SM700-M Smart Converter
Instructions for use

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Disclaimer:

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 However, content may become outdated or invalid due to product/software upgrades.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 for advice and answers.

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1. Introduction of SM700-M Converter

1.1 Product Introduction

SM700-M smart converter is a product developed by using ARM microprocessor, special chip and a lot of practical experience. It is designed according to the requirements of industrial products and has the characteristics of high reliability and stability. The intelligent converter is equipped with two standard RS485 interfaces, which can convert standard and non-standard MODBUS _ RTU protocols into standard MODBUS _ RTU protocols.

Because the SM700-M smart converter is designed for industrial integration, it has a special design in terms of temperature range, vibration, electromagnetic compatibility and interface diversity, which ensures stable operation in harsh environments and provides high quality assurance for your equipment.

1.2 Product Performance

- Support standard and non-standard MODBUS _ RTU protocol transmission.
- Equipped with standard RS485 interface, it can communicate with computer or server.
- Communication parameters such as baud rate, check bit and stop bit can be set according to actual communication equipment.
- With power-off memory function, parameters do not need to be reset after power off.

1.3 Main Parameters

- Shell size: length 103 mm × width 71 mm × height 43 mm.
- Working temperature: -20 ℃ ~ + 80 ℃.
- Relative humidity: 10% ~ 80%.
- Power supply input voltage: DC 12 ~ 24V, the ripple of the power supply shall not be greater than 200 mA, and the power supply shall provide 100mA.

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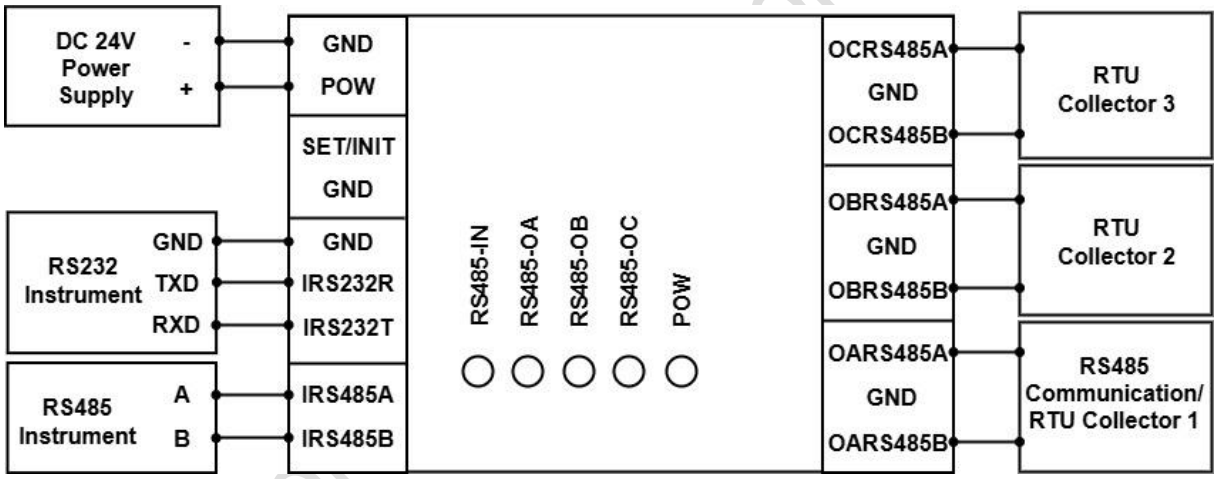
2. SM700-M Converter Physical Drawing and Indicator Light Function

2.1 Physical Drawings

2.2 Wiring Diagram



2.3 Port Introduction

Port name	PROM	IRS485B、IRS485A	IRS232T、IRS232R、GND	GND、SET/INIT	POW、GND
Function/access device	Proceed	RS485 meter	RS232 instrument		Power source
Port name	OARS485B、GND、OARS485A		OBRS485B、GND、OBRS485A	OCRS485B、GNDOCRS485A	
Function/access device	RS485 communication/RTU collector 1		RTU collector 2		

- PROM: Press the program button. Press and hold the button before applying power to the converter. At this time, the converter enters the next program state. The converter can be upgraded through IRS485 port or IRS232 port.
- IRS485A, IRS485B: RS485 communication input interface, according to different requirements, refer to the wiring diagram to connect the instrument equipment to realize the data transmission between the converter and the instrument.

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- IRS232T, IRS232R, GND: RS232 communication input interface, according to different requirements, refer to the connection diagram to connect the instrument and equipment to realize the data transmission between the converter and the instrument.
- POW, GDN: DC power supply, the positive and negative poles (+,-) of the power line are connected to the corresponding (POW, GND) terminals respectively.
- OARS485A, GND, OARS485 B: both parameter setting interface and MODBUS signal output interface. The internal parameters of the converter can be set by connecting the RS485 communication line to the computer. Connected to the host device, the converter can convert the read instrument data into the standard MODBUS protocol and output it.
- OBRS485A, GND, OBRS485B: connect the host equipment, and the converter will convert the read instrument data into the standard MODBUS protocol and output it.

2.4 Description of Indicator Light

- RS485 _ IN indicator: RS485 or RS232 communication indicator.
- RS485 _ OA indicator: OARS485 communication indicator.
- RS485 _ OB indicator: OBRS485 communication indicator.
- RS485 _ OC indicator: OCRS485 communication indicator.
- POW indicator: power indicator.

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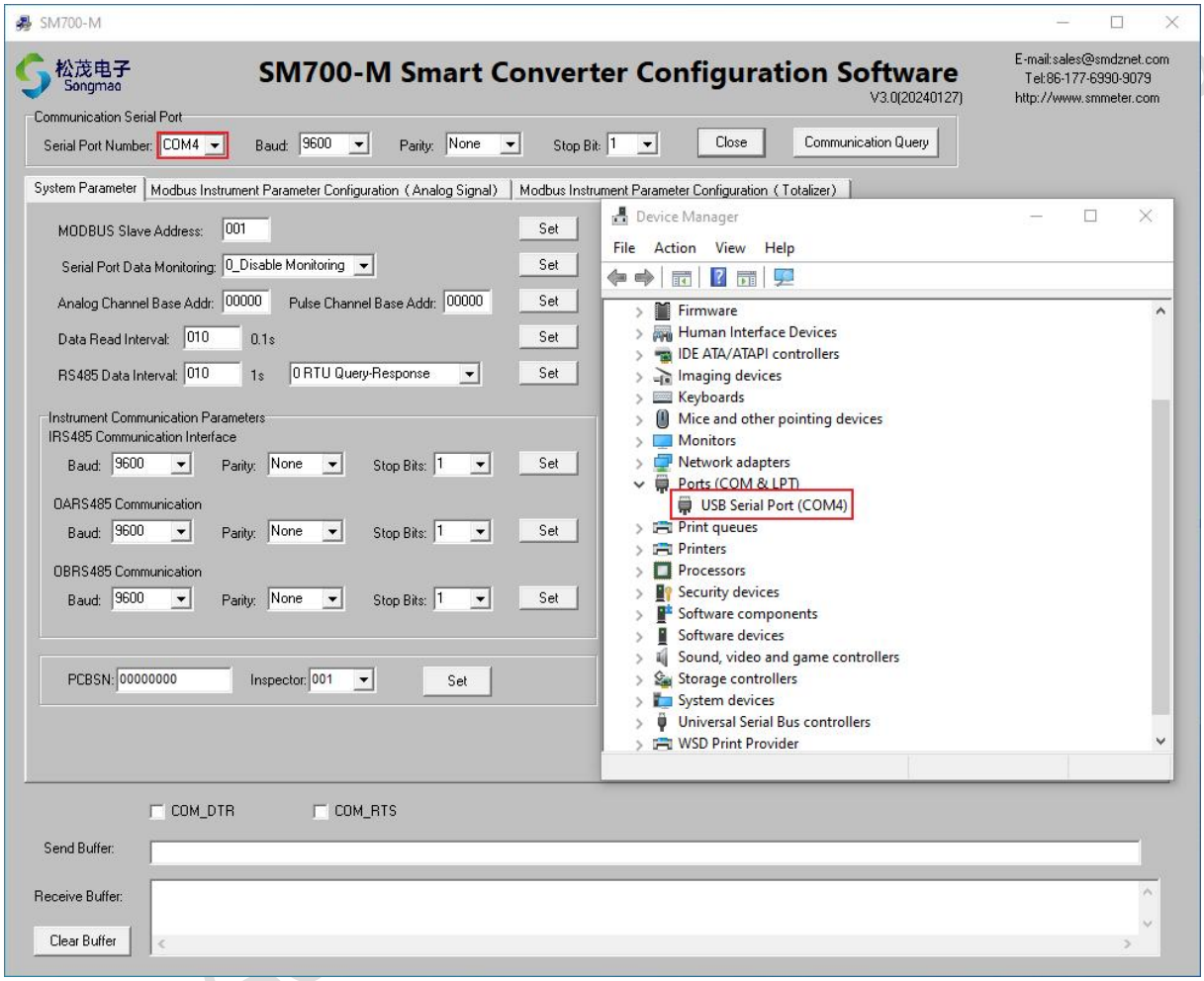
3. Function Introduction of Configuration Software

3.1 Communication Connection

Open the configuration software, select the correct port number, baud rate, check bit and stop bit in the "Main serial port communication interface" box, then open the serial port and click "Communication query". At this time, you can see the returned version number in the receive buffer below, indicating that the communication between the converter and the computer is successful.



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3.2 System Parameter

1) MODBUS slave address: Enter the 3-digit slave address and click "Set".

2) Serial port data monitoring : OARS485 interface can monitor the data of IRS485 interface or IRS232 interface, select the required monitoring mode, and then click "Set".

① Disable monitoring: When it is set to no monitoring, the OARS485 interface only outputs MODBUS protocol data.

② RS485: when it is set as RS485 interface, OARS485 interface is used for data monitoring to monitor the communication between IRS485 interface or IRS232 interface and the instrument.

3) Analog/pulse channel base address: set the analog channel base address and pulse channel base address respectively, and the converter will Set the read analog quantity and cumulative quantity in turn from this address.

① When the channel base address $X_{\text{Anlog}} \geq X_{\text{Pulse}}$, and $X_{Pulse} = 0$ When, the converter starts from the $X_{An\log}$ The address begins to store data;

② When the channel base address $X_{An\log} \leq X_{Pulse}$, and $X_{An\log} = 0$ When, the converter starts from the X_{Pulse} The address begins to store data;

③ When the channel base address $X_{An\log} \geq X_{Pulse} \succ 0$ When, the converter starts from the X_{Pulse} Address to start storing data.

4) Data reading interval: it is the interval time for sending instructions when reading RS485 instrument data. Input the time and click "Set".

(Note: interval time = input value × 0.1s)

5) RS485 data interval

① When the time is set as 000 and the mode is set as RTU question-answer mode, the converter OARS485 interface and OBRS485 interface output standard MODBUS protocol data.

② When the time is set as 003 and the mode is set as general message mode, only the OBRS485 interface of the converter has output, and the output data is non-standard MODBUS protocol data with header 23 23 23 before the standard MODBUS protocol and no check at the end of the packet.

③ When the time is set as 003 and the mode is set as message 2, only the OBRS485 interface of the converter has output, and the output data is the fire alarm protocol.

④ Message 3 is a standby protocol.

6) Instrument communication parameters

① IRS485 communication interface: Select the communication baud rate, check bit and stop bit according to the RS485/RS232 instrument connected to the IRS485/IRS232 interface, and then click "Set" to Set the modified parameters.

② OARS485 communication interface: Select the communication baud rate, check bit and stop bit according to the host device connected to the OARS485 interface, and then click "Set".

③ OBRS485 communication interface: select the communication baud rate, check bit and stop bit according to the host device connected to the OBRS485 interface, and then click "Set".

6) Command 1 ~ 6

Command codes can be set in command 1 ~ 6 setting boxes respectively, and the converter will send commands to the connected RS485/RS232 instruments in turn according to the set command codes.

① Enable: select the enable state according to the actual situation. "Close" means no command is sent, and "RS485B" means command is sent.

② Command: When the enable state is set to "RS485B", the command code for reading the instrument data needs to be

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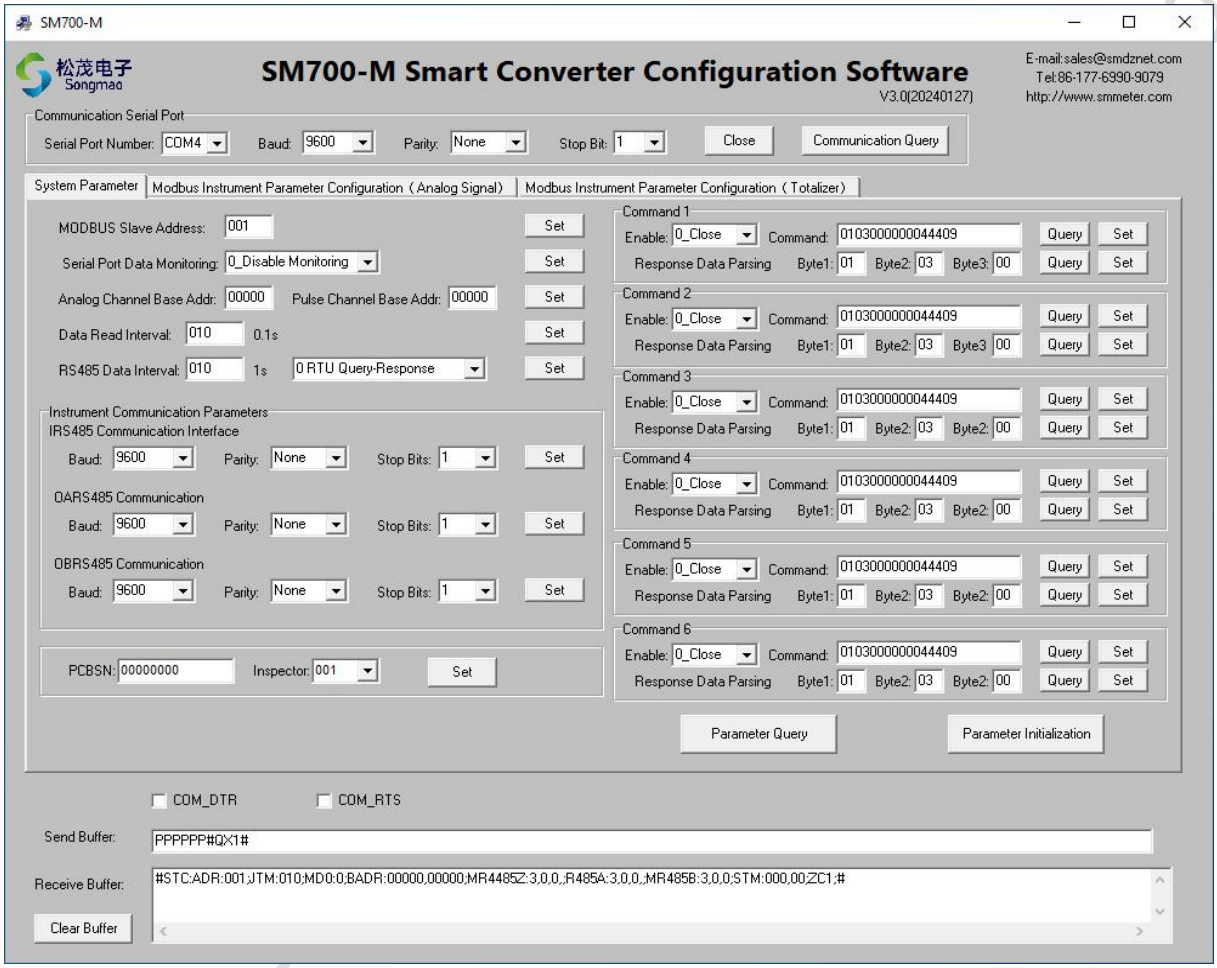
input. This command code is sent when the master device reads RS485/RS232 instrument data. Only when the command sent by the master device is consistent with the set command code, the command is considered valid and the converter sends the command to the instrument.

③ Response data parsing: Byte1 ~ 3 of the header are judgment bytes. When the first 3 bytes of the returned data information are consistent with Byte1 ~ 3 of the header respectively, the data information is considered to be valid, and the converter will further analyze the data. When Byte1 to Byte3 of the packet header are 00, it indicates that the returned data information is not judged, and all the data information is correct by default.



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3.3 Modbus Instrument Parameter Configuration (Analog signal)

1) Query: Click the "Query" button to read the parameter configuration of the interface.

2) Command code: the converter sends the command to the connected RS485/RS232 instrument according to the selected command number. Check the instrument protocol, and select the corresponding instruction number according to the instrument data to be analyzed and the instruction content set in the "System Parameters" interface.

3) Address: Get the start address of the data. When the converter communicates with the RS485/RS232 instrument, the converter sends a command corresponding to the command number to the instrument, and the instrument returns the data information code after receiving the command request. The client intercepts a valid data code for the returned data information code. The data information code starts counting from 0 byte, and the valid data to be intercepted is the Nth byte, so the start address is set to N. For example:

Send Command: 01 03 00 00 00 02 C4 0B

Return command: 01 03 04 7A E1 42 B3 C2 08

7A E1 42 B3 is the valid data code to be intercepted, counting from 0. The code starts from the third byte, so the starting address should be set to 003.

4) Length: Get the data length of data. For example, 7A E1 42 B3 is the valid data code to be intercepted. This code is 4 bytes in total, so the data length should be set to 4.

5) Data type: the parsing format of the read data. The data format includes floating point, integer, BCD code, character string, double floating point number and other data formats. The user selects the corresponding analytical format according to the data format in the MODBUS protocol of RS485 instrument.

6) Coefficient: after the converter reads the RS485 instrument data, the read data information shall be Setd. If the Setd data needs to be processed, it can be realized by setting the coefficient parameter.

7) Data address: after the converter reads RS485/RS232 instrument data, the read data information shall be Setd. The start address of the register where the data is stored is the address of the stored data set in this parameter box.

8) Data format: after the converter reads RS485/RS232 instrument data, the read data information shall be Setd. The Setd data format is the data format set in the parameter box.

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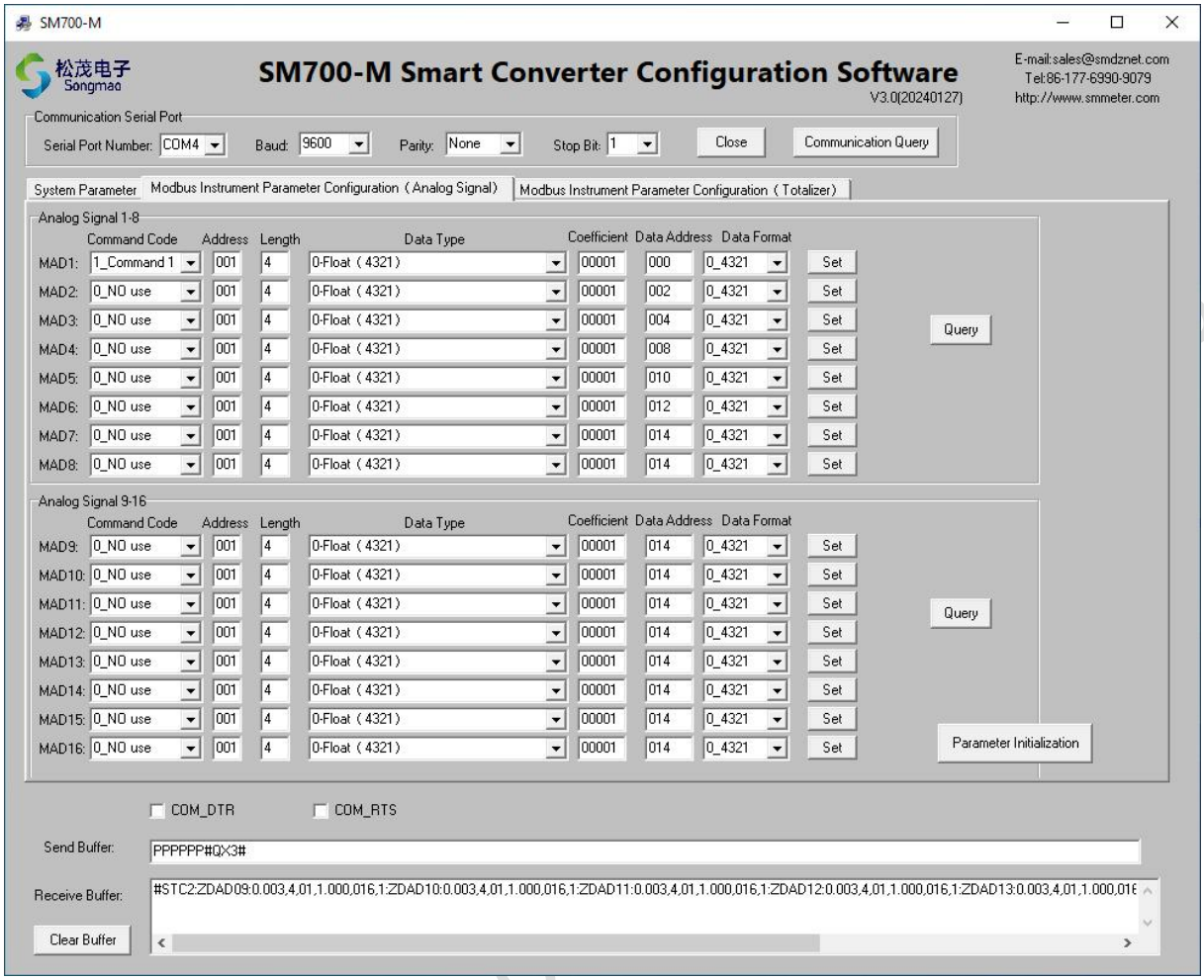

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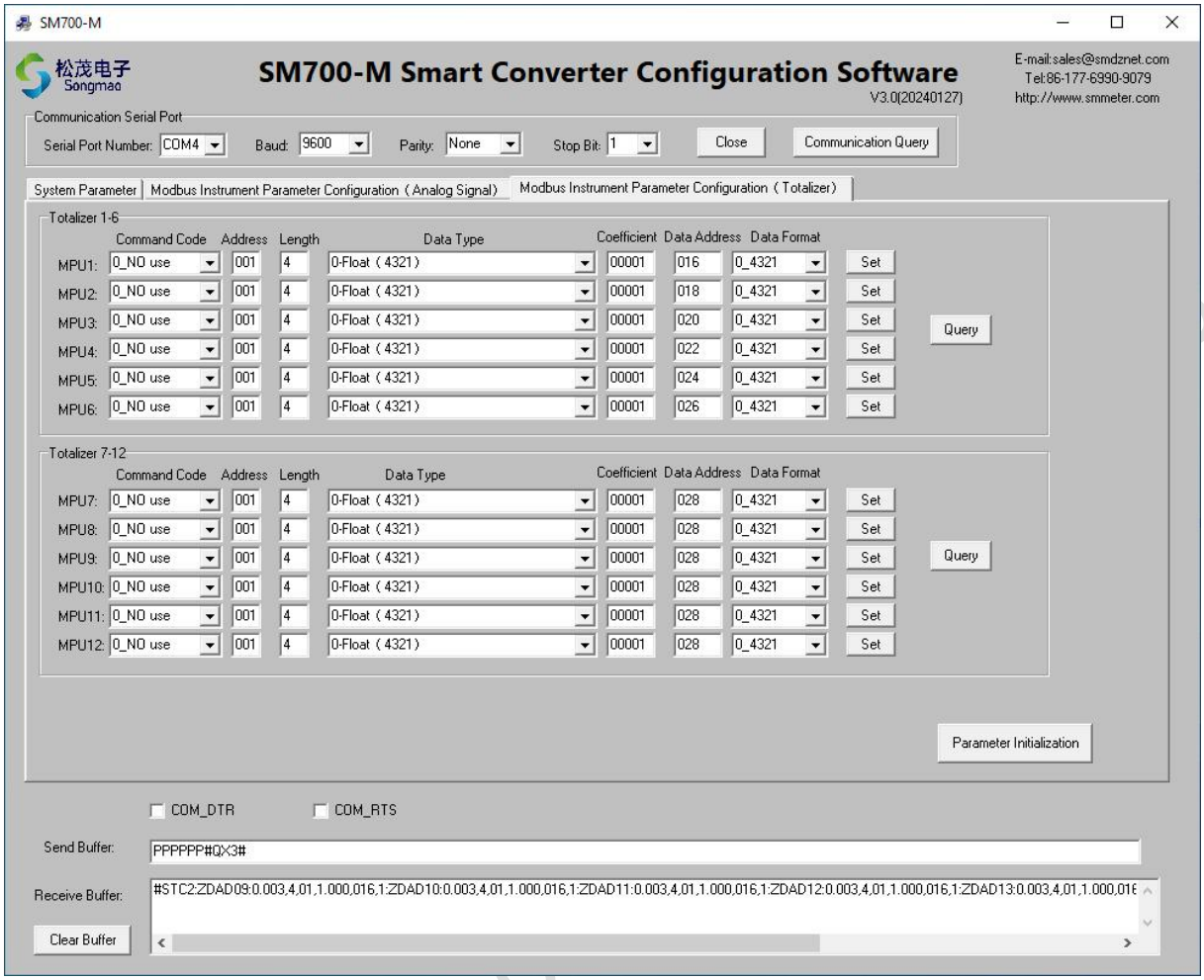

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4. Service and Warranty

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.

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