

SM100-M-16 HART Data Collector

Instructions for use



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Before using the product, please read the manual intensively. First, please confirm which type of Instruments is used with the HART protocol, and then find out the appropriate using method in the manual. Before switching on the power, please confirm all interfaces are correctly connected. The company will not be held liable for any damage caused by improper use that violates the methods specified herein unless following the instructions.

This document serves as the official product description. However, content may become outdated or invalid due to product/software upgrades. We do not guarantee consequences arising from such changes. Please monitor version updates and ensure prompt updates.

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1. Introduction to SM100-M-16 HART Data Collector

1.1 Product Introduction

SM100-M-16 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 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 simultaneous connection of 16 HART devices.
- 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

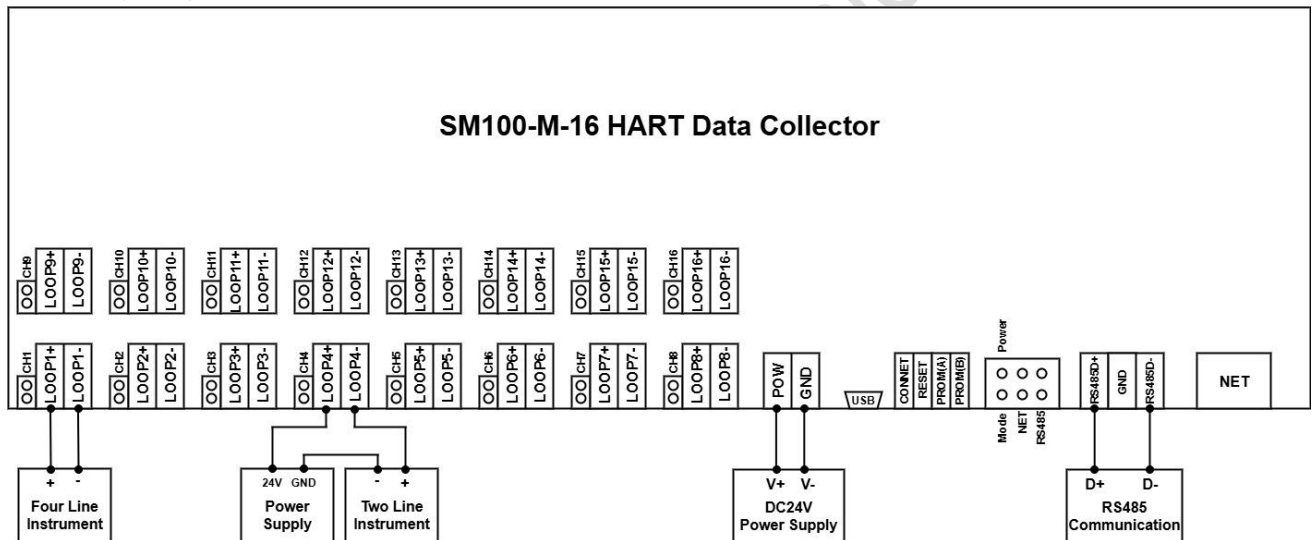
- Power supply voltage: DC 24V.
- Operating current: < 80mA.
- Shell size: 305 mm in length × 160 mm in width × 35 mm in height.
- Installation dimension: 347.4 mm (L) × 35 mm (W) × 160 mm (H).
- Working temperature: -20 °C ~ + 75 °C.
- Humidity of working environment: 5% ~ 95% (no condensation).

2. Hardware Description of SM100-M-16 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 Instrument 1		HART Instrument 2		HART Instrument 3		HART Instrument 4	
Port name	LOOP5+	LOOP5-	LOOP6+	LOOP6-	LOOP7+	LOOP7-	LOOP8+	LOOP8-
Function/access device	HART Instrument 5		HART Instrument 6		HART Instrument 7		HART Instrument 8	
Port name	LOOP9+	LOOP9-	LOOP10+	LOOP10-	LOOP11+	LOOP11-	LOOP12+	LOOP12-
Function/access device	HART Instrument 9		HART Instrument 10		HART instrument 11		HART instrument 12	
Port name	LOOP13+	LOOP13-	LOOP14+	LOOP14-	LOOP15+	LOOP15-	LOOP16+	LOOP16-
Function/access device	HART Instrument 13		HART Instrument 14		HART Instrument15		HART Instrument 16	
Port name	POW	GND	USB	RS485D+	GND	RS485D-	NET1	NET2
Function/access device	DC power supply		USB port	RS485 communication			Gateway 1	Gateway 2

- LOOP1 +, LOOP1- ~ LOOP16 +, LOOP16-: 16 groups of HART instrument communication interface terminals.
- 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, which can not only set the parameters of the collector, but also output MODBUS _ TCP protocol data.

2.4 Description of Indicator Light and Dial Switch

- CH1 ~ CH16: respectively indicate the communication between HART instruments 1 ~ 16 and the collector, the red light is the receiving indicator, and the green light is the sending indicator.
- CONNET: communication selection switch, which can be used to query and set the parameters of the data collector when it is dialed.
- RSET: reset switch, which can initialize the parameters of the data collector when it is dialed up.
- PROM (B): B mainboard program download switch, which can download the program of data collector B mainboard when the dial switch is turned up.
- PROM (A): A mainboard program download switch, which can download the program of the data collector A mainboard when the dial switch is turned up.
- Power: power indicator, always on after the power is connected.
- 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.

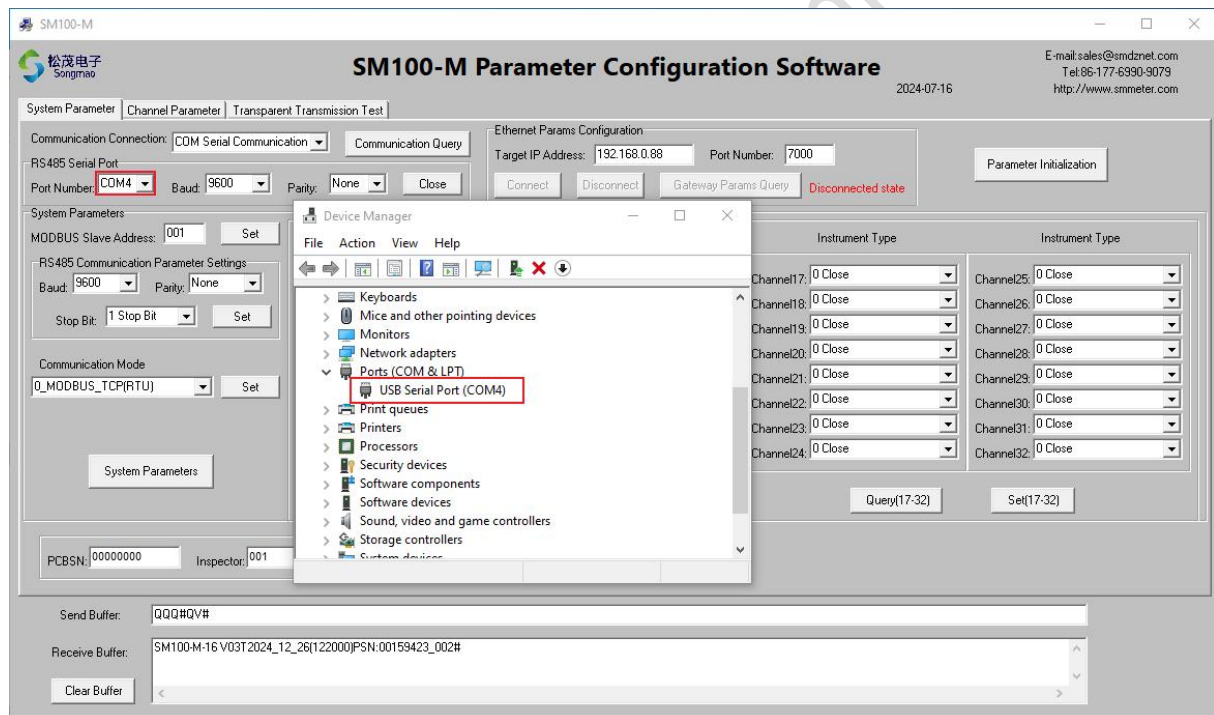
2) Open the configuration debugging software and select the communication connection mode: COM serial port communication and IP network communication.

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

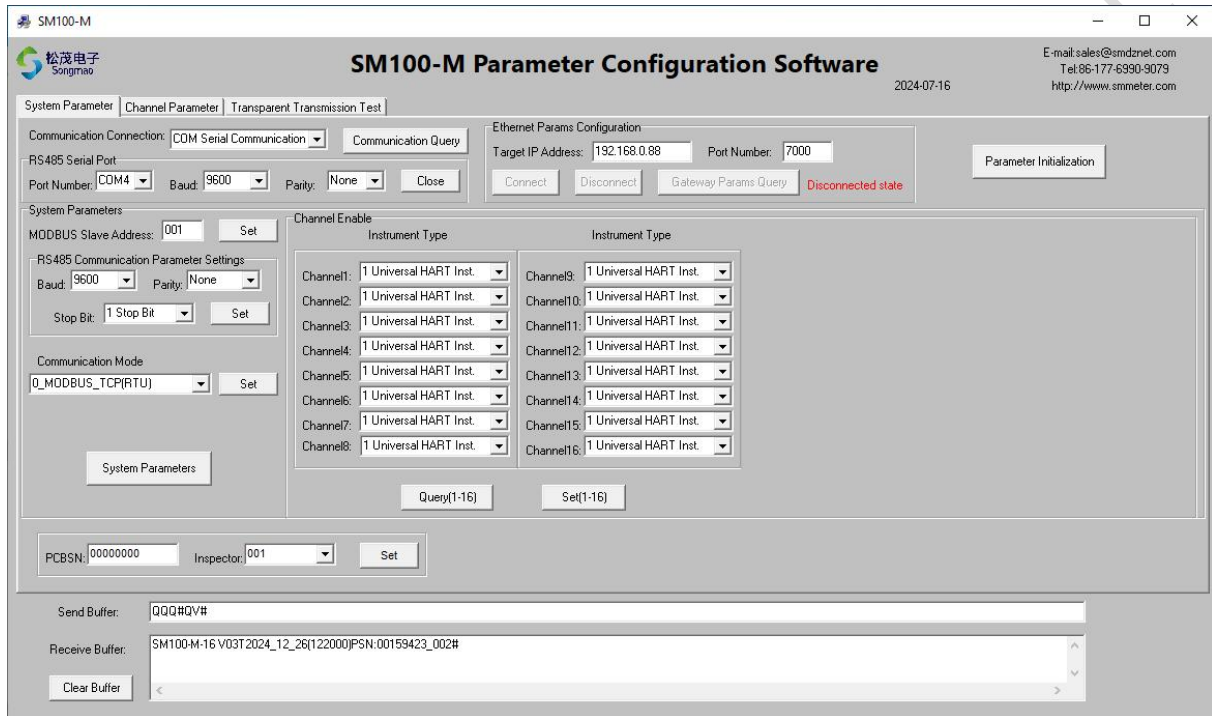
Connect the USB serial port communication line, and select com serial port communication as the communication connection mode. Then select the correct port number, baud rate and check bit (default baud rate 9600, check bit None), open the serial port, and click "Communication Query". At this time, the 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.



4) IP network communication

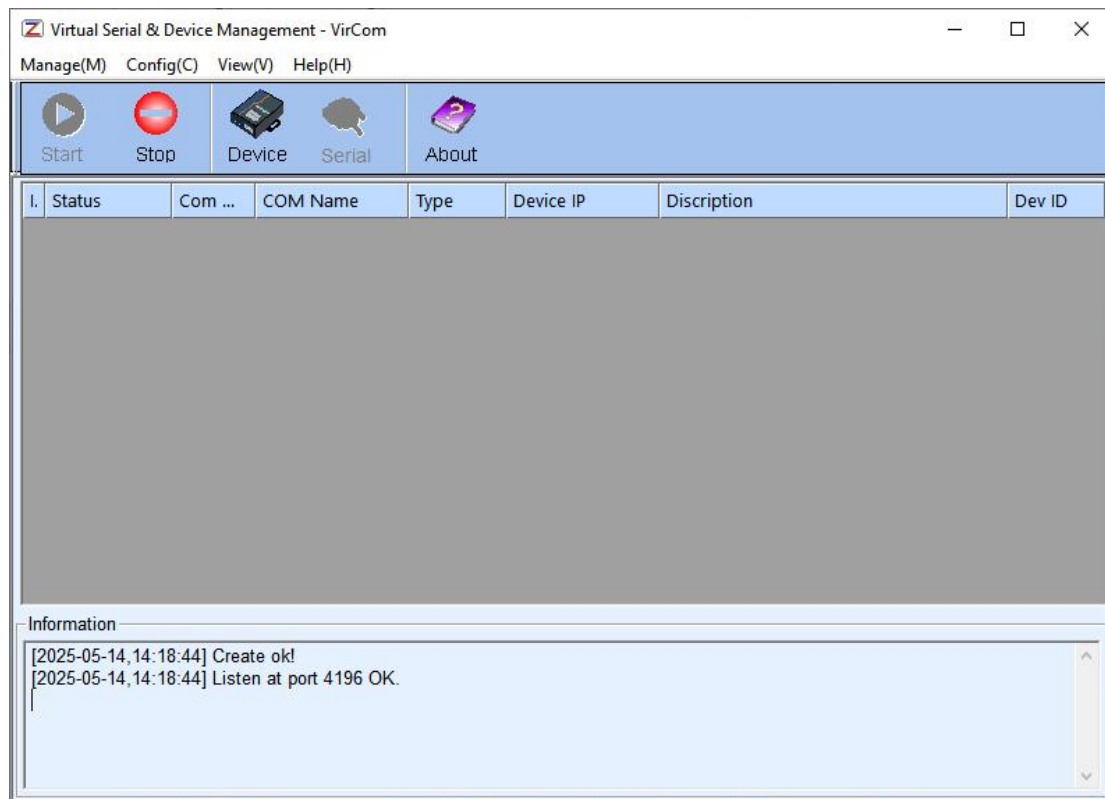
Connect the network cable, and select IP network communication as the communication connection mode. Then click "Gateway Params Query" and configure Ethernet parameters in the pop-up window. After the parameters are configured, input the correct target IP address and port number, and click "Establish Connection". When "Connected" is displayed, the connection is successful. Finally, click "Communication Query". At this time, the version number of the data collector can be queried in the "Receiving Buffer" below, indicating that the communication between the computer and the collector is successful.

Note: Ethernet interface default IP: 192.168.0.88, port 7000. For Ethernet parameter configuration, see "3.2 Configuring Ethernet Parameters".

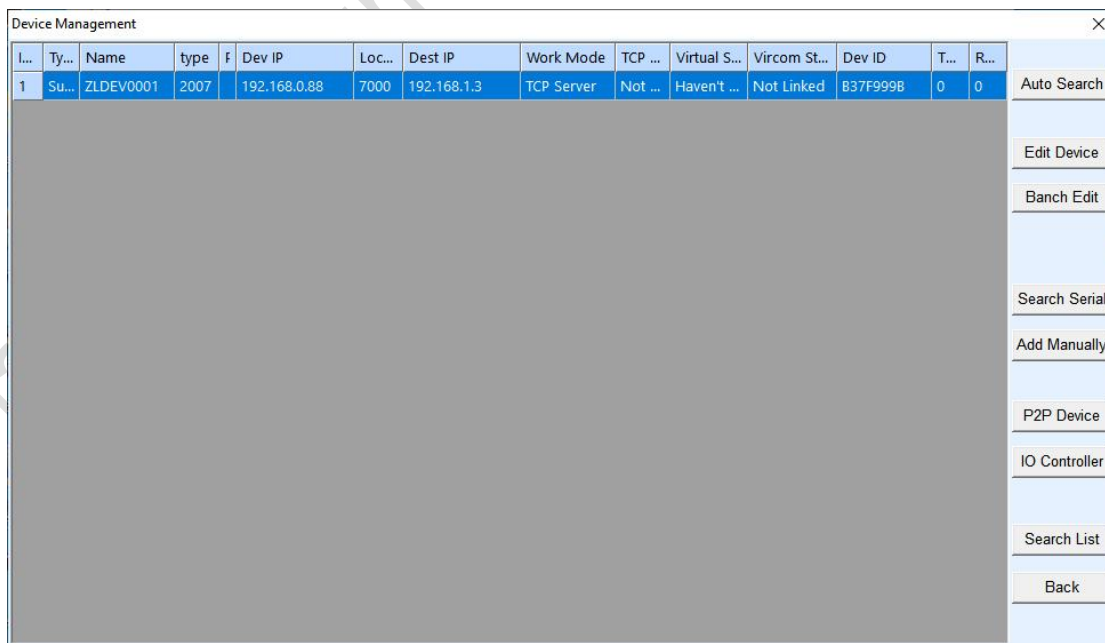


3.2 Configure Ethernet Parameters

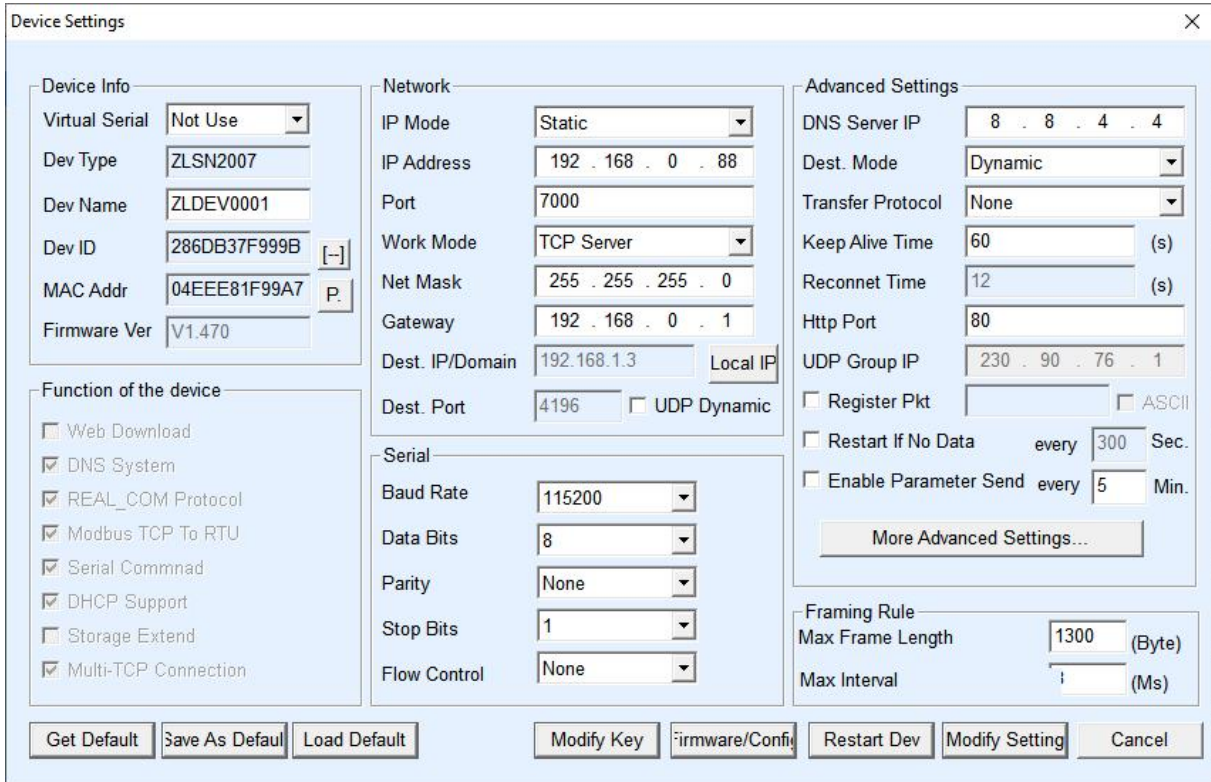
- 1) Double-click to run the gateway parameter configuration software, and the gateway parameter configuration window will pop up.



- 2) Click "Device Management" in the gateway parameter configuration window, and the "Device Management" window will pop up. The software will automatically search the gateway devices of this collector, and the search results will be displayed in the main window.



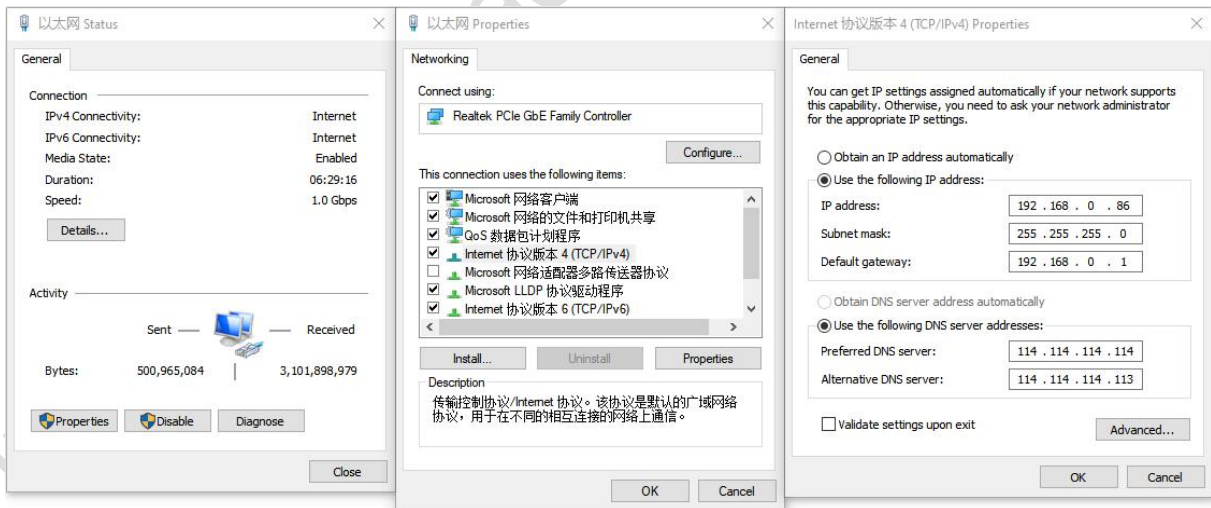
- 3) Select the searched gateway device and click "Edit Settings". The "Device Settings" window will pop up and the current configuration information of the module will be displayed in this window.



The "Device Settings" window is divided into several sections:

- Device Info:** Virtual Serial (Not Use), Dev Type (ZLSN2007), Dev Name (ZLDEV0001), Dev ID (286DB37F999B), MAC Addr (04EEE81F99A7), Firmware Ver (V1.470).
- 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), Dest. Port (4196), UDP Dynamic (unchecked).
- 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), Reconnect Time (12 s), Http Port (80), UDP Group IP (230.90.76.1), Register Pkt (unchecked), ASCII (unchecked), Restart If No Data (every 300 Sec), Enable Parameter Send (every 5 Min), Framing Rule (Max Frame Length 1300 Byte, Max Interval 1 Ms).
- Function of the device:** Web Download (unchecked), DNS System (checked), REAL_COM Protocol (checked), Modbus TCP To RTU (checked), Serial Commnad (checked), DHCP Support (checked), Storage Extend (unchecked), Multi-TCP Connection (checked).
- Buttons:** Get Default, Save As Default, Load Default, Modify Key, Firmware/Conf, Restart Dev, Modify Setting, Cancel.

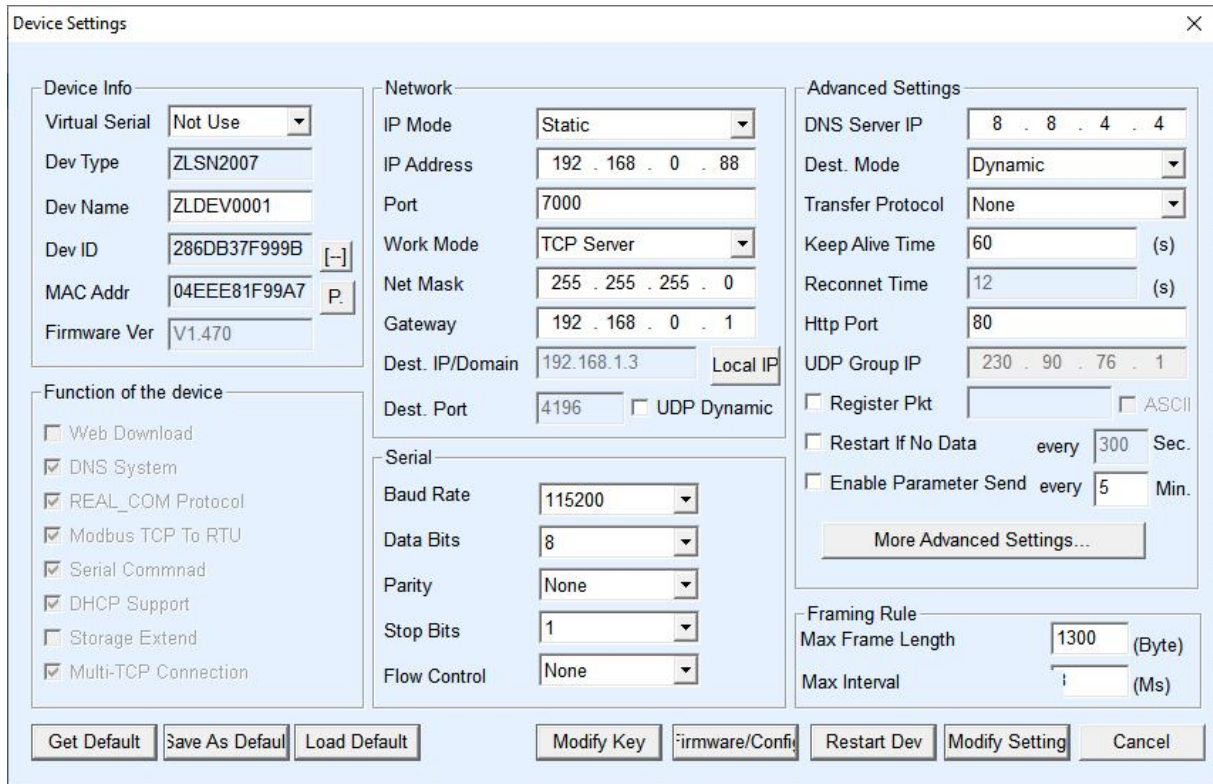
- 4) The user queries the local Internet protocol (TCP/IP) attribute in the computer, and sets the Ethernet parameters according to the query result. Among them, serial port baud rate — 115200, check/data/stop — None, 8, 1 are fixed values and cannot be changed. The last byte of the IP address is different and can be defined by the user.



The image shows three overlapping Windows network configuration windows:

- 以太网 Status (Ethernet Status):** Shows connection status (IPv4/IPv6 Connectivity: Internet), Media State: Enabled, Duration: 06:29:16, Speed: 1.0 Gbps. Activity section shows Sent/Received bytes and a graph.
- 以太网 Properties (Ethernet Properties):** Networking tab shows "Connect using: Realtek PCIe GbE Family Controller". The list of items includes Microsoft 网络客户端, Microsoft 网络的文件和打印机共享, QoS 数据包计划程序, Internet 协议版本 4 (TCP/IPv4), Microsoft 网络适配器多路传送器协议, Microsoft LLDP 协议驱动程序, and Internet 协议版本 6 (TCP/IPv6).
- Internet 协议版本 4 (TCP/IPv4) Properties:** General tab shows "Use the following IP address" with IP address: 192.168.0.86, Subnet mask: 255.255.255.0, and Default gateway: 192.168.0.1. It also shows DNS server settings.

5) After changing the parameters, click "Modify Settings" 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 image shows a "Device Settings" window with the following sections:

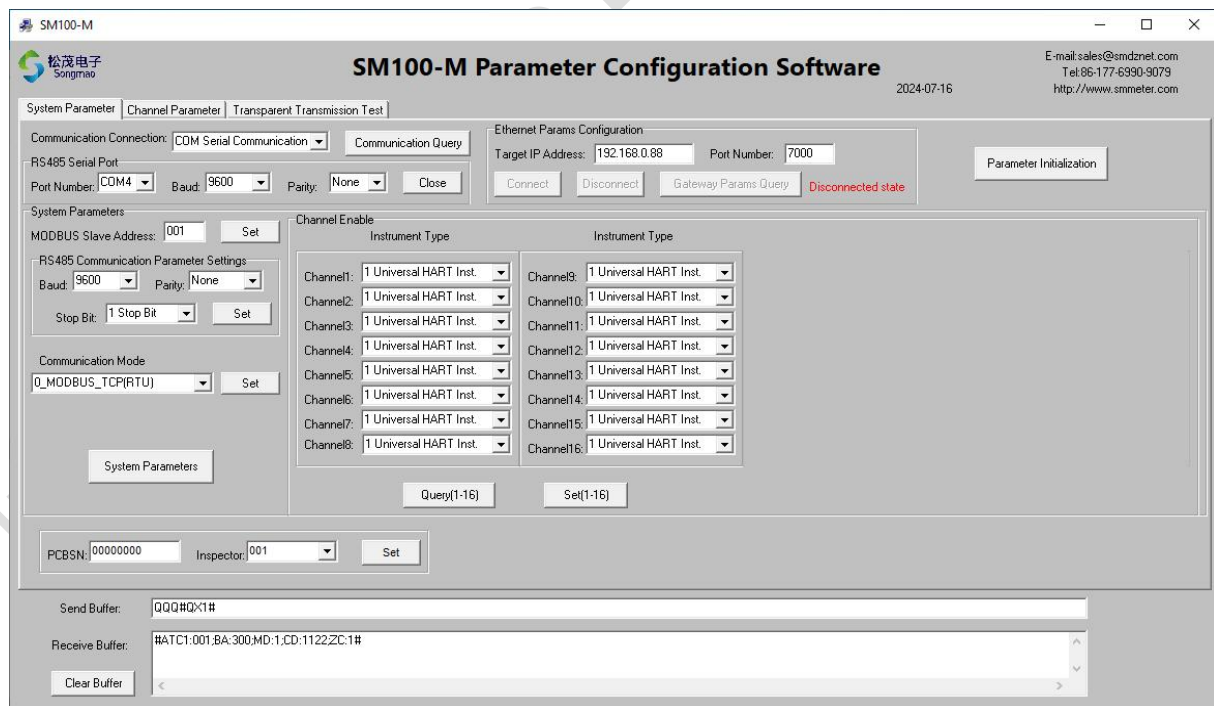
- Device Info:**
 - Virtual Serial: Not Use
 - Dev Type: ZLSN2007
 - Dev Name: ZLDEV0001
 - Dev ID: 286DB37F999B
 - MAC Addr: 04EEE81F99A7
 - Firmware Ver: V1.470
- Function of the device:**
 - ☐ Web Download
 - ☒ DNS System
 - ☒ REAL_COM Protocol
 - ☒ Modbus TCP To RTU
 - ☒ Serial Commnad
 - ☒ DHCP 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
 - 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
 - ☐ 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, RS485 communication parameters, scanning interval time, channel instrument type, etc.

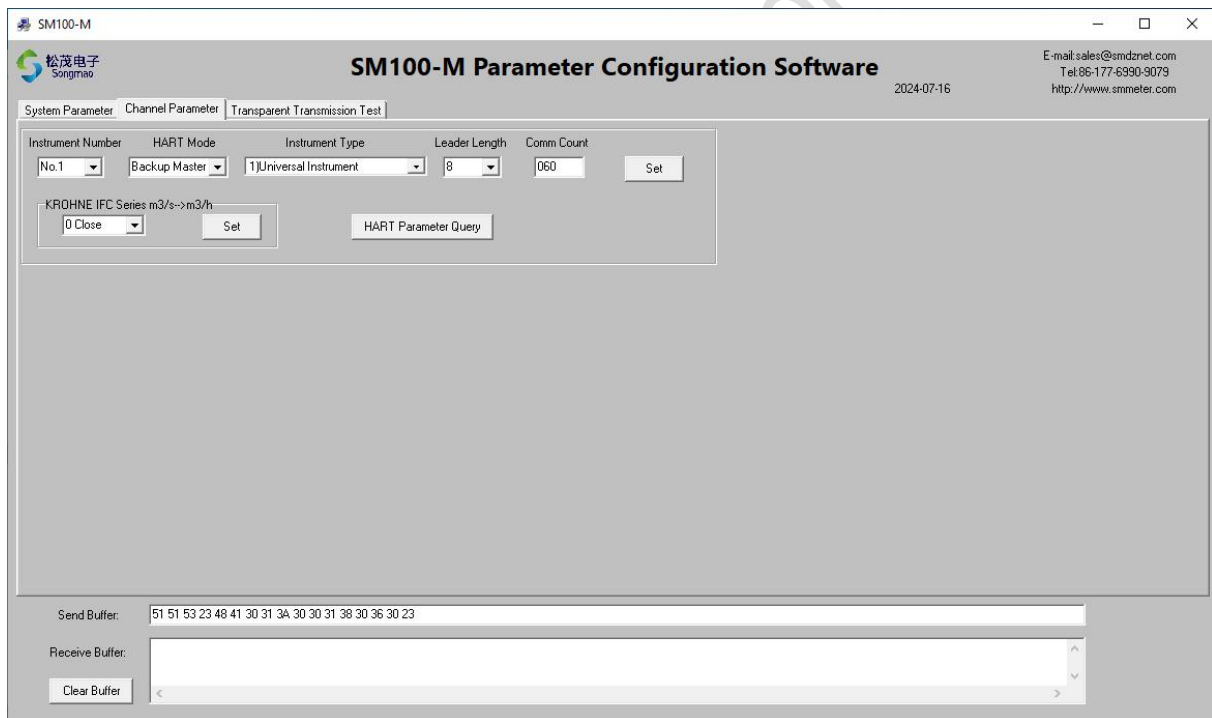
- 1) Communication query: The version number of the HART data collector can be queried.
- 2) System parameters: MODBUS slave address, RS485 communication parameters, channel instrument type and other parameter information can be read.
- 3) MODBUS slave address: Enter the 3-digit slave address and click "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): When other devices collect HART instrument data at the same time, the working mode of the module is set to "Monitoring to MODBUS RTU(Custom)" to meet the condition that two devices collect HART instrument data at the same time.
 - ② USB Transparent Transmission: When using USB communication, the working mode of the module is set to "USB Transparent Transmission".
 - ③ RS485 Transparent Transmission: When using RS485 communication, the working mode of the module is set to "RS485 Transparent Transmission".
 - ④ Ethernet Transparent Transmission: When communicating through Ethernet, the working mode of the module is set to "Ethernet Transparent Transmission".
- 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 Configuration

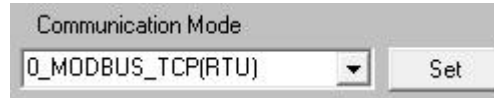
Click "HART Parameter Query" in the "Channel Parameter Configuration" interface, select the corresponding instrument number and instrument type according to the accessed instrument channel and instrument model, use the default value for other parameters, and then click "Set".

- 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.



Communication Mode

0_MODBUS_TCP(RTU) [Set]

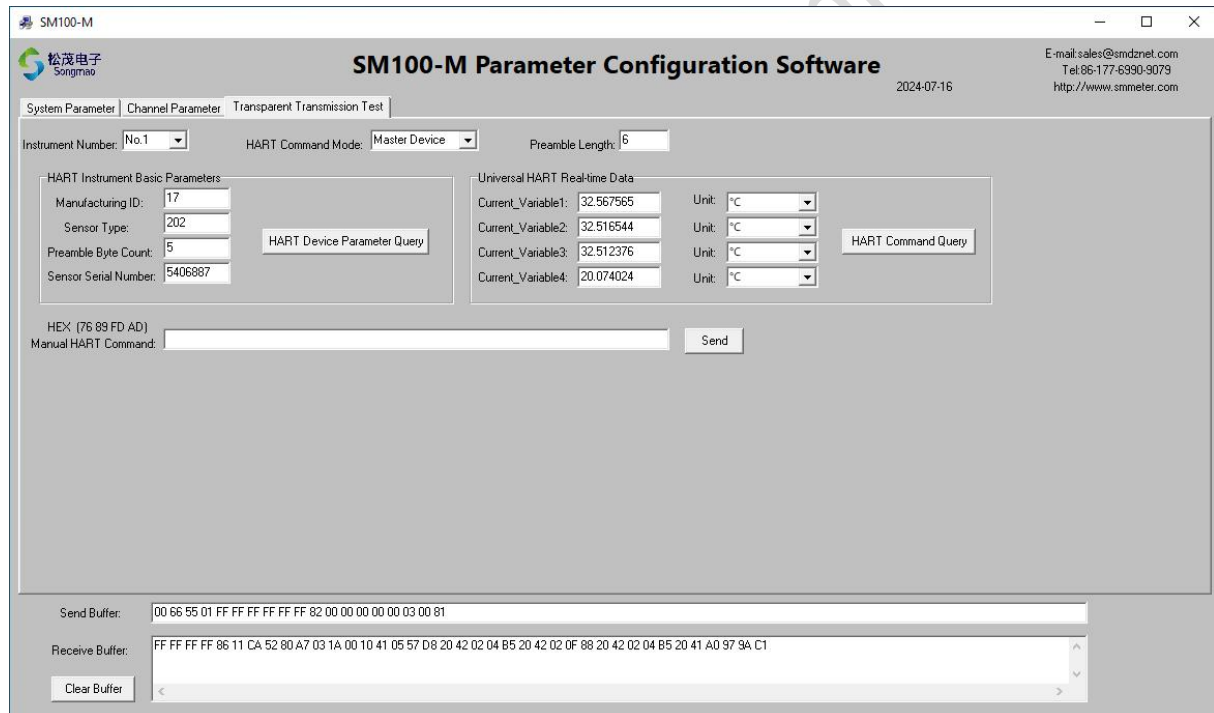
- 2) Configure HART instrument parameters:

- 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 Leader length: the 'FF' quantity of the leader of the HART instruction, which is generally 6 bytes.

- 3) Instrument parameter query: basic parameter information of HART instrument can be queried.

- 4) General data query: 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 Parameter Configuration Software

2024-07-16

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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: 17
Sensor Type: 202
Preamble Byte Count: 5
Sensor Serial Number: 5406887

HART Device Parameter Query

Universal HART Real-time Data

Current_Variable1: 32.567565 Unit: °C
Current_Variable2: 32.516544 Unit: °C
Current_Variable3: 32.512376 Unit: °C
Current_Variable4: 20.074024 Unit: °C

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: FF FF FF FF 86 11 CA 52 80 A7 03 1A 00 10 41 05 57 D8 20 42 02 04 B5 20 42 02 0F 88 20 42 02 04 B5 20 41 A0 97 9A C1

Clear Buffer

3.6 Mod Scan32 Communication Test

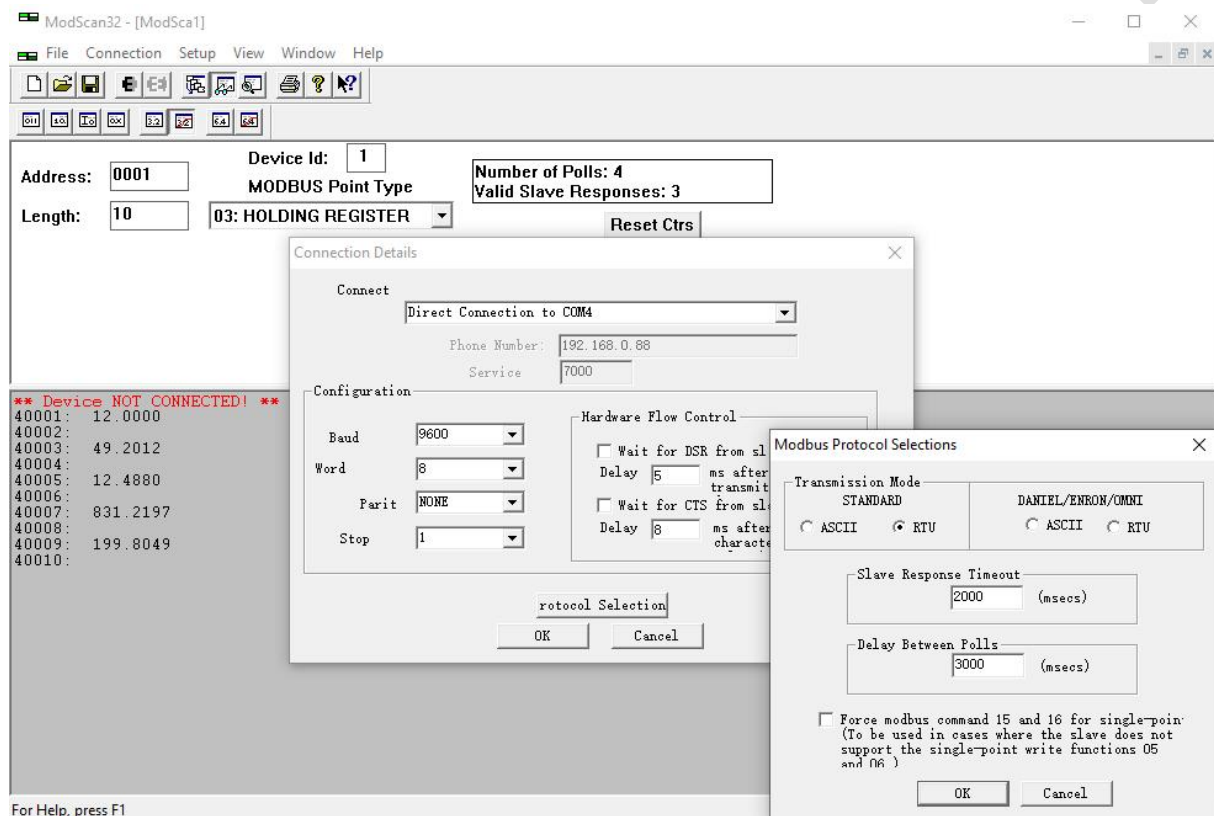
- 1) Set the working mode as "working mode" in the "system parameter" interface of the configuration software.
- 2) Close the serial port of the configuration software, open the Modscan32 software, click "connection", configure the appropriate parameters in the pop-up dialog box according to the arrow 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
.....						
.....						
16	1 (16 index)	Current value	30181 30182	IEE754	4321	Read only
		Primary variable 1	30183 30184	IEE754	4321	Read only
		Variable 2	30185 30186	IEE754	4321	Read only
		Variable 3	30187 30188	IEE754	4321	Read only
		Variable 4	30189 30190	IEE754	4321	Read only
		HART status	30191 30192	32 Bit	4321	Read only

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/write	06
	Spare	40019~40034				
	Local RFID number	40035 40036 40037 40038	Uint64		Read/write	10
	Spare	40039 40040				
1	Damping time of main variable	40041 40042	IEE754		Read/write	10
	Primary variable upper range limit	40043 40044	IEE754	4321	Read/write	10
	Primary variable lower range limit (zero point)	40045 40046	IEE754	4321	Read/write	10
	Main variable code	40047	Uint16		Read/write	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 40062	Standard string		Read/write	10
	40063 40064			Read/write	
Descriptor	40065 40066	Standard string		Read/write	10
	40067 40068			Read/write	
	40069 40070			Read/write	
	40071 40072			Read/write	
News	40073 40074	Standard string		Read/write	10
	40075 40076			Read/write	
	40077 40078			Read/write	
	40079 40080			Read/write	
	40081 40082			Read/write	
	40083 40084			Read/write	
	40085 40086			Read/write	
	40087 40088			Read/write	
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/write	10
Wiring mode of temperature sensor	40098	Uint16		Read/write	
Zero output of differential pressure transmitter	40099 40100	IEE754	4321	Read/write	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/write	10
Spare	40113 40114	Uint32			
Spare	40115 40116	Uint32			

	Spare	40117 40118	Uint32			
	Spare	40119 40120	Uint32			
.....						
.....						
16	Damping time of main variable	41241 41242	IEE754		Read/write	10
	Primary variable upper range limit	41243 41244	IEE754	4321	Read/write	10
	Primary variable lower range limit (zero point)	41245 41246	IEE754	4321	Read/write	10
	Primary Variable Unit Code	41247	Uint16		Read/write	06
	2 # Variable Unit Code	41248	Uint16		Read	
	3 # Variable Unit Code	41249	Uint16		Read	
	4 # Variable Unit Code	41250	Uint16		Read	
	Manufacturer ID	41251	Uint16		Read	
	HART protocol version number	41252	Uint16		Read	
	HART ID Device Serial Number 1	41253 41254	Uint32	4321	Read	
	Device type	41255	Uint16		Read	
	Year	41256	Uint16		Read	
	Month	41257	Uint16		Read	
	Day	41258	Uint16		Read	
	Software version number	41259	Uint16		Read	
	Hardware version number	41260	Uint16		Read	
	Label	41261 41262	Standard string		Read/write	10
		41263 41264			Read/write	
	Descriptor	41265 41266	Standard string		Read/write	10
		41267 41268			Read/write	
		41269 41270			Read/write	
		41271 41272			Read/write	
	News	41273 41274	Standard string		Read/write	10
		41275 41276			Read/write	
		41277 41278			Read/write	
		41279 41280			Read/write	
		41281 41282			Read/write	
		41283 41284			Read/write	
		41285 41286			Read/write	
		41287 41288			Read/write	
	HART Device Fault Status	41289 41290	Uint32		Read	
	Channel ID	41291	Uint16		Read	
	Device status	41292	Uint16		Read	
	Communication success rate	41293 41294	IEE754	4321	Read	
	Fixed current output value	41295 41296	IEE754	4321	Write	10

	Type of temperature sensor	41297	Uint16		Read/write	10
	Wiring mode of temperature sensor	41298	Uint16		Read/write	
	Zero output of differential pressure transmitter	41299 41300	IEE754	4321	Read/write	10
	Upper limit of HART instrument measurement	41301 41302	IEE754	4321	Read	
	Lower limit of HART instrument measurement	41303 41304	IEE754	4321	Read	
	HART instrument measuring minimum scale	41305 41306	IEE754	4321	Read	
	Number of times the parameter was modified	41307 41308	Uint32	4321	Read	
	Current DC 4mA output	41309	Uint16		Write	06
	Current DC 20mA output	41310	Uint16		Write	06
	HART ID number	41311 41312	Uint32		Read/write	10
	Spare	41313 41314	Uint32			
	Spare	41315 41316	Uint32			
	Spare	41317 41318	Uint32			
	Spare	41319 41320	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

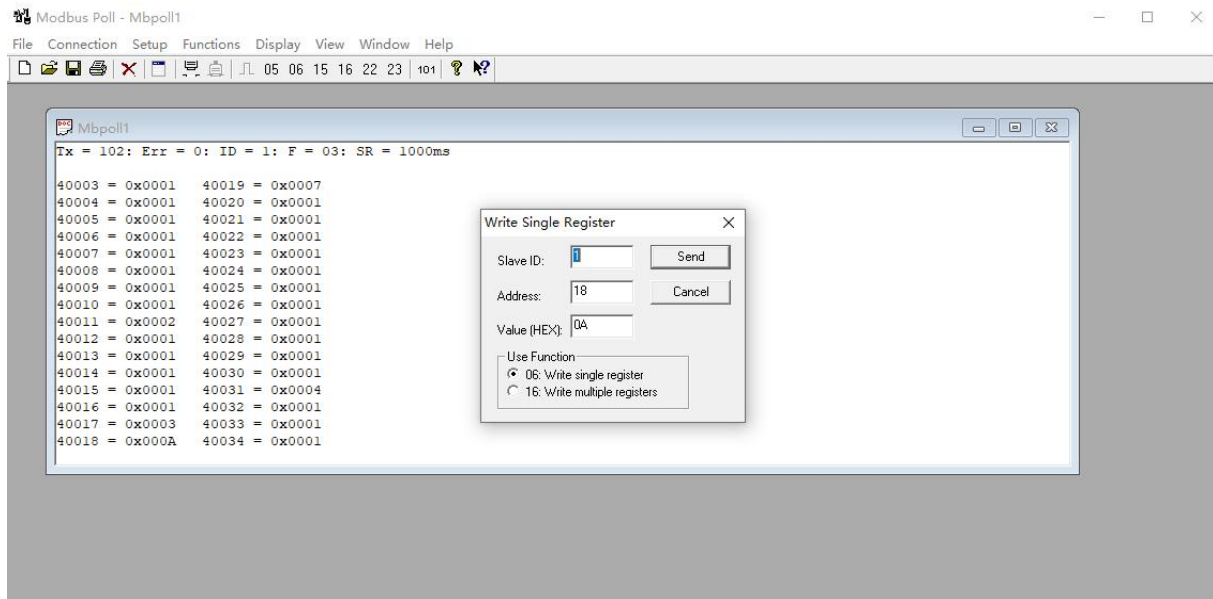
Mbpoll1

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

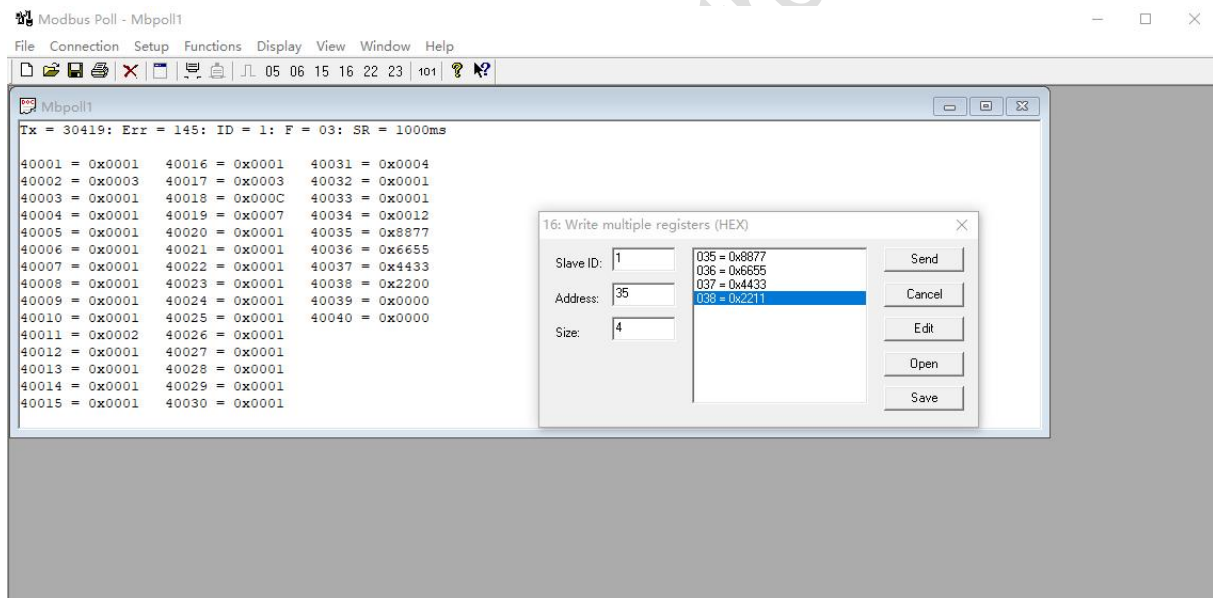
30097 =	3.800000	30121 =	0.000000	30145 =	0.000000	30169 =	0.000000
30098 =		30122 =		30146 =		30170 =	
30099 =	-0.003615	30123 =	0.000000	30147 =	0.000000	30171 =	0.000000
30100 =		30124 =		30148 =		30172 =	
30101 =	7.748426	30125 =	0.000000	30149 =	0.000000	30173 =	0.000000
30102 =		30126 =		30150 =		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 =	

4.3.2 Setting the instrument type

Set up a 16-channel instrument type

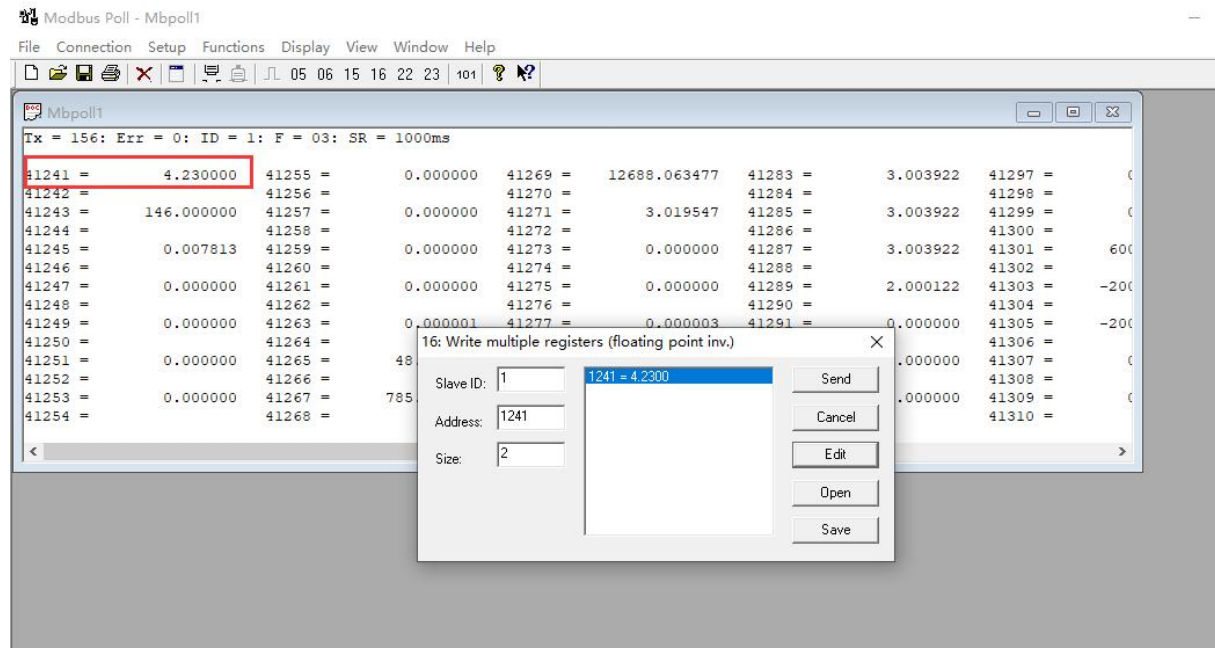


4.3.3 Set the local RFID number

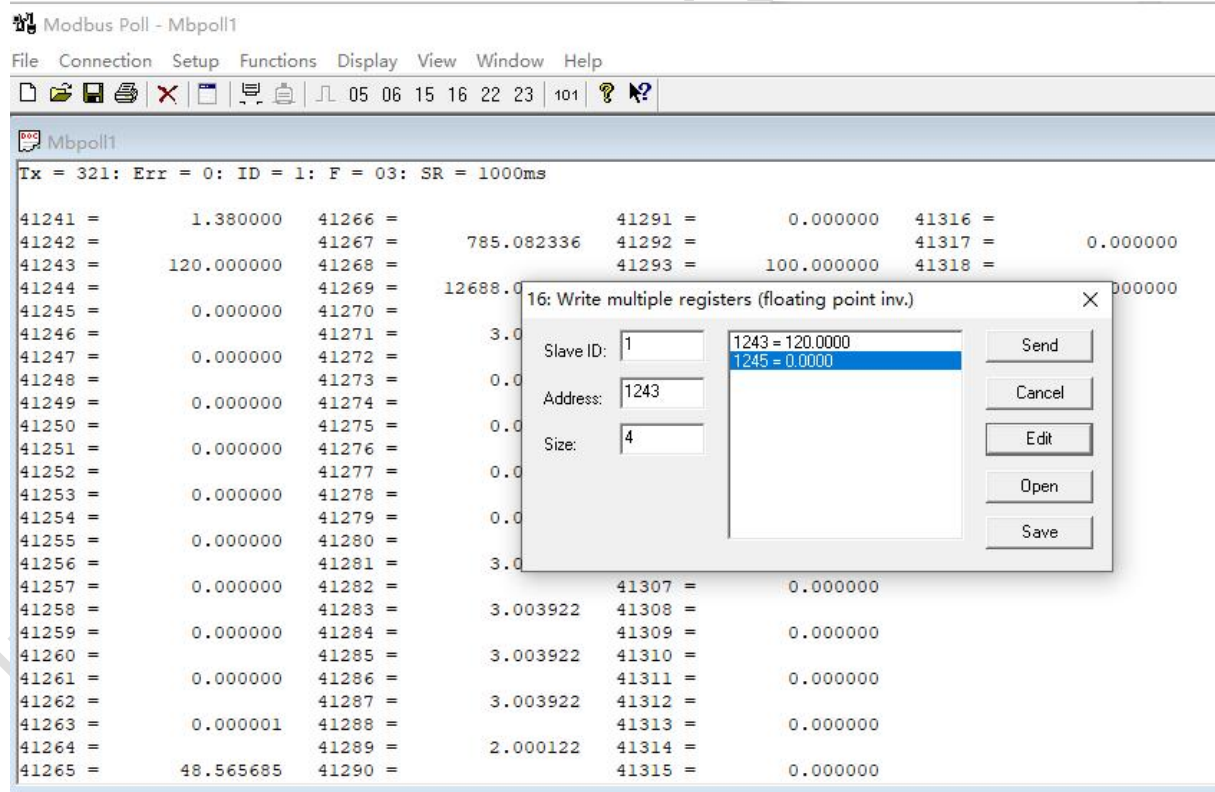


4.3.4 Setting the damping time of the main variable

Set the damping time of the 16-channel master variable

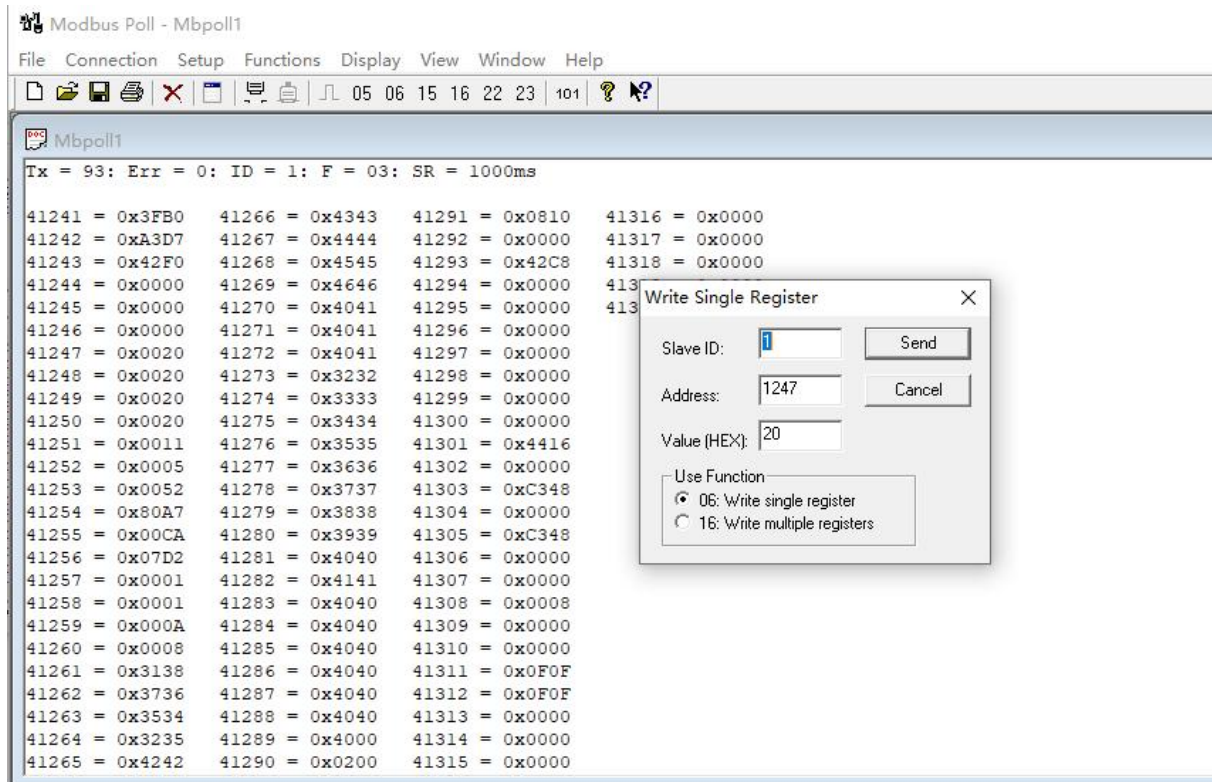


4.3.5 Set the upper limit and lower limit of the main variable range



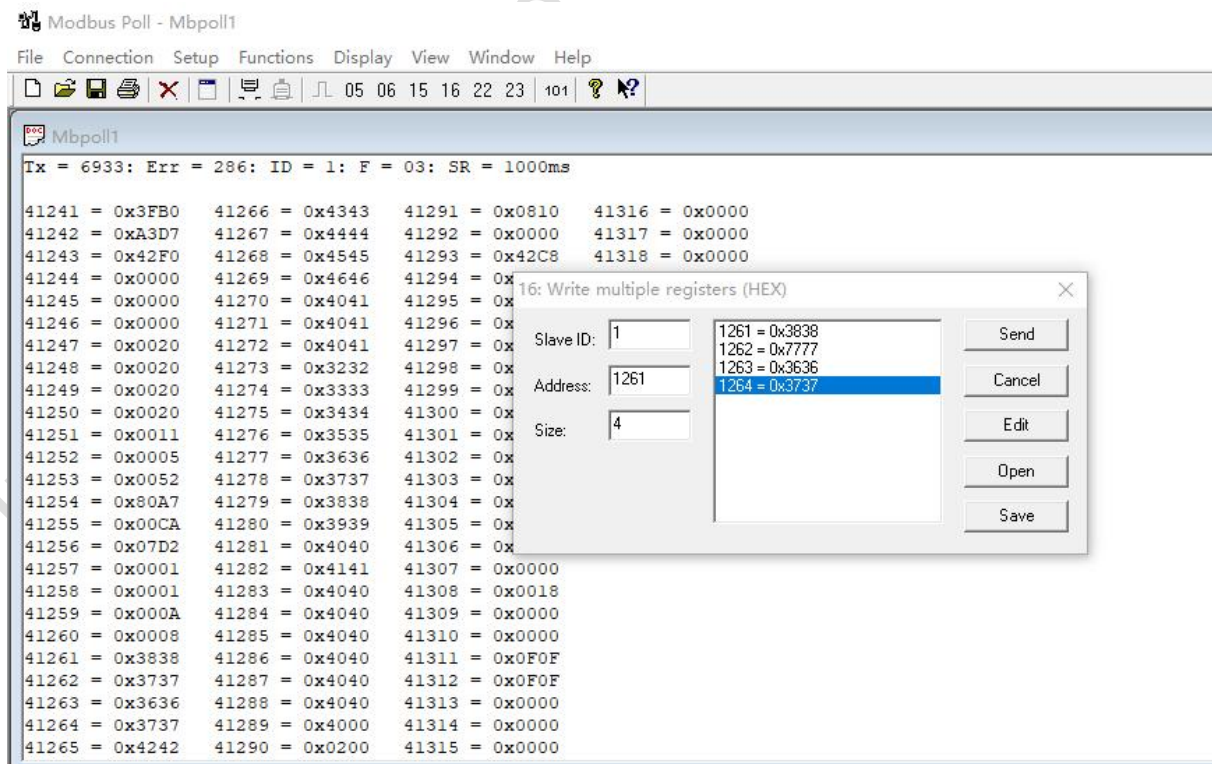
4.3.6 Set Primary Variable Unit Code

Set 16-channel primary variable unit code



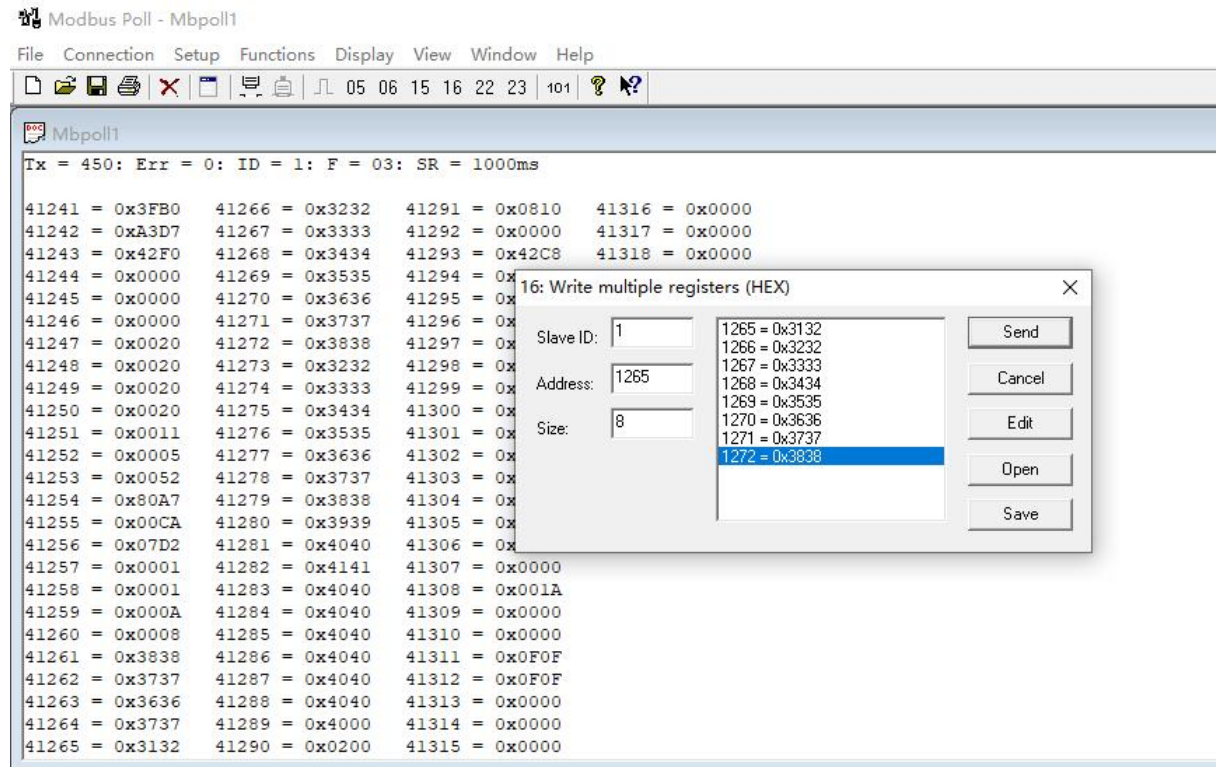
4.3.7 Setting the label

Set the 16-channel label



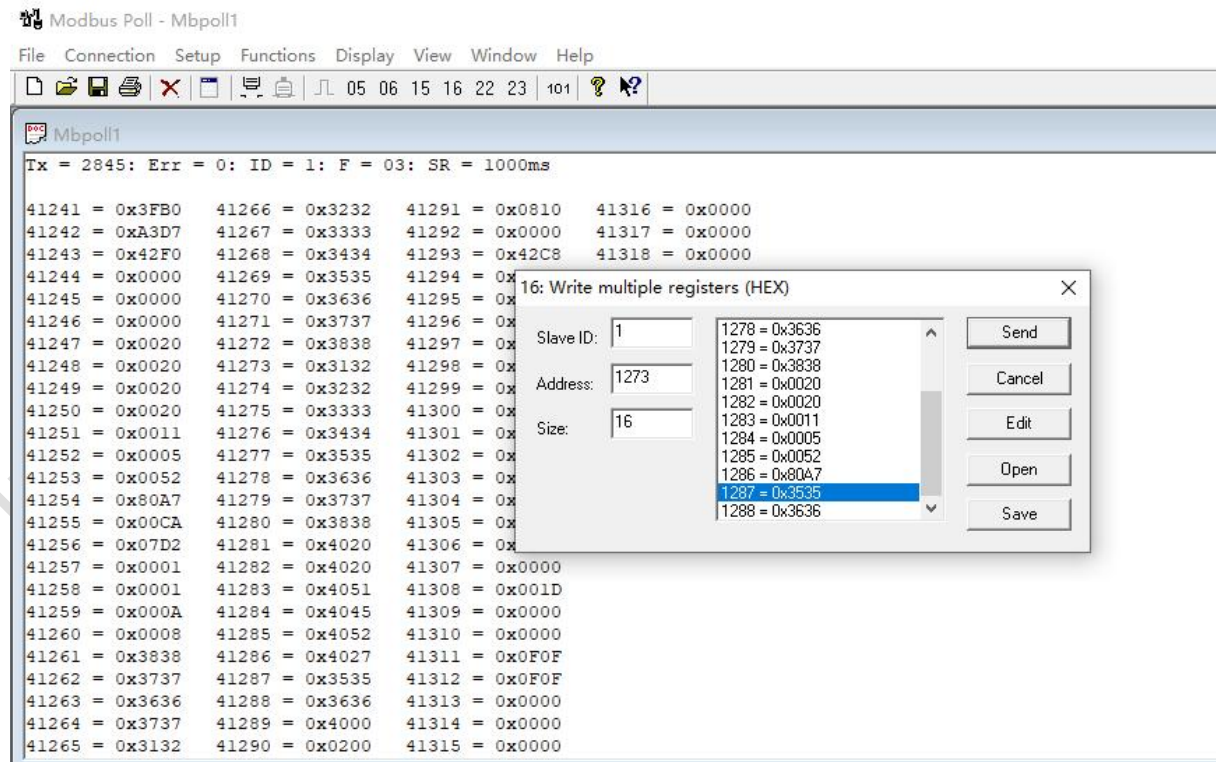
4.3.8 Set Descriptor

Set 16-channel descriptor



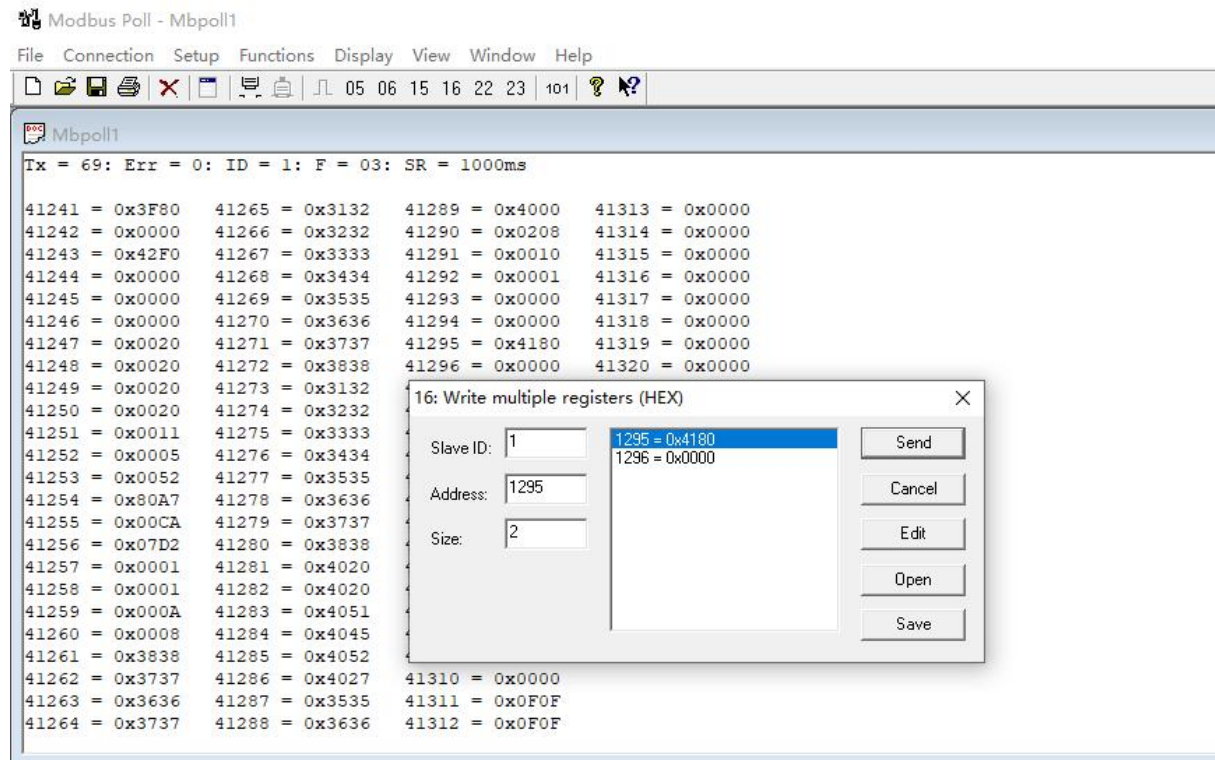
4.3.9 Set Message

Set 16-channel message



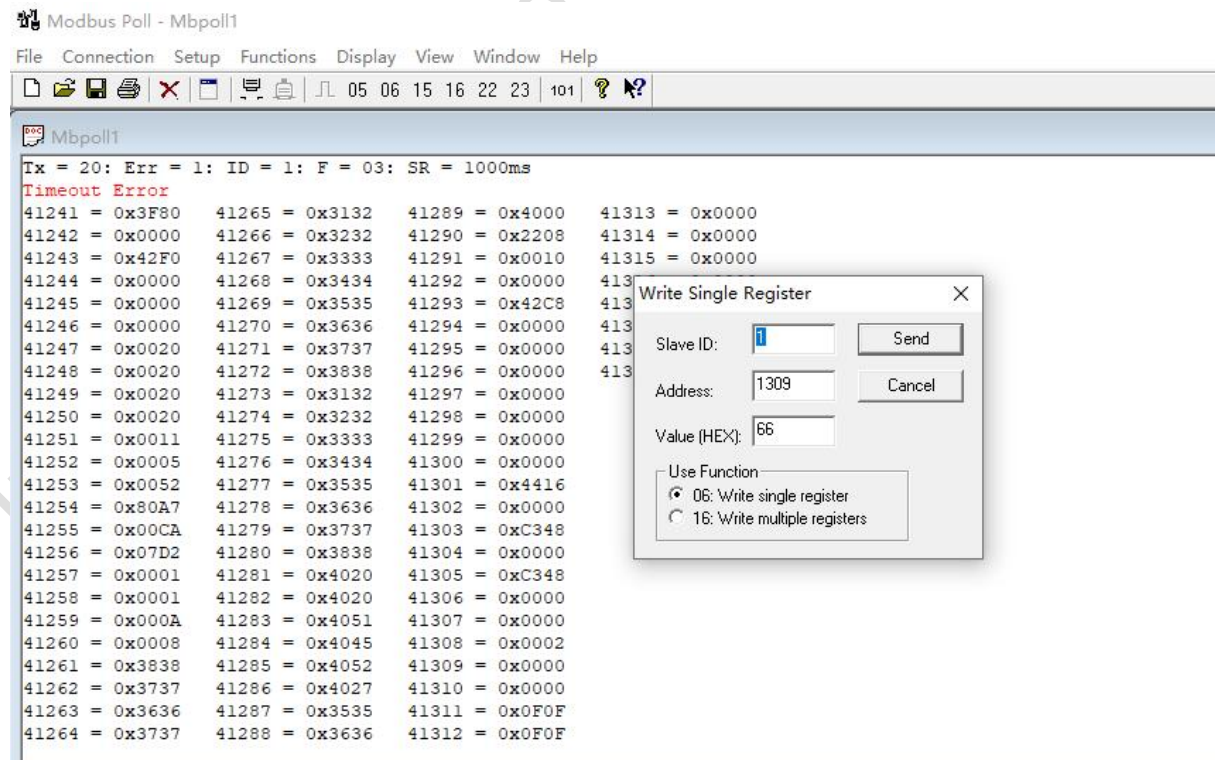
4.3.10 Setting the fixed current output value

Sets the 16-channel fixed current output values



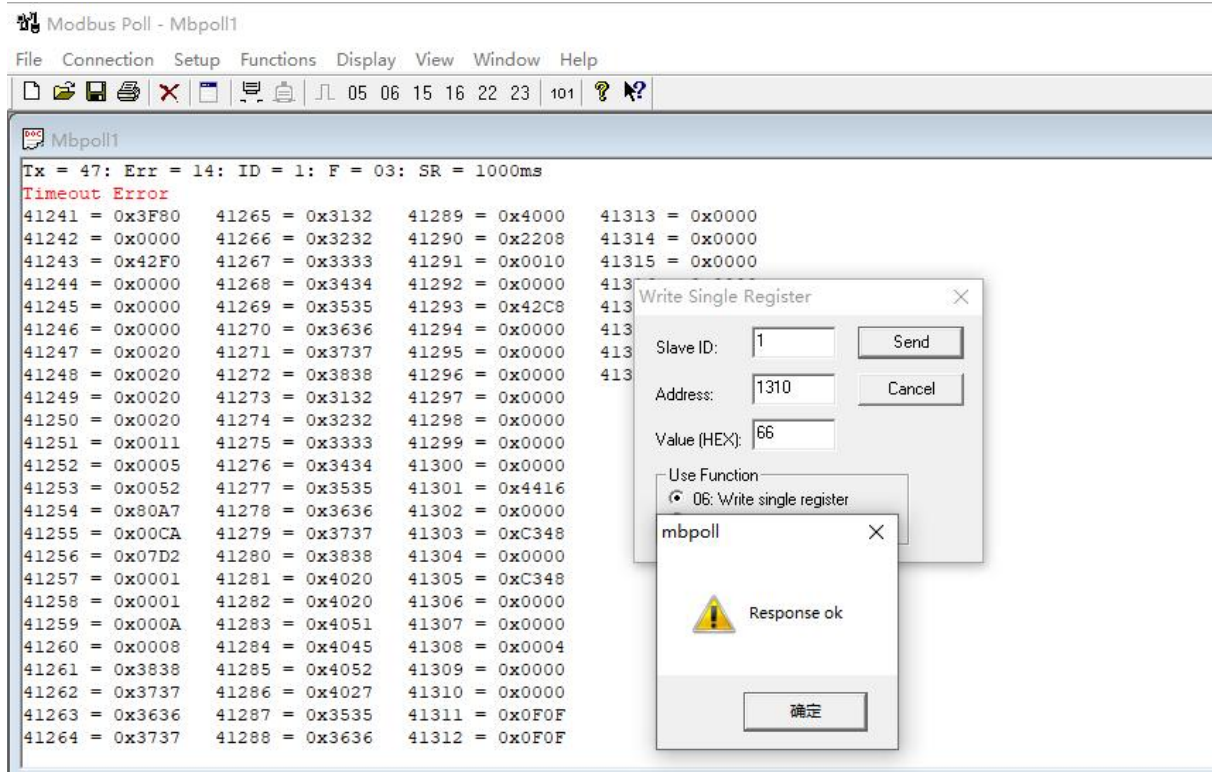
4.3.11 Set zero point (4mA)

Set 16-channel zero (4mA)



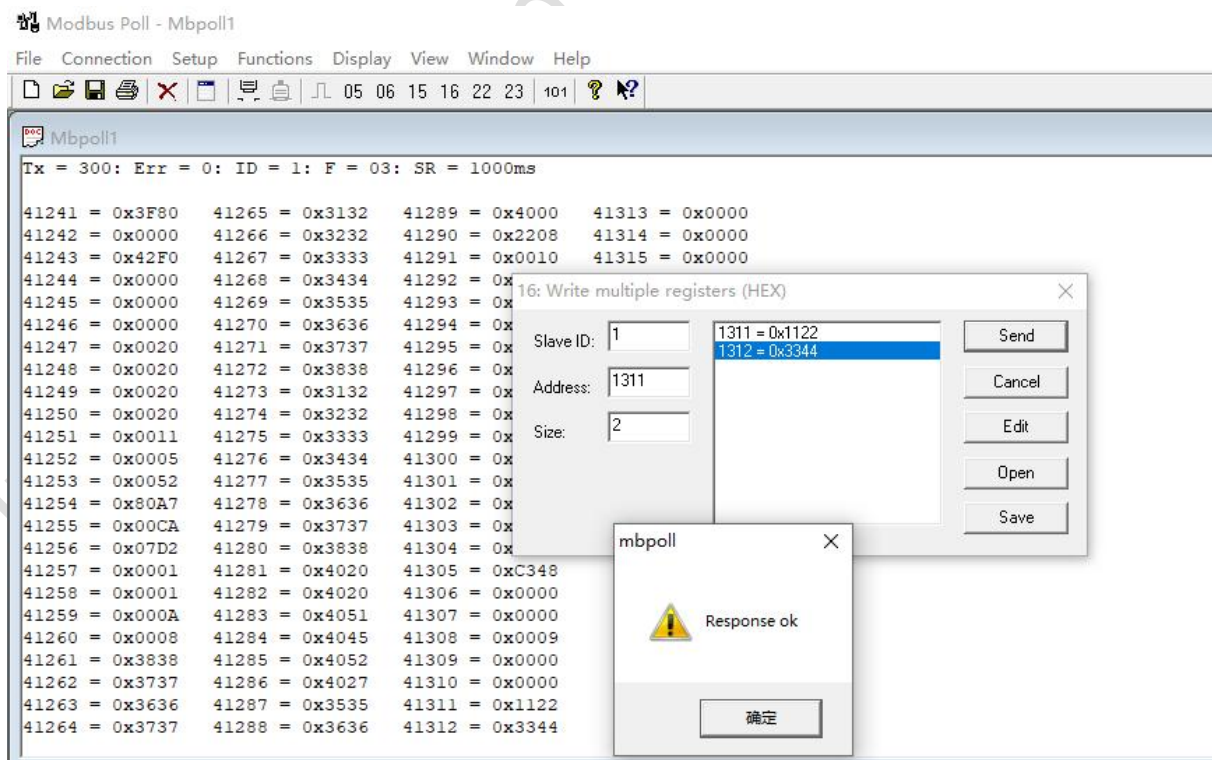
4.3.12 Set Full Scale (20 mA)

Set 16 channel full scale (20 mA)

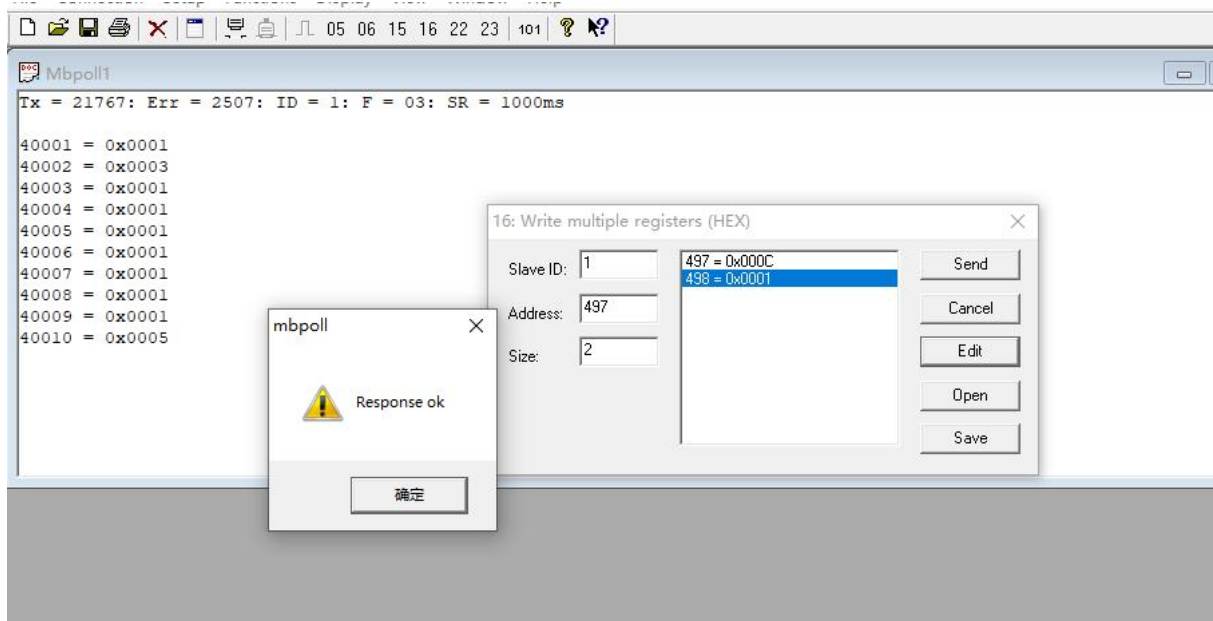


4.3.13 Set Channel ID

Set 16 channel ID



4.3.14 Set the type and wiring mode of 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: 86-573-82623038

Email: service@smdznet.com