



PLC&HMI Frequently Asked Question

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1. PLC FAQs

1.1. CTSC-100 PLC Getting-Started

1.1.1. How many communication ports are available on CTSC-100 CPUs and the maximum extension modules?

CPU122 has only 1 PPI/freeport with none extension module; CPU124, CPU124XP, CPU126 all have 1 PPI and 1 Freeport with maximum 3 extension modules.

1.1.2. “Nonfatal error” at Download

Proceeded as following procedures:

1. Validate the Timer and Counter no. are not exceed 127, as the CTSC-100 CPU has only 128 Timers and Counters which is half of the CTSC200 CPU. But the CTS7 114-1BD20-0620, for which the serial no. started from PF09832, has 256 Timers and Counters.
2. While using freeport communication, you need to use the modbus library of Co-trust.

1.1.3. How may Analog I/Os are available on CPU124XP and how to access these I/Os?

CPU124XP has 4 Analog Inputs and 2 Analog Outputs. Analog Input ranges from -10V to 10V; Analog Output ranges from 0 to 10V, all with 12-bit resolution, nonsupport for current signal Input/Output. Users can obtain values for these Analog channel by accessing AIW0-AIW6, AQW0-AQW2 in the programming software.

1.1.4. Are there HSC and HSP outputs available on CTSC-100 CPUs and how to use?

CTSC-100 CPUs (except for 124 transistor type) have 4 50KHz HSC outputs and 2 50KHz HSP outputs; the 124 transistor type has 3 50KHz HSC outputs and 3 50KHz HSP outputs. HSC can be used by Instruction Wizard, HSP needs to call the motion control

library of Co-trust.

1.1.5. The value reading from CPU124XP analog input has exceeded 5000 while it disconnect, is this normal or malfunction?

It's normal, the analog input has a built-in 1.65V voltage signal while disconnect.

1.1.6. What's the differences between CTSC-100 CPUs and CTSC-200 CPUs?

CTSC-100 CPU has only 128 Timers and Counters which is half of the CTSC200 CPU. But the CTS7 114-1BD20-0620, for which the serial no. started from PF09832, has 256 Timers and Counters. Please check the Timer and Counter number not exceed 127 if the "Nonfatal error" occurred at download.

1.1.7. Whether the HSP for CTSC-100 CPUs can output PWM signal?

No, they can only output PT0 signal with duty cycle fixed at 50%.

1.1.8. Whether the CTSC-100 PLCs can use our PID library PID_T?

No, they can only use the PID Wizard build-in Siemens software.

1.1.9. Whether the Siemens modbus library can be used for Freeport Communication?

No, Please using the Cotrust CPU with the dedicated Cotrust modbus library.

1.1.10. Whether the CTSC-100 CPUs can be used with CTSC-200 modules?

No, the CTSC-100 CPU are not compatible with CTSC-200 CPUs.

1.1.11. Whether the CTSC-100 CPUs support Siemens Programming cable?

No, they can only support the Cotrust cable CTS7-191-USB30.

1.1.12. Thermal resistor wiring issues

Solution:

The thermal resistor can be connected as four-wire, three-wire or dual-wire, please refer the description about CTSC200 temperature-measuring module of Thermal resistor type on our website. In principle, a thermal resistor should be connected between A+&A-, a+&a-, and users should terminate A+ with a+, A- with a-.

1.2. CTSC-200 PLC Getting-Started

1.2.1. What's the operation temperature of the CTSC-200 PLC?

The rating operation temperature ranges from 0 to 50.

1.2.2. Which kind of protocols are supported by CTSC-200 PLC?

PPI, MPI, Freeport communication (including modbus), DP (by using EM277A or EM277B), CANopen, and UDP_PPI, modbus-tcp over EtherNET.

1.2.3. Where to Download the Cotrust Library?

Cotrust Librarys are available for download at our website, which including corresponding

user manuals and practices, <http://www.co-trust.com> . These Librarys are available for using in Step7-Micro/Win.

1.2.4. How to open the program compiled in Micro/Win by using our MagicWorks PLC software?

You can download the program into Cotrust PLC and then upload it into MagicWorks PLC software.

1.2.5. Whether the CTSC-200 PLC can be used with Siemens modules?

Yes, but only PLC which version as of 4.04 can support Siemens modules (only Digital, Analog and Temperature modules) , and our modules (only Digital, Analog and Temperature modules) can also be used with S7-200 CPU.

1.2.6. How did the Analog addressing of CTSC-200 PLC work?

There are three types of Analog addressing: 1) general AIW Addressing; 2) addressing for normal Temperature module; 3) addressing for Temperature module with PID.

1.2.7. Whether the Digital Input have demand on polarity?

No, the Digital Input can be triggered by High-level or Low-level.

1.2.8. Whether the Digital Output have demand on polarity?

Only Transistor output type. As for now, the CPU 226H can output Low-level, and the other CPUs and modules output High-level.

1.2.9. What's the differences between 277A and 277B modules and how to use them?

277A and 277B are DP communication modules which can support up to 6 extension modules and communicate with 300DP master via DP protocol. 277A must be installed with a CTSC 200 CPU then can use the extension modules, while 277B can use the extension modules directly, both support up to 125 modules. Either of them can only be used with the corresponding GSD files are installed in the programming software, these files can be download from Cotrust website, <http://www.co-trust.com> .

1.2.10. How to use DIP switch while combine the PT100 thermal resistor with our RTD modules?

There are different PT100 criteria in various countries, 3850 PT100 is generally the domestic one, and user need only to follow the default DIP (SW1-SW5 are 0).

1.2.11. How much PIDs can one CTSC-200 CPU support?

56 (Siemens CPU can support 8)

1.2.12. Which PID libraries can Cotrust provide?

PID_T (Which integrated into all CTSC 200 CPUs), PID_SETTING (Can only be used on modules with intelligent PID), PID_SETTING_7HF (Provided for 7HF).

1.2.13. Whether the PID libraries support self-tuning?

PID_T supports self-tuning while PID_SETTING don't.

1.2.14. DIP switch setting on the Analog module can only be effective after powering up again?

Yes, thus can prevent the DIP switch changing during normal operation , which can lead to danger.

1.2.15. Whether the Weighing library of Cotrust can be used on Siemens CPU?

Yes.

1.2.16. How much 277C Slaves and I/Os can one CAN CPU from Cotrust can support?

Up to 32 277Cs and 640DI/640DO, 192AI/192AO.

1.2.17. What's the max. distances for Cotrust CANopen Communication products?

The max distance for CANopen communication is 2500m, and different rates are correspond to different distances. Up to 8 slaves can be used at 20Kbps and each supports 8 analog I/Os.

1.2.18. Which modules does the 277C support?

All CTSC-200 extension modules except 3 PID modules and motion control modules.

1.2.19. How long does the PLC Data Hold time while power-off?

For CTSC-100:

1. 1 year with build-in button cell;
2. Permanent with using Permanent library to store data into EEPROM.

For CTSC-200 and H224X/H226XL in CTH200:

1. 100 hours with build-in button cell;
2. About 2 years with external battery card;
3. Permanent with using Permanent library to store data into EEPROM.

For CTH300 and H224/H226 in CTH200:

Permanent.

1.2.20. Which CPUs support RS232?

CPU224+, CPU226L and CPU226M, in which the first two are compatible completely with Siemens CPU.

1.2.21. How to use HSP with CPU224+ and CPU226L?

224+ and 226L can only use the HSP register SMB66-SMB85 to send HSP; the other CTSC-200 transistor-type CPUs can use motion-control library from Cotrust to do this.

1.2.22. When using the SPEED or PTP instruction from motion-control library, why did the PLC always indicate Busy?

One axe in CPU can only accept 1 PTP instruction, but users may reuse it or interrupt the enable of sending pulses, which results the axe to be occupied.

1.3. CPU Troubleshooting

1.3.1. SF lights on irregularly (System Faults)

Step1:

Connect the programming cable in STOP mode, if communication cannot be established, the hardware may have a problem.

Step2:

If communication has been established, please erase the CPU program and disconnect the other modules, then set CPU into RUN mode.

Step3:

Clear all faults and check the program. If the data type for address is not match with instruction requirement, you can click menu command PLC -> Information to check the location, for instance SBR1 NETWORK10.

If you delete the program but the SF LED still lights on, check the error code and repeat diagnosing, possible reason is that values in data area and statements in CPU are various.

1.3.2. Three LEDs flash synchronously on CPU, what does that indicate?

First, please check the power of CPU is stable.

Then connect the programming cable in STOP mode, if communication cannot be established, the hardware may have a problem, please return to depot.

1.3.3. The input terminal of CPU has been disassembled, but all the input indicators light on, is there anything wrong with CPU itself?

The input indicators only light on under normal power, if you disassemble terminals and they are still ON, there may exist fault in hardware, it's better to check the input terminals for high level voltage which burnout the inputs of PLC.

1.3.4. Forget PLC password

If you forget the PLC password, the program block, data block and system block must be erased together, and then reload the program. Note: the PLC memory must be cleared while the PLC is in STOP mode, this would reset PLC to default (except the PLC address, baud rate and realtime clock) and you need to reload the program.

Erase the PLC program following below procedures:

1. Select menu command PLC -> Clear..., the Clear dialog pops up.
2. check all boxes and click OK.
3. If you had set a password, a verification dialog would pop up. Enter the CLEARPLC (Case Insensitive) and continue to clear.

1.3.5. Compile error occurs during download

Select menu command PLC -> Information to open the Information dialog, following the prompting characters to locate the final cause or faulty network.

The possible reasons are:

1. The Timer, Counter or register were out of range.
2. CTSC-100 with HSC and H224/H226L in CTH200 support HSC0-HSC3.

3. Parameters in library were set incorrectly. Please use the MODBUS library from Cotrust.

Try to analyze by deleting networks with potential errors If you can't identify the causes.

1.4. Module failures

1.4.1. SF indicator flashes on the EM131-7ND

The possible causes may be line broken or over-range. Unused channel on EM131-7ND should be connected with a 100Ω resistor.

1.4.2. What are Forward calibration & Negative calibration?

The Forward calibrate value is 3276.7 (Fahrenheit or Celsius), Negative calibrate value is -3276.8. when detected line broken or over-range, these value would be set automatically for respective channels.

1.4.3. EM131 measurement not stable

Solution:

Connect with Ground depending on the sanitation situation around circumstance.

1.4.4. How to connect two-wire TC with TC temperature module?

Shorts A+ with a+, A- with a-, then connect with each end of TC.

1.4.5. RTD/TC modules always lights on red

- SF lighting on indicates that module has problem; SF flashing indicates input failure.
- Some channel were not connected, bad contact or over-range.

- Unused channel on EM231 RTD needs to connect a 100 Ω resistor, and EM231 TC needs to short the unused channel.

1.4.6. RTD/TC modules measurement inaccurate

- Validate the wiring and dial switch are setting properly.
- Check the accessing address is correct (some measuring modules have special addresses)
- Check the temperature is correct, the resolution for TC/RTD modules is 0.1°C, which means the measurement value 300 representing 30.0°C.
- Ensure there has no distraction for temperature measurement, like high-power inverter.

1.5. The similarities and differences between CTH200 and CTSC-100/CTSC-200 profiles

CTH200 PLC	Similarities	Corresponding CTSC-100/CTSC-200 PLC
H222 DC	14/24/40 I/Os CPU, 1 Ethernet port, 1 or 2 RS485 interfaces, 1 DB board interface. Not support CAN expansion card and SM253. Modules can't be used mixed.	CTSC-CPU122
H222 RLY		CTSC-CPU122
H224 DC		CTSC-CPU124
H224 RLY		CTSC-CPU124
H226L DC		CTSC-CPU126
H226L RLY		CTSC-CPU126
H224X DC	24/40 I/Os CPU, 1 Ethernet port, 2 RS485 interfaces, 1 DB board interface. Modules can't be used mixed.	CTSC-CPU224
H224X RLY		CTSC-CPU224
H226XL DC		CTSC-CPU226
H226XL RLY		CTSC-CPU226

Profiles	Relations with CTH200 PLC
CTSC-100 PLC	The CPU H224/H226L replaces CTSC-100, with modules not compatible.
CTSC-200 PLC	The CPU H224X/H226XL replaces CTSC-200 (except for CPU 226H), with modules not compatible.
CTSC-300PLC	There has no direct relations.
CTH300 PLC	Cooperate with CTH300 PLC for large scale control system
TP07/TP10 HMI	Connect with CTH200 PLC via RS485 interface, as with CTSC-200.
TP07i/TP10i Ethernet HMI	Connect with CTH200 PLC via Ethernet or serial port, working as standard HMI
TD Text Screen	Compatible, working as with CTSC-200
E10/H1A/H2A Servo Drive	In simple motion control applications, CTH200 PLC can be used with E10/H1A/H2A servo for impulse control and CAN control solutions.

Differences	CTH200 PLC	CTSC-100/CTSC-200 PLC
Instruction speed	H224X/H226XL CPUs are in accord with CTSC-200 H224/H226L CPUs have higher speed as CTSC-100	
Data/Program space		
Image Area	H224X: 640DI/640DQ, 194AI/194AQ Only H226XL supports CAN expansion board.	128DI/128DQ 32AI/32AQ
Data holding on power-off	Supporting holding on power-off for all data. Support persist automatic-holding for partial data	Using lithium battery with external battery card or super capacitor with external battery card
Extension module	7 (including expansion board)	3/7
Expansion board	1 (SM Addressing)	0
Communication port	1 Ethernet port 1~2 RS485 interfaces (PPI/Freeport)	1~3 RS485 interfaces, PPI or Freeport
Timer	256/512 (Adding 256 10ms TON/TONFs)	128/256
HSP and HSC	H224/H226L CPUs have cover the CTSC-100 H224X/H226XL CPUs have cover the CTSC-200 (except for 226H)	
Configuration Software	Magicworks PLC STEP7 MicroWIN (except for Ethernet configuration and Hardware configuration)	
PID_T Library	H224/H226L support 16 channels, H224X/H226XL and CTSC-200 support 64 channels, CTSC-100 cannot support	

1.6. CTH300 Getting Started

1.6.1. Wiring Specifications

1. PWR-02 module is the best match for CTH300 system to provide power for CPU and it's expansion modules.

Each rack needs one power module, but the digital I/Os and sensor need to select the other power supply.

Note: CPUs are powered by independent supply, which is different from external devices. Unstable power would result stop as the CPU initiating protection.

2. Ground connection is default, but you need to make decisions depend on the environment.

3. Network cable between relay module and EtherCAT port must use parallel lines with the same sequence for each end, standard 568B: White-Orange, Orange, White-Green, Blue, White-Blue, Green, White-Brown, Brown.

1.6.2. CTH300 Architectures and Differences

CTH300-C and CTH300-H CPUs implement the same hardware platform and share the same expansion modules (except for CAN modules).

The main feature for CTH300-C is motion control based on CODESYS, while the CTH300-H is based on MagicWorks Software which is primary for Logical and Process control.

1.6.3. Expansion Capability for CTH300 system

CTH300 system support various expansion modules with maximum 4096DI/DQ, 1024AI/AQ.

1.6.4. Remote programming support for CTH300-C

CPUs Ethernet port and specific functions

Not support, the Ethernet Port supports only local program downloading and data monitoring, also for Socket and third-party device communication.

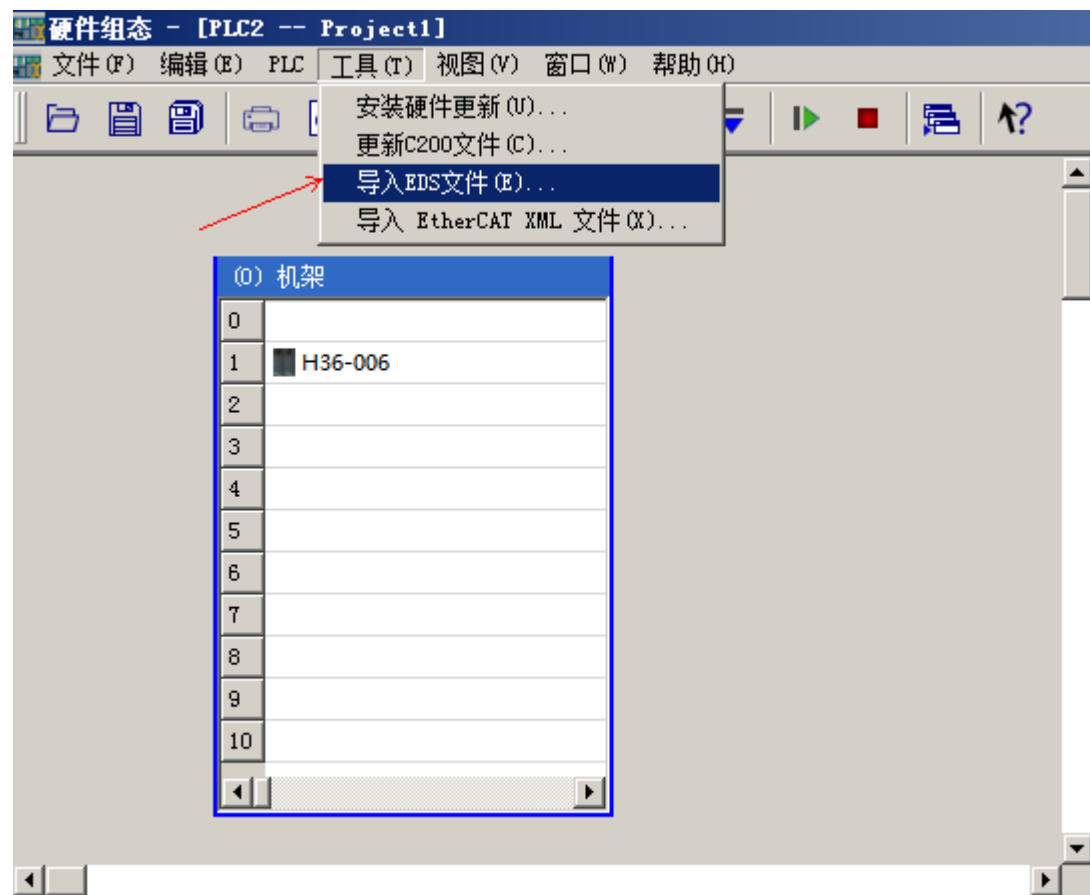
1.6.5. Max EtherCAT Slaves for CTH300 CPU

CTH300-C CPU supports up to 128 slaves; CTH300-H36 supports up to 64 slaves and can connects ECT-00 remote I/O modules, Servo Drives from COTRUST and third-party

EtherCAT slaves.

1.6.6. How to add EDS for third-party to achieve communication with Servo from third-party

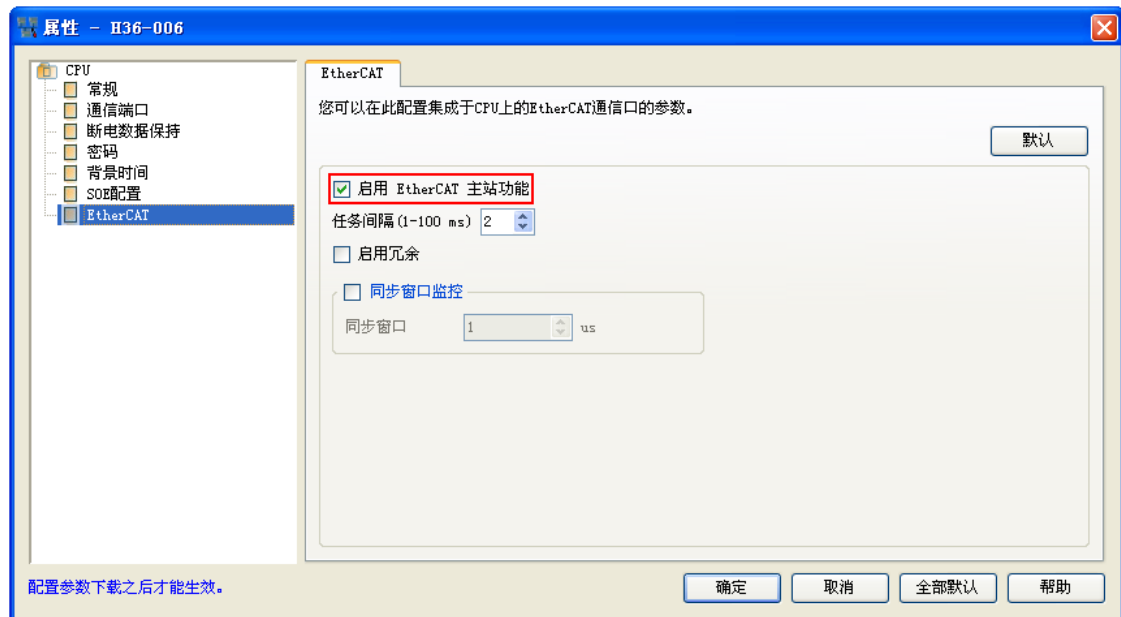
In MagicWorks PLC, open Hardware configuration and select Tools > Import EDS files, thus the EDS files for CAN slave can be added.



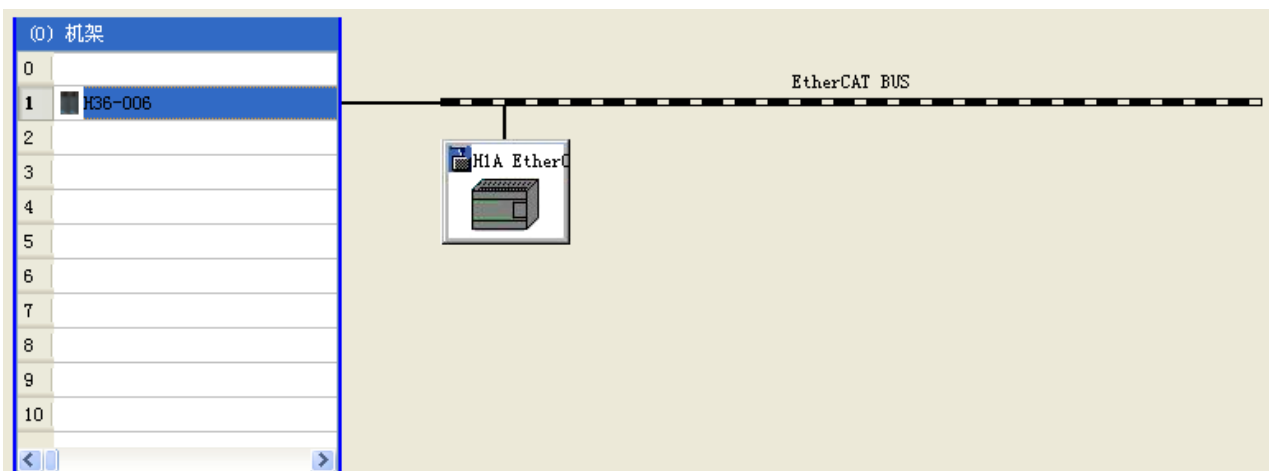
1.6.7. How to use Hardware configuration for MagicWorks PLC to add EtherCAT slave

1. In the Hardware configuration interface, drag the Power, CPU H36 from Catalog into rack, then double-click the H36.

Select the EtherCAT tab from left, check "Enable EtherCAT master" to enable the EtherCAT function.



2. Check H1A and drag it under EtherCAT Bus, the slave has been added successfully.



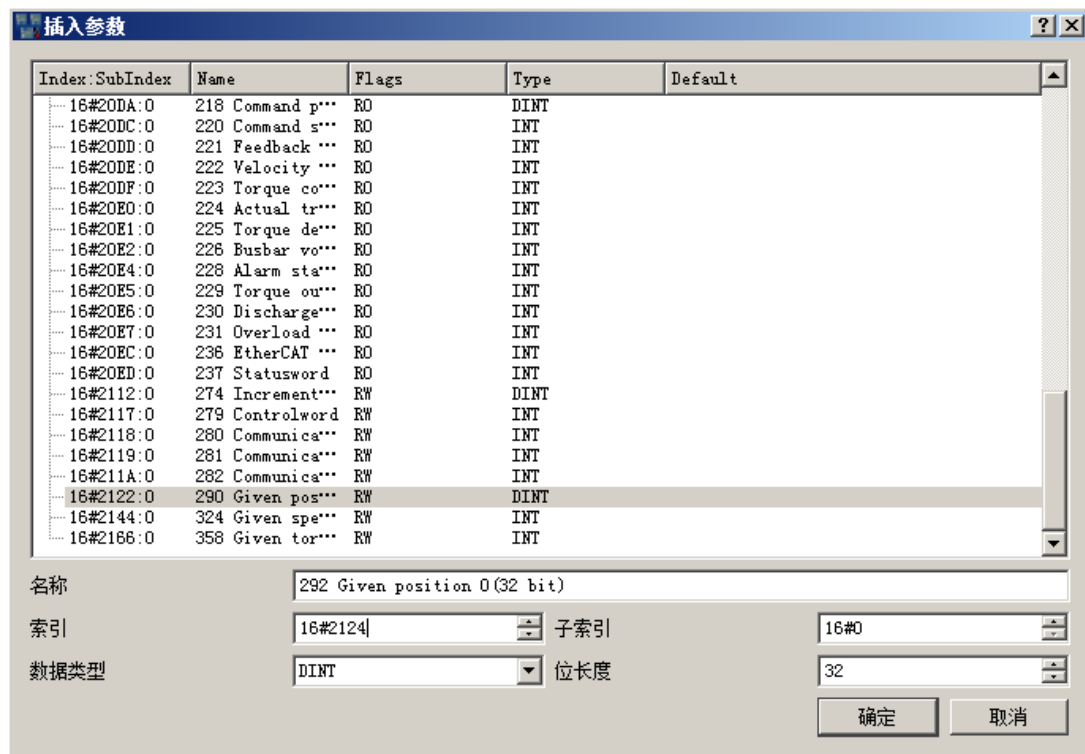
1.6.8. How to add variables which are not persist in process data of EtherCAT slave (like P292)?

Step 1. Enable Expert settings



Step 2. Right click PDO Content PDO Content and select Insert.

Step 3. Select P290, modify Name, Index and click OK.



1.7. CTH300 Faults Diagnose

Check the following conditions when faulted:

1) CTH300-H CPUs and expansion modules are powered normally.

Note: It's recommended to use independent power supply for CPU to prevent halts by

unstable power.

2) Screws and connectors for I/O terminal of CTH300-H CPU and expansion module is tighten.

3) Connections for communication cables is correct.

4) Check and modify the Communication Settings like Baud rate, Serial Interface or IP when the PLC can't be searched, then research the PLC.

Except the above methods, you can read diagnosing information from MagicWorks PLC or check the status via LED indicators of PLC.

1.7.1. MagicWorks PLC

Read diagnosing information: Open MagicWorks PLC → Double-click Hardware Configuration → Select Menu Item "PLC" → "Obtain Diagnosing information" to open the Diagnose window.

Table 1 Description for Diagnose window

Items	Meaning	Note
Date	Date for diagnostic event, format: Year.Month.Day	
Time	Time for diagnostic event, format: Hour: Minute: Second: millisecond	
Type	Type for diagnostic event	
Process Variable	Process Variable values when SOE event occurred (only for SOE event)	Up to 16 SOE events can be configured; type and format for Process Variable can be configured in CPU "Properties" → "SOE Config".

Table 2 Diagnostic Function

Supported Event type	Type Code	Event code and description	
		Code	Description
Operation mode change	0x5	0x01	Power On
		0x02	Starting up
		0x03	Halt
Synchronization error	0x6	0x00	No error (reserved)
		0x01	DB in use is not exist or exceeded the board (reserved)
CPU nonfatal error	0x7	0x00	No fatal errors present; no error
		0x01	HSC box enabled before executing HDEF box
		0x02	Conflicting assignment of input interrupt to a point already assigned to a HSC
		0x03	Conflicting assignment of inputs to an HSC already assigned to input interrupt or other HSC
		0x04	Attempted execution of an instruction that is not allowed in an interrupt routine

		0x05	Attempted execution of a second HSC/PLS with the same number before completing the first (HSC/PLS in an interrupt routine conflicts with HSC/PLS in main program)
		0x06	Indirect addressing error
		0x07	TODW (Time-of-Day Write) or TODR (Time-of-Day Read) data error
		0x08	Maximum user subroutine nesting level exceeded
		0x09	Simultaneous execution of XMT/RCV instructions on Port 0
		0x0A	Attempt to redefine a HSC by executing another HDEF instruction for the same HSC
		0x0B	Simultaneous execution of XMT/RCV instructions on Port 1
		0x0C	Reserved
		0x0D	Reserved
		0x0E	Reserved
		0x0F	Illegal numeric value in compare contact instruction
		0x10	Reserved
		0x11	Reserved
		0x12	Reserved
		0x13	Illegal PID loop table
		0x80	Program too large to compile; reduce program size
		0x81	Reserved
		0x82	Illegal instruction; check instruction mnemonics.
		0x83	Missing MEND or instruction not allowed in main program: add MEND instruction, or remove
		0x85	Missing FOR; add FOR instruction or delete NEXT instruction.
		0x86	Missing NEXT; add NEXT instruction or delete FOR instruction.
		0x87	Missing label (LBL, INT, SBR); add the appropriate label.
		0x88	Missing RET or instruction not allowed in a subroutine: add RET to the end of the subroutine or remove incorrect instruction
		0x89	Missing RETI or instruction not allowed in an interrupt routine: add RETI to the end of the interrupt routine or remove incorrect instruction.
		0x8B	Illegal JMP to or from an SCR segment
		0x8C	Duplicate label (LBL, INT, SBR); rename one of the labels.
		0x8D	Illegal label (LBL, INT, SBR); ensure the number of labels allowed was not exceeded.
		0x90	Illegal parameter; verify the allowed parameters for the instruction.
		0x91	Range error (with address information); check the operand ranges.
		0x92	Error in the count field of an instruction (with count information); verify the maximum count

		0x93	size.
		0x94	FOR/NEXT nesting level exceeded.
		0x95	Missing LSCR instruction (Load SCR)
		0x96	Missing SCRE instruction (SCR End) or disallowed instruction before the SCRE instruction
		0x97	User program contains both unnumbered and numbered EV/ED instructions
		0x98	Illegal edit in RUN mode (edit attempted on program with unnumbered EV/ED instructions)
		0x99	Too many hidden program segments (HIDE instructions)
		0x9A	Attempt to switch to Freeport mode while in a user interrupt
		0x9B	Illegal index (string operation in which a starting position value of 0 is specified)
CPU fatal error	0x8	0x00	No fatal errors present
		0x01	Reserved
		0x02	Reserved
		0x03	Scan watchdog time-out error
		0x04	Reserved
		0x05	Reserved
		0x06	Reserved
		0x07	Reserved
		0x08	Reserved
		0x09	Reserved
		0x0A	Reserved
		0x0B	Reserved
		0x0C	Reserved
		0x0D	Reserved
		0x0E	Reserved
		0x0F	Reserved
		0x10	Internal software error
		0x11	Compare contact indirect addressing error
		0x12	Compare contact illegal floating point value
		0x13	Reserved
		0x14	Compare contact range error
Communication error	0xA	Reserved	
SOE events	0xB	Status change for BOOL type variable: (1)DI/DQ: ON→OFF, OFF→ON (2)BOOL: ON→OFF, OFF→ON	Up to 16 SOE events can be configured for cyclic scanning (1-16), process variables (signed/unsigned INT, signed/unsigned DINT, Float) and event texts are configurable and

			display in Diagnostic information.
SOE monitoring log		Log once for each scanning cycle	
EtherCAT register SMB400~SMB465 for H36-00		Refer to Table 3 for each status bit	
Diagnostic events SMB500~ SMB531 Refer to table 4	0x C	0x00	No fault
		0x01	Module is busy
		0x02	Module time-out with no response
		0x03	Module type unmatched
		0x04	Module version unmatched
		0x05	Software error
		0x06	Module waiting flag is time-out
		0x07	Bus ACK error
		0x08	Bus CRC validation error
		0x10	Memory shift outrange
		0x11	Module not ready
		0x12	Module configuration error
		0x13	Module not support this instruction
		0x15	Module internal diagnose
		0x16	Module has no power

Table 3 Diagnostic function for special register SMB400~SMB465 of H36-00

SMB	Error description
SMB400	No. of founded EtherCAT slaves
SMB401	EtherCAT error: 0 - No error 1 - error for configuration parameters 2 - slave not found 3 - error for status change 4 - error when writing configuration 5 - error for number of slaves 6 - slave not match
SMB402	Status for the 1 st slave: 0 - no connection 1 - initiation status 2 - pre-operation status 4 - safe operation 8 - operation status 16#80: product ID not match 16#81: manufacturer ID not match 16#82: error when writing SDO others: error status
SMB403~SMB465	Status for slave 2~64

Table 4 Diagnostic function for special register SMB500~SMB531

SMB	Error description
SMB500	Error for 1 st module(Rack0, Slot3)
SMB501	Error for 2 nd module(Rack0, Slot4)
SMB502	Error for 3 rd module(Rack0, Slot5)
SMB503	Error for 4 th module(Rack0, Slot6)
SMB504	Error for 5 th module(Rack0, Slot7)
SMB505	Error for 6 th module(Rack0, Slot8)
SMB506	Error for 7 th module(Rack0, Slot9)
SMB507	Error for 8 th module(Rack0, Slot10)
SMB508	Error for 9 th module(Rack1, Slot3)
SMB509	Error for 10 th module(Rack1, Slot4)
SMB510	Error for 11 th module(Rack1, Slot5)
SMB511	Error for 12 th module(Rack1, Slot6)
SMB512	Error for 13 th module(Rack1, Slot7)
SMB513	Error for 14 th module(Rack1, Slot8)
SMB514	Error for 15 th module(Rack1, Slot9)
SMB515	Error for 16 th module(Rack1, Slot10)
SMB516	Error for 17 th module(Rack2, Slot3)
SMB517	Error for 18 th module(Rack2, Slot4)
SMB518	Error for 19 th module(Rack2, Slot5)
SMB519	Error for 20 th module(Rack2, Slot6)
SMB520	Error for 21 th module(Rack2, Slot7)
SMB521	Error for 22 th module(Rack2, Slot8)
SMB522	Error for 23 th module(Rack2, Slot9)
SMB523	Error for 24 th module(Rack2, Slot10)
SMB524	Error for 25 th module(Rack3, Slot3)
SMB525	Error for 26 th module(Rack3, Slot4)
SMB526	Error for 27 th module(Rack3, Slot5)
SMB527	Error for 28 th module(Rack3, Slot6)
SMB528	Error for 29 th module(Rack3, Slot7)
SMB529	Error for 30 th module(Rack3, Slot8)
SMB530	Error for 31 th module(Rack3, Slot9)
SMB531	Error for 32 th module(Rack3, Slot10)

Table 5 Diagnostic function for special register SMB550~SMB2047

SMB	Error description
SMB550~SMB589	The 1 st CAN module (sequencing by hardware configuration)
SMB550	Master status 0x00: initiation 0x01: disconnect 0x04: stop

	0x05: operation 0x7F: pre-operation 0xFF: error in configuration data
SMB551	Status for slave 1 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB552~SMB581	Status for slave 2 (sequencing by node ID)~31 (sequencing by node ID)
SMB582	Status for slave 32 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB583	Software version number for CAN module
SMB584~SMB589	Reserved
SMB590~SMB629	The 2 nd CAN module (sequencing by hardware configuration)
SMB590	Master status 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation 0xFF: error in configuration data
SMB591	Status for slave 1 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB592~SMB621	Status for slave 2 (sequencing by node ID)~31 (sequencing by node ID)
SMB622	Status for slave 32 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB623	Software version number for CAN module
SMB624~SMB629	Reserved
SMB630~SMB669	The 3 rd CAN module (sequencing by hardware configuration)

SMB630	Master status 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation 0xFF: error in configuration data
SMB631	Status for slave 1 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB632~SMB661	Status for slave 2 (sequencing by node ID)~31 (sequencing by node ID)
SMB662	Status for slave 32 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB663	Software version number for CAN module
SMB664~SMB669	Reserved
SMB670~SMB709	The 4 th CAN module (sequencing by hardware configuration)
SMB670	Master status 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation 0xFF: error in configuration data
SMB671	Status for slave 1 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB672~SMB701	Status for slave 2 (sequencing by node ID)~31 (sequencing by node ID)
SMB702	Status for slave 32 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation

	0x7F: pre-operation
SMB703	Software version number for CAN module
SMB704~SMB709	Reserved
SMB710~SMB749	The 5 th CAN module (sequencing by hardware configuration)
SMB710	Master status 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation 0xFF: error in configuration data
SMB711	Status for slave 1 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB712~SMB741	Status for slave 2 (sequencing by node ID)~31 (sequencing by node ID)
SMB742	Status for slave 32 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB743	Software version number for CAN module
SMB744~SMB749	Reserved
SMB750~SMB789	The 6 th CAN module (sequencing by hardware configuration)
SMB750	Master status 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation 0xFF: error in configuration data
SMB751	Status for slave 1 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB752~SMB781	Status for slave 2 (sequencing by node ID)~31 (sequencing by node ID)
SMB782	Status for slave 32 (sequencing by node ID)

	0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB783	Software version number for CAN module
SMB784~SMB789	Reserved
SMB790~SMB829	The 7 th CAN module (sequencing by hardware configuration)
SMB790	Master status 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation 0xFF: error in configuration data
SMB791	Status for slave 1 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB792~SMB821	Status for slave 2 (sequencing by node ID)~31 (sequencing by node ID)
SMB822	Status for slave 32 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB823	Software version number for CAN module
SMB824~SMB829	Reserved
SMB830~SMB869	The 8 th CAN module (sequencing by hardware configuration)
SMB830	Master status 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation 0xFF: error in configuration data
SMB831	Status for slave 1 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation

	0x7F: pre-operation
SMB832~SMB861	Status for slave 2 (sequencing by node ID)~31 (sequencing by node ID)
SMB862	Status for slave 32 (sequencing by node ID) 0x00: initiation 0x01: disconnect 0x04: stop 0x05: operation 0x7F: pre-operation
SMB863	Software version number for CAN module
SMB864~SMB869	Reserved
SMB870	Control word for module internal diagnostic 1: obtain the module internal diagnostic information specified by SMB871 and write it into bytes following SMB872
SMB871	Module number for internal diagnostic Require to obtain the module number for internal diagnostic, Bit 0~3: Slot ID Bit 4~7: Rack ID
SMB872~SMB905	Module internal diagnostic
SMB906~SMB999	Reserved
SMB1000~SMB1015	Description information for the 1 st module (Rack0, Slot3)
SMB1000~SMB1002	actual module information
SMB1003	Module version number
SMD1004	Module error counter
SMB1008~SMB1015	Reserved
SMB1016~SMB1031	Description information for the 2 nd module (Rack0, Slot4)
SMB1016~SMB1018	actual module information
SMB1019	Module version number
SMD1020	Module error counter
SMB1024~SMB1031	Reserved
SMB1032~SMB1047	Description information for the 3 rd module (Rack0, Slot5)
SMB1032~SMB1034	actual module information
SMB1035	Module version number
SMD1036	Module error counter
SMB1040~SMB1047	Reserved
SMB1048~SMB1063	Description information for the 4 th module (Rack0, Slot6)
SMB1048~SMB1050	actual module information
SMB1051	Module version number
SMD1052	Module error counter
SMB1056~SMB1063	Reserved
SMB1064~SMB1079	Description information for the 5 th module (Rack0, Slot7)
SMB1064~SMB1066	actual module information
SMB1067	Module version number

SMD1068	Module error counter
SMB1072~SMB1079	Reserved
SMB1080~SMB1095	Description information for the 6 th module (Rack0, Slot8)
SMB1080~SMB1082	actual module information
SMB1083	Module version number
SMD1084	Module error counter
SMB1088~SMB1095	Reserved
SMB1096~SMB1111	Description information for the 7th module (Rack0, Slot9)
SMB1096~SMB1098	actual module information
SMB1099	Module version number
SMD1100	Module error counter
SMB1104~SMB1111	Reserved
SMB1112~SMB1127	Description information for the 8th module (Rack0, Slot10)
SMB1112~SMB1114	actual module information
SMB1115	Module version number
SMD1116	Module error counter
SMB1120~SMB1127	Reserved
SMB1128~SMB1143	Description information for the 9th module (Rack1, Slot3)
SMB1128~SMB1130	actual module information
SMB1131	Module version number
SMD1132	Module error counter
SMB1136~SMB1143	Reserved
SMB1144~SMB1159	Description information for the 10th module (Rack1, Slot4)
SMB1144~SMB1146	actual module information
SMB1147	Module version number
SMD1148	Module error counter
SMB1152~SMB1159	Reserved
SMB1160~SMB1175	Description information for the 11th module (Rack1, Slot5)
SMB1160~SMB1162	actual module information
SMB1163	Module version number
SMD1164	Module error counter
SMB1168~SMB1175	Reserved
SMB1176~SMB1191	Description information for the 12th module (Rack1, Slot6)
SMB1176~SMB1178	actual module information
SMB1179	Module version number
SMD1180	Module error counter
SMB1184~SMB1191	Reserved
SMB1192~SMB1207	Description information for the 13th module (Rack1, Slot7)
SMB1192~SMB1194	actual module information
SMB1195	Module version number
SMD1196	Module error counter
SMB1200~SMB1207	Reserved
SMB1208~SMB1223	Description information for the 14th module (Rack1, Slot8)

SMB1208~SMB1210	actual module information
SMB1211	Module version number
SMD1212	Module error counter
SMB1216~SMB1223	Reserved
SMB1224~SMB1239	Description information for the 15th module (Rack1, Slot9)
SMB1224~SMB1226	actual module information
SMB1227	Module version number
SMD1228	Module error counter
SMB1232~SMB1239	Reserved
SMB1240~SMB1255	Description information for the 16th module (Rack1, Slot10)
SMB1240~SMB1242	actual module information
SMB1243	Module version number
SMD1244	Module error counter
SMB1248~SMB1255	Reserved
SMB1256~SMB1271	Description information for the 17th module (Rack2, Slot3)
SMB1256~SMB1258	actual module information
SMB1259	Module version number
SMD1260	Module error counter
SMB1264~SMB1271	Reserved
SMB1272~SMB1287	Description information for the 18th module (Rack2, Slot4)
SMB1272~SMB1274	actual module information
SMB1275	Module version number
SMD1276	Module error counter
SMB1280~SMB1287	Reserved
SMB1288~SMB1303	Description information for the 19th module (Rack2, Slot5)
SMB1288~SMB1290	actual module information
SMB1291	Module version number
SMD1292	Module error counter
SMB1296~SMB1303	Reserved
SMB1304~SMB1319	Description information for the 20th module (Rack2, Slot6)
SMB1304~SMB1306	actual module information
SMB1307	Module version number
SMD1308	Module error counter
SMB1312~SMB1319	Reserved
SMB1320~SMB1335	Description information for the 21th module (Rack2, Slot7)
SMB1320~SMB1322	actual module information
SMB1323	Module version number
SMD1324	Module error counter
SMB1328~SMB1335	Reserved
SMB1336~SMB1351	Description information for the 22th module (Rack2, Slot8)
SMB1336~SMB1338	actual module information
SMB1339	Module version number
SMD1340	Module error counter

SMB1344~SMB1351	Reserved
SMB1352~SMB1367	Description information for the 23th module (Rack2, Slot9)
SMB1352~SMB1354	actual module information
SMB1355	Module version number
SMD1356	Module error counter
SMB1360~SMB1367	Reserved
SMB1368~SMB1383	Description information for the 24th module (Rack2, Slot10)
SMB1368~SMB1370	actual module information
SMB1371	Module version number
SMD1372	Module error counter
SMB1376~SMB1383	Reserved
SMB1384~SMB1399	Description information for the 25th module (Rack3, Slot3)
SMB1384~SMB1386	actual module information
SMB1387	Module version number
SMD1388	Module error counter
SMB1392~SMB1399	Reserved
SMB1400~SMB1415	Description information for the 26th module (Rack3, Slot4)
SMB1400~SMB1402	actual module information
SMB1403	Module version number
SMD1404	Module error counter
SMB1408~SMB1415	Reserved
SMB1416~SMB1431	Description information for the 27th module (Rack3, Slot5)
SMB1416~SMB1418	actual module information
SMB1419	Module version number
SMD1420	Module error counter
SMB1424~SMB1431	Reserved
SMB1432~SMB1447	Description information for the 28th module (Rack3, Slot6)
SMB1432~SMB1434	actual module information
SMB1435	Module version number
SMD1436	Module error counter
SMB1440~SMB1447	Reserved
SMB1448~SMB1463	Description information for the 29th module (Rack3, Slot7)
SMB1448~SMB1450	actual module information
SMB1451	Module version number
SMD1452	Module error counter
SMB1456~SMB1463	Reserved
SMB1464~SMB1479	Description information for the 30th module (Rack3, Slot8)
SMB1464~SMB1466	actual module information
SMB1467	Module version number
SMD1468	Module error counter
SMB1472~SMB1479	Reserved
SMB1480~SMB1495	Description information for the 31th module (Rack3, Slot9)
SMB1480~SMB1482	actual module information

SMB1483	Module version number
SMD1484	Module error counter
SMB1488~SMB1495	Reserved
SMB1496~SMB1511	Description information for the 32th module (Rack3, Slot10)
SMB1496~SMB1498	actual module information
SMB1499	Module version number
SMD1500	Module error counter
SMB1504~SMB1511	Reserved
SMB1512~SMB2047	Reserved

1.7.2. CTH300-H CPU indicators

Table 6 function description for LED indicators of H35-00

Indicator	Color	Description
24V power	Green 	ON: 24VDC power normal, OFF: no 24VDC power
SF	Red 	ON: system fault, OFF: no error
BF	Red 	ON: Bus fault, OFF: no error
FRCE	Yellow 	ON: some item has been forced, OFF: no item been forced (or controlled by DLED instruction)
RMC	Green 	ON: CPU communicate with remote server successfully (DIP 3 is ON and Ethernet port configured correctly) OFF: communication with remote server is failed or forbidden (controlled by DIP switch)
RUN	Green 	ON: system operation, OFF: system stop
STOP	Orange 	ON: system stop, OFF: system operation
Ethernet indicator	Green 	ON: connect, Flash: not connect
	Yellow 	ON: 100Mbps, OFF: 10Mbps

2. HMI FAQs

2.1. Getting Started

2.1.1. Install USB download cable Driver on HMI

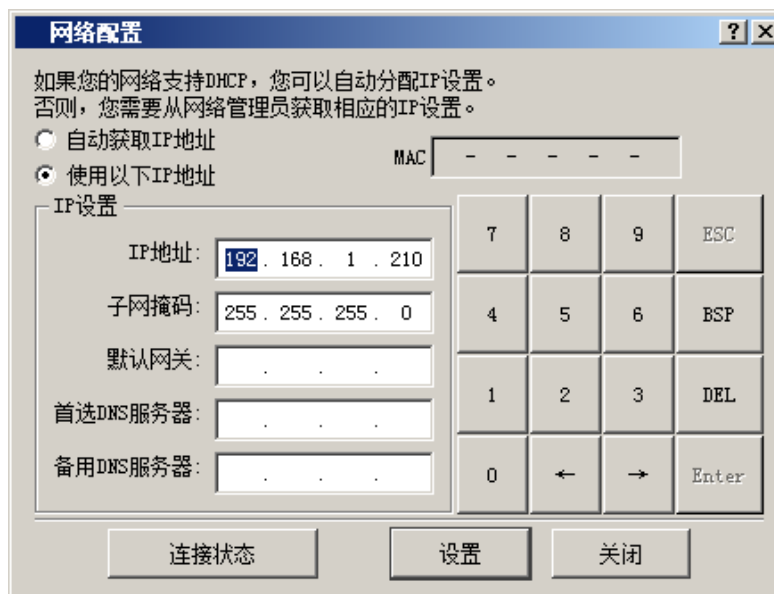
When you can't install this driver correctly in Win 7 system, please press F8 to get into Advanced Boot Options, then select Disable Driver Signature Enforcement mode. After that ,

press Enter to start system and install the driver again. For more details, please refer to the Help in MagicWorks HMI software.

2.1.2. How to update project via network cable

1. Use standard network cable to connect HMI (from Ethernet port) with PC directly or via router;
2. Check IP address for HMI from the Configuration interface, you can set it manually or automatically.
3. IPs for PC and WAN port of HMI should be in the same segment in order to download.

Set IPs for HMI and PC into the same segment but not repeat, as shown below, IP for HMI is 192.168.1.210, then the IP for PC should be 192.168.1.XXX (XXX: 1--255), then you can continue to program and download.



2.1.3. How to set system parameters for specified HMI in Configuration interface

- 1) During the HMI powering up, press and hold Enter, then keep touching the screen about 3s until the following control panel appeared. You can set parameters in this panel.
- 2) During the HMI operation, you can enter Parameter Configuration interface by pressing ctrl+alt+home keys, or click the upleft, upright, downright and

downleft points in order on the screen.

2.1.4. How to update project via USB disk

Procedures:

- 1) Compile and save the configured project;
- 2) Copy the project into USB disk and rename it as tmp;
- 3) plug USB disk into USB port of the HMI, then get into the Configuration interface;
- 4) Click Update Project and a dialog would be popped up, in which you can enter Password 26470489 and click OK

Notes:

About Password — If the current project has no password, you need to input 26470489 to update the project; if there has a password, you need to input it when update the older project.

About Update — If failed, the possible reason can be HMI type dis-match or the version of HMI is dis-match with configuration software, please change the type of HMI or update the HMI.

2.1.5. How to set password for current project in

Magicworks HMI software

- 1、 Right-click Item, pops up a dialog for Set Project Password,
- 2、 Click it and pops up a Password Setting dialog
- 3、 Input corresponding password and click OK, and a Project Password dialog would pop-up when you open the project later

Note:

- HMI screen can't be downloaded into hardware
- Copanel HMI support 3 methods for downloading project: USB port, Ethernet Port (only for TP07/TP10 Ethernet HMIs) and USB disk. For details, please refer to Help in MagicWorks HMI software.
- Projects can only be downloaded into HMI by getting into Download interface.

Version numbers for Configuration software and System software must be consist. The former can be found in Help → About in the software, the later can be found while getting into the System Configuration interface.

After connecting the download cable with HMI, transmission screen would be appear on the software, you can select the required download method and power up HMI, then get into Download screen.

2.2. General Faults

2.2.1. HMI can't recognize USB disk

Copanel HMI supports only USB disk with format as FAT32. For USB disk with other formats, they must be formatting by FAT32 tool before use.

Note: after formatting, files in the USB previously would be erased, thus you need to backup beforehand.

2.2.2. Communication timeout for serial connection

Representation: can't connect with device and update data, displaying #####

Possible reasons	Detection	Treatment Measure	Note
1. Abnormal communication connection	Check whether the connector is loose	Reconnect it firmly	①
2. Ground incorrect	Make sure the GND for HMI is connect with ground terminals of transformer, drive and motor	Connect GND and ground terminals correctly	/
3. Inconsistent communication parameter settings	Check the communication parameters for HMI are consistent with device, such as station number, baud rate, stop bit and parity bit.	Set the consistent communication parameters for HMI and related devices.	/
4. Inconsistent communication protocols	Check the communication protocols for devices and HMI are match.	Set the consistent communication protocols for HMI and related devices.	/

① **Note :** please configure port number correctly and make connections corresponding with the following tables.

Table 1 Power interface definition

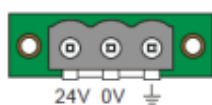
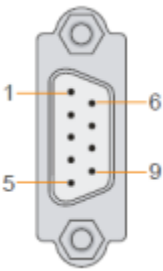
Power interface	Terminal number	Symbol	Signal
	1	24V	24V +
	2	0V	24V -
	3	GND	Ground

Table 2 RS485 Port

Power interface	Pin number	Port1 signal	Port0 signal
	1	GND	GND
	2	-	-
	3	RS485 D1+	RS485 D1+
	4	-	-
	5	0V DC	0V DC
	6	+5V DC	+5V DC
	7	24V DC	24V DC
	8	RS485 D1-	RS485 D1-
	9	-	-

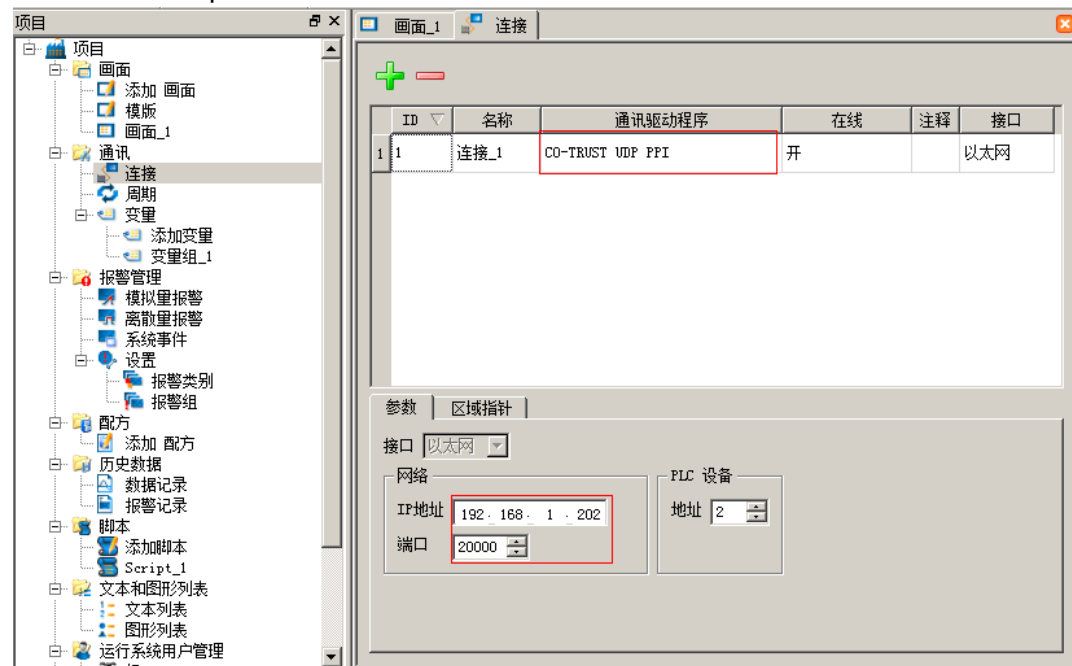
2.2.3. Ethernet Communication timeout

Representation: can't connect with Ethernet and update data, displaying #####

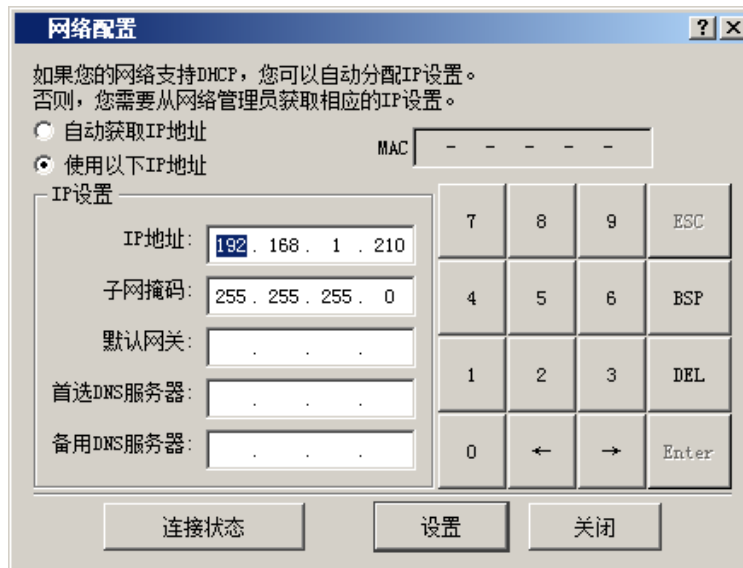
Possible reasons	Detection	Treatment Measure	Note
1. Incorrect IP address	Make sure the addresses for HMI and devices are in the same segment	Reconnect it firmly	
2. Inconsistent protocols	Check the communication protocols for devices and HMI are match.	Set the consistent communication protocols for HMI and related devices.	/
3. Illegal communication address	Detect whether the project has access illegal or non-exist communication addresses.	Delete controls for access illegal addresses.	/
4. Fault on Switch or net cable	Please change switch with high quality, and use cat 5e UTP		/

Solutions

1. Open the project in configuration software, make sure the IP for selected communication protocol and connection is consistent with PLC.



2. Enter the Configuration interface to check the IP address for HMI in IP settings (manual or automatic, IP settings can be changed), as shown below: 192.168.1.210.



Set the IPs for HMI and PLC into same segment (but not repeat) , as shown in above figure, the IP for HMI is 192.168.1.210, then the PLC should be 192.168.1.XXX (1--255 for XXX).

2.2.4. “Device not connected” prompted in Win7

“Device not connected” prompted when download screen into hardware via USB in Win7 system

Solutions:

If this happens in Win 7 system, please press F8 to enter Advanced Boot Options interface and select "Disable driver signature enforcement" mode. Then press Enter to start-up system, and plug download cable into HMI to download screens.

Additionally, the version number for configuration software must be consistent with System software on HMI. The former can be found in Help → About in the software, the later can be found while getting into the System Configuration interface.

2.2.5. Less Touch Sensitivity

Click upper left→upper right→down right→down left in order on the screen to enter Parameter Configuration interface, and click Screen Calibration, Press '+' (with auxiliary pen, click the center of +) on the screen until it prompts calibration successfully.



2.2.6. Screen display abnormally, blank or splash

Representation:

Upon the screen powered up, it came to be blank with no prompt, or constant splash

Possible reasons:

Unsteady power supply or hardware damage

Detail requirements for power supply

1. Only DC power with $24V \pm 20\%$ can be used, and it provides at least 300mA current.
2. Isolation must be implemented between DC and Main AC power supply; common supply for HMI and it's inductive load circuit is not allowed, in case of electromagnetic interference.
3. It's recommended to use a independent #14AWG conductor for ground line which is directly connected to GND, not passing through the shell of other electrical devices, to ensure no current from other branches flow through this connector.
4. 24V power line and communication cable should be avoided to be parallel with AC power line or motor drive line, the distance between each needs at least 30cm.

3. OPC FAQs

1. When the third-party configuration software like KingView, Forcecontrol and WinCC Communicates with Magicworks OPC Server, ### would not be displayed and no data update while communication with PLC is disconnected, how to judge the communication?

Answer

The Configuration software connects to COTRUST server with a connection named OPCDASVR.CT.1, it has a variable named *state*, unsigned with 4 bytes and cumulative real-time changing.

2. KingView can't read values of some variables

Answer

Change the access right for Read-only or Write-only variables in OPC Server into Read/Write.

3. There are 2 Gateway modules, but only 1 can be connected by OPC Server on PC (not

suitable on tablet)

Possible reasons

- Confirm the length of net cable between PC and CP6451 hasn't exceed 100m.
- If there is a router between PC and CP6451, please check the related settings.
- Identify there is no duplicated MAC and IP addresses for PC and CP6451.
- Check whether the Port number for CP6451 has been occupied other process, and delete it as required. (In the system menu, click Start→All Program→Accessory→Command Prompt, right click and select Run as administrator) -b - displaying the name of process in use; -p udp - displaying the port number for UDO protocol.

4. The PLC writes a constant into a variable, but when the KingView input a value, it hasn't return this constant

Answer

It has been verified as the concepts of KingView for Asynchronous accessing, you should set synchronous access in the OPC drive for KingView.

5. The PLC output controlled by KingView is delayed.

Answer

It has been verified as the concepts of KingView for Asynchronous accessing, you should set synchronous access in the OPC drive for KingView.

4. Communication FAQs

4.1. Serial Communication

4.1.1. COTRUST PLCs can't communicate with Program software

Step1: Check the wiring

- Make sure the cable is in good condition;
- Please use legitimate program cable, if the Serial port on PC is 232, use 232-485 adaptor and then connect with PLC.
- The Program cable must connect to the white port on PLC (if the communication protocol has been changed previously, please set the switch on PLC to STOP).

Step2: whether the Driver has been installed

- Please install the corresponding driver if you use the program cable from COTRUST.
- For installation package, please visit <http://www.co-trust.com>.

Step3: Check the Communication Settings

- Select PPI protocol;
- Select the corresponding Com port and make sure it hasn't been used by other software, or else close the COM port and corresponding software or change related settings, if it still be used, you can open the Task Manager to close it;
- Select the corresponding baud rate and search PLC, if the remote address isn't match with PLC address, please change it to the search result.

4.1.2. About using MODBUS_RTU library

Some CPUs provided by COTRUST have 2 Freeports, which are used for different modbus library while in serial communication:

For FPORT0, you can use CT_MBUS_MASTER and CT_MBUS_SLAVE;

For FPORT1, you can use CT_MBUS_MASER_PORT1 and CT_MBUS_SLAVE_PORT1.

Note: COTRUST CPUs must used with dedicated modbus library provided by COTRUST.

CPU as master: one MBUS_MSG instruction can be active one time. If there are more than 1, the 1st would be processed, other MBUS_MSGs would be break and generate error code 6.

CPU as slave: MBUS_INIT instruction must be executed correctly, which generally invoked by

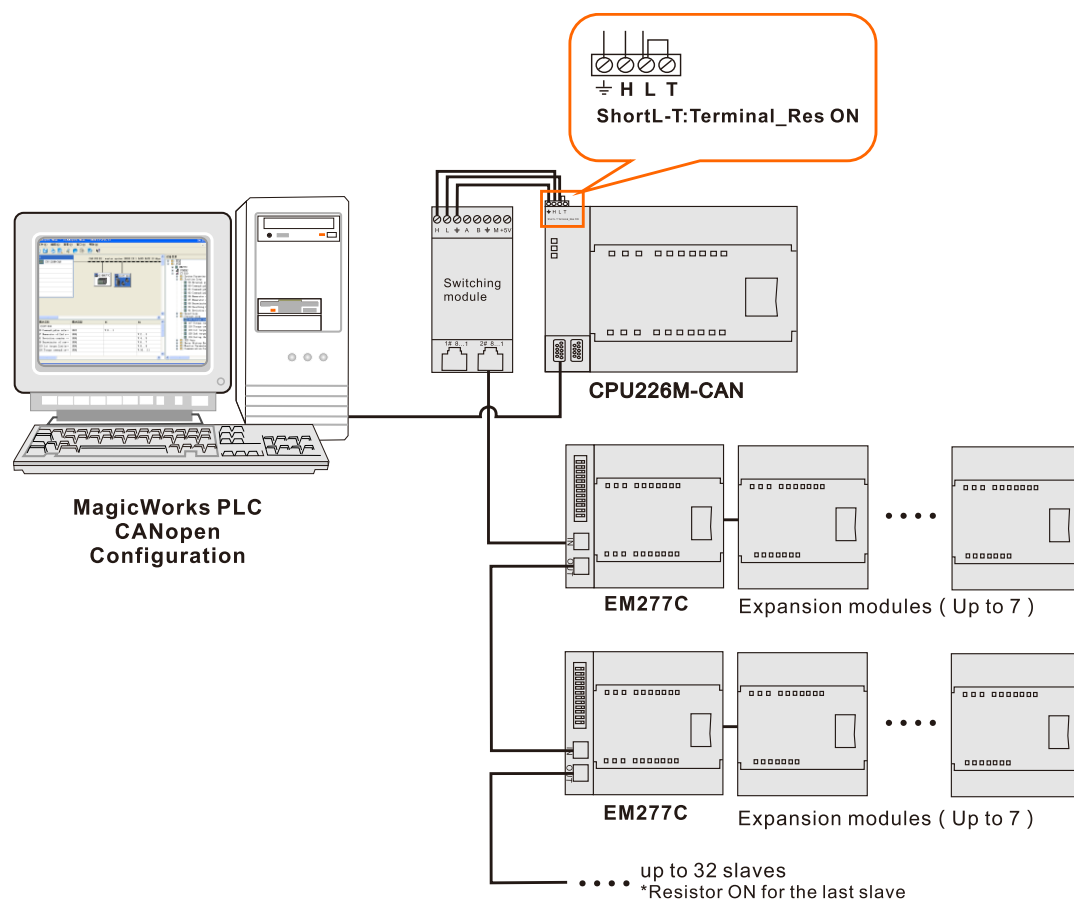
SM0.1, and the delay for cable network is typically set at 5~20ms.

4.1.3. 226M-CAN can't connect with 277C module

Solutions:

- Hardware: 226M-CAN connects with 277C via CTS7 291-CC001 which used as a communication adaptor by using network cable.
- Software: use MagicWorks PLC provided by COTRUST to configure CANopen network, set communication rate and address.
- Set the DIP switch on 277C to an appropriate location.
- Pull up the terminal resistor for the last 277C
- Check the wiring after all devices had been connected.
- Power up all devices in the system.
- Download hardware configuration into PLC.

(Notice: DIP switch needs to be effective after power-on again)



Diagnose by hardware

LED indicators for 277C

After the 277C powered up, LED "ON" would light on (green).

If the BF and SF keep OFF, it indicates that the 277C operated normally.

If the BF and SF light on or flash, it indicates error in hardware configuration or wiring. While the main system is operational without fault, the possible reason for error is shown below:

Description for LEDs of 277C

LED	ON	OFF	Flash	Note
ON	With power	Without power	---	Power indicator
SF	Expansion IO module faulted	Expansion IO module no fault	---	System fault
BF	CAN network not detected	CAN network detected	Inconsistent configuration	Bus fault

Diagnose via Magicworks PLC

Special memory SMB550-582 is corresponding for CAN communication status of the 1st ~ 32th slaves (sequenced by Node ID).

4.1.4. CAN CPU of Small PLCs communicates with the third-party CANopen slave devices

Master CPUs support slaves conforming to CANopen protocol DS301-V402.

PDO transport type: event trigger, time trigger;

EDS file Importing for the third-party slaves is not supported, please refer to the related manual to input Main index and sub index.

Can't establish communication:

Please refer to the CANOPEN User Manual;

1. Check the wiring for whole system;
2. Check the hardware configuration, to see whether it is consistent for the station number, baud rate, the main index and sub index match with slave device manual.
3. Verify that the communication protocol for 3rd party device is conform with the related standards.
4. Based on the above all, you can also diagnose with Magicworks PLC,
Special memory SMB550-582 is corresponding for CAN communication status of the 1st ~ 32th slaves (sequenced by Node ID).

Apart from all above, If you can't solve problem, please consult the technicians from COTRUST and get the following materials: 1) hardware configuration program; 2) EDS files of 3rd party devices; 3) specific device version and specifications, which contain instructions about main index and sub index.

4.2. Ethernet communication

4.2.1. Ethernet Port

It can be used for downloading program (standard network cable is simply required).

Communicate with multiple Ethernet devices via Switch, to achieve high speed data exchange.

Support remote program, debug and monitor.

Support the Address Mapping Table for MODBUS communication with 3rd party devices.

4.2.2. CTSC-200 PLC Ethernet communication

Built-in 3 COM ports

Support Ethernet, MPI, PPI, Freeport, MODBUS communication protocols

200Bytes data for one network read-write operation, with high networking communication

PLC	H224/H226L	H224X/H226XL/224I/226I
Protocol type	UDP_PPI, MODBUS_TCP protocols support Ethernet communication between PLCs, Uploading / downloading programs	
adaptive crossover connection	Yes	No
transmission rate	10/100Mbps adaptive	10/100Mbps adaptive
Max. IT connections	8 UDP_PPI connections, master/slave insensitive 5 MODBUS_TCP connections, master/slave insensitive	8 UDP_PPI connections, 4 masters/4 slaves

4.2.3. CTH300 PLCs Ethernet communication

CTH300-C support MODBUS_TCP, MODBUS_RTU communication protocols.

CTH300-H support UDP_PPI, MPI, PPI, Freeport, MODBUS communication protocols.

PLC	C35/C36/C37	H35/H36
Protocol type	MODBUS_TCP protocol, support support Ethernet communication between PLCs, Uploading / downloading programs	UDP_PPI, MODBUS_TCP protocols, support Ethernet communication between PLCs, Uploading / downloading programs
adaptive crossover connection	Yes	Yes

transmission rate	10/100Mbps adaptive	10/100Mbps adaptive
Max. IT connections	32 MODBUS_TCP connections, master/slave insensitive	8 UDP_PPI connections, master/slave insensitive 32 MODBUS_TCP connections ,master/slave insensitive

Notes:

CPU accesses other device as a master, which means using a master connection for this CPU

CPU is accessed by other device as a slave, which means using a slave connection for this CPU.

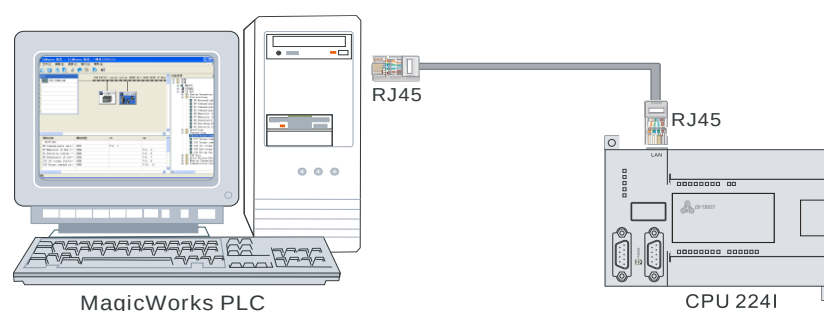
When CPU as slave, the Ethernet communication would be independent of the whole cycle; when CPU as master, transmit-receive operations are controlled by user program. Communication processing time is about 20-30ms.

4.2.4. Download via Ethernet Port

Connect PLC with Program device by standard net cable;

Use MagicWorks PLC software;

Double click the icon for MagicWorks PLC to launch the software, select File -> New to create a new Project.



Select the serial port communication protocol in “Set PG/PC Interface” dialog, which will be used as a interface for PLC communication. For example CPU300/200(TCP/IP), please proceed as following:

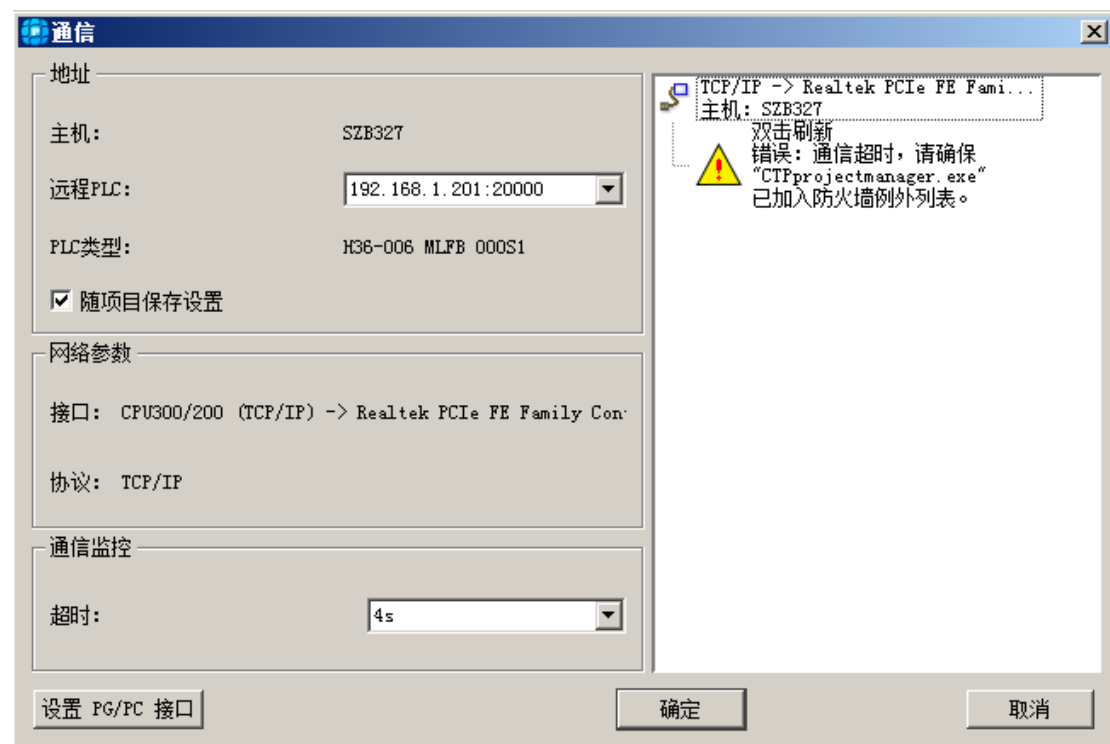
- (1) Click the “Set PG/PC Interface” in the “Communications” screen.
- (2) Select the “CPU300/200(TCP/IP)-> VMware Virtual Ethernet Adapter for VMnet1” in

“Set PG/PC Interface”, then click the “Properties” button in this dialog to set the communication parameters.

(3) Click OK to return to the “Communications” page. Then double-click Refresh to find the connected CTSC-200 CPU.

(4) Select the CPU and click OK. If the MagicWorks PLC can't find the CPU, please check the wiring and configuration parameters, then repeat the above procedures. After establishing communication with CPU, set IPs for PC and CTSC-200 CPU into the same segment but not repeat, for example, the IP for CTSC-200 CPU is 192.168.1.202, then the IP for PC should be 192.168.1.XXX (XXX: 1--255).

4.2.5. Downloading from Ethernet Port is abnormal



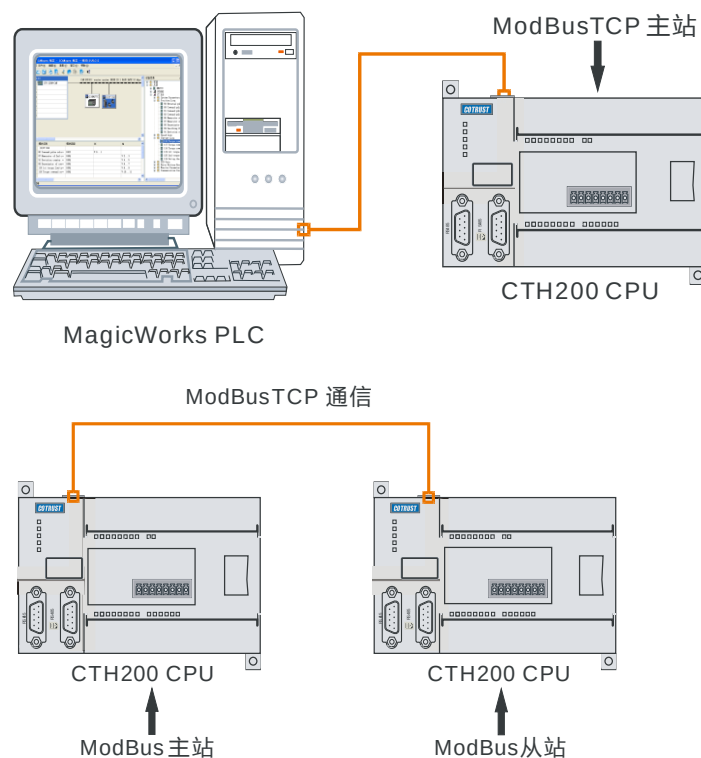
Exclude the following situations:

1. Communication cable is normal
2. LED indicators on the Ethernet port of CPU is normal
3. Select the correct drive

If still can't research the CPU, you can try to disable the other network cards and keep only the current connected card, then research again.

4.2.6. Modbus TCP Communication

When using the EtherNET port for Modbus TCP communication, CTH200 PLC can serve as Modbus TCP slave directly without any configuration, the default port number is 502. When CTH200 PLC serve as Modbus TCP master to communicate with other slaves, you need to use Modbus TCP Wizard or Ct_Mbus_master_tcp_single library to configure the master communication.



Notice

CPU H224X/H226XL/H228XL not support adaptive crossover, thus the PLCs should use Crossover Cable to implement ModBus_TCP.

Address Image for slave with TCP protocol (the default port number is 502)

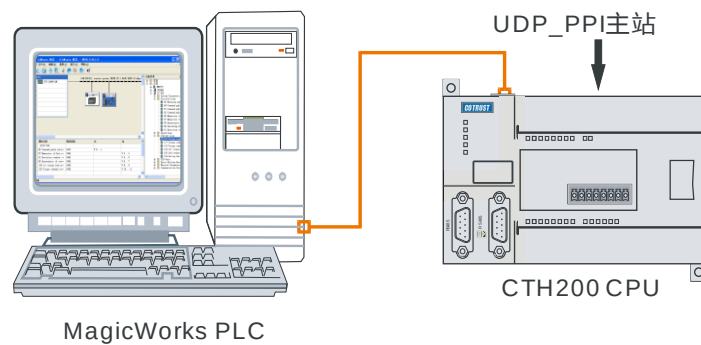
ModBus slave address	CTH200 address
000001	Q0.0
000002	Q0.1
000003	Q0.2
...	...
000127	Q15.6
000128	Q15.7
010001	I0.0

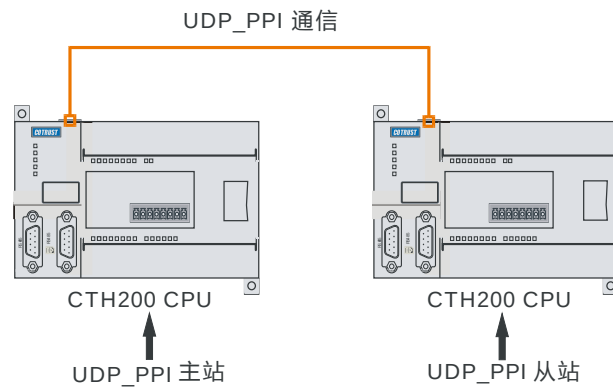
010002	I0.1
010003	I0.2
...	...
010127	I15.6
010128	I15.7
030001	AIW0
030002	AIW2
030003	AIW4
...	...
030032	AIW62
040001	VW0
040002	VW0+2
...	...
04xxxx	VW0+2 x (xxxx-1)

4.2.7. UDP PPI Communication

When using the EtherNET port for Modbus TCP communication, CTH200 PLC can serve as Modbus TCP slave directly without any configuration, the default port number is 502. The CTH200 PLCs can serve as UDP PPI master or slave to communicate with other devices in the same LAN by using NETW/NETR Wizard or UDP_NETR/UDP_NETW instructions. The CTH200 PLC can also be used as slave of HMI in the UDP_PPI network.

Instructions generated from Wizard must be called by SM0.0.





4.2.8. Configure Ethernet AP Mode for Gateway module

Configure Gateway by using Net cable

1. Use standard cable to connect WIFI Gateway module (Ethernet Port) with PC directly or via router.

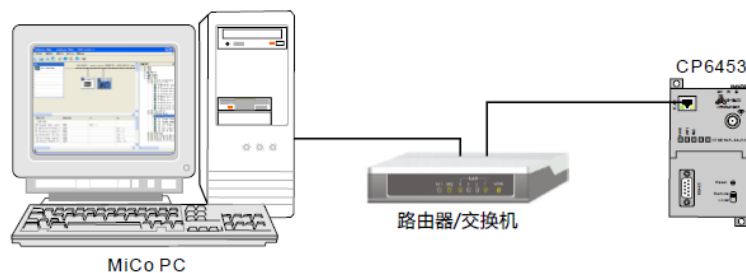
If Ethernet port indicator lights on and the WIFI LED lights green, it indicates the module is in AP mode, default as 192.168.1.210 (you can try to reset the Gateway at the first time, to ensure it is in AP mode).

2. Set the IPs for PC and CP6453 into the same segment but not reoeat, if the IP for AP mode is 192.168.1.210, then PC should be 192.168.1.XXX (XXX: 1--255)

3. Open MiCo, click Search on Device page to search for local Gateway devices, then the local gateways online would be appear. Click each device to see and configure related information.

4. If still can't search any device, you can try to disable other network cards and only reserve the current one, then repeat the Step 3 above.

5. After changing device or device group name, you only need to input the old device password (default 12345678) to modify.





4.2.9. Configure Ethernet STA mode for Gateway module

Configure Gateway by using Net cable

1. Use standard cable to connect WIFI Gateway module (Ethernet Port) with PC directly or via router.

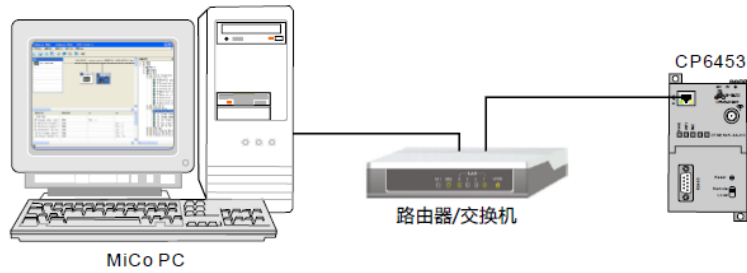
If Ethernet port indicator lights on and indicates AP mode, please change to STA with WIFI indicator not bright or flash, default at 192.168.126.1

2. Set the IPs for PC and CP6453 into the same segment but not repeat, if the IP for AP mode is 192.168.126.1, then PC should be 192.168.126.XXX (XXX: 1--255).

3. Open MiCo, click Search on Device page to search for local Gateway devices, then the local gateways online would be appear. Click each device to see and configure related information.

4. If still can't search any device, you can try to disable other network cards and only reserve the current one, then repeat the Step 3 above.

5. After changing device or device group name, you only need to input the old device password (default 12345678) to modify.



STA Mode: Gateway module accesses into router wirelessly.

AP Mode: Gateway module is accessed by other mobile device as Hot Spot.

4.2.10. Make standard Net cable

It's recommended to use standard cable for communication, which has two types as in the following figure:



568B: parallel lines - same line sequence on each side, white-orange, orange, white-green, blue, white-blue, green, white-brown, brown.

568A: crosswire - different line sequence on each side, white-green, green, white-orange, blue, white-blue, orange, white-brown, brown.

5. Analog input addressing

Analog addressing for CTSC-100 PLCs:

Analog output addressing: AQW0, AQW2, AQW4.....and so on, ordered from left to right, top to bottom.

Analog input addressing: AIW0, AIW2, AIW4.....and so on, ordered from left to right, top to bottom.

Analog addressing for CTSC-200 PLCs:

Analog output addressing: AQW0, AQW2, AQW4.....and so on, ordered from left to right, top to bottom.

Analog input addressing: AIW0, AIW2, AIW4.....and so on, ordered from left to right, top to bottom.

Related modules

Items	Name	Order Number
1	EM231-0HC, 4AI	CTS7 231-0HC32
2	EM235-0KD, 4AI.1AO	CTS7 235-0KD32
3	EM231-7HB, 2AI, with high speed and accuracy	CTS7 231-7HB32
4	EM231-7HC, 4AI, with high speed and accuracy	CTS7 231-7HC32
5	EM231-7PB, 2*PT100/NTC	CTS7 231-7PB32
6	EM231-7PC, 4*PT100/NTC	CTS7 231-7PC32
7	EM231-7PD, 4*TC	CTS7 231-7PD32
8	EM231-7ND, 2AI, 2*PT100/NTC	CTS7 231-7ND32
9	EM231-7PF, 4*TC	CTS7 231-7PF32
10	EM231-5HF, 8AI Voltage-Current type	CTS7 231-5HF32

Addressing method for PID modules:

VWxx	Ch 0	Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7
Slot0	VW2048	VW2064	VW2080	VW2096	VW2112	VW2128	VW2144	VW2160
Slot1	VW2304	VW2320	VW2336	VW2352	VW2368	VW2384	VW2400	VW2416
Slot2	VW2560	VW2576	VW2592	VW2608	VW2624	VW2640	VW2656	VW2672
Slot3	VW2816	VW2832	VW2848	VW2864	VW2880	VW2896	VW2912	VW2928
Slot4	VW3072	VW3088	VW3104	VW3120	VW3136	VW3152	VW3168	VW3184
Slot5	VW3328	VW3344	VW3360	VW3376	VW3392	VW3408	VW3424	VW3440
Slot6	VW3584	VW3600	VW3616	VW3632	VW3648	VW3664	VW3680	VW3696

Related PID modules

Items	Name	Order Number
1	EM231-7TD, 4TC, PID	CTS7 231-7TD32
2	EM231-7TF, 8TC, PID	CTS7 231-7TF32
3	EM231-7HF, 8TC, PID	CTS7 231-7HF32

8 Analog inputs Addressing

Calculation formula: $x(VWx) = \text{Slot no.} \times 64 + \text{Input channel no.} \times 2$

VWxx	Channel 0	Channel 1	Channel 2	Channel3	Channel 4	Channel5	Channel6	Channel 7
Slot 0	VW0	VW2	VW4	VW6	VW8	VW10	VW12	VW14
Slot 1	VW64	VW66	VW68	VW70	VW72	VW74	VW76	VW78
Slot 2	VW128	VW130	VW132	VW134	VW136	VW138	VW140	VW142
Slot 3	VW192	VW194	VW196	VW198	VW200	VW202	VW204	VW206
Slot 4	VW256	VW258	VW260	VW262	VW264	VW266	VW268	VW270
Slot 5	VW320	VW322	VW324	VW326	VW328	VW330	VW332	VW334
Slot 6	VW384	VW386	VW388	VW390	VW392	VW394	VW396	VW398

Related modules

Items	Name	Order Number
1	EM231-0HF, 8AI, Voltage type	CTS7 231-0HF32
2	EM231-1HF, 8AI, current type	CTS7 231-1HF32
3	EM231-7PF, 8TC	CTS7 231-7PF32
4	EM231-7NF, 8TC	CTS7 231-7NF32

Analog Addressing for CTH200 PLCs

- AIW Addressing

Related modules

Items	Name	Order Number
1	SM231-0HC, 4AI	CTH2 231-0HC32
2	SM235-0KD, 4AI, 1AO	CTH2 235-0KD32
3	SM231-7PB, 2*PT100/NTC	CTH2 231-7PB32
4	SM231-7PC, 4*PT100/NTC	CTH2 231-7PC32
5	SM231-7PD, 4*TC	CTH2 231-7PD32
6	SM231-7ND, 2AI, 2*PT100/NTC	CTH2 231-7ND32
7	SM231-0HF	CTH2 231-0HF32

- 8 Analog Inputs Addressing

Calculation formula: $x(\text{VWx}) = \text{Slot no.} \times 64 + \text{Input channel no.} \times 2$

VWxx	Channel 0	Channel 1	Channel 2	Channel3	Channel 4	Channel5	Channel6	Channel 7
Slot 0	VW0	VW2	VW4	VW6	VW8	VW10	VW12	VW14
Slot 1	VW64	VW66	VW68	VW70	VW72	VW74	VW76	VW78
Slot 2	VW128	VW130	VW132	VW134	VW136	VW138	VW140	VW142
Slot 3	VW192	VW194	VW196	VW198	VW200	VW202	VW204	VW206
Slot 4	VW256	VW258	VW260	VW262	VW264	VW266	VW268	VW270
Slot 5	VW320	VW322	VW324	VW326	VW328	VW330	VW332	VW334
Slot 6	VW384	VW386	VW388	VW390	VW392	VW394	VW396	VW398

Related modules

Items	Name	Order Number
1	SM231-7PF, 8TC	CTH2 231-0PF32
2	SM231-7NF, 8RTD	CTH2 231-7NF32

Analog input Addressing for PID modules

Calculation formula:

Address name	Formula	Note
PID parameter address	$A = (2048 + S \times 256) + 16 \times C$	S = slot No. (0~6) C = channel No. (SM231-7TF: 0~7, SM231-7TD: 0~3)
PID positive impulse output address	$X = (2048 + S \times 256) + 12$	
PID negative impulse	$Y = (2048 + S \times 256) + 13$	

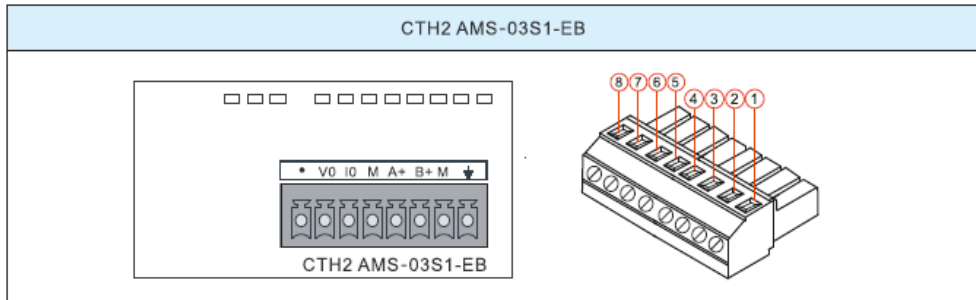
output address		
----------------	--	--

VWxx	Ch 0	Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7
Slot0	VW2048	VW2064	VW2080	VW2096	VW2112	VW2128	VW2144	VW2160
Slot1	VW2304	VW2320	VW2336	VW2352	VW2368	VW2384	VW2400	VW2416
Slot2	VW2560	VW2576	VW2592	VW2608	VW2624	VW2640	VW2656	VW2672
Slot3	VW2816	VW2832	VW2848	VW2864	VW2880	VW2896	VW2912	VW2928
Slot4	VW3072	VW3088	VW3104	VW3120	VW3136	VW3152	VW3168	VW3184
Slot5	VW3328	VW3344	VW3360	VW3376	VW3392	VW3408	VW3424	VW3440
Slot6	VW3584	VW3600	VW3616	VW3632	VW3648	VW3664	VW3680	VW3696

Related modules:

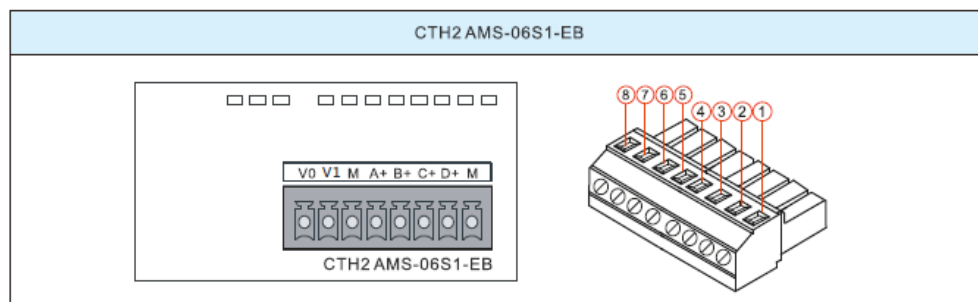
Items	Name	Order Number
1	SM231-7TD, 4TC, PID	CTH2 231-7TD32
2	SM231-7TF, 8TC, PID	CTH2 231-7TF32

Analog Addressing for Analog expansion board



Terminal definition and function

Terminal	Signal definition	Terminal	Signal definition
1	Float	5	Analog Input A+
2	Voltage output VO	6	Analog Input B+
3	Current output IO	7	Ground GND-M
4	Ground GND-M	8	Earth
Function	Image address	Function	Image address
A+ input	SMW116	Module type	SMB114
B+ input	SMW118	Module status	SMB115
VO output	SMW124		



Terminal definition and function

Terminal	Signal definition	Terminal	Signal definition
1	Output V0/I0	5	Analog Input B+
2	Output V1/I1	6	Analog Input C+
3	Ground GND-M	7	Analog Input D+
4	Analog Input A+	8	Ground GND-M

Function	Image address	Function	Image address
A+ input	SMW116	V0/I0 output	SMW124
B+ input	SMW118	V1/I1 output	SMW126
C+ input	SMW120	Module type	SMB114
D+ input	SMW122	Module status	SMB115

Analog Addressing for CTH300 PLCs:

For H series CPU: Generates corresponding address after configuring with MAGICWORKS PLC ;

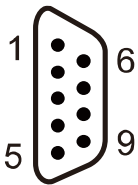
For C series CPU: Generates corresponding address after configuring with CODESYS.

6. Communication Port Definition

6.1. COM port definition for CTSC-100

CTSC-100 COM ports

Name	Order number	Port description
CPU 122 PNP	CTS7 112-1AD20-0X14	1 COM port PORT0: PPI/Freeport (RS485)
CPU 122 RLY	CTS7 112-1BD20-0X14	
CPU 124 PNP	CTS7 114-1AD20-0X24	2 COM ports. PORT0: PPI Port (RS485) FPORT: Freeport (RS485)
CPU 124 RLY	CTS7 114-1BD20-0X24	
CPU 124XP PNP	CTS7 114-1AD20-0620	
CPU 124XP RLY	CTS7 114-1BD20-0620	
CPU 126 PNP	CTS7 116-1AD20-0X40	
CPU 126 RLY	CTS7 116-1BD20-0X40	

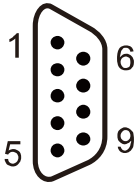
Connector	Pin number	CPU124,CPU124XP,CPU126		CPU122
		FPORT(RS485)	PORT0(RS485)	PORT0(RS485)
	1	Chassis ground	Chassis ground	Chassis ground
	2	logic ground	logic ground	logic ground
	3	RS-485 signal B	RS-485 signal B	RS-485 signal B
	4	RTS (TTL)	RTS (TTL)	RTS (TTL)
	5	logic ground	logic ground	logic ground
	6	+5 V, 100Ω series resistor	+5 V, 100Ω series resistor	+5 V, 100Ω series resistor
	7	+24V	+24V	+24V
	8	RS-485 signal A	RS-485 signal A	RS-485 signal A
	9	-	-	-
	Connector shell	Chassis ground	Chassis ground	Chassis ground

6.2. COM port definition for CTSC-200

Name	Order number	Port description
CPU 224+ PNP	CTS7 214-1AD33-0X24	2 COM ports PORT0: PPI Port (RS485)
CPU 224+ RLY	CTS7 214-1BD33-0X24	

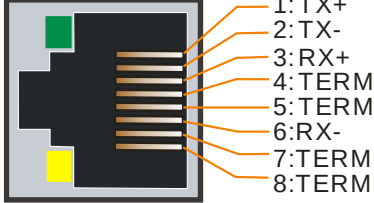
		FPORT: Freeport (RS485/RS232)
CPU 224E PNP	CTS7 214-1AE33-0X24	2 COM ports
CPU 224E RLY	CTS7 214-1BE33-0X24	PORT0: PPI Port (RS485) FPORT: Freeport (RS485)
CPU 224I PNP	CTS7 214-1AD41-0X24	3 COM ports
CPU 224I RLY	CTS7 214-1BD41-0X24	PORT0: PPI Port(RS485) FPORT: Freeport (RS485) LAN: RJ45
CPU 226I PNP	CTS7 216-2AD41-0X40	3 COM ports
CPU 224I RLY	CTS7 216-2BD41-0X40	PORT0: PPI/Freeport (RS485) PORT1: PPI/Freeport (RS485) LAN: RJ45
CPU 226M PNP	CTS7 216-1AF33-0X24	3 COM ports FPORT0/FPORT1 (Freeport, RS485); PORT0(PPI, RS232/RS485)
	CTS7 216-1AD33-0X24	3 COM ports PORT0(PPI, RS485); PORT1(PPI/Freeport, RS232/RS485); FPORT0(Freeport, RS485)
CPU 226M RLY	CTS7 216-1BF33-0X24	3 COM ports FPORT0/FPORT1(Freeport, RS485); PORT0(PPI, RS232/RS485)
	CTS7 216-1BD33-0X24	3 COM ports PORT0(PPI, RS485); PORT1(PPI/Freeport, RS232/RS485); FPORT0(Freeport, RS485)
CPU 226L PNP	CTS7 216-2AF33-0X40	3 COM ports FPORT0/FPORT1(Freeport, RS485); PORT0(PPI, RS232/RS485)
	CTS7 216-2AD33-0X40	3 COM ports PORT0(PPI □, RS485); PORT1(PPI/Freeport, RS232/RS485); FPORT0(Freeport, RS485)
CPU 226L RLY	CTS7 216-2BF33-0X40	3 COM ports FPORT0/FPORT1(Freeport, RS485); PORT0(PPI, RS232/RS485)
	CTS7 216-2BD33-0X40	3 COM ports PORT0(PPI, RS485); PORT1(PPI/Freeport, RS232/RS485); FPORT0(Freeport, RS485)
CPU 226H Motion control	CTS7 216-1AH33-0A24	3 COM ports FPORT0/FPORT1 (Freeport, RS485); PORT0(PPI, RS232/RS485)
	CTS7 216-1AH33-1A24	3 COM ports FPORT0/FPORT1 (Freeport, RS485); PORT0(PPI, RS232/RS485)
	CTS7 216-1AH33-0B24	3 COM ports

		FPORT0/FPORT1 (Freeport, RS485); PORT0(PPI, RS485)
	CTS7 216-1AH34-0B24	3 COM ports PORT0(PPI, RS485); PORT1(PPI/Freeport, RS485); FPORT0(Freeport, RS485)
	CTS7 216-1AH33-1B24	3 COM ports FPORT0/FPORT1(Freeport, RS485); PORT0(PPI, RS485)
	CTS7 216-1AH34-1B24	3 COM ports PORT0(PPI, RS485); PORT1(PPI/Freeport, RS485); FPORT0(Freeport, RS485)
	CTS7 216-1AH34-2B24	3 COM ports PORT0/PORT1(PPI/Freeport, RS485); CAN Port
	CTS7 216-1AH33-0X24	3 COM ports FPORT0/FPORT1(Freeport, RS485); PORT0(PPI, RS485)
	CTS7 216-1AH34-0X24	3 COM ports PORT0(PPI, RS485); PORT1(PPI/Freeport, RS485); FPORT0(Freeport, RS485)
PCS266 special controller	CTSC 266-3AT33-2424	3 COM ports PORT0/PORT1(PPI, RS485); FPORT(Freeport, RS485)

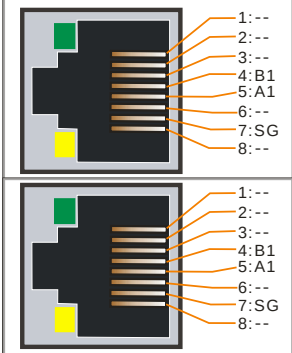
连接器	插针号	RS485	RS232/RS485
	1	Chassis ground	Chassis ground
	2	24V 地	RXD(RS232)
	3	RS-485 signal B	RS-485 signal B
	4	Send request	CTS(RS232)
	5	Logical ground	Logical ground
	6	+5 V/100Ω series resistor	+5 V/100Ω series resistor
	7	+24V	RTS(RS232)
	8	RS-485 signal A	RS-485 signal A
	9	10 bits protocol selection (input)	TXD(RS232)
	Connector shell	Chassis ground	Chassis ground

6.3. COM port definition for CTH300

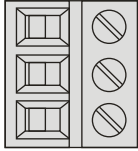
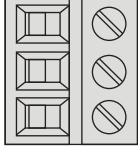
Standard Ethernet/EtherCAT port

Single port (EtherNET)	Bit	Signal	Definition
	1	TX+	Data send +
	2	TX-	Data send -
	3	RX+	Data receive +
	4	--	--
	5	--	--
	6	RX-	Data receive -
	7	--	--
	8	--	--
	Connector shell	PE	Chassis ground

RS485 Port for H35-00

Dual ports (PORT1)	Bit	Signal	Definition
	1	--	--
	2	--	--
	3	--	--
	4	B1	RS485 signal B
	5	A1	RS485 signal A
	6	--	--
	7	SG	RS485 signal earth
	8	--	--

RS485 terminal definition

6 bit removable terminal (PORT0)		Signal	Definition
X2		A0	RS485 signal A
		B0	RS485 signal B
		SG	RS485 signal earth
X3		A0	RS485 signal A
		B0	RS485 signal B
		SG	RS485 signal earth