. Grouped Objects, user view, alarm view, recipe view, trend view and data view cannot be rotated.) |
|  | Group command. Use this command to compose the selected objects into one group, you can edit the group the same as other objects.(user view, alarm view, recipe view, trend view and data view cannot be composed.).                                                                    |
|  | Ungroup command. Use the command to decompose the group,restore the group to single objects.                                                                                                                                                                                            |
|  | Lock Command. Use the command to lock the selected objects in the screen, and the locked objects would not respond to the drag operation of the mouse.                                                                                                                                  |
|  | Unlock Command. Unlock the objects, and the objects would respond to the operation of the mouse.                                                                                                                                                                                        |

### 3.3 Project view

In the project view, all of the available components are displayed as a tree structure.



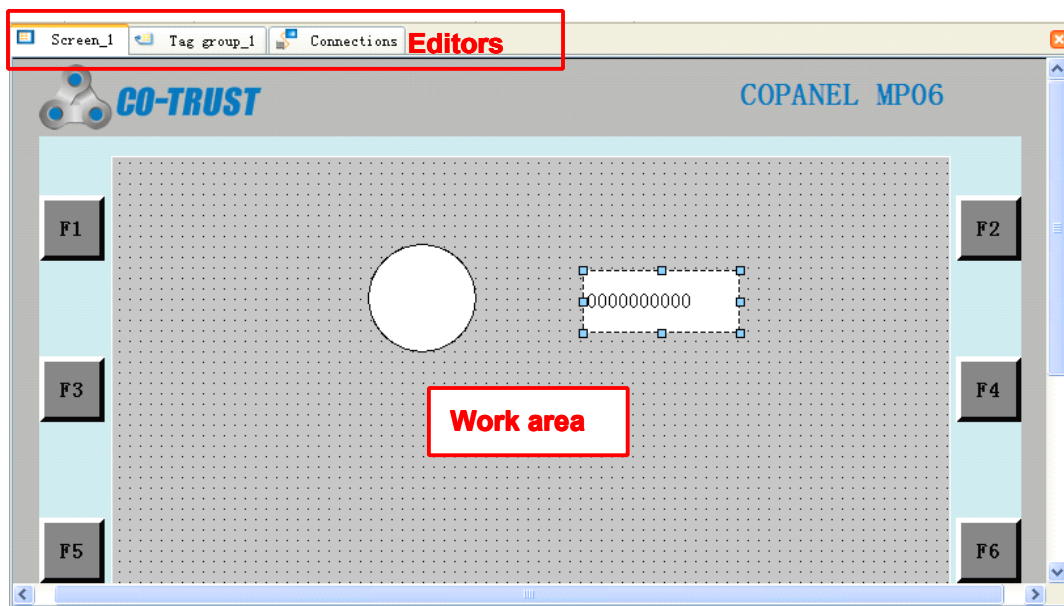
Note: You can rename the new screen, tag\_group, scripts, data logs, Alarm logs in the project view by pressing F2 key from the keyboard.

### 3.4 Work area

You can edit screen objects in work area.

Double-click the component in project view to open the editor and display its work area. Click the upper-right corner button  of work area to close the open editor.

When multiple editors are opened, click the upper tag in work area to switch to the corresponding editor, it's allowed to open 20 editors at most.



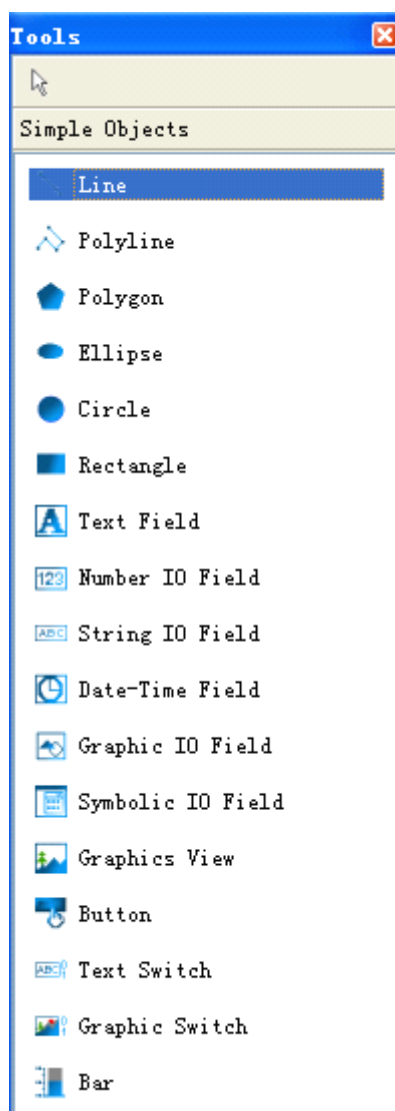
### 3.5 Tool window

Tool window includes Simple Objects, Enhanced Objects, Graphics and Object Inspector.

#### Simple Objects

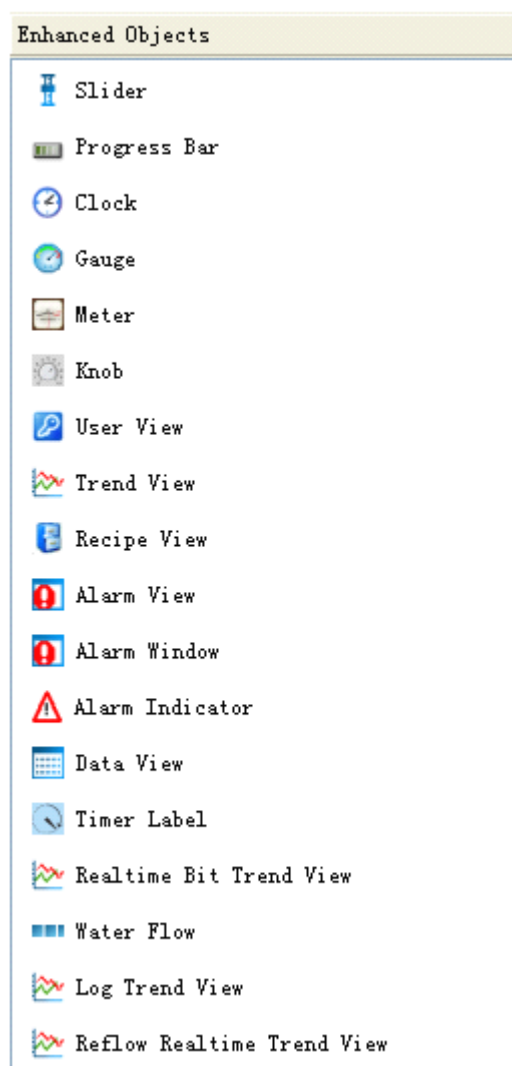
Simple objects include Line, Poly Line, Polygon, Ellipse, Circle, Rectangle, Test Field, Number IO Field, String IO Field, Data-time Field, Graphic IO Field, Symbolic IO Field, Graphics view, Button, Test Switch, Graphic Switch and bar.

Simple objects' screen see as following figure:



### Enhanced Objects

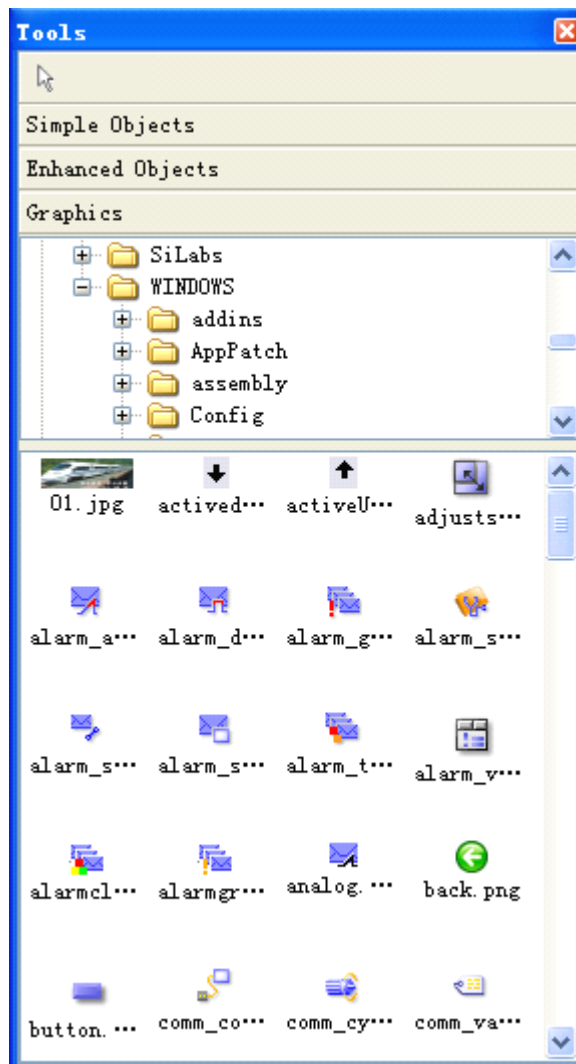
Complex objects are basically some more powerful components. The purpose of these objects is dynamic display process. Enhance objects include Slider、Progress Bar、Clock、Gauge、Meter、Knob、User View、Trend View、Recipe View、Alarm View、Alarm Window、Alarm Indicator、Timer Label、Data View、Realtime Bit Trend View and Water Flow. It shows as following picture.

**Tips**

- 1) The Alarm window and Alarm Indicator can only be configured in the Template.
- 2) Log Trend View and Reflow Realtime Trend View can only be configured under HIM Runtime.

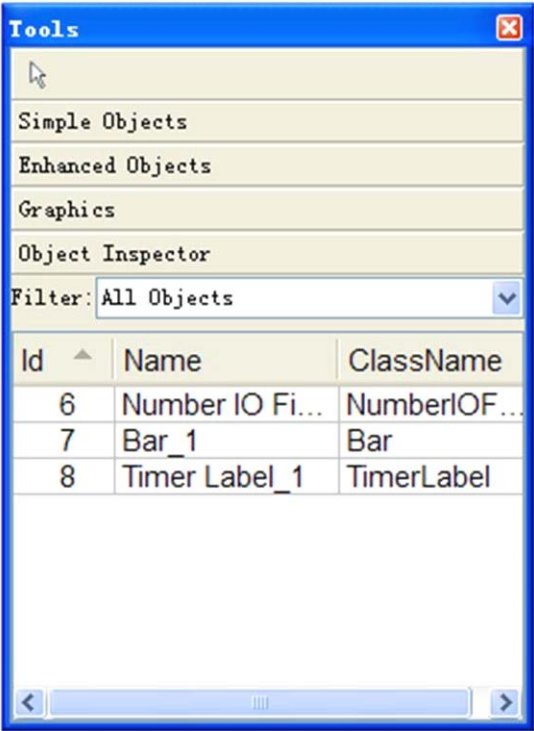
**Graphics**

These graphics are existing in your computer, you can preview them in Graphics Tool and configure them for screens. Graphics Tool show as below:



## Object Inspector

Using the Object Inspector to display all the objects of the current screen in the table, click the object from the table, you can make the selected object to be the current editing item.

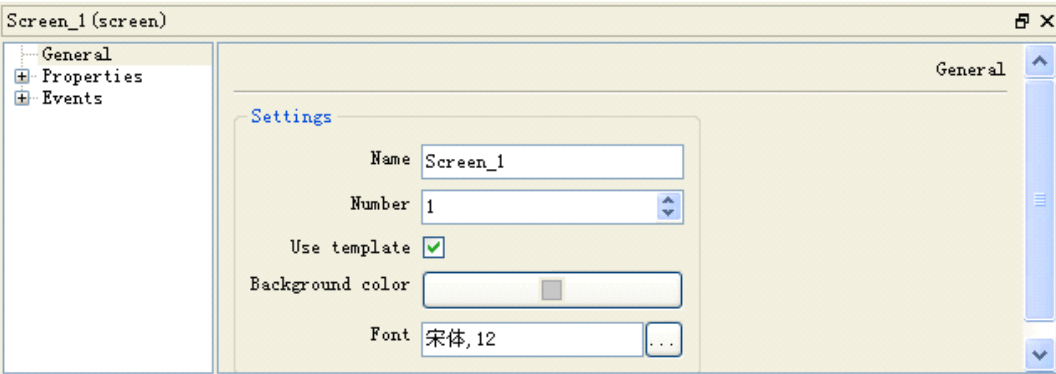


### 3.6 Property view

Property view is used to display and set the properties of screens, objects, tags and alarms.

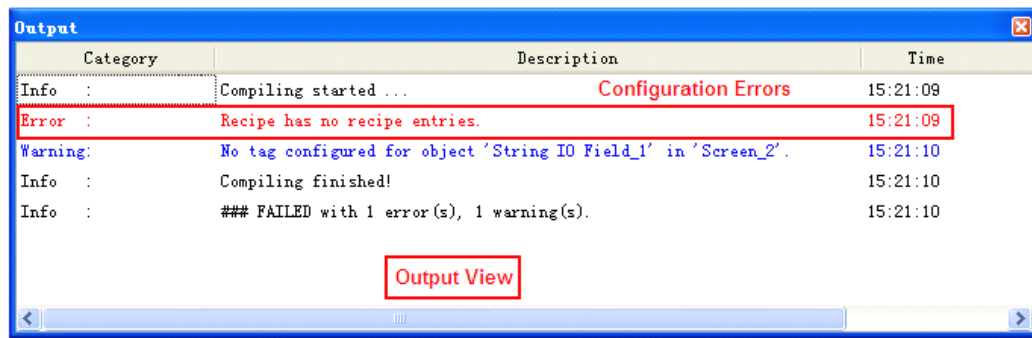
If you switch to another screen, the property of object, tag or alarm is automatically switched.

The property view is displayed under the work area by default, you can close it by clicking the upper-right corner button . The following figure shows the property view of a screen:



### 3.7 Output view

Output view is used to display the compiler information, show as below:



## 3.8 Simulator

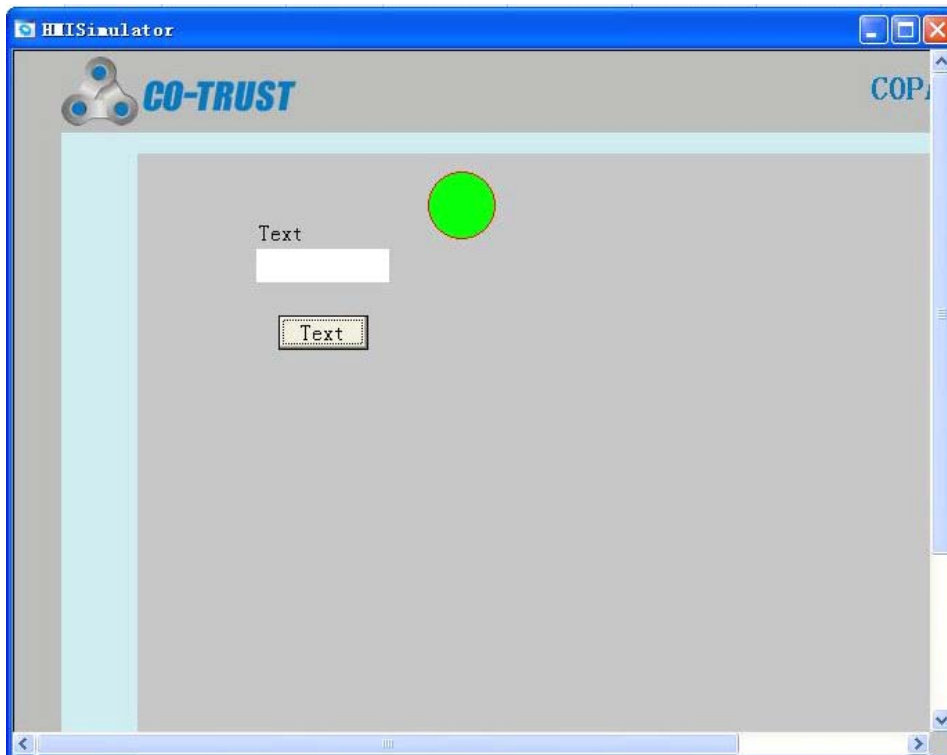
After configured the object, you can simulate the project in runtime system, click icon



to start Runtime.

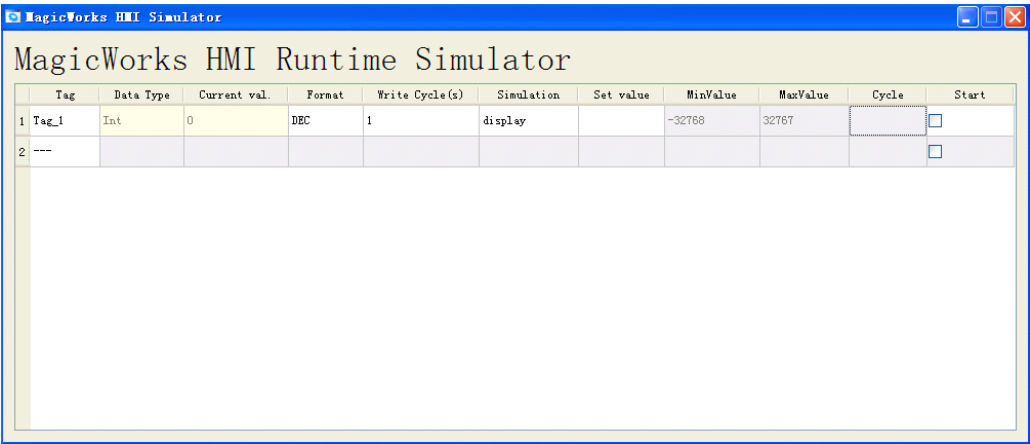
The function of simulator is to debug the projects' functions offline. Simulator includes two parts: the simulator of screens and the simulator of tags which are configured in project.

The simulator of screens is displaying as follows:



In the simulator of screens, you can simulate user's operation by mouse and keyboard offline.

The simulator of tags is displaying as follows:



In the simulator, users can operate on the screen of the objects, such as buttons, to simulate some control process. It can also monitor the process of tags. We can use the empty simulation to simulate the variable value from PLC. Double-click 'tag' column to show each variable value or input tags directly.

## 4 Configuration method of MagicWorks HMI

The general process of configuring a project:

1. Create a new project.
2. Add connections, choose communication protocol for them.
3. Define internal and external tags.
4. Design the project's screens.
5. Compile and Start Runtime.
6. Download projects to the HMI and run it.

Instruction: These steps are not completely independent, in fact, they are often cross.

### 4.1 How to configure a project

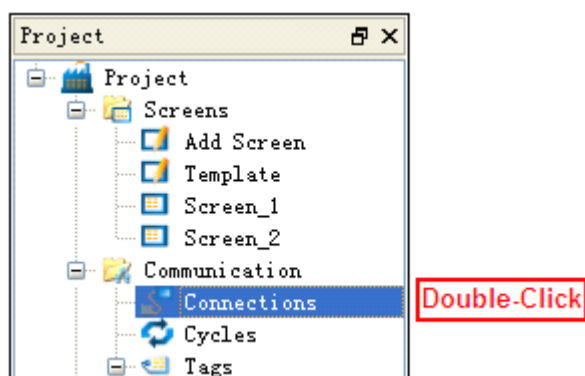
Please refer to chapter 2.1 of creating a new project.

### 4.2 How to configure connections

Use 'Connection' editor to create new connections.

The steps of configuring a new connection, show as below:

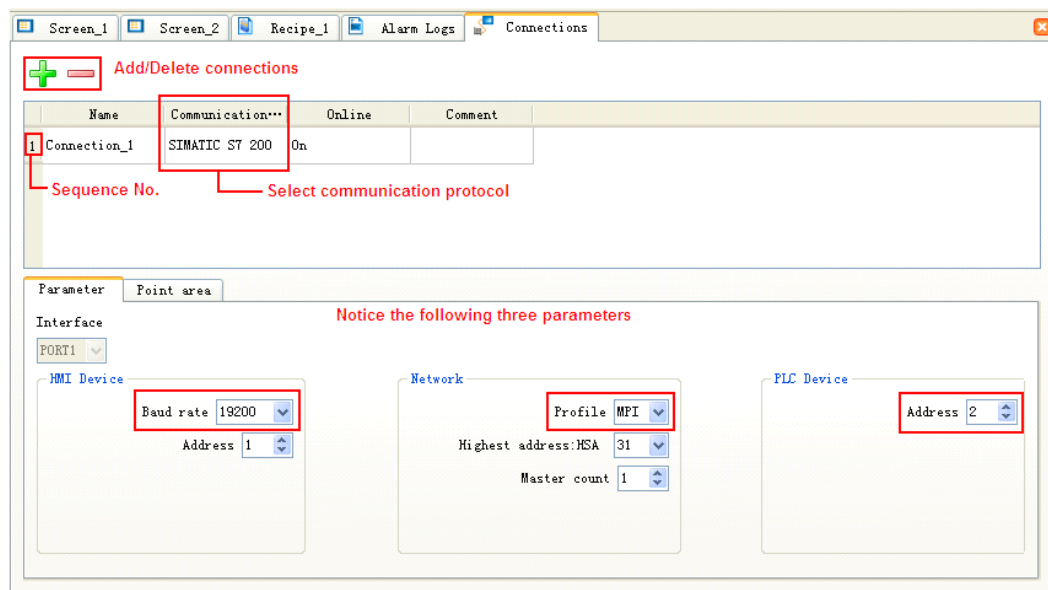
1. Double-click 'Connections' to open the connection editor in the project view, see as follows:



2. Click  or right-click on the Sequence Number to select "Add" to add a new connection.

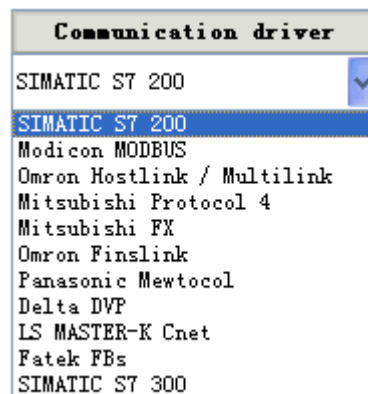
Click  or right-click on the Sequence Number to select "Delete" to delete the

selected connections.



If you want to rename the new connection, double click the 'Name' column in the connection editor.

Assign a communication driver for the new connection in 'Communication driver' column. There are ten communication drivers for you to select: SIMATIC S7 200, Modicon MODBUS, Omron Hostlink / Multilink, Mitsubishi Protocol 4, Mitsubishi FX, Omron Finslink, Panasonic Mewtocol, Delta DVP, LS MASTER-K Cnet, Fatek FBs, SIMATIC S7 300.



### 3. Configure "Parameters" for the new connection.

Parameters mainly include four parts: Interface, HMI Device, Network and PLC Device.

We should configure the network's profile, the HMI device's baud rate and its address, and the PLC device's address.

The screenshot shows the 'Point area' configuration window. It has three sub-sections: 'HMI Device' with 'Baud rate' set to 19200 and 'Address' set to 1; 'Network' with 'Profile' set to MFI, 'Highest address:HSA' set to 31, and 'Master count' set to 1; and 'PLC Device' with 'Address' set to 2.

Baud rate: Define the transmission rate between HMI and PLC device.

Profile: Choose the relevant configuration files in the network.

Address: Set the address of the PLC device which would connect to the HMI device.

Different connections with the same interface must have the same HMI Device and Network, but the address of PLC Device must be different.

4. We can configure usable point area by using "Point area" of the connection editor.

Please refer to chapter 5.1 for details.

The screenshot shows the 'Point area' configuration window with two tables. The first table, 'For all connections', has columns: Connection, Name, Address, Length, Trigger mode, Acquisition cycl, and Comment. It lists three connections: 1 (Screen number, Length 5), 2 (Date/Time PLC, Length 6), and 3 (Project Id, Length 1). The second table, 'For each connections (Connection\_1)', has columns: Active, Name, Address, Length, Trigger mode, Acquisition cycl, and Comment. It lists four connections: 1 (Date/Time, Active Off, Length 6), 2 (Data mailbox, Active Off, Length 5), 3 (Coordination, Active Off, Length 1), and 4 (Job mailbox, Active Off, Length 4).

5. Save the project.

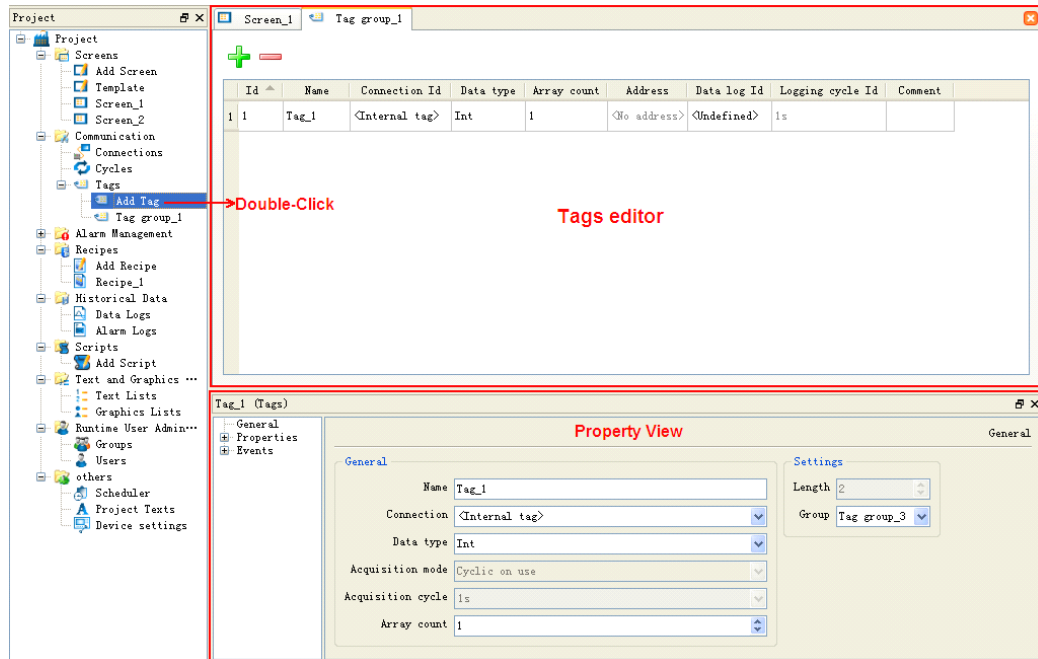
## 4.3 How to configure tags

Tag groups and tags can be added, deleted or renamed, also we can edit the tag's properties and control the tag table's displaying.

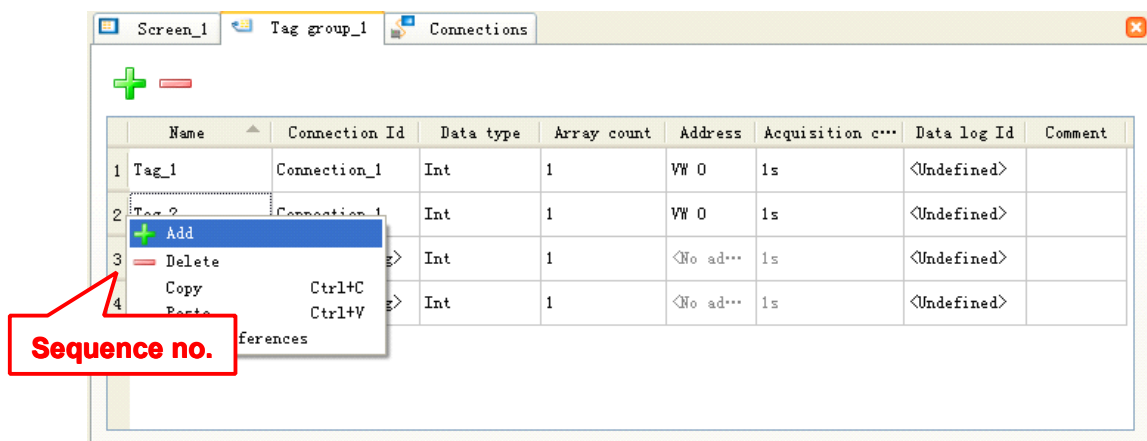
### [Add tags]

Creating a new tag:

1. Double click 'Add tags' in the Project view to add new tag group, double click tag group can open the tag editor, see as below:

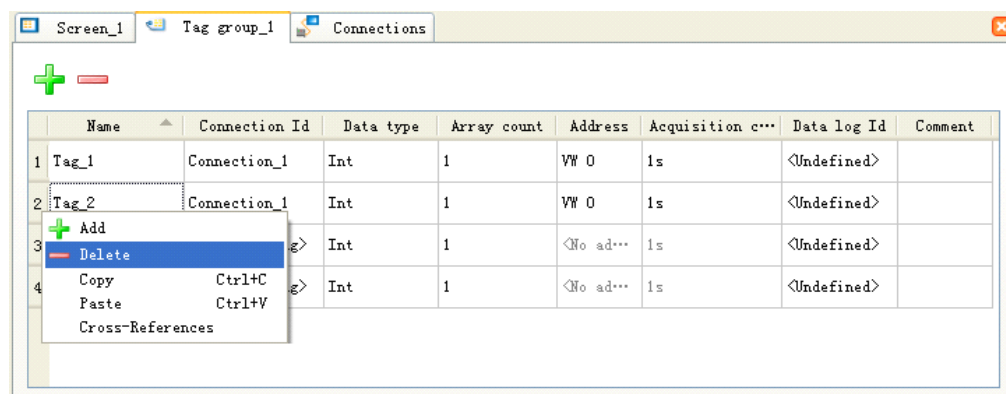


2. Click  or right-click the mouse on the Sequence Number and choosing "Add" to add a new tag.

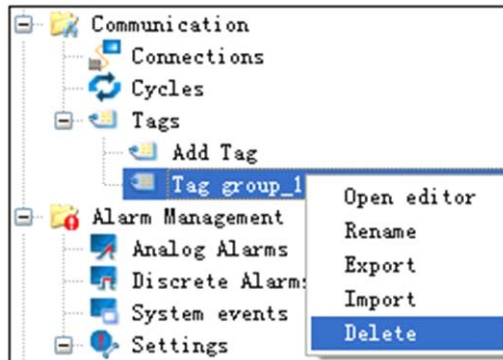


### [Delete tags]

Click  or right-click on the Sequence Number to choose 'delete' or enter the Delete key from keyboard to delete one tag or multiple tags, you can select multiple tags by drag the mouse.



You can also delete the tag group by right-clicking on the tag group that you don't need, see below:



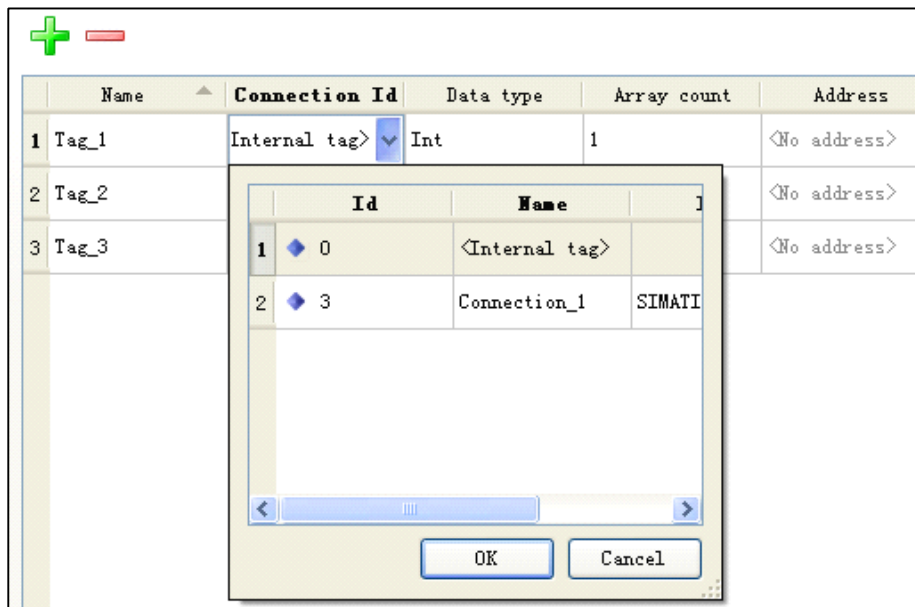
### [Configure the properties of the tag]

There are four important properties for the tag to be configured: Connection Id, Data type, Address, Acquisition cycle Id.

We can edit the tag in the table or in its property view.

#### 1) Configuring 'Connection ID'

Select the tag, double-click the 'Connected Id' column of the tag editor, it appears a dropdown arrow, and click it, it will popup a dialog box which we can specify a connection for the tag, see as follows:



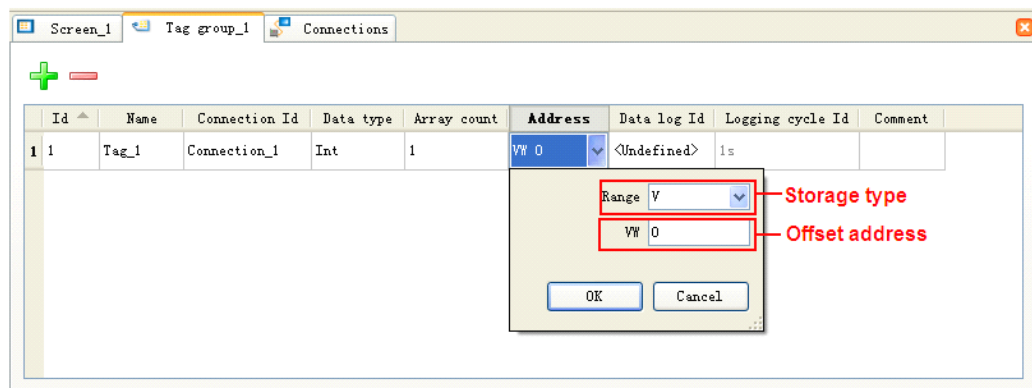
#### 2) Configuring 'Data type'

Select the tag, double-click the 'Data type' of the tag, it appears a dropdown arrow, and click it, it will popup a dialog which we can select a data type for the tag, see as follows:

|   | Id | Name  | Connection Id  | Data type                                                                     |
|---|----|-------|----------------|-------------------------------------------------------------------------------|
| 1 | 1  | Tag_1 | <Internal tag> | Int                                                                           |
| 2 | 2  | Tag_2 | <Internal tag> | Char<br>Byte                                                                  |
| 3 | 3  | Tag_3 | <Internal tag> | Int<br>UInt<br>Long<br>ULong<br>Float<br>Double<br>Bool<br>String<br>DateTime |

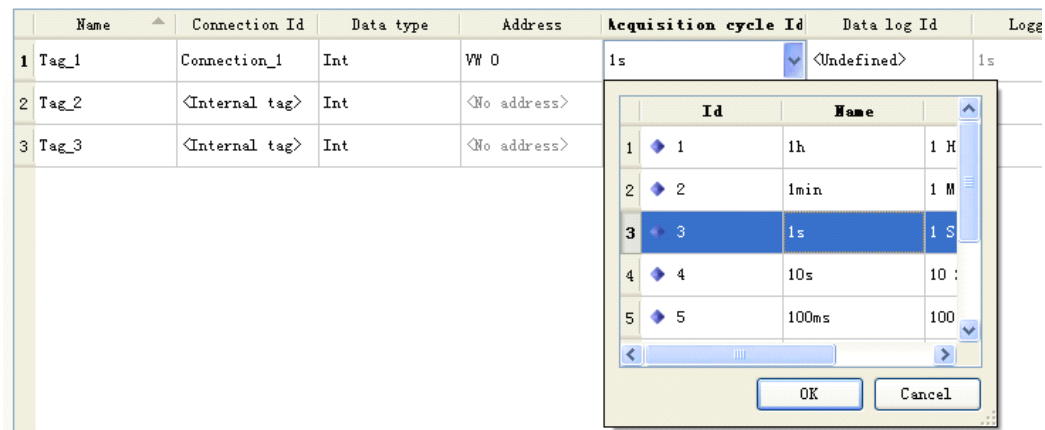
### 3) Configuring 'Address'

Select the tag, double-click the 'Address' of the tag. It appears a dialog, and click it, it will popup a dialog which we configure storage area type and offset address, see as follows:



### 4) Configuring 'Acquisition cycle'

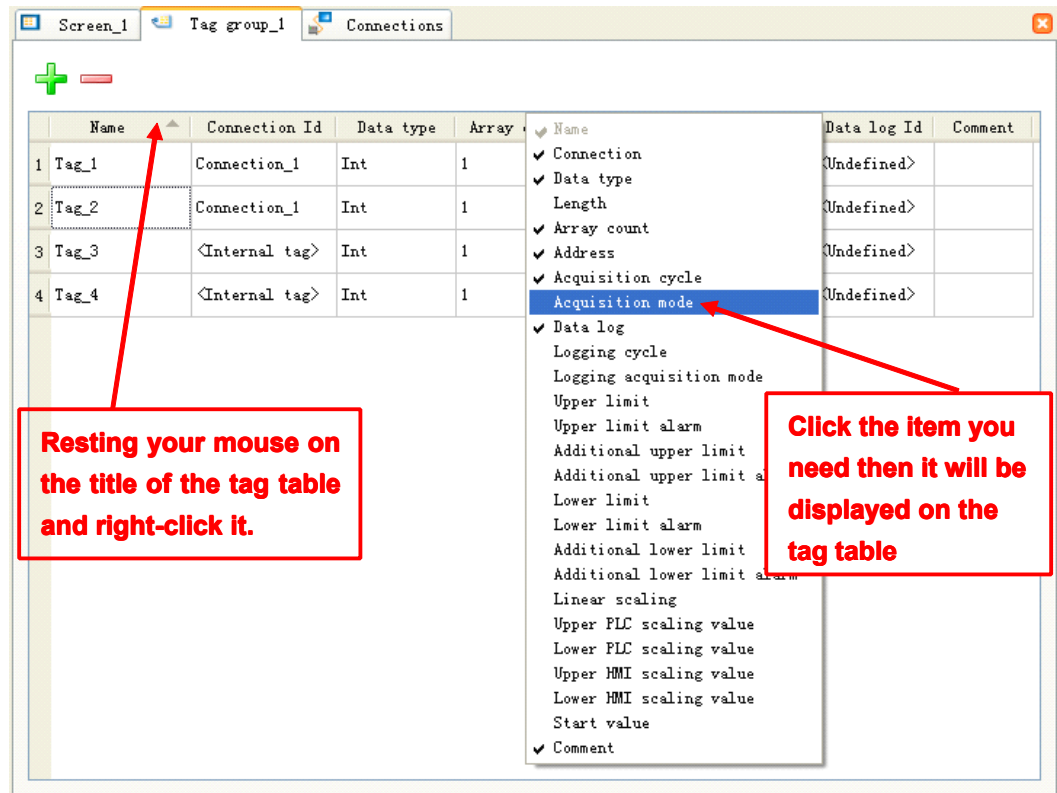
Select the tag, double-click the 'Acquisition cycle' of the tag. It appears a dialog, and click it, it will popup a dialog which we can select a cycle, as follows:



**[Control the table's displaying]**

Show or hide the columns of table to control the table's displaying.

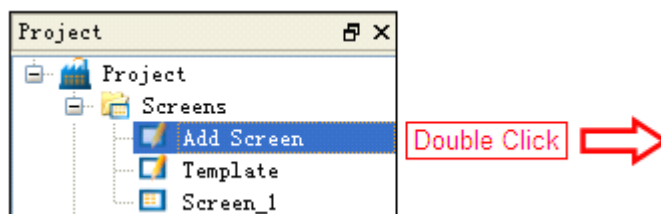
Right-click the title of horizontal, enable or disable the item in the popup list, see as following, If choose '✓', so display the column, otherwise hide the column.



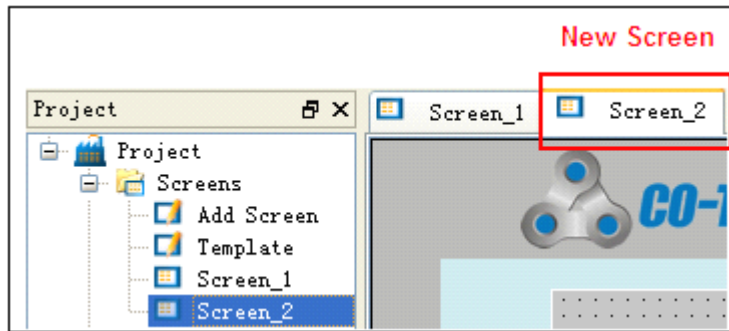
## 4.4 How to design screens

### 4.4.1 Create Screen

A new screen will be automatically created when you creat a new project. Double-click 'Add Screen' to add a new screen, see as follows:

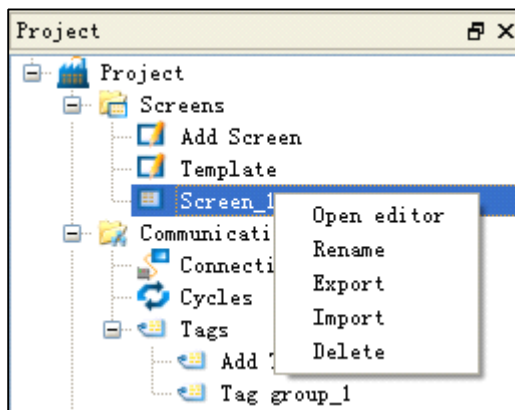


The new screen is created, and the new screen is opened in work area, show as follows:



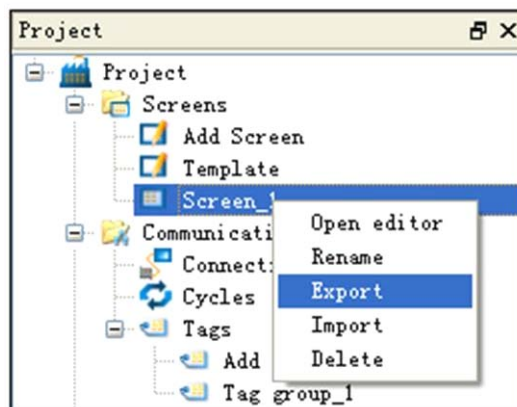
#### 4.4.2 Edit Screen

Right-click the screen in project view, then choose the relevant options to edit screen. The following figure is the right-click menu, show as follows:



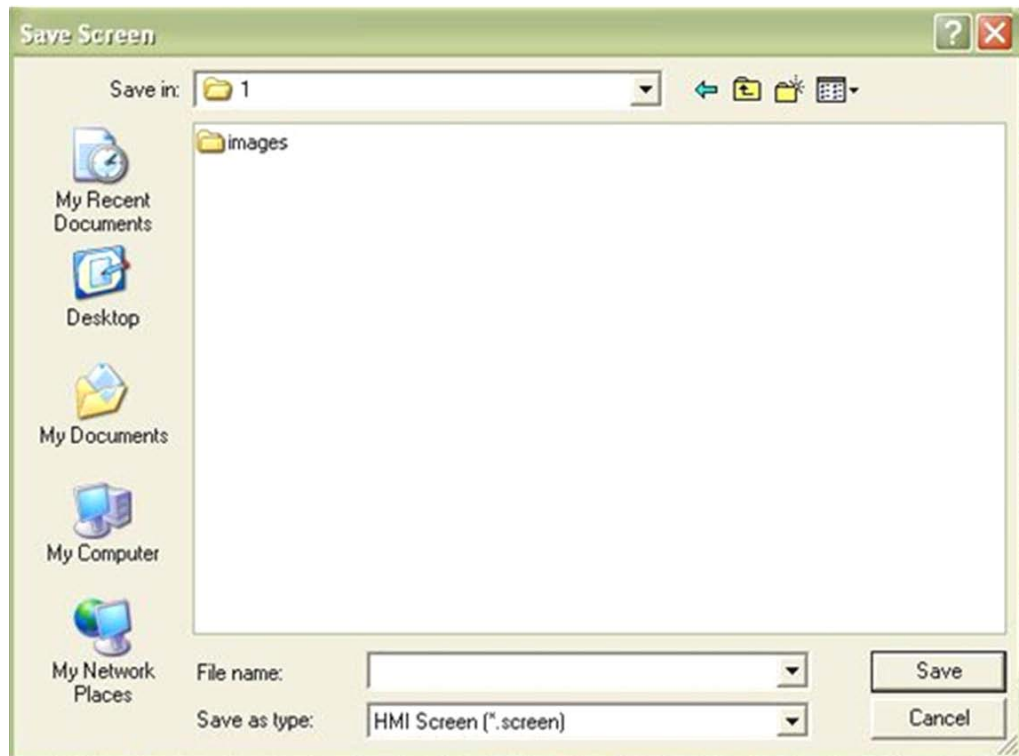
#### [Export screen]

Export screen is copying screen object.



The steps of exporting the screen show as follows:

Right-Click on the screen which needs to be exported and then click Export. It will show following figure:



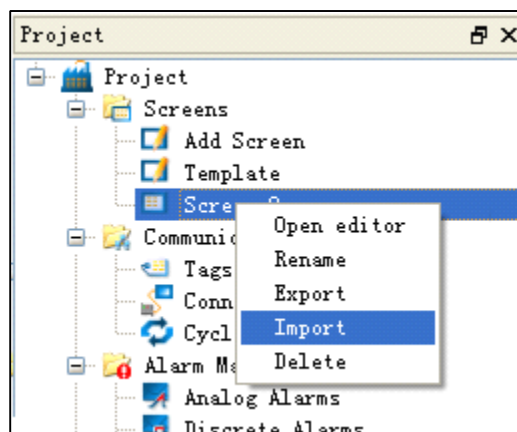
Choose the path to save the screen.

Input screen name in the “filename” column.

Choose the default values 'HMI screen (\*.screen)' in the “Save as type” option.

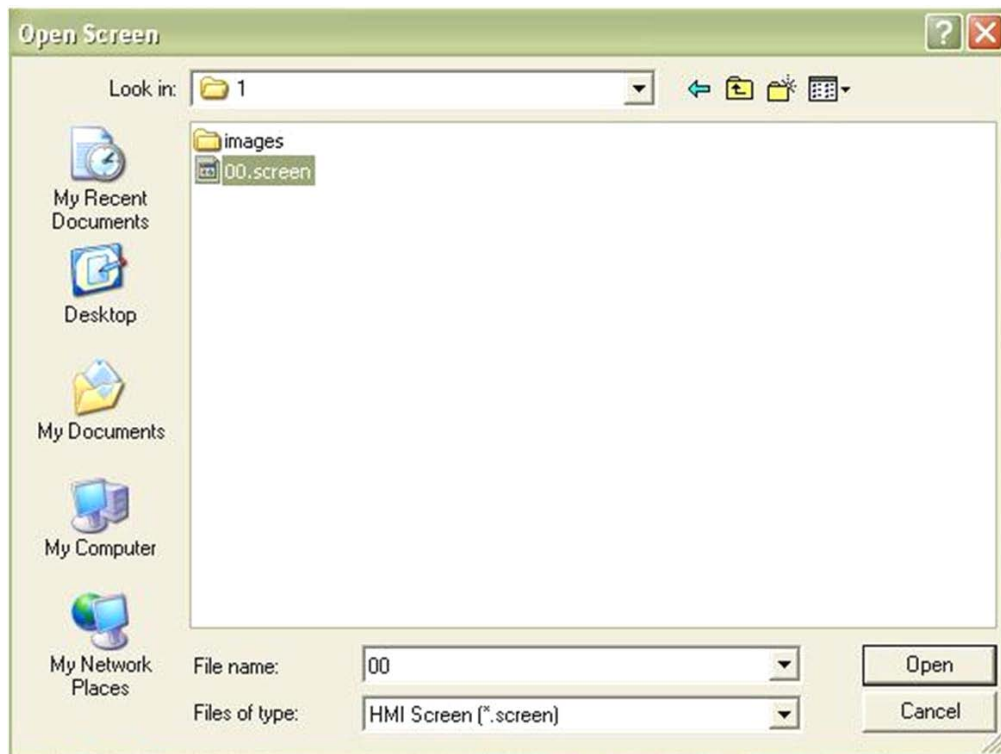
### [Import screen]

Import screen is pasting screen object.



Steps as follow:

Right-Click on the screen which needs to be imported and then click “Import”. It will show following figure:



Find the storage location and choose the screen (\*.screen).

### [Rename screen]

Rename screen: Change the name of the selected screen.

### [Delete screen]

Delete: Delete the selected screen.

Edit the properties of the screen:



“General” properties are described as below:

| Property name | Description                        |
|---------------|------------------------------------|
| Name          | Customize the name for the screen. |
| Number        | Edit screen ID.                    |

|                  |                                          |
|------------------|------------------------------------------|
| Use template     | Whether to enable the template or not.   |
| Background color | Set the background color.                |
| Font             | Set the default font for screen objects. |

“Properties” properties are described as following:

Infotext: Describe the object by the text.

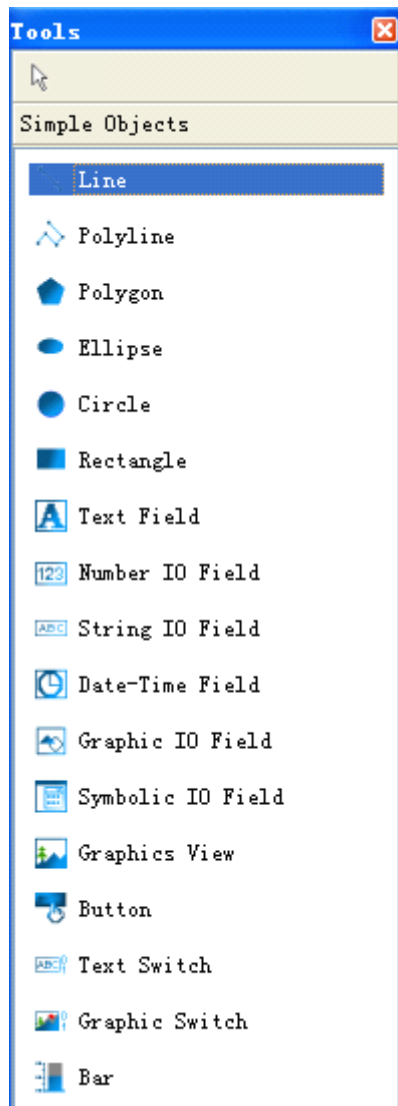
“Events” properties refer to chapter 11.1.

Note: After setup the fonts under “General” property, the text in the screen all default for this font, users can also edit font in the screen directly.

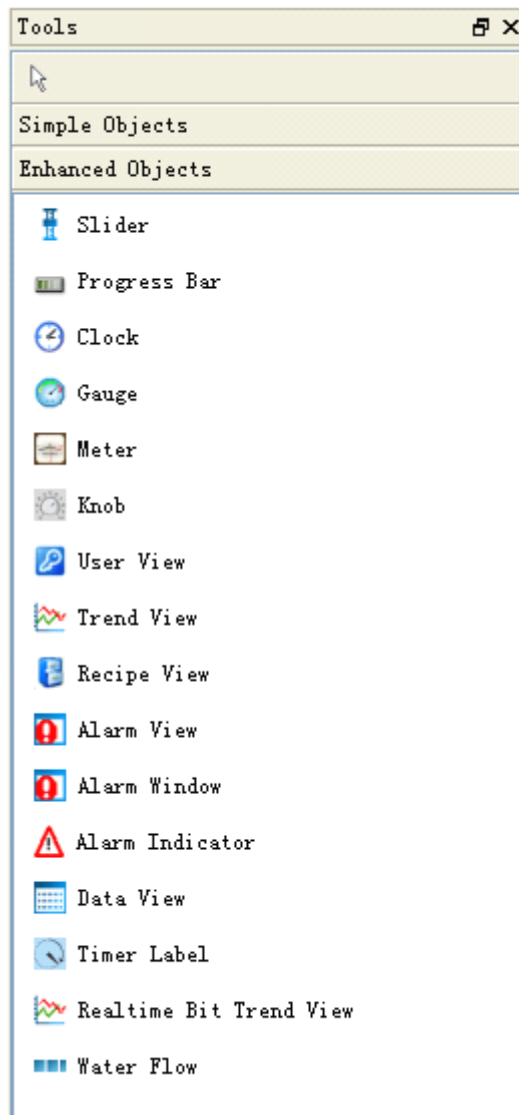
### 4.4.3 Create Screen objects

We can configure all screen objects which include Simple Objects, Enhance Objects and Graphics.

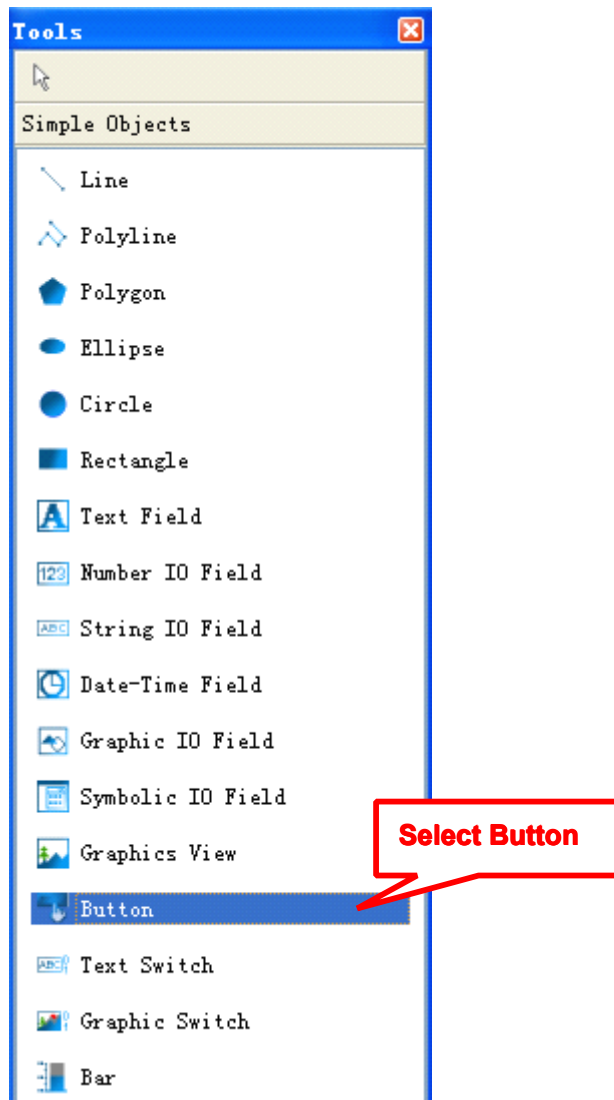
See the following simple objects:



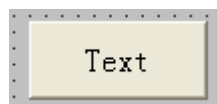
See the following enhanced objects:

**[Insert a new object]**

Choose the simple object which needs to be configured from toolbar buttons or from the right drawer views. The background of the selected simple object will turn to dark. Such as the 'Button' we selected here.



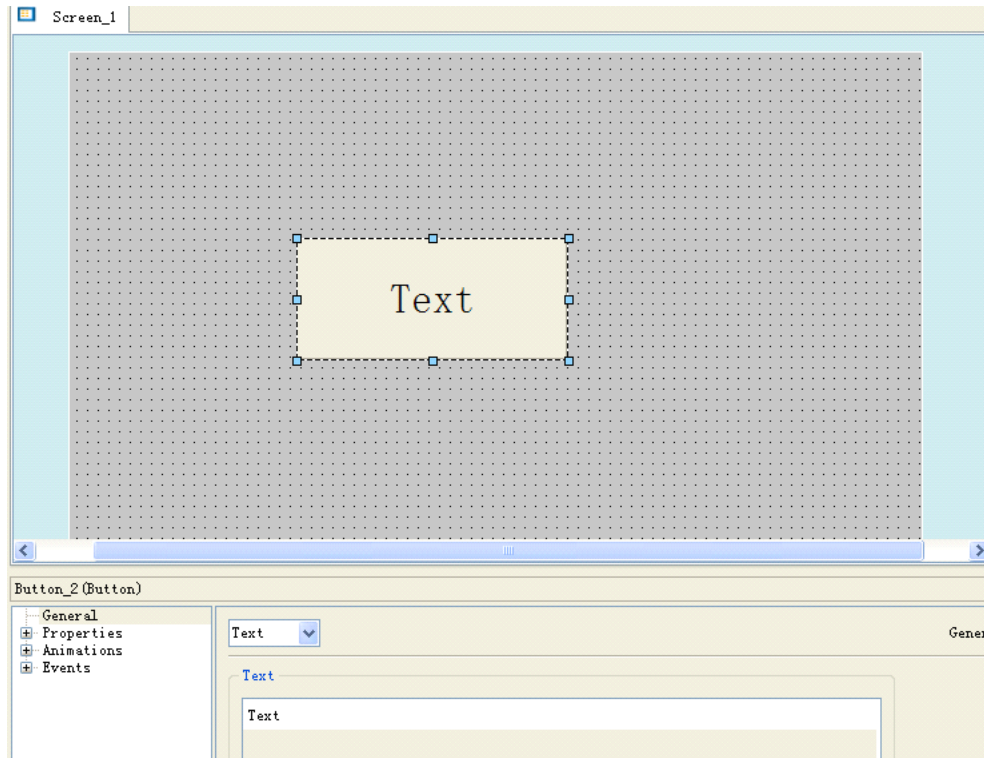
Move your mouse to the screen, the cursor will become cross shape  $\text{+}$ , it means that the screen can be inserted objects now. Then click the mouse will generate object in the screen, see as following figure.



The object, which just be inserted is in the selected state. There are eight little rectangles around it. (The eight little rectangles have active and inactive state. When selecting multiple objects, the last one was selected. The eight little rectangles around it also are active. The active state is used in 'Left justify', 'Right justify', 'Top justify' and 'Bottom justify'). The eight little rectangles are active at the time. Move the mouse to the eight little rectangles the mouse cursor will change. It means that we can use the mouse and drag to change size of the object now. We also can press the left key of the mouse to move the objects.

### [Editing object properties]

We can change the position and the size of the object in the screen by dragging the mouse. Different objects which include simple objects and enhanced objects have different properties editor. Click the left tree item of the screen editor to open different properties editor. Then you can edit the specific properties of the objects, and it work immediately. Such as changing the 'button' texts' properties.



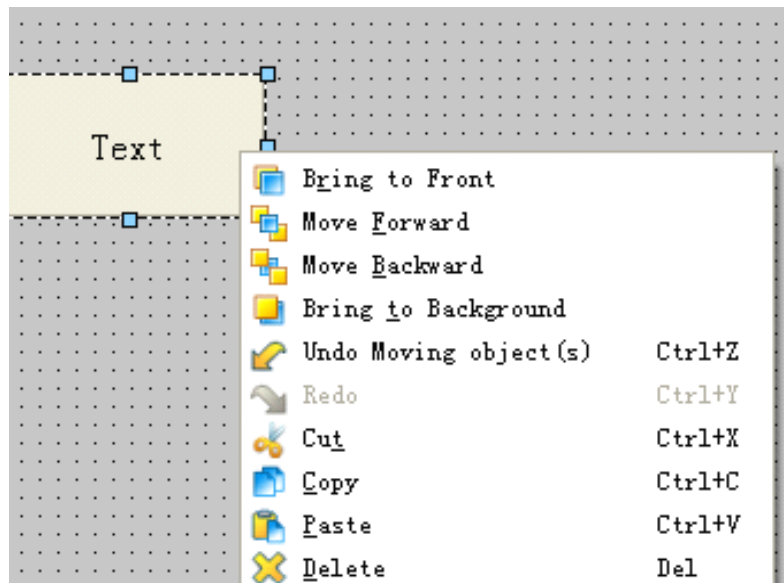
The related operations of screens and objects

#### (1) Select multiple objects

Hold the Shift key, and then click the mouse to select multiple objects. We also can use the mouse to draw a rectangle, and then select the multiple objects which we need drag into the rectangle.

#### (2) Right-click operation of screen object

Right-click the selected object, it will show the following options:



Toolbar and menu bar had also provided the right-click function.

### (3) Bulk editing screen objects

Select more than one objects in the screen, you can bulk edit the selected objects according to the same type, different types would not handle.

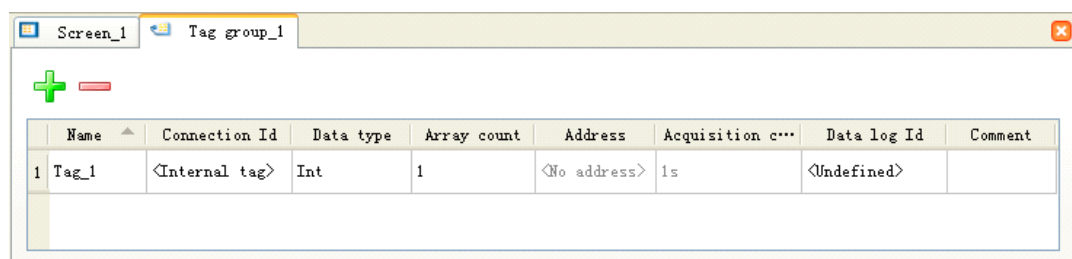
## 4.4.4 Take Number IO Field for example to indicate how to configure screen objects

Here we take Number IO Field for an example to indicate how to configure the screen objects.

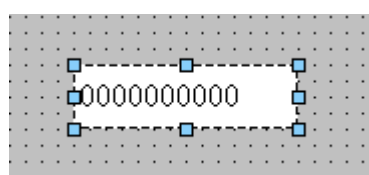
Configuring Number IO Field:

1. Configure a tag for number IO field.

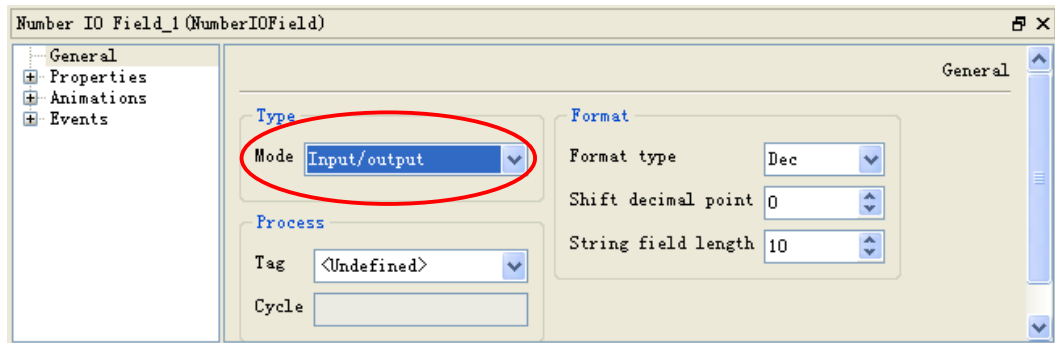
Create an integer (INT) tag (tag\_1) in the Data type column of the tab table.



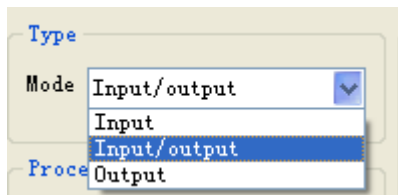
2. Open a screen and select the simple objects. Click the 'Number IO Field' and drag it into the screen.



3. Configure the type 'Mode' and 'Process tag' for it in 'General' properties.



Number IO Field has three operating modes, see as follows:

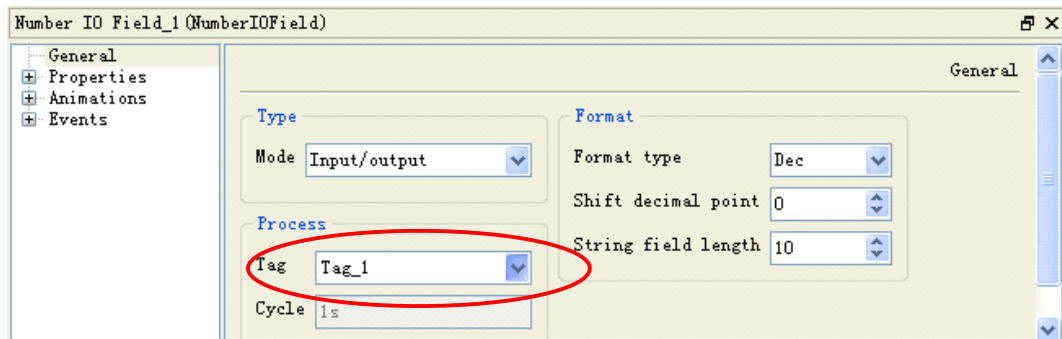


**Output:** Only display variable value.

**Input:** For operator input digital which need transfer to PLC, and save the input value into the specified tags.

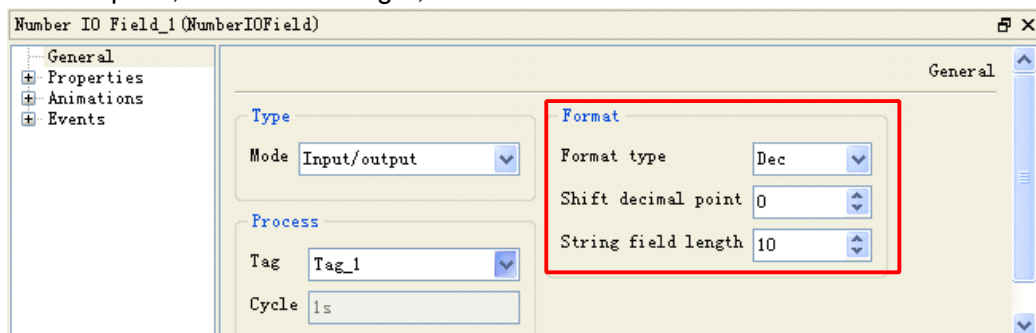
**Input/Output:** It has both input and output functions, we can change its value and display the value.

Configure the process tag for it in 'General' properties:



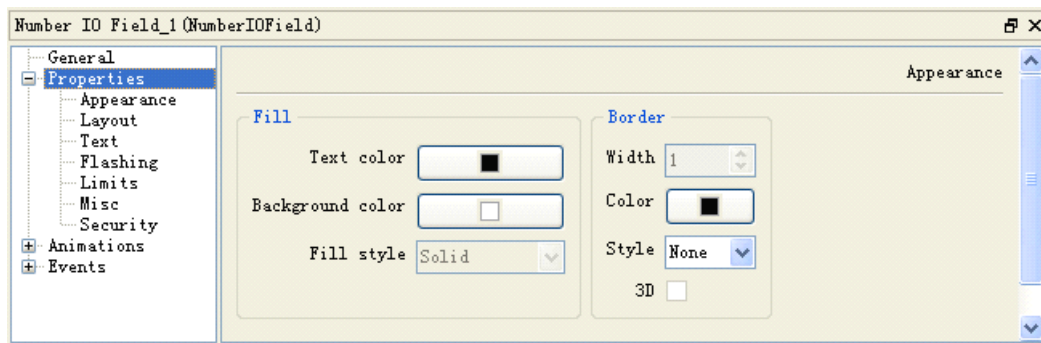
Configure the display format in 'General' properties.

In the 'Format' box, you can configure the format type(such as Dec, Hes, Bin), decimal point, and the field length, show as follows:



You can configure other properties like Appearance, Layout, Text, Flashing, Limits,

Misc and Security etc., see as follows:

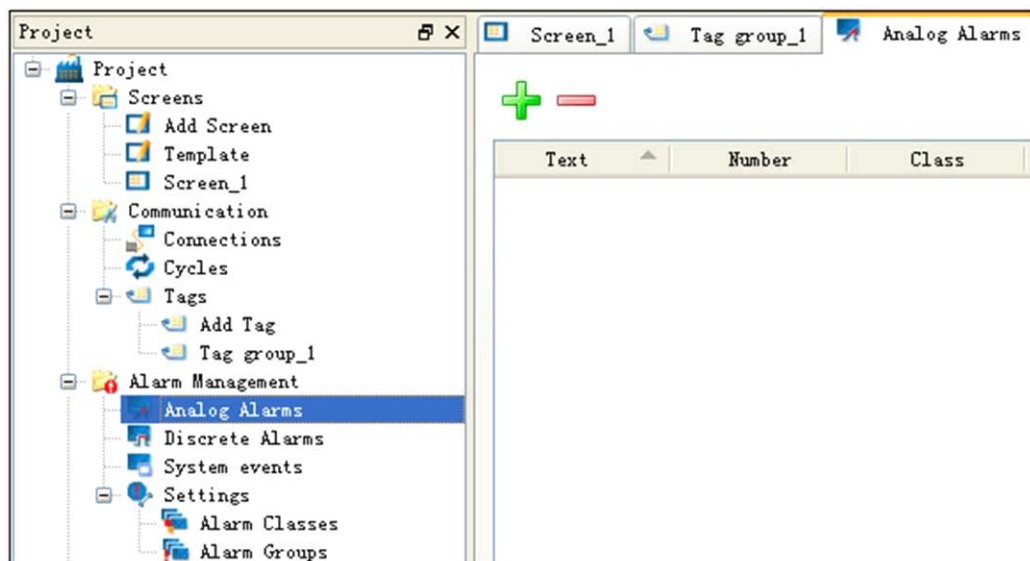


## 4.5 How to create alarms

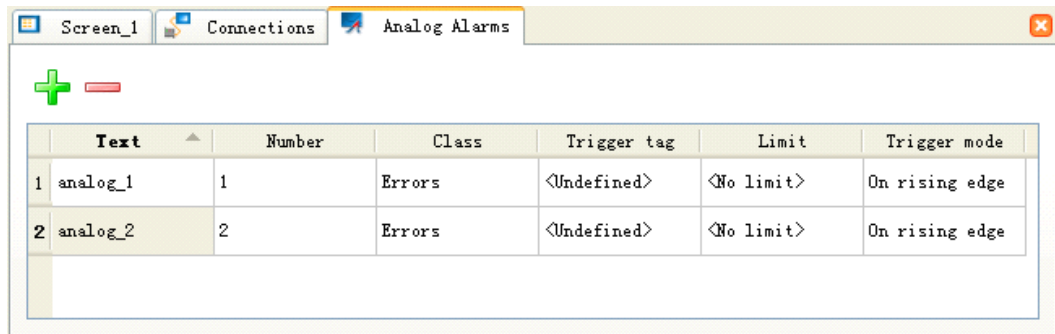
Configuring alarm view is to display the Process condition in the HMI device or Measure and report process data which received from PLC. If you set a specific position of PLC, HMI device will trigger the alarm, as we have configured the Analog alarm in the MagicWorks HMI at that time. If a tag beyond the limit value, HMI device will trigger the alarm. For we have configured the Analog alarm in the MagicWorks HMI device at this time. System events are predefined on this device so that it can display the Specific system state of the PLC and HMI device. Custom alarm and system alarm both can be triggered by HMI device and PLC, and both can be displayed on the HMI device.

### 4.5.1 Create Analog Alarms

1. Double-click the Analog Alarm in below project view, show as follows:



2. Click  to add an analog alarm, click  to delete analog alarms, as follow:



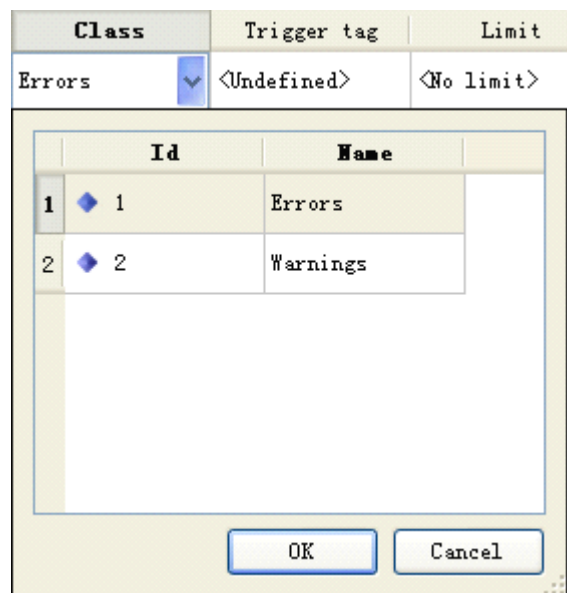
3. Configure alarm properties, such as Text, Class, Trigger tag, Limit, Trigger mode, Alarm Group ect..

#### [Configure Text]

Input the text in Text cell.

#### [Configure Class]

Click the drop-down arrow of 'Class', select a alarm class from the drop-down box, see as follows:



#### [Configure Trigger tag]

Click the  button right beside 'Trigger tag' column, select a tag from the drop-down box, see as follows:

| Trigger tag   | Limit      | Trigger mod    |
|---------------|------------|----------------|
| <Undefined> ▼ | <No limit> | On rising edge |

|   | Id   | Name        |        |
|---|------|-------------|--------|
| 1 | ◆ -1 | <Undefined> | <No ad |
| 2 | ◆ 1  | Tag_1       | VW 0   |
| 3 | ◆ 2  | Tag_2       | VW 2   |

< >

OK Cancel

**[Configure Limit]**

Double click the 'Limit' cell, click the drop-down arrow of 'Trigger tag' to select a limit type, see as follows:

| Limit        |
|--------------|
| ▼ <No limit> |
| Disabled     |
| Constant     |
| Tag          |

There are three types, Disabled, Constant and Tag. If you select 'Constant', you can input the value directly in the cell, if you select 'Tag', you should configure a tag for it from the drop-down box, as follows:

| Limit           | Trigger mode   |
|-----------------|----------------|
| ▼ <Undefined> ▼ | On rising edge |

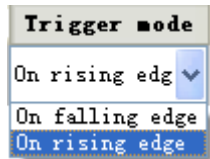
|   | Id   | Name        |        |
|---|------|-------------|--------|
| 1 | ◆ -1 | <Undefined> | <No ad |
| 2 | ◆ 1  | Tag_1       | VW 0   |
| 3 | ◆ 2  | Tag_2       | VW 2   |

< >

OK Cancel

**[Configure Trigger mode]**

Double click the 'Trigger mode' cell, click the drop-down arrow of it, select one of the two trigger modes, see as follows:

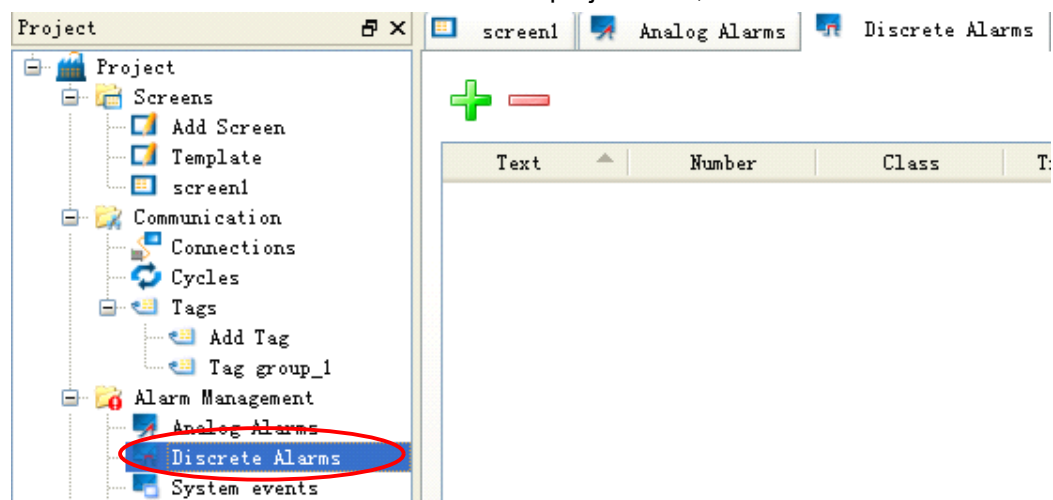


On falling edge: The alarm is triggered when the tag value is greater than the limit value.

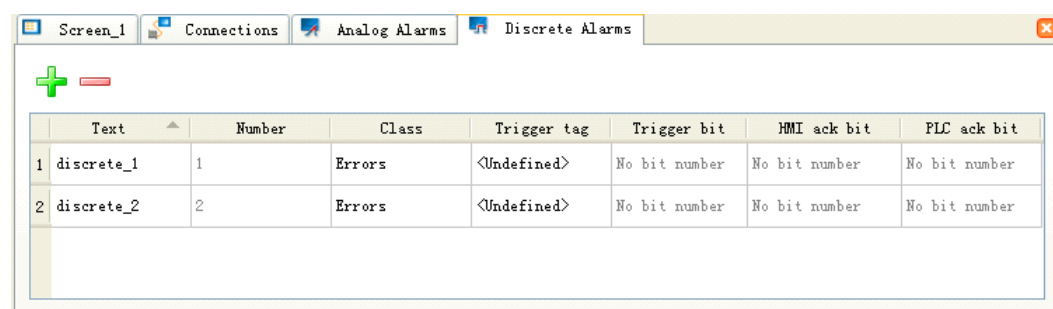
On rising edge: The alarm is triggered when the tag value is less than the limit value.

## 4.5.2 Create Discrete Alarms

1. Double-click the Discrete Alarm in below project view, as follow:



2. Click  to add a discrete alarm, Click  to delete a discrete alarm, show as follow:



3. Configure its properties, such as Text, Class, Trigger tag, Trigger bit, Alarm Group ect..

### [Configure Text]

Input the text in Text cell.

### [Configure Class]

Click the drop-down arrow of 'Class', select a alarm class from the drop-down box, see as follows:

| Class  | Trigger tag | Limit      |
|--------|-------------|------------|
| Errors | <Undefined> | <No limit> |

|   | Id | Name     |
|---|----|----------|
| 1 | 1  | Errors   |
| 2 | 2  | Warnings |

OK Cancel

### [Configure Trigger tag]

Click the drop-down arrow of 'Trigger tag' cell, select a tag from the drop-down box, see as follows:

| Trigger tag | Trigger bit   |
|-------------|---------------|
| <Undefined> | No bit number |

|   | Id | Name        |        |
|---|----|-------------|--------|
| 1 | -1 | <Undefined> | <No ad |
| 2 | 1  | Tag_1       | VW 0   |
| 3 | 2  | Tag_2       | VW 2   |

OK Cancel

### [Configure Trigger bit]

Double click the 'Trigger bit' cell, the input the bit(0-15), default to 0.

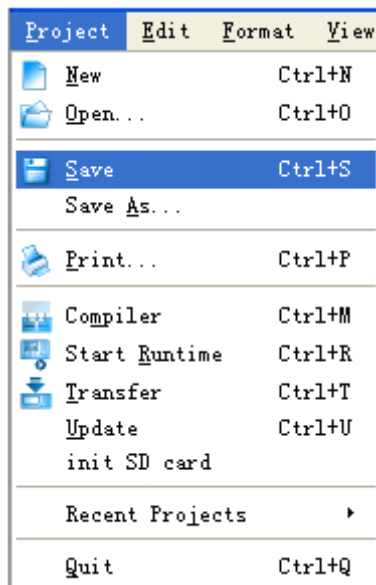
## 4.6 Debug projects

### 4.6.1 How to debug projects

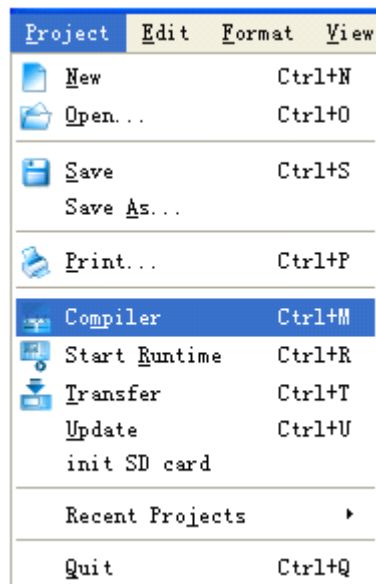
Configuring the project is a cross process, need several times to verify the project.

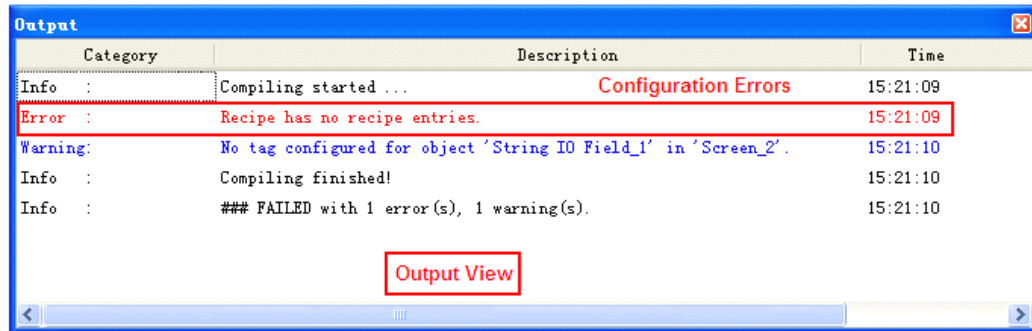
The steps of debugging a project:

1. First select the "Save" from Project menu or click the save button  from toolbar to save the project .



2. Select "Compile" from Project menu or click the compile button  from toolbar to compile the project, then compiler information are displayed in Output view, see as follows:



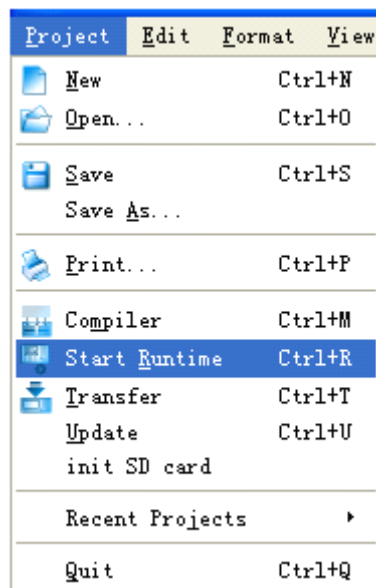


The red words in above output view is configuration error, double-click the error can be transferred to the error place.

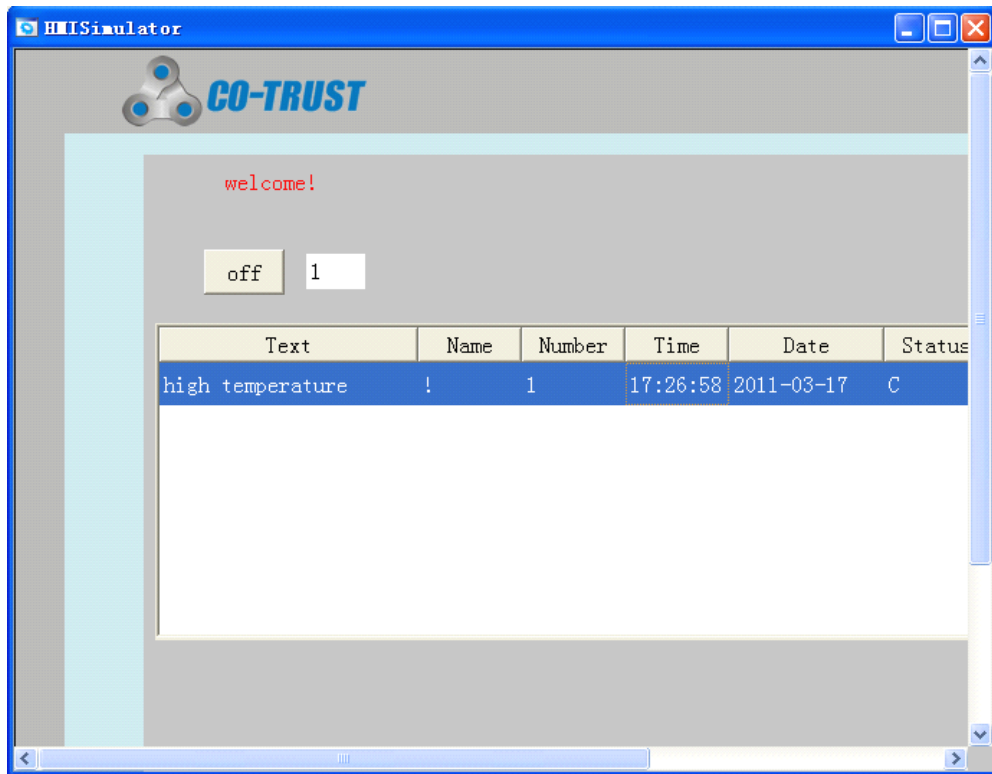
3. Run the project on PC.

Run the project if there are no errors after compiling.

Select "Start Runtime" from Project menu or click the button  from toolbar to start the simulator and debug the project.

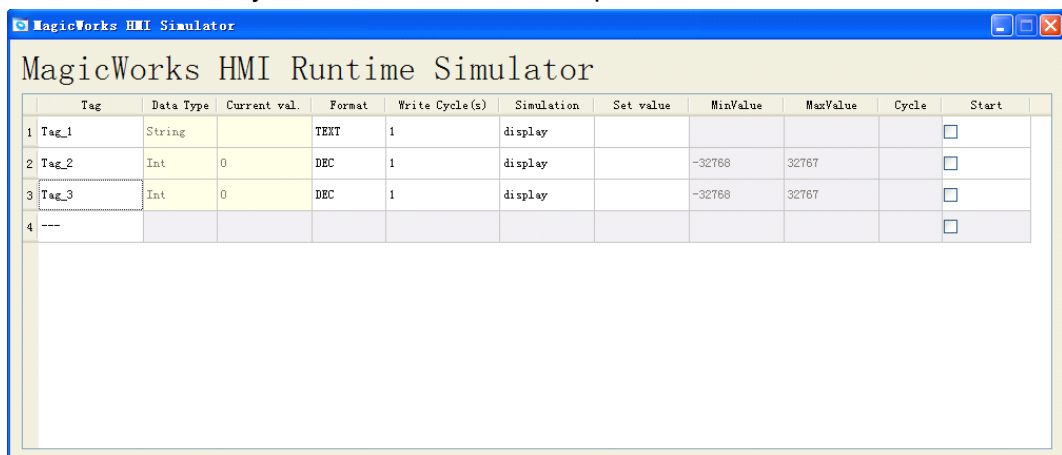


After started runtime, you can simulate the project offline, such as debugging text objects, graphic objects, alarms ect. The simulator including two parts, screen simulator and tag simulator, see as follows:



### Screen simulator

In screen simulator you can simulate the user operations on HMI device.



### Tag simulator

In tag simulator you can emulate the PLC device, such as changing the value of the PLC tag.

## 4.6.2 Attach compile information

| Serial number      | Incorrect configuration                 | Compiled information                              |
|--------------------|-----------------------------------------|---------------------------------------------------|
| <b>About alarm</b> |                                         |                                                   |
| 1                  | The text of analog alarm %1 is missing. | [Warning] The text of analog alarm %1 is missing. |
| 2                  | The trigger tag of analog alarm         | [Error] The trigger tag of analog alarm %1 is     |

|                         |                                                                          |                                                                                  |
|-------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------|
|                         | %1 is missing.                                                           | missing.                                                                         |
| 3                       | The analog alarm %1 is an invalid type.                                  | [Error] The analog alarm %1 is an invalid type.                                  |
| 4                       | The limit value at the analog alarm %1 is missing or of an invalid type. | [Error] The limit value at the analog alarm %1 is missing or of an invalid type. |
| 5                       | Alarm class of discrete alarm %1 is not available.                       | [Error] Alarm class of discrete alarm %1 is not available.                       |
| 6                       | The alarm group of analog alarm %1 is not available.                     | [Error] The alarm group of analog alarm %1 is not available.                     |
| 7                       | The text of discrete alarm %1 is missing.                                | [Warning] The text of discrete alarm %1 is missing.                              |
| 8                       | The trigger tag of discrete alarm %1 is missing.                         | [Error] The trigger tag of discrete alarm %1 is missing.                         |
| 9                       | The alarm group of discrete alarm %1 is not available.                   | [Error] The alarm group of discrete alarm %1 is not available.                   |
| 10                      | The acknowledgment HMI tag of discrete alarm %1 is not available.        | [Error] The acknowledgment HMI tag of discrete alarm %1 is not available.        |
| 11                      | The acknowledgment PLC tag of discrete alarm %1 is not available.        | [Error] The acknowledgment PLC tag of discrete alarm %1 is not available.        |
| 12                      | The alarm log file of alarm class %1 is unavailable.                     | [Error] The alarm log file of alarm class %1 is unavailable.                     |
| <b>About connection</b> |                                                                          |                                                                                  |
| 13                      | Invalid driver for selected PLC type. Please install a valid driver.     | [Error] Invalid driver for selected PLC type. Install a valid driver.            |
| 14                      | The acquisition cycle of 'for all connections' is unavailable.           | [Error] The cycle of 'for all connections' is unavailable.                       |
| 15                      | The acquisition cycle of 'for each connections' is unavailable.          | [Error] The cycle of 'for each connections' is unavailable.                      |
| 16                      | Address areas are overlapping.                                           | [Error] Address areas are overlapping.                                           |
| 17                      | Number of configured connections exceeds system limit connections.       | [Error] Number of configured connections exceeds system limit connections.       |
| 18                      | Address areas exceeds valid address space.                               | [Error] Address areas exceeds valid address space.                               |
| 19                      | Protocol combination not possible.                                       | [Error] Protocol combination not possible.                                       |
| 20                      | The HMI address is the same as the PLC address.                          | [Error] The HMI address is the same as the PLC address.                          |
| 21                      | Maximum number of interface for the communication driver                 | [Error] Maximum number of interface for the communication driver exceeded.       |

|                                      |                                                                                                                                                                                                                         |                                                                                                                                  |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|                                      | exceeded.                                                                                                                                                                                                               |                                                                                                                                  |
| <b>About tag</b>                     |                                                                                                                                                                                                                         |                                                                                                                                  |
| 22                                   | The connection of tag %1 is unavailable.                                                                                                                                                                                | [Error] The connection of tag %1 is unavailable.                                                                                 |
| 23                                   | The acquisition cycle of tag %1 is unavailable.                                                                                                                                                                         | [Error] The cycle of tag %1 is unavailable.                                                                                      |
| 24                                   | The data logging of tag %1 is unavailable.                                                                                                                                                                              | [Warning]The data logging of tag %1 is unavailable.                                                                              |
| 25                                   | [Error] The logging cycle of tag %1 is unavailable.                                                                                                                                                                     | [Error] The cycle of tag %1 is unavailable.                                                                                      |
| 26                                   | Invalid limit for tag %1.                                                                                                                                                                                               | [Error] Invalid limit for tag %1.                                                                                                |
| 27                                   | Communication driver was changed but the tag's address was not changed. Please open tags editor to change tag's address.                                                                                                | [Error] Communication driver was changed but the tag's address was not changed. Please open tags editor to change tag's address. |
| <b>Text and graphics list module</b> |                                                                                                                                                                                                                         |                                                                                                                                  |
| 28                                   | A range value in the list '%1' is invalid.                                                                                                                                                                              | [Error] A range value in the list '%1' is invalid.                                                                               |
| <b>About screen</b>                  |                                                                                                                                                                                                                         |                                                                                                                                  |
| 29                                   | Invalid type for tag of '%1' in screen '%2'.<br>eg. If the process tag of number IO field configured INT tag at first, and change the tag's type to String in tag table, then there would be a warning after compiling. | [Warning] Invalid type for tag of '%1' in screen '%2'.                                                                           |
| 30                                   | The configuration tag of the screen is missing.                                                                                                                                                                         | Invalid tag or tag missing for property of screen item '%1' in screen '%2'.                                                      |
| 31                                   | The ID of the graphic list is invalid or missing.                                                                                                                                                                       | Invalid graphic list assigned to graphic IO field '%1' in screen '%2'.                                                           |
| 32                                   | The ID of the text list is invalid or missing.                                                                                                                                                                          | Invalid text list assigned to symbolic IO field '%1' in screen '%2'.                                                             |
| 33                                   | The authorization ID configured for this screen is missing.                                                                                                                                                             | The runtime authorization configured for this screen object '%1' is not available in screen '%2'.                                |
| 34                                   | Invalid reference parameter for system function. Including tag , name of the screen, recipe name.                                                                                                                       | Invalid reference parameter for system function.                                                                                 |
| 35                                   | The alarm log ID in the alarm view is not available.                                                                                                                                                                    | The used alarm log in the alarm view is not available.                                                                           |
| 36                                   | No graphic configured for graphics view.                                                                                                                                                                                | [Warning] No graphic assigned to graphics view.                                                                                  |

|                         |                                                                                                                                                                                                     |                                                                                                      |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| 37                      | The graphic configured for graphics view has been deleted.                                                                                                                                          | [Error] Invalid graphic assigned to '%1' in screen '%2'.                                             |
| 38                      | In the set Value column, the parameter is (tag_1, xxx) we need to check xxx whether it is the value style. Otherwise, error.                                                                        | [Error] Invalid reference parameter for system function.                                             |
| <b>About recipe</b>     |                                                                                                                                                                                                     |                                                                                                      |
| 39                      | Recipe has no recipe entries.                                                                                                                                                                       | [Error] Recipe has no recipe entries.                                                                |
| 40                      | The tag of the recipe entry is undefined                                                                                                                                                            | [Error] No tag assigned to recipe entry.                                                             |
| 41                      | The tag assigned to the recipe entry is deleted.                                                                                                                                                    | [Error] The tag assigned to the recipe entry is not available.                                       |
| 42                      | The array count of the tag assigned to the recipe entry is changed.                                                                                                                                 | [Error] The array count of the tag assigned to the recipe entry is invalid, please reselect the tag. |
| 43                      | The transfer property of the recipe has configured synchronization, but the connection is undefined.                                                                                                | [Error] Recipe is flagged for synchronization but no connection is specified.                        |
| 44                      | The transfer property of the recipe has configured synchronization, and the connection is selected. But data mailbox in area pointer is not activated or the connection has been deleted.           | [Error] Recipe is synchronized to a connection which has no data mailbox area pointer.               |
| 45                      | The transfer property of the recipe has configured synchronization, and the connection is selected, data mailbox in area pointer is also activated. But the address of the data mailbox is invalid. | [Error] Invalid address for area pointer 'Data Mailbox'.                                             |
| <b>About trend view</b> |                                                                                                                                                                                                     |                                                                                                      |
| 46                      | No trend tag configured for trend.                                                                                                                                                                  | [Warning] No trend tag configured for trend 'name of trend'.                                         |
| 47                      | The trend tag of trend is invalid.                                                                                                                                                                  | [Error] The trend tag of trend 'name of trend' invalid.                                              |
| 48                      | When the x axis of the trend view is time model, configure buffer bit triggered or Real-time bit triggered.                                                                                         | [Error] This trend type cannot be used with the currently selected X-axis mode.                      |
| 49                      | Buffer bit triggered of the trend                                                                                                                                                                   | [Error] This trend type cannot be used with                                                          |

|    |                                                                                                                                        |                                                                                                                                                     |
|----|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|    | do not configure a tag.                                                                                                                | the currently selected X-axis mode.                                                                                                                 |
| 50 | Buffer bit triggered and real-time bit triggered do not configure trend request tag for trend.                                         | [Warning] No trend request tag configured for trend 'name of trend'.                                                                                |
| 51 | The trend request tag of trend which configured by buffer bit triggered and real-time bit triggered is invalid.                        | [Error] The trend request tag of trend 'name of trend' is invalid.                                                                                  |
| 52 | The request tag of the buffer bit triggered and real-time bit triggered conflict with other trend.                                     | [Error] Multiple usage of bit in curve.                                                                                                             |
| 53 | Trend of the buffer bit triggered and the real-time bit triggered do not configure transfer 1 tag.                                     | [Warning] No trend transfer 1 tag configured for trend 'name of trend'.                                                                             |
| 54 | The transfer 1 tag which configured by Trend of the buffer bit triggered and the real-time bit triggered is invalid.                   | [Error] The trend transfer 1 tag of trend 'name of trend' is invalid.                                                                               |
| 55 | The Array count of transfer 1 tag which configured by Trend of the buffer bit triggered is smaller than the trend's count.             | [Error] Samples and trend buffer are not valid at 'name of trend'. Maybe the array count of the switch buffer does not match the number of samples. |
| 56 | The bit of transfer 1 tag which configured by Trend of the buffer bit triggered and real-time bit triggered conflict with other trend. | [Error] Multiple usage of bit in curve.                                                                                                             |
| 57 | Trend of the buffer bit triggered selects switch buffer, but does not configure the tag.                                               | [Warning] No switch buffer tag configured for trend 'name of trend'.                                                                                |
| 58 | Trend of the buffer bit triggered selects switch buffer and configures the tag, but the tag is invalid.                                | [Error] The switch buffer tag of trend 'name of trend' is invalid.                                                                                  |
| 59 | Trend of the buffer bit triggered selects switch buffer, but does not configure the tag of transfer 2.                                 | [Warning] No trend transfer 2 tag configured for trend 'name of trend'.                                                                             |
| 60 | Trend of the buffer bit triggered selects switch buffer, and also configures the tag of transfer 2. But the tag is invalid.            | [Error] The trend transfer 2 tag of trend 'name of trend' is invalid.                                                                               |

|                        |                                                                                                                                     |                                                                                                                                                |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 61                     | Trend of the buffer bit triggered selects switch buffer, and also configures the bit of transfer 2 which conflict with other trend. | [Error] Multiple usage of bit in curve.                                                                                                        |
| 62                     | Trend of the buffer bit triggered selects switch buffer. The array count of the tag is smaller than the trend's count.              | [Error] Samples and switch buffer are not valid at 'trend_1'. Maybe the array count of the switch buffer does not match the number of samples. |
| 63                     | Compiler will occur error when "bit" value of "InvertBitInTag、ResetBitInTag、RetBitInTag" exceed the range of variables.             | [Error] Invalid of reference parameter for system function.                                                                                    |
| <b>Animation</b>       |                                                                                                                                     |                                                                                                                                                |
| 64                     | Invalid range configured for animation appearance of %1 in %2.                                                                      | [Error] Invalid range configured for animation appearance of %1 in %2.                                                                         |
| 65                     | Invalid bit position in animation for picture element '%1' in picture '%2'.                                                         | [Error] Invalid bit position in animation for picture element '%1' in picture '%2'.                                                            |
| <b>System function</b> |                                                                                                                                     |                                                                                                                                                |
| 66                     | Invalid of reference parameter for system function.                                                                                 | [Error] Invalid of reference parameter for system function .                                                                                   |

## 4.7 Download projects

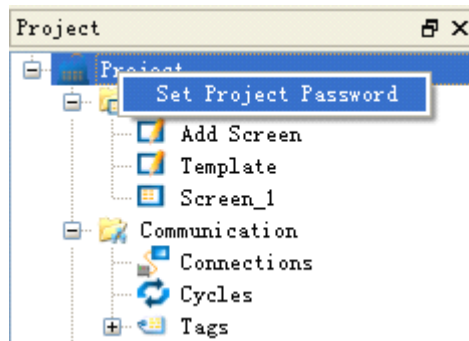
Please refer to chapter 2.6 for details.

## 4.8 Configure project password

Project password is used to set the permissions for users configuring the project. After set password, it needs the password to reopen the project.

The steps of configuring password:

1. Right-click "Project" in project view, it appears following screen.



2. Click the 'Set Project Password', it show as follows:



3. Input new password and verify password, and then click the 'OK'.

## 4.9 Key functions and configuration

The key here is the function key (F key and K key) on the HMI key panel screen.

We can configure the system function or script for the function key. At the running state, configure the function key, it will run the system function or script. The F key that configured in the template can choose the function of quoting or reconfiguring in the screen. The function configured the K key in the template is Fixed and effective on each screen.

Key configuration has three parts: One is configuration of the key function, the other is configuration of the key LED, the last part is configuration of the key permissions.

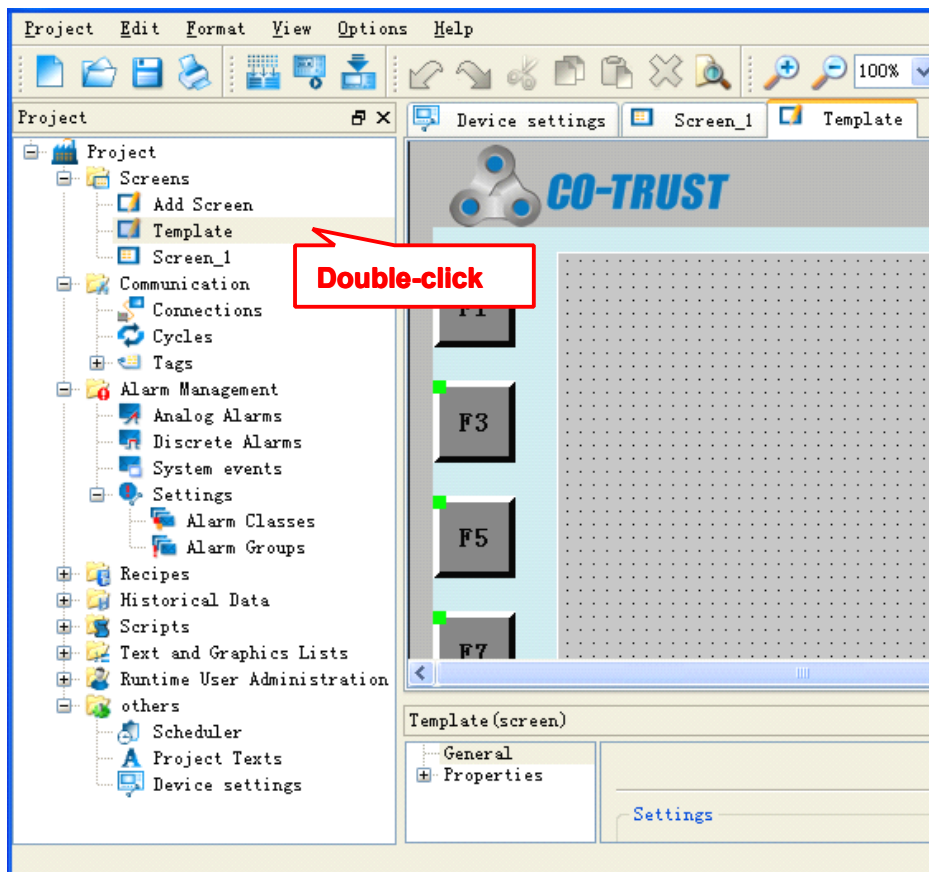
### 4.9.1 Function and the configuration of the key LED

The key LED can be used to indicate user for the next operation. It also can use to show whether the operation of current key is right or not.

Key LED only can be configured in template, the steps show as follows:

1. Open the Template screen.

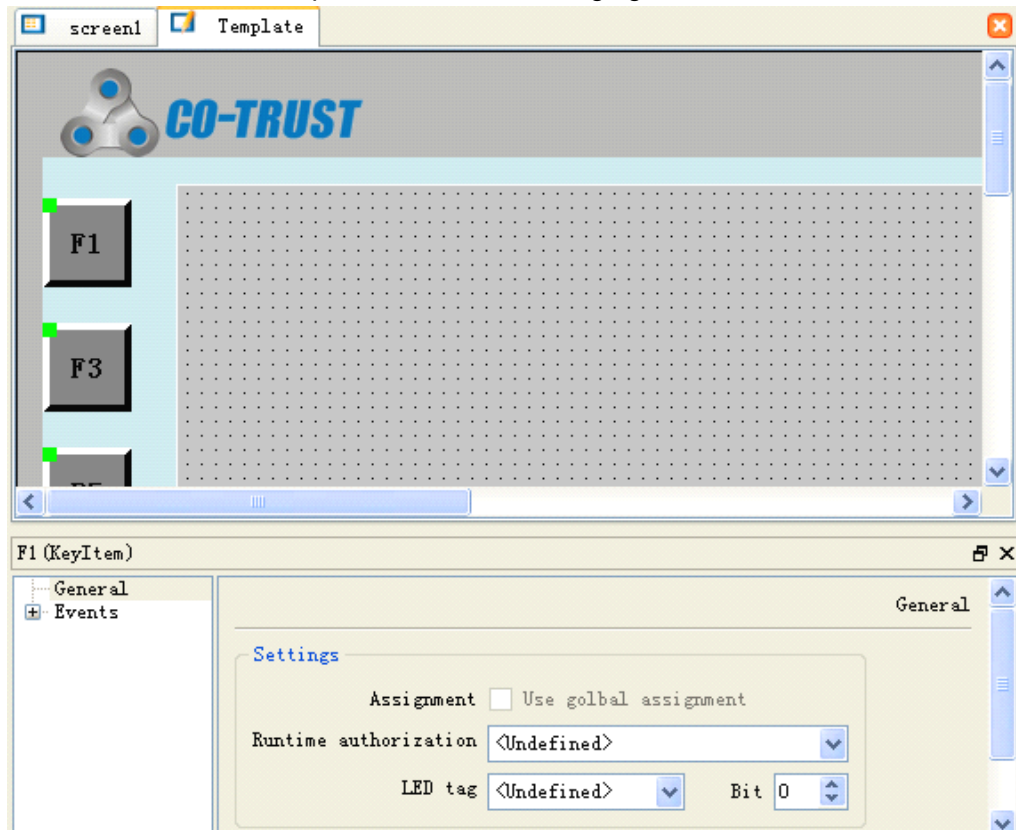
Double-click "Template" in project view to open the Template screen.



2. Choose the K key or F key which need configure.

Take F1 for an example.

Click the 'F1' on the Template, it shows following figure:



3. Choose the properties of F1, and configure LED property in the “General” of the F1 key.

In the setting column, select a tag for the LED tag. Here select tag\_1 for the LED tag, and the Bit column select 1.



#### Tips

- Key LED is triggered by one bit of the tag. LED light will turn on if the tag bit is 1, while the LED light will turn off when the tag bit is 0.
- If the key has LED, there is a small green Square logo  on the right top of the key. Besides, LED property in “General” also has the logo. Only the key has the property can be configured, otherwise, it can't be configured.
- The configuration of the K key is the same as the F key.

## 4.9.2 Key functions and configuration

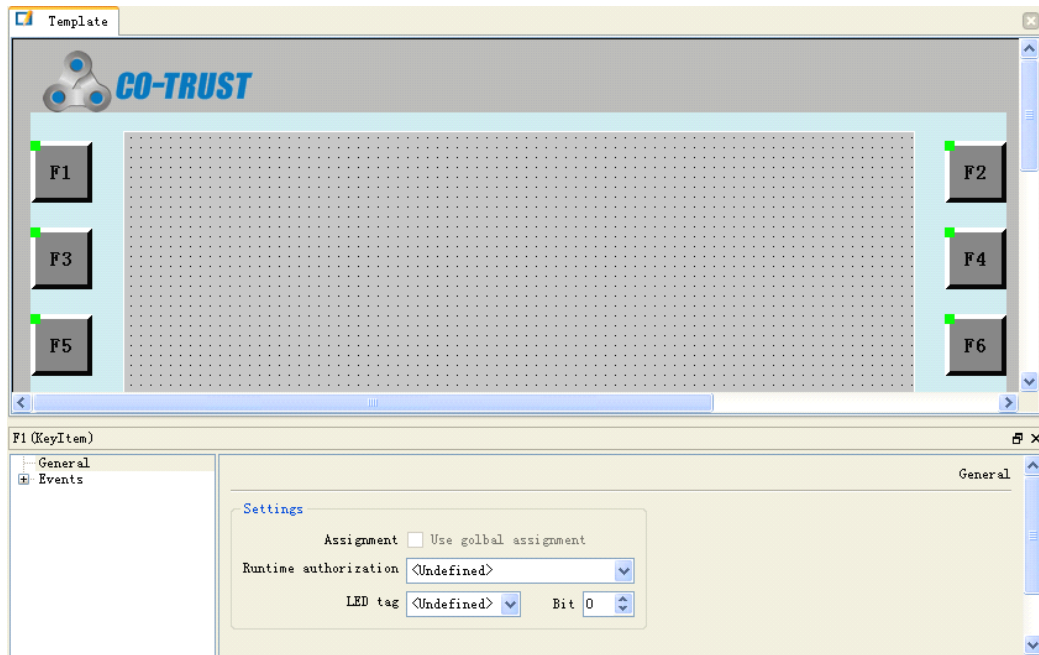
We can configure the system function or script for the function key. After configuration, the functional key will run the system function or script when we press it at the running state. The F key can configure global permissions in "template", the global permissions of the screen comes from the "template". Local permissions of the F key can only be configured in the screens. Global permission of K key can only be configured in the template (All screens have the same global permission as "template").

### 4.9.2.1 Configure F key function

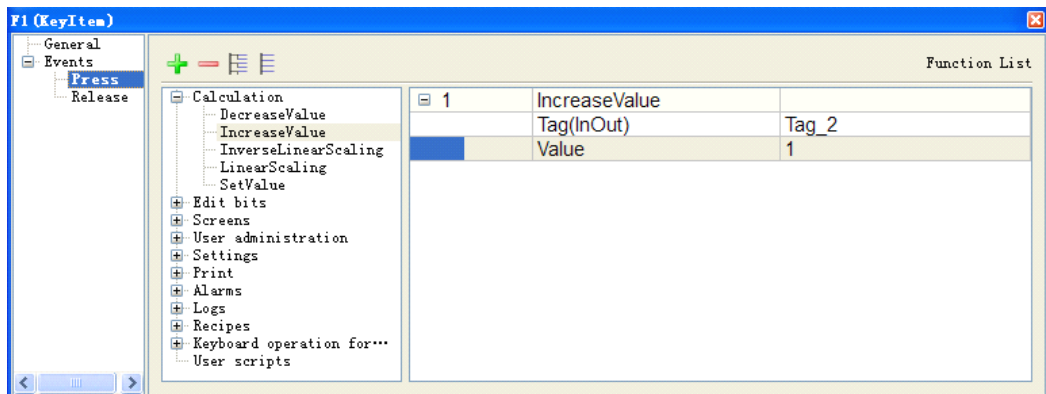
F key can configure global permissions in "template", after we configured global permission in the template, and then we can use global function in the screens. In general, we configure global functions in the screen by choosing 'use global assignment' in the property view. When using a global function, tag and bit of the LED would default to the tag and the value that configured in the template. F key can be configured both global function and local function in different screens.

Take F1 key of kp10 device for example to show the configuration steps. F1 key configure the global function in screen\_1 and screen\_2, F1 key configure local function in screen\_3, F1 key configure no function in screen\_4.

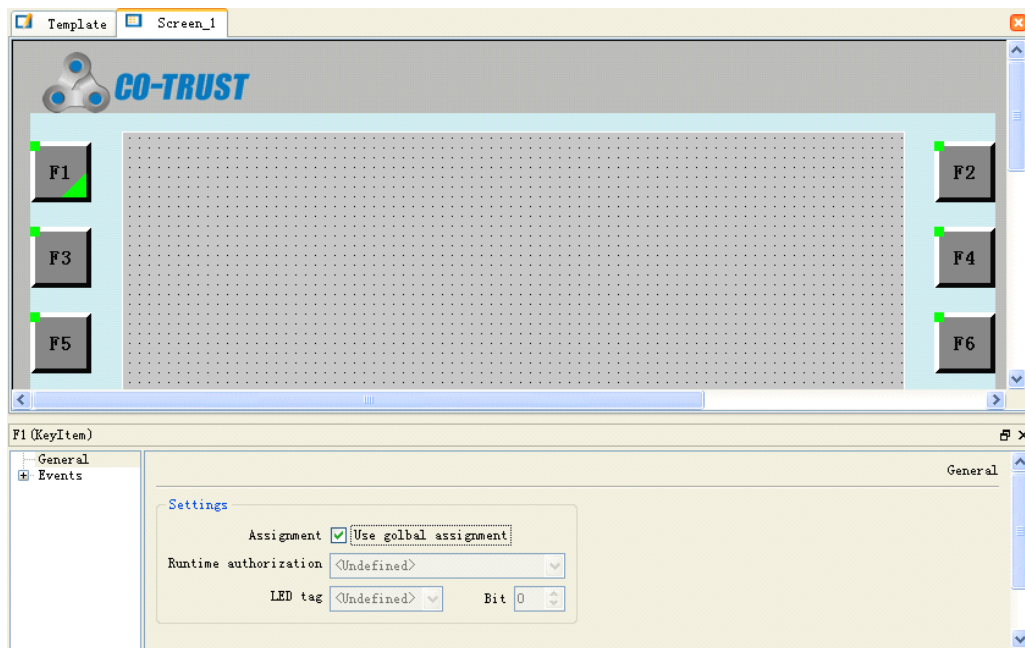
1. Double-click the [Screens] / [Template] in the project view, entry the template editor.
2. Click the F1 in the template, show as follow figure:



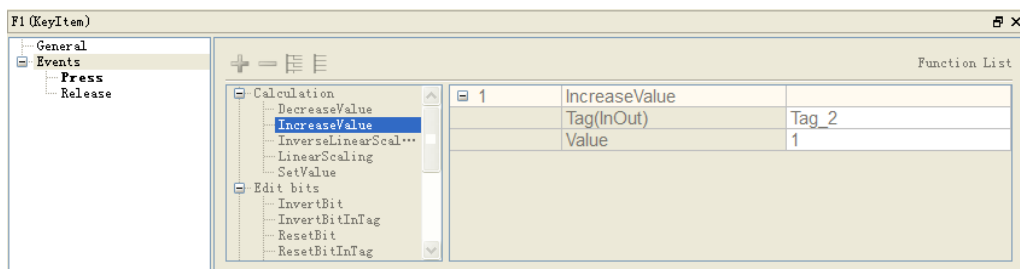
3. Double-click the 'Events' in the F1 key property view, and then click 'Press'. Configure the 'Increase Value' function for F1 key. It shows as follows:



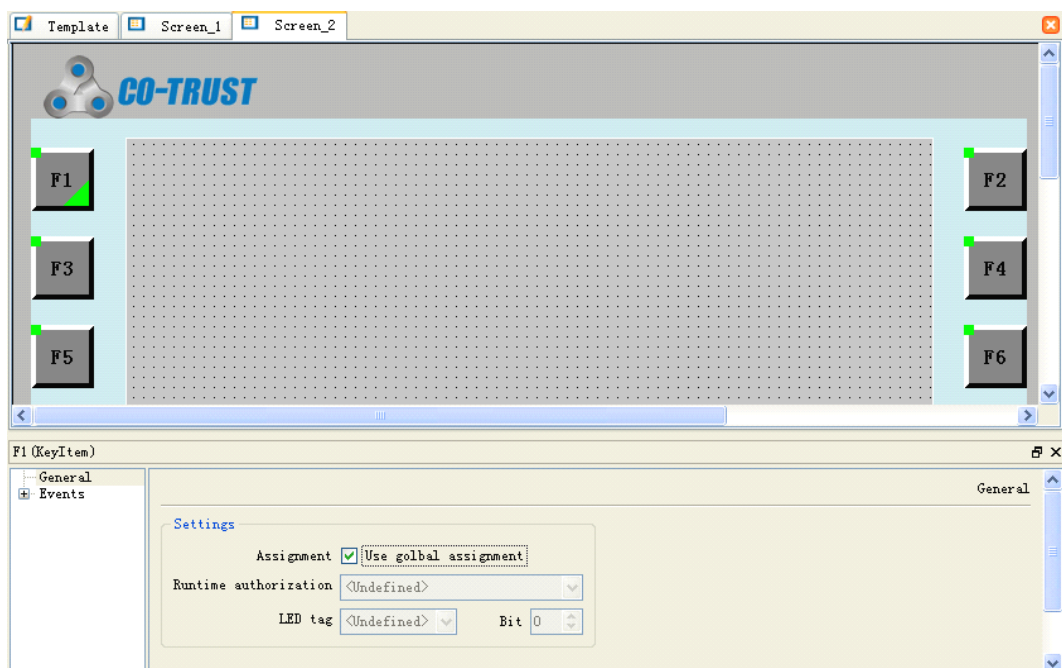
4. Click the 'General' of F1 key in screen\_1, and the enable the 'Use global assignment'. It shows as follow.



After that, event function of the F1 key shows the same as the F1 key that configured in the template. Both of them cannot be configured.



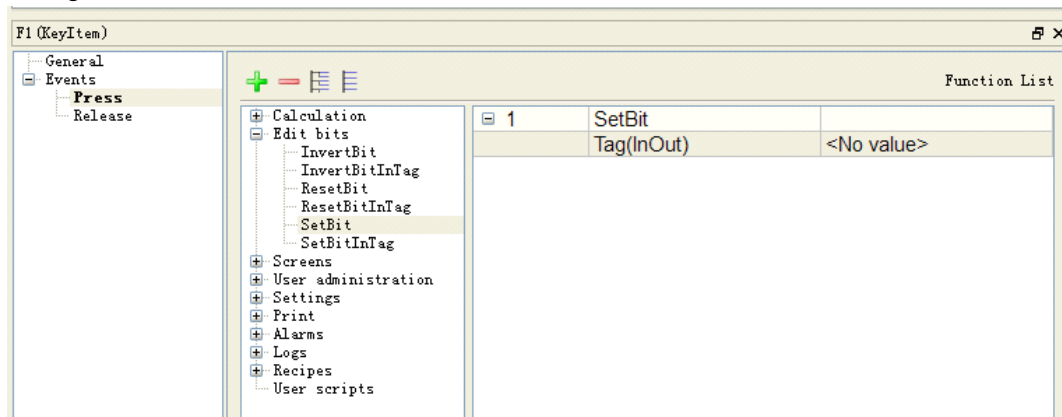
5. Open the screen\_2, and tick the 'Use global assignment' for F1 key in the 'General' properties view.



Then 'Events' function of the F1 key in the screen\_2 shows the same as the F1 key

that configured in the template. Both of them cannot be configured.

6. Open the screen\_3, select the F1 key and click the 'Events' properties view to configure SetBit function.



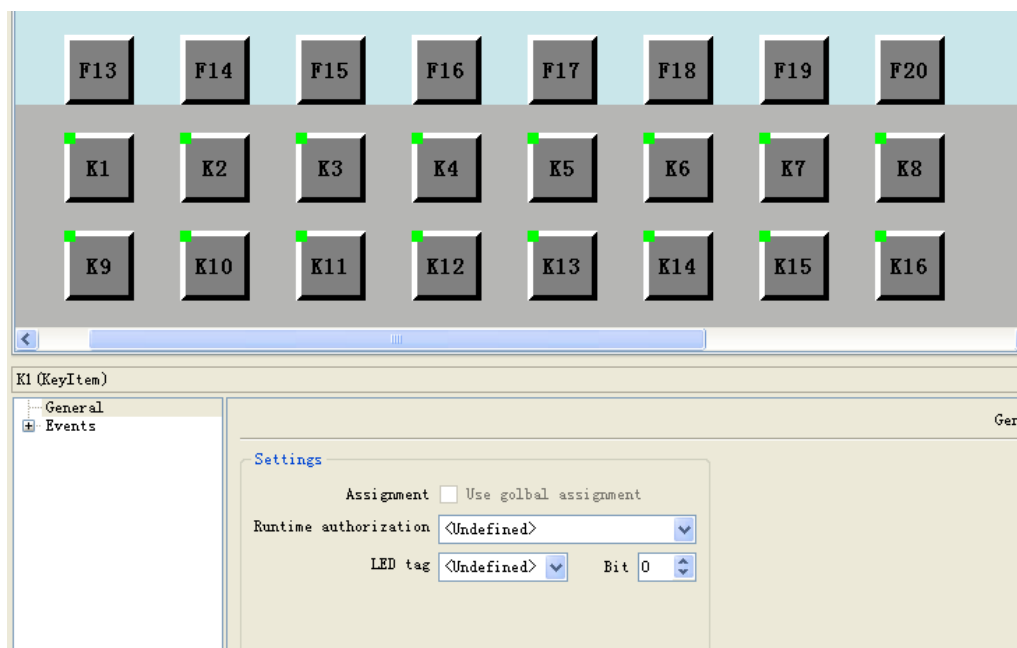
7. Open screen\_4, configure no function for it.

#### 4.9.2.2 Configure K key function

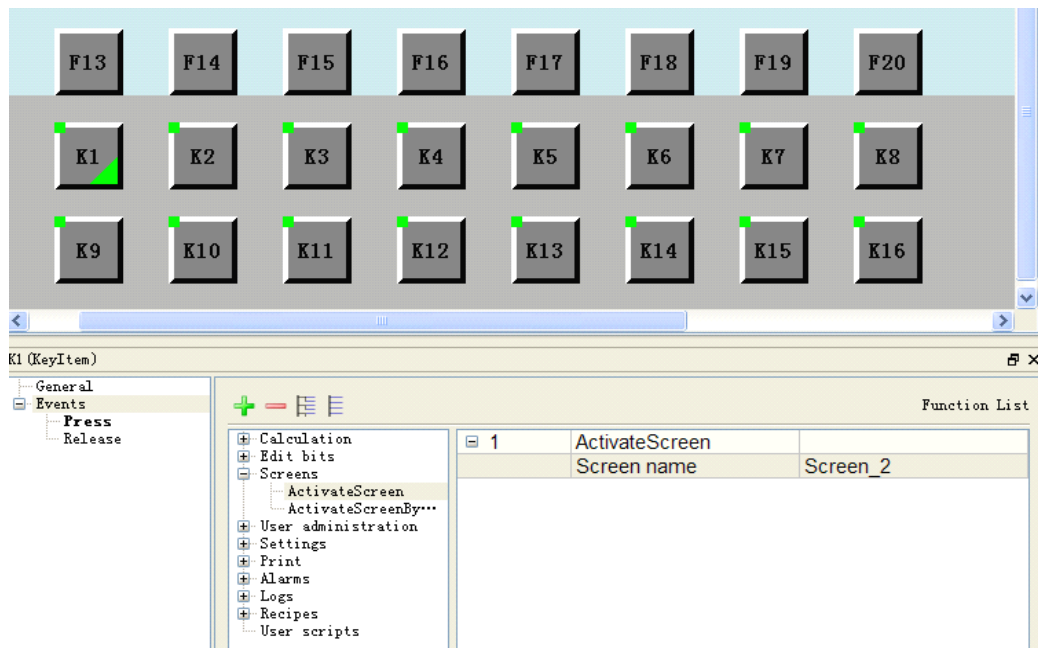
K key can only be configured global function (the functions of the K key in the project are the same) in the template, cannot be configured in the screen. Take the F1 key of KP10 for an example to show the steps.

1. Double-click [Screens] / [Template] in the project view to enter in the template editor.

2. Select K1 key in the template. It shows as following:



3. Click the 'Events' in the property view, and click the 'Press' to configure Active-Screen function.



### 4.9.3 Configure Key permissions

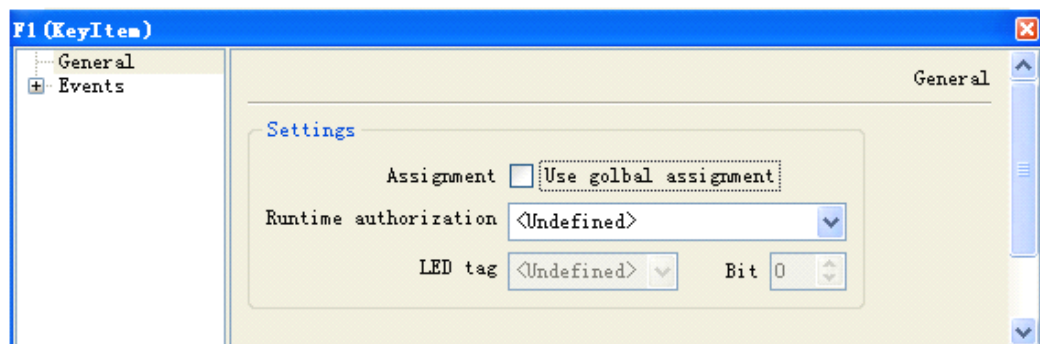
F key and K key can be configured permissions. But there are some differences between them.

F key can configure global permissions in "template", the global permissions of the screen comes from the "template". Local permissions of the F key can only be configured in the screens.

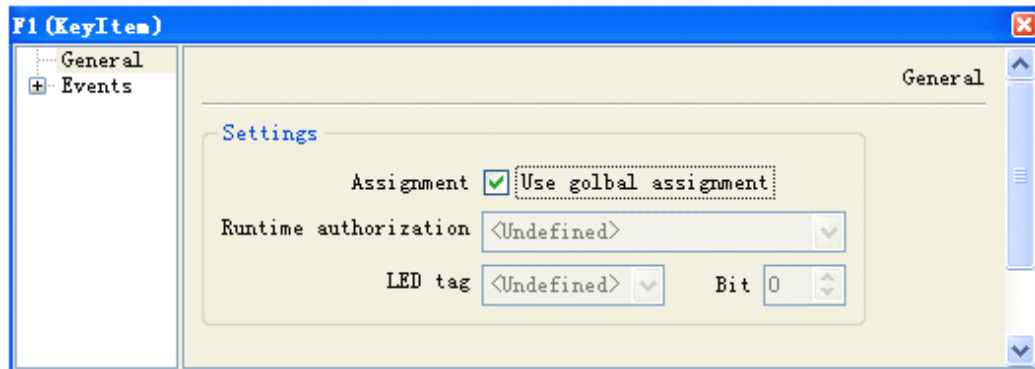
K key fix global permission (All screens have the same global permission as "Template".), which only can be configured in the template.

#### Configuring the F key global permission

1. Click the template in the project view, and enter in the template editor.
2. Click the F key and select an existing permission in the runtime authorization of the "General" properties. See below configuration:

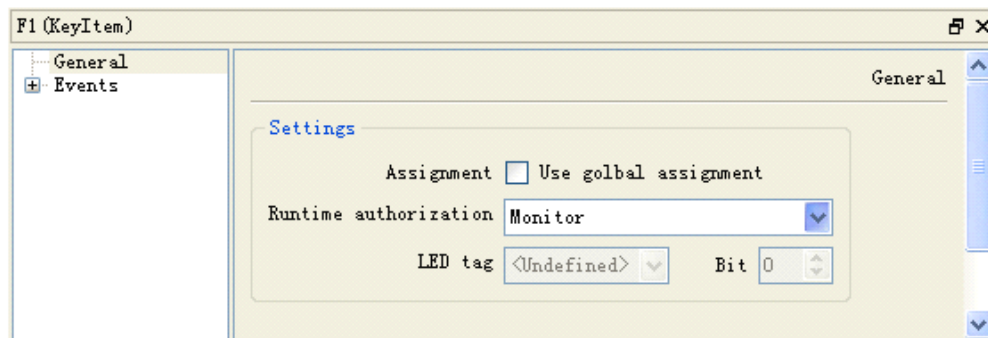


3. Distribute global permission for F key in the screen. If the F key has selected the "Use global assignment", it defaults to global permission. It shows as follow.



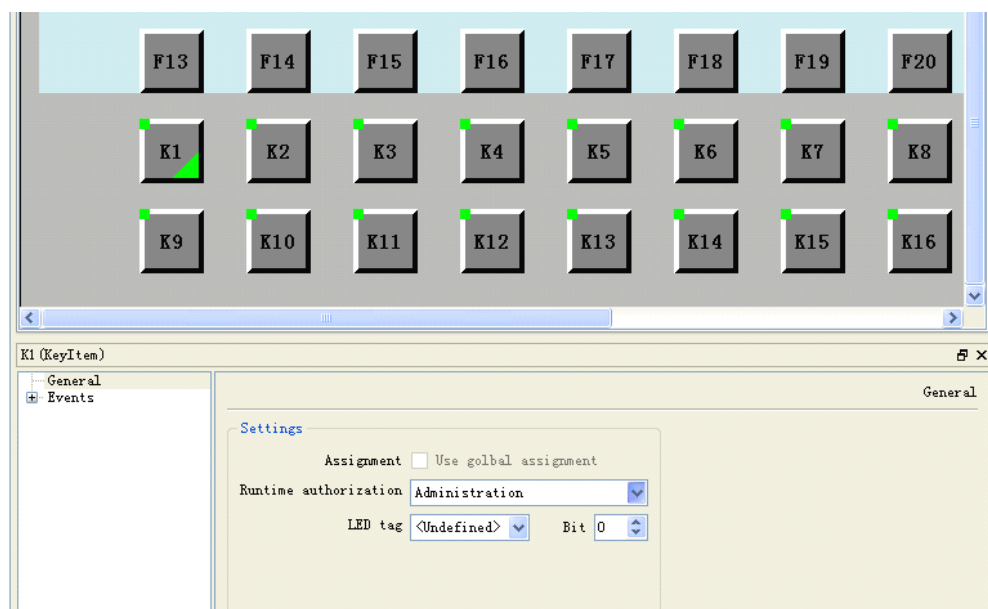
### Configuring the F key local permission:

In the project view double-click the screen which we need. Enter the screen editor and click the F key. Select the existing permission in the 'Runtime authorization' of the general properties. It shows as below:



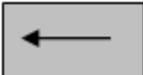
### Configuring the K key permission

The steps are the same as F key global permission's. See as following:



## 4.9.4 Function list of other system keys

Below is the function of system key in the key-press screen:

| keys                                                                                | Function                      | Instruction                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Delete character              | Delete the characters on the left of the cursor.                                                                                                                                                               |
|    | Move the cursor               | Select a screen object can be operate on the current object.                                                                                                                                                   |
|    | Move to the top               | Move to the top of the line/object. It is used in string IO field and Data view.                                                                                                                               |
|    | Move to the bottom            | Move to the bottom of the line/object. It is used in string IO field and Data view.                                                                                                                            |
|    | Enter key                     | Application and closed input.<br>Open the dropdown list of String IO field.<br>Trigger the button.                                                                                                             |
|    | TAB keys                      | According to the configured order, select the next available screen objects.                                                                                                                                   |
|    | Through comments              | Open operator comments configured for the object, such as alarm and IO field. LED send a signal indicated that the selected object has operator comments.                                                      |
|  | Cancel                        | Delete a value of the input character, return to its original value.<br>Shut the window in working conditions.                                                                                                 |
|  | Confirm                       | Confirm that the error alarm or all error of the alarm group.<br>LED light have been lighted, As long as there was wrong in queue.                                                                             |
|  | Shift                         | For key combination input special characters.<br>Some key in the lower contains blue special characters, Such as '%' character. FN+ some left lower special character, which can input this special character. |
|  | Shift                         | For key combination, such as Switching to the capital letters.                                                                                                                                                 |
|  | Conventional control function | For key combination, such as browsing through trend view. CTRL+ALT+ buttons, which can move the trend's ruler. Move a pixel once.                                                                              |
|  | Conventional control function | Use in Key combination, such as using 'state mandatory' picture objects.                                                                                                                                       |
|  | Delete character              | Delete the characters of cursor.                                                                                                                                                                               |

## 5 Communication Parameters

### 5.1 Connections

The protocols supported by MagicWorks HMI are: SIMATIC S7 200 PPI/MPI、Modicon Modbus、Omron Hostlink/ Multi link、Mitsubishi protocol 4、Mitsubishi FX、Omron Finslink、Panasonic Mewtocol、Delta DVP、LS MASTER-K Cnet、Fatek FBs、SIMATIC S7 300.

The max. Connections of each protocol are displayed in below table:

| Protocol                   | Max. connections |
|----------------------------|------------------|
| SIMATIC S7 200 PPI         | 1                |
| SIMATIC S7 200 MPI         | 32               |
| Modicon Modbus             | 32               |
| Omron Hostlink/ Multi link | 32               |
| Mitsubishi protocol 4      | 16               |
| Mitsubishi FX              | 1                |
| Omron Finslink             | 16               |
| Panasonic Mewtocol         | 16               |
| Delta DVP                  | 16               |
| LS MASTER-K Cnet           | 32               |
| Fatek FBs                  | 32               |
| SIMATIC S7 300             | 1                |

In project view, double-click [Communication] / [Connections] to open the connection editor, it consists of three parts: Connection table, Parameter and Point area, see as follows:

| Name           | Communication driver | Online | Comment |
|----------------|----------------------|--------|---------|
| 1 Connection_1 | SIMATIC S7 200       | On     |         |

**Parameter**

Interface  
IF1 B

HMI Device  
Baud rate: 19200  
Address: 1

Network  
Profile: MPI  
Highest address: HSA: 31  
Master count: 1

PLC Device  
Address: 2

**[Connection]**

In the connections form, show the basic properties of connection:

Name: Configure 'Connection' name, has uniqueness. You can configure the name according to your requirements.

Communication driver: SIMATIC S7 200, Modicon MODBUS, Omron Hostlink / Multilink, Mitsubishi Protocol 4, Mitsubishi FX, Omron Finslink, Panasonic Mewtocol, Delta DVP, LS MASTER-K Cnet, Fatek FBs, SIMATIC S7 300.

Online: We can choose 'open' or 'close', choose 'open' in general.

Comment: The description will be inputted to the 'comments' area. Comment is not visible at run time.

**5.1.1 Setup communication parameters****[Parameter]**

Different communication drivers determine different parameters.

When choose SIMATIC S7200 as communication driver, the Parameters see as below:

| Name            | Range                     | Description                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interface       | Port1                     | The HMI device is connected to the PPI network or MPI network through this interface.                                                                                                                                                                                                                                                                                                    |
| Baud rate       | 19200 (Default)<br>187500 | Data transfer rate between PLC and HMI device. The entire network must be consistent. When configured for PPI, support three baud rates: 9600/19200/187500, when configured for MPI, support two baud rate: 19200/187500.                                                                                                                                                                |
| Address         | 1 to 31                   | Set the HMI device's MPI addresses. In the network, the MPI address must be unique.                                                                                                                                                                                                                                                                                                      |
| Profile         | MPI<br>PPI                | Choose relevant network configuration files, support MPI and PPI.                                                                                                                                                                                                                                                                                                                        |
| Highest Address | 15<br>31<br>63<br>126     | Set the highest address. The highest address must be equal to or greater than the highest MPI address. The entire network must be consistent.                                                                                                                                                                                                                                            |
| Master count    | 0 to 31                   | When the HMI device is connected to the network, this feature prevents bus disturbances. The slave station can only send data after receiving request from the master station. If the HMI device connected to the slave station only, please set "Only master on the bus" check box to disable this security feature. For SIMATIC S7 200, HMI device must also be set to master station. |
| Address         | 0 to 31                   | It's address of the PLC device. Set the slave station address to communicate with HMI.                                                                                                                                                                                                                                                                                                   |

#### Data type description of Tag

| Data Type | Bit    | Description      | Range        |
|-----------|--------|------------------|--------------|
| Char      | 8-bit  | Character        | -128~127     |
| Byte      | 8-bit  | Byte             | 0~255        |
| Int       | 16-bit | Signed integer   | -32768~32767 |
| Word      | 16-bit | Unsigned integer | 0~65535      |

|            |        |                       |                        |
|------------|--------|-----------------------|------------------------|
| DInt       | 32-bit | Signed long integer   | -2147483648~2147483647 |
| DWord      | 32-bit | Unsigned long integer | 0~4294967295           |
| Real       | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| bool       | 1-bit  | Bool (Bit)            | 0~1                    |
| StringChar | -      | String char           |                        |
| Timer      | 32-bit | Null                  | Datetime value         |

When choose Modicon MODBUS as communication driver, the Parameters see as below:

| Name          | Range                                                                       | Description                                                                                                                                            |
|---------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interface     | Port0/Port1                                                                 | The HMI device is connected to the PPI network or MPI network through this interface.<br>Note:The two ports cannot be configured to the same protocol. |
| Baud rate     | 1200<br>2400<br>4800<br>9600 (Default)<br>19200<br>38400<br>57600<br>115200 | Data transfer rate between PLC and HMI device.                                                                                                         |
| Parity        | None<br>Odd<br>even (Default)                                               | Internal checking rule of each byte.                                                                                                                   |
| Date bits     | 8                                                                           | Data bits of each byte frame for 232 or 485.                                                                                                           |
| Stop bits     | 1 (Default)<br>2                                                            | Stop bits of each byte frame for 232 or 485.                                                                                                           |
| Framing       | RTU standard                                                                |                                                                                                                                                        |
| Slave Address | 1 to 247                                                                    | Slave Address of PLC.                                                                                                                                  |

Data type description of Tag

| Data Type | Bit | Description | Range |
|-----------|-----|-------------|-------|
|-----------|-----|-------------|-------|

|              |        |                       |                        |
|--------------|--------|-----------------------|------------------------|
| Int          | 16-bit | Unsigned integer      | 0~65535                |
| +/-Int       | 16-bit | Signed integer        | -32768~32767           |
| Double       | 32-bit | Unsigned long integer | 0~4294967295           |
| +/-Double    | 32-bit | Signed long integer   | -2147483648~2147483647 |
| Float        | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| bit          | 1-bit  | Bool(bit)             | 0~1                    |
| 16 bit Group | 16-bit | Unsigned integer      | 0~65535                |
| ASCII        | -      | String char           |                        |

When choose Omron Hostlink / Multilink as communication driver, the Parameters see as below:

The screenshot shows a configuration window with two tabs: 'Parameter' and 'Point area'. The 'Parameter' tab is selected. Inside, there's a section for 'interface' with a dropdown menu set to 'PORT1'. Below this, there are two main configuration areas: 'HMI Device' and 'PLC Device'. The 'HMI Device' section contains four settings: 'Baud rate' (9600), 'Parity' (Even), 'Data bits' (7), and 'Stop bits' (2). The 'PLC Device' section contains one setting: 'Station address' (0). All settings are displayed with dropdown menus or input fields.

| Name      | Range                                                                       | Description                                                                                                                                            |
|-----------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interface | Port0/Port1                                                                 | The HMI device is connected to the PPI network or MPI network through this interface.<br>Note:The two ports cannot be configured to the same protocol. |
| Baud rate | 1200<br>2400<br>4800<br>9600 (Default)<br>19200<br>38400<br>57600<br>115200 | Data transfer rate between PLC and HMI device.                                                                                                         |
| Parity    | None<br>Odd<br>even (Default)                                               | Internal checking rule of each byte.                                                                                                                   |
| Date bits | 7 (Default)<br>8                                                            | Data bits of each byte frame for 232 or 485.                                                                                                           |
| Stop bits | 1<br>2 (Default)                                                            | Stop bits of each byte frame for 232 or 485.                                                                                                           |
| Station   | 0 to 31                                                                     | Station Address of PLC.                                                                                                                                |

|          |                                       |                                                                                                                                                                                                                                         |
|----------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Address  |                                       |                                                                                                                                                                                                                                         |
| CPU type | FX0N、FX1S<br>FX2C、FX1N、<br>FX2N、FX2NC | Mitsubishi Protocol 4 supports the PLC type FX0N、FX1S、FX2C、FX1N、FX2N、FX2NC of Mitsubishi, this protocol also applies to Inovance Inothink H1U/H2U PLC, which "FX0N、FX1S" corresponds to H1U, "FX2C、FX1N、FX2N、FX2NC" corresponds to H2U. |

## Data type description of Tag

| Data Type | Bit    | Description           | Range                  |
|-----------|--------|-----------------------|------------------------|
| BYTE      | 8-bit  | Byte                  | 0~255                  |
| DEC       | 16-bit | Unsigned integer      | 0~65535                |
| +/-DEC    | 16-bit | Signed integer        | -32768~32767           |
| LDEC      | 32-bit | Unsigned long integer | 0~4294967295           |
| +/-LDEC   | 32-bit | Signed long integer   | -2147483648~2147483647 |
| IEEE      | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| BIN       | 1-bit  | Bool (Bit)            | 0~1                    |
| ASCII     | -      | String Char           |                        |

When choose Mitsubishi Protocol 4 as communication driver, the Parameters see as below:

| Name      | Range                                           | Description                                                                                                                              |
|-----------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Interface | Port0/Port1                                     | Two 485 ports of HMI. Please configure Port1 if there is one 485 port.<br>Note: The two ports cannot be configured to the same protocol. |
| Baud rate | 1200<br>2400<br>4800<br>9600 (Default)<br>19200 | Data transfer rate between PLC and HMI device.                                                                                           |
| Parity    | None                                            | Internal checking rule of each byte.                                                                                                     |

|                 |                                       |                                                                                                                                                                                                                                         |
|-----------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | Odd<br>even (Default)                 |                                                                                                                                                                                                                                         |
| Date bits       | 7 (Default)<br>8                      | Data bits of each byte frame for 232 or 485.                                                                                                                                                                                            |
| Stop bits       | 1 (Default)<br>2                      | Stop bits of each byte frame for 232 or 485.                                                                                                                                                                                            |
| Checksum        | Yes (Default)<br>No                   | You can select to check the data or not.                                                                                                                                                                                                |
| Station Address | 0 to 15                               | Station Address of PLC.                                                                                                                                                                                                                 |
| CPU type        | FX0N、FX1S<br>FX2C、FX1N、<br>FX2N、FX2NC | Mitsubishi Protocol 4 supports the PLC type FX0N、FX1S、FX2C、FX1N、FX2N、FX2NC of Mitsubishi, this protocol also applies to Inovance Inothink H1U/H2U PLC, which "FX0N、FX1S" corresponds to H1U, "FX2C、FX1N、FX2N、FX2NC" corresponds to H2U. |

Data type description of Tag

| Data Type    | Bit    | Description           | Range                  |
|--------------|--------|-----------------------|------------------------|
| Int          | 16-bit | signed integer        | -32768~32767           |
| Word         | 16-bit | Unsigned integer      | 0~65535                |
| DInt         | 32-bit | signed long integer   | -2147483648~2147483647 |
| DWord        | 32-bit | Unsigned long integer | 0~4294967295           |
| Real         | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| bit          | 1-bit  | Bool (Bit)            | 0~1                    |
| 4 bit block  | 4-bit  | Unsigned              | 0~15                   |
| 8 bit block  | 8-bit  | Unsigned              | 0~255                  |
| 12 bit block | 12-bit | Unsigned              | 0~4095                 |
| 16 bit block | 16-bit | Unsigned              | 0~65535                |
| 20 bit block | 20-bit | Unsigned              | 0~1048575              |
| 24 bit block | 24-bit | Unsigned              | 0~16777215             |
| 28bit block  | 28-bit | Unsigned              | 0~268435455            |
| 32 bit block | 32-bit | Unsigned              | 0~4294967295           |
| string       | -      | String char           |                        |

When choose Mitsubishi FX as communication driver, the Parameters see as below:



| Name      | Range                                                         | Description                                                                                                                              |
|-----------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Interface | Port0/Port1                                                   | Two 485 ports of HMI. Please configure Port1 if there is one 485 port.<br>Note: The two ports cannot be configured to the same protocol. |
| Baud rate | 300<br>600<br>1200<br>2400<br>4800<br>9600 (Default)<br>19200 | Data transfer rate between PLC and HMI device.                                                                                           |
| Parity    | None<br>Odd<br>even (Default)                                 | Internal checking rule of each byte.                                                                                                     |
| Date bits | 7 (Default)<br>8                                              | Data bits of each byte frame for 232 or 485.                                                                                             |
| Stop bits | 1 (Default)<br>2                                              | Stop bits of each byte frame for 232 or 485.                                                                                             |

Remark: This protocol also applies to Invoance Inothink H1U/H2U PLC.

#### Data type description of Tag

| Data Type | Bit    | Description           | Range                  |
|-----------|--------|-----------------------|------------------------|
| Int       | 16-bit | signed integer        | -32768~32767           |
| Word      | 16-bit | Unsigned integer      | 0~65535                |
| DInt      | 32-bit | signed long integer   | -2147483648~2147483647 |
| Double    | 32-bit | Unsigned long integer | 0~4294967295           |

|              |        |                 |                  |
|--------------|--------|-----------------|------------------|
| IEEE-Float   | 32-bit | Floating number | -3.4e+38~3.4e+38 |
| bit          | 1-bit  | Bool (Bit)      | 0~1              |
| 4 bit block  | 4-bit  | Unsigned        | 0~15             |
| 8 bit block  | 8-bit  | Unsigned        | 0~255            |
| 12 bit block | 12-bit | Unsigned        | 0~4095           |
| 16 bit block | 16-bit | Unsigned        | 0~65535          |
| 20 bit block | 20-bit | Unsigned        | 0~1048575        |
| 24 bit block | 24-bit | Unsigned        | 0~16777215       |
| 28bit block  | 28-bit | Unsigned        | 0~268435455      |
| 32 bit block | 32-bit | Unsigned        | 0~4294967295     |
| String       | -      | String char     |                  |

When choose Omron Finslink as communication driver, the Parameters see as below:

The screenshot shows the 'Connections' window with the following details:

| Name           | Communication driver | Online | Comment |
|----------------|----------------------|--------|---------|
| 1 Connection_1 | Omron Finslink       | On     |         |

Below the table, the 'Parameter' tab is selected, showing the 'Point area' configuration for 'PORT1'.

**HMI Device Parameters:**

- Baud rate: 9600
- Parity: Even
- Data bits: 7
- Stop bits: 2

**PLC Device Parameters:**

- Station address: 0

| Name      | Range                                                                       | Description                                                                                                                              |
|-----------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Interface | Port0/Port1                                                                 | Two 485 ports of HMI. Please configure Port1 if there is one 485 port.<br>Note: The two ports cannot be configured to the same protocol. |
| Baud rate | 1200<br>2400<br>4800<br>9600 (Default)<br>19200<br>38400<br>57600<br>115200 | Data transfer rate between PLC and HMI device.                                                                                           |
| Parity    | None<br>Odd<br>even (Default)                                               | Internal checking rule of each byte.                                                                                                     |

|                 |                  |                                              |
|-----------------|------------------|----------------------------------------------|
| Date bits       | 7 (Default)<br>8 | Data bits of each byte frame for 232 or 485. |
| Stop bits       | 1<br>2 (Default) | Stop bits of each byte frame for 232 or 485. |
| Station Address | 0 to 31          | Station Address of PLC.                      |

Data type description of Tag

| Data Type | Bit    | Description           | Range                  |
|-----------|--------|-----------------------|------------------------|
| DEC       | 16-bit | Unsigned integer      | 0~65535                |
| +/-DEC    | 16-bit | signed integer        | -32768~32767           |
| LDEC      | 32-bit | Unsigned long integer | 0~4294967295           |
| +/-LDEC   | 32-bit | signed long integer   | -2147483648~2147483647 |
| IEEE      | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| BIN       | 1-bit  | Bool (Bit)            | 0~1                    |
| ASCII     | -      | String char           |                        |

When choose Panasonic Mewtocol as communication driver, the Parameters see as below:

| Name      | Range                                               | Description                                                                                                                              |
|-----------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Interface | Port0/Port1                                         | Two 485 ports of HMI. Please configure Port1 if there is one 485 port.<br>Note: The two ports cannot be configured to the same protocol. |
| Baud rate | 9600 (Default)<br>19200<br>38400<br>57600<br>115200 | Data transfer rate between PLC and HMI device.                                                                                           |
| Parity    | None<br>Odd<br>even (Default)                       | Internal checking rule of each byte.                                                                                                     |

|                 |                  |                                              |
|-----------------|------------------|----------------------------------------------|
| Date bits       | 7 (Default)<br>8 | Data bits of each byte frame for 232 or 485. |
| Stop bits       | 1<br>2 (Default) | Stop bits of each byte frame for 232 or 485. |
| Station Address | 1 to 16          | Station Address of PLC.                      |

Data type description of Tag

| Data Type | Bit    | Description           | Range                  |
|-----------|--------|-----------------------|------------------------|
| +/-INT    | 16-bit | signed integer        | -32768~32767           |
| UINT      | 16-bit | Unsigned integer      | 0~65535                |
| +/-LONG   | 32-bit | signed long integer   | -2147483648~2147483647 |
| ULONG     | 32-bit | Unsigned long integer | 0~4294967295           |
| FLOAT     | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| BIT       | 1-bit  | Bool (Bit)            | 0~1                    |
| ASCII     | -      | String char           |                        |

When choose Delta DVP as communication driver, the Parameters see as below:

| Name      | Range                                               | Description                                                                                                                              |
|-----------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Interface | Port0/Port1                                         | Two 485 ports of HMI. Please configure Port1 if there is one 485 port.<br>Note: The two ports cannot be configured to the same protocol. |
| Baud rate | 9600 (Default)<br>19200<br>38400<br>57600<br>115200 | Data transfer rate between PLC and HMI device.                                                                                           |
| Parity    | None<br>Odd<br>even (Default)                       | Internal checking rule of each byte.                                                                                                     |
| Date bits | 7 (Default)<br>8                                    | Data bits of each byte frame for 232 or 485.                                                                                             |

|                 |                  |                                              |
|-----------------|------------------|----------------------------------------------|
| Stop bits       | 1 (Default)<br>2 | Stop bits of each byte frame for 232 or 485. |
| Station Address | 0 to 16          | Station Address of PLC.                      |

Data type description of Tag

| Data Type | Bit    | Description           | Range                  |
|-----------|--------|-----------------------|------------------------|
| +/-INT    | 16-bit | signed integer        | -32768~32767           |
| UINT      | 16-bit | Unsigned integer      | 0~65535                |
| +/-LONG   | 32-bit | signed long integer   | -2147483648~2147483647 |
| ULONG     | 32-bit | Unsigned long integer | 0~4294967295           |
| FLOAT     | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| BIT       | 1-bit  | Bool (Bit)            | 0~1                    |
| ASCII     | -      | String char           |                        |

### 【Fatek FBs】

When choose Fatek FBs as communication driver, the Parameters see as below:

| Name      | Range                                               | Description                                                                                                                              |
|-----------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Interface | Port0/Port1                                         | Two 485 ports of HMI. Please configure Port1 if there is one 485 port.<br>Note: The two ports cannot be configured to the same protocol. |
| Baud rate | 9600 (Default)<br>19200<br>38400<br>57600<br>115200 | Data transfer rate between PLC and HMI device.                                                                                           |
| Parity    | None<br>Odd<br>even (Default)                       | Internal checking rule of each byte.                                                                                                     |

|                 |                  |                                              |
|-----------------|------------------|----------------------------------------------|
| Date bits       | 7 (Default)<br>8 | Data bits of each byte frame for 232 or 485. |
| Stop bits       | 1 (Default)<br>2 | Stop bits of each byte frame for 232 or 485. |
| Station Address | 1 to 32          | Station Address of PLC.                      |

Data type description of Tag

| Data Type | Bit    | Description           | Range                  |
|-----------|--------|-----------------------|------------------------|
| +/-INT    | 16-bit | signed integer        | -32768~32767           |
| UINT      | 16-bit | Unsigned integer      | 0~65535                |
| +/-LONG   | 32-bit | signed long integer   | -2147483648~2147483647 |
| ULONG     | 32-bit | Unsigned long integer | 0~4294967295           |
| FLOAT     | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| BIT       | 1-bit  | Bool (Bit)            | 0~1                    |
| ASCII     | -      | String char           |                        |

**【LS MASTER-K Cnet】**

When choose LS MASTER-K Cnet as communication driver, the Parameters see as below:

| Name      | Range                                     | Description                                                                                                                              |
|-----------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Interface | Port0/Port1                               | Two 485 ports of HMI. Please configure Port1 if there is one 485 port.<br>Note: The two ports cannot be configured to the same protocol. |
| Baud rate | 9600<br>19200 (Default)<br>38400<br>57600 | Data transfer rate between PLC and HMI device.                                                                                           |
| Parity    | None (Default)                            | Internal checking rule of each byte.                                                                                                     |

|                 |                  |                                              |
|-----------------|------------------|----------------------------------------------|
|                 | Odd<br>even      |                                              |
| Date bits       | 7<br>8 (Default) | Data bits of each byte frame for 232 or 485. |
| Stop bits       | 1 (Default)<br>2 | Stop bits of each byte frame for 232 or 485. |
| Station Address | 0 to 31          | Station Address of PLC.                      |

Data type description of Tag

| Data Type | Bit    | Description           | Range                  |
|-----------|--------|-----------------------|------------------------|
| +/-INT    | 16-bit | signed integer        | -32768~32767           |
| UINT      | 16-bit | Unsigned integer      | 0~65535                |
| +/-LONG   | 32-bit | signed long integer   | -2147483648~2147483647 |
| ULONG     | 32-bit | Unsigned long integer | 0~4294967295           |
| FLOAT     | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| BIT       | 1-bit  | Bool (Bit)            | 0~1                    |
| ASCII     | -      | String char           |                        |

**【SIMATIC S7 300】**

When choose SIMATIC S7 300 as communication driver, the Parameters see as below:

The screenshot shows the 'Parameter' configuration window for a SIMATIC S7 300. The 'Point area' tab is active. Under the 'interface' section, 'PORT1' is selected. The 'HMI Device' section has 'Baud rate' set to 19200 and 'Address' set to 1. The 'PLC Device' section has 'Address' set to 2.

| Name      | Range                     | Description                                                                                                                                                                                                               |
|-----------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interface | Port1                     | The HMI device is connected to the PPI network or MPI network through this interface.                                                                                                                                     |
| Baud rate | 19200 (Default)<br>187500 | Data transfer rate between PLC and HMI device. The entire network must be consistent. When configured for PPI, support three baud rates: 9600/19200/187500, when configured for MPI, support two baud rate: 19200/187500. |
| Address   | 0 to 31                   | Set the HMI device's MPI addresses. In the network, the MPI address must be unique.                                                                                                                                       |

|         |         |                                                                                        |
|---------|---------|----------------------------------------------------------------------------------------|
| Address | 0 to 31 | It's address of the PLC device. Set the slave station address to communicate with HMI. |
|---------|---------|----------------------------------------------------------------------------------------|

Data type description of Tag

| Data Type  | Bit    | Description           | Range                  |
|------------|--------|-----------------------|------------------------|
| Char       | 8-bit  | Character             | -128~127               |
| Byte       | 8-bit  | Byte                  | 0~255                  |
| Int        | 16-bit | Signed integer        | -32768~32767           |
| Word       | 16-bit | Unsigned integer      | 0~65535                |
| DInt       | 32-bit | Signed long integer   | -2147483648~2147483647 |
| DWord      | 32-bit | Unsigned long integer | 0~4294967295           |
| Real       | 32-bit | Floating number       | -3.4e+38~3.4e+38       |
| bool       | 1-bit  | Bool (Bit)            | 0~1                    |
| String     | -      | String char           |                        |
| StringChar | -      | String                |                        |
| Timer      | 16-bit | Timer                 |                        |
| Counter    | 16-bit | Counter               |                        |
| Date       | 16-bit | Date                  |                        |
| Time       | 32-bit | Time                  |                        |
| Datetime   | 64-bit | Datetime              |                        |
| TimeOfDay  | 32-bit | The time of the day   |                        |

### 5.1.2 Point area

"Point Area" is parameter domain, MagicWorks HMI can obtain the location and size info of data area of the controller, in the communication process, controller and HMI equipment read, write the data information by each other.

Such as:

- (1) Use PLC to control HMI screens.
- (2) PLC and HMI exchange clock function. (This function can solve the problem of losing clock when PLC power-off).

Select "Communication"->"Connections" from project view to set and activate the point area:

Parameter Point area

For all connections

| Connection    | Name          | Address | Length | Trigger mode     | Acquisition cycl | Comment |
|---------------|---------------|---------|--------|------------------|------------------|---------|
| 1 <Undefined> | Screen number |         | 5      | Cyclic contin... | <Undefined>      |         |
| 2 <Undefined> | Date/Time PLC |         | 6      | Cyclic contin... | <Undefined>      |         |

For each connections (Connection\_1)

| Active | Name         | Address | Length | Trigger mode     | Acquisition cycl | Comment |
|--------|--------------|---------|--------|------------------|------------------|---------|
| 1 Off  | Date/Time    |         | 6      | Cyclic contin... | <Undefined>      |         |
| 2 Off  | Data mailbox |         | 5      | Cyclic contin... | <Undefined>      |         |
| 3 Off  | Coordination |         | 1      | Cyclic contin... | <Undefined>      |         |
| 4 Off  | Job mailbox  |         | 4      | Cyclic contin... | <Undefined>      |         |

Point area includes the following parameters:

- Active: Enable the point area. You should activate the point area before use.
- Name: Defined by MagicWorks HMI.
- Address: The variable address in PLC.
- Length: MagicWorks HMI define the default length.
- Trigger mode: On demand, Cyclic on use, Cyclic continuous.
- Acquisition Cycle: Define a collection cycle used for this field to read point area periodically at run time.
- Comment: The description of the point area.



#### Tips

- The communication protocol of "Connections" should be the same as controllers'.
- You can monitor the point area only when connected to the correct PLC and must be in runtime system.

The following table introduces the access method of controller and HMI device to variable data area: Read or Write:

| Data area     | Operations                                                               | HMI | Controller |
|---------------|--------------------------------------------------------------------------|-----|------------|
| Screen number | Evaluation by the controller to determine which screen is currently open | W   | R          |
| Date/Time PLC | Transfer of date and time from the controller to the HMI device          | R/W | R/W        |
| Date/Time     | Transfer of date and time from the HMI device to the controller          | R   | W          |
| Data mailbox  | Synchronous transfer the data mailbox                                    | W   | R          |
| Coordination  | Querying the status of the HMI device in the controller program          | R   | W          |
| Job mailbox   | Trigger the functions on the HMI device by controller program.           | R/W | R/W        |

### "Screen number" point area

Function: The HMI devices store information on the screen called up on the HMI device in the "Screen number" area pointer.

This allows information on the current screen content of the HMI device to be transferred to the controller and to trigger certain reactions from the controller, for example calling up a different screen.

Application: Point is "Screen number" can only be created in one controller once. Even if there is more than one connection, you can create "Screen number" point area for one connection.

The screen number is transferred spontaneously to the controller; in other words, it is transferred whenever a new screen is selected on the HMI device. It is therefore unnecessary to configure an acquisition cycle. (Default to "Undefined")

The point area is a data area in the memory of the controller with a fixed length of 5 words.

|          | 15                               | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|----------------------------------|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| 1st word | Current screen type(Fixed to 1)  |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 2nd word | Current screen number(1~65535)   |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 3rd word | Reserved(Fixed to 0)             |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 4th word | Current field number(Fixed to 0) |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 5th word | Reserved(Fixed to 0)             |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |

### "Date/Time PLC" point area

Function: This area pointer is used to transfer the date and time from the controller to the HMI device.

This is enabled when the controller is time master.

The controller loads the data area of the point area. All definitions are coded in BCD format.

The HMI device reads the data cyclically at the configured acquisition interval and synchronizes itself.



#### Tip

To avoid negative effect to the performance of the HMI device, please configure a long enough acquisition cycle for the date/time point area.

Recommendation: Acquisition cycle of 1 minute, if the process allows this.

The date/time data area has the following structure: Its length is six words.

DATA\_AND\_TIME Format (BCD code)

| Data word | Most significant byte |       |   | Least significant byte |       |   |
|-----------|-----------------------|-------|---|------------------------|-------|---|
|           | 7                     | ..... | 0 | 7                      | ..... | 0 |

|       |                   |               |                     |
|-------|-------------------|---------------|---------------------|
| n + 0 | Year (80-99/0-29) | Month (1-12)  |                     |
| n + 1 | Day (1-31)        | Hour (0-23)   |                     |
| n + 2 | Minute (0-59)     | Second (0-59) |                     |
| n + 3 | Reserved          | Reserved      | Week(1-7, 1=Sunday) |
| n + 4 | Reserved          | Reserved      |                     |
| n + 5 | Reserved          | Reserved      |                     |

Note that when you enter the year, values 80-99 result in years 1980 through 1999 and the values 0-29 result in the years 2000 through 2029.

### "Date/Time" point area

Function: This point area is used to transfer the date and time from the HMI device to the controller.

The controller writes job mailbox "41" to the jobs mailbox.

When it evaluates the job mailbox, the HMI device writes its current date and the time in the data area configured in the "Date/time" area pointer. All definitions are coded in BCD format. You must enable all the point area for each connection when one project that contains more than one connections intends to use "Data/Time" point area.

The date/time data area has the following structure:

| Data word | Left byte         |    |    |    |    |    |   |   | Right byte             |   |   |   |   |   |   |   |      |
|-----------|-------------------|----|----|----|----|----|---|---|------------------------|---|---|---|---|---|---|---|------|
|           | 15                | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |      |
| n + 0     | Reserved          |    |    |    |    |    |   |   | Hour (0-23)            |   |   |   |   |   |   |   | Time |
| n + 1     | Minute (0-59)     |    |    |    |    |    |   |   | Second (0-59)          |   |   |   |   |   |   |   |      |
| n + 2     | Reserved          |    |    |    |    |    |   |   | Reserved               |   |   |   |   |   |   |   |      |
| n + 3     | Reserved          |    |    |    |    |    |   |   | Week (1-7, 1 = Sunday) |   |   |   |   |   |   |   | Date |
| n + 4     | Day (1-31)        |    |    |    |    |    |   |   | Month (1-12)           |   |   |   |   |   |   |   |      |
| n + 5     | Year (80-99/0-29) |    |    |    |    |    |   |   | Reserved               |   |   |   |   |   |   |   |      |

Note that when you enter the year, values 80-99 result in years 1980 through 1999 and the values 0-29 result in the years 2000 through 2029.

### "Data mailbox" point area

Function: This is useful when configured the transfer as "Synchronize with PLC" for recipe view.

- Application:
- 1) The controller is the "active partner" in the transfer of data mailboxes,
  - 2) Information about the recipe number and data mailbox number needs to be evaluated on the controller.
  - 3) The transfer of data mailboxes is triggered by a job mailbox.

Requirement: In order to synchronize transfer of data records between the HMI device and the controller, the following requirements must be met during configuration:

1) Point area has been set up;

2) The controller with which the HMI device synchronizes transfer of data mailboxes is specified in the recipe.

The data structure shows as below:

|          | 15                                    | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|---------------------------------------|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| 1st word | Current recipe number (1-999)         |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 2nd word | Current data mailbox number (1-65535) |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 3rd word | Reserved                              |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 4th word | Status (0、2、4、12)                     |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 5th word | Reserved                              |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |

Status (The meaning of the 4th word)

| Value   |           | Meaning                               |
|---------|-----------|---------------------------------------|
| Decimal | Binary    |                                       |
| 0       | 0000 0000 | Transfer permitted, data mailbox free |
| 2       | 0000 0010 | Transfer active                       |
| 4       | 0000 0100 | Transfer completed without error      |
| 12      | 0000 1100 | Transfer completed with error         |

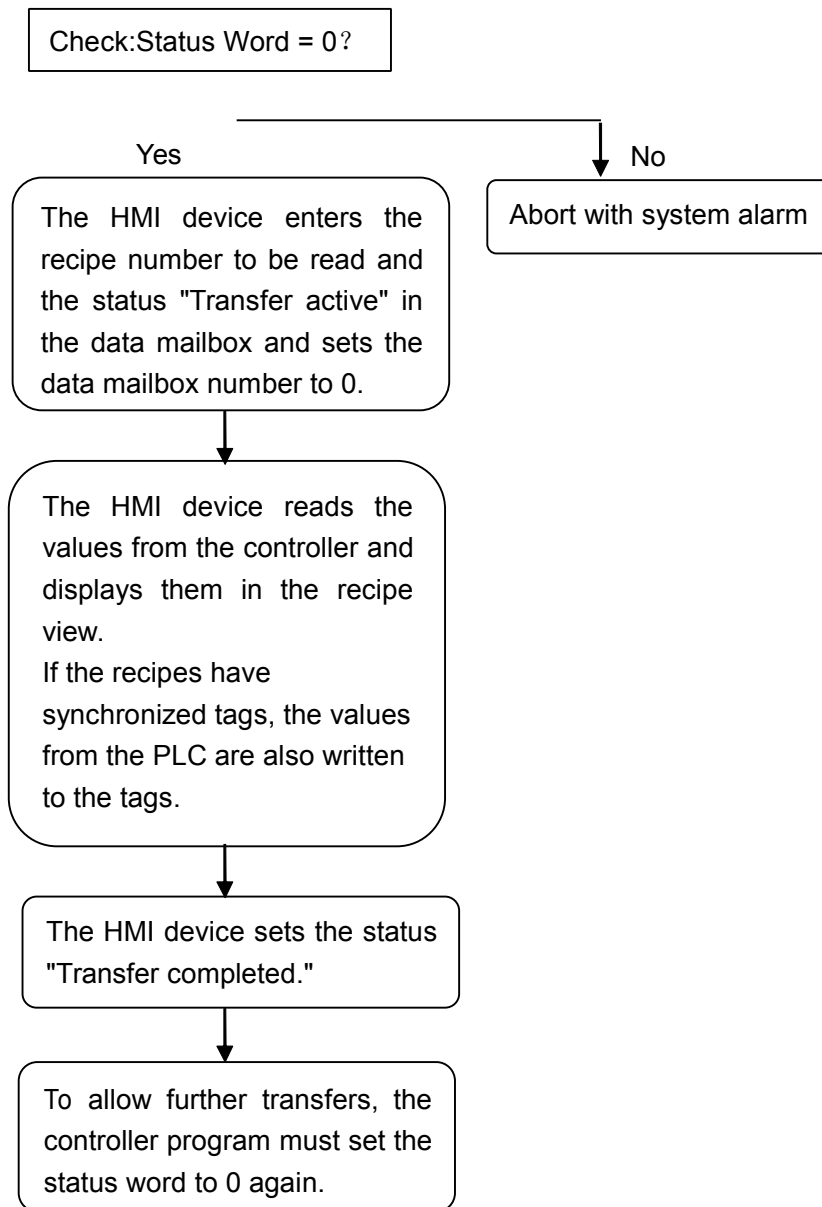
Start data record transfer by one of following three methods:

- 1) Input in recipe view by operators.
- 2) It's triggered by PLC job mailbox
- 3) It's triggered by functions

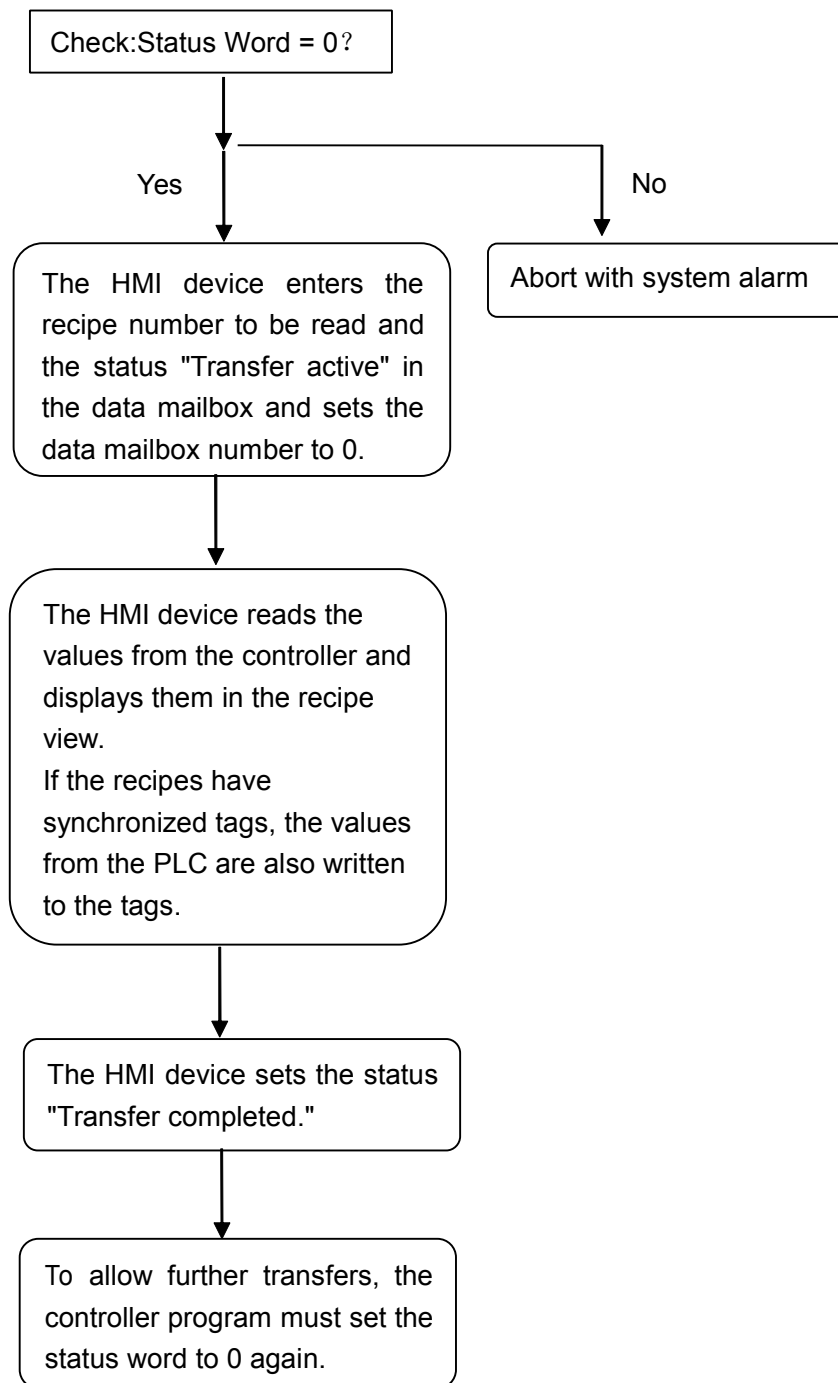
The transfer sequence started by operators in recipe view

1) Start PLC Read operation

HMI device read the value from PLC and display it in the recipe view, if recipe has synchronization variables, and would write the value which read from PLC to those variables.



## 2) Start PLC Write operation

**Tip**

You can only set the status word by HMI device, PLC can only reset the status word to 0.

The transfer sequence after triggered by job mailbox:

- The data log transfer between HMI device and PLC can be started by any station.

- The PLC job 69 and 70 is available for such kind transfer.

1) No. 69:Read the specified data mailbox of designated recipe from PLC.

Job mailbox no. 69 transfers data mailboxes from PLCto the HMI device. The job mailbox is structured as follows:

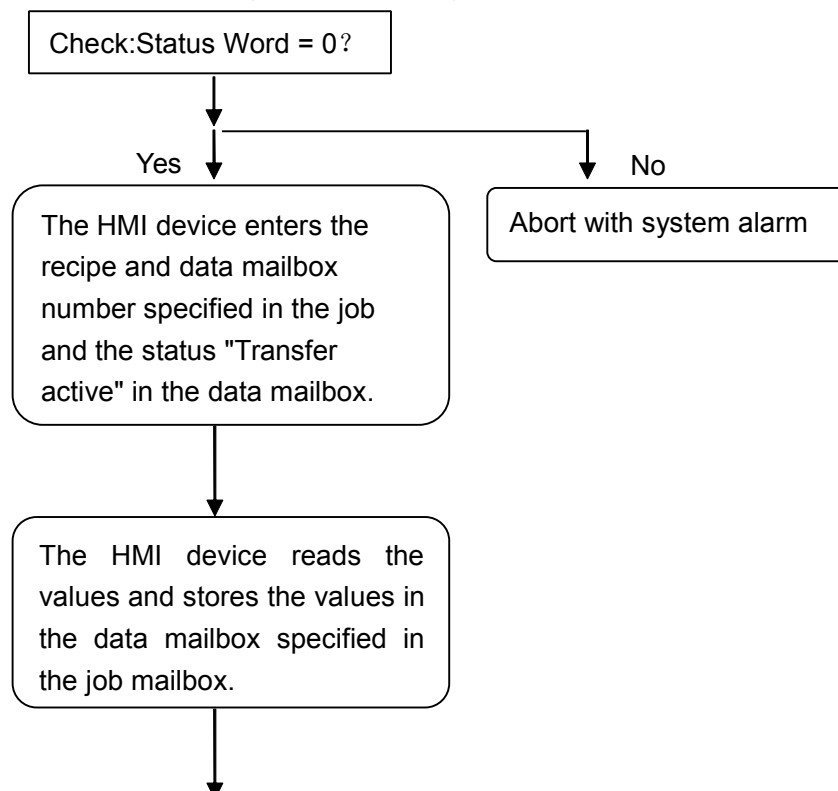
| Word     | Most significant byte                                                         | Least significant byte |
|----------|-------------------------------------------------------------------------------|------------------------|
| 1st word | 0                                                                             | 69                     |
| 2nd word | Recipe number (1-999)                                                         |                        |
| 3rd word | Data mailbox number (1-65535)                                                 |                        |
| 4th word | Do not overwrite existing data mailbox:0<br>Overwrite existing data mailbox:1 |                        |

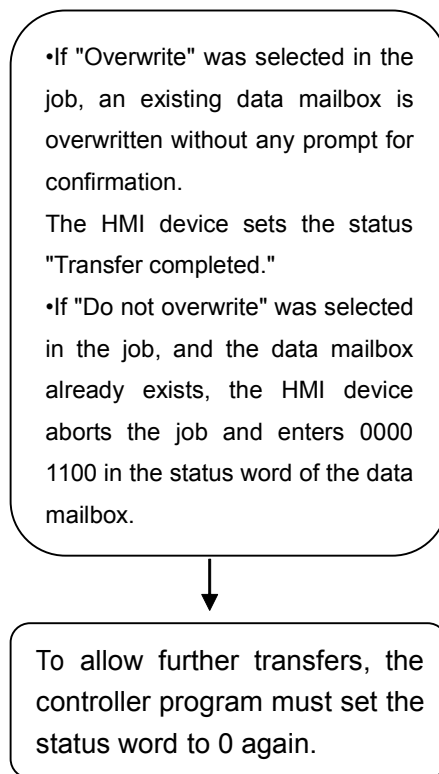
2) No. 70:Write the specified data mailbox of designated recipe to PLC.

Job mailbox no. 70 transfers data mailboxes from the HMI device to PLC. The job mailbox is structured as follows:

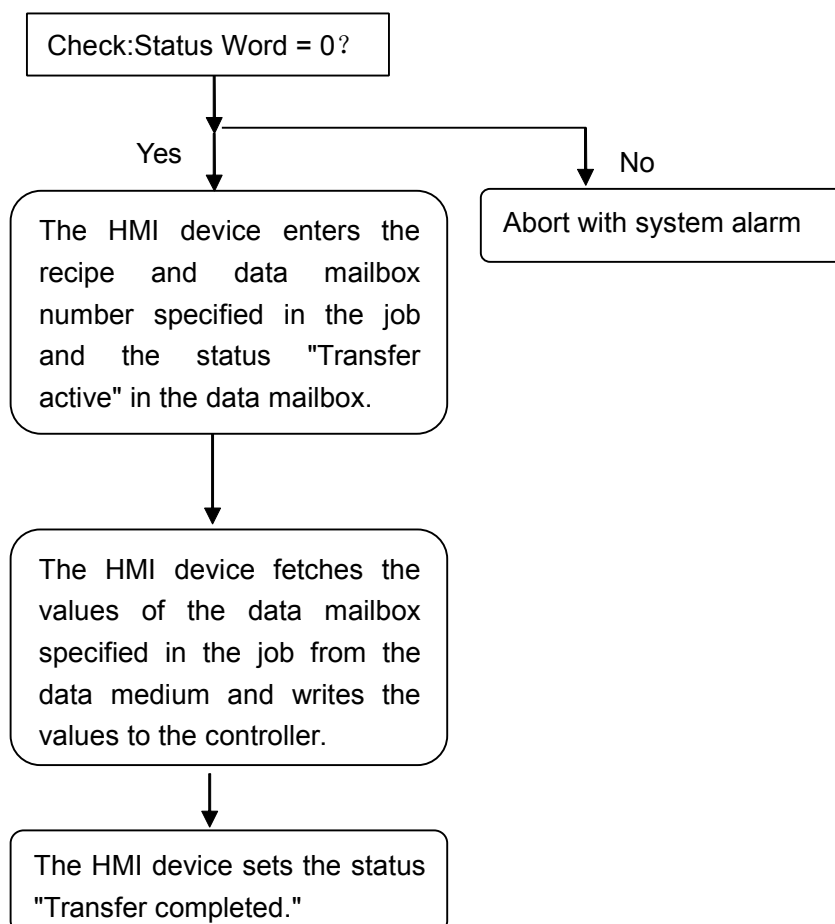
|          | Most significant byte         | Least significant byte |
|----------|-------------------------------|------------------------|
| 1st word | 0                             | 70                     |
| 2nd word | Recipe number (1-999)         |                        |
| 3rd word | Data mailbox number (1-65535) |                        |
| 4th word | —                             |                        |

3) Sequence when reading from PLC with job mailbox (No. 69)





#### 4) Sequence of writing to the PLC using PLC job (No.70)



↓

The controller program can now evaluate the transferred data.

To allow further transfers, the controller program must set the status word to 0 again.

### "Coordination" point area

Function: The "Coordination" area pointer is used to implement the following functions:

- 1) Detecting the startup of the HMI device in the control program
- 2) Detecting the current operating mode of the HMI device in the control program
- 3) Detecting whether the HMI device is ready to communicate in the control program

Its length is two words. It's always write whole coordination area when HMI device updated point area.

The data format of "Coordination" see as below:

| Word     | Most significant byte |    |    |    |    |    |   |   | Least significant byte                                                                     |   |   |   |   |   |   |   |
|----------|-----------------------|----|----|----|----|----|---|---|--------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|
|          | 15                    | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7                                                                                          | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1st word | Reserved              |    |    |    |    |    |   |   | 0 is startup bit, 1 is operating mode, 2 is status bit, the rest of the bits are reserved. |   |   |   |   |   |   |   |
| 2nd word | Not assigned          |    |    |    |    |    |   |   | Not assigned                                                                               |   |   |   |   |   |   |   |

| Item           | Description                                                                                                                                                                                                                                                              |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Startup bit    | The startup bit is set briefly to "0" by the HMI device during startup. After startup, the bit is set permanently to "1."                                                                                                                                                |
| Operating mode | As soon as the HMI device is switched offline by the user, the operating mode bit is set to 1.<br>In normal operation of the HMI device, the state of the operating mode bit is "0." You can find out the current operating mode of the HMI device by querying this bit. |
| Status bit     | The status bit is inverted by the HMI device at intervals of approximately one second. By querying this bit in the controller program, you can check whether or not the connection to the HMI device still exists.                                                       |

### "Job mailbox" point area

Function: The job mailboxes can be given to the HMI device so as to trigger actions

on the HMI device.

Data structure: The first word of the job mailbox contains the job number. Depending on the job mailbox, up to three parameters can be transferred.

| Word  | Most significant byte | Least significant byte |
|-------|-----------------------|------------------------|
| n + 0 | 0                     | Job number             |
| n + 1 | Parameter 1           |                        |
| n + 2 | Parameter 2           |                        |
| n + 3 | Parameter 3           |                        |

If the first word of the job mailbox is equal to 0, the HMI device evaluates the job mailbox. This means that the parameters must be entered in the job mailbox first, followed by the job number.

When the HMI device accepts the job mailbox, the first word is set to 0 again. The execution of the job mailbox is generally not completed at this point in time.

All of the job mailbox and its parameters are showing in below table, the job mailbox can be triggered only when the HMI device is online.

| Job No.   | Function                                                                                                                                                                                             |                                                      |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| <b>14</b> | <b>Setting time (In BCD code)</b>                                                                                                                                                                    |                                                      |
|           | Parameter 1                                                                                                                                                                                          | Left byte:- ; Right byte: Hour (0-23)                |
|           | Parameter 2                                                                                                                                                                                          | Left byte: Minute (0-59); Right byte: Second (0-59)  |
|           | Parameter 3                                                                                                                                                                                          | -                                                    |
| <b>15</b> | <b>Setting date (In BCD code)</b>                                                                                                                                                                    |                                                      |
|           | Parameter 1                                                                                                                                                                                          | Left byte:-; Right byte: Week (1-7, Sunday-Saturday) |
|           | Parameter 2                                                                                                                                                                                          | Left byte: Date (1-31) Right byte: Month (1-12)      |
|           | Parameter 3                                                                                                                                                                                          | Left byte: Year                                      |
| <b>23</b> | <b>User login</b>                                                                                                                                                                                    |                                                      |
|           | Logs the user on with the name "PLC user" at the HMI device with the group number transferred in parameter 1.<br>The logon is possible only when the transferred group number exists in the project. |                                                      |
|           | Parameter 1                                                                                                                                                                                          | Group number: 1 to 255                               |
|           | Parameter 2, 3                                                                                                                                                                                       | -                                                    |
| <b>24</b> | <b>User logoff</b>                                                                                                                                                                                   |                                                      |
|           | Logs off the currently logged on user. (The function corresponds to the "logoff" system function)                                                                                                    |                                                      |
|           | Parameter 1, 2, 3                                                                                                                                                                                    | -                                                    |
| <b>40</b> | <b>Transfer date and time to HMI</b>                                                                                                                                                                 |                                                      |
|           | (in the S7 DATE_AND_TIME format)<br>There should be at least 5 seconds between two jobs, otherwise the HMI device will be overloaded.                                                                |                                                      |
|           | Parameter 1, 2, 3                                                                                                                                                                                    | -                                                    |
| <b>41</b> | <b>Transfer date and time to PLC</b>                                                                                                                                                                 |                                                      |

|           |                                                                                                                            |                                                                              |
|-----------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|           | (in the OP/MP format)<br>There should be at least 5 seconds between two jobs, otherwise the HMI device will be overloaded. |                                                                              |
|           | Parameter 1、2、3                                                                                                            | -                                                                            |
| <b>51</b> | <b>Screen selection</b>                                                                                                    |                                                                              |
|           | Parameter 1                                                                                                                | Screen number                                                                |
|           | Parameter 2、3                                                                                                              | -                                                                            |
| <b>69</b> | <b>Read mailbox from PLC</b>                                                                                               |                                                                              |
|           | Parameter 1                                                                                                                | Recipe No. (1-999)                                                           |
|           | Parameter 2                                                                                                                | Data mailbox No. (1-65535)                                                   |
|           | Parameter 3                                                                                                                | 0:Do not overwrite existing data record<br>1:Overwrite existing data mailbox |
| <b>70</b> | <b>Write mailbox to PLC</b>                                                                                                |                                                                              |
|           | Parameter 1                                                                                                                | Recipe No. (1-999)                                                           |
|           | Parameter 2                                                                                                                | Data mailbox No. (1-65535)                                                   |
|           | Parameter 3                                                                                                                | -                                                                            |

Note:The data format of job number is decimal.eg. If you want to use screen selection function,and the data structure is: 5132, 51means the job No., 32 is parameter1, means the 32th screen number,parameter 2 and parameter 3 are null.

#### 5.1.2.1 Configuring Point area

##### Example 1:Screen number

Step 1:Create a new project.

Step 2:Create a new connection"Connection\_1", and configure the point area for this connection, the specific configuration see as below:

Screen\_1 Connections

|   | Name         | Communication driver | Online | Comment |
|---|--------------|----------------------|--------|---------|
| 1 | Connection_1 | SIMATIC ST 200       | On     |         |

Parameter Point area

For all connections

|   | Connection   | Name          | Address | Length | Trigger mode     | .cquisition cycl | Comment |
|---|--------------|---------------|---------|--------|------------------|------------------|---------|
| 1 | Connection_1 | Screen number | VW 0    | 5      | Cyclic contin... | <Undefined>      |         |
| 2 | Connection_1 | Date/Time PLC | VW 10   | 6      | Cyclic contin... | 1min             |         |

For each connections (Connection\_1)

|   | Active | Name         | Address | Length | Trigger mode     | .cquisition cycl | Comment |
|---|--------|--------------|---------|--------|------------------|------------------|---------|
| 1 | On     | Date/Time    | VW 22   | 6      | Cyclic contin... | <Undefined>      |         |
| 2 | On     | Data mailbox | VW 34   | 5      | Cyclic contin... | <Undefined>      |         |
| 3 | On     | Coordination | VW 44   | 1      | Cyclic contin... | <Undefined>      |         |
| 4 | On     | Job mailbox  | VW 46   | 4      | Cyclic contin... | 1s               |         |

From above figure that the address of screen number is from VW0 to VW8.

After you selected one protocol for the connection, you can configure the corresponding point area for the connection; If choose connection\_1 for the first row in the point area table, the address would begin from VW0, and the length would default to 5, that means the data range is from VW0 to VW8. You can change the address, but cannot change the length, the premise is the new address cannot be reused.

Step 3: Create a tag group\_1, and create 5 tags in the group: Tag\_1(VW0), Tag\_2(VW2), Tag\_3(VW4), Tag\_4(VW6), Tag\_5(VW8), and configure the "Connection\_1" for the five tags.

| ID | Name  | Connection Id | Data type | Array count | Address | Acquisition c... | Data log Id | Logging cycle Id | Logging acquis... | Comment |
|----|-------|---------------|-----------|-------------|---------|------------------|-------------|------------------|-------------------|---------|
| 1  | Tag_1 | Connection_1  | Int       | 1           | VW 0    | 1s               | <Undefined> | 1s               | Cyclic contin...  |         |
| 2  | Tag_2 | Connection_1  | Int       | 1           | VW 2    | 1s               | <Undefined> | 1s               | Cyclic contin...  |         |
| 3  | Tag_3 | Connection_1  | Int       | 1           | VW 4    | 1s               | <Undefined> | 1s               | Cyclic contin...  |         |
| 4  | Tag_4 | Connection_1  | Int       | 1           | VW 6    | 1s               | <Undefined> | 1s               | Cyclic contin...  |         |
| 5  | Tag_5 | Connection_1  | Int       | 1           | VW 8    | 1s               | <Undefined> | 1s               | Cyclic contin...  |         |

Step 4: Create a screen, and configure 5 Number IO field in the screen, and configure 5 tags for each number IO field: Tag\_1、Tag\_2、Tag\_3、Tag\_4、Tag\_5, see below configuration:

|                |            |            |            |            |            |
|----------------|------------|------------|------------|------------|------------|
| Screen number: | 0000000000 | 0000000000 | 0000000000 | 0000000000 | 0000000000 |
|----------------|------------|------------|------------|------------|------------|

Whenever select a new screen on HMI device, the screen info would transfer to the data are of the specified controller. The current screen number of the HMI would store in the second word of this point area, the first word is fixed to 1, the following 3 words are 0.

Such as: When current screen default to screen 1, the 5 number IO field would show: 1、1、0、0、0

If configure the screen number at screen 2, when switch to screen 2, the 5 number IO field would show: 1、2、0、0、0

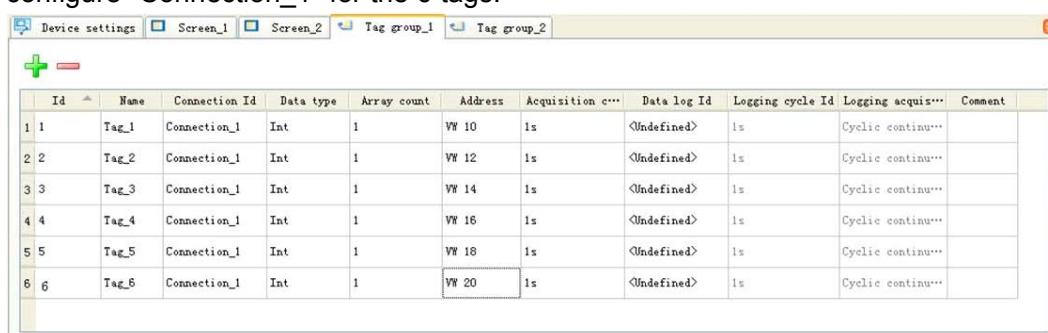
Likewise, if switch to screen N, the 5 number IO field would show: 1、N、0、0、0 (N: 1~65535)

Step 5: Use communication cable to connect the HMI with PLC, download PLC program, and communicate with HMI, the HMI would show the screen number of current screen: 1、1、0、0、0

### Example 2: Date/Time PLC

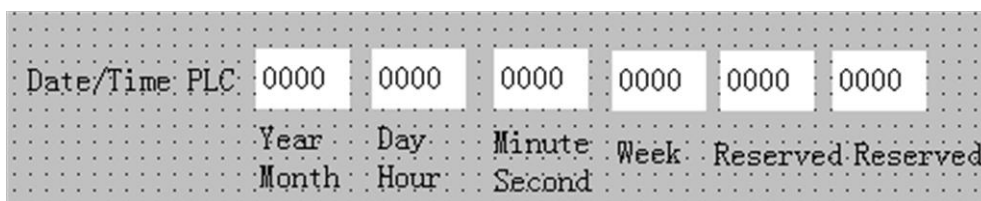
Step 1: Create a new project and a new connection according to Example 1.

Step 2: Create a tag group\_1, and configure 6 tags in this group: Tag\_1 (VW10), Tag\_2 (VW12), Tag\_3 (VW14), Tag\_4 (VW16), Tag\_5 (VW18), Tag\_6 (VW20), and configure "Connection\_1" for the 6 tags.



| ID | Name  | Connection Id | Data type | Array count | Address | Acquisition c... | Data log Id | Logging cycle Id | Logging acquis... | Comment |
|----|-------|---------------|-----------|-------------|---------|------------------|-------------|------------------|-------------------|---------|
| 1  | Tag_1 | Connection_1  | Int       | 1           | VW 10   | 1s               | <Undefined> | 1s               | Cyclic continu... |         |
| 2  | Tag_2 | Connection_1  | Int       | 1           | VW 12   | 1s               | <Undefined> | 1s               | Cyclic continu... |         |
| 3  | Tag_3 | Connection_1  | Int       | 1           | VW 14   | 1s               | <Undefined> | 1s               | Cyclic continu... |         |
| 4  | Tag_4 | Connection_1  | Int       | 1           | VW 16   | 1s               | <Undefined> | 1s               | Cyclic continu... |         |
| 5  | Tag_5 | Connection_1  | Int       | 1           | VW 18   | 1s               | <Undefined> | 1s               | Cyclic continu... |         |
| 6  | Tag_6 | Connection_1  | Int       | 1           | VW 20   | 1s               | <Undefined> | 1s               | Cyclic continu... |         |

Step 3: Create a new screen, and configure 6 number IO field in the screen, then configure tag for each number IO field: Tag\_1, Tag\_2, Tag\_3, Tag\_4, Tag\_5, Tag\_6, see as below:



| Date/Time PLC | 0000 | 0000   | 0000 | 0000     | 0000     | 0000 |
|---------------|------|--------|------|----------|----------|------|
| Year          | Day  | Minute | Week | Reserved | Reserved |      |
| Month         | Hour | Second |      |          |          |      |

Note: It's better to use hexadecimal data for above number IO field.

The 6 consecutive data areas of controller are used to save the periodical update data/time paras of HMI clock. The time is DATE\_AND\_TIME format (BCD code), the data structure see as follows:

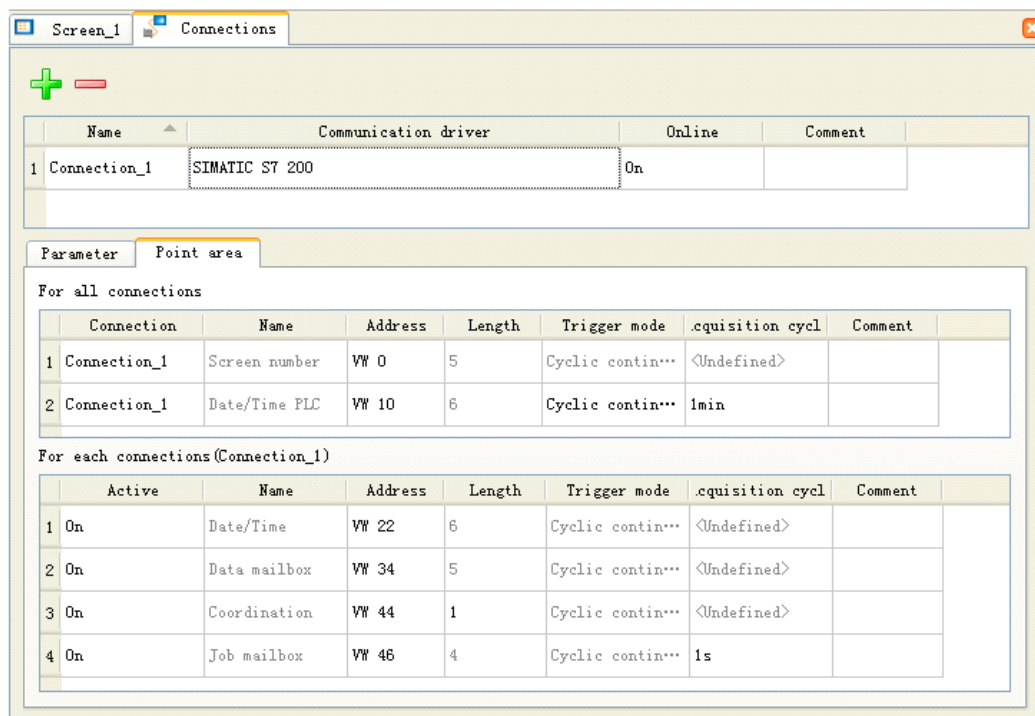
| Data word | High byte         | Low byte    |
|-----------|-------------------|-------------|
| n+0       | Year (80-99/0-29) | Month(1-12) |

|     |              |                     |
|-----|--------------|---------------------|
| n+1 | Day(1-31)    | Hour(0-23)          |
| n+2 | Minute(0-59) | Second(0-59)        |
| n+3 | Reserved     | Weekl(1-7,1=Sunday) |
| n+4 | Reserved     | Reserved            |
| n+5 | Reserved     | Reserved            |

Step 4:Download PLC program first and PLC communicates with HMI, PLC would read the tags of above Data/Time PLC,and write the time to HMI data/time field after 1 minute.

### Example 3:Data mailbox

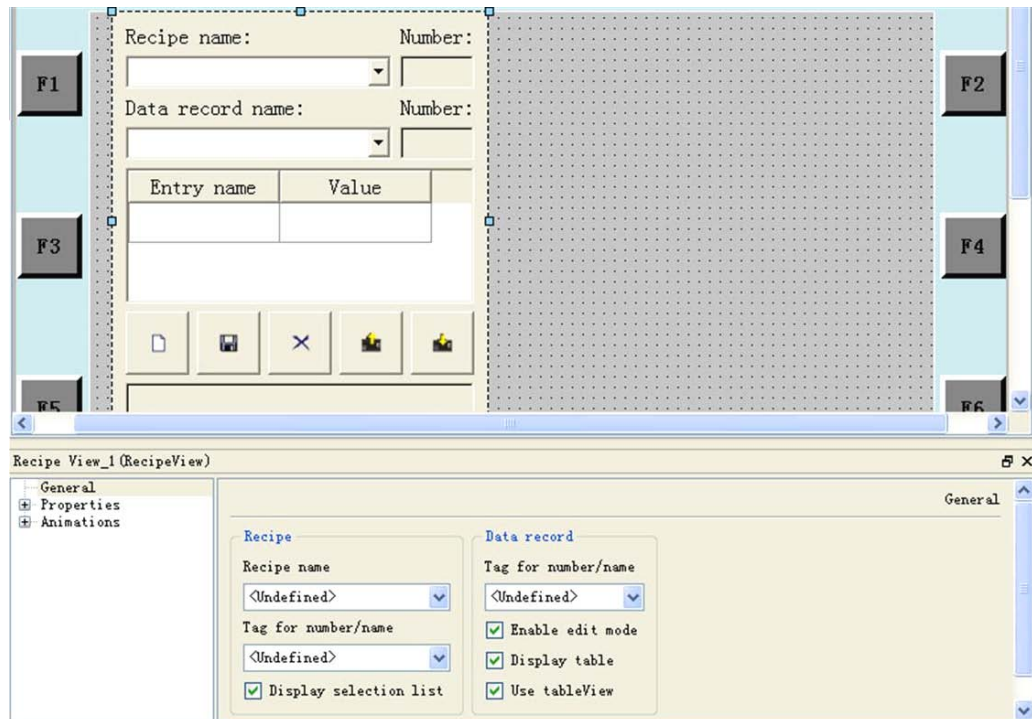
Step 1:Create new project and new connection according to example 1, see below configuration of point area:



Step 2:From above figure, the address of data mailbox is from VW34 to VW42. Configure 5 tags in the new screen, and setup their connection to "Connection\_1", and the address for each tag is:VW34、VW36、VW38、VW40、VW42.

|   | Id | Name  | Connection Id | Data type | Array count | Address | Acquis... | Data log Id | Logging c... | Logging acqui... | Comment |
|---|----|-------|---------------|-----------|-------------|---------|-----------|-------------|--------------|------------------|---------|
| 1 | 1  | Tag_1 | Connection_1  | Int       | 1           | VW 34   | 1s        | <Undefined> | 1s           | Cyclic contin... |         |
| 2 | 2  | Tag_2 | Connection_1  | Int       | 1           | VW 36   | 1s        | <Undefined> | 1s           | Cyclic contin... |         |
| 3 | 3  | Tag_3 | Connection_1  | Int       | 1           | VW 38   | 1s        | <Undefined> | 1s           | Cyclic contin... |         |
| 4 | 4  | Tag_4 | Connection_1  | Int       | 1           | VW 40   | 1s        | <Undefined> | 1s           | Cyclic contin... |         |
| 5 | 5  | Tag_5 | Connection_1  | Int       | 1           | VW 42   | 1s        | <Undefined> | 1s           | Cyclic contin... |         |

Step 3:Configure a recipe in the screen:



Step 4: Click "Recipe" -> "Add Recipe" from project view to create 3 recipes, they are Recipe\_1, Recipe\_2, Recipe\_3. And add Elements and data records for each recipe, see below configuration:

Number  Name  Display name  Version

Elements

|   | Name      | Display name | Tag   | Default value | Decimal | Information text |
|---|-----------|--------------|-------|---------------|---------|------------------|
| 1 | Element_1 | Element_1    | Tag_6 | 0             | 0       |                  |
| 2 | Element_2 | Element_2    | Tag_7 | 0             | 0       |                  |
| 3 | Element_3 | Element_3    | Tag_8 | 0             | 0       |                  |

Number  Name  Display name  Version

Elements

|   | Name      | Display name | Tag    | Default value | Decimal | Information text |
|---|-----------|--------------|--------|---------------|---------|------------------|
| 1 | Element_1 | Element_1    | Tag_9  | 0             | 0       |                  |
| 2 | Element_2 | Element_2    | Tag_10 | 0             | 0       |                  |

Number  Name  Display name  Version

Elements

|   | Name      | Display name | Tag    | Default value | Decimal | Information text |
|---|-----------|--------------|--------|---------------|---------|------------------|
| 1 | Element_1 | Element_1    | Tag_11 | 0             | 0       |                  |
| 2 | Element_2 | Element_2    | Tag_12 | 0             | 0       |                  |

Note: In order to synchronize transfer of data records between the HMI device and the controller, the following requirements must be met during configuration:

- 1) Point area has been set;
- 2) The controller with which the HMI device synchronizes transfer of data mailboxes is specified in the recipe.

Property

**Data Media**

Storage Location: file

Path: \flash\recipe

**Options**

☐ Synchronize Tags ☐ Tags offline

**Transfer**

☒ Synchronize

Synchronize with: Connection\_1

**Infotext**

Ok Cancel

Step 5: Create 3 number IO fields for Recipe\_1 in the screen, and configure Tag\_6, tag\_7, tag\_8 for the three number IO fields;

Create 2 number IO fields for Recipe\_2 in the screen, and configure Tag\_9, tag\_10 for the two number IO fields;

Create 2 number IO fields for Recipe\_3 in the screen, and configure Tag\_11, tag\_12 for the two number IO fields;

Recipe name: Number: 0000000000 0000000000 0000000000 配方1

Data record name: Number: 0000000000 0000000000 配方2

0000000000 0000000000 配方3

| Entry name | Value |
|------------|-------|
|            |       |

Number IO Field\_1 (NumberIOField)

General

Type

Mode: Input/output

Process

Tag: Tag\_6

Cycle: 1s

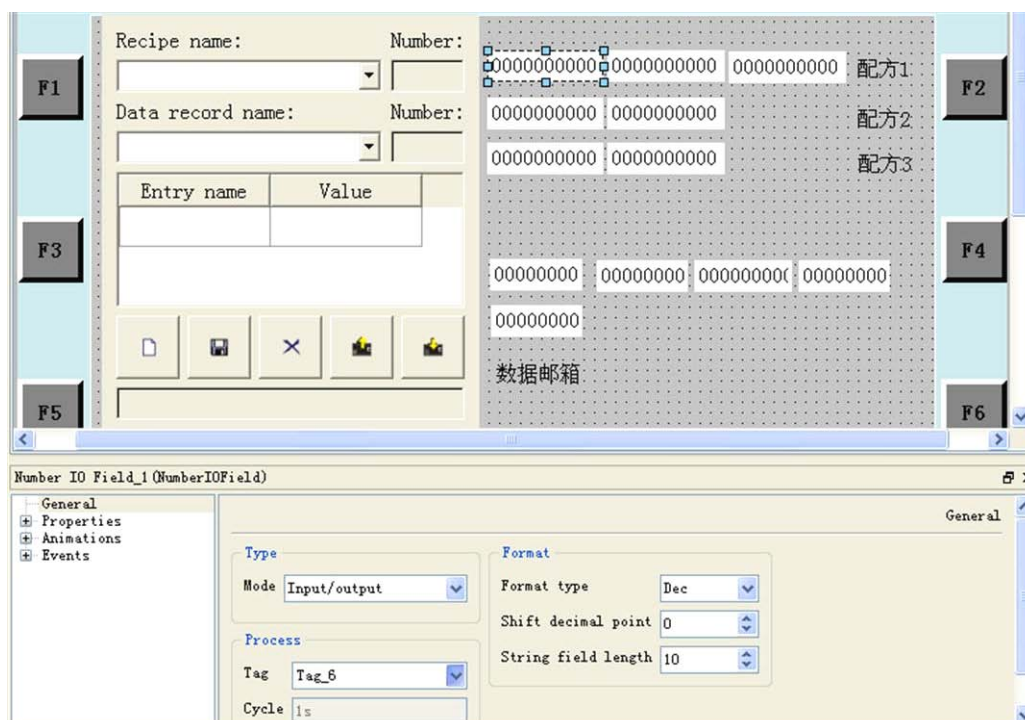
Format

Format type: Dec

Shift decimal point: 0

String field length: 10

Step 6: Create 5 number IO fields for data mailbox, and configure the tag\_1, tag\_2, tag\_3, tag\_4, tag\_5 for the 5 number IO fields as the process tag:



Step 7: Download PLC program first and after PLC is communicated with HMI device, download project from PC to HMI, write variable to recipes and download to PLC, the data in data mailbox would be changed.

Such as configure 80, 55, 102 as the elements of Recipe\_1, and select Data logs\_3, after downloaded the project to PLC, the data mailbox changed to 1、3、0、4、0;

Data structure of the Data mailbox show as below:

|          | 15                                 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|------------------------------------|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| 1st word | Current recipe No. (1-999)         |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 2nd word | Current data mailbox No. (1-65535) |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 3rd word | Reserved                           |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 4th word | Status (0、2、4、12)                  |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |
| 5th word | Reserved                           |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |

Status (The meaning of the 4th word)

| Value   |           | Meaning                                     |
|---------|-----------|---------------------------------------------|
| Decimal | Binary    |                                             |
| 0       | 0000 0000 | Transfer is available, data record is free. |
| 2       | 0000 0010 | Transfer is busy.                           |
| 4       | 0000 0100 | Transfer is finished, and no errors.        |
| 12      | 0000 1100 | Transfer is finished, and occurred errors   |

Step 8: If you changed other recipe value and need download to PLC, then you should set the 4th bit to 0.

#### Example 4: Job mailbox

Here use the 51th Job as a sample.

Step 1: Create project and connection according to Example 1, the data area configuration of the connection see as follows:

| Name           | Communication driver | Online | Comment |
|----------------|----------------------|--------|---------|
| 1 Connection_1 | SIMATIC S7 200       | On     |         |

| Connection     | Name          | Address | Length | Trigger mode     | Acquisition cycl | Comment |
|----------------|---------------|---------|--------|------------------|------------------|---------|
| 1 Connection_1 | Screen number | VW 0    | 5      | Cyclic contin... | <Undefined>      |         |
| 2 Connection_1 | Date/Time PLC | VW 10   | 6      | Cyclic contin... | 1min             |         |

| Active | Name         | Address | Length | Trigger mode     | Acquisition cycl | Comment |
|--------|--------------|---------|--------|------------------|------------------|---------|
| 1 On   | Date/Time    | VW 22   | 6      | Cyclic contin... | <Undefined>      |         |
| 2 On   | Data mailbox | VW 34   | 5      | Cyclic contin... | <Undefined>      |         |
| 3 On   | Coordination | VW 44   | 1      | Cyclic contin... | <Undefined>      |         |
| 4 On   | Job mailbox  | VW 46   | 4      | Cyclic contin... | 1s               |         |

Step 2: From above figure, we know the address of job mailbox is from VW46 to VW52. Then configure 4 tags, and set "Connection\_1" as their connection, set their address as VW46、VW48、VW50、VW52.

| ID | Name  | Connection ID | Data type | Array count | Address | Acquis... | Data log ID | Logging c... | Logging acqui... | Comment |
|----|-------|---------------|-----------|-------------|---------|-----------|-------------|--------------|------------------|---------|
| 1  | Tag_1 | Connection_1  | Int       | 1           | VW 46   | 1s        | <Undefined> | 1s           | Cyclic contin... |         |
| 2  | Tag_2 | Connection_1  | Int       | 1           | VW 48   | 1s        | <Undefined> | 1s           | Cyclic contin... |         |
| 3  | Tag_3 | Connection_1  | Int       | 1           | VW 50   | 1s        | <Undefined> | 1s           | Cyclic contin... |         |
| 4  | Tag_4 | Connection_1  | Int       | 1           | VW 52   | 1s        | <Undefined> | 1s           | Cyclic contin... |         |

Step 3: Create a new screen, and configure 4 number IO field in the screen, then configure tag for each IO field: Tag\_1、Tag\_2、Tag\_3、Tag\_4, see as below:

| Job mailbox | 0000000000 | 0000000000 | 0000000000 | 0000000000 |
|-------------|------------|------------|------------|------------|
|             |            |            |            |            |

The first word of the job mailbox contains job number. Transfer 3 paras at most according to the different type of job mailbox.

| Word  | Most significant byte | Least significant byte |
|-------|-----------------------|------------------------|
| n + 0 | 0                     | Job number             |
| n + 1 | Parameter 1           |                        |
| n + 2 | Parameter 2           |                        |

|       |             |
|-------|-------------|
| n + 3 | Parameter 3 |
|-------|-------------|

Step 4: Please refer to chapter 5.1.2 for the job mailbox table, here we select job 51, the format of job 51 see as follows:

|           |                         |               |
|-----------|-------------------------|---------------|
| <b>51</b> | <b>Screen selection</b> |               |
|           | Parameter 1             | Screen number |
|           | Parameter 2、3           | -             |

Step 5:According to the format of job mailbox,write 51、2、0、0 to the four number IO field in turn,then switch to screen 2.

|             |    |   |   |   |
|-------------|----|---|---|---|
| Job mailbox | 51 | 2 | 0 | 0 |
|-------------|----|---|---|---|

**Note:The data format of Job number is decimal.**

## 5.2 Tags

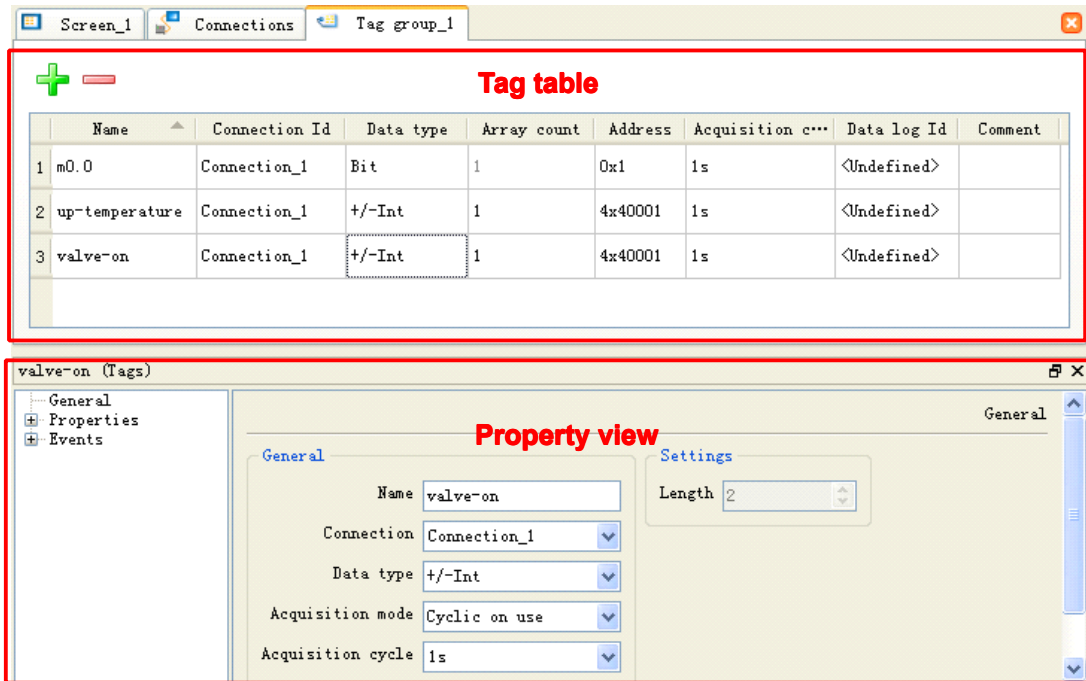
### 5.2.1 The properties of tags

Tags contain external and internal tags.

External tags are the reflection of PLC storage units, they are the exchanging data bridge of HMI and PLC. They can be accessed by HMI device and PLC. Their data types depend on the PLC which will connect to HMI device.

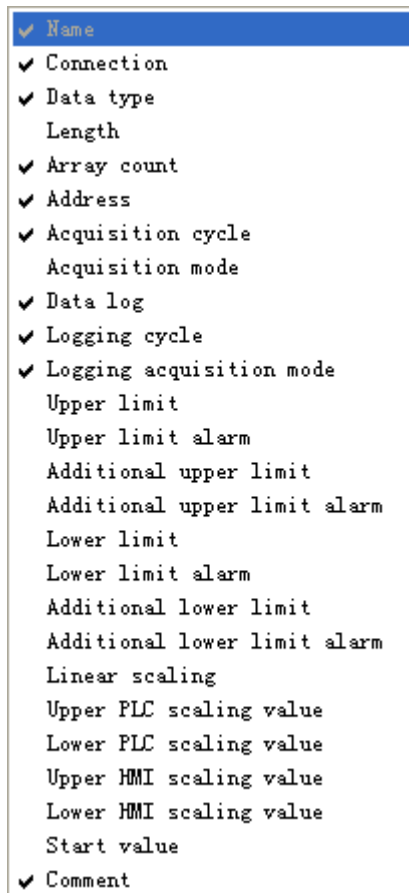
Internal tags are stored in memory of HMI device, they are used for the internal calculation or performing other tasks of the HMI device, they are no connections with the PLC, and only can be accessed by the HMI device. They have no address, only be distinguished by their name.

In the Project view,double-click [Communication] / [Tags] to open the tag editor, it consists of two parts, tag table and Property view, see as follows:



### [Tag properties]

Tag table and Property view include all of the following properties:



Name: The name of the tag, you can edit it. In one tag group, the tags' name must be unique. If tag is copied and pasted to the tag group, the name of the tag would add "\_1". eg. If the tag name here is "Tag\_1", the name of the tag would be changed to "Tag\_1\_1".

"Tag\_1\_1" after the tag is copied and pasted for the first time, paste the tag twice the name would change to "Tag\_1\_2", etc.

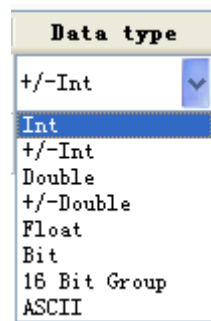
Connection: For external tags, you must configure a PLC connection.

Date type: The value type of variable, how to preserve these values in the internal and the maximum values range of the variables. Different communication drivers of the connection decide different data types.

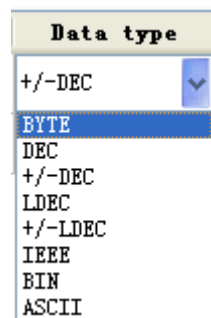
The following picture shows the Data type of SIMATIC S7 200 protocol:



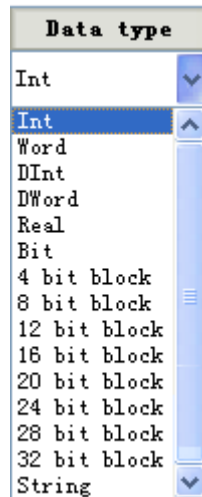
The following picture shows the Data type of Modicon MODBUS protocol:



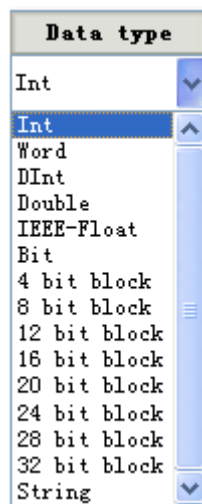
The following picture shows the Data type of Omron Hostlink / Multilink protocol:



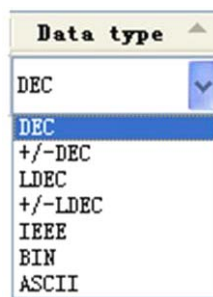
The following picture shows the Data type of Mitsubishi Protocol 4 protocol:



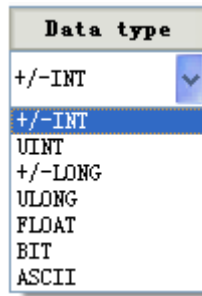
The following picture shows the Data type of Mitsubishi FX protocol:



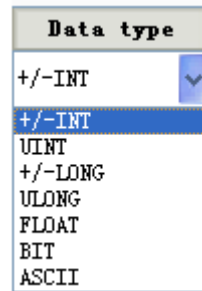
The following picture shows the Data type of Omron Finslink protocol:



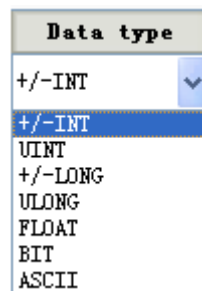
The following picture shows the Data type of Panasonic Mewtocol protocol:



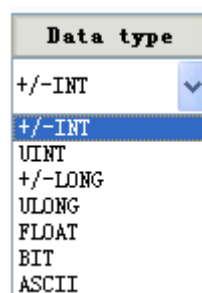
The following picture shows the Data type of Delta DVP protocol:



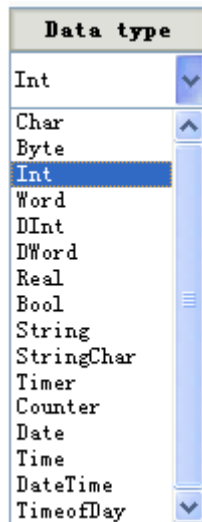
The following picture shows the Data type of Fatek FBs protocol:



The following picture shows the Data type of LS MASTER-K Cnet protocol:



The following picture shows the Data type of SIMATIC S7 300 protocol:

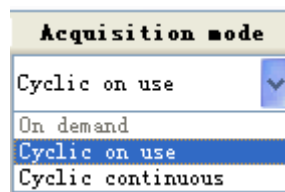


Acquisition mode: The modes of updating tags. Three types: On demand, Cyclic on use, Cyclic continuous.

On demand is reserved.

Cyclic on use: Continuous update the tags for current screen.

Cyclic continuous: Continuous update the tags for all of the screens.



Acquisition cycle: The updating cycle of the tags.

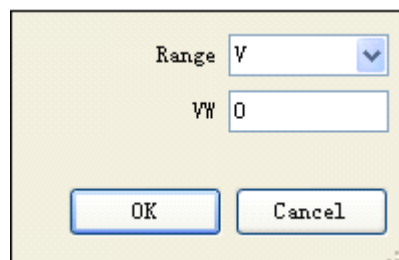
Array count: The dimension of the array tag.

Length: The length of the tag, decided by its Data type and Array count. Length equals Data types \* Array count.

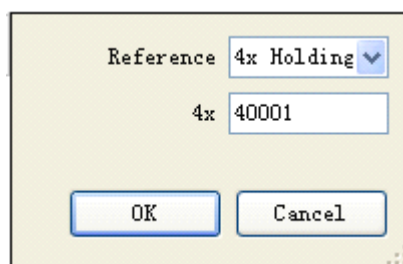
Address: The address of the tag, such as VW0, it is composed of three parts, area, data type and start position in area, only external tags have an address.

We can configure the address of the tag by setting the following parameters:

SIMATIC S7 200:



Modicon MODBUS:

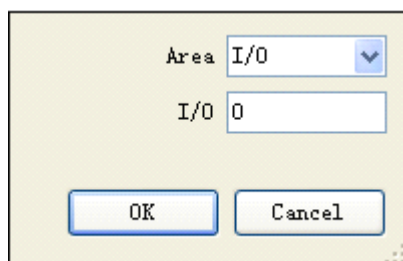


Reference 4x Holding ▾

4x 40001

OK Cancel

Omron Hostlink / Multilink:

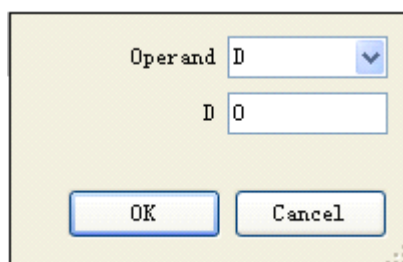


Area I/O ▾

I/O 0

OK Cancel

Mitsubishi Protocol 4:

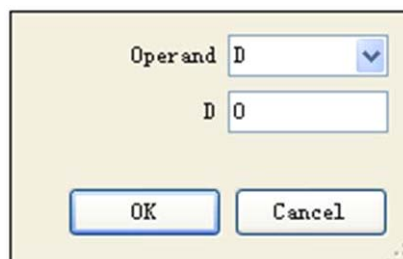


Operand D ▾

D 0

OK Cancel

Mitsubishi FX:

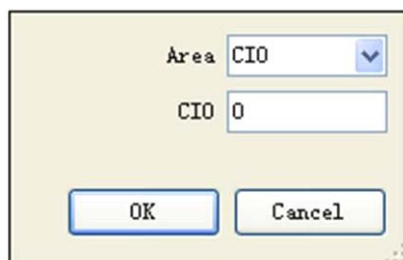


Operand D ▾

D 0

OK Cancel

Omron Finslink:

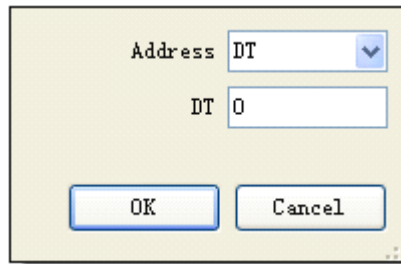


Area CIO ▾

CIO 0

OK Cancel

Panasonic Mewtocol:

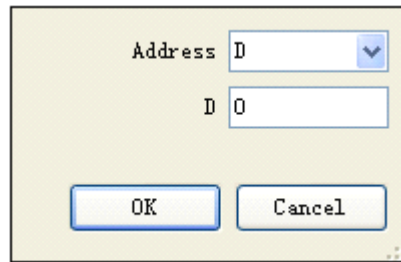


Address DT ▼

DT 0

OK Cancel

Delta DVP:

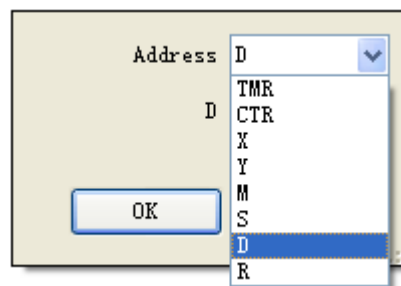


Address D ▼

D 0

OK Cancel

Fatek FBs:

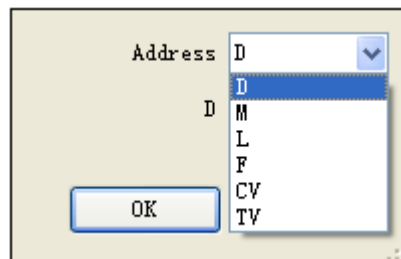


Address D ▼

D TMR  
CTR  
X  
Y  
M  
S  
D  
R

OK

LS MASTER-K Cnet:

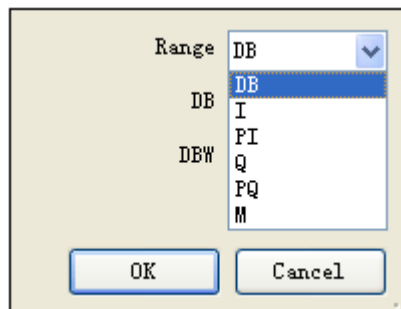


Address D ▼

D D  
M  
L  
F  
CV  
TV

OK

SIMATIC S7 300



Range DB ▼

DB DB  
I  
PI  
Q  
PQ  
M

DBW

OK Cancel

## Address

| Communication driver       | Address   | Description                                                           |
|----------------------------|-----------|-----------------------------------------------------------------------|
| SIMATIC S7 200             | Range     | Setup the memory type and offset address of the connection variables. |
| Modicon MODBUS             | Reference | Setup the memory type and offset address of the connection variables. |
| Omron Hostlink / Multilink | Area      | Setup the memory type and offset address of the connection variables. |
| Mitsubishi Protocol 4      | Operand   | Setup the memory type and offset address of the connection variables. |
| Mitsubishi FX              | Operand   | Setup the memory type and offset address of the connection variables. |
| Omron Finslink             | Area      | Setup the memory type and offset address of the connection variables. |
| Panasonic Mewtocol         | Address   | Setup the memory type and offset address of the connection variables. |
| Delta DVP                  | Address   | Setup the memory type and offset address of the connection variables. |
| Fatek FBs                  | Address   | Setup the memory type and offset address of the connection variables. |
| LS MASTER- K Cnet”         | Address   | Setup the memory type and offset address of the connection variables. |
| SIMATIC S7 300             | Address   | Setup the memory type and offset address of the connection variables. |

## Limit

| Limit |              |                              | Description                                                                                              |
|-------|--------------|------------------------------|----------------------------------------------------------------------------------------------------------|
| Limit | limit        | Upper limit                  | The digital tags can be specified the number range with upper limit range.                               |
|       |              | Additional upper limit       | The digital tags can be specified the number range with additional upper limit range.                    |
|       |              | Additional lower limit       | The digital tags can be specified the number range with additional lower limit range.                    |
|       |              | Lower limit                  | The digital tags can be specified the number range with upper limit range.                               |
|       | Create alarm | Upper limit alarm            | If the process value (should be stored in a variable) reached the limits, can produce a warning message. |
|       |              | Additional upper limit alarm | If the process value of the variable in an additional upper limit range, will produce the analog alarm.  |
|       |              | Additional lower limit alarm | If the process value of the variable in an additional lower limit range, will produce the analog alarm.  |
|       |              | Lower limit                  | If the process value of the variable in a lower limit                                                    |

|  |  |       |                                       |
|--|--|-------|---------------------------------------|
|  |  | alarm | range, will produce the analog alarm. |
|--|--|-------|---------------------------------------|

#### Linear scaling

| Linear scaling |     |                   | Description          |
|----------------|-----|-------------------|----------------------|
| Linear scaling | PLC | Upper limit value | PLC set upper limit. |
|                |     | Lower limit value | PLC set lower limit. |
|                | HMI | Upper limit value | HMI set upper limit. |
|                |     | Lower limit value | HMI set lower limit. |

Start value: Each variable can configure a start value. When running the operation system, the variable will be set to this value. In this way, can ensure project startup is the initial condition.

Comment: Info text of the tag.

#### Log

| Log |          |                   | Description                                                                                                                                                                                                                                                                                    |
|-----|----------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| log | Data log | Name              | In order to facilitate filing and later evaluation, data can be stored in the different of data log.                                                                                                                                                                                           |
|     | Trigger  | Acquisition mode  | Three types: on change, on demand, Cyclic continuous<br>On Change: The data record would be written while the variable were changed<br>On demand: A data log would be written while LogTag was executed each time.<br>Cyclic continuous: Data log would be written according to the log cycle. |
|     |          | Acquisition cycle | Specifies how time to update the variable values.                                                                                                                                                                                                                                              |

### [Tag 'Events']

Each variable has three events types:

Change value: The function would be triggered when the tag's value is changed.

High limit: The function would be triggered when the tag's value is higher than the high limit.

Note: Please set the "upper" or "Additional upper" in the properties view that the function would be triggered by the high limit.

Low limit: The function would be triggered when the tag's value is less than the low limit.

Note: Please set the "Lower" or "Additional Lower" in the properties view that the function would be triggered by the low limit.

Switch On: The function would be triggered when the value of bool type tag is 1.

Switch Off: The function would be triggered when the value of bool type tag is 0.

Please refer to chapter 11.1 for configuring the "Events" function.

### 5.2.2 The import / export function of tag group

The tag group supports the import / export function.

Right-click the tag group that need to be imported or exported from the project view, would pop up the corresponding dialog.

#### Export tag group

The exported tag group is a binary format file, you cannot edit it by Excel; When export the tag group, the "Data Log Id", "Logging Acquisition Mode", "Logging Cycle Id" and the system functions are discarded.

#### Import tag group

MagicWorks HMI supports to import the tag group from external, the imported data must meet the following requirements:

- The file format of the file to be imported must be ".tag".
- Before importing, MagicWorks HMI would judge whether the "Connection Id" and "Acquisition Cycle Id" are existing or not, if exist one of the two options(they are the same) or not exist the two options, the tag group can be imported; If exist the option but not entirely the same, it cannot be imported.

### 5.2.3 The bulk editing function of tag table

You can bulk edit the "Connection Id", "Acquisition Cycle Id", "Data log Id", "Data Type", "Arrange Count", "Logging Cycle Id", "Length", "Logging Acquisition mode" from tag table.

Note: You need select the column that to be bulk edited.

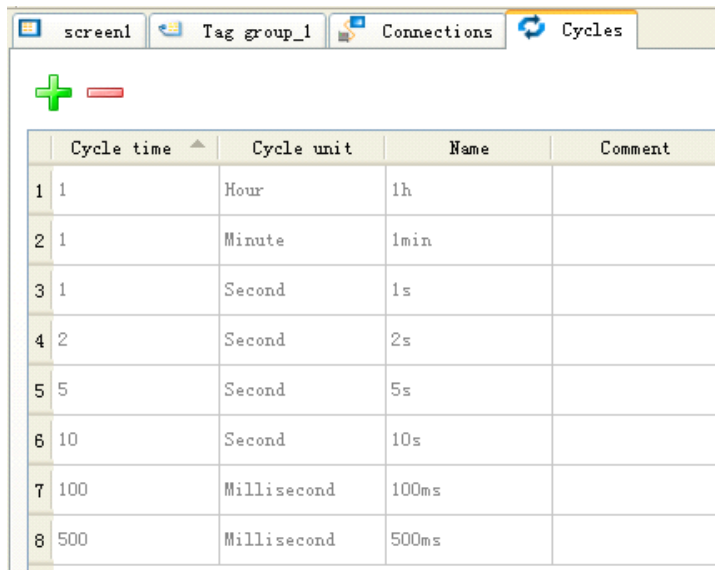
### 5.2.4 The filter function of tag table

It's available for you to select the tags by "Tag Group", "Connection" etc requirements.

## 5.3 Cycles

"Cycle" includes collection cycle and record cycle, to be mainly used for controlling the updating rate of variable and storing rate of data record.

In Project view, double-click [Communication] → [Cycles] to open the editor, see as follows:

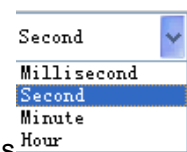


|   | Cycle time | Cycle unit  | Name  | Comment |
|---|------------|-------------|-------|---------|
| 1 | 1          | Hour        | 1h    |         |
| 2 | 1          | Minute      | 1min  |         |
| 3 | 1          | Second      | 1s    |         |
| 4 | 2          | Second      | 2s    |         |
| 5 | 5          | Second      | 5s    |         |
| 6 | 10         | Second      | 10s   |         |
| 7 | 100        | Millisecond | 100ms |         |
| 8 | 500        | Millisecond | 500ms |         |

There are 8 default cycles in the system, and you can't edit them, but you can add a new cycle by clicking  button, also you can click  button to delete a cycle added by yourself.

### [Cycle properties]

Cycle unit: Smallest unit of cycles, there are four types, Hour, Minute, Second, Millisecond.



Double-click 'cycle unit' cell ,it will appear a drop-down list box,like this , then select a suitable cycle unit.

The range of cycle unit see as following:

| Cycle unite | Range        |
|-------------|--------------|
| Hour        | 1-18         |
| Minute      | 1-1092       |
| Second      | 1-65535      |
| Millisecond | 100-65535000 |

Cycle time: Integer multiples of Cycle unit.

Double-click 'cycle time' to modify the time for the cycle.

Name: The name of a cycle.

Double-click "Name" unit can change a new name for the cycle according to your requirements.

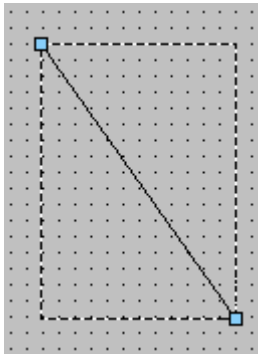
Comment: The comments of a cycle.

## 6 Components of Screen

### 6.1 Simple Objects

#### 6.1.1 Line

Line is an open object. Length and gradient of Line are defined by the height and width which surround the object. Every endpoint of the Line has a blue point, drag it can change its position directly.



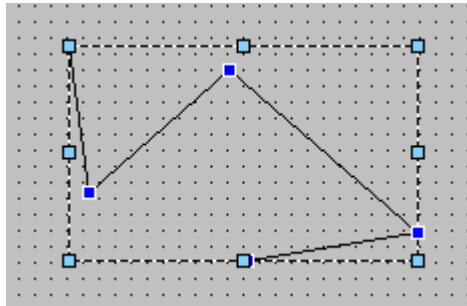
You can set properties of line in the 'Properties' dialog of properties view.

| Property name |             |                | Description                                                                                      |
|---------------|-------------|----------------|--------------------------------------------------------------------------------------------------|
| Appearance    | Color       | Border color   | Forecolor of line.                                                                               |
|               |             | Fill color     | Background color of line.                                                                        |
|               | Border      | width          | Width of border line.                                                                            |
|               |             | style          | Five styles:<br>Solid, Dash, Dot, DashDot, DashDotDot.                                           |
|               |             | Line Start     | Standard and Arrow two types.It defaults to Standard.                                            |
|               |             | Line End       | Standard and Arrow two types.It defaults to Standard.                                            |
|               |             | Line End Shape | Square and Round two types.It defaults to Square.                                                |
| Layout        | Start point | X              | Horizontal distance between the start point of line and the left edge of screen, units of pixel. |
|               |             | Y              | Vertical distance between the start point of line and the top edge of screen, units of pixel.    |
|               | End point   | X              | Horizontal distance between the end point of line and the left edge of screen, units of pixel.   |
|               |             | Y              | Vertical distance between the end point of line and the top edge of screen, units of pixel.      |
| Flashing      | Runtime     | Flashing       | Two modes: 'standard' and 'none'.                                                                |

|      |               |         |                       |
|------|---------------|---------|-----------------------|
|      | Appearance    |         |                       |
| Misc | Miscellaneous | Name    | Name of line.         |
|      |               | Opacity | Transparency of line. |

### 6.1.2 Polyline

Polyline is an open object. The area defined by line cannot be filled, even if the start point is coincided with the end point. Every endpoint of the polyline has a blue point, drag it can change its position directly.



You can set properties of polyline in the 'Properties' dialog of properties view.

**X and Y coordinates of inflection point "1", "2", "3", "4" and "5" labeled above.**

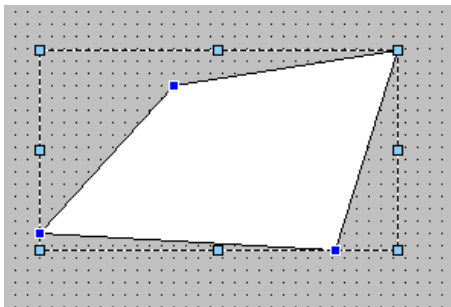
|   | Pos X | Pos Y |
|---|-------|-------|
| 1 | 279   | 33    |
| 2 | 289   | 106   |
| 3 | 359   | 45    |
| 4 | 453   | 126   |
| 5 | 368   | 140   |

| Property name |        |              | Description                   |
|---------------|--------|--------------|-------------------------------|
| Appearance    | Color  | Border color | Forecolor of polyline.        |
|               |        | Fill color   | Background color of polyline. |
|               | Border | Width        | Width of border line.         |

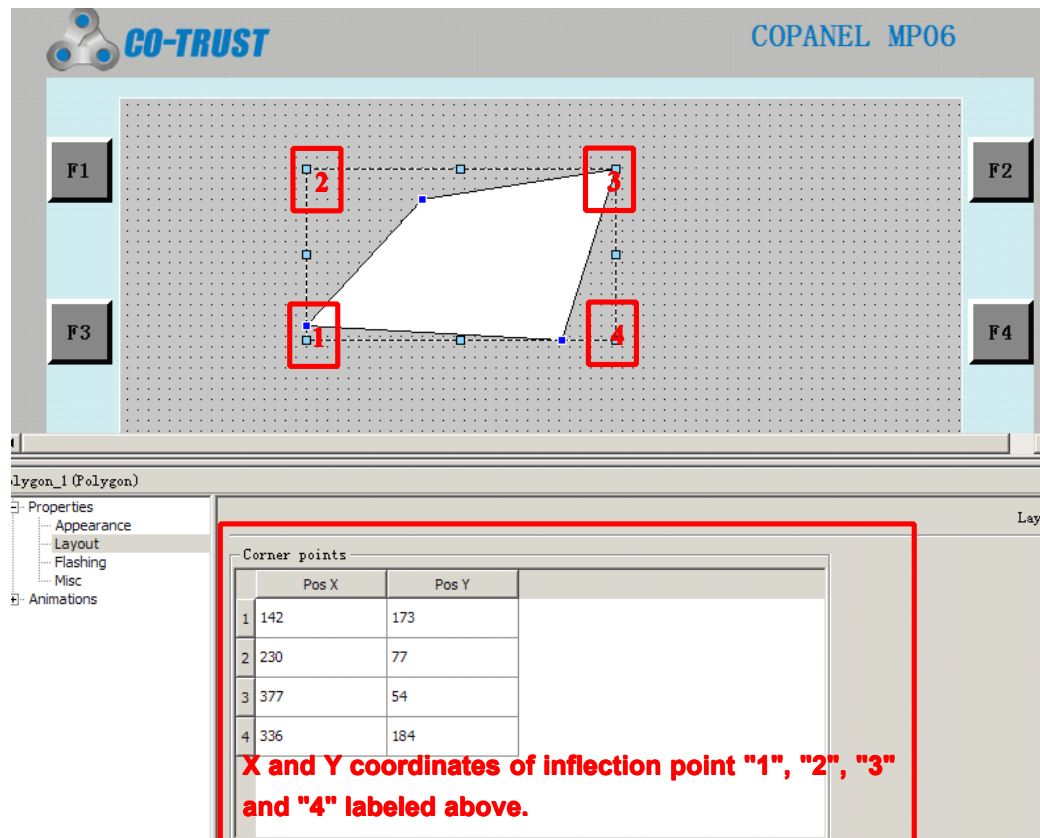
|          |                    |          |                                                                                                   |
|----------|--------------------|----------|---------------------------------------------------------------------------------------------------|
|          |                    | Style    | (referring to description of 'Line')                                                              |
| Layout   | Corner Point       | X        | Horizontal distance between the spinodal of polyline and the left edge of screen, units of pixel. |
|          |                    | Y        | Vertical distance between the spinodal of polyline and the top edge of screen, units of pixel.    |
| Flashing | Runtime Appearance | Flashing | (referring to description of 'Line')                                                              |
| Misc.    | Miscellaneous      | Name     | (referring to description of 'Line')                                                              |
|          |                    | Opacity  | (referring to description of 'Line')                                                              |

### 6.1.3 Polygon

'Polygon' is a closed object can be filled by background color. Every endpoint of the polygon has a blue point, drag it can change its position directly.



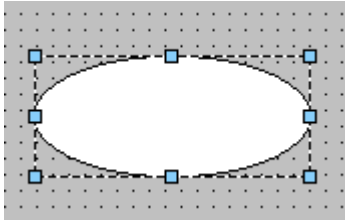
You can set properties of polygon in the 'Properties' dialog of properties view.



| Property name |                    | Description  |                                                                                                  |
|---------------|--------------------|--------------|--------------------------------------------------------------------------------------------------|
| Appearance    | Color              | Border Color | Border line color of polygon.                                                                    |
|               |                    | Fill Color   | Fill color of polyline.                                                                          |
|               | Border             | Width        | Width of border line.                                                                            |
|               |                    | Style        | (referring to description of 'Line')                                                             |
| Layout        | Corner Point       | X            | Horizontal distance between the spinodal of polygon and the left edge of screen, units of pixel. |
|               |                    | Y            | Vertical distance between the spinodal of polygon and the top edge of screen, units of pixel.    |
| Flashing      | Runtime Appearance | Flashing     | (Refer to the description of 'Line')                                                             |
| Misc.         | Miscellaneous      | Name         | (Refer to the description of 'Line')                                                             |
|               |                    | Opacity      | (Refer to the description of 'Line')                                                             |

### 6.1.4 Ellipse

'Ellipse' is a closed object.

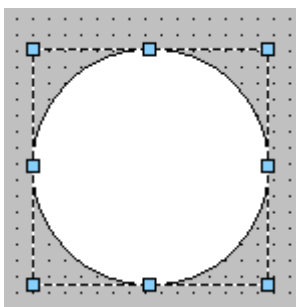


You can set properties of ellipse in the 'Properties' dialog of properties view.

| Property name |                    |              | Description                                                                                            |
|---------------|--------------------|--------------|--------------------------------------------------------------------------------------------------------|
| Appearance    | Color              | Border color | Border line color of ellipse.                                                                          |
|               |                    | Fill color   | Fill color of ellipse.                                                                                 |
|               | Border             | Width        | Width of border line.                                                                                  |
|               |                    | Style        | (referring to description of 'Line')                                                                   |
| Layout        | Position           | X            | Horizontal distance between the original point of ellipse and the left edge of screen, units of pixel. |
|               |                    | Y            | Vertical distance between the s original point of ellipse and the top edge of screen, units of pixel.  |
|               | Size               | Width        | Width of the ellipse, units of pixel.                                                                  |
|               |                    | Height       | Height of the ellipse, units of pixel.                                                                 |
| Flashing      | Runtime Appearance | Flashing     | (referring to description of 'Line')                                                                   |
| Misc.         | Miscellaneous      | Name         | (referring to description of 'Line')                                                                   |
|               |                    | Opacity      | (referring to description of 'Line')                                                                   |

### 6.1.5 Circle

'Circle' is a closed object.



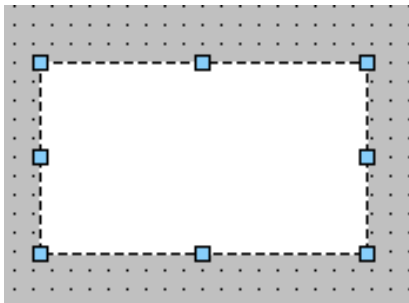
You can set properties of circle in the 'Properties' dialog of properties view.

| Property name |          |              | Description                             |
|---------------|----------|--------------|-----------------------------------------|
| Appearance    | Color    | Border Color | Border line color of circle.            |
|               |          | FillColor    | Fill color of circle.                   |
|               | Border   | Width        | Width of border line.                   |
|               |          | Style        | (referring to description of 'Ellipse') |
| Layout        | Position | X            | (referring to description of 'Ellipse') |
|               |          | Y            | (referring to description of 'Ellipse') |

|          |                    |          |                                         |
|----------|--------------------|----------|-----------------------------------------|
|          | Size               | Width    | (referring to description of 'Ellipse') |
|          |                    | Height   | (referring to description of 'Ellipse') |
| Shape    | Shape              | Shape    | Three shapes:Pie, Arc, Chord.           |
|          |                    | Start    | The start radian.                       |
|          |                    | Span     | The span range.                         |
| Flashing | Runtime Appearance | Flashing | (referring to description of 'Line')    |
| Misc.    | Miscellaneous      | Name     | (referring to description of 'Line')    |
|          |                    | Opacity  | (referring to description of 'Line')    |

### 6.1.6 Rectangle

'Rectangle' is a closed object.

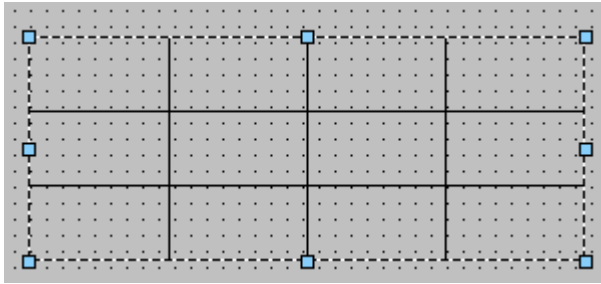


You can configure properties of rectangle in the 'Properties' dialog of properties view.

| Property name |                    |              | Description                          |
|---------------|--------------------|--------------|--------------------------------------|
| Appearance    | Color              | Border Color | Border line color of rectangle.      |
|               |                    | Fill Color   | Fill color of rectangle.             |
|               | Border             | Width        | Width of border line.                |
|               |                    | Style        | (referring to description of 'Line') |
| Layout        | Position           | X            | (referring to description of 'Line') |
|               |                    | Y            | (referring to description of 'Line') |
|               | Size               | Width        | (referring to description of 'Line') |
|               |                    | Height       | (referring to description of 'Line') |
| Shape         | Shape              | Shape        | Rect<br>RoundRect                    |
| Flashing      | Runtime Appearance | Flashing     | (referring to description of 'Line') |
| Misc.         | Miscellaneous      | Name         | (referring to description of 'Line') |
|               |                    | Opacity      | (referring to description of 'Line') |

### 6.1.7 Simple Form

'Simple Form' is a closed object, it is composed of one row or multiple rows cell, and it's used to display figures or other items which can be easily quoted and analyzed. The items in the simple form are organized by rows and columns.



'Simple Form' contains two properties: "Property" and "Animations"

1. You can set the following properties under "Properties" view:

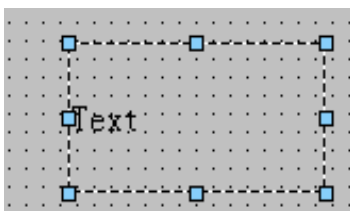
| Property name |                    |              | Description                                                                |
|---------------|--------------------|--------------|----------------------------------------------------------------------------|
| Appearance    | Colors             | Border color | The color of the border.                                                   |
|               |                    | Fill color   | None.                                                                      |
|               |                    | Border style | None.                                                                      |
|               | Border             | Width        | The width of the border, defaults to 1, Range: 1-30;                       |
|               |                    | Style        | The displaying effect of the border. Solid, Dash, Dot, DashDot, DashDotDot |
| Layout        | Position           | X            | (referring to description of 'Ellipse')                                    |
|               |                    | Y            | (referring to description of 'Ellipse')                                    |
|               | Size               | Width        | (referring to description of 'Ellipse')                                    |
|               |                    | Height       | (referring to description of 'Ellipse')                                    |
| Row/Column    | General            | Rows         | Defaults to 3, Range:1-128;                                                |
|               |                    | Column       | Defaults to 4, Range:1-128;                                                |
| Flashing      | Runtime Appearance | Flashing     | (referring to description of 'Line')                                       |
| Misc.         | Miscellaneous      | Name         | (referring to description of 'Line')                                       |
|               |                    | Opacity      | (referring to description of 'Line')                                       |

2. Animations

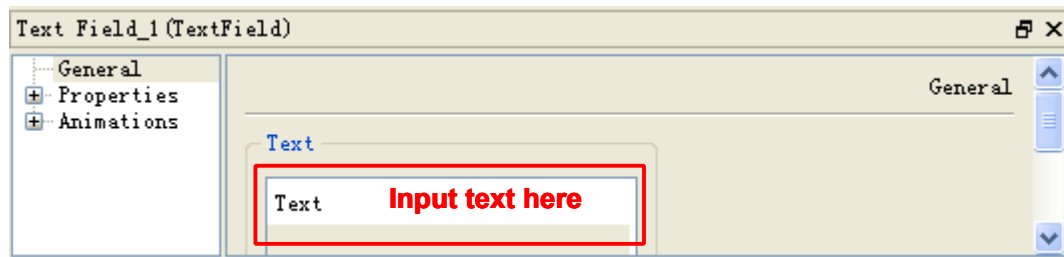
'Simple Form' contains 7 kinds of animations, please refer to chapter 11.2 for details.

### 6.1.8 Text Field

'Text Field' is a closed object, it can be filled with different colors. Its text can be displayed in multiple languages, and can be dynamically displayed.



Configure text: Input the text in 'Text' box of 'General' dialog of properties view.

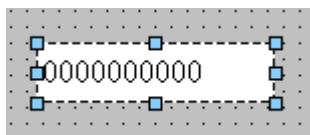


2. You can configure properties of text field in the 'Properties' dialog of properties view.

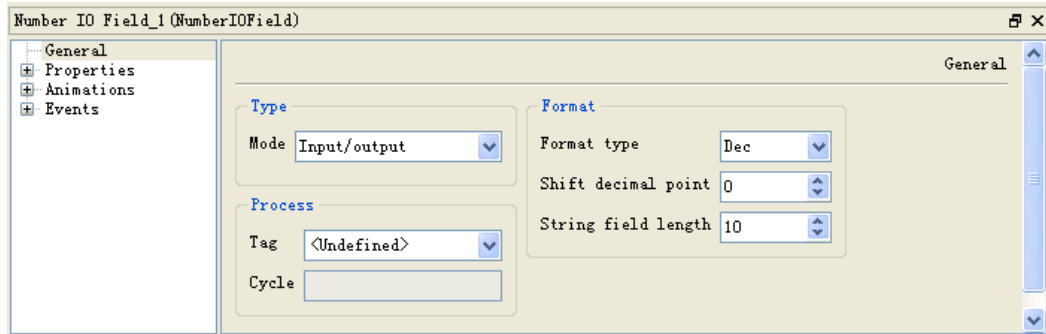
| Property name |                    |                  | Description                                                                                                                                                                                                                         |
|---------------|--------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance    | Fill               | Text color       | The color of the text.                                                                                                                                                                                                              |
|               |                    | Background color | The fill color.                                                                                                                                                                                                                     |
|               |                    | Fill style       | Solid:filling the background fully with background color.<br>Lucid:displaying without background color.                                                                                                                             |
|               | Border             | 3D               | Whether the border of object using 3D mode.                                                                                                                                                                                         |
| Layout        | Position           | X                | (referring to description of 'Ellipse')                                                                                                                                                                                             |
|               |                    | Y                | (referring to description of 'Ellipse')                                                                                                                                                                                             |
|               | Size               | Width            | (referring to description of 'Ellipse')                                                                                                                                                                                             |
|               |                    | Height           | (referring to description of 'Ellipse')                                                                                                                                                                                             |
| Text          | Style              | Style            | Setting the font size of object.                                                                                                                                                                                                    |
| Whirl         | Whirl              | Continuou<br>s   | No: not continuous.<br>Yes: continuous.                                                                                                                                                                                             |
|               |                    | Speed            | 1 to 5, character count of per movement.                                                                                                                                                                                            |
|               |                    | Direction        | NoDirection:fixed text (displaying as configured ).<br>LeftToRight:text shift right horizontally.<br>RightToLeft:text shift left horizontally.<br>TopToBottom:text shift down vertically.<br>BottomToTop:text shifts up vertically. |
| Flashing      | Runtime Appearance | Flashing         | (referring to description of 'Line')                                                                                                                                                                                                |
| Misc.         | Miscellaneous      | Name             | (referring to description of 'Line')                                                                                                                                                                                                |
|               |                    | Opacity          | (referring to description of 'Line')                                                                                                                                                                                                |

### 6.1.9 Number IO Field

'Number IO Field' is used to input and display process value of a tag.



1. You can set the following properties in 'General' dialog of properties view.



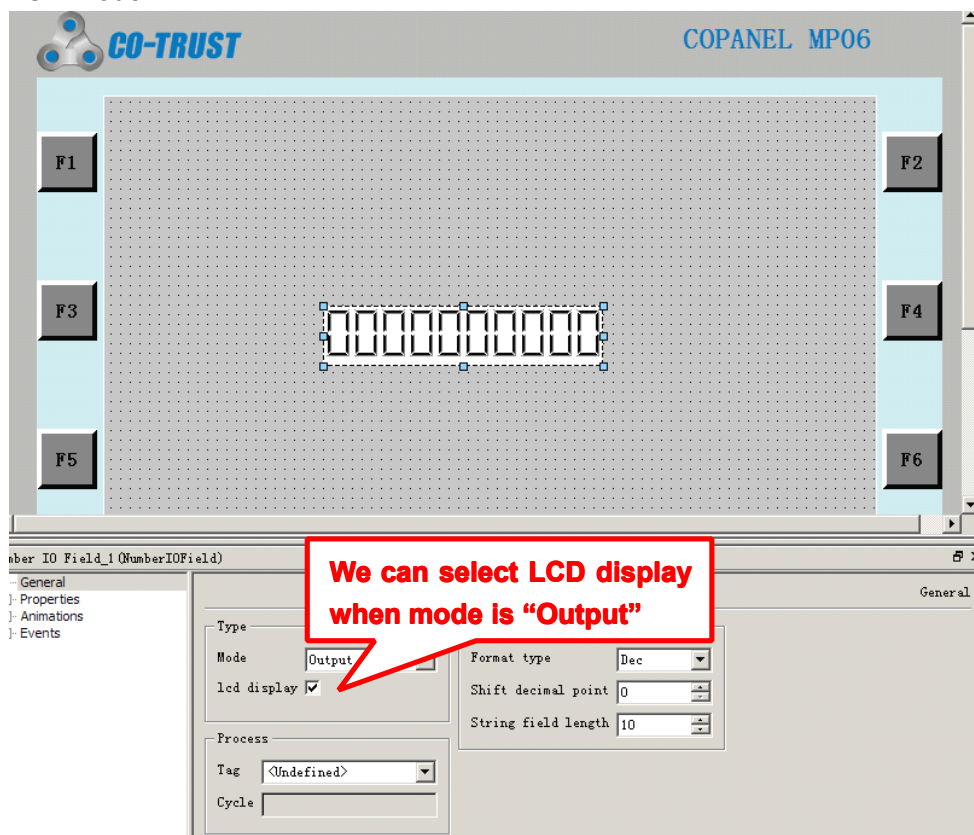
### [Mode]

The operating mode of the object in runtime system there are three modes as following:

- 1) Input: Input only.
- 2) Input/Output: Both input and output.
- 3) Output: Output only.

LCD display: Display LCD, we can select LCD display when the Mode is configured to Output.

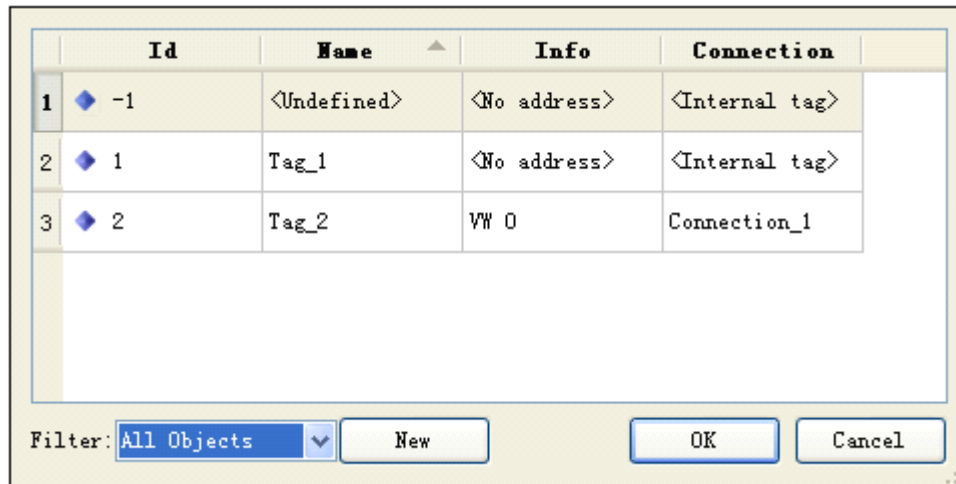
The following picture is an example of a Number IO Field object which displaying as LCD mode.



### [Process]

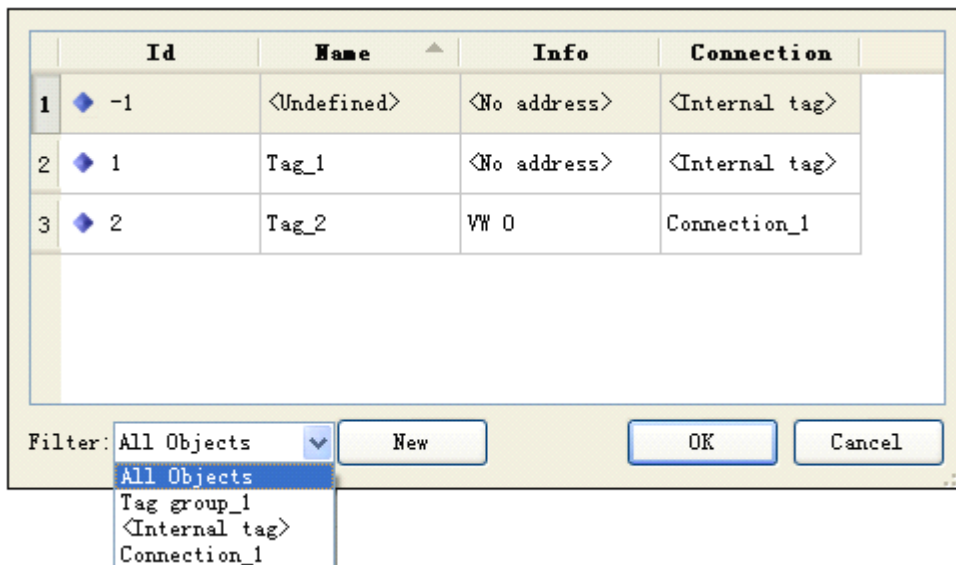
Tag: Connection tag of number IO field. You can select the tag from "Filter" or create tags directly.

Click the  button from “Tag”, following dialog would appear:



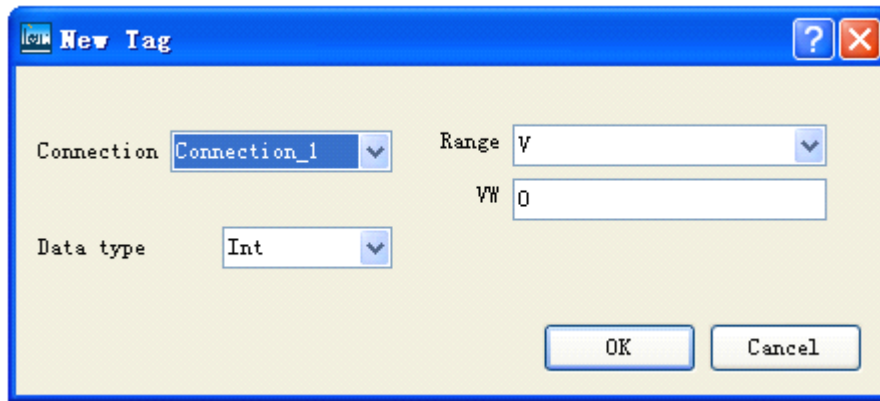
- Filter

Click  button from the right side of “Filter”, the dialog shown below appears, you can choose the tag for the IO field based on following conditions:



- New Tag

Click “New” from above dialog, the following dialog would be prompted, you can create a new tag according to your requirements, the connection and data type would be remembered as you create new tags again.



### [Format]

- Cycle:Read only, acquisition cycle of tag, value defaults to 1s.
- Format:Data type of field content. Available data formats:Bin, Dec, Hex.
- Shift decimal point: Pseudo decimal place can make integer displaying as decimals. Specify pseudo decimal place you need. This property can be used only if you have configured 'Tag' of 'Process', and the 'Format type' is Dec.
- String field length: Maximum number of characters can be used.

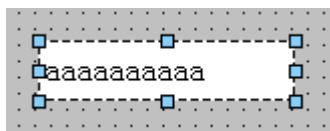
2. You can set properties of number IO field in the 'Properties' dialog of properties view.

| Property name |          |                  | Description                                                                                                                                                                                                                               |
|---------------|----------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance    | Fill     | Text color       | Border line color of number IO field.                                                                                                                                                                                                     |
|               |          | Background color | Fill color of number IO field.                                                                                                                                                                                                            |
|               |          | Fill style       | When you select "Output" as the Mode, there are two filling styles of background:'Solid' and 'Transparent'.<br>Transparent: The object displaying without background color.<br>Solid: Filling the background fully with background color. |
|               | Border   | Width            | Width of number IO field, units of pixel.                                                                                                                                                                                                 |
|               |          | Color            | Border line color of number IO field.                                                                                                                                                                                                     |
|               |          | Style            | Border line style of number IO field:<br>None:Display without border line.<br>Solid:Display with border line.                                                                                                                             |
|               |          | 3D               | Whether the border line of object use 3D mode.                                                                                                                                                                                            |
| Layout        | Position | X                | (Refer to the description of 'Ellipse')                                                                                                                                                                                                   |
|               |          | Y                | (Refer to description of 'Ellipse')                                                                                                                                                                                                       |
|               | Size     | Width            | (Refer to description of 'Ellipse')                                                                                                                                                                                                       |
|               |          | Height           | (Refer to description of 'Ellipse')                                                                                                                                                                                                       |
| Text          | Style    | Style            | Setting the font size of object.                                                                                                                                                                                                          |

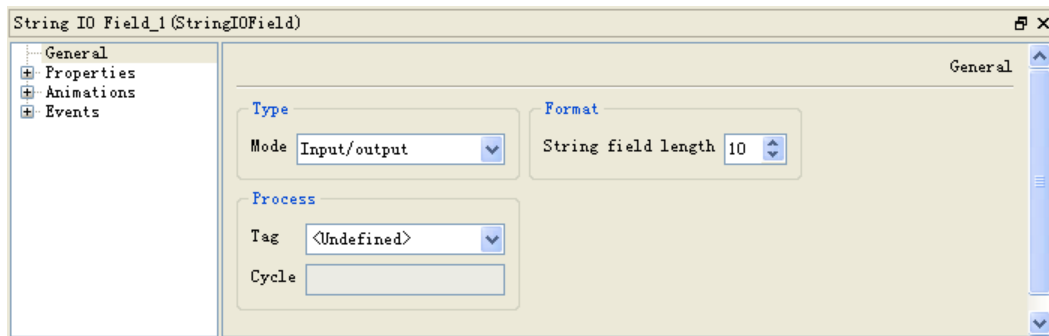
|          |                    |                             |                                                                                                                                                                                                                                                                                                    |
|----------|--------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | Alignment          | Horizontal                  | Horizontal alignment:<br>Left: Left-aligned text within the object.<br>Center: Center-aligned text within the object.<br>Right: Right-aligned text within the object.                                                                                                                              |
|          |                    | Vertical                    | Vertical alignment:<br>Top: Top-aligned text within the object.<br>Middle: Middle-aligned text within the object.<br>Bottom: Bottom-aligned text within the object.                                                                                                                                |
| Flashing | Runtime Appearance | Flashing                    | (refer to the description of 'line')                                                                                                                                                                                                                                                               |
|          | Flashing           | Flashing on limit violation |                                                                                                                                                                                                                                                                                                    |
| Limits   | Color              | Above upper limit color     | Displaying this color when the value is above upper limit.                                                                                                                                                                                                                                         |
|          |                    | Below lower limit color     | Displaying this color when the value is below lower limit.                                                                                                                                                                                                                                         |
| Misc.    | Miscellaneous      | Name                        | (refer to description of 'Line')                                                                                                                                                                                                                                                                   |
|          |                    | Opacity                     | (refer to description of 'Line')                                                                                                                                                                                                                                                                   |
| Security | Runtime security   | Authorization               | Appoint the user authorization which can operate the object.                                                                                                                                                                                                                                       |
|          | Operation          | Enabled                     | Whether the object can be used during runtime.<br>Enable: The object can be operated during runtime.<br>Disable: The object cannot be operated during runtime.                                                                                                                                     |
|          |                    | Hidden input                | The object takes effect during runtime.<br>If not tick this option, the object display the cursor, and you can input the data intuitively.<br>If you tick this option, the object would not display the cursor at runtime system, it could only display * while enter the data in the input field. |

### 6.1.10 String IO Field

'String IO Field' is used to input and display process string of a string tag.



1. Setting following params of string IO field in the 'General' dialog of properties view.



### [Mode]

There are three modes of object in runtime:

- 1) Input:Input only.
- 2) Input/Output:Both input and output.
- 3) Output:Output only.

### [Process]

Tag: Connection tag of string IO field. Please refer to the description of Number IO filed.

### [Format]

String field length: Maximum number of characters can be used.

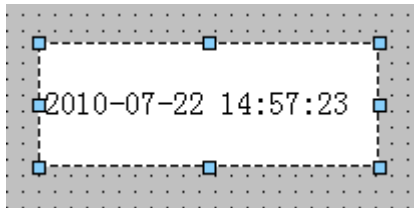
2. You can set properties of string IO field in the 'Properties' dialog of properties view.

| Property name |           |                  | Description                                                                                                                                                                                                                                |
|---------------|-----------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance    | Fill      | Text color       | (refer to description of 'Number IO Field')                                                                                                                                                                                                |
|               |           | Background color | (refer to description of 'Number IO Field')                                                                                                                                                                                                |
|               |           | Fill style       | When you select "Output" as the Mode, there are two filling styles of background: 'Solid' and 'Transparent'.<br>Transparent: The object displaying without background color.<br>Solid: Filling the background fully with background color. |
|               | Border    | Width            | (refer to description of 'Number IO Field')                                                                                                                                                                                                |
|               |           | Color            | (refer to description of 'Number IO Field')                                                                                                                                                                                                |
|               |           | Style            | (refer to description of 'Number IO Field')                                                                                                                                                                                                |
|               |           | 3D               | (refer to description of 'Number IO Field')                                                                                                                                                                                                |
| Layout        | Position  | X                | (refer to description of 'Ellipse')                                                                                                                                                                                                        |
|               |           | Y                | (refer to description of 'Ellipse')                                                                                                                                                                                                        |
|               | Size      | Width            | (refer to description of 'Ellipse')                                                                                                                                                                                                        |
|               |           | Height           | (refer to description of 'Ellipse')                                                                                                                                                                                                        |
| Text          | Style     | Style            | (refer to description of 'Number IO Field')                                                                                                                                                                                                |
|               | Alignment | Horizontal       | (refer to description of 'Number IO Field')                                                                                                                                                                                                |
|               |           | Vertical         | (refer to description of 'Number IO Field')                                                                                                                                                                                                |

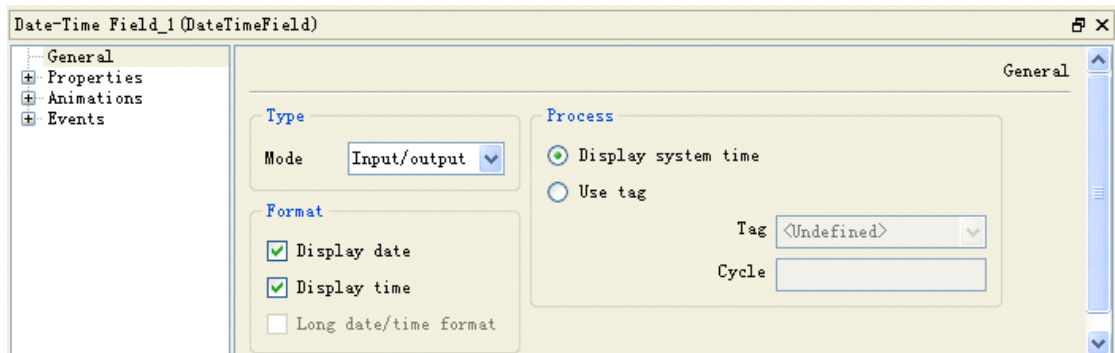
|          |                    |               |                                                                                                                                                                                                                                                                                                      |
|----------|--------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flashing | Runtime appearance | Flashing      | (refer to style description of 'Line')                                                                                                                                                                                                                                                               |
| Misc.    | Miscellaneous      | Name          | (refer to style description of 'Line')                                                                                                                                                                                                                                                               |
|          |                    | Opacity       | (refer to style description of 'Line')                                                                                                                                                                                                                                                               |
| Security | Runtime security   | Authorization | (refer to description of 'Number IO Field')                                                                                                                                                                                                                                                          |
|          | Operation          | Enabled       | (refer to description of 'Number IO Field')                                                                                                                                                                                                                                                          |
|          |                    | Hidden input  | The object takes effect during runtime.<br>If not tick this option, the object display the cursor, and you can input the data intuitionally.<br>If you tick this option, the object would not display the cursor at runtime system, it could only display * while enter the data in the input field. |

### 6.1.11 Date-Time Field

You can view the real-time clock and set it of HMI device by configuring the Date-Time Field object on screen.



1. You can configure following properties of Date-Time Field in the 'General' dialog of properties view.



The following params can be set:

■ Mode: The mode of object in runtime. There are two modes:

- 1) Input/Output: Both Input and output.
- 2) Output: Output only.

■ Display date: Displaying date or not.

- 1) Enable: Date can display.

2) Disable:Date cannot display

- Display time:Display time or not.

1) Enable:Time can display.

2) Disable:Time cannot display.

- Display system time: Displaying system time or not. If 'Display system time' option is activated, the system time will be displaying in the Date-Time field.
- Use tag:Using tag to display system time or not. If 'Use tag' option was activated, 'Tag' field will be enabled.
- Directions:'Display system time' and 'Use tag' can not be Chosen at the same time.
- Tag:Time tag. The datetime type of internal tag , Date、DateTime、Timeofday type tag of S7-300 PLC can be configured.
- Cycle:Acquisition cycle of time tag. Read only.

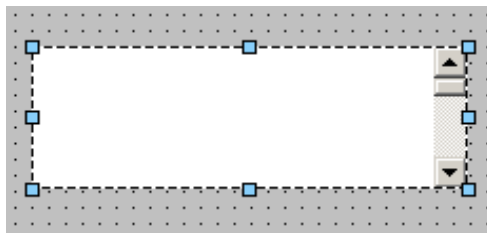
2. You can set properties of date-time field in the 'Properties' dialog of properties view.

| Property name |           |                  | Description                                                                                                                                                                                                                               |
|---------------|-----------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance    | Fill      | Text color       | (refer to description of 'Number IO Field')                                                                                                                                                                                               |
|               |           | Background color | (refer to description of 'Number IO Field')                                                                                                                                                                                               |
|               |           | Fill style       | When you select "Output" as the Mode, there are two filling styles of background:'Solid' and 'Transparent'.<br>Transparent: The object displaying without background color.<br>Solid: Filling the background fully with background color. |
|               | Border    | Width            | (refer to description of 'Number IO Field')                                                                                                                                                                                               |
|               |           | Color            | (refer to description of 'Number IO Field')                                                                                                                                                                                               |
|               |           | Style            | Style of border line.<br>'Solid' or 'None':<br>Solid:solid line separator.<br>None:transparent line separator.                                                                                                                            |
|               |           | 3D               | Whether the border line of object using 3D mode.<br>Directions:this property can be enabled only if the style of border is solid.                                                                                                         |
|               | Layout    | Position         | X<br>(refer to description of 'Ellipse')                                                                                                                                                                                                  |
|               |           |                  | Y<br>(refer to description of 'Ellipse')                                                                                                                                                                                                  |
|               |           | Size             | Width<br>(refer to description of 'Ellipse')                                                                                                                                                                                              |
|               |           |                  | Height<br>(refer to description of 'Ellipse')                                                                                                                                                                                             |
| Text          | Style     | Style            | (refer to description of 'Number IO Field')                                                                                                                                                                                               |
|               | Alignment | Horizontal       | (refer to description of 'Number IO Field')                                                                                                                                                                                               |

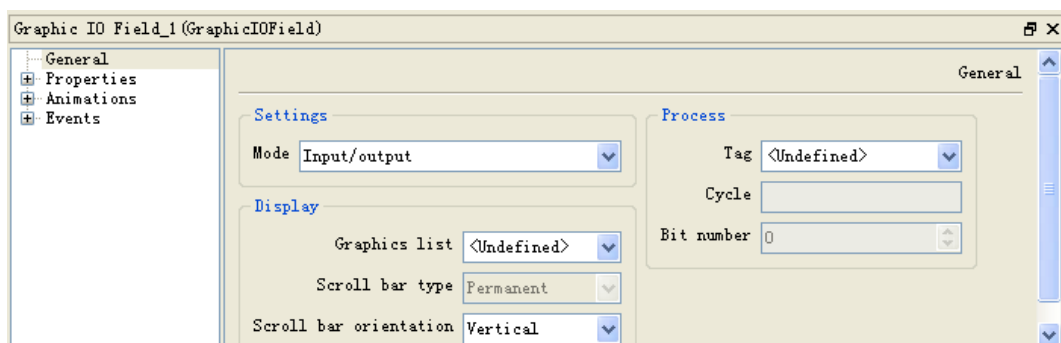
|          |                    |               |                                                                                                                                                                                                                                                                                                    |
|----------|--------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                    | Vertical      | (refer to description of 'Number IO Field')                                                                                                                                                                                                                                                        |
| Flashing | Runtime appearance | Flashing      | (refer to style description of 'Line')                                                                                                                                                                                                                                                             |
| Misc.    | Miscellaneous      | Name          | (refer to style description of 'Line')                                                                                                                                                                                                                                                             |
|          |                    | Opacity       | (refer to style description of 'Line')                                                                                                                                                                                                                                                             |
| Security | Runtime security   | Authorization | (refer to description of 'Number IO Field')                                                                                                                                                                                                                                                        |
|          | Operation          | Enabled       | (refer to description of 'Number IO Field')                                                                                                                                                                                                                                                        |
|          |                    | Hidden input  | The object takes effect during runtime.<br>If not tick this option, the object display the cursor, and you can input the data intuitively.<br>If you tick this option, the object would not display the cursor at runtime system, it could only display * while enter the data in the input field. |

### 6.1.12 Graphic IO Field

'Graphic IO Field' is used to display and set the process status of the tag as graphics through configuring graphics list and tag for it.



1. You can set properties of Graphic IO Field in the 'General' dialog of properties view.

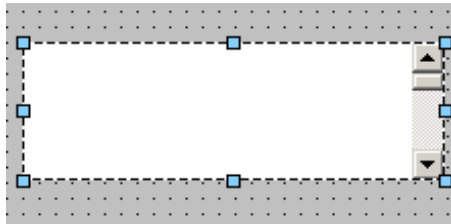


■ Mode: The mode of object in runtime. There are two modes as following:

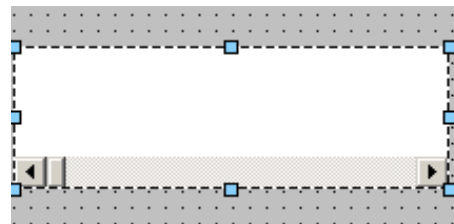
- 1) Input: Used to choose graphic.
- 2) Input/Output: Used to input and display graphic.
- 3) Output: Display graphic only.

- Tag:Used to control the display content of object.
- Cycle:Acquisition cycle of tag.
- Bit number:Bit number of tag.
- Graphic list:Define the graphic list connecting with the object.
- Scroll bar type:Default to 'Solid'.
- Scroll bar orientation:'Vertical' and 'Horizontal'.

'Vertical' is showed as (1); 'Horizontal' is showed as (2);



(1)



(2)

2. You can set properties of graphic IO field in the 'Properties' dialog of properties view.

| Property name |                    |                  | Description                                                                                                                                                                     |
|---------------|--------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance    | Fill               | Text color       | (refer to description of 'Number IO Field')                                                                                                                                     |
|               |                    | Background color | (refer to description of 'Number IO Field')                                                                                                                                     |
|               |                    | Fill style       | Fill style of background:'Solid' and 'Transparent'.<br>Transparent:the object displaying without background color.<br>Solid:filling the background fully with background color. |
| Layout        | Position           | X                | (refer to description of 'Ellipse')                                                                                                                                             |
|               |                    | Y                | (refer to description of 'Ellipse')                                                                                                                                             |
|               | Size               | Width            | (refer to description of 'Ellipse')                                                                                                                                             |
|               |                    | Height           | (refer to description of 'Ellipse')                                                                                                                                             |
|               | Sizing             | Auto-Sizing      | Adjust the graph to the original size.<br>“Width”, “Height”, “Keep proportions” can not be configured while this is operated.                                                   |
|               |                    | Keep proportions | 图片保持原始的大小比例进行手动缩放。<br>The graph keep the original size by manual zooming.                                                                                                       |
| Flashing      | Runtime appearance | Flashing         | (refer to style description of 'Line')                                                                                                                                          |
| Misc.         | Miscellaneous      | Name             | (refer to style description of 'Line')                                                                                                                                          |
|               |                    | Opacity          | (refer to style description of 'Line')                                                                                                                                          |
| Security      | Runtime            | Authorization    | (refer to description of 'Number IO Field')                                                                                                                                     |

|  |           |        |                                             |
|--|-----------|--------|---------------------------------------------|
|  | security  |        |                                             |
|  | Operation | Enable | (refer to description of 'Number IO Field') |

### 6.1.13 Symbolic IO Field

'Symbolic IO Field' can be used to configure runtime for input and output text selection list



1. You can set the following paras in the 'General' dialog of properties view.



■ Mode: The mode of object in runtime.

1) Output: Output text list only.

2) Input: Input text only.

3) Input/Output: Used to input and display text.

■ Tag: Used to control the content of symbolic IO field.

■ Cycle: Acquisition cycle of tag.

■ Bit number: Bit number of tag.

■ Text list: Define a text list connecting with the object.

■ Field length: Maximum number of characters can be used.

■ Number of visible items: Maximum number of visible items.

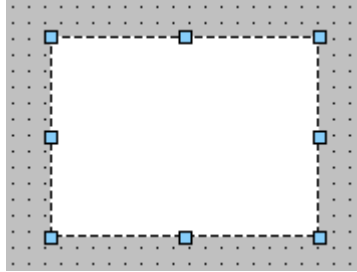
2. You can set properties of symbolic IO field in the 'Properties' dialog of properties view.

| Property name |      |                  | Description                                           |
|---------------|------|------------------|-------------------------------------------------------|
| Appearance    | Fill | Text color       | (refer to description of 'Number IO Field')           |
|               |      | Background color | (refer to description of 'Number IO Field')           |
|               |      | Fillstyle        | Fill style of background.: 'Solid' and 'Transparent'. |

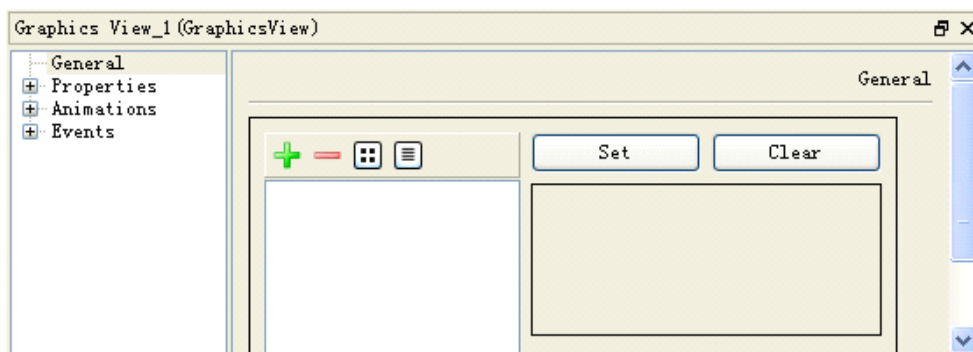
|          |                             |                             |                                                                                                                                                                                                                                                                                    |
|----------|-----------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                             |                             | Transparent: The object displaying without background color.<br>Solid: Filling the background fully with background color.                                                                                                                                                         |
| Layout   | Position                    | X                           | (refer to description of 'Ellipse')                                                                                                                                                                                                                                                |
|          |                             | Y                           | (refer to description of 'Ellipse')                                                                                                                                                                                                                                                |
|          | Size                        | Width                       | (refer to description of 'Ellipse')                                                                                                                                                                                                                                                |
|          |                             | Height                      | (refer to description of 'Ellipse')                                                                                                                                                                                                                                                |
| Text     | Style                       | Style                       | Set font size of the text.                                                                                                                                                                                                                                                         |
|          | Alignment                   | Horizontal                  | Horizontal alignment:<br>Left: Left-aligned text within the object.<br>Center: Center-aligned text within the object.<br>Right: Right-aligned text within the object.<br>Directions: When mode is 'input' or 'input/output', 'Horizontal' cannot be configured, default to 'left'. |
|          |                             | Vertical                    | Vertical alignment:<br>Top: Top-aligned text within the object.<br>Middle: Middle-aligned text within the object.<br>Bottom: Bottom-aligned text within the object.<br>Directions: When mode is 'input' or 'input/output', 'Vertical' cannot be configured, defaults to 'Top'.     |
|          |                             |                             |                                                                                                                                                                                                                                                                                    |
| Flashing | Runtime appearance          | Flashing                    | (refer to style description of 'Line')                                                                                                                                                                                                                                             |
|          | Flashing on limit violation | Flashing on limit violation | (refer to style description of 'Line')                                                                                                                                                                                                                                             |
| Limits   | Color                       | Above upper limit color     | Displaying this color when the value is above upper limit.                                                                                                                                                                                                                         |
|          | Color                       | Below lower limit color     | Displaying this color when the value is below lower limit.                                                                                                                                                                                                                         |
| Misc.    | Miscellaneous               | Name                        | (refer to style description of 'Line')                                                                                                                                                                                                                                             |
|          |                             | Opacity                     | (refer to style description of 'Line')                                                                                                                                                                                                                                             |
| Security | Runtime security            | Authorization               | (Refer to description of 'Number IO Field').                                                                                                                                                                                                                                       |
|          | Operation                   | Enable                      | (Refer to description of 'Number IO Field').                                                                                                                                                                                                                                       |

### 6.1.14 Graphics View

'Graphics view' can be used to display graphics.



1. You can set the following params in the 'General' dialog of properties view.



:Create a new graph from files (Choosing a graphic from folder).



:Delete an image from graphic display.



:Output images based on text list to view area.



:Output images based on icon list to view area.

- Set:Display the graphic.
- Clear:Disables to display graphic.

Directions:The image supports 6 formats:png, jpg, jpeg, gif, tiff and wmf. Furthermore, the image format of .jpg/jpeg/gif/tiff can automatically switch to .png format. And support .wmf format image (the same as png).

2. You can set the following params in the 'Properties' dialog of properties view.

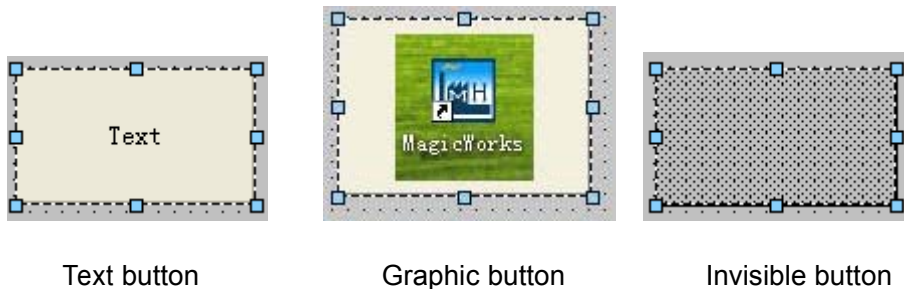
| Property name |      | Description      |                                                             |
|---------------|------|------------------|-------------------------------------------------------------|
| Appearance    | Fill | Text color       | (refer to description of 'Number IO Field')                 |
|               |      | Background color | (refer to description of 'Number IO Field')                 |
|               |      | FillStyle        | Fill style of background.<br>Fixed as 'Solid' in all modes. |

|          |                    |          |                                        |
|----------|--------------------|----------|----------------------------------------|
| Layout   | Position           | X        | (refer to description of 'Ellipse')    |
|          |                    | Y        | (refer to description of 'Ellipse')    |
|          | Size               | Width    | (refer to description of 'Ellipse')    |
|          |                    | Height   | (refer to description of 'Ellipse')    |
| Flashing | Runtime appearance | Flashing | (refer to style description of 'Line') |
| Misc.    | Miscellaneous      | Name     | (refer to style description of 'Line') |
|          |                    | Opacity  | (refer to style description of 'Line') |

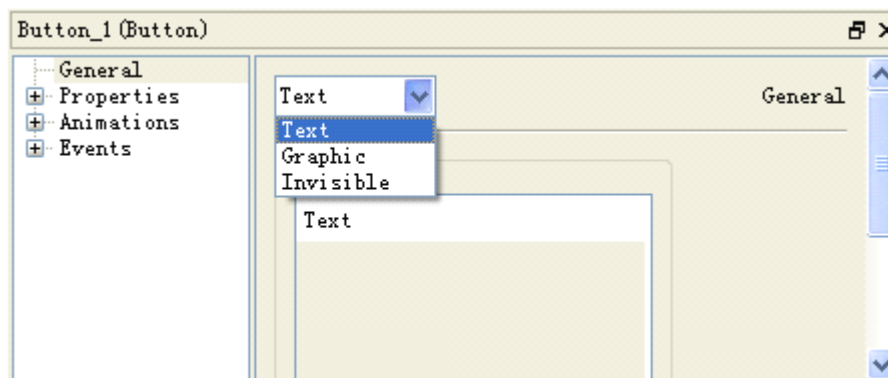
### 6.1.15 Button

Operator can control the process by button.

Button owns three types: text button, Invisible button and graphic button, show as below:

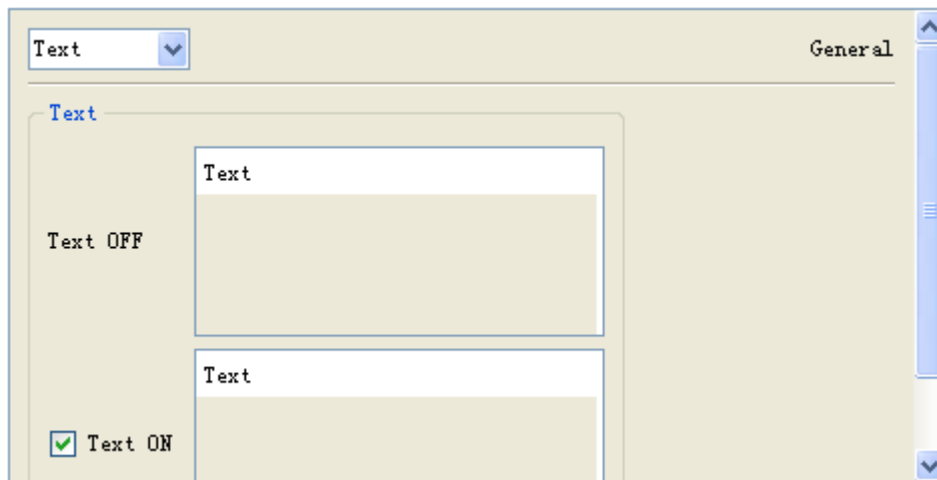


#### 1. General



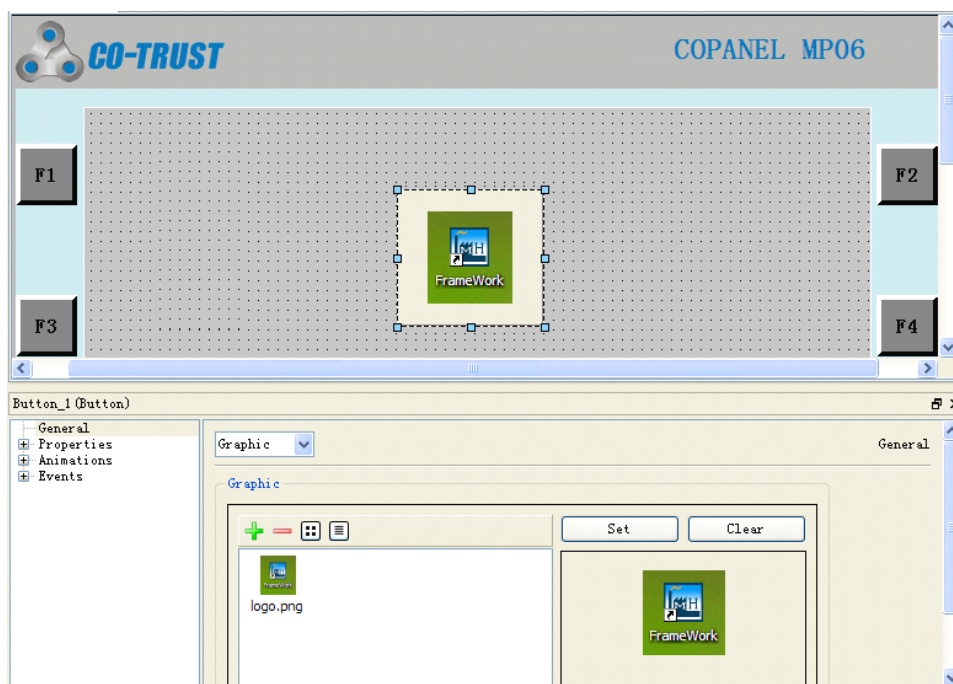
Button modes: There are three modes in the drop-down list: 'Text', 'Invisible' and 'Graphic'.

Text: Input the text on the button. Text ON indicates the text being pressed, Text OFF indicates the text being released (You can tick the box before "Text ON" to choose it or not).



Graphic:Graph on the button. You can configure graph in the properties view shown as following picture:

Click  to add graph, then select the graph and click button 'set', the graphic displays on the button.



Invisible:The button panel is invisible, only focus rect is visible.

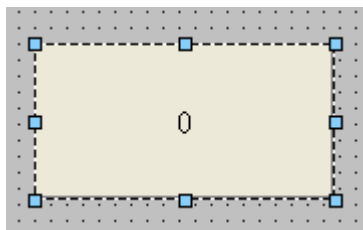
2. You can set properties of button in the 'Properties' dialog of properties view.

| Property name |        |                  | Description                                                       |
|---------------|--------|------------------|-------------------------------------------------------------------|
| Appearance    | Fill   | Text color       | (refer to description of 'Number IO Field')                       |
|               |        | Background color | (refer to description of 'Number IO Field')                       |
|               |        | FillStyle        | Fill style of background. Two modes of 'Solid' and 'Transparent'. |
|               | Border | 3D               | Whether the border line of object use 3D mode.                    |

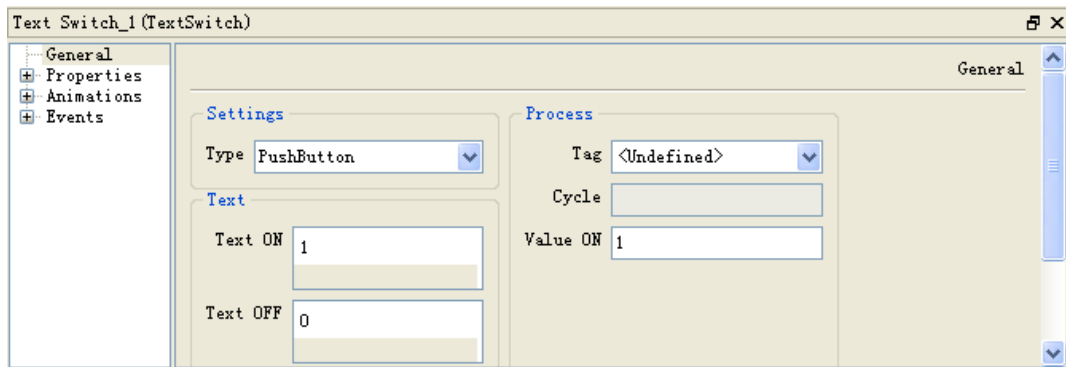
|          |                    |                        |                                                                                                                                                                                                                                                                   |
|----------|--------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                    | Animation when clicked | You can select whether to display the animation effect of the button on simulation mode.                                                                                                                                                                          |
| Layout   | Position           | X                      | (refer to description of 'Ellipse')                                                                                                                                                                                                                               |
|          |                    | Y                      | (refer to description of 'Ellipse')                                                                                                                                                                                                                               |
|          | Size               | Width                  | (refer to description of 'Ellipse')                                                                                                                                                                                                                               |
|          |                    | Height                 | (refer to description of 'Ellipse')                                                                                                                                                                                                                               |
| Text     | Style              | Style                  | Set font size of the text.                                                                                                                                                                                                                                        |
|          | Alignment          | Horizontal             | Horizontal alignment:<br>Left: Left-aligned text within the object.<br>Center: Center-aligned text within the object.<br>Right: Right-aligned text within the object.<br>Directions: The properties can be configured when 'Text' has been selected in 'General'. |
|          |                    | Vertical               | Vertical alignment:<br>Top: Top-aligned text within the object.<br>Middle: Middle-aligned text within the object.<br>Bottom: Bottom-aligned text within the object.<br>Directions: The properties can be configured when 'Text' has been selected in 'General'.   |
|          |                    |                        |                                                                                                                                                                                                                                                                   |
| Flashing | Runtime appearance | Flashing               | (Refer to style description of 'Line').                                                                                                                                                                                                                           |
| Misc.    | Miscellaneous      | Name                   | (Refer to style description of 'Line').                                                                                                                                                                                                                           |
|          |                    | Opacity                | (Refer to style description of 'Line').                                                                                                                                                                                                                           |
| Security | Runtime security   | Authorization          | (refer to description of 'Number IO Field')                                                                                                                                                                                                                       |
|          | Operation          | Enable                 | (refer to description of 'Number IO Field')                                                                                                                                                                                                                       |

### 6.1.16 Text Switch

'Text switch' is used to configure switch, so that it can switch between two predefined states in the runtime. We can also visualize the current state of the "text switch" by text.

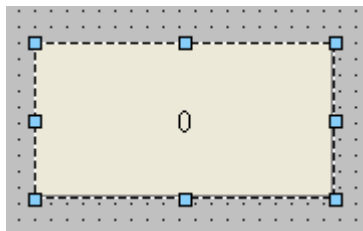


1. You can set the following params in the 'General' dialog of properties view.

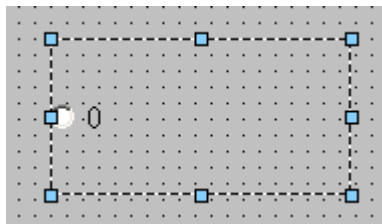


- Type: There are three types of button: 'PushButton', 'RadioButton', and 'CheckBox'.

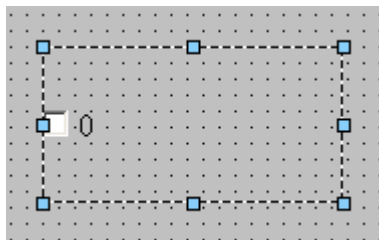
'PushButton' as shown below:



'RadioButton' as shown below:



'CheckBox' as shown below:



- Text ON: The 'Open' state text displayed on the object.
- Text OFF: The 'Close' state text displayed on the object.
- Tag: Used to control the switch state.
- Cycle: Acquisition cycle of the tag in process.
- Value ON: Index of 'Open' switch.

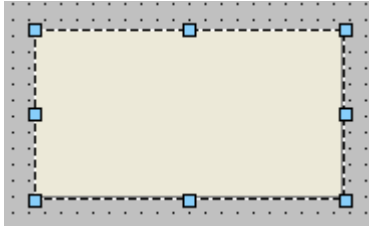
2. You can set properties of text switch in the 'Properties' dialog of properties view.

| Property name |      |            | Description                                 |
|---------------|------|------------|---------------------------------------------|
| Appearance    | Fill | Text color | (refer to description of 'Number IO Field') |
|               |      | Background | (refer to description of 'Number IO Field') |

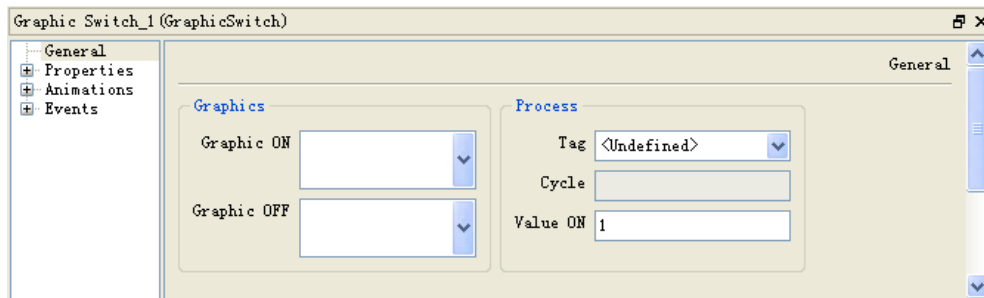
|          |                             |                             |                                                                                                                                                                                                                                                                                                                      |
|----------|-----------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                             | color                       |                                                                                                                                                                                                                                                                                                                      |
|          |                             | FillStyle                   | Fill style of background.<br>Two modes: 'Solid' and 'Transparent'.                                                                                                                                                                                                                                                   |
|          | Border                      | 3D                          | Whether the border line of object use 3D mode.                                                                                                                                                                                                                                                                       |
| Layout   | Position                    | X                           | (refer to description of 'Ellipse')                                                                                                                                                                                                                                                                                  |
|          |                             | Y                           | (refer to description of 'Ellipse')                                                                                                                                                                                                                                                                                  |
|          | Size                        | Width                       | (refer to description of 'Ellipse')                                                                                                                                                                                                                                                                                  |
|          |                             | Height                      | (refer to description of 'Ellipse')                                                                                                                                                                                                                                                                                  |
| Text     | Style                       | Style                       | Set font size of the text.                                                                                                                                                                                                                                                                                           |
|          | Alignment                   | Horizontal                  | Horizontal alignment:<br>Left: Left-aligned text within the object.<br>Center: Center-aligned text within the object.<br>Right: Right-aligned text within the object.                                                                                                                                                |
|          |                             | Vertical                    | Vertical alignment:<br>Top: Top-aligned text within the object.<br>Middle: Middle-aligned text within the object.<br>Bottom: Bottom-aligned text within the object.                                                                                                                                                  |
| Flashing | Runtime appearance          | Flashing                    | (refer to style description of 'Line')                                                                                                                                                                                                                                                                               |
|          | Flashing on limit violation | Flashing on limit violation | Whether to indicate limit violation through object flashing. If process value of the tag is above or below the limit value, the object will flash in runtime. When 'Flashing' is 'Standard', 'Flashing on limit violation' is unavailable. When 'Flashing on limit violation' is enabled, 'Flashing' is unavailable. |
| Limits   | Color                       | Above upper limit color     | Displaying this color when the value is above upper limit.                                                                                                                                                                                                                                                           |
|          |                             | Below lower limit color     | Displaying this color when the value is below lower limit.                                                                                                                                                                                                                                                           |
| Misc.    | Miscellaneous               | Name                        | (refer to style description of 'Line')                                                                                                                                                                                                                                                                               |
|          |                             | Opacity                     | (refer to style description of 'Line')                                                                                                                                                                                                                                                                               |
| Security | Runtime security            | Authorization               | (refer to description of 'Number IO Field')                                                                                                                                                                                                                                                                          |
|          | Operation                   | Enable                      | (refer to description of 'Number IO Field')                                                                                                                                                                                                                                                                          |

### 6.1.17 Graphic Switch

'Graphic Switch' is used to configure switch, in order to switch between two predefined states in runtime. The current state of 'Switch' can be visible by means of graph.



1. You can set the following params in the 'General' dialog of properties view.



- Graphic ON: The 'Open' state text displays on the object.
- Graphic OFF: The 'Close' state text displays on the object.
- Tag: Used to control the switch state.
- Cycle: Acquisition cycle of the tag in process.
- Value ON: Index of 'Open' switch.

2. You can set properties of graphic switch in the 'Properties' dialog of properties view.

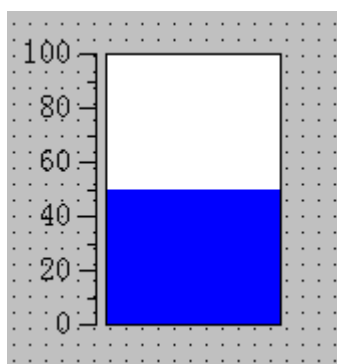
| Property name |               |                  | Description                                                          |
|---------------|---------------|------------------|----------------------------------------------------------------------|
| Appearance    | Fill          | Text color       | (refer to description of 'Number IO Field')                          |
|               |               | Background color | (refer to description of 'Number IO Field')                          |
|               |               | FillStyle        | Fill style of background.<br>Two modes of 'Solid' and 'Transparent'. |
|               | Border        | 3D               | Whether the border line of object use 3D mode.                       |
| Layout        | Position      | X                | (refer to description of 'Ellipse')                                  |
|               |               | Y                | (refer to description of 'Ellipse')                                  |
|               | Size          | Width            | (refer to description of 'Ellipse')                                  |
|               |               | Height           | (refer to description of 'Ellipse')                                  |
| Text          | Style         | Style            | Set font size of the text.                                           |
|               | Alignment     | Horizontal       | 'Graphic Switch' cannot configuration this property.                 |
|               |               | Vertical         | 'Graphic Switch' cannot configuration this property.                 |
| Misc.         | Miscellaneous | Name             | (refer to style description of 'Line')                               |
|               |               | Opacity          | (refer to style description of 'Line')                               |
| Security      | RuntimeSecuri | Authorization    | (refer to description of 'Number IO Field')                          |

|  |           |        |                                             |
|--|-----------|--------|---------------------------------------------|
|  | ty        |        |                                             |
|  | Operation | Enable | (refer to description of 'Number IO Field') |

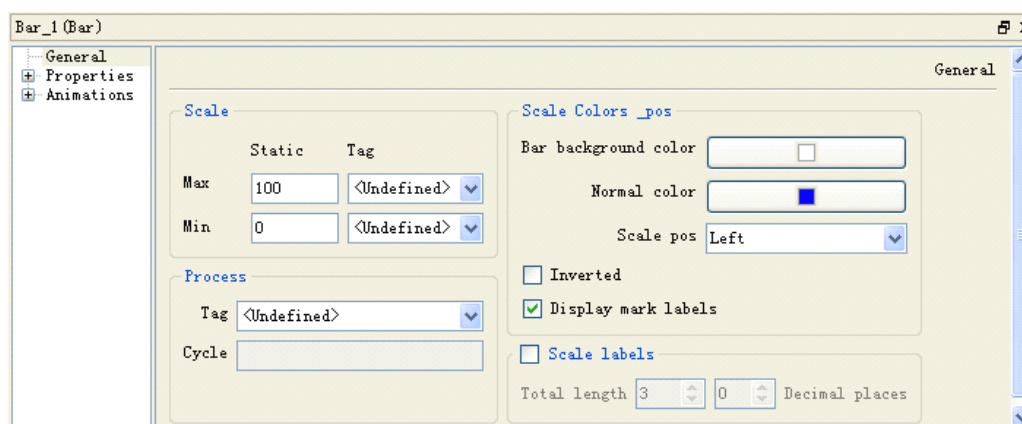
### 6.1.18 Bar

'Bar' can display the value of the controller. And it can show the difference between current value and limit value, or whether it has reached the reference value. Bar also can display filling volume or batch quantity.

As show in below figure:



1. You can configure 'Max', 'Min', 'Process', 'Scale color' and 'Scale pos' of bar in the 'General' of properties view. Show in below figure:



The 'General' property of bar is described as below:

| Property name |        |     | Description                                                               |                                                                                                                 |
|---------------|--------|-----|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Scale         | Static | Max | Value on the top of bar scale, it is static value defined as constant.    | If bar scale using tag, 'Static' cannot be configured, and the static properties are invalid configured before. |
|               |        | Min | Value on the bottom of bar scale, it is static value defined as constant. |                                                                                                                 |
|               | Tag    | Max | Value on the top of bar scale, it is static                               |                                                                                                                 |

|                     |                      |                      |                                                                           |                                                       |
|---------------------|----------------------|----------------------|---------------------------------------------------------------------------|-------------------------------------------------------|
|                     |                      |                      | value defined as variable.                                                |                                                       |
|                     |                      | Min                  | Value on the bottom of bar scale, it is static value defined as variable. |                                                       |
| Process             | Tag                  | Tag                  | Change value of bar scale, which is defined as variable.                  |                                                       |
| Scale<br>Colors-pos | Bar background color | Bar background color | Acquisition cycle of max tag.                                             | This property can be active when bar scale using tag. |
|                     | Normal color         | Normal color         | Color of bar scale.                                                       |                                                       |
|                     | Scale pos            | No                   | Scale value.                                                              |                                                       |
|                     |                      | Left                 | Scale displays on the left of bar.                                        |                                                       |
|                     |                      | Right                | Scale displays on the right of bar.                                       |                                                       |
|                     |                      | Top                  | Scale displays on the top of bar.                                         |                                                       |
|                     |                      | Bottom               | Scale displays on the bottom of bar.                                      |                                                       |
|                     | Inverted             | Inverted             | Scale pos and normal marks can be inverted for 180 degrees.               |                                                       |
|                     | Display mark labels  |                      | Select to display or hide the mark labels.                                |                                                       |
| Scale labels        | Total length         |                      | The total length of the mark number                                       |                                                       |
|                     | Decimal places       |                      | The decimal places of the mark number                                     |                                                       |

2. You can set properties of button in the 'Properties' dialog of properties view:

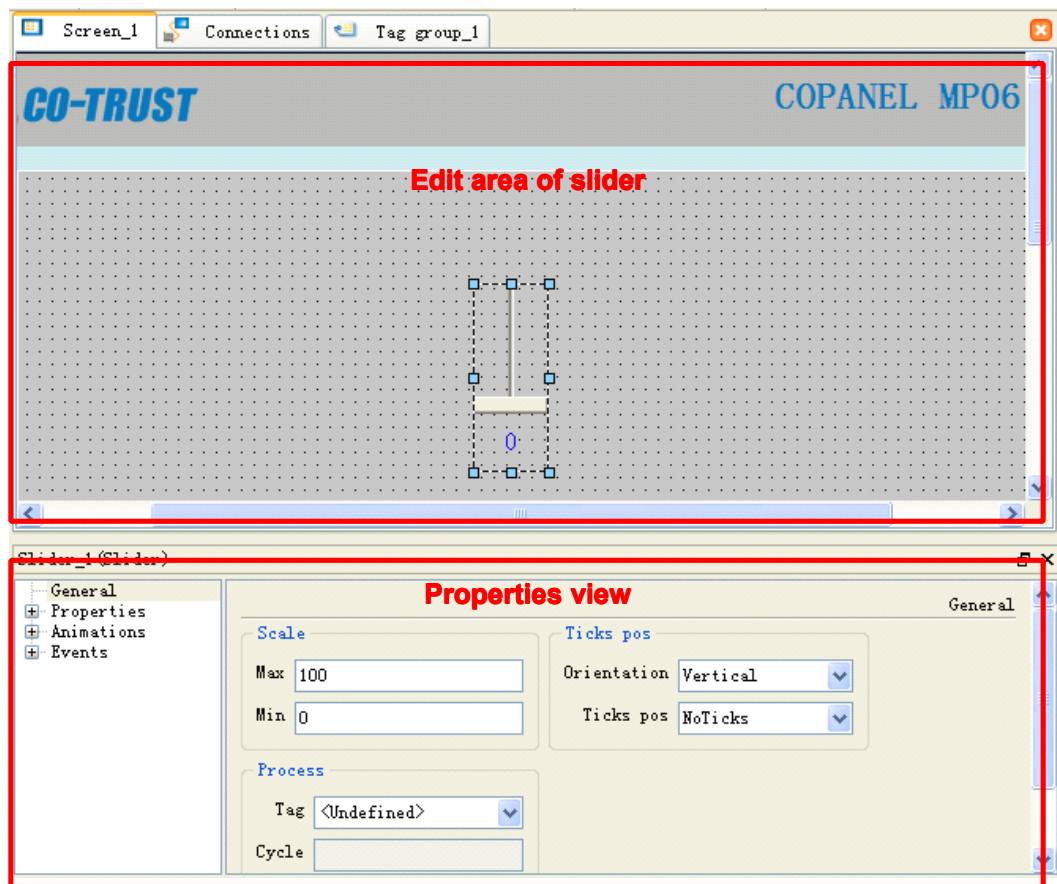
| Property name |          |                  | Description                                                                                               |
|---------------|----------|------------------|-----------------------------------------------------------------------------------------------------------|
| Appearance    | Fill     | Text color       | Text color of bar.                                                                                        |
|               |          | Background color | Background color of bar.                                                                                  |
|               |          | FillStyle        | Style of border line:'Solid' , 'None'.<br>Solid:solid line separator.<br>None:transparent line separator. |
| Layout        | Position | X                | Horizontal distance between the original point of bar and the left edge of screen, in units of            |

|          |                                                   |                             |                                                                                                                                                                                                                                                                                                                      |
|----------|---------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                                                   |                             | pixel.                                                                                                                                                                                                                                                                                                               |
|          |                                                   | Y                           | Vertical distance between the s original point of bar and the top edge of screen, in units of pixel.                                                                                                                                                                                                                 |
|          | Size                                              | Width                       | Width of bar, in units of pixel.                                                                                                                                                                                                                                                                                     |
|          |                                                   | Height                      | Height of selecting rectangle, in units of pixel.                                                                                                                                                                                                                                                                    |
| Flashing | Runtime appearance<br>Flashing on limit violation | Flashing                    | Two patterns of 'standard' and 'none'.                                                                                                                                                                                                                                                                               |
|          |                                                   | Flashing on limit violation | Whether to indicate limit violation through object flashing. If process value of the tag is above or below the limit value, the object will flash in runtime. When 'Flashing' is 'Standard', 'Flashing on limit violation' is unavailable. When 'Flashing on limit violation' is enabled, 'Flashing' is unavailable. |
| Limits   | Color                                             | Above upper limit color     | Displaying this color when the value is above upper limit.                                                                                                                                                                                                                                                           |
|          |                                                   | Below lower limit color     | Displaying this color when the value is below lower limit.                                                                                                                                                                                                                                                           |
| Misc.    | Miscellaneous                                     | Name                        | Name of bar.                                                                                                                                                                                                                                                                                                         |
|          |                                                   | Opacity                     | Sharpness of bar.                                                                                                                                                                                                                                                                                                    |

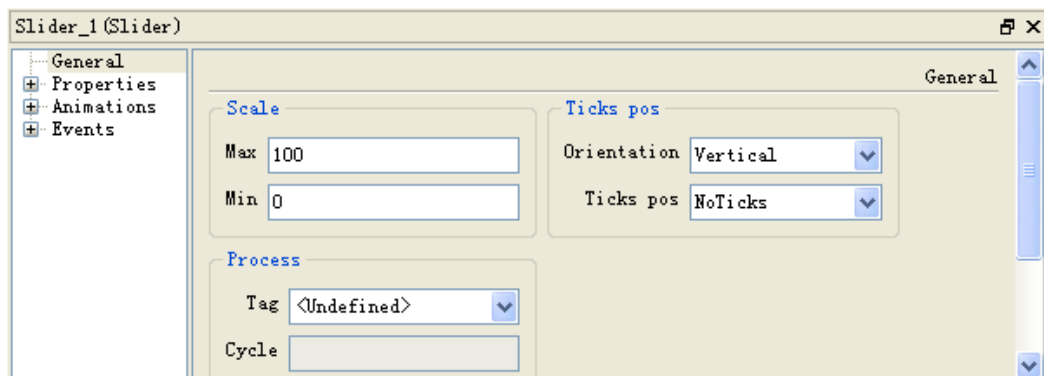
## 6.2 Enhanced Objects

### 6.2.1 Slider

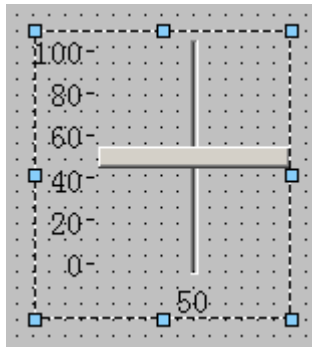
Using 'Slider', you can monitor and adjust the process value within pre-defined range.



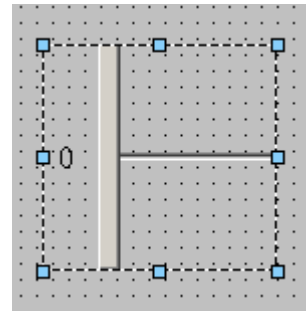
1. You can set properties of slider in the 'General' properties view.



- Max:Value displaying on the top of slider, which is a static constant.
- Min:Value displaying on the bottom of slider, which is a static constant.
- Orientation:Define the placement of ruler. There are two choice of 'Vertical' and 'Horizontal'. Slider of 'Vertical' is shown as (1). Slider of 'Horizontal' is shown as (2).

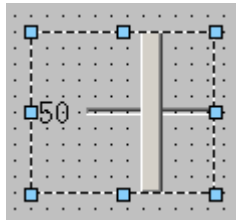


(1)

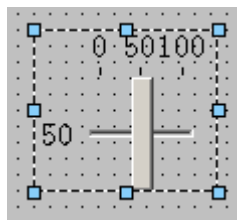


(2)

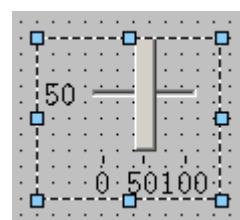
- Ticks pos: Define position and ticks' displaying of ruler. Ticks pos has four choice: 'NoTicks', 'TicksLeft', 'TicksRight' and 'TicksBothSides'. Slider of 'NoTicks' is showed as (1). Slider of 'TicksLeft' is shown as (2). Slider of 'TicksRight' is shown as (3). Slider of 'TicksBothSides' is shown as (4). You can configure ticks position according to your need.



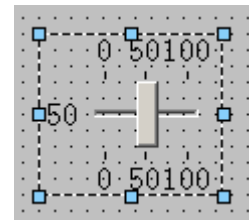
(1)



(2)



(3)



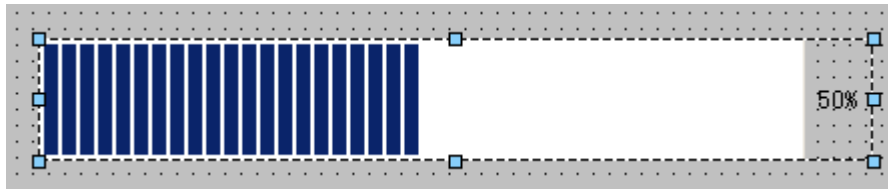
(4)

You can set the properties of slider in the 'Properties' dialog of properties view.

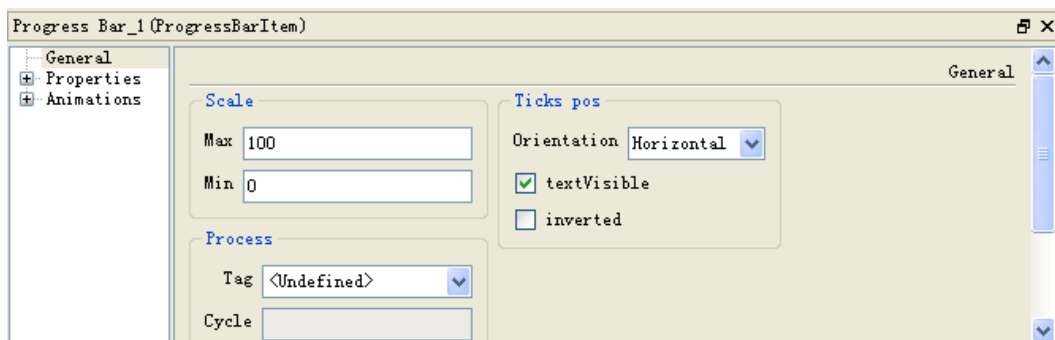
| Property name |                 |                  | Description                                                                                                                                                  |
|---------------|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance    | Fill            | Text color       | Color of slider scale.                                                                                                                                       |
|               |                 | Background color | Background color of number range.                                                                                                                            |
| Layout        | Position        | X                | Horizontal distance between the original point of slider and the left edge of screen, units of pixel.                                                        |
|               |                 | Y                | Vertical distance between the s original point of slider and the top edge of screen, units of pixel.                                                         |
|               | Size            | Width            | Width of slider, in units of pixel.                                                                                                                          |
|               |                 | Height           | Height of slider, in units of pixel.                                                                                                                         |
| Misc.         | Miscellaneous   | Name             | Name of slider.                                                                                                                                              |
|               |                 | Opacity          | Transparency of slider.                                                                                                                                      |
| Security      | RuntimeSecurity | Authorization    | Appoint the user authorization which can operate the object.                                                                                                 |
|               | Operation       | Enable           | Whether the object can be used during runtime.<br>Enable:The object can be operated during runtime.<br>Disable:The object cannot be operated during runtime. |

## 6.2.2 Progress Bar

'Progress Bar' displays a proportion value of process.

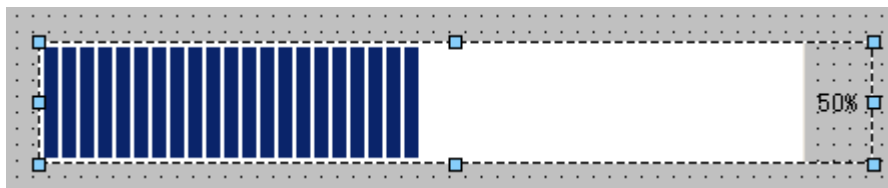


1. In 'General' dialog, you can set the properties including 'Scale', 'Process', and 'Ticks pos'. 'General' view of progress bar is shown as below figure:

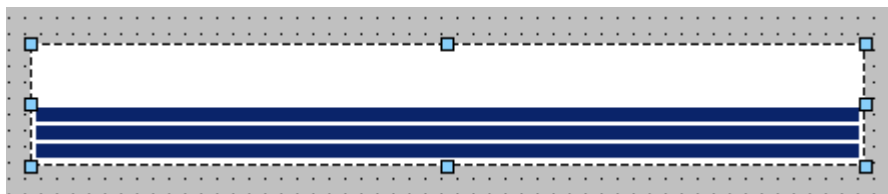


- Max:Max value displaying on the slider, which is a static constant.
- Min:Min value displaying on the slider, which is a static constant.
- Tag:Value of the shadow part of progress bar.
- Cycle:The default value is one second.
- Orientation:There are two classes of 'Horizontal' and 'Vertical', which is distinguished by the position of shadow part in the progress bar.

Slider of 'Horizontal' is shown as below picture:



Slider of 'Vertical' is shown as below figure:



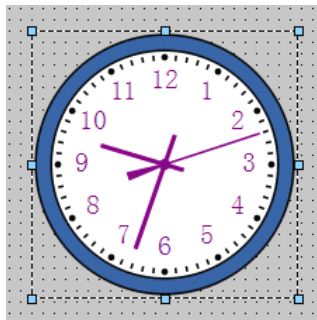
- TextVisible:Whether to show the current progress number or not.
- Inverted:Check this check box, the scale value will be set to the other side of the progress bar.

2. You can set the properties of slider in the 'Properties' dialog of properties view.

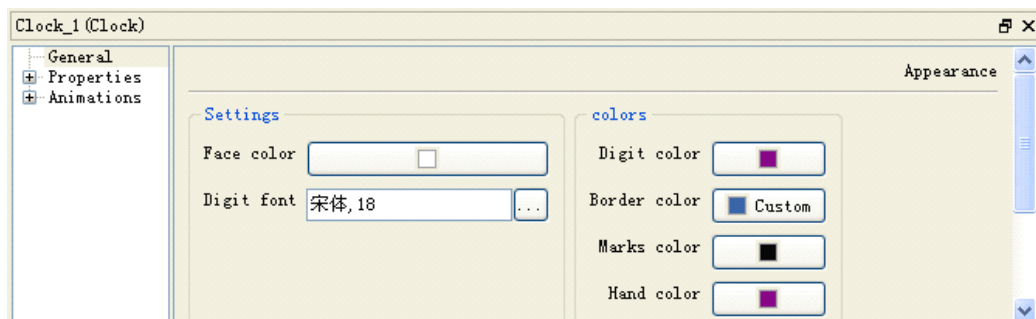
| Property name |                    |                  | Description                                                                                                                                     |
|---------------|--------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance    | Fill               | Text color       | The color of the text.                                                                                                                          |
|               |                    | Background color | The fill color.                                                                                                                                 |
|               |                    | Fill style       | Default to 'Transparent'.                                                                                                                       |
| Layout        | Position           | X                | (referring to description of 'Line')                                                                                                            |
|               |                    | Y                | (referring to description of 'Line')                                                                                                            |
|               | Size               | Width            | (referring to description of 'Line')                                                                                                            |
|               |                    | Height           | (referring to description of 'Line')                                                                                                            |
| Flashing      | Runtime appearance | Flashing         | There two styles can be selected are 'None' and 'Standard' when you click 'Flashing' drop-down list.<br>None:no flashing.<br>Standard:flashing. |
| Misc.         | Miscellaneous      | Name             | Name of Progress Bar.                                                                                                                           |
|               |                    | Opacity          | Transparency of Progress Bar.                                                                                                                   |
|               | Infotext           | Infotext         | Notes of the progress bar.                                                                                                                      |

### 6.2.3 Clock

'Clock' is available to display time in runtime system.



1. You can set properties of slider in the 'General' properties view.



- Face color: Define color of the dial.
- Digit font: Define font and size of the digit in the dial according to your need.
- Digit color: Color of clock digit.
- Border color: Border Color of clock face.

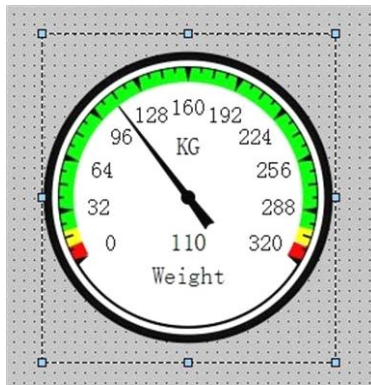
- Marks color: Color of marks.
- Hand color: Text color of pointer.

2. You can set the properties of clock in the 'Properties' properties view.

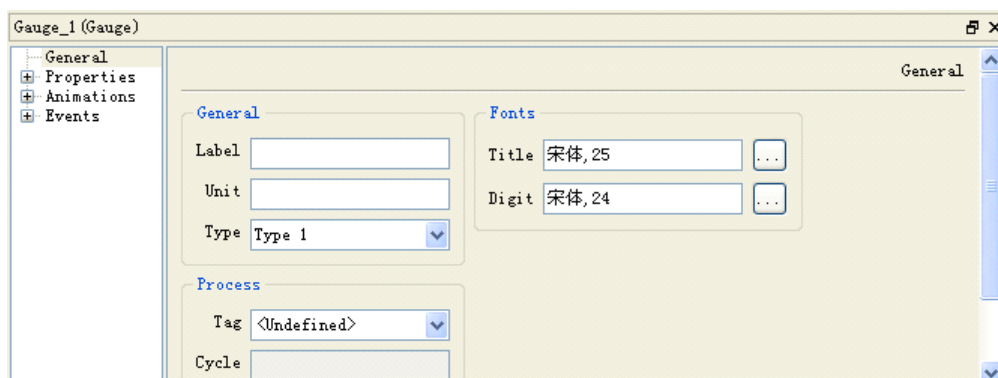
| Property name |               |                  | Description                                                                                          |
|---------------|---------------|------------------|------------------------------------------------------------------------------------------------------|
| Appearance    | Fill          | Text color       | Color of clock scale value.                                                                          |
|               |               | Background color | Background color of number range.                                                                    |
| Layout        | Position      | X                | Horizontal distance between the original point of clock and the left edge of screen, units of pixel. |
|               |               | Y                | Vertical distance between the s original point of clock and the top edge of screen, units of pixel.  |
|               | Size          | Width            | Width of clock, in units of pixel.                                                                   |
|               |               | Height           | Height of clock, in units of pixel.                                                                  |
| Misc.         | Miscellaneous | Name             | Name of clock.                                                                                       |
|               |               | Opacity          | Transparency of the background color of clock.                                                       |

## 6.2.4 Gauge

'Gauge' displays the value of the process variable by analog form.

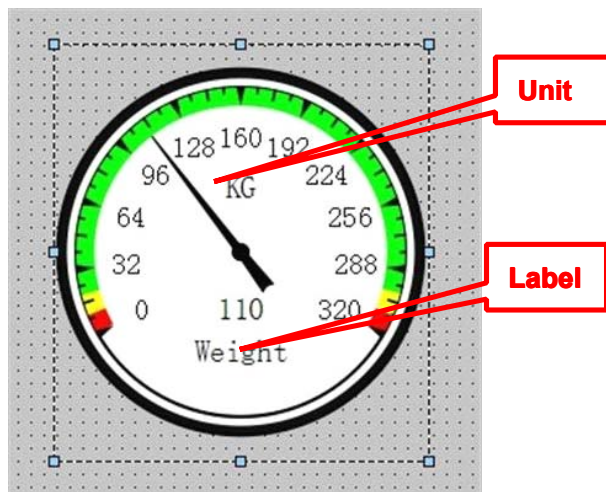


1. You can set properties of gauge in the 'General' properties view.

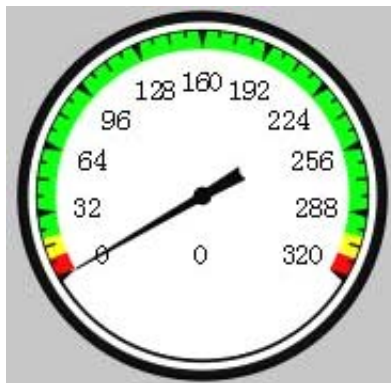


- Label:Text on the gauge.
- Unit:Name of physical unit.

Show as below picture:



- Type:Provide two appearance types for you to choose. See below:



**Type 1**



**Type 2**

- Title:Set the font style and size of label and unit.
- Digit:Set the style and size of digit in the gauge.
- Tag:Process variable displayed by the gauge.

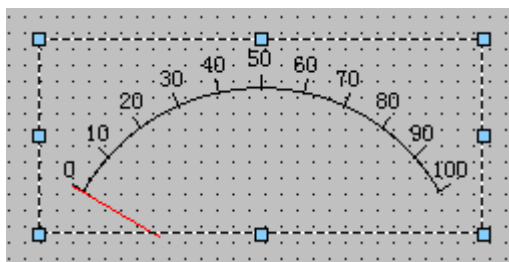
2. You can set the properties of clock in the 'Properties' dialog of properties view.

| Property name |          |                  | Description                                                                                          |
|---------------|----------|------------------|------------------------------------------------------------------------------------------------------|
| Appearance    | Fill     | Text color       | Color of garge scale, label, and unit.                                                               |
|               |          | Background color | Background color of number range.                                                                    |
| Layout        | Position | X                | Horizontal distance between the original point of gauge and the left edge of screen, units of pixel. |
|               |          | Y                | Vertical distance between the original point of gauge and the top edge of screen, units of pixel.    |
|               | Size     | Width            | Width of gauge, in units of pixel.                                                                   |

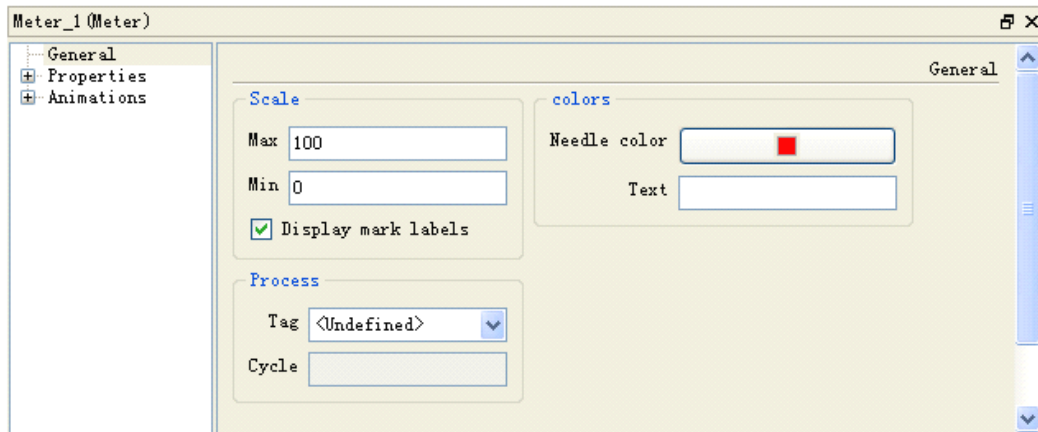
|       |               |                     |                                                                                |
|-------|---------------|---------------------|--------------------------------------------------------------------------------|
|       |               | Height              | Height of gauge, in units of pixel.                                            |
| Scale | Range         | minValue            | Specify the gauge's minimum scale,it must be constant.                         |
|       |               | lowError            | Specify the gauge's low error scale,it must be constant.                       |
|       |               | lowWarning          | Specify the gauge's low warning scale,it must be constant.                     |
|       |               | highWarning         | Specify the gauge's high warning scale,it must be constant.                    |
|       |               | highError           | Specify the gauge's high error scale,it must be constant.                      |
|       |               | maxValue            | Specify the gauge's maximum scale,it must be constant.                         |
|       | Color         | normalColor         | The dial color which show the normal range,select it from the drow-down box.   |
|       |               | warningColor        | The dial color which show the warning range, select it from the drow-down box. |
|       |               | errorColor          | The dial color which show the error range, select it from the drow-down box.   |
|       | Display       | Display mark labels | You can select to display or hide the mark labels of the gauge.                |
| Misc  | Miscellaneous | Name                | Name of the gauge.                                                             |
|       |               | Opacity             | Transparency.                                                                  |

### 6.2.5 Meter

'Meter' displays value of the process variable by analog form.



1. In 'General' dialog of 'Meter', you can set the properties including 'Scale', 'colors' and 'Process'.



- Max:Max value displaying on the meter, which is a static constant.
- Min:Min value displaying on the meter, which is a static constant.
- Display mark labels:You can select to display or hide the mark labels of the meter.
- Tag:Process variable displaying on the meter.
- Needle color:Color of the meter needle.
- Text:Notes displaying on central axis of the meter.

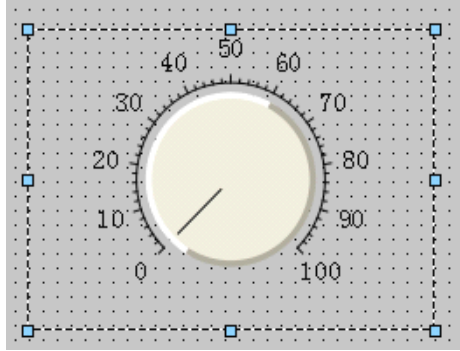
2. You can set the following params in the 'Properties' dialog of properties view.

| Property name |                    |                  | Description                                                                                                                                     |
|---------------|--------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance    | Fill               | Text color       | Color of scale and label on the meter.                                                                                                          |
|               |                    | Background color | Background color of number range.                                                                                                               |
|               |                    | Fillstyle        | Default to 'Solid'.                                                                                                                             |
| Layout        | Position           | X                | Horizontal distance between the central axis of meter and the left edge of screen, units of pixel.                                              |
|               |                    | Y                | Vertical distance between the s central axis of meter and the top edge of screen, units of pixel.                                               |
|               | Size               | Width            | Width of meter, in units of pixel.                                                                                                              |
|               |                    | Height           | Height of meter, in units of pixel.                                                                                                             |
| Text          | Style              | Style            | Set font and size of text on the meter.                                                                                                         |
|               | Alignment          | Horizontal       | Using the default value 'Left'.                                                                                                                 |
|               |                    | Vertical         | Using the default value 'Top'.                                                                                                                  |
| Flashing      | Runtime appearance | Flashing         | There two styles can be selected are 'None' and 'Standard' when you click 'Flashing' drop-down list.<br>None:no flashing.<br>Standard:flashing. |
| Misc.         | Miscellaneous      | Name             | Name of the meter.                                                                                                                              |
|               |                    | Layer            | The default is 10.                                                                                                                              |
|               |                    | Opacity          | Transparency.                                                                                                                                   |

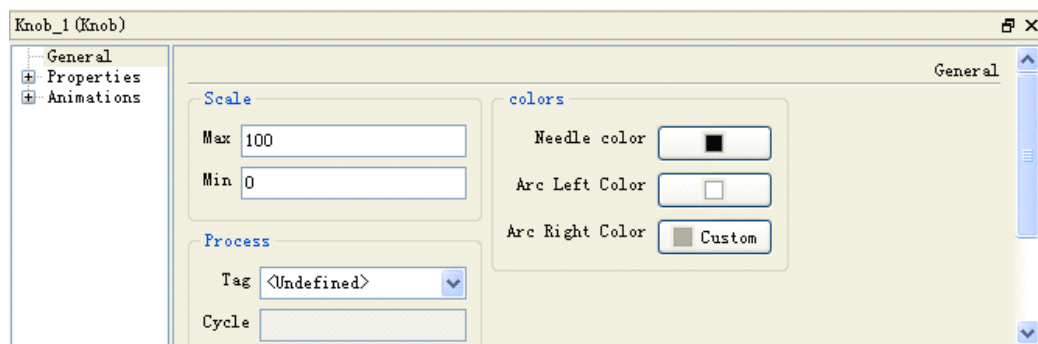
|  |          |          |                     |
|--|----------|----------|---------------------|
|  | Infotext | Infotext | Notes of the meter. |
|--|----------|----------|---------------------|

### 6.2.6 Knob

'Knob' displays value of the process variable by analog form.



1. In 'General' dialog, you can set the properties including 'Scale', 'Process', and 'colors'.



- Max:Max value displaying on the dial of knob, which is static constant.
- Min:Min value displaying on the dial of knob, which is static constant.
- Tag:Process variable of the displaying value.
- Cycle:Use the default value.
- Needle color:Set the displaying color of the needle on the knob. The color will display directly after you click the 'Needle color' button.
- Arc Left Color:Set the delaying color of knob on the left. The color will display directly after you click the 'Arc Left Color' button.
- Arc Left Color:Set the delaying color of knob on the right.The color will display directly after you click the 'Arc Left Color' button.

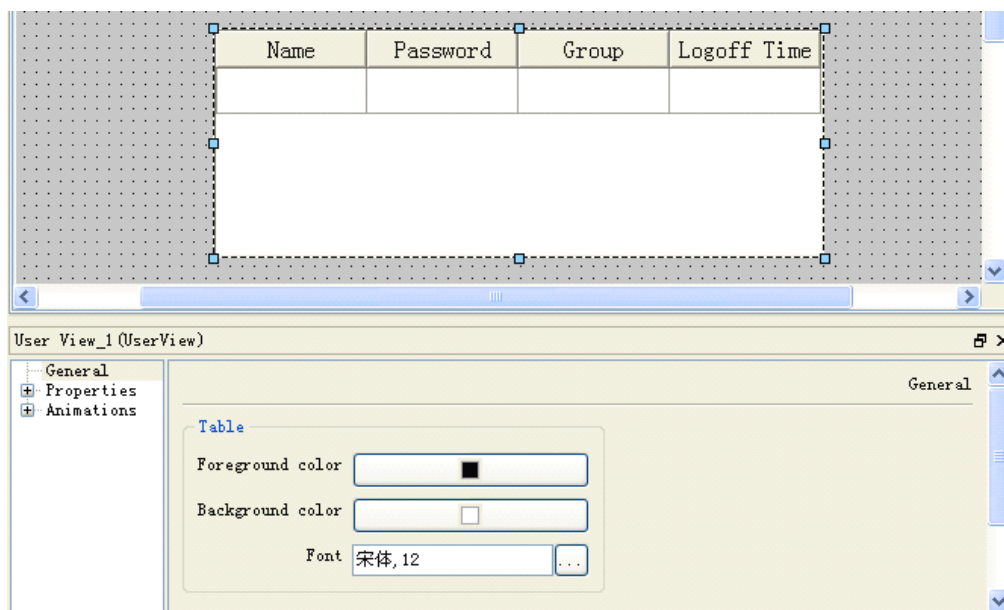
2. You can set the following params in the 'Properties' dialog of 'Knob'.

| Property name |      |                  | Description                           |
|---------------|------|------------------|---------------------------------------|
| Appearance    | Fill | Text color       | Color of scale and label on the knob. |
|               |      | Background color | Background color of number range.     |
|               |      | FillStyle        | Default to 'Solid'.                   |

|        |               |            |                                                                                                      |
|--------|---------------|------------|------------------------------------------------------------------------------------------------------|
| Layout | Position      | X          | Horizontal distance between the central axis of knob and the left edge of screen, in units of pixel. |
|        |               | Y          | Vertical distance between the s central axis of knob and the top edge of screen, in units of pixel.  |
|        | Size          | Width      | Width of knob, in units of pixel.                                                                    |
|        |               | Height     | Height of knob, in units of pixel.                                                                   |
| Text   | Style         | Style      | Set font and size of scale on the knob.                                                              |
|        | Alignment     | Horizontal | Using the default value 'Left'.                                                                      |
|        |               | Vertical   | Using the default value 'Top'.                                                                       |
| Misc   | Miscellaneous | Name       | Name of the knob.                                                                                    |
|        |               | Layer      | Using the default value.                                                                             |
|        |               | Opacity    |                                                                                                      |
|        | Infotext      | Infotext   | Notes of the knob.                                                                                   |

### 6.2.7 User View

'User View' is used to manage users in runtime system.



You can set the following params in the 'General' dialog of 'User View'.

- Text color: Set text color of user view.
- Background color: Set background color of user view.
- Font: Set the font style and size of the title bar on the user view.

You can set the params of user view in 'Properties' dialog.

| Property Name |      |                  | Description                    |
|---------------|------|------------------|--------------------------------|
| Appearance    | Fill | Text color       | Reserved.                      |
|               |      | Background color | Background color of user view. |

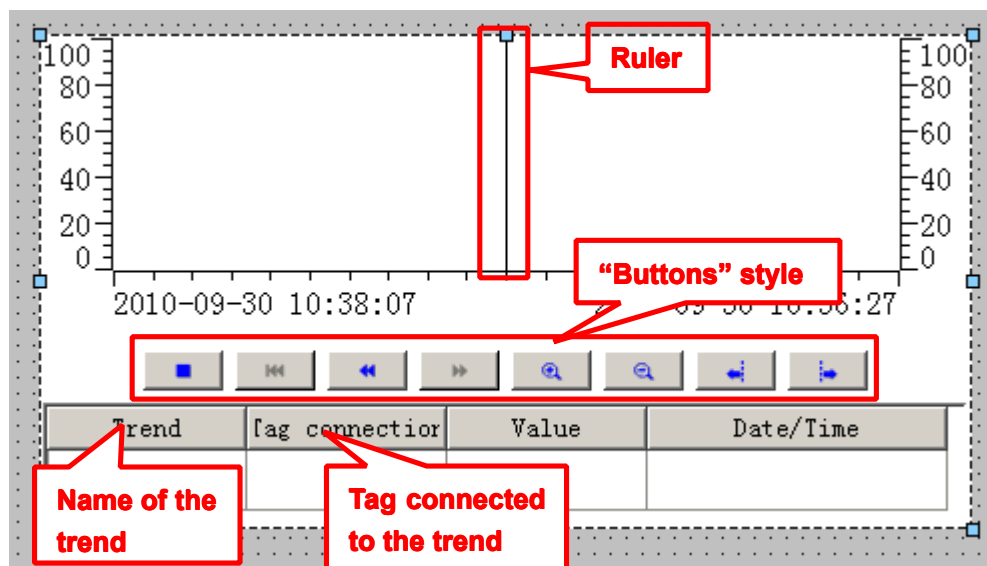
|        |               | Fill style | Reserved.                                                                                            |
|--------|---------------|------------|------------------------------------------------------------------------------------------------------|
| Layout | Position      | X          | Horizontal distance between the original point of clock and the left edge of screen, units of pixel. |
|        |               | Y          | Vertical distance between the original point of clock and the top edge of screen, units of pixel.    |
|        | Size          | Width      | Width of user view, in units of pixel.                                                               |
|        |               | Height     | Height of user view, in units of pixel.                                                              |
| Misc.  | Miscellaneous | Name       | Name of the user view.                                                                               |
|        |               | Opacity    | Transparency of the background color of user view.                                                   |

## 6.2.8 Trend View

### 6.2.8.1 Trend View and Trend Introductions

Trend view is a kind of graph that expresses the current processes or logs in the form of trend.

Trend view show as below figure:



You can configure 8 trends in a trend view at most.

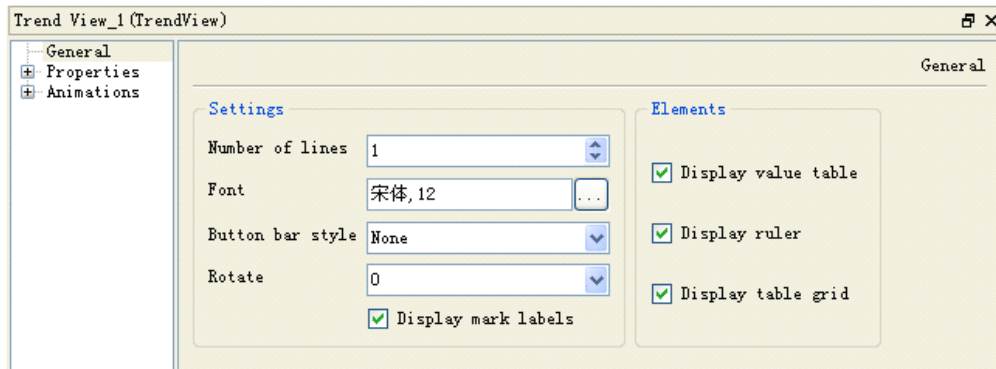
There are two parts of the trend view properties: Appearance properties and Trend properties.

Appearance contains 3 items: 'General', 'Properties' and 'Animations'.

'Properties' contains Appearance and Trend.

### [Appearance properties]

#### General



'General' contains two important parts: 'Settings' and 'Elements'.

The params of 'Settings':

- Number of lines: Lines number of the table.
- Font: Size and style of the font in the trend view.
- Button bar style: Whether to display the buttons or not. Operator can control appearance of the components. There are two styles can be selected, they are 'None' and 'Buttons'. 'None' means the trend view showing without buttons, 'Buttons' means the trend view showing with buttons.
- Rotate: There are four items for selection: '0', '90', '180' and '270'.

'0': The trend view will be placed horizontally.

'90': The trend view will be clockwise rotated by 90 degree.

'180': The trend view will be clockwise rotated by 180 degree.

'270': The trend view will be clockwise rotated by 270 degree.

- Display mark labels: You can select to display or hide the mark labels of the trend view.

The params of 'Elements':

- Display value table: Users can check the value on a time or a point, and the ruler and the table grid can not be operated.
- Display ruler: A vertical line on the trend view. When the ruler is existent, the table will display the value of the cross point of the curve and the ruler. When the ruler is inexistent, the table will display the current value.
- Display table grid: Whether to display the table grid or not.

Functions table of the buttons:

| Buttons                                                                             | Functions                                                                 |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
|  | The trend graphic will roll a display width to the left (half a screen).  |
|  | The trend graphic will roll a display width to the right (half a screen). |

|                                                                                   |                                                    |
|-----------------------------------------------------------------------------------|----------------------------------------------------|
|  | Move the ruler to the left (a pixel at one time).  |
|  | Move the ruler to the right (a pixel at one time). |
|  | Start recording trend value.                       |
|  | Display the current trend.                         |
|  | Decrease the marks value of X axis.                |
|  | Increase the marks value of X axis.                |

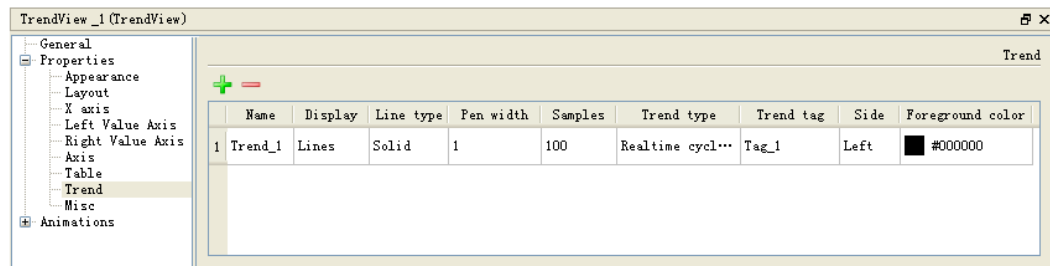
### Properties

| Property name   |              |                      | Description                                                                                                    |
|-----------------|--------------|----------------------|----------------------------------------------------------------------------------------------------------------|
| Appearance      | Fill         | Ruler color          | Set ruler color.                                                                                               |
|                 |              | Background color     | Set background color.                                                                                          |
|                 |              | Scale color          | Set scale color.                                                                                               |
| Layout          | Position     |                      | Positions of X and Y axis.                                                                                     |
|                 | Size         |                      | Width and height of the rectangle.                                                                             |
| X axis          | Settings     | Mode                 | Selections of modes. 'Time', 'Points' and 'Tag/constant'.                                                      |
|                 |              | New values from      | Set data source out from left or right.                                                                        |
|                 |              | Time display-Format  | There are four ways to display time when the 'Mode' is time:<br>yyyy-MM-dd hh:mm:ss<br>hh:mm:ss<br>mm:ss<br>ss |
|                 |              | Oscillograph display | Whether to enable oscilloscope trend type or not. Only applies to time mode.                                   |
|                 | Axis scaling | Axis begin           | It's effective only for 'Tag/constant' mode.                                                                   |
|                 |              | Axis end             | It's effective only for 'Tag/constant' mode.                                                                   |
|                 |              | Time Interval (Sec.) | It's effective only for 'Time' mode.                                                                           |
|                 |              | Number of points     | It's effective only for 'Points' and 'Tag/constant' mode.                                                      |
| Left Value Axis | Scale        | Axis begin           | Set axis begins on the left scale.                                                                             |
|                 |              | Axis end             | Set axis end on the left scale.                                                                                |
| Right Value     | Scale        | Axis begin           | Set axis begins on the right scale.                                                                            |

|       |                     |          |                                                                                                                                                                                                                                                                                                       |
|-------|---------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Axis  |                     | Axis end | Set axis end on the right scale.                                                                                                                                                                                                                                                                      |
| Axis  | X axis              |          | Set the increments and marks of X axis.                                                                                                                                                                                                                                                               |
|       | Left value axis     |          | Set the increments and marks of left Y axis.                                                                                                                                                                                                                                                          |
|       | Right value axis    |          | Set the increments and marks of right Y axis.                                                                                                                                                                                                                                                         |
|       | Axis labels         |          | Whether to display X axis, left value axis, and right value axis.                                                                                                                                                                                                                                     |
| Table | Text color          |          | Set the text color of the table.                                                                                                                                                                                                                                                                      |
|       | Background color    |          | Set background color of the table header.                                                                                                                                                                                                                                                             |
|       | Font                |          | Set the size and style of the table header.                                                                                                                                                                                                                                                           |
| Trend | Name                |          | Set the name of the trend.                                                                                                                                                                                                                                                                            |
|       | Display             |          | Set the display mode of curve. There are four kinds are bars, steps, point, and lines.                                                                                                                                                                                                                |
|       | Line type           |          | Set line type. You can select 'Dash' or 'Solid'. This is available only for the display mode of 'Lines'.                                                                                                                                                                                              |
|       | Bar width/Pen Width |          | Set the width of bar.It's enabled when "Display" selects "Bars".The bar width defaults to 50%. Setup the pen width.It is enabled when "Display" select "Steps", "Points" or "Lines".As you select the "Lines" as the display type, the pen width can be configured, the range is 1~30, defaults to 1. |
|       | Samples             |          | Set the sample number displaying in the trend view.                                                                                                                                                                                                                                                   |
|       | Trend type          |          | There are four types of trend, they are 'Realtime cyclic triggered', 'Realtime bit triggered', 'Buffer bit triggered', and 'Log'.                                                                                                                                                                     |
|       | Trend tag           |          | The tag will be continuous displayed in the trend view.                                                                                                                                                                                                                                               |
|       | Side                |          | Setting of side which shows whether the curve is subject to the left scale of Y axis or the right scale of Y axis.                                                                                                                                                                                    |
| Misc. | Foreground color    |          | Set the color of the curve. If the trend tag has upper or lower limits, it's the color of the trend tag within the limits.                                                                                                                                                                            |
|       | Miscellaneous       | Name     | Name of the trend view.                                                                                                                                                                                                                                                                               |
|       |                     | Layer    | Using the default value.                                                                                                                                                                                                                                                                              |
|       |                     | Opacity  | Transparency.                                                                                                                                                                                                                                                                                         |
|       | Infotext            |          | Notes of the trend view.                                                                                                                                                                                                                                                                              |

**[Trend properties]**

Show as the right side of below figure:



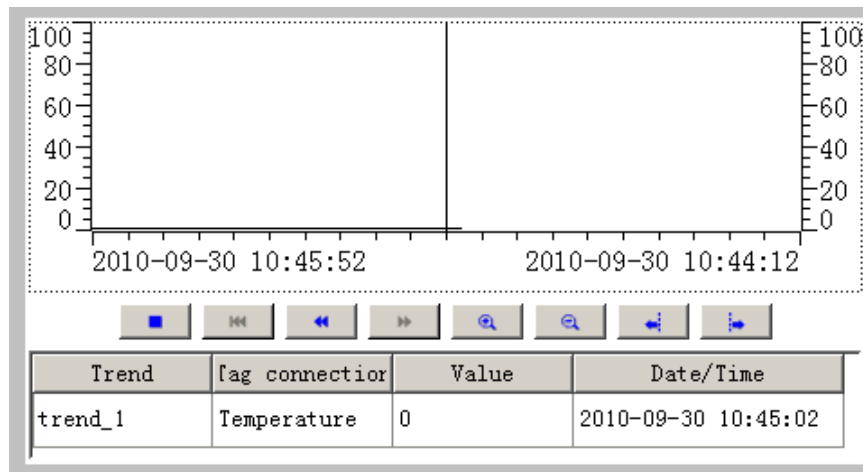
Descriptions of trend properties:

| Name             | Settings of trend name                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Display          | Set the display mode of curve. There are four kinds are bars, steps, point, and lines.                                                                                                                                                                                                                                                                                                 |
| Line type        | Set line type. You can select 'Dash' or 'Solid'. This is available only for the display mode of 'Lines'.                                                                                                                                                                                                                                                                               |
| Bar width        | Set the width of bar, only in terms of bar.                                                                                                                                                                                                                                                                                                                                            |
| Samples          | Set the sample number displaying in the trend view (or 'Points' number).                                                                                                                                                                                                                                                                                                               |
| Trend type       | There are four types of trend, they are 'Realtime cyclic triggered', 'Realtime bit triggered', 'Buffer bit triggered', and 'Log'.<br>Realtime cyclic triggered: value displaying by time triggered.<br>Realtime bit triggered: value displaying by events triggered.<br>Buffer bit triggered: buffer data displaying by events triggered.<br>Log: Used to display the logs of the tag. |
| Trend tag        | Double-clicking 'Trend tag' will popup a dialog.<br>Trend tag: The tag that the trend views will be drawing curve of.<br>Pulse: The time interval of displaying variable value in the trend view.                                                                                                                                                                                      |
| Side             | Setting of side which shows whether the curve is subject to the left scale of Y axis or the right scale of Y axis.                                                                                                                                                                                                                                                                     |
| Foreground color | Set the color of the curve. If the trend tag has upper or lower limits, it's the color of the trend tag within the limits.                                                                                                                                                                                                                                                             |

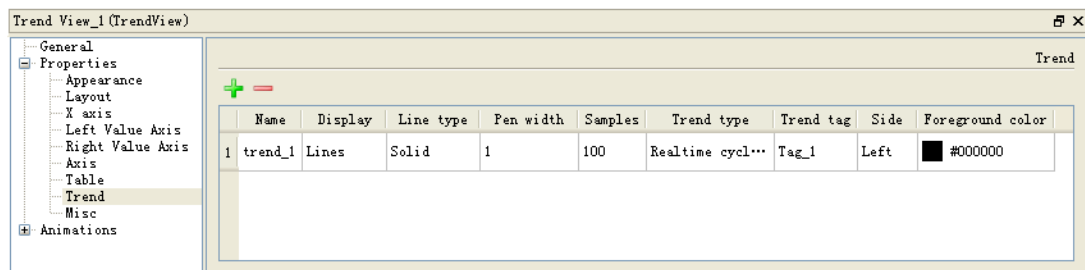
### 6.2.8.2 Trend Configuration

The following is a typical example of trend view.

1. Drag a trend view into the screen, and then drag a number IO field to the screen to show the information of the trend view.



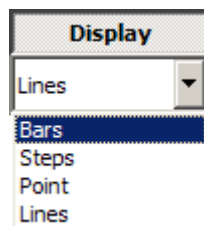
2. Select the trend view, and double-click [Properties] / [Trend] of properties view, and then it will popup a trend dialog as below:



3. Click  in the trend view, a new trend can be created. Select a trend and then click , you can delete a trend.

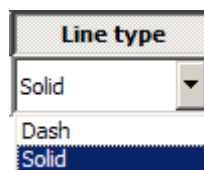
4. Click the 'Name' column, then input name of the trend.

5. Double-click 'Display', and then it pops a dialog as below:



You can select the patterning as needed. Here we select 'Line'.

6. Double-click 'Line type', and then it pops a dialog as below:

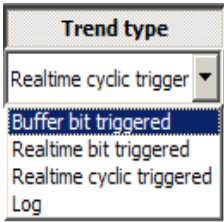


You can select the displaying patterning as needed.

7. If you select 'Bar' in the 'Display', click 'Bar width', and input width of the bar.

8. Click 'Sample', and input the number of samples.

9. Double-click 'Trend type', and then it pops a dialog as below. You can select trend type as needed.



There are four types of trend:

Log:Used to display the logs of the tag.

Realtime cyclic triggered:Value displaying by time triggered.

Realtime bit triggered:Value displaying by events triggered.

Buffer bit triggered:Buffer data displaying by events triggered.

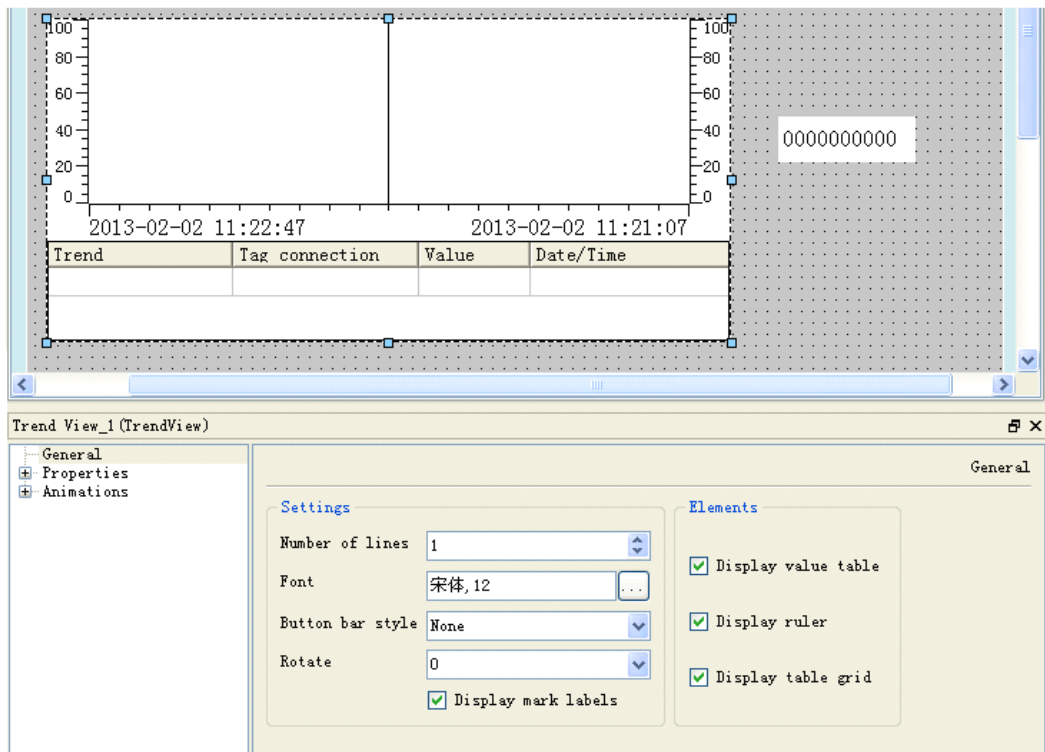
### 'Realtime cyclic triggered'

First create a new project and save it.

Configure 'General'.

Add a trend view in the screen, then configure 'Settings' and 'Elements' in 'General'. The number of lines is '1'.

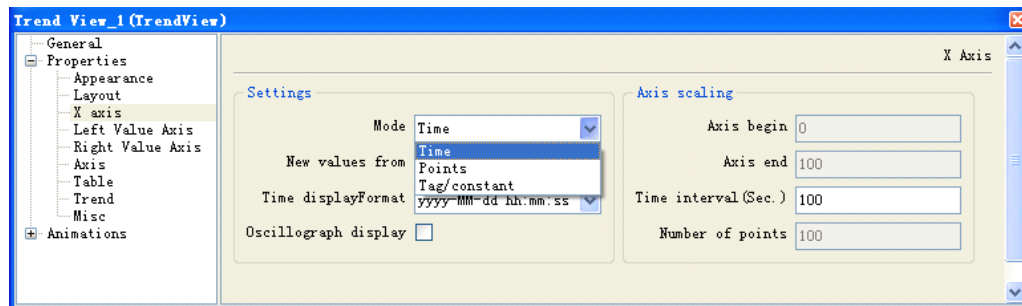
The font of trend view is '宋体,12', and 'Button bar style' is 'None', 'Rotate' is '0'. Select 'Display value table', 'Display ruler' and 'Display table grid' in 'Elements'. Showing as picture below:



Configure 'Properties'.

You can configure 'Appearance', 'Layout', 'Left Value Axis', 'Right Value Axis', 'Axis', 'Table' and 'Misc' as needed.

Configure 'X axis' in 'Properties' as below:



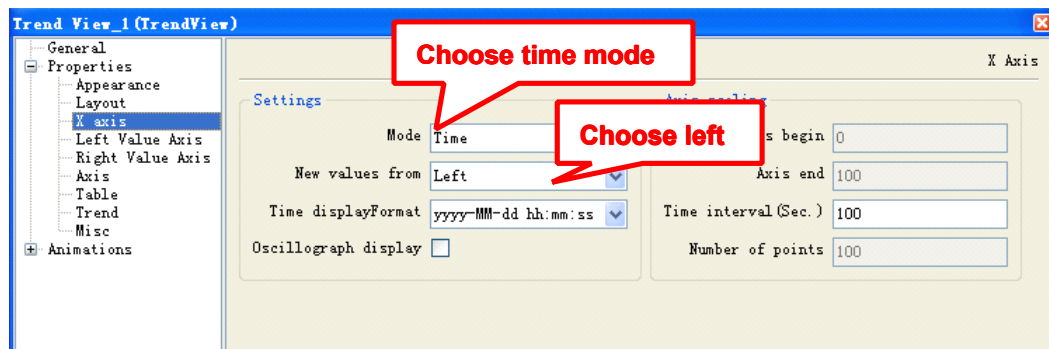
There are 3 modes for you to configure.

**Time:** Interval between each two samples. When choose 'Time', you should configure 'Time interval (Sec.)'. You can configure Oscillograph under this mode.

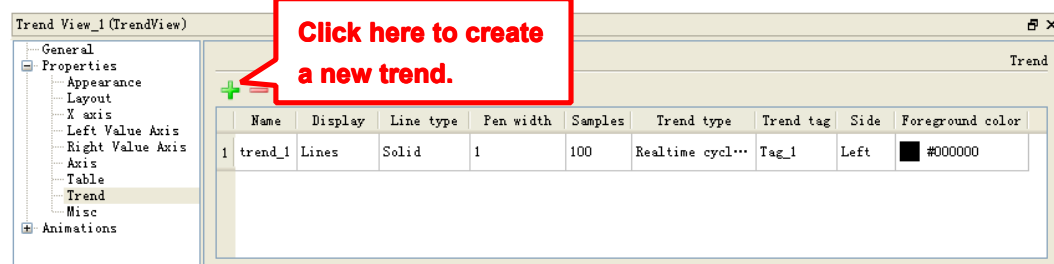
**Points:** When you choose 'Points', the scale will use the values using percentage.

**Tag/constant:** Scale range of axes. When choose 'Tag/constant', you should configure 'Axis begin', 'Axis end', and 'Number of points'.

Example 1: We select 'Time' mode, and do not enable oscillograph display.



Configure 'Trend' in 'Properties', showing as picture below:



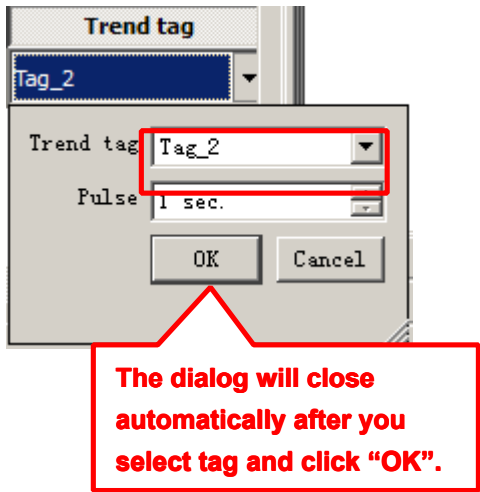
Click  to add a new trend, and then configure property columns as needed.

Configure 'Lines' for 'Display', 'Solid' for 'Line type' and '100' for 'Samples'.

'Trend type' is 'Realtime cyclic triggered'.

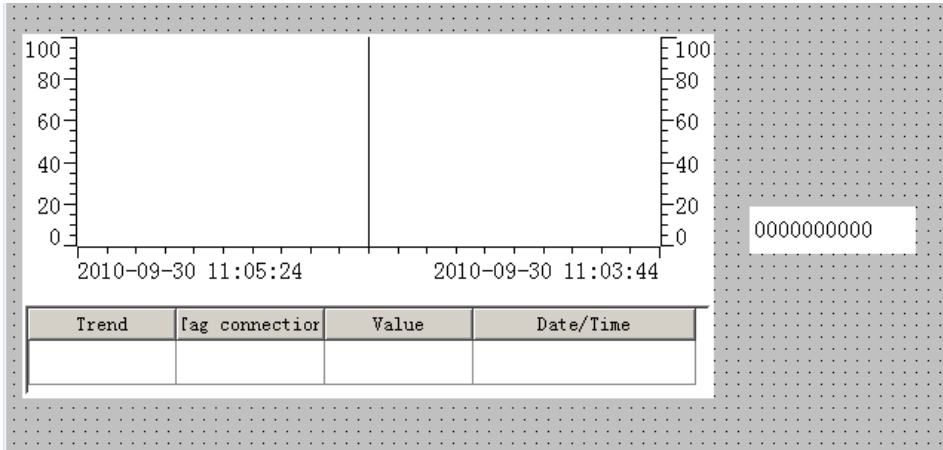
'Trend tag' can be configured by non-array tags.

Double-click 'Trend tag', and select 'Tag\_2', 'Pulse' is 1s, then click 'OK'.



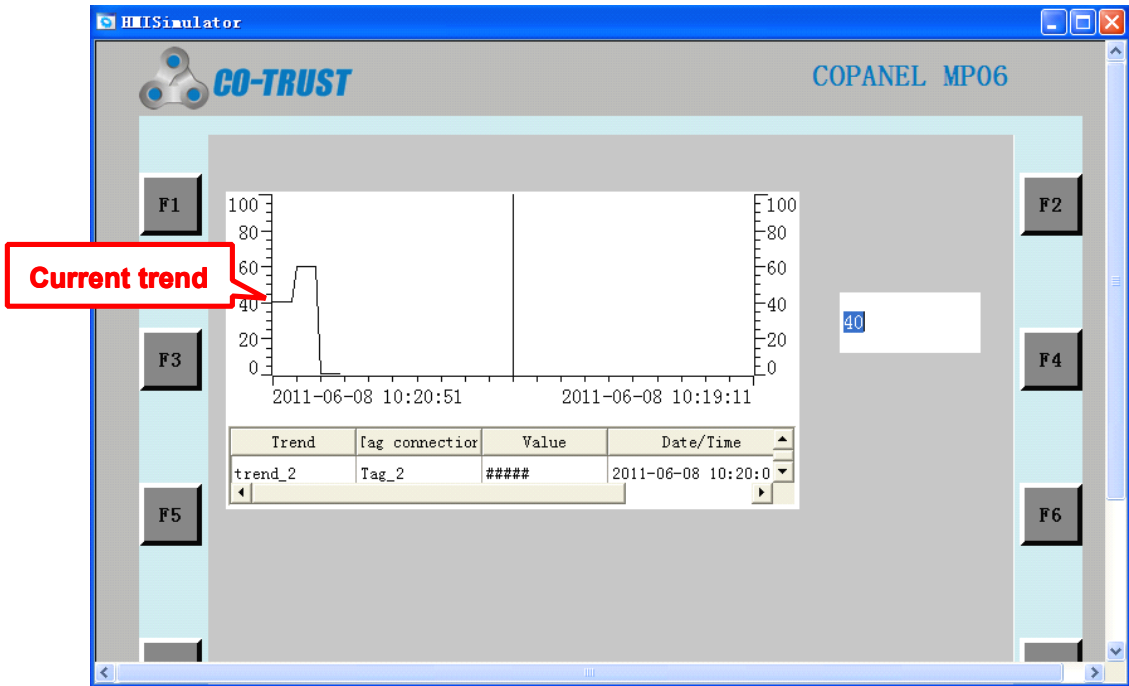
Configure a number IO field in the screen, the process tag of which is 'Tag\_2'.

The final result see as below figure:

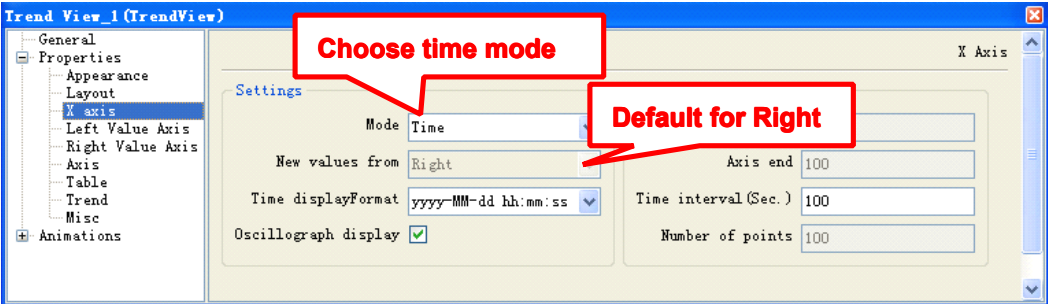


The trend view will draw curve automatically when you enter value in the IO field. In this project, the length of the line is 10 points.

The final running result is shown as below figure.

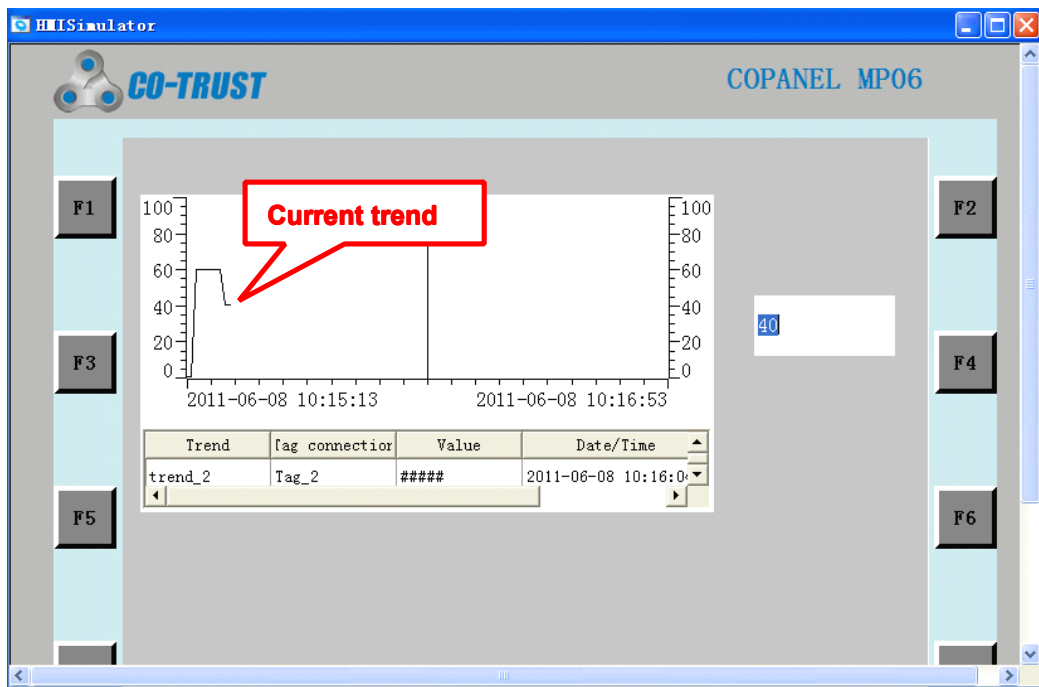


Example 2: We select 'Time' mode, and enable oscillograph display.



Configure 'Trend' as above.

The final running result is shown as below figure:



### Tips

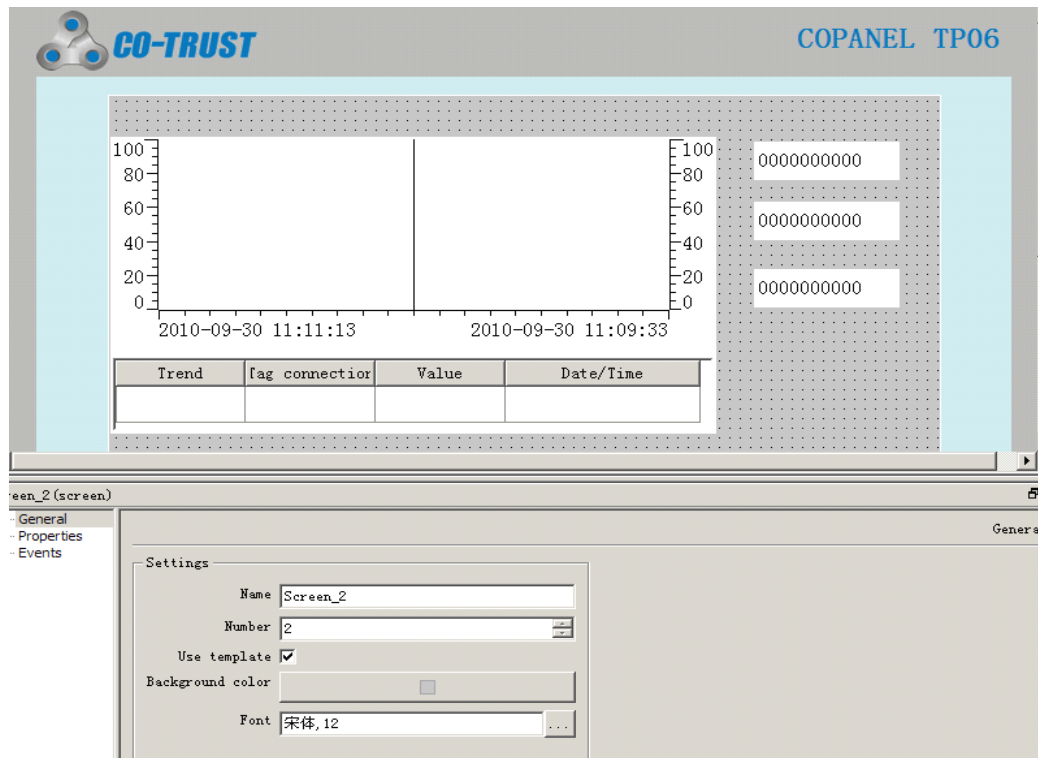
- We can only configure oscillograph function in time mode.
- We set left for "new values from", curve display from left, when the curve displaying is filled the whole screen, curve moves to the left again.
- When curve didn't fill in a full screen, zoom-in button is invalid, means that it cannot undertake zoom; When the curve is filled in a full screen, the zoom-in and zoom-out function recovered.
- When curve didn't fill in a full screen, scroll function is invalid, after fill a full screen scroll function will recover.
- It is recommended to use oscillograph function alone, you'd better not to mixed use with Log mode, buffer bit triggered mode and realtime bit triggered mode.

### 'Realtime bit triggered'

First create a new project and save it.

Configure 'General'.

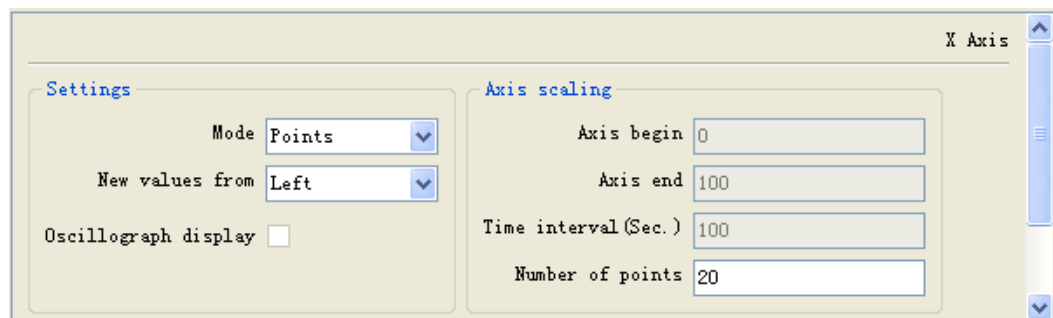
Add a trend view in the screen, and then configure 'Settings' and 'Elements' in 'General' property.



Configure 'Properties'.

You can configure 'Appearance', 'Layout', 'Left Value Axis', 'Right Value Axis', 'Axis', 'Table' and 'Misc' as needed.

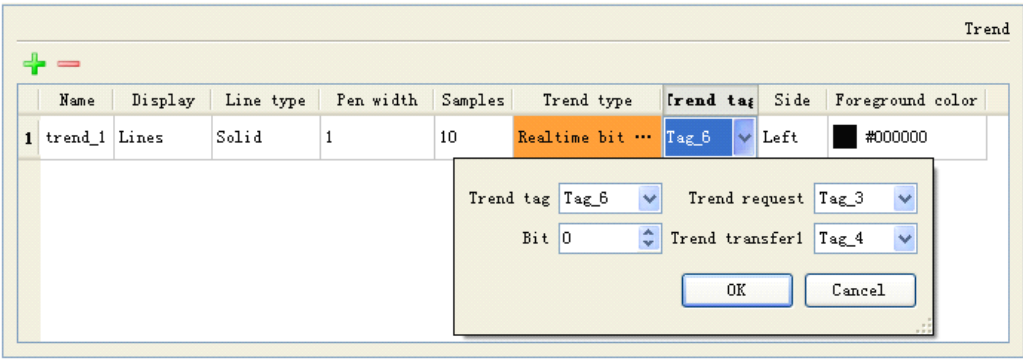
Configure 'X axis' in 'Properties' as below:



Configure 'Points' as 'Mode' and '20' as 'Number of points'.

Configure 'Realtime bit triggered' as 'Trend type', 'Tag\_6' as 'Trend tag', 'Tag\_3' as 'Trend request', 'Tag\_4' as 'Trend transfer1', and '0' as 'Bit', then click 'OK'.

Note: In simulator runtime, trend curve shows the value of 'Tag\_6'. Configure 'Tag\_4' as HEX, and then when the value of 'Tag\_4' is '8001', the trend will be triggered once.



Configure 3 number IO fields in the screen, and the process tag of which is 'Tag\_6'.

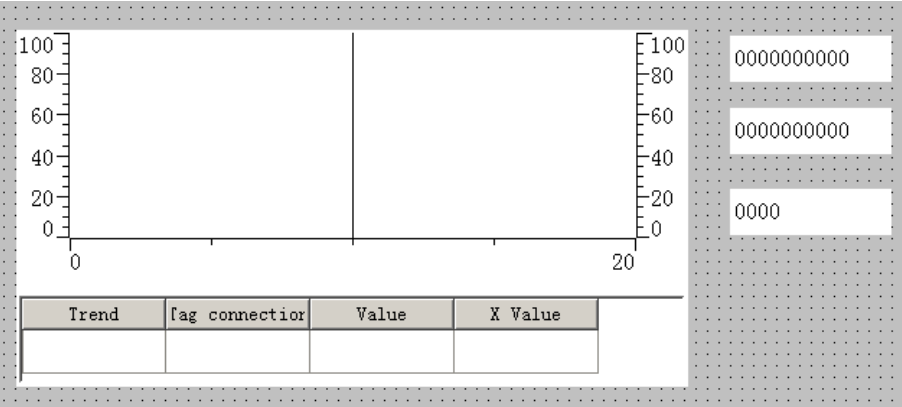
**Trend tag:**It can be configured only by non-array tags of external connections, and shows the trend value of the trend view.

**Trend request:**It can be configured only by the tags of external connections (include array and non-array tags). Select a variable in 'Trend request', and the bit number of the variable is not less than the number of the trends that will display in the trend view.

**Bit:**This is the bit number of 'Trend request' and 'Trend transfer1'. Select different number for each trend.

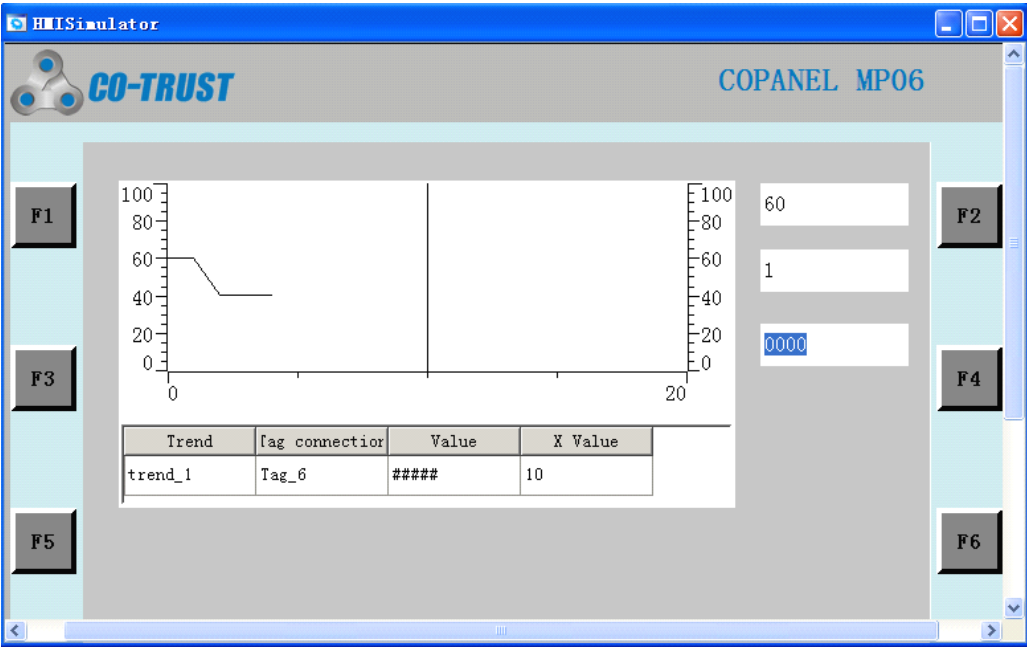
**Trend transfer1:**It can be configured only by the tags of external connections (include array and non-array tags). This variable is used to trigger the trend.

The final configuration see as below figure:



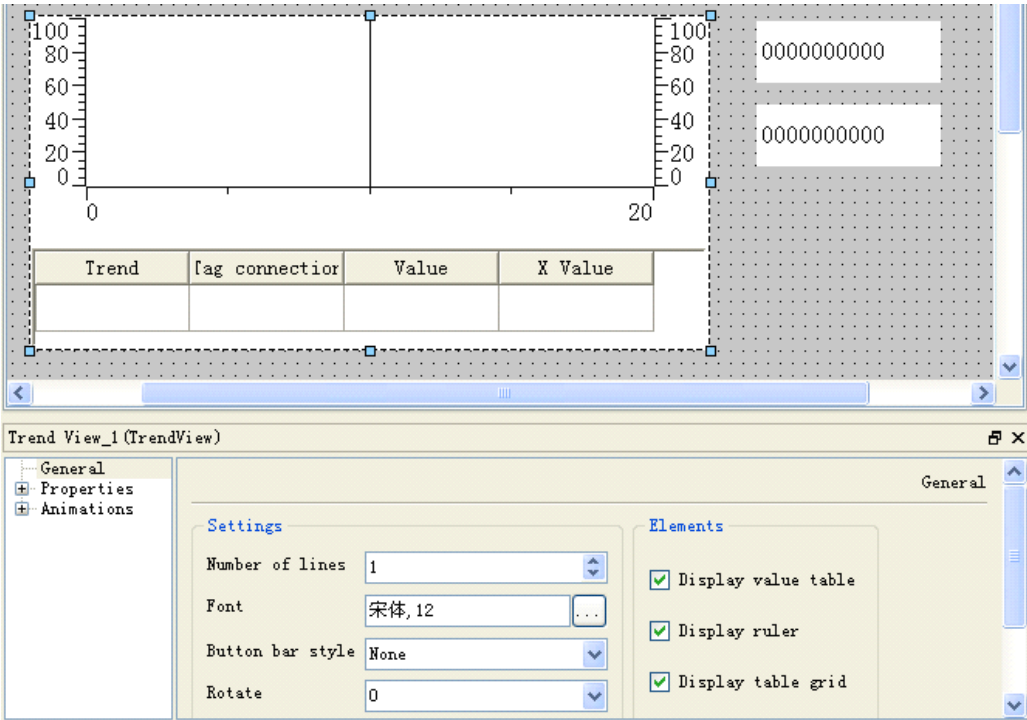
Enter '60' into the IO field of 'Tag\_6', and enter '8001' into the IO field of 'Tag\_4', then the trend will be triggered once.

The final runtime simulator is shown as the picture below:



**'Buffer bit triggered'**

First create a new project and save it.



**'General'**

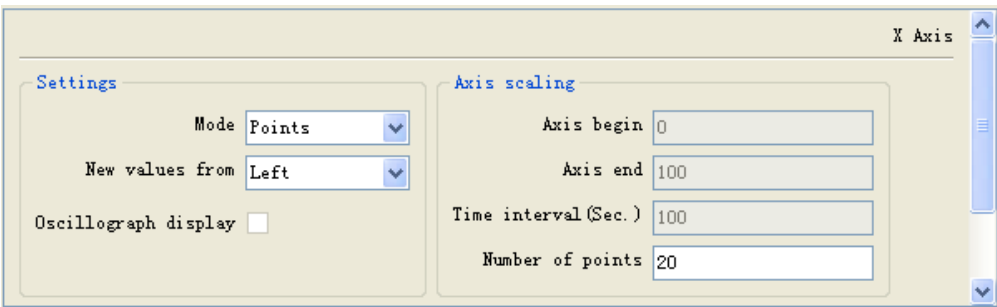
Drag a trend view of the enhanced objects into the screen, and then configure 'Settings' and 'Elements' in 'General' which shown as the picture below:



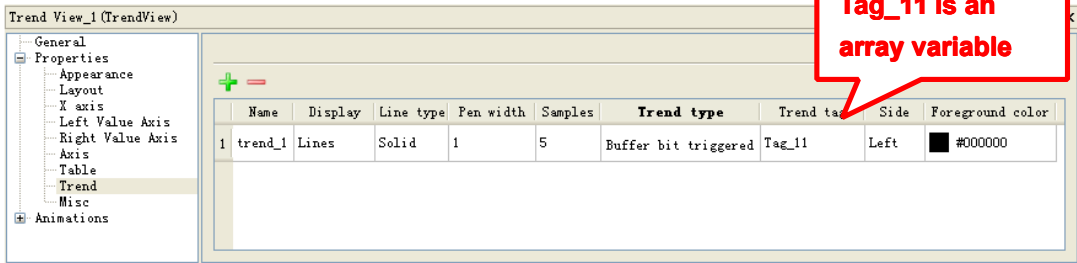
'Properties'

You can configure 'Appearance', 'Layout', 'Left Value Axis', 'Right Value Axis', 'Axis', 'Table', and 'Misc'.

Select mode as 'point', the point of axis scale is set to '20'.

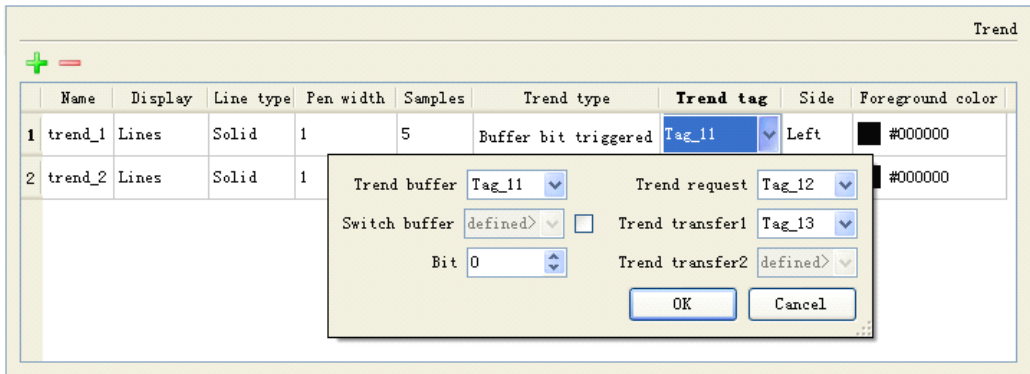


Configure 'Trend'



In above picture, the 'Sample' is '5', and the 'Trend type' is 'Buffer bit triggered'.

Double-click 'Trend tag', and then it pops a dialog as the picture below:



Trend buffer: This can be configured by array tags as well as non-array tags. It is used to display the value of trends in the trend view.

**Trend request:** This can only be configured by non-array tags of 'INT (V/M)' or 'WORD (V/M)' of external connections. Select a variable in 'Trend request', and the bit number of the variable is not less than the number of the trends that will display in the trend view.

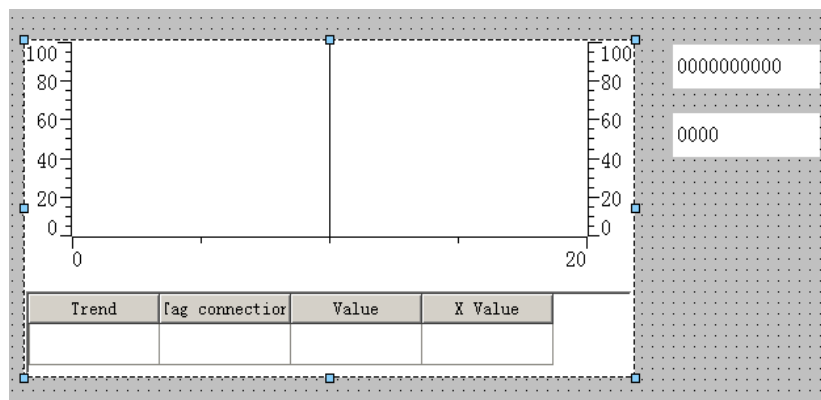
**Bit:** This is the bit number of 'Trend request' and 'Trend transfer1'. Select different number for each trend.

**Trend transfer1 and Trend transfer2:** This can only be configured by non-array tags of 'INT (V/M)' or 'WORD (V/M)' of external connections. This variable is used to trigger the trend.

In the dialog above, select 'Tag\_11' as trend tag, select 'Tag\_12' as trend request, and select 'Tag\_13' as trend transfer1, and then click 'OK'.

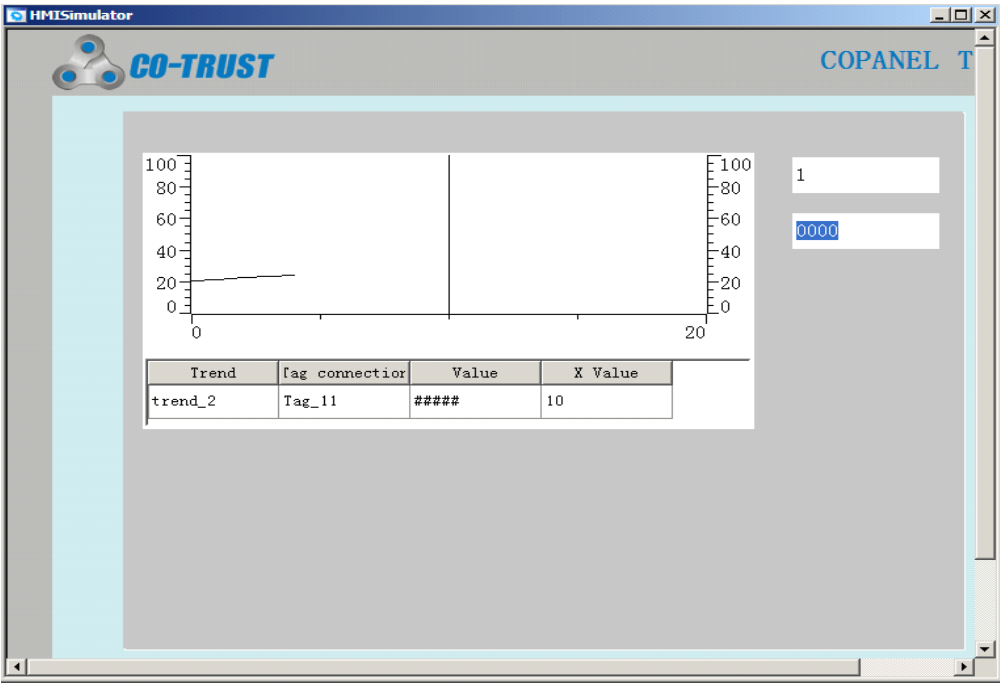
Drag two number IO fields in to the screen, the process tag of one is 'Tag\_12', and the process tag of the other one is 'Tag\_13'.

The configured trend screen is shown as below:



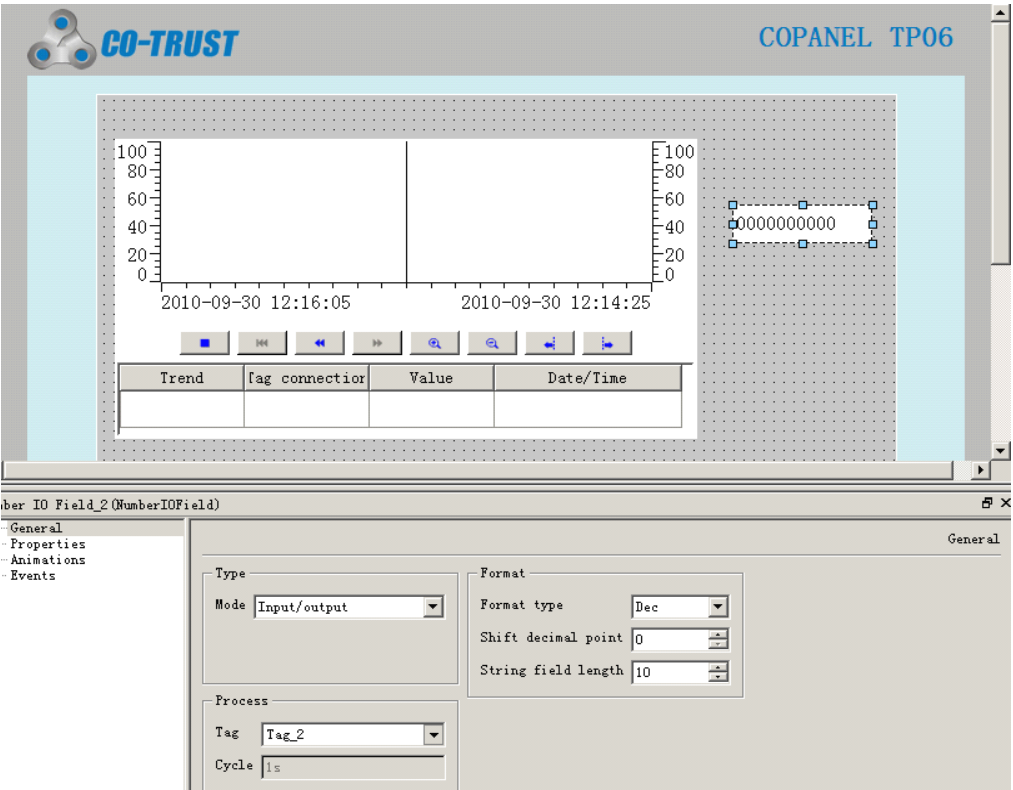
Enter '30' into the IO field of 'Tag\_11', and enter '8001' into the IO field of 'Tag\_13', then the trend will be triggered once.

The final running result is shown as below:



**'Log'**

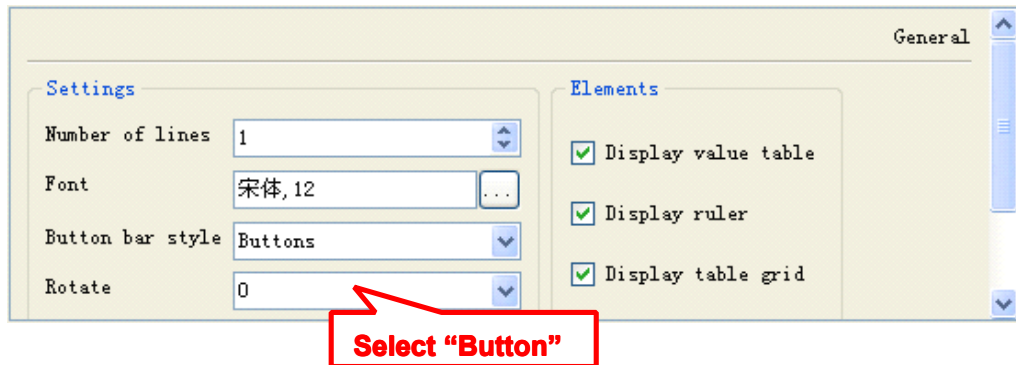
The trend type of 'Log' is shown as the picture below:



When select Log as trend type, please connect the U disk(which has stored data log) to HMI device.

First create a new project and save it.

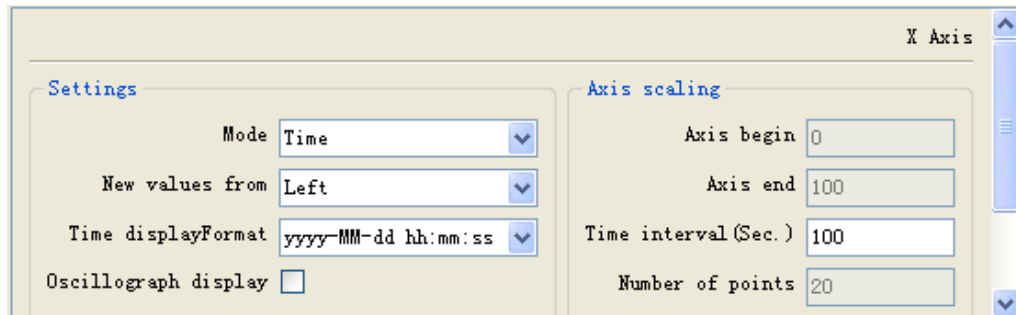
Drag a trend view from the enhanced objects view into the screen, and then configure 'Settings' and 'Elements' in 'General' which shown as below picture:



'Properties'

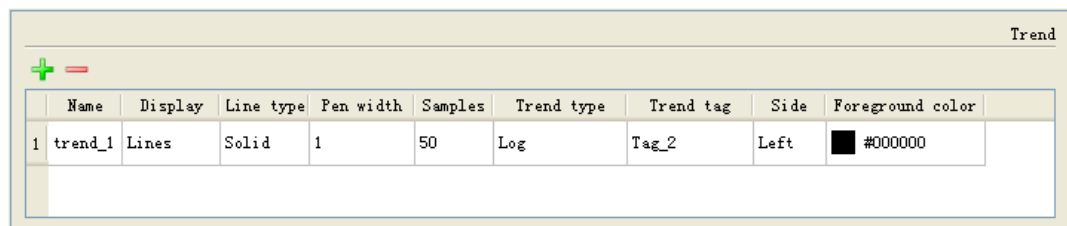
You can configure 'Appearance', 'Layout', 'Left Value Axis', 'Right Value Axis', 'Axis', 'Table' and 'Misc'.

Configure 'X axis'



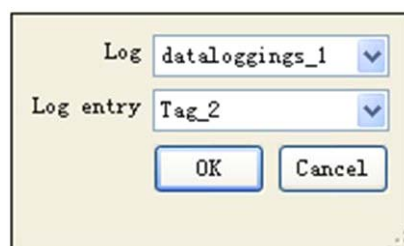
Configure 'Time' for 'Mode' and '100' for 'Time interval (Sec.)'.

Configure 'Trend'



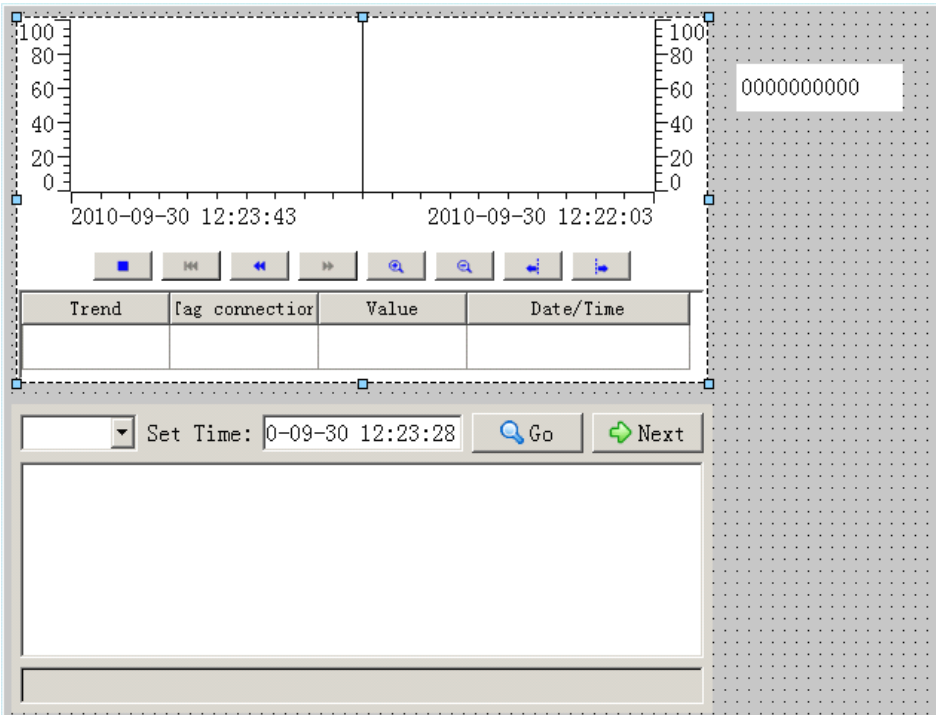
Select 'Log' as 'Trend type'.

Double-click 'Trend tag', select 'dataloggings\_1' as log, select 'Tag\_2' as 'Log entry', and then click 'OK'.

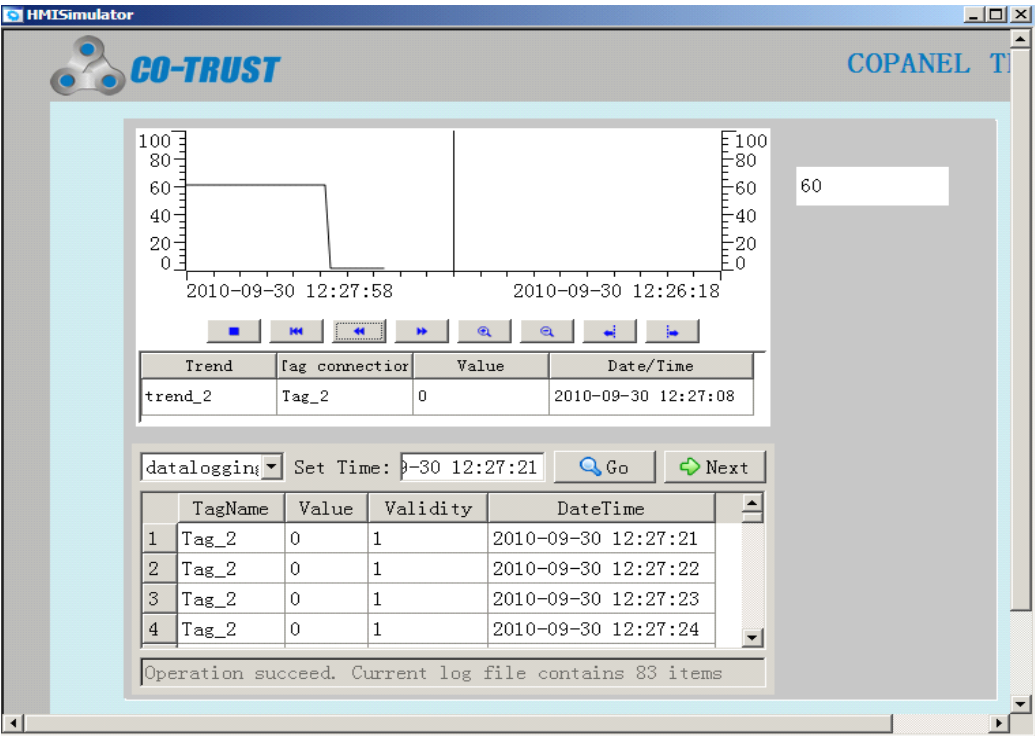


Drag a data view and a number IO field into the screen, the trend screen after

configuring is shown as the picture below:



Click  or , you can check the logs of a certain time. The final running effect is shown as the picture below:



10. Configuration of 'Side' and 'Foreground color':

Double-click 'Side', you can select 'Left' or 'Right'. Double-click 'Foreground color', you can configure the foreground color.

### 6.2.9 Recipe View

Recipe view is a general screen object, which is used to manage recipe data records. Recipe view display data logs in form of table. Recipe view can display and modify recipes.

1. You can set the following paras in the 'General' dialog of properties view.

- **Recipe name:** The recipe name displaying in recipe view. After you select recipe name for recipe view, the recipe view display this recipe fixedly in runtime, you can not modify the recipe.

- **Tag for number,** which is divided into two types:

One is 'Tag for number' of recipe, which identifies uniquely the current recipe ID in the recipe view (the recipe ID will be written in this tag after user selecting the recipe), you can also change the display of recipe dynamically in the recipe view by changing value of the tag.

The other is 'Tag for number' of data record, which is the same as recipe, but here it identifies data record ID (the data record ID will be written in this tag after user selected the recipe), you can also change the display of data record dynamically in the recipe view by changing value of the tag.

Note: It's not available to configure String type for "Tag for number".

- Display selection list:Whether to display the selection list of 'Recipe name'.
- Checking the box means 'Display selection list', otherwise the list will not be displayed.
- Enable edit mode:Whether elements value (which is the 'value' of the recipe view table) of the recipe can be modified. Checking the 'Enable edit mode' box means you can change the elements value.
- Display table:Whether to display the table in the recipe view. As show in below picture:

| Entry name | Value |
|------------|-------|
|            |       |

Checking the 'Display table' box means displaying, otherwise means not displaying.

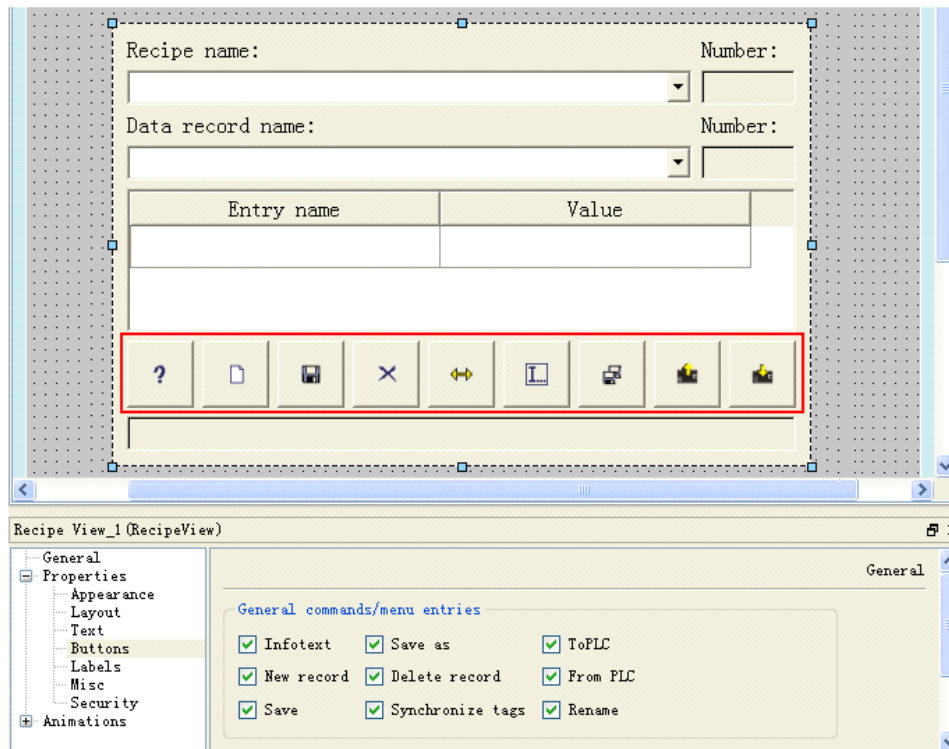
- Use tableView:If tick the option, recipe view will arrange the data records according to the “entry name” and “value” table. If no tick, recipe view from top to bottom, from left to right to display the value.

2. You can configure the params in the 'Properties' dialog of recipe view.

| Property name |                                        |                  | Description                                                                                                |
|---------------|----------------------------------------|------------------|------------------------------------------------------------------------------------------------------------|
| Appearance    | Fill                                   | Text color       | Fillcolor of foreground in the recipe view.                                                                |
|               |                                        | Background color | Fillcolor of background in the recipe view.                                                                |
| Layout        | Position                               | X                | Horizontal distance between the original point of recipe view and the left edge of screen, units of pixel. |
|               |                                        | Y                | Vertical distance between the original point of recipe view and the top edge of screen, units of pixel.    |
|               | Size                                   | Width            | Width of recipe view, units of pixel.                                                                      |
|               |                                        | Height           | Height of recipe view, units of pixel.                                                                     |
| Text          | Text                                   | Title            | Font style and size of the object.                                                                         |
| Buttons       | Select buttons you want to display.    |                  |                                                                                                            |
| Labels        | Recipe                                 | Name             | Name of recipe view.                                                                                       |
|               |                                        | Number           | Number of recipe view.                                                                                     |
|               |                                        | Element          | Elements of recipe view.                                                                                   |
|               | Data record                            | Name             | Name of data record.                                                                                       |
|               |                                        | Number           | Number of data record.                                                                                     |
|               |                                        | Value            | Enter the value within the reasonable range of data record type.                                           |
|               | Note:User can redefine all the labels. |                  |                                                                                                            |
| Misc          | Misc                                   | Name             | Name of recipe view.                                                                                       |
|               |                                        | Opacity          | Opacity of the background color when recipe view is displaying.                                            |
| Security      | RuntimeSecu                            | Authorization    | Authorization of the Operator component                                                                    |

|  |           |        |                                                                                                                                                         |
|--|-----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | rity      |        | in the recipe view.                                                                                                                                     |
|  | Operation | Enable | Whether the recipe view can be used in runtime.<br>Enable: The object can be operated in runtime.<br>Disable: The object cannot be operated in runtime. |

### 3. [Properties] / [Buttons]



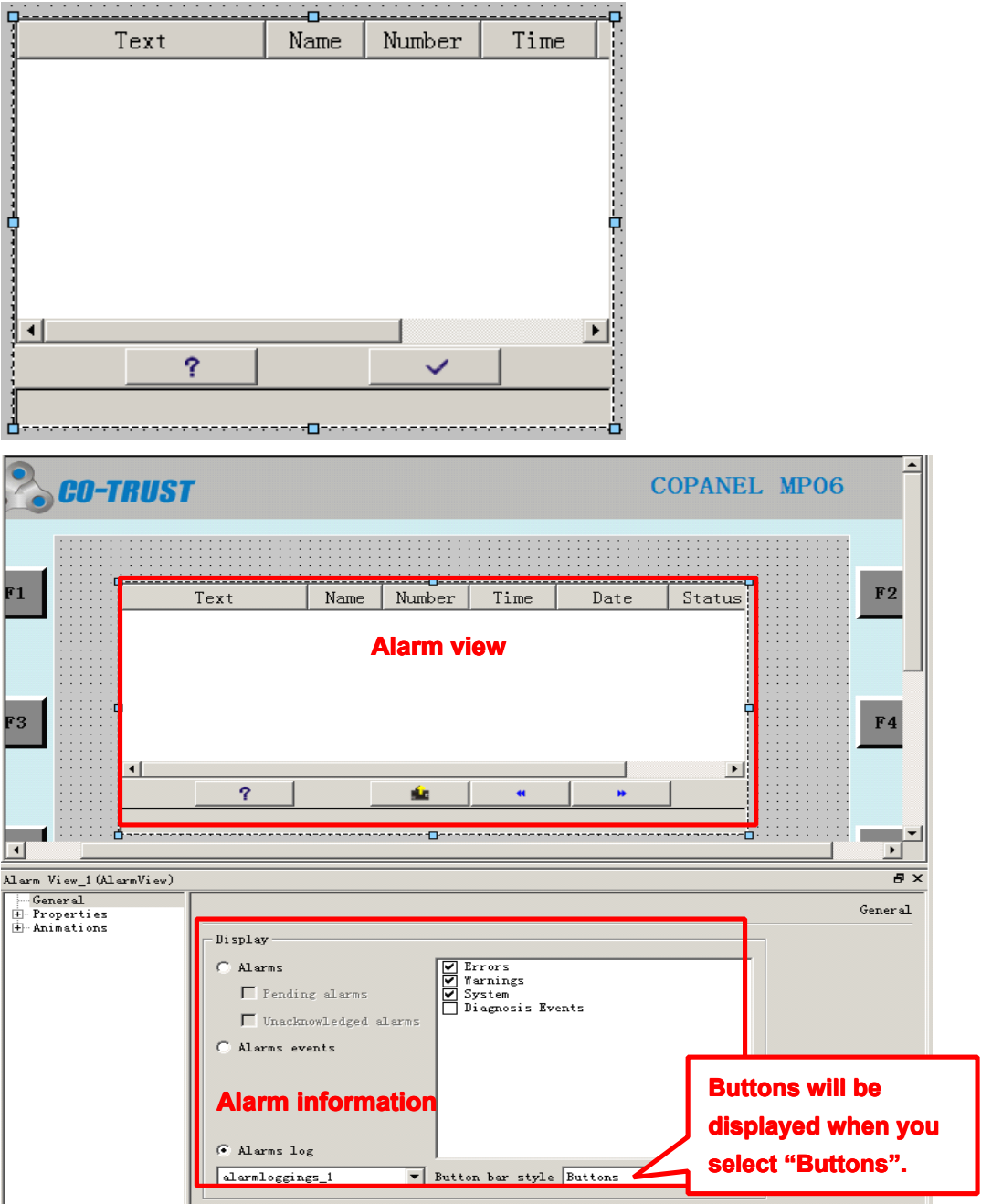
| Control element |                  | Description                                                      |
|-----------------|------------------|------------------------------------------------------------------|
|                 | Infotext         | Call the infotext of the selected recipe.                        |
|                 | New record       | Create new record in the recipe.                                 |
|                 | Save             | Save the modified record by current name.                        |
|                 | Delete record    | Delete the record which is selected.                             |
|                 | Synchronize tags | Compare the value of the selecting record with the value of PLC. |
|                 | Save as          | Save the modified record by new name.                            |
|                 | From PLC         | Send the recipe tag value of PLC to the recipe view of HMI.      |
|                 | ToPLC            | Send data record value of the recipe view to PLC.                |

|                                                                                   |        |                                            |
|-----------------------------------------------------------------------------------|--------|--------------------------------------------|
|  | Rename | Rename the data record in the recipe view. |
|-----------------------------------------------------------------------------------|--------|--------------------------------------------|

6.2.10 Alarm View

Alarm view is used to display the alarm information of specified classes in runtime system.

Alarm view shows as below:



Alarm view properties contain 3 items, they are 'General', 'Properties' and 'Animations'. Each item also contains some sub-properties as follows:

1. 'General'

This contains 2 important properties, they are 'Display' and 'Button bar style'.

'Display' is used to define the alarm classes and display mode of alarm view in runtime.

'Button bar style' is used to configure whether to display 'Help' and 'OK' buttons of the alarm view.

The following table explains the display states of alarm in alarm view when you configure every kind of display modes and alarm classes.

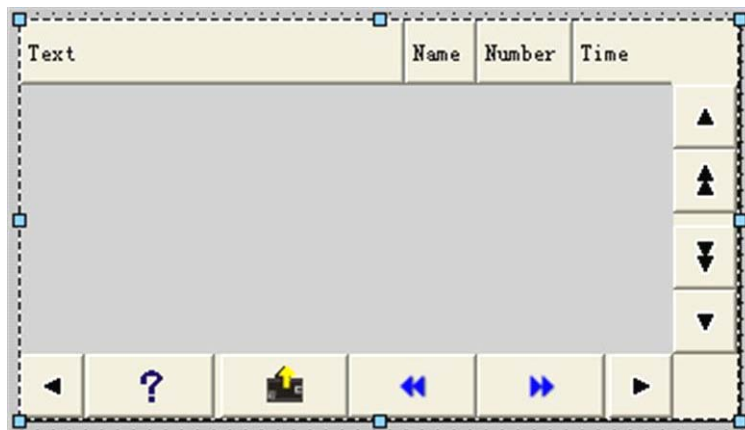
| Properties name |                                            | Description of the display mode                                                                                                                                                                                                                                                                                                                                                        |
|-----------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm           | Pending alarm                              | Show the alarm which 'has entered' but not 'left' or 'has confirmed.' Display all kinds of alarm, which including 'reach' and 'to confirm' (reach and confirm at the same time) of such errors.                                                                                                                                                                                        |
|                 | Unacknowledged alarms                      | Show the 'reach',' reach and leave' (reach first and then leave) alarm which is errors classes.                                                                                                                                                                                                                                                                                        |
|                 | Pending alarm and Unacknowledged alarms    | Show the alarm which including 'reach', 'reach and then leave' and 'reach and confirm' (reach and confirm at the same time).                                                                                                                                                                                                                                                           |
|                 | No pending alarm, no unacknowledged alarms | Show the alarm which including 'reach', 'reach and then leave' and 'reach and confirm' (reach and confirm at the same time).                                                                                                                                                                                                                                                           |
| Alarm events    |                                            | Show the news events selected by MESSAGECLASSES (show the reach, leave and confirm).show every alarm of all alarm. It including 'reach', '(reach) confirm', '(reach) confirm' (reach first and then leave), 'reach and confirm' (reach and confirm at the same time), '(reach and confirm) leave' (reach and confirm at the same time and then leave) and '(reach and leave) confirm'. |
| Alarm log       |                                            | Display all alarm of an alarm category.                                                                                                                                                                                                                                                                                                                                                |

The following is the 'Buttons' on the alarm view:

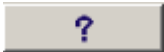
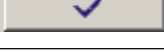
When you select 'Alarms' or 'Alarms events' in 'Display', 8 buttons will be displayed in the alarm view, as shown below:



When you select 'Alarms log' in 'Display', 10 buttons will be displayed on alarm view, show as below:

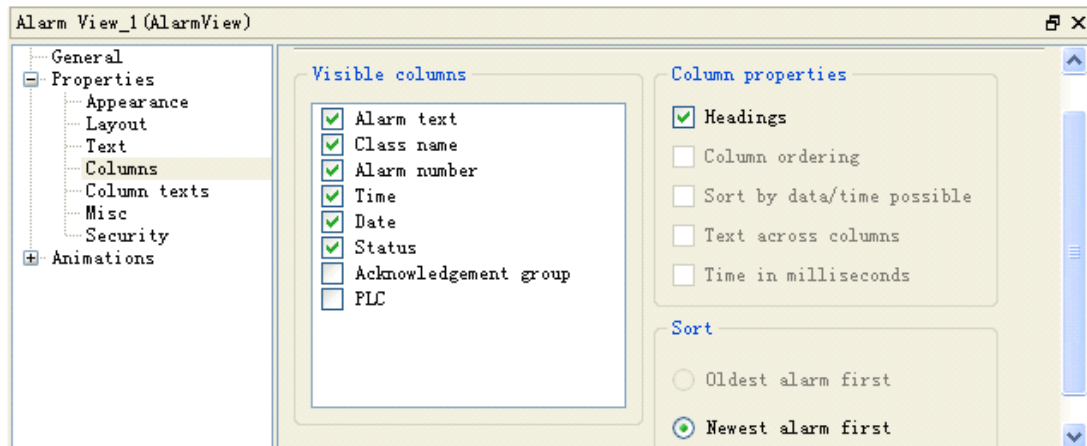


The following table indicates the functions of all the buttons on the alarm view.

| Buttons                                                                             | Functions                                         |
|-------------------------------------------------------------------------------------|---------------------------------------------------|
|  | Display the help information of alarms.           |
|  | Upload alarm logs.                                |
|  | Scroll one page to the left in the alarm view.    |
|  | Scroll one page to the right in the alarm view.   |
|  | Confirm alarms.                                   |
|  | Scroll one column of the alarm view to the left.  |
|  | Scroll one column of the alarm view to the right. |
|  | Scroll up to one row in the alarm view.           |
|  | Scroll down to one row in the alarm view.         |

|                                                                                   |                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------|
|  | Scroll up to one page in the alarm view.   |
|  | Scroll down to one page in the alarm view. |

## 2.'Properties'



| Property name |                   |                              | Description                                   |
|---------------|-------------------|------------------------------|-----------------------------------------------|
| Appearance    | Fill              | Text color                   | Settings of text color.                       |
|               |                   | Background color             | Settings of background color.                 |
|               |                   | FillStyle                    | The default is 'Solid'.                       |
| Layout        | Position          |                              | Settings of X axis and Y axis.                |
|               | Size              |                              | Settings of width and height.                 |
| Text          | Title             |                              | Font size and style of alarm view title.      |
| Columns       | Visible columns   | Alarm number                 | Whether to select alarm number.               |
|               |                   | Time                         | Whether to select time.                       |
|               |                   | Status                       | Whether to select alarm status.               |
|               |                   | Alarm text                   | Whether to select alarm text.                 |
|               |                   | Class name                   | Whether to select class name.                 |
|               |                   | Date                         | Whether to select date.                       |
|               |                   | Acknowledgment group         | Whether to select acknowledgment group.       |
|               |                   | PLC                          | Whether to select PLC.                        |
|               | Column properties | Headings                     | Whether to display headings.                  |
|               |                   | Column ordering              | Selection of column ordering.                 |
|               |                   | Sort by date / time possible | Selection of sorting by date / time possible. |
|               |                   | Text across columns          | Selection of text across columns.             |
|               |                   | Time in milliseconds         | Selection of time in milliseconds.            |
|               | Sort              | Oldest alarm first           | Oldest alarm first.                           |
|               |                   | Newest alarm first           | Newest alarm first.                           |
| Column        | Texts             | Alarm text                   | You can modify the column texts               |

|          |                  |                    |                                                                           |
|----------|------------------|--------------------|---------------------------------------------------------------------------|
| texts    |                  | Class name         | according to your needs.                                                  |
|          |                  | Alarm number       |                                                                           |
|          |                  | Time               |                                                                           |
|          |                  | Date               |                                                                           |
|          |                  | Status             |                                                                           |
|          |                  | GR                 |                                                                           |
|          |                  | PLC                |                                                                           |
| Misc.    | Misc.            | Name               | Name of alarm view.                                                       |
|          |                  | Layer              | Reserved.                                                                 |
|          |                  | Opacity            | Transparency.                                                             |
| Security | Runtime Security | Authorization      | Set authorization, which is related to the module of User Administration. |
|          | Operation        | Whether be enabled | Whether the object can be operated in runtime.                            |

### 3. 'Animations'

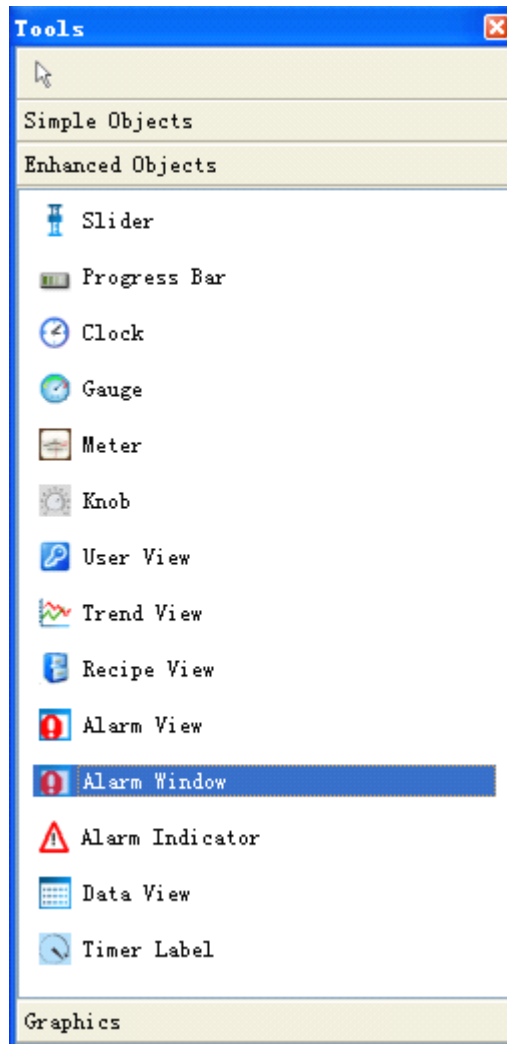
Alarm view has 7 animation properties.

Please refer to 11.2 to configure animations.

## 6.2.11 Alarm Window

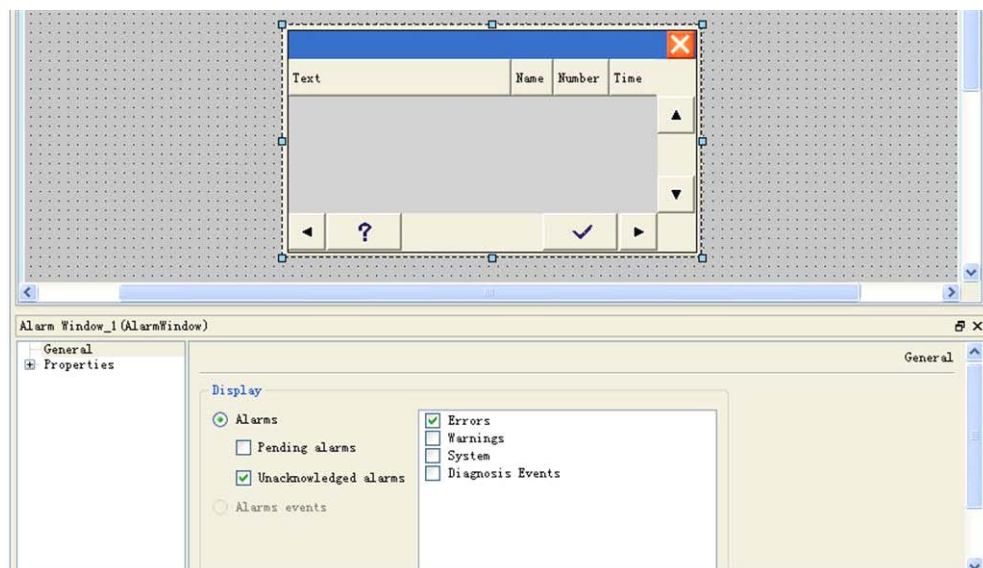
Alarm window is used to dynamically display the alarm information of specified classes in runtime. Alarm window will display dynamically on the front layer in the screen when it meet the conditions, and otherwise it will be closed dynamically. Users can also close the window at any time.

Alarm window can be configured in template only, that is only open the 'Template' that the toolbar of the screen will have 'Alarm Window' component. After configured in runtime, when specified alarms come into being, all the windows will display the alarm window.



Configuring all properties of alarm window:

There are mainly two parts: 'Display' modes in 'General' and 'Alarm classes' of the alarms. These two parts are the same as alarm view; please refer to the part of alarm view. Alarm window and its properties are displayed in below picture:



Property Description:

General:Including 'Display', 'Alarm classes' and 'Button bar style'. The three parts are the same as 'Alarm View', please refer to the part of alarm view.

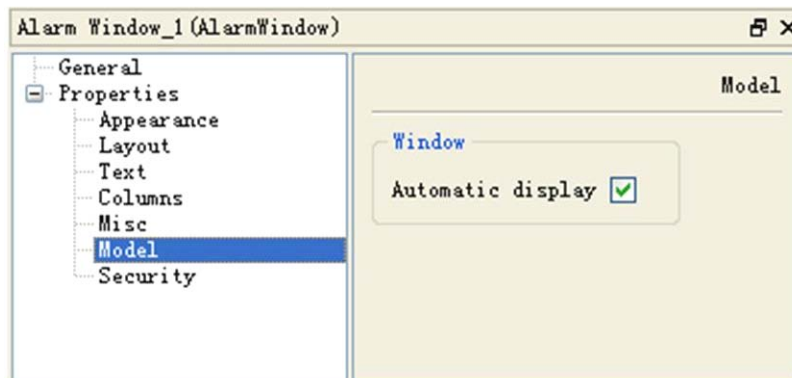


### Tip

At present, you can only configure 'Display', 'Alarms events' and 'Alarms log' can not be configured.

Properties:They are the same as 'Alarm View', please refer to the part of alarm view.

Model: You can select whether to automatic display the alarm window or not.



Display and operate the alarm window in runtime:

1. Dynamically display of alarm window:Alarm window will dynamically display on the front layer when alarms of specified categories the occur in the system.

2. Dynamically closure of alarm window:

- 'Display' do not configure 'that has confirmed' for the alarm. After the alarm window displays, if runtime system dose not exist specified alarm types, Alarm Windows will close automatically.
- 'Display' has configured 'that has confirmed', after the alarm window displays, be sure there is no specified alarm and all the alarms which need to acknowledge has been confirmed, Alarm window will be closed automatically.

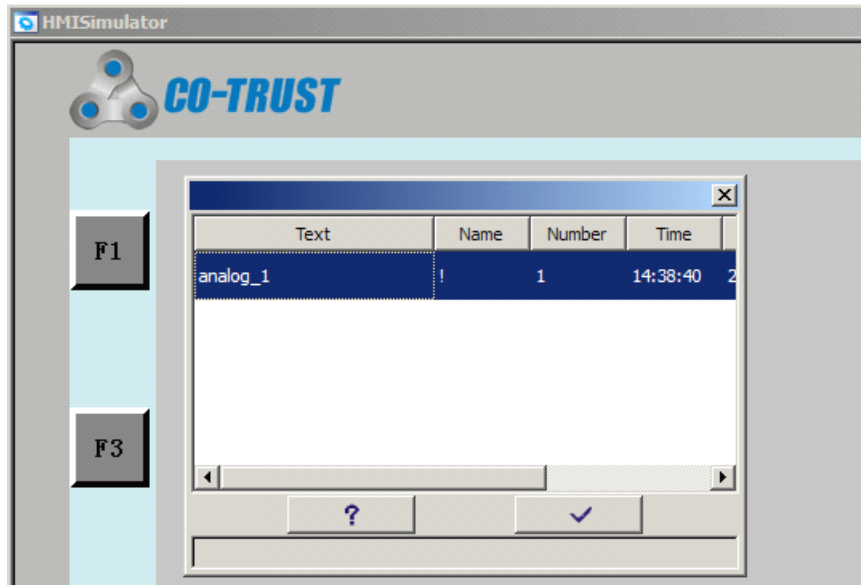
3. Alarm window 'Operation'

Two parts operation of Alarm view in the Runtime, see as below:

Users close alarm window:Key screen panel press 'ESC' key, touch screen click 

directly on the alarm indicator. Users can close the operation at any time.

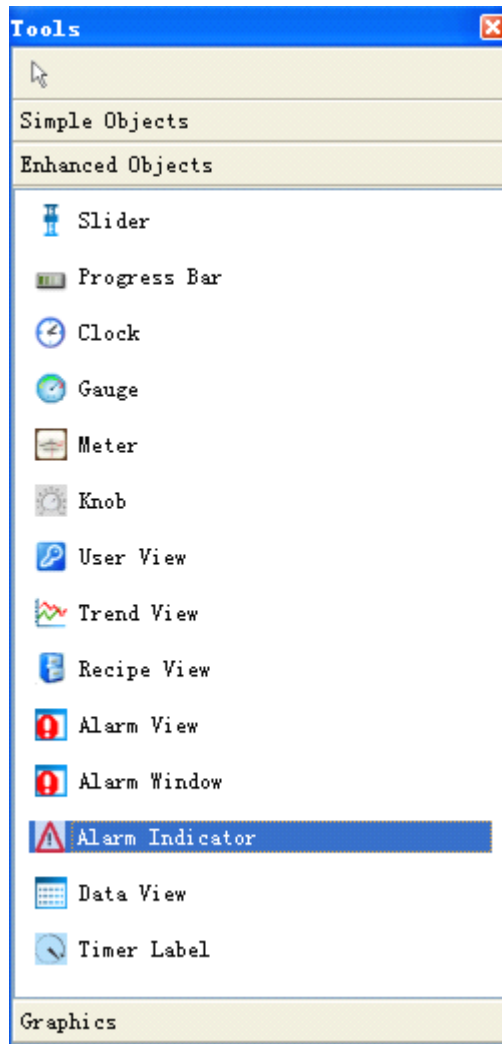
Alarm button on the window 'Operation':Alarm View, implement the help button on the left and confirm button on the right to check the alarm information and confirm the help respectively. Scroll one column to left/right button  、  to display the alarm info for one column to left or right.Scroll up/down button  、  to display the alarm info for one row.



### 6.2.12 Alarm Indicator

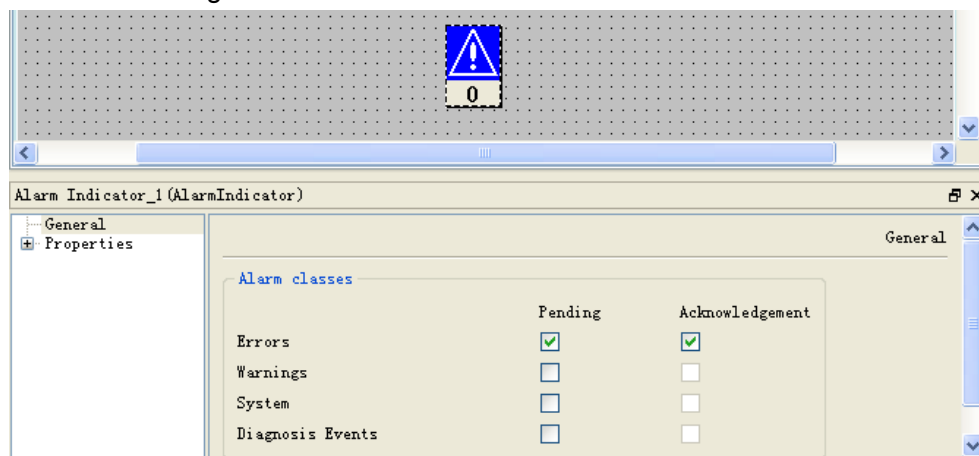
The alarm indicator is a graphical symbol that used to dynamic hint the specified alarm in the system. If accords with the condition, Alarm window will automatically show the picture on the Layer, Otherwise hide it.

Alarm indicators can only be configured in the template, that means only open 'Template' of toolbar that will contain components of 'Alarm indicator', and we can only configure one alarm indicator in the screen. Once the specified alarm occurred, all the screens will display the alarm indicator.



Configuring the properties of Alarm indicator:

The “Alarm classes” in the 'General' property is available to define the class of alarm. See the following:



### **"General" properties specification:**

Alarm classes: Including the classes of system pre-defined and custom definition.

Alarm status: Contain 'Pending' and 'Acknowledgement'. We can configure “Acknowledgement” only when the screen contain alarm classes that need to confirm,

otherwise "Acknowledgement" cannot be configured.

Each alarm class has four kinds of configuration at most.

### "Properties" properties specification:

Position

X: Horizontal distance between the original point of alarm indicator and the left edge of screen, units of pixel.

Y: Vertical distance between the original point of alarm indicator and the top edge of screen, units of pixel.

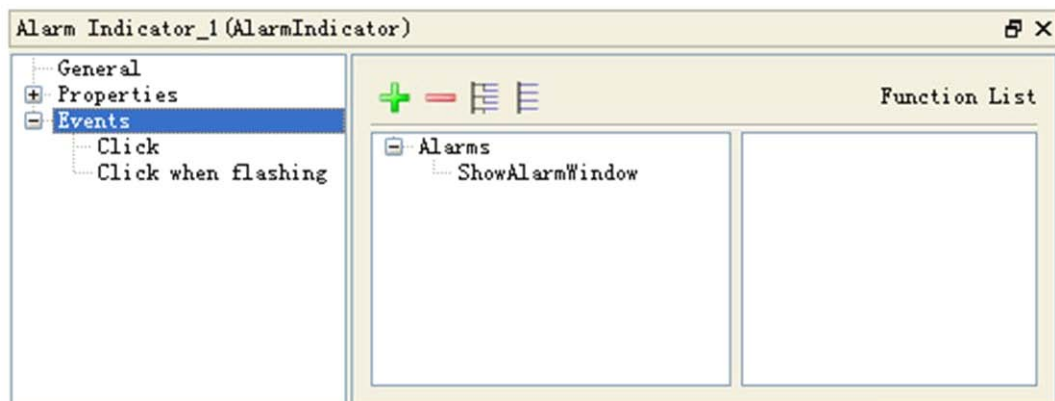
Size

Width: It's not allowed to operate.

Height: It's not allowed to operate.

### "Events" properties specification:

Alarm indicator contains "Click" and "Click when flashing" events.



Operating Alarm view in Runtime system:

1. The alarm indicator will hide if there is no specified alarm class triggered, once the specified alarm occurred, all the screens will display the alarm indicator.
2. In spite of indicator system exists specified alarm class, if you do not configure 'Acknowledgement', alarm indicator will hide.
3. The alarm indicator won't indicate whether to confirm the alarm until we configure the 'Acknowledgement'. The alarm indicator would be hidden when all the alarm records were confirmed.
4. User can't operate alarm indicators in the runtime system.

## 6.2.13 Data View

In runtime, we can use 'Data view' to check specified data record information of storage media in a certain period of time.

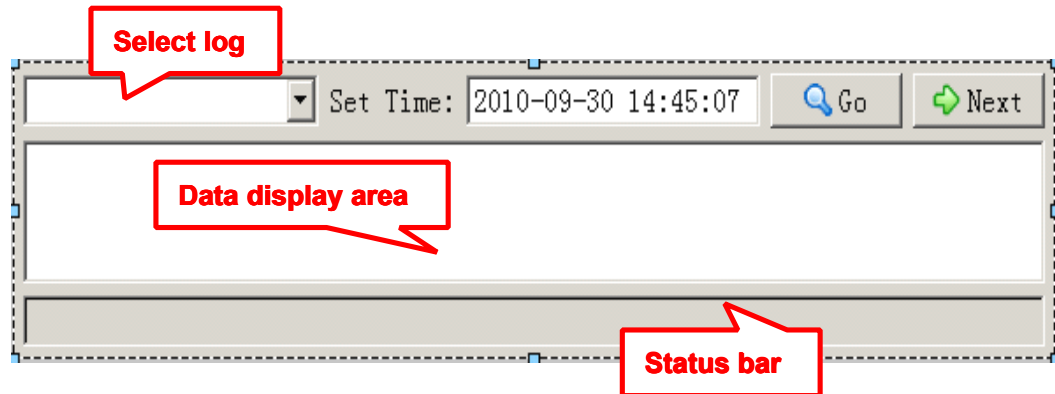
Data view consists of 6 parts: 'Log name', 'Set Time', 'Go', 'Next', 'Data display area'

Set time

Query Button

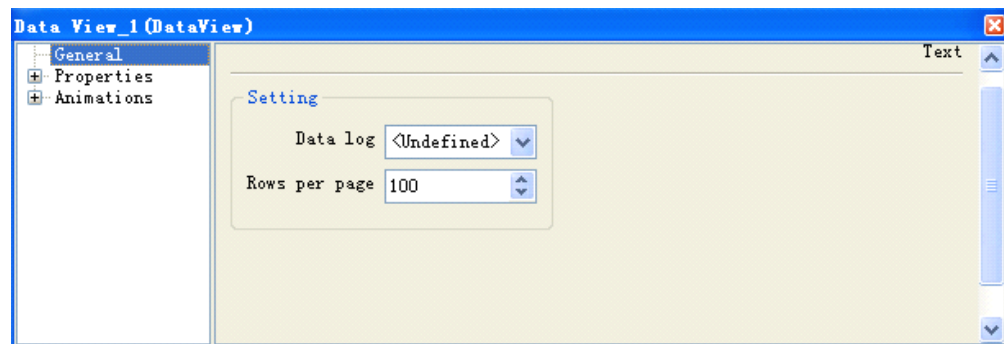
Next page Button

and 'Status bar'. See the following figure:



Data view property contains 3 parts: 'General', 'Properties' and 'Animations':

### 1. 'General'



Properties instructions:

- Data log: Select the data log you want to display.
- Rows per page: The maximum rows number in each page of data view.

### 2. 'Properties'

| Property name |          |                  | Description                                                                                              |
|---------------|----------|------------------|----------------------------------------------------------------------------------------------------------|
| Appearance    | Fill     | Text color       | Fill color of data view foreground.                                                                      |
|               |          | Background color | Fill color of data view background.                                                                      |
| Layout        | Position | X                | Horizontal distance between the original point of data view and the left edge of screen, units of pixel. |
|               |          | Y                | Horizontal distance between the original point of data view and the top edge of screen, units of pixel.  |
|               | Size     | Width            | Width of data view, units of pixel.                                                                      |
|               |          | Height           | Height of data view, units of pixel.                                                                     |
| Text          | Text     | Text             | Define the font style and size of the object.                                                            |
| Misc.         | Misc.    | Name             | Name of data view.                                                                                       |
|               |          | Opacity          | Opacity of the background color when data view is displaying.                                            |

### 3. 'Animations'

Data view has 7 animation properties.

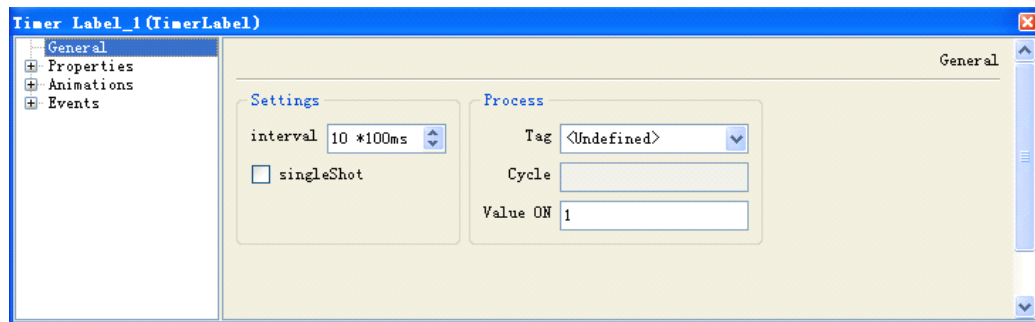
### 6.2.14 Timer label

Time label is an enhanced object that it could cyclic or single execute events function according to the given time interval.

The timer Properties includes the following four parts: "General" , "Properties", "Animations" and "events".

#### 1."General"

Properties see as below:



"General" including Settings and process two parts, its Properties as follows:

| Property name |            | Description                                                                                                                   |
|---------------|------------|-------------------------------------------------------------------------------------------------------------------------------|
| Settings      | Interval   | Set timing for the timer label.<br>Intervals range:100ms~60s.                                                                 |
|               | Singleshot | Whether enable single trigger events or not (timer will circular trigger if without enabling).                                |
| Process       | Tag        | It is a process tag that Control the timer starts and stops.                                                                  |
|               | Cycle      | The cycle of process tags.                                                                                                    |
|               | Value ON   | Set It is a variable to start-up the timer. When the process tag value is "value ON" then start timer, otherwise close timer. |

#### 2."Properties"

You can set the property for timer in the "Properties" dialog box:

| Property name |          | Description      |                                                                                     |
|---------------|----------|------------------|-------------------------------------------------------------------------------------|
| Appearance    | Fill     | Text color       | The frame and text color for timer.                                                 |
|               |          | Background color | The background color for timer.                                                     |
|               |          | Fill style       | Default for "solid".                                                                |
| Layout        | Position | X                | The horizontal distance of timer origin to the left edges of the screen, in pixels. |
|               |          | Y                | The vertical distance of timer origin to the upper edges of the screen, in pixels.  |
|               | Size     | Width            | The width of the timer, in pixels.                                                  |
|               |          | Height           | The height of the timer, in pixels.                                                 |
| Flashing      | Runtime  | standard         | Flashing according to the system given flashing                                     |

|  |            |          |                                                                  |
|--|------------|----------|------------------------------------------------------------------|
|  | appearance |          | form.                                                            |
|  |            | None     | No flashing.                                                     |
|  | Misc.      | Name     | The name for the timer.                                          |
|  |            | Layer    | Use the default values.                                          |
|  |            | Infotext | Comment text of the timer.                                       |
|  |            | opacity  | The transparency of the background color When the timer display. |

### 3.“Animations”

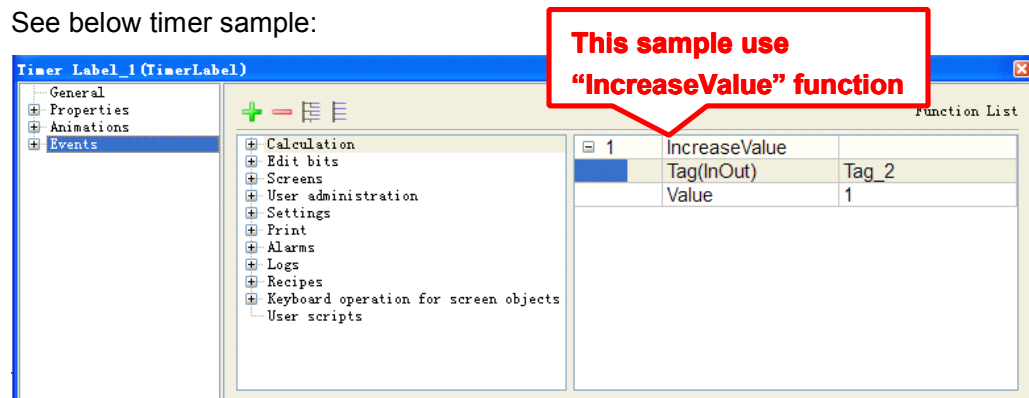
Timer contains 7 kinds of animation properties.

Refer to chapter 11.2 for configuring the animations.

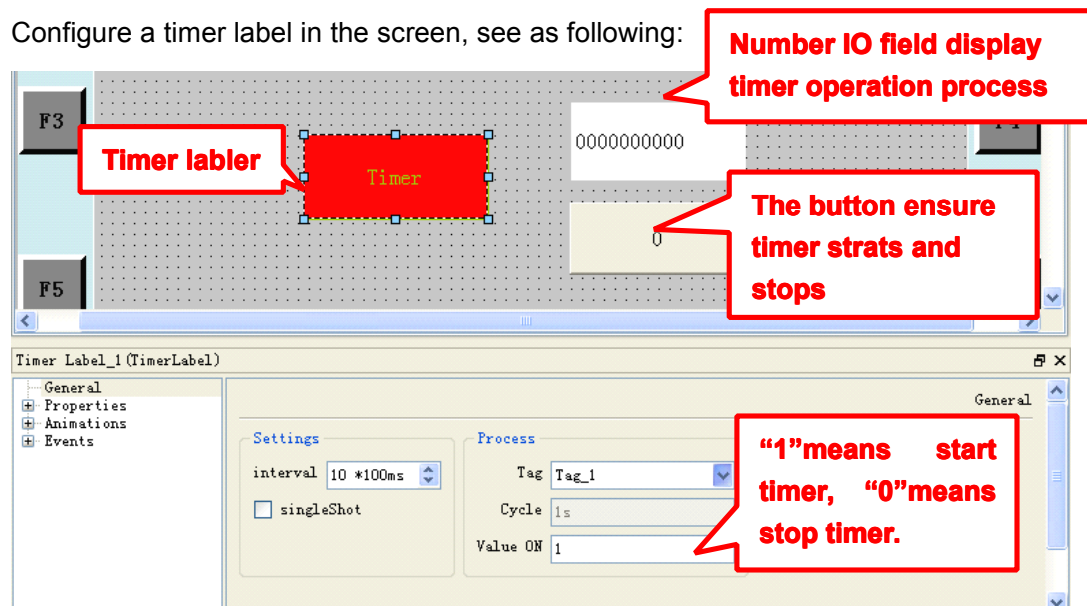
### 4.“Events”

You can configure timeout trigger operation function for the timer through this property.

See below timer sample:



Configure a timer label in the screen, see as following:



#### Tip

Timer implementation has nothing to do with the current screen, even switch to other screens, the timer and its associated event function is executing normally.

### 6.2.15 Realtime Bit Trend View

"Realtime Bit Trend View" displays current tag value as curves in the form of trend.

The property of "Realtime Bit Trend View" includes following 3 sections: "General", "Properties", "Animations".

#### 1. "General"

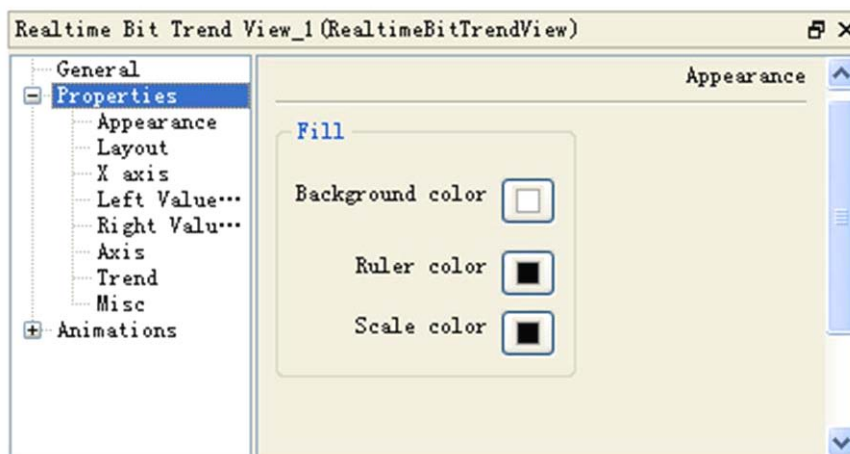


The "General" dialog contains following properties:

| Property name |                  | Description                                    |
|---------------|------------------|------------------------------------------------|
| Settings      | Number of lines  | Defaults to "1"                                |
|               | Font             | The font displayed on realtime bit trend view. |
|               | Button bar style | Defaults to "None"                             |
|               | Rotate           | Defaults to "0"                                |

#### 2. "Properties"

The "Properties" of the property view includes: Appearance, Layout, X axis, Left Value Axis, Right value Axis, Axis, Trend and Misc. The specific description refers to chapter 6.2.8.1.



**Tips**

- X axis can configure points mode only, and displayed the curve from left to right by Oscillograph mode.
- Trend->Trend type defaults to "Realtime cyclic triggered".
- Sampling points are subjected to the "samples", after the sampling is finished, the view stop drawing the curves.

## 3. "Animations"

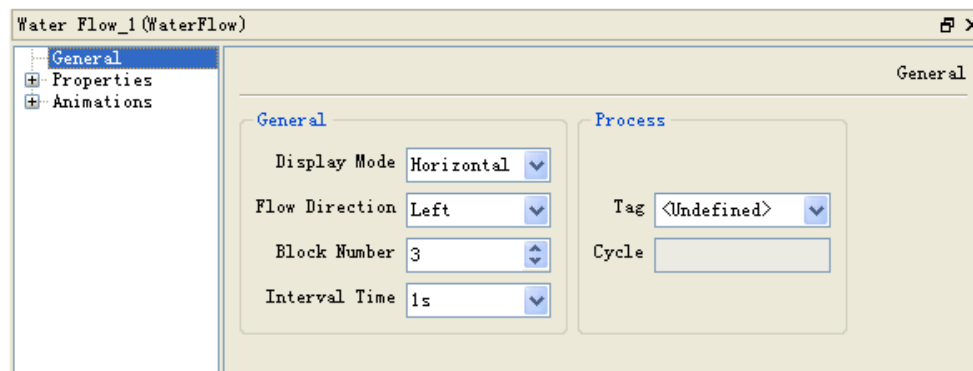
There are 8 kinds of animations from the "Animation" dialog for the Realtime Bit Trend view, please refer to chapter 11.2 for details.

**6.2.16 Water Flow**

"Water Flow" is used to display the water flow effect. When water flow object is running, it would not get focus, and cannot configure events.

The property of "Water Flow" includes following 3 sections: "General", "Properties", "Animations".

## 1. "General"



The "General" property includes following properties:

| Name    |                | Description                               |
|---------|----------------|-------------------------------------------|
| General | Display mode   | Horizontal / Vertical;                    |
|         | Flow direction | Left / Right;                             |
|         | Block number   | Defaults to 3, Range:1-32;                |
|         | Interval time  | Defaults to 1s, Range:0.5s/1s/2s/5s;      |
| Process | Tag            | It only can be configured Bool type tags. |
|         | Cycle          | Reserved                                  |

Remark: When no tag is configured for water flow object, it would dynamically display flowing effect during runtime simulator; After you configured Bool type tag for water flow object, the object would flow or stop according to the tag value.

## 2. "Properties"



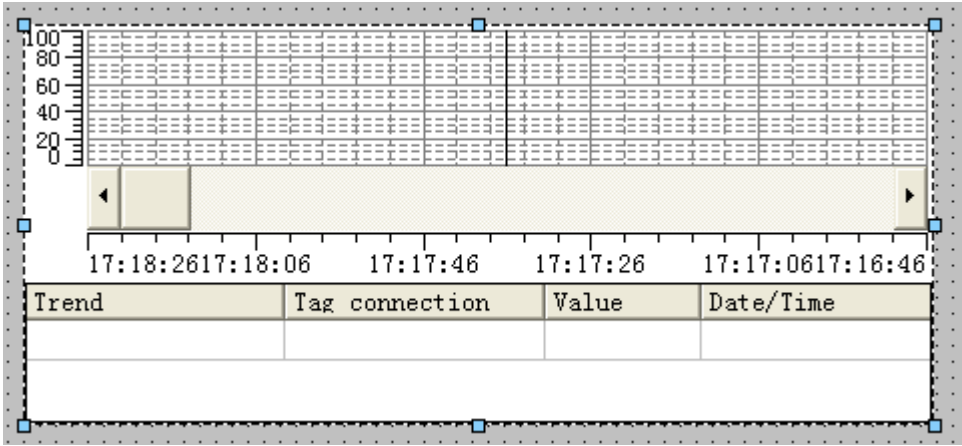
| Name       |                    |                  | Description                                                                                      |
|------------|--------------------|------------------|--------------------------------------------------------------------------------------------------|
| Appearance | Fill               | Foreground Color | The color of the water block;                                                                    |
|            |                    | Background Color | The background color of the water block;                                                         |
|            |                    | Brush Style      | The filling style of the water block;<br>There are 15 kinds of filling styles for you to select. |
|            | Border             | Color            | The color of the border;                                                                         |
| Layout     | Position           | X                | The horizontal distance of timer origin to the left edges of the screen, in pixels.              |
|            |                    | Y                | The vertical distance of timer origin to the upper edges of the screen, in pixels.               |
|            | Size               | Width            | The width of the timer, in pixels.                                                               |
|            |                    | Height           | The height of the timer, in pixels.                                                              |
| Flashing   | Runtime appearance | Flashing         | You can select "None" or "Standard".                                                             |
| Misc       | Miscellaneous      | Name             | The name of the water flow.                                                                      |
|            |                    | Layer            | Use acquiescent value.                                                                           |
|            |                    | Opacity          | The transparency of the water flow object.                                                       |
|            | Infotext           |                  | The comment of the water flow.                                                                   |

### 3. "Animations"

There are 7 kinds of animations from the "Animations" dialog for the Water Flow, please refer to chapter 11.2 for details.

## 6.2.17 Log Trend View

"Log Trend View" is used to display the history curve of the trend view. It's visible only under HMI Runtime screen.



**Tips**

The scrolling of log trend can be scrolled to 50 pages at most, it's enabled while users performing find function, which can be executed as the page is the initial one.

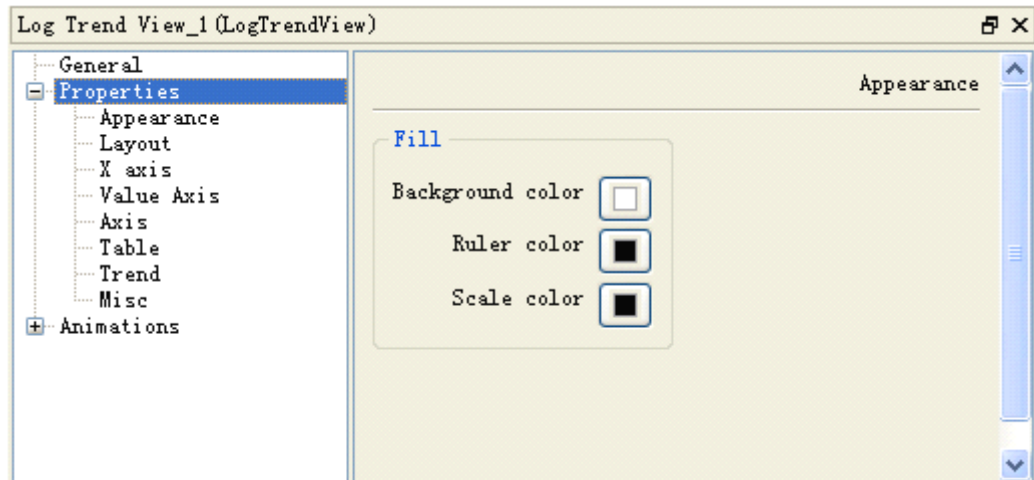
1) Properties of “General”



| Name     |                     | Description                                            |
|----------|---------------------|--------------------------------------------------------|
| Setting  | Number of lines     | Range: 1~8, it's defaults to 1.                        |
|          | Font                | You can set the font type and size of value table.     |
|          | Button bar style    | No editing is permitted.                               |
|          | Rotate              | No editing is permitted.                               |
|          | Display mark labels | You can choose whether display the mark labels or not. |
| Elements | Display value table | You can choose whether display the value table or not. |
|          | Display ruler       | You can choose whether display the ruler or not.       |
|          | Display table grid  | You can choose whether display the table grid or not.  |

2) Properties of “Properties”

There are 8 parts in the “Properties”: Appearance, Layout, X axis, Value Axis, Axis, Table, Trend, and Misc. The figure sees as follows:



| Item       |              |                      | Description                                                                                                                                                      |
|------------|--------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance | Fill         | Ruler color          | You can set the color of the ruler.                                                                                                                              |
|            |              | Background color     | You can set the color of the background.                                                                                                                         |
|            |              | Scale color          | You can set the color of the axis.                                                                                                                               |
| Layout     | Position     |                      | The position of X axis and Y axis.                                                                                                                               |
|            | Size         |                      | The height and width of the rectangle.                                                                                                                           |
| X axis     | Settings     | Mode                 | It defaults to time mode.<br>Time mode: The time interval of two sampling points, “Time interval” should be configured.                                          |
|            |              | New values from      | It defaults to left, which means the new value is from left.                                                                                                     |
|            |              | Time display format  | It includes following four time mode: <ul style="list-style-type: none"> <li>● yyyy-MM-dd hh:mm:ss</li> <li>● hh:mm:ss</li> <li>● mm:ss</li> <li>● ss</li> </ul> |
|            |              | Oscillograph display | It's not configurable.                                                                                                                                           |
|            | Axis Scaling | Axis begin           | Cannot be configured.                                                                                                                                            |
|            |              | Axis end             | Cannot be configured.                                                                                                                                            |
|            |              | Time interval(sec.)  | It's valid only under time mode.                                                                                                                                 |
|            |              | Number of points     | Cannot be configured.                                                                                                                                            |
| Value Axis | Scale        | Axis begin           | It's used to set the beginning of left scale, it's effective for Tag or constant'.                                                                               |
|            |              | Axis end             | It's used to set the end of left scale, it's effective for Tag or constant'.                                                                                     |

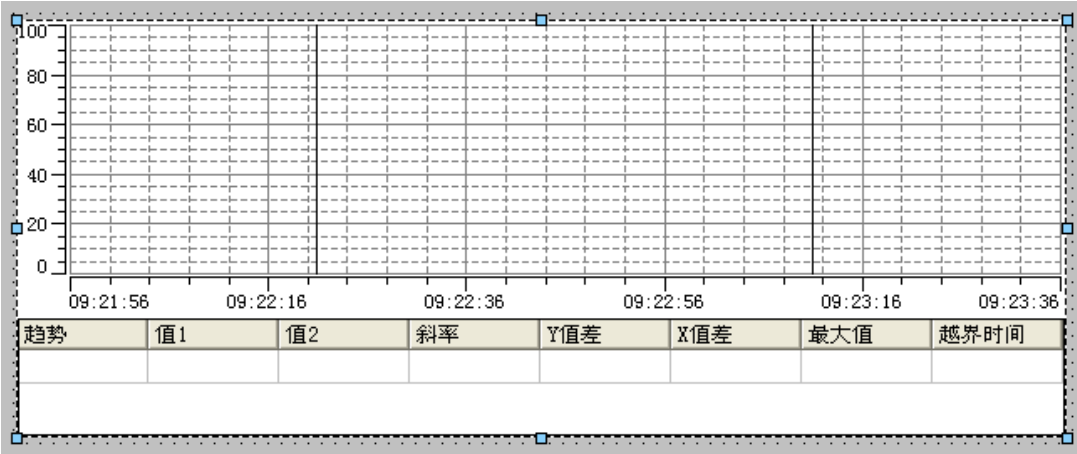
|       |                  |         |                                                                                                                                                                                                                                                                                                                          |
|-------|------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                  |         | The scales of Y axis are evenly distributed, and the right Y axis scale is for auxiliary observation only.                                                                                                                                                                                                               |
| Axis  | X Axis           |         | Set the increments and marks of X axis.                                                                                                                                                                                                                                                                                  |
|       | Left value axis  |         | Set the increments and marks of left Y axis.                                                                                                                                                                                                                                                                             |
|       | Axis labels      |         | Whether to display X axis, left value axis.                                                                                                                                                                                                                                                                              |
| Table | Foreground color |         | Set foreground color of the table.                                                                                                                                                                                                                                                                                       |
|       | Background color |         | Set background color of the table.                                                                                                                                                                                                                                                                                       |
|       | Font             |         | Set the size and style of fonts in the table.                                                                                                                                                                                                                                                                            |
| Trend | Name             |         | Set the name of the trend.                                                                                                                                                                                                                                                                                               |
|       | Display          |         | It defaults to line.                                                                                                                                                                                                                                                                                                     |
|       | Line type        |         | It's defaults to solid.                                                                                                                                                                                                                                                                                                  |
|       | Pen width        |         | Set the pen width, it defaults to 1, the range is 1~30.                                                                                                                                                                                                                                                                  |
|       | Samples          |         | Set the sample number displaying in the trend view.                                                                                                                                                                                                                                                                      |
|       | Trend type       |         | It defaults to Log.                                                                                                                                                                                                                                                                                                      |
|       | Trend tag        |         | <p>The tag will be continuous displayed in the trend view. Double-click "Trend tag", a dialog would be displayed.</p> <ul style="list-style-type: none"> <li>● Trend Tag: The tag will be continuous displayed in the trend view.</li> <li>● Pulse: The time interval of the continuous displaying tag value.</li> </ul> |
|       | Side             |         | It defaults to "Left", which subjects to the left scale of Y axis.                                                                                                                                                                                                                                                       |
| Misc  | Miscellaneous    | Name    | The name of the trend view.                                                                                                                                                                                                                                                                                              |
|       |                  | Layer   | Refer to the description of slider.                                                                                                                                                                                                                                                                                      |
|       |                  | Opacity | The opacity of the background color.                                                                                                                                                                                                                                                                                     |
|       | Infotext         |         | Remark of the trend view.                                                                                                                                                                                                                                                                                                |
|       |                  |         |                                                                                                                                                                                                                                                                                                                          |

### 3. "Animations"

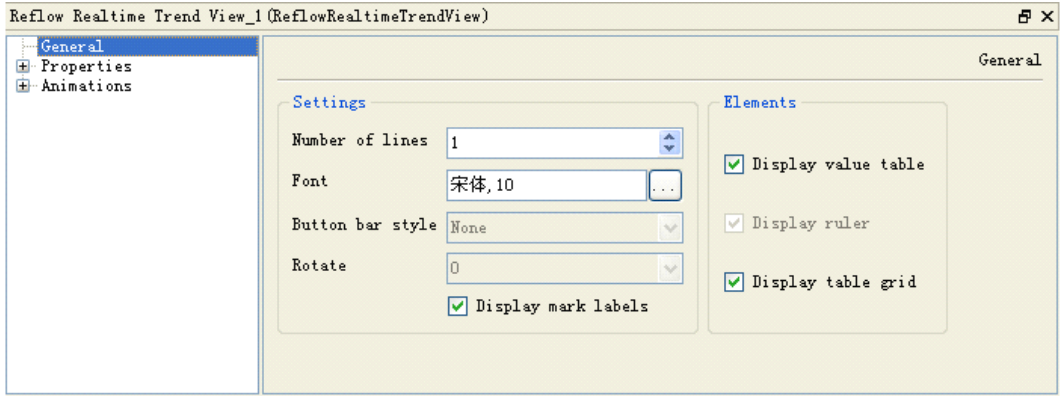
There are 7 kinds of animations from the "Animations" dialog for Log trend view, please refer to chapter 11.2 for details.

## 6.2.18 ReFlow Realtime Trend View

"ReFlow Realtime Trend View" is used to measure the temperature of each area in the Reflow machine, you can calculate the max. Temperature and rising slope of each area. It's visible only under HMI Runtime screen.



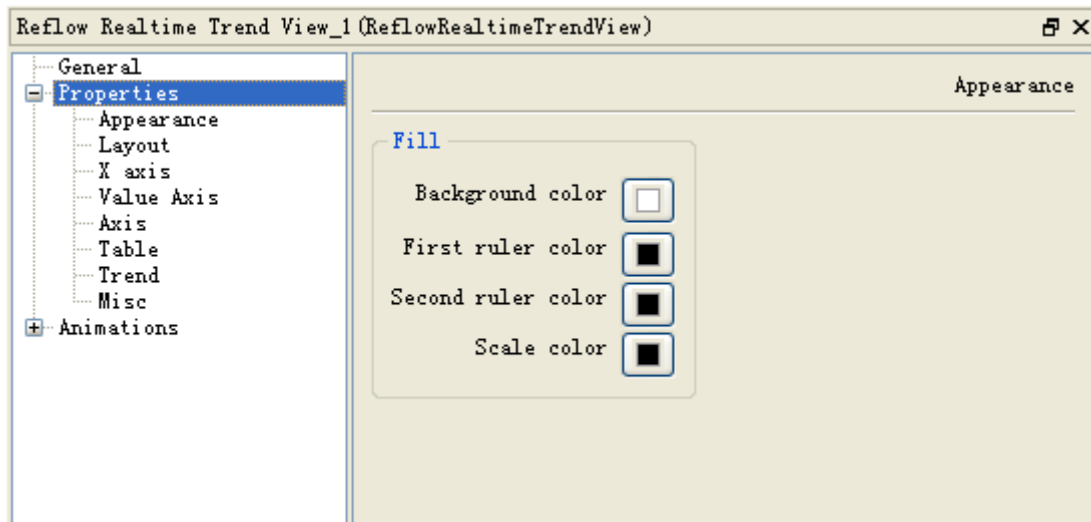
1) Properties of “General”



| Name     |                     | Description                                            |
|----------|---------------------|--------------------------------------------------------|
| Setting  | Number of lines     | Range: 1~8, it's defaults to 1.                        |
|          | Font                | You can set the font type and size of value table.     |
|          | Button bar style    | No editing is permitted.                               |
|          | Rotate              | No editing is permitted.                               |
|          | Display mark labels | You can choose whether display the mark labels or not. |
| Elements | Display value table | You can choose whether display the value table or not. |
|          | Display ruler       | No editing is permitted.                               |
|          | Display table grid  | You can choose whether display the table grid or not.  |

2) Properties of “Properties”

There are 8 parts in the “Properties”: Appearance, Layout, X axis, Value Axis, Axis, Table, Trend, and Misc. The figure sees as follows:



| Item       |              |                      | Description                                                                                                                                                                             |
|------------|--------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance | Fill         | First ruler color    | You can set the color of the first ruler.                                                                                                                                               |
|            |              | Second ruler color   | You can set the color of the second ruler.                                                                                                                                              |
|            |              | Background color     | You can set the color of the background.                                                                                                                                                |
|            |              | Scale color          | You can set the color of the axis.                                                                                                                                                      |
| Layout     | Position     |                      | The position of X axis and Y axis.                                                                                                                                                      |
|            | Size         |                      | The height and width of the rectangle.                                                                                                                                                  |
| X axis     | Settings     | Mode                 | It defaults to time mode.<br>Time mode: The time interval of two sampling points, "Time interval" should be configured.                                                                 |
|            |              | New values from      | It defaults to left, which means the new value is from Right.                                                                                                                           |
|            |              | Time display-Format  | There are four ways to display time when the 'Mode' is time: <ul style="list-style-type: none"> <li>● yyyy-MM-dd hh:mm:ss</li> <li>● hh:mm:ss</li> <li>● mm:ss</li> <li>● ss</li> </ul> |
|            |              | Oscillograph display | It defaults to Oscillograph display, and no configuring is permitted.                                                                                                                   |
|            | Axis scaling | Axis begin           | No editing is permitted.                                                                                                                                                                |
|            |              | Axis end             | No editing is permitted.                                                                                                                                                                |
|            |              | Time Interval (Sec.) | It's effective only for 'Time' mode.                                                                                                                                                    |
|            |              | Number of points     | No editing is permitted.                                                                                                                                                                |

|            |                  |            |                                                                                                                                                                                                                                                                                                                         |
|------------|------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value axis | Scale            | Axis begin | It's used to set the beginning of left scale, it's effective for Tag or constant'.                                                                                                                                                                                                                                      |
|            |                  | Axis end   | It's used to set the end of left scale, it's effective for Tag or constant'.<br>The scales of Y axis are evenly distributed, and the right Y axis scale is for auxiliary observation only.                                                                                                                              |
| Axis       | X axis           |            | The increments of X axis are defaults to 5 sections, the marks are defaults to 4, and no configuring is permitted.                                                                                                                                                                                                      |
|            | Left value axis  |            | Set the increments and marks of left Y axis.                                                                                                                                                                                                                                                                            |
|            | Axis labels      |            | Whether to display X axis, left value axis, and right value axis.                                                                                                                                                                                                                                                       |
| Table      | Foreground color |            | Set foreground color of the table.                                                                                                                                                                                                                                                                                      |
|            | Background color |            | Set background color of the table.                                                                                                                                                                                                                                                                                      |
|            | Font             |            | Set the size and style of fonts in the table.                                                                                                                                                                                                                                                                           |
| Trend      | Name             |            | Set the name of the trend.                                                                                                                                                                                                                                                                                              |
|            | Display          |            | It defaults to line.                                                                                                                                                                                                                                                                                                    |
|            | Line type        |            | It defaults to solid.                                                                                                                                                                                                                                                                                                   |
|            | Pen width        |            | Set the pen width, it defaults to 1, the range is 1~30.                                                                                                                                                                                                                                                                 |
|            | Samples          |            | Set the sample number displaying in the trend view.                                                                                                                                                                                                                                                                     |
|            | Trend type       |            | The trend type defaults to "Realtime cyclic triggered".                                                                                                                                                                                                                                                                 |
|            | Trend tag        |            | The tag will be continuous displayed in the trend view.<br>Double-click "Trend tag", a dialog would be displayed.<br><ul style="list-style-type: none"> <li>● Trend Tag: The tag will be continuous displayed in the trend view.</li> <li>● Pulse: The time interval of the continuous displaying tag value.</li> </ul> |
|            | Side             |            | It defaults to "Left", which subjects to the left scale of Y axis.                                                                                                                                                                                                                                                      |
| Misc.      | Miscellaneous    | Name       | The name of the trend view.                                                                                                                                                                                                                                                                                             |
|            |                  | Layer      | Refer to the description of Slider.                                                                                                                                                                                                                                                                                     |
|            |                  | Opacity    | The opacity of the background color.                                                                                                                                                                                                                                                                                    |
|            | Infotext         |            | Remark of the trend view.                                                                                                                                                                                                                                                                                               |

### 3. "Animations"

There are 7 kinds of animations from the "Animations" dialog for Reflow realtime trend view, please refer to chapter 11.2 for details.

## 7 Alarm Management

Alarm includes two types: System alarm and user-defined alarm.

- System alarm is called system events, is the pre-defined alarm, it is triggered by HMI device or PLC device.
- User-defined alarm is configured by the creator of the project in MagicWorks HMI, it includes two types: Analog Alarms and Discrete Alarms.

Analog alarm is triggered when its tag exceeds its limit value.

Discrete alarm is triggered when its tag's bit value change from 0 to 1.

### 7.1 The central components of an alarm

Alarm is mainly composed of these parts: Alarm text, Alarm number, Alarm trigger, Alarm class.

#### **[Alarm Text]**

Description of an alarm.

#### **[Alarm Number]**

Alarm number used to identify an alarm. Each alarm number in the same alarm type is unique.

#### **[Alarm Trigger]**

How to trigger an alarm, analog alarms by detecting the value of the alarm's trigger tag, discrete alarms by detecting the bit of the alarm's trigger tag.

#### **[Alarm Class]**

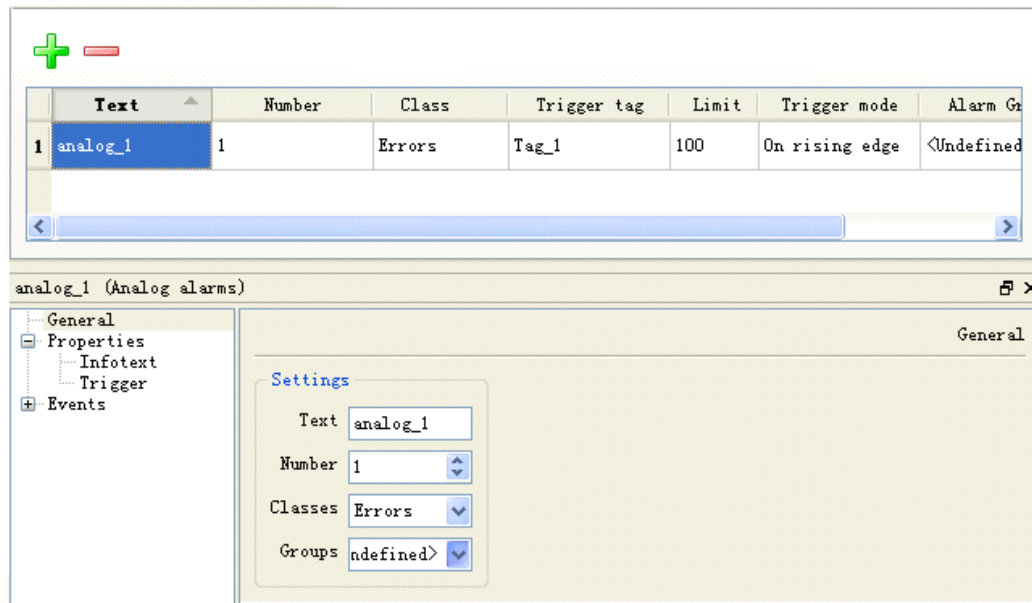
Please refer to 7.5.1 Alarm Classes.

### 7.2 Analog Alarms

The analog alarm is triggered when its tags' value exceed the upper/lower limit.

The following properties must be configured for an analog alarm: Alarm text, Alarm class, Trigger tag, Limit and Trigger mode.

The following picture is the Analog Alarms editor:



The top part of the image shows a table with columns: Text, Number, Class, Trigger tag, Limit, Trigger mode, and Alarm Group. The first row is highlighted with 'analog\_1' in the Text column, '1' in the Number column, 'Errors' in the Class column, 'Tag\_1' in the Trigger tag column, '100' in the Limit column, 'On rising edge' in the Trigger mode column, and '<Undefined>' in the Alarm Group column.

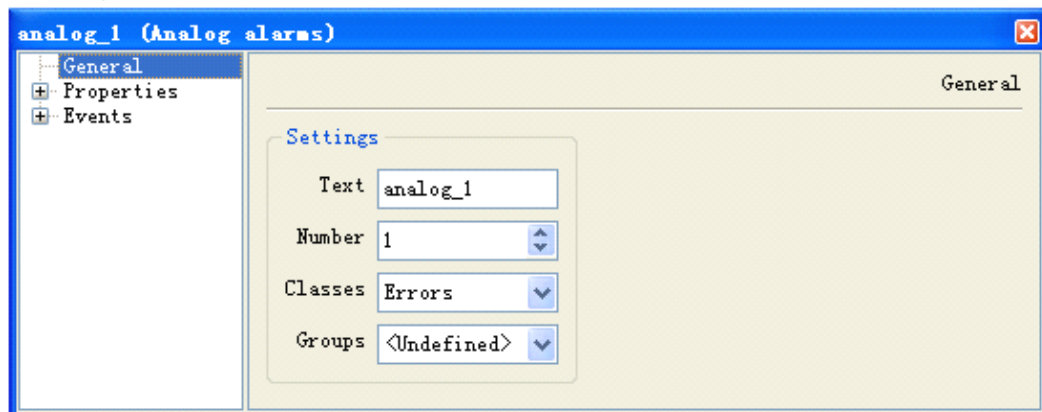
The bottom part shows the 'analog\_1 (Analog alarms)' dialog box. It has a left sidebar with 'General', 'Properties', 'Infotext', 'Trigger', and 'Events'. The 'General' tab is selected, showing a 'Settings' section with the following fields: Text (analog\_1), Number (1), Classes (Errors), and Groups (<Undefined>).

**Tip**

You can bulk edit "Class", "Trigger tag", "Alarm group", "Limit", "Trigger mode", "Hysteresis mode", "Hysteresis in percent", "Hysteresis" and "Delay" in analog alarm table.

**[Analog Alarm properties]**

In the 'General' dialog box of analog alarm property view, you can configure the following properties:



The dialog box 'analog\_1 (Analog alarms)' is shown with the 'General' tab selected. The 'Settings' section contains the following fields: Text (analog\_1), Number (1), Classes (Errors), and Groups (<Undefined>).

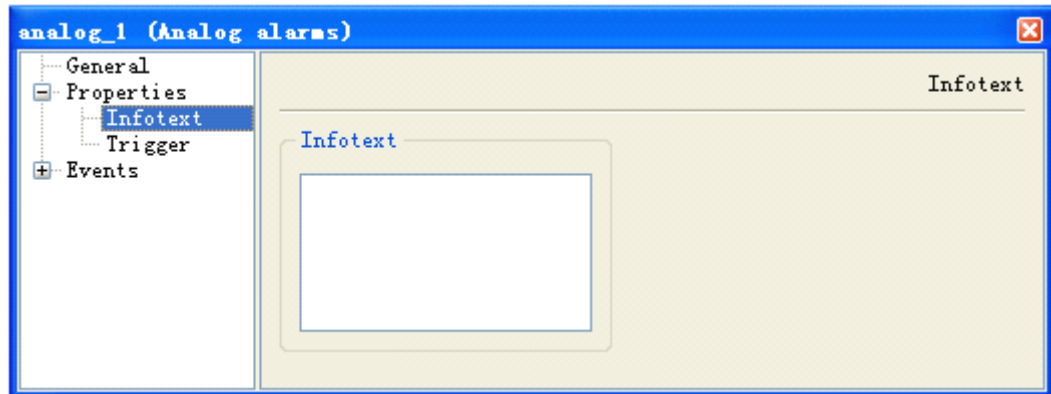
- Text:Description of the alarm.
- Number:Alarm Numbers used to identify alarm, each alarm numbers is unique.
- Classes:Consist of 'errors' and 'warnings'.

'Errors' indicates emergency or dangerous operation and process status that must be confirmed. 'Warning' indicates normal operating status, process status and process order which no need to confirm.

- Groups:If the alarm belongs to an alarm group, we can confirm it and other alarms by one operation in this alarm group.

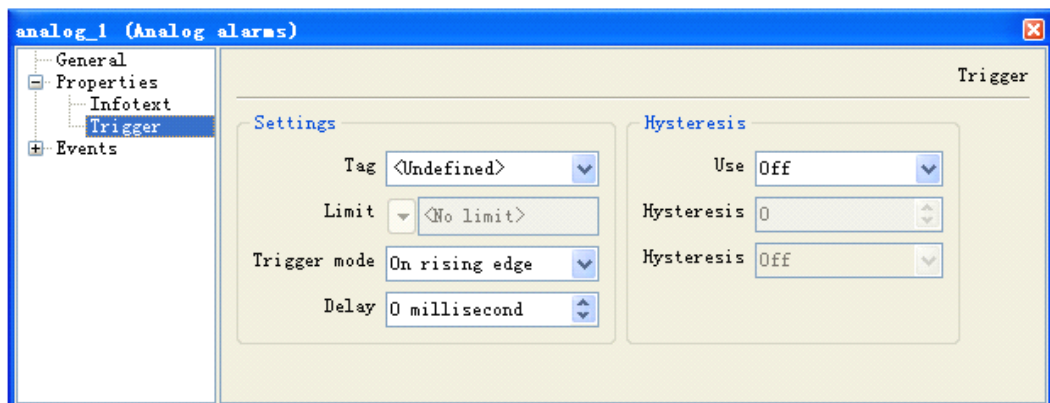
We can configure 'Infotext' and 'Trigger' properties in the 'Properties' view of analog alarm.

In the 'Infotext' dialog box of the properties view, we can configure 'Infotext'.



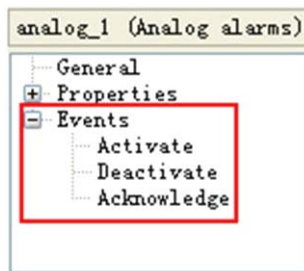
Infotext:Operators comments may contain the additional information about alarm. When the operator press <help > button, Operator Notes will be displayed on the independence window of operator's device.

In the 'Trigger' dialog box of properties view, can configure follows parameters for analog alarm:



- Tag:Set the tags which was monitored, once the tags' value beyond the limit, alarm will be triggered.
- Limit:The limit value should be within the range of the tags limit value.otherwise it will trigger alarm. 'Limit' can be configured for 'Constants' and 'Tags' .
- Trigger mode:Including 'On rising edge'and 'On falling edge' two types. 'On rising edge' means the alarm will be triggered when the value exceed the limit. 'On falling edge' means the alarm will be triggered when the value is lower than the limit.
- Delay:Input a time in the 'delay' field. If you want to trigger the alarm, must satisfy the triggering conditions in delay time. Delay alarm use 'ms' as a time unit.
- Use:In the 'use' domain, choose the change of the alarm status under hysteresis situation.Including 'Off', 'On activated', 'On activated and deactivated' and 'On deactivated' four status.
- Hysteresis:Lag the designated constants.

There are three events of analog alarm: Activate, Deactivate, Acknowledge.



### [Configure Analog alarms]

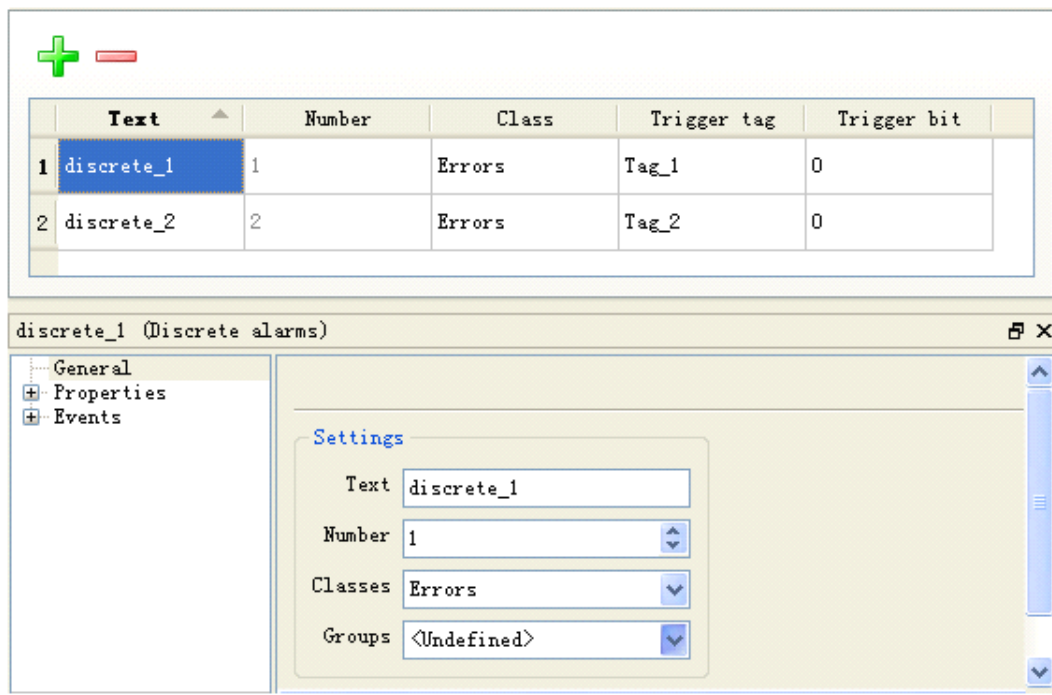
Please refer to 4.5.1 Create Analog Alarms.

## 7.3 Discrete Alarms

The discrete alarm is triggered when the tag's bit changes from 0 to 1.

The following properties must be configured for a discrete alarm: Alarm text, Alarm class, Trigger tag, Limit and Trigger mode.

The following picture is the editor of Discrete Alarms:

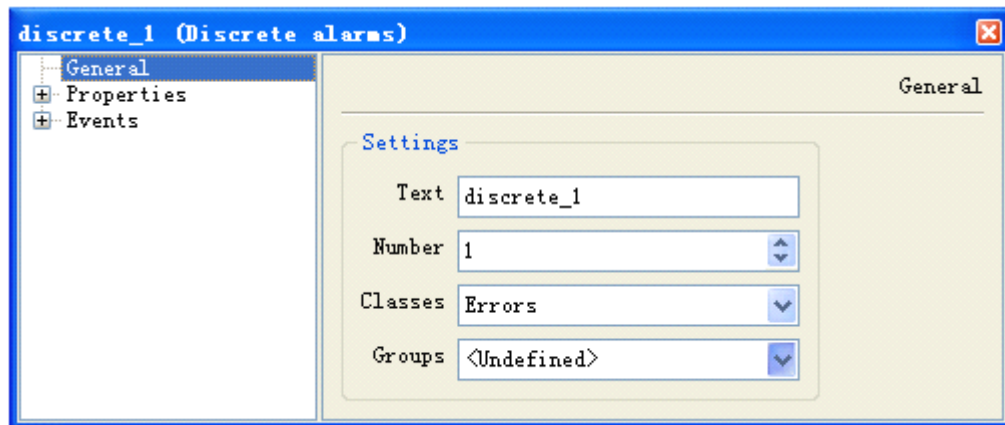


### Tip

You can bulk edit "Class" and "Alarm group" in discrete alarm table.

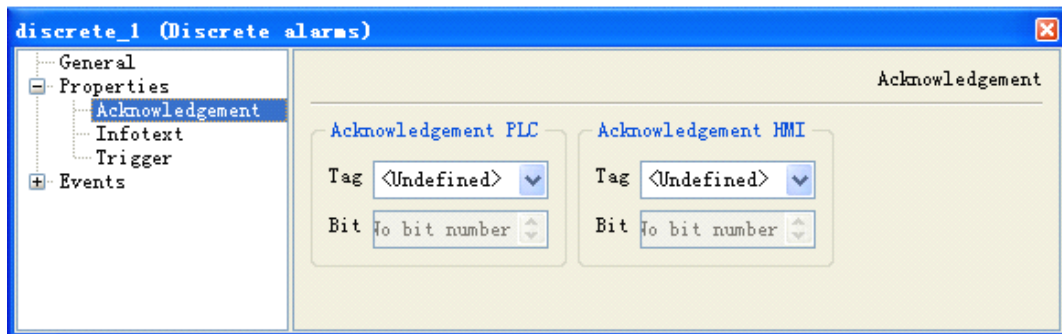
### [Discrete Alarm properties]

In the 'General' properties view, we can configure the following properties:



The configuration of the 'text', 'number', 'classes', 'group' according to the 'Analog alarms'.

In the 'Acknowledgement' dialog box of the properties view, we can set the following parameters:



### [Acknowledgement PLC]

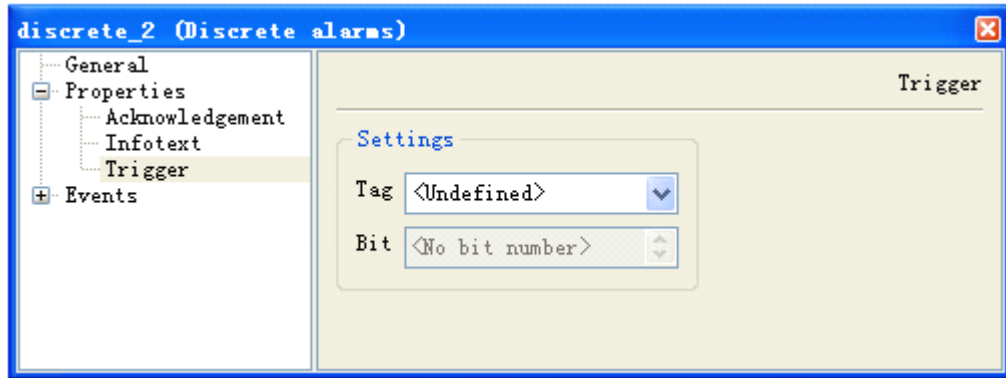
Tag: PLC tag to be used for acknowledgement. Tag containing the bit used by the control program to acknowledge the alarm. Only available if the selected alarm class requires alarm acknowledgement.

Bit: Bit number of acknowledgement PLC tag. The control program is used to acknowledge the bit number of the alarm.

### [Acknowledgement HMI]

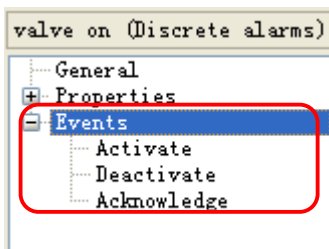
Tag: Tag to be written into PLC after user acknowledgement. Tag containing the bit that is set by the operator upon acknowledgement. Only available if the selected alarm class requires alarm acknowledgement.

Bit: Bit number of acknowledgement HMI tag. Number of the bit which is set when the user acknowledges the alarm.



- Trigger tag: Configure tags to trigger an alarm. S7-200 Protocol supports Int、Word、Bool data type for V、M、I register.
- Trigger bit: The bit number of the trigger bit.

There are three events of discrete alarm, Activate, Deactivate, Acknowledge.



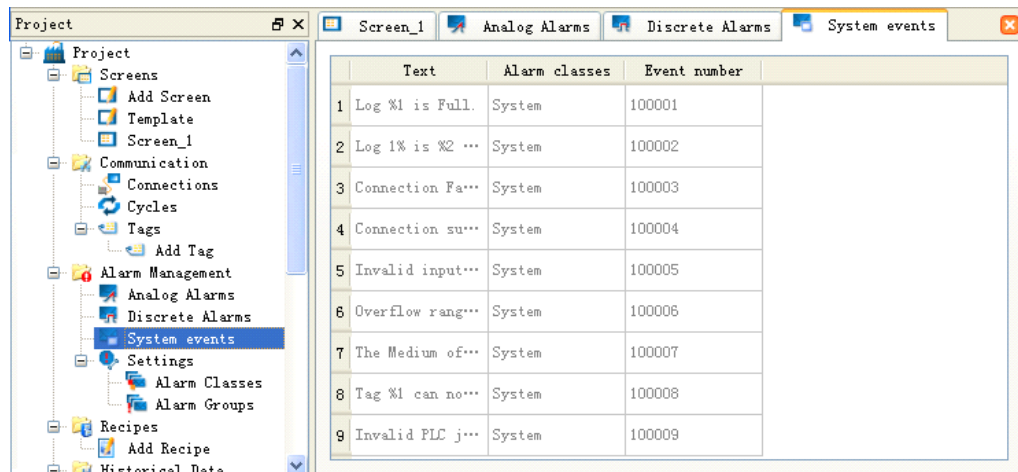
#### [Configure Discrete alarms]

Please refer to 4.5.2 Create Discrete Alarms.

## 7.4 System events

System events is used for system alarms and is also available to indicate the operation status of HMI device and PLC. They are predefined alarms, users can not edit them. They are triggered by HMI device or PLC device. We can check all of the HMI system alarms in the "system events" editor.

Double-click 'System events' in Project view, see the following:



'System Events' contains the following nine kinds of custom alarm:

- Log %1 is Full.
- Log %1 is 2% percent full.
- Connection Failure:%1,station 2%.
- Connection Successful:%1,station 2%.
- Invalid input of date/time.
- Overflow range,the valid range is [%1-%2].
- The Medium of Log is full.
- Tag %1 can not write to PLC.
- Invalid PLC job number.

## 7.5 Alarm Settings

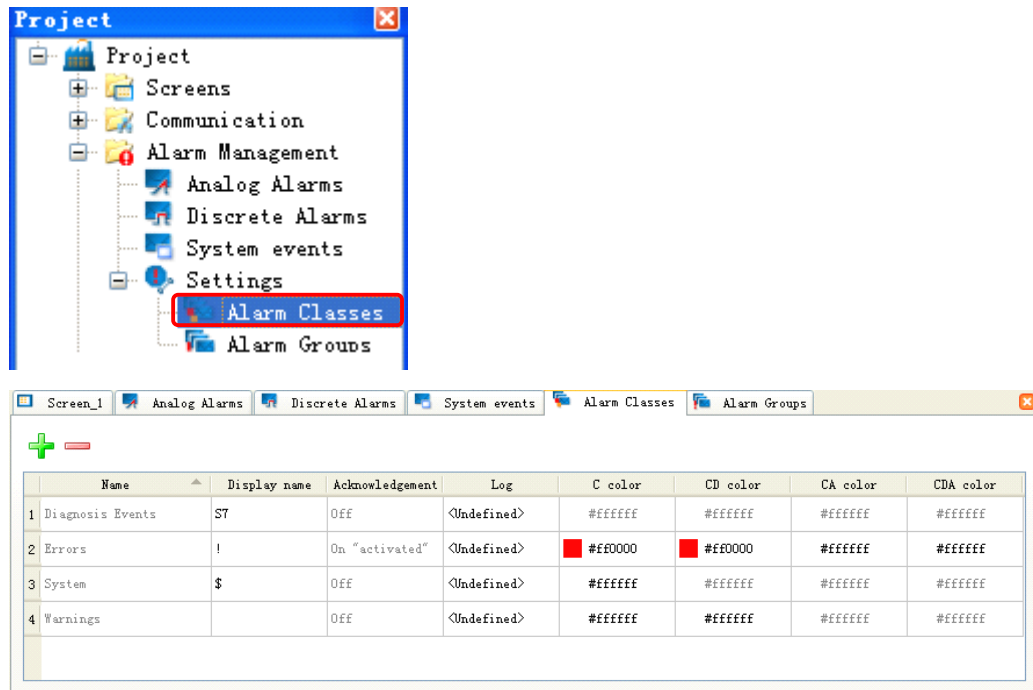
Alarm settings include Alarm Classes and Alarm Groups.

If you want to adjust the alarm system to meet the specific equipment requirements, only need to change the default settings.

### 7.5.1 Alarm Classes

Alarm class decides whether the alarm must to be acknowledged.

Double click 'Alarm Classes' below Project view to open its editor, see as follows:



There are four default alarm types, Errors, Warnings, System, and Diagnosis Event.

Errors: Indicate emergency or hazardous operations and process status. Such alarm must always be acknowledged.

Warnings: Indicates normal operating state, process state and process the order. Such alarm does not need to be confirmed.

System: It is predefined alarm; it is triggered by HMI device or PLC device.

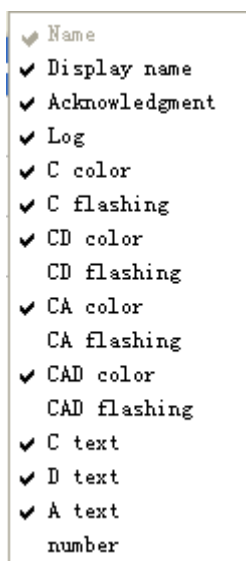
Diagnosis Event: Does not support this function at present.

You can add alarm classes and configure their properties in the Alarm Classes editor.

Click  to add a new alarm class; click  to delete the custom alarm class.

### [Classes Properties]

The property lists as follows:



| Property        | Description                                                                                                                                                                                                                                                                     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The localized name of the alarm classes. The four predefined classes can't be edited.                                                                                                                                                                                           |
| Display name    | The display name of class, it represents the level of alarm, enter the abbreviation to identify the type of alarm. Displaying before the alarm number when the alarm is triggered and displayed on alarm view.                                                                  |
| Acknowledgement | To identify and set whether the class needs to be acknowledged.<br>When it's Off, means the alarms of the class don't need to be acknowledged. When it's On 'activated', means the alarms of the class need to be acknowledged.<br>The four predefined classes can't be edited. |
| Log             | To set whether the class alarms relate with an alarm log.                                                                                                                                                                                                                       |
| C color         | To set the alarm message's background color on alarm view when its status is activated.                                                                                                                                                                                         |
| C flashing      | To set the alarm message whether flashing when its status is activated.                                                                                                                                                                                                         |
| CD color        | To set the alarm message's background color on alarm view when its status is activated and deactivated.                                                                                                                                                                         |
| CD flashing     | To set the alarm message whether flashing when its status is activated and deactivated.                                                                                                                                                                                         |
| CA color        | To set the alarm message's background color on alarm view when its status is activated and acknowledged.                                                                                                                                                                        |
| CA flashing     | To set the alarm message whether flashing when its status is activated and acknowledged.                                                                                                                                                                                        |
| CAD color       | To set the alarm message's background color on alarm view when its status is activated, deactivated and acknowledged.                                                                                                                                                           |
| CAD flashing    | To set the alarm message whether flashing when its status is activated deactivated and acknowledged.                                                                                                                                                                            |
| C text          | Enter the text represents the activate state of alarm. Displaying under the 'status' list of alarm view table when the alarm is triggered and displayed on alarm view.                                                                                                          |
| D text          | Enter the text represents the deactivate state of alarm. Enter the text                                                                                                                                                                                                         |

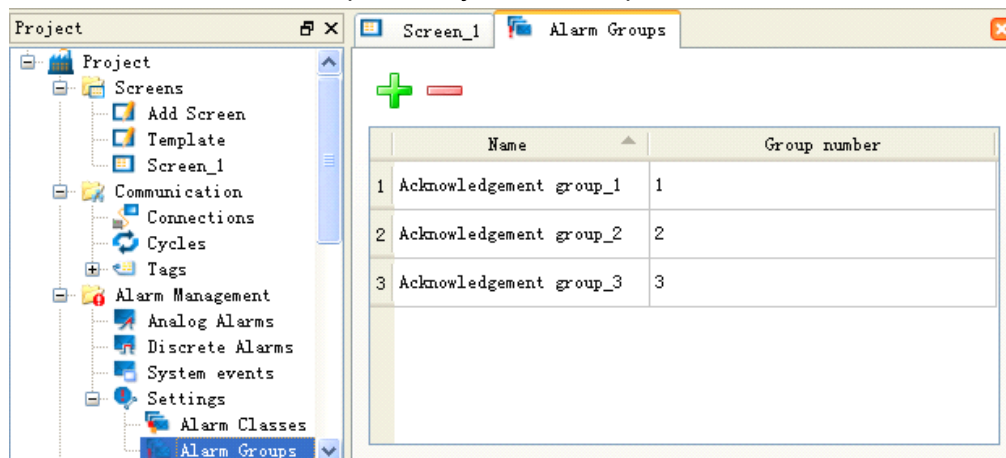
|        |                                                                                                                                                                                                                                  |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | represents the activate state of alarm. Displaying under the 'status' list of alarm view table when the alarm is triggered and displayed on alarm view.                                                                          |
| A text | Enter the text represents the acknowledge state of alarm. Enter the text represents the activate state of alarm. Displaying under the 'status' list of alarm view table when the alarm is triggered and displayed on alarm view. |

## 7.5.2 Alarm Groups

You can configure alarm group for analog alarms and discrete alarms.

Acknowledge any alarm of the alarm group; you can acknowledge the entire alarm group if their Class is Error.

1. Double click 'Alarm Groups' in Project view to open its editor, see as follows:



2. Click  to add alarm, Click  to delete alarm.

You can edit 'name' cell in a group, but can't edit 'Group number'.

## 7.6 Example of how to configure and debug alarms

In this example, we configure two alarms, one is analog alarm which is triggered when its trigger tag's value is greater than 100, and the other is discrete alarm which is triggered when its trigger bit is from 0 to 1.

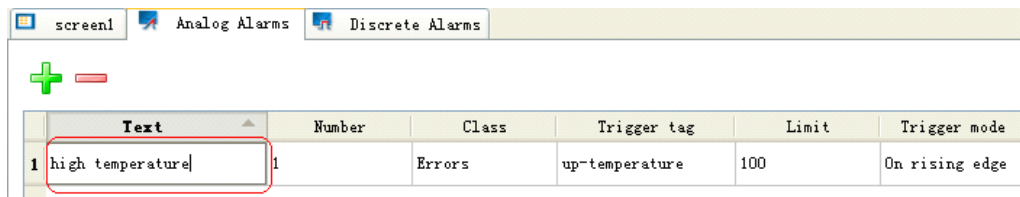
Alarm Configuring steps:

1. create a connection, and add two connection tags, one is 'up-temperature', the other is 'valve-on', data type are Int.

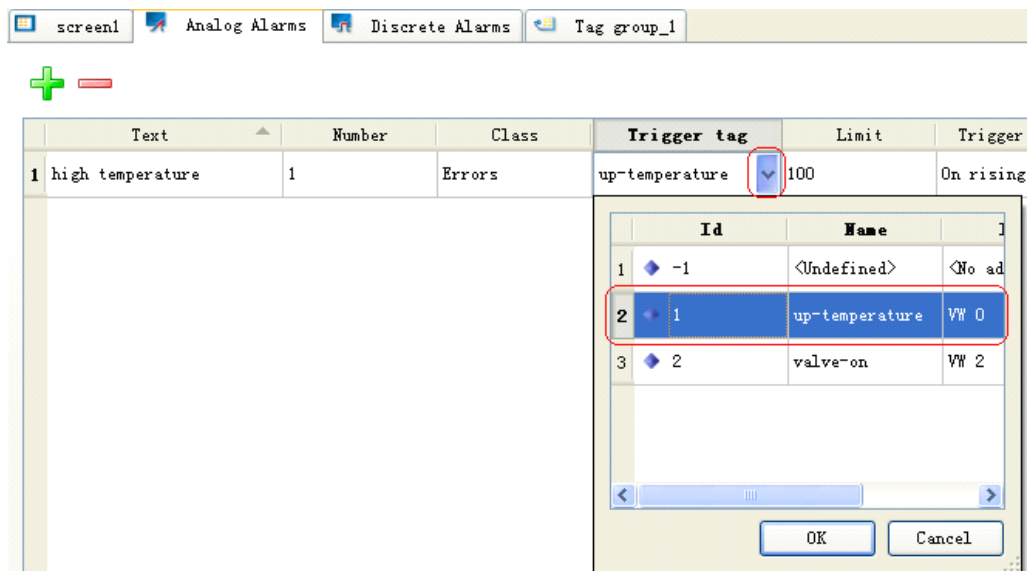
2. Click  to create an analog alarm in Analog Alarms editor.

The alarm's "Class" keeps the default property.

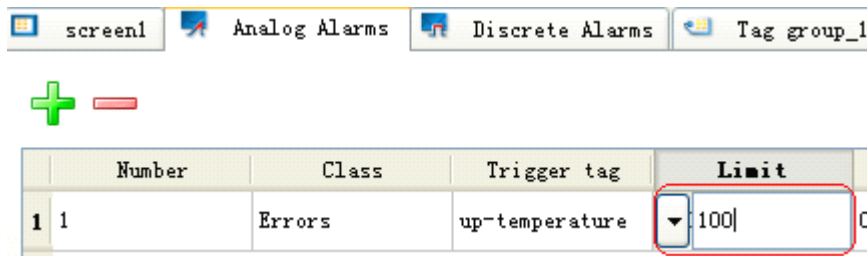
3. Configure the alarm text for it, input 'high temperature' in Text cell, and see as follows:



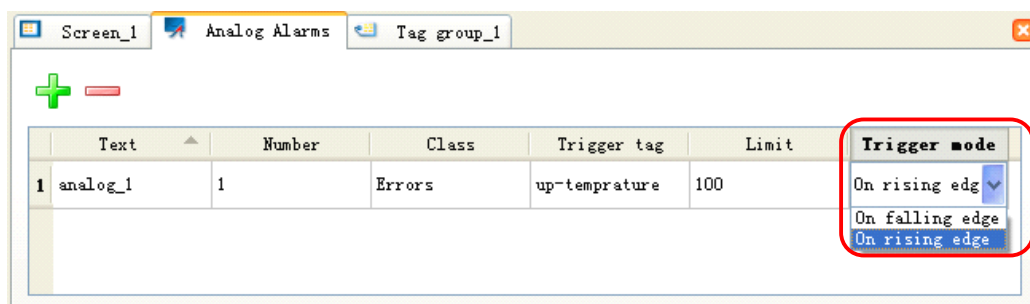
4. Configure the trigger tag for it, select 'up-temperature' from drop-down box of Trigger tag, and see as follows:



5. Configure the limit for it, input 100 in Limit cell, see as follows:



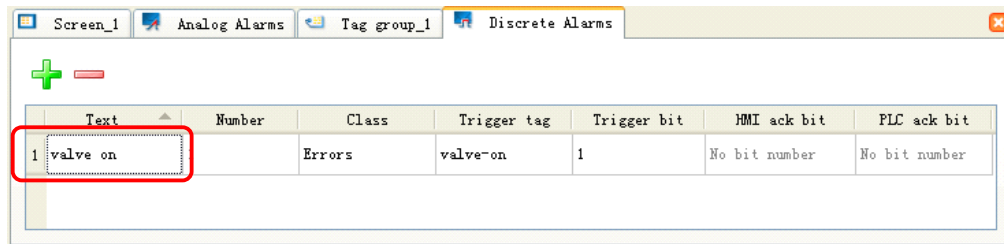
6. Configure the trigger mode for it, select 'on rising edge' from the drop-down list of Trigger mode cell, see as follows:



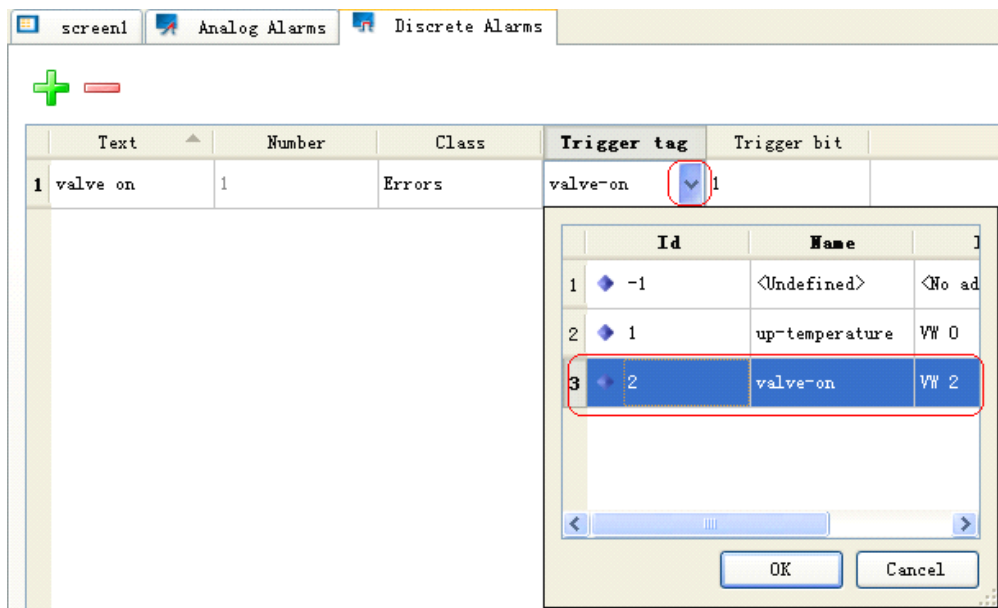
7. Click  to create a discrete alarm in Discrete Alarms editor.

The alarm's Class keeps the default property Errors.

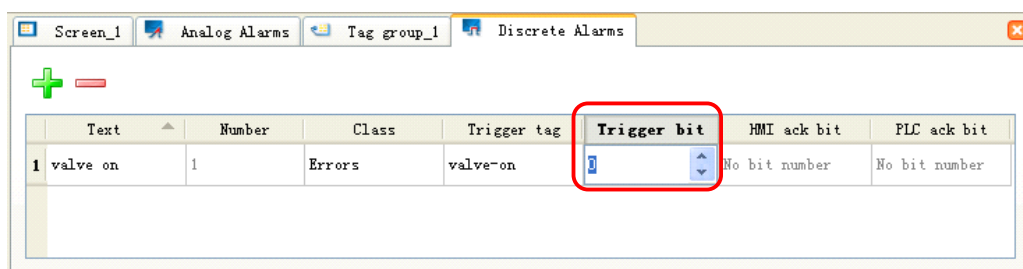
8. Configure the alarm text for it, input 'valve on' in Text cell, shows as follows:



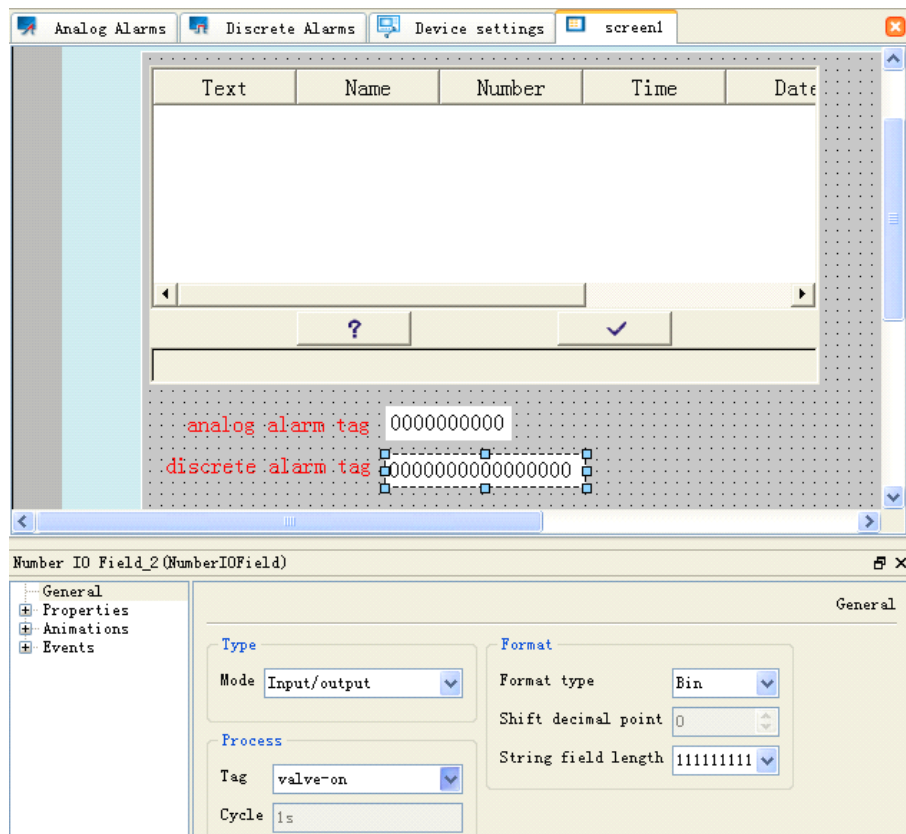
9. Configure the trigger tag for it, select 'valve-on' from drop-down box of Trigger tag, shows as follows:



10. Configure the trigger bit for it, input the bit value 0 or click the up/down arrow to set the bit in Trigger bit cell, see as follows:

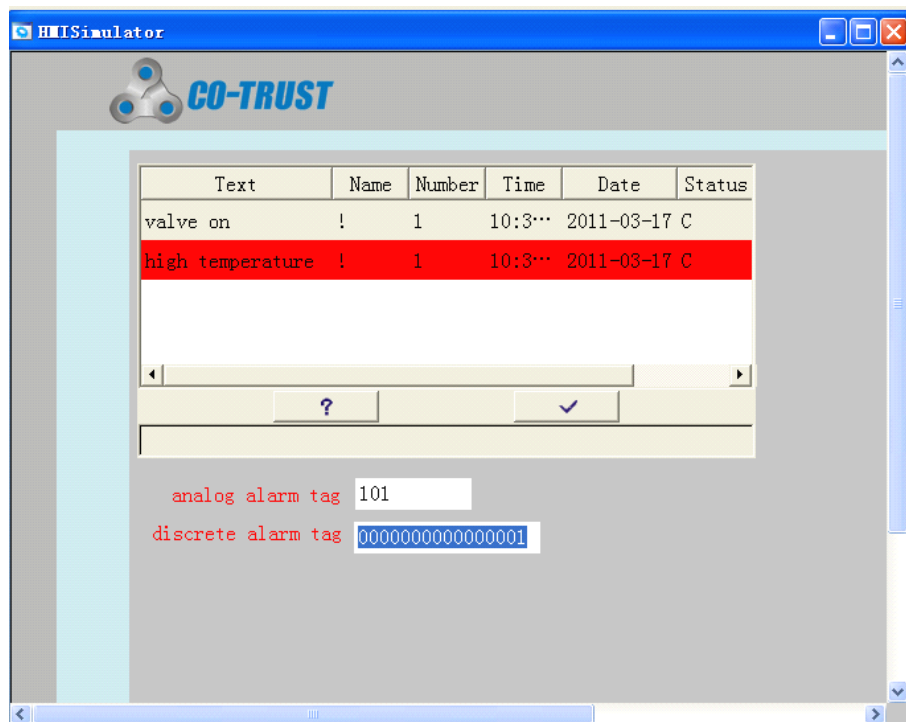


11. Insert an Alarm View object, two Text Field objects and two Number IO Field objects in screen1, Alarm View keep the default properties, two Number IO Field objects configure two alarms Trigger Tag respectively, see as following:



## 12. Debug the project.

Select "Project" -> "Start Runtime" from menu bar or click  in Toolbar starting Runtime to debug the two alarms. Input the value 101 in the upper Number IO Field, and set the lowest bit as 1 to the lower Number IO Field, then you can see the two alarms are displayed in the Alarm View.



## 8 Recipes data

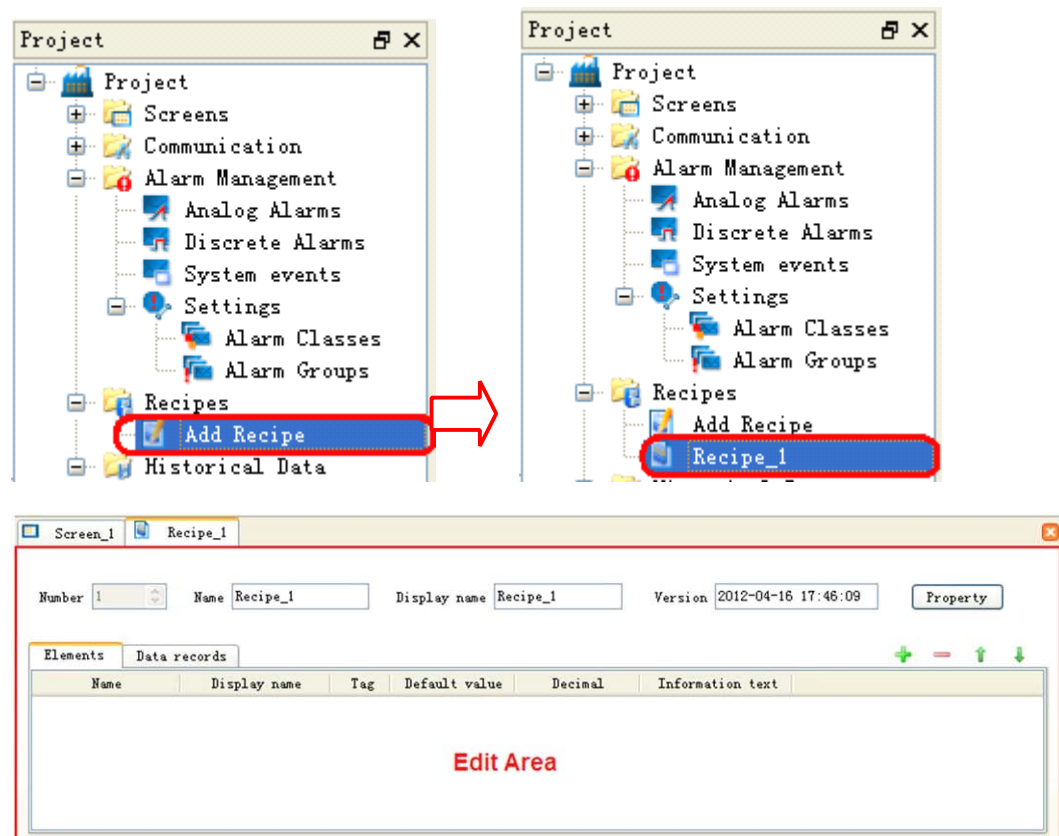
### 8.1 Function of Recipes

Recipe is the muster of some related data, such as a set parammeters of a machine and a set of production data. You can transfer a set of data stored in HMI device to the controller to change their corresponding production tags of the controller only by one operation step when the MHI device is running. The final destination of the recipe data is the PLC memory, before you use them to control the technologic process you must download them to the PLC.

### 8.2 How to create a recipe

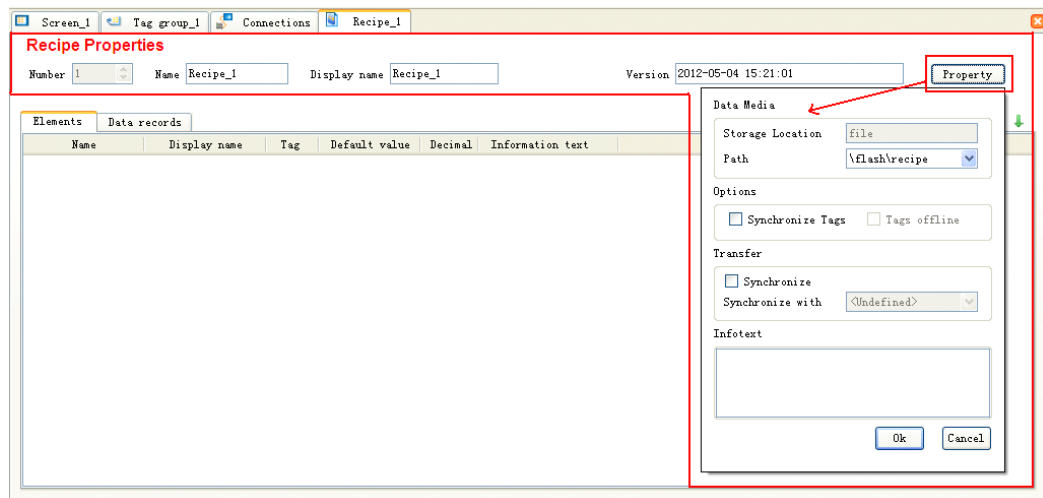
Recipe consists of 'recipe information', 'recipe elements' and 'recipe data records'. You can edit the recipe information in the recipe editor, edit the recipe element in the recipe element form and edit the data records in the recipe data records form.

1. Double-click "Add Recipe" in Project view to add a new recipe, then the new recipe displayed under 'Add Recipe', and the new recipe's editor opened as follows:

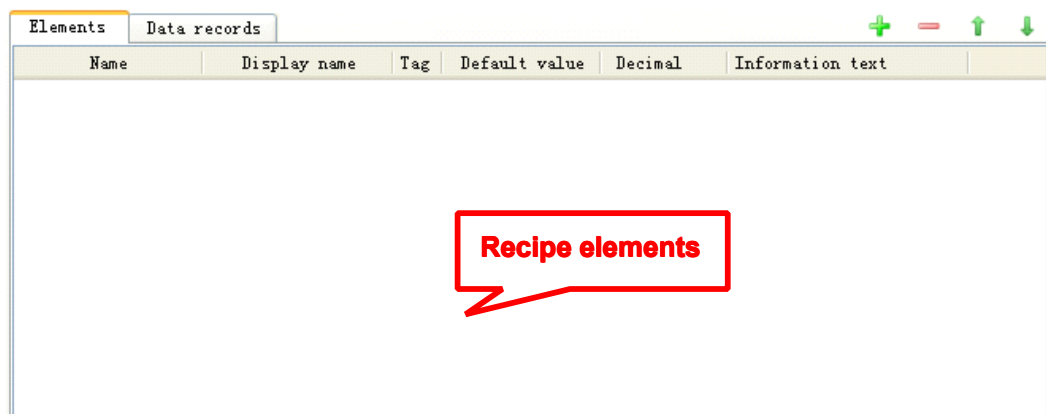


Recipe edit area mainly contains three parts: Recipe properties, Elements and Data records.

Recipe properties see as below:



Recipe Elements see below:

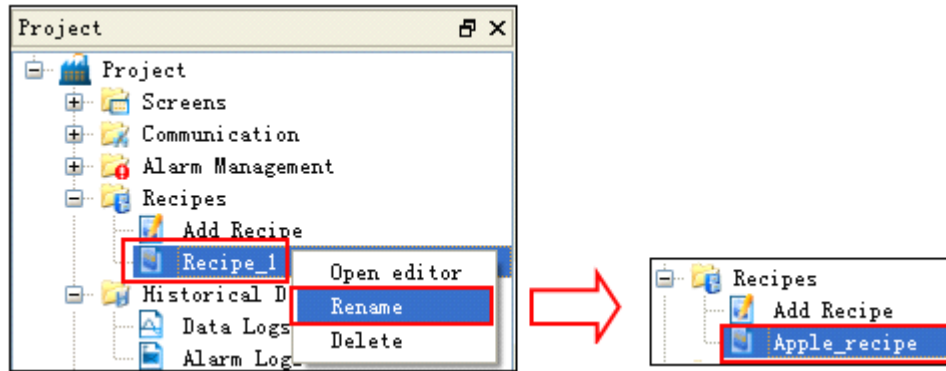


Recipe Data records see below:

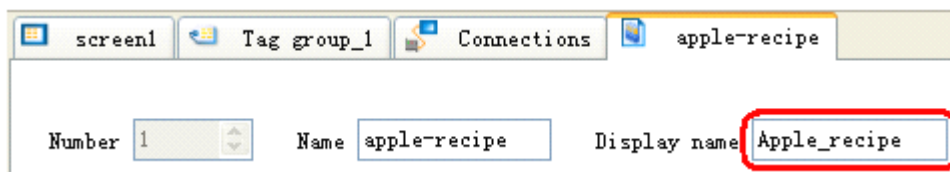


Configure the recipe's properties: Name, Display name, synchronizes/offline Tags and synchronous Transfer etc..

Configure Name: Right-click the recipe, select Rename item from the drop-down list, then input a descriptive name in the text box, as follows:



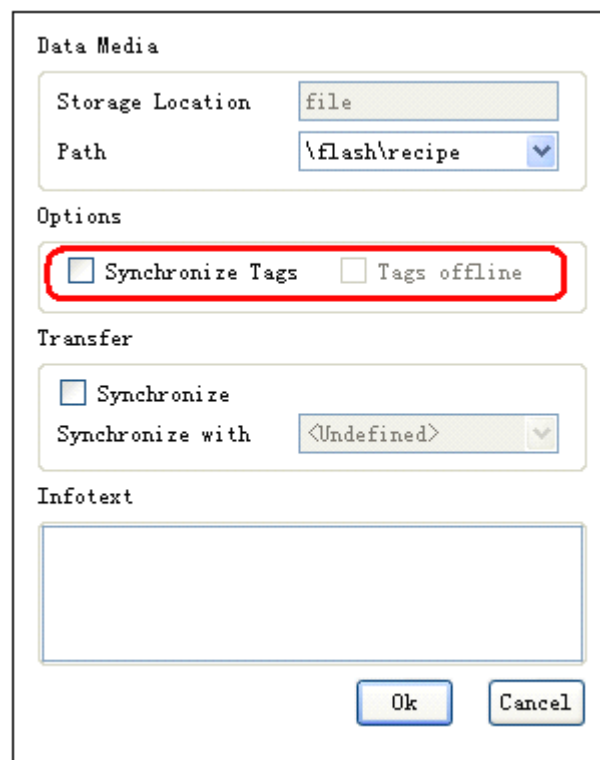
Configure Display name: Input the display name in the text box of Display name, as follows:



### Configure synchronize/offline Tags

There are two options in the Options box: Synchronize Tags and Tags offline. They are used to define the recipe tags' synchronize characteristics during the HMI running, including two aspects, one aspect is to make synchronization between Recipe view and recipe screen, the other aspect is to make synchronous transfer of recipe tags between HMI device and PLC.

Click the button Property, then enable one or all the options in the drop-down box, then click the Ok button, see as follows:



Enable Synchronize tags, but not enable Tags offline, the elements default values will be wrote into recipe tags and PLC.

Only enable Synchronize tags to make synchronization between Recipe view and recipe screen and make synchronous transfer of recipe tags between HMI device and PLC

Enable the two options to make synchronization between Recipe view and recipe screen.

Don't enable any options, the recipe has no synchronize characteristics.

### Configure synchronize Transfer

Synchronize Transfer define the recipe date record's synchronize transfer characteristics between HMI device and PLC,if you enable Synchronize,you must configure a connection for Synchronize with property,and must configure Data mailbox in Point area of the connection.

Click the button Property, then enable Synchronize in the drop-down box, then click the Ok button, as follows:

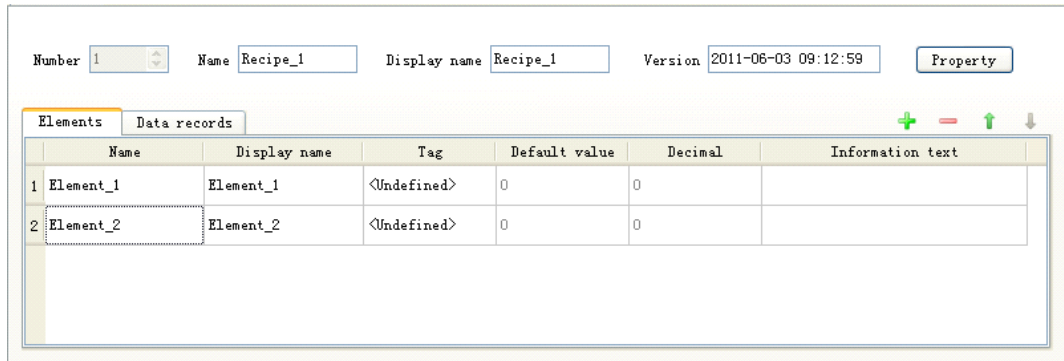
The screenshot shows a 'Data Media' configuration window. It contains several sections: 'Data Media' with 'Storage Location' set to 'file' and 'Path' set to '\\flash\\recipe'; 'Options' with 'Synchronize Tags' checked and 'Tags offline' unchecked; 'Transfer' with 'Synchronize' checked and 'Synchronize with' set to '<Undefined>'; and 'Infotext' which is an empty text area. At the bottom are 'Ok' and 'Cancel' buttons. A red rectangle highlights the 'Synchronize' checkbox and the 'Synchronize with' dropdown in the Transfer section.

### Add elements for the recipe

The screenshot shows a table interface with two tabs: 'Elements' and 'Data records'. The 'Elements' tab is selected and highlighted with a red box. Below the tabs is a table with two columns: 'Name' and 'Disp.'.

Click Elements to switch to the Elements table, then click button  to add elements. Click  can delete elements. Select any element

of the data records table, and then click  can move up a sequence. Click  can move down a sequence.



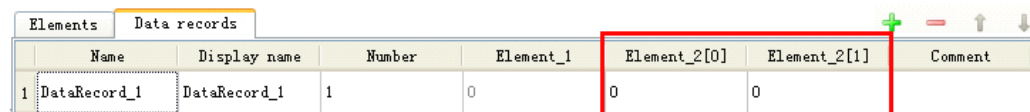
|   | Name      | Display name | Tag         | Default value | Decimal | Information text |
|---|-----------|--------------|-------------|---------------|---------|------------------|
| 1 | Element_1 | Element_1    | <Undefined> | 0             | 0       |                  |
| 2 | Element_2 | Element_2    | <Undefined> | 0             | 0       |                  |

Elements include Name, Display name, Tag, etc..

Configure Name: Input the descriptive name in the cell of Name.

Configure Display name: Input the display name in the cell of Display name.

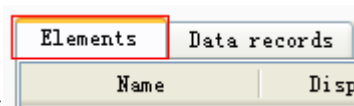
Configure Tag: Select the tag you want to link to the recipe element from the drop-down list of Tag column. You can configure an array tag for it, for example, after you configured a tag which Array count is 2 for Element\_2, there are added 2 lists of Element\_2 (Element\_2[0] and Element\_2[1]) in the data records table, as follows:



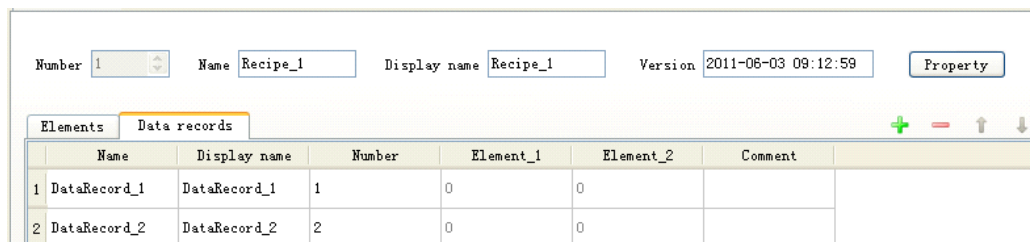
|   | Name         | Display name | Number | Element_1 | Element_2[0] | Element_2[1] | Comment |
|---|--------------|--------------|--------|-----------|--------------|--------------|---------|
| 1 | DataRecord_1 | DataRecord_1 | 1      | 0         | 0            | 0            |         |

Configure Decimal: Set the displaying decimal bit of the element.

### Add data records for the recipe



Click Data records to switch to the data records tab, then click button  to add data records. Click  can delete data records. Use  or  can move up or move down one sequence for the selected data records.



|   | Name         | Display name | Number | Element_1 | Element_2 | Comment |
|---|--------------|--------------|--------|-----------|-----------|---------|
| 1 | DataRecord_1 | DataRecord_1 | 1      | 0         | 0         |         |
| 2 | DataRecord_2 | DataRecord_2 | 2      | 0         | 0         |         |

Data records include Name, Display name, element value, etc..

Configure Name: Input the descriptive name in the cell of Name.

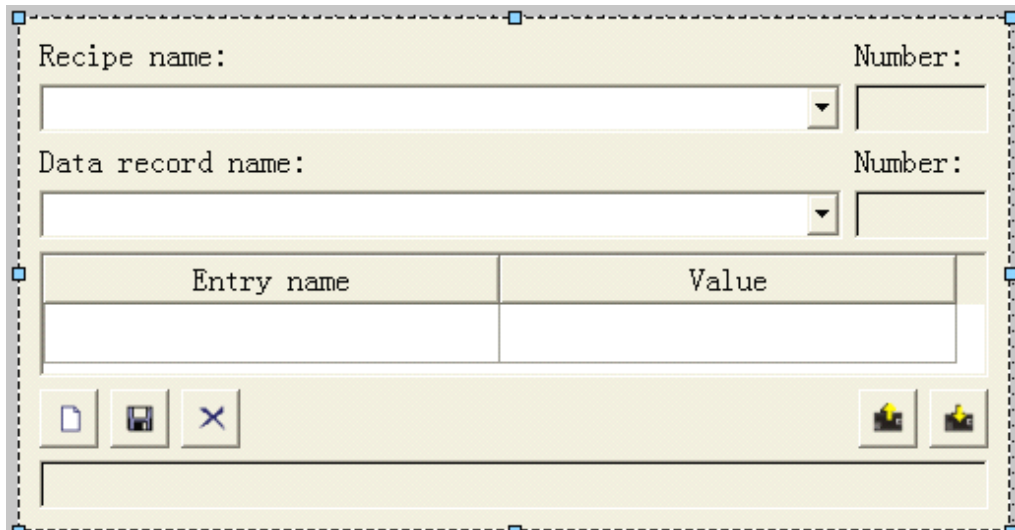
Configure Display name: Input the display name in the cell of Display name.

Configure element value: Input the value for each elements in the cell of Element Name.

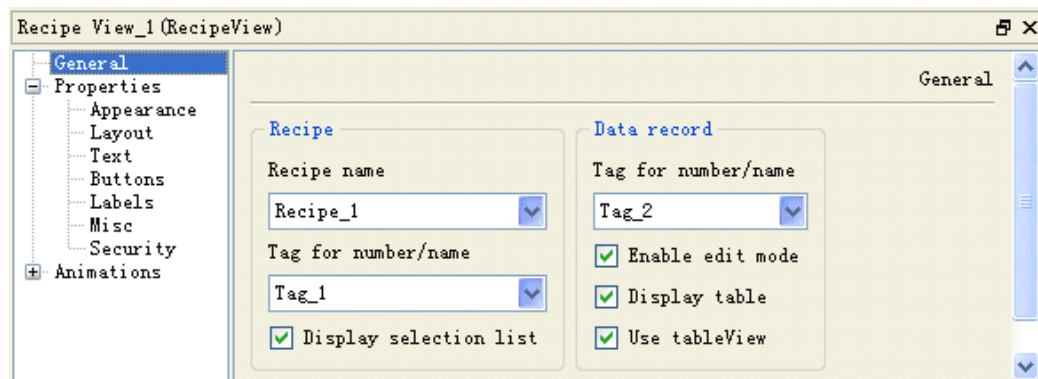
## 8.3 Configure a recipe in the screen

The steps of configuring a recipe show as following:

1. Insert a Recipe view object in the screen.



2. Configure the recipe properties in the property view according to your requirements:



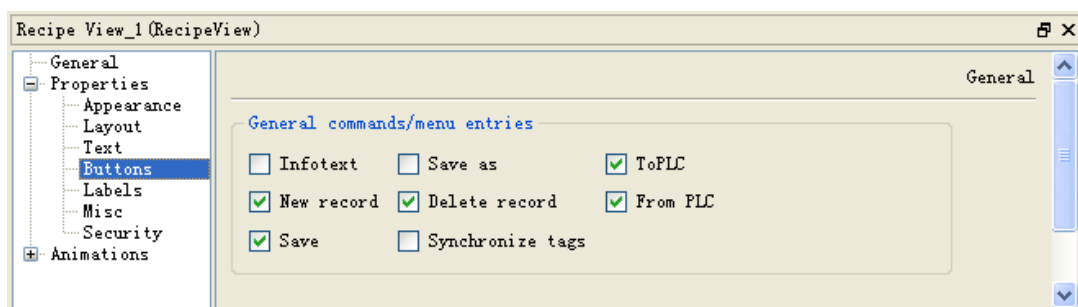
### Configure General properties

- Recipe name: If you only operate a fixed recipe on a recipe view, suggest selecting the recipe from 'Recipe name' property, other wise Recipe name remains empty.
- Tag for number/name: If you want to operate the recipe controlled by a tag, please configure a tag in 'Tag for number/name'.
- Tag for number/name: If you want to operate the data record by a tag, please select a tag from 'Tag for number/name'.
- Display selection list: If you want to display the selection list of recipes, please enable 'Display selection list', other wise disable it.

- Enable edit mode: If you want to edit the recipes' data records, please enable 'Enable edit mode', otherwise disable it.
- Display table: If you want to display the table of data records, please enable 'Display table', otherwise disable it.
- Use tableView: If you want to show the table of data records, please enable 'Use tableView', otherwise hide the 'Entry name' of the table and from top to bottom, from left to right to display the recipe values.

### Configure 'Buttons'

In the Buttons property box, enable or disable any items you need, the enabled button would immediately display in the recipe view.

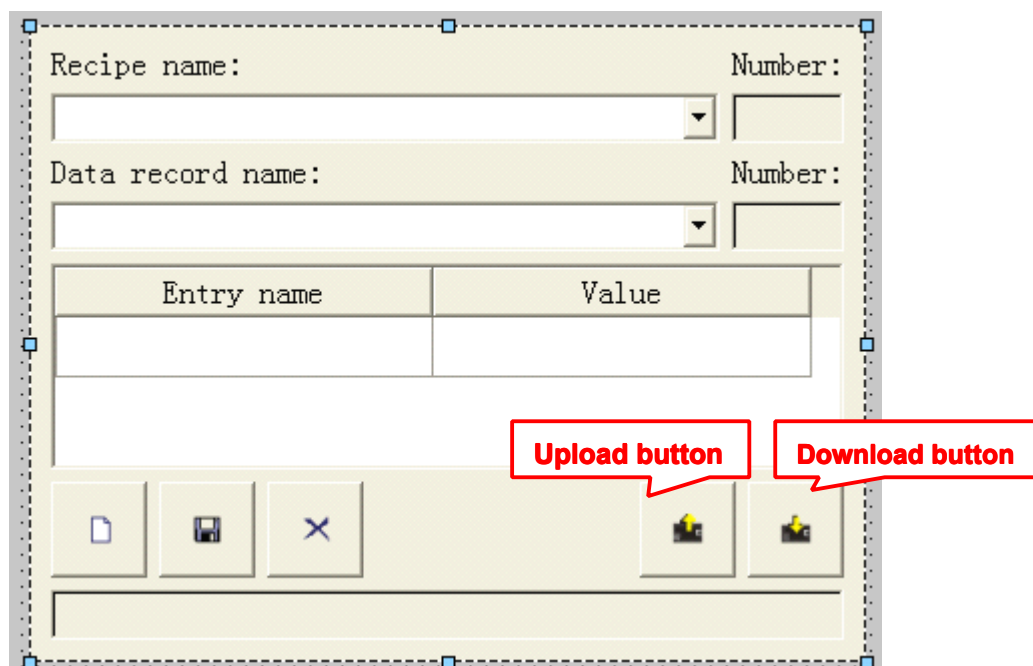


## 8.4 Upload/Download recipe data

Download: Transfer a set of recipe data to PLC from HMI device.

Upload: Transfer a set of PLC data to HMI device from PLC.

You can transfer a set of recipe data between PLC and HMI device by operating the download or upload button in the Recipe view, see the following figure:



## Download steps

1. Select the recipe from the drop-down list of Recipe name, see below:

Recipe name: Apple\_recipe Number:

| Entry name | Value |
|------------|-------|
|            |       |
|            |       |
|            |       |

Icons: [File] [Save] [Close] [Download] [Upload]

2. Select the data record from drop-down list of Data record name, see as follows:

Recipe name: Apple\_recipe Number: 1

Data record name: DataRecord\_1 Number:

| Element      | Value |
|--------------|-------|
| Element_1    | 0     |
| Element_2[0] | 0     |
| Element_2[1] | 0     |

Icons: [File] [Save] [Close] [Download] [Upload]

3. Click  button on the recipe view to start downloading the data record.

4. During the downloading process, the status bar will display the message 'write data log into PLC...':

Recipe name: Apple\_recipe Number: 1

Data record name: DataRecord\_1 Number:

DataRecord\_2

|              |   |
|--------------|---|
| Element_1    | 0 |
| Element_2[0] | 0 |
| Element_2[1] | 0 |

Buttons: [New] [Save] [Close] [Upload] [Download]

**Status bar**

Upload steps:

1. Select the recipe from the drop-down list of Recipe name.
2. Press  button to create a new data record or select an existing data record from Data record name.
3. Press  button on the recipe view to start uploading the PLC data.
4. During the uploading process, the status bar will display the message 'read data log from PLC...'.  
 5. After completed the upload process, press  button to save the current data record.



### Tip

In order to load full set of data record, you should not change the recipe view's displaying before the download/upload operation is completed.

## 9 Historical Data

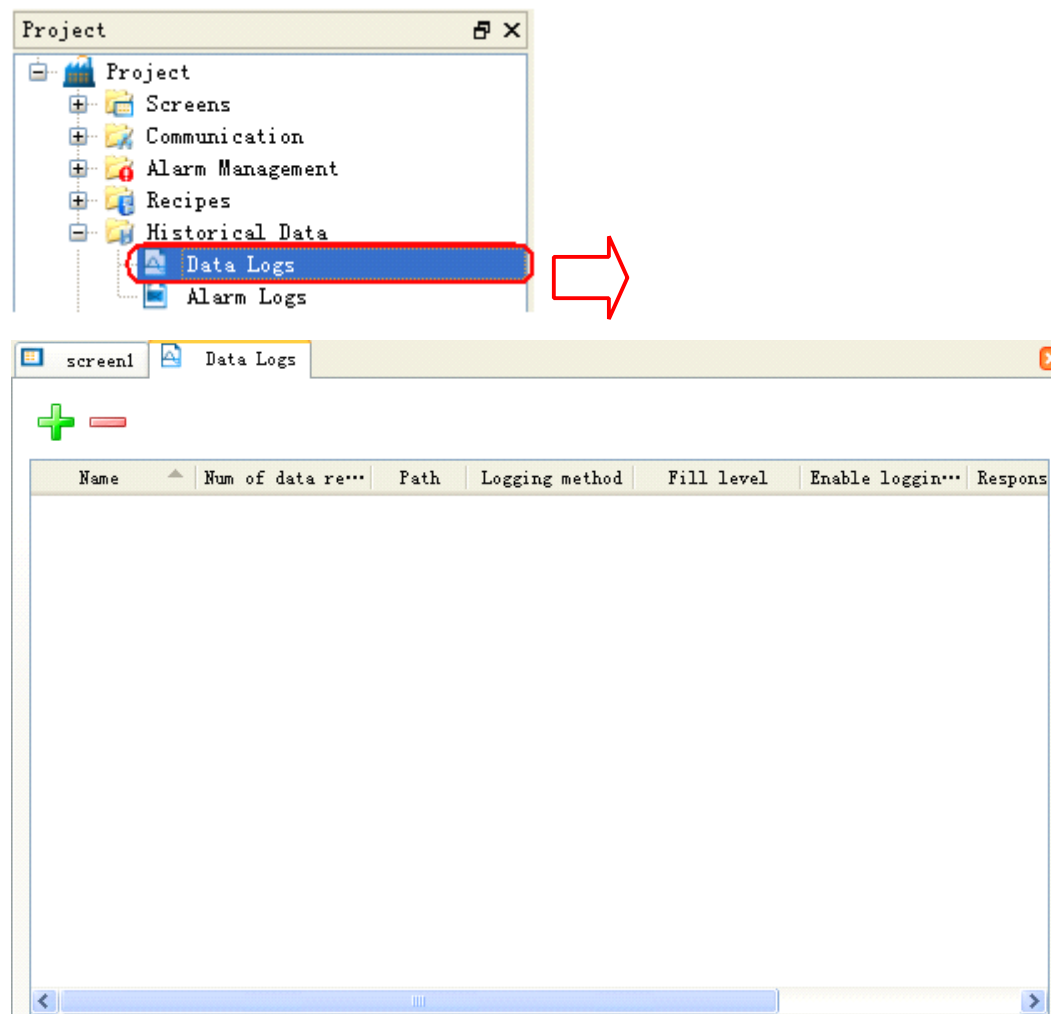
Historical Data are the tag values and alarm messages of the past period of time, it includes two types: Data Logs and Alarm Logs. Data Logs is used to log and store the tag's process values in the past period of time. Alarm Logs is used to log and store the alarm process messages in the past period of time.

### 9.1 Data Logs

#### 9.1.1 How to create Data Logs

The steps of creating a data log:

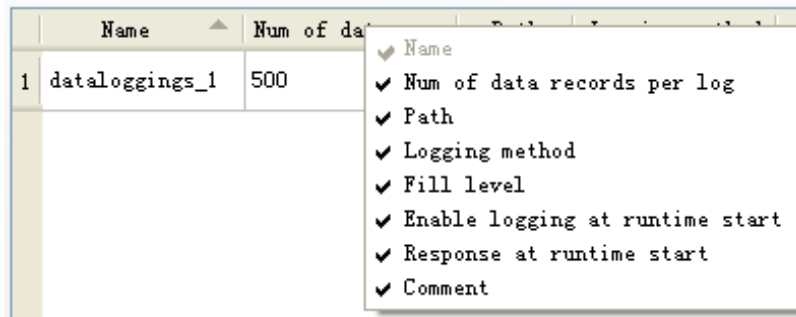
1. Double-click [Historical Data] / [Data Logs] in Project view to open the editor.



2. Click button  in the editor to add a new data log.

### 3. Configure the properties of the data log.

Right-click the horizontal header of the data log table, then enable the property column of the table from the drop-down list, as follows, then configure the properties of a data log.

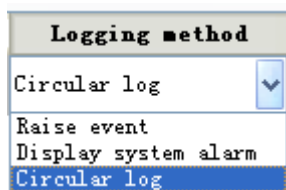


Configure Name: Input the descriptive name in the cell of 'Name'.

Configure Num of data records per log: Set the max number of data records will be stored in the log file, input the numbers in the cell of it.

Configure Path: Keep the default property.

Configure Logging method: Select a logging method from the drop-down list of the cell, as follows:



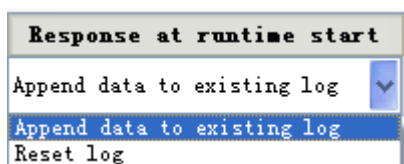
There are three methods: Raise event, Display system alarm, Circular log.

- **Raise event:** A system alarm is triggered when the log file is full, and the log stop recording, the alarm event number is 100001.
- **Display system alarm:** A system alarm is triggered when the log file reached the Fill level, and the log won't stop recording until its full, the alarm event number is 100002.
- **Circular log:** A system alarm is triggered when the log file reached the specified number, the system will start to record from scratch and the new log will overlap with previous logs.

Configure Fill level: The system alarm is triggered when the fill percentage of the log files reached the level. It is available when the 'display system alarm' is selected as the logging method. We can input the number from 1 to 100.

Configure Enable logging at runtime start: Enable or disable the automatically logging when the system start running, select 'On' to enable it, select 'Off' to disable it.

Configure Response at runtime start: How to deal with the records of the log file when the system start running. There are two types: 'Append data to existing' and 'Reset log', as follows:



'Append data to existing log' means appending new records directly in the log file,

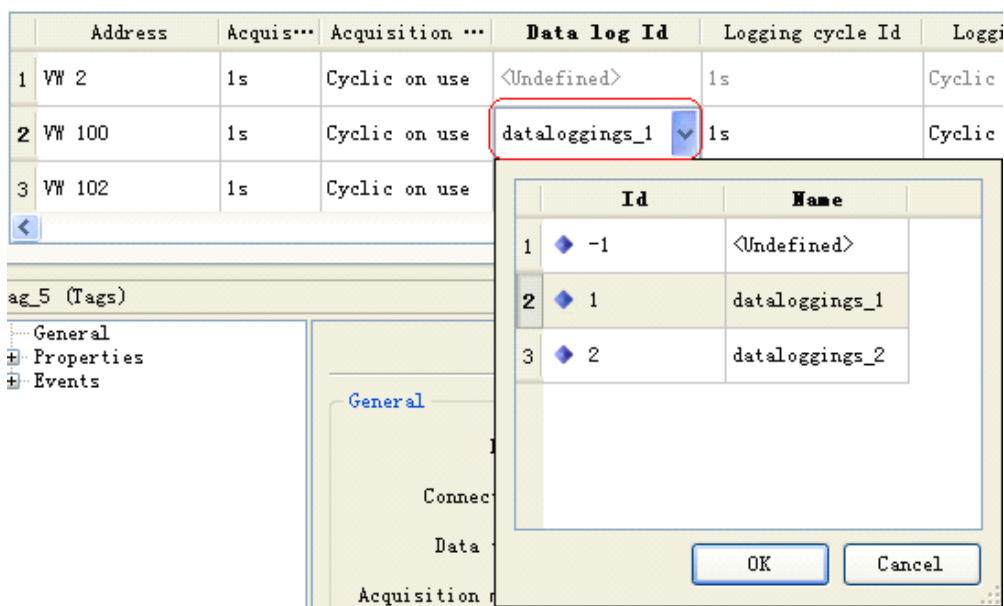
'Reset log' means all the records in the log file will be deleted before appending new records.

Configure Comment: Input the comments for a data log.

We know Data Logs is used to log and store the tag's process values, so we should configure a data log for a tag, and configure the 'Logging acquisition mode' property of the tag.

Configure a data log for a tag:

Double-click the Data log Id cell of the tag, and select the data log you need from the drop-down list, as follows:



Configure the Logging acquisition mode for a tag: Double-click the Logging acquisition mode cell of the tag, and select the mode you need from the drop-down list, as follows

|   | Address | Acquis... | Acquisition ... | Data log Id    | Logging cycle Id | Logging acquisition mode |
|---|---------|-----------|-----------------|----------------|------------------|--------------------------|
| 1 | VW 2    | 1s        | Cyclic on use   | <Undefined>    | 1s               | Cyclic continuous        |
| 2 | VW 100  | 1s        | Cyclic on use   | dataloggings_1 | 1s               | Cyclic continuous        |
| 3 | VW 102  | 1s        | Cyclic on use   | dataloggings_2 | 1s               | On change                |

There are three Logging acquisition modes: On change, On demand, Cyclic continuous.

- On change: log a record when the tag value is changed.
- On demand: log a record when user triggers a command.

- Cyclic continuous:log a record according to the logging cycle configured in Logging cycle Id cell.

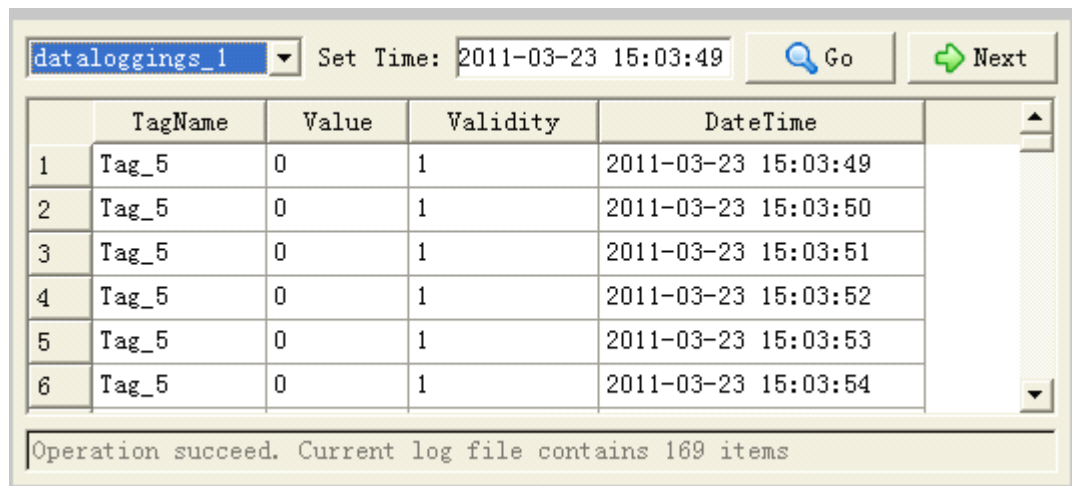
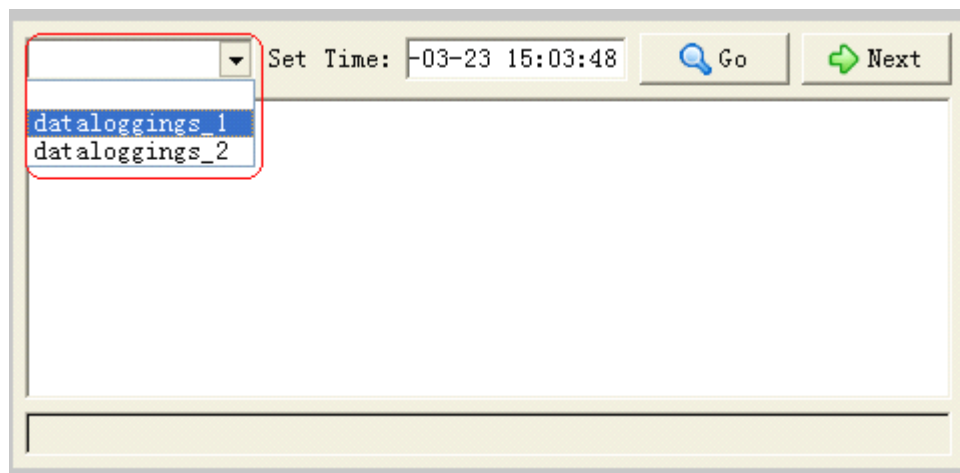
### 9.1.2 View data records

You must insert a Data View object in the screen to observe or operate the data records when the HMI device is running.

When the simulator is running, the database file 'historicaldata.db' including all Data logs is in the folder 'Logs' under the project list, but its stored in USB storage or SD card when HMI device is running.

The steps of viewing a data log:

1. Open the first drop-down list on the left to select the data log, see as follows:



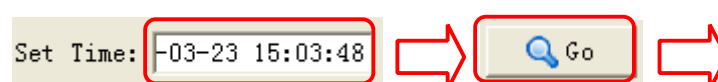
2. At this time, you can view the previous records of the data log. You can press



button to continue observing the following records.

If you want to observe the records in a specified time, you can set the time in the input

field on the right of 'Set time', then press button , as follows:



| dataloggings_1 |         | Set Time: 2011-03-23 15:10:49 |          | Go                  | Next |
|----------------|---------|-------------------------------|----------|---------------------|------|
|                | TagName | Value                         | Validity | DateTime            |      |
| 1              | Tag_5   | 0                             | 1        | 2011-03-23 15:10:49 |      |
| 2              | Tag_5   | 0                             | 1        | 2011-03-23 15:10:50 |      |
| 3              | Tag_5   | 0                             | 1        | 2011-03-23 15:10:51 |      |
| 4              | Tag_5   | 0                             | 1        | 2011-03-23 15:10:52 |      |
| 5              | Tag_5   | 0                             | 1        | 2011-03-23 15:10:53 |      |
| 6              | Tag_5   | 0                             | 1        | 2011-03-23 15:10:54 |      |

Operation succeed.

3. Now, the records you want to view are displaying in the table of Data View.

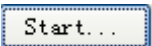


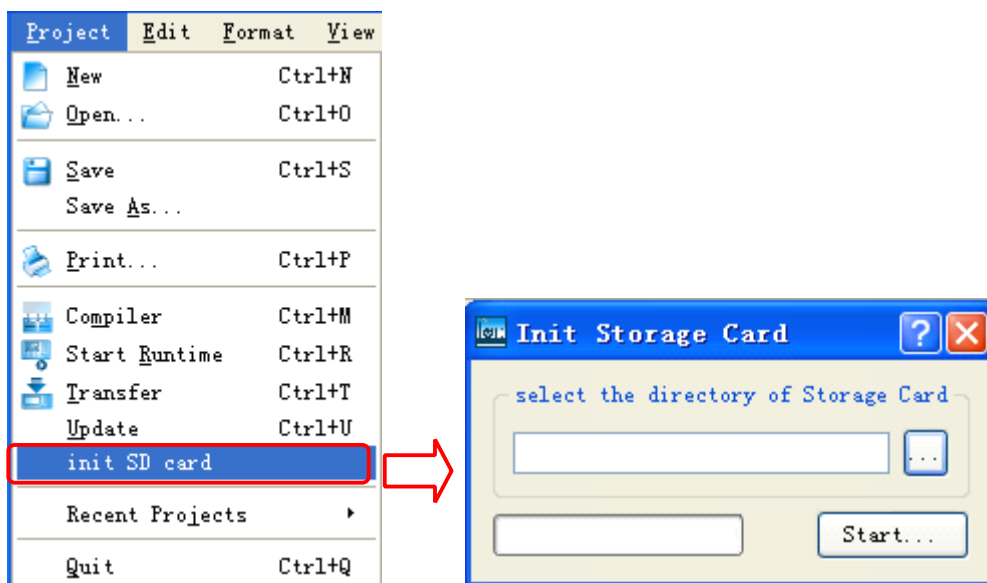
### Tips

- When you view records on HMI device, make sure the USB storage or SD card is inserted in HMI device's corresponding port.
- You'd better initialize the database of data log on PC before visit records on HMI device.

Initialize steps: First, make sure the USB storage or SD card is inserted in the PC's

USB port, then click item [Project] / [initialize SD card], then click the button  in the dialog box 'Init storage Card', then select the disk symbol of the USB storage, then

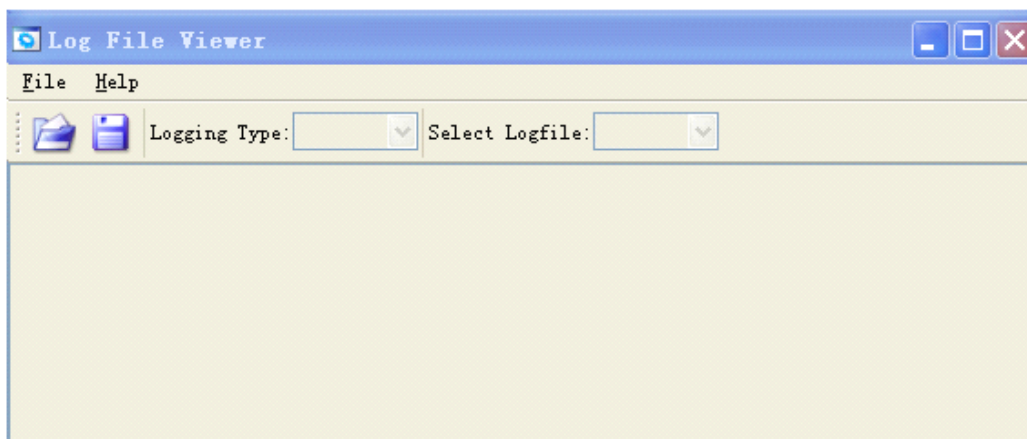
click the button  to Initialize it. See the following:



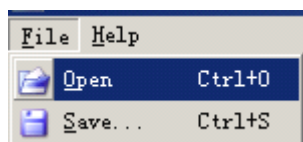
## 9.1.3 Export Data Logs

1. Pull out the USB storage or SD card from HMI device, then insert in the USB port of PC.
2. Open record export tools LogFile Viewer.

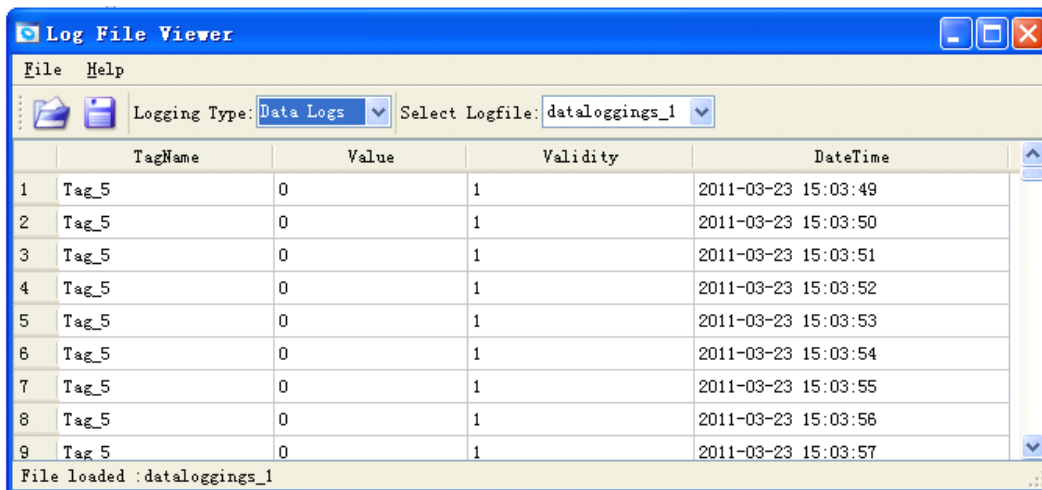
Click [Sart] / [Pogram] / [MagicWorks] / [HMI] / [LogFile Viewer], show as below:



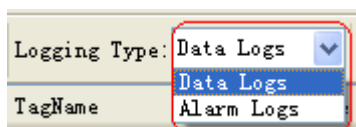
3. Open the data log.



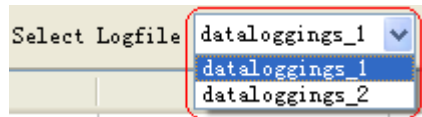
Clicking  to open the record database 'historicaldata.db' in the 'logs' folder of the USB device, then double-click 'historicaldata.db',as follows:



Then select the log type in the drop-down list of the selection field on the right of 'Logging Type:',as follows:

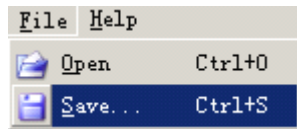


Then select a data log in the drop-down list of the selection filed on the right of 'Select Logfile:',as follows:



At this time, all the data records are displaying in the table.

4. Save the data log and export it.



Click  or click button  in the tool bar to save it as a '.csv' file.

You can open the file through Excel, so you can view and analyse the previous data on PC.

The following picture is the screenshot of a exported data log opened by EXCEL.

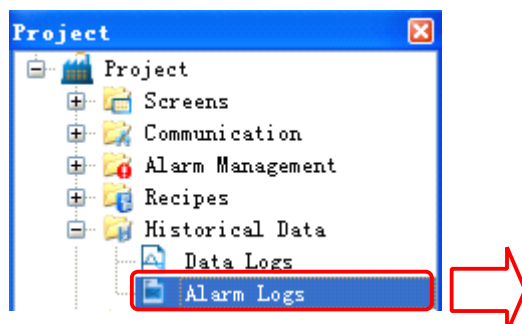
|    | A       | B     | C        | D                |
|----|---------|-------|----------|------------------|
| 1  | TagName | Value | Validity | DateTime         |
| 2  | Tag_1   | 0     | 1        | 2010-10-27 14:45 |
| 3  | Tag_5   | 0     | 1        | 2010-10-27 14:45 |
| 4  | Tag_7   | 0     | 1        | 2010-10-27 14:45 |
| 5  | Tag_1   | 0     | 1        | 2010-10-27 14:45 |
| 6  | Tag_5   | 0     | 1        | 2010-10-27 14:45 |
| 7  | Tag_7   | 0     | 1        | 2010-10-27 14:45 |
| 8  | Tag_1   | 0     | 1        | 2010-10-27 14:45 |
| 9  | Tag_5   | 0     | 1        | 2010-10-27 14:45 |
| 10 | Tag_7   | 0     | 1        | 2010-10-27 14:45 |

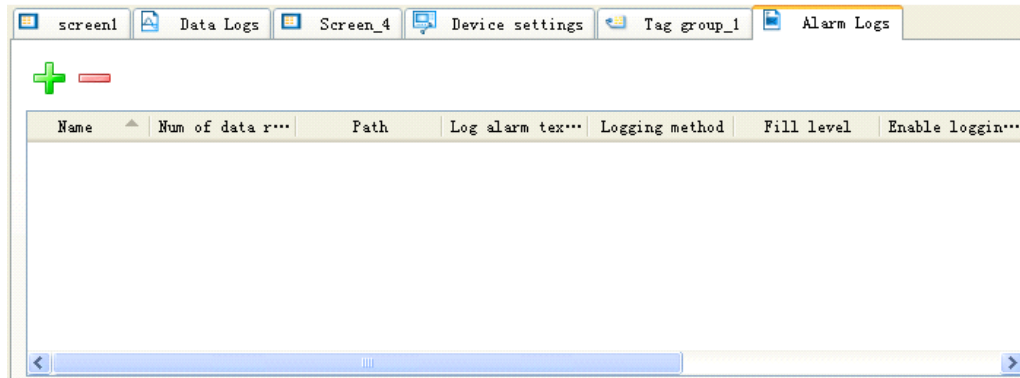
## 9.2 Alarm Logs

### 9.2.1 How to create Alarm Logs

The steps of creating a data log:

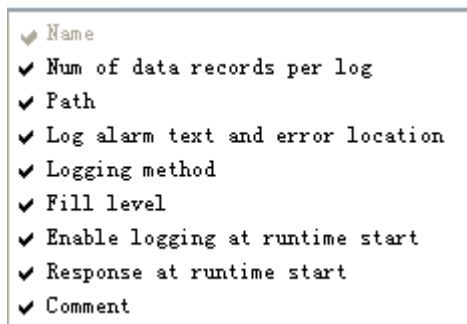
1. Double-click [Historical] / [Alarm logs] in Project view to open the editor.





2. Click button  in the editor to add a new alarm log.
3. Configure the properties of the alarm log.

Right-click the horizontal header of the alarm log table, then enable the property column of the table from the drop-down list, as follows, then configure the properties of a alarm log.



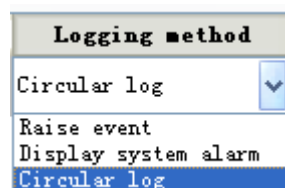
Configure Name: Input the descriptive name in the cell of Name.

Configure Num of data records per log: Set the max number of alarm records will be stored in the log file, input the numbers in the cell of it.

Configure Path: Keep the default property.

Configure Log alarm text and error location: Whether log the alarm text and error location of the alarm message, select 'On' to log them, select 'Off' means don't log them.

Configure Logging method: Select a logging method from the drop-down list of the cell, as follows:



There are three methods: Circular log, Display system alarm, Circular log.

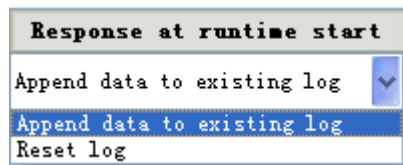
- Raise event: A system alarm is triggered when the log file is full, and the log stop recording, the alarm event number is 100001.

- **Display system alarm:** A system alarm is triggered when the log file reached the Fill level, and the log won't stop recording until its full, the alarm event number is 100002.
- **Circular log:** A system alarm is triggered when the log file reached the specified number, the system will start to record from scratch and the new log will overlap with previous logs.

**Configure Fill level:** The system alarm is triggered when the fill percentage of the log files reached the level. It is available when the 'display system alarm' is selected as the logging method. We can input the number from 1 to 100.

**Configure Enable logging at runtime start:** Enable or disable the automatically logging when the system start running, select 'On' to enable it, select 'Off' to disable it.

**Configure Response at runtime start:** How to deal with the records of the log file when the system start running. There are two types, 'Append data to existing' and 'Reset log', as follows:



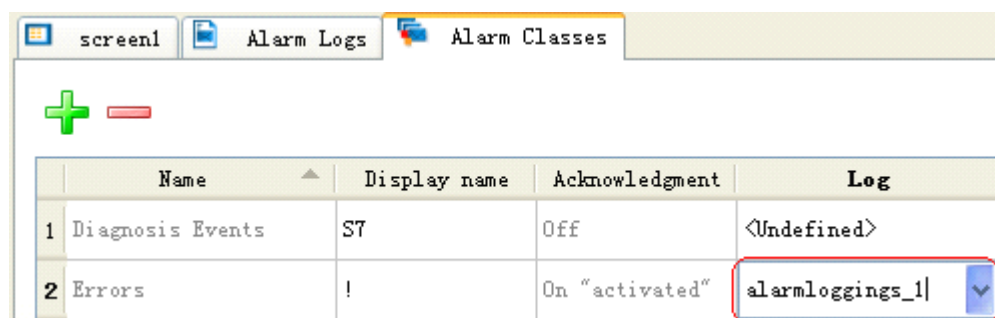
- 'Append data to existing log' means appending new records directly in the log file,
- 'Reset log' means all the records in the log file will be deleted before appending new records.

**Configure Comment:** Input the comments of the data record.

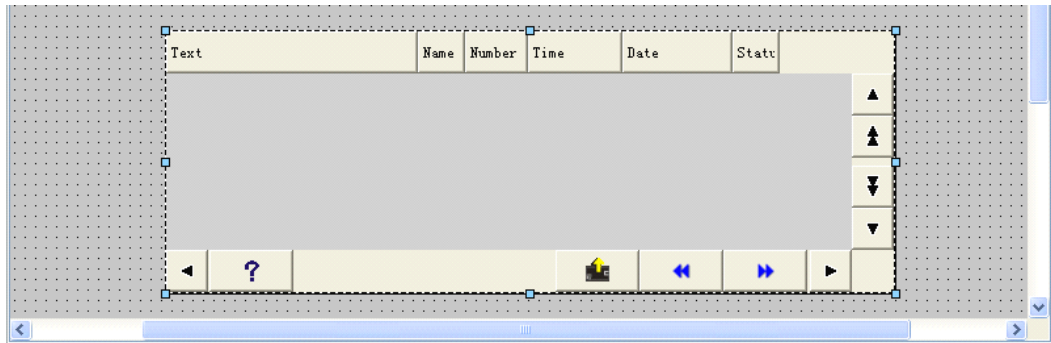
**Configure Alarm Log for Alarm Classes:**

An alarm log can be configured by one or more alarm classes.

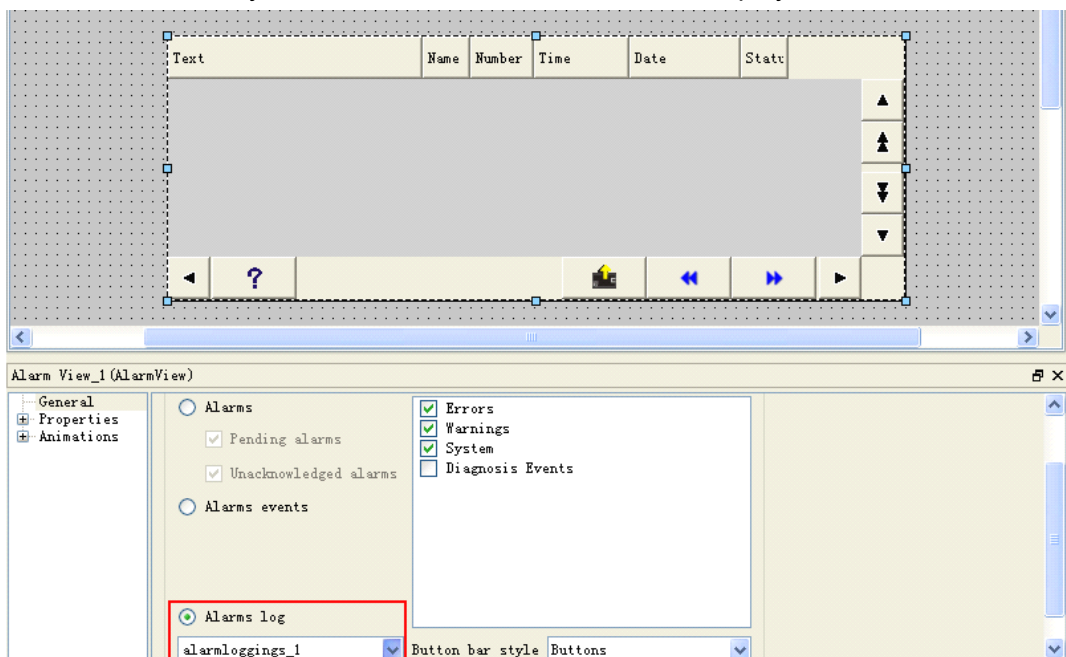
1. Double-click [Alarm Management] \ [settings] \ [Alarm classes] in Project view, then select the class you want to configure Alarm Log, select the alarm log from the drop-down list of 'Log' cell, see as follows:



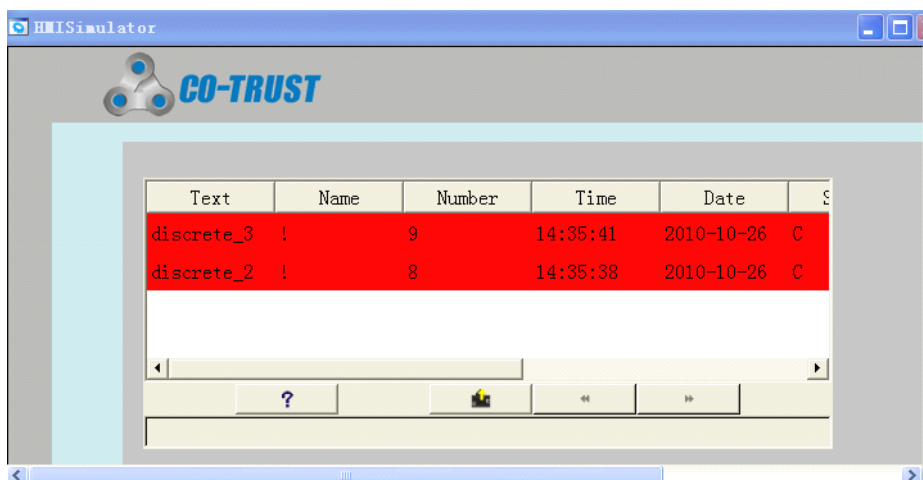
2. Insert "Alarm view" object into the screen editor. Show as below:



3. In the "General" properties dialog box of the alarm view. Select the "Alarms log". Choose alarm log from the drop-down menu. Select "alarmloggings\_1" in this example. Choose "Buttons" style in the 'button bar style', all buttons can be displayed in the alarm view. If you select "None", the buttons won't display in the alarm view.

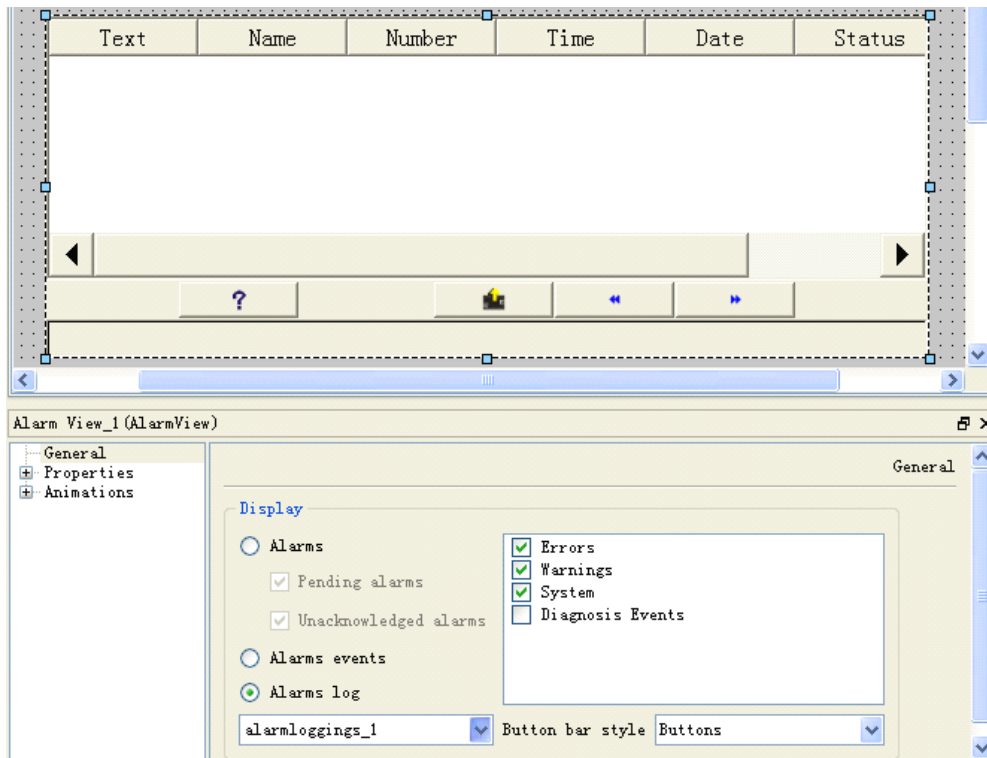


4. After configured the alarm log, start Runtime, as follows:



## 9.2.2 View the alarm records

You must insert a Alarm View object in the screen to observe or operate the data records when the HMI device is running. See the following figure:

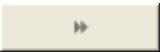
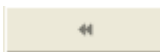


When the simulator is running, the database file 'historicaldata.db' including all Alarm logs is in the folder 'Logs' under the project directory, but it is stored in USB storage or SD card when HMI device is running.

The steps of viewing an alarm records on runtime system:

1. Click button  of alarm view object to refresh the displaying of the alarm records on alarm view.

| Text             | Name | Number | Time     | Date       | Status |
|------------------|------|--------|----------|------------|--------|
| high temperature | !    | 1      | 15:55:13 | 2011-03-24 | CD     |
| high temperature | !    | 1      | 15:55:12 | 2011-03-24 | C      |
| high temperature | !    | 1      | 15:55:10 | 2011-03-24 | CD     |
| high temperature | !    | 1      | 15:55:10 | 2011-03-24 | C      |
| high temperature | !    | 1      | 15:55:08 | 2011-03-24 | CD     |

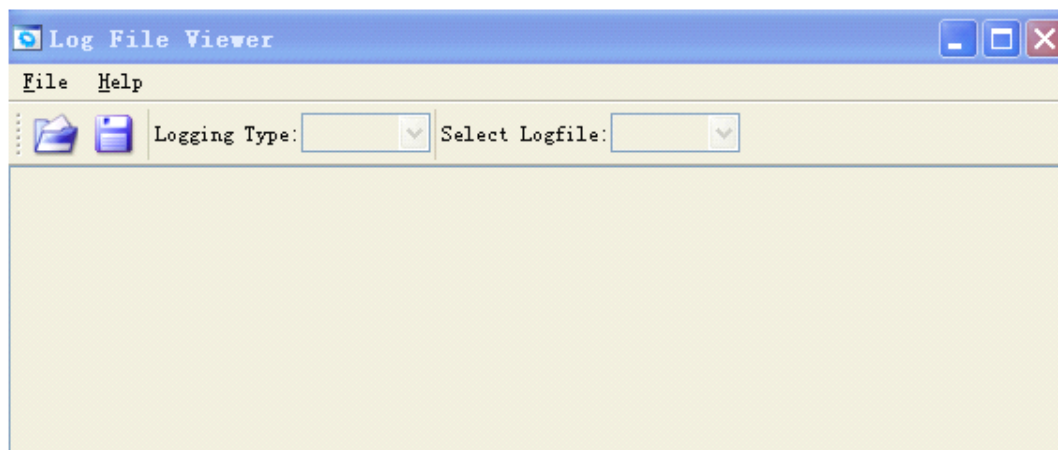
At this time, you can view the latest alarm records. If you want to view the previous records, press button , also you can operate button  to view the upper records.

When switch to the screen that including alarm views would automatically refresh the alarm view once.

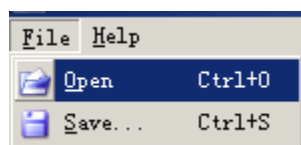
### 9.2.3 Export Alarm Logs

1. Pull out the USB stroage or SD card from HMI device, and insert in the USB port of PC.
2. Open record export tools LogFile Viewer.

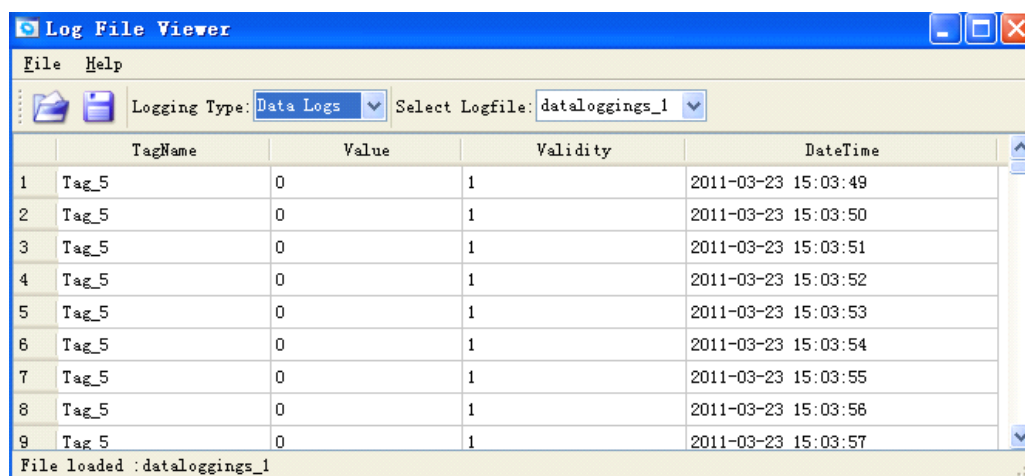
Click [Sart] / [Pogram] / [MagicWorks] / [HMI] / [LogFile Viewer], show below:



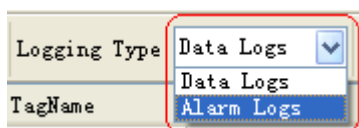
3. Open the data log.



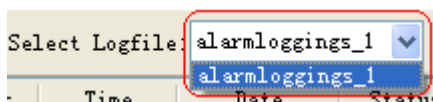
Clicking  to open the record database 'historicaldata.db' in the 'logs' folder of the USB device, then double-click 'historicaldata.db', as follows:



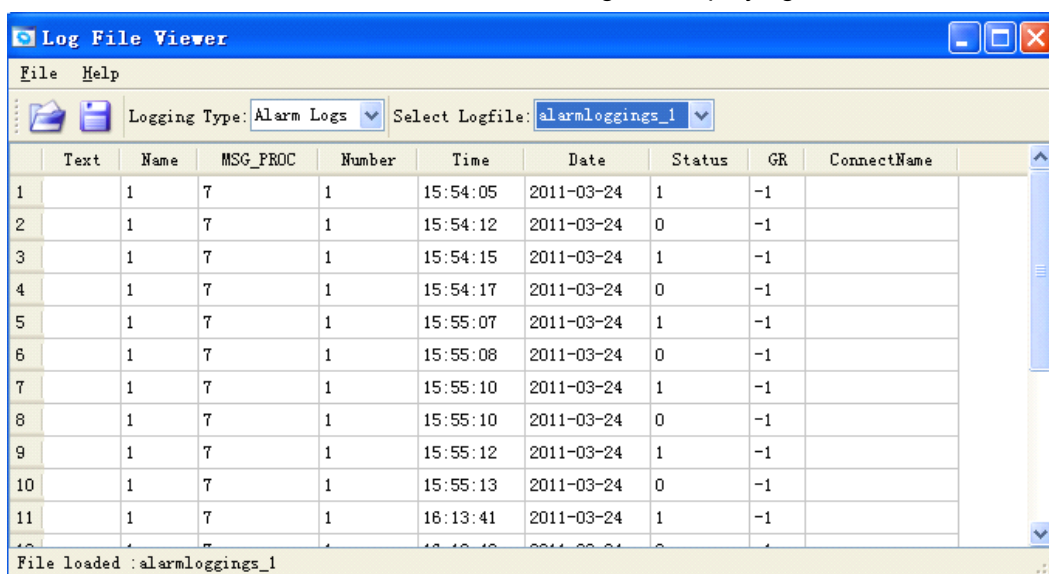
Then select the log type 'Alarm Logs' in the drop-down list of the selection field on the right of 'Logging Type', see as follows:



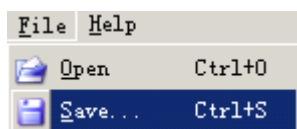
Then select a alarm log in the drop-down list of the selection filed on the right of 'Select Logfile:', as follows:



At this time, all the alarm records of the alarm log are displaying in the table.



4. Save the current alarm log and export it.



Click  in the tool bar to save it as a '.csv' file.

You can open the file through Excel, so you can view and analyse the previous data on PC.

When you open this logs through Excel, show as below:

The following picture is the screenshot of an exported alarm log opened by EXCEL.

|    | A    | B    | C        | D      | E        | F         | G      | H  | I           |
|----|------|------|----------|--------|----------|-----------|--------|----|-------------|
| 1  | Text | Name | MSG_PROC | Number | Time     | Date      | Status | GR | ConnectName |
| 2  |      | 1    | 7        | 1      | 15:54:05 | 2011-3-24 | 1      | -1 |             |
| 3  |      | 1    | 7        | 1      | 15:54:12 | 2011-3-24 | 0      | -1 |             |
| 4  |      | 1    | 7        | 1      | 15:54:15 | 2011-3-24 | 1      | -1 |             |
| 5  |      | 1    | 7        | 1      | 15:54:17 | 2011-3-24 | 0      | -1 |             |
| 6  |      | 1    | 7        | 1      | 15:55:07 | 2011-3-24 | 1      | -1 |             |
| 7  |      | 1    | 7        | 1      | 15:55:08 | 2011-3-24 | 0      | -1 |             |
| 8  |      | 1    | 7        | 1      | 15:55:10 | 2011-3-24 | 1      | -1 |             |
| 9  |      | 1    | 7        | 1      | 15:55:10 | 2011-3-24 | 0      | -1 |             |
| 10 |      | 1    | 7        | 1      | 15:55:12 | 2011-3-24 | 1      | -1 |             |

Alarm logs document have 8 lists, see the following table:

| List name                | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm text(Msg text)     | The text of alarm.It will be logged into the log file only when the alarm log's 'Log alarm text and error location' property is 'On'.                                                                                                                                                                                                                                                                                         |
| Alarm number(Msg_Number) | The number of the alarm.                                                                                                                                                                                                                                                                                                                                                                                                      |
| Process(Msg_Proc)        | 4 kinds process, instead of code.<br>0:The unknown alarm process;<br>1:System alarm(system events);<br>2:The process of the alarm bit (discrete alarm);<br>7: Analog alarm.                                                                                                                                                                                                                                                   |
| Status(Stateafter)       | 5 kinds status, instead of code:<br>0:activated/deactivated;<br>1:activated;<br>2:activated/acknowledged/deactivated;<br>3:activated/acknowledged;<br>6:activated/deactivated /acknowledged.                                                                                                                                                                                                                                  |
| Classes(Msg_Class)       | 4 kinds alarm classes:<br>0:No alarm classes;<br>1:'Errors';<br>2:'Warning';<br>3:'system events';<br>64.....:The alarm classes user-defined.                                                                                                                                                                                                                                                                                 |
| ConnectName(PLC)         | If the "Log alarm text and error location" property is "On", In this alarm log files will record alarm positioning, Otherwise not record to the document (Null).<br>There are three cases:<br>1. The name of the connection which the tag configured by the alarm belongs to;<br>2. 'Internal': When the alarm's Trigger tag is an internal tag;<br>3. Null: when the alarm is not configured by user, such as system alarms. |
| Time                     | The time when the alarm is triggered.<br>Format: hours: minutes: seconds.                                                                                                                                                                                                                                                                                                                                                     |
| Date                     | The date when the alarm is triggered.<br>Format: years: months:days.                                                                                                                                                                                                                                                                                                                                                          |

## 10 Text Lists and Graphics Lists

In Runtime system, Symbolic IO Field and Graphic IO Field objects don't display the actual value of the tag they linked, but display the corresponding text or graphics of the tag value. When configuring symbolic I/O field object, we can choose the displaying text from text list, if configuring the graphic I/O field object, we can choose the displaying graphic from graphics list.

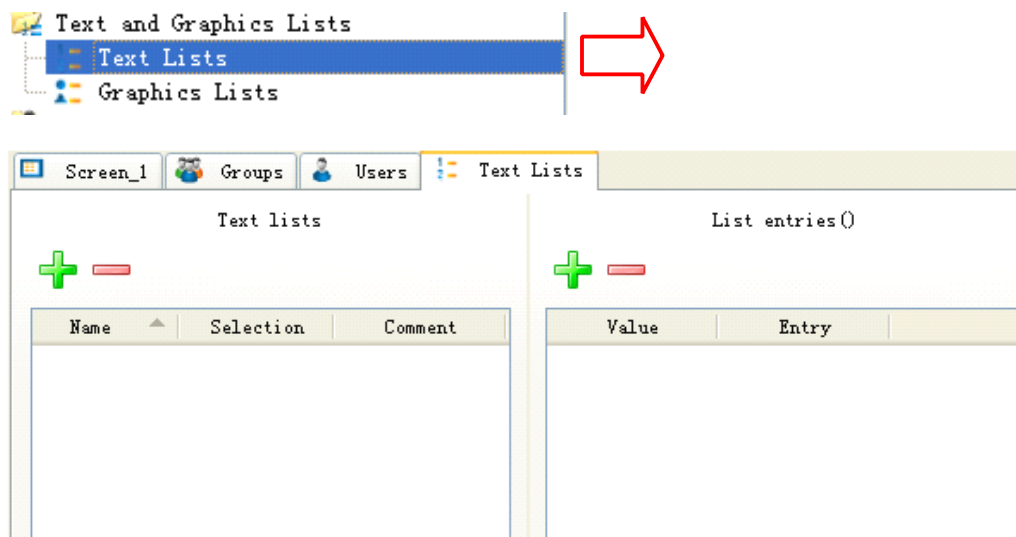
### 10.1 Text Lists

In Text List editor, the values of tag are assigned to various texts. Add text lists in Text lists table, and configure list entries for them in List entries table. Text lists are used by Symbolic IO Field objects. When you configure the text list and tag for the Symbolic IO Field object, the relationship between the text list and tag are established.

#### 10.1.1 How to create a text list

Steps of creating a text list see as follows:

1. Double-click 'Text Lists' in Project view to open the editor, see as follows:



2. Click button  in Text lists table to add a default text list.

Click button  to delete the selected text list.

Text lists

+
-

|   | Name        | Selection         | Comment |
|---|-------------|-------------------|---------|
| 1 | Text list_1 | Range (... - ...) |         |

3. Configure the properties of the text list.

Input the texts in the cell of Name to rename it. Double-click the cell of selection, select one type from the drop-down list, see as following:

|   | Name        | Selection                                                                                                                                   | Comment |
|---|-------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 1 | Text list_1 | <div style="border: 2px solid red; padding: 5px;"> Range (... - ...) <br/>Bit (0, 1) <br/>Bit number (0 - 31) <br/>Range (... - ...) </div> |         |

There are three properties: Name, Selection, Comment.

Name: The name of text list.

Selection: The types of text list, there are three types: Bit (0,1), Bit number (0-31) and Range (...-...).

Bit (0, 1): If select this type, text entries are assigned to the two states of a binary variable. You can create text entries for binary variable state. The number of entries is 2.

Bit number (0-31): If select this type, the text entries are assigned to each bit of a tag. The max number of entries is 32.

Range (...-...): If select this type, the text entries are assigned to some ranges of an integer or a tag. The number of entries are not limited.

Comment: The comment of the text list.

4. Configure text entries for the text list.

Select the text list in Text lists table, then click button + in the List entries table to add list entries, then set the value and entry for it.

There are two properties in List entries table: Value and Entry.

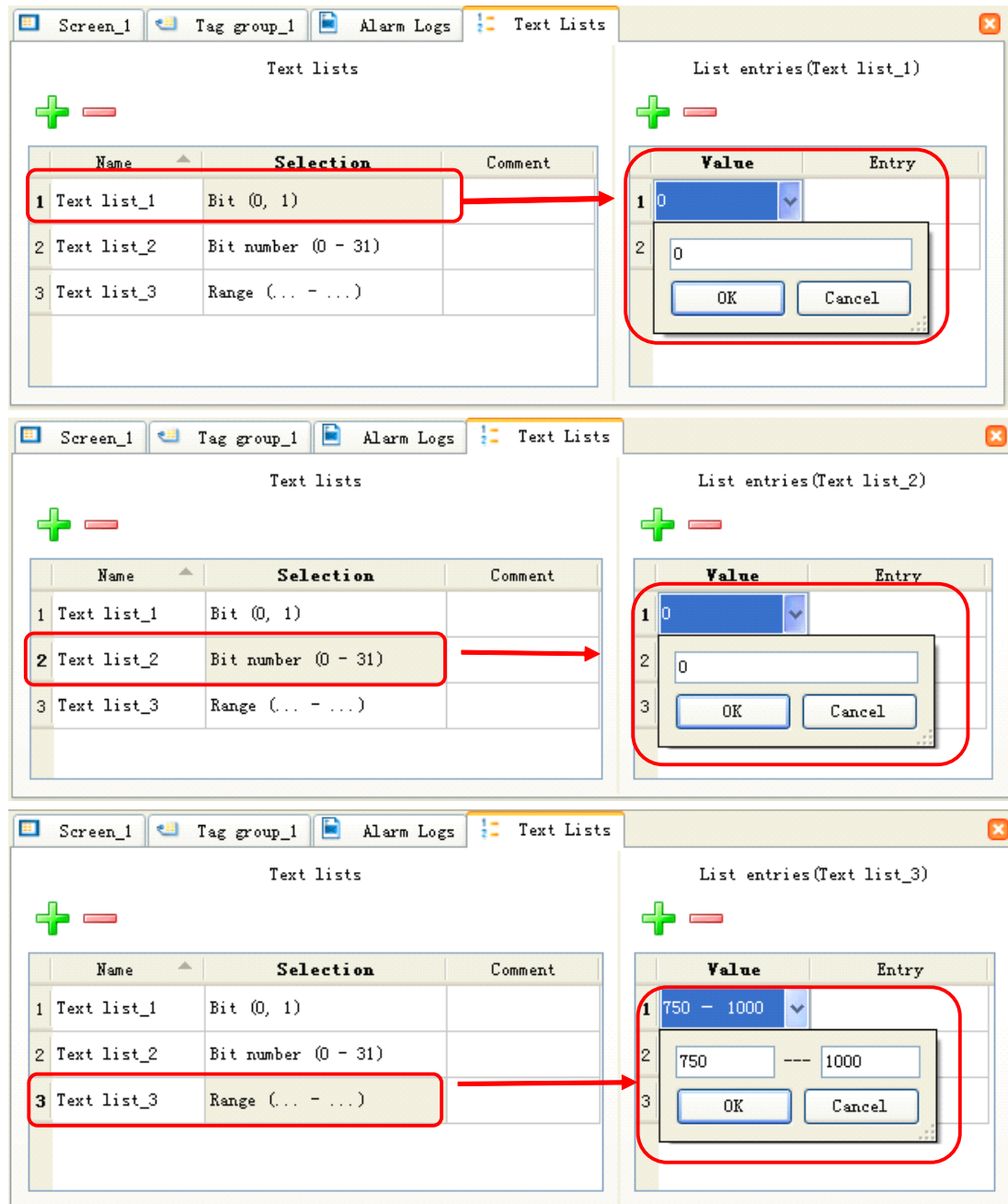
Value: This text list associated with a symbolic IO field corresponding to the value of the variable, the values of a text list in the list entry table must be unique.

Entry: It is a text corresponds to the Value.

You can configure the two properties, but the configuration of Value is restricted by the type of text list. If the type is Bit(0,1), you can only set the value 0 or 1. If the type is Bit number(0-31), you can set the value between 0 and 31. If the type is

Range(...-...),you must set the range(two values).

Set Value:Double-click the cell of Value, input the value into the in input field of the drop-down box, and then click 'OK' button.



Set Entry:Directly input the texts in Entry cell, as follows:

List entries(Text list\_1)

|   | Value | Entry |
|---|-------|-------|
| 1 | 0     | off   |
| 2 | 1     | on    |

## 10.2 Graphics Lists

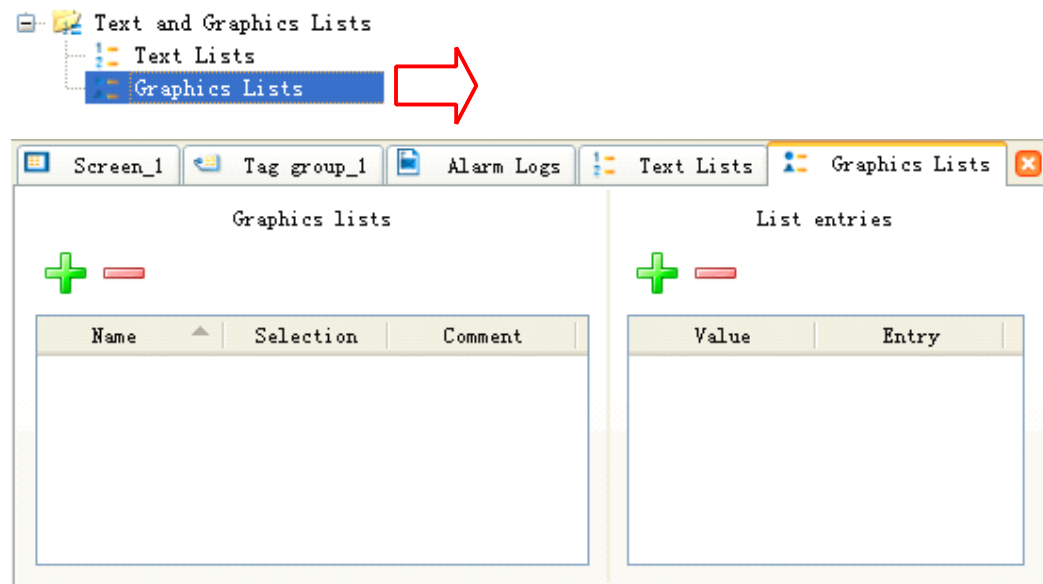
In Graphics List editor, the values of tag are assigned to various pictures. Add graphics lists in Graphics lists table, and configure graphics entries for them in Graphics entries table. Graphics lists are used by Graphic IO Field objects. When you configure the graphics list and tag for the Graphic IO Field object, the relationship between the graphics list and tag are established.

### 10.2.1 How to create a graphics list

Graphics list is created in the 'Graphics Lists' view. Configure connection between the graphics list and variable for the object (such as Graphic IO Field).

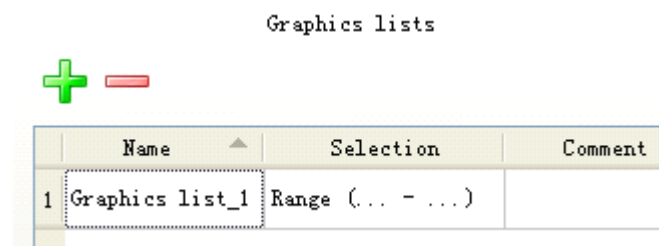
Steps of creating a graphics list:

1. Double-click 'Graphics Lists' in Project view to open the editor, see as follows:



2. Click button  in Graphics lists label to add a default graphics list.

Click button  to delete the selected graphics list.



3. Configure the properties of the graphics list.

Input the texts in the cell of Name to rename it. Double-click the cell of selection, select one option from the drop-down list, as follows:

|   | Name            | Selection                                                                                      | Comment |
|---|-----------------|------------------------------------------------------------------------------------------------|---------|
| 1 | Graphics list_1 | Bit (0, 1)                                                                                     |         |
|   |                 | <div> <div>Bit (0, 1)</div> <div>Bit number (0 - 31)</div> <div>Range (... - ...)</div> </div> |         |

There are three properties: Name, Selection, Comment.

- Name: The name of graphics list.
- Selection: The type of graphics list, there are three types: Bit(0,1), Bit number(0-31) and Range(...-...).

Bit (0, 1): If select this type, the graphics entries are assigned to the two states of a binary variable. You can create text entries for binary variable state. The number of entries is 2.

Bit number (0-31): If select this type, the graphics entries are assigned to each bit of a tag. The max number of entries is 32.

Range (...-...): If select this type, the graphics entries are assigned to some ranges of an integer or a tag. The number of entries are not limited.

- Comment: The comment of the graphic list.

#### 4. Configure graphics entries for the graphics list.

Select the graphics list in Graphics lists table, then click button  in the List entries table to add graphics entries, then set the 'Value' and graphics 'Entry' for it. Click button  to delete the selected list entry.

There are two properties in List entries table: Value and Entry.

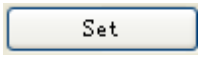
- Value: This text list associated with a symbolic IO field corresponding to the value of the variable, the values of a graphic list in the list entry table must be unique.
- Entry: It is a text which corresponds to the Value.

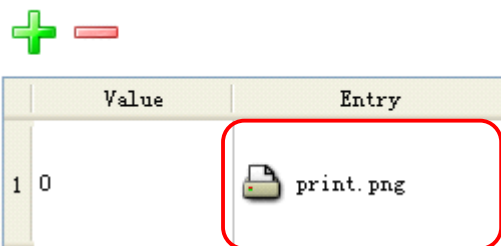
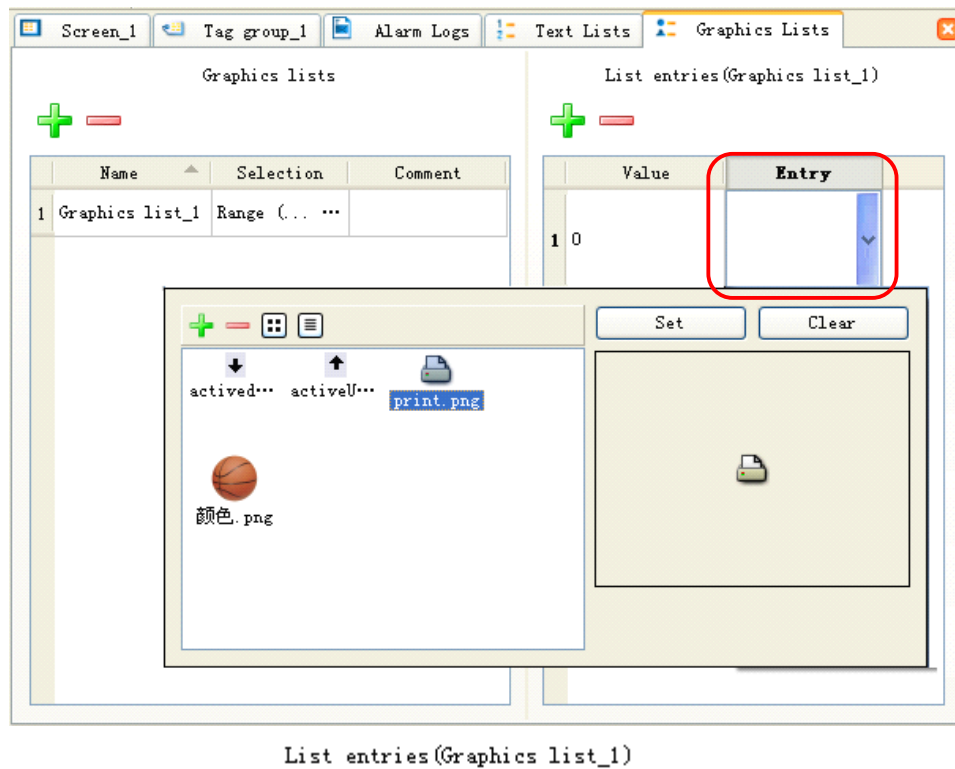
You can configure the two properties, but the configuration of Value is restricted by the type of graphics list. If the type is Bit(0,1), you can only set the value 0 or 1. If the type is Bit number(0-31), you can set the value between 0 and 31. If the type is Range(...-...), you must set the range (two values).

Set Value: Double-click the cell of Value, input the value into the input field of the drop-down box, and then click OK button, the same as setting values for a text list.

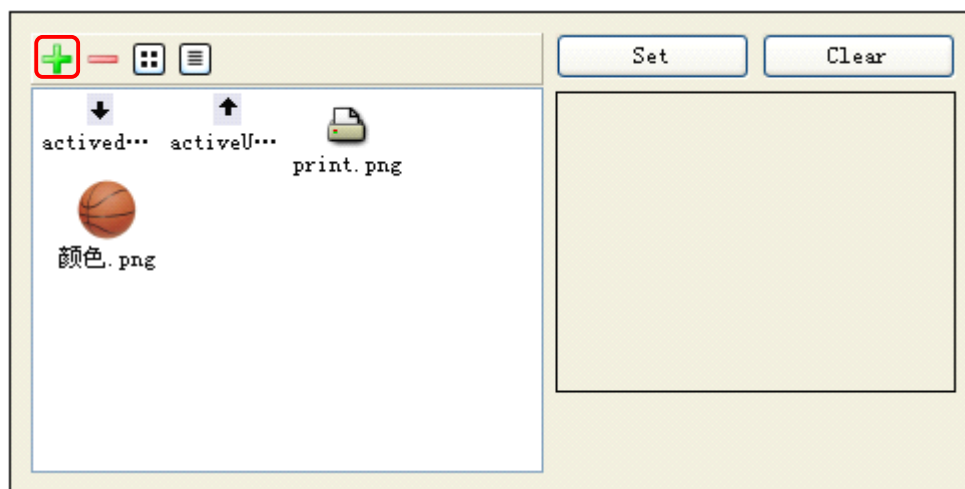
Set Entry:

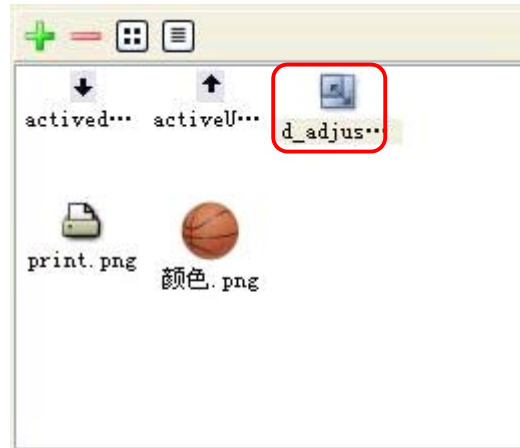
Double-click the cell of Entry, select the picture you want in the drop-down box, then

click button  to assign the picture to the entry, as follows:



If the picture is not in the project, you should add it to the project, click button  of the drop-down dialog to open the File dialog, then double-click the picture you need, at this time the picture is assigned to the Entry and added to the project, see as follows:



**Tip**

Please delete the unnecessary pictures to release the programmer space,click button  to delete the selected pictures.

---

## 11 System functions and Animations

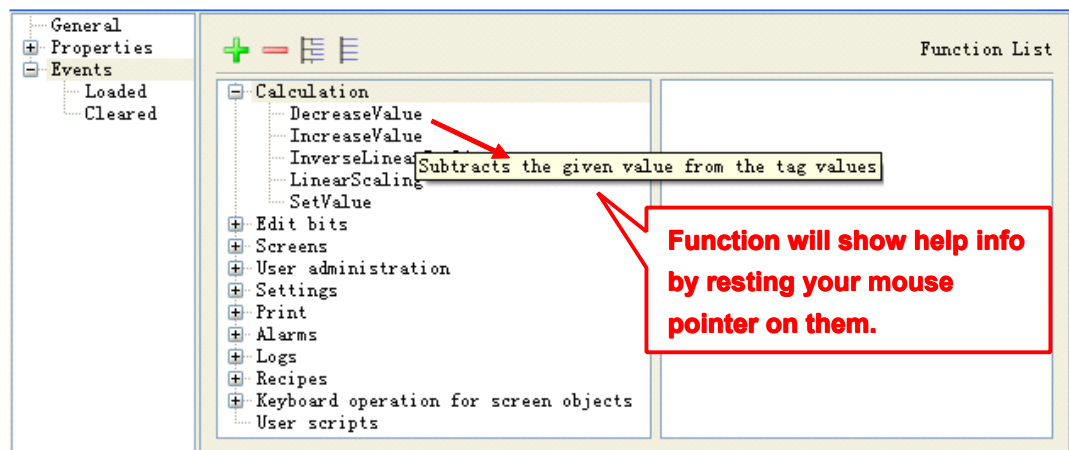
### 11.1 System functions

MagicWorks HMI provides many predefined system functions for common configuration task. You can use them to perform many tasks in Runtime and need no programming skills to do so. System functions can be configured by every event.

#### 11.1.1 Function List and description

Events can configure the system functions, all functions can be configured by any event.

MagicWorks HMI support online help for system function, when the user configure system function, the function will display its help information by resting your mouse pointer on them, see below figure:



Note: You can delete the system function from the function list by the Delete key on the keyboard.

##### 11.1.1.1 Function List

| Function Type | Function Name        | Function Description                                                               |
|---------------|----------------------|------------------------------------------------------------------------------------|
| Calculation   | DecreaseValue        | Subtract the given value from the tag.                                             |
|               | IncreaseValue        | Add the given value to the tag.                                                    |
|               | InverseLinearScaling | Using the given tag Y of the linear function $X = (Y - b) / a$ to calculate tag X. |
|               | LinearScaling        | Using the given tag X of linear function $Y = (a * X) + b$ to calculate tag Y.     |
|               | SetValue             | Assign a value to a given tag.                                                     |

| Function Type       | Function Name             | Function Description                                                                              |
|---------------------|---------------------------|---------------------------------------------------------------------------------------------------|
| Edit bits           | InvertBit                 | Invert the bool type tag.                                                                         |
|                     | InvertBitIntag            | Invert the given bit of the given tag.                                                            |
|                     | ResetBit                  | Set the bool type tag's value to 0(false).                                                        |
|                     | ResetBitIntag             | Set the given bit's value of the given tag to 0(false).                                           |
|                     | SetBit                    | Set the bool type tag's value to 1(true).                                                         |
|                     | SetBitIntag               | Set the given bit's value of the given tag to 1(true).                                            |
| Screens             | ActivePreviousScreen      | Switches to the previously activated screen.                                                      |
|                     | ActiveScreen              | Switch to the specified screen.                                                                   |
|                     | ActiveScreenByNumber      | Switch to the screen which Screen Number is equal to the value of the given tag.                  |
| User administration | GetGroupNumber            | Get the user's group number who has logged on the HMI device, and then write it to the given tag. |
|                     | GetPassWord               | Get the user's password who has logged on the HMI device, and then write it to the given tag.     |
|                     | GetUserName               | Get the user's name who has logged on the HMI device, and then write it to the given tag.         |
|                     | Logoff                    | Logout the current user.                                                                          |
|                     | Logon                     | Login HMI according the established user name and user password stored in two different tags.     |
|                     | ShowLogonDialog           | Show the login dialog.                                                                            |
| Settings            | SetLanguage               | Set the project's display language on the HMI.                                                    |
|                     | Reboot                    | Reboot the HMI system.                                                                            |
|                     | Shutdown PC               | Shutdown PC without prompts(Only under HMI Runtime)                                               |
| Print               | PrintScreen               | Capture the current screen and save it to specific path as a picture file on HMI Runtime system.  |
|                     | PrintAlarm                | Prints the Alarmview contents.                                                                    |
|                     | PrintLog                  | Prints the Dataview contents.                                                                     |
|                     | PrintRecipe               | Prints the Recipeview contents.                                                                   |
|                     | PrintPreviewRuntimeScreen | Print preview the screen displayed on current HMI device (Only under HMI Runtime)                 |
|                     | PrintRuntimeScreen        | Print the screen displayed on current HMI device (Only under HMI Runtime)                         |

| Function Type                         | Function Name              | Function Description                                                                                                             |
|---------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Alarms                                | ClearAlarmBuffer           | Clear all alarms in the alarm buffer.                                                                                            |
|                                       | ShowAlarmWindow            | Hides or shows the alarm window on the HMI device.                                                                               |
| Logs                                  | ClearLog                   | Clear all records of the given log file.                                                                                         |
|                                       | LogTag                     | Store the tag's process value to a given data log file.                                                                          |
|                                       | StartLogging               | Start the given log file's logging, include data logs and alarm logs.                                                            |
|                                       | StopLogging                | Stop the given log file's logging, include data logs and alarm logs.                                                             |
|                                       | OpenAllLogs                | Rebuilt the connection between MagicWorks HMI and Logs, which can keep on logging.                                               |
|                                       | CloseAllLogs               | Disconnect all the connections between MagicWorks HMI and Logs.                                                                  |
| Recipes                               | DeleteDataRecord           | Delete the specified data record or all data records of a recipe.                                                                |
|                                       | GetDataRecordFrom PLC      | Read the given recipe tag's value from PLC and then save them in the specified. Data record of the recipe on HMI storage medium. |
|                                       | GetDataRecordName          | Read the given data record's name of a given recipe and write the recipe's name and data record's name to two specific tags.     |
|                                       | GetDataRecordTags From PLC | Read the recipe tags' values from PLC to update them in screen on HMI runtime system.                                            |
|                                       | LoadDataRecord             | Read specific recipe's data record's values from HMI's storage medium to update the recipe tags in screen.                       |
|                                       | SaveDataRecord             | Save the recipe's tags' value in a given data record storing in HMI's storage medium.                                            |
|                                       | SetDataRecordTagsTo PLC    | Set the recipe tag's value to PLC which is communicating with HMI.                                                               |
|                                       | SetDataRecordTo PLC        | Set the data record of a recipe to the PLC which is communicating with HMI.                                                      |
|                                       | SetRecipeTags              | Set the recipe tags' status to online or offline.                                                                                |
| Keyboard operation for screen objects | AlarmViewAcknowledgeAlarm  | Acknowledges the alarms selected in the given alarm view.                                                                        |
|                                       | AlarmViewShowOperatorNotes | Displays the configured operator notes of the alarm selected in the given alarm screen.                                          |
|                                       | RecipeViewDeleteDataRecord | Delete the data record which is currently displayed in the recipe view.                                                          |

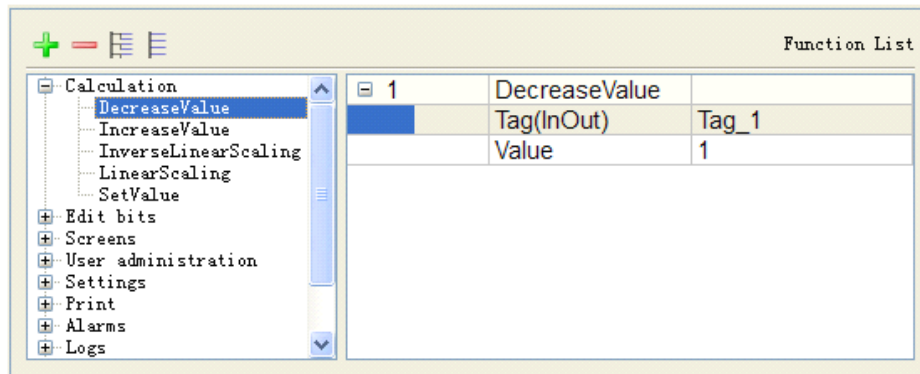
| Function Type                         | Function Name                           | Function Description                                                                                                        |
|---------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Keyboard operation for screen objects | RecipeViewGetDataRecordFromPLC          | Transfer the data record that is currently loaded in the PLC to the HMI device and displays it in the recipe view.          |
|                                       | RecipeViewNewDataRecord                 | Create a new data record in the given recipe view.                                                                          |
|                                       | RecipeViewSaveAsDataRecord              | Saves the data record currently being displayed in the recipe view under a new name.                                        |
|                                       | RecipeViewSaveDataRecord                | Saves the data record currently being displayed in the recipe view.                                                         |
|                                       | RecipeViewSetDataRecordToPLC            | Transfer the data record which is currently displayed in the recipe view to the PLC.                                        |
|                                       | RecipeViewShowOperatorNotes             | Displays the configured infotext of the given recipe view.                                                                  |
|                                       | RecipeViewSynchronizeDataRecordWithTags | Synchronizes the values of the data record which is currently displayed in the recipe view with their recipe tags.          |
|                                       | TrendViewBackToBeginning                | Scrolls to the beginning of the trend recording in trend view. The start values of the trend recording are displayed there. |
|                                       | TrendViewRulerBackward                  | Moves the read-line backwards(to the left) in the trend view.                                                               |
|                                       | TrendViewRulerForward                   | Moves the read-line forwards(to the right) in the trend view.                                                               |
|                                       | TrendViewScrollBack                     | Scrolls back one display width to the left in the trend view.                                                               |
|                                       | TrendViewScrollForward                  | Scrolls forward one display width to the left in the trend view.                                                            |
|                                       | TrendViewSetRulerMode                   | Hides or shows the read-line in the trend view. the read-line displays the Y value beginning to the X value.                |
|                                       | TrendViewStartStop                      | Stops the trend recording or continues the trend recording in the trend view.                                               |
| Simple Realtime Bit TrendView         | Start Realtime Bit Trend                | Start to data acquisition                                                                                                   |
|                                       | Stop Realtime Bit Trend                 | Stop to data acquisition                                                                                                    |
|                                       | Clear Realtime Bit Trend                | Clear to data buffer                                                                                                        |

| Function Type              | Function Name        | Function Description                                                                           |
|----------------------------|----------------------|------------------------------------------------------------------------------------------------|
| Log Trend View             | ShowMainGrid         | Show the main grid (Only under HMI Runtime)                                                    |
|                            | HideMainGrid         | Hide the main grid (Only under HMI Runtime)                                                    |
|                            | ShowMinGrid          | Show the min grid (Only under HMI Runtime)                                                     |
|                            | HideMinGrid          | Hide the min grid (Only under HMI Runtime)                                                     |
|                            | QueryHistoryLog      | Query the data between start time and end time (Only under HMI Runtime)                        |
|                            | ZoomInCurve          | Zoom in current curve (Only under HMI Runtime)                                                 |
|                            | ZoomOutCurve         | Zoom out current curve (Only under HMI Runtime)                                                |
|                            | SwitchToInitialPage  | Switch to the initial page (Only under HMI Runtime)                                            |
| Reflow Realtime Trend View | ShowReflowMainGrid   | Show the main grid (Only under HMI Runtime)                                                    |
|                            | HideReflowMainGrid   | Hide the main grid (Only under HMI Runtime)                                                    |
|                            | ShowReflowMinGrid    | Show the min grid (Only under HMI Runtime)                                                     |
|                            | HideReflowMinGrid    | Hide the min grid (Only under HMI Runtime)                                                     |
|                            | StartReflowTrendView | Start to gather data (Only under HMI Runtime)                                                  |
|                            | StopReflowTrendView  | Stop to gather data (Only under HMI Runtime)                                                   |
|                            | ZoomInReflowCurve    | Zoom in current Curve (Only under HMI Runtime)                                                 |
|                            | ZoomOutReflowCurve   | Zoom out current curve (Only under HMI Runtime)                                                |
|                            | RestoreReflowCurve   | Restore X-axis coordinate (Only under HMI Runtime)                                             |
|                            | OpenReflowCurve      | Open the existing data (Only under HMI Runtime)                                                |
|                            | SaveReflowCurve      | Save the current data (Only under HMI Runtime)                                                 |
|                            | SetBorderValue       | Set the border value, the cross-border time is related to this value. (Only under HMI Runtime) |
|                            | ShowFirstRuler       | Show the first ruler (Only under HMI Runtime)                                                  |
|                            | HideFirstRuler       | Hide the first ruler (Only under HMI Runtime)                                                  |
|                            | ShowSecondRuler      | Show the second ruler (Only under HMI Runtime)                                                 |
|                            | HideSecondRuler      | Hide the second ruler (Only under HMI Runtime)                                                 |

### 11.1.1.2 Function parameter descriptions

#### DecreaseValue

Subtract the given value from the tag.



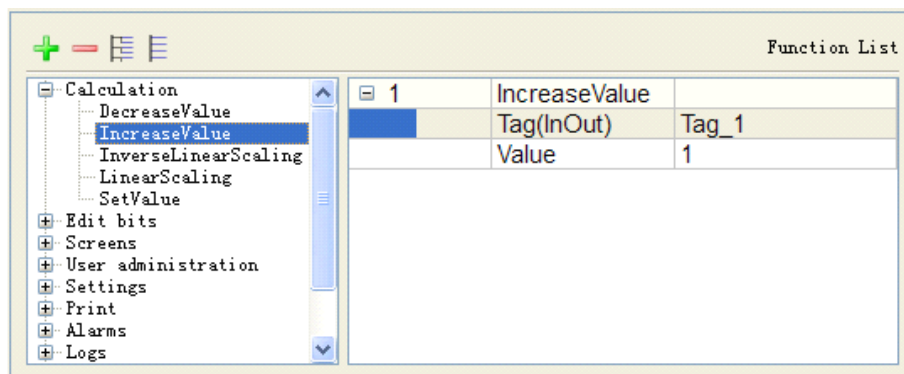
Tag(InOut):The tag will be assigned a given value.

Value:Constant or a tag,the value Tag(InOut) will be decreased.

If 'X' represents 'Tag(InOut)', 'a' represents 'Value' with a, the function is  $X = X - a$ .

### IncreaseValue

Add the given value to the tag.



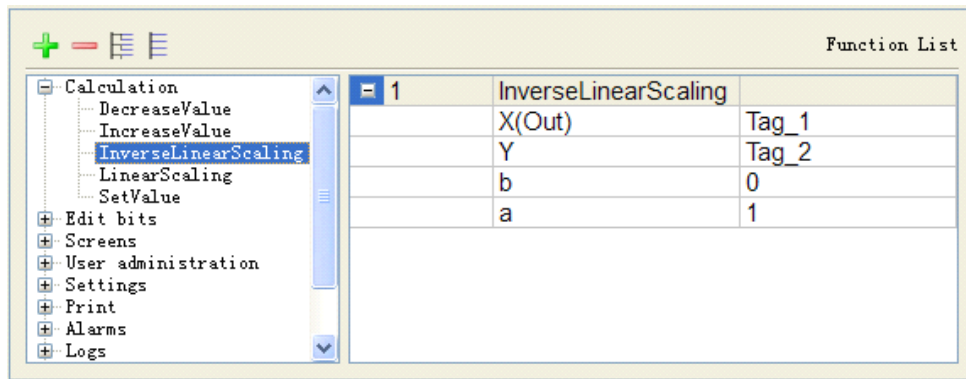
Tag(InOut):The tag will be assigned a given value.

Value:Constant or a tag,the value Tag(InOut) will be increased.

If 'X' means 'Tag(InOut)', 'a' means 'Value' with a, the function is  $X = X + a$ .

### InverseLinearScaling

Using the given tag Y of the linear function  $X = (Y - b) / a$  to calculate tag X.



X(Out):The tag will be assigned the value outputed by the linear equation  $X = (Y - b) / a$ .

Y:The tag used to calculate.

b:Subtrahend, constant or tag.

a:Divisor,constant or tag.

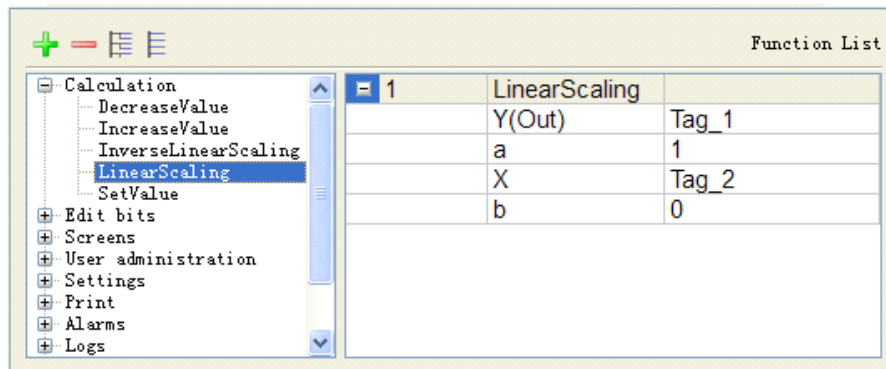


#### Tip

X(Out) and Y can't be the same tag.

### LinearScaling

Using the given tag X of linear function  $Y = (a * X) + b$  to calculate tag Y.



Y(Out):The tag will be assigned the value outputed by the linear equation  $Y = (a * X) + b$ .

X:The tag used to calculate.

a:The value of the multiplier,constant or tag.

b:The value of the addend,constant or tag.

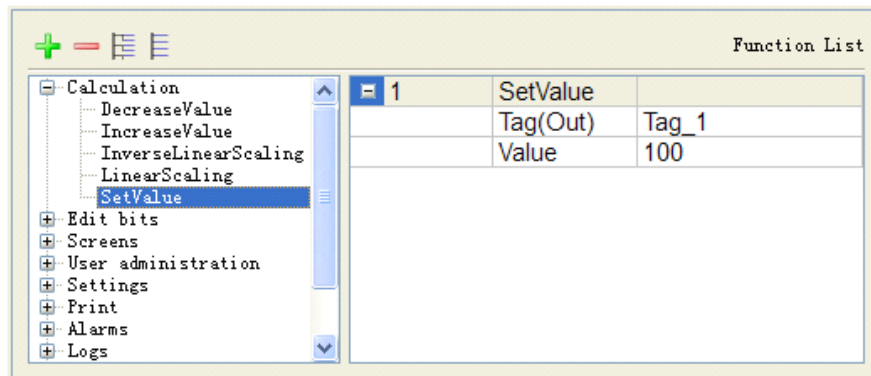


#### Tip

Y(Out) and X can't be the same tag.

## SetValue

Assign a value to a given tag.



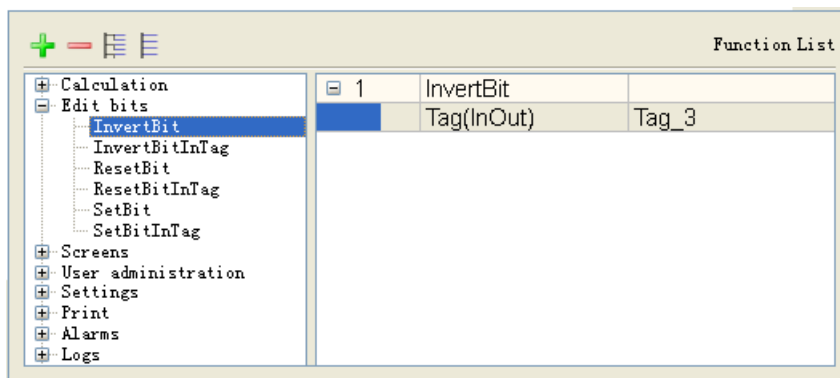
Tag(Out):The tag will be assigned a given value.

Value:Constant or a tag,the value Tag(InOut) will be increased.

If 'X'means 'Tag(InOut)', 'a' means 'Value' with a, the function is  $X = a$ .

## InvertBit

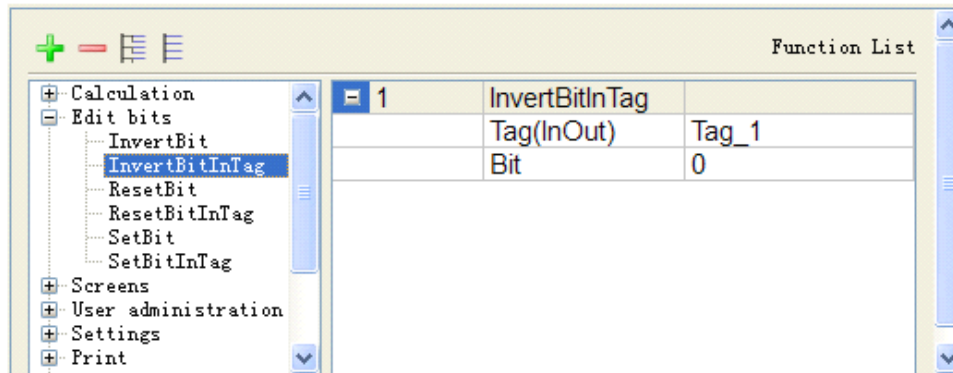
Invert the bool type tag. If its value is 1(true), after the implementation of the function, it value will be 0(false), and vice versa.



Tag(InOut):The tag will be inverted, it must be bool teyp tag.

## InvertBitIntag

Invert the given bit of the given tag,and don't affect the other bits of the tag. If the bit's value is 1(true), after the implementation of the function, it's value will be 0(false), and vice versa.

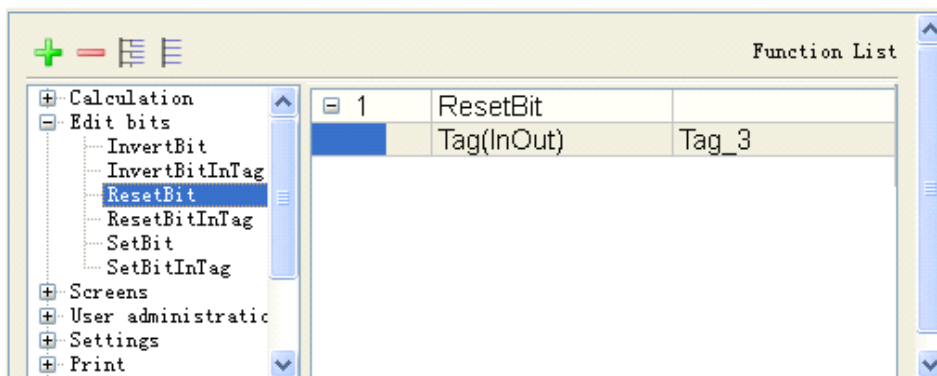


Tag(InOut):The tag what's bit will be inverted

Bit:The bit of the Tag(InOut) will be inverted, it must be constant,and less than or equal the tag's bits.

### ResetBit

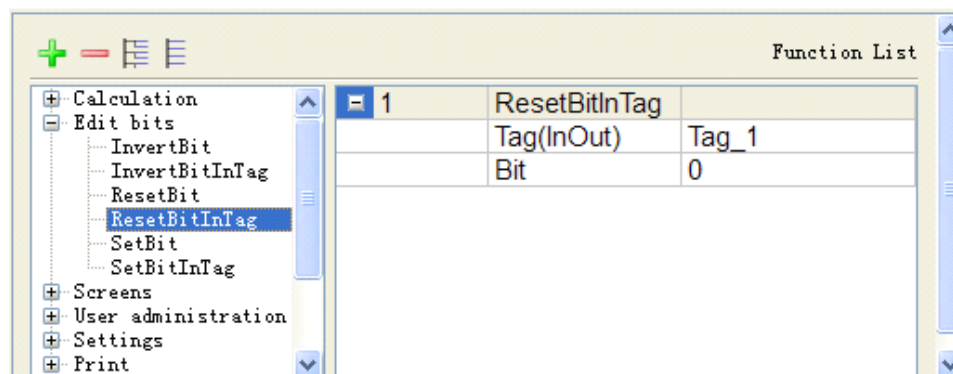
Set the bool type tag'value to 0(false).



Tag(InOut):The bool type tag to be reset,it must be bool type tag.

### ResetBitInTag

Set the given bit'value of the given tag to 0(false), and don't affect the other bits of the tag.

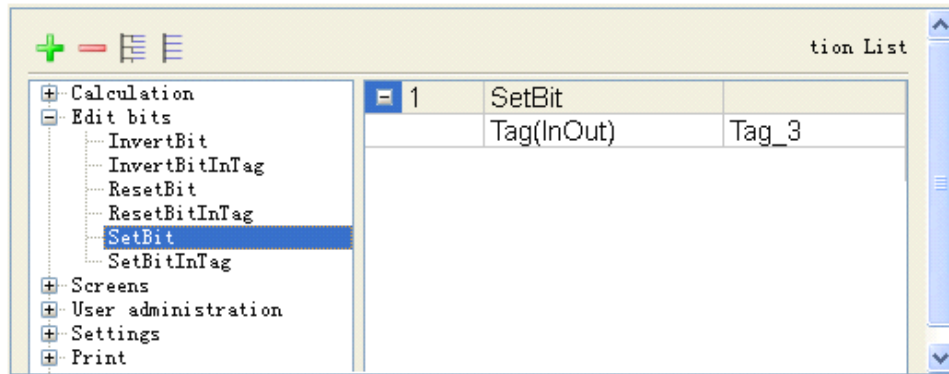


Tag(InOut):The tag will be reset.

Bit: The bit of the Tag(InOut) will be reset, it must be constant, and less than or equal to the tag's bits.

### SetBit

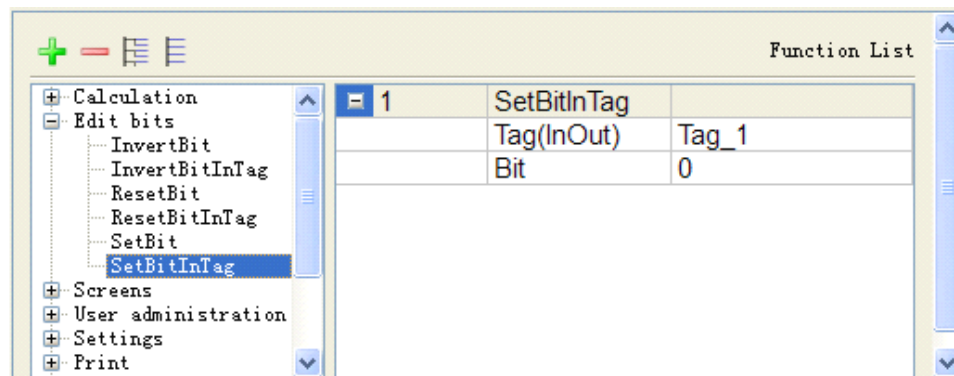
Set the bool type tag's value to 1(true).



Tag(InOut): The bool type tag to be set 1(true), it must be bool type tag.

### SetBitInTag

Set the given bit's value of the given tag to 1(true), and don't affect the other bits of the tag.

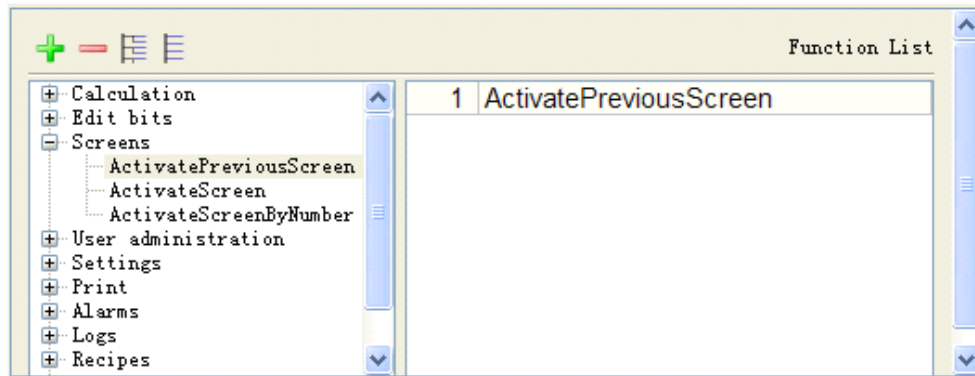


Tag(InOut): The tag will be set.

Bit: The bit of the Tag(InOut) will be set, it must be constant, and less than or equal to the tag's bits.

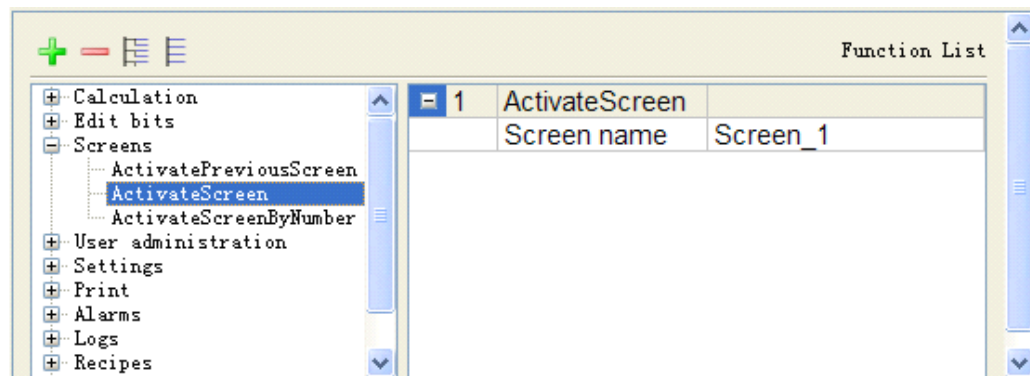
### ActivatePreviousScreen

Switch to the previously activated screen.



### ActivateScreen

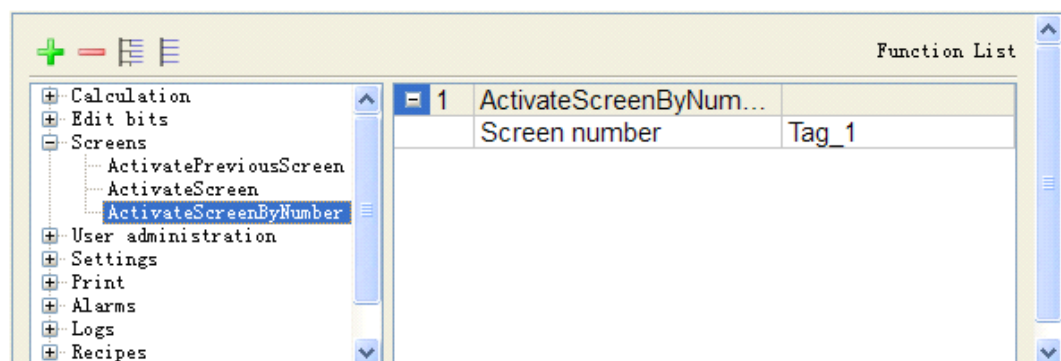
Switch to the specified screen.



Screen name: The name of the screen which you want to switch to, it must be the name of an existing screen.

### ActivateScreenByNumber

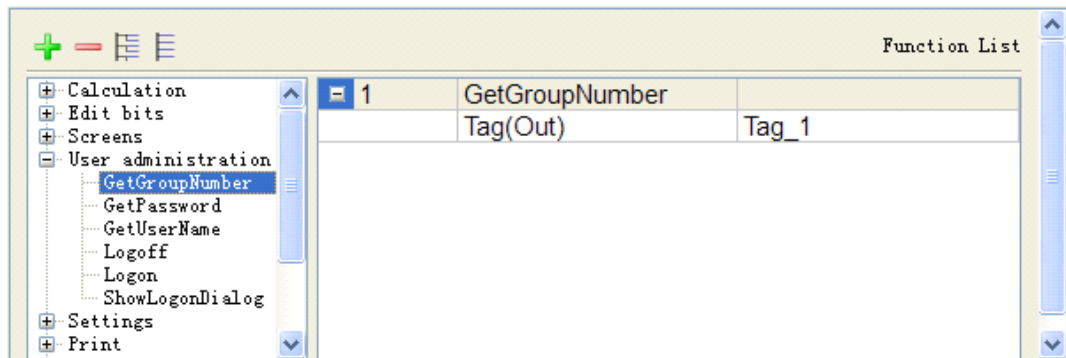
Switch to the screen which Screen Number is equal to the value of the given tag.



Screen number: The tag includes the screen's number which you want to switch to.

### GetGroupNumber

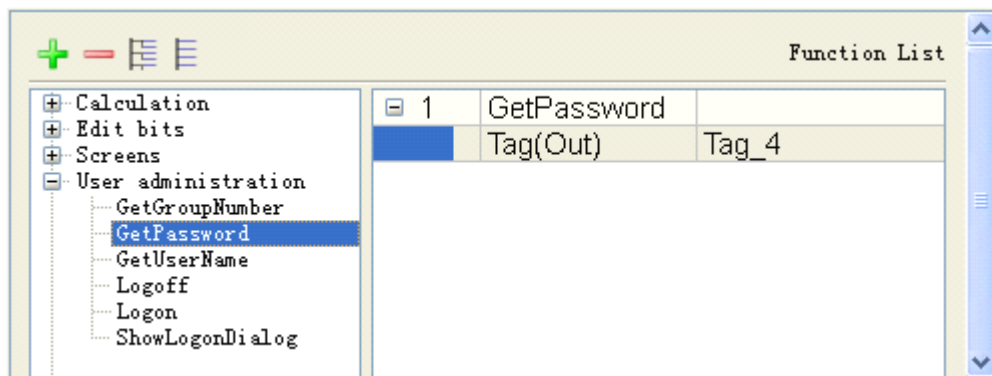
Get the user's group number who has logged on HMI, and then write it to the given tag.



Tag(Out):The tag to store the user's group number who has logged on HMI.

### GetPassWord

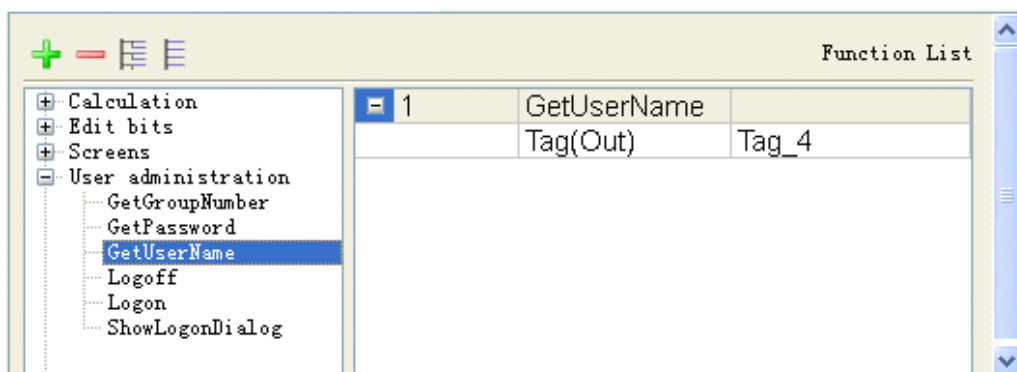
Get the user's password who has logged on the HMI device, and then write it to the given tag.



Tag(Out):The tag to store the user's password who has logged on HMI. It must be string type tag.

### GetUserName

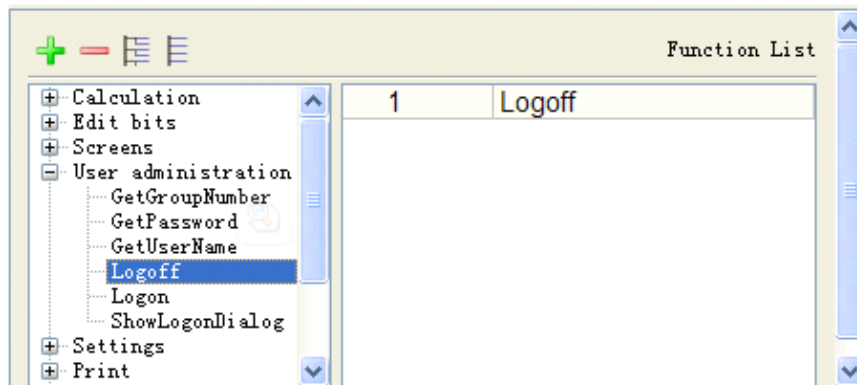
Get the user's name who has logged on the HMI device, and then write it to the given tag.



Tag(Out):The tag to store the user's name who has logged on HMI. It must be string type tag.

## Logoff

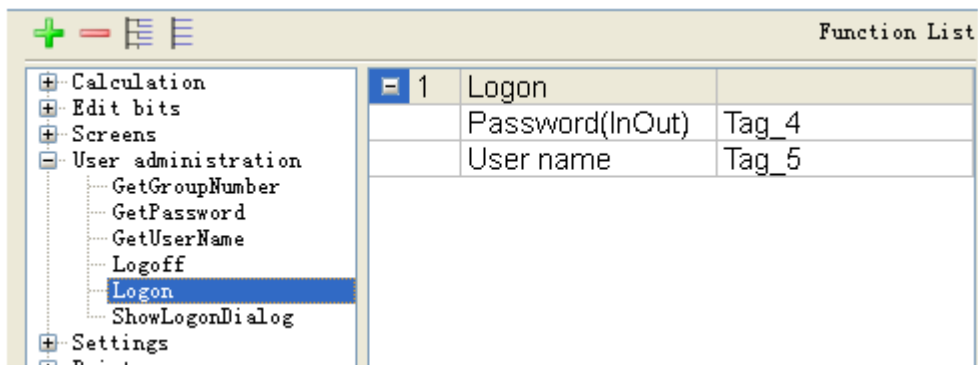
Logout the current user.



This function has no parameters.

## Logon

Login HMI according the established user name and user password stored in two different tags.



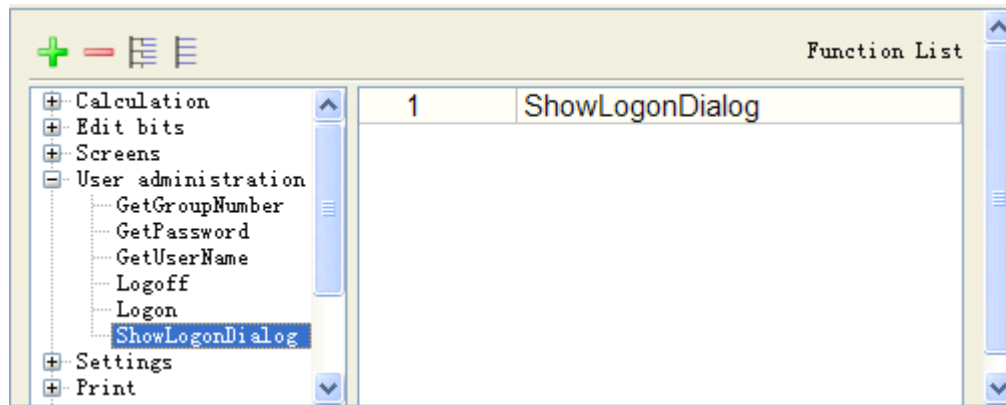
Password: The tag used to store the user's password who wants to log on HMI.

User name: The tag used to store the user's name who wants to log on HMI.

The above two tags must be different string tags.

## ShowLogonDialog

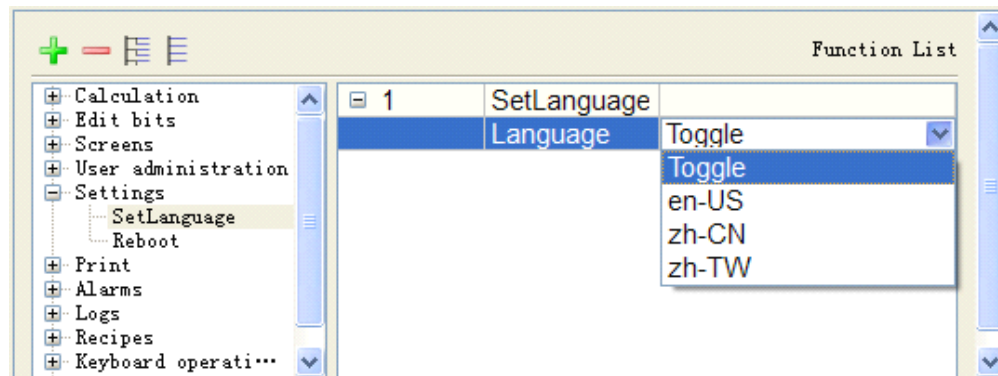
Show the login dialog.



This function has no parameters.

### SetLanguage

Set the project's display language on the HMI.

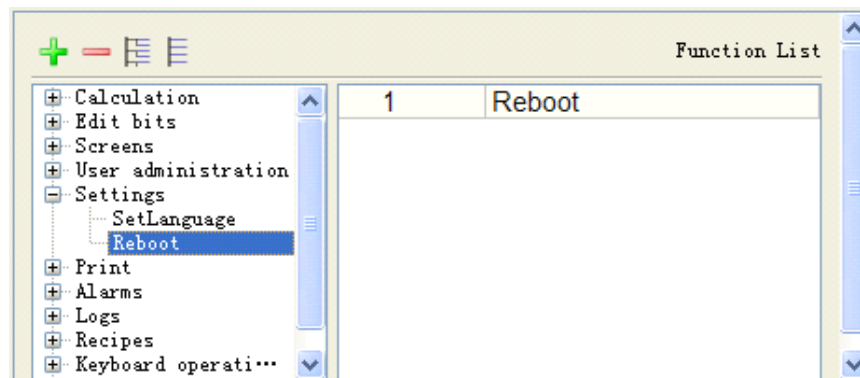


Language: A language you have configured in the project or 'Toggle'.

'Toggle' means switching between all languages you have configured by cycle.

### Reboot

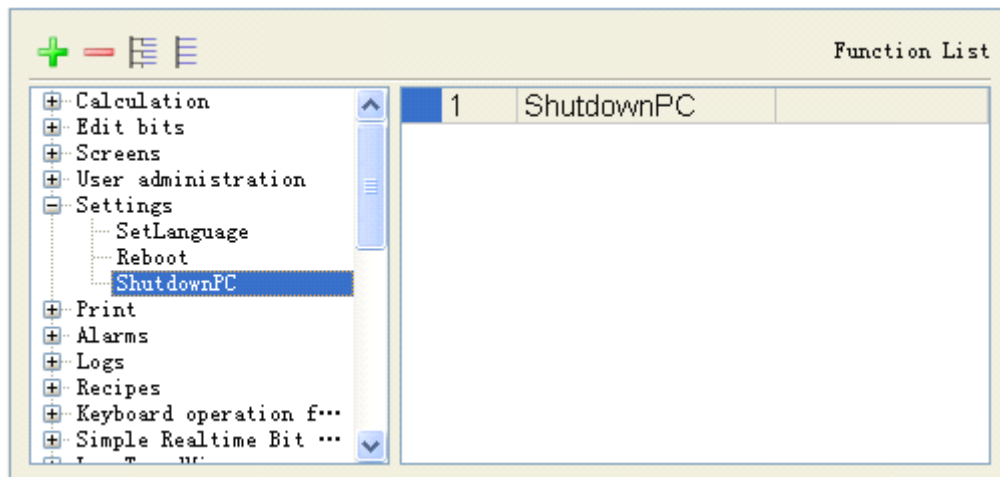
Reboot the HMI system.



This function has no parameters.

### Shutdown PC

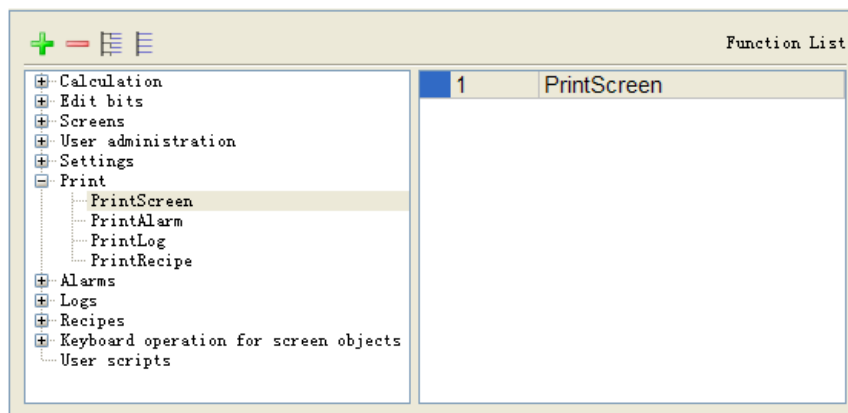
Shutdown PC without prompts(Only under HMI Runtime)



### PrintScreen

Capture the current screen and save it to specific path as a picture file on HMI Runtime system. The file's path and name will be specified by the operator on the simulation runtime system, but on HMI Runtime system, and the file name will be automatically named, and will be automatically saved to the root directory of USB memory. The file is named like this: ScreenNumber\_time.png, ex.

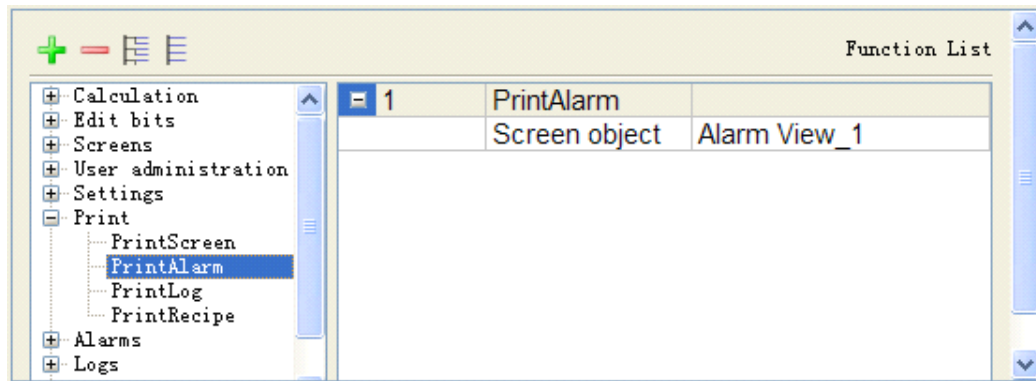
1\_20100422143558.png. In the whole process, Runtime system has no messages.



This function has no parameters.

### PrintAlarm

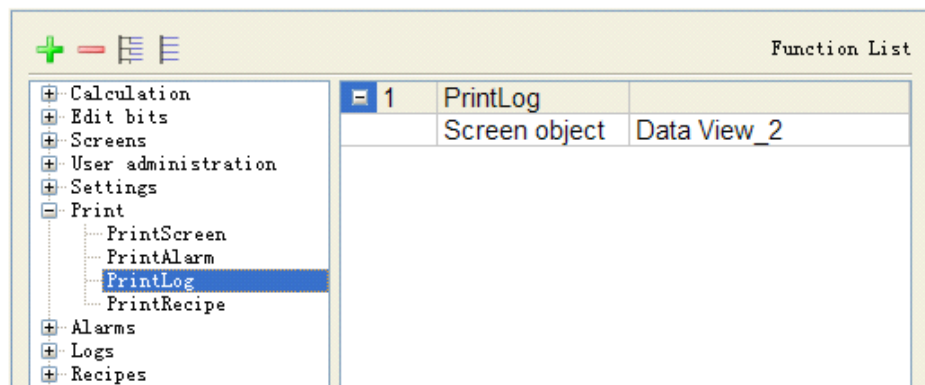
Prints the Alarmview contents.



Screen object:Current Alarm View.

### PrintLog

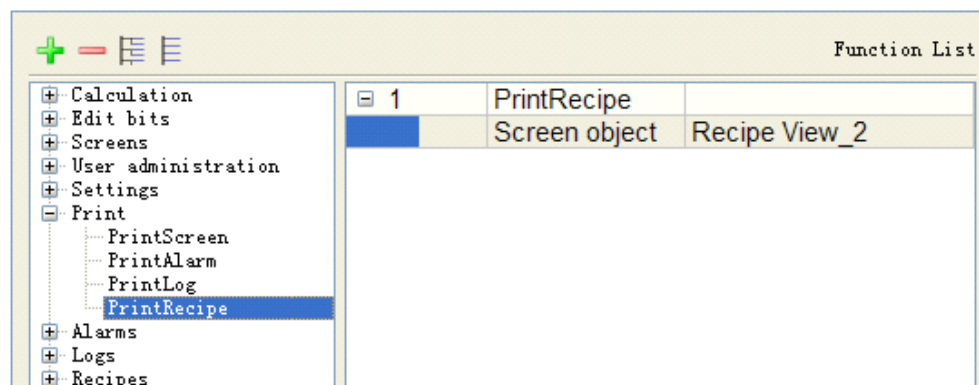
Prints the Dataview contents



Screen object:Current Data View.

### PrintRecipe

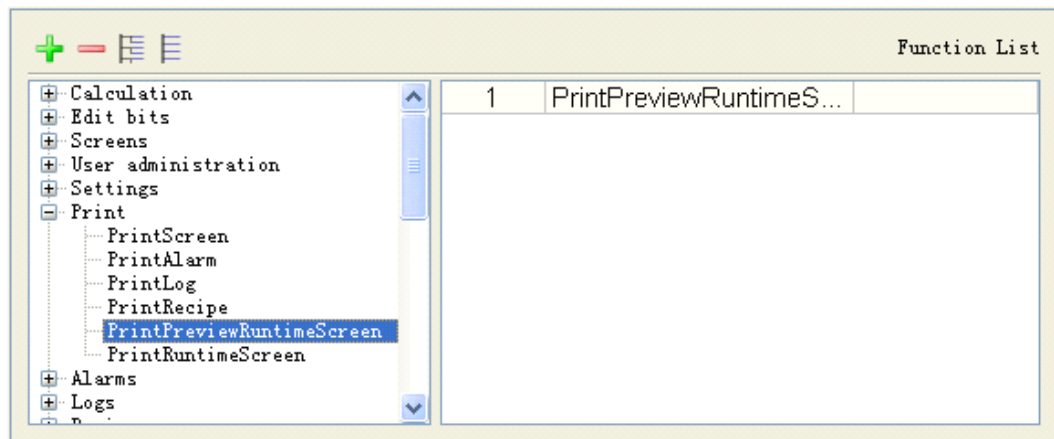
Prints the Recipeview contents



Screen object:Current Recipe View.

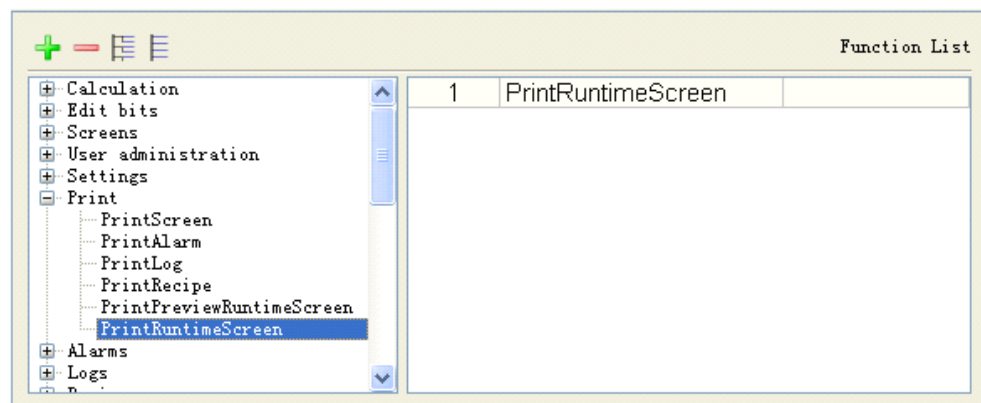
### PrintPreviewRuntimeScreen

Print preview the screen displayed on current HMI device (Only under HMI Runtime)



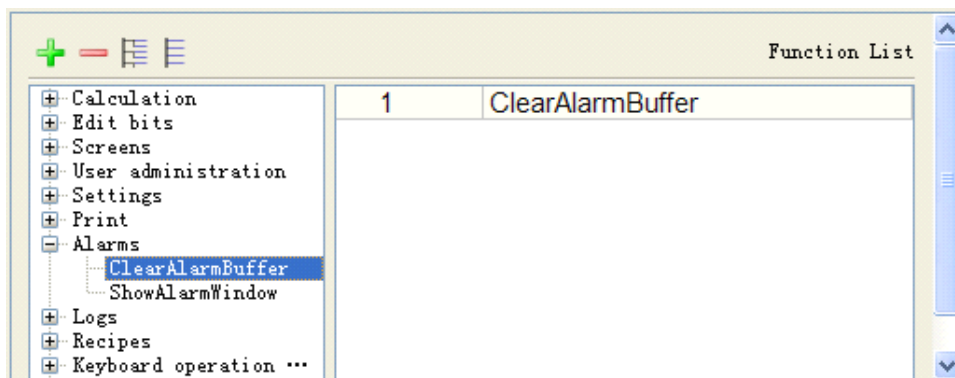
### PrintRuntimeScreen

Print the screen displayed on current HMI device (Only under HMI Runtime)



### ClearAlarmBuffer

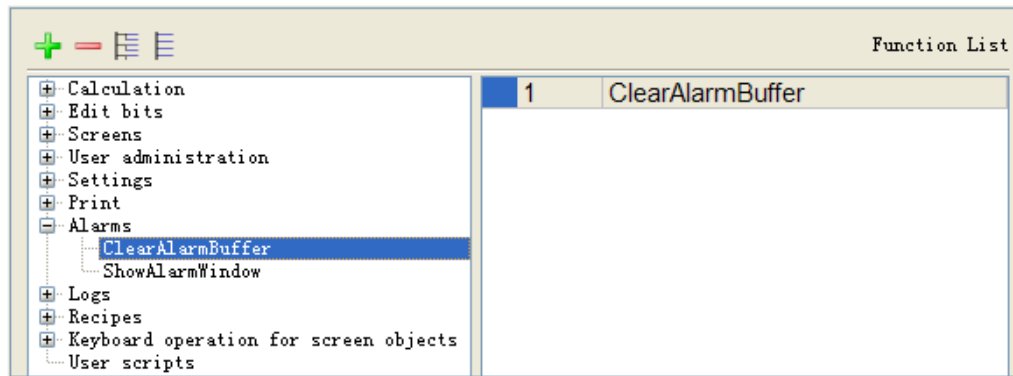
Clear all alarms in the alarm buffer.



This function has no parameters.

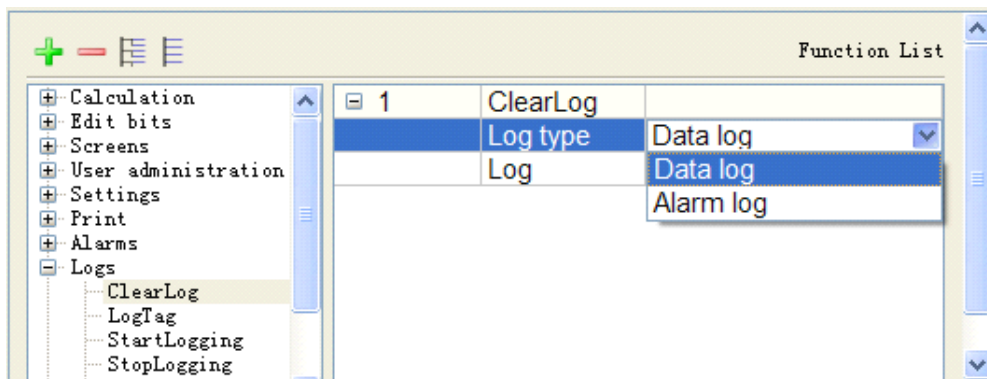
### ShowAlarmWindow

Hides or shows the alarm window on the HMI device.



### ClearLog

Clear all records of the given log file,log type includes data logs and alarm logs.

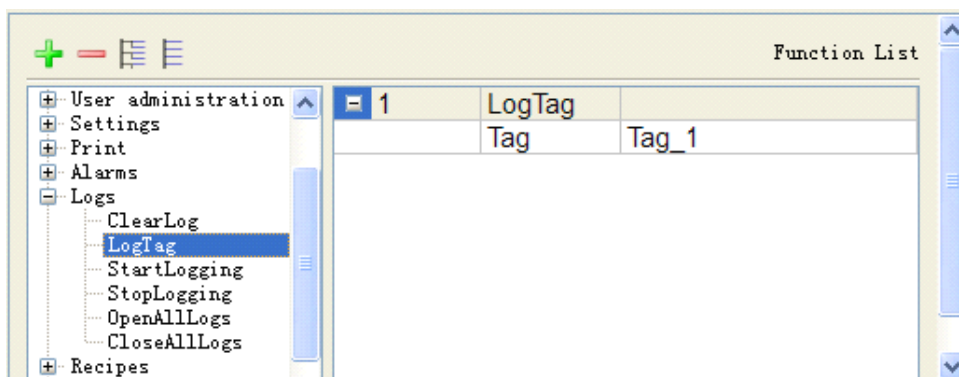


Log type:The type of the log you want to clear,two types,Data logs or Alarm logs.

Log:The name of the log you want to clear.

### LogTag

Store the tag' process value to a given data log file.

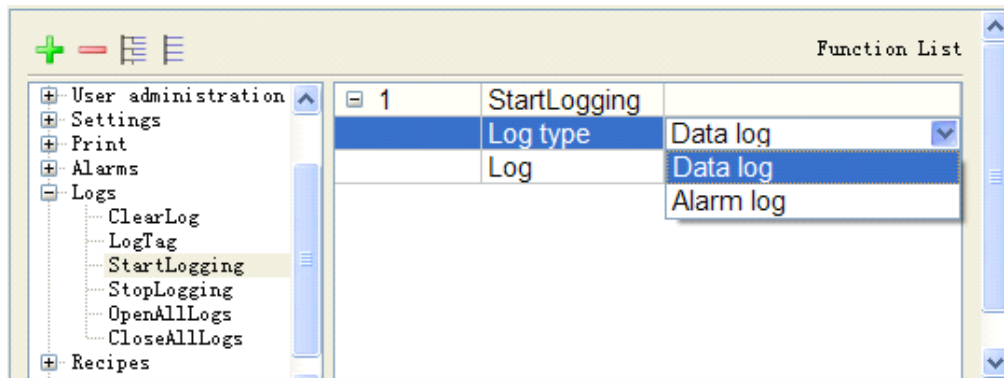


Tag:The tag to be recorded.

### StartLogging

Start the given log file 's logging,include data logs and alarm logs.

You can stop the log file's logging by using function StopLogging.



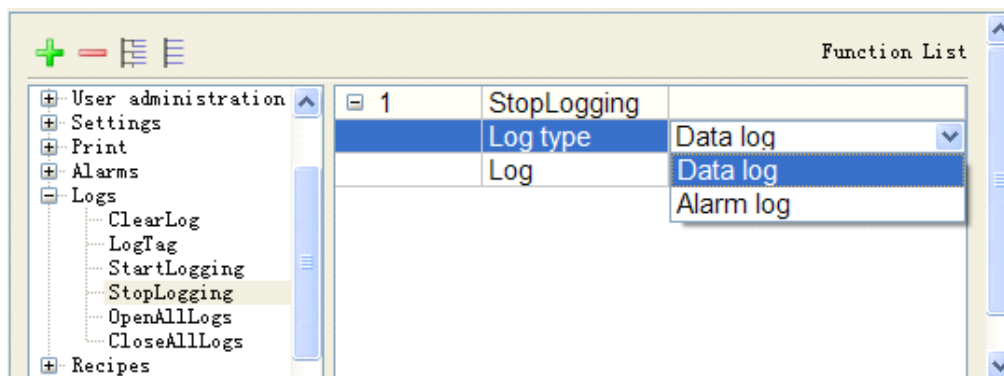
Log type: The type of the log you want to clear, two types, Data logs or Alarm logs.

Log: The name of the log you want to clear.

### StopLogging

Stop the given log file's logging.

You can start the log file's logging by using function StopLogging.

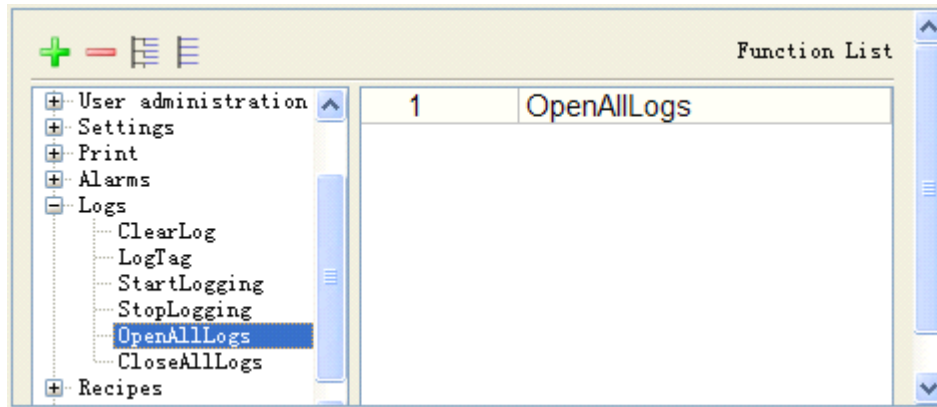


Log type: The type of the log you want to clear, two types, Data logs or Alarm logs.

Log: The name of the log you want to clear.

### OpenAllLogs

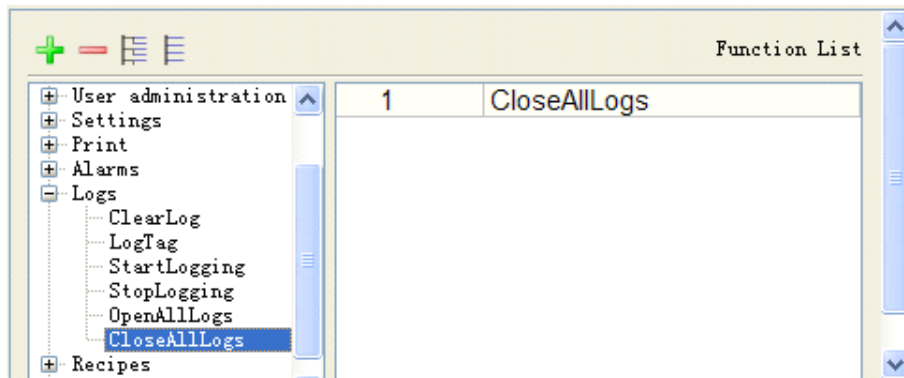
Permit all log files's logging. You can prohibit the log file's logging by using function StartLogging.



This function has no parameters.

### CloseAllLogs

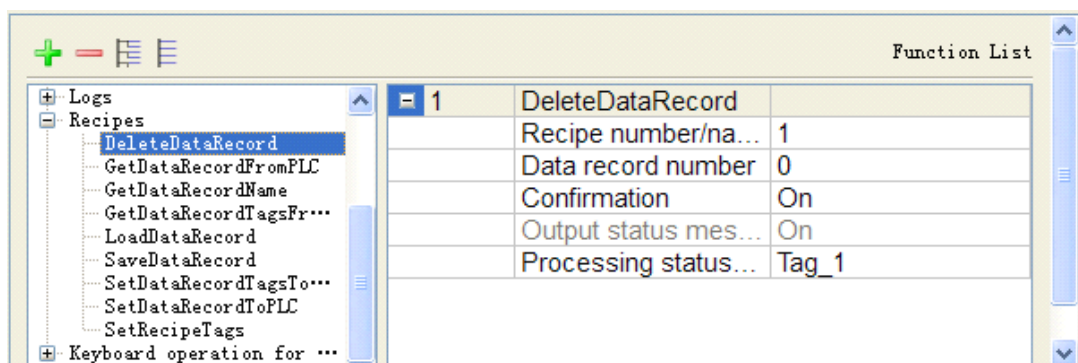
Prohibit all log files's logging. Befroe the next logging it must be open by using function OpenAllLogs.



This function has no parameters.

### DeleteDataRecord

Delete the specified data record or all data records of a recipe or all recipes. Using this function you can delete the specific data record of the specific recipe,delete all recipes's specific data records,delete all recipes's all data records.



Rcipe number/name:The number or the name of the recipe which data record to be deleted.you can input the number.If you want to delete all recipes's specific data

record,you should input number '0'.

Data record number:The number or the name of the data record to be deleted.If you want to delete all data records of a recipe,you should input number '0'.

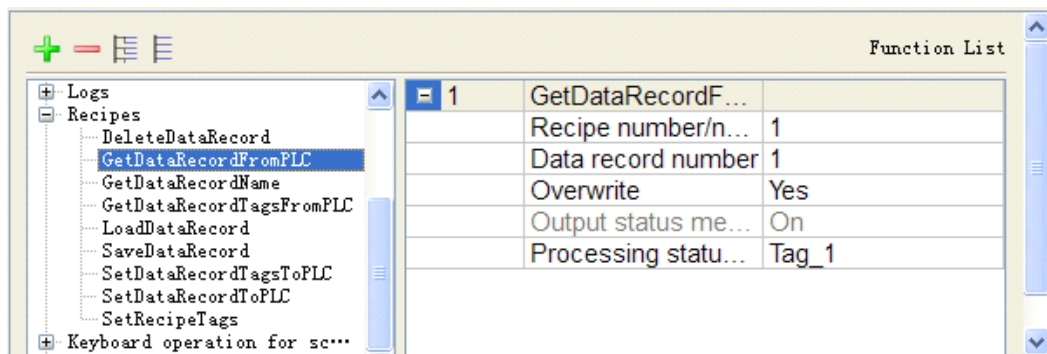
Confirmation:Confirm whether the delete operate needs to be confirmed,two choices,'On' need to confirm,Off don't need to confirm.

Output status message:Confirm whether output status message after the delete operate.Default on,outputing status message.

Processing status(Out,optional):The processing status of the function.Default 'No value',don't output processing status. There are three status, represented by three different numbers,number '2' means the function is processing,number'4' means the function completed successfully,number'12' means the function did not complete for errors. The processing status will be output to the interger tag you configured.The meaning of status parameter: 2 = The system function is processing. 4 = The system function has been finished. 12 = The system function has not executed due to errors.

### GetDataRecordFromPLC

Read the given recipe tag'svalue of PLC and then save them in the specified.data record of the recipe on HMI stroage medium.



Rcipe number/name:The number or the name of the recipe which data record will be saved.You can input the number or select an exist recipe from the drop-down list.It must be the existing recipe.

Data record number:The number or the name of the data record to be saved. You can input the number or select an exist data record from the drop-down list.

Overwrite:Confirm whether overwrite the existing data record of the configured recipe.

There are three choices, 'No','Yes','With confirmation'.

'No':Don't overwrite the data record.

'Yes':Overwrite the data record.

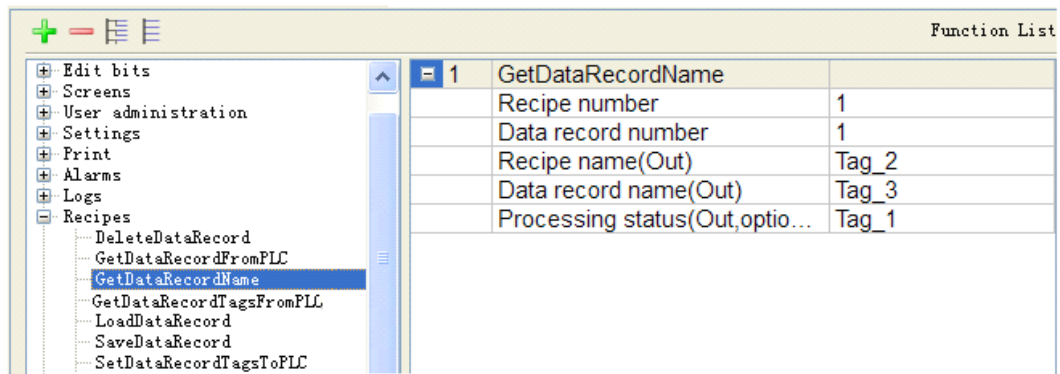
'With confirmation':Whether overwrite the data record depends user.There will show a confirm dialog box to be confirmed by user before write the data record.

Output status message:Confirm whether output status message after the delete operate.Default on,outputing status message.

Processing status(Out,optional):The processing status of the function,the same as function 'DeleteDataRecord'. The meaning of status parameter : 2 = The system function is processing. 4 = The system function has been finished. 12 = The system function has not executed due to errors.

### GetDataRecordName

Read data record's name of a given recipe and write the recipe's name and data record's name to two specific tags.



| Function List |                                |
|---------------|--------------------------------|
| 1             | GetDataRecordName              |
|               | Recipe number                  |
|               | Data record number             |
|               | Recipe name(Out)               |
|               | Data record name(Out)          |
|               | Processing status(Out,optio... |

Recipe number:The number or the name of the recipe which data record to be read.

Data record number:The number or the name of the data record to be read.

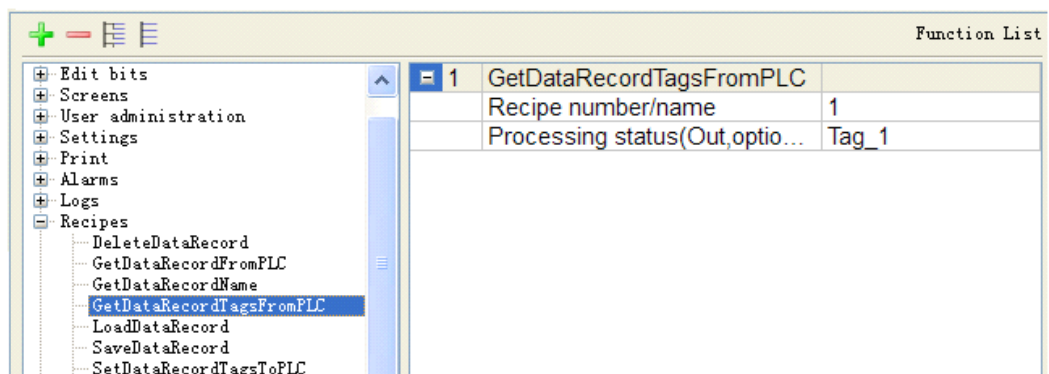
Recipe name(Out):The tag will be written with the recipe name.It 's Data type must be String.

Data record name(Out):The tag will be written with the data record name.It 's Data type must be String.

Processing status(Out,optional):The processing status of the function,the same as function 'DeleteDataRecord'. The meaning of status parameter : 2 = The system function is processing. 4 = The system function has been finished. 12 = The system function has not executed due to errors.

### GetDataRecordTagsFromPLC

Read the recipe tags's value from PLC to update them in screen on HMI runtime system.



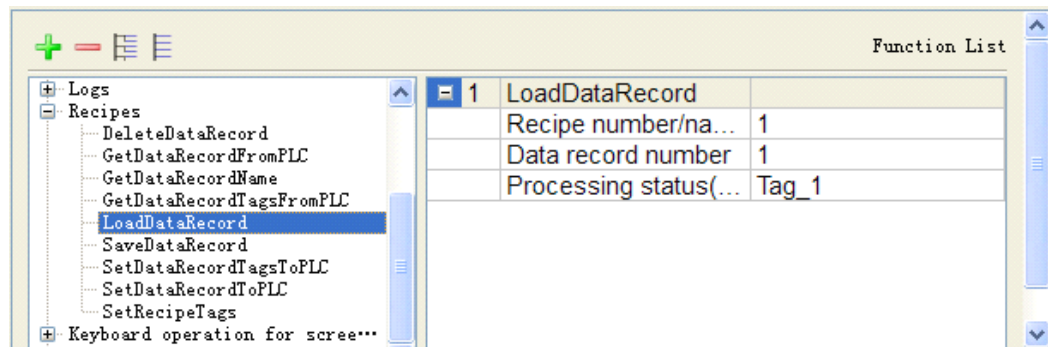
| Function List |                                |
|---------------|--------------------------------|
| 1             | GetDataRecordTagsFromPLC       |
|               | Recipe number/name             |
|               | Processing status(Out,optio... |

Rcipe number/name:The number or the name of the recipe which will be read.

Processing status(Out,optional):The processing status of the function,the same as function 'DeleteDataRecord'. The meaning of status parameter : 2 = The system function is processing. 4 = The system function has been finished. 12 = The system function has not executed due to errors.

### LoadDataRecord

Read specific recipe's data record's values from HMI's storage medium to update the recipe tags in screen.



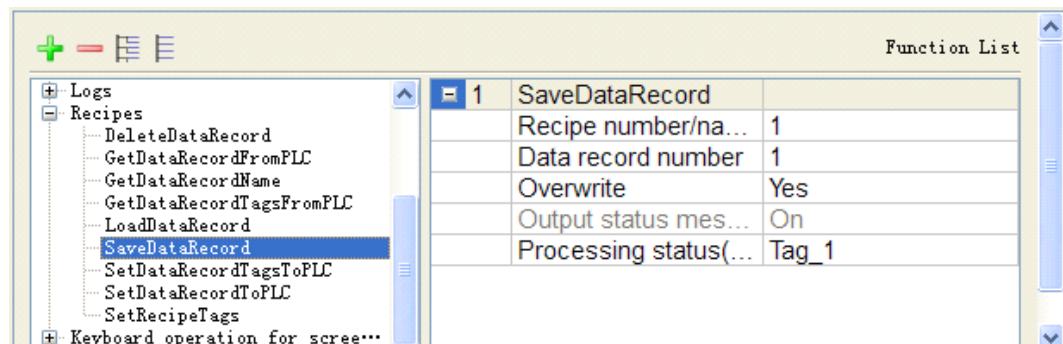
Rcipe number/name:The number or the name of the recipe which will be loaded.

Data record number:The number or the name of the data record to be loaded.

Processing status(Out,optional):The processing status of the function, the same as function 'DeleteDataRecord'. The meaning of status parameter: 2 = The system function is processing. 4 = The system function has been finished. 12 = The system function has not executed due to errors.

### SaveDataRecord

Save the recipe tag's value in a given data record which stored in HMI's storage medium.



Rcipe number/name:The number or the name of the recipe which will be saved.

Ddata record number:The number or the name of the data record which will be saved.

Overwrite:Confirm whether overwrite the existing data record of the configured recipe.

There are three choices, 'No', 'Yes', 'With confirmation'.

'No':Don't overwrite the data record.

'Yes':Overwrite the data record.

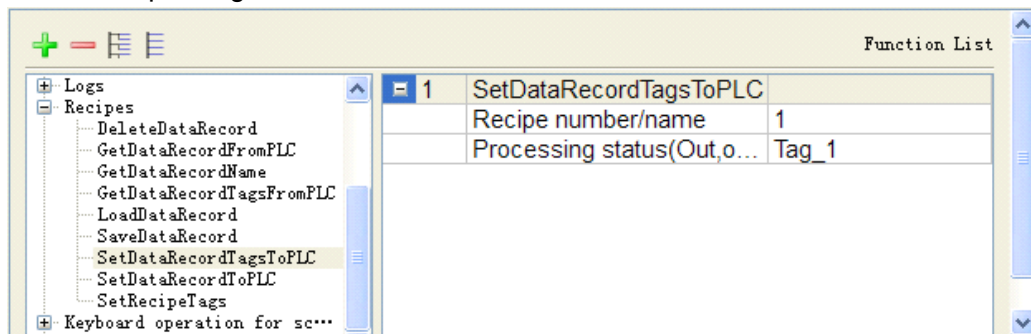
'With confirmation':Whether overwrite the data record depends user.There will show a confirm dialog box to be confirmed by user before write the data record.

Output status message:Confirm whether output status message after the delete operate.Default on,outputing status message.

Processing status(Out,optional):The processing status of the function,the same as function 'DeleteDataRecord'. The meaning of status parameter : 2 = The system function is processing. 4 = The system function has been finished. 12 = The system function has not executed due to errors.

### SetDataRecordTagsToPLC

Set the recipe's tag value to PLC which are communicate with HMI.

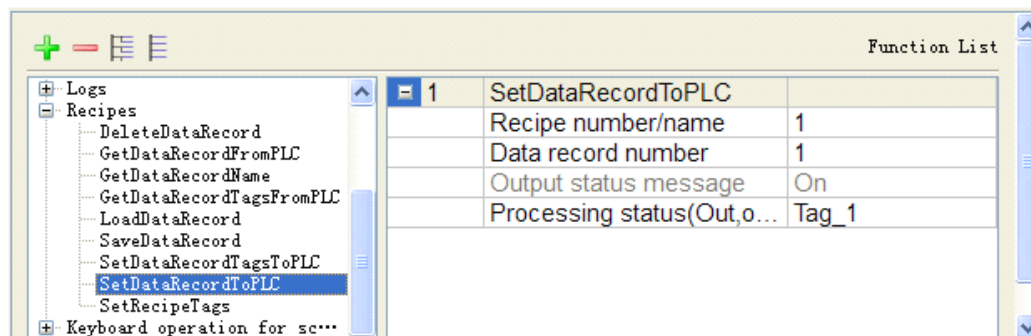


Rcipe number/name:The number or the name of the recipe which will be set.

Processing status(out,optional):The processing status of the function,the same as function 'DeleteDataRecord'. The meaning of status parameter : 2 = The system function is processing. 4 = The system function has been finished. 12 = The system function has not executed due to errors.

### SetDataRecordToPLC

Set the data record of a recipe to the PLC which are communicated with HMI.



Rcipe number/name:The number or the name of the recipe which will be set.

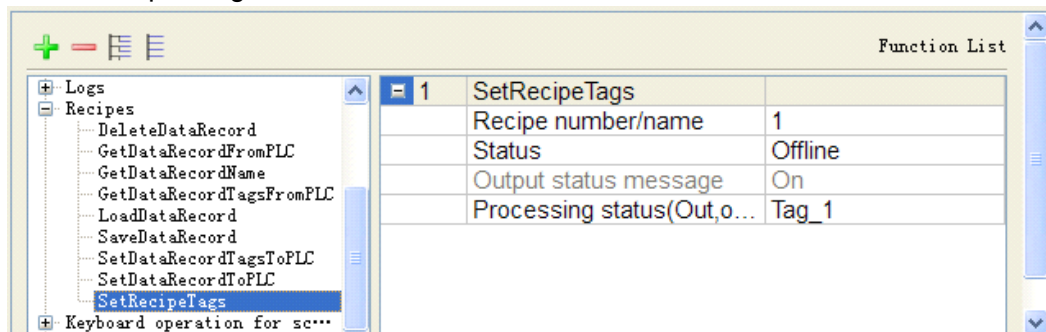
Data record number:The number or the name of the data record which will be set.

Output status message: Confirm whether output status message after the delete operate. Default on, outputting status message.

Processing status(Out, optional): The processing status of the function, the same as function 'DeleteDataRecord'. The meaning of status parameter: 2 = The system function is processing. 4 = The system function has been finished. 12 = The system function has not executed due to errors.

## SetRecipeTags

Set the recipe's tags's status to online or offline.



Recipe number/name: The number or the name of the recipe which will be set.

Status: Set the recipe tag's status, 'Online' or 'Offline'.

'Online': If the value of the recipe's tag has changed, it will be written to PLC immediately which are communicate with HMI device.

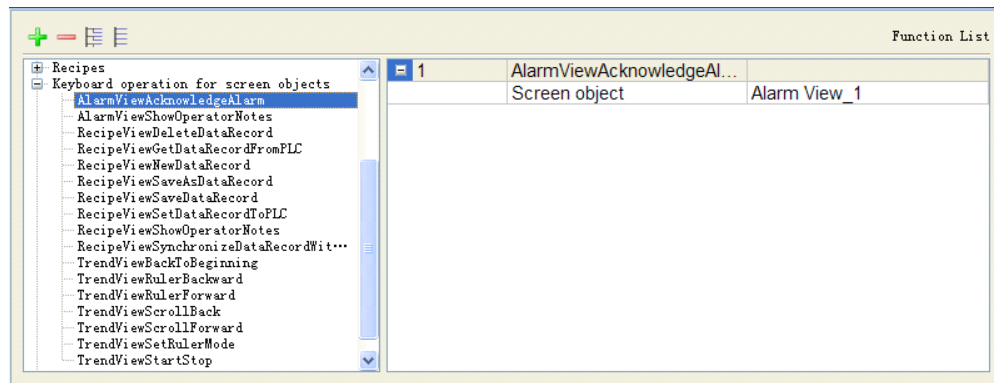
'Offline': If the value of the recipe's tag has changed, it will not be written to PLC which are communicate with HMI device.

Output status message: Confirm whether output status message after the delete operate. Default on, outputting status message.

Processing status(Out, optional): The processing status of the function, the same as function 'DeleteDataRecord'. The meaning of status parameter: 2 = The system function is processing. 4 = The system function has been finished. 12 = The system function has not executed due to errors.

## AlarmViewAcknowledgeAlarm

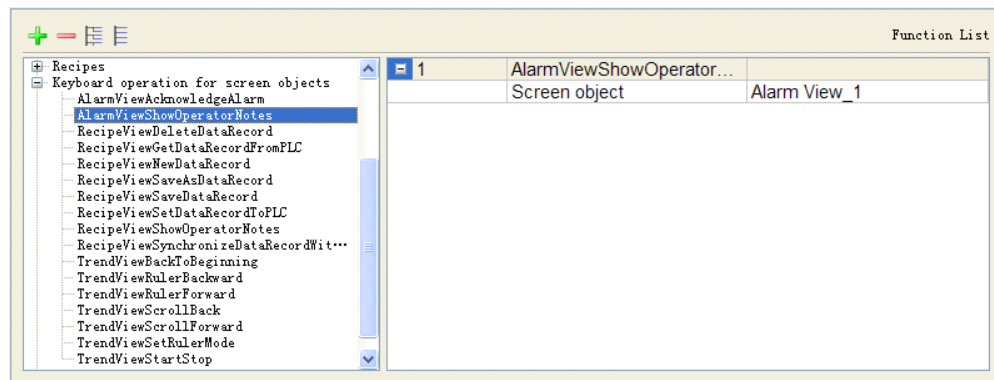
Acknowledges the alarms selected in the given alarm view.



Screen object:Current Alarm View.

### AlarmViewShowOperatorNotes

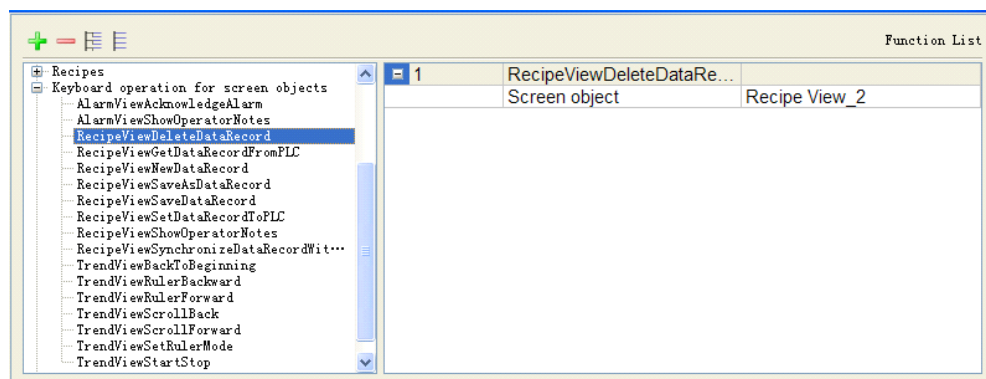
Displays the configured operator notes of the alarm selected in the given alarm screen.



Screen object: Current Alarm View.

### RecipeViewDeleteDataRecord

Delete the data record which is currently displayed in the recipe view.

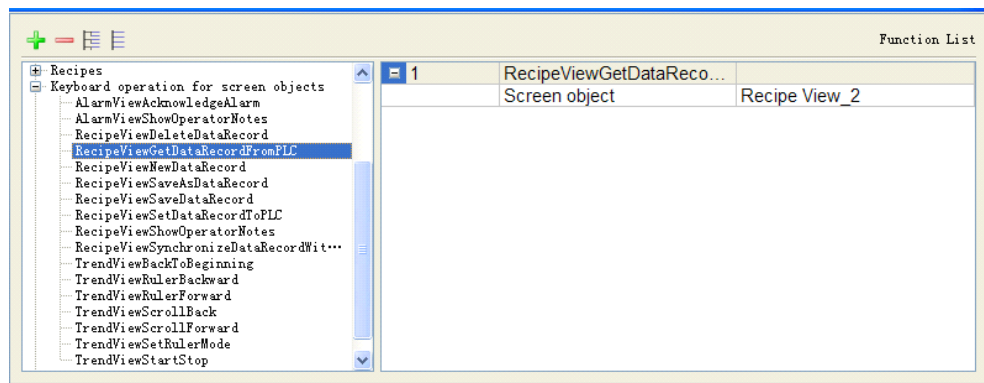


Screen object: Current recipe View.

### RecipeViewGetDataRecordFromPLC

Transfer the data record that is currently loaded in the PLC to the HMI device and

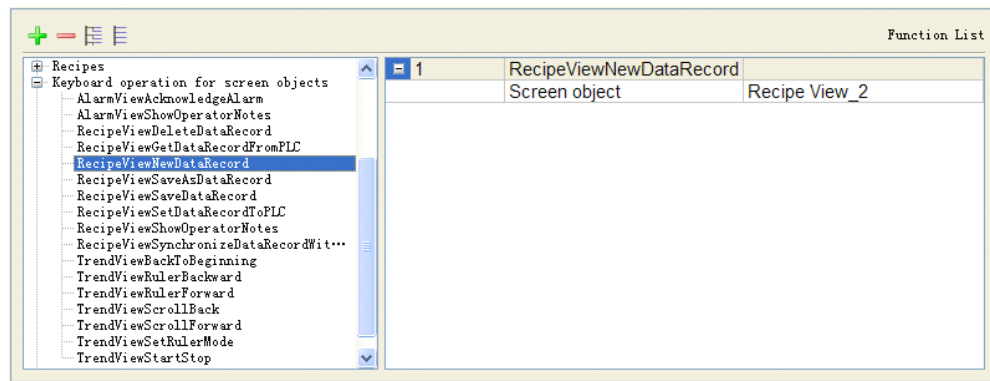
displays it in the recipe view.



Screen object: Current Recipe View.

### RecipeViewNewDataRecord

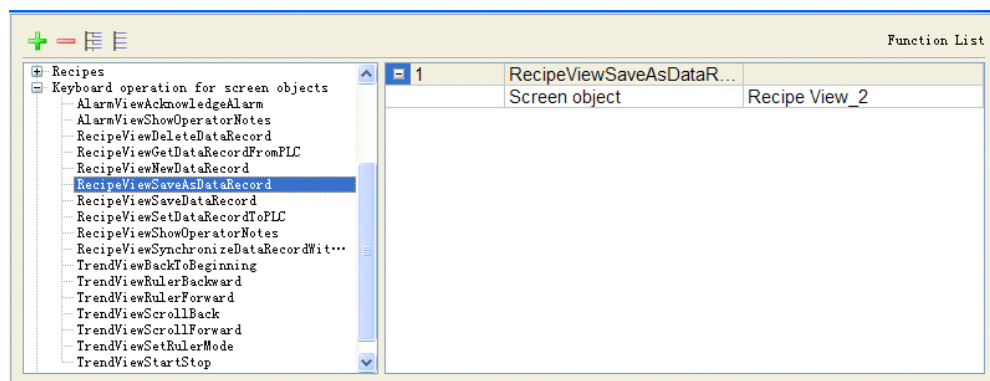
Create a new data record in the given recipe view.



Screen object: Current Recipe View.

### RecipeViewSaveAsDataRecord

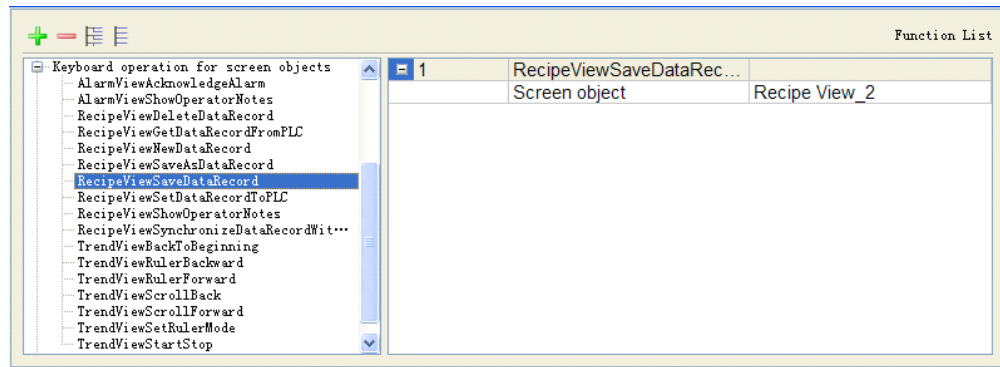
Saves the data record currently being displayed in the recipe view under a new name.



Screen object: Current Recipe View.

### RecipeViewSaveDataRecord

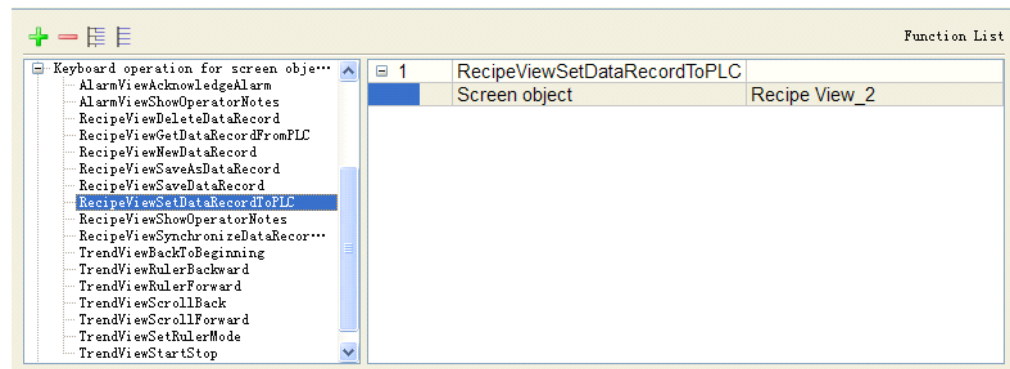
Saves the data record currently being displayed in the recipe view.



Screen object:Current Recipe View.

### RecipeViewSetDataRecordToPLC

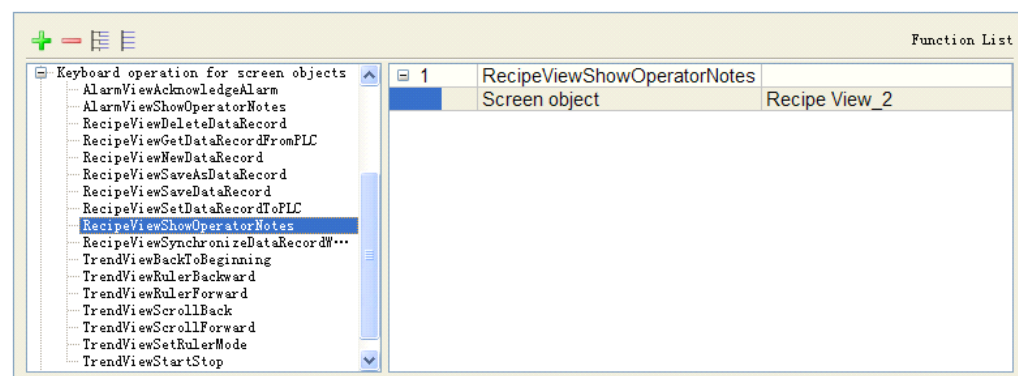
Transfer the data record which is currently displayed in the recipe view to the PLC.



Screen object:Current Recipe View.

### RecipeViewShowOperatorNotes

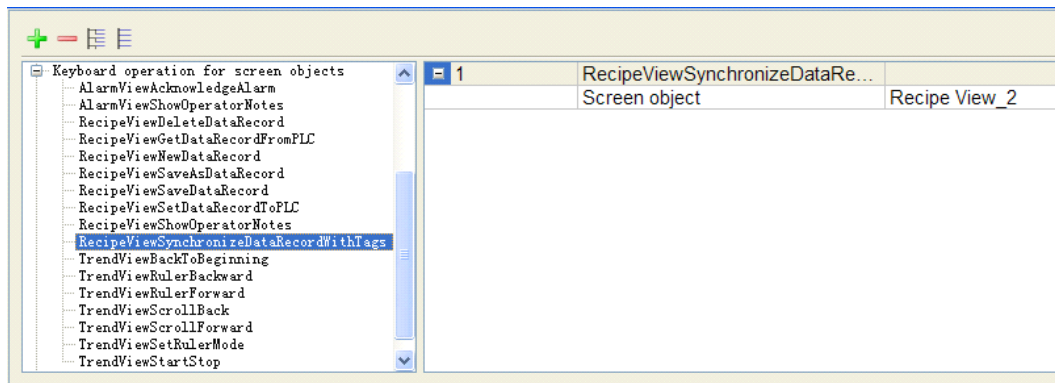
Displays the configured infotext of the given recipe view.



Screen object:Current Recipe View.

### RecipeViewSynchronizeDataRecordWithTags

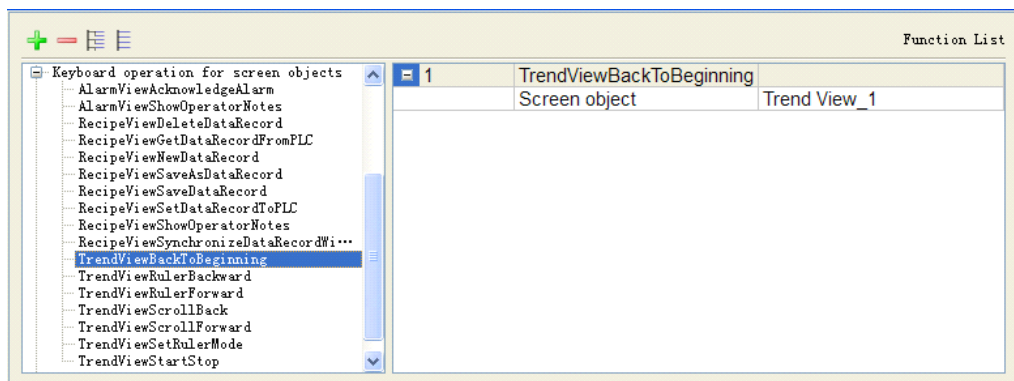
Synchronizes the values of the data record which is currently displayed in the recipe view with their recipe tags.



Screen object:Current Recipe View.

### TrendViewBackToBeginning

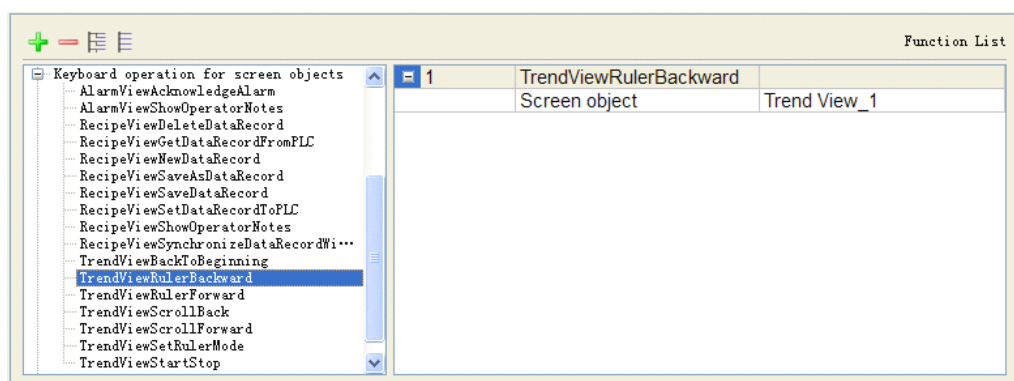
Scrolls to the beginning of the trend recording in trend view. The start values of the trend recording are displayed there.



Screen object:Current Recipe View.

### TrendViewRulerBackward

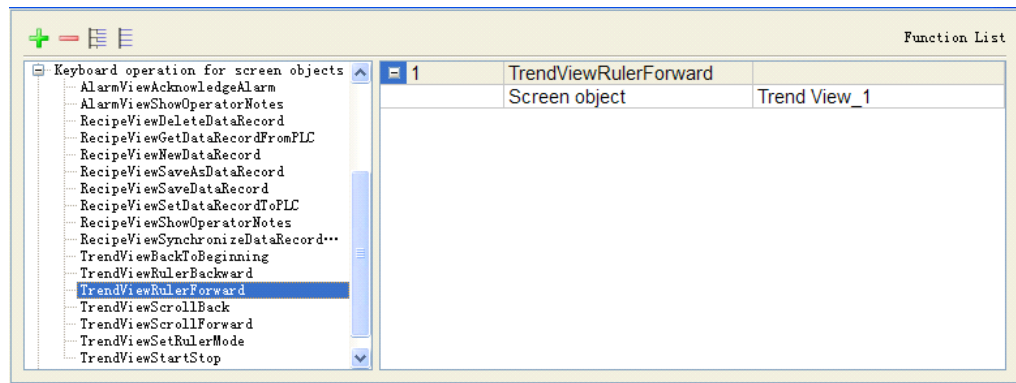
Moves the read-line backwards(to the left) in the trend view.



Screen object:Current Trend View.

### TrendViewRulerForward

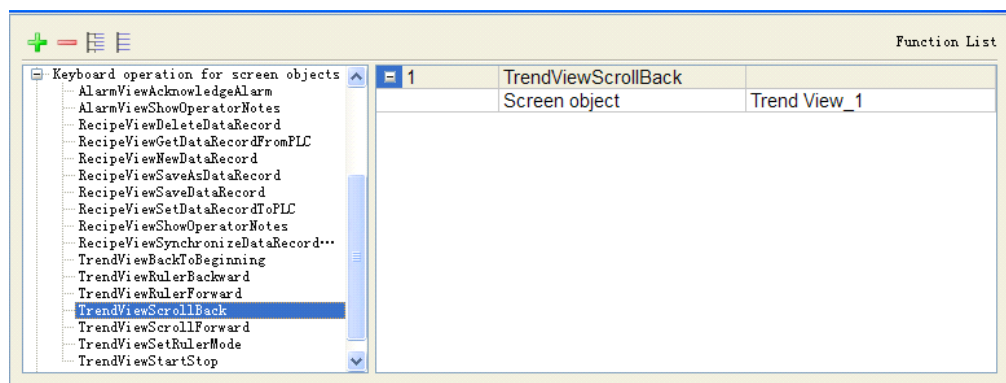
Moves the read-line forwards(to the right) in the trend view.



Screen object:Current Trend View.

### TrendViewScrollBack

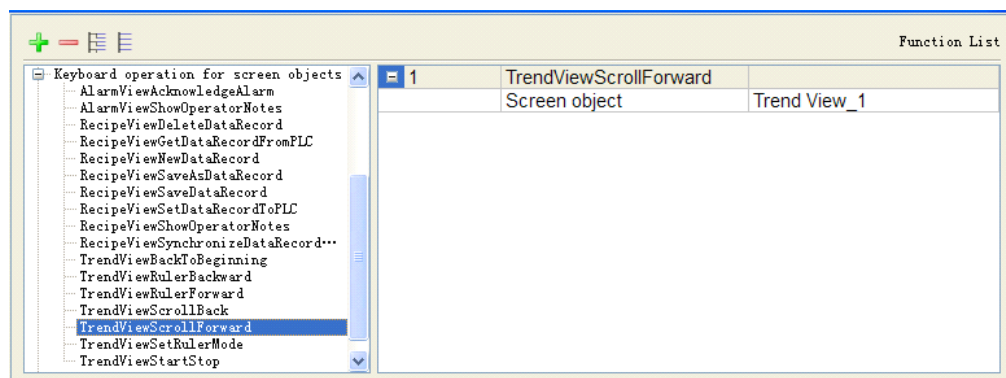
Scrolls back one display width to the left in the trend view.



Screen object:Current Trend View.

### TrendViewScrollForward

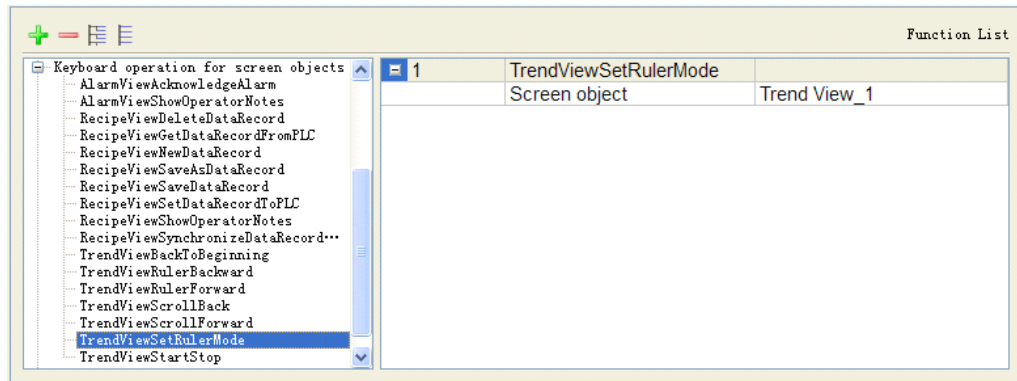
Scrolls forward one display width to the left in the trend view.



Screen object:Current Trend View.

### TrendViewSetRulerMode

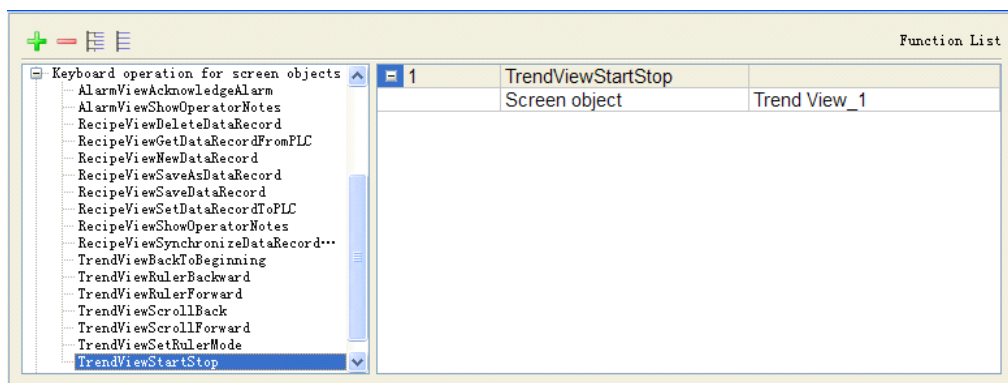
Hides or shows the read-line in the trend view.the read-line displays the Y value beginning to the X value.



Screen object:Current Trend View.

### TrendViewStartStop

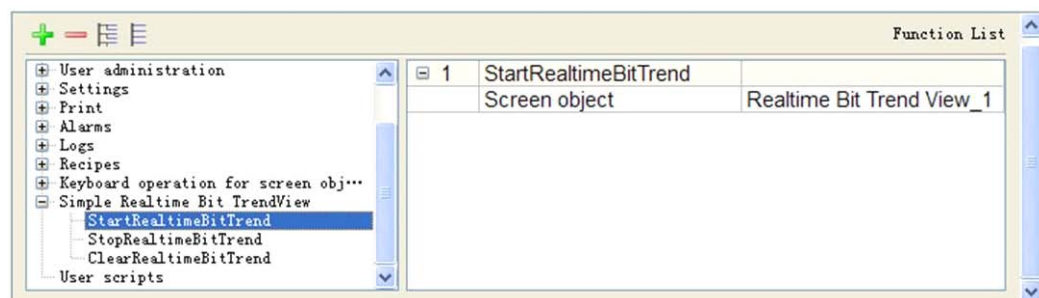
Stops the trend recording or continues the trend recording in the trend view.



Screen object:Current Trend View.

### Start Realtime BitTrend

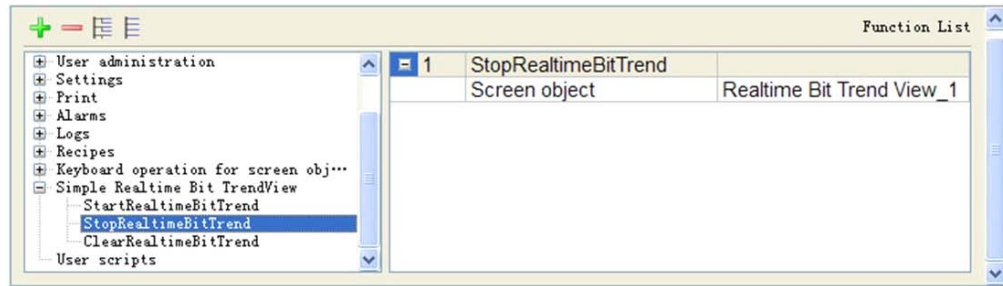
Start to data acquisition



Screen object:Current Realtime BitTrend view.

### Stop Realtime BitTrend

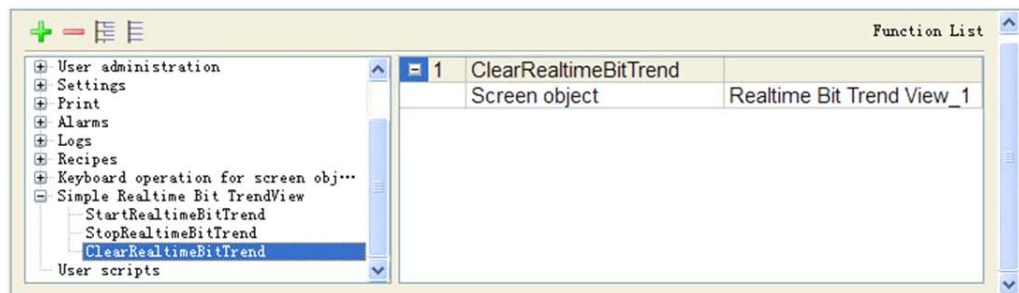
Stop to data acquisition



Screen object:Current Realtime BitTrend view.

### Clear Realtime BitTrend

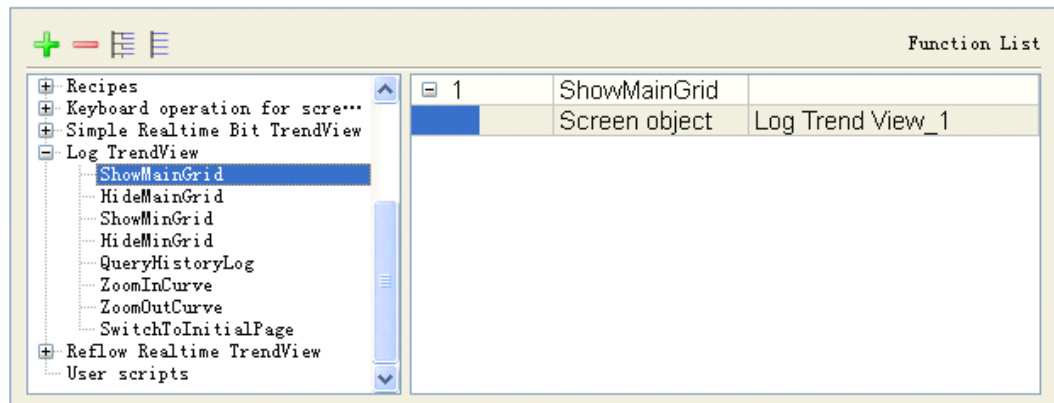
Clear to data buffer



Screen object:Current Realtime BitTrend view.

### ShowMainGrid

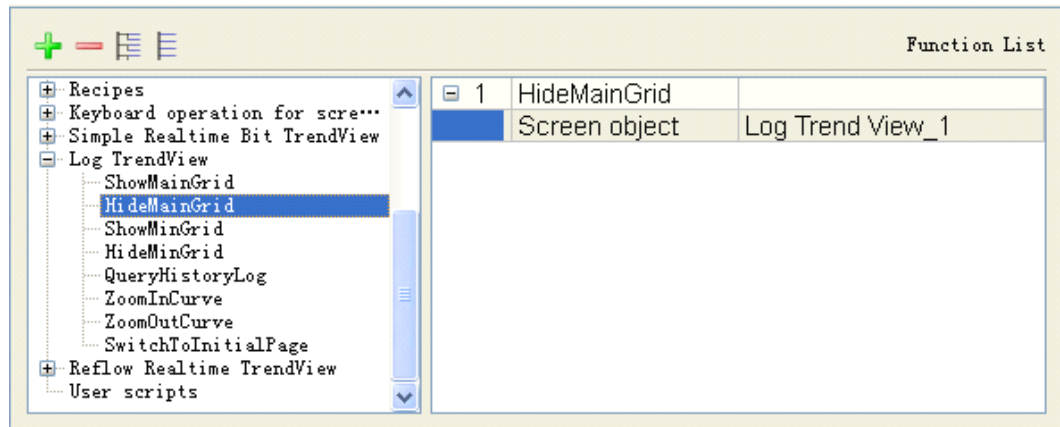
Show the main grid (Only under HMI Runtime)



Screen object:Current Log Trend view.

### HideMainGrid

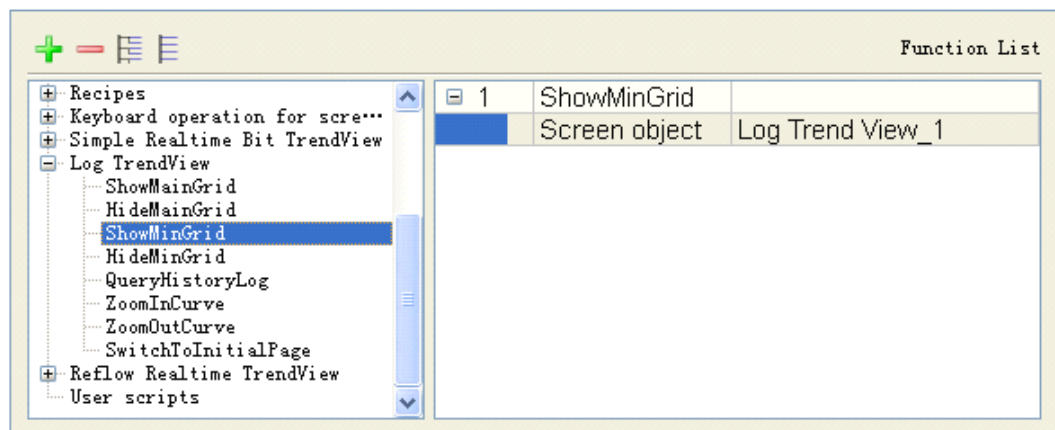
Hide the main grid (Only under HMI Runtime)



Screen object:Current Log Trend view.

### ShowMinGrid

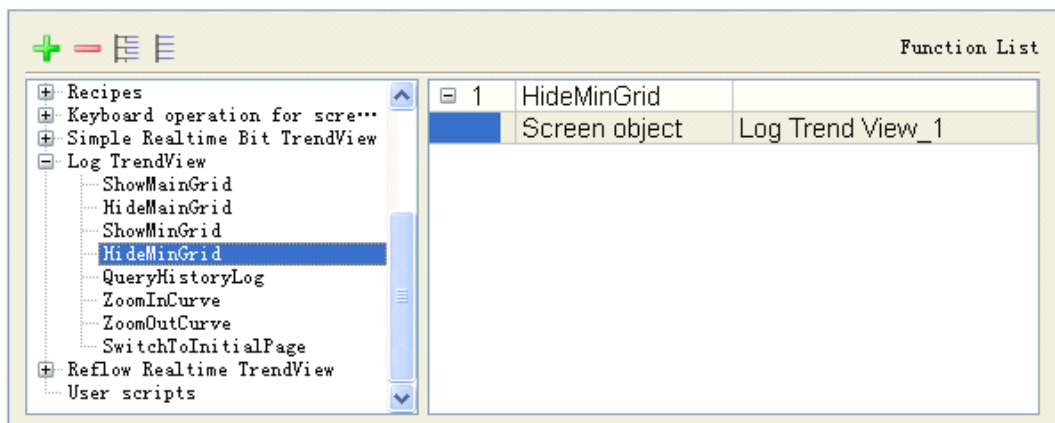
Show the min grid (Only under HMI Runtime)



Screen object:Current Log Trend view.

### HideMinGrid

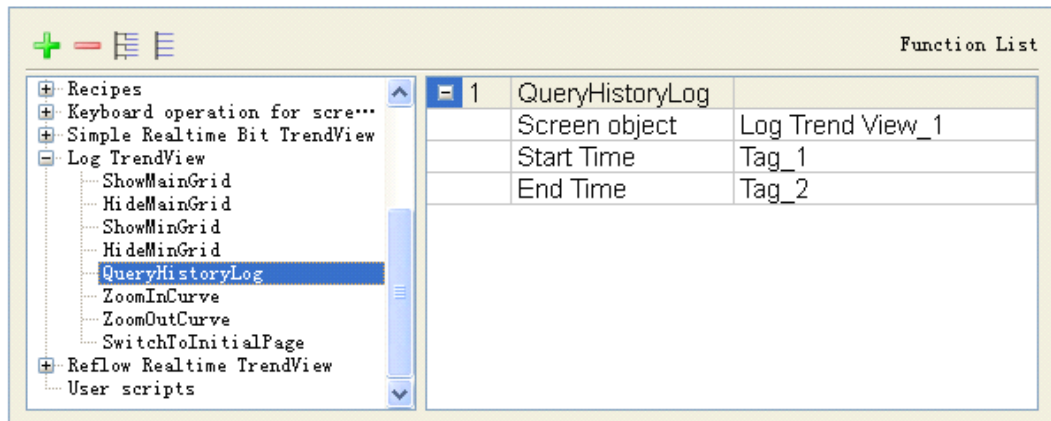
Hide the min grid (Only under HMI Runtime)



Screen object:Current Log Trend view.

## QueryHistoryLog

Query the data between start time and end time (Only under HMI Runtime)



Screen object:Current Log Trend view.

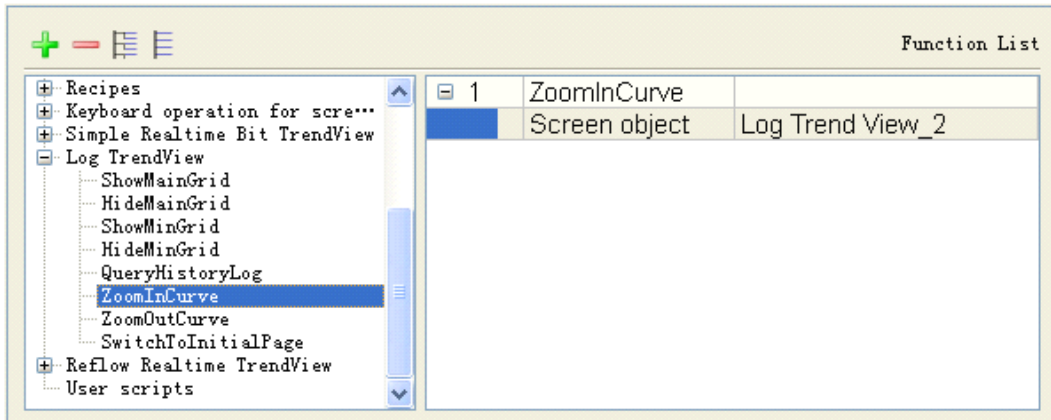
Start Time: The internal tag with Datetime data type.

End time: The internal tag with Datetime data type.

Note: So as to obtain convenient observation, advise to set the start time and end time to different tags.

## ZoomInCurve

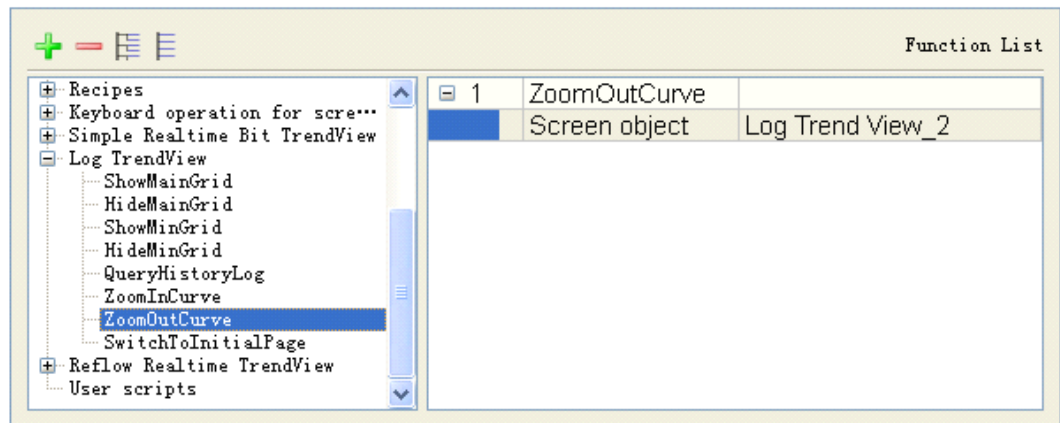
Zoom in current curve (Only under HMI Runtime)



Screen object:Current Log Trend view.

## ZoomOutCurve

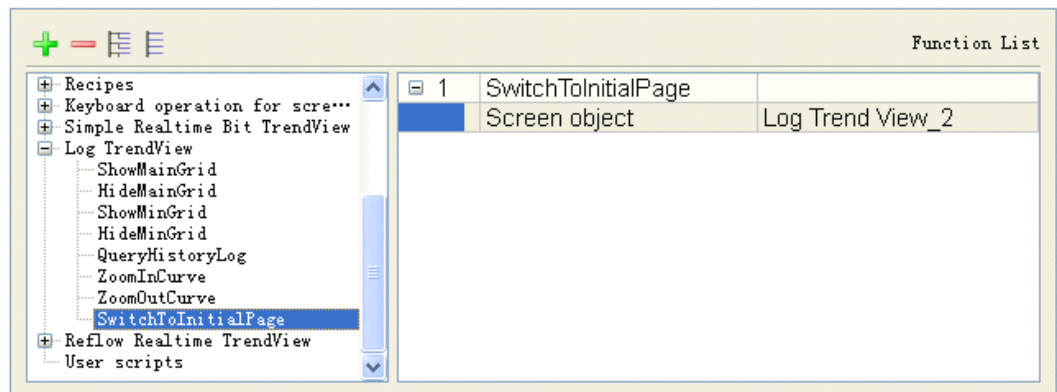
Zoom out current curve (Only under HMI Runtime)



Screen object:Current Log Trend view.

### SwitchToInitialPage

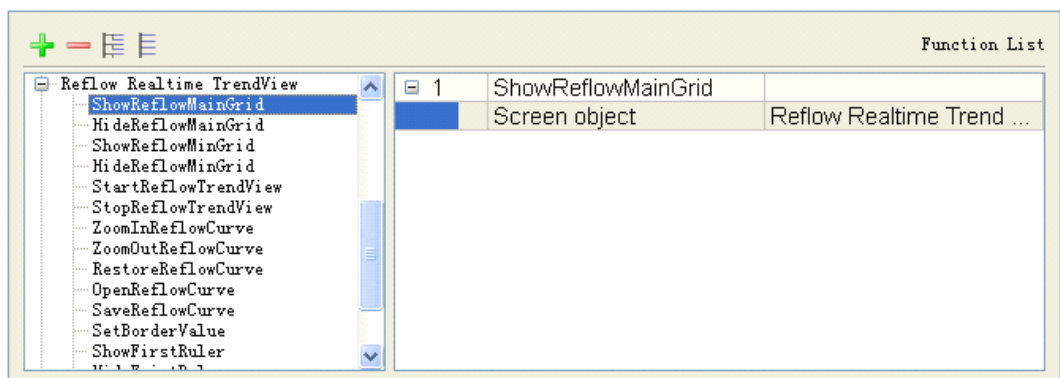
Switch to the initial page (Only under HMI Runtime)



Screen object:Current Log Trend view.

### ShowReflowMainGrid

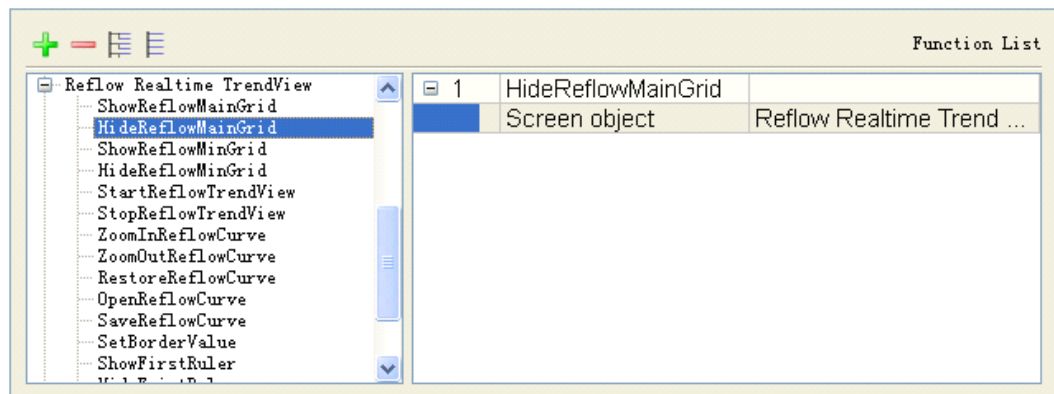
Show the main grid (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

### HideReflowMainGrid

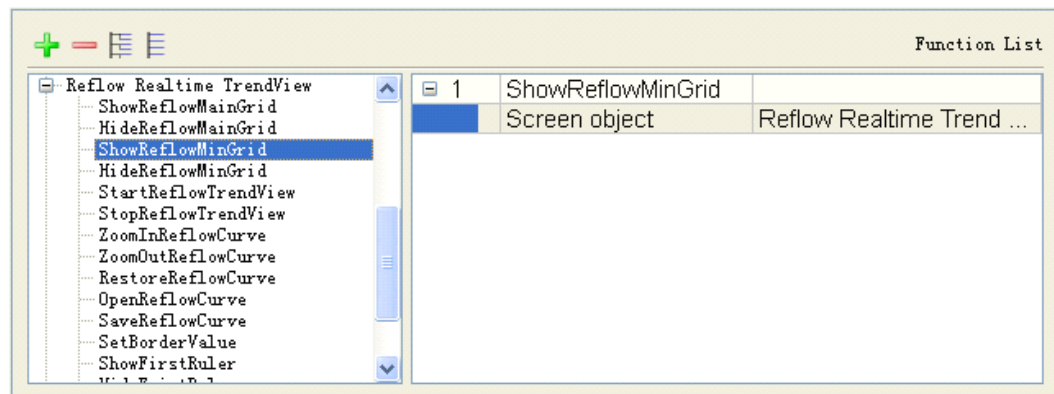
Hide the main grid (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

### ShowReflowMinGrid

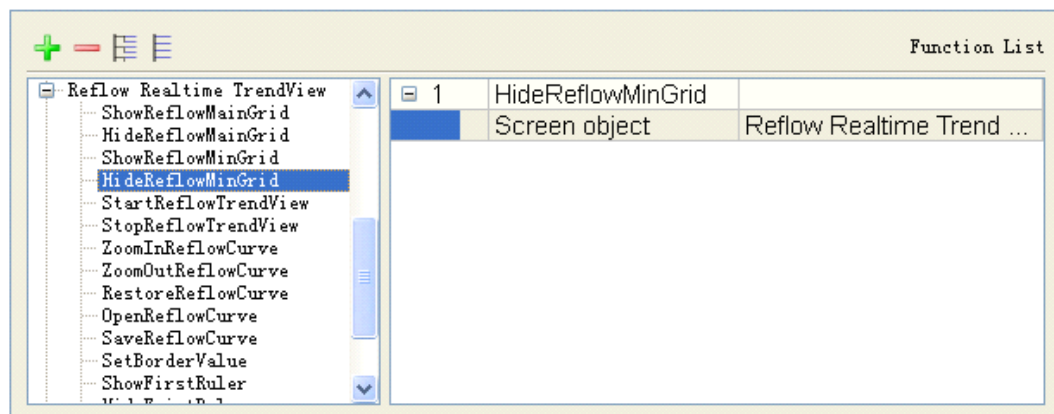
Show the min grid (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

### HideReflowMinGrid

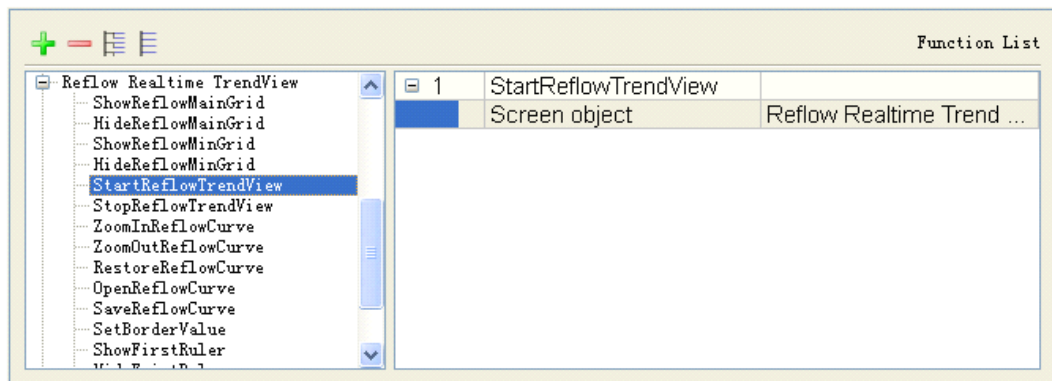
Hide the min grid (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

### StartReflowTrendView

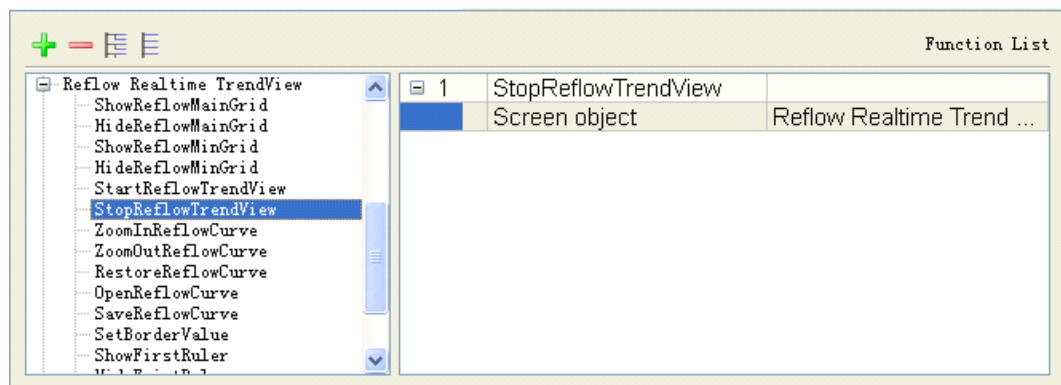
Start to gather data (Only under HMI Runtime)



Screen object: Current Reflow Realtime Trend view.

### StopReflowTrendView

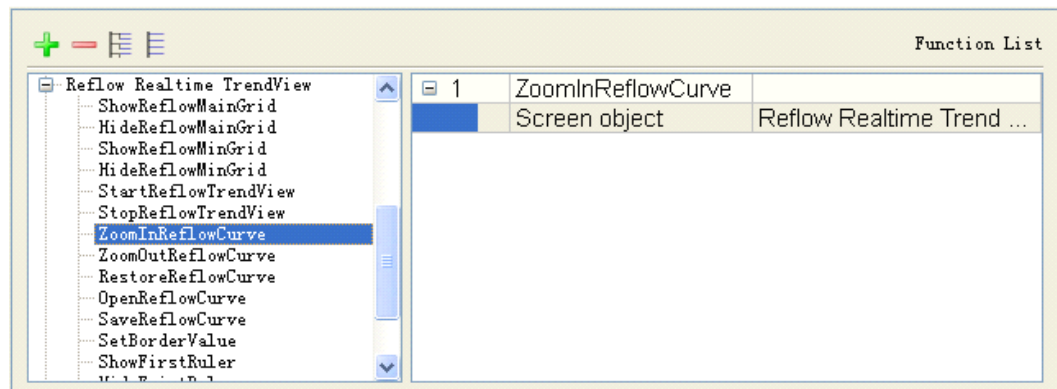
Stop to gather data (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

### ZoomInReflowCurve

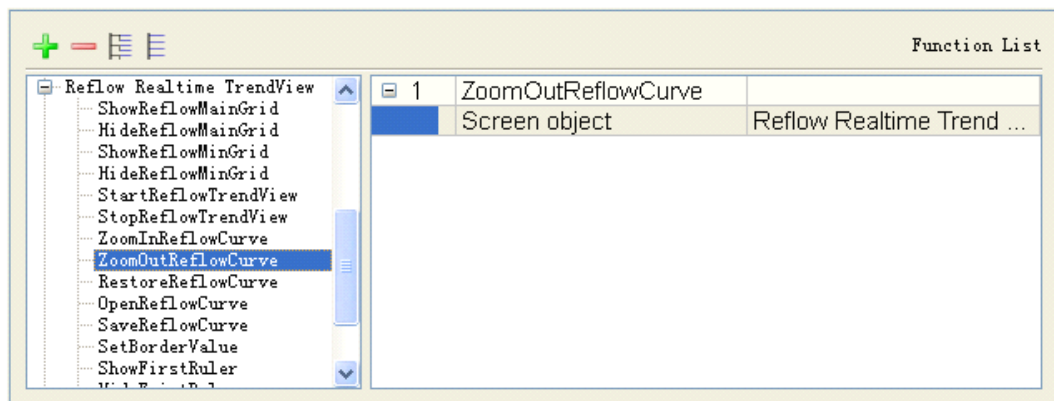
Zoom in current Curve (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

### ZoomOutReflowCurve

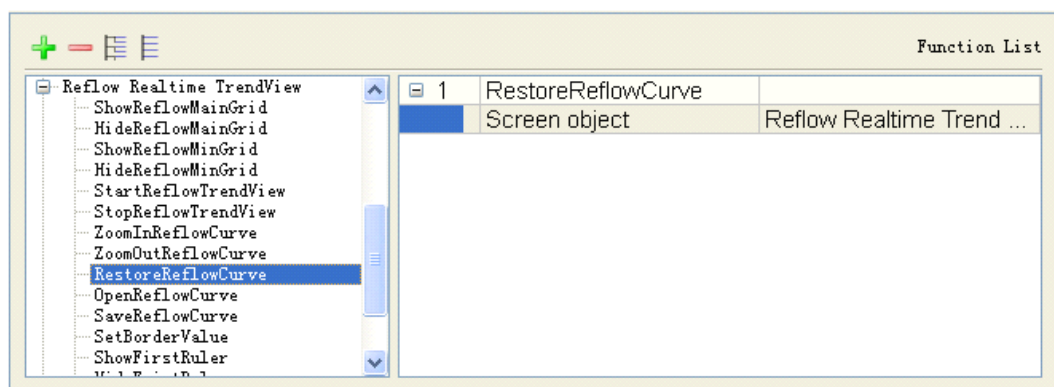
Zoom out current curve (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

### RestoreReflowCurve

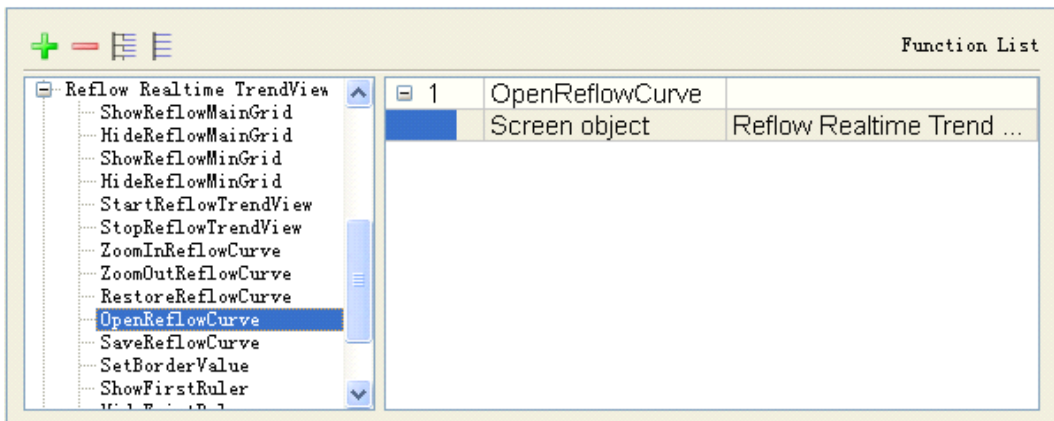
Restore X-axis coordinate (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

### OpenReflowCurve

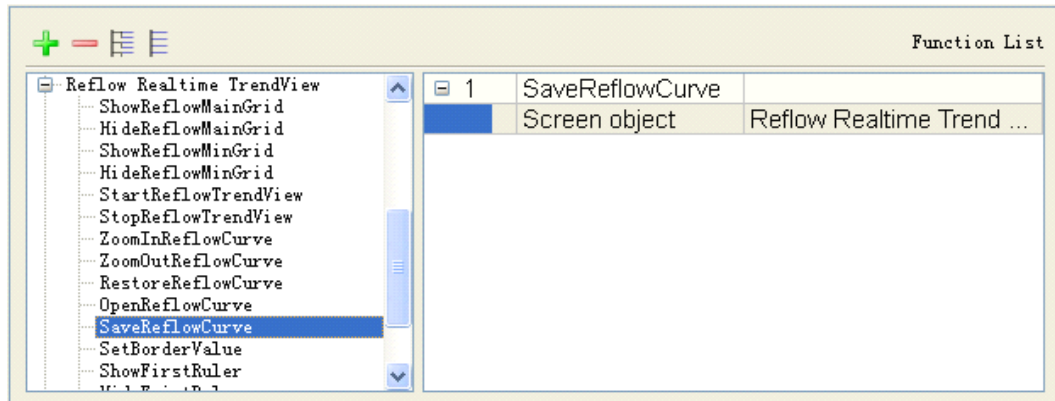
Open the existing data (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

## SaveReflowCurve

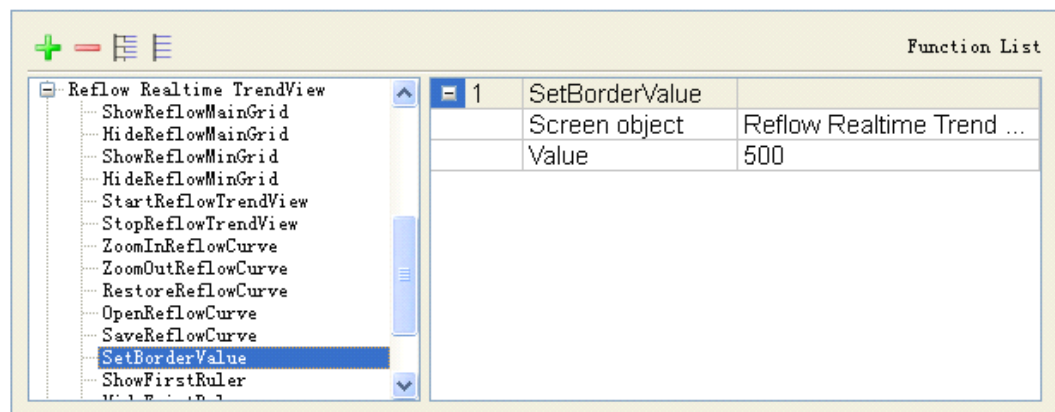
Save the current data (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

## SetBorderValue

Set the border value, the cross-border time is related to this value. (Only under HMI Runtime)

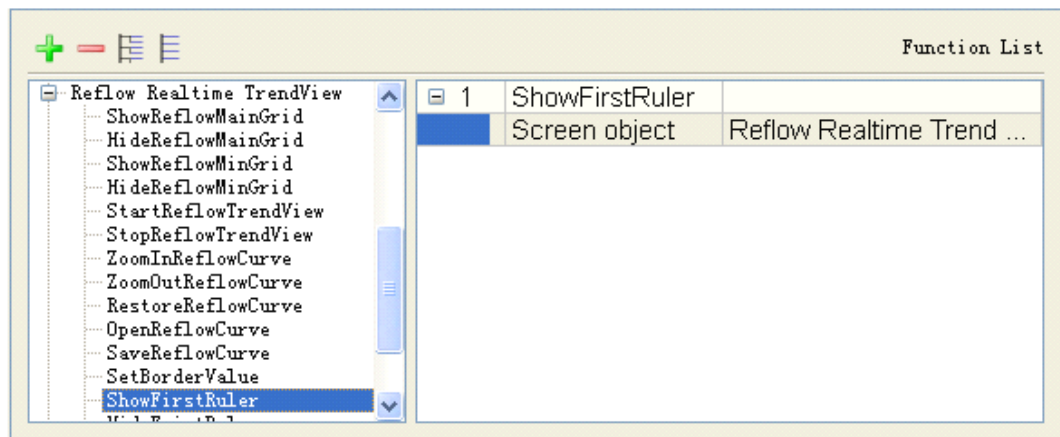


Screen object:Current Reflow Realtime Trend view.

Value: The border value of the curve, which can be set to variable or constant.

## ShowFirstRuler

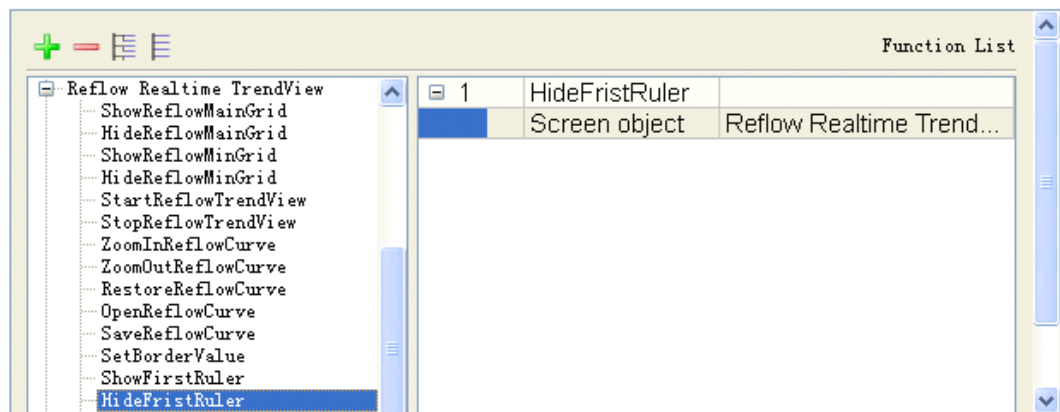
Show the first ruler (Only under HMI Runtime)



Screen object: Current Reflow Realtime Trend view.

### HideFirstRuler

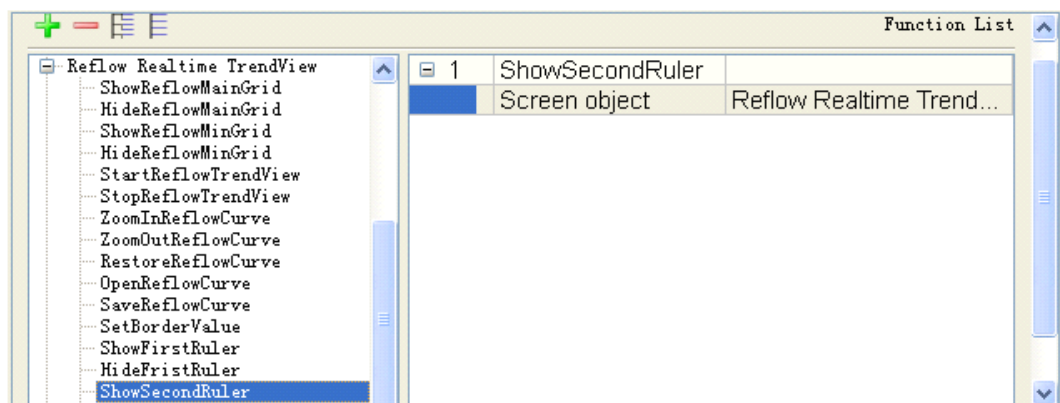
Hide the first ruler (Only under HMI Runtime)



Screen object: Current Reflow Realtime Trend view.

### ShowSecondRuler

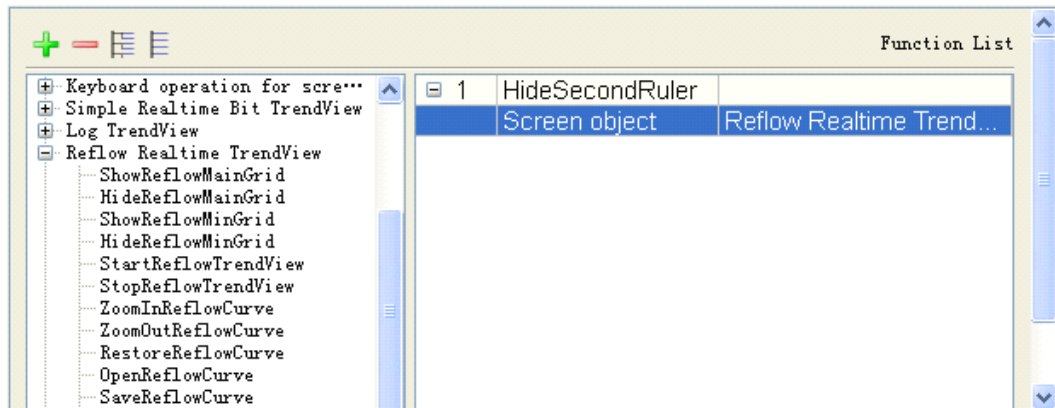
Show the second ruler (Only under HMI Runtime)



Screen object: Current Reflow Realtime Trend view.

## HideSecondRuler

Hide the second ruler (Only under HMI Runtime)



Screen object:Current Reflow Realtime Trend view.

### 11.1.2 Events

MagicWorks HMI's events include six types:Object events,Tag events,Alarm events, KeyItem Events, Screen events and Scheduler events.

| Kind of events      | Description                                                                                      | Objects belongs to                                                                                                                       |
|---------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Loaded              | It's triggered When switch the screen and all configured objects on the screen have been loaded. | Screen                                                                                                                                   |
| Cleared             | It's triggered when switching to other screens from current screen.                              | Screen                                                                                                                                   |
| Activate (Object)   | It's triggered when the current object gets the focus.                                           | Number IO Field 、 String IO Field 、 Date-Time Field 、 Text Switch 、 Graphic Switch 、 Buttons 、 Slider 、 Symbolic IO Field Graphics View  |
| Deactivate(Objects) | It's triggered when the current object lost the focus.                                           | Number IO Field 、 String IO Field 、 Date-Time Field 、 Button 、 Text Switch 、 Graphic Switch 、 Symbolic IO Field 、 Slider 、 Graphics View |
| Activate (Alarms)   | It's triggered when the alarm is arrived which configured by users.                              | Analog Alarms                                                                                                                            |
| Deactivate(Alarms)  | It's triggered when the alarm is departed which configured by users.                             | Discrete Alarms                                                                                                                          |

|                       |                                                                                |                                                                         |
|-----------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Acknowledge(Alarms)   | It's triggered when the alarm is acknowledged which configured by users.       | Analog Alarms, Discrete Alarms                                          |
| Change                | It's triggered when the object's state is changed.                             | Slider、Symbolic IO Field、Gauge、Text switch、Graphic switch、Graphics View |
| Switch off            | It's triggered when the Switch's state is changed from on to off.              | Text switch、Graphic switch                                              |
| Switch on             | It's triggered when the Switch's state is changed from off to on.              | Text switch、Graphic switch                                              |
| Click                 | It's triggered when the button object is pressed and released.                 | Button Graphics View                                                    |
| Press                 | It's triggered when the button object is pressed.                              | Button、KeyItem、Graphics View                                            |
| Release               | It's triggered when the button object is released.                             | Button、KeyItem、Graphics View                                            |
| ReturnPressed         | It's triggered when pressed enter key to confirm the input.                    | Number IO field<br>String IO field<br>Date-time field                   |
| Change screen         | It's triggered when switched to other screens.                                 | Scheduler                                                               |
| Change user           | It's triggered when user logout or login.                                      | Scheduler                                                               |
| Overflow alarm buffer | It's triggered when alarm buffer overflows.                                    | Scheduler                                                               |
| ScreenSave activated  | It's triggered when runtime system switch to ScreenSave.                       | Scheduler                                                               |
| Start up              | It's triggered when runtime system starts up.                                  | Scheduler                                                               |
| Logon                 | Perform when logon success                                                     | Scheduler                                                               |
| 1 min                 | Perform every minute,Min:00.                                                   | Scheduler                                                               |
| Once                  | Perform once.<br>Date:year-month-day, Time:hour:min.                           | Scheduler                                                               |
| 1 h                   | Perform every hour,Minute:X.                                                   | Scheduler                                                               |
| Daily                 | Perform every day,Time:hour:min.                                               | Scheduler                                                               |
| Weekly                | Perform every week,Day of week:X, Time :hour:min.                              | Scheduler                                                               |
| Monthly               | Perform every month,Day:xx,Time:hour:min.                                      | Scheduler                                                               |
| Yearly                | Perform every year,<br>Date:month-day,Time:hour:min.                           | Scheduler                                                               |
| 1 min                 | Perform every minute,and at Min:00.                                            | Scheduler                                                               |
| X SecondS             | Perform every X seconds.                                                       | Scheduler                                                               |
| High limit            | It is triggered when the tag's value is more than its Low Limit by configured. | Tags                                                                    |
| Low limit             | It is triggered when the tag's value is less                                   | Tags                                                                    |

|              |                                                 |      |
|--------------|-------------------------------------------------|------|
|              | than its Low Limit by configured.               |      |
| Change value | It's triggered when the tag's value is changed. | Tags |

### 11.1.3 Examples of how to use system functions

#### 11.1.3.1 Configure system functions

MagicWorks HMI's events include six types: Object events, tag events, alarm events, KeyItem Events, screen events and scheduler events. System function can be configured by any events.

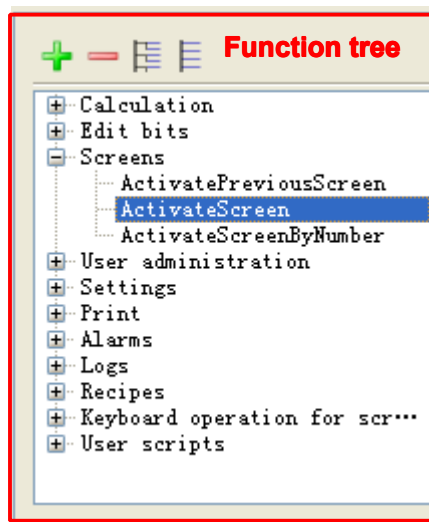
General steps of configuring the system functions:

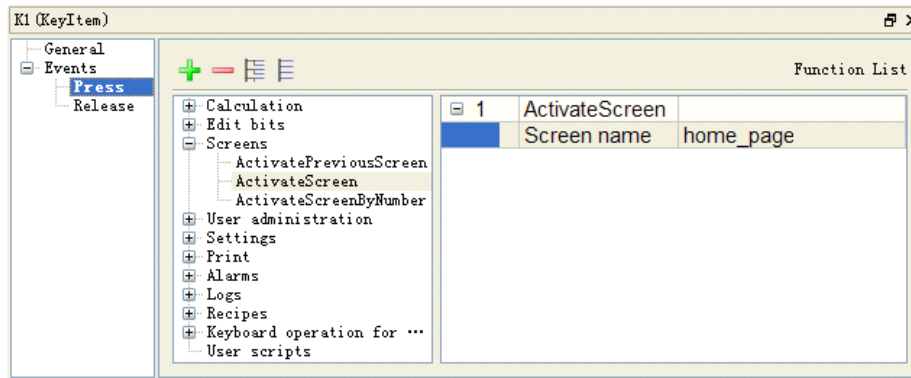
1. Select the object you are required.

Click the '+' button on the left of 'Events' in 'Property View', select the event from the drop-down list.

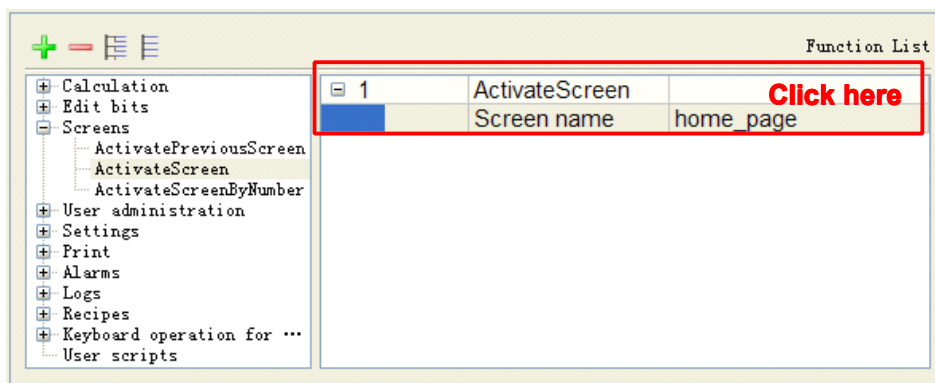
2. Configure system functions for the event.

Click the '+' button on the left of function class name in FunctionTree, double-click the function from the drop-down list, or click the function then click the '+' button above the FunctionTree, the function will be added in the 'Function List' box, then configure it's parameters if it has parameters. Click the '-' button can delete the function you have selected in the 'Function List' box.





Click  button on the left side of the function name to open the function, see as follows.



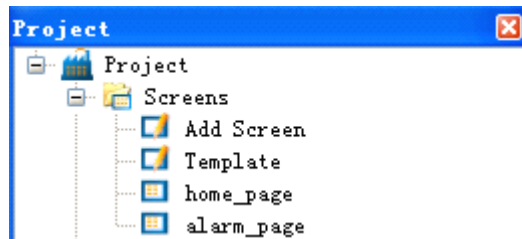
### 11.1.3.2 Examples of using system functions

Six examples: System functions are configured by six different events, see as follows:

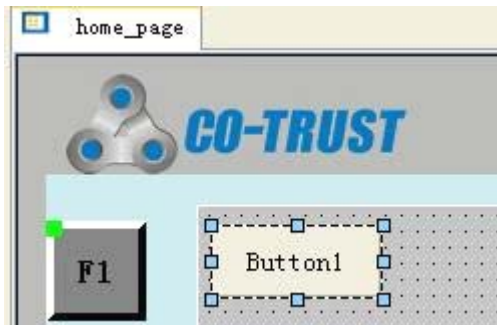
- ◆ Configured by KeyItem Events: Switch to screen 'home\_page' if the Key 'K1' is pressed;
- ◆ Configured by Object Events: Set the bit tag 'm0.0' if the button 'Button1' is pressed, reset the bit tag 'm0.0' if the button 'Button1' is released;
- ◆ Configured by Alarm Events: Switch to the page 'alarm\_page' if the discrete alarm 'Discrete\_1' is triggered;
- ◆ Configured by Tag Events: The tag 'VW12' will increase 1 if the tag 'VW10' is changed;
- ◆ Configured by Screen Events: The tag 'VW14' will increase 1 if the screen 'home-page' is loaded;
- ◆ Configured by Scheduler Events: Write a tag to its datalog at 08:0 every day;

Precondition Steps:

1. Firstly, create two screens in the project view, rename them as 'home-page' and 'alarm\_page':



2. Create a 'button' object in the screen and set the name of the button from 'text' to 'Button1':



3. Add six tags, Rename them as 'm0.0','logTag1','alarm-Tag','VW10','VW12' and 'VW14'.

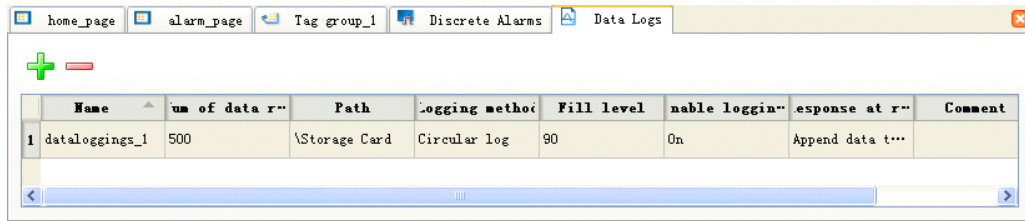
'm0.0' will be used for 'Button\_1' , 'alarm-Tag' will be used for alarm' discrete\_1', 'logTag1' will be used for 'Job\_1','VW10' is the tag which will configures the event 'Change-value','VW12' will be used for the screen 'home-page' which configures the event 'Loaded'. 'VW14' will be used for the screen 'home-page'.

|   | Name      | Connection Id | Data type | Array c... | Address | Acquis... | Data log Id    | Loggi... | Logging acqui... |
|---|-----------|---------------|-----------|------------|---------|-----------|----------------|----------|------------------|
| 1 | m0.0      | Connection_1  | Bool      | 1          | M 0.0   | 1s        | <Undefined>    | 1s       | Cyclic contin... |
| 2 | logTag1   | Connection_1  | Int       | 1          | VW 0    | 1s        | dataloggings_1 | 1s       | On demand        |
| 3 | alarm-tag | Connection_1  | Int       | 1          | VW 8    | 1s        | <Undefined>    | 1s       | Cyclic contin... |
| 4 | VW10      | Connection_1  | Int       | 1          | VW 10   | 1s        | <Undefined>    | 1s       | Cyclic contin... |
| 5 | VW12      | Connection_1  | Int       | 1          | VW 12   | 1s        | <Undefined>    | 1s       | Cyclic contin... |
| 6 | VW14      | Connection_1  | Int       | 1          | VW 14   | 1s        | <Undefined>    | 1s       | Cyclic contin... |

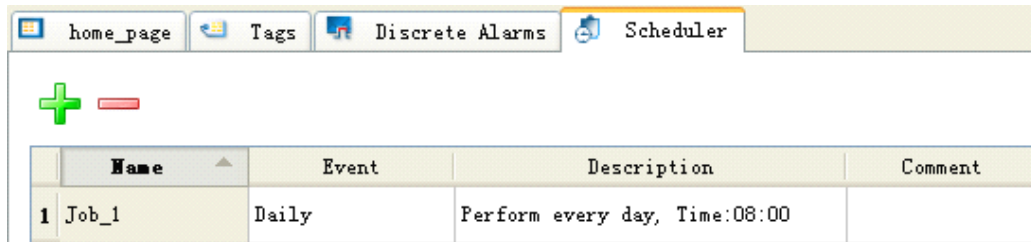
4. Add a discrete alarm named 'discrete\_1':

|   | Text       | Number | Class  | Trigger tag | Trigger bit |
|---|------------|--------|--------|-------------|-------------|
| 1 | discrete_1 | 1      | Errors | Alarm-tag   | 0           |

5. Add a Data Log named 'datalogging\_1':



6. Add a scheduler job named 'Job\_1':



### [Configured by KeyItem Events]

- 1) Switch to screen 'home\_page' if the Key 'K1' is pressed.
- 2) Double-click on [Screen] / [Template] to open it in the project view.
- 3) Select the Key 'K1';
- 4) Click the '+' button on the left of 'Events' in 'Property View', select the 'press' event from the drop-down list;
- 5) Click the '+' button on the left of 'Screen' in FunctionTree, then double click the function 'ActivateScreen' from the drop-down list. The function are showed in the Function List box;
- 6) Configure the function's parameter in Function List box, double click the '<No value>' cell on the right of the parameter 'Screen name', then click the drop-down arrow on right, select the screen 'home-page' or input the text 'home-page' directly.
- 7) The configuration is finished.

### [Configured by Object Events]

- 1) Set the bit tag 'm0.0' if the button 'Button1' is pressed, reset the bit tag 'm0.0' if the button 'Button1' is released.
- 2) Double-click [screen] / [home-page] to open it in the project view:
- 3) Select the button 'Button-1' on the screen;
- 4) Click the '+' button on the left of 'Events' in 'Property View', select the 'press' event from the drop-down list;
- 5) Click the '+' button on the left of 'Edit bits' in FunctionTree, and then double click

the function 'SetBit' from the drop-down list. The function are showed in the Function List box;

- 6) Configure the function's parameter in Function List box, double click the '<No value>' cell on the right of the parameter 'Tag(InOut)', then click the drop-down arrow on right, select the tag 'm0.0' or input the text 'm0.0' directly;
- 7) Select the 'press' event from the drop-down list;
- 8) Double click the function 'ResetBit' from the drop-down list. The function are showed in the Function List box;
- 9) Double click the '<No value>' cell on the right of the parameter 'Tag(InOut)', then click the drop-down arrow on right, select the tag 'm0.0' or input the text 'm0.0' directly;
- 10) The configuration is finished.

### **[Configured by Alarm Events]**

- 1) Switch to the page 'alarm\_page' if the discrete alarm 'discrete\_1' is triggered.
- 2) Double-click on [Alarm Management] / [Discrete Alarms] to open it in the project view;
- 3) Select the line of 'discrete-1' alarm;
- 4) Click the '  ' button on the left of 'Events' in 'Property View', select the 'Activate' event from the drop-down list;
- 5) Click the '  ' button on the left of 'Screen' in FunctionTree, then double click the function 'Activate Screen' from the drop-down list. The function is showed in the Function List box;
- 6) Configure the function's parameter in Function List box, double click the '<No value>' cell on the right of the parameter 'Screen name', then click the drop-down arrow on right, select the screen 'alarm-page' or input the text 'home-page' directly;
- 7) The configuration is finished.

### **[Configured by Tag Events]**

- 1) The tag 'VW12' would increase 1 if the tag 'VW10' is changed.
- 2) Double-click on [Communication] / [Tags] to open it in the project view;
- 3) Select the line of 'logTag1' tag;
- 4) Click the '  ' button on the left of 'Events' in 'Property View', select the 'Change value' event from the drop-down list;
- 5) Click the '  ' button on the left of 'Calculation' in FunctionTree, then double click the function 'IncreaseValue' from the drop-down list. The function is shown in the

Function List box;

- 6) Configure the function's parameter Function List box, double click the '<No value>' cell on the right of the parameter 'Tag(InOut)', then click the drop-down arrow on right, select the tag 'VW12' or input the text 'VW12' directly;
- 7) The configuration is finished.

### **[Configured by Screen Events]**

- 1) The tag 'VW14' increases 1 if the screen 'home-page' is loaded.
- 2) Double-click on [screen] / [home-page] to open it in the project view;
- 3) Select any blank areas on the screen;
- 4) Click the '+' button on the left of 'Events' in 'Property View', select the 'Loaded' event from the drop-down list;
- 5) Click the '+' button on the left of 'Calculation' in FunctionTree, then double click the function 'IncreaseValue' from the drop-down list. The function are showed in the Function List box;
- 6) Configure the function's parameter added in step 4 in Function List box, double click the '<No value>' cell on the right of the parameter 'Tag(InOut)', then click the drop-down arrow on right, select the tag 'VW14' or input the text 'VW14' directly;
- 7) The configuration is finished.

### **[Configured by Scheduler Events]**

- 1) Write a tag to its datalog at 08:0 every day.
- 2) Double-click on [others] / [Scheduler] to open it in the project view;
- 3) Select the line of 'Job\_1' job;
- 4) Click the '+' button on the left of 'Logs' in FunctionTree below the Job table, then double click the function 'LogTag' from the drop-down list. The function are displayed in the Function List box;
- 5) Configure the function's parameter in Function List box, double click the '<No value>' cell on the right of the parameter 'Tag(InOut)', then click the drop-down arrow on right, select the tag 'logTag1' or input the text 'VW14' directly;
- 6) The configuration is finished.

## **11.2 Animations**

Animations in this article refer to the object's dynamic displaying, which includes

Appearance Change, Enable Object, Diagonal Movement, Horizontal Movement, Vertical Movement, Direct Movement, Custom Movement, Dynamic Movement and Visibility. Different objects have different animations, please refer to the object's 'Animations' in Properties View for details.

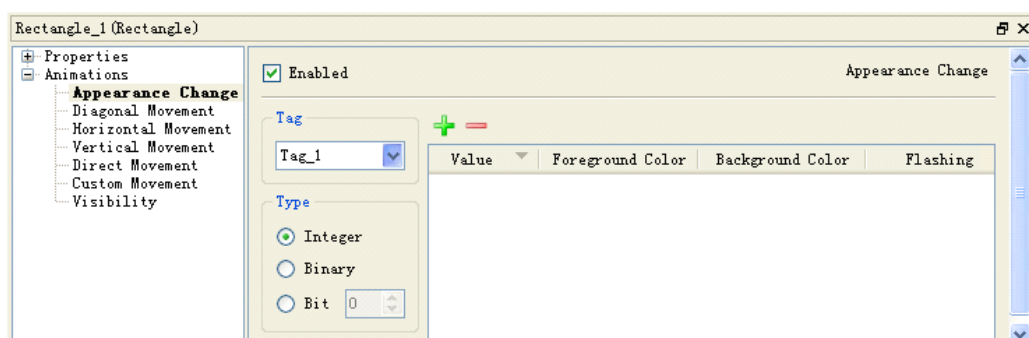
There are nine animations, the corresponding descriptions see as follows:

| Animations          | Description                                                                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance Change   | Control the appearance of the object Dynamically in Runtime system, including Foreground color, Background color and Flashing properties.             |
| Enable Object       | Control the operability of the object Dynamically in Run-time system.                                                                                 |
| Diagonal Movement   | Control the movement in the Diagonal direction of the object Dynamically in Run-time system.                                                          |
| Horizontal Movement | Control the movement in the Horizontal direction of the object Dynamically in Run-time system.                                                        |
| Vertical Movement   | Control the movement in the Vertical direction of the object Dynamically in Run-time system.                                                          |
| Direct Movement     | Control the movement in the Horizontal and Vertical direction of the object Dynamically in Runtime system.                                            |
| Custom Movement     | The object moves along custom coordinates.                                                                                                            |
| Dynamic Movement    | Control the object moving along a specifically path or moving specific number of pixels (at an angle) in run-time system by changing the tag's value. |
| Visibility          | Control the visibility of the object Dynamically in Runtime system.                                                                                   |

### 11.2.1 Appearance Change

In Runtime system, you can dynamically control the object's appearance (including Foreground color, Background color and Flashing) by changing the tag's value. Of course, you should predefine several appearances in the table of 'Appearance Change' property view, and assign a particular value or a certain range or a bit for each appearance. If the tag value is equal to the value or within the range configured in the table, the object's appearance changes to the corresponding appearance, otherwise, the object remains the same appearance.

'Appearance Change' Property View, see as follows:



Including following properties:

**Enable:** Whether to enable the 'Appearance Change' animation. Tick the checkbox 'Enable' if you want to enable it.

**Tag:** The tag will be used to control the appearance of an object.

**Type:** The type of the tag, three choices: 'Integer', 'Binary' and 'bit'.

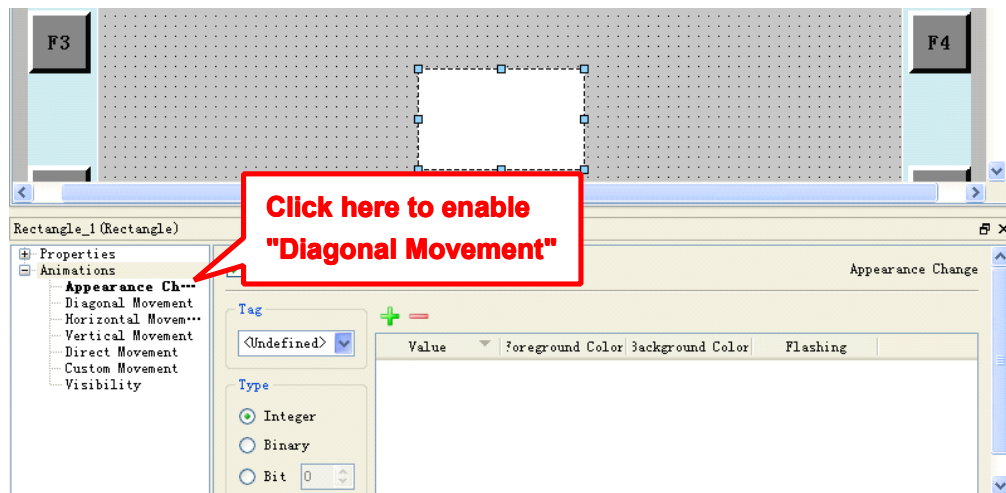
| Type    | Description                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integer | According to the integer value of the tag to control the appearance of the object. You can define a number of values or ranges, each value or range represent an appearance, but could not redefine values and ranges.<br>If the tag value is equal to the value or within the range configured in the table, the object's appearance changes to the corresponding appearance, otherwise, the object displays the static appearance. |
| Binary  | Different bit of the tag corresponds to different appearance.<br>The number of appearance you can define should according to the tag's data type. For example, the 'Word' type tag has 16bits, you can define 16 appearances at most, and can't redefine the 'bit'.<br>If one of the bits configured in the table changes to 1, the object displays its corresponding appearance, otherwise displays the static appearance.          |
| Bit     | According to the value of bit to control the appearance to the object.<br>You can define 2 appearances at most, when the bit is 1 or 0.<br>If the bit value is 1, the object displays the appearance of value 1, otherwise the object display another configured appearance.                                                                                                                                                         |

The table has four columns, each row represents an appearance.

| Properties       | Description                                                 |
|------------------|-------------------------------------------------------------|
| Value/Bit number | The value or the bit number of the tag configured in 'Tag'. |
| Foreground Color | The object's foreground color displayed in run-time system. |
| Background Color | The object's background color displayed in run-time system. |
| Flashing         | Two choices of Flashing state: 'Yes' or 'No'.               |

The flowing is the steps of configuring an object's 'Enable Object' animation:

1. Select the object in screen.
2. Click the '  ' button on the left of 'Animations' in 'Property View', select 'Appearance Change'.
3. Enable 'Enable Object' animation by ticking the checkbox.

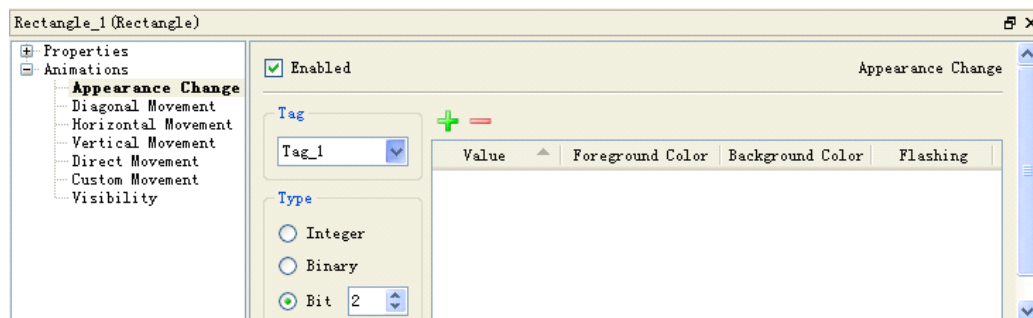


4. Configure a tag in 'Tag'.

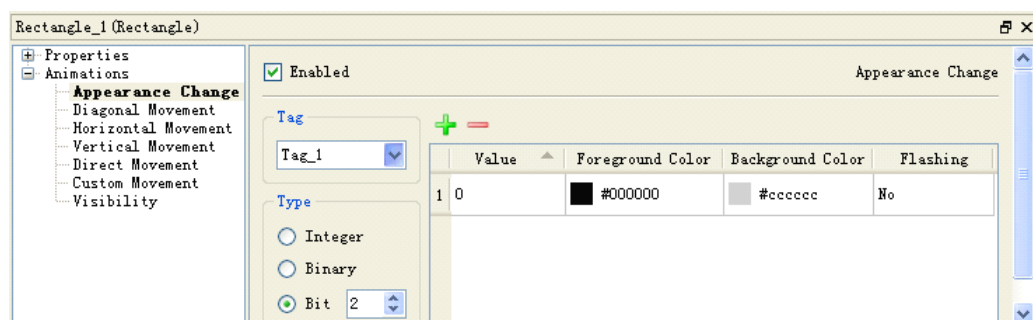
Configure the 'Type' for the Tag: 'Integer' or 'Binary' or 'Bit'.

If you enable 'Bit', you should input the bit you need.

The first column's displaying name of the right table up to the 'Type'. If the 'Type' is 'Integer' or 'Bit', the name is 'Value', if the 'Type' is 'Binary', the name is 'Bit number'.



5. Click button '+' to add a default appearance.



6. Edit the first cell of the appearance to input a value or a range or a Bit number.

7. Edit the 'Foreground Color' and 'Background Color' cells, select a color you desired from the drop-down box.

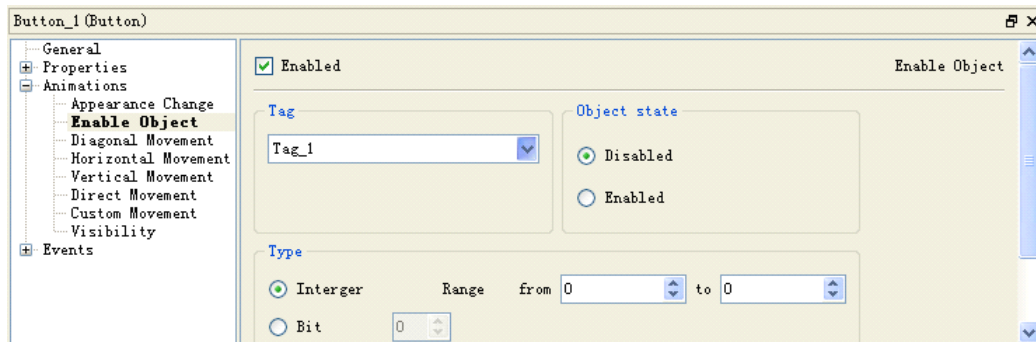
8. Edit the 'Flashing' cell, select 'Yes' or 'No' from the drop-down list.

9. Click button '-' to delete the selected appearance.

### 11.2.2 Enable Object

You can control the operability of the object dynamically in run-time system by changing the tag's value which you have configured in its 'Enable Object' animation property. Whether the object will be able to be operated depends on the state and the value of the tag. If the tag value equals to a particular value or within a certain range, the object will be able to be operated.

'Enable Object' Property View as follows:



Including these properties:

- **Enable:** Whether to enable the 'Enable Object' animation. Tick the checkbox 'Enable' if you want to enable it.
- **Object state:** Operational status of the object: 'Enabled' and 'Disabled'.
- **Enabled:** The object will be able to be operated when the tag's 'Bit' is true or the tag value is equal to the value or within the range.
- **Disabled:** The object will not be able to be operated when the tag's 'Bit' is true or the tag value is equal to the value or within the range.
- **Tag:** The tag which control the operability of an object.
- **Type:** The type of the tag, two choices: 'Integer' and 'bit'.

| Type    | Description                                                                                                                                                                                                                                                                                                                     |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integer | Whether to display or hide the object depends on the value or the range of the tag. If you enable it, you also should configure the range ('from' ..'to' ..). If the 'Object state' is 'Enabled', and the tag value is within the range, the object will be able to be operated, otherwise, it will not be able to be operated. |
| Bit     | Whether to display or hide the object depends on the bit of the tag. If you enable it, you also should assign a bit for the tag. If the 'Object state' is 'Enabled', and the bit is true the object will be able to be operated, otherwise, it will not be able to be operated.                                                 |

The flowing is the steps of configuring an object's 'Enable Object' animation:

1. Select the object in screen.
2. Click the '+' button on the left of 'Animations' in 'Property View', select 'Enable

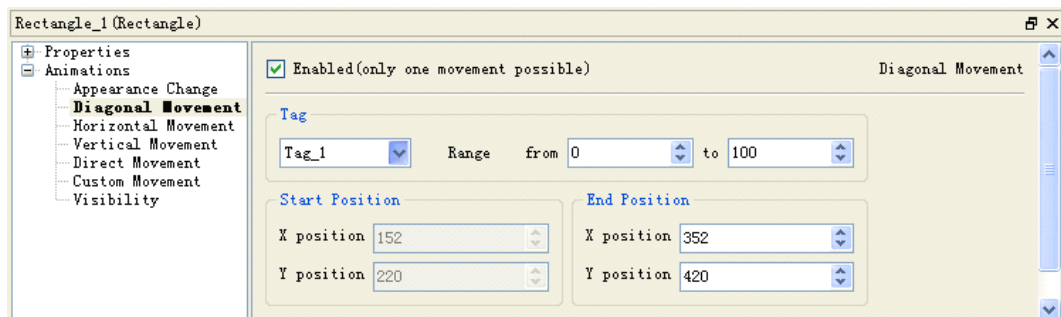
Object'.

3. Tick the 'Enable' checkbox.
4. Configure the 'Object state', choose 'Enabled' or 'Disabled'.
5. Configure a tag for the object's visibility, and then configure the range or bit for it.

### 11.2.3 Diagonal Movement

The object moves along a specifically path which has defined start and end points, and the relative position (including X and Y position) controlled by one tag.

'Diagonal Movement' Property View see as following:

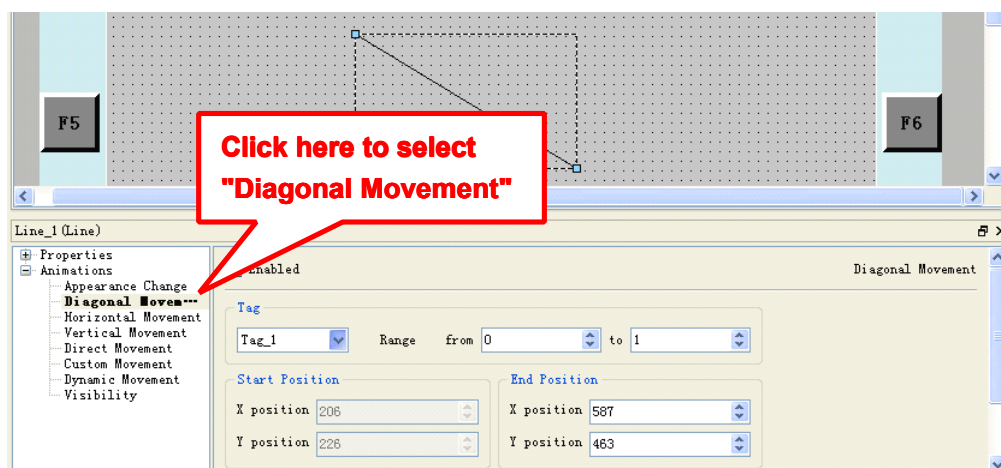


'Diagonal Movement' includes below properties:

- **Enable:** Whether to enable the Diagonal movement or not. The objects will move between start position and end position if tick the button.
- **Tag:** Used to control the objects' relative position in the path.
- **Range:** The effective range of the Tag to control the object's moving.
- **Start Position:** The position comes from the object's 'Layout', the start position of X and Y axis cannot be configured.
- **End Position:** It is the position where the object will move to, you should configure the end position of X and Y axis.

The following is an example of Diagonal Movement for line objects:

1. Select line object, then open the property view "animation" of line, select "Diagonal Movement".



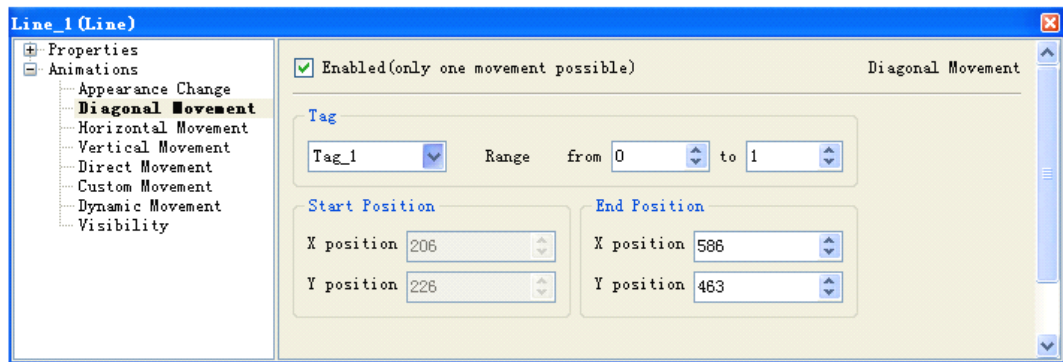
## 2. Enable "Diagonal Movement"

## 3. Configure "tag"

Click "tag" drop-down menu to open variables lists, choose the variable that would be used to control the object, and then choose data type for the variable. (The data type in this example for tag\_1 is Int type.)

## 4. Configure "Range", "Start position" and "End position".

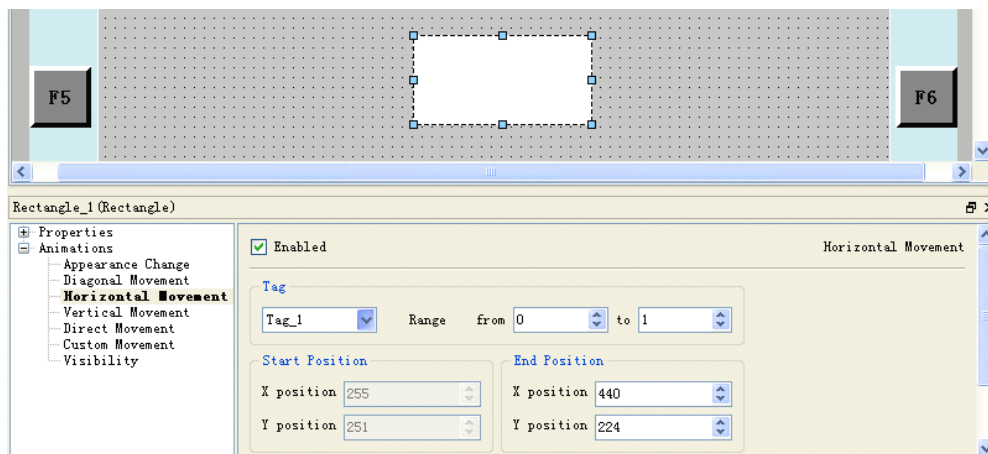
After configured above sections, the property for the line show as below:



### 11.2.4 Horizontal Movement

The object moves along a specifically path which has defined start and end points, and the relative position(including X and Y position) controlled by one tag.

'Horizontal Movement' Property is the same as "Diagonal Movement", see below:



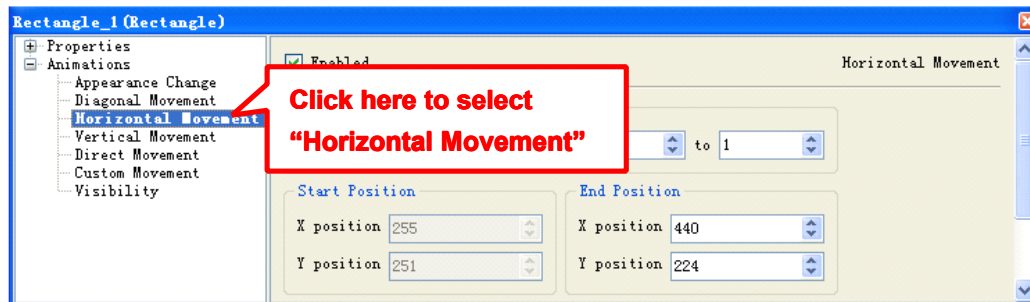
'Horizontal Movement' includes below properties:

- Enable: Whether to enable the Horizontal movement or not. The objects will move between start position and end position if tick this button.
- Tag: Used to control the objects' relative position in the path.
- Range: The effective range of the Tag to control the object's moving.
- Start and End Position: Turn right/left in horizontal direction (objects will only moves along X axis direction, Y axis remains the same). When the distance in X axis direction is greater than 0 (end to start), the objects move to right, otherwise moves to the left. When variables change 1,  $X \text{ offset} = (X \text{ end} - X \text{ starting}) / (X2 -$

X1); If variable values is greater than X2, the objects would move to end position directly, variable value is less than X1, move to start position directly, the objects won't move to the outside of the screen.

The following is an example of Horizontal Movement for rectangle objects:

1. Select rectangle object, then open the property view "Animation" of rectangle, select "Horizontal Movement".



2. Enable "Horizontal Movement"

3. Configure "tag"

Click "tag" drop-down menu to open variables lists, choose the variable that would be used to control the object, and then choose data type for the variable. (the data type in the example for tag\_1 is Int type.)

4. Configure "Range", "Start Position" and "End Position".

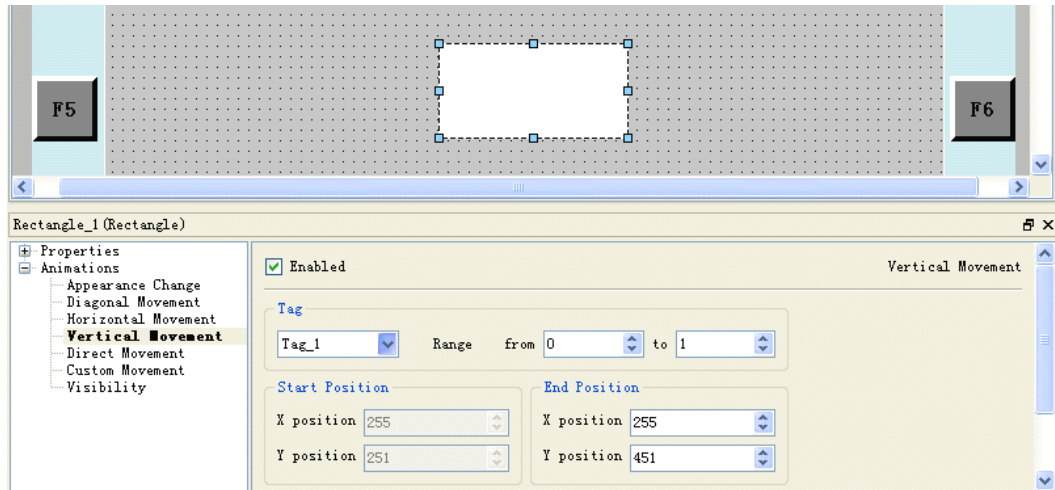
After configured above sections, the property for the rectangle show as below:



## 11.2.5 Vertical Movement

The object can move proportional distance at the vertical direction by setting the range for the variable.

'Vertical Movement' Property is the same as "Diagonal Movement", see below:



'Vertical Movement' includes below properties:

- Enable: Whether to enable the Vertical movement or not.
- Tag: Configure variable to control the objects' relative position in the path.
- Range: The effective range of the tag to control the object's vertical moving.
- Start Position: The position comes from the object's 'Layout', the start position of X and Y axis cannot be configured.
- End Position: It is the position where the object will move to, you should configure the end position of X and Y axis.

| Position   | Description                                                         |
|------------|---------------------------------------------------------------------|
| X Position | Configure the horizontal coordinates that the objects will move to. |
| Y Position | Configure the vertical coordinates that the objects will move to.   |

The following is an example of Vertical Movement for rectangle objects:

1. Select rectangle object, then open the property view "Animation" of the rectangle, select "Vertical Movement".



2. Enable "Vertical Movement"

3. Configure "tag"

Click "tag" drop-down menu to open variable lists, choose the variable that would use to control the object's vertical moving, and then select data type for the variable. (The data type in the example for tag\_1 is integer.)

4. Configure "range", "start position" and "end position".

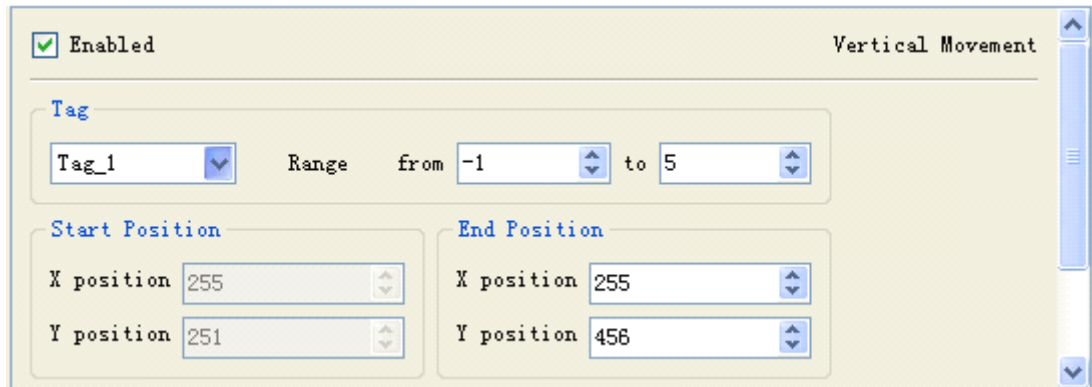
### 1) Configure "Range"

Input the range. Also can click ▲ or ▼ on the default to modify the current value of the range.

### 2) Configure "Start position" and "End position"

Input X, Y axis start position and end position of the object. Also can click ▲ or ▼ on the default to modify the position.

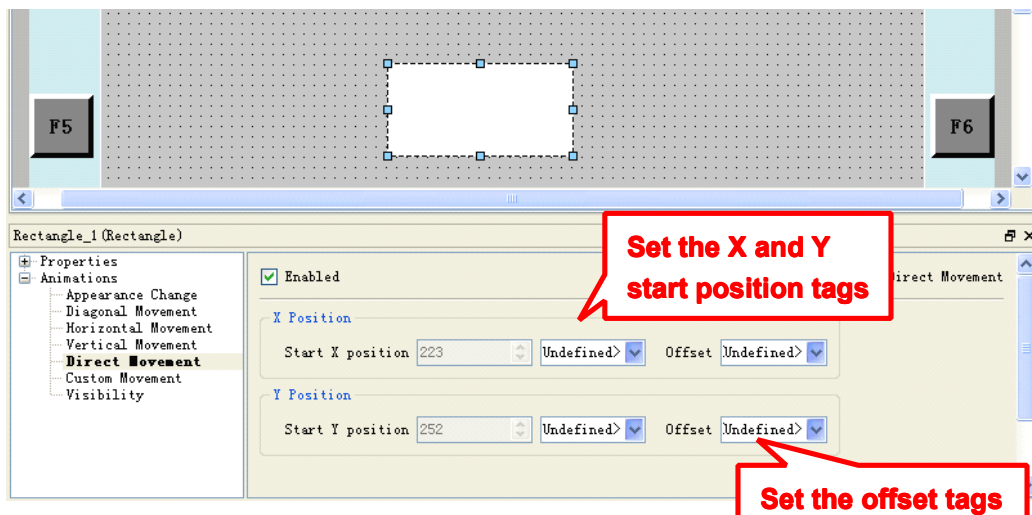
After configured above sections, the property for the rectangle show as below:



## 11.2.6 Direct Movement

The object moves a specific number of pixels along the X and Y coordinate. The distance-to-go defined by the absolute value of two variables.

'Direct Movement' Property of a rectangle's displays as below:



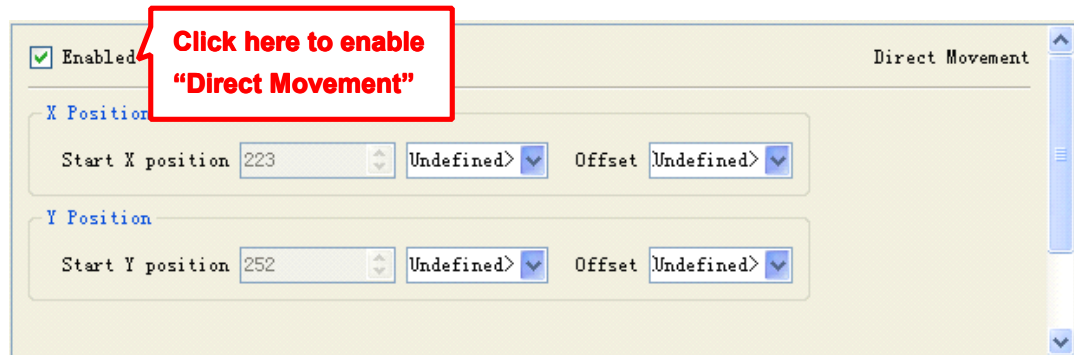
The property of 'Direct Movement' sees below table:

| Property   |                  | Description                             |
|------------|------------------|-----------------------------------------|
| Enabled    |                  | Enable objects to move.                 |
| X Position | Start X position | A tag to set X start position.          |
|            | Offset           | A tag to set the offset in X direction. |
| Y Position | Start Y position | A tag to set Y start position.          |
|            | Offset           | A tag to set the offset in Y direction. |

- X axis: If the variable value in X axis direction is greater than 0, the object moves along the positive direction, otherwise moves along the negative direction. When variable value is equal to 0, the object retains the same.
- Y axis: If the variable value in Y axis direction is greater than 0, the object moves along the positive direction, otherwise moves along the negative direction. When variable value is equal to 0, the object retains the same.

The following is an example of Direct Movement for rectangle objects:

1. Select rectangle object, then open the property view "Animation" of the rectangle, select "Direct Movement".



2. Enable "Direct Movement".

3. Configure "Start X position".

Click "Start X position" drop-down menu to open variable list, select a variables and use it to control X position.

4. Configure "Start Y position".

Click "start Y position" drop-down menu to open variable list, select a variable and use it to control Y position.

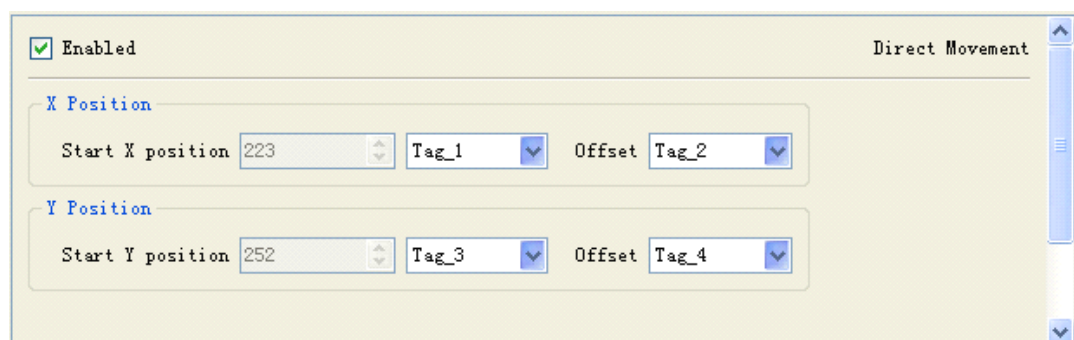
Configure X position "Offset".

Click X position "Offset" drop-down menu to open variable list, select a variable and use it to control the offset of X axis.

Configure Y position "Offset".

Click Y position "Offset" drop-down menu to open variable list, select a variables and use it to control the offset of Y axis.

After configured above sections, the property for the rectangle show as below:



### 11.2.7 Custom Movement

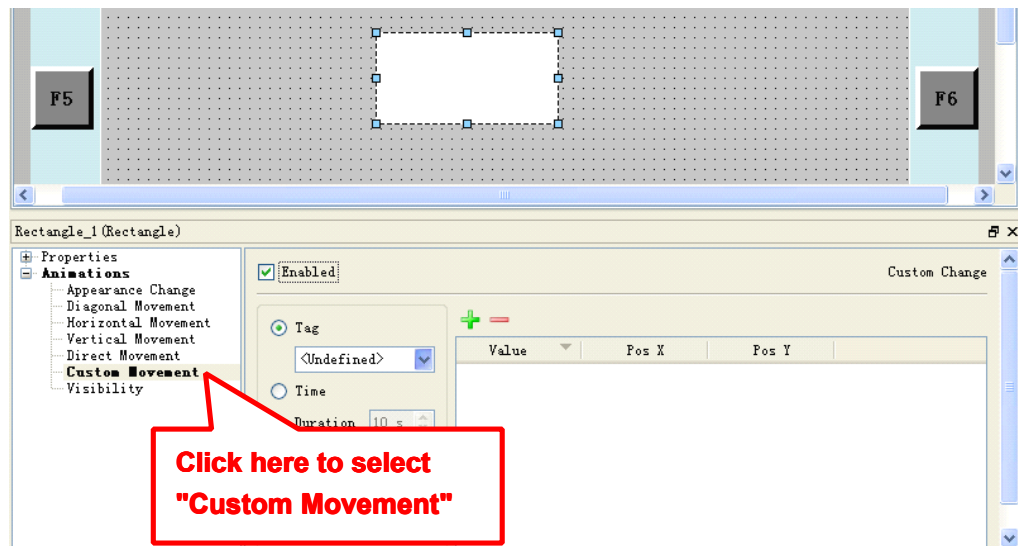
The object moves along custom coordinates.

We can customize tag mode and time mode for Custom Movement.

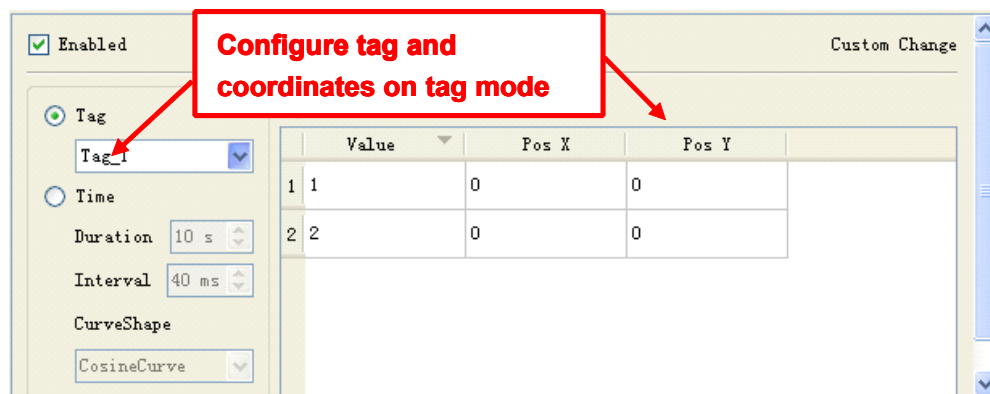
- Tag mode: The movement defined by the tags, the objects moves along the X,Y coordinate that in accordance with the variables.
- Time mode: The movement defined by the Duration and Interval, we can select curve shape by setting duration.
- Moving points: We can configure 32 points at most.

The following is an example of Custom Movement for rectangle objects:

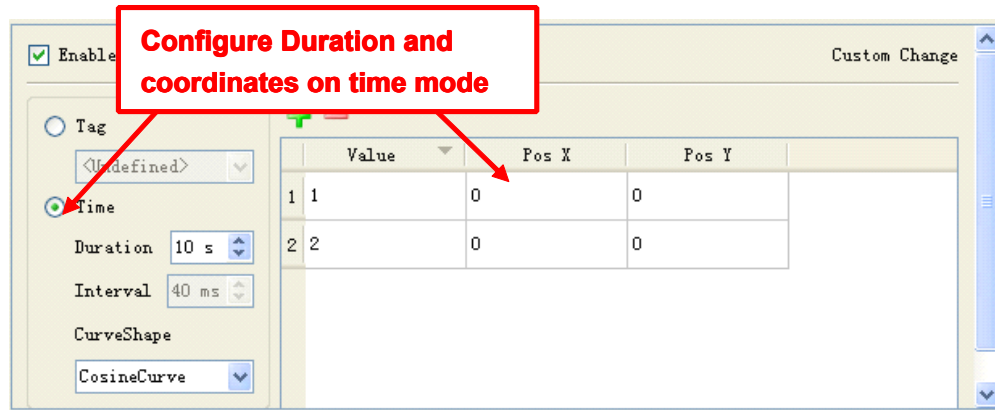
1. Select rectangle object, then open the property view "animation" of the rectangle, select "Custom Movement".



2. The objects moves by customizing tag and coordinates on tag mode. See below figure:



3. The objects moves by customizing time and coordinates On time mode, see below figure:



Duration range: 1 ~ 60 seconds

Curve Shape:

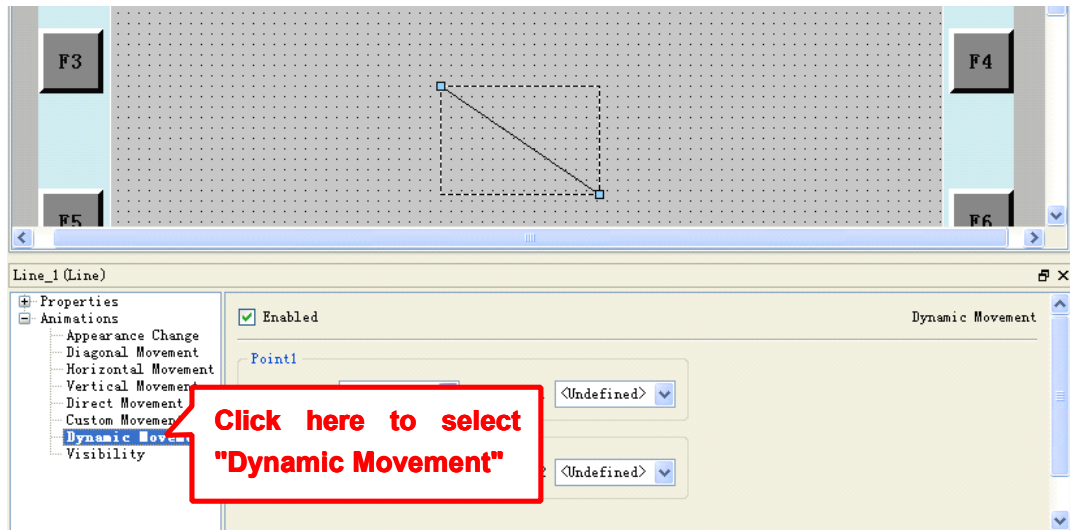
| Curve Type     | Description                                                                                         |
|----------------|-----------------------------------------------------------------------------------------------------|
| EaseInCurve    | The objects doing acceleration curve motion along the customized coordinates.                       |
| EaseOutCurve   | The objects doing deceleration curve motion along the customized coordinates.                       |
| EaseInOutCurve | The objects doing first speed up and later slow down curve motion along the customized coordinates. |
| LinearCurve    | The objects doing uniform curve motion along the customized coordinates.                            |
| SineCurve      | The objects doing sin curve motion along the customized coordinates.                                |
| CosineCurve    | The objects doing cos curve motion along the customized coordinates.                                |

### 11.2.8 Dynamic Movements

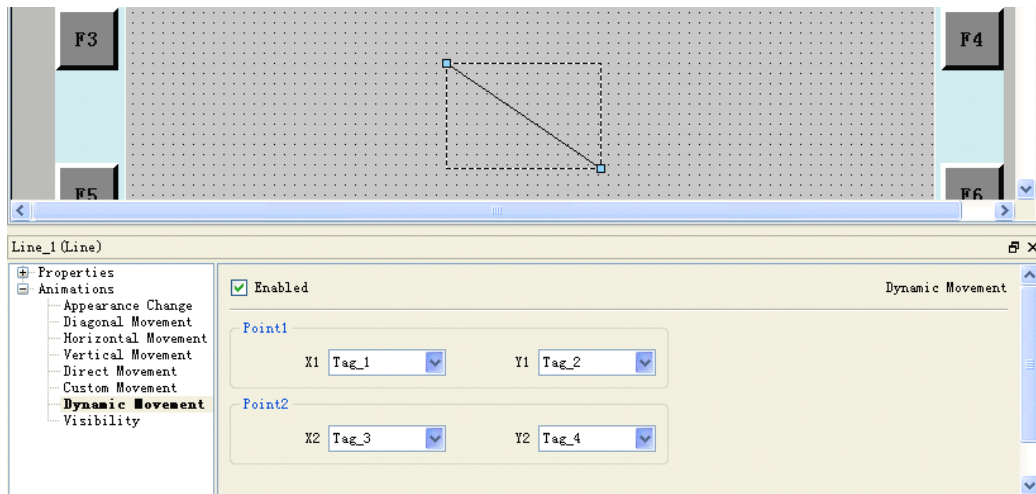
You can control the object moving along a specifically path or moving specific number of pixels (at an angle) in run-time system by changing the tag's value.

The flowing is the steps of configuring a line's dynamic movement.

1. Select line object, then open the property view "animation" of the line, select "Dynamic Movement".



2. Configure tags for point 1 and point 2. We configure tag\_1 for X1 position, tag\_2 for Y1 position, tag\_3 for X2 position, tag\_4 for Y2 position, see the following:



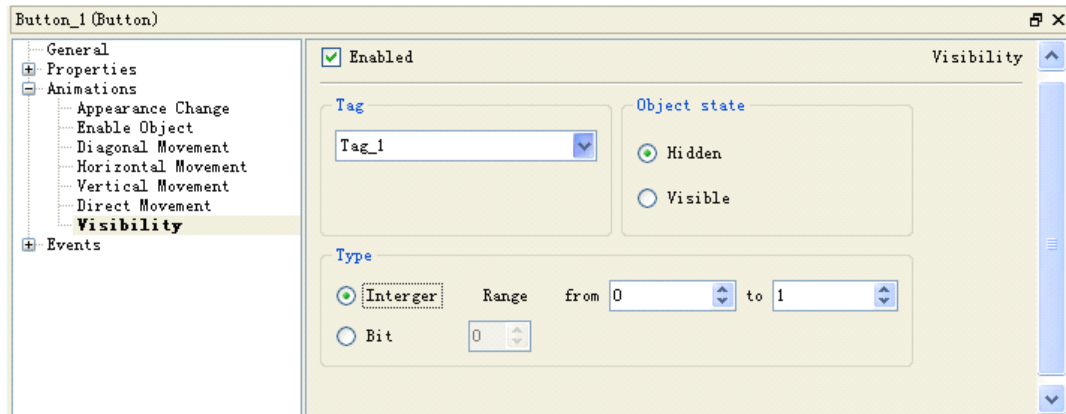
### Tip

These four variables' type must be Integer. (X1, Y1) might not be the starting of the line, may be ending.

## 11.2.9 Visibility

You can control the visibility of the object dynamically in run-time system by changing the tag's value which you have configured in its 'Visibility' animation property. Whether the object will be displayed depends on the state and the value of the tag. If the tag value equals to a particular value or within a certain range, the object will display.

'Visibility' Property View as follows:



Including these properties:

- **Enable:** Whether to enable the 'Visibility' animation. Enable the checkbox 'Enable' if you want to enable it.
- **Object state:** The object's display status, two status: 'Hidden' and 'Visible'.

**Hidden:** The object will hide when the tag's 'Bit' is true or the tag value is equal to the value or within the range.

**Visible:** The object will display when the tag's 'Bit' is true or the tag value is equal to the value or within the range.

- **Tag:** The tag which control the visibility of an object.
- **Type:** The type of the tag, two choices: 'Integer' and 'Bit'.

| Type    | Description                                                                                                                                                                                                                                                                        |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integer | Whether to display or hide the object depends on the value or the range of the tag. If you enable it, you also should configure the range('from'..'to'..). If the 'Object state' is visible, and the tag value is within the range, the object is visible, otherwise, it's hidden. |
| Bit     | Whether to display or hide the object depends on the bit of the tag. If you enable it, you also should assign a bit for the tag. If the 'Object state' is visible, and the bit is true the object is visible, otherwise, it's hidden.                                              |

The following is the steps of configuring an object's 'Visibility' animation:

- 1) Select the object in screen.
- 2) Click the '+' button on the left of 'Animations' in 'Property View', select 'Visibility'.
- 3) Enable the 'Enable' checkbox.
- 4) Configure the 'Object state' you need: 'Visible' or 'Hidden'.
- 5) Configure a tag for the object's visibility, and then configure the range or bit for it.

## 12 Simulator

MagicWorks HMI support simulation function, you can simulate a project on PC, but the simulation can't communicate with PLC.

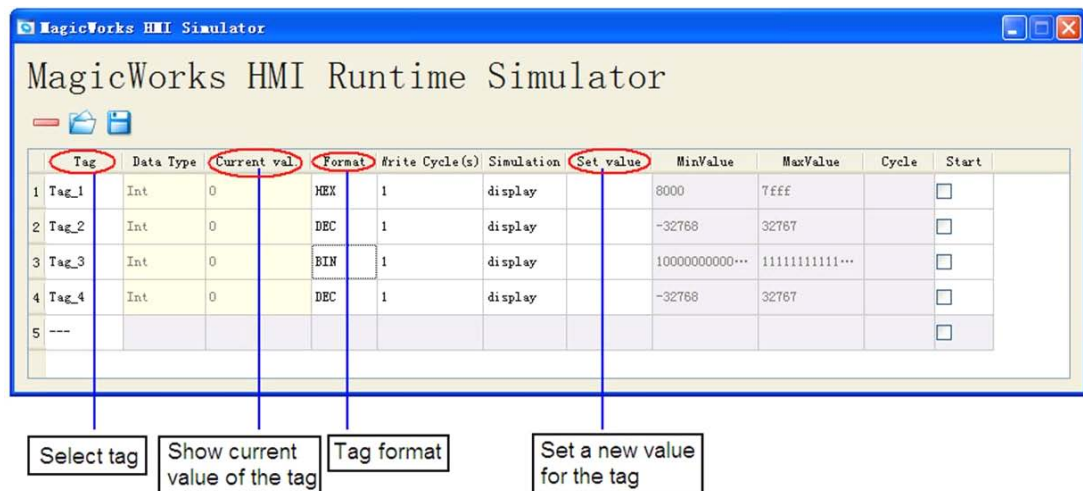
The steps of simulate the project:

1. Create a new project, configure connections, tags and screens.
2. Save and compile the project.
3. Select [Project] / [Start Runtime] or click  button to simulate the project.

For the first time to simulate, MagicWorks HMI simulator will start a new empty simulation table.

4. Now you can operate the tags in the simulation table, such as set the tag's value in 'Set value' column, then you can observe the changes of the configuration object in simulation screen.

The simulator table sees as follows:



|   | Tag   | Data Type | Current val. | Format | #rite Cycle(s) | Simulation | Set value | MinValue       | MaxValue       | Cycle | Start                    |
|---|-------|-----------|--------------|--------|----------------|------------|-----------|----------------|----------------|-------|--------------------------|
| 1 | Tag_1 | Int       | 0            | HEX    | 1              | display    |           | 8000           | 7fff           |       | <input type="checkbox"/> |
| 2 | Tag_2 | Int       | 0            | DEC    | 1              | display    |           | -32768         | 32767          |       | <input type="checkbox"/> |
| 3 | Tag_3 | Int       | 0            | BIN    | 1              | display    |           | 10000000000... | 11111111111... |       | <input type="checkbox"/> |
| 4 | Tag_4 | Int       | 0            | DEC    | 1              | display    |           | -32768         | 32767          |       | <input type="checkbox"/> |
| 5 | ---   |           |              |        |                |            |           |                |                |       | <input type="checkbox"/> |

Each column of the simulator table is described as follows:

| Name          | Description                                             |
|---------------|---------------------------------------------------------|
| Tag           | Select the tag to be simulated.                         |
| Current value | Display the current value of the object.                |
| Set value     | Double-click the column and input an value for variable |
| Data Type     | The data type of the variable.                          |
| Format        | Offers DEC, HEX and BIN formats for selection.          |
| Simulation    | Select the simulation method of current tag.            |

In the runtime simulator table, first double-click "Tag" column to choose the tags to be simulated.

Input the value in the "Set Value" column and click "Enter" Key from keyboard, then you can see the value you have set displaying in the Current val.' column.

You can delete, open or save the contents in the runtime simulator by keys.



 Button is used to delete the selected contents in the runtime simulator.

 Button is used to save the variables in the runtime simulator, the saving location defaults to where the project is located, the filename extension is sim.

 Button is used to open the simulator which has been saved. As different projects used different variables, this project can only open the saved sim file of this project.

## 13 Set system parameters for HMI

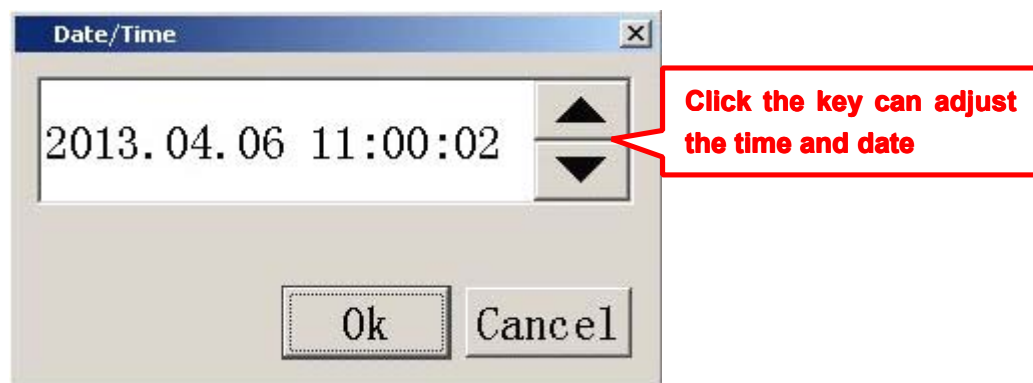
Copanel HMI provides a User-friendly interface, users can define parameters include: Date/Time, Language, Buzz, Update, Screensaver, Test, Calibrate, Print Setup, Repairing Tool, Font Manage and Reboot.

Enter in parameters configuration interface by one of following methods:

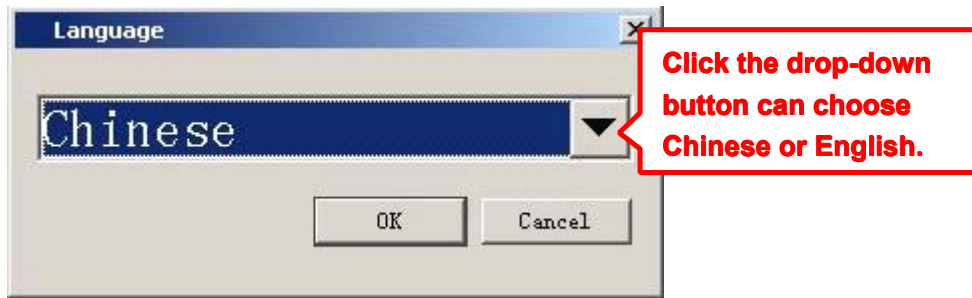
1. Provide power to HMI, touch screen panel should press the screen for about 3 seconds / the key screen should press "Enter" button to enter in selection screen, click "Configure" to enter into configure interface.
2. During the HMI operating process, click the HMI screen to enter in configuration interface according to the sequence: Upper left-> Upper right->Lower right->Lower left:



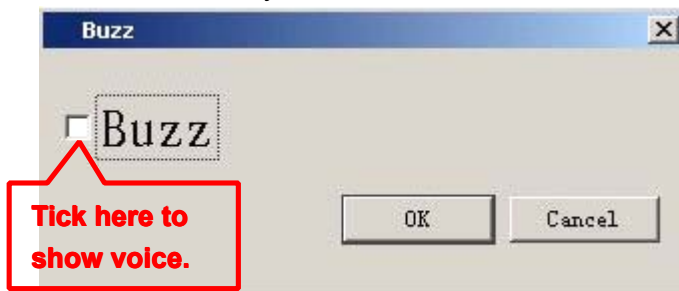
- 'Date/time', Set the time and date of the touch screen in the below interface:



- 'Language', Set screen language (It is useful to predefined text of complex view, you can check these predefined text in 'Project Text').The settings will take effect after the operation is completed.



- 'Buzz', set the key panel or touch panel's voice. After setting, the HMI must restart then it will take effect. In the below interface, choose 'Buzz' and click 'OK' to enable the key voice.



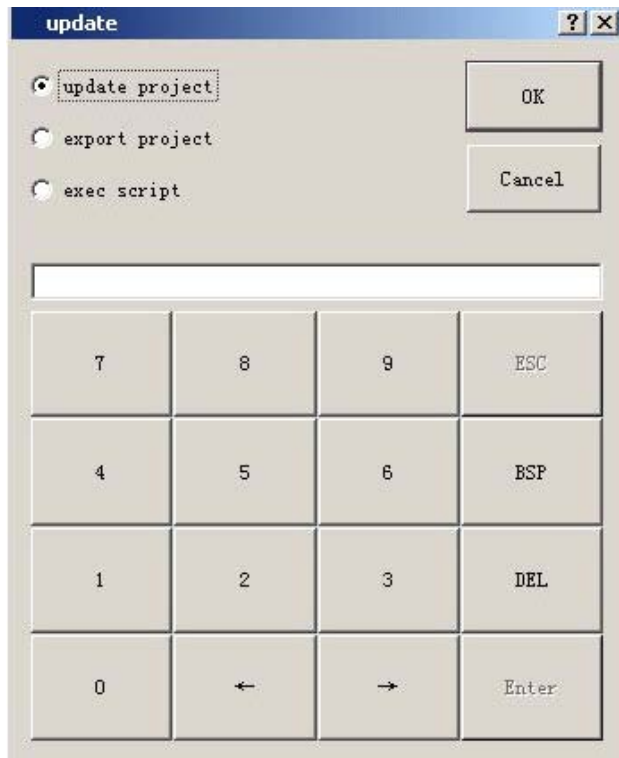
- 'Update' including the following three functions:

'update project' update HMI user project by U disk.

Note: Please compile the project before updating it to the U disk.

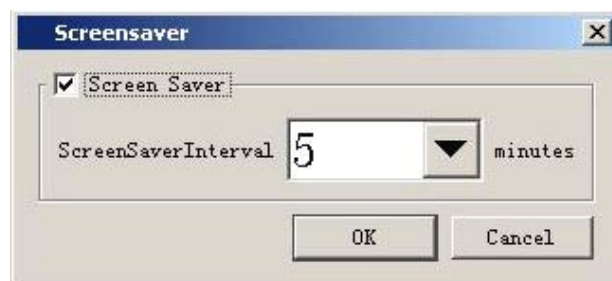
'export project' export user project to U disk(including export recipe view and user view).

'exec script' for internal debugging use.



If the current project doesn't need a password, input the password '26470489' to update the project. If the current project has been set an 'update password', when use the new project to update the old project, you must input the 'update password' you set. After the updated is completed, would prompt 'Update success', otherwise prompt 'update failure'.

- 'Screen Saver', whether opens the screen saver and time interval (N minutes). After completed the Settings, immediately take effect. After opened the screen saver, If do not operate HMI in N minutes, HMI automatically enter screen savers, and display project configuration screen saver, When operating HMI again or produce an alarm, Screen saver automatically disappear. After opening the screen savers, the first operation is useless, only will cancel the screen saver.



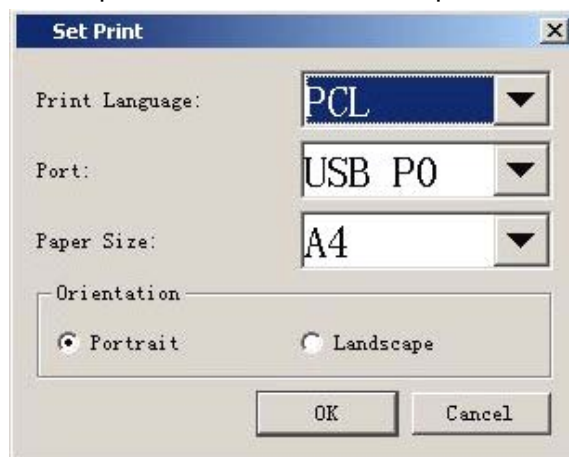
Note: The setting would take effect after the HMI device is rebooted.

- 'Test', hardware test, used for the production test. Users do not need this function.
- 'Calibrate', recalibration touch screen. Only the touch screen has this option. Click '+' to enter calibration interface, use the calibration pen to click the center of '+',

after the calibration is successful, the interface will prompt 'OK'. Otherwise will prompt 're-calibration', and need provide power to HMI again.



- 'Print Setup', it's used to setup the printer. You can set the print language, port, Paper size, Orientation of the printer:



- 'Repairing Tool', repair SD/U disk, mainly repairs historical data(data record, alarm record) on the SD/U dish.



- 'Font Manage', it's used to manage the font file of HMI device. The functions of the four buttons on "Font Manage" interface are described as follows:



: Copy the fonts from HMI device to U disk;



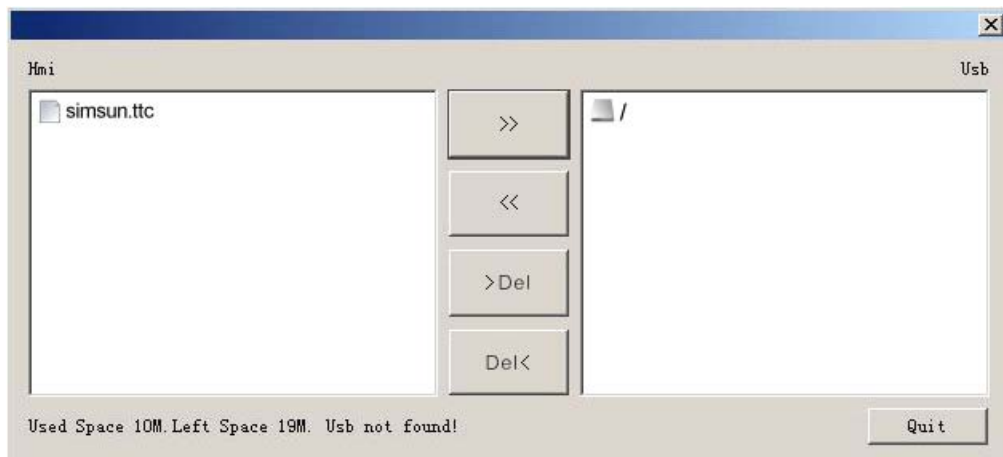
: Copy the fonts (format must be ttf or ttc) from U disk to HMI device;



: Delete the fonts from HMI device;



: Delete the fonts from U disk;



**Note:**

The supported font's format of HMI device is ttc and ttf.

You need reboot the HMI device after updated the font's files, so that the new fonts could take effect.

If the fonts are directly downloaded from the Internet, you'd better follow below steps to install it to HMI device.

- 1) Copy the downloaded fonts to "Control Panel"->"Fonts", and install the fonts.
- 2) All the fonts that installed to the "Fonts" file are converted to ttf or ttc formats, then copy those fonts from "Fonts" file to U disk;
- 3) Connect the U disk to HMI device, and enter into HMI loader interface-> Font manage, copy the fonts from U disk to HMI device and finally reboot it, then the fonts in U disk are copied to HMI device.

- 'Reboot', it's used to restart the HMI device.

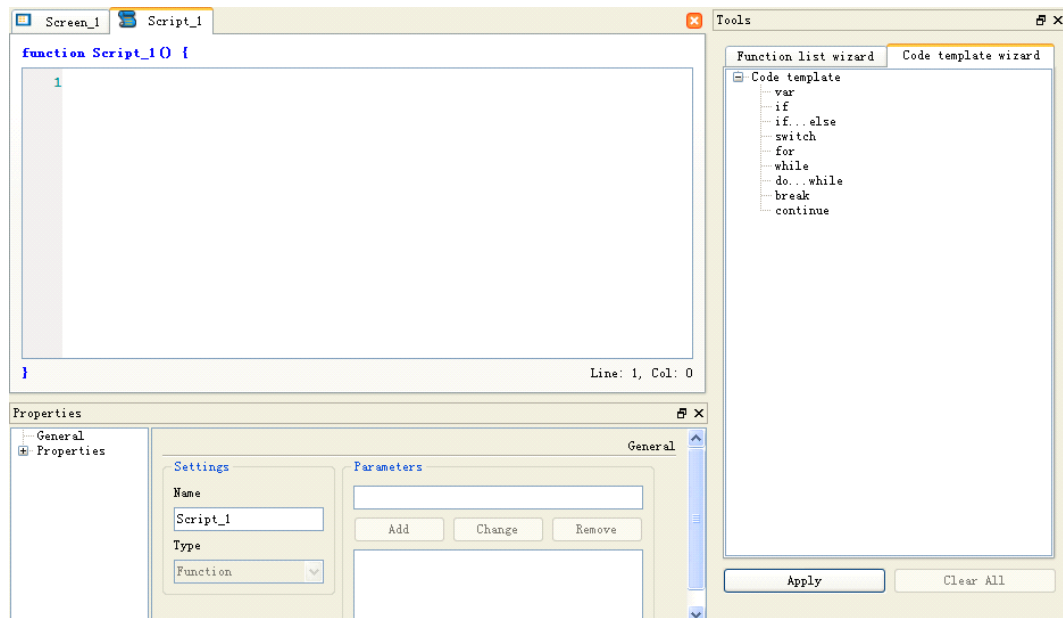
## 14 Script

### 14.1 Quickly Start: How to use a simple script

The procedure of configuring a script is as follows:

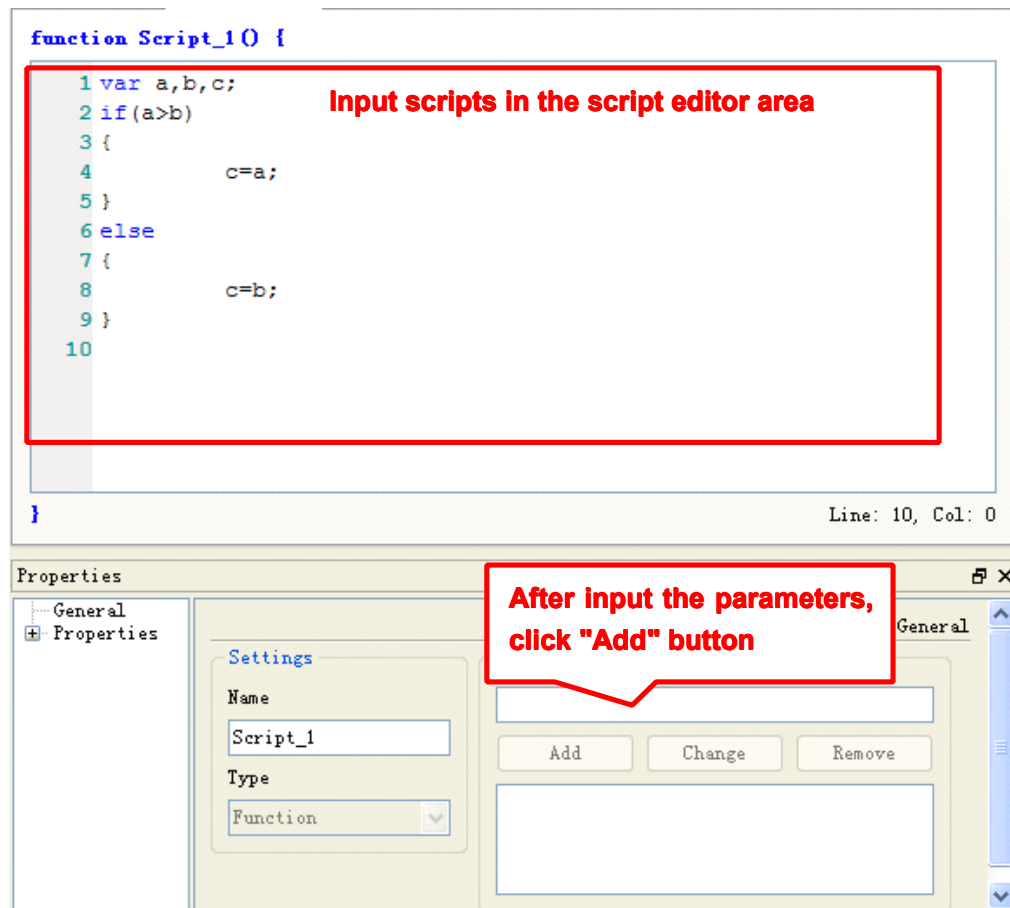
1. Create a new script

In the project view double-click [Script] [Add script]  , a new script "Script\_1" would be created, and appears the script editor, show as below:



2. Configure script

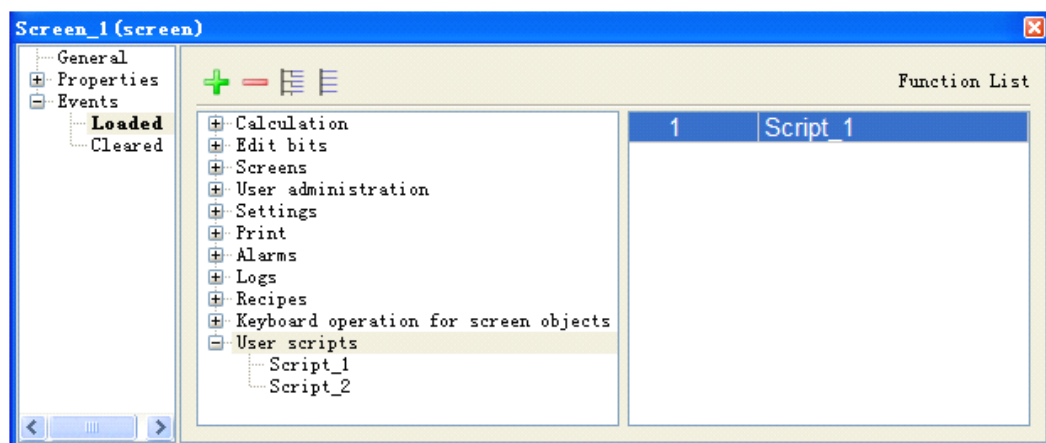
Write the script in the script editor according to your requirement, set name and parameters for script in "General" properties.



We use the default name "Script\_1" here, do not set parameters.

### 3. Calling scripts

Call scripts in "Events"



We need to call "Script\_1" for screen here. We have written two scripts, in "User scripts" would show "Script\_1" and "Script\_2", double-click "Script\_1" or choose

"Script\_1" to click  , it will show callable Script "Script\_1" in function list.



#### Tip

All events can call any one or more of the scripts. Script can't call each other.

## 14.2 Script functions

The script has the following 6 functions:

1. The script is essentially a user-defined function, user can configure it like other system functions (predefined functions); it can be configured up to 100 scripts.
2. The script can call its own standard functions, also can call HMI system function.

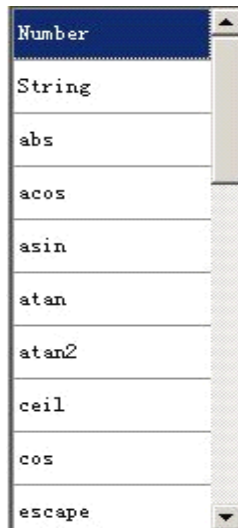
Script support two parts system functions: One is the data function of JavaScript, the second is parts of MagicWorks HMI system function.

JavaScript data functions are listed as below:

| Name   | Usage               | Function                                                                              |
|--------|---------------------|---------------------------------------------------------------------------------------|
| abs    | abs(number)         | Returns the absolute value of a number.                                               |
| acos   | acos(number)        | Returns the arccosine value of a number, the result is $0 \sim \pi$ radians.          |
| asin   | asin(number)        | Returns the arcsine value of a number, the result is $-\pi/2 \sim \pi/2$ radians.     |
| atan   | atan(number)        | Returns the arc tangent value of a number, the result is $-\pi/2 \sim \pi/2$ radians. |
| atan2  | atan2(number)       | Returns the polar coordinates Angle value of a coordinates.                           |
| ceil   | ceil(number)        | Returns the minimum integer value of a number (which is equal to or greater than ).   |
| cos    | cos(number)         | Returns the cosine value of a number, the results is $-1 \sim 1$ .                    |
| exp    | exp(number)         | Return the power value of e (natural logarithms).                                     |
| floor  | floor(number)       | Returns the maximum integer value of a number (which is less than or equal to ).      |
| log    | log(number)         | Natural logarithm function, and returns the natural logarithms (e) value of a number. |
| max    | max(number, number) | Returns the maximum value of two numbers.                                             |
| min    | min(number, number) | Returns the minimum value of two numbers.                                             |
| pow    | pow(number)         | Returns the power value of a number.                                                  |
| random | random()            | Returns the random value of a number that ranges from $0 \sim 1$ .                    |
| round  | round(number)       | Returns the rounding value of a number, the type is an integer.                       |
| sin    | sin(number)         | Returns the sine value of a number, the results is $-1 \sim 1$ .                      |
| sqrt   | sqrt(number)        | Returns the square root value of a number.                                            |
| tan    | tan(number)         | Returns the tangent value of a number.                                                |

Note: Add "Math." before function name when using above functions, or obtain the

functions by clicking  button:



The following take 'sqrt' for an example to illustrate the usage of above functions.

Example: Call function “sqrt” to calculate square root a for b.

```
a = Math.sqrt( b);
```

MagicWorks HMI system functions are listed as below:

| Name                   | Usage                                     | Function                                            |
|------------------------|-------------------------------------------|-----------------------------------------------------|
| DecreaseValue          | DecreaseValue(tag)                        | The value subtract 1.                               |
| IncreaseValue          | IncreaseValue(tag)                        | The value add 1.                                    |
| InverseLinearScaling   | InverseLinearScaling(Y,b,a)               | Inverse Linear conversion.                          |
| LinearScaling          | LinearScaling(a,X,b)                      | Linear conversion.                                  |
| SetValue               | SetValue(tag)                             | SetValue.                                           |
| InvertBit              | InvertBit(tag)                            | Invert Bit variables.                               |
| InvertBitInTag         | InvertBitInTag(tag)                       | one bit of the invert variables.                    |
| ResetBit               | ResetBit(Tag)                             | Reset a bit variable.                               |
| ResetBitInTag          | ResetBitInTag(Tag)                        | Reset one bit of the variable.                      |
| SetBit                 | SetBit(Tag)                               | Set Bit variable.                                   |
| SetBitInTag            | SetBitInTag(Tag)                          | One bit of the Set Bit variable.                    |
| ActivatePreviousScreen |                                           | Switch to previous activated screen.                |
| ActivateScreen         | ActivateScreen(screens name)              | Switch to fixed screen.                             |
| ActivateScreenByNumber | ActivateScreenByNumber(s<br>creen number) | Switch to picture ID that equal to variable screen. |

Note: The usage of below functions can refer to chapter 11.1 function parts.

### 3. 'The operators that supported by the script'

Support most generic operators of JavaScript, contained arithmetic operators, comparison operators, logical operators, string operator.

#### (1) Arithmetic operator

| Operator | Declaration                                                                                                                                              | Example                                                                         |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| =        | value assignment (value)                                                                                                                                 | A = 5 // The result is A equal to 5.                                            |
| +        | Implement the additions if all the operands are numbers. If some operand contained string will execute the function of connecting string.                | A = 5 + 8 // The result is 13.<br>A ="5"+ 8 // The result is "58".              |
| -        | Subtraction                                                                                                                                              | A = 8 – 5                                                                       |
| *        | Multiplication                                                                                                                                           | A = 8 * 5                                                                       |
| /        | Division                                                                                                                                                 | A = 20 / 5                                                                      |
| %        | Get remainder – The remainder after division                                                                                                             | 10 % 3 = 1                                                                      |
| ++       | Unary increasing. This operator only calculate an operand, operand value add 1. Return value depends on + + operator is located before or after operand. | ++x returns x value after increasing.<br>x++ returns x value before increasing. |
| --       | Unary decreasing. This operator only calculate an operand. Return value depends on - - operator is located before or after operand.                      | --x returns x value after decreasing.<br>x-- returns x value before decreasing. |
| -        | Unary complementary.This operator returns the opposite number of the operand.                                                                            | If a equal to 5,so-a=-5.                                                        |

## (2) Comparison operators

| Operator | Declaration                                                                                           | Example                   |
|----------|-------------------------------------------------------------------------------------------------------|---------------------------|
| =        | Equal to. If the two operands are equal, then returning True.                                         | a == b                    |
| !=       | Unequal to. If the two operands differ, return True.                                                  | Var2 != 5                 |
| >        | Greater than. If left operand is greater than the right operand, return True                          | Var1 > var2               |
| >=       | Greater than or equal to. If left operand is greater than or equal to the right operand, return True. | Var1 >= 5<br>Var1 >= var2 |
| <        | Less than. If left operand is less than right operand, return True                                    | Var2 < var1               |
| <=       | Less than or equal to. If left operand is less than or equal to right operand, then return True       | Var2 <= 4<br>Var2 <= var1 |

## (3) Logical operators

| Operator | Declaration | Example        |
|----------|-------------|----------------|
| And(&&)  | logical and | expr1 && expr2 |
| Or (  )  | logical or  | expr1    expr2 |
| Not (!)  | logical not | !expr          |

## (4) String operator

| Operator | Declaration                                       | Example                                        |
|----------|---------------------------------------------------|------------------------------------------------|
| =        | Value assignment (string)                         | x = "yellow";<br>y = "green";                  |
| +        | Add specified string after the designated string. | z = x + y + "white"; So z is yellowgreenwhite. |

## 4. Script can visit the project variables

Script access project variables through keyword SmartTags "call by reference".

SmartTags quoted rules: SmartTags (" variable name ")

For example: SetValue SmartTags ("Tag1 "), 64; / / \* \* the function of this statement is to assign 64 to variables "Tag1".

## 5. The script calls HMI clock

It's available for Scripts library function, which place the invoked clock in some fixed internal variables. The script can meet the requirement of calling HMI system clock. Specific script invoked functions as below:

```
getFullYear();    // This function read year(four figures)
getMonth();       // This function read month(0-11)
getDate();        // this function read the date of the month(1-31)
getHours();       // this function read hours(0-23)
getMinutes();     // this function read minutes(0-59)
getSeconds();     // this function read seconds(0-59)
getMilliseconds();// This function read Milliseconds(0-999)
```

The example of Script calling HMI system clock refer to chapter 14.5.2.

## 6. Script timer function

Script timer has the function of cyclic and single executing the timer.

The script timer has the following four functions:

SetInterval:Set intervals for cycle timer and quote timing function.

SetTimeout:Set intervals for single timer and quote timing function.

ClearInterval:Stop cycle timer.

ClearTimeout:Stop single timer.

The using standard of Script timer function:

| Function grammar and parameters                                                                                                                                                 | function return value                                                                                                                                                                                                                                                                          | function declaration                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| grammar:<br>setInterval (func, interval)<br>parameters:<br>func - Timing function name<br>interval - Milliseconds interval                                                      | ID identifier (timer ID) for<br>setInterval function, every<br>time we call setInterval<br>function would generate a<br>unique ID, we can stop<br>setInterval function by calling<br>clearInterval function (the<br>parameters of the function<br>receives a returned ID from<br>setInterval). | SetInterval function would<br>repeat to execute for a<br>period of time, so it should<br>use clearInterval to stop it.                                                       |
| grammar:<br>clearInterval (id)<br>parameters:<br>id – ID that returned by the<br>setInterval function                                                                           | null                                                                                                                                                                                                                                                                                           | stop                                                                                                                                                                         |
| grammar:<br>setTimeout (func, interval)<br>parameters:<br>func - Timing function name<br>interval - Waiting for milliseconds<br>(usually used to generate<br>animation effects) | ID identifier (timer ID) for<br>SetTimeout function, every<br>time we call SetTimeout<br>function would generate a<br>unique ID, we can stop<br>setTimeout function by calling<br>clearTimeout function (the<br>parameters of the function<br>receives a returned ID from<br>setTimeout).      | Suspended for a period of<br>time before implement<br>timing function through<br>the setTimeout function, it<br>can achieve some special<br>effects.                         |
| grammar:<br>clearTimeout (id)<br>parameters:<br>id - ID that returned by the<br>setTimeout function                                                                             | null                                                                                                                                                                                                                                                                                           | If it's not yet execute the<br>code of the setTimeout<br>function, it would call<br>clearTimeout function, so<br>it won't execute the code<br>of the setTimeout<br>function. |

The example of Script timer refer to chapter 14.5.3.

### 14.3 Application standards of Script

MagicWorks HMI use JavaScript as a script language.

Like any other language, JavaScript also follows some basic rules of grammar.

1. Support basic data types: numeric type, logical type or Boolean type, string type and empty type.
2. Support operators including: arithmetic operators, comparison operators, logical operators, string operator.
3. Conditional statement including: if... Else and branch statements switch.
4. Looping statements including: for , do... While, while, break & continue statement.
5. Contain some predefined function, can also create user-defined functions.

### 14.3.1 Standard

Like any other language, JavaScript also follows some basic grammar rules, such as: case-sensitive, use pairs of symbols, use Spaces and use comments.

#### Writing rules:

- (1) Case-sensitive of characters.
- (2) Naming rules of identifier: use letters, underline '\_' or the dollar symbol '\$' as a beginning, allow the name to contain letters, Numbers and underline '\_' and the dollar symbol '\$', case-sensitive.
- (3) Statement use semicolon (";") as end operator.
- (4) Use comments: Support / \*... \* / and / /...Comments statement. / \*... \* / :means multi-line comment, / /... :means one-line comments.
- (5) Use pairs of symbol: such as (), {}, etc.
- (6) Use blank spaces (blank character):

Appropriate blank lines can greatly improve the readability of the codes, can make code logic much more transparent.

#### Proposal:

- 1) Leave blank appropriately in expressions.
- 2) If there are parentheses behind keywords, it would be best to leave blank between left brace '(' and keywords, such as for, if, while etc.
- 3) It is not suitable to leave blank between brackets and function name, but if its anonymous function, must be left blank between left brace '(' and function, otherwise, editor would mistake function name for function.
- 4) In expression, binary operators (except left brace '(', left brackets '[' scope point'. ') and it's better to leave blank between the two operands.
- 5) Unary operator (if it is not word "typeof" etc) and its operands are unfavorable to leave blank.
- 6) Comma ',' should leave blank behind, in order to show clear parameters interval, variable interval, etc..
- 7) Behind semicolons ';' usually indicates the end of expression statements, and shall

leave blank lines.

8) In the conditional statement “for”, should leave blank after a semicolon.

(7) The length of the line: The code for each line should less than 80 characters. If the code is longer, should try to choose new-line, the next line code should be indented eight spaces.

## 14.3.2 Grammar

MagicWorks HMI supports JavaScript variable declaration statement, conditional statement and circular statement.

Variable declaration statement:var.

Conditional statement including: if... Else and branch statements switch.

Circular statements including: for , do... While, while, break & continue statement.

### 14.3.2.1 Var

Var is variable declaration, variable is a kind of container that quotesd memory location, which is used to save the value that can be changed when executes the script.

Declaration and application of the variable:

Variable declaration should satisfy the following conventions:

1. Variable names must use letters or underscore (\_) as a start.
2. Variable names must consist of English letters, Numbers, underscore (\_).
3. Because of JavaScript case-sensitive, so usable alphabet includes A to Z (capital) and a to z (small) characters.
4. Variable names can't use JavaScript keywords and JavaScript reserved words, and cannot use JavaScript language internal words. Such as Infinity, NaN, undefined.

Variable application:

It's best for variable to declare before use, also can use it when declaring;

The local variables that the Var keyword declare only effective inside the function, and the variables without var statement is regarded as global variable.

Examples

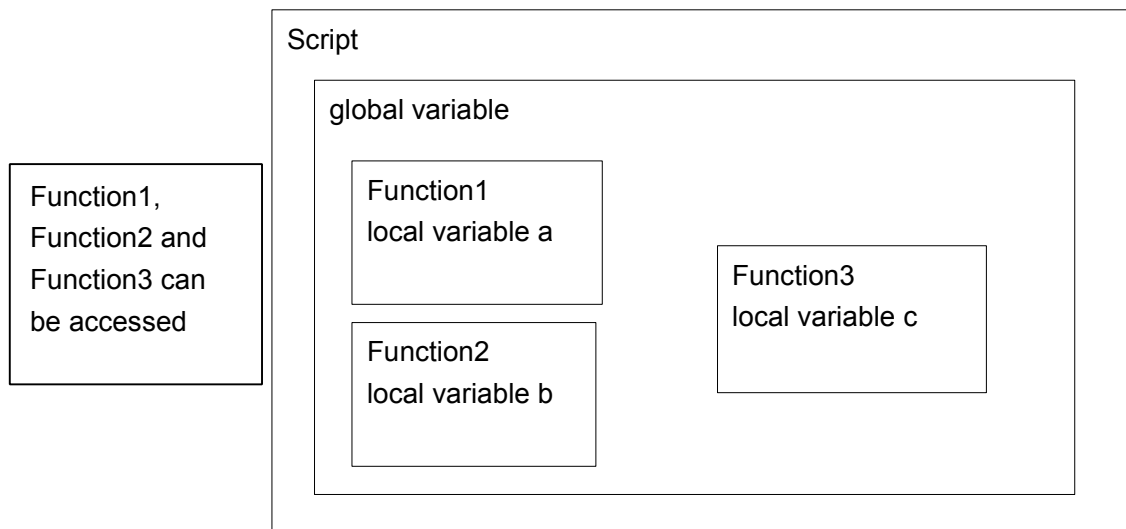
```
var a, b ;
var result ;
var mystring ;
var c = 5 ;
a = 10 ;
result = true ;
```

```
mystring = "d r e a m d u" ;
```

### Introductions

- Var represents declarative variables (declare means create). Var is the abbreviation of variable.
- a, b, c, result and mystring are variable names.
- 5, 10, true and "dreamdu" are variable value, 5 represents a number, "dreamdu" is a string, so should use double quotation marks.

The action scopes of variables



### Variable data types

There are four basic data types in JavaScript, listed as table below:

| Data Type                              | Description                       |
|----------------------------------------|-----------------------------------|
| numeric type (Number)                  | Integer or real number.           |
| Logical type or Boolean type (Boolean) | True or False.                    |
| String (String)                        | Such as "Hello World", "1234".    |
| Empty type (null)                      | The special keywords means null . |

#### 14.3.2.2 If...else

If... Else statement is used to estimate whether the given conditions meet the requirement, and provide operating mode according to the judgment.

If statements grammar

```

if(condition)
{
    Statement a;
    Statement b;
}

```

```

        .
        .
    }

```

Note: If the condition is fulfilled, it will perform statement a and statements b.

If...else statement syntax

```

if(condition)
{
    Statement a;
    Statement b;
}
else
{
    Statement c;
    Statement d;
}

```

Note: If the condition is satisfied, it will perform statement a and statement b, otherwise, it will perform statement c and statement d.

If...else declarative statements:

1. "if" Can be used independently, also "if... Else" can be compatible with it.
2. If... Else can be nested if... Else.

### Example

Request the maximum value between a and b, and assign the max. Value to c.

```

if(a>b)
{
    c = a;
}
else
{
    c = b;
}

```

#### 14.3.2.3 Switch

Switch statement syntax

```

switch(conditional expression)
{
    case constant:
    {
        Statement a;
    }
    break;
}

```

```

        case constant:
        {
            Statement b;
        }
        break;
        case constant:
        {
            Statement c;
        }
        break;
        ...
        case constant:
        {
            Statement f;
        }
        break;
        default:
        {
            Statement n;
        }
    }

```

Switch statements declaration:

- 1) Sequentially perform each statements that behind “case”, finally execute the statement n that under default.
- 2) There can be more statements behind each “case”, but need use {} as including.
- 3) Each value that behind “case” must be different from each other.

### Example

```

var a =3;
switch(a)
{
    case 0:
    {
        document.write("www");
    }
    break;
    case 1:
    {
        document.write("dreamdu");
    }
    break;
    case 2:
    {

```

```

        document.write("com");
    }
    break;
    case 3:
    {
        document.
Write("www.dreamdu.com");
    }
    break;
    default:
    {
        document.write("http://www.dreamdu.com");
    }
}

```

Switch Statement announcement:

The one behind “case” must be constant (which is immutable).

#### 14.3.2.4 for

For statement syntax

```

For (The initializer; Judge expression; Circulation
expression)
{
    statement;
}

```

For declarative statements

“for” statement is very flexible, it can replace 'while' and 'do... While' statement. See below figure, first execute "initialized expression", then according to the result of "Judge expression" to decide whether should execute circulation, if judge expression is “true”, execute the statements of the circulation, and finally perform the "Circulation expression", and continue to return to the beginning of the circulation to start for a new round; When expression is “false”, it does not execute cycle, and exit “for” cycle (true and false are JavaScript Boolean type).

#### Example

Calculate the sum of all the integers that ranges from 1~100 (including 1 and 100)

```

for(var i=0,iSum=0;i<=100;i++)
{
    iSum+=i;
}

```

“for” Statement announcement:

1. Should use braces {} to contain multiple statements (if there is only one statement, it's better to use braces).
2. Initializer may contain many expressions; circulation expression can also contain multiple expressions.

#### 14.3.2.5 while

while statement syntax

```
while( expression )
{
    statement;
}
```

while declarative statements:

"While" is uncertainty circulation, when expression result is true, execute the statements of the circulation; when expression is false, it does not execute cycle (true and false are JavaScript Boolean type).

#### Example

Calculate the sum of all the integers which ranges from 1~100 (including 1 and 100)

```
var i=0;
var iSum=0;
while(i<=100)
{
    iSum+=i;
    i++;
}
document. Write("1-100 the sum for all the numbers "+iSum);
```

When we use "while" statement , should pay attention to the followings:

1. Should use braces {} to contain multiple statements (It would be better to use brace even if there is only one statement).
2. Should contain cycling exit statements in cycling body, such as the above example i++ (Otherwise the cycling will endlessly run).
3. Notice the statements sequence of the cycling body, such as above example, if change the statements sequence iSum + = i; And i++; the results will be totally different.

#### 14.3.2.6 do...while

do...while statement syntax

```
do
{
    statement ;
```

```
}while(expression)
```

do...while statement declaration

“Do... While” is uncertainty circulation, firstly execute the statements that inside brace, when expression result is true, execute the statement of the cycling; It won't execute the cycling when expression is false, and exit “do... While” cycling (true and false are JavaScript Boolean type).

### Example

Calculate the sum of all the integers which ranges from 1-100 (including 1 and 100)

```
var i=0;
var iSum=0;
do
{
    iSum+=i;
    i++;
}while(i<=100)
```

When we use “do...while” statements, should pay attention to the followings:

1. Should use braces {} to contain multiple statements (It would be better to use brace even if there is only one statement)
2. Should contain cycling exit statements in cycling body, such as the above example i++ (Otherwise, the cycling will endlessly run).
3. Notice the statements sequence of the cycling body, such as the above example, if change the statements sequence iSum + = i; And i++; the results will be totally different.

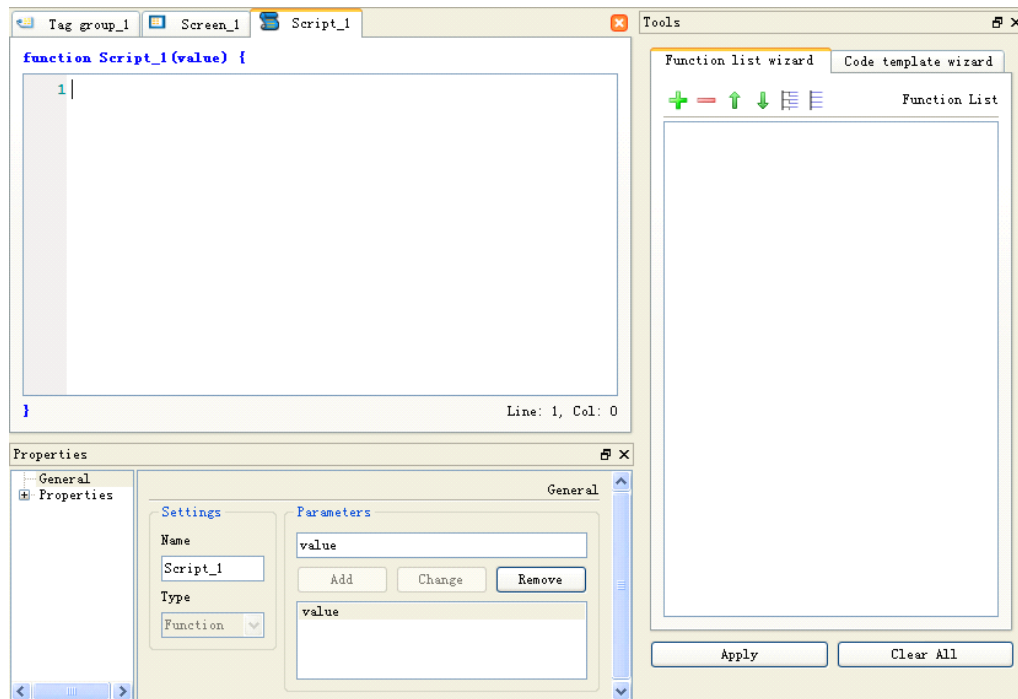
## 14.4 Script configuration mode

There are two ways to configure the script:

- (1) Input scripts in the script editor.
- (2) Use the tools “wizard” (function list wizard and code template wizard) to complete script automatically input.

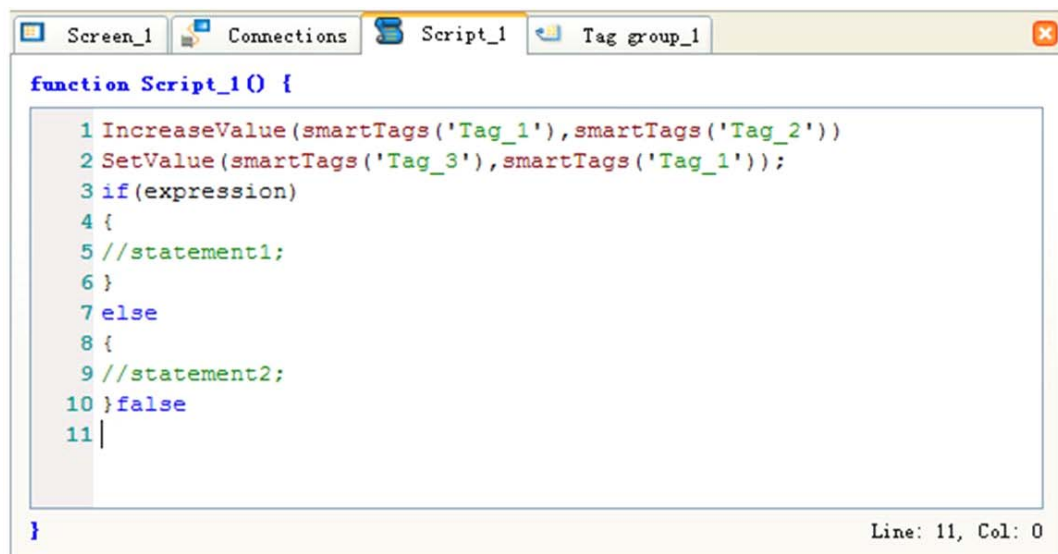
The input mode of scripts editor:

Double-click "Add Script" in project view, appear the following script editor:



### [Scripts editor]

Input scripts in script editor. Script editor provides intelligent perception, emphasis on grammar and other functions when programming.



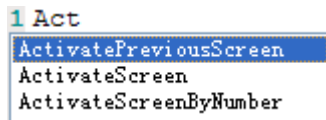
(1) When we input script, the first character of script name must be letters, the latter characters must be letters, numbers or underlined, cannot use Chinese characters, the maximum length for script name are 128 characters.

(2) The left side of the editor display line numbers, the lower right side prompt ranks information, in order to skip to the line numbers and choose the line, selected line show blue background.

(3) Keyword color and recognition is syntax coloring function.

After entered the first three letters of the script in script editor area, the system will

display all functions that including the three letters. See the example as below:



| Color | Implication             | Examples |
|-------|-------------------------|----------|
| Blue  | Keyword                 | if, else |
| Grey  | Keyword (object module) |          |
| Cyan  | Scripts                 |          |
| Brown | System function         | Increase |
| Green | tag comment             | tag_1    |

(4) MagicWorks HMI software provide 10 script edit menu for the script editor in the toolbars. Listed all scripts, system functions and JavaScript mathematical functions, etc. Show as below:



:Show javascripts constant.



:Show javascripts comment function.



:Show system variable.



:Show system functions



:Increase indent.



:Decrease indent.



:Comment out the selected lines.



:Uncomment out the selected lines.



:Go to the line.



:Check Javascript syntax.

(5) Checking language, need to check grammar for the script, the output window will prompt errors for inexistent variables after compiling is completed.

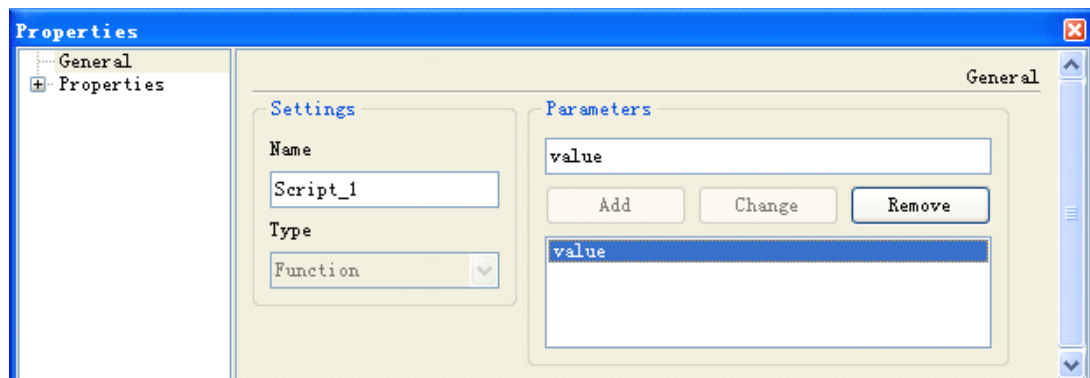
1) Check all the variables that used in the script, such as variable was deleted or renamed.

2) Likewise, the screen parameter of ActivateScreen may do similar inspection.

- 3) For other system function, if parameter numbers mismatching will display error.
- 4) Check the variables that configured by the system function have consensus of type, such as all the variables that configured by the systems function cannot be an array type, if so, the compiler will tip error information.
- 5) System function like DecreaseValue 、 IncreaseValue 、 InverseLinearScaling and LinearScaling can't be configured to Bool, String, DateTime type.
- 6) InvertBit, ResetBit, SetBit only can be configured to Bool type.
- 7) InvertBitIntag, ResetBitIntag SetBitIntag, ActivateScreenByNumber cannot configure Float, Double, Bool,String, DateTime type.
- 8) Compiled error message can't locate to the row or the column, only can prompt system function name.
- (6) The number of code line is restricted, no more than 100 lines.

### [Properties]

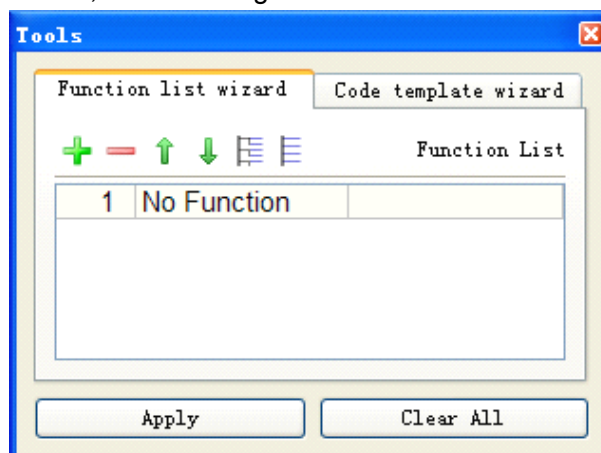
Configure "Name" and "Parameters" for the script in "General" properties view according to your requirements.



We can type a comment to declare the script in "Properties" properties view.

Wizard methods

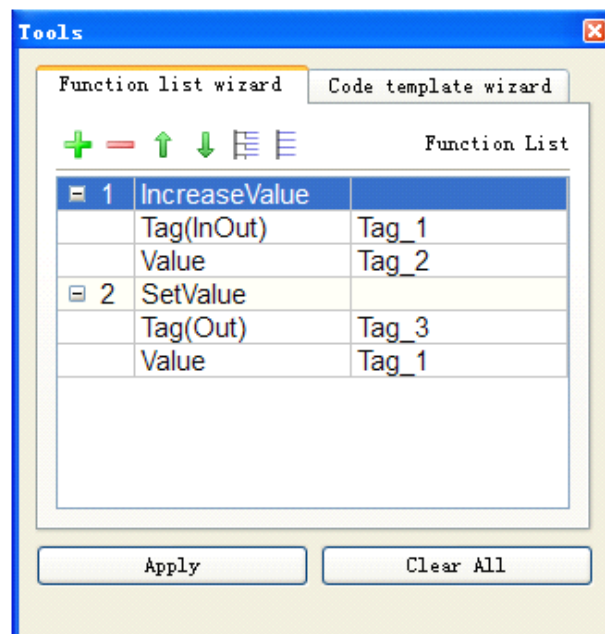
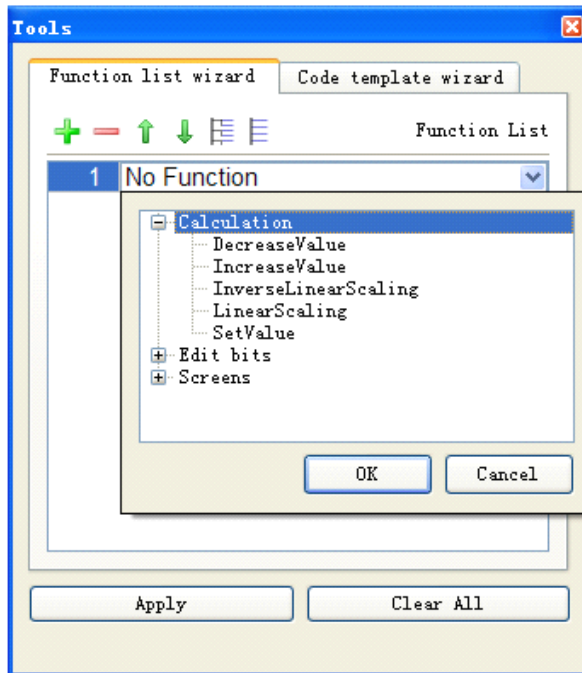
There are two wizard methods under "Tools": Function list wizard and Code template wizard, see below figure:



Complete the automatically input for the script through above "tools" wizard (Function list wizard and Code template wizard).

1. Configure function under Function list wizard

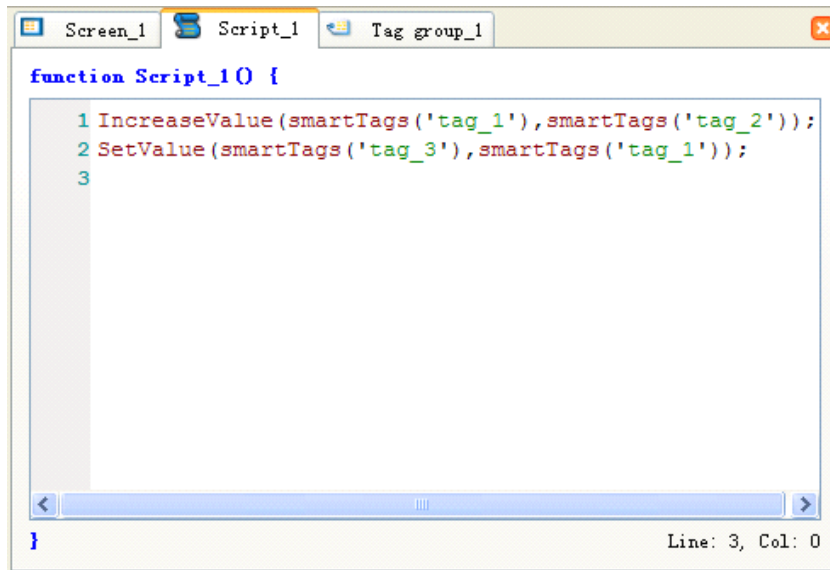
Click on  to show function "No Function" under the Function list, double click it, select the function you need in the appearing Drop-down dialog, then click "OK":



After configured the function, click "Apply", the system function script can be found in the scripts editor.

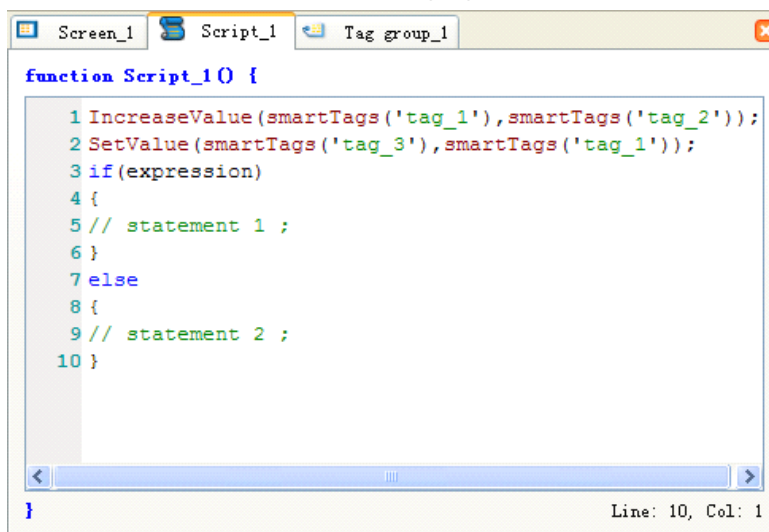
If you want to delete the function, click "Clear All".

The scripts that configured by the above figure displayed in below script editor:



2. Configure function under "Code template wizard".

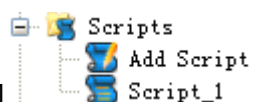
"Code template wizard" contains 10 script statements, choose a script statement according to your requirements and then click "apply" or double-click the statements. Script editor will appear statements, input scripts on the basis of the statements format. You can input conditions and comments to replace "expression" and "statement" section in the following figure:



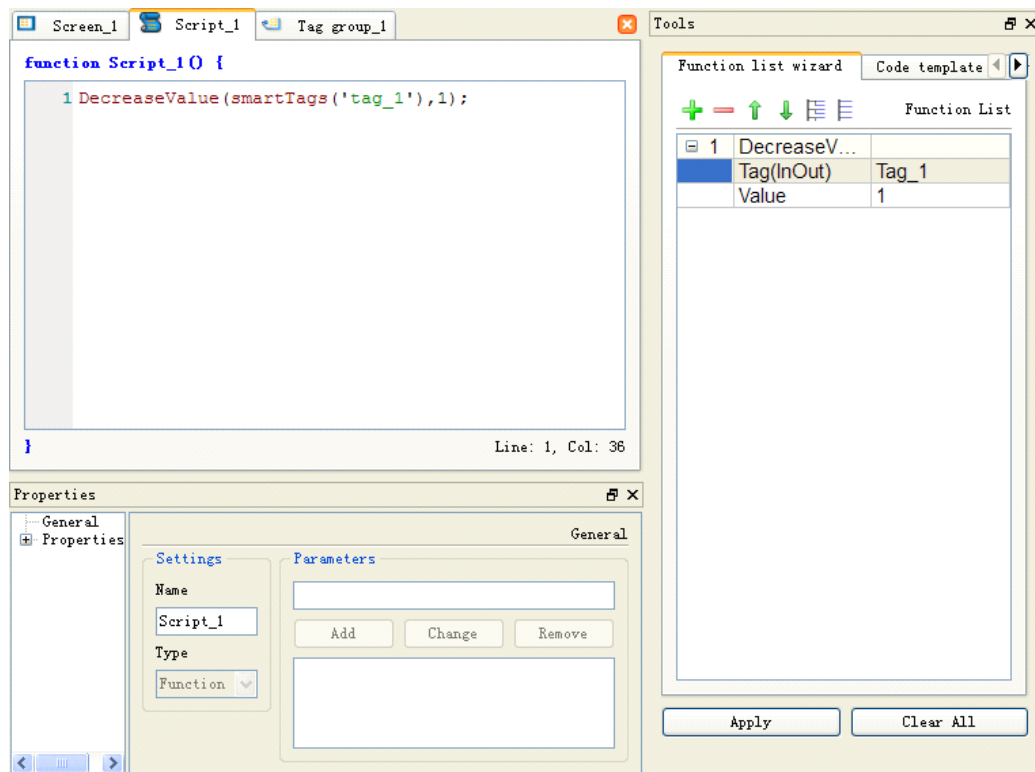
## 14.5 Several script samples

### 14.5.1 Create a script to call system function

The steps of calling system function are displaying as follows:

1. Double-click the [ script ] -> [ add script ]  , generate "Script\_1 "

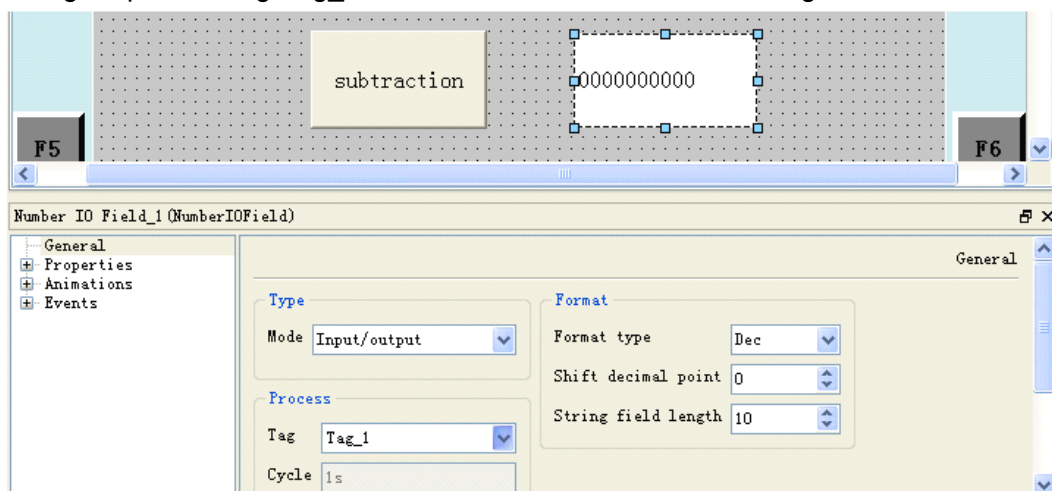
and appear the script editor, configure Script name "Script\_1" under "Settings":



2. Select "Function list wizard" on the right side of "Tools", click  to add the system function based on your requirements. We use "DecreaseValue" as an example, configure variables as "tag\_1", value is "1".

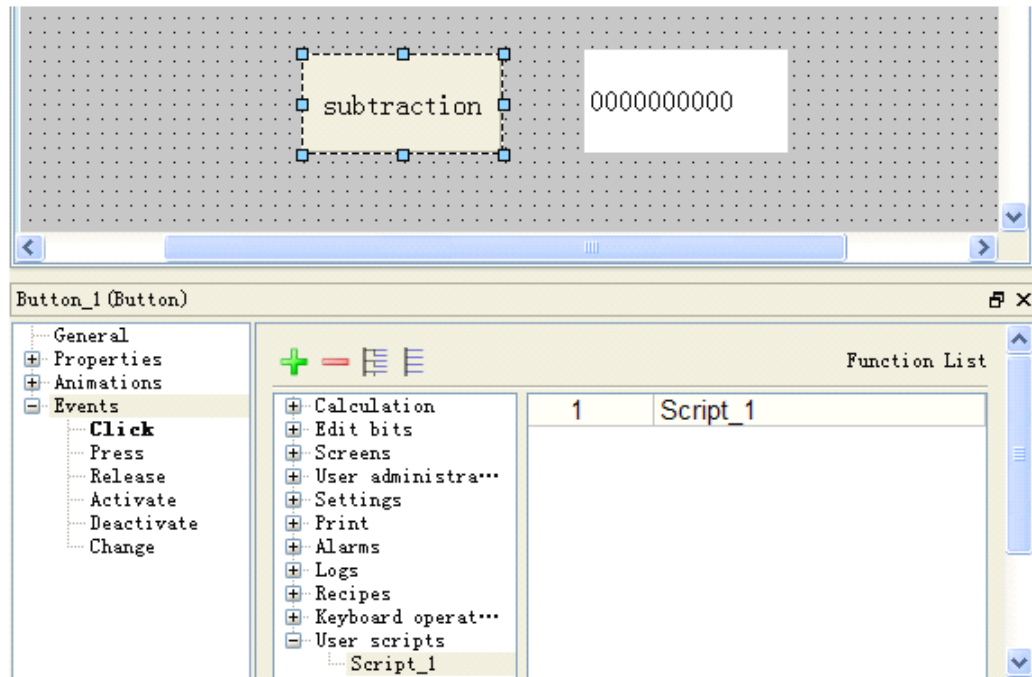
After configured the function, click "Apply", automatically generate JavaScript statement on the left side of the script editor.

4. Configure simple objects "Number IO field" and "Button" in the screen, and then configure process tag "tag\_1" for "Number IO field". See below figure:



5. Call scripts for the "Button".

Double-click the [Event] \ [Click] \ [User script] \ [Script\_1]:



6. Runtime simulation effect displays as below:

Click "subtraction" button for one time, the number IO field would decrease "1".



### 14.5.2 Create a script to call HMI system clock

Provide the function of scripts library function, place the invoked clock in some fixed internal variables. The script can meet the requirement of calling HMI system clock.

Basic steps of script invoking HMI clock show as below:

1. Create a new screen "screen\_1".
2. Create a variables group "tag group\_1", and configure below tags (UINT type):

|   | Name        | Connection Id  | Data type | Array count | Address      | Acquisition cycle Id | Data log Id | Logging cycle Id | Logging acqui... | Comment |
|---|-------------|----------------|-----------|-------------|--------------|----------------------|-------------|------------------|------------------|---------|
| 1 | Second      | <Internal tag> | UInt      | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic contin... |         |
| 2 | Hour        | <Internal tag> | UInt      | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic contin... |         |
| 3 | Year        | <Internal tag> | UInt      | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic contin... |         |
| 4 | Date        | <Internal tag> | UInt      | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic contin... |         |
| 5 | Month       | <Internal tag> | UInt      | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic contin... |         |
| 6 | Millisecond | <Internal tag> | UInt      | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic contin... |         |
| 7 |             | <Internal tag> | UInt      | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic contin... |         |

3. Double-click [Add Script] to create a new script "Script\_1", write scripts in the script editor of "Script\_1", see follows:

```

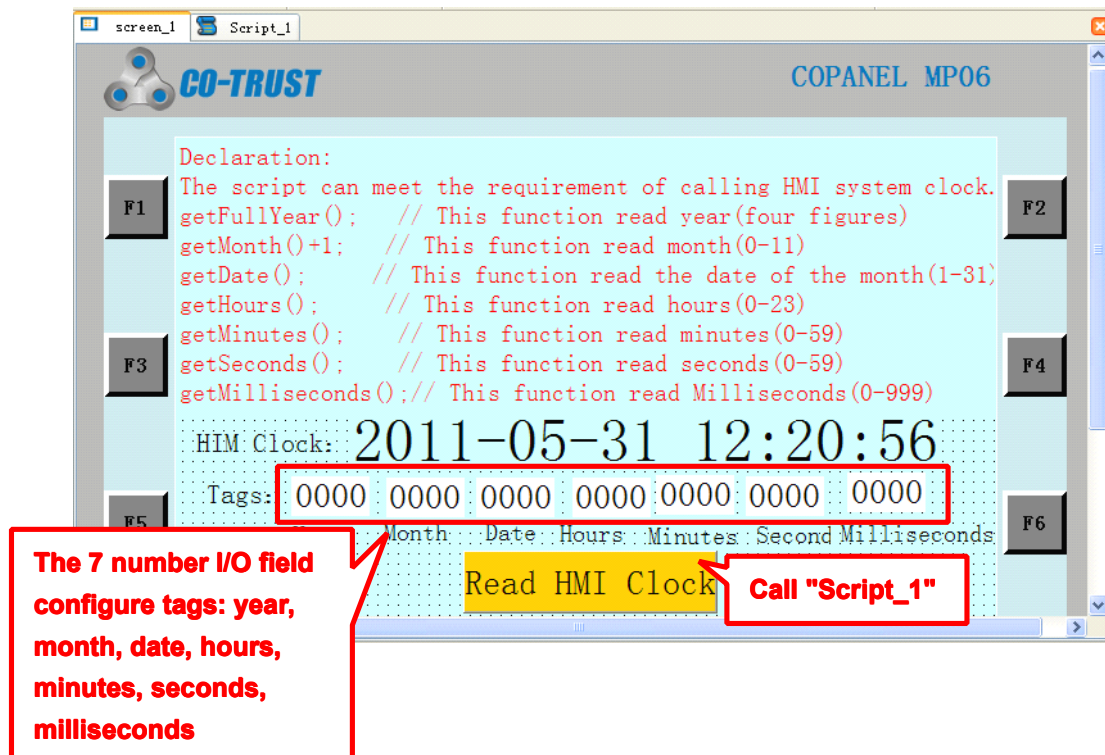
function Script_10 {
  1 var now = new Date();
  2
  3 var year = now.getFullYear(); //This function read the year (1-9999)
  4 var month = now.getMonth() + 1;
  5 var day = now.getDate(); //This function read the date of the month (1-31)
  6 var hour = now.getHours(); //This function read hours (0-23)
  7 var minute = now.getMinutes(); //This function read minutes (0-59)
  8 var second = now.getSeconds(); //This function read seconds (0-59)
  9 var millisecond = now.getMilliseconds(); //This function read Milliseconds (0-999)
  10
  11 smartTags("Year") = year;
  12 smartTags("Month") = month;
  13 smartTags("Date") = day;
  14 smartTags("Hour") = hour;
  15 smartTags("Minute") = minute;
  16 smartTags("Second") = second;
  17 smartTags("Millisecond") = millisecond;
  18
}
  
```

Month function add 1

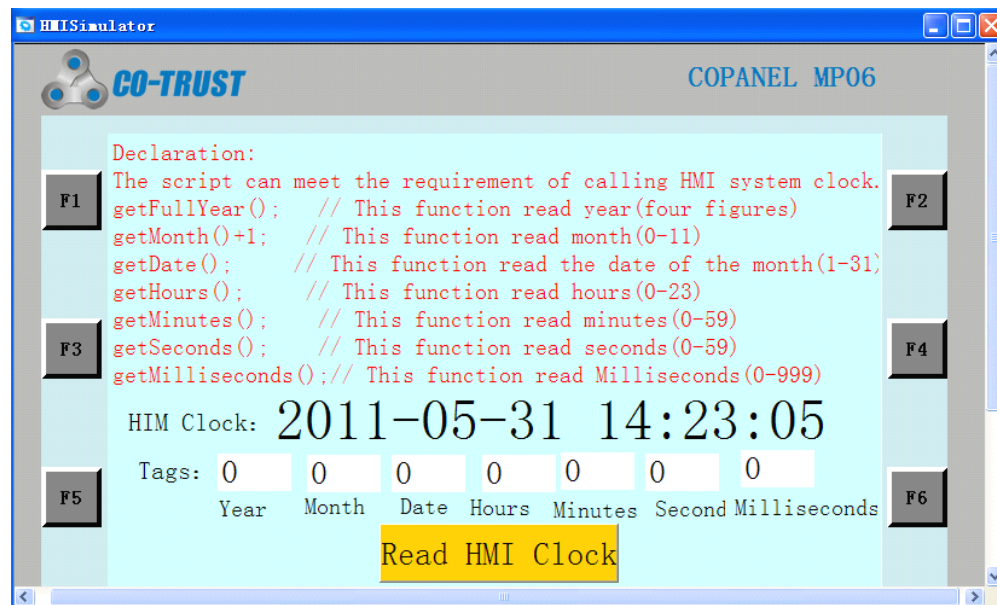
Line: 15, Col: 17

Note: As the range for month is 0-11, if you want to show January to December, the function should add 1.

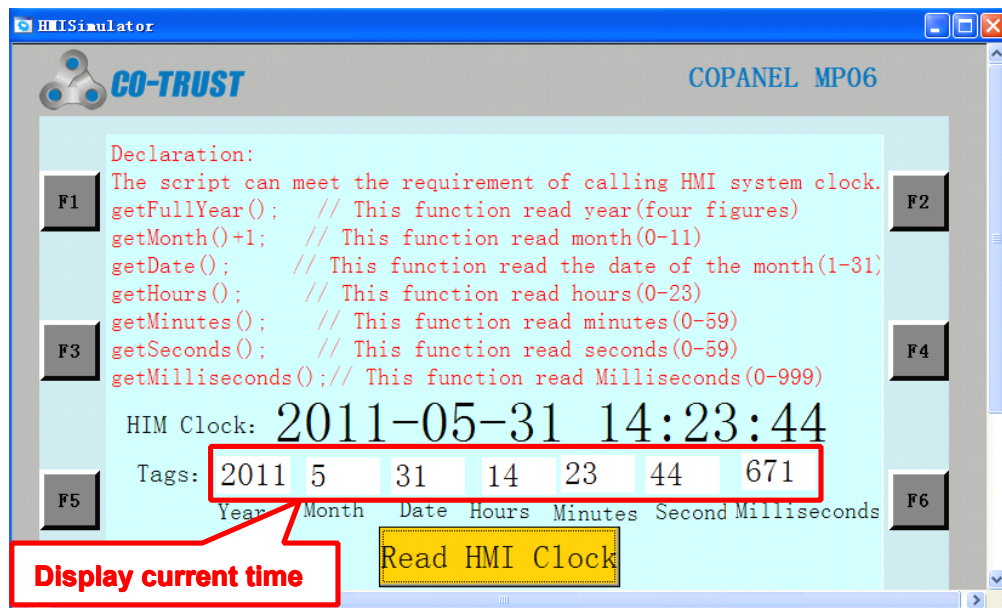
4. Configure objects clock, number I/O field, button and text in screen\_1.



5. Runtime operation effect as below:



6. Click "Read HMI Clock" button, I/O field would display the real-time clock:



### 14.5.3 Example of script Timer

Take script timer function setInterval, setTimeout, clearInterval, clearTimeout for example to configure a script cyclical and single execute the timer.

The basic steps of configuring script timer are as following:

1. Create a new screen "screen\_1".
2. Create a variable group "tag group\_1", and configure the following variables:

| Name      | Connection Id  | Data type | Array count | Address      | Acquisition cycle Id | Data log Id | Logging cycle Id | Logging acquisition mode | Comment |
|-----------|----------------|-----------|-------------|--------------|----------------------|-------------|------------------|--------------------------|---------|
| 1 Tag_1   | <Internal tag> | Int       | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic continuous        |         |
| 2 Tag_2   | <Internal tag> | Int       | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic continuous        |         |
| 3 stopall | <Internal tag> | Bool      | 1           | <No address> | 1s                   | <Undefined> | 1s               | Cyclic continuous        |         |

3. The following scripts illustrate script timer single and cyclical execute function.

Double-click [Add Script] twice, pop-up "Script\_1" and "Script\_2", write the following scripts in the scripts editor for "Script\_1" and "Script\_2":

```

function Script_10 {
1 var t1; //timer1
2
3 var x1 = smartTags("Tag_1");
4 function timer1()
5 { x1 = x1 + 1;
6   smartTags("Tag_1") =x1;
7   if (smartTags('stopall') == 0) //Close timer When stopall is equal to 1
8     { clearTimeout(t1);}
9 }
10 //=====calling timer=====
11 t1 = setTimeout(timer1,500);
12
}

```

Line: 12, Col: 0

Note: "Script\_1" take function "clearTimeout" and "setTimeout" for an example to configure a variable single execute timer.

```

function Script_20 {
1 var t1;//timer1
2
3 var x1 = smartTags("Tag_2");
4 function timer1()
5 { x1 = x1 + 1;
6   smartTags("Tag_2") =x1;
7   if (smartTags('stopall') == 0) //Close timer When stopall is equal to 1
8     { clearInterval(t1);
9   }
10 }
11
12 //=====Calling timer=====
13 t1 = setInterval(timer1,500);
}

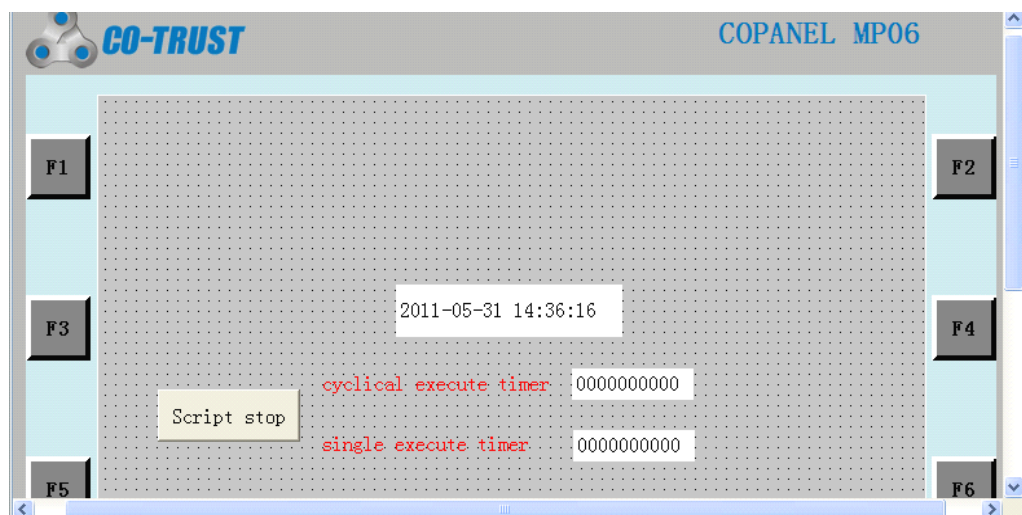
```

Line: 7, Col: 36

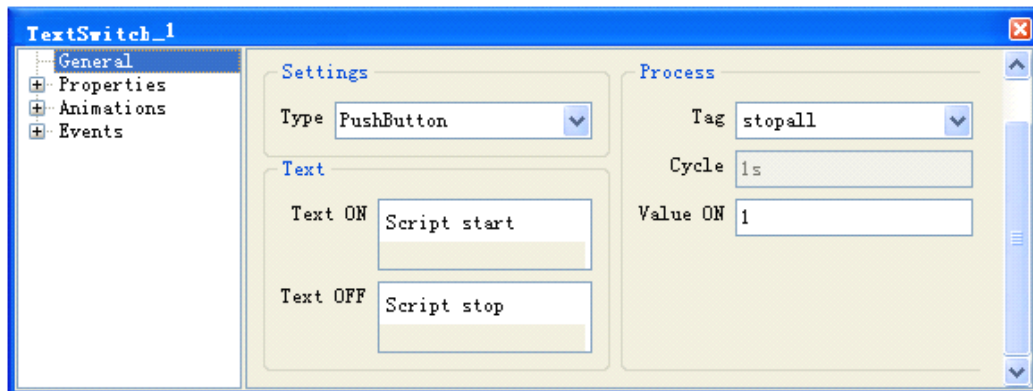
Note: "Script\_2" take function "clearInterval" and "setInterval" for example to configure a variable cyclical execute timer.

4. Configure objects like text switch, number I/O field and text in the screen.

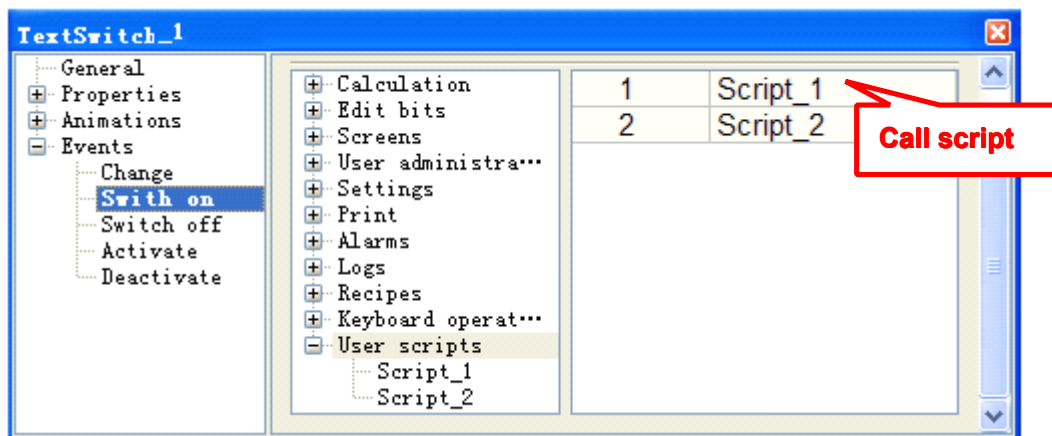
The first number I/O field call tag\_1, the second one call tag\_2.



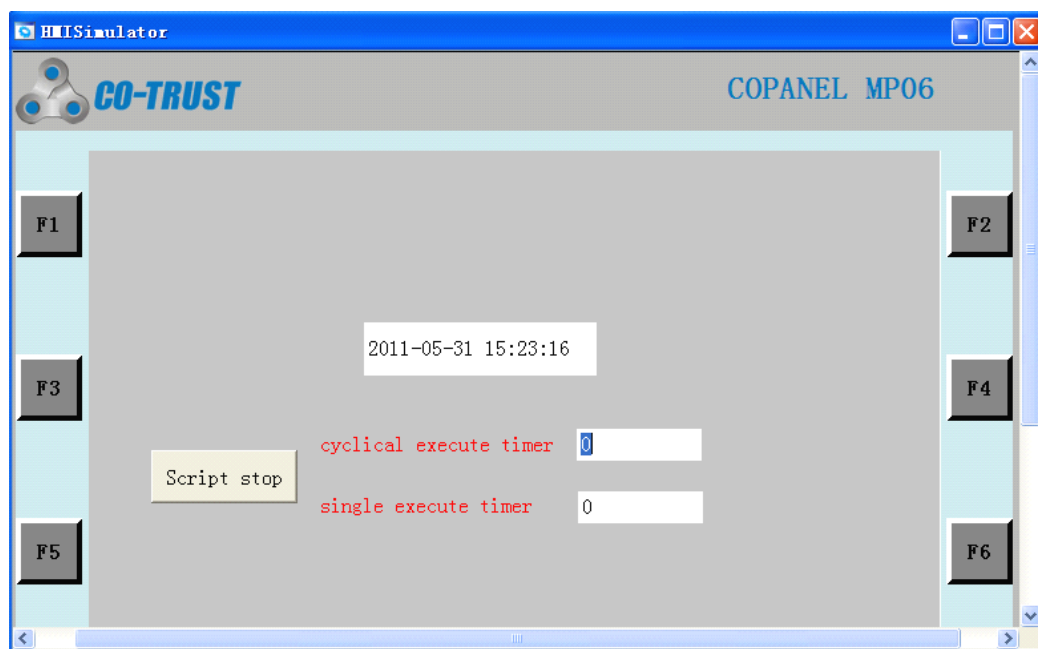
5. Configure process tag “stopall” for the Text switch, meanwhile, call Script\_1 and Script\_2 for it. The specific configuration is as follows:



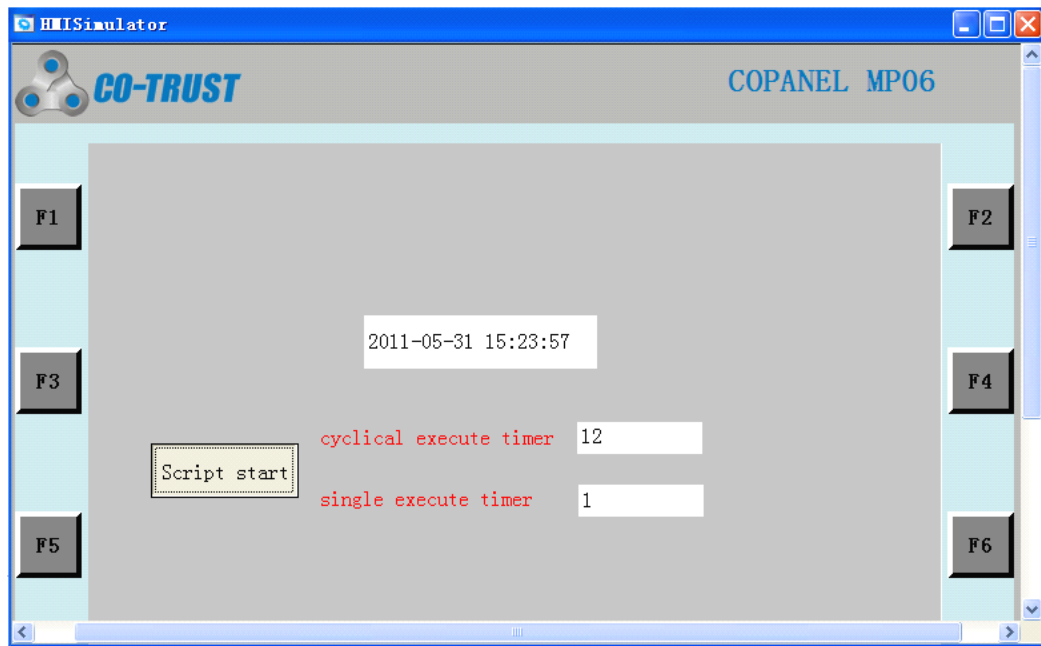
Click [Events] / [switch on] / [User scripts] to invoke "Script\_1" and "Script\_2".



6. Runtime simulation effect displays as below:



7. Click button "Script start", the timer would start, the upper number I/O field executes the script for one time, the lower number I/O field cyclical executes the script.



Click "Script stop" when the timer is operating, the above two timers stop running. If you don't stop timer, the timer and its associated event function continues executing normally even switch to other screens.

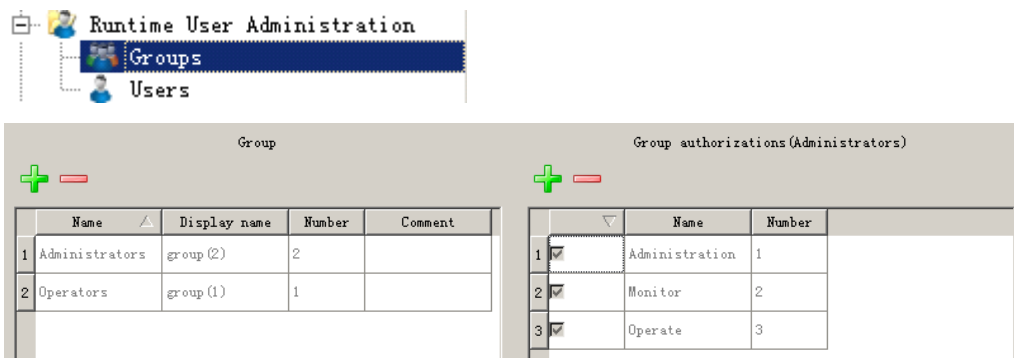
## 15 User administration

The function of User administration is the permission the user can log on and operate, etc. User groups and authorizations are administered centrally in user administration. When a project is being created, we should configure "Group authorization" at first, and then assign "Group authorization" to the "Group", finally configure the user and assign to the "User Groups".

### 15.1 Groups and Group authorizations

User group has Specified access authority. We use "User view" to manage users and passwords in runtime system. In 'Group' editor, you can assign one or several group authorizations to a group.

Double-click [Runtime User Administration] / [Groups] in project view to open the editor of Group and Group authorizations, as follows:



'Group' editor includes 'Group' table and 'Group authorization' table. 'Group' table shows the existing user groups. 'Group authorization' table shows the distribution authorizations for the user group.

#### [Group authorizations]

There are three default authorizations in Group authorizations table: Administration, Monitor and Operate, they cannot be changed, show as below:

Group authorizations (Administrators)

|   |                                     | Name           | Number |
|---|-------------------------------------|----------------|--------|
| 1 | <input checked="" type="checkbox"/> | Administration | 1      |
| 2 | <input checked="" type="checkbox"/> | Monitor        | 2      |
| 3 | <input checked="" type="checkbox"/> | Operate        | 3      |

**Administration:** On runtime system, the users with this authorization can execute all operations of the project (including all security operations), and can edit users' information (except user 'admin'), including add, delete and modify users.

**Monitor:** General authorization, the users with this authorization can operate the projects which security property is configured as Monitor.

**Operate:** General authorization, the users with this authorization can operate the projects which security property is configured as Operate.

You can add new authorizations according to your needs. Click button  to add a new authorization, and click button  to delete the selected authorizations.

## [Groups]

There are two default groups in Group table: Administrators and Operators show as below:

Group

|   | Name           | Display name | Number | Comment |
|---|----------------|--------------|--------|---------|
| 1 | Administrators | group (2)    | 2      |         |
| 2 | Operators      | group (1)    | 1      |         |

**'Administrators':** Has all authorizations of the group, you cannot reassign authorizations to it, it has the highest operating authorizations in runtime system, and the users of the group can edit the user's assigned Administration group authorization.

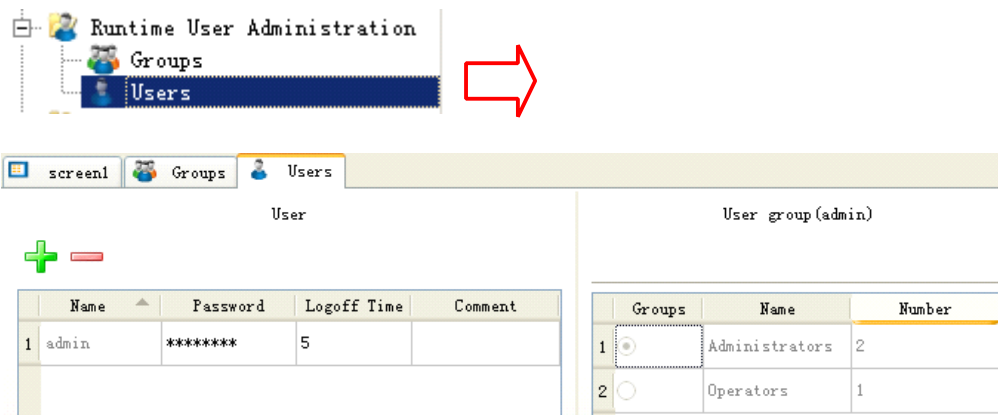
You can add new groups according to your requirements, click button  to add a new group, and click button  to delete it. After added a group, you should assign one or more authorizations for it, select the group at first, and then enable the check boxes before authorizations in Group authorizations table, and you can rename the group, and edit Display name and Comment for it.

**Note:** The users that have "Administration" authority but do not belong to the

"administrators" group can create users, but can't modify "Administrators" group info.

## 15.2 Users

Double-click [Runtime User Administration] -> [Users] in project view to open the editor of User and User group, show as follows:



'Users' editor includes 'User' table and 'User group' table.' Users' table shows the existing users. 'User group' table shows the distribution group for the users.

### [User]

There is a default user in user table: 'admin', you can configure it(Except its Name property).

Click button  to add a new user, and click button  to delete it, all properties of the user can be configured.

Configure user's properties:

1) Double-click 'password', set up user's password, shows as below:

The 'Password' dialog box has a title bar 'Password'. It contains a text field with '\*\*\*\*\*' and a dropdown arrow. Below it, there are two input fields: 'Enter password' and 'Confirm password'. At the bottom, there are 'Ok' and 'Cancel' buttons.

2) Input 'Enter password' and 'Confirm password', click 'Ok' Set Password's dialog box disappears.

3) Double-click 'off time', input 'off time' according to your needs.

4) Double-click 'Comment', input 'Comment' you are desired.

5) Assign a user group for it: Select the user at first, and then check the check boxes

before user group in User group table. One user can only configure a user group.

We can assign several group authorizations to a group, so one user could have several group authorizations.

### [User group]

The groups in this table come from 'Group authorizations' table; you cannot edit them in this table.

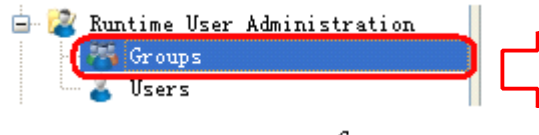
## 15.3 Example of how to Use the User Administration

In this example, we configure a user view, three Number IO Field object and respectively assign 'admin', 'operator' and 'monitor' authorizations to them. In runtime system, the operation of the three Number IO Field object are protected, before operating you must log on the corresponding user which has the authorization. After logged on, the user's information are displaying in user view.

The steps of configuring and debugging the project:

### 1. Configure user group.

Double-click 'Groups' in Project view to open the editor, and then add two groups, Admin and Monitor, as shown below:



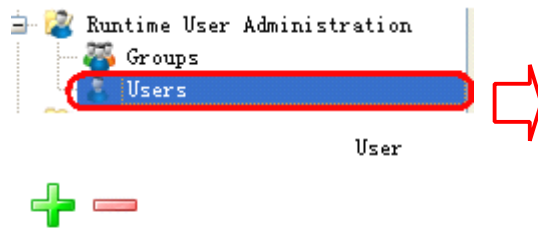
Group

|   | Name           | Display name | Number | Comment       |
|---|----------------|--------------|--------|---------------|
| 1 | Admin          | admin        | 3      | admin         |
| 2 | Administrators | group(2)     | 2      | all authoriza |
| 3 | Moni           | monitor      | 4      | monitor       |
| 4 | Operators      | group(1)     | 1      | operate       |

Configure group authorizations for the groups, assign Operation authorization to 'Operators' group, assign Monitor authorization to 'Moni' group, assign Administration authorization to 'Admin' group.

### 2. Configure users.

Double-click 'Users' in Project view to open the editor, and then add three users, 'op1', 'mo1' and 'ad1', as shown below:



|   | Name  | Password | Logoff Time | Comment         |
|---|-------|----------|-------------|-----------------|
| 1 | admin | *****    | 5           | password:111111 |
| 2 | op1   | *****    | 5           | password:222222 |
| 3 | mo1   | *****    | 5           | password:333333 |
| 4 | ad1   | *****    | 5           | password:444444 |

Configure group for users: Assign 'Operators' group for op1, assign 'Moni' group for mo1, assign 'Admin' group for ad1.

| User |       |          |             |                | User group (op1) |                |        |
|------|-------|----------|-------------|----------------|------------------|----------------|--------|
|      | Name  | Password | Logoff Time | Comment        | Groups           | Name           | Number |
| 1    | admin | *****    | 5           | password:11111 | 1                | Admin          | 3      |
| 2    | op1   | *****    | 5           | password:22222 | 2                | Administrators | 2      |
| 3    | mo1   | *****    | 5           | password:33333 | 3                | Moni           | 4      |
| 4    | ad1   | *****    | 5           | password:44444 | 4                | Operators      | 1      |

Configure Password for the users

Double-click Password cell of the user, then set the password in the drop-down box, see as follows:

Password of admin is 111111, password of op1 is 222222, password of mo1 is 333333, password of ad1 is 444444.

|   | Name  | Password | Logoff Time | Comment         |
|---|-------|----------|-------------|-----------------|
| 1 | admin | *****    | 5           | password:111111 |
| 2 | op1   | *****    | 5           | password:222222 |
| 3 | mo1   | *****    | 5           | password:333333 |
| 4 | ad1   | *****    | 5           | password:444444 |

Enter password: [password field]

Confirm password: [password field]

Ok Cancel

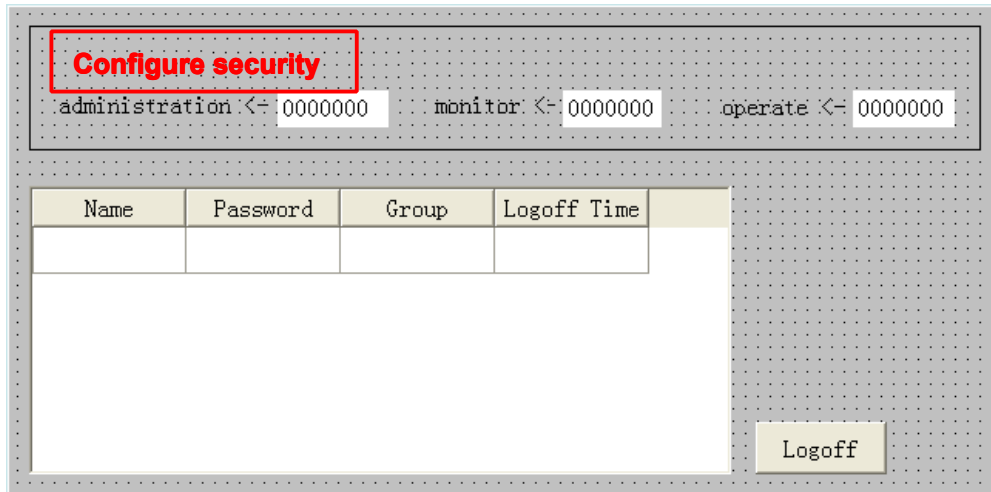
Configure Logoff Time for the users

Double-click the cell of Logoff Time and input the value.

|   | Name  | Password | Logoff Time | Comment         |
|---|-------|----------|-------------|-----------------|
| 1 | admin | *****    | 5           | password:111111 |

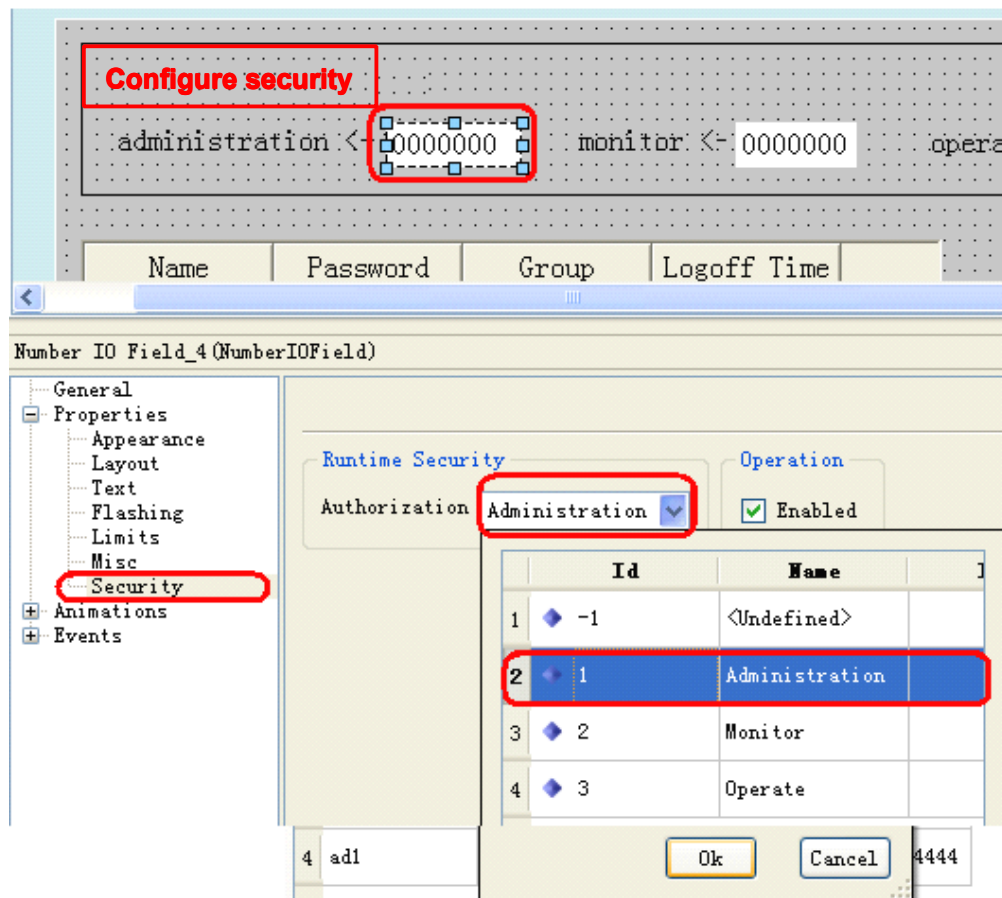
### 3. Configure a screen of User Administration

Configure some objects with security property and a User View object, such as the following picture; the three Number IO Field objects from left to right are respectively configured Administrator, Monitor and Operate authorizations.



Configure Authorization for the Number IO Field object.

Select the object, and click [Properties] / [Security] in Property view, then select an authorization from the drop-down box of the input box of Authorization, see as follows:



### 4. Debugging the screen of User Administration.

After the configuration is completed, Start Runtime simulation, the running effect shows as below:

| Name | Password | Group | Logoff Time |
|------|----------|-------|-------------|
|      |          |       |             |

Move the cursor to the left Number IO Field object and enter the value, it will pop up a 'User Logon' dialog, show as below:

In the 'User logon' dialog, input the correct User name(ad1) and Password(444444), then click 'Ok' button to logon. After the user 'ad1' which has the administration authorization is logged on, you can input value into the IO Field object, and the user's and other users' information would display in user view.

Configure security

administration <- 
monitor <- 
op

| Name | Password | Group    | Logoff Time |
|------|----------|----------|-------------|
| op1  | *****    | group(1) | 5           |
| mo1  | *****    | monitor  | 5           |
| ad1  | *****    | admin    | 5           |
|      |          |          |             |

Because the administrator has the authorizations which change other user's information (except user 'admin') and add new users, you can see the other users' info are displaying in the user view.

If the login user is not an administrator, you cannot operate the Number IO Field object, and only displaying the login user's information on user view.

Some operations on user view: Logon/logoff, change user's information, adds users.

- Logon/logoff: Click the blank-line of user view, a User Logon dialog will be opened. When you log on another user, the logged user will automatically be logged off.
- Edit user's information: If the logged on user is not an administrator, it can edit it's informations except Group, if the logged on user is an administrator, it can change it's all informations, and can change other user's all informations on user view, if the logged on user is 'admin', it has the highest authorization, it can change it's informations except Group, and can change all other users' whole informations, even add a administrator user.
- Add users: Click the blank-line of user view to add a default user after the administrator or 'admin' is logged on.

Note: There is only one 'admin' user in a project.

## 16 Other features

### 16.1 Scheduler and Jobs

You can configure some jobs in Scheduler editor to do some special features. A job consists of a triggering event and a 'function List'. When the event occurs, the scheduler starts the jobs' associated events, and executes the linked functions.

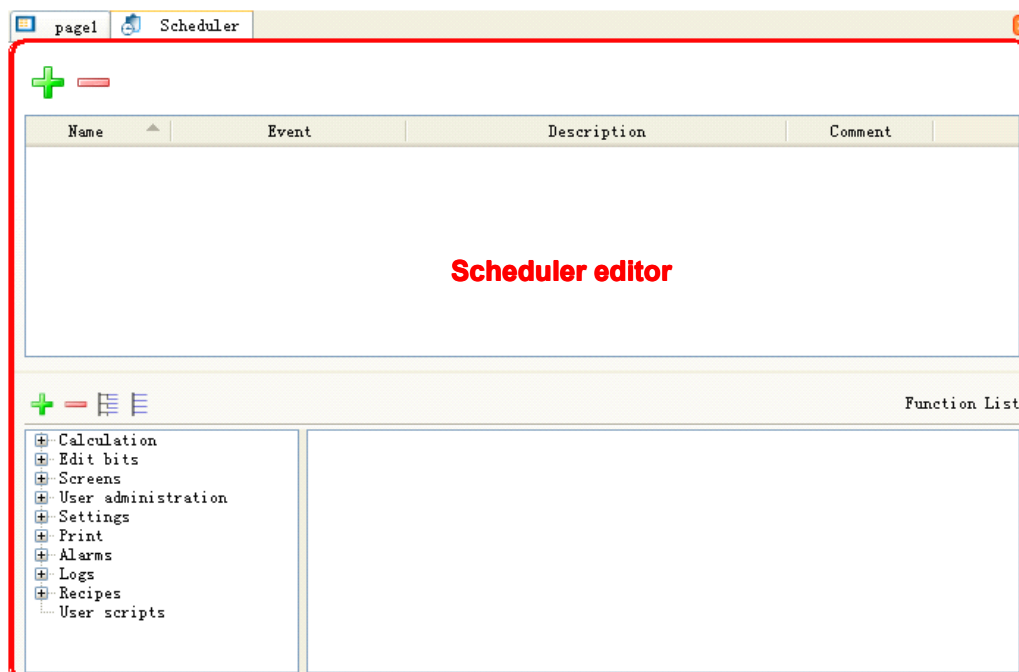
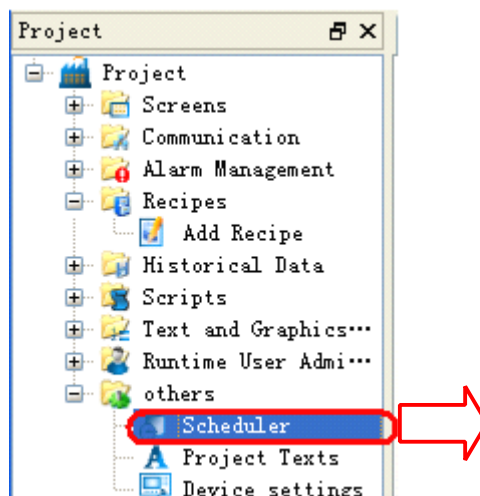
#### 16.1.1 Scheduler events

MagicWorks HMI provides some pre-defined events for jobs, including time-based events and system events. A time-based event occurs at a particular time, for example, 'Starting daily at 08:00'. Examples of system events are 'Start up' and 'Change screen'.

| Name                  | Description                                                      | Restriction                                                    |
|-----------------------|------------------------------------------------------------------|----------------------------------------------------------------|
| Once                  | Perform once,<br>Date:year-month-day,Time:hour:min.              |                                                                |
| 1 h                   | Perform every hour,Minute:X.                                     |                                                                |
| Daily                 | Perform every day,Time:hour:min.                                 |                                                                |
| Weekly                | Perform every week,Day of week:X,<br>Time :hour:min.             |                                                                |
| Monthly               | Perform every month,<br>Day:xx,Time:hour:min.                    |                                                                |
| Yearly                | Perform every year,<br>Date:month-day,Time:hour:min.             |                                                                |
| 1 min                 | Perform every minute,Min:00.                                     |                                                                |
| X SecondS             | Perform every X seconds.                                         | Time-based event. it can only be configured once in a project. |
| Change screen         | Perform when the current screen is changed.                      | System events,it can only be configured once in a project.     |
| Change user           | Perform when the current user is changed(during logon or logoff) | System events,it can only be configured once in a project.     |
| Overflow alarm buffer | Perform if the alarm buffer overflows.                           | System events, it can only be configured once in a project.    |
| Screensaver activated | Perform when the HMI runtime switch to Screensaver.              | System events, it can only be configured once in a project.    |
| Start up              | Perform on runtime start up                                      | System events, it can only be configured once in a project.    |
| logon                 | Perform when logon success                                       |                                                                |

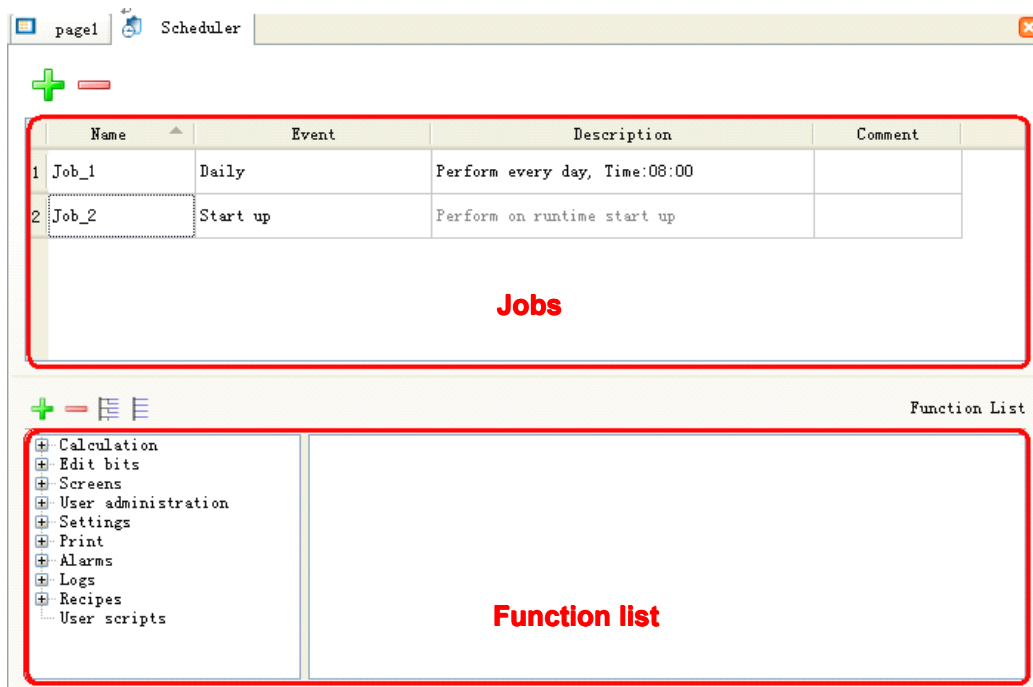
### 16.1.2 Configure jobs

In the project view, double-click on 'Scheduler' to open Scheduler editor.



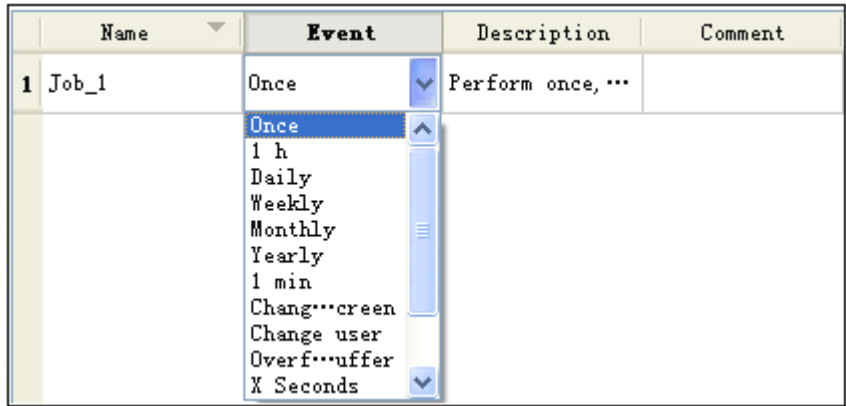
#### [Add / Delete jobs]

Click button  to add a new job, or click button  to delete a selected job. After added two jobs, the scheduler displays as follows:



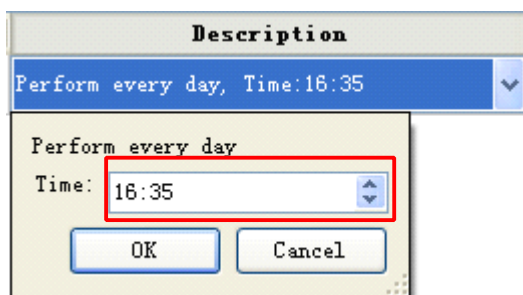
**[Configure the triggering event]**

Select the job you want to configure, double-click 'Event' cell, click  to select the event you from the drop-down list. See as follows:



**[Configure additional information]**

Additional information includes 'Description' and 'Comment'.  
If the job's event is the 'time-based events', you should configure 'Description', include the date or the time. See as follows, double-click 'Description' cell, click  to configure, then click 'OK' button to confirm this configuration.



If the job's event is the 'system events', the 'Description' can't be configured, as follows:

|   | Name   | Event    | Description                   | Comment |
|---|--------|----------|-------------------------------|---------|
| 1 | Job_1  | Daily    | Perform every day, Time:16:36 |         |
| 2 | Job_16 | Start up | Perform on runtime start up   |         |

### [Configure system functions]

Select the job as needed (click any cell of the job row), in the function list you configure the functions or scripts to be executed in the job. Select the function (as

'LogTag'), and then click  button, the function display in Function List. Click  button to delete the selected function you have configured.

|   | Name  | Event    | Description                   | Comment |
|---|-------|----------|-------------------------------|---------|
| 1 | Job_1 | Daily    | Perform every day, Time:09:02 |         |
| 2 | Job_2 | Start up | Perform on runtime start up   |         |






- Calculation
- Edit bits
- Screens
- User administration
- Alarms
- Logs
  - ClearLog
  - LogTag
  - StartLogging
  - StopLogging
  - OpenAllLogs
  - CloseAllLogs
- Recipes
- User scripts

Function List

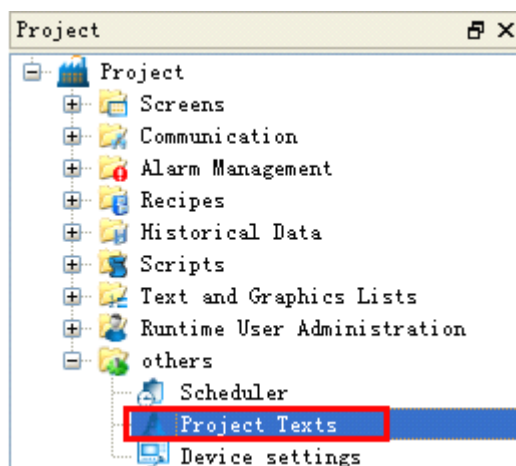
|   |        |       |
|---|--------|-------|
| 1 | LogTag | Tag_1 |
| 2 | LogTag | Tag_2 |
| 3 | LogTag | Tag_3 |

## 16.2 Project Texts

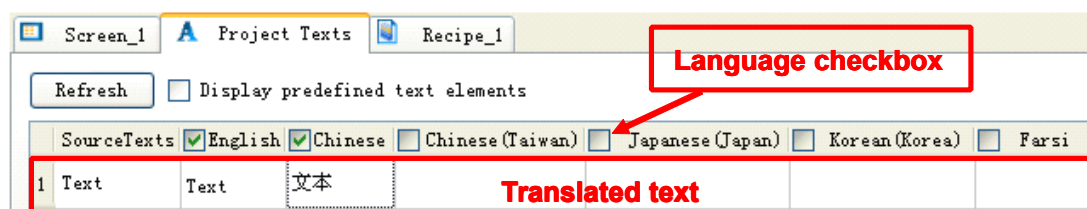
You can access and translate all texts come from the screens of a project in the 'Project Texts' editor.

Double-click 'Project texts' to open 'Project Texts' editor in the project view, see as

follows:



### 16.2.1 'Project Texts' editor introduction



There are three parts in Project Texts editor:

The table of 'Project texts': Seven columns, the first column 'SourceTexts' is used to display the texts come from screens, it means reference text, the rest six columns on the right side are used for users to translate. Before translating you must configure the language you need by enabling the language checkbox (like Chinese and English in above figure). After enabled a language, you can enter the translating texts in its cells for screen texts. In Runtime system, if you switch to the language, the screen texts will be displayed as the translated texts in the table. You can configure more than 6 languages in a project.

- Button 'Refresh': After click it, the latest texts in screens will be displayed in the column 'SourceTexts'.
- 'Display predefined text elements': Enable the checkbox before displaying the predefined texts if you want to access them. Predefined texts include the texts of 'User View', 'Trend View', 'Recipe View', 'Alarm View' and 'Data View'.

### 16.2.2 Configure a project in multiple languages

The general steps of configuring a project in multiple languages are described as follows:

1. Start 'MagicWorks HMI' software and create a new project.
2. Add several text objects to screens, such as Text Field, Button and so on.
3. Select the languages you need in 'Project Texts', and then translate all source texts

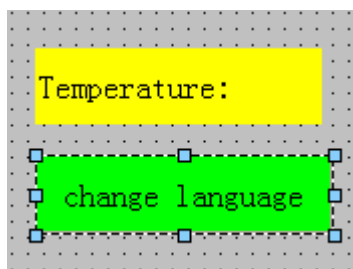
according to the selected language.

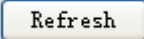
4. Select an operator to control elements(a KEY or a button), configure 'SetLanguage' system function for its event.

### Example

Support two languages: Chinese and English, switch between the two languages by clicking a button, MagicWorks's Editing Language is English.

Add a Text Field(The Text is 'temperature')and add a button(The Text is 'change language') in screen\_1, shows as follows:



1. Double-click on 'Project Texts' to open it in the project view.
2. Click  button, all texts are displaying in the 'SourceTexts' column, see as follows:

screen1

Project Texts

Refresh

☐ Display predefined text elements

|   | SourceTexts     | <input type="checkbox"/> English(United States) | <input type="checkbox"/> Chinese(People's Republic of China) |
|---|-----------------|-------------------------------------------------|--------------------------------------------------------------|
| 1 | temperature:    | temperature:                                    |                                                              |
| 2 | change language | change language                                 |                                                              |
|   |                 |                                                 |                                                              |

We can see the texts also displaying in 'English' column, because MagicWorks's Editing Language is English.

Note: Configure the Editing Language in Menu [Option] / [Setting]->'Language'.

3. Enable the checkboxes before 'English' and 'Chinese'.

Screen\_1

Project Texts

Refresh

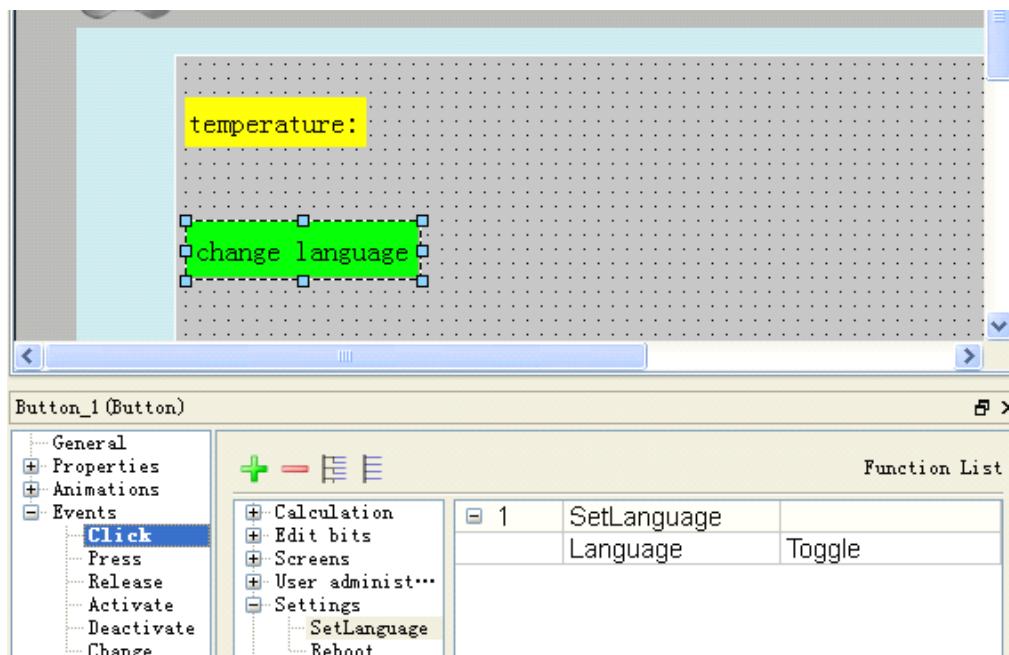
☐ Display predefined text elements

|   | SourceTexts     | <input checked="" type="checkbox"/> English(United States) | <input checked="" type="checkbox"/> Chinese(P... | <input type="checkbox"/> Chinese(Taiwan) | <input type="checkbox"/> Japanese(Japan) | <input type="checkbox"/> Korean(Korea) | <input type="checkbox"/> Farsi |
|---|-----------------|------------------------------------------------------------|--------------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|--------------------------------|
| 1 | temprature      | temprature                                                 |                                                  |                                          |                                          |                                        |                                |
| 2 | change language | change language                                            |                                                  |                                          |                                          |                                        |                                |

4. Translate the source texts according to the target languages. The English texts remains, enter '温度' and '切换语言' in Chinese cells, as follows:



5. Select the button 'change language' in screen1, configure 'SetLanguage'system function for its 'Click' Event, and set the Parameters is 'Toggle', see as follows:



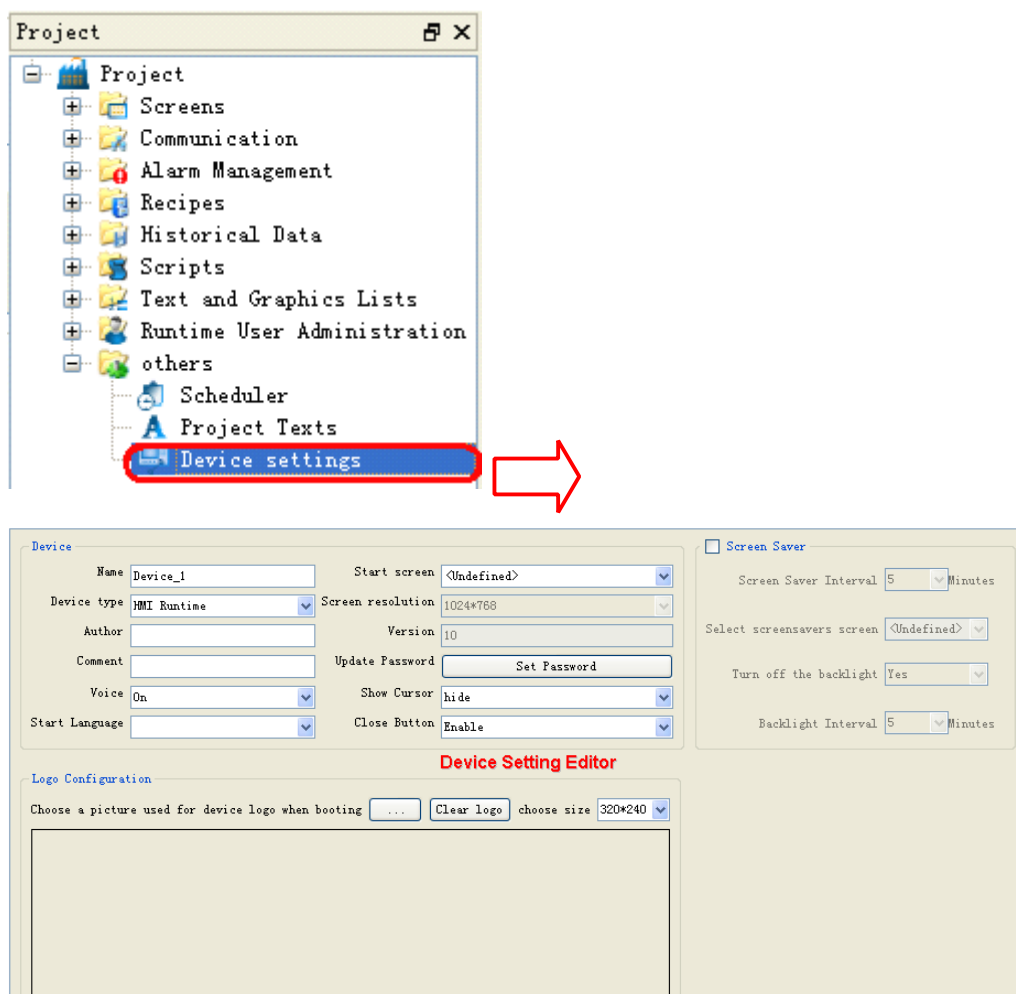
## 16.3 Device settings

### 16.3.1 Function of Device settings

In Device settings editor, you can see the project's default properties about 'Device' and 'Screen Saver', you can also configure them, including Name, Start screen, Device type, Author, Comment, Update Password, Voice, Screensaver, etc. All the configurations may be effective after the project was downloaded to HMI device.

### 16.3.2 Configure Device settings

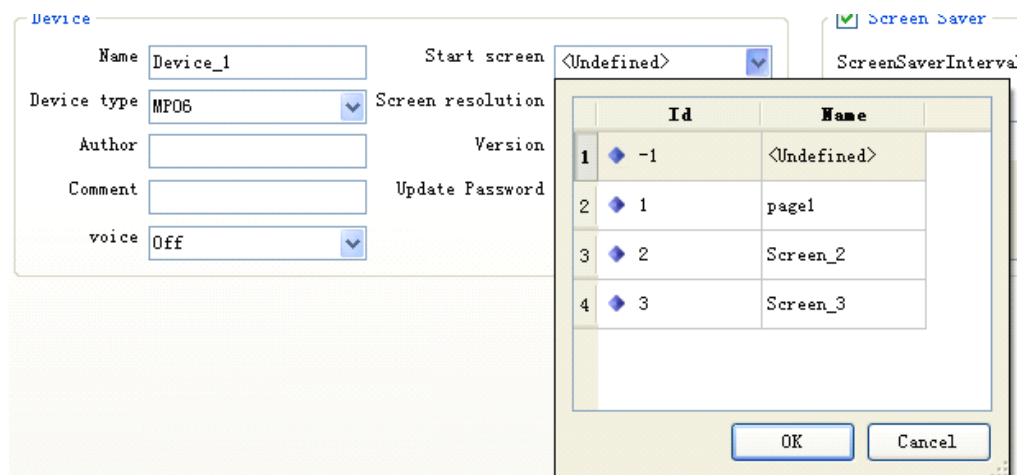
Double-click 'Device settings' from project view to open the device setting editor, see as follows:



In Device setting editor, you can configure the following settings:

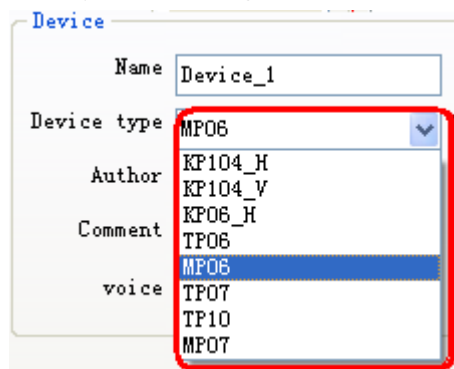
**Name:** The name for the device.

**Start screen:** The first displaying screen when the runtime system starts up. Its 'Undefined' as default, you can configure it, select a screen from the drop-down list, as follows, and then click 'OK' button.



**Device type:** Current project's device and you can configure it. For example, the current device type is MP06, you want to convert it to TP10, you just need to select

'TP10' from the drop-down list as follow page. After changed the device type, all screens of the project are automatically converted to TP10, Objects on screens are displayed according to the scaled.



### Tip

You can convert it between any device types, but after the conversion, only screen will be remained, the information of 'Key-Item' will be deleted.

**Screen Resolution:** The resolution for the selected screen type.

**Author:** You can input the author name you are desired.

**Comment:** The comment of the device.

**Update password:** Press 'Set Password' button to set the password when you use USB medium to update project. If you want to update project for HMI device by USB medium, you must input the right password of the current project, otherwise, you can't update.

1) Click the 'Set Password' button, input 'New Password' and 'Verify Password' in the 'Password Settings' dialog:

**Device**

|             |                                       |                   |                                             |
|-------------|---------------------------------------|-------------------|---------------------------------------------|
| Name        | <input type="text" value="Device_1"/> | Start screen      | <input type="text" value="⟨Undefined⟩"/>    |
| Device type | <input type="text" value="MPO6"/>     | Screen resolution | <input type="text" value="640*480"/>        |
| Author      | <input type="text"/>                  | Version           | <input type="text" value="1"/>              |
| Comment     | <input type="text"/>                  | Update Password   | <input type="button" value="Set Password"/> |
| voice       | <input type="text" value="Off"/>      |                   |                                             |

**Password Settings**

New Password

Verify Password

Click 'OK' button to finish the password setting, if the setting is correctly, above dialog would disappear, if the "New password" is inconsistent with the "Verify password", the dialog would tip following message:

**Password Settings**

New Password

Verify Password

Input error!

2) Click the 'Change Password' button, input 'Old Password' , 'New Password' and 'Verify Password' in the 'Password Settings' dialog:

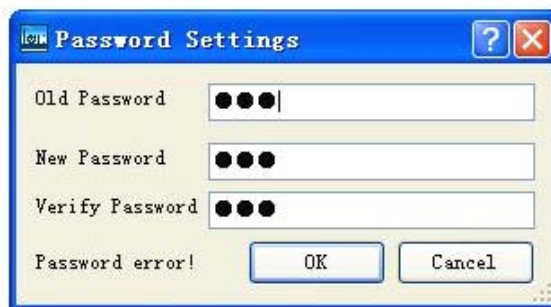
**Password Settings**

Old Password

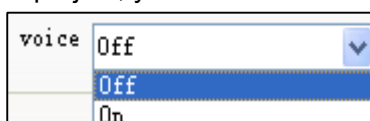
New Password

Verify Password

Click 'OK' button to finish the password setting, if the setting is correctly, above dialog would disappear, if the password is incorrectly, the dialog would tip following message:



**Voice:** The feedback voice when user operates HMI device. There are two choices: 'Off' and 'On'. 'On' means enable the voice, 'Off' means disable the voice. After configured Voice of the project, you need reboot the HMI device to take effect.

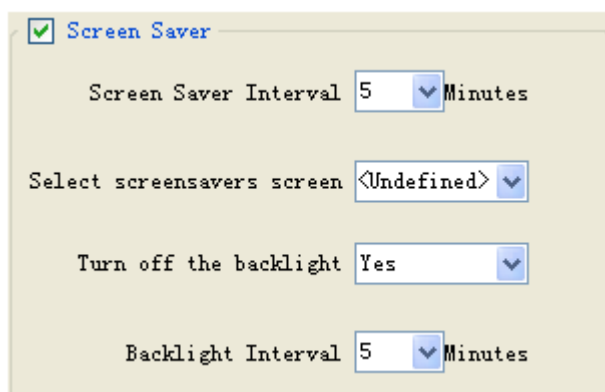


**Show Cursor:** You can select to display or hide the cursor while device is running, which would be valid after the device was rebooted.

**Close Button:** You can select to display or hide the close button  while the project is started runtime or online runtime. If selected "Enable", the runtime window would be closed via Alt+F4 or Task Manager.

**Start Language:** You can select the project text to be the initial displaying language as the device is running after the project is configured.

**Screensaver:** Configure the Screensaver function on HMI runtime system. If the interval of two operations exceeds the value of "Screen Saver Interval", HMI would enter in Screensaver interface.



- ◆ ScreenSaverInterval: Set the interval of ScreenSaver, selecting from the drop-down list. The unit is minute, the minimum time is 5 and the maximums are 360 minutes.
- ◆ Select Screensavers Screen: Select the screen which you are desired to use the screensaver function.

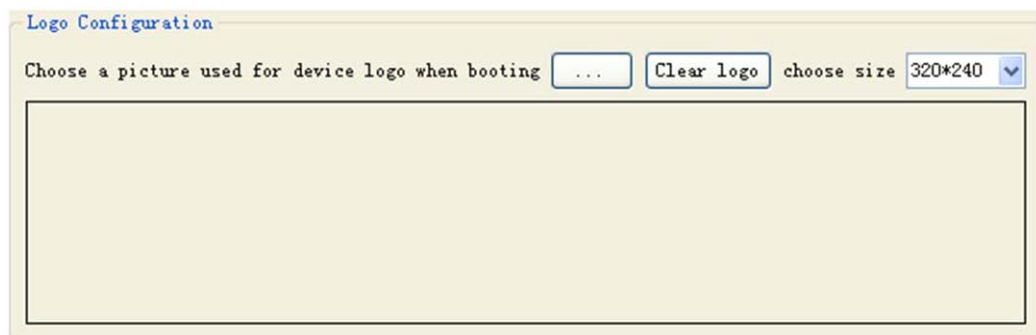
- ◆ Turn off the backlight: Turn off the backlight of the screensaver.
- ◆ Backlight Interval: The displaying interval of the backlight as screen saver has configured.

eg. If you selected "Yes" of "Turn off the backlight" and set the "Backlight interval" to 5 minutes, the backlight of the HMI would be shut after 5 minutes when HMI entered Screensaver.

Note: If the screensaver is changed, which would be valid after the device is rebooted.

**Logo Configuration:** Configure the start logo of the HMI device.

Click the  button to add a new picture, and choose the display size from the "Choose Size" drop-down list, then click the "Transfer" button  from tool bar or select "File"->"Transfer" from menu bar to change the start logo for your HMI device.



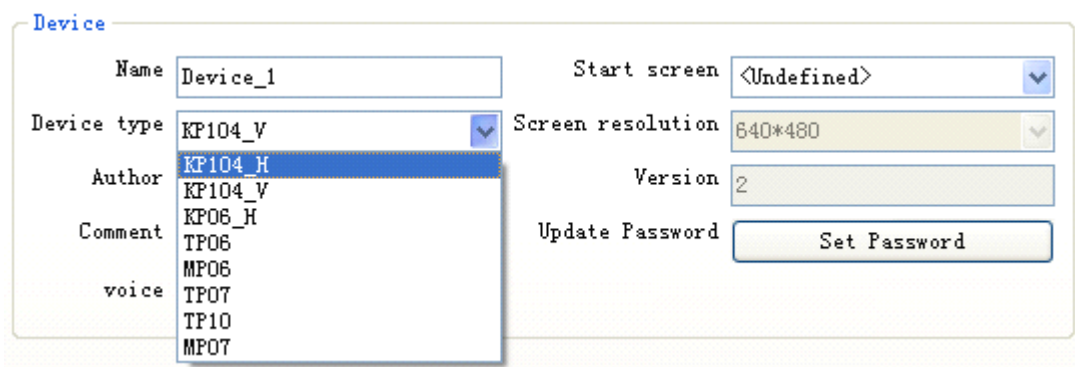
### 16.3.3 Convert the Device Type

1. The function of converting the device type

Perform to convert the screens.

2. Convert the device type

Double-click the project view [others] / [Device Settings] to open the device Settings editor.



There are eight kinds of device types for you to select :KP104\_H, KP104\_V, KP06\_H,

TP06, MP06, TP07, TP10 and MP07. Screen size and the objects' position will be changed by converting different device types, keys will also be changed (keep or remove keys). When converting the same resolution device, frame size and position retains the same. If convert different resolution device, the frame size and screen objects position zoom in and zoom out the same ratio, the ratio ups to the resolution. Such as converting the device from TP06(640 \* 480) to TP10 (800 \* 600),  $sx = 800/640 = 1.25$ ,  $sy = 600/480 = 1.25$ , so the screen should enlarge 1.25 times.

## 16.4 Multilanguage

Project's screens can be displayed in multiple languages in Runtime system, support Chinese, English and Farsi three kinds of language, please refer 16.2 Project Texts to configure the project.

## 16.5 HMI Print function

1. Printer is available for hot swaps.
2. Support the following functions:
  - 1) Print current screen.
  - 2) Print real-time alarm, the HMI does not support to print alarm record.
  - 3) Print current data record of the recipe.
  - 4) Print current data record, the HMI does not support to print historical data.

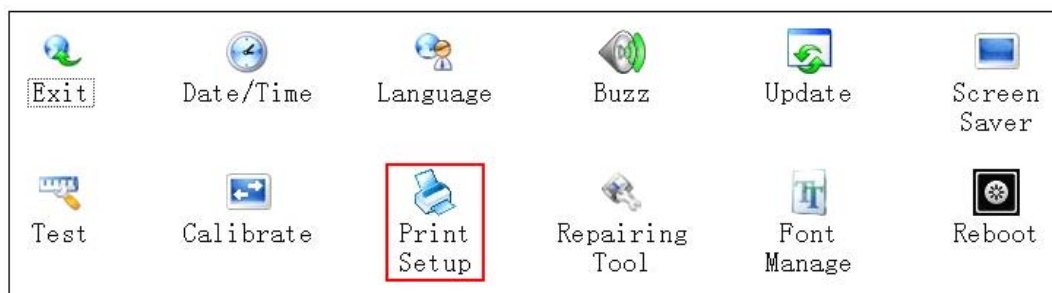
### 16.5.1 Printer Requirements

- 1) Select USB interface printer.
- 2) Support PCL5 language series printer.
- 3) Support HP Laserjet P1606dn printer.
- 4) Support A4 / A3 / Letter three kinds of paper.

### 16.5.2 Configuring Printers

The specific steps of how to configure the printer on HMI device show as follows:

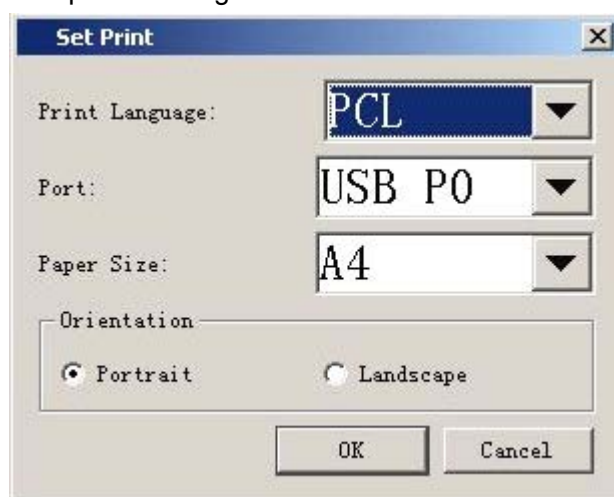
- 1) Turn on the power for HMI, touch screen panel should press the screen for several seconds / the key screen should press 'Enter' button to enter in below configuration interface:



We can enter into Printer configuration interface from the configure interface.

- 2) Users can complete the selection and configuration of following function: Print language, Port, Paper size and Direction.
- 3) While configuration is completed, printer will use present configuration for default next time.

HMI printer configuration interface show as below:



Print Language: Use PCL print language by default.

Port: Defaults to USBP0.

Paper Size: Support A4 / A3 / Letter three kinds of paper.

Orientation: Portrait, Landscape.

Nonsupport the function of detecting printer in the configure interface, if user accesses inconformity print language for the printer, would show below message box:



### 16.5.3 The format of printing content

Printing contents sustain report forms and Graphic formats.

1. Report forms printing contains:

- Print real-time alarm and alarm records.
- Print current data records of recipe views
- Print current data records of data view.

Report forms printing format:

- 1) The top row of the title, such as " Recipe Data Record" \ "Alarm" \ "Alarm Logs," font size is 16, the coarse in italics.
- 2) The 2th row of the title, such as recipe name, record name etc, font size is 14, the coarse in italics.
- 3) The property name of the recipe (such as Name, Path, Entry Name, Value) font size is 10, the thick italic; the value of the recipe property name is 10, the coarse in italics.
- 4) All Printed fonts are song typeface.

2. Graphic printing includes:

- Print current screen.

## 16.5.4 Print functions of report forms

### 16.5.4.1 Print Alarm view

Execute system function "PrintAlarm" to print the current alarm view.

Print current alarm information or alarm records of the alarm view, begin to print from the latest alarm time or the line that cursor is positioned, print two pages at most.

All the alarm record of the HMI are saved in U disk, as HMI use the same USB port as printers, it does not support to print alarm record, but it can be printed in the simulation mode.

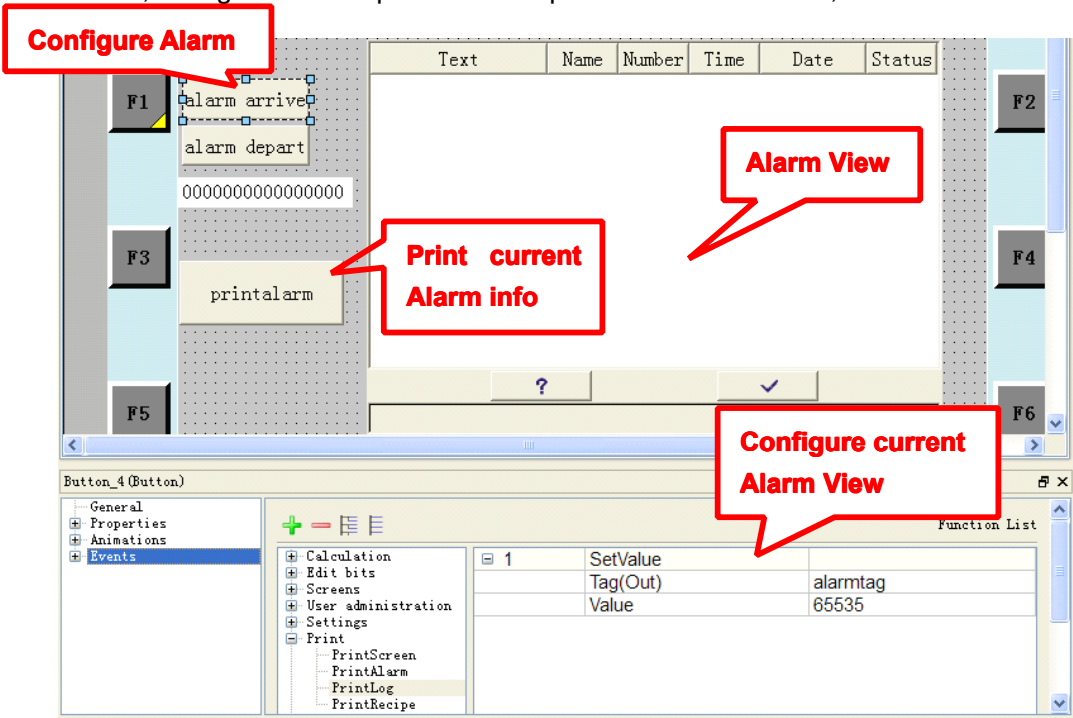
When simulative run, current printed alarm information and alarm record saved as PNG pictures format under the project list, the same printing format with the HMI, the font of HMI is song typeface, nonsupport the bold and italic, the font is Times when simulative operate.

1. The specifications of Alarm forms' headers and data content show as below:

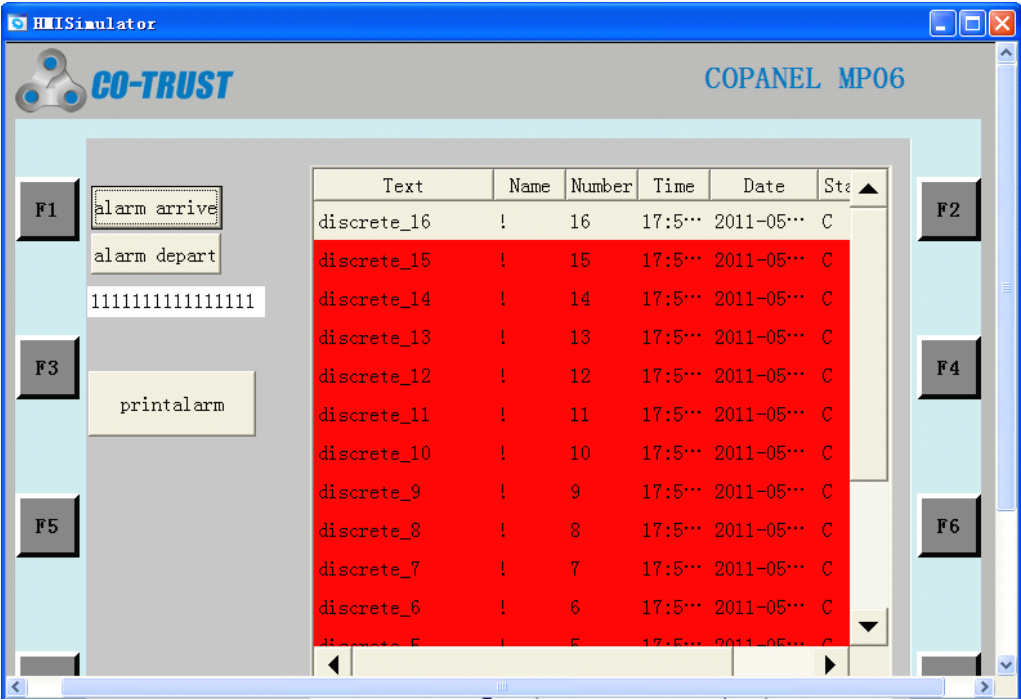
|                               |      |        |          |           |        |           |
|-------------------------------|------|--------|----------|-----------|--------|-----------|
| Alarm (16 font size)          |      |        |          |           |        |           |
| <u>\\Alarm</u> (14 font size) |      |        |          |           |        |           |
| Text                          | Name | Number | Time     | Date      | Status | PLC       |
| DiscreteAlarms_1              | !    | 1      | 11:28:24 | 2011-1-18 | (C)D   | Undefined |
| DiscreteAlarms_1              | !    | 1      | 11:28:24 | 2011-1-18 | (C)D   | Undefined |

|            |    |    |          |          |    |     |
|------------|----|----|----------|----------|----|-----|
| XXX        | XX | XX | XX:XX:XX | XX-XX-XX | XX | XXX |
| Print Date |    |    | Page     |          |    |     |

2. Create a new project, configure alarm view, buttons and number I/O field in the screen, configure button "printalarm" to print current alarm info, see below:



3. See below Simulation running effect:



4. See below print view:

| Alarm       |      |        |          |            |        |           |
|-------------|------|--------|----------|------------|--------|-----------|
| \ Alarm     |      |        |          |            |        |           |
| Text        | Name | Number | Time     | Date       | Status | PLC       |
| discrete_16 | !    | 16     | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_15 | !    | 15     | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_14 | !    | 14     | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_13 | !    | 13     | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_12 | !    | 12     | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_11 | !    | 11     | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_10 | !    | 10     | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_9  | !    | 9      | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_8  | !    | 8      | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_7  | !    | 7      | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_6  | !    | 6      | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_5  | !    | 5      | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_4  | !    | 4      | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_3  | !    | 3      | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_2  | !    | 2      | 15:22:10 | 2011-05-27 | C      | Undefined |
| discrete_1  | !    | 1      | 15:22:10 | 2011-05-27 | C      | Undefined |

2011-05-27 15:22:13 1

#### 16.5.4.2 Print recipe view

Execute system function “PrintRecipe” to print the current recipe view.

Print current data records of the recipe view, pages without limit.

When simulative run, current printed data record saved as PNG pictures format under the engineering list, the same printing format with the HMI, the font of HMI is song typeface, nonsupport the bold and italic, the font is Times when simulative operate.

1. The specifications of recipe data record forms' headers and data content show as below:

| Recipe Data Record \Recipe name \Data Record Name |                |                  |    |
|---------------------------------------------------|----------------|------------------|----|
| Name                                              | Recipe name XX | Storage location | XX |
| Path                                              | XX             | Number           | XX |
| Version                                           | XX             | Synchronize tags | XX |
| Tags offline                                      | XX             | Synchronization  | XX |
| <i>Entry Name</i>                                 |                | <i>Value</i>     |    |
| Element                                           | XX             | XX               |    |
| .....                                             |                |                  |    |
| Print Date                                        |                | Page             |    |

The objects “Synchronizetags, Tags offline, Synchronization” in above table are respectively matchup below recipe property, The value for Synchronizetags, Tags

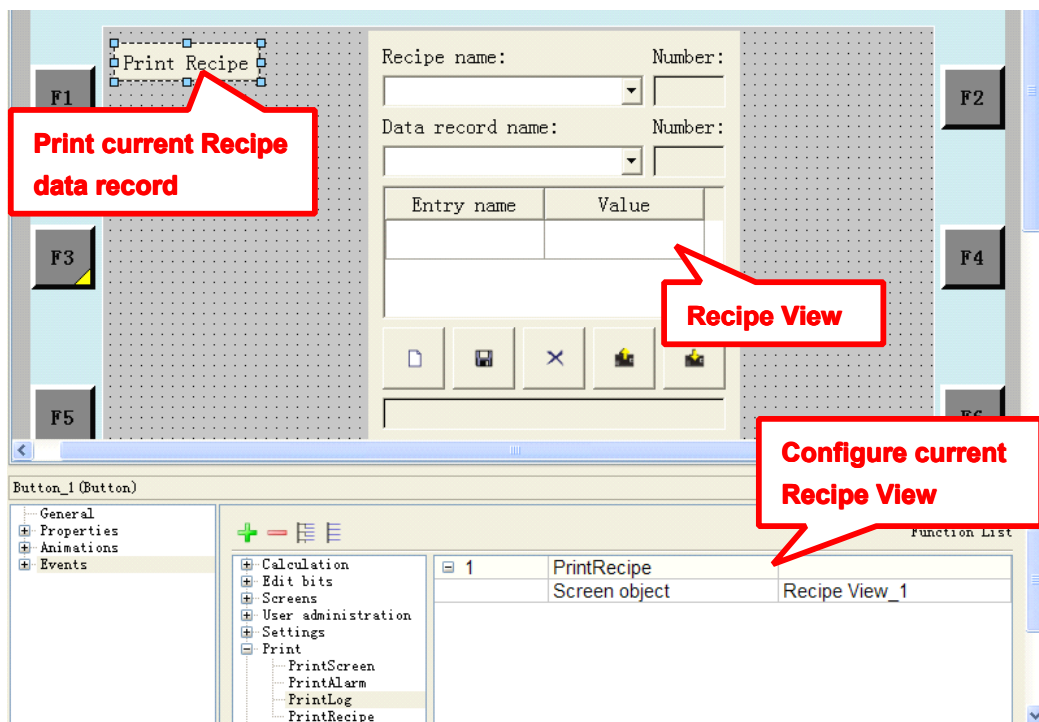
offline and Synchronization are: True or False .Recipe property view is as following:

The dialog box is titled "Data Media" and contains the following sections:

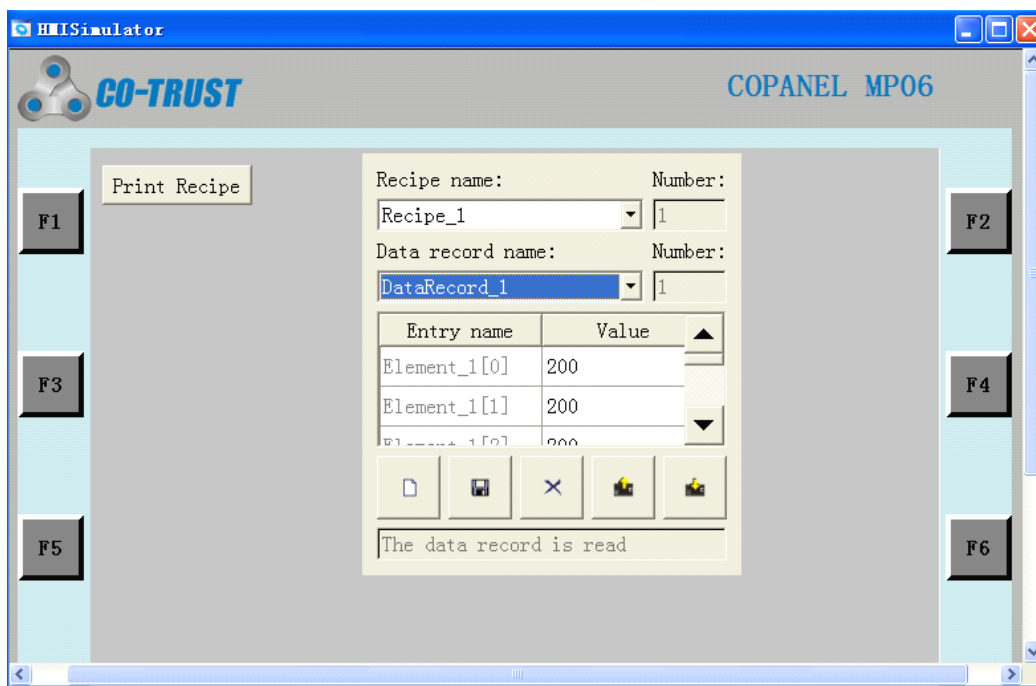
- Data Media:**
  - Storage Location: file
  - Path: \flash\recipe
- Options:**
  - ☐ Synchronize Tags
  - ☐ Tags offline
- Transfer:**
  - ☐ Synchronize
  - Synchronize with: <Undefined>
- Infotext:**
  - A large empty text area.

At the bottom are "Ok" and "Cancel" buttons.

2. Create a new project, configure recipe view and button in the screen, configure button "print" to print all current data record that assigned by the recipe view, see below:



3. Simulation running effect sees as below:



4. See below print view:

| Recipe Data Record  |                     |                         |       |
|---------------------|---------------------|-------------------------|-------|
| Recipe_1 \\\        |                     |                         |       |
| <b>Name</b>         | Recipe_1            | <b>Storage location</b> | file  |
| <b>Path</b>         | \flash\recipe       | <b>Number</b>           | 1     |
| <b>Version</b>      | 2011-05-17 10:08:59 | <b>Synchronize tags</b> | False |
| <b>Tags offline</b> | False               | <b>Synchronization</b>  | False |
| <b>Entry name</b>   | <b>Value</b>        |                         |       |
| Element_1[0]        | 200                 |                         |       |
| Element_1[1]        | 200                 |                         |       |
| Element_1[2]        | 200                 |                         |       |
| Element_1[3]        | 200                 |                         |       |
| Element_1[4]        | 200                 |                         |       |
| Element_1[5]        | 200                 |                         |       |
| 2011-05-17 10:12:17 |                     |                         | 1/1   |

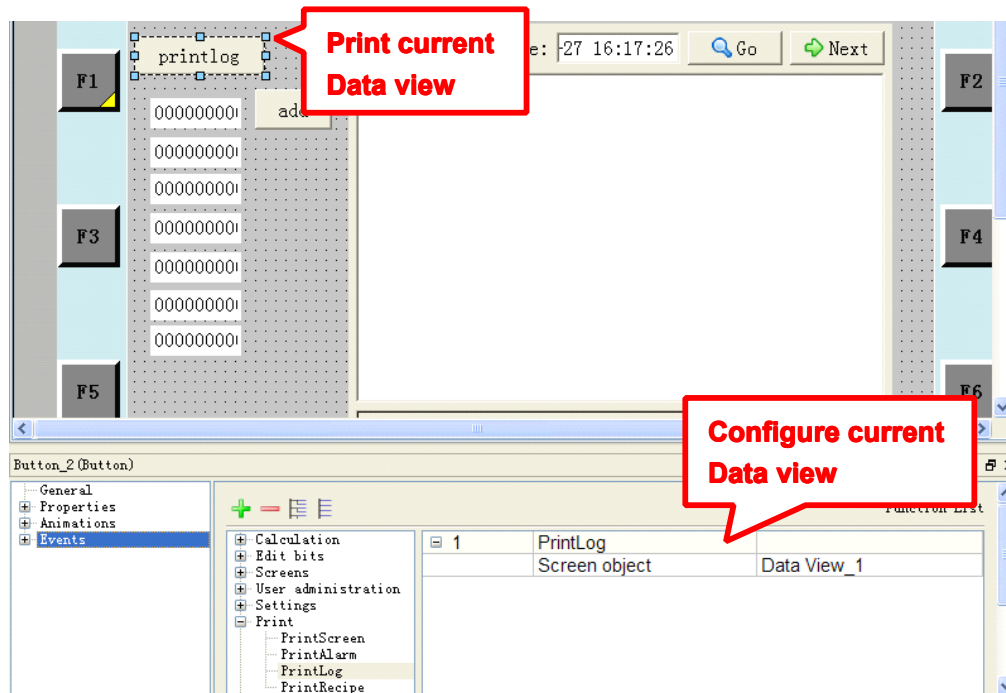
#### 16.5.4.3 Print Data View

Execute system function "PrintLog" to print the current Data view.

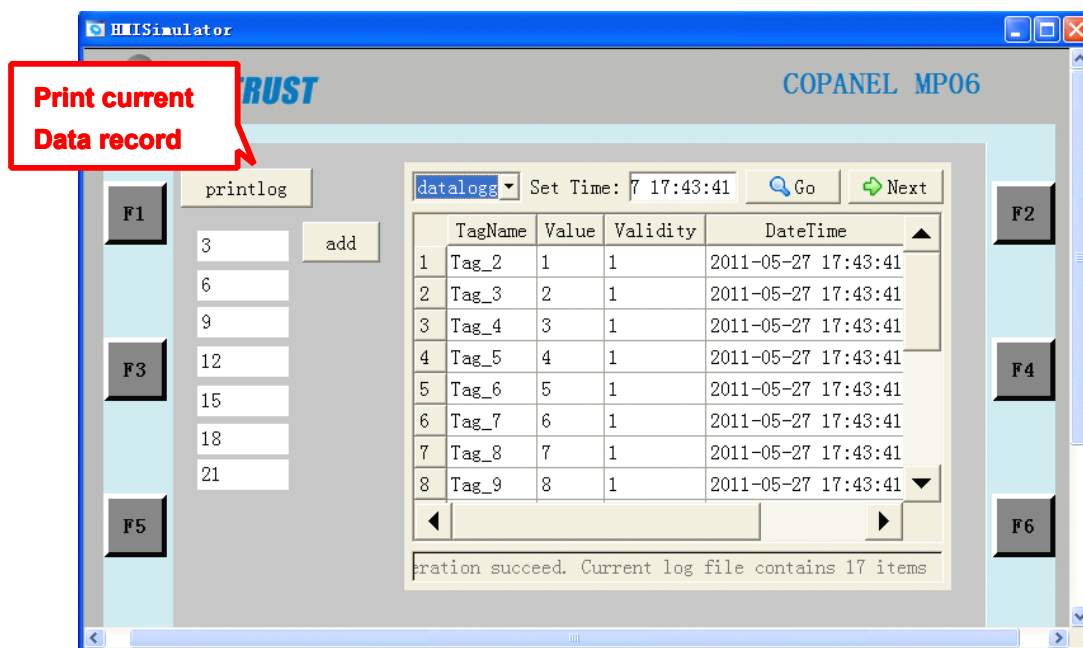
All the historical data records of the HMI are saved in the U disk, as HMI use the same USB port as printers, it does not support printing historical data, but it can be printed in the simulation mode.

When simulative run, current printed data record and historical data record saved as PNG pictures format under the project list, the same printing format with the HMI, the font of HMI is song typeface, nonsupport the bold and italic, the font is Times when simulative operate.

1. Create a new project, configure Data view, number I/O field and button in the screen, configure button "printlog" to print all current data record that assigned by the Data view, see below:



2. See as below Simulation running effect:



3. See below print view:

| History Data Record |              |                 |                     |
|---------------------|--------------|-----------------|---------------------|
| \\dataloggings_1    |              |                 |                     |
| <i>TagName</i>      | <i>Value</i> | <i>Validity</i> | <i>DateTime</i>     |
| Tag_2               | 1            | 1               | 2011-05-17 10:58:30 |
| Tag_3               | 2            | 1               | 2011-05-17 10:58:30 |
| Tag_4               | 3            | 1               | 2011-05-17 10:58:30 |
| Tag_5               | 4            | 1               | 2011-05-17 10:58:30 |
| Tag_6               | 5            | 1               | 2011-05-17 10:58:30 |
| Tag_7               | 6            | 1               | 2011-05-17 10:58:30 |
| Tag_8               | 7            | 1               | 2011-05-17 10:58:30 |
| Tag_9               | 8            | 1               | 2011-05-17 10:58:30 |
| Tag_2               | 2            | 1               | 2011-05-17 10:58:32 |
| Tag_3               | 4            | 1               | 2011-05-17 10:58:32 |
| Tag_4               | 6            | 1               | 2011-05-17 10:58:32 |
| Tag_5               | 8            | 1               | 2011-05-17 10:58:32 |
| Tag_6               | 10           | 1               | 2011-05-17 10:58:32 |
| Tag_7               | 12           | 1               | 2011-05-17 10:58:32 |
| Tag_8               | 14           | 1               | 2011-05-17 10:58:32 |
| Tag_9               | 16           | 1               | 2011-05-17 10:58:32 |
| Tag_2               | 3            | 1               | 2011-05-17 10:58:33 |
| Tag_3               | 6            | 1               | 2011-05-17 10:58:33 |
| Tag_4               | 9            | 1               | 2011-05-17 10:58:33 |
| Tag_5               | 12           | 1               | 2011-05-17 10:58:33 |
| Tag_6               | 15           | 1               | 2011-05-17 10:58:33 |
| Tag_7               | 18           | 1               | 2011-05-17 10:58:33 |
| Tag_8               | 21           | 1               | 2011-05-17 10:58:33 |
| Tag_9               | 24           | 1               | 2011-05-17 10:58:33 |
| 2011-05-17 10:58:43 |              |                 | 1/1                 |

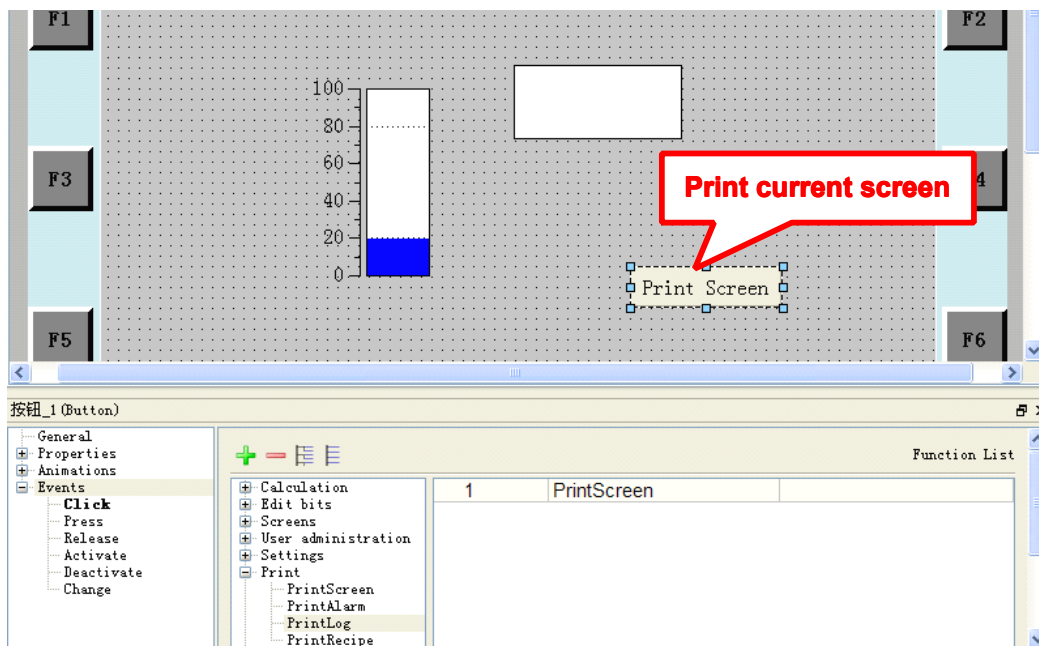
### 16.5.5 Print functions of Graphics

Execute system function "PrintScreen" to print the current screen.

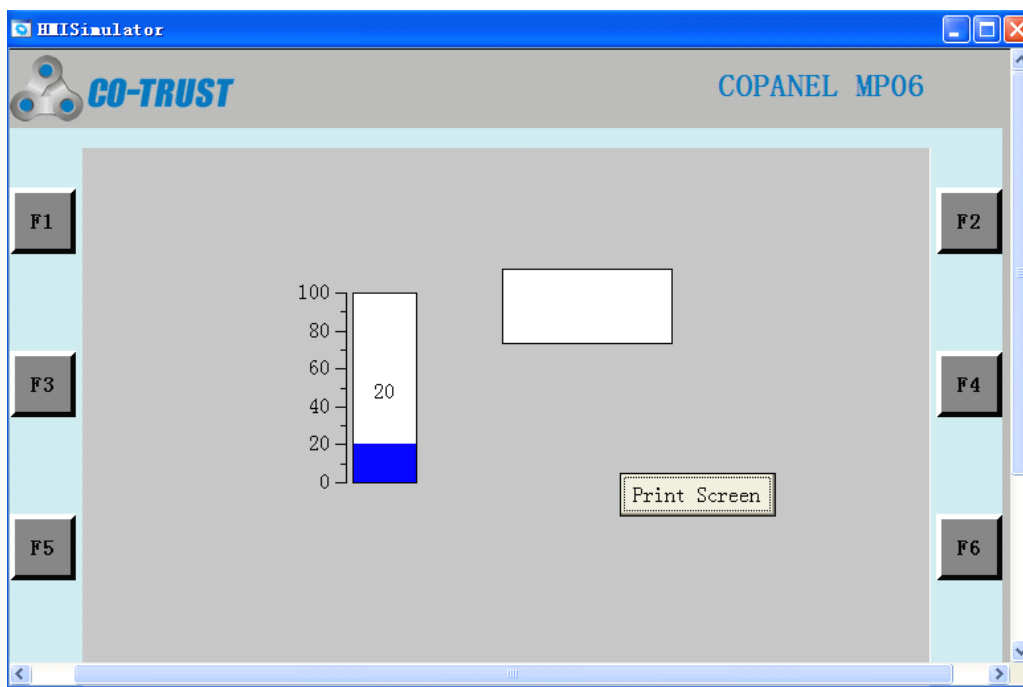
Only print the content of current screen, it won't print title and time; the print size of the screen adapt to the width of the paper. Print current screen need 30 seconds, the other pages need about 3 – 5 seconds to print out.

When it simulative run, current printed screen saved as PNG pictures format under the project list, the same printing format with the HMI, the font of HMI is song typeface, nonsupport the bold and italic, the font is Times when simulative operate.

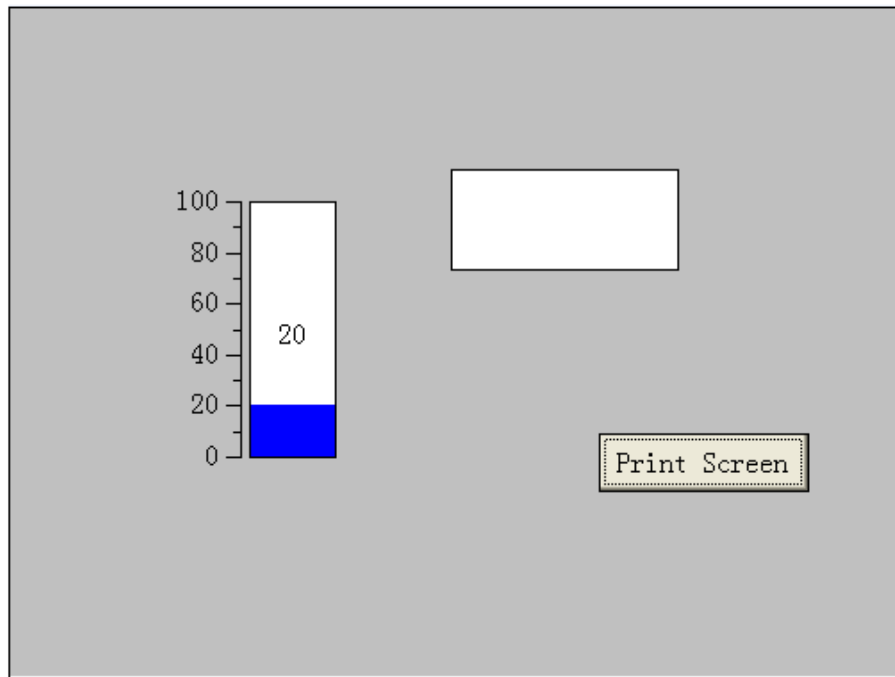
1. Create a new project, configure bar, rectangle and button, configure button "print Screen" to print current screen, see below:



2. See below Simulator running effect:

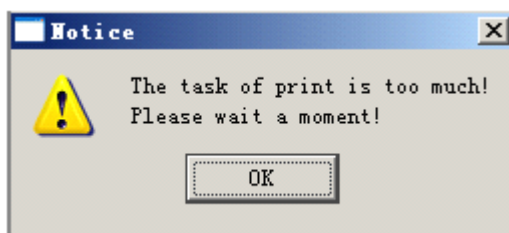


3. See below print view:

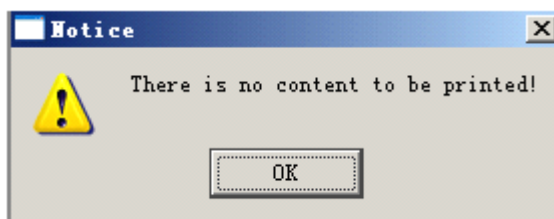


### 16.5.6 Print Prompts

1. After Started any printing task, and you are going to print more than 10 pages, the printer would not accept new print tasks, the prompt would popup:



2. If the content to be printed is empty, will popup below dialog:



3. If printer out of connection when printing is processing, HMI would no Prompt, all print tasks of the printing queue will be discarded.

4. Because the screen printing function overlaps with original functions (screens stored in the U disk), there is no tip whether printer is existing or not.

## 16.6 Introduction of HMI Input Method

Support Chinese, English and Special characters input methods.

## 16.6.1 Specification of input method

### Chinese input method

Supports more than 6000 characters and some common phrases at present.

### English input method

Supports case sensitive of 26 letters and 0-9 digital characters.

### Special characters input method

Supports following special characters:

"+", "-", "\*", "/", "(", ")", "[", "]", "=", "%", "!", "@", "#", "\$", "?", ";", ":", ":", ":", ":", ":", "<", ">", "|", "&", "\\", "{", "}", "~", "\_"

## 16.6.2 Specification of soft keyboard

### 16.6.2.1 Chinese input interface

Supports phonetic input method, only applied to touch screen types HMI.

The soft keyboard of Chinese input interface sees as follows:



The function keys of Chinese soft keyboard are described as follows:

| Function Key | Description                                                                                                                    |
|--------------|--------------------------------------------------------------------------------------------------------------------------------|
| EN           | Switch to English input method.                                                                                                |
| *#           | Switch to special character input method.                                                                                      |
| ESC          | Cancel this input, hide input interface.                                                                                       |
| Enter        | Send the characters in the editor to the corresponding object, and hide the input field.                                       |
| Del          | First delete phonetic characters, if no phonetic character, delete the contents in the edit box, each time delete a character. |
| <            | Display 5 characters of previous page.                                                                                         |
| >            | Display 5 characters of next page.                                                                                             |

### 16.6.2.2 English input interface

The soft keyboard of English input interface see as follows:



The function keys of English soft keyboard are described as follows:

| Function Key | Description                                                                              |
|--------------|------------------------------------------------------------------------------------------|
| CN           | Switch to Chinese input method                                                           |
| *#           | Switch to special character input method                                                 |
| Caps         | Switch to Capital letters interface, click again would switch to lower case.             |
| ESC          | Cancel this input, hide input interface                                                  |
| Enter        | Send the characters in the editor to the corresponding object, and hide the input field. |
| Del          | Delete the contents in the edit box, each time delete a character.                       |

### 16.6.2.3 Special character input interface

The soft keyboard of Special character input interface see as follows:



The function keys of Special character soft keyboard are described as follows:

| Function Key | Description                                                                              |
|--------------|------------------------------------------------------------------------------------------|
| <<           | Return to the last input method.                                                         |
| ESC          | Cancel this input, hide input interface.                                                 |
| Enter        | Send the characters in the editor to the corresponding object, and hide the input field. |
| Del          | Delete the contents in the edit box, each time delete a character.                       |

## 16.7 Updating projects in U disk

The steps of updating projects in U disk are detailed as below:

- 1) Compile and save the configured project.
- 2) Copy the project to U disk, and rename the project as tmp;
- 3) Insert the U disk to the USB port of HMI screen, and enter in configuration interface, pressing the four corners of HMI according to the sequence of Upper Left—Upper Right—Lower Right—Lower left (Pressing the screen to enter configuration interface while the device is starting) .
- 4) Click “Update project” from configuration interface would pop a update dialog, you need enter password “26470489”, then click “OK” to start updating.
- 5) Wait until the updating is finished, the screen would tip as “Update is successful”, click “Exit” to exit from configuration interface or run the updated projects after the HMI is rebooted.



### Tips

- 1) The device type of HMI device and Magicworks HMI should be the same, otherwise would tip “Project type is incorrect” or “Project version is incorrect”;
- 2) You have to compile the projects before its saved to U disk, otherwise HMI screen would tip “There is no projects in the card”.

## 16.8 Compatible Version

### 16.8.1 Compatible Projects

Compatibility principle of projects: Low version MagicWorks HMI projects can be opened by high version MagicWorks HMI, but low version MagicWorks HMI could not open the projects with higher version.

Such as, V3.3.0 MagicWorks HMI could open the projects which version is V3.00, but V3.00 MagicWorks HMI cannot open the projects with V3.3.0 version.

If the projects with low version and be opened by higher version, the solutions for opening the projects by low version are detailed below:

- 1) Delete the files which suffix are “hmidb”;
- 2) Then rename “x.hmidb.\*orig” file to “x.hmidb”, “x” is the project name, “\*” is the version;
- 3) Open the projects with lower version MagicWorks HMI.

Example:

Use V3.3.0 MagicWorks HMI to open the “123” project which version is V3.00, that you could not open the project by V3.00 MagicWorks HMI. As you want to open the project by V3.00 MagicWorks HMI again, first you should open “123” project, then delete the file named as “123.hmidb”, and renamed “123.hmidb.300orig” as “123.hmidb”, so that you can use V3.00 MagicWorks HMI to open the project.

## 16.9 The address mapping relation between Modbus and S7-200

Address mapping table of Modbus protocol and S7-200 protocol:

| Address of Modbus | Address of S7-200 |
|-------------------|-------------------|
| 0x1               | Q0.0              |
| 0x2               | Q0.1              |
| ....              | ....              |
| 0x127             | Q15.6             |
| 0x128             | Q15.7             |

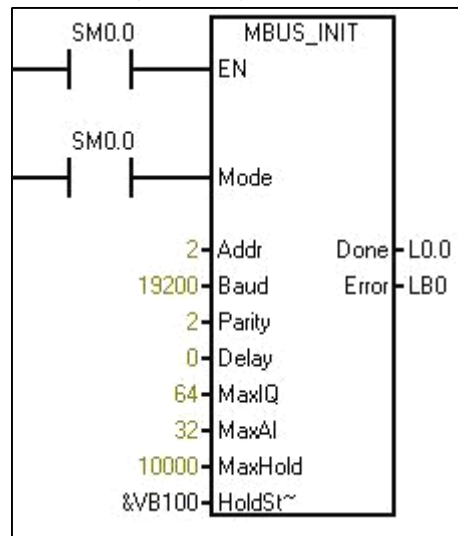
|         |       |
|---------|-------|
| 1x10001 | I0.0  |
| 1x10002 | I0.1  |
| ....    | ....  |
| 1x10127 | I15.6 |
| 1x10128 | I15.7 |

| 3x30001           | AIW0                   |
|-------------------|------------------------|
| 3x30002           | AIW2                   |
| ....              | ....                   |
| 3x30032           | AIW62                  |
| Address of Modbus | Address of S7-200      |
| 4x40001           | HoldStart              |
| 4x40002           | HoldStart +2           |
| 4x40003           | HoldStart +4           |
| ....              | ....                   |
| 4x4nnnn           | HoldStart +2* (nnnn-1) |

Considering the table above, the example detailed below describes the relation between HMI Modbus address 4x40001 and the V memory of PLC.

Following diagram is a Modbus slave library, the pointer of Holdstart is VB100, address 4x40001 of HMI corresponds to VW100 of PLC, 4x40002 of HMI corresponds to VW102, other addresses along the way. If modify the pointer of

Holdstart to VB0, 4x40001 of HMI corresponds to VW0, 4x40002 of HMI corresponds to VW2, other addresses along the way.



## 16.10 MPI protocol

MPI (Multi-point-Interface) can configure master/slave protocol or master/master protocol between HMI and PLC.

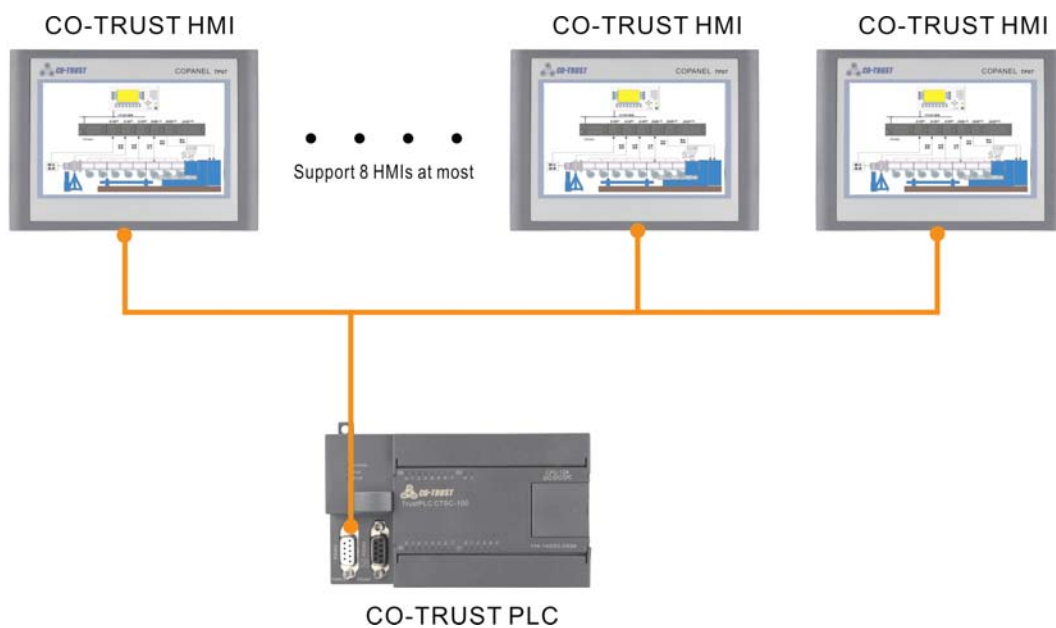
Bus: The “Bus” we mentioned here are RS485 communication bus (That is connecting all RS485 ports of devices in parallel).

Master: Active requester is called master.

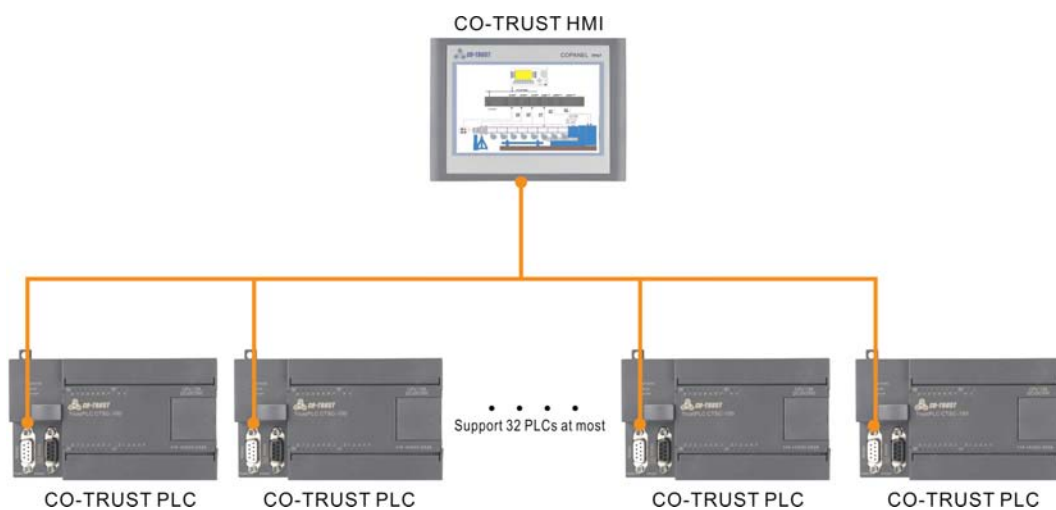
Slave: The station which responds the request and offers data is called slave.

Multi-masters and multi-slaves are available in the same bus while applied MPI protocol, which means multi-HMI screens and multi-PLCs can be connected in parallel via RS485 interface, that the communication between HMI and PLC are workable.

Connecting multi-HMI as masters in one bus, a PLC is connected as slave, the connection diagram are shown as below:



Connecting a HMI as master in one bus, multi-PLCs are connected as slaves, the connection diagram are shown as below:



**SHENZHEN CO-TRUST TECHNOLOGY CO.,LTD.**

Address: Room 209 & 210, 2/F, ShenZhen IC design &  
application industrial park, South of Chaguang Road, Xili  
Town, Nanshan District, Shenzhen, CHINA.

Hotline: 400-700-4858

E-mail: [sales@co-trust.com](mailto:sales@co-trust.com)

[http: //www.co-trust.com](http://www.co-trust.com)

It is to be noted that all these parameters  
are subjected to change without notice.

All Rights Reserved.

The reproduction,or use of this document  
is not permitted without express  
written authority.