

# Operation Guide for RS-485 Communication



**Manufacturer of World-Class Sensors**

# CONTENT

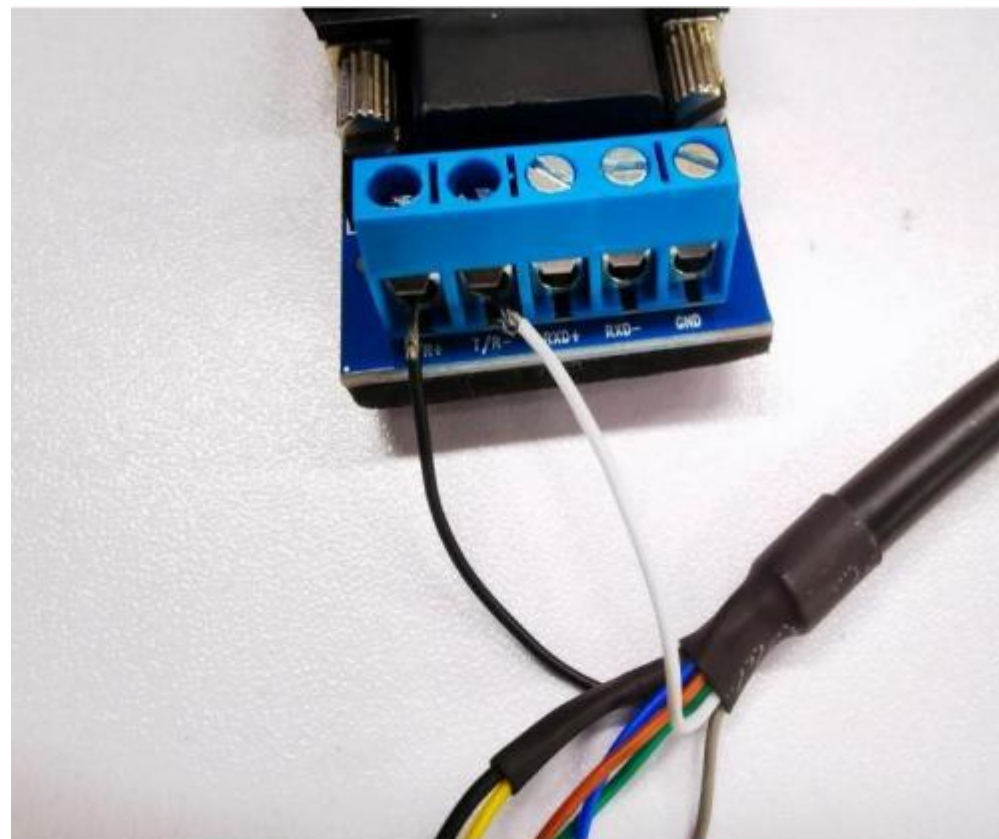
- I.     Wiring Method**
- II.    Baud Confirmation**
- III.   Serial Port Number Confirmation**
- IV.    Freeport Communication Protocol**
- V.     Absolute Altitude Command**
- VI.    Modbus RTU Protocol**



## I. Wiring Method

### Steps:

1. Connect the **brown wire** on the camera cable to the "24V" positive end of the power supply and the **blue wire** to the "0V" negative end of the power supply.
2. Find the terminals "**T/R+**" and "**T/R-**" on the communication module.
3. Connect the **black wire** of the camera cable to the terminal "**T/R+**" and the white wire to the terminal "**T/R-**".



## II. Baud Confirmation

### Steps:

1. Press the ZERO button on the camera to ensure it is on the homepage.
2. Press SET button twice to find "bAud", and press SET to enter, press "+" or "-" to find the value you desire to set, and then press SET button to confirm. Finally, press ZERO button to return to the homepage.
3. Make sure that the baud rate on the serial port debugging assistant is the same as the baud rate set by the camera. For example, the baud rate on the serial port assistant is 9600. Then the baud rate on the camera should also be set to 9600, or vice versa.



### III. Serial Port Number Confirmation

#### Steps:

1. If there are too many serial ports and it is impossible to determine which one is connected, you can verify it by **plugging and unplugging** in the list of Ports of the Device Manager on the computer. Pull out the USB and plug it back in to see which serial port number will change. The changed serial port number is the camera's serial port number.



## IV. Freeport Communication Protocol

### Steps:

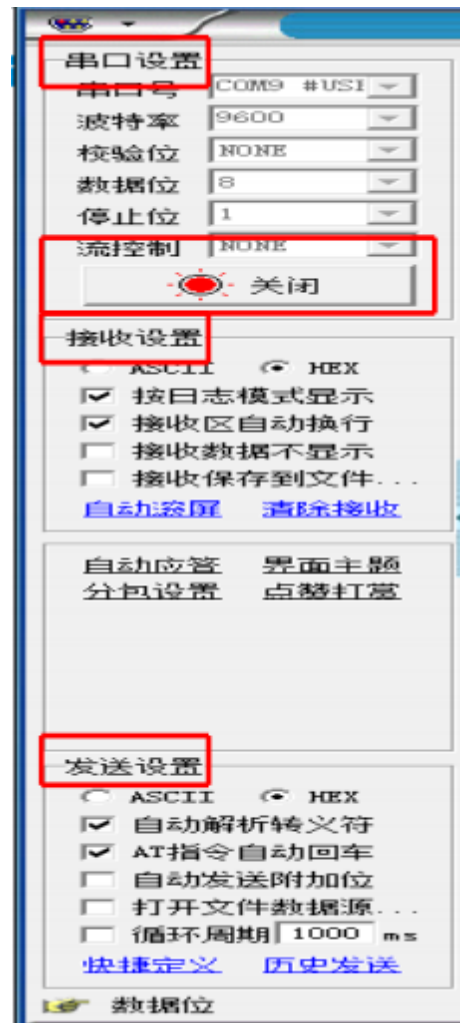
1. Press the ZERO button on the camera to ensure it is on the homepage.
2. Press SET button twice to find "bAud", and press "+" or "-" to find "Ptcs", and then press SET to enter, then, press "+" or "-" to find "SSZN", and then press SET button to confirm. Finally, press ZERO button to return to the homepage. (If the option "Ptcs" cannot be found, skip this step and proceed to the next step directly)
3. Press SET button twice to find "bAud", and press "+" or "-" to find "nbuS", and then press SET to enter. Press "+" or "-" to set the station value into "0", and then press SET button to confirm. Finally, press ZERO button to return to the homepage.



## IV. Freeport Communication Protocol

### Steps:

4. Serial port settings: Ensure that the “Serial No.” and “Baud Rate” are consistent with the camera settings. Select “NONE” for the check bit, “8” for the data bit, “1” for the stop bit, and turn “On” (i.e., the position of “Off” in the right figure).
5. Receive Settings: Select “HEX” and check the options “Display in Log Mode” and “Automatic Word Wrap in Receiving Area”.
6. Send Settings: Select “HEX” and check the options “Automatically parse escape characters” and “Automatic carriage return for AT command”.

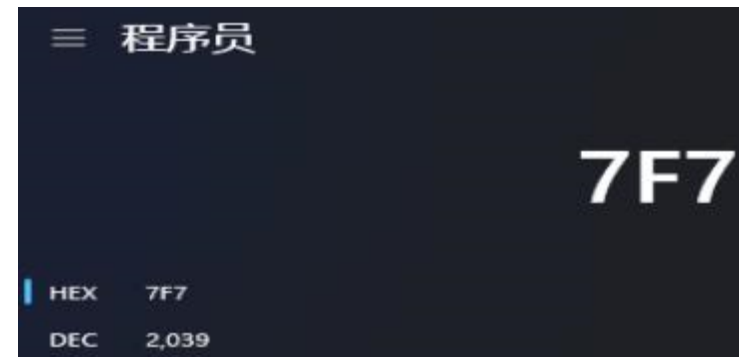


## IV. Freeport Communication Protocol

### Steps:

- Send command "02 43 B0 01 03 F2".
- Currently, the serial assistant returns "02 06 07 F7 03 F6", and converts the third and fourth digits of the return value, i.e., "07 F7" above, into decimal numbers, which is the camera return value (HEX refers to hexadecimal, and the return value starts with 02 06, which is the normal value).

```
[2023-12-06 14:10:17.610]# SEND HEX>  
02 43 B0 01 03 F2  
  
[2023-12-06 14:10:17.681]# RECV HEX>  
02 06 07 F7 03 F6
```



## V. Absolute Altitude Command (**One decimal place more than the displayed value on the screen**)

### Steps:

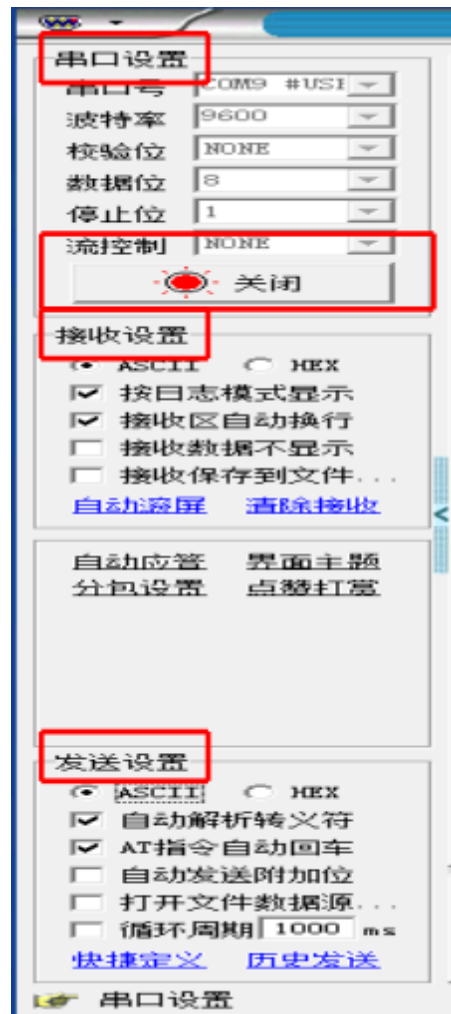
1. Get the settings (**Wiring, Serial No. and Baud**) in the previous few pages ready for the following steps.
2. Press the ZERO button on the camera to ensure it is on the homepage.
3. Press SET button twice to find "bAud", and press "+" or "-" to find "Ptcs", and then press SET to enter, then, press "+" or "-" to find "cd33", and then press SET button to confirm. Finally, press ZERO button to return to the homepage. (**If the option "Ptcs" cannot be found, skip this step and proceed to the next step directly**)
4. Press SET button twice to find "bAud", and press "+" or "-" to find "nbuS", and then press SET to enter. Press "+" or "-" to set the station value into "0", and then press SET button to confirm. Finally, press ZERO button to return to the homepage.



## V. Absolute Altitude Command

### Steps:

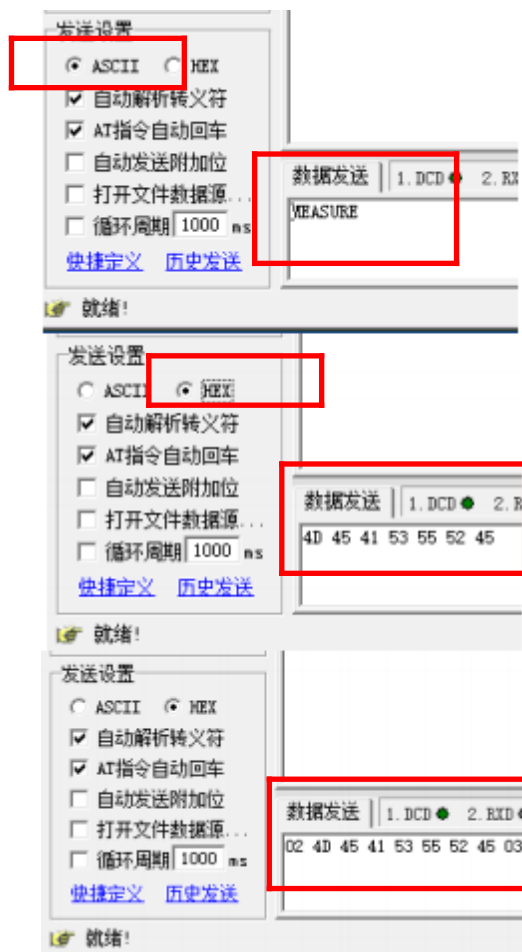
5. Serial port settings: Ensure that the “Serial No.” and “Baud Rate” are consistent with the camera settings. Select “NONE” for the check bit, “8” for the data bit, “1” for the stop bit, and turn “On” (i.e., the position of “Off” in the right figure).
6. Receive Settings: Select “ASCII” and check the options “Display in Log Mode” and “Automatic Word Wrap in Receiving Area”.
7. Send Settings: Select “ASCII” and check the options “Automatically parse escape characters” and “Automatic carriage return for AT command”.



## V. Absolute Altitude Command

### Steps:

- Input the "MEASURE" command in the send setting in "ASCII" mode.
- Change the mode "ASCII" into "HEX" and the "MEASURE" command just input will be converted into hexadecimal numbers, which will be "4D 45 41 53 55 52 45" as shown in the right figure.
- Add "02" before the "4D 45 41 53 55 52 45" command and "03" after it. Now, the command will be "02 4D 45 41 53 55 52 45 03".



## V. Absolute Altitude Command

### Steps:

11. Send the command "02 4D 45 41 53 55 52 45 03". At this time, the serial debugging assistant will return the value of the absolute height, i.e., "33.276" on the right figure, indicating that the camera is 33.276mm away from the surface of the measured object. Currently, "3.276" is displayed on the camera display. (The working distance of the camera in the case is 30mm, which means that when the distance between the camera and the surface of the object being measured is 30mm, the display shows 0.)

```
[2023-12-06 14:42:12.710]# SEND HEX>  
02 4D 45 41 53 55 52 45 03  
  
[2023-12-06 14:42:12.791]# RECV ASCII>  
33.2760□
```



## VI. Modbus RTU Protocol

### Steps:

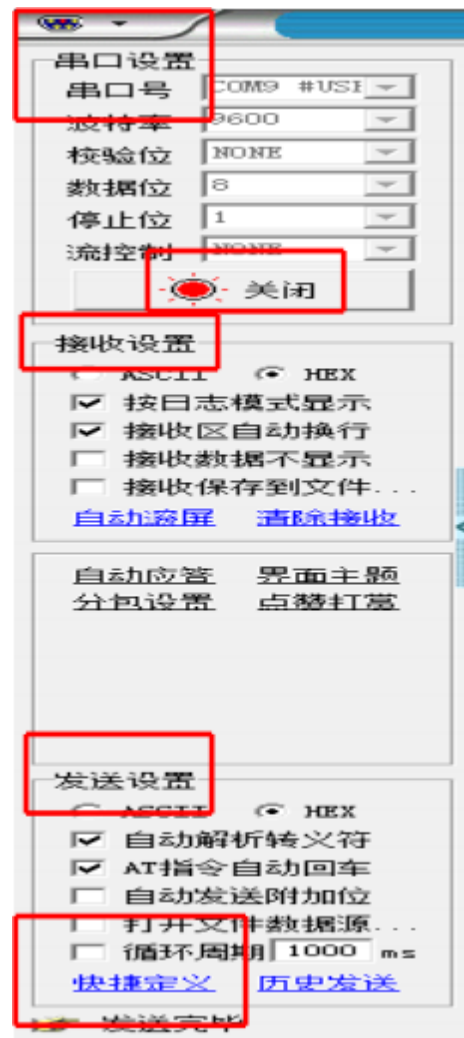
1. Get the settings (**Wiring, Serial No. and Baud**) in the previous few pages ready for the following steps.
2. Press SET button twice to find "**bAud**", and press "+" or "-" to find "**Ptcs**", and then press SET to enter, then, press "+" or "-" to find "**nbuS**", and then press SET button to confirm. Finally, press ZERO button to return to the homepage. ((The **nbuS** here is in the three-level menu. If you can't find the item "**Ptcs**", just skip this step and go to the next step.)
3. Press SET button twice to find "**bAud**", and press "+" or "-" to find "**nbuS**", and then press SET to enter. Press "+" or "-" to set the station value, and then press SET button to confirm. Finally, press ZERO button to return to the homepage. (The **nbuS** here are in the secondary menu, and the station number can be set in the range 1-128. In this demonstration, we set it as 1.)



## VI. Modbus RTU Protocol

### Steps:

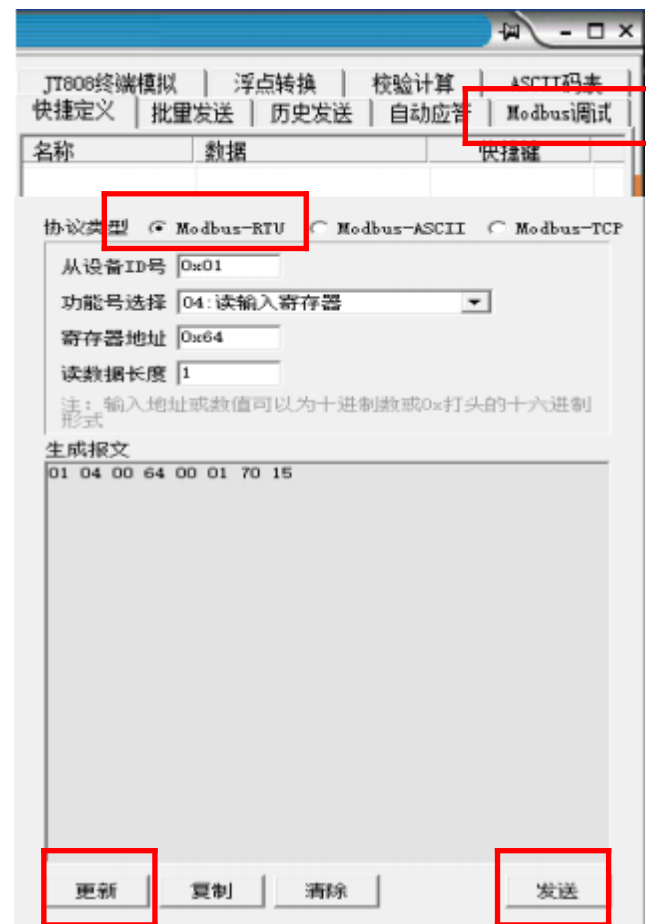
4. Serial port settings: Ensure that the “Serial No.” and “Baud Rate” are consistent with the camera settings. Select "NONE" for the check bit, "8" for the data bit, "1" for the stop bit, and turn "On" (i.e., the position of "Off" in the right figure).
5. Receive Settings: Select “HEX” and check the options "Display in Log Mode" and "Automatic Word Wrap in Receiving Area".
6. Send Settings: Select “HEX” and check the options "Automatically parse escape characters" and "Automatic carriage return for AT command".
7. Click "Quick Definition"



## VI. Modbus RTU Protocol

### Steps:

- Click "Modbus Debugging".
- Select "Modbus-RTU", and "From Device ID" refers to the station number. The station number set by the camera in this demonstration is "1", so it will be "0x01" here. If the camera station number is set to "5", it will be "0x05" here, and so on.
- "Function Number Selection" refers to the function number. The function number for reading the measured value is "04". For details of other function codes, please refer to the User Manual.
- "Register Address" is set to "0x64" in hexadecimal number. For details of other function numbers, please refer to the User Manual.
- Set the value of "Read Data Length" as "1".
- Click on "Update" in the bottom left corner, and then click "Send" in the bottom right corner.



## VI. Modbus RTU Protocol

### Steps:

14. Now, the return value from the serial debugging assistant is "01 04 02 0C 87 FC 52".
15. Convert the fourth and fifth hexadecimal values into decimal numbers. Here, we convert the hexadecimal value "0C 87" into decimal value "3,207", which is consistent with the value on the camera display screen.

```
[2023-12-06 15:24:02.447]# SEND HEX>  
01 04 00 64 00 01 70 15  
  
[2023-12-06 15:24:02.528]# RECV HEX>  
01 04 02 0C 87 FC 52
```





# SHENZHEN SINCEVISION TECHNOLOGY CO., LTD

---



|                               |                                                                                                                        |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Headquarters</b>           | : 5th Floor, Building 2, Chongwen Industrial Park, Nanshan Zhiyuan, Nanshan District, Shenzhen, China                  |
| <b>Dongguan Office</b>        | : Room 406, Building F4, Tian'an Digital City, Nancheng District, Dongguan City, Guangdong Province, China             |
| <b>East China Office</b>      | : Room 1305, Building 7, Xiangyu Liang'an Trade Center, No. 1588, Chuangye Road, Kunshan, Jiangsu Province, China      |
| <b>North China Office</b>     | : Unit 922, Building 4, Times Fortune World, Courtyard 1, Hangfeng Road, Fengtai District, Beijing, China              |
| <b>Southwest China Office</b> | : Room 604, Block B, Yingchuang Interational Building, No. 66, Chuangzhi South 1st Road, Pidu District, Chengdu, China |
| <b>Northwest China Office</b> | : Room 601, Chuangke Building, Cuihua Road, Yanta District, Xi 'an City, Shaanxi Province, China                       |

Web: [www.cnsszn.com](http://www.cnsszn.com) Tel: 0755-29655425 400-966-0626