

SM101-D HART Modem User Manual



Jiaxing Songmao Electronics Co., Ltd.

<http://www.smmeter.com>

E-mail:sales@smdznet.com

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Disclaimer:

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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 However, content may become outdated or invalid due to product/software upgrades.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.

For the latest information, please refer to our website: www.smmeter.com. If you have any questions about this document or the performance description of this product, please contact your supplier or contact us directly. E-mail : sales@smdznet.com or contact tel: [86-573-82623038](tel:86-573-82623038) for advice and answers.

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1. SM101-D Introduction

1.1 Product Introduction

SM101-D is a HART modem independently developed and produced by Jiaxing Songmao Electronics Co., Ltd. according to industrial standards. It can communicate with HART instruments from any manufacturer, such as Rosemount, E+H, Siemens, Cologne, Yokogawa, Kawai, etc. The modem is equipped with standard RS485 interface and RS232 interface, the users can use it conveniently and quickly.

Since the SM101-D modem is designed for industrial product integration, it adopts special designs in temperature range, vibration, electromagnetic compatibility and interface diversity, ensuring stable operation in harsh environments and providing high quality assurance for your equipment.

1.2 Product performance

- Supported operating systems: Windows XP, Windows 7, Windows 10.
- Using industrial universal module housing, easy to install and debug.
- Equipped with special configuration software, it can communicate data with HART instruments through a modem.
- Standard HART protocol transmission.
- Fully transparent data conversion.
- Compatible with any HART protocol.
- HART signals are transmitted using an isolation transformer.
- Built-in high-precision loop 250Ω resistor, no additional resistor is needed during communication testing.
- The housing panel features status indicators, providing clear visibility of the modem's operational state.

1.3 Main parameters

- Power input voltage: DC 12~24V, the power ripple must not be greater than 200mV, and the current must provide 100mA.
- Housing dimensions: 96 mm long × 80 mm wide × 25 mm high.
- Working environment temperature: -20℃~+80℃.
- Relative humidity: 10% ~ 80%.

2. SM101-D physical picture and indicator light function

2.1 Physical Picture

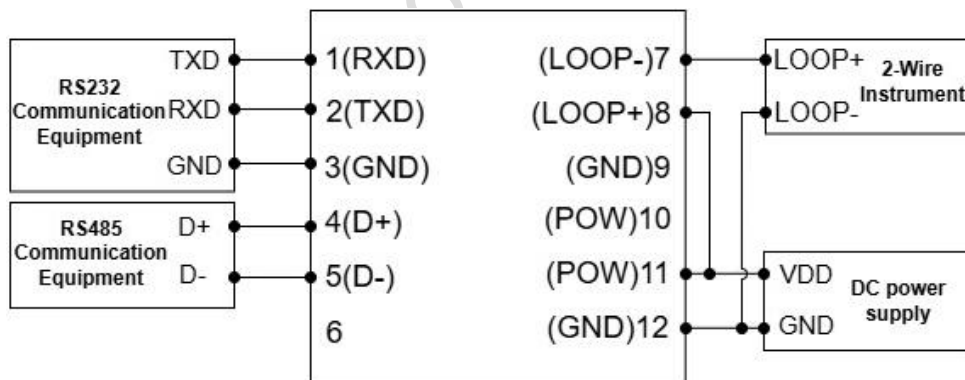


2.2 Product Selection

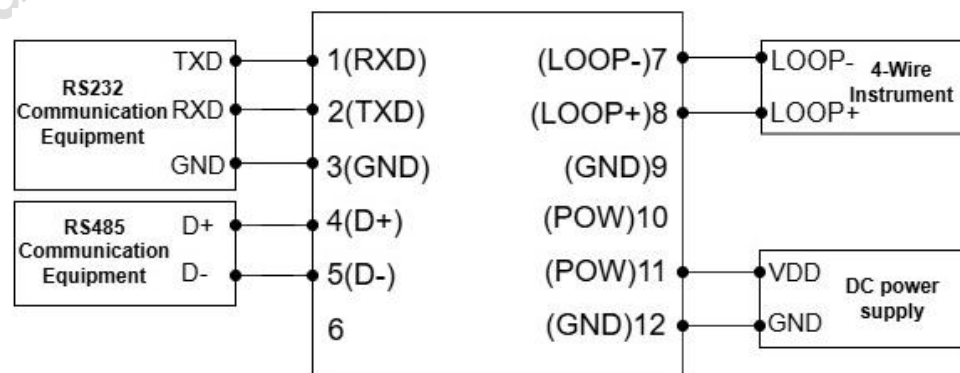
Serial number	model	RS485 interface	RS232 interface
1	SM101-D-001	√	×
2	SM101-D-002	×	√

2.3 Wiring Diagram

2.3.1 Two-wire instrument wiring diagram



2.3.2 Four-wire instrument wiring diagram



2.4 Port Introduction

Port Number	1	2	3	4	5	6	7	8	9	10	11	12
Port Name	RXD	TXD	GND	D+	D-		LOOP -	LOOP+	GND	POW	POW	GND
Function/ Access Device	RS232 Communication			RS485 Communi-cation			HART Instrumentation			power supply		

- RXD, TXD, GND: RS232 communication interface terminals.
- D+, D-: RS485 communication interface terminals.
- LOOP+, LOOP-: HART instrument communication interface terminals.
- POW, GND: Power interface terminals, POW is connected to the positive pole of the power supply, and GND is connected to the negative pole of the power supply.

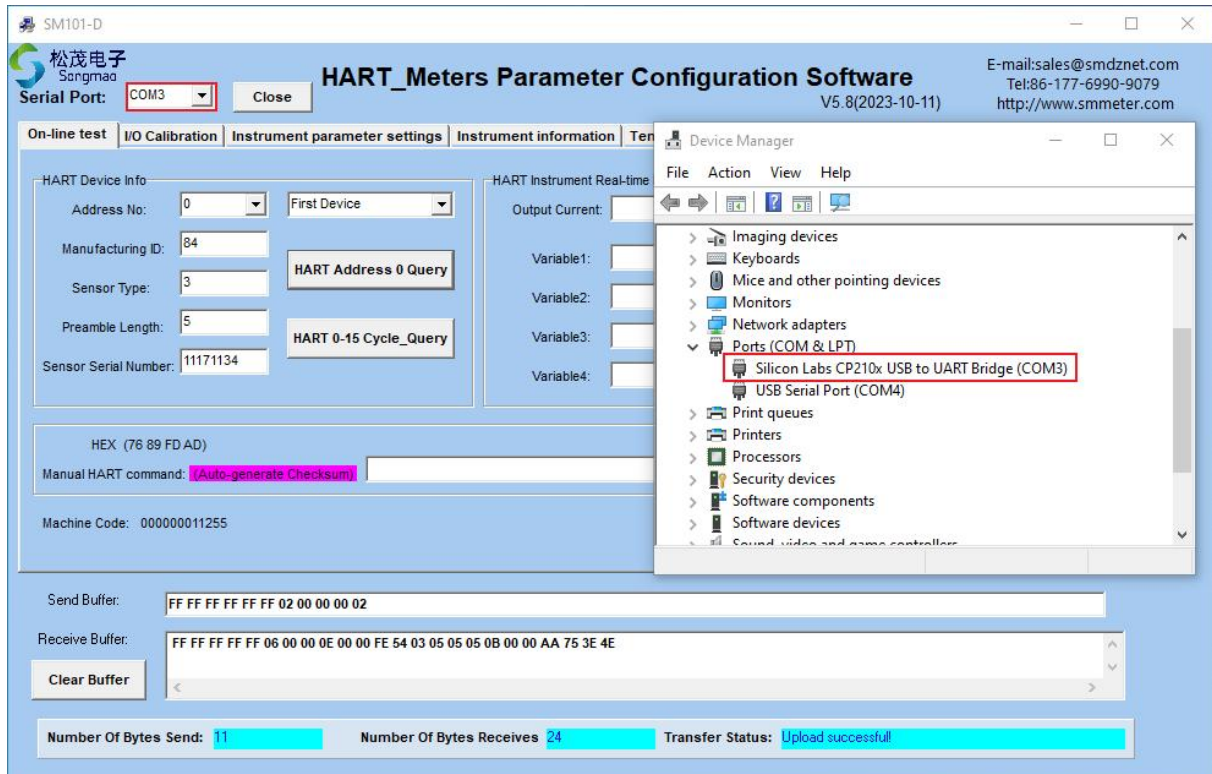
2.5 Indicator Light Description

- TXD communication indicator light: flashes when data is being sent.
- PWR power indicator light: It stays on when the power is turned on.
- RXD communication indicator: flashes when data is being received.

3. Configuration software function introduction and operation steps

3.1 Communication connection

According to described in the port overview section, connect the power supply, RS485/RS232 cables , and proceed with parameter configuration once the PWR indicator illuminates steadily. According to the port number recognized by the computer, select the correct serial port number and open the serial port. Now you can start communication debugging for the instruments.



3.2 Online test

1) Basic information of HARTSMART instrument equipment

① When the instrument address is 0, click "HART 0 address query" to query the basic parameter information of the HART instrument.

② When the HART address is not 0, the output current of the HART instrument is always 4mA. Select the corresponding address number and click "HART 0 address query" or directly click "HART 0-15 address patrol detection" to query the basic parameter information of the HART instrument.

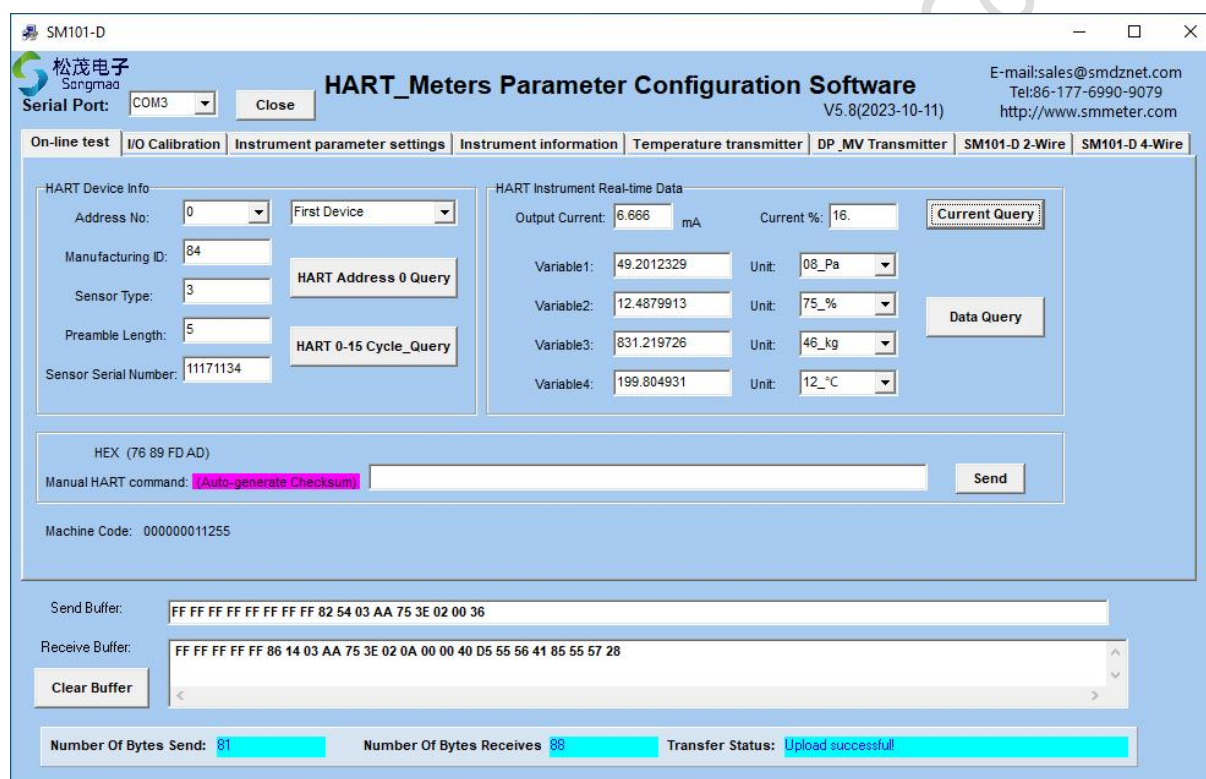
2) Real-time data of HART SMART instrument

① Click "Current Current Query" to read the output current value and output current percentage.

② Click "Instrument Real-time Data Query" to read the real-time data of the HART instrument.

3) Manual HART command

You can manually input HART commands to read the real-time data of HART instruments. (Note: The Preamble and check byte of HART commands do not need to be filled in)



3.3 Instrument input and output calibration

1) Current output calibration

Current Output Calibration for Rosemount 3051 Series Instruments When current output deviation occurs, perform the following calibration,

- ① Output High Current Trim: Set instrument to fixed 20mA output, Enter actual current value in "Output High Current Trim" field, and finally click "Download"
- ② Output low current Trim: Set instrument to fixed 4mA output, Enter actual current value in "Output Low Current Trim" field, and finally click "Download"
- ③ 4mA Calibration: At zero condition, click Download in "Calibrate 4mA" to trim 4mA output.
- ④ 20mA Calibration: At full scale condition, click Download in "Calibrate 20mA" to trim 20mA output

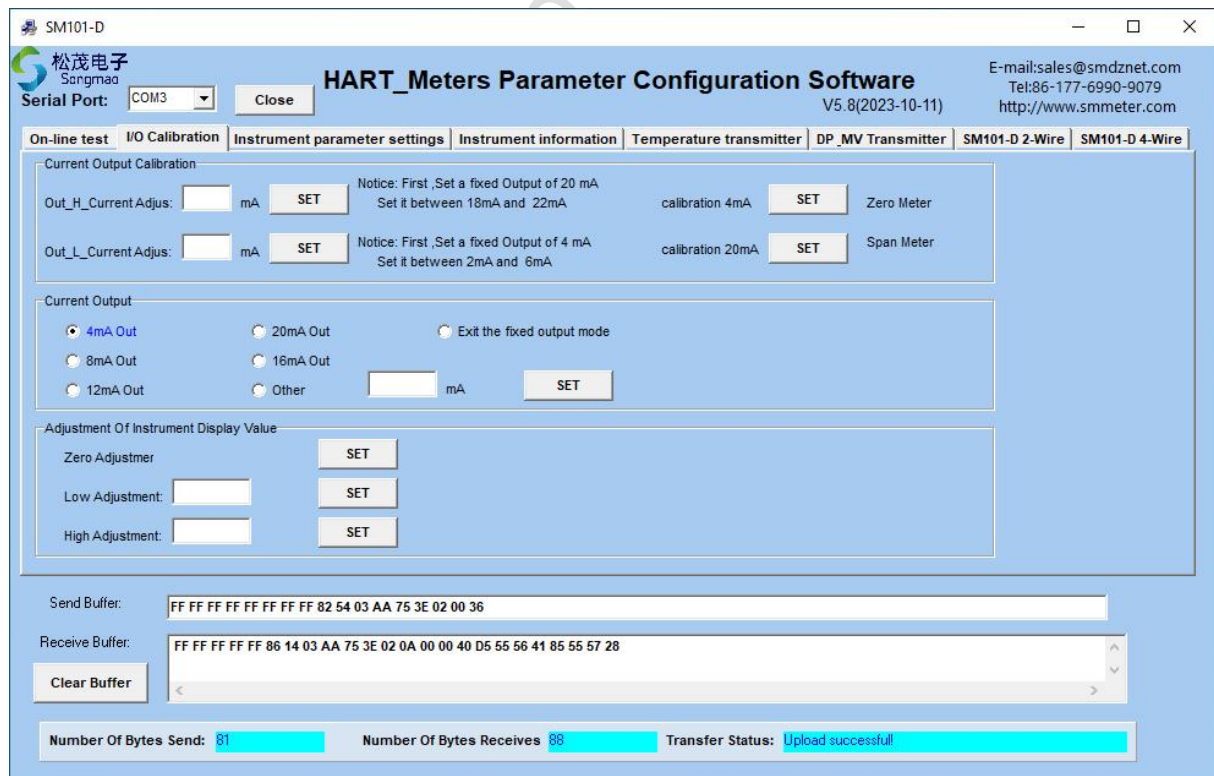
2) Current output

- ① Enter Fixed Current output Mode: Select target current output value (or enter custom value) Click Download → Instrument outputs fixed current
- ② Exit Fixed Current output Mode: Select "Exit Fixed Output Mode" Click Download, Output current varies with primary variable.

3) Instrument display value adjustment.

Display Value Adjustment for Rosemount 3051 Series Instruments When measurement value deviations occurs, perform the following Adjustment

- ① Zero Trim: Click "Download" to auto-adjust zero display
- ② Lower Range Value adjustment: Enter Low Point display value in "Low Point Adjustment" field and Click "Download" to adjust the instrument low point display
- ③ High point adjustment: Enter the high point display value in the "High point adjustment" field, and click "Download" to adjust the instrument high point display.



3.4 Basic instrument parameter Configuration

1) Measurement range and accuracy

Click "Upload" to read the hardware physical measurement Upper Range Limit (URL), Lower Range Limit (LRL) and unit from the HART instrument

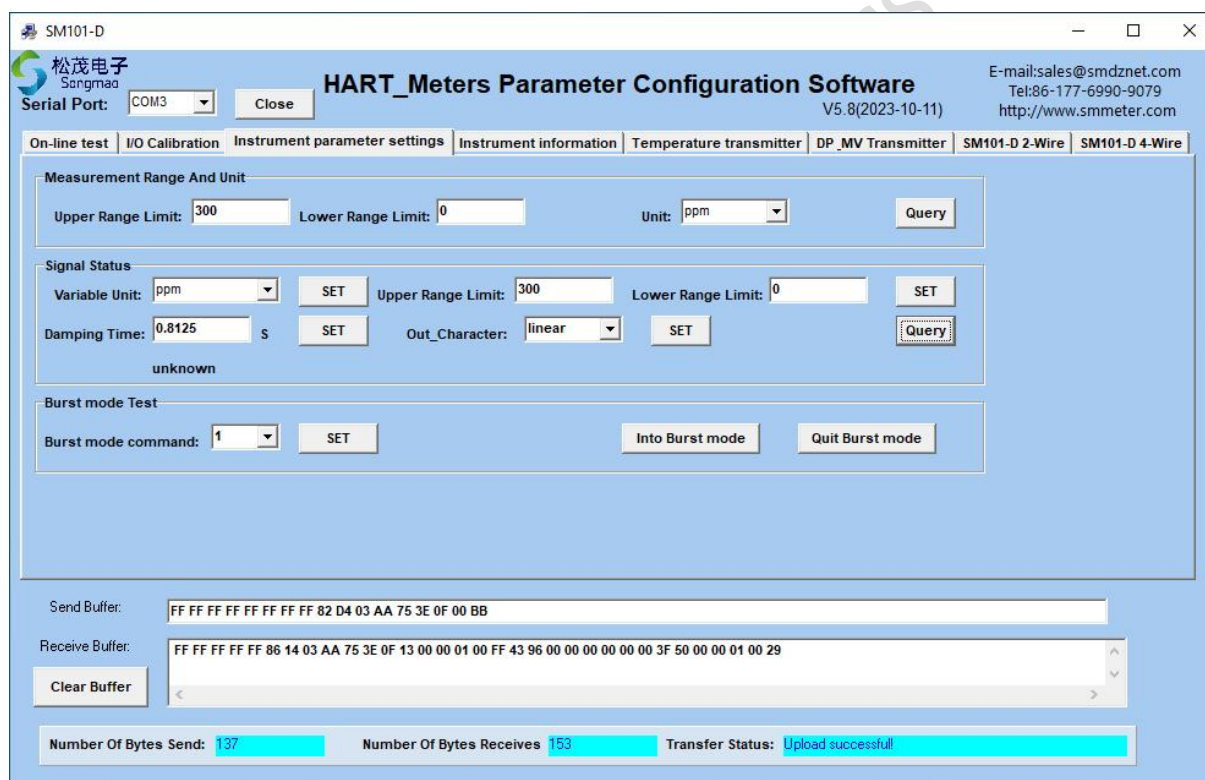
2) Signal status

Parameters such as Variable unit, Upper Range Limit (URL), Lower Range Limit (LRL), damping time, and output characteristic can be queried and configured here. "Upload Data": Reads current parameters from the device. "Download": Writes (sets) parameters to the device, the HART instrument

3) Burst mode test

When the HART instrument is in burst mode, it will autonomously output HART data packets. Click "Enter Burst Mode" or "Exit Burst Mode" to set the device's burst mode state. The content of the autonomously output HART data varies depending on the selected burst command.

- ① Command No. 1: Outputs Primary Variable (PV) data.
- ② Command No. 2: Output current value and current percentage.
- ③ Command No. 3: Output process variable data and current value.



SM101-D

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Songmao

Serial Port: COM3 Close

HART_Meters Parameter Configuration Software
V5.8(2023-10-11)

E-mail:sales@smdznet.com
Tel:86-177-6990-9079
http://www.smmeter.com

On-line test | I/O Calibration | Instrument parameter settings | Instrument information | Temperature transmitter | DP_MV Transmitter | SM101-D 2-Wire | SM101-D 4-Wire

Measurement Range And Unit

Upper Range Limit: 300 Lower Range Limit: 0 Unit: ppm Query

Signal Status

Variable Unit: ppm SET Upper Range Limit: 300 Lower Range Limit: 0 SET

Damping Time: 0.8125 s SET Out_Character: linear SET Query

unknown

Burst mode Test

Burst mode command: 1 SET Into Burst mode Quit Burst mode

Send Buffer: FF FF FF FF FF FF FF FF 82 D4 03 AA 75 3E 0F 00 BB

Receive Buffer: FF FF FF FF FF 86 14 03 AA 75 3E 0F 13 00 00 01 00 FF 43 96 00 00 00 00 00 3F 50 00 00 01 00 29

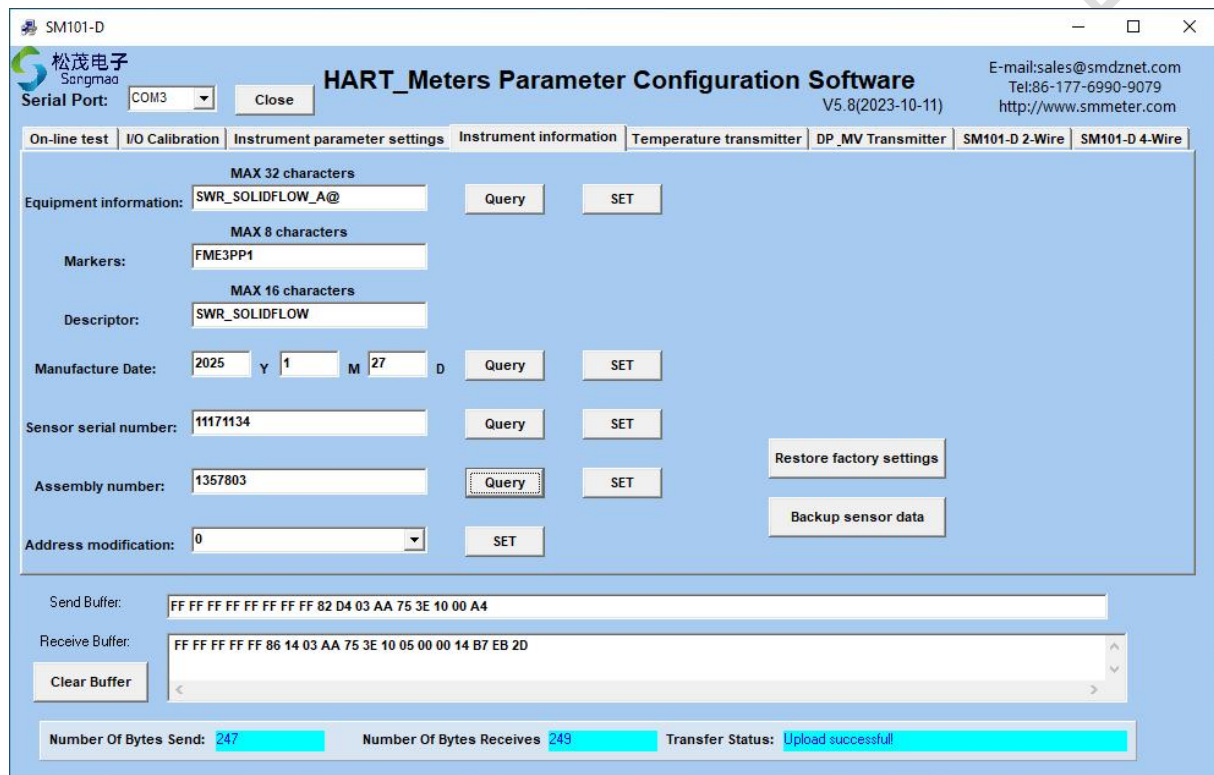
Clear Buffer

Number Of Bytes Send: 137 Number Of Bytes Receives: 153 Transfer Status: Upload successful!

3.5 Basic information of the instrument

This interface allows reading and setting instrument parameters such as Device ID, Tag, Descriptor, Sensor Serial Number, etc. Click "Upload" to read the instrument parameters, and click "Download" to set the instrument parameters.

- 1) Device ID: Read or set the HART device's identification information. The Device ID can be up to 32 alphanumeric characters.
- 2) Tag: Read or set the HART device's Tag (unique identifier). The Tag can be up to 8 alphanumeric characters.
- 3) Descriptor: Read or set the HART device's Descriptor (descriptive text). The Descriptor can be up to 16 alphanumeric characters.
- 4) Date of Manufacture: Read or set the HART instrument's manufacture date.
- 5) Sensor serial number: Sets the HART instrument's Sensor Serial Number.
- 6) Assembly number: Reads or sets the HART instrument's Assembly Number.
- 7) Short frame address modification: The short frame address of the HART instrument can be modified.



SM101-D

松茂电子
Songmao

Serial Port: COM3 Close

HART_Meters Parameter Configuration Software
V5.8(2023-10-11)

E-mail:sales@smdznet.com
Tel:86-177-6990-9079
http://www.smmeter.com

On-line test | I/O Calibration | Instrument parameter settings | Instrument information | Temperature transmitter | DP_MV Transmitter | SM101-D 2-Wire | SM101-D 4-Wire

MAX 32 characters
Equipment information: SWR_SOLIDFLOW_A@ Query SET

MAX 8 characters
Markers: FME3PP1

MAX 16 characters
Descriptor: SWR_SOLIDFLOW

Manufacture Date: 2025 Y 1 M 27 D Query SET

Sensor serial number: 11171134 Query SET

Assembly number: 1357803 Query SET

Address modification: 0 SET

Restore factory settings
Backup sensor data

Send Buffer: FF FF FF FF FF FF FF 82 D4 03 AA 75 3E 10 00 A4

Receive Buffer: FF FF FF FF FF 86 14 03 AA 75 3E 10 05 00 00 14 B7 EB 2D

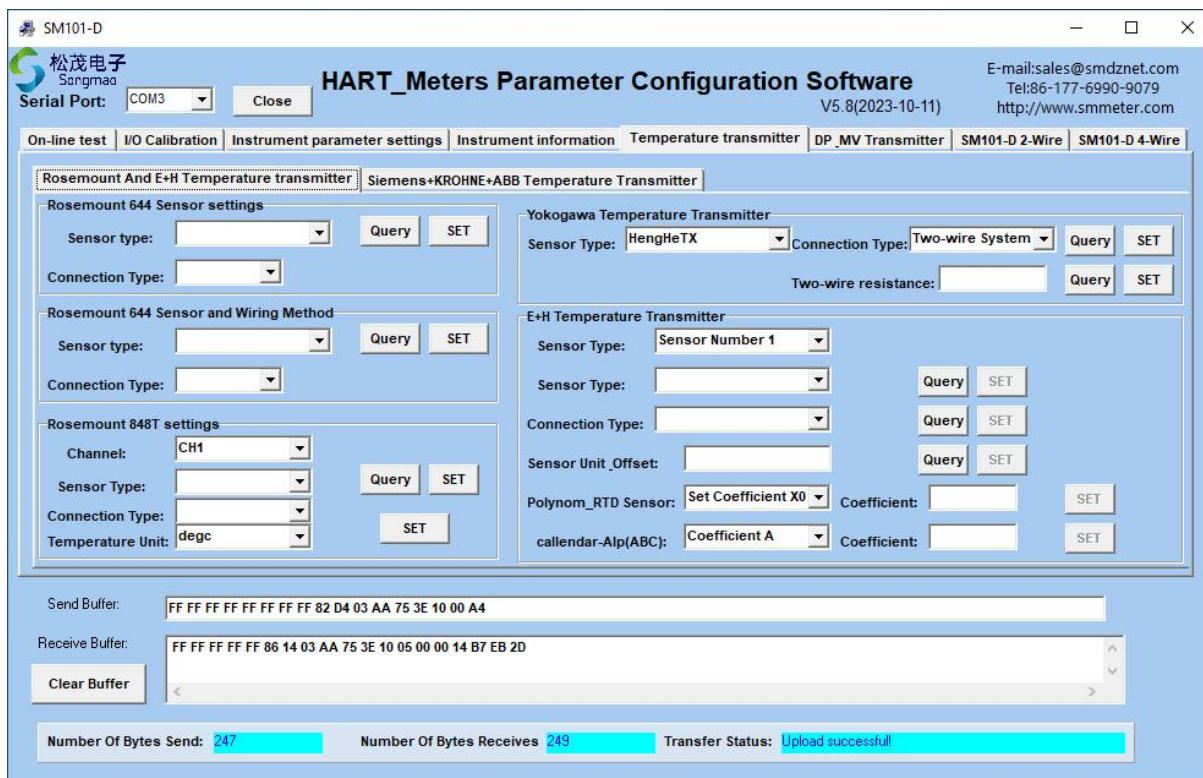
Clear Buffer

Number Of Bytes Send: 247 Number Of Bytes Receives: 249 Transfer Status: Upload successful!

3.6 Temperature transmitter parameter configuration

temperature transmitters of different brands , you can query and set some special command parameters , such as sensor type, wiring method, sensor unit , etc. Click "Upload" to read the instrument parameters, and click "Download" to set the instrument parameters.

Currently supported instruments include: Rosemount 644 temperature sensor, Rosemount 644RK temperature sensor, Rosemount 848T temperature sensor, Yokogawa temperature transmitter, E+H temperature transmitter, Siemens temperature transmitter, KROHNE TT50C sensor and ABBTTH200 sensor.



The screenshot shows the 'HART_Meters Parameter Configuration Software' interface. The title bar indicates 'SM101-D'. The interface includes a top menu bar with options like 'On-line test', 'I/O Calibration', 'Instrument parameter settings', 'Instrument information', 'Temperature transmitter', 'DP_MV Transmitter', 'SM101-D 2-Wire', and 'SM101-D 4-Wire'. The main area is divided into several sections for configuring different transmitters:

- Rosemount And E-H Temperature transmitter**: Includes settings for Rosemount 644 Sensor (Sensor type, Connection Type, Query, SET) and Rosemount 644 Sensor and Wiring Method (Sensor type, Connection Type, Query, SET).
- Rosemount 848T settings**: Includes settings for Channel (CH1), Sensor Type, Connection Type, and Temperature Unit (degc), with Query and SET buttons.
- Siemens+KROHNE+ABB Temperature Transmitter**: Includes settings for Yokogawa Temperature Transmitter (Sensor Type: HengHeTX, Connection Type: Two-wire System, Two-wire resistance, Query, SET) and E+H Temperature Transmitter (Sensor Type: Sensor Number 1, Sensor Type, Connection Type, Sensor Unit_Offset, Polynom_RTD Sensor: Set Coefficient X0, Coefficient, Callendar-Alp(ABC): Coefficient A, Coefficient, Query, SET).

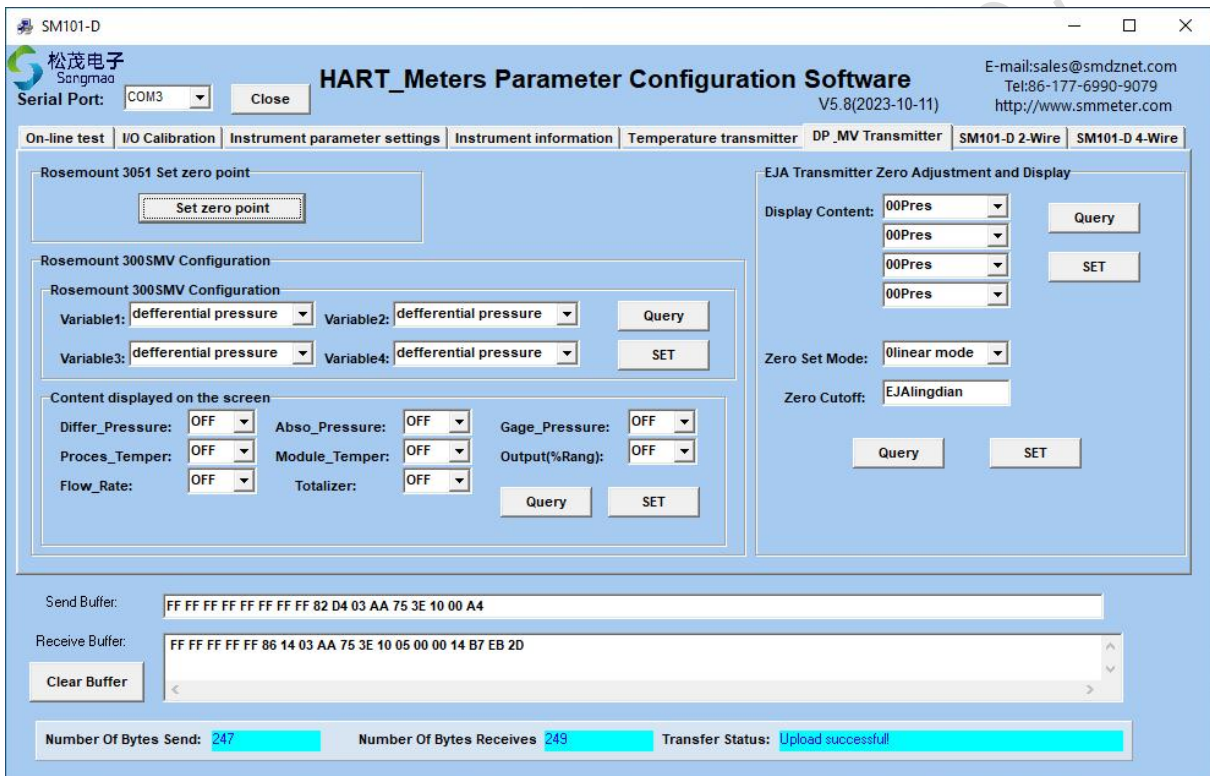
At the bottom, there are fields for 'Send Buffer' (FF FF FF FF FF FF FF FF 82 D4 03 AA 75 3E 10 00 A4) and 'Receive Buffer' (FF FF FF FF FF 86 14 03 AA 75 3E 10 05 00 00 14 B7 EB 2D), a 'Clear Buffer' button, and a status bar showing 'Number Of Bytes Send: 247', 'Number Of Bytes Receives: 249', and 'Transfer Status: Upload successfull'.

3.7 Differential pressure and multivariable transmitters

pressure transmitters of different brands , you can query and set some special command parameters , such as transmitter zero calibration, variable output configuration, display configuration , etc. Click "Upload" to read instrument parameters, and click "Download" to set instrument parameters.

Currently supported instruments include: Rosemount 3051 differential pressure transmitter , Rosemount 300SMV multivariable transmitter, and Yokogawa EJA differential pressure transmitter.

- 1) Rosemount 3051 differential pressure transmitter zero point setting: Performs zero calibration for the differential pressure transmitter.
- 2) Rosemount 300SMV multi-variable parameter setting: Configures up to 4 process variable outputs and manages display parameters.
- 3) EJA differential pressure transmitter zero adjustment and display: Manages display configuration, zero adjustment mode, and zero cutoff settings.



The screenshot shows the 'HART_Meters Parameter Configuration Software' interface. The window title is 'SM101-D'. The top bar includes the Songmao logo, 'Serial Port: COM3', and a 'Close' button. The main menu includes 'On-line test', 'I/O Calibration', 'Instrument parameter settings', 'Instrument information', 'Temperature transmitter', 'DP_MV Transmitter', 'SM101-D 2-Wire', and 'SM101-D 4-Wire'. The 'DP_MV Transmitter' tab is active, showing three sub-sections: 'Rosemount 3051 Set zero point' with a 'Set zero point' button; 'Rosemount 300SMV Configuration' with fields for Variable1, Variable2, Variable3, and Variable4, each with a 'Query' or 'SET' button; and 'Content displayed on the screen' with checkboxes for various parameters like Differ_Pressure, Abso_Pressure, Gage_Pressure, Proces_Temper, Module_Temper, Output(%Rang), Flow_Rate, and Totalizer. The 'EJA Transmitter Zero Adjustment and Display' section on the right includes 'Display Content' dropdowns, 'Zero Set Mode' (0linear mode), 'Zero Cutoff' (EJAlingdian), and 'Query'/'SET' buttons. At the bottom, there are 'Send Buffer' and 'Receive Buffer' text areas, a 'Clear Buffer' button, and a status bar showing 'Number Of Bytes Send: 247', 'Number Of Bytes Receives: 249', and 'Transfer Status: Upload successfull'.

4. Service and Warranty

1. This product has a three-year warranty under normal use.
2. During the warranty period, our company will provide you with warranty services for any failure caused by product technical reasons.
3. The following situations are not covered by free warranty:
 - ① Products that have been disassembled, assembled, or repaired without the consent of our company;
 - ② Damage caused by external forces and other natural disasters.
4. If the user believes that our product needs repair, please call our company to contact us in time. We will repair it and send it back as soon as possible.
5. This warranty liability is limited to product failure repairs during the warranty period, and no other liability is assumed.

After-sales service hotline: 86-573-82623038

Email: service@smdznet.com