
SM100-M-32 HART Data Collector

Instructions for use



Jiaxing Songmao Electronics Co Ltd

<http://www.smdznet.com>

<http://www.hart-rs232.com>

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Disclaimer:

Please read this document carefully before using this product. First confirm which type of instrument with HART protocol is used, and then find the wiring method of the corresponding type in the manual. Before powering on, please strictly check whether all wiring is correct, and then power on. The company will not be responsible for any damage to the product caused by the use of the method not specified in the document.

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For the latest information, please refer to our website: www.hart-rs232.com. If you have any questions about this document or the performance description of this product, please contact your supplier or contact us directly smdz2007@smdznet.com? QQ: 2850687718 for advice and answers.

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1. Introduction to SM100-M-32 HART Data Collector

1.1 Product Introduction

SM100-M-32 HART data collector is a product developed with ARM microprocessor, HART protocol modem chip and a lot of practical experience. It is designed according to the requirements of industrial products and has high reliability and stability. The data collector is equipped with standard RS485 interface, RS232 interface and gateway, which can transparently transmit data with intelligent instruments with HART protocol or convert data into MODBUS _ RTU or MODBUS _ TCP protocol to read data, so as to ensure real-time data transmission.

The HART protocol uses the Bell202 Frequency Shift Keying (FSK) standard to superimpose a modulated digital signal on a 4 to 20 mA basis, allowing the HART protocol instrument to allow bidirectional data communication without interfering with the 4 to 20 mA analog signal. SM100-M series HART data collector is an intelligent converter for bidirectional modulation and demodulation of digital signal and analog signal.

1.2 Product Features

- Support connection of 32 HART devices at the same time.
- Support parallel and simultaneous scanning of all HART channels configured for the HART data collector.
- Three-terminal electromagnetic full quarantine between HART channels and between HART and host power supply. Each channel adopts two-wire interface. The voltage of electromagnetic quarantine of HART module is not less than 1500 V. It supports the function of separating HART signal/4 ~ 20ma signal.
- The quarantine voltage of RS485 interface and NET Ethernet interface shall not be lower than 1500 V.
- Adopt the modular design of separating the HART module from the host, and support the function of replacing the HART module online in any channel.
- Each channel is provided with an independent indicator light, which provides indication of HART equipment online and HART equipment communication status respectively.
- Equipped with equipment status indicator light: operation/fault, communication interface, etc.
- Data refresh rate per channel & It; 1 second.
- Support Ethernet interface (speed not less than 100Mbps) and RS485 interface.
- Support proprietary HART commands to read the HART ID of all HART devices.
- Support configuration and operation mode, and support Telnet remote setting.
- Support firmware program update.
- Supports standard DIN rail mounting.
- The equipment does not affect the transmission and accuracy of 4 ~ 20 mA analog signal in normal, power failure or fault, and the loop resistance is less than or equal to 250 ohms.
- This equipment does not supply power to field instruments.
- Compatible with HART protocol Ver5.0 and above.

1.3 Main Parameters

- Power supply voltage: DC 24V.
- Operating current: < 80mA.
- Shell size: length 482 mm × width 67 mm × height 160 mm.
- Working temperature: -20 °C ~ + 75 °C.
- Humidity of working environment: 5% ~ 95% (no condensation).

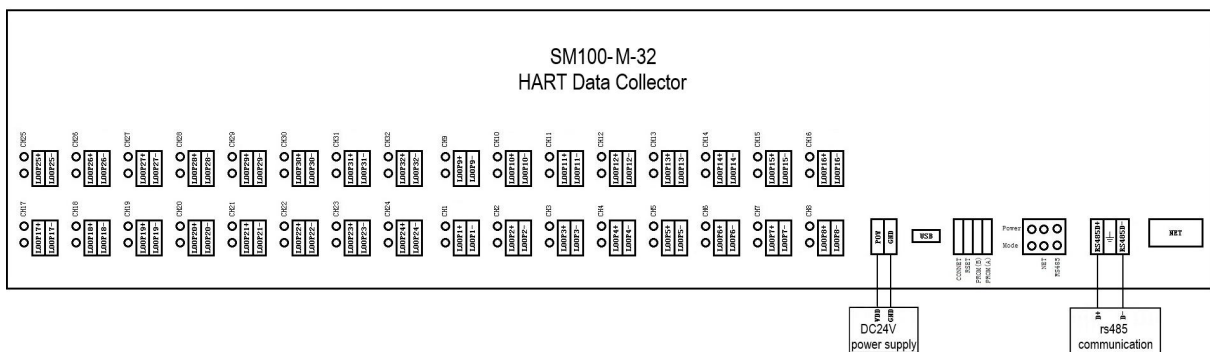
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2. Hardware Description of SM100-M-32 HART Data Collector

2.1 Physical Drawings



2.2 Wiring Diagram



2.3 Port Introduction

Port name	LOOP1 +	LOOP1 -	LOOP2 +	LOOP2 -	LOOP3 +	LOOP3 -	LOOP4 +	LOOP4 -
Function/access device	HART Instrumentation 1		HART Instrumentation 2		HART Instrumentation 3		HART Instrumentation 4	
Port name	LOOP5 +	LOOP5 -	LOOP6 +	LOOP6 -	LOOP7 +	LOOP7 -	LOOP8 +	LOOP8 -
Function/access device	HART Instrumentation 5		HART Instrumentation 6		HART Instrumentation 7		HART Instrumentation 8	
Port name	LOOP9 +	LOOP9 -	LOOP1 0+	LOOP1 0-	LOOP1 1+	LOOP1 1-	LOOP1 2+	LOOP1 2-
Function/access device	HART		HART		HART instrument		HART instrument	

ss device	Instrumentation 9		Instrumentation 10		11		12	
Port name	LOOP1 3+	LOOP1 3-	LOOP1 4+	LOOP1 4-	LOOP1 5+	LOOP1 5-	LOOP1 6+	LOOP1 6-
Function/acce ss device	HART Instrumentation 13		HART Instrumentation 14		HART Instrumentation 15		HART Instrumentation 16	
Port name	LOOP1 7+	LOOP1 7-	LOOP1 8+	LOOP1 8-	LOOP1 9+	LOOP1 9-	LOOP2 0+	LOOP2 0-
Function/acce ss device	HART Instrumentation 17		HART Instrumentation 18		HART Instrumentation 19		HART instrument 20	
Port name	LOOP2 1+	LOOP2 1-	LOOP2 2+	LOOP2 2-	LOOP2 3+	LOOP2 3-	LOOP2 4+	LOOP2 4-
Function/acce ss device	HART Instrumentation 21		HART Instrumentation 22		HART Instrumentation 23		HART instrument 24	
Port name	LOOP2 5+	LOOP2 5-	LOOP2 6+	LOOP2 6-	LOOP2 7+	LOOP2 7-	LOOP2 8+	LOOP2 8-
Function/acce ss device	HART Instrumentation 25		HART Instrumentation 26		HART Instrumentation 27		HART Instrumentation 28	
Port name	LOOP2 9+	LOOP2 9-	LOOP3 0+	LOOP3 0-	LOOP3 1+	LOOP3 1-	LOOP3 2+	LOOP3 2-
Function/acce ss device	HART Instrumentation 29		HART Instrumentation 30		HART Instrumentation 31		HART Instrumentation 31	
Port name	POW	GND	USB		RS485 D+	GND	RS485 D-	NET
Function/acce ss device	DC power supply		USB serial port communication		RS485 communication			Gatewa y

- NET: Ethernet interface. LOOP1 +, LOOP1- ~ LOOP32 +, LOOP32-: 32 groups of HART instrument communication interface terminals in total.
- POW, GND: power interface terminal, POW is connected to the positive pole of the power supply, and GND is connected to the negative pole of the power supply.
- USB: USB serial port communication, used to set the parameters of the collector.
- RS485D +, RS485D-, GND: RS485 communication, the positive and negative ends of the 485 line are connected to the RS485 + and RS485- ports respectively.
- NET: Ethernet interface.

2.4 Description of Indicator Light and Dial Switch

- CH1 ~ CH32: respectively indicate the communication between HART instruments 1 ~ 32 and the collector. The red light is the receiving indicator, and the green light is the transmitting indicator.
- CONNET: communication selection switch, which can be used to query and set the parameters of the mainboard of data collector A when the dial switch is turned down, and to query and set

the parameters of the mainboard of data collector B when the dial switch is turned up.

- RSET: reset switch, which can initialize the parameters of the data acquisition unit before delivery.
- PROM (B): B mainboard program download switch, which can download the program of data collector B mainboard when it is turned down.
- PROM (A): A mainboard program download switch, which can download the program of the data collector A mainboard when it is turned down.
- Power: power indicator, always on after the power is turned on.
- Mode: working mode indicator.
- NET: Ethernet interface communication, the red light is the sending data indicator, and the green light is the receiving data indicator.
- RS485: RS485 interface communication, the red light is the sending data indicator, and the green light is the receiving data indicator.

3. Function Introduction and Operation Steps of Configuration Software

3.1 Communication Connection

1) According to the introduction of the port in the above part, connect the HART data collector to the power supply, and then connect the USB serial port communication cable/network cable. After the Power indicator is always on, the parameter configuration can be performed.

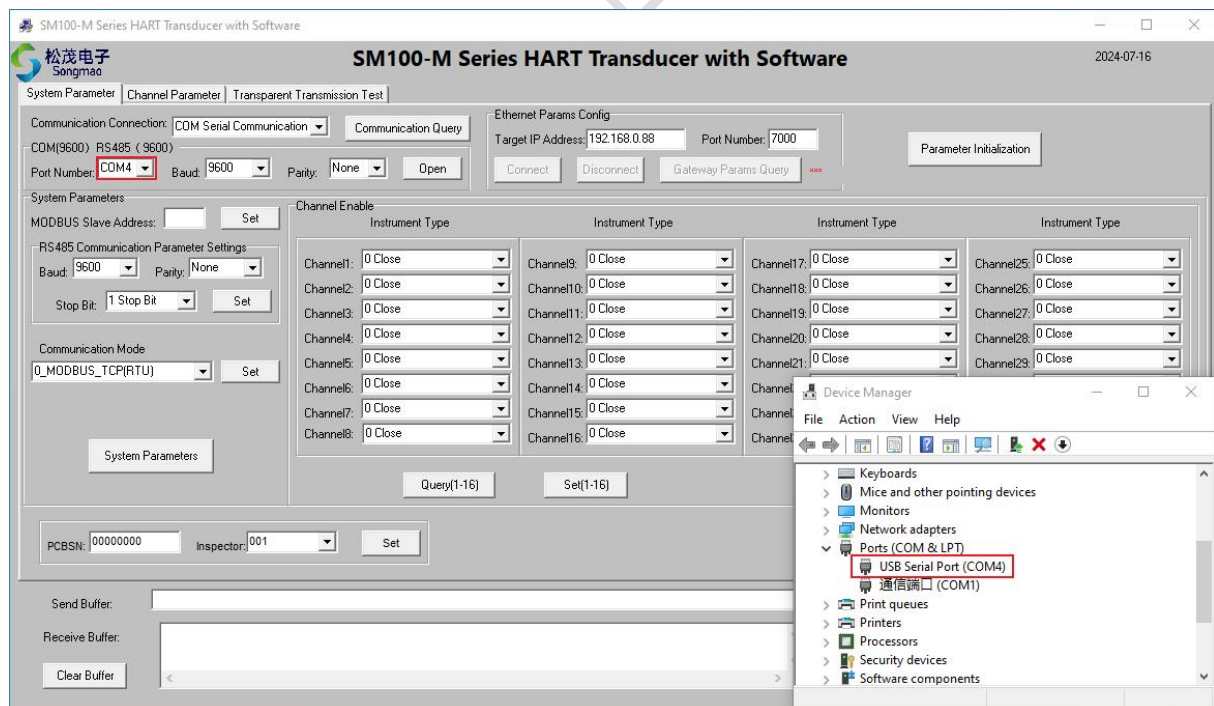
2) Open the configuration debugging software and select the communication connection mode: COM serial port communication and IP network communication.

When the data acquisition unit is connected with a USB serial port communication line, com serial port communication is selected as the communication connection mode;

When the data collector is connected to the network cable, the communication connection mode is IP network communication.

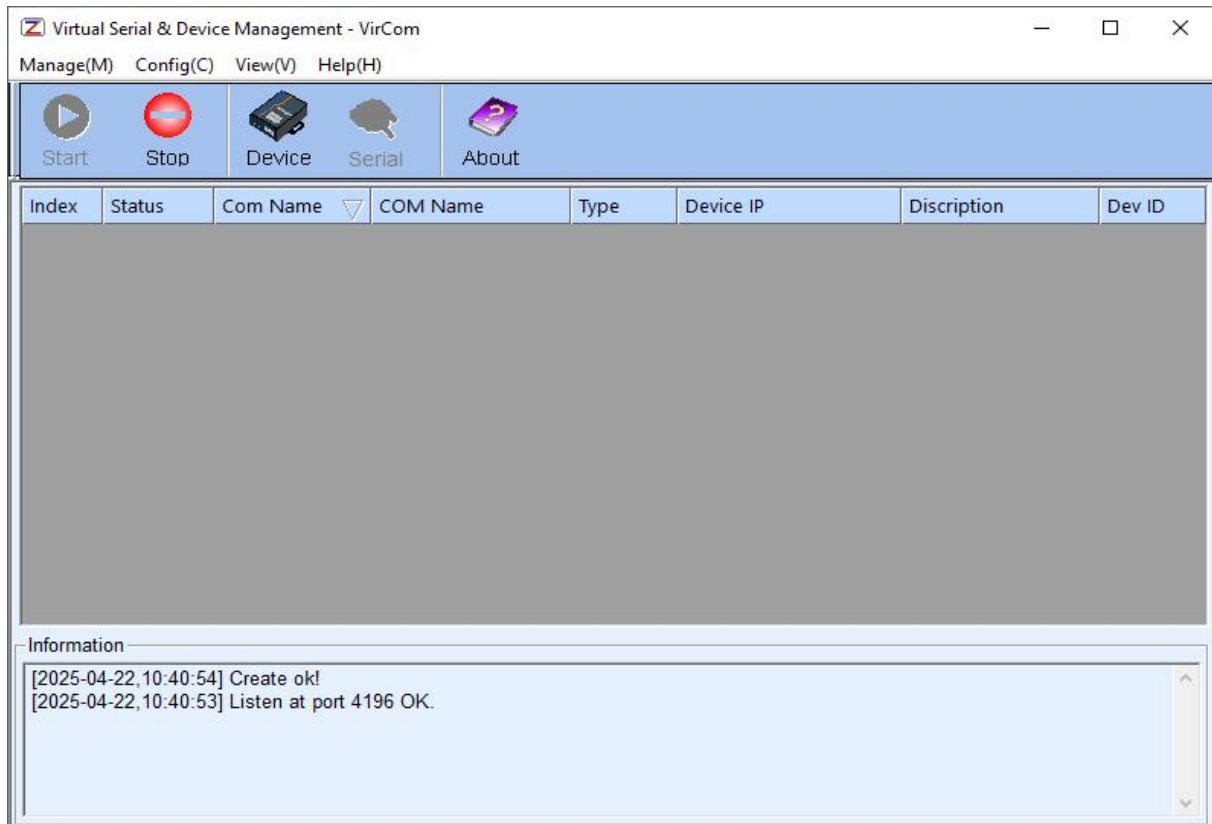
3) Com serial communication

Connect the USB serial port communication line, and select com serial port communication as the communication connection mode. Then select the correct port number, baud rate and check bit (default baud rate 9600, check bit None), open the serial port, and click "Communication Query". At this time, the version number of this data collector can be queried in the "Receiving Buffer" below, indicating that the communication between the computer and the collector is successful.

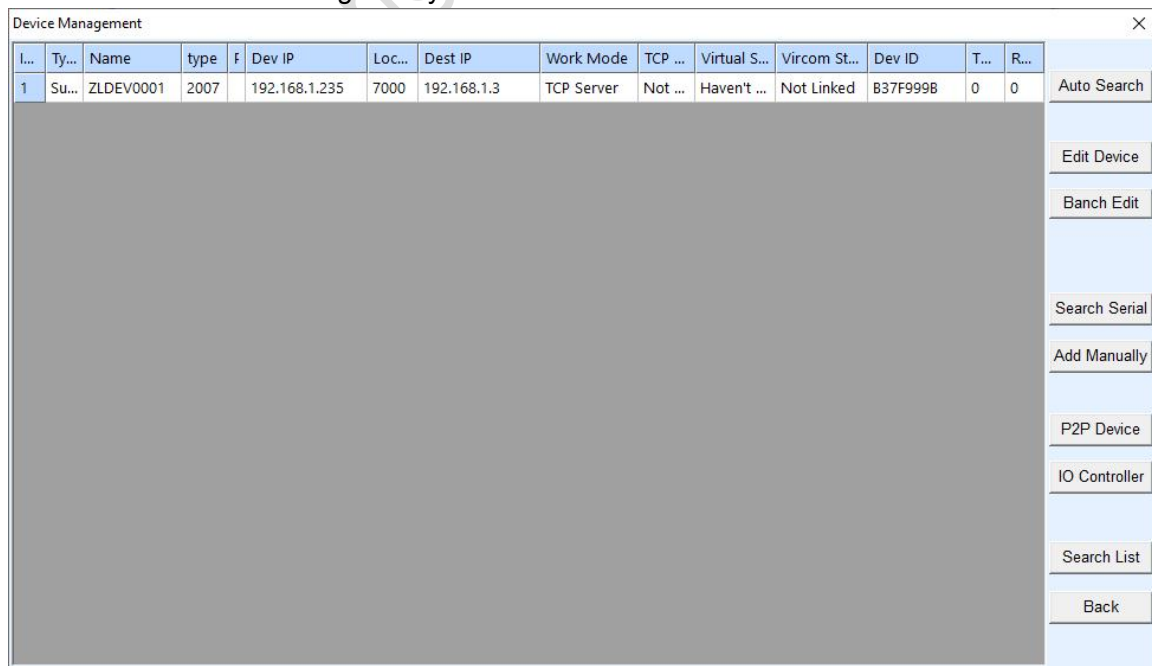


3.2 Configure Ethernet Parameters

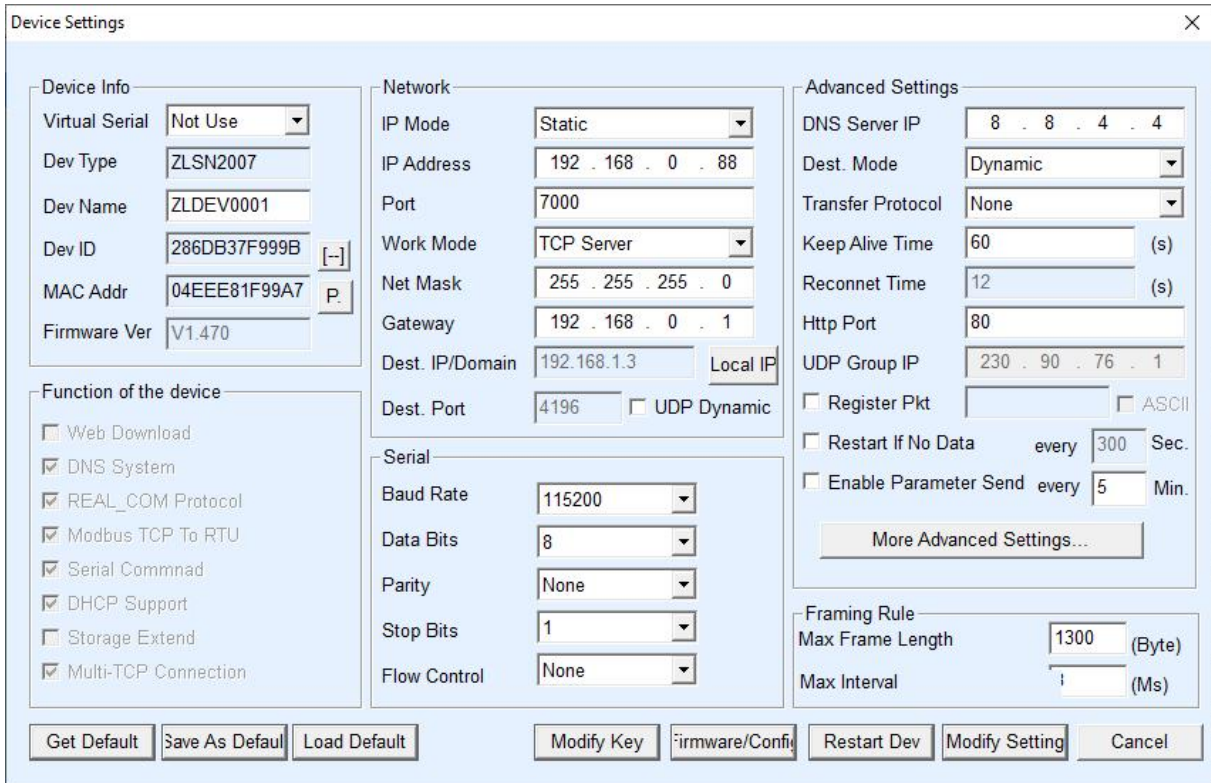
- 1) Double-click to run the Gateway Parameter Configuration Software. This will open the Gateway Parameter Configuration Window. In the window, click "Device".



- 2) The "Device Management" window will pop up. The software will automatically search for gateway devices connected to this collector. The search results will be displayed in the main window. Select the found gateway device and click "Edit Device".



- 5) After changing the parameters, click "Modify Setting" to save the configured Ethernet parameters. Finally, close the gateway parameter configuration software. At this time, all parameters of the gateway have been configured.



The screenshot shows the 'Device Settings' window with the following sections:

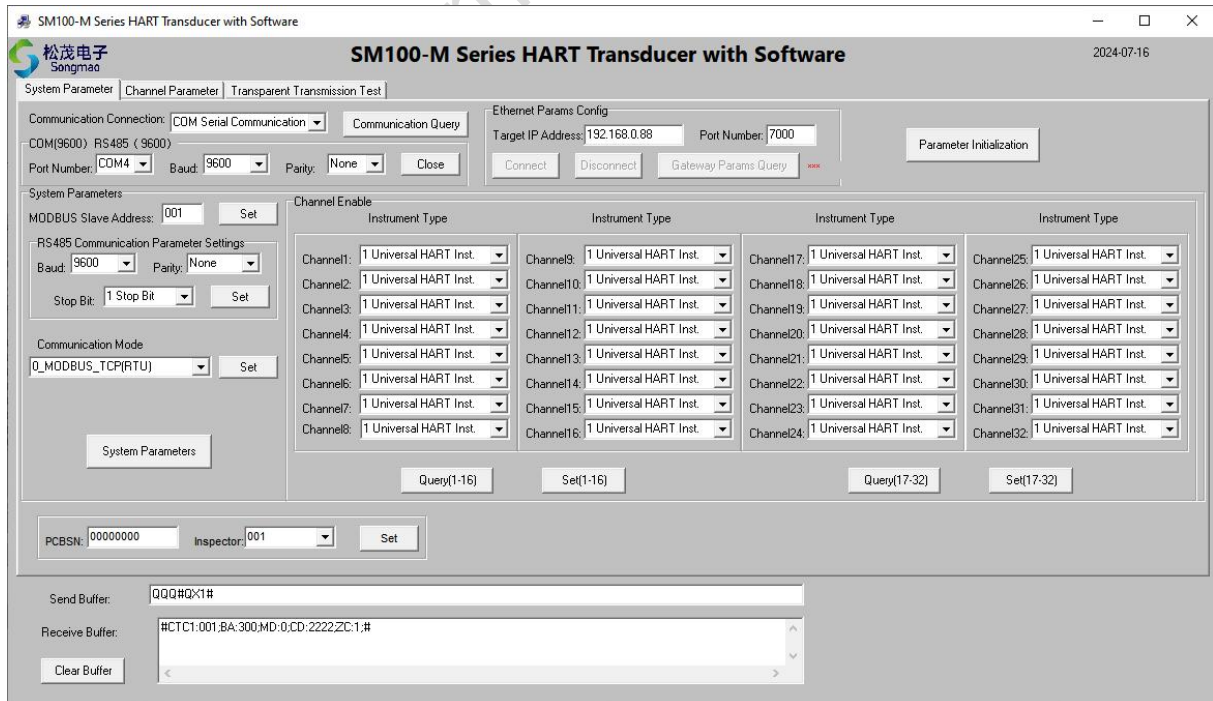
- Device Info:**
 - Virtual Serial: Not Use
 - Dev Type: ZLSN2007
 - Dev Name: ZLDEV0001
 - Dev ID: 286DB37F999B
 - MAC Addr: 04EEE81F99A7
 - Firmware Ver: V1.470
- Function of the device:**
 - ☐ Web Download
 - ☒ DNS System
 - ☒ REAL_COM Protocol
 - ☒ Modbus TCP To RTU
 - ☒ Serial Commnad
 - ☒ DHCP Support
 - ☐ Storage Extend
 - ☒ Multi-TCP Connection
- Network:**
 - IP Mode: Static
 - IP Address: 192 . 168 . 0 . 88
 - Port: 7000
 - Work Mode: TCP Server
 - Net Mask: 255 . 255 . 255 . 0
 - Gateway: 192 . 168 . 0 . 1
 - Dest. IP/Domain: 192.168.1.3 Local IP
 - Dest. Port: 4196 ☐ UDP Dynamic
- Serial:**
 - Baud Rate: 115200
 - Data Bits: 8
 - Parity: None
 - Stop Bits: 1
 - Flow Control: None
- Advanced Settings:**
 - DNS Server IP: 8 . 8 . 4 . 4
 - Dest. Mode: Dynamic
 - Transfer Protocol: None
 - Keep Alive Time: 60 (s)
 - Reconnet Time: 12 (s)
 - Http Port: 80
 - UDP Group IP: 230 . 90 . 76 . 1
 - ☐ Register Pkt ☐ ASCII
 - ☐ Restart If No Data every 300 Sec.
 - ☐ Enable Parameter Send every 5 Min.
 - More Advanced Settings...
 - Framing Rule:
 - Max Frame Length: 1300 (Byte)
 - Max Interval: 1 (Ms)

Buttons at the bottom: Get Default, Save As Default, Load Default, Modify Key, Firmware/Config, Restart Dev, Modify Setting, Cancel.

3.3 System Parameters

This interface is used to set and query basic parameters such as MODBUS slave address, working mode, RS485 communication parameters, channel instrument type, etc.

- 1) Communication query: The version number of the HART data collector can be queried.
- 2) System parameters: MODBUS slave address, RS485 communication parameters, channel instrument type and other parameter information can be read.
- 3) MODBUS slave address: Enter the 3-digit slave address and click "Set".
- 4) RS485 communication parameter settings: The user can select the baud rate, check bit and stop bit (default baud rate is 9600, check bit is None, and stop bit is 1stop bit) for RS485 communication according to the actual situation, and then click "Set". After the setting is successful, when the RS485 communication line is used for communication, the set baud rate and check bit need to be re-selected, and the serial port needs to be opened for normal communication.
- 5) Communication mode
 - ① MODBUS _ TCP (RTU): In this mode, the data of the collector is converted into standard MODBUS _ TCP and MODBUS _ RTU protocol for output.
 - ② USB interface transparent transmission: In this mode, the HART protocol can be used to communicate with the HART instrument connected through the USB serial communication line.
 - ③ RS485 interface transparent transmission: In this mode, the HART protocol can be used to communicate with the HART instrument connected through the RS485 communication line.
 - ④ Network port interface transparent transmission: In this mode, the HART protocol can be used to communicate with the HART instrument connected through the network cable.
- 6) Instrument type: select the corresponding instrument type according to the instrument model connected to each channel, and then click "Set".



3.4 Channel Parameter

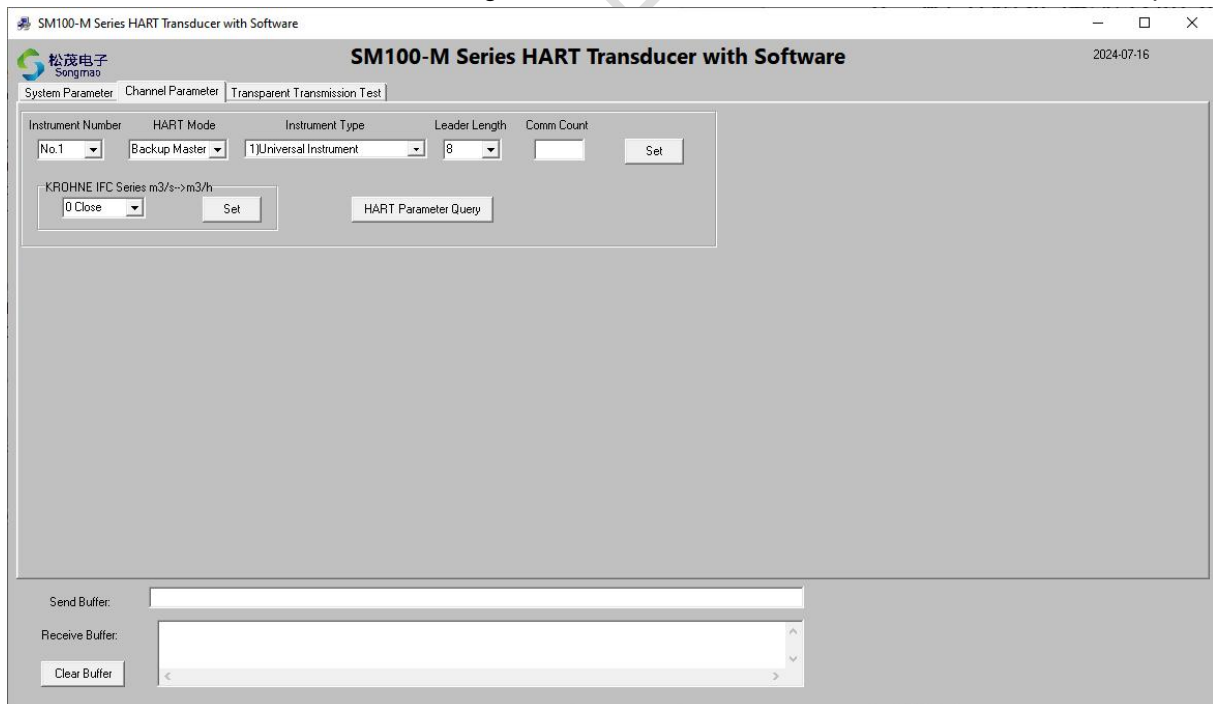
Click "HART Parameter Query" in the "Channel Parameter" interface, select the corresponding instrument number and instrument type according to the accessed instrument model and instrument channel, use the default value for other parameters, and then click "Set".

- 1) Instrument number: refers to the channel number of HART instrument connected to the collector.
- 2) HART mode: main equipment and auxiliary main equipment are available, which can be selected according to the needs of the instrument.
- 3) Instrument type: the instrument type shall be selected according to the actually connected instrument.

General Purpose Instruments--Suitable for most HART protocol instruments.

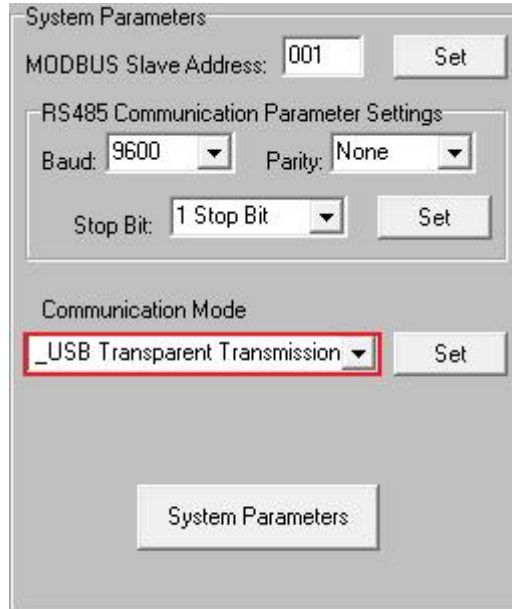
Special instrument--the instrument connected is not the instrument that the general HART command reads the data. If the model corresponds to the special instrument model, just select the model.

- 4) Leader length: the number of leader 'FF' of HART instruction.
- 5) Communication count: when the continuous communication between the collector and the HART instrument is abnormal, and the abnormal times exceed the communication times, the collector will clear the data.
- 6) KROHNE IFC series m3/s m3/h: connected to the Cologne flowmeter. To change the instantaneous flow rate into instantaneous flow, it is necessary to multiply the coefficient 3600. At this time, the enable in the "Cologne IFC series m3/s -- > m3/h" box should be set to "open".



3.5 Transparent Transmission Test

- 1) Set the working mode of the module: enter the "Transparent transmission test" interface, and set the working mode of the module as USB interface transparent transmission/RS485 interface transparent transmission/Ethernet interface transparent transmission in the "System parameter" interface. After setting, enter the "Transparent Transmission Test" interface.



- 2) Configure HART instrument parameters:

- ① Instrument number: refers to the channel number of HART instrument connected to the converter.
- ② HART command working mode: main mode and auxiliary main mode are available for selection, which can be selected according to the requirements of the instrument.
- ③ Preamble length: the 'FF' quantity of the leader of the HART instruction, which is generally 6 bytes.

- 3) HART Instrument basic parameters: basic parameter information of HART instrument can be queried.
- 4) Universal HART real-time data: The real-time data of general HART instruments can be read, but the real-time data of other customized instruments cannot be displayed.
- 5) Manual HART command: read the real-time data of HART instrument by manually inputting HART command.

SM100-M Series HART Transducer with Software

2024-07-16

System Parameter Channel Parameter Transparent Transmission Test

Instrument Number: No.1 HART Command Mode: Master Device Preamble Length: 6

HART Instrument Basic Parameters:

Manufacturing ID: 42

Sensor Type: 11

Preamble Byte Count: 5

Sensor Serial Number: 1211140

HART Device Parameter Query

Universal HART Real-time Data:

Current_Variable1: 2.646545 Unit: bar

Current_Variable2: 28.676384 Unit: °C

Current_Variable3: 27.623364 Unit: °C

Current_Variable4: 0.0874765 Unit: mbar

HART Command Query

HEX (76 89 FD AD)

Manual HART Command: Send

Send Buffer: 00 66 55 01 FF FF FF FF FF 82 00 00 00 00 03 00 81

Receive Buffer: 50 61 73 73 77 6F 72 64 20 69 73 20 65 72 72 6F 72 21

Clear Buffer

3.6 Mod Scan32 Communication Test

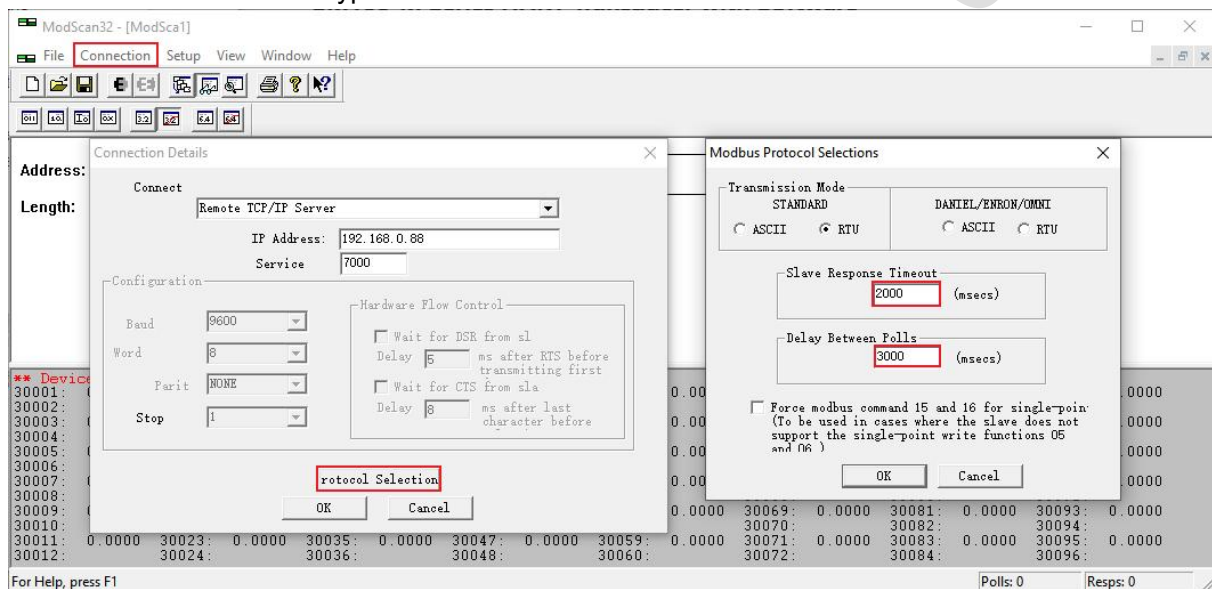
- 1) Set the working mode as "working mode" in the "system parameter" interface of the configuration software.
- 2) Close the serial port of the configuration software, open the Modscan32 software, click "connection", configure the appropriate parameters in the pop-up dialog box according to the arrow in the figure below, and then click OK.
- 3) Select the appropriate data format in the main window of modscan32 software, input the correct parameter information, and then click the "Connect" button to read the instrument data information.

Address-Address of MODBUS data start register

Device Id-MODBUS slave address

Length-read data length

MODBUS Point Type-Function Code



4. MODBUS Communication Protocol

When the RS485 interface is used for communication, the communication protocol is a standard MODBUS _ RTU protocol; The communication protocol is the standard MODBUS _ TCP protocol when using the.NET Ethernet interface for communication.

4.1 Real-Time Data Register Address Table

Use 04 function code when reading data.

Channel number	Instrument number	Data name	Data address	Data type	Data format	Mode of operation
1	1 (1 index)	Current value	30001 30002	IEE754	4321	Read only
		Primary variable 1	30003 30004	IEE754	4321	Read only
		Variable 2	30005 30006	IEE754	4321	Read only
		Variable 3	30007 30008	IEE754	4321	Read only
		Variable 4	30009 30010	IEE754	4321	Read only
		HART status	30011 30012	32 Bit	4321	Read only
2	1 (2 index)	Current value	30013 30014	IEE754	4321	Read only
		Primary variable 1	30015 30016	IEE754	4321	Read only
		Variable 2	30017 30018	IEE754	4321	Read only
		Variable 3	30019 30020	IEE754	4321	Read only
		Variable 4	30021 30022	IEE754	4321	Read only
		HART status	30023 30024	32 Bit	4321	Read only
3	1 (3 index)	Current value	30025 30026	IEE754	4321	Read only
		Primary variable 1	30027 30028	IEE754	4321	Read only
		Variable 2	30029 30030	IEE754	4321	Read only
		Variable 3	30031 30032	IEE754	4321	Read only
		Variable 4	30033 30034	IEE754	4321	Read only
		HART status	30035 30036	32 Bit	4321	Read only
.....						
.....						
32	1 (32 index)	Current value	30373 30374	IEE754	4321	Read only
		Primary variable 1	30375 30376	IEE754	4321	Read only

		Variable 2	30377	30378	IEE754	4321	Read only
		Variable 3	30379	30380	IEE754	4321	Read only
		Variable 4	30381	30382	IEE754	4321	Read only
		HART status	30383	30384	32 Bit	4321	Read only

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4.2 Instrument Parameter Register Address Table

Use 03 function code when reading parameters, use 06 function code when modifying a single register parameter, and use 10 function code when modifying multiple register parameters.

Instrument number	Data name	Data address	Data type	Data format	Mode of operation	Write the function code
	Device MODBUS address	40001	Uint16		Read/write	06
	RS485 baud rate	40002	Uint16		Read/write	06
	HART Instrument Type No.1	40003	Uint16		Read/write	06
	HART Instrument Type No.2	40004	Uint16		Read/write	06
	HART Instrument Type No.3	40005	Uint16		Read/write	06
	HART Instrument Type No.4	40006	Uint16		Read/write	06
	HART Instrument Type No.5	40007	Uint16		Read/write	06
	HART Instrument Type No.6	40008	Uint16		Read/write	06
	HART Instrument Type No.7	40009	Uint16		Read/write	06
	HART Instrument Type No.8	40010	Uint16		Read/write	06
	HART Instrument Type No.9	40011	Uint16		Read/write	06
	HART Instrument Type No.10	40012	Uint16		Read/write	06
	HART Instrument Type No.11	40013	Uint16		Read/write	06
	HART Instrument Type No.12	40014	Uint16		Read/write	06
	HART Instrument Type No.13	40015	Uint16		Read/write	06
	HART Instrument Type No.14	40016	Uint16		Read/write	06
	HART Instrument Type No.15	40017	Uint16		Read/write	06

	HART Instrument Type No.16	40018	Uint16		Read/wri te	06
	HART Instrument Type No.17	40019	Uint16		Read/wri te	06
	No.18 HART Instrument Type	40020	Uint16		Read/wri te	06
	HART Instrument Type No.19	40021	Uint16		Read/wri te	06
	HART Instrument Type No.20	40022	Uint16		Read/wri te	06
	HART Instrument Type No.21	40023	Uint16		Read/wri te	06
	HART Instrument Type No.22	40024	Uint16		Read/wri te	06
	No.23 HART Instrument Type	40025	Uint16		Read/wri te	06
	HART Instrument Type No.24	40026	Uint16		Read/wri te	06
	HART Instrument Type No.25	40027	Uint16		Read/wri te	06
	HART Instrument Type No.26	40028	Uint16		Read/wri te	06
	HART Instrument Type No.27	40029	Uint16		Read/wri te	06
	HART Instrument Type No.28	40030	Uint16		Read/wri te	06
	HART Instrument Type No.29	40031	Uint16		Read/wri te	06
	HART Instrument Type No.30	40032	Uint16		Read/wri te	06
	HART Instrument Type No.31	40033	Uint16		Read/wri te	06
	HART Instrument Type No.32	40034	Uint16		Read/wri te	06
	Local RFID number	40035 40036 40037 40038	Uint64		Read/wri te	10
	Spare	40039 40040				
1	Damping time of main variable	40041 40042	IEE754		Read/wri te	10

	Primary variable upper range limit	40043 40044	IEE754	4321	Read/wri te	10
	Primary variable lower range limit (zero point)	40045 40046	IEE754	4321	Read/wri te	10
	Main variable code	40047	Uint16		Read/wri te	06
	2 # variable code	40048	Uint16		Read	
	3 # variable code	40049	Uint16		Read	
	4 # variable code	40050	Uint16		Read	
	Manufacturer ID	40051	Uint16		Read	
	HART protocol version number	40052	Uint16		Read	
	HART ID Device Serial Number 1	40053 40054	Uint32	4321	Read	
	Device type	40055	Uint16		Read	
	Year	40056	Uint16		Read	
	Month	40057	Uint16		Read	
	Day	40058	Uint16		Read	
	Software version number	40059	Uint16		Read	
	Hardware version number	40060	Uint16		Read	
	Label	40061	Standard string		Read/wri te	10
		40062			Read/wri te	
		40063			Read/wri te	
		40064			Read/wri te	
	Descriptor	40065	Standard string		Read/wri te	10
		40066			Read/wri te	
		40067			Read/wri te	
		40068			Read/wri te	
		40069			Read/wri te	
		40070			Read/wri te	
	News	40071	Standard string		Read/wri te	10
		40072			Read/wri te	
		40073			Read/wri te	
		40074			Read/wri te	
		40075			Read/wri te	
		40076			Read/wri te	
		40077	Standard string		Read/wri te	10
		40078			Read/wri te	
		40079			Read/wri te	
		40080			Read/wri te	

		40081 40082			Read/wri te	
		40083 40084			Read/wri te	
		40085 40086			Read/wri te	
		40087 40088			Read/wri te	
	HART Device Fault Status	40089 40090	Uint32		Read	
	Channel ID	40091	Uint16		Read	
	Device status	40092	Uint16		Read	
	Communication success rate	40093 40094	IEE754	4321	Read	
	Fixed current output value	40095 40096	IEE754	4321	Write	10
	Type of temperature sensor	40097	Uint16		Read/wri te	10
	Wiring mode of temperature sensor	40098	Uint16		Read/wri te	
	Zero output of differential pressure transmitter	40099 40100	IEE754	4321	Read/wri te	10
	Upper limit of HART instrument measurement	40101 40102	IEE754	4321	Read	
	Lower limit of HART instrument measurement	40103 40104	IEE754	4321	Read	
	HART instrument measuring minimum scale	40105 40106	IEE754	4321	Read	
	Number of times the parameter was modified	40107 40108	Uint32	4321	Read	
	Current DC 4mA output	40109	Uint16		Write	06
	Current DC 20mA output	40110	Uint16		Write	06
	HART ID number	40111 40112	Uint32		Read/wri te	10
	Spare	40113 40114	Uint32			

	Spare	40115 40116	Uint32			
	Spare	40117 40118	Uint32			
	Spare	40119 40120	Uint32			
.....						
.....						
32	Damping time of main variable	42521 42522	IEE754		Read/write	10
	Primary variable upper range limit	42523 42524	IEE754	4321	Read/write	10
	Primary variable lower range limit (zero point)	42525 42526	IEE754	4321	Read/write	10
	Primary Variable Unit Code	42527	Uint16		Read/write	06
	2 # Variable Unit Code	42528	Uint16		Read	
	3 # Variable Unit Code	42529	Uint16		Read	
	4 # Variable Unit Code	42530	Uint16		Read	
	Manufacturer ID	42531	Uint16		Read	
	HART protocol version number	42532	Uint16		Read	
	HART ID Device Serial Number 1	42533 42534	Uint32	4321	Read	
	Device type	42535	Uint16		Read	
	Year	42536	Uint16		Read	
	Month	42537	Uint16		Read	
	Day	42538	Uint16		Read	
	Software version number	42539	Uint16		Read	
	Hardware version number	42540	Uint16		Read	
	Label	42541 42542	Standard string		Read/write	10
		42543 42544			Read/write	
	Descriptor	42545 42546	Standard string		Read/write	10
		42547 42548			Read/write	
		42549 42550			Read/write	

		42551 42552			Read/write	
	News	42553 42554	Standard string		Read/write	10
		42555 42556			Read/write	
		42557 42558			Read/write	
		42559 42560			Read/write	
		42561 42562			Read/write	
		42563 42564			Read/write	
		42565 42566			Read/write	
		42567 42568			Read/write	
	HART Device Fault Status	42569 42570	Uint32		Read	
	Channel ID	42571	Uint16		Read	
	Device status	42572	Uint16		Read	
	Communication success rate	42573 42574	IEE754	4321	Read	
	Fixed current output value	42575 42576	IEE754	4321	Write	10
	Type of temperature sensor	42577	Uint16		Read/write	10
	Wiring mode of temperature sensor	42578	Uint16		Read/write	
	Zero output of differential pressure transmitter	42579 42580	IEE754	4321	Read/write	10
	Upper limit of HART instrument measurement	42581 42582	IEE754	4321	Read	
	Lower limit of HART instrument measurement	42583 42584	IEE754	4321	Read	
	HART instrument measuring minimum scale	42585 42586	IEE754	4321	Read	

	Number of times the parameter was modified	42587 42588	Uint32	4321	Read	
	Current DC 4mA output	42589	Uint16		Write	06
	Current DC 20mA output	42590	Uint16		Write	06
	HART ID number	42591 42592	Uint32		Read/write	10
	Spare	42593 42594	Uint32			
	Spare	42595 42596	Uint32			
	Spare	42597 42598	Uint32			
	Spare	42599 42600	Uint32			

4.3 Read HART Instrument Real-Time Data and Instrument Parameter Examples

4.3.1 Read real-time data of HART instrument

1) Read the real-time data of HART instrument on 1 ~ 8 channels

Modbus Poll - Mbpoll1

File Connection Setup Functions Display View Window Help

05 06 15 16 22 23 101 ?

Mbpoll1

Tx = 58: Err = 0: ID = 1: F = 04: SR = 1000ms

30001 =	4.004883	30025 =	0.000000	30049 =	0.000000	30073 =	0.000000
30002 =		30026 =		30050 =		30074 =	
30003 =	0.001197	30027 =	0.000000	30051 =	0.000000	30075 =	0.000000
30004 =		30028 =		30052 =		30076 =	
30005 =	9.383409	30029 =	0.000000	30053 =	0.000000	30077 =	0.000000
30006 =		30030 =		30054 =		30078 =	
30007 =	0.000000	30031 =	0.000000	30055 =	0.000000	30079 =	0.000000
30008 =		30032 =		30056 =		30080 =	
30009 =	0.000000	30033 =	0.000000	30057 =	0.000000	30081 =	0.000000
30010 =		30034 =		30058 =		30082 =	
30011 =	0.000000	30035 =	0.000000	30059 =	0.000000	30083 =	0.000000
30012 =		30036 =		30060 =		30084 =	
30013 =	0.000000	30037 =	0.000000	30061 =	0.000000	30085 =	4.960934
30014 =		30038 =		30062 =		30086 =	
30015 =	0.000000	30039 =	0.000000	30063 =	0.000000	30087 =	0.002923
30016 =		30040 =		30064 =		30088 =	
30017 =	0.000000	30041 =	0.000000	30065 =	0.000000	30089 =	0.000424
30018 =		30042 =		30066 =		30090 =	
30019 =	0.000000	30043 =	0.000000	30067 =	0.000000	30091 =	8.476578
30020 =		30044 =		30068 =		30092 =	
30021 =	0.000000	30045 =	0.000000	30069 =	0.000000	30093 =	10.447110
30022 =		30046 =		30070 =		30094 =	
30023 =	0.000000	30047 =	0.000000	30071 =	0.000000	30095 =	0.000000
30024 =		30048 =		30072 =		30096 =	

2) Read the real-time data of HART instrument on 9 ~ 16 channels

Modbus Poll - Mbpoll1

File Connection Setup Functions Display View Window Help

05 06 15 16 22 23 101 ?

Mbpoll1

Tx = 4: Err = 0: ID = 1: F = 04: SR = 1000ms

30097 =	3.800000	30121 =	0.000000	30145 =	0.000000	30169 =	0.000000
30098 =		30122 =		30146 =		30170 =	
30099 =	-0.003615	30123 =	0.000000	30147 =	0.000000	30171 =	0.000000
30100 =		30124 =		30148 =		30172 =	
30101 =	7.748426	30125 =	0.000000	30149 =	0.000000	30173 =	0.000000
30102 =		30126 =		30150 =		30174 =	
30103 =	8.240662	30127 =	0.000000	30151 =	0.000000	30175 =	0.000000
30104 =		30128 =		30152 =		30176 =	
30105 =	-3.615391	30129 =	0.000000	30153 =	0.000000	30177 =	0.000000
30106 =		30130 =		30154 =		30178 =	
30107 =	0.000000	30131 =	0.000000	30155 =	0.000000	30179 =	0.000000
30108 =		30132 =		30156 =		30180 =	
30109 =	0.000000	30133 =	0.000000	30157 =	0.000000	30181 =	12.000000
30110 =		30134 =		30158 =		30182 =	
30111 =	0.000000	30135 =	0.000000	30159 =	0.000000	30183 =	8.817618
30112 =		30136 =		30160 =		30184 =	
30113 =	0.000000	30137 =	0.000000	30161 =	0.000000	30185 =	8.784986
30114 =		30138 =		30162 =		30186 =	
30115 =	0.000000	30139 =	0.000000	30163 =	0.000000	30187 =	8.817986
30116 =		30140 =		30164 =		30188 =	
30117 =	0.000000	30141 =	0.000000	30165 =	0.000000	30189 =	20.074022
30118 =		30142 =		30166 =		30190 =	
30119 =	0.000000	30143 =	0.000000	30167 =	0.000000	30191 =	2.002077
30120 =		30144 =		30168 =		30192 =	

3) Read the real-time data of HART instrument on 17 ~ 24 channels

Modbus Poll - Mbpoll1

File Connection Setup Functions Display View Window Help

05 06 15 16 22 23 101 ? ?

Mbpoll1

Tx = 3: Err = 0: ID = 1: F = 04: SR = 1000ms

30193 =	0.000000	30217 =	0.000000	30241 =	0.000000	30265 =	0.000000
30194 =		30218 =		30242 =		30266 =	
30195 =	0.000000	30219 =	0.000000	30243 =	0.000000	30267 =	0.000000
30196 =		30220 =		30244 =		30268 =	
30197 =	0.000000	30221 =	0.000000	30245 =	0.000000	30269 =	0.000000
30198 =		30222 =		30246 =		30270 =	
30199 =	0.000000	30223 =	0.000000	30247 =	0.000000	30271 =	0.000000
30200 =		30224 =		30248 =		30272 =	
30201 =	0.000000	30225 =	0.000000	30249 =	0.000000	30273 =	0.000000
30202 =		30226 =		30250 =		30274 =	
30203 =	0.000000	30227 =	0.000000	30251 =	0.000000	30275 =	0.000000
30204 =		30228 =		30252 =		30276 =	
30205 =	0.000000	30229 =	0.000000	30253 =	0.000000	30277 =	3.200000
30206 =		30230 =		30254 =		30278 =	
30207 =	0.000000	30231 =	0.000000	30255 =	0.000000	30279 =	-0.293610
30208 =		30232 =		30256 =		30280 =	
30209 =	0.000000	30233 =	0.000000	30257 =	0.000000	30281 =	8.941805
30210 =		30234 =		30258 =		30282 =	
30211 =	0.000000	30235 =	0.000000	30259 =	0.000000	30283 =	-24.126871
30212 =		30236 =		30260 =		30284 =	
30213 =	0.000000	30237 =	0.000000	30261 =	0.000000	30285 =	0.000000
30214 =		30238 =		30262 =		30286 =	
30215 =	0.000000	30239 =	0.000000	30263 =	0.000000	30287 =	0.000000
30216 =		30240 =		30264 =		30288 =	

4) Read the real-time data of HART instrument on 25 ~ 32 channels

Modbus Poll - Mbpoll1

File Connection Setup Functions Display View Window Help

05 06 15 16 22 23 101 ? ?

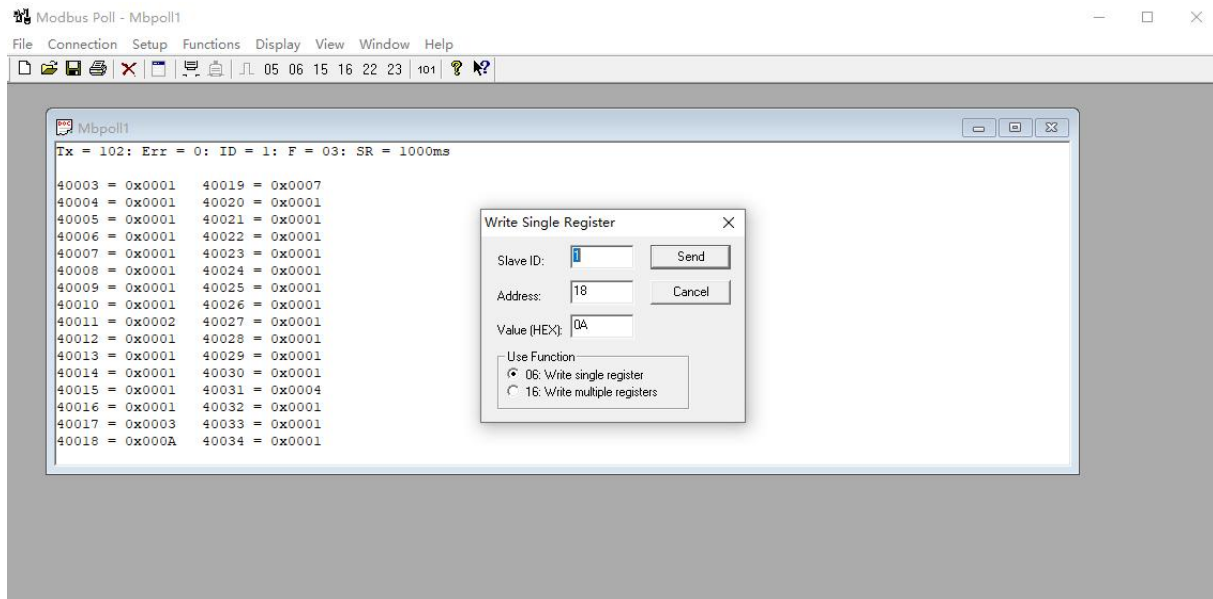
Mbpoll1

Tx = 3: Err = 0: ID = 1: F = 04: SR = 1000ms

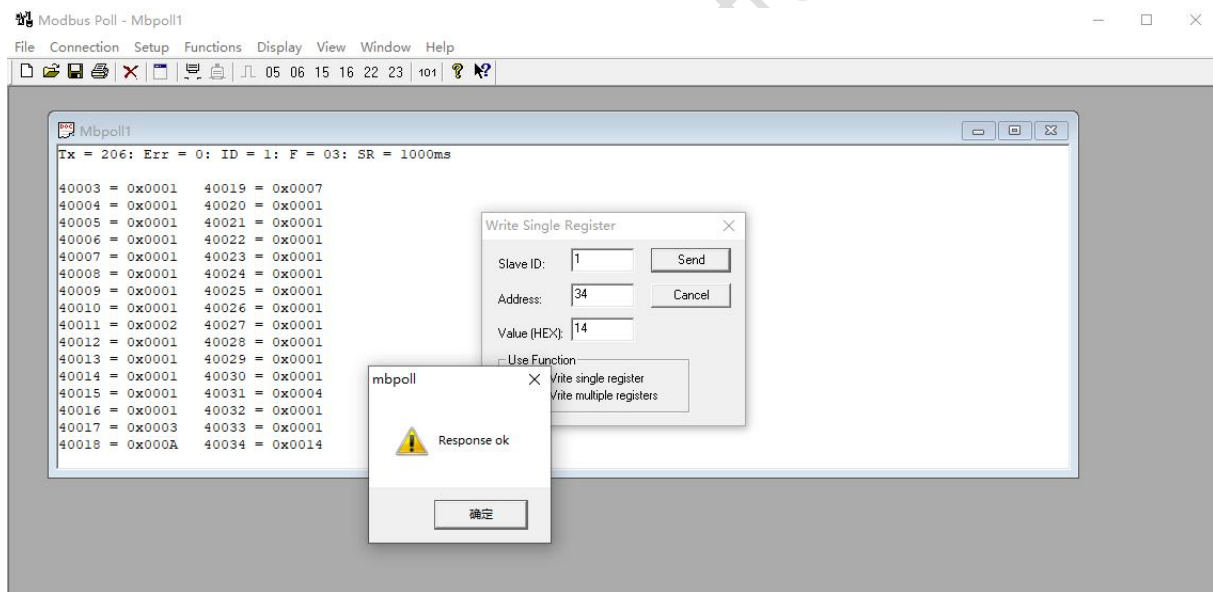
30289 =	6.462000	30313 =	0.000000	30337 =	0.000000	30361 =	0.000000
30290 =		30314 =		30338 =		30362 =	
30291 =	0.000000	30315 =	0.000000	30339 =	0.000000	30363 =	0.000000
30292 =		30316 =		30340 =		30364 =	
30293 =	15.387501	30317 =	0.000000	30341 =	0.000000	30365 =	0.000000
30294 =		30318 =		30342 =		30366 =	
30295 =	11.000000	30319 =	0.000000	30343 =	0.000000	30367 =	0.000000
30296 =		30320 =		30344 =		30368 =	
30297 =	25470.347656	30321 =	0.000000	30345 =	0.000000	30369 =	0.000000
30298 =		30322 =		30346 =		30370 =	
30299 =	0.000000	30323 =	0.000000	30347 =	0.000000	30371 =	0.000000
30300 =		30324 =		30348 =		30372 =	
30301 =	0.000000	30325 =	0.000000	30349 =	0.000000	30373 =	12.000000
30302 =		30326 =		30350 =		30374 =	
30303 =	0.000000	30327 =	0.000000	30351 =	0.000000	30375 =	45.958008
30304 =		30328 =		30352 =		30376 =	
30305 =	0.000000	30329 =	0.000000	30353 =	0.000000	30377 =	11.617035
30306 =		30330 =		30354 =		30378 =	
30307 =	0.000000	30331 =	0.000000	30355 =	0.000000	30379 =	1.#QNAN0
30308 =		30332 =		30356 =		30380 =	
30309 =	0.000000	30333 =	0.000000	30357 =	0.000000	30381 =	1.#QNAN0
30310 =		30334 =		30358 =		30382 =	
30311 =	0.000000	30335 =	0.000000	30359 =	0.000000	30383 =	0.000000
30312 =		30336 =		30360 =		30384 =	

4.3.2 Setting the instrument type

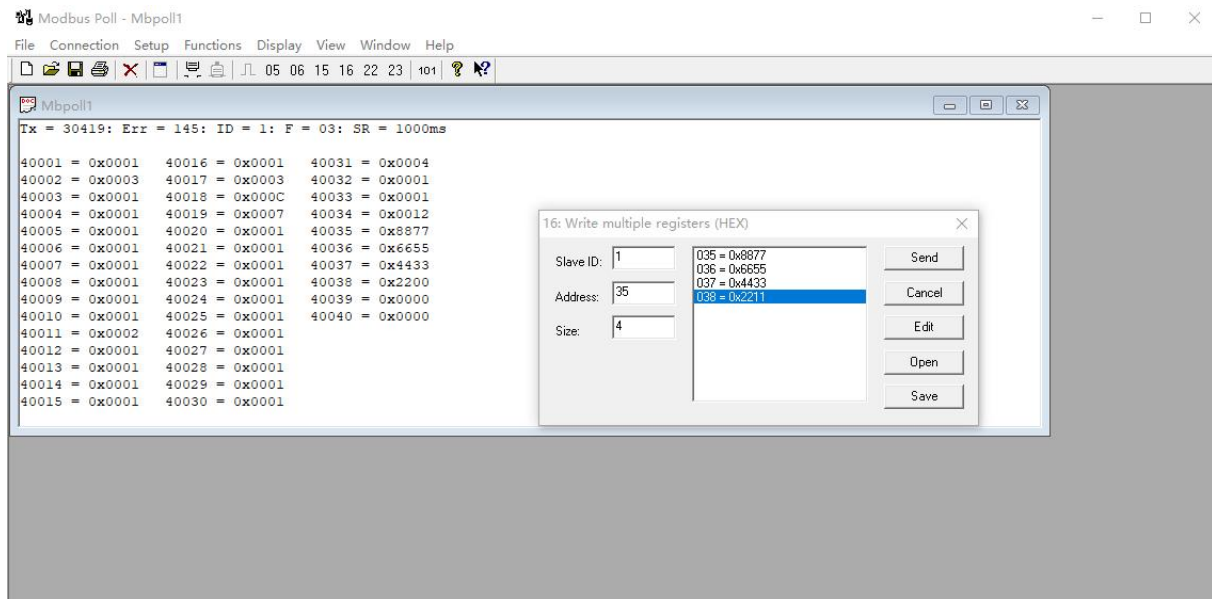
1) Set 16-channel instrument type



2) Set up 32-channel instrument type

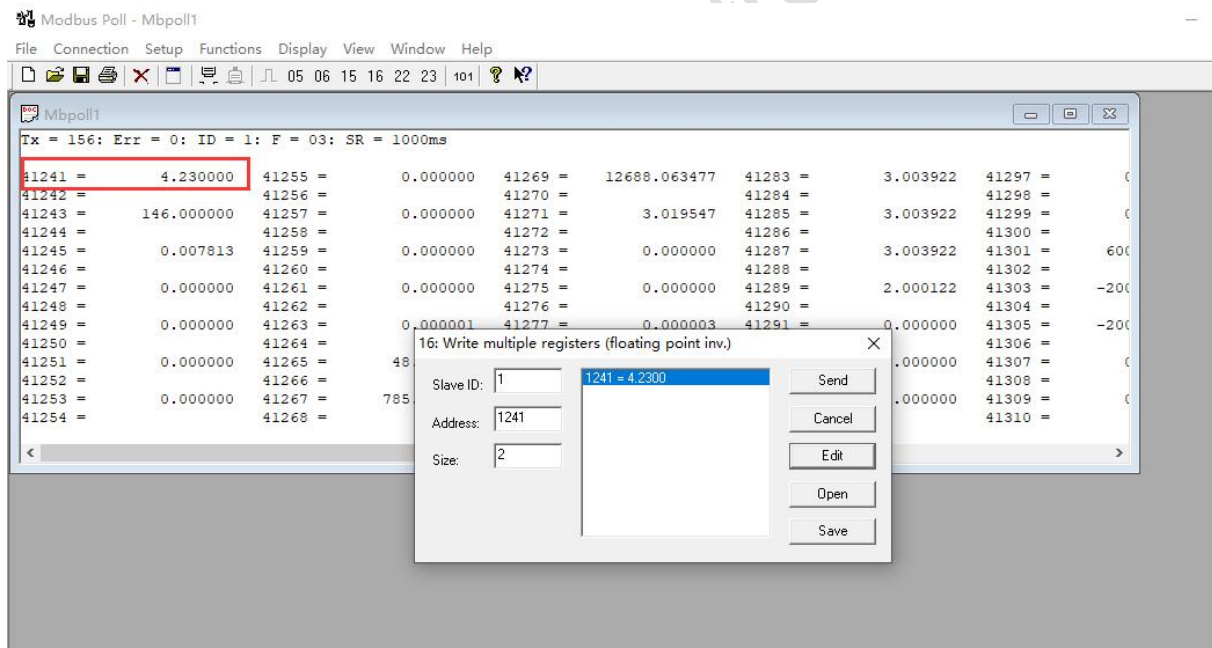


4.3.3 Set the local RFID number

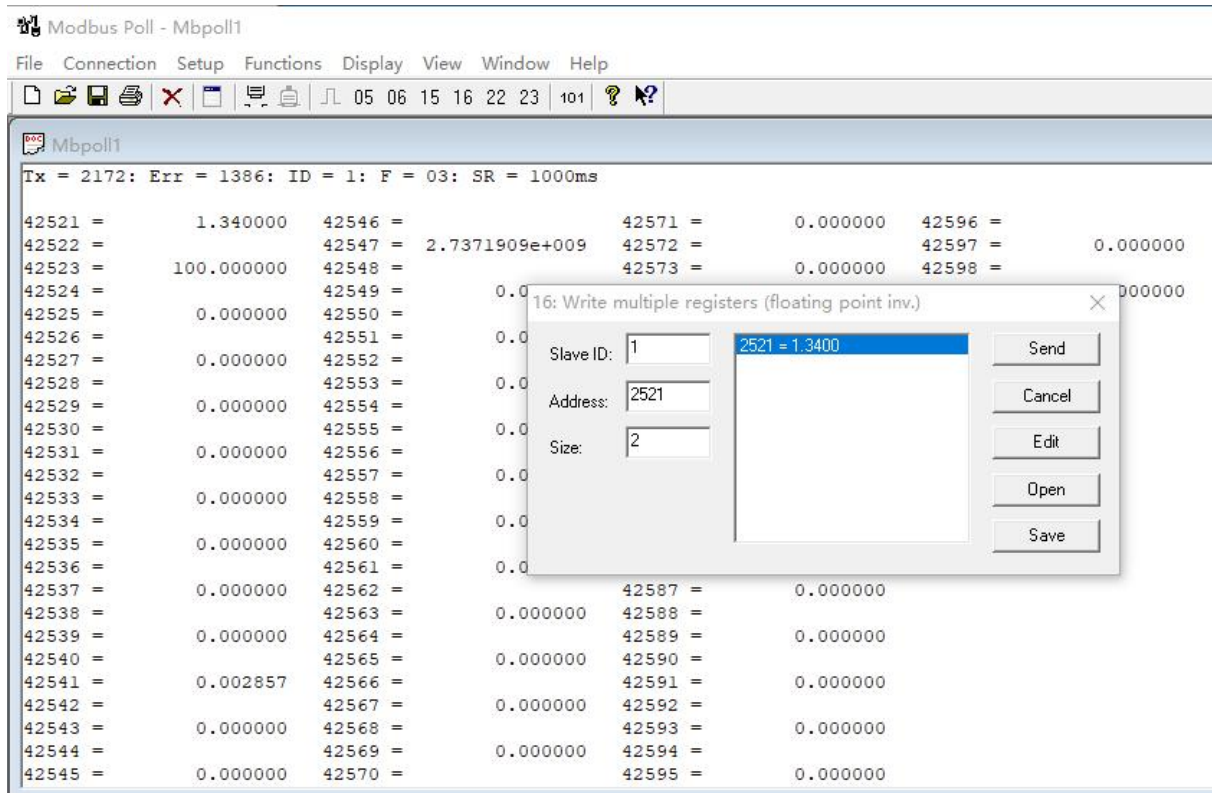


4.3.4 Setting the damping time of the main variable

1) Set the main variable damping time of 16 channels

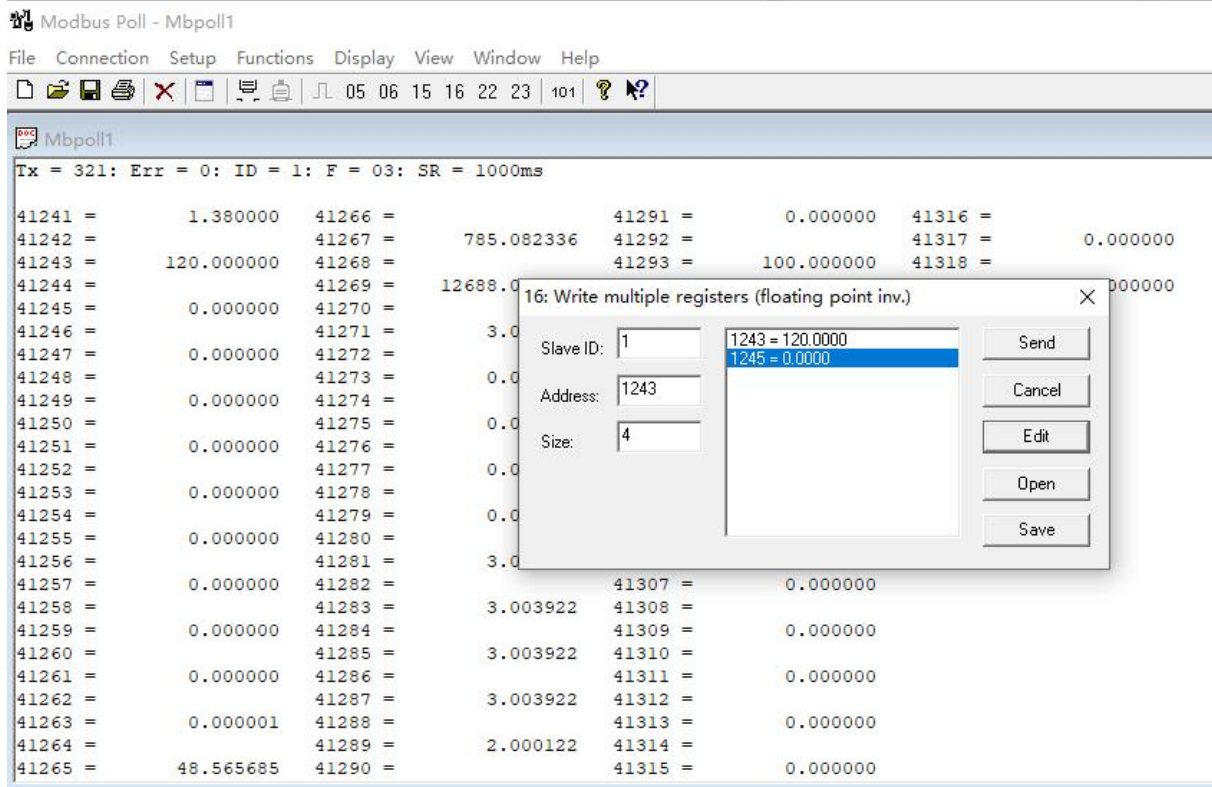


2) Set the main variable damping time of 32 channels

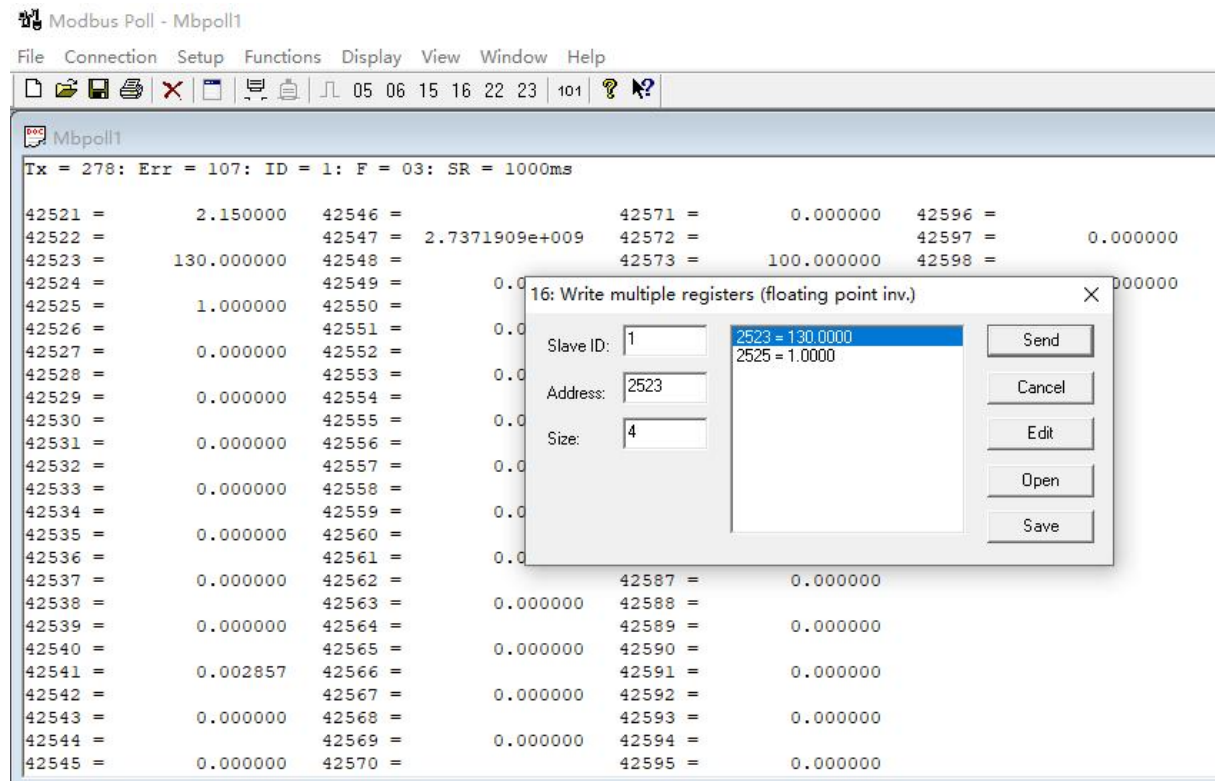


4.3.5 Set the upper limit and lower limit of the main variable range

1) Set the upper limit and lower limit of the main variable range of 16 channels

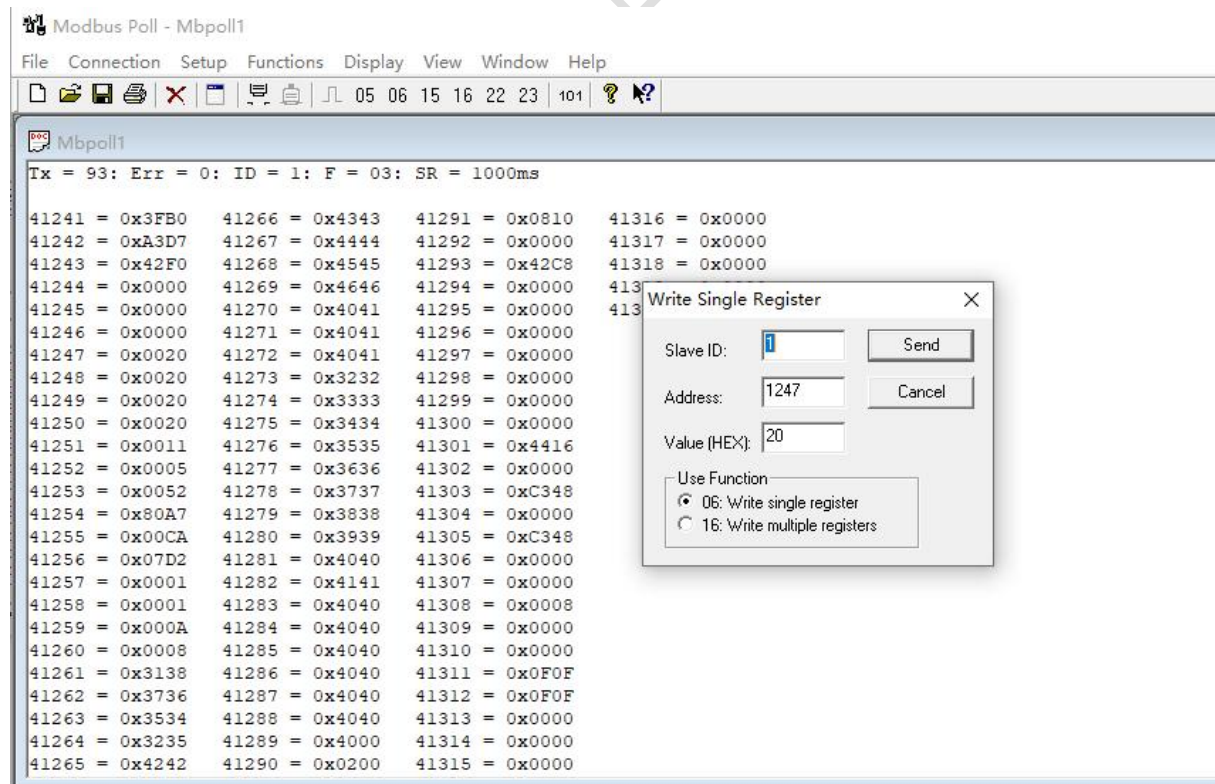


2) Set the upper limit and lower limit of the main variable range of 32 channels

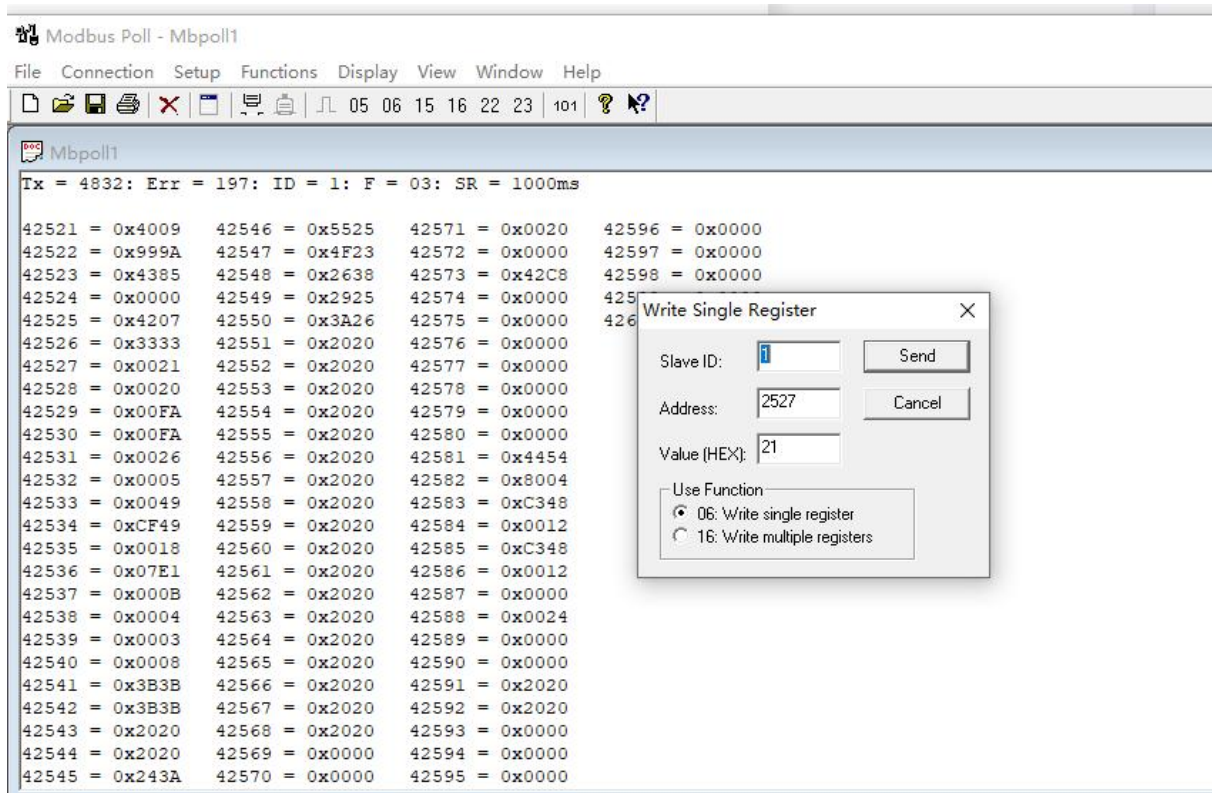


4.3.6 Set Primary Variable Unit Code

1) Set 16-channel primary variable unit code

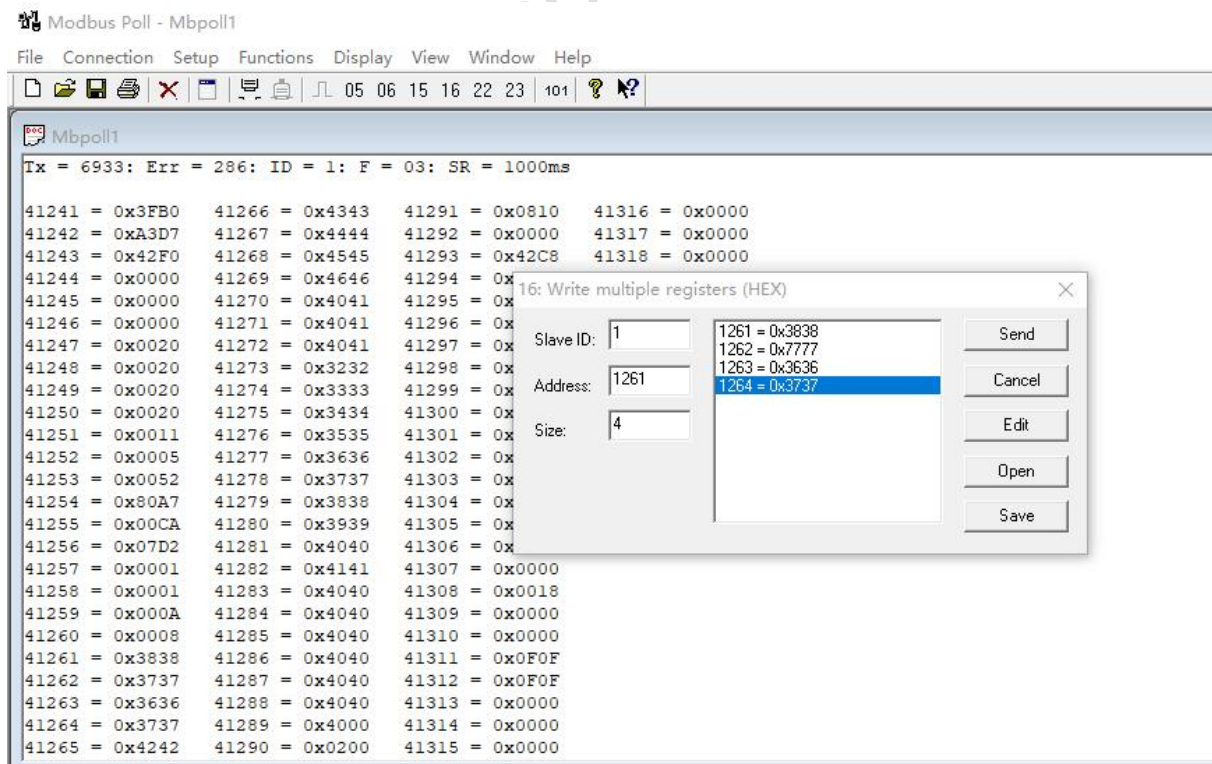


2) Set 32-channel primary variable unit code

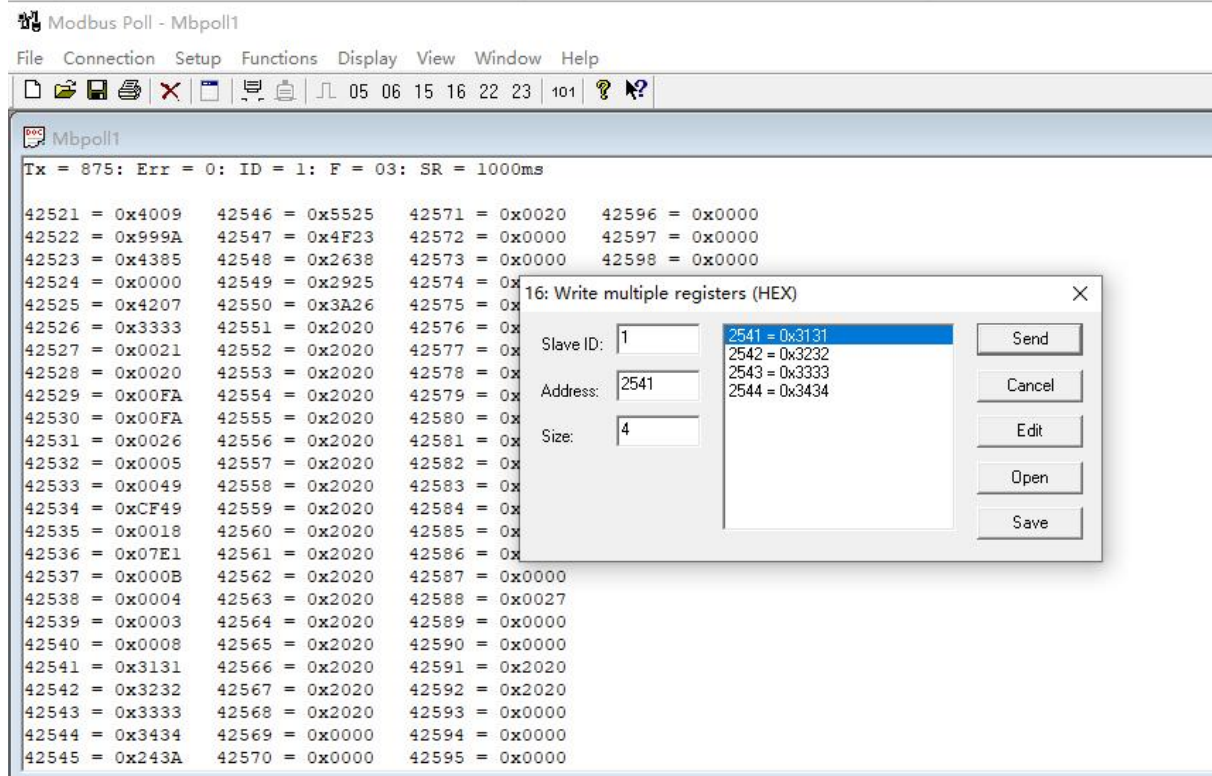


4.3.7 Setting the label

1) Set the 16-channel label

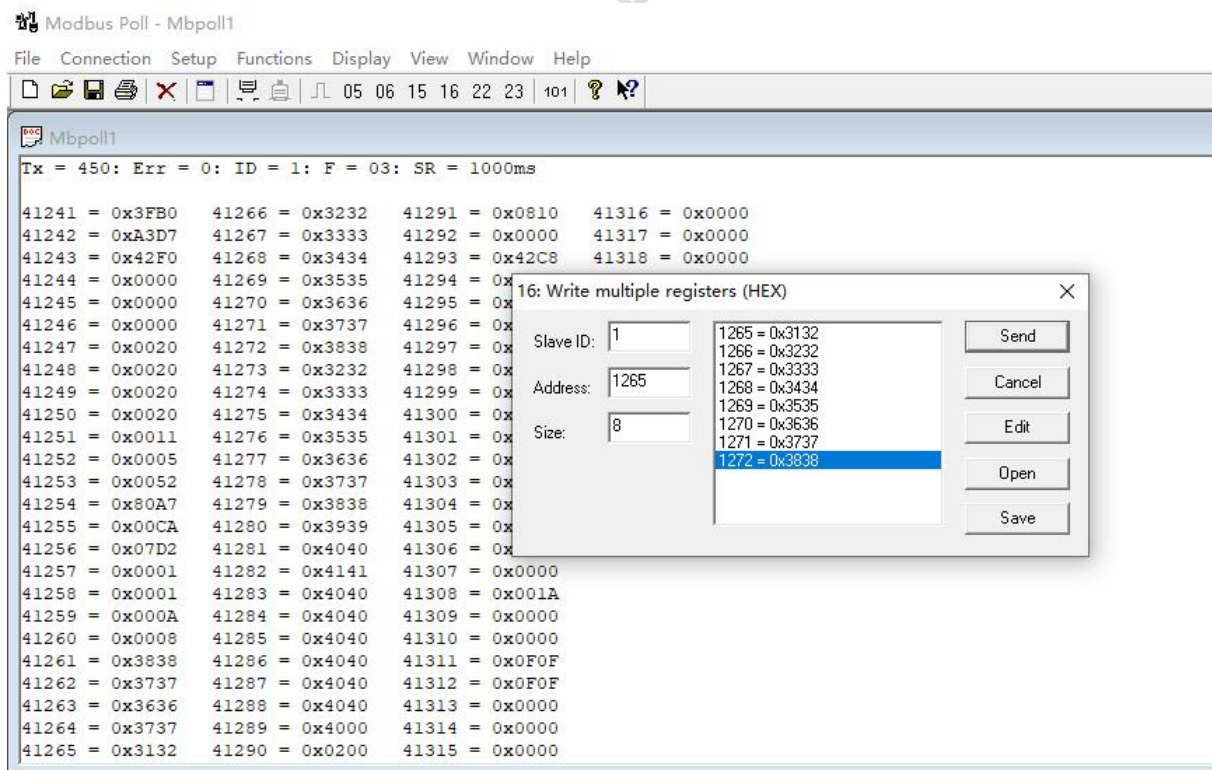


2) Set the 32-channel label



4.3.8 Set Descriptor

1) Set 16-channel descriptor



2) Set 32 channel descriptor

Modbus Poll - Mbpoll1

File Connection Setup Functions Display View Window Help

05 06 15 16 22 23 101 ?

Mbpoll1

Tx = 1148: Err = 0: ID = 1: F = 03: SR = 1000ms

42521 = 0x4009	42546 = 0x3232	42571 = 0x0020	42596 = 0x0000
42522 = 0x999A	42547 = 0x3333	42572 = 0x0000	42597 = 0x0000
42523 = 0x4385	42548 = 0x3434	42573 = 0x0000	42598 = 0x0000
42524 = 0x0000	42549 = 0x3131	42574 = 0x0000	
42525 = 0x4207	42550 = 0x3333	42575 = 0x0000	
42526 = 0x3333	42551 = 0x3636	42576 = 0x0000	
42527 = 0x0021	42552 = 0x3737	42577 = 0x0000	
42528 = 0x0020	42553 = 0x2020	42578 = 0x0000	
42529 = 0x00FA	42554 = 0x2020	42579 = 0x0000	
42530 = 0x00FA	42555 = 0x2020	42580 = 0x0000	
42531 = 0x0026	42556 = 0x2020	42581 = 0x0000	
42532 = 0x0005	42557 = 0x2020	42582 = 0x0000	
42533 = 0x0049	42558 = 0x2020	42583 = 0x0000	
42534 = 0xCF49	42559 = 0x2020	42584 = 0x0000	
42535 = 0x0018	42560 = 0x2020	42585 = 0x0000	
42536 = 0x07E1	42561 = 0x2020	42586 = 0x0000	
42537 = 0x000B	42562 = 0x2020	42587 = 0x0000	
42538 = 0x0004	42563 = 0x2020	42588 = 0x0029	
42539 = 0x0003	42564 = 0x2020	42589 = 0x0000	
42540 = 0x0008	42565 = 0x2020	42590 = 0x0000	
42541 = 0x3131	42566 = 0x2020	42591 = 0x2020	
42542 = 0x3232	42567 = 0x2020	42592 = 0x2020	
42543 = 0x3333	42568 = 0x2020	42593 = 0x0000	
42544 = 0x3434	42569 = 0x0000	42594 = 0x0000	
42545 = 0x3131	42570 = 0x0000	42595 = 0x0000	

16: Write multiple registers (HEX)

Slave ID: 1

Address: 2545

Size: 8

2545 = 0x3131
2546 = 0x3232
2547 = 0x3333
2548 = 0x3434
2549 = 0x3131
2550 = 0x3333
2551 = 0x3636
2552 = 0x3737

Send Cancel Edit Open Save

4.3.9 Set Message

1) Set 16-channel message

Modbus Poll - Mbpoll1

File Connection Setup Functions Display View Window Help

05 06 15 16 22 23 101 ?

Mbpoll1

Tx = 2845: Err = 0: ID = 1: F = 03: SR = 1000ms

41241 = 0x3FB0	41266 = 0x3232	41291 = 0x0810	41316 = 0x0000
41242 = 0xA3D7	41267 = 0x3333	41292 = 0x0000	41317 = 0x0000
41243 = 0x42F0	41268 = 0x3434	41293 = 0x42C8	41318 = 0x0000
41244 = 0x0000	41269 = 0x3535	41294 = 0x0000	
41245 = 0x0000	41270 = 0x3636	41295 = 0x0000	
41246 = 0x0000	41271 = 0x3737	41296 = 0x0000	
41247 = 0x0020	41272 = 0x3838	41297 = 0x0000	
41248 = 0x0020	41273 = 0x3132	41298 = 0x0000	
41249 = 0x0020	41274 = 0x3232	41299 = 0x0000	
41250 = 0x0020	41275 = 0x3333	41300 = 0x0000	
41251 = 0x0011	41276 = 0x3434	41301 = 0x0000	
41252 = 0x0005	41277 = 0x3535	41302 = 0x0000	
41253 = 0x0052	41278 = 0x3636	41303 = 0x0000	
41254 = 0x80A7	41279 = 0x3737	41304 = 0x0000	
41255 = 0x00CA	41280 = 0x3838	41305 = 0x0000	
41256 = 0x07D2	41281 = 0x4020	41306 = 0x0000	
41257 = 0x0001	41282 = 0x4020	41307 = 0x0000	
41258 = 0x0001	41283 = 0x4051	41308 = 0x001D	
41259 = 0x000A	41284 = 0x4045	41309 = 0x0000	
41260 = 0x0008	41285 = 0x4052	41310 = 0x0000	
41261 = 0x3838	41286 = 0x4027	41311 = 0x0F0F	
41262 = 0x3737	41287 = 0x3535	41312 = 0x0F0F	
41263 = 0x3636	41288 = 0x3636	41313 = 0x0000	
41264 = 0x3737	41289 = 0x4000	41314 = 0x0000	
41265 = 0x3132	41290 = 0x0200	41315 = 0x0000	

16: Write multiple registers (HEX)

Slave ID: 1

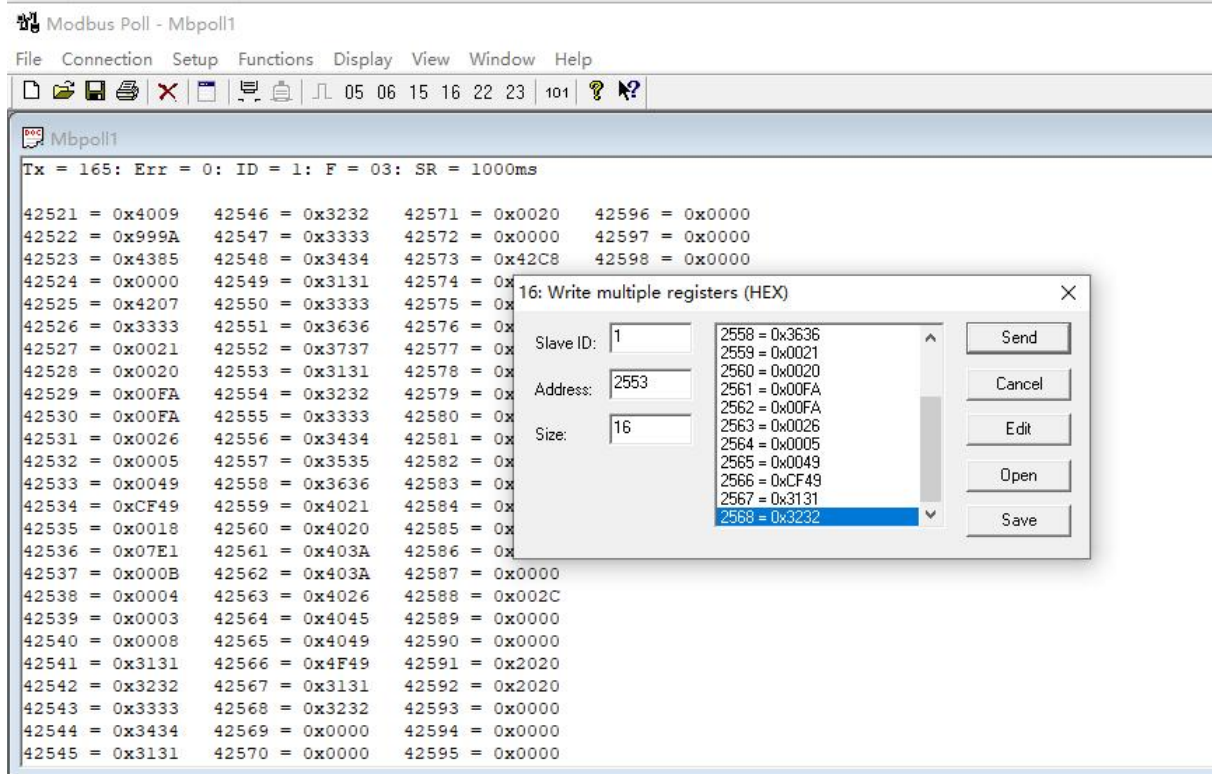
Address: 1273

Size: 16

1278 = 0x3636
1279 = 0x3737
1280 = 0x3838
1281 = 0x0020
1282 = 0x0020
1283 = 0x0011
1284 = 0x0005
1285 = 0x0052
1286 = 0x80A7
1287 = 0x3535
1288 = 0x3636

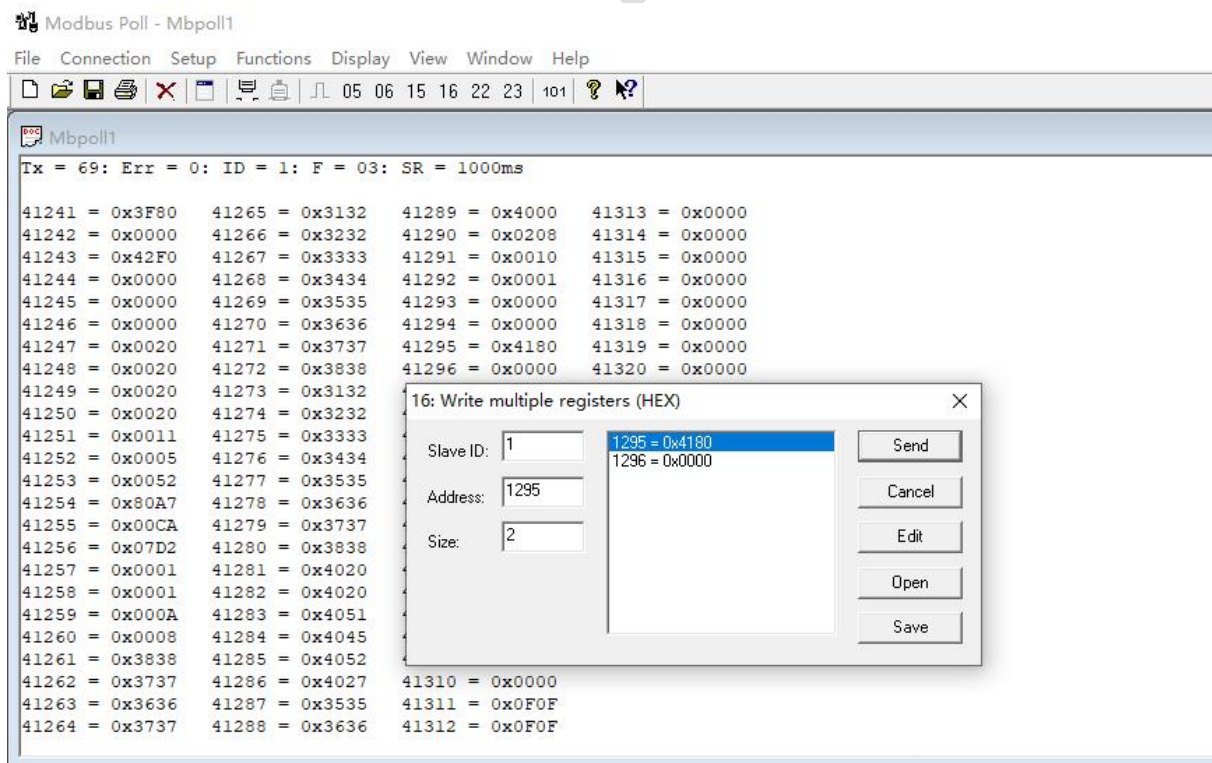
Send Cancel Edit Open Save

2) Set 32 channel message

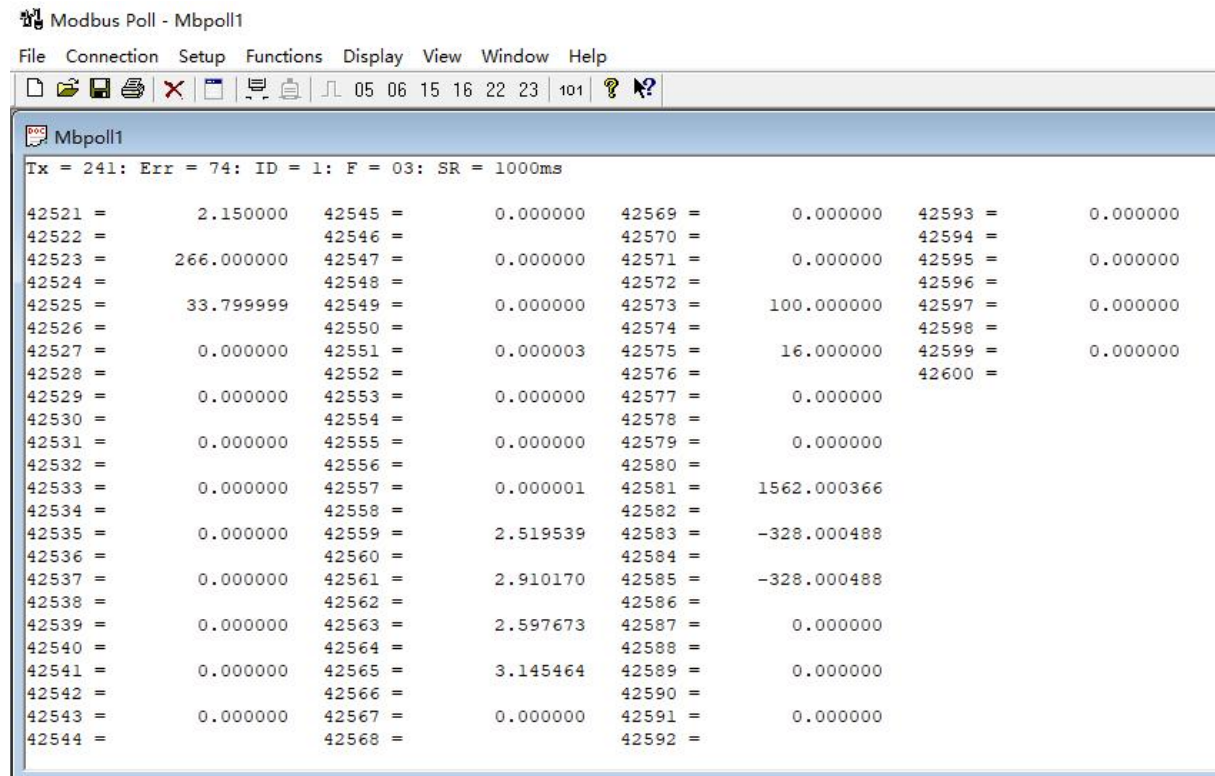


4.3.10 Setting the fixed current output value

1) Set the 16-channel fixed current output value

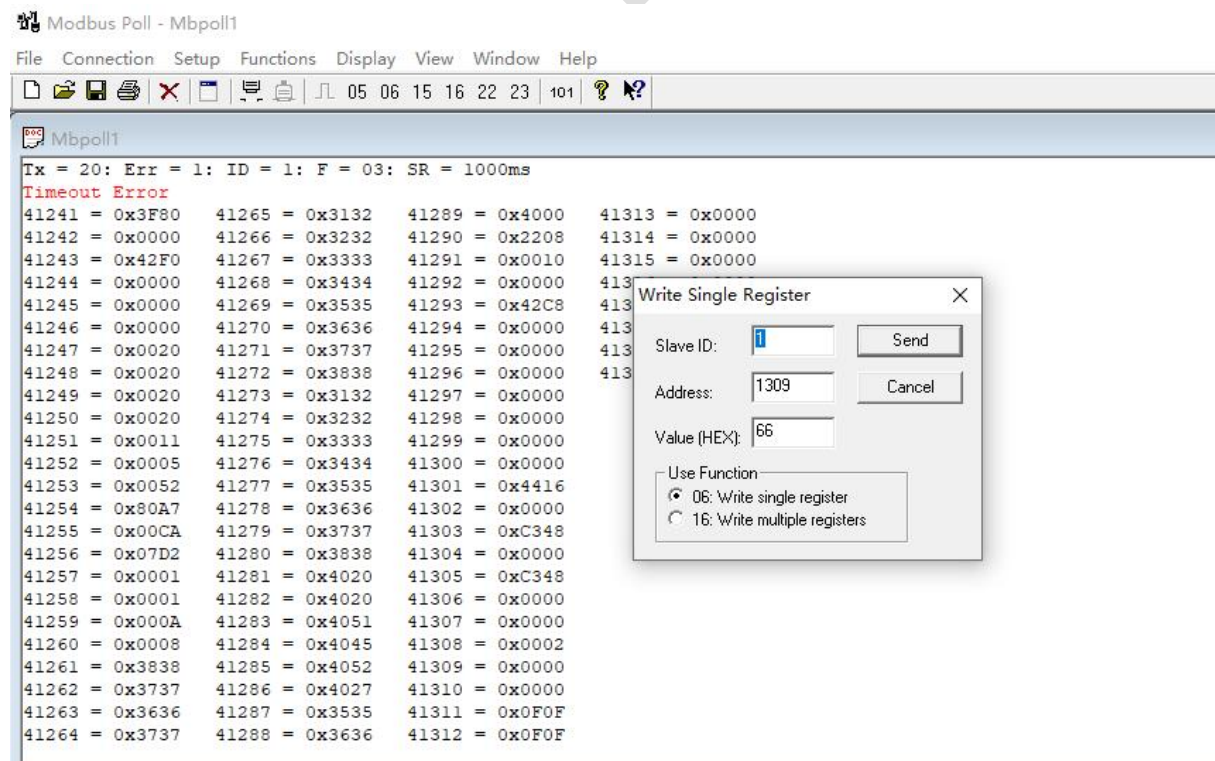


2) Set the fixed current output value of 32 channels



4.3.11 Set zero point (4mA)

1) Set 16-channel zero point (4mA)



2) Set 32-channel zero point (4mA)

Modbus Poll - Mbpoll1

File Connection Setup Functions Display View Window Help

05 06 15 16 22 23 101 ?

Mbpoll1

Tx = 248: Err = 0: ID = 1: F = 03: SR = 1000ms

42521 = 0x4009	42545 = 0x3131	42569 = 0x0000	42593 = 0x0000
42522 = 0x999A	42546 = 0x3232	42570 = 0x0000	42594 = 0x0000
42523 = 0x4385	42547 = 0x3333	42571 = 0x0020	42595 = 0x0000
42524 = 0x0000	42548 = 0x3434	42572 = 0x0000	
42525 = 0x4207	42549 = 0x3131	42573 = 0x42C8	
42526 = 0x3333	42550 = 0x3333	42574 = 0x0000	
42527 = 0x0021	42551 = 0x3636	42575 = 0x4140	
42528 = 0x0020	42552 = 0x3737	42576 = 0x0000	
42529 = 0x00FA	42553 = 0x3131	42577 = 0x0000	
42530 = 0x00FA	42554 = 0x3232	42578 = 0x0000	
42531 = 0x0026	42555 = 0x3333	42579 = 0x0000	
42532 = 0x0005	42556 = 0x3434	42580 = 0x0000	
42533 = 0x0049	42557 = 0x3535	42581 = 0x44C3	
42534 = 0xCF49	42558 = 0x3636	42582 = 0x4003	
42535 = 0x0018	42559 = 0x4021	42583 = 0xC3A4	
42536 = 0x07E1	42560 = 0x4020	42584 = 0x0010	
42537 = 0x000B	42561 = 0x403A	42585 = 0xC3A4	
42538 = 0x0004	42562 = 0x403A	42586 = 0x0010	
42539 = 0x0003	42563 = 0x4026	42587 = 0x0000	
42540 = 0x0008	42564 = 0x4045	42588 = 0x0031	
42541 = 0x3131	42565 = 0x4049	42589 = 0x0000	
42542 = 0x3232	42566 = 0x4F49	42590 = 0x0000	
42543 = 0x3333	42567 = 0x3131	42591 = 0x2020	
42544 = 0x3434	42568 = 0x3232	42592 = 0x2020	

Write Single Register

Slave ID: 1 Send

Address: 2589 Cancel

Value (HEX): 66

Use Function

06: Write single register registers

Response ok

确定

4.3.12 Set Full Scale (20 mA)

1) Set 16 channel full scale (20 mA)

Modbus Poll - Mbpoll1

File Connection Setup Functions Display View Window Help

05 06 15 16 22 23 101 ?

Mbpoll1

Tx = 47: Err = 14: ID = 1: F = 03: SR = 1000ms

Timeout Error

41241 = 0x3F80	41265 = 0x3132	41289 = 0x4000	41313 = 0x0000
41242 = 0x0000	41266 = 0x3232	41290 = 0x2208	41314 = 0x0000
41243 = 0x42F0	41267 = 0x3333	41291 = 0x0010	41315 = 0x0000
41244 = 0x0000	41268 = 0x3434	41292 = 0x0000	
41245 = 0x0000	41269 = 0x3535	41293 = 0x42C8	
41246 = 0x0000	41270 = 0x3636	41294 = 0x0000	
41247 = 0x0020	41271 = 0x3737	41295 = 0x0000	
41248 = 0x0020	41272 = 0x3838	41296 = 0x0000	
41249 = 0x0020	41273 = 0x3132	41297 = 0x0000	
41250 = 0x0020	41274 = 0x3232	41298 = 0x0000	
41251 = 0x0011	41275 = 0x3333	41299 = 0x0000	
41252 = 0x0005	41276 = 0x3434	41300 = 0x0000	
41253 = 0x0052	41277 = 0x3535	41301 = 0x4416	
41254 = 0x80A7	41278 = 0x3636	41302 = 0x0000	
41255 = 0x00CA	41279 = 0x3737	41303 = 0xC348	
41256 = 0x07D2	41280 = 0x3838	41304 = 0x0000	
41257 = 0x0001	41281 = 0x4020	41305 = 0xC348	
41258 = 0x0001	41282 = 0x4020	41306 = 0x0000	
41259 = 0x000A	41283 = 0x4051	41307 = 0x0000	
41260 = 0x0008	41284 = 0x4045	41308 = 0x0004	
41261 = 0x3838	41285 = 0x4052	41309 = 0x0000	
41262 = 0x3737	41286 = 0x4027	41310 = 0x0000	
41263 = 0x3636	41287 = 0x3535	41311 = 0x0F0F	
41264 = 0x3737	41288 = 0x3636	41312 = 0x0F0F	

Write Single Register

Slave ID: 1 Send

Address: 1310 Cancel

Value (HEX): 66

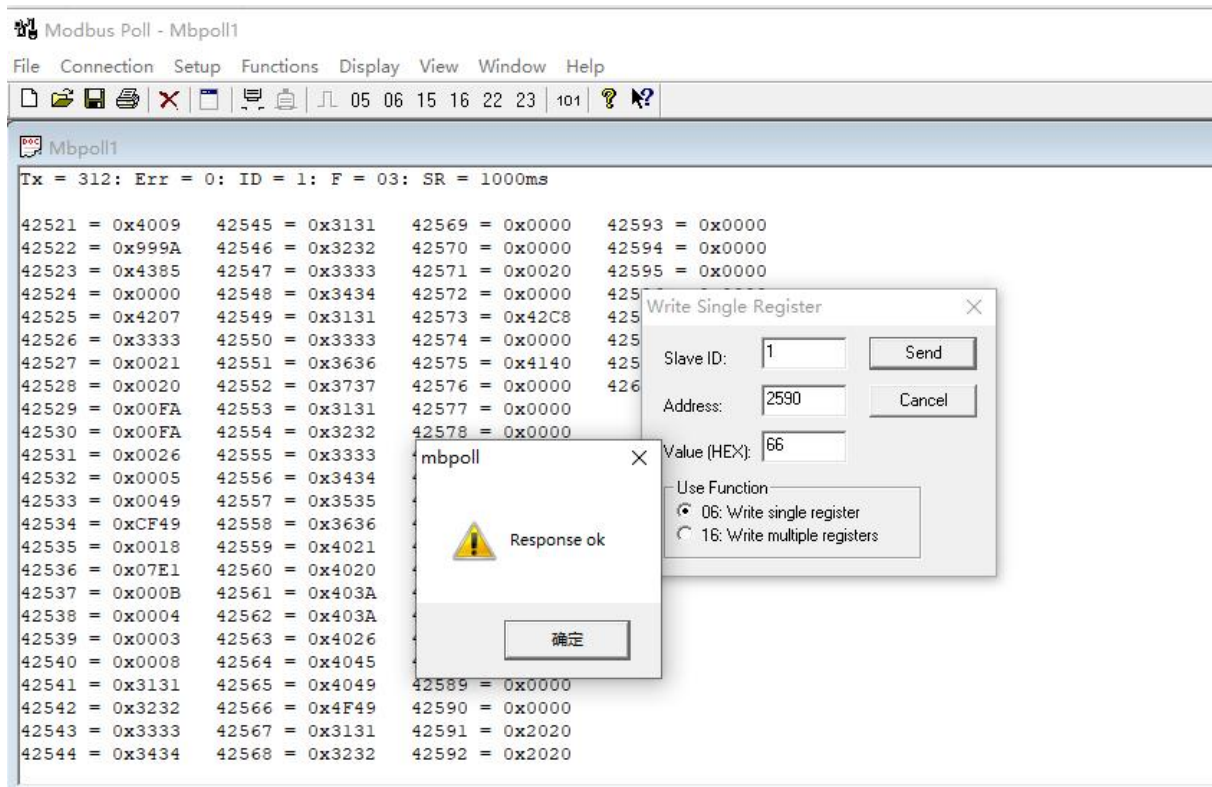
Use Function

06: Write single register

Response ok

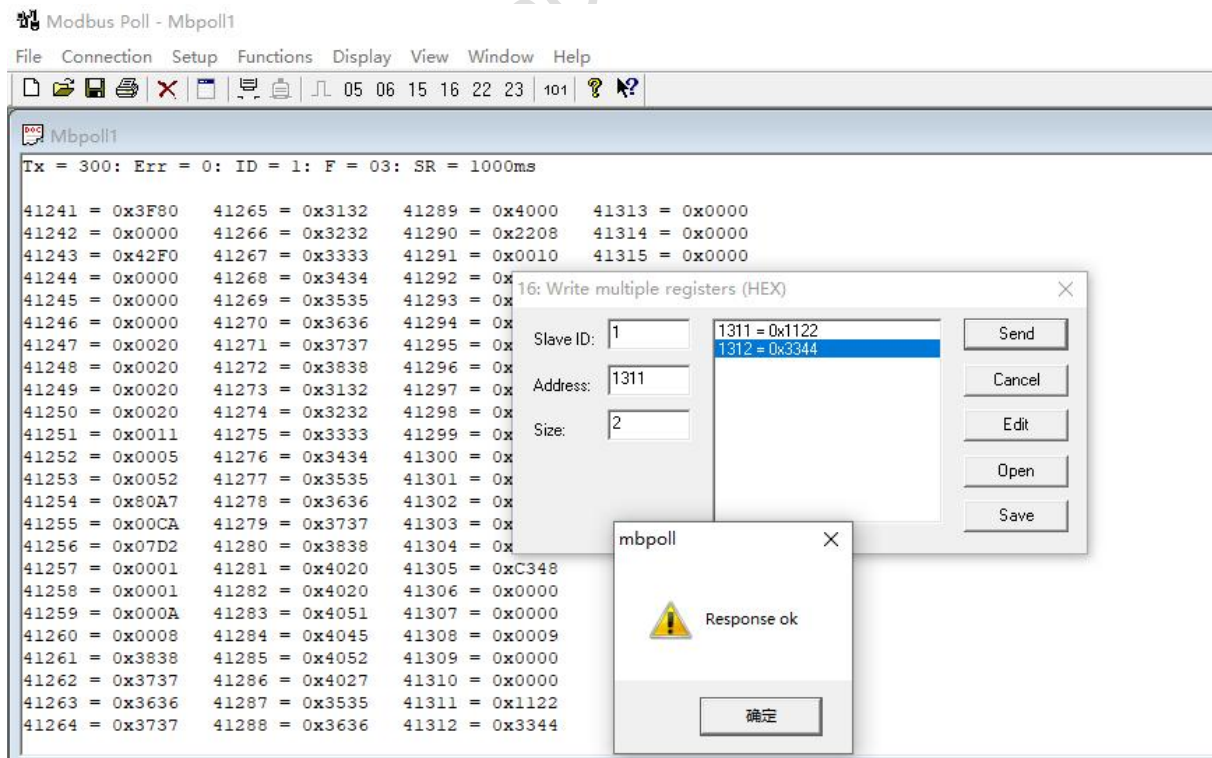
确定

2) Set 32 channel full scale (20 mA)

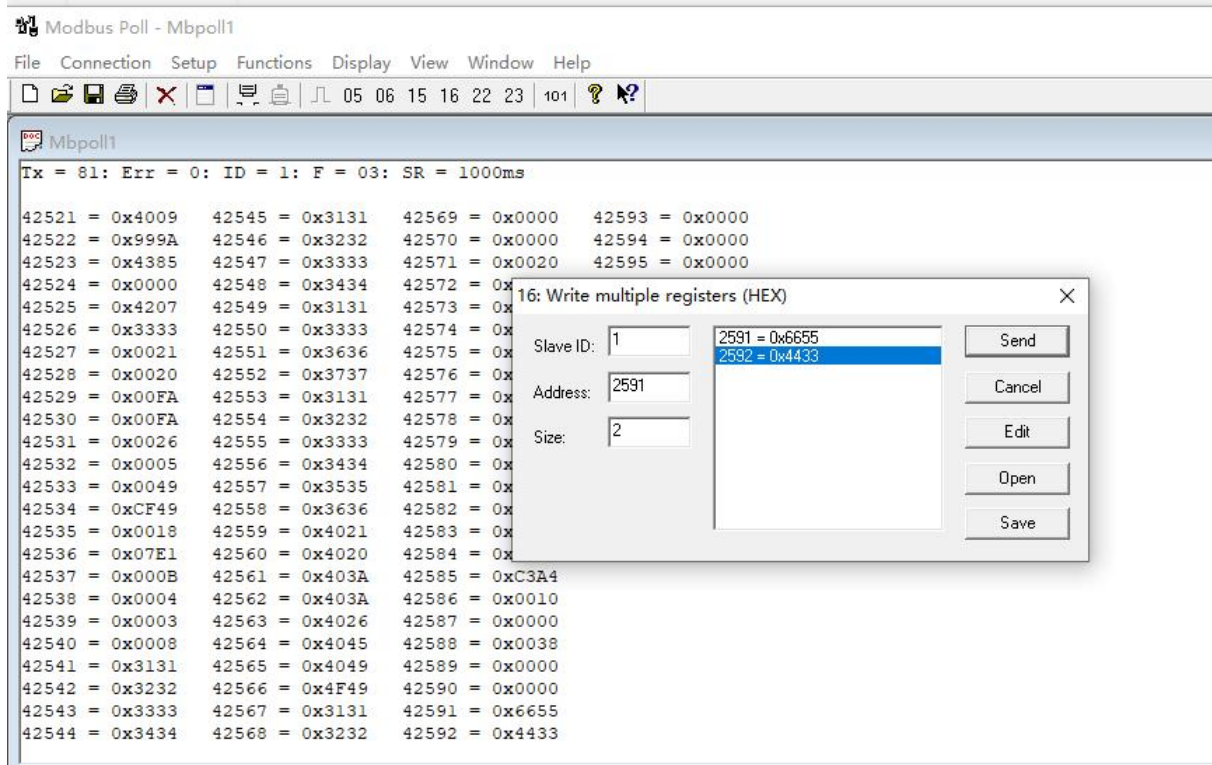


4.3.13 Set Channel ID

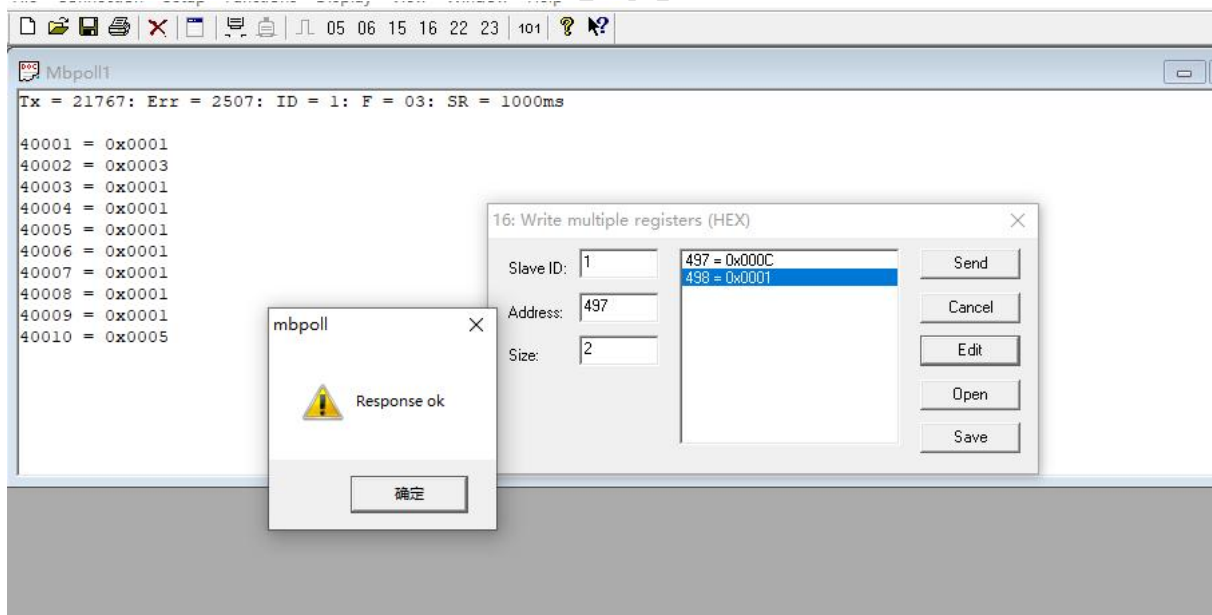
1) Set 16 channel ID



2) Set 32 channel ID



4.3.14 Set the wiring type and mode of the temperature sensor



5. Service and Warranty

SM100-M Series HART Data Collector Quality Assurance

1. This product is guaranteed for three years under normal use conditions.
2. During the warranty period, our company will provide you with warranty service for any failure caused by product technology.
3. The following circumstances are not within the scope of free warranty:
 - ① Products that are disassembled and repaired without the consent of the Company;
 - ② Damage caused by external force and other natural disasters.
4. If the user thinks that the product of our company needs to be repaired, please call our company to contact us in time, and we will repair and send it back as soon as possible.
5. The warranty liability is limited to the fault maintenance of the product during the warranty period, and does not assume other responsibilities.

Precautions for Using SM100-M Series HART Data Collector

1. Please read the instructions carefully before use.
2. Confirm whether the power supply meets the working requirements of equipment.
3. Check whether the distance from the HART instrument equipment is more than 200 m. If it is beyond this range, please use a thicker wire and add a shielded cable. When using a shielded wire, connect one end to ground.
4. Whether there is a large inductive load nearby, which seriously interferes with the signal, and appropriate shielding measures should be taken.

After-sales service hotline: 4007-803-803