Programmable High-Speed Counter/Timer

CTH Series Modbus Connection Guide · CTH Modbus Monitor · QModMaster · PLC

Firmware V3.00 · Rev 1

Thank you for purchasing an INICS product.

This guide explains, step by step with screens and examples, how to connect the CTH Series to our PC program **CTH Modbus Monitor**, the free Modbus program **QModMaster** and **PLCs**, and how to read and write values. For the communication specifications, frame structure and full address list (Mapping Table), see the **CTH Series Communication Manual**.

About This Guide

- For wiring, function settings and **safety precautions**, always refer to the **User Manual** supplied with the product.
- The **Communication Manual** is the reference for addresses, setting ranges and write rules. If this guide and the communication manual differ, follow the communication manual.
- QModMaster is a free open-source program, not our product. Its screens may differ slightly by version.
- The contents of this guide may change without notice for product performance and firmware improvements.

■ Notation

Notation	Description
※	Supplementary explanation of the function
e.g.)	Example of the function
0064H	Hexadecimal value (H: Hexadecimal). e.g.) 10H = 16
301004 (03EB)	Modbus register number in the communication manual and the Address in the frame (hexadecimal)
[Connect]	Name of a button, menu or entry box on the CTH Modbus Monitor or QModMaster screen
① ②	Steps to follow; black circled numbers on screenshots refer to the numbers in the description table

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2. CTH Modbus Monitor
3. QModMaster Setup
4. QModMaster Examples
5. Connecting a PLC
6. Troubleshooting

1. Preparing the Connection

■ 1.1 What You Need

Item	Description
CTH Series	Firmware V3.00 or later
PC	Windows 10 / 11 PC (when using CTH Modbus Monitor or QModMaster)
USB-RS232 converter	Needed if the PC has no RS232 (D-SUB 9 pin) port
Comm. cable	Connects the product RXD · TXD · GND terminals to the RS232 port of the PC or PLC (max. 15 m)
CTH Modbus Monitor	Our PC program - view the present value and settings, and write them (see chapter 2)
QModMaster	Free Modbus communication program (see 3.1)
PLC	RS232 port or communication module with the Modbus RTU master function (see chapter 5)

■ 1.2 Wiring

Product terminal	PC (D-SUB 9 pin)	PLC	Remarks
RXD	RXD (pin 2)	Receive (RD)	Connect same names
TXD	TXD (pin 3)	Send (SD)	Connect same names
GND (0V)	GND (pin 5)	SG	Common

※ The RXD · TXD labels on the product terminals are **named from the host device side**. Always wire **after turning off the power**.

※ RS232 is a 1:1 connection. Several products cannot be connected to one port.

■ 1.3 Product Communication Settings

Check the comm. address and baud rate in the setting mode on the product front panel. Communication settings cannot be changed over communication. (See the user manual for key operation)

Setting item	Display	Setting
Comm. address	Adr	1~127 (default 1). Set the same as [Address] of CTH Modbus Monitor, [Slave Addr] of QModMaster, or the station number of the PLC
Baud rate	bPS	9600 / 19200 / 38400 / 115200 bps (default 9600). Set the same as the PC or PLC
Comm. write protect	CPrt	OFF: write allowed (default), ON: write protected (only read · RESET · BATCH RESET possible)

※ The data format is **8 data bits, parity None, 1 stop bit (fixed)**. Always set the PC or PLC the same.

■ 1.4 Checking the COM Port Number on the PC

① Plug the USB-RS232 converter into the PC and install the driver from the converter manufacturer.

② Right-click the Windows [Start] button and open [Device Manager].

③ Expand [Ports (COM & LPT)] and check the number after the converter name. e.g.) USB Serial Port **(COM3)** → COM port number 3

④ The number may change if the converter is plugged into another USB port. If it does not connect, check the number again.

2. CTH Modbus Monitor

CTH Modbus Monitor is a PC program provided by INICS. Without knowing any addresses, you can see the present value and output status on a screen that looks like the product front panel, and read and write the setting values and all function settings in a table. It is the easiest way to make the first connection or to check the settings.

■ 2.1 Getting and Running the Program

① Download **CTH Modbus Monitor EN.exe** from the **Download** section of the INICS website (www.iinics.com).

② Put the file in any folder and run it. No installation is needed, and it does not create settings or log files on the PC.

③ The user manual, communication manual, this connection guide and the C example code are built into the program and can be opened from the menu on the left.

■ 2.2 Connecting



Connection bar (connected)

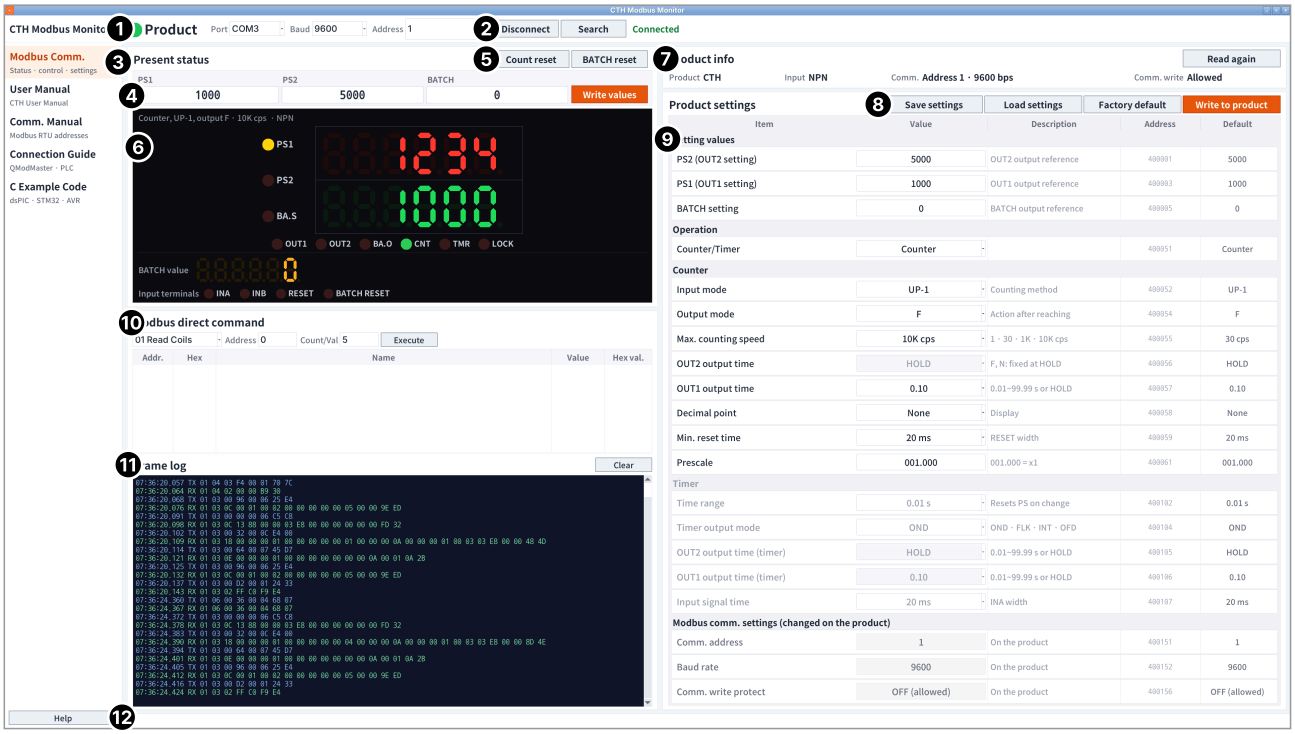
① Choose the COM port number (1.4) in [Port], and set [Baud] and [Address] the same as the product front panel settings (bPS · Adr). The factory default is 9600 · 1.

② Press [Connect]. When the 'Product' circle turns **green** and 'Connected' appears, the product is connected. If it is red, check the text next to it and chapter 6.

③ If you do not know the baud rate or address, press [Search]. It tries 4 baud rates × addresses 1~127 and connects automatically. (Addresses 1~32 in about 15 s, all in up to about 35 s)

④ [Disconnect] releases the port. Other programs (QModMaster, PLC programming tools etc.) cannot use the same COM port at the same time.

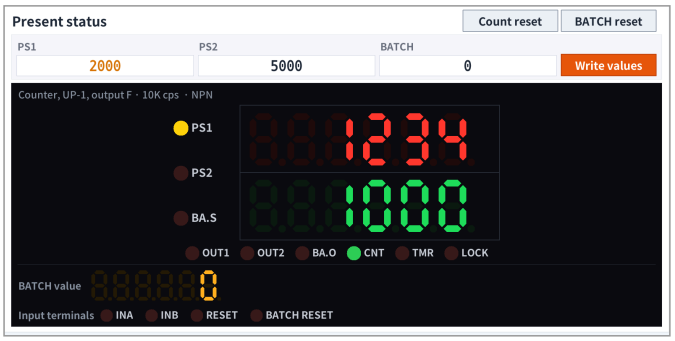
■ 2.3 Screen Layout ([Modbus Comm.] screen)



CTH Modbus Monitor (counter counted to 1234)

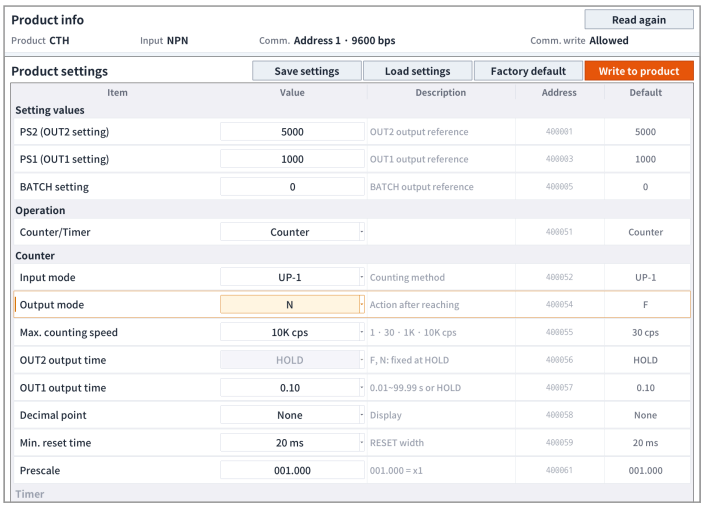
No.	Name	Description
1	**Port · Baud · Address**	COM port and the product baud rate and address
2	**[Connect] · [Search]**	Connect / disconnect, automatic search for baud rate and address
3	**Left menu**	Modbus Comm. · User Manual · Comm. Manual · Connection Guide · C Example Code
4	**PS1 · PS2 · BATCH**	Setting value boxes and [Write values] (2.4)
5	**[Count reset] · [BATCH reset]**	Same as the front RESET key and BATCH reset
6	**Present status**	Display, indicators, BATCH value and input terminals as on the product front panel (updated every 0.3 s)
7	**Product info**	Product · input (NPN / PNP) · comm. address · baud rate · comm. write (allowed / protected), [Read again]
8	**Product settings buttons**	[Save settings] · [Load settings] · [Factory default] · [Write to product] (2.5)
9	**Product settings table**	Value, description, Modbus register and factory default of every setting
10	**Modbus direct command**	Read and write directly with function code, address and count (2.6)
11	**Frame log**	Sent (TX) and received (RX) frames in hexadecimal, red = error or exception
12	**[Help]**	How to use; the title shows the firmware version of the product

■ 2.4 Present Status · Writing Setting Values · Reset



- The display and indicators are the same as on the product front panel. (red = present value, green = setting value)
- When you enter a value in the PS1 · PS2 · BATCH boxes, the box turns **orange**; press **[Write values]** to write it to the product.
- PS1 · PS2 are shown and entered with the product decimal point (counter: decimal point, timer: time range). If you type digits continuously, the decimal point is inserted automatically as on the front panel; values above the maximum become the maximum.
- [Count reset] = front RESET key, [BATCH reset] = resets the BATCH value

■ 2.5 Reading · Writing · Saving Product Settings

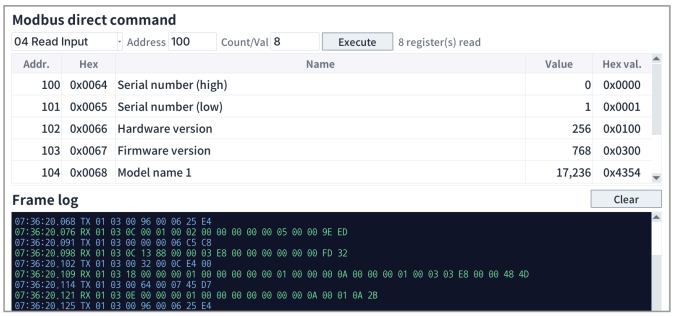


- When connected, all product settings are read and shown in the table. Grey cells are not used in the current operation mode or are fixed.
- A changed row turns **orange**. Press **[Write to product]** to write it to the product; after writing, the settings are read again and shown.
- [Factory default]: changes only the table values to factory defaults. (Write with [Write to product])
- [Save settings]: saves the product settings to a file (CTH_settings_date.txt).
- [Load settings]: enters the values of a saved file into the table. Use it to put the same settings into several products. (Comm. address, baud rate and CPrt are not loaded)
- [Read again]: reads the product info and settings again. Orange values not yet written are discarded.

※ Changing function settings (counter/timer, input mode, output mode etc.) resets the present value and outputs of the product. Take care while the machine is running.

※ If a write is rejected, the reason is shown in a pop-up. (front panel setting mode in progress, comm. write protect CPrt = ON, value out of range)

■ 2.6 Modbus Direct Command · Frame Log



- Enter the function code, address and count and press [Execute]; the result is shown with address, name and value.
- Enter the Address of the communication manual in decimal (e.g. 100) or in hexadecimal with 0x (e.g. 0x0064).
- e.g.) 04 Read Input, address 100, count 8 → product info (firmware version 0300H = V3.00)
- For writes (05 · 06 · 16), enter the value in [Count/Val]. For 16, separate several values with commas (e.g. 34464,1)
- Comparing TX · RX in the frame log with the frames of your PLC or program makes address and order errors easy to find.

■ 2.7 User Manual · Comm. Manual · Connection Guide · C Example Code

Left menu	Contents
User Manual	CTH user manual (PDF). [Prev. page] · [Next page] · [Zoom in] · [Zoom out] · [Fit width], Ctrl + wheel = zoom
Comm. Manual	Communication specifications · frames · addresses (Mapping Table) · examples
Connection Guide	This guide (how to connect CTH Modbus Monitor, QModMaster and PLCs)
C Example Code	C example for reading and writing the CTH from an MCU (dsPIC, STM32, AVR etc.). [Copy all] · [Save to file]

3. QModMaster Setup

■ 3.1 Downloading and Running QModMaster

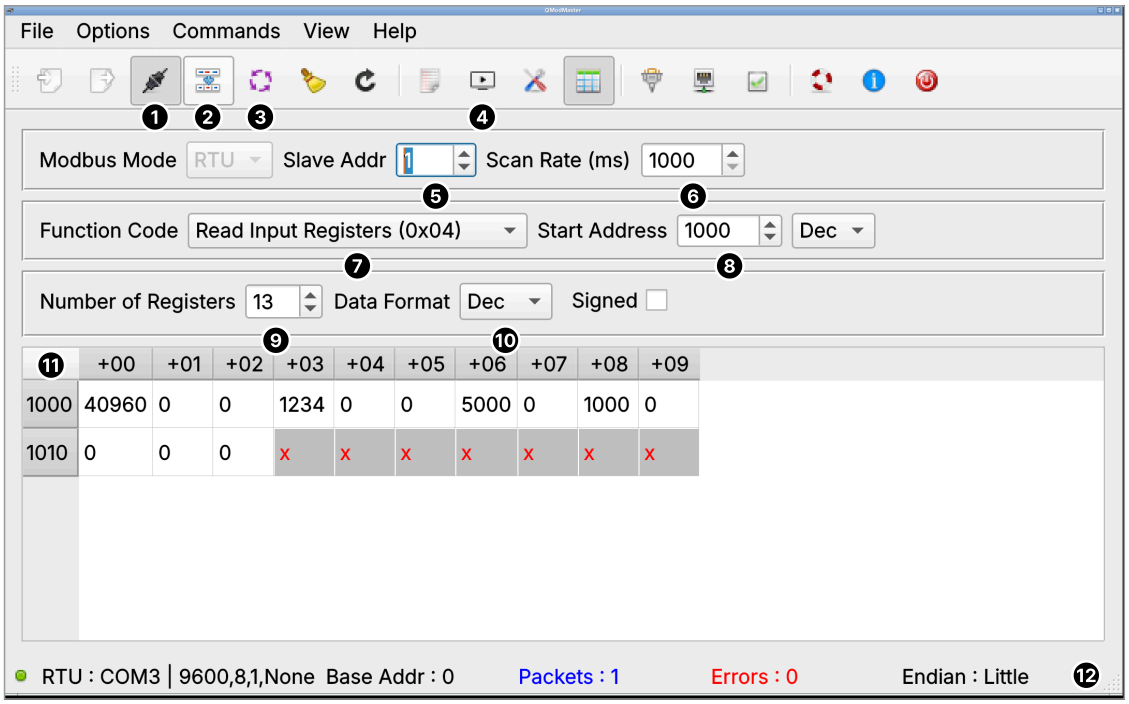
① Search for **QModMaster** on the internet and download the Windows zip file from the official distribution page (sourceforge.net/projects/qmodmaster).

② Unzip it and run **qModMaster.exe**. No installation is needed.

③ Settings are saved in qModMaster.ini in the same folder as the program and are restored the next time it runs.

※ QModMaster is free open-source software under the GPL license. For questions about the program itself, use its distribution page.

■ 3.2 Screen Layout

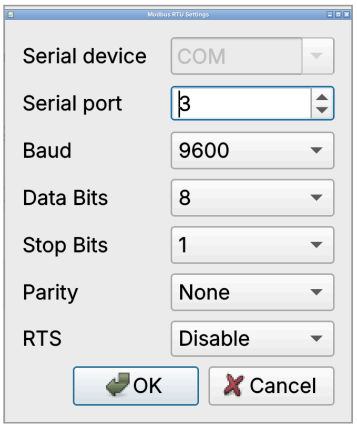


QModMaster screen (CTH present value and setting values read at once)

No.	Name	Description
1	**Connect**	Opens / closes the comm. port (pressed = connected)
2	**Read / Write**	Reads or writes once with the selected function code
3	**Scan**	Reads repeatedly at the [Scan Rate] interval (pressed = repeating)
4	**Bus Monitor**	Shows sent and received frames (see 4.7)
5	**Slave Addr**	Comm. address of the product (Adr)
6	**Scan Rate (ms)**	Repeat read interval (1000 ms or more, at least 2 × the Response Timeout)
7	**Function Code**	Function code (0x01 ~ 0x10)
8	**Start Address**	Start address (the [Start Address] value in 3.5), Dec / Hex on the right: number base of the address
9	**Number of Registers**	Number to read or write
10	**Data Format**	Value display (Dec: decimal, Hex: hexadecimal, Bin: binary)
11	**Value table**	Values read / values to write. Row number on the left + column +00 ~ +09 at the top = address (shown with [View] → [Headers])
12	**Status bar**	Port and comm. conditions, Base Addr, Packets (number of transactions), Errors (number of errors)

■ 3.3 Communication Settings (Modbus RTU)

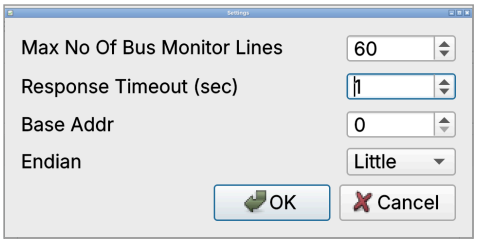
Open [Options] → [Modbus RTU...], set the same communication conditions as the product and press [OK]. These cannot be changed while connected, so set them with [Connect] off.



Item	Setting	Remarks
Serial port	COM port number	The number checked in 1.4 (e.g. 3)
Baud	9600	Same as the product bPS
Data Bits	8	Fixed
Stop Bits	1	Fixed
Parity	None	Fixed
RTS	Disable	Direct RS232 connection

■ 3.4 Address Base · Response Timeout (Settings)

Set the following in [Options] → [Settings...]. All address values in this guide assume **Base Addr = 0**.



Item	Setting	Description
Response Timeout (sec)	1	Response wait time
Base Addr	0	Addresses counted from 0 (same as the Address in the frame)
Endian	Little	No change needed

※ With Base Addr = 0, enter the Address of the communication manual (hexadecimal in brackets) in [Start Address] as it is. If you set the number base on the right to **Hex**, enter it in hexadecimal like 03EB; with **Dec**, enter it in decimal like 1003.

※ With Base Addr = 1 (the QModMaster default) addresses shift by 1, and in some versions the start address of [Scan] repeat reads was found to be sent differently. Use 0.

■ 3.5 Frequently Used Addresses (QModMaster entries, Base Addr = 0)

What to read / write	Comm. manual register	Function Code	Start Address (Dec)	Number of Registers
Present value · setting values at once	301001~301013	0x04	1000	13
Present value (32 bit)	301004~301005	0x04	1003	2
BATCH value (32 bit)	301002~301003	0x04	1001	2
Product info (firmware · model)	300101~300108	0x04	100	8
PS2 · PS1 · BATCH setting values	400001~400006	0x03 / 0x10	0	6
PS1 setting value (32 bit)	400003~400004	0x03 / 0x10	2	2
PS1 (not saved)	400203~400204	0x03 / 0x10	202	2
Counter function settings	400051~400062	0x03	50	12
Timer function settings	400101~400107	0x03	100	7
Comm. settings (read only)	400151~400156	0x03	150	6
RESET (present value reset)	000001	0x05	0	1
BATCH RESET	000005	0x05	4	1
Output status (RESET · OUT2 · OUT1 · BATCH)	000001~000004	0x01	0	4
Input terminal status	100001~100005	0x02	0	5

※ Start Address = the number after the first digit of the register in the communication manual - 1. e.g.) 301004 → 1004 - 1 = **1003**, 400003 → 3 - 1 = **2**

※ Max. per request: 0x01 · 0x02 up to 5, 0x03 · 0x04 up to 32, 0x10 up to 27. If the range includes a register not in the tables, exception 02 is returned.

4. QModMaster Examples

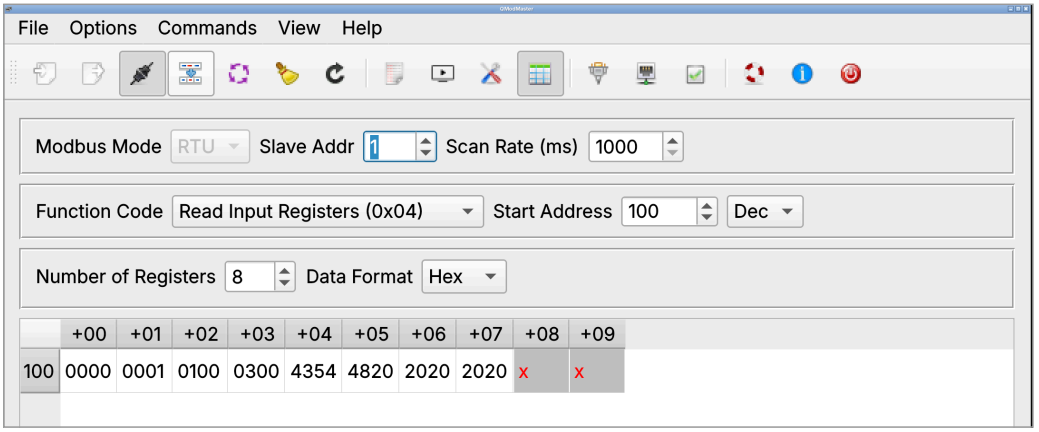
The following examples use a product with comm. address 1, 9600 bps, counter mode (factory settings except counting speed 10 kcps) that has counted 1,234 pulses.

■ 4.1 Connecting and Reading Product Info

① [Slave Addr] = 1, [Function Code] = **Read Input Registers (0x04)**, [Start Address] = **100**, [Number of Registers] = **8**, [Data Format] = **Hex**

② Press [Connect] (① in 3.2). When the circle on the left of the status bar turns green, the port is open.

③ Press [Read / Write] (②).



Reading product info (300101~300108)

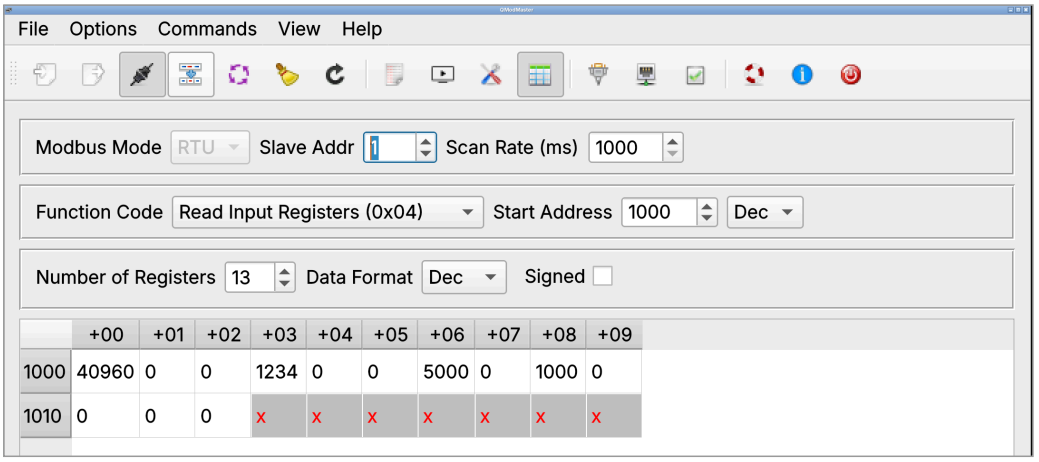
Address	Value read	Meaning
+02	0100	Hardware version V1.00
+03	0300	Firmware version **V3.00**
+04 ~ +07	4354 4820 ...	Model name ASCII "CTH" (43H = C, 54H = T, 48H = H)

※ If values appear and [Errors] does not increase, communication is normal. If an error occurs, see 4.8 and chapter 6.

■ 4.2 Reading the Present Value and Setting Values at Once

① [Function Code] = **Read Input Registers (0x04)**, [Start Address] = **1000**, [Number of Registers] = **13**, [Data Format] = **Dec**

② Press [Read / Write].



Reading the present value and setting values (301001~301013)

Address	Name	Value read	Meaning
+00	**LED status**	40960	A000H = bit15 CNT · bit13 PS1 on (bit table in comm. manual 6.5)
+01 · +02	**BATCH value**	0, 0	0
+03 · +04	**Present value**	1234, 0	**1234** = 1234 + 0 × 65536
+05	**Display unit**	0	Counter: 0 decimal places, timer: time range code
+06 · +07	**PS2 setting value**	5000, 0	5000
+08 · +09	**PS1 setting value**	1000, 0	1000
+10 · +11	**BATCH setting value**	0, 0	0
+12	**Input logic**	0	0: NPN, 1: PNP

■ Calculating 32-bit Values

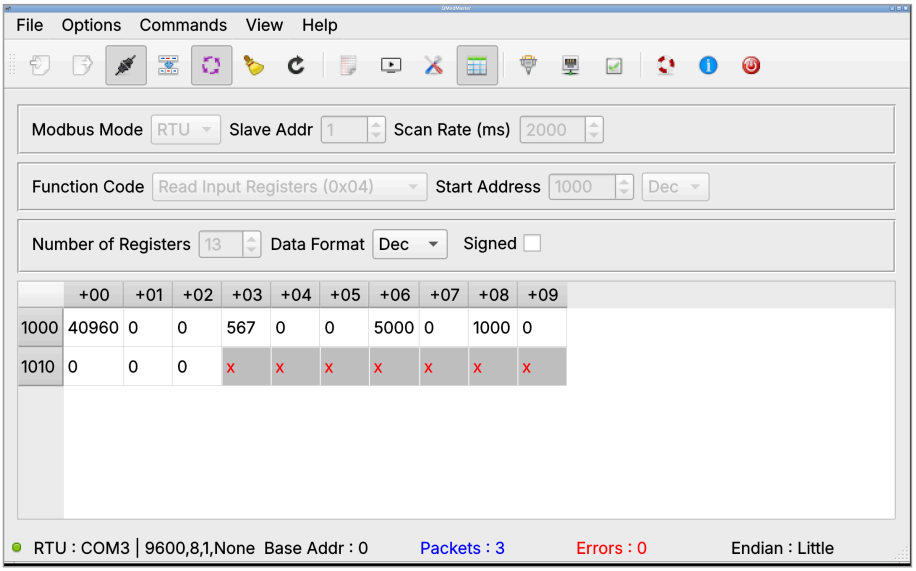
- The present value, BATCH, PS1, PS2 and prescale use 2 registers. **First register = low 16 bits, next register = high 16 bits**.
- Value = first register value + next register value × 65536. e.g.) 34464, 1 → 34464 + 1 × 65536 = **100000**
- If the next register value is 32768 or more, the value is negative. Value = (first + next × 65536) - 4294967296. e.g.) 65436, 65535 → **-100**
- The decimal point follows [Display unit] (+05). e.g.) with 1 decimal place, 1234 → 123.4

■ 4.3 Repeated Reading (Scan)

① Set up as in 4.2 and enter **2000** in [Scan Rate (ms)] (at least 2 × the 1 s Response Timeout).

② Press [Scan] (③ in 3.2) to read every 2 s and update the value table. [Packets] should increase and [Errors] should stay 0.

③ Press [Scan] again to stop. The function code and address cannot be changed while scanning.



Scanning (present value 567, Packets 3)

※ If the Scan Rate is less than Response Timeout × 2, the message "Scan rate should be at least 2 * Timeout." appears and scanning does not start.

■ 4.4 Writing a Setting Value (PS1 = 100000)

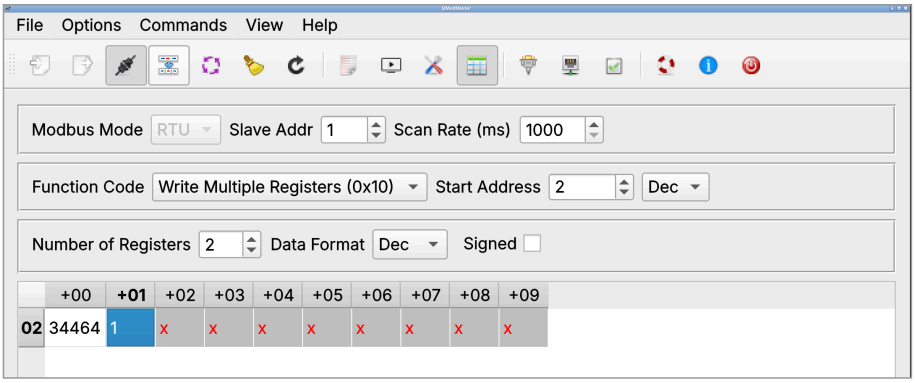
A 32-bit value is written to 2 registers at once with **Write Multiple Registers (0x10)**. First split the value into two.

Value to write	First register (low) = value ÷ 65536 remainder	Next register (high) = value ÷ 65536 quotient
100000 (0001 86A0H)	34464 (86A0H)	1
5000	5000	0
999999 (000F 423FH)	16959 (423FH)	15

① [Function Code] = **Write Multiple Registers (0x10)**, [Start Address] = **2** (PS1 400003), [Number of Registers] = **2**

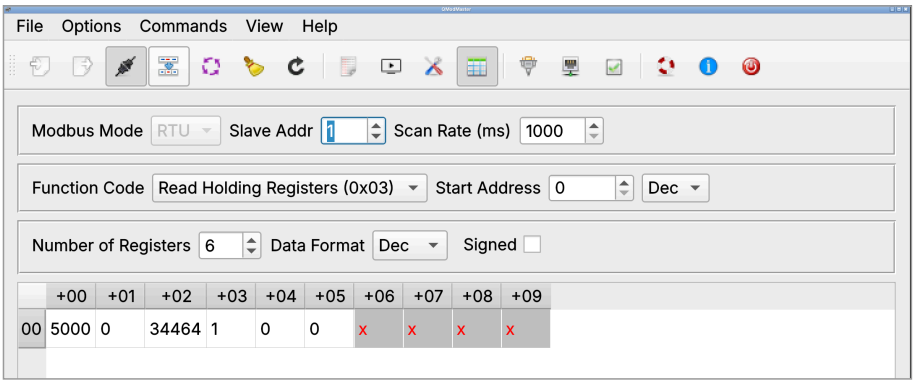
② Double-click the +00 cell of the value table and enter **34464**, then **1** in the +01 cell. (Press Enter after each entry)

③ Press [Read / Write]. If no error is shown, the write is complete.



Writing PS1 = 100000 (400003~400004)

① Check: [Function Code] = **Read Holding Registers (0x03)**, [Start Address] = **0**, [Number of Registers] = **6** → [Read / Write]



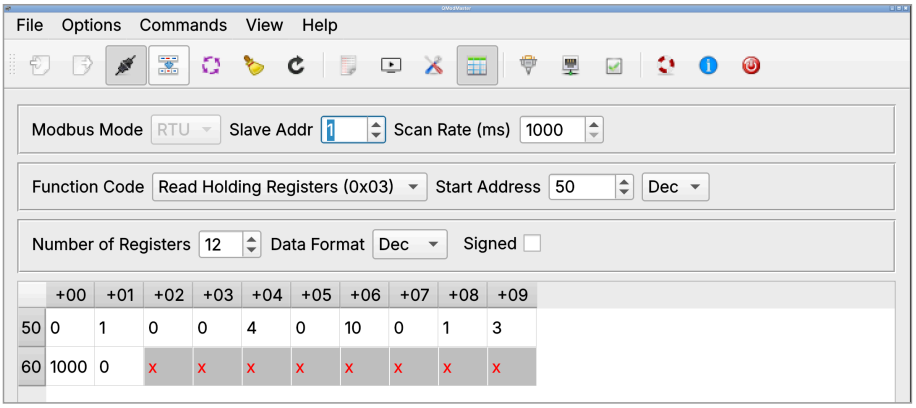
Read back: PS2 5000 · PS1 100000 (34464, 1) · BATCH 0

※ Values written to 400001~ are saved 3 s after the first write. For **values changed often** from a PLC etc., use the **400201~ (not saved, Start Address 200~)** registers.

※ Values that cannot be written (out of range, 0 not allowed in some output modes etc.) show "Illegal data value" (exception 03) and are not applied.

■ 4.5 Reading and Writing Function Settings

① Read: [Function Code] = **Read Holding Registers (0x03)**, [Start Address] = **50**, [Number of Registers] = **12** → [Read / Write]



Reading counter function settings (400051~400062)

Address	Name	Value	Meaning (codes: see comm. manual 6.7)
50	**Counter/Timer**	0	Counter
51	**Input mode**	1	UP-1
53	**Output mode**	0	F
54	**Counting speed**	4	10 kcps
55 · 56	**OUT2 · OUT1 output time**	0 · 10	HOLD · 0.10 s (10 ms units)
57	**Decimal point**	0	No decimal point
60 · 61	**Prescale**	1000 · 0	1.000 (32 bit, 0.001 units)

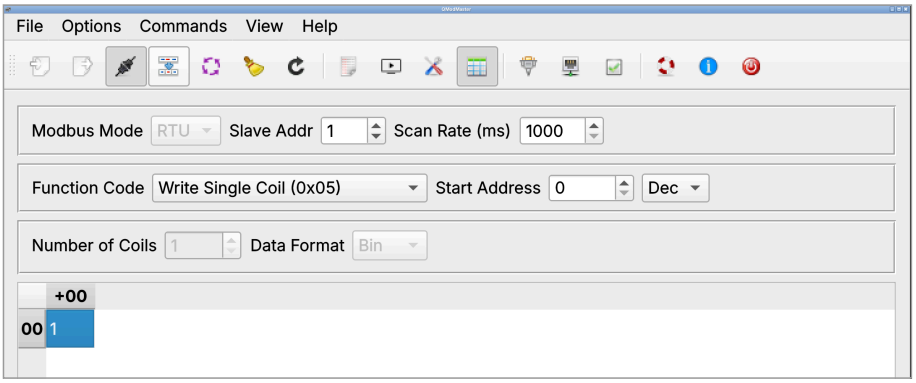
① Write (output mode = N): [Function Code] = **Write Single Register (0x06)**, [Start Address] = **53**, value table +00 = **1** → [Read / Write]

※ Changing a function setting resets the present value and outputs, as with the front panel setting. Take care during operation.

■ 4.6 Present Value Reset · BATCH Reset

① [Function Code] = **Write Single Coil (0x05)**, [Start Address] = **0** (RESET) or **4** (BATCH RESET)

② Enter **1** in the +00 cell of the value table and press [Read / Write]. (1 = ON = FF00H is sent)

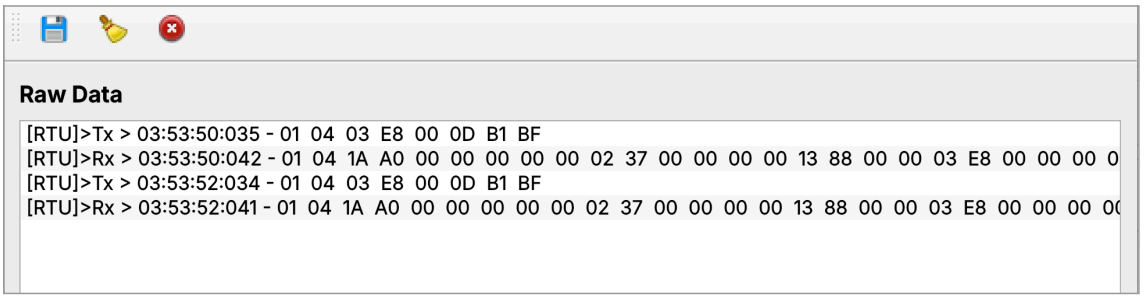


Present value reset (000001 = ON)

※ RESET · BATCH RESET work even while comm. write protect (CPrt = ON) is set. Write Multiple Coils (0x0F) is not supported.

■ 4.7 Viewing the Communication (Bus Monitor)

Open [View] → [Bus Monitor] (④ in 3.2) to see the sent (Tx) and received (Rx) frames in hexadecimal. Use it to compare frames when writing a PLC program.

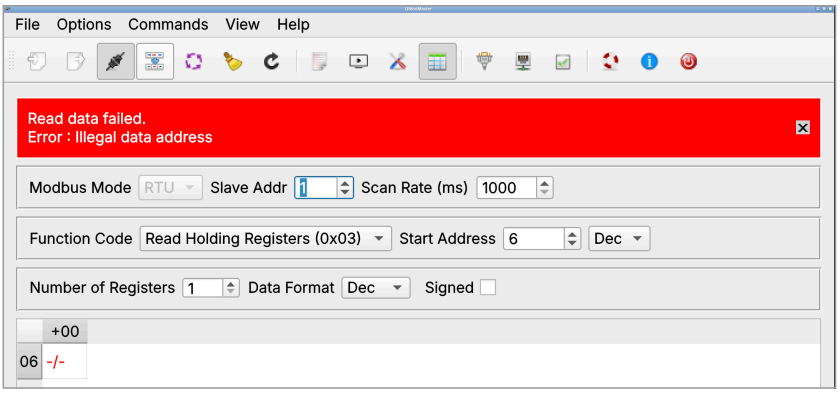


Bus Monitor (during the repeated reading in 4.3)

Type	Frame (address | function code | ... | CRC)
Tx	01 | 04 | 03 E8 | 00 0D | **B1 BF** (address 1, 0x04, register 03E8H = 1000, 13 registers)
Rx	01 | 04 | 1A | A0 00 | 00 00 00 00 | 02 37 00 00 | ... (26 bytes = 13 registers, 0237H = present value 567)

■ 4.8 Error Messages and Actions

When communication fails, the cause is shown in a red bar at the top of the screen and [Errors] increases by 1.



Reading a nonexistent register (Start Address 6) → Illegal data address

QModMaster message	Exception	Cause · action
Timeout	-	No response: check wiring, COM number, baud rate, Slave Addr (Adr) and data format (8 / None / 1)
Illegal function	01	Unsupported function code (e.g. 0x0F write multiple coils) → use 0x05
Illegal data address	02	Nonexistent register, write to a read-only register (comm. settings), range includes a nonexistent register → check 3.5
Illegal data value	03	Count exceeded (32 or less for 0x03 · 0x04), setting range or write rule violation
Slave device or server failure	04	Write while comm. write protect (CPrt = ON) is set → CPrt = OFF
Slave device or server is busy	06	Setting in progress on the front panel → send again after finishing the front panel setting
Could not connect to serial port	-	Wrong COM port number or the port is used by another program → check 1.4, close the other program

5. Connecting a PLC

The PLC works as the **Modbus RTU master (client)** and the CTH as the slave. The names and setup of the PLC Modbus functions (dedicated instructions, communication module setup screens etc.) differ by model, so refer to the manual of your PLC as well.

■ 5.1 PLC Communication Settings

PLC setting item	Setting	Remarks
Interface · protocol	RS232, Modbus RTU master	1:1 connection
Baud rate	Same as the product bPS	9600 / 19200 / 38400 / 115200 bps
Data · parity · stop	8 bit · None · 1 bit	Check it - some PLCs default to Even etc.
Station number (slave address)	Product Adr	1~127. No response to 0 (broadcast)
Response timeout	100 ms or more	300 ms ~ 1 s recommended
Retries	1~3	Against noise
Request interval	Send after the response	For periodic reads, see the comm. times in 5.5

■ 5.2 Address Entry Methods

Each PLC has its own way of entering addresses. Enter them according to the method of your PLC. Whichever method is used, the frame actually sent is the same.

Address entry method of the PLC	Present value (301004)	PS1 (400003)	RESET (000001)
6-digit register number (type + number from 1)	301004 / 31004	400003 / 40003	000001 / 00001
Function code + number from 1	04 + 1004	03 · 16 + 3	05 + 1
Function code + Address from 0	04 + 1003 (03EBH)	03 · 16 + 2 (0002H)	05 + 0 (0000H)

※ If addresses are shifted by one and wrong values are read, or exception 02 is returned, switch the entry method (from 0 / from 1) and check. Reading the product info (300104 = 0300H) makes this easy to confirm.

■ 5.3 Reading 32-bit Values (Word Order)

CTH 32-bit values are **first register = low word, next register = high word**. When the PLC receives them as 32 bits (DINT, double word), set the word order of the PLC accordingly. Depending on the PLC it is called "low word first", "Word Swap", "CDAB" etc.

Value	First register (low)	Next register (high)	If received in reverse word order
1234 (0000 04D2H)	04D2H (1234)	0000H	80871424
100000 (0001 86A0H)	86A0H (34464)	0001H	-2036334591
-100 (FFFF FF9CH)	FF9CH (65436)	FFFFH	-6488065

※ The present value can be negative (counter -99999~), so handle it as a **signed 32-bit** value.

■ 5.4 Writing 32-bit Values (at Once with Function Code 16)

Always write PS1 · PS2 · BATCH · prescale to both registers at once with **function code 16 (Write Multiple Registers)**. If you write one word at a time with function code 06, the intermediate value may be out of range and rejected, leaving a wrong value.

e.g.) PS1 999999 → 100000	Function code 06 twice (low first)	Function code 16 once
1st write	Low 86A0H → intermediate 000F 86A0H = 1017504 (out of range) → **exception 03, not applied**	0001 86A0H at once → OK
2nd write	High 0001H → 0001 423FH = **82495**	
Result	**82495 (wrong value)**	

※ All values of function code 16 are checked first and applied at once; if any value is invalid, none are applied. Up to 27 registers can be written at once.

■ 5.5 Recommended Communication Setup

- **Periodic reading**: reading 301001~301013 (function code 04, Address 03E8H, 13 registers) at once gives the LED status, BATCH, present value and setting values at the same moment.
- **Setting values changed often**: write them to 400201~400206 (not saved). Writing repeatedly to the 400001~ (saved) registers shortens the memory life. They return to the last saved values at the next power-on.
- **Reset**: write FF00H to 000001 (RESET) or 000005 (BATCH RESET) with function code 05.
- **Max. per request**: read function codes 03 · 04 in blocks of 32 or fewer. If the PLC reads large blocks such as 125, exception 03 is returned.

Baud rate	One transaction (reference)	Recommended read cycle	Remarks
9600 bps	about 45 ms	100 ms or more	Reading 13 registers (request 8 bytes + response 31 bytes)
19200 bps	about 23 ms	50 ms or more	
38400 bps	about 12 ms	50 ms or more	
115200 bps	about 5 ms	20 ms or more	

■ 5.6 Handling Exception Responses

When the PLC receives an exception response (function code + 80H), handle it as follows.

Exception	Cause	PLC handling
02	Nonexistent register, write to a read-only register	Check the address and entry method (fix the program)
03	Count exceeded, setting range or write rule violation	Check the value range and count (fix the program)
04	Comm. write protect (CPrt = ON)	Set the product CPrt = OFF or stop writing
06	Setting in progress on the front panel	Send again after a while (retry)

6. Troubleshooting

Symptom	Check
No response (Timeout)	RXD · TXD · GND wiring (connect same names) Baud rate · address of the product and PC / PLC (bPS, Adr), 8 data bits · parity None · 1 stop bit COM port number (1.4), use of address 0 (broadcast) If the baud rate or address is unknown, use [Search] in CTH Modbus Monitor (2.2)
Port open failure	COM port number, converter driver, whether another program (monitor program, terminal etc.) is using the port
Occasional no response	Response timeout (100 ms or more), request interval (send after receiving the response) Cable length (15 m or less) and separation from power lines
Wrong values	Address entry method (from 0 / 1, 5.2), 32-bit word order (first register = low, 5.3), sign (negative), decimal point · unit (4.2)
Written value changes	Check whether a 32-bit value was written in two parts with function code 06 (5.4). For values changed automatically, see comm. manual 7.2
Value returns after power-on	Values written to 400201~ (not saved) are not stored. Use 400001~ if they must be saved
Exception 02 · 03 · 04 · 06	See 4.8 · 5.6

※ When contacting us, please include the frame log of CTH Modbus Monitor (2.6), the Bus Monitor contents of QModMaster (4.7) or the sent and received frames of your PLC, so we can check quickly.