

SM701-A (B) Smart Operating Instructions for Multiplexer



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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 However, content may become outdated or invalid due to product/software upgrades.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. Introduction of SM701-A (B) Converter

1.1 Product Introduction

SM701-A (B) intelligent multiplexer is A product developed by using ARM microprocessor, special chip and combining with 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 smart converter is equipped with 2 standard RS485 interfaces.

Because SM701-A (B) intelligent multiplexer is specially designed for industrial integration, it adopts special design in terms of temperature range, vibration, electromagnetic compatibility and interface diversity to ensure stable operation in harsh environment and provide high quality assurance for your equipment.

1.2 Product Performance

- One RS485 or RS232 interface can be converted into two RS485 interfaces.
- Support standard and non-standard MODBUS _ RTU protocol transmission.
- Equipped with standard RS485 or RS232 interface, it can communicate with computer or server.
- Support multiple collectors or PCs.
- Baud rate, check bit, stop bit and other communication parameters can be set according to the actual access of RS485 or RS232 instrument.
- With power-off memory function, parameters do not need to be reset after power off.

1.3 Main Parameters

- Shell size: length 96 mm × width 80 mm × height 25 mm.
- Working temperature: -20 °C ~ + 80 °C .
- 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.

2. Function of SM701-A (B) Converter Physical Drawing and Indicator Light

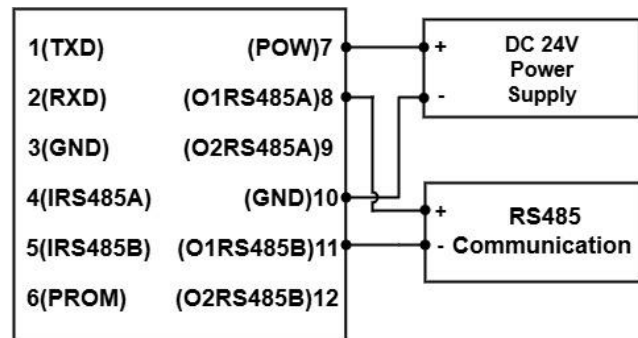
2.1 Physical Drawings



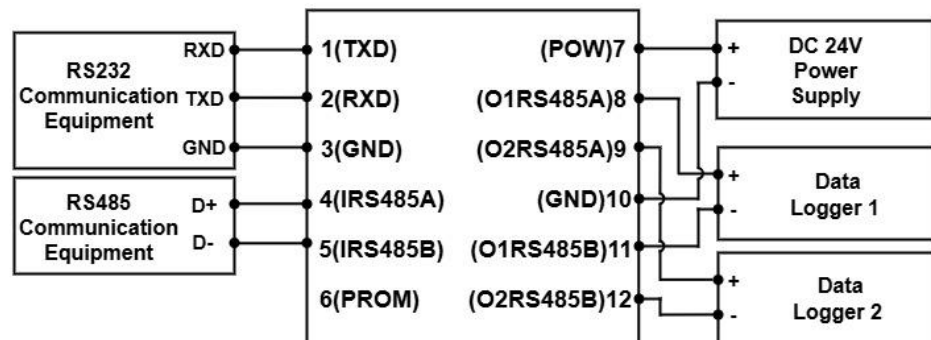
2.2 Wiring Diagram

Parameter Configuration

Wiring Diagram



Equipment Wiring Diagram



2.2.1 Setting Mode

Connect the positive and negative poles of the 24 V DC power supply to the POW and GND ports respectively, and then use the 485 communication line to connect the computer and the SM701-A (B) converter. The D + line of the 485 communication line is connected to the OARS485A port of the converter, and the D- line is connected to the OARS485B port.

Open the configuration software, select the correct port number, baud rate, check bit and stop bit, then open the serial port and set the working mode to "command mode". At this time, you can set the parameters of the converter.

2.2.2 Operation Mode

After the parameters are set successfully, the converter is set to the multi-master-one-slave mode.

Connect the RS485/RS232 instrument to the IRS485/IRS232 port of the converter, connect the monitoring equipment or RTU collector to the ORS485A and ORS485B ports, and finally connect the positive and negative poles of the 24 V DC power supply to the POW and GND ports of the converter respectively. At this point, the SM701-A (B) converter enters normal operating mode.

2.3 Port Introduction

Port number	1	2	3	4	5	6
Port name	TXD	RXD	GND	IRS485A	IRS485B	PROM
Function/access device	Communication IRS232			RS485 input		Program download
Port number	7	8	9	10	11	12
Port name	POW	O1RS485A	O2RS485A	GND	O1RS485B	O2RS485B
Function/access device	Power source	RS485 output 1 +	RS485 output 2 +	Power source	RS485 output 1- 1-	RS485 output 2-

- TXD, RXD, GND: RS232 communication input interface, according to different needs, refer to the connection diagram to connect the instrument equipment, to achieve data transmission between the converter and the instrument.
- 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.
- PROM: lower program port. After the PROM is connected to the GND port, the power is supplied to the converter. At this time, the converter enters the lower program state. The converter can be upgraded through IRS485 port or IRS232 port.
- POW, GND: DC power supply, the positive and negative poles (+, -) of the power line are connected to the corresponding (POW, GND) terminals respectively.
- ORS485A, ORS485 B: RS485 signal output interface, which can be connected to two different RTU acquisition systems.

2.4 Description of Indicator Light

- IR485 indicator: RS485 or RS232 communication indicator.
- O1R485 indicator: O1RS485 communication indicator.
- O2R485 indicator: O2RS485 communication indicator.
- POW indicator: power indicator.

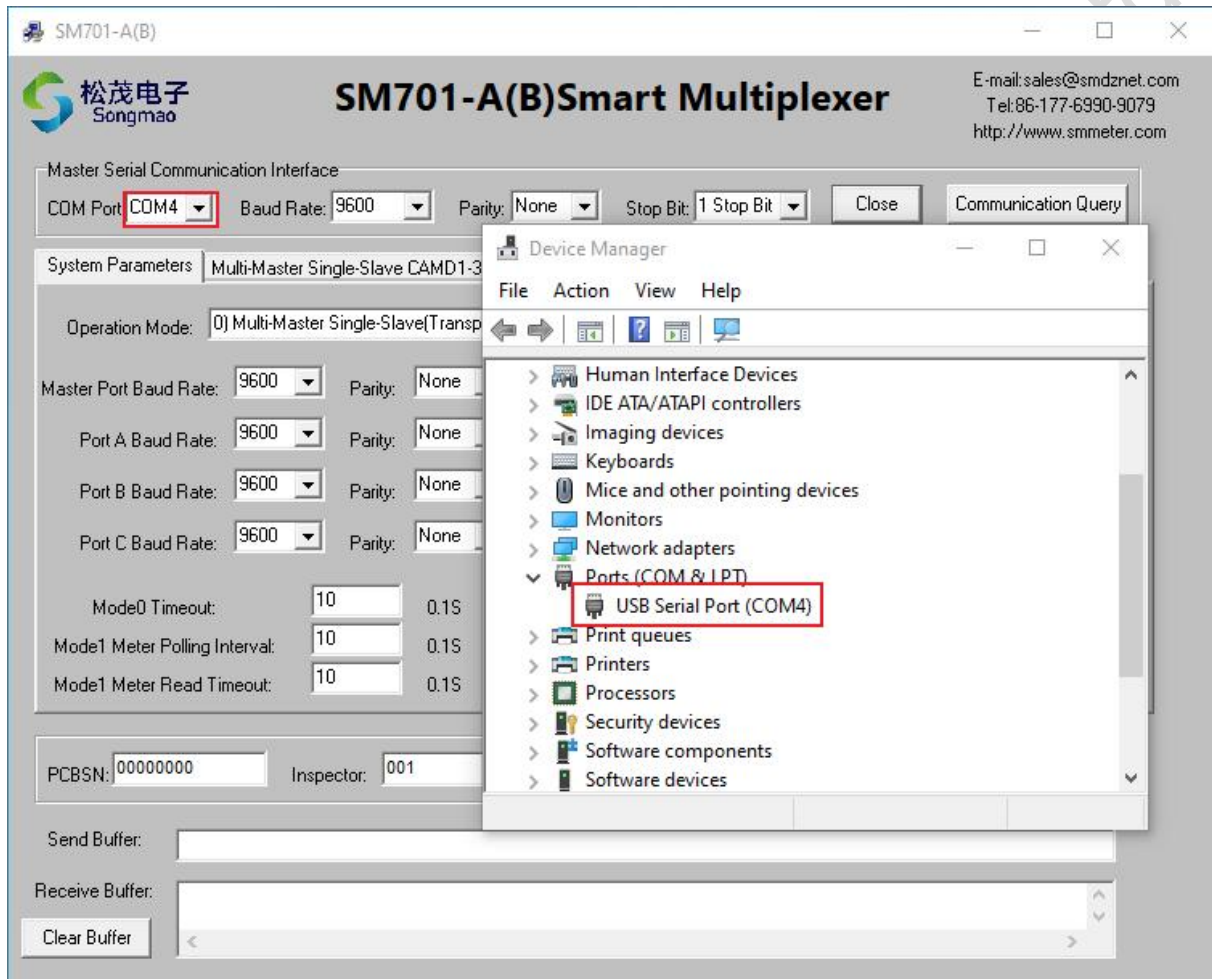
3. Function Introduction of Configuration Software

3.1 Multi-Master-One-Slave (transparent Transmission Mode)

3.1.1 Communication Connection

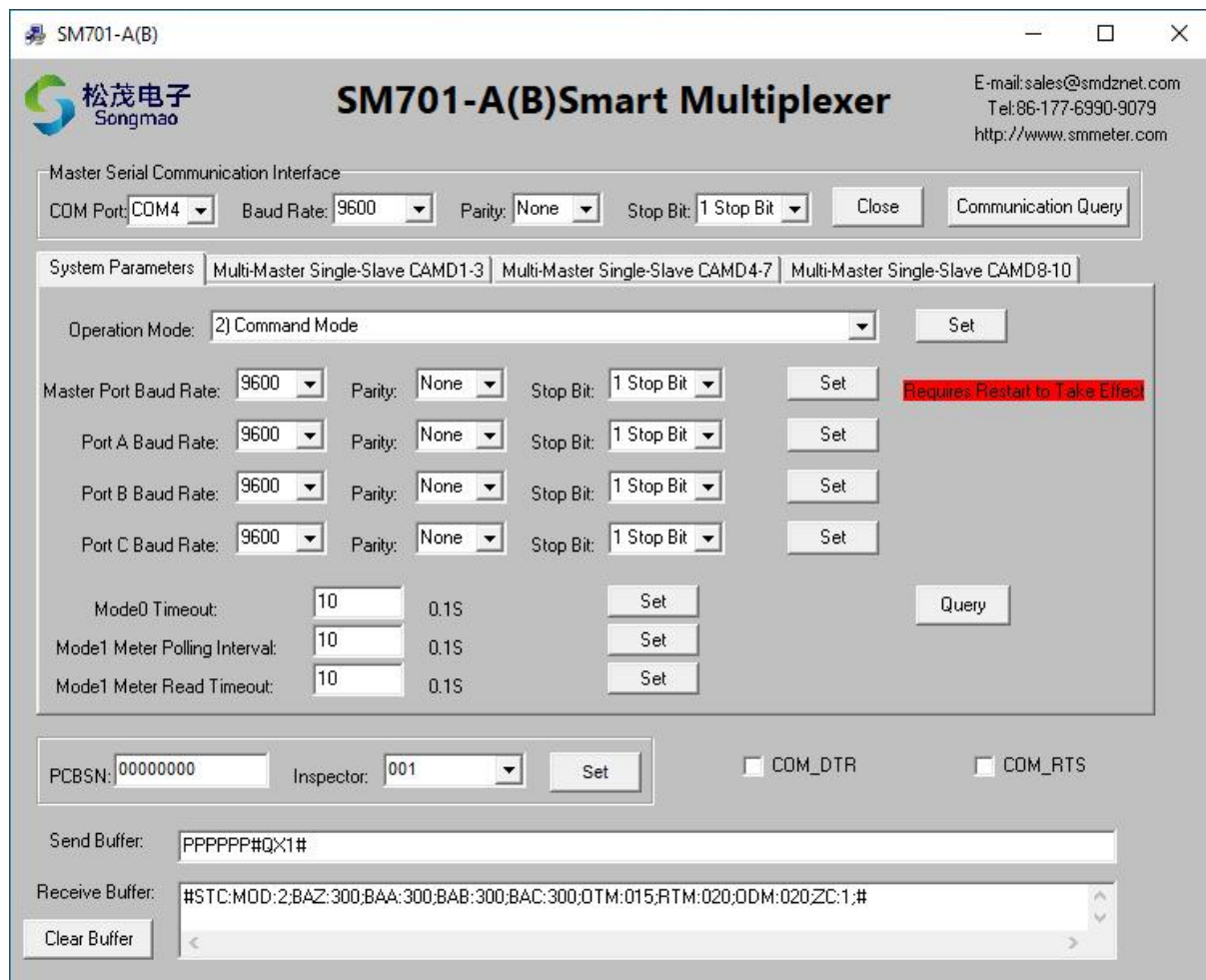
Open the configuration software and select the correct port number, baud rate, check bits, and stop bits. Then open the serial port and set the working mode to "command mode". Finally, click "Communication Query". At this time, you can see the returned version number in the receiving buffer below, indicating that the communication between the converter and the computer is successful.

(Note: The port number can be viewed through the device manager of the computer. The baud rate, check bit, and stop bit are 9600, None, and 1 by default.)



3.1.2 Parameter Setting of Slave Device

Set the communication baud rate, check bit and stop bit of the slave device in the master serial port box according to the RS485/RS232 instrument accessed by the 485/232 channel, and then click "Set" to save the modified parameters.



The screenshot shows the 'SM701-A(B) Smart Multiplexer' software window. The title bar indicates the window name is 'SM701-A(B)'. The interface includes a 'Master Serial Communication Interface' section with dropdowns for 'COM Port' (set to COM4), 'Baud Rate' (9600), 'Parity' (None), and 'Stop Bit' (1 Stop Bit). There are 'Close' and 'Communication Query' buttons. Below this is a 'System Parameters' section with tabs for 'Multi-Master Single-Slave CAMD1-3', 'Multi-Master Single-Slave CAMD4-7', and 'Multi-Master Single-Slave CAMD8-10'. The 'Operation Mode' is set to '2) Command Mode'. The 'Master Port Baud Rate' is 9600, with 'Parity' set to None and 'Stop Bit' set to 1 Stop Bit. There are 'Set' buttons for each of these parameters, and a red warning message 'Requires Restart to Take Effect' is displayed. Below the master port settings are settings for 'Port A Baud Rate', 'Port B Baud Rate', and 'Port C Baud Rate', all set to 9600, with 'Parity' set to None and 'Stop Bit' set to 1 Stop Bit. There are 'Set' buttons for each. The 'Mode0 Timeout' is 10, 'Mode1 Meter Polling Interval' is 10, and 'Mode1 Meter Read Timeout' is 10, all with units of 0.1S and 'Set' buttons. A 'Query' button is also present. At the bottom, there is a 'PCBSN' field set to '00000000', an 'Inspector' dropdown set to '001', and 'Set' and 'COM_DTR'/'COM_RTS' checkboxes. The 'Send Buffer' contains 'PPPPPP#QX1#' and the 'Receive Buffer' contains '#STC:MOD:2;BAZ:300;BAA:300;BAB:300;BAC:300;DTM:015;RTM:020;ODM:020;ZC:1;#'. There are 'Clear Buffer' and 'Query' buttons.

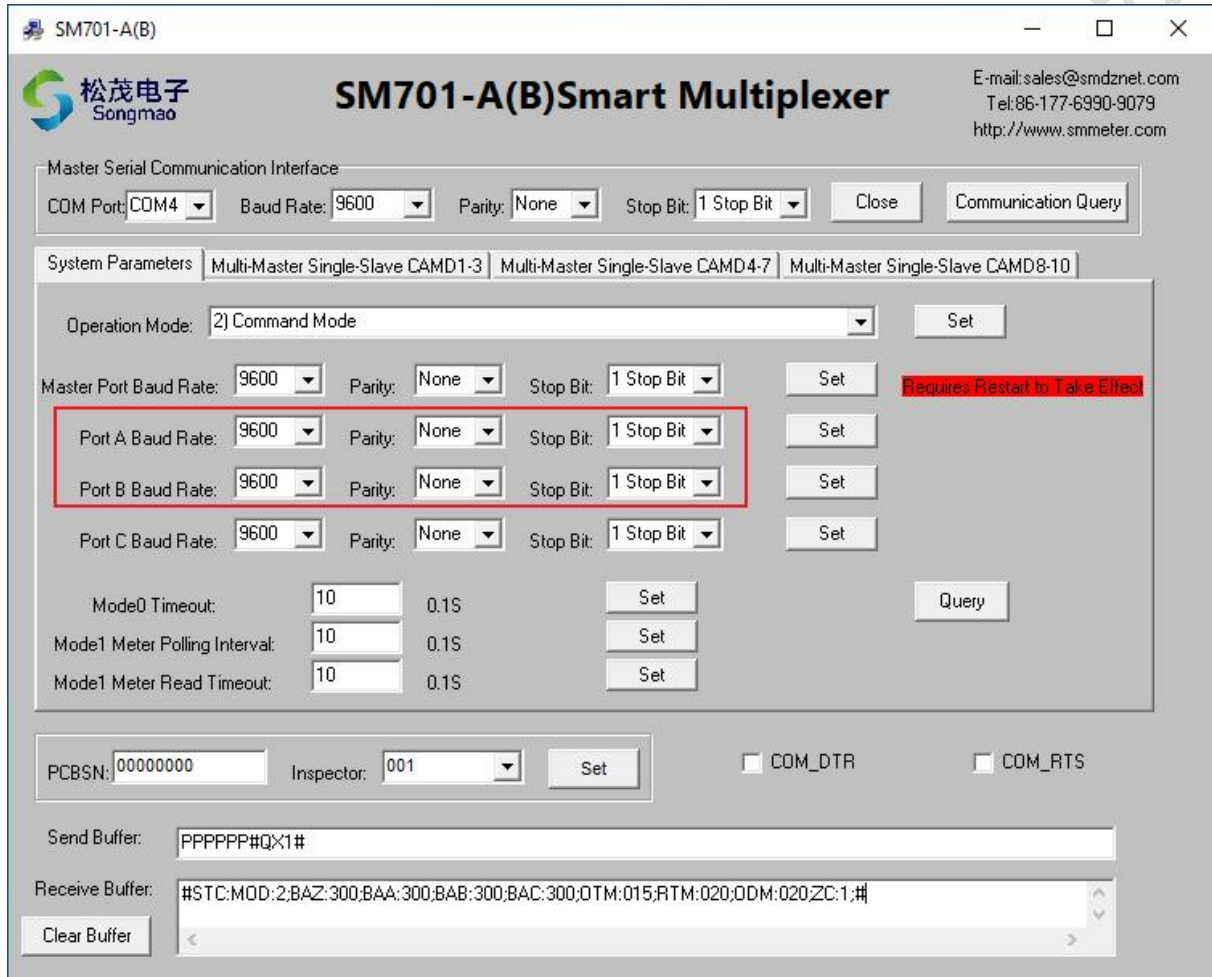
3.1.3 Parameter Setting of Main Equipment

1) Set communication parameters

According to the monitoring equipment or RTU collector accessed by each 485 channel, set the communication baud rate, check bit and stop bit of the two main equipment in the and B serial port boxes respectively, and then click "Set" in turn to save the modified parameters.

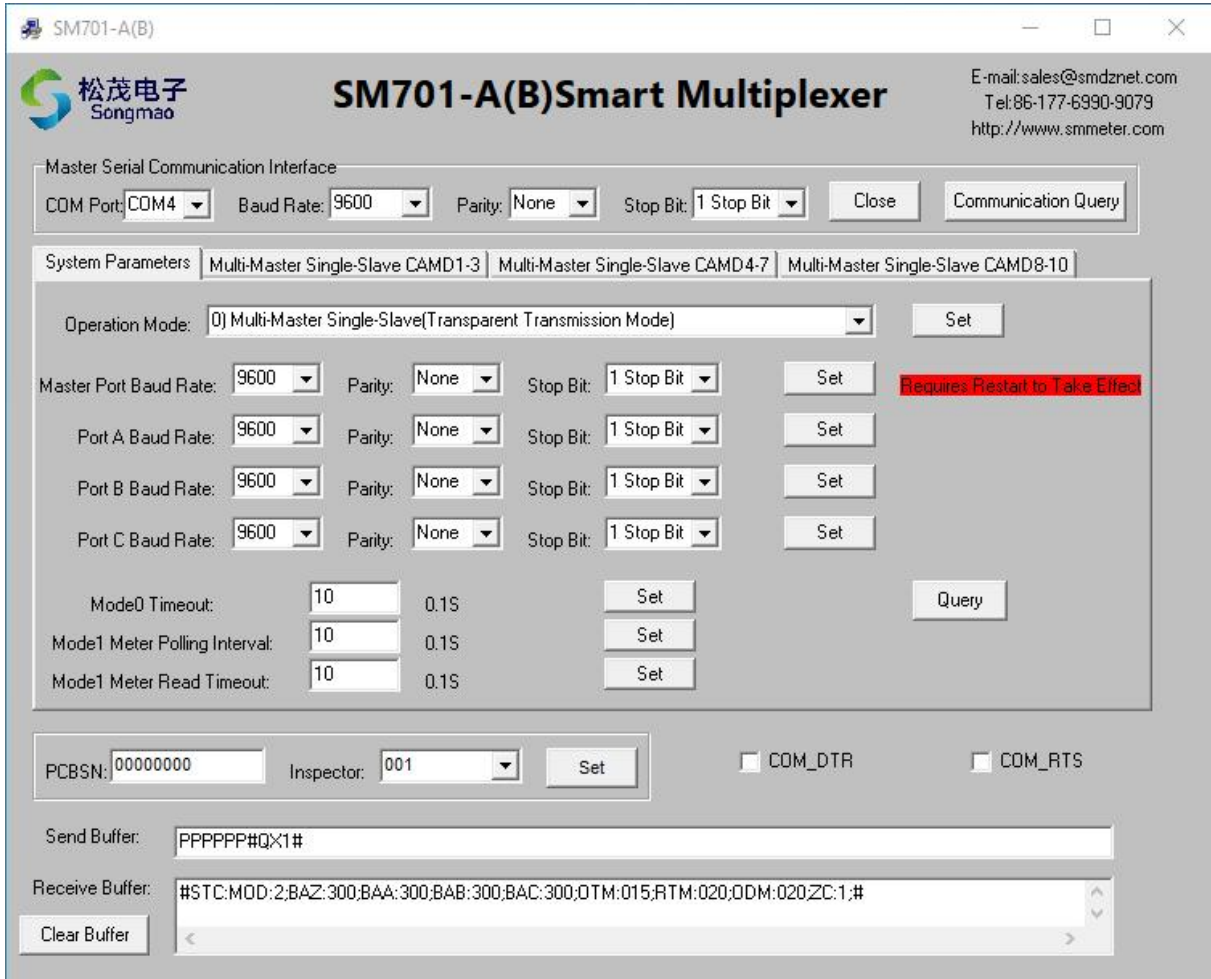
2) Set mode 0 timeout

When reading the data, if the instrument does not return the data after the timeout time, it is considered that the communication between the converter and the instrument is not successful. Input timeout time and click "Set", where timeout time = input time * 0.1S.



3.1.4 Working Mode Settings

After the communication parameters of the equipment are set, set the working mode of the converter as "multi-master single-slave (transparent transmission mode)" in the "system parameters" interface. At this point, the converter begins normal operation.



The screenshot displays the 'SM701-A(B) Smart Multiplexer' software window. The 'System Parameters' tab is active, showing various configuration options:

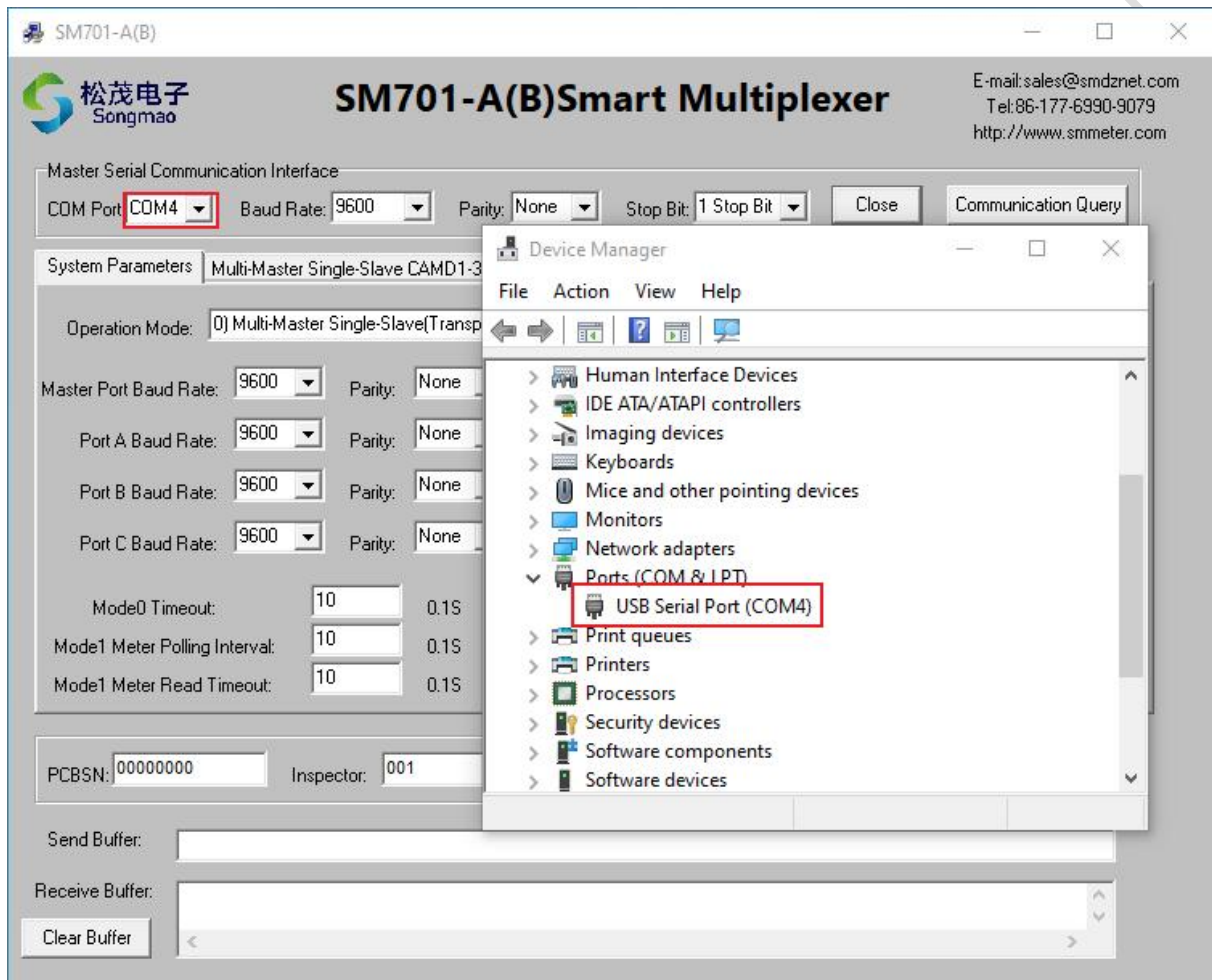
- Master Serial Communication Interface:** COM Port: COM4, Baud Rate: 9600, Parity: None, Stop Bit: 1 Stop Bit. Buttons: Close, Communication Query.
- System Parameters:** Multi-Master Single-Slave CAMD1-3, Multi-Master Single-Slave CAMD4-7, Multi-Master Single-Slave CAMD8-10.
- Operation Mode:** 0) Multi-Master Single-Slave(Transparent Transmission Mode). Button: Set.
- Master Port Baud Rate:** 9600, Parity: None, Stop Bit: 1 Stop Bit. Button: Set. A red warning message 'Requires Restart to Take Effect' is visible next to the Set button.
- Port A Baud Rate:** 9600, Parity: None, Stop Bit: 1 Stop Bit. Button: Set.
- Port B Baud Rate:** 9600, Parity: None, Stop Bit: 1 Stop Bit. Button: Set.
- Port C Baud Rate:** 9600, Parity: None, Stop Bit: 1 Stop Bit. Button: Set.
- Mode0 Timeout:** 10, 0.1S. Button: Set.
- Mode1 Meter Polling Interval:** 10, 0.1S. Button: Set.
- Mode1 Meter Read Timeout:** 10, 0.1S. Button: Set.
- PCBSN:** 00000000, **Inspector:** 001. Button: Set.
- COM_DTR:** ☐ **COM_RTS:** ☐
- Send Buffer:** P P P P P # Q X 1 #
- Receive Buffer:** #STC:MOD:2;BAZ:300;BAA:300;BAB:300;BAC:300;DTM:015;RTM:020;ODM:020;ZC:1;#
- Clear Buffer:** Button.

3.2 Multiple Masters and One Slave (command Presetting)

3.2.1 Communication Connection

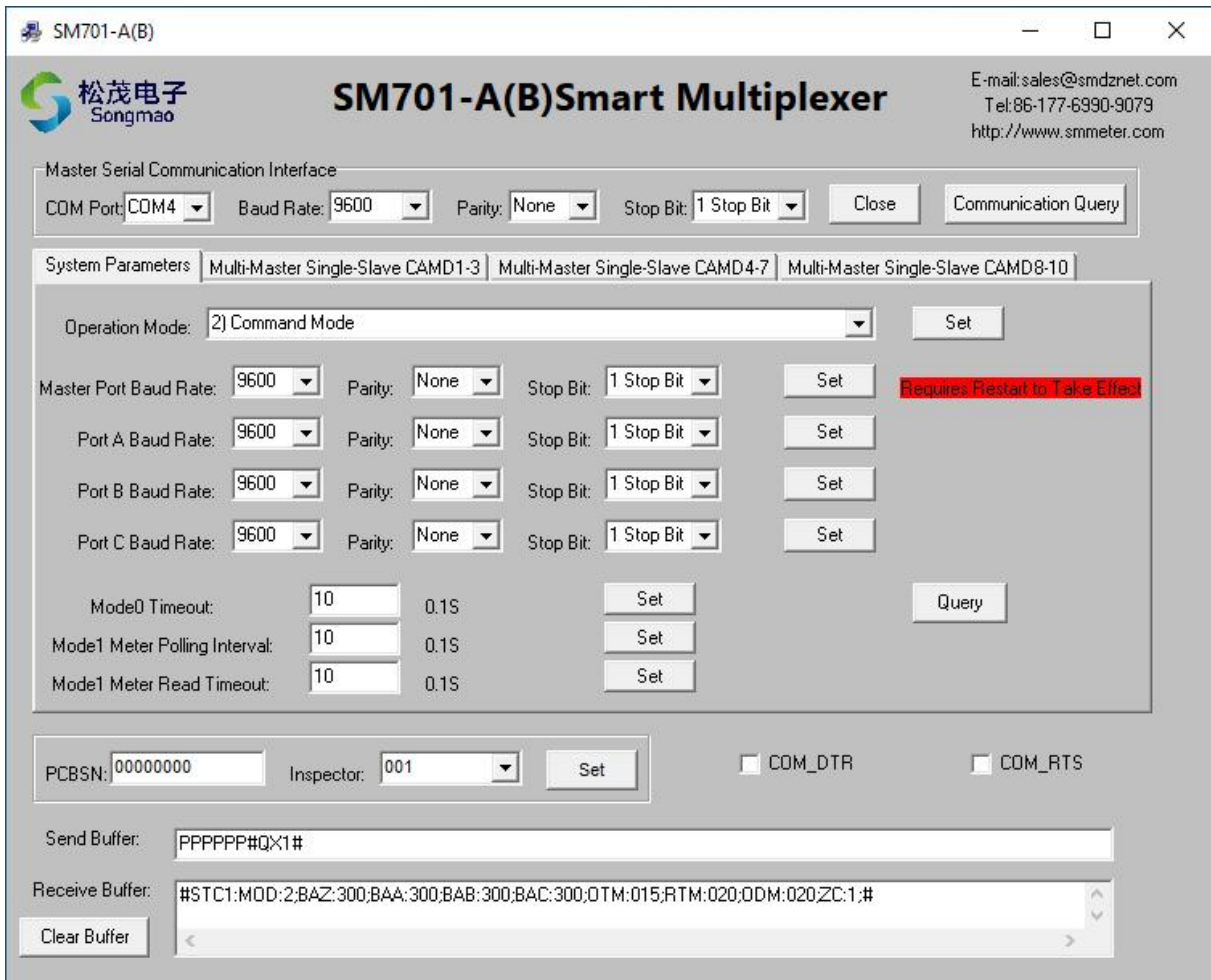
Open the configuration software and select the correct port number, baud rate, check bits, and stop bits. Then open the serial port and set the working mode to "command mode". Finally, click "Communication Query". At this time, you can see the returned version number in the receiving buffer below, indicating that the communication between the converter and the computer is successful.

(Note: The port number can be viewed through the device manager of the computer. The baud rate, check bit, and stop bit are 9600, None, and 1 by default.)



3.2.2 Parameter Setting of Slave Device

Set the communication baud rate, check bit and stop bit of the slave device in the master serial port box according to the RS485/RS232 instrument accessed by the 485/232 channel, and then click "Set" to save the modified parameters.



The screenshot shows the 'SM701-A(B) Smart Multiplexer' software window. The 'Master Serial Communication Interface' section at the top has dropdowns for COM Port (COM4), Baud Rate (9600), Parity (None), and Stop Bit (1 Stop Bit), along with 'Close' and 'Communication Query' buttons. Below this are tabs for 'System Parameters', 'Multi-Master Single-Slave CAMD1-3', 'Multi-Master Single-Slave CAMD4-7', and 'Multi-Master Single-Slave CAMD8-10'. The 'System Parameters' tab is active, showing 'Operation Mode' set to '2) Command Mode'. It lists settings for Master Port, Port A, Port B, and Port C, each with Baud Rate (9600), Parity (None), and Stop Bit (1 Stop Bit) options, and a 'Set' button. A red warning box states 'Requires Restart to Take Effect'. At the bottom, there are fields for PCBSN (00000000), Inspector (001), and checkboxes for COM_DTR and COM_RTS. A 'Send Buffer' field contains 'PPPPPP#QX1#' and a 'Receive Buffer' field contains '#STC1:MOD:2;BAZ:300;BAA:300;BAB:300;BAC:300;OTM:015;RTM:020;ODM:020;ZC:1;#'. A 'Clear Buffer' button is also present.

3.2.3 Parameter Setting of Main Equipment

1) Set communication parameters

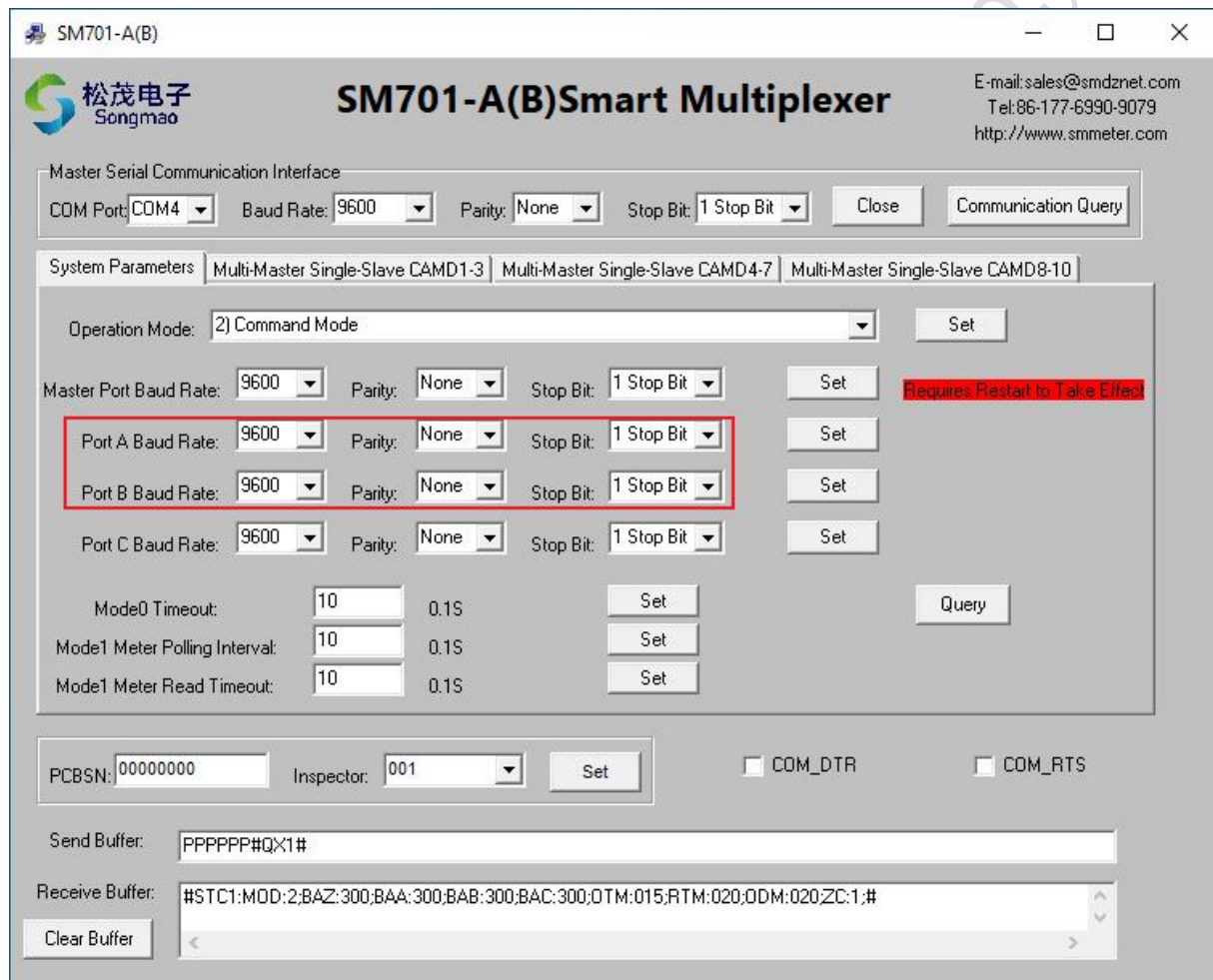
According to the monitoring equipment or RTU collector accessed by each 485 channel, set the communication baud rate, check bit and stop bit of the two main equipment in the A and B serial port boxes respectively, and then click "Set" in turn to save the modified parameters.

2) Set the interval time of reading instrument in mode 1

The converter sends the command according to the set time interval and reads the data information of the slave device. Enter the interval time and click "Set", where interval time = entered time * 0.1S.

3) Set the timeout time of reading instrument in mode 1

When reading the data, if the instrument does not return the data after the timeout time, it is considered that the communication between the converter and the instrument is not successful. Input timeout time and click "Set", where timeout time = input time * 0.1S.



4) Meter read command

A total of 9 commands can be set. Open the command enable in the corresponding instrument command setting column, input the correct command code and data analysis parameters, and then click "Set".

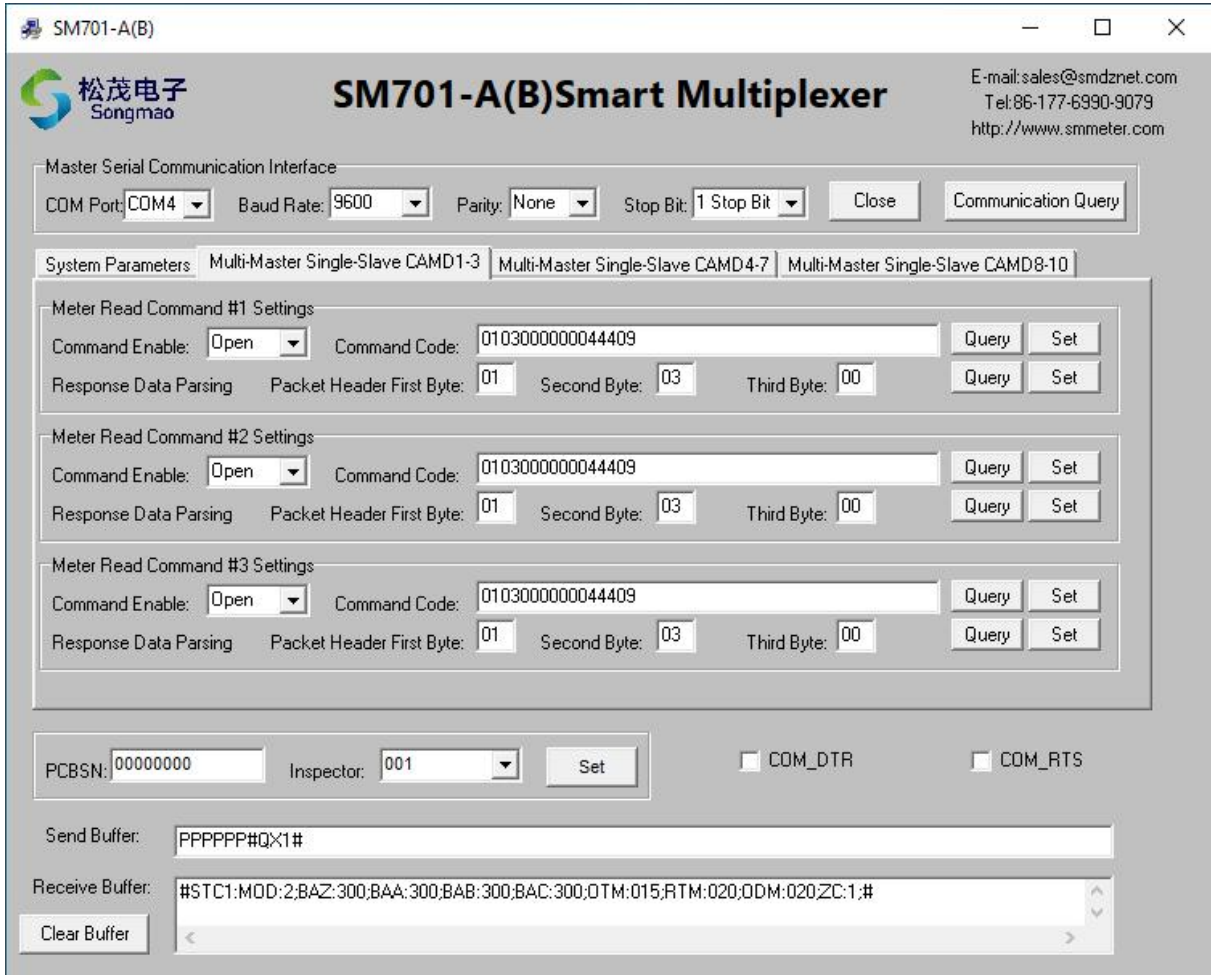
① Command enable: When the converter is required to send the command in the command box to the RS485/RS232 instrument, the command enable shall be set to "Open".

② Command code: refers to the instruction code sent when the main equipment reads RS485/RS232 instrument data.

Only when the instruction sent by the main equipment is consistent with the set instruction code, the instruction is

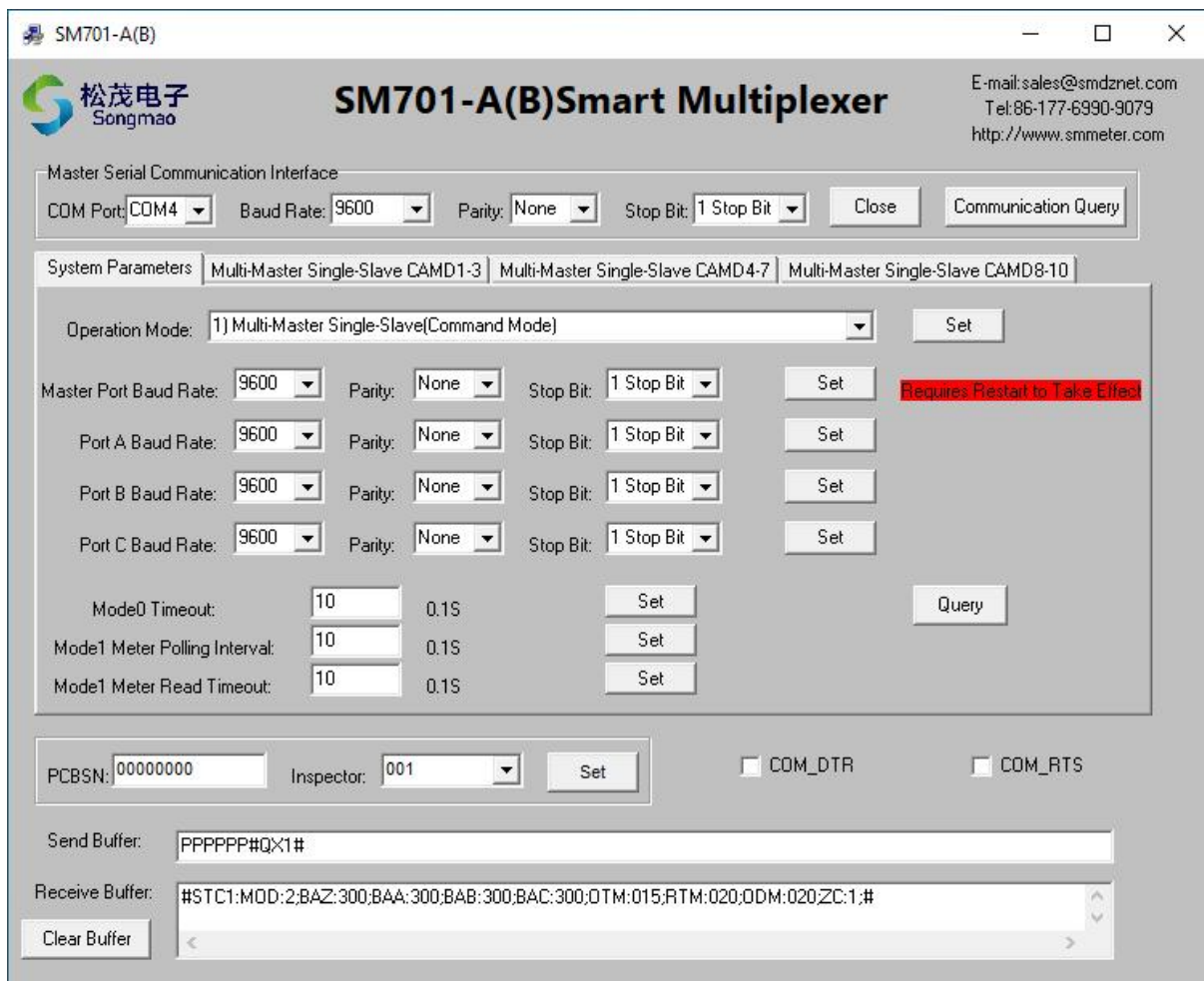
considered valid and the converter sends the instruction to the instrument.

- ③ Packet header first bytes: The first to third bytes of the header are judgment bytes. Only when the first three bytes of the returned data information are consistent with the first, second and third bytes of the header, the data information is considered to be valid, and the converter will further analyze the data. When the first to third bytes of the packet header are set to 00, it means that the returned data information is not judged, and all the data information is correct by default.



3.2.4 Working Mode Settings

In the "System Parameters" interface, set the working mode of the converter as "Multi-master single-slave (command mode)". If it has been set to "Multi-master single-slave (Transparent Transmission Mode)", it needs to be set to "command mode" first, and then set to "multi-master single-slave (command mode)".



SM701-A(B)

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Master Serial Communication Interface

COM Port: COM4 Baud Rate: 9600 Parity: None Stop Bit: 1 Stop Bit Close Communication Query

System Parameters Multi-Master Single-Slave CAMD1-3 Multi-Master Single-Slave CAMD4-7 Multi-Master Single-Slave CAMD8-10

Operation Mode: 1) Multi-Master Single-Slave(Command Mode) Set

Master Port Baud Rate: 9600 Parity: None Stop Bit: 1 Stop Bit Set Requires Restart to Take Effect

Port A Baud Rate: 9600 Parity: None Stop Bit: 1 Stop Bit Set

Port B Baud Rate: 9600 Parity: None Stop Bit: 1 Stop Bit Set

Port C Baud Rate: 9600 Parity: None Stop Bit: 1 Stop Bit Set

Mode0 Timeout: 10 0.1S Set Query

Mode1 Meter Polling Interval: 10 0.1S Set

Mode1 Meter Read Timeout: 10 0.1S Set

PCBSN: 00000000 Inspector: 001 Set COM_DTR COM_RTS

Send Buffer: PPPPPP#QX1#

Receive Buffer: #STC1:MOD:2;BAZ:300;BAA:300;BAB:300;BAC:300;OTM:015;RTM:020;ODM:020;ZC:1;#

Clear Buffer

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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