

NCU16L Communication protocol application specification

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Documentation Edition

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Summary

This specification will detail the NCU16L communication protocol.

Section 1: Detailed description of the NCU16L communication protocol;

Section 2: NCU16L OTA Detailed Description of the upgrade protocol;

Section 3: Description of the NCU16L communication hardware interface.

1、NCU16L Detailed description of the communication protocol

(1) Hardware protocol

① RS485 Communications

Item	Description
Baud rate	Default 19200 (actual port rate according on order requirements)
data bit	Eight
check bit	not have
stop bit	One

(2) NCU16L Communication protocol

① Communication 0x30,0x31,0x32,0x33,0x3A protocol packets sent by the host computer to NCU16L

Protocol package with a fixed length of 5

The protocol package adopts the large-end mode

The basic package format is as follows:

NO.	Item	Description
1	STX (1byte)	Data head / frame head fixed value: 0x02
2	ADDR (1byte)	NCU16L Hardware address, value range 0x00~0x9F; for example, when ADDR = 0x00, high four control the NCU16L at 0x00, lower four control the lock at 0 x 00;
3	CMD (1byte)	For instructions, refer to the NCU16L instruction table
4	ETX (1byte)	Data tail / frame tail fixed value: 0x03
5	SUM (1byte)	Low byte for the checksum of the entire instruction packet; for example, SUM = STX + ADDR + CMD + ASK + ETX = 0 x 125 D, SUM = 0 x 5 D

② Communication Ox 37 instruction protocol packet sent to the NCU16L

The protocol package has a fixed length of 7

The protocol package adopts the large-end mode

The basic package format is as follows:

NO.	Item	Description
1	STX (1byte)	Data head / frame head fixed value: 0x02
2	ADDR (1byte)	NCU16L Hardware address, value range 0x00~0x9F; for example, when ADDR = 0x00, high four control the NCU16L at 0x00, lower four control the lock at 0 x 00;
3	CMD (1byte)	For instructions, refer to the NCU16L instruction table
4	DATA (2byte)	When CMD = Ox 37 sets the unlocking time, DATA = 2 byte, the value range 0x0000~0x1770 (decimal) indicates 0s-60s, the factory default value is 550ms;
5	ETX (1byte)	Data tail / frame tail fixed value: 0x03

6	SUM (1byte)	Low byte for the checksum of the entire instruction packet; for example, SUM = STX + ADDR + CMD + ASK + ETX = 0 x 125 D, SUM = 0 x 5 D
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③ Communication Ox 39,0x40 instruction protocol packets sent to the NCU16L

The protocol package has a fixed length of 6

The protocol package adopts the large-end mode

The basic package format is as follows:

NO.	Item	Description
1	STX (1byte)	Data head / frame head fixed value: 0x02
2	ADDR (1byte)	NCU16L Hardware address, value range 0x00~0x9F; for example, when ADDR = 0x00, high four control the NCU16L at 0x00, lower four control the lock at 0 x 00;
3	CMD (1byte)	For instructions, refer to the NCU16L instruction table
4	DATA (1byte)	When CMD = Ox 39 sets the delay unlocking time, DATA = 1 byte, the value range 0 x 00 ~ 0 xFA (decimal) is 0s-250s, the factory default value is 0s;
5	ETX (1byte)	Data tail / frame tail fixed value: 0x03
5	SUM (1byte)	Low byte for the checksum of the entire instruction packet; for example, SUM = STX + ADDR + CMD + ASK + ETX = 0 x 125 D, SUM = 0 x 5 D

④ NCU16L Communication protocol packet sent to the host computer

The protocol package has a fixed length of 9

The protocol package adopts the large-end mode

The basic package format is as follows:

NO.	Item	Description
1	STX (1byte)	Data head / frame head fixed value: 0x02
2	ADDR (1byte)	NCU16L Hardware address, value range 0x00~0x9F; for example, when ADDR = 0x00, high four control the NCU16L at 0x00, lower four control the lock at 0 x 00;
3	CMD (1byte)	For instructions, refer to the NCU16L instruction table
4	DATA1 (1byte)	It represents the lock status of lock No.1-8 on NCU16L, where bit0-bit7-bits correspond to the lock status of lock no. 1-8; for example, bit0=0 indicates the lock status of lock no. 1; bit0=1 indicates the lock status of lock No.1; Note that the bit value and the lock status may correspond in reverse (depending on the lock switch of logistics cabinet lock using normally open (NO) or normally closed (NC) detection) When CMD = 0 x 3 A, this byte indicates the short-circuit overcurrent state of the drive port 1 # ~8 #, where bit0-bit7-bit corresponds to the short-circuit overcurrent state of no. 1-8 drive port; for example, bit0=0, indicating no short-circuit overcurrent of 1 drive port; bit0=1, indicating short-circuit overcurrent of 1 drive port;
5	DATA2 (1byte)	It represents the lock status of lock No.9-16 on NCU16L, where bit0-bit7-bit corresponds to the lock status of lock no. 9-16; for example, bit0=0 indicates the lock status of lock No.9; bit0=1 indicates the lock

		status of lock No.9; Note that the bit value and the lock status may correspond in reverse (depending on the lock switch of the logistics cabinet lock is normally open (NO) or normally closed (NC)) When CMD = 0 x 3 A, this byte indicates the short-circuit overcurrent state of drive port 9 # ~16 #, where bit0-bit7-bit correspond to the short-circuit overcurrent state of 9-16 drive port; for example, bit0=0, indicating no short-circuit overcurrent of 9 drive port; bit0=1, indicating short-circuit overcurrent of 9 drive port;
6	DATA3 (1byte)	When CMD = 0 x 35,0x36,0x39 indicates the infrared detection state of lock 1-8 on NCU16L, where bit0-bit7 bits correspond to the infrared detection state of lock 1-8; for example, bit0=0, indicating that lock 1 is in free state; bit0=1, indicating that lock 1 is in free state; When CMD = 0 x 38, the byte indicates that the unlocking time is eight high, and the value range is 0x00~0x17; When CMD = 0 x 3 A, this byte indicates the drive port of control board 1 # ~8 #, where bit0-bit-bit7 correspond to the open state of number 1-8 drive port; for example, bit0=0, no break of # 1 drive port; bit0=1, no open state of # 1 drive port;
7	DATA4 (1byte)	When CMD = 0 x 35,0x36,0x39, it indicates the infrared detection status of lock 9-16 on NCU16L, where bit0-bit7 bits correspond to the infrared detection status of lock 9-16; for example, bit0=0 means that lock 9 is in free state; bit0=1 means that lock 9 is in free state; When CMD = 0 x 38, the byte represents the low eight-bit unlocking time data, taking the value range of 0 x 00 ~ 0xFF; When CMD = 0 x 3 A, the byte indicates the drive port of controller 9 # ~16 #, where bit0-bit7 corresponds to the open non-current state of the number 1-8 drive port; for example, bit0=0, indicating the number 9 drive port; bit0=1, indicates the number 9 drive port;
8	ETX (1byte)	Data tail / frame tail fixed value: 0x03
9	SUM (1byte)	Low byte for the checksum of the entire instruction packet; for example, SUM = STX + ADDR + CMD + DATA + ETX = 0 x 125 D, then SUM = 0 x 5 D

(3) NCU16L Communication sending instruction schedule

NO.	Instruct	Code	Description
Communication command (host computer <—> NCU16L)			
1	Obtain a single state	0x30	Get the status of the lock
2	Unlock	0x31	Unlock command
3	Gets all of the CU states	0x32	Get all CU states on the RS485 bus
4	Open all of the CU locks	0x33	Unlock command
5	Set up / query the unlocking time	0x37	Set up / query the unlocking time
6	Set / query the delay unlock time	0x39	Set / query the time of delay unlocking
7	Current detection status	0x3A	Obtain the short circuit overcurrent and open circuit noncurrent status of the control board

remarks	
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(4) NCU16L Communication receiving instruction schedule

NO.	Instruct	Code	Description
Communication command (NCU16L <----> Host computer)			
1	Return data	0x35	Return the lock hook detection and infrared detection data instructions for a single NCU16L
2	Return data	0x36	Return the lock hook detection and infrared detection data instructions for all NCU16L of the bus
3	Return data	0x38	Return to the lock power-on time and lock hook detection data instruction
4	Return data	0x39	Return the delay unlocking time and lock hook detection data instructions
5	Return data	0x3A	Return the short circuit and open circuit current detection data instructions for all NCU16L control boards on the specified NCU16L or bus
remarks			

(5) NCU16L Instructions are explained in detail

Introduce the meaning of instructions in detail to help customers quickly understand the usage of instructions;

① Get the state

1) Instruction code:

Instructions: 0x30

2) Command function

Obtain the lock hook and infrared bar status of a single NCU16L;

3) Refer to communication routine:

1、 Gets the status of the NCU16L for the specified address (the following routine is the status of the NCU16L with address 0x00):

Downlink communication command (upper computer —> NCU16L): 02 00 30 03 35

Uplink communication command (NCU16L—> upper computer): 02 00 35 01 00 01 00 03 3C

4) Example analysis:

1、 Example for the NCU16L lock hook and infrared bar address 0x00, 01 00 said to the lock hook status data, learned from the data: Ox 01 lock hook status, the rest of the lock hook are unlocked hook, including 01 00 said to infrared bar status data, learned from the data: Ox 01 cabinet have detected items, not detected in the cabinet

② Unlock instructions

1) Instruction code:

Instructions: 0x31

2) Command function

Open the specified lock of the NCU16L according to the specified parameter;

3) Format of the data DATA

No DATA data were available

4) Refer to communication routine:

1、 Open a specified lock on the NCU16L of the specified address (the following routine is the third lock of the NCU16L with address 0x00):

Downlink communication command (upper computer —> NCU16L): 02 02 31 03 38

Uplink communication command (NCU16L—> upper computer): None

5) Example analysis:

1、 In the routine, 0 means the CU with address 0x00, 2 opens the CU third lock; (0x00~0x0F) represents the number 1 to 16 locks of the control board

③ Gets all the CU status instructions of the bus

1) Instruction code:

Instructions: 0x32

2) Command function

Obtains the status of all CUs on the RS485 bus

3) Refer to communication routine:

1、 Get the status of all NCU16L of the RS485 bus (the following routine is the status of all NCU16L of the RS485 bus):

Downlink communication command (upper computer —> NCU16L): 02 F0 32 03 27

Uplink communication command (NCU16L—> upper computer): 02 00 36 00 03 01 00 03 3F
02 10 36 01 00 00 08 03 54

4) Example analysis:

1、 The first example indicates the lock hook and infrared bar status of NCU16L at 0x00, where 00 03 means the lock hook status data, learned that the 9 and 10 locks are in the lock state, and the remaining 14 locks are unlocked state; 01 00 means the infrared bar detection status data, learned from the data: 1 infrared bar detected items, the remaining 15 infrared bars did not detect items;

2、 The second example indicates the lock hook and infrared bar status of NCU16L with address 0x10, where 01 00 means the lock hook status data; the data are the three locks and the remaining 15 locks are unlocked; 00 08 indicates the infrared bar detection status data and learned from the infrared bar 12, while the remaining 15 infrared bars have not detected items;

④ Open all of the CU locks

1) Instruction code:

Instructions: 0x33

2) Command function

Open all the locks on the CU board one by one

3) Refer to communication routine:

1、 Open the 16 locks of the specified address NCU16L (the following routine is the 16 locks of the NCU16L with address 0x00):

Downlink communication command (upper computer —> NCU16L): 02 00 33 03 38

Uplink communication command (NCU16L—> upper computer): 02 00 35 0F 00 01 00 03 4A

4) Example analysis:

1、 The presentation in the routine opens 16 locks on 0x00 address CU in turn, and obtains the lock hook and infrared bar status of NCU16L with address 0x00, where 0F 00 indicates the lock status data, learned from the data: No.1, 2, 3 and 4, the remaining 12 locks are unlocked state; 01 00 indicates the infrared detection status data, learned from the data: No.1 infrared bar detected items and the remaining 15 infrared bars have not detected items;

⑤ Query and set the unlocking time

1) Instruction code:

Instructions: 0x37

2) Command function

Query and set the unlocking time of NCU16L, the unlocking time parameter value range of 0-655350ms (decimal), the initial default value of 55 (decimal), indicating 550ms;

3) Format of the data DATA

U16 OpenLockTIme; // unlocking time value range Ox0000~0x1770 (decimal) represents 0s-60s, the initial default value is 550ms, indicates the unlocking time is 0x37 * 10ms=550ms;

4) Refer to communication routine:

query:

1、 Query the unlocking time of the specified address NCU16L (the following routine is the unlocking time of the NCU16L with the query address 0x00):

Downlink communication command (upper computer —> NCU16L): 02 00 37 03 3C

Uplink communication command (NCU16L—> upper computer): 02 00 38 0F 00 00 37 03 83

set up:

2、 Set the unlock time for the specified address NCU16L (the following routine is the unlock time for NCU16L with the address 0x00):

Downlink communication command (upper computer —> NCU16L): 02 00 37 00 64 03 A0

Uplink communication command (NCU16L—> upper computer): 02 00 38 00 00 00 00 03 A1

5) Example analysis:

1、 The first example represents the unlocking time and lock hook status of NCU16L with 0x00, 0F 00 means the

lock status data, 1, 2, 3, 4, the remaining 12 locks are unlocked; 00 37 indicates the unlocking time $0x37*10=550ms$, from the data, the unlocking time of 0x00 is $0x0037*10=550ms$;

2、 The second example represents the unlocking time and lock hook state of NCU16L with an address of 0x00, where 00 00 obtains the locking state data and understands from the data: 16 locks are the unlocked state; 00 64 indicates the unlocking time of CU with an address of 0x00, and understands from the data: the unlocking time of 0x00 is $0x0064*10=1000ms$;

3、 After initialization, the default unlocking time is $0x0037*10ms=550ms$. Pay special attention to sending the set unlocking time command, NCU16L will enter the data saving task. At this time, it is recommended to wait for more than 500ms before sending the command.

⑥ Query and set all CU unlocking time of the bus

1) Instruction code:

Instructions: 0x37

2) Command function

Query and set the unlocking time of NCU16L, the unlocking time parameter value range of 0-655350ms (decimal), the initial default value of 55 (decimal), indicating 550ms;

3) Format of the data DATA

U16 OpenLockTlme; // unlocking time value range 0x0000~0x1770 (decimal) indicates 0s-60s, the initial default value is 550ms, indicates the unlocking time is $0x37*10ms=550ms$;

4) Refer to communication routine:

query:

1、 Query obtains the unlocking time of all CU on RS485 bus (the following routine is the unlocking time of all CU on RS485 bus):

Downlink communication command (upper computer —> NCU16L): 02 F0 37 03 2C

Uplink communication command (NCU16L—> upper computer): 02 00 38 0F 00 00 37 03 83

02 10 38 00 00 00 37 03 84

set up:

2、 Set the unlocking time for all CUs on the RS485 bus (the following routine is to set the unlocking time for all CUs on the RS485 bus):

Downlink communication command (upper computer —> NCU16L): 02 F0 37 00 64 03 90

Uplink communication command (NCU16L—> upper computer): 02 00 38 0F 00 00 64 03 4C

02 10 38 00 00 00 64 03 4D

5) Example analysis:

1、 The first example indicates the unlocking time and lock hook status of NCU16L with 0x00, where 0F 00 means the locking status data: 1, 2, 3 ,4 and the remaining 12 locks are unlocked; 00 37 indicates the unlocking time $0x37*10=550ms$, learned from the data: the unlocking time of 0x00 is $0x0037*10=550ms$;

2、 The second example represents the unlocking time and lock hook state of NCU16L with 0x10, where 00 00 means the lock hook status data, from the data: 16 locks are the lock hook unlocked state; 00 37 indicates the unlocking time $0x37*10=550ms$, from the data: the unlocking time with 0x10 is $0x0037*10=550ms$;

3、 The third example indicates the unlocking time and obtaining hook status of NCU16L at 0x00, where 0F 00 indicates the locking status data, 1, 2, 3 and 4, the remaining 12 locks are unlocked; 00 37 indicates CU unlocking duration data with 0x00, learned from the data: 0x00, 0x01 control board unlocking time is 550ms;

4、 The fourth routine represents the unlocking time of NCU16L and the lock hook state with the address of 0x10, where 00 00 represents the lock hook status data, and from the data, the 16 locks are the unlocked state; 00 64 represents the CU unlocking time with the address of 0x10, and from the data, the CU control board unlocking time of 0x00, 0 and 0x01 is 1000ms;

5、 After initialization, the default unlocking time is 0x0037x10ms=550ms. Pay special attention to sending the **set unlocking time** command, NCU16L will enter the data saving task. At this time, it is recommended to wait for more than 500ms before sending the command.

⑦ Set the delay unlocking time

1) Instruction code:

Instructions: 0x39

2) Command function

Set the unlocking time of NCU16L, the unlocking time parameter value range of 0-250s (decimal), initialize the default value of 0S;

3) Format of the data DATA

u8 DelayOpenLockTime; // delay unlocking time value range 0 x 00 ~ 0 xFA indicates the delay time 0~250s, the factory default delay unlocking time 0S;

4) Refer to communication routine:

set up:

1、 Set the delay unlocking time of the specified address NCU16L (the following routine is to set the delay unlocking time of the NCU16L with the address 0x00):

Downlink communication command (upper computer —> NCU16L): 02 00 39 01 03 3F

Uplink communication command (NCU16L—> upper computer): 02 00 39 01 00 00 01 03 40

5) Example analysis:

1、 The first example represents the delayed unlocking time of NCU16L with the address 0x00, where 01 represents the delayed unlocking time; 01 00 represents the data: the lock 1 is locked; the remaining 15 locks are unlocked in the state; 00 01 means items are detected in cabinet 9, and the remaining locks are not detected in the cabinet; if the delay unlocking time is greater than 250S, the delayed unlocking time does not change.

⑧ Current detection status

1) Instruction code:

Instructions: 0x3A

2) Command function

Obtain the short circuit overcurrent state and open circuit no current state of NCU16L control board;

3) Refer to communication routine:

query:

1、 Obtain the current detection state of the specified address NCU16L (the following routine is to obtain the current detection state of the NCU16L with the address 0x00):

Downlink communication command (upper computer —> NCU16L): 02 00 3A 03 3F

Uplink communication command (NCU16L—> upper computer): 02 00 3A 00 00 FF FF 03 3D

2、Obtain the current detection status of the bus address NCU16L (the following routine is to obtain the current detection status of the NCU16L connecting 0x00 and 0x01 on the bus address):

Downlink communication command (upper computer —> NCU16L): 02 F0 3A 03 2F

Uplink communication command (NCU16L—> upper computer): 02 00 3A 00 00 FF FF 03 3D
02 10 3A 00 01 00 00 03 350

4) Example analysis:

1、The first routine indicates the current detection state of NCU16L at 0x00. It is learned from the data that 00 00 means that 16 drive ports have short circuit without short circuit, and FF FF means that 16 drive ports have open circuit and no current state;

2、The second routine indicates the current detection state of NCU16L at 0x00. It is learned from the data that 00 01 means the short-circuit overcurrent data, short circuit overcurrent in port 9, no short circuit overcurrent in other ports, and 00 00 means that the 16 drive ports have no open circuit without current state;

2、MCU OTA Upgrade the communication protocol details

(1)Hardware protocol

① RS485 Communications

project	explain
Baud rate	19200 (factory default)
data bit	Eight
check bit	not have
stop bit	One
Note: When the CU enters the upgrade state, the port rate selects 115200.	

(2)MCU OTA Upgrade and obtain the version number

communication protocol

① Communication protocol data packet

The maximum length of a protocol package is 10

The minimum length is 6

The protocol package adopts the large-end mode

Protocol package format: the instruction package is the same as the answer package format. The basic package format is as follows:

NO.	Item	explain
1	STX (1byte)	Data head / frame head fixed value: 0 xF 5
2	CMD (1byte)	For instructions, see the communication list
3	ADDR (1byte)	NCU16L Hardware address, the value range is 0x00~0x10; for example,

		when ADDR = 0 x 00, 00 means control NCU16L at 0x00, ADDR = 0x01 means control NCU16L at 0 x 01;
4	DATALEN (1byte)	Length of the data DATA
5	ETX (1byte)	Fixed value of data tail / frame tail: 0x5F
6	SUM (1byte)	Low byte of the checksum of the entire instruction package, for example all data sum is 0x125D, then sum=0x5D
...	DATA (DATALEN bytes)	Data, data length DATALEN is zero, without this data, different instructions data formats are different, can see the instruction details.

(3) OTA upgrade, obtain version number communication list

NO.	instruct	code	explain
Communication command (Host computer <—> CU)			
1	MCU OTA	0xB5	Enter the OTA upgrade mode and clear the application
2	Get version number	0xB6	Get the current software version number and the hardware version number

(4) MCU OTA Upgrade, obtain the version number instruction details

① MCU OTA

1) Instruction code:

Instructions: 0xB5

2) Command function

After sending this command, the CU control board enters the OTA upgrade state;

3) Format of the data DATA

char OTA_flag [4]; // OTA upgrade code (numeric ASCII value)

4) Refer to communication routine:

1、 Get the CU of the specified address to OTA upgrade status (the following routine involves sending the CU with address 0x00 to upgrade status):

Downlink communication command (upper computer —> CU): F5 B5 00 04 5F E7 35 36 37 38

Uplink communication command (CU —> upper computer): F5 B5 00 00 5F 09

2、 Bring the CU at any address to the OTA upgrade status (the following routine involves upgrading a single CU at any address of the current connection):

Downlink communication command (upper computer —> CU): F5 B5 64 04 5F 4B 35 36 37 38

Uplink communication command (CU —> upper computer): F5 B5 00 00 5F 09

5) Example analysis:

1、 Where 00 means open CU of 0x00, 64, a single CU of any address; 35 36 37 38 represents the input OTA upgrade code, indicating the string is "5678";

2、 MCU OTA The command should be used with caution. After sending the command, the MCU original application will be cleared and enter the OTA upgrade state;

3、 The document upgrade adopts the XModem protocol communication protocol;

② Get the current version number

1) Instruction code:

Instructions: 0xB6

2) Command function

Get the current software version number and the hardware version number

3) Format of the data DATA

////////// Version of the ///////////

```
struct
{
    u8 softversion;
    u8 hardversion;
}version;
```

4) Refer to communication routine:

1、Get the version number of CU for the specified address (the following routine is the version number of CU with address 0x00):

Downlink communication command (upper computer —> CU): F5 B6 00 00 5F 0A

Uplink communication command (CU —> upper computer): F5 B6 00 00 5F 0A

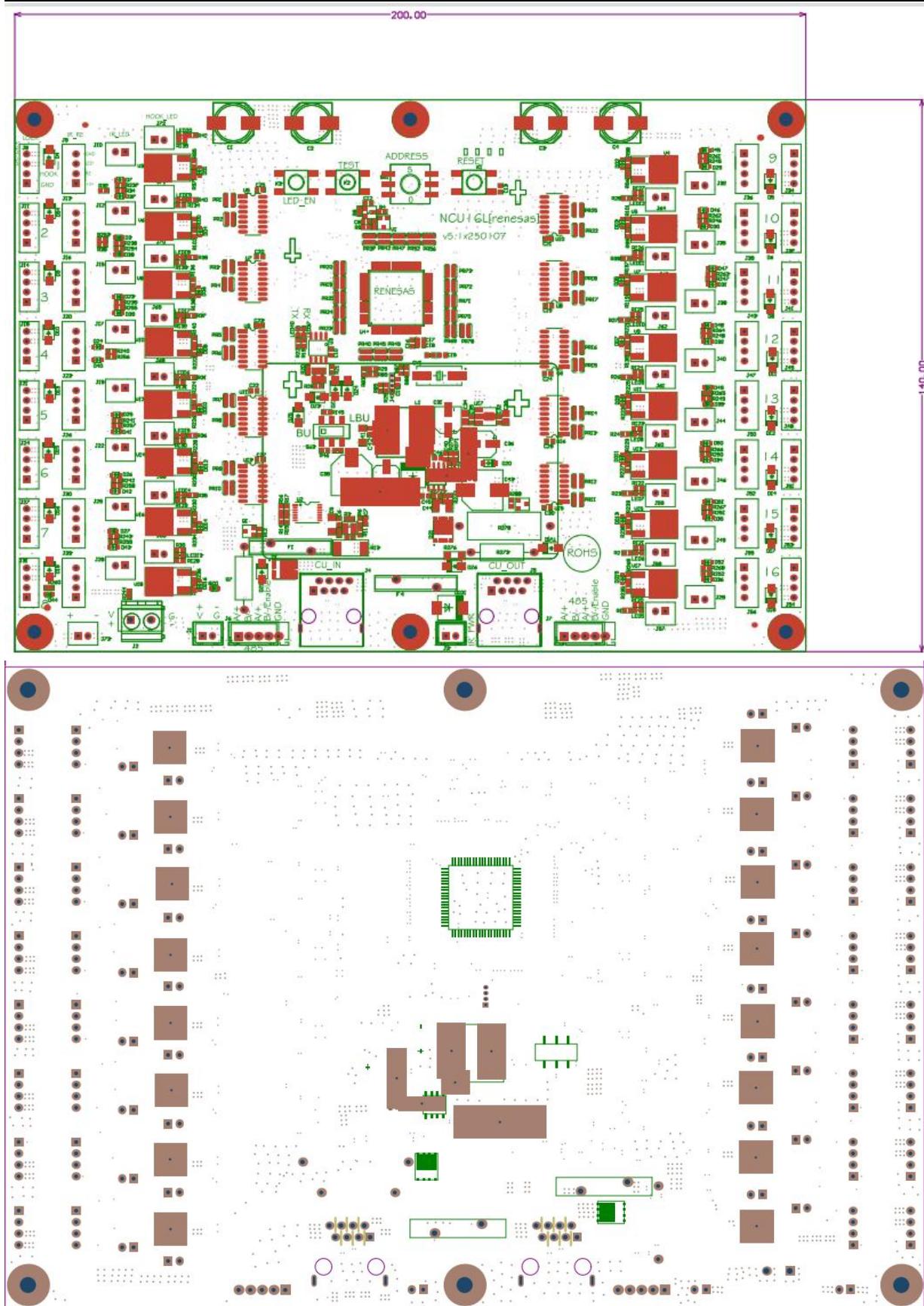
5) Example analysis:

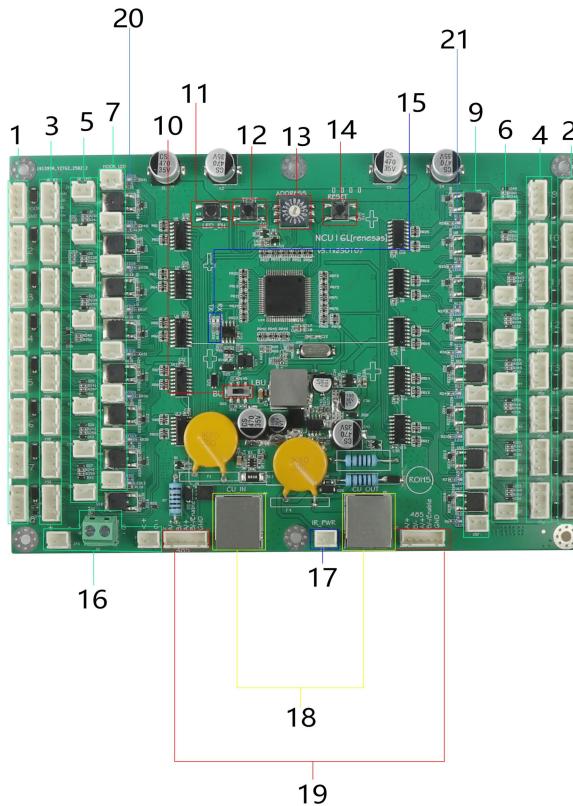
- 1、Where 00 means a CU with 0x00;
- 2、01 indicates that the current software version number is 1;
- 3、01 indicates that the current hardware version number is 1.

3、Hardware instructions

Hardware parameter table

working voltage	Standby current	Drive ability	Powering time	The number of serial	quiescent dissipation
DC 8~24V	16 sets of lock hook lights on 28 mA @ 12 V 16 group lock hook lamp out 20 mA @ 12 V 16 sets of lock hook lights on 43 mA @ 24 V 16 group lock hook lamp out 38 mA @ 24 V	Drive current <2.8A at 12V (circuit cut off over 2.8A) Drive current <1.5A at 24V (circuit cut off over 1.5A)	0~655350ms, default 550ms (customers can design according to different locks), the lock interval above 800ms; motor type lock is not required;	Up to 16 NCU16L series (when driving electromagnet, each control board is recommended to provide independent power supply; locking to CPU line is not more than 5 m; with an additional power supply every 10 m)	2μA@12V 5μA@24V





① interface specification

1. Terminal [16]: Power interface (2Pin):WT300V-5.08-2P cable port / XH2.54-2Pin-2Pcs port
2. Terminal [1 column: lock 1 # ~8 #]: driver interface (4 Pin), 2 Pin is the positive and negative lock end, 2 Pin is the lock hook detection switch end;
3. Terminal [2 columns: lock 9 # ~16 #]: driver interface (4 Pin), 2 Pin is lock positive and negative end, 2 Pin is lock hook detection switch end;
4. Terminal [3 columns: IR receiving 1 # ~8 #]: IR receiving terminal (4 Pin), 1 Pin is the IR receiving positive electrode, 1 Pin is the IR receiving signal terminal, 1 Pin is the positive LED lamp, 1 Pin is the negative electrode (GND);
5. Terminal [4 columns: IR receiving 9 # ~16 #]: IR receiving terminal (4 Pin), 1 Pin is the positive IR receiving electrode, 1 Pin is the IR receiving signal end, 1 Pin is the positive LED lamp, 1 Pin is the negative electrode (GND);
6. Terminal [5 columns: infrared indicator 1 # ~8 #]: interface (2 Pin), respectively positive and negative poles of the indicator;
7. Terminal [6 columns: infrared indicator light 9 # ~16 #]: interface (2 Pin), respectively, for the positive and negative indicator poles;
8. Terminal [7 columns: lock hook indicator 1 # ~8 #]: interface (2 Pin), respectively, for the positive and negative indicator poles;
9. Terminal [9 columns: lock hook indicator 9 # ~16 #]: interface (2 Pin), respectively positive and negative poles of the indicator;
10. Terminal [17]: the transmitting end of the external infrared bar;

-
11. Terminal [18]: RS485 communication interface, RJ 45 seat, also used to connect multiple NCU16L;
 12. Terminal [19]: RS485 communication interface (5 Pin), for XH 2.54 seat;

② Description of dial address / lever switch

1. No. [10] Push lever switch: push the lever to the BU direction, the control board is the long power supply version, push the lever to the LBU direction, the control board is the low-power version;
2. Serial number [19] Dial code switch: NCU16L address, maximum series 16PcsNCU16L;
Note: When receiving multiple NCU16L's, the NCU16L address cannot be the same;

③ Key function description

1. Serial number [11] LED_EN key: no function yet;
2. Serial number [12] Test key: Click TEST to conduct the lock opening test; long press 3S, TEST to initialize the control board and restore to the factory setting state;
3. Sial [14] reset key: click the RESET reset button, the control board will reset and power on;

④ Description of the function

1. Serial number [22] Power supply indicator light: when the control board is working, the light is on;
2. No. [20] 1 # -8 # Lock status indicator: when the lock hook detects the switch is on, the indicator is off, when the lock hook detects the switch is off, the indicator is on;
3. No. [21] 9 # -16 # Lock status indicator: when the lock hook detects the switch is on, the indicator light is off, when the lock hook detects the switch is off, the indicator light is on;
4. No. [15] Communication indicator light: the TX signal light flashes red light when the control board actively uploads data, and when the control board receives data, the RX signal light flashes red light;

⑤ RS485 communication wiring instructions (long power supply version)

1. Control board A docking with RS485 communication T / R +;
2. Control board B docking with RS485 communication T / R -;
3. Control board Y docking with RS485 communication RXD +;
4. Control board Z docking RS485 communication RXD -;
5. Control board GND docking RS485 communication GND;



⑥ RS485 communication wiring instructions (low-power version)

1. Control board A + docking RS485 communication T / R +;
2. Control board B-docking RS485 communication T / R -;
3. Control board GND docking RS485 communication GND;



4、NCU16L Lock operation instructions

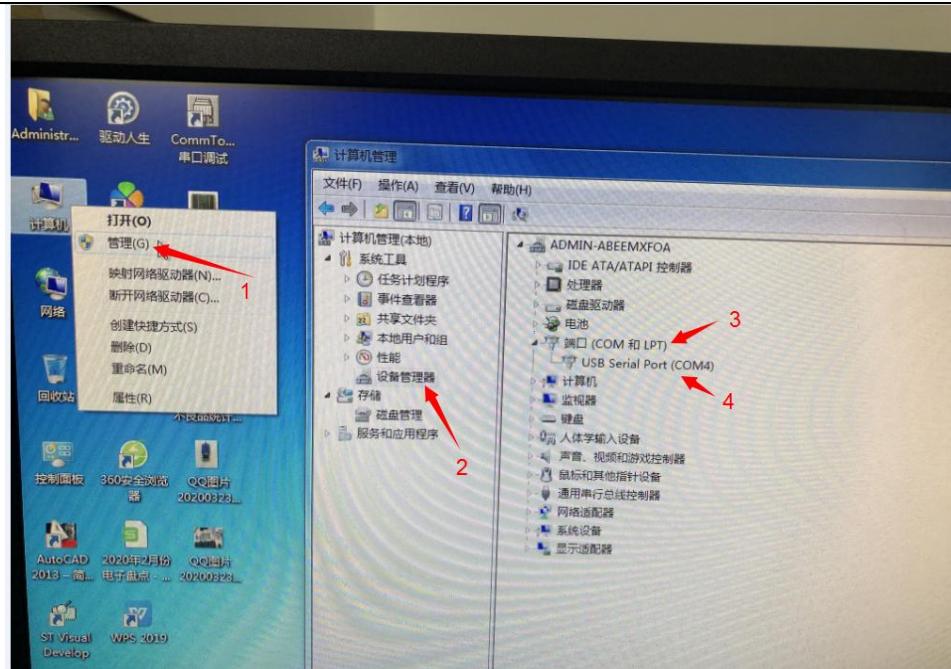
① The RS485 communication operation

- 1、Connect RS485, NCU16L (long power supply) and PC correctly, and the wiring diagram is as follows:

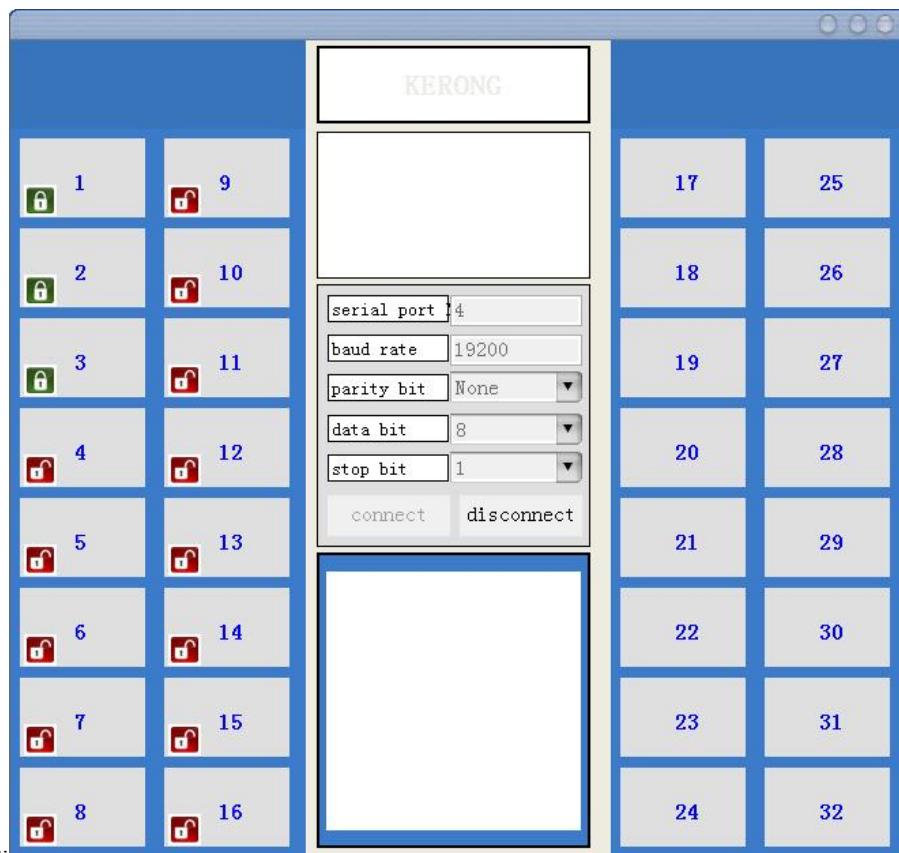


- 1、Check the PC port number used by RS485, right-click "My Computer", select "Management" to open, and enter the computer

Management, select Device Manager, and select Port (COM and LPT) in the right box to view the port number used by RS485, as detailed below



1、Test method 1: open RS485 test software, select the query, as above COM4, port rate selection: 19200, check bit: None, data bit: 8, stop bit: 1, as

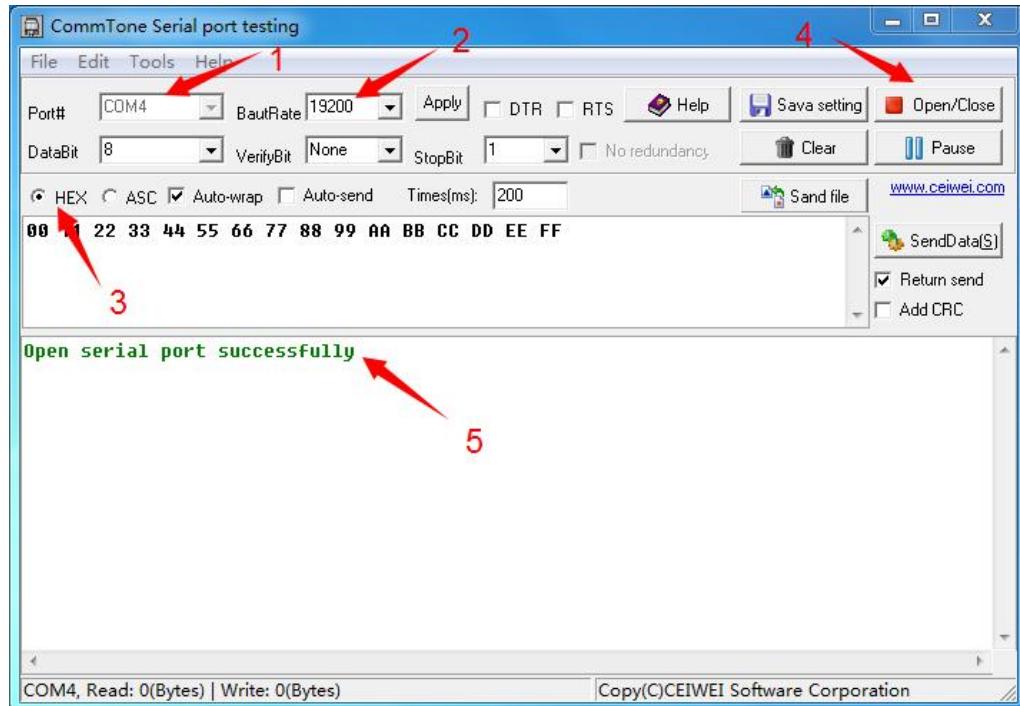


follows:

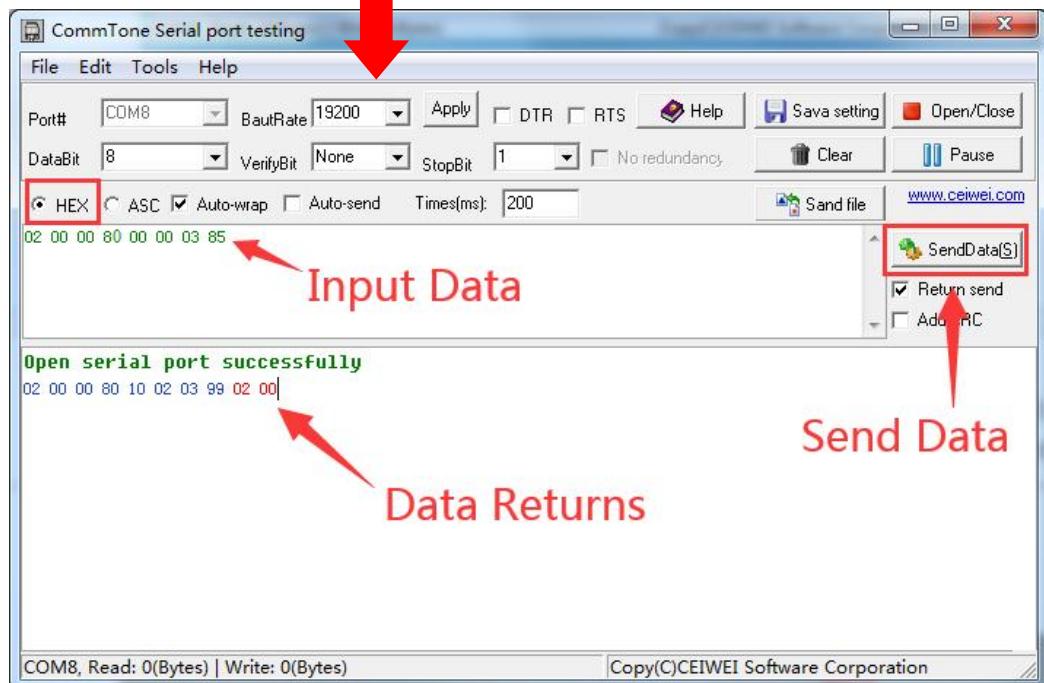


2、Test method 2: Open the "CommTone Serial Port Debug" assistant for test operation. Note that the port

rate should select 19200, and the sending data format is hex (namely HEX), as shown in the figure below:



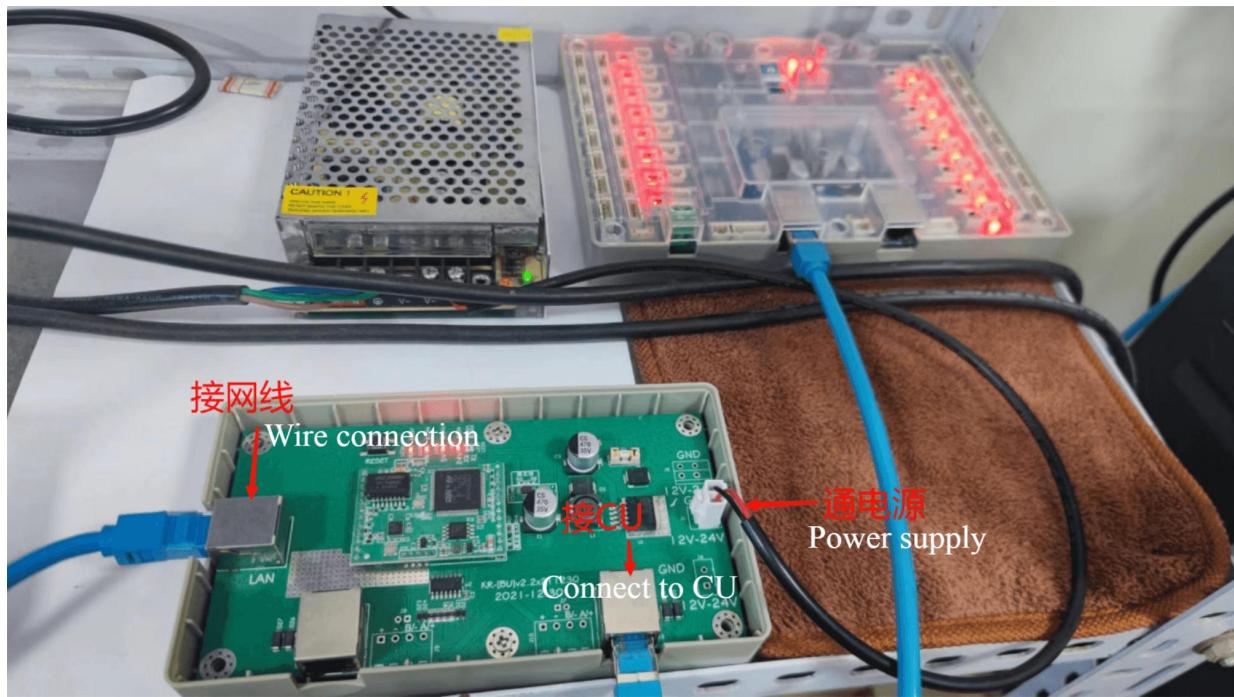
Test the NCU16L communication protocol, choose headecimal, or "HEX"



② BU communication operation, namely, TCP / IP operation

1. The BU, NCU16L (long power supply version), PC correctly connected, pay attention to the BU connection network cable, need to be a router, can not a switch,

The wiring diagram is as follows:



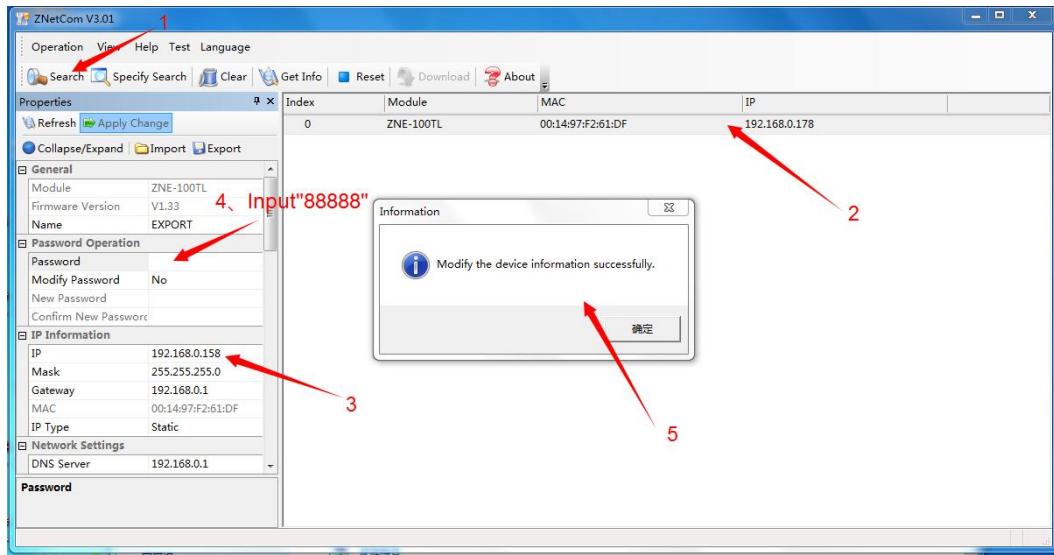
2、Set the IP address of the BU, note that it can not be the same as the PC IP address, that is, the last IP address is different, such as the PC

If the IP address is 192.168.0.100, then the address of BU can be set to 192.168.0.158, and the last number is not the same,

The specific operations are performed as follows:



① Open the BU setting software ZHetCom Utility, as shown below:



1 "Search <Search>" BU module information

2 double-click the searched BU module

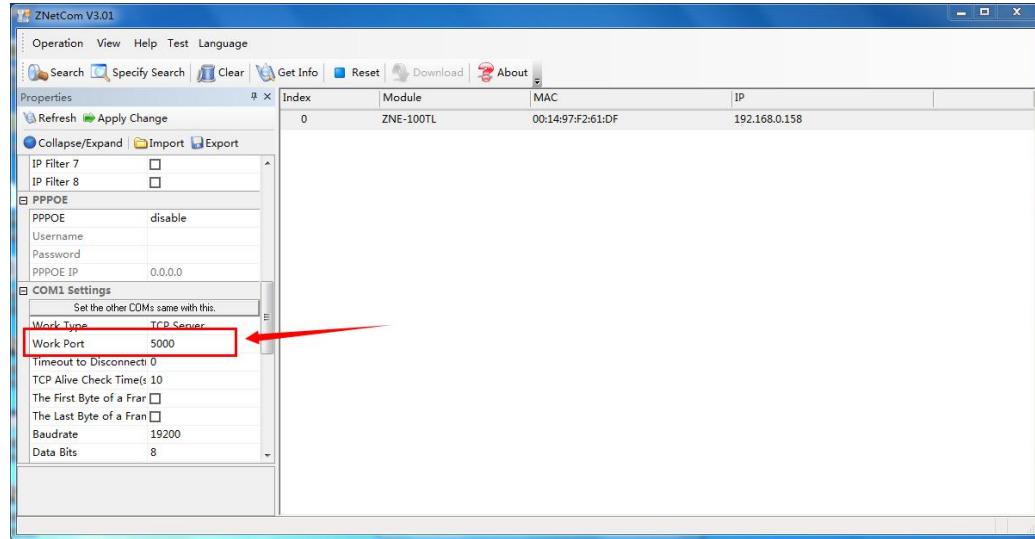
3 to set the IP address of BU,

4 Enter the password "88888"

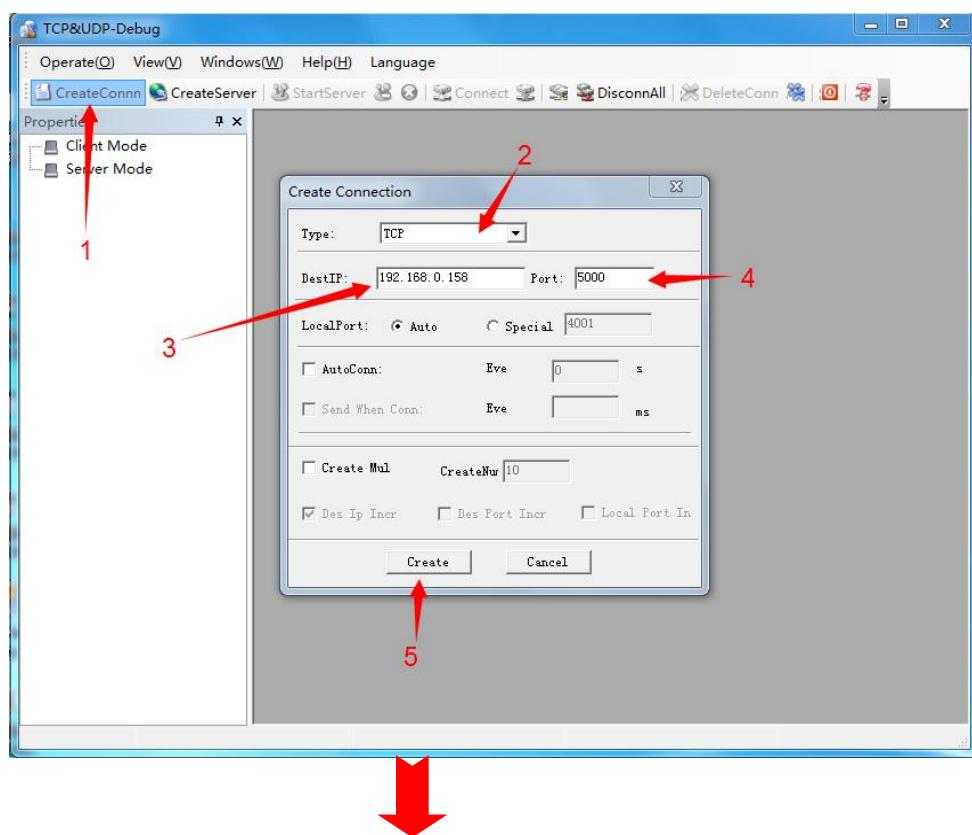
5 submit export, set success will be a success prompt

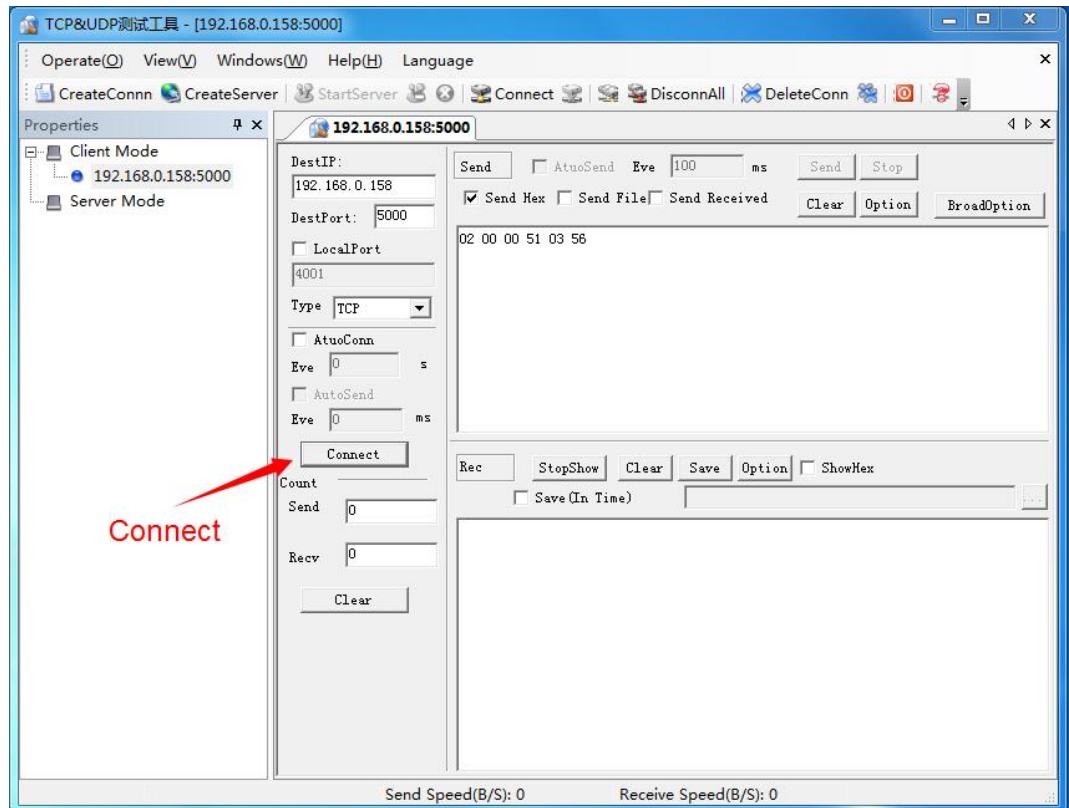
Note: After the successful modification, the BU needs to be initialized

- ② View the BU working port, as shown below:

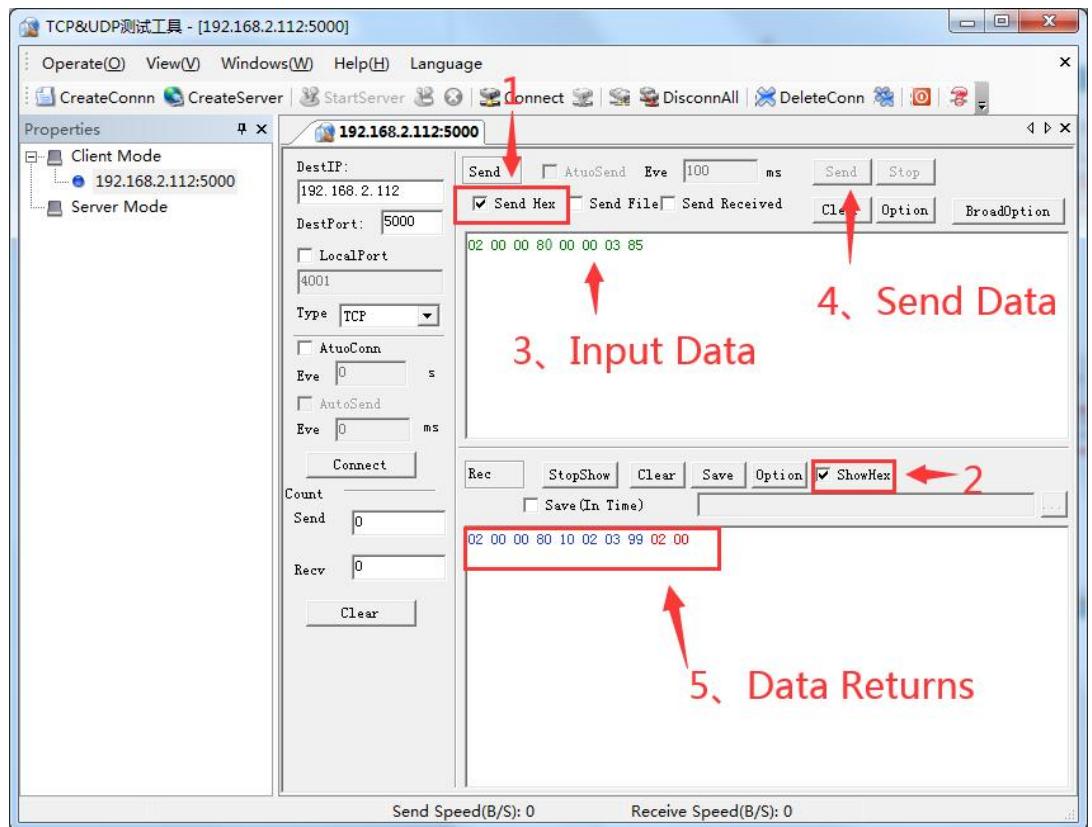


- ③ Test Method 1: After BU setting, open TCP test software "TCP & UDPDebug" and then "Create connection", type: TCP, target IP: set BU address (e.g. 192.168.0.158), port: query BU working port (e.g. 5000), and then click "Create" as follows:





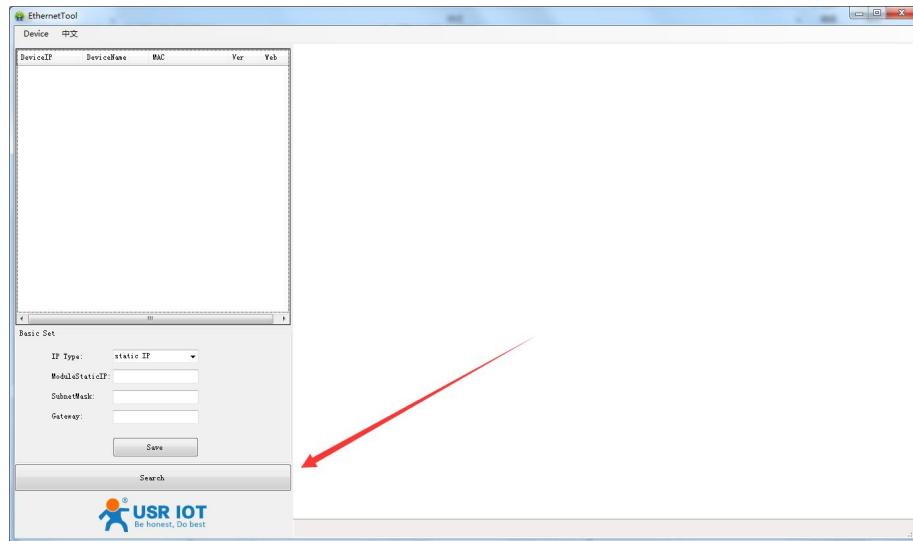
According to NCU16L communication protocol, test, note the
headacheal



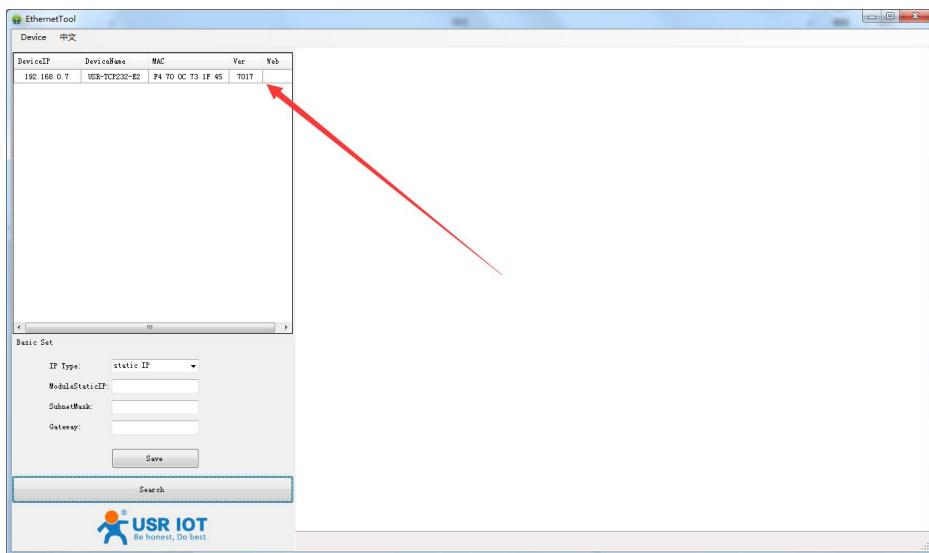
New-style BU Settings operation:

1. Open the manned BU setting software, and the operation  **EthernetTool.exe** is shown in the figure below

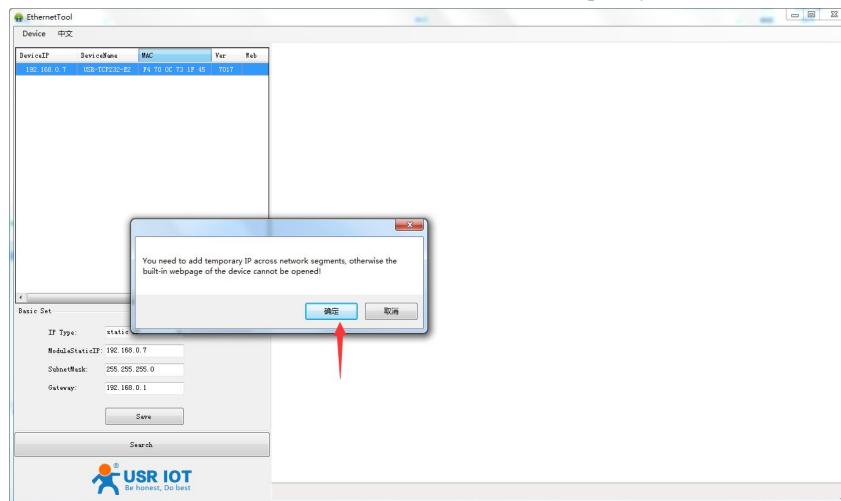
1. Click Search



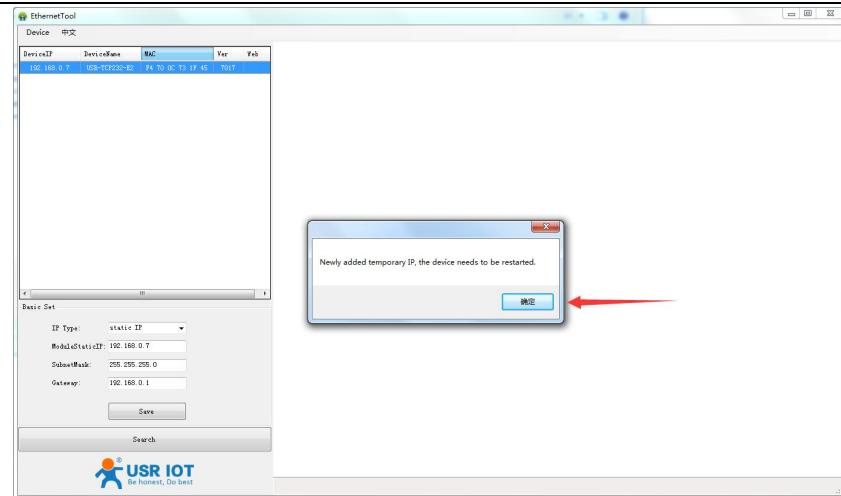
2. Double-click the IP address of the searched BU module



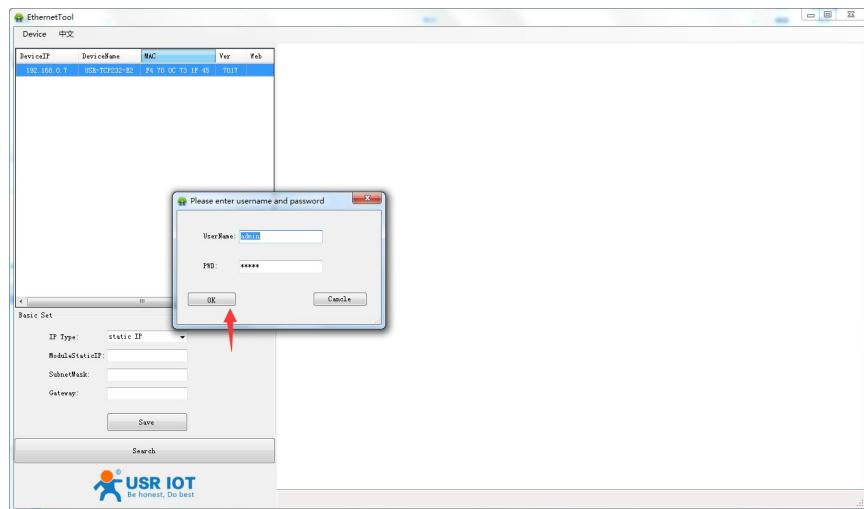
3. Click OK to allow the addition of a temporary IP



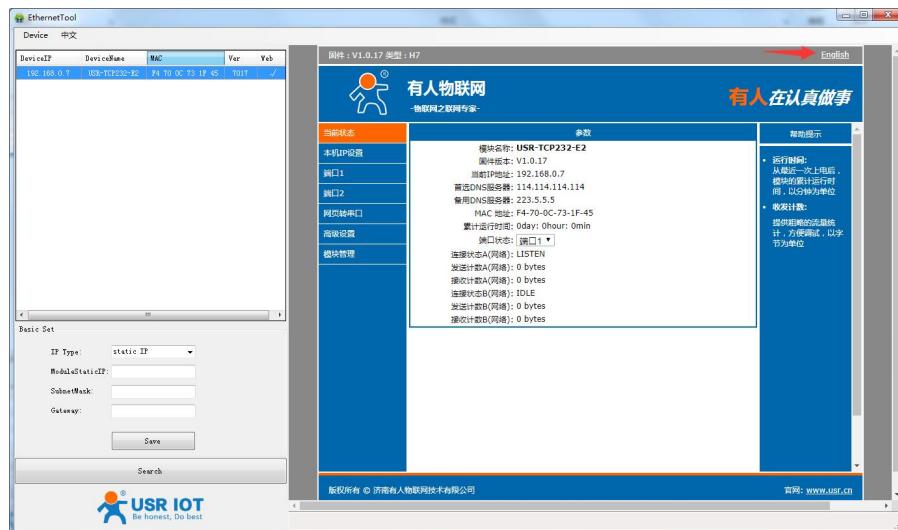
4. Click OK to allow the BU to restart after adding a temporary IP



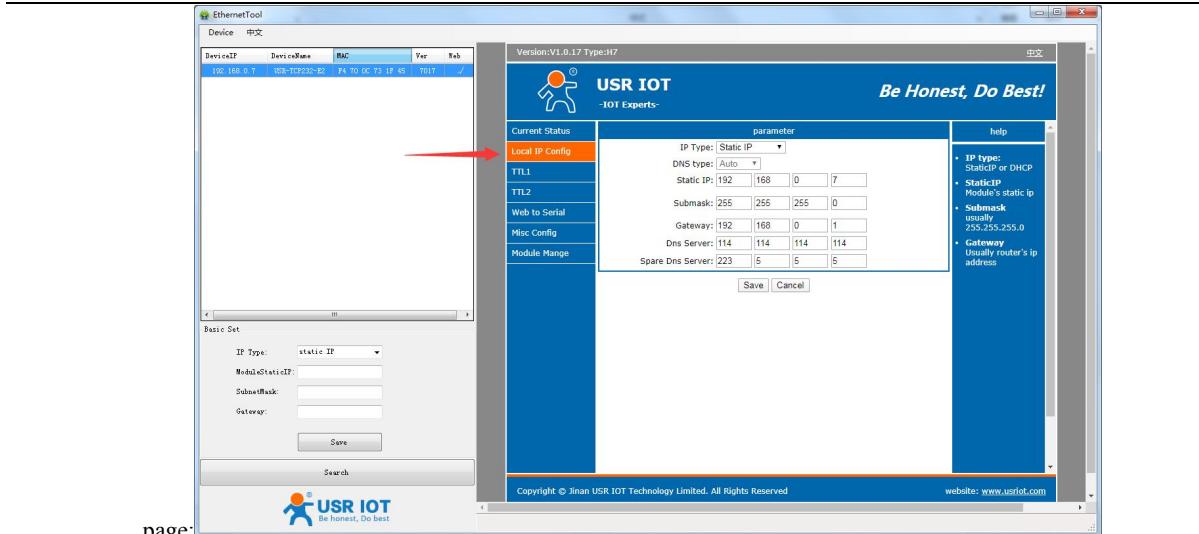
5. Click OK to Login



6. Switch to English

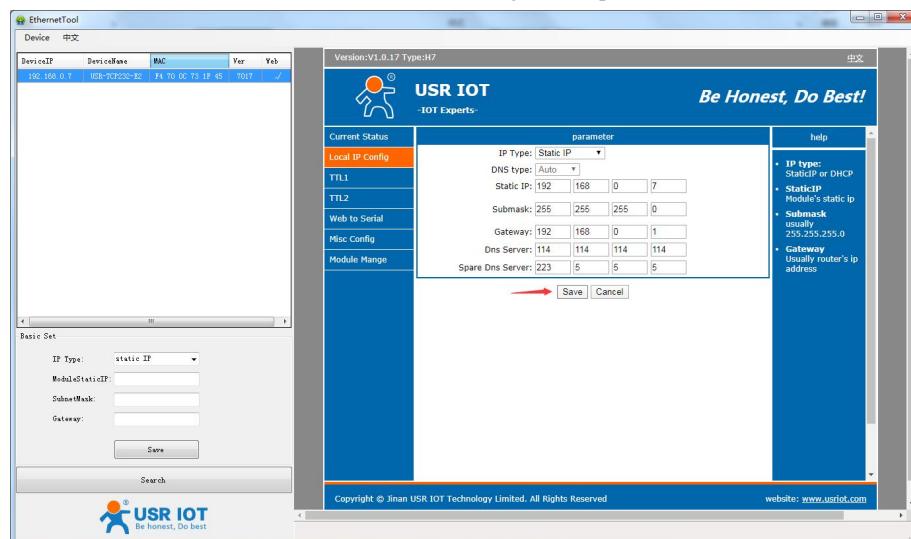


7. Modify the IP address and gateway on this

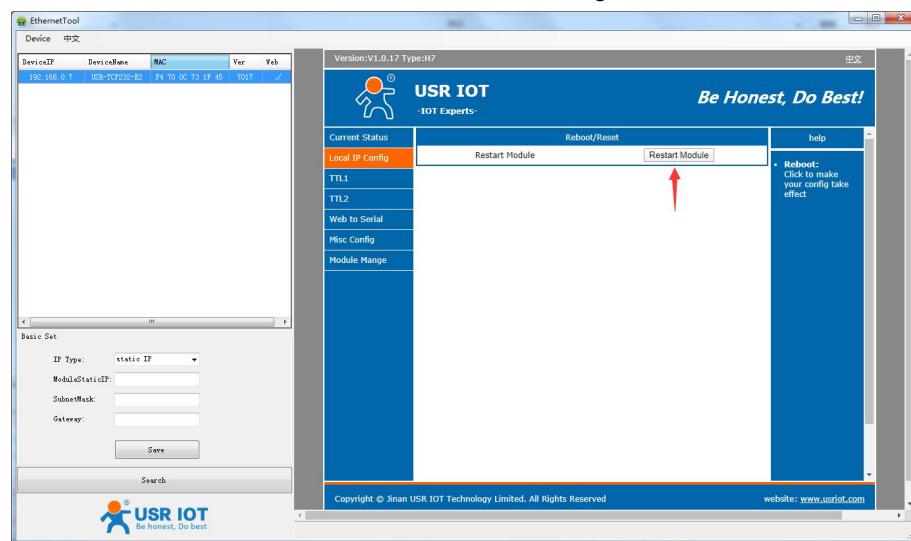


page;

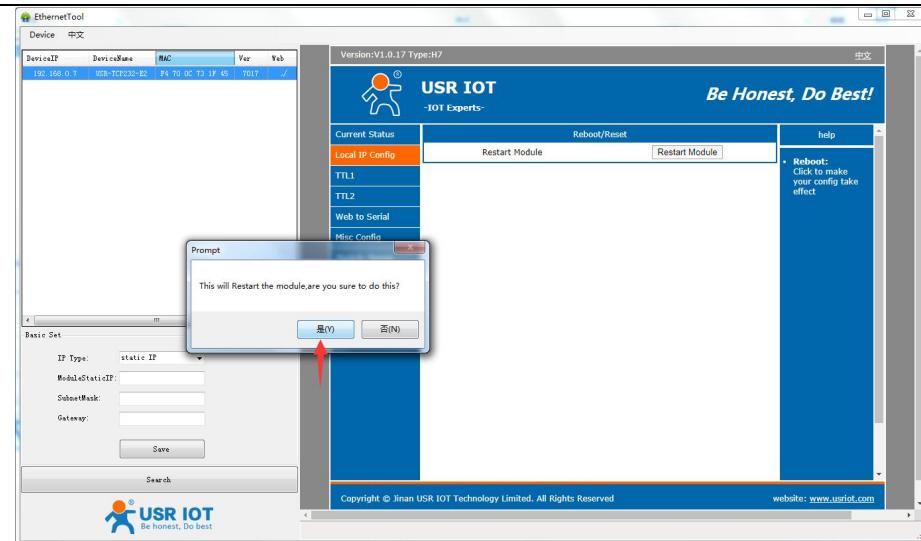
Click Save after the change is completed;



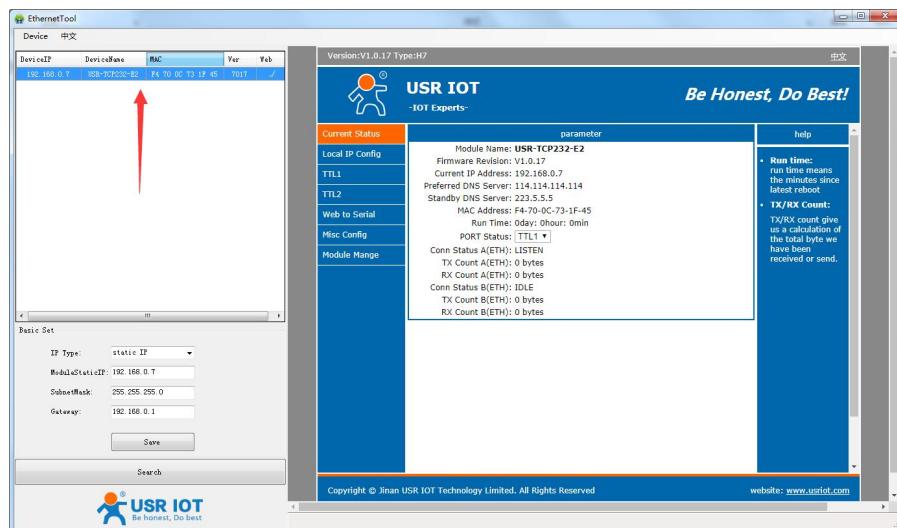
Then restart the module and let the change take effect



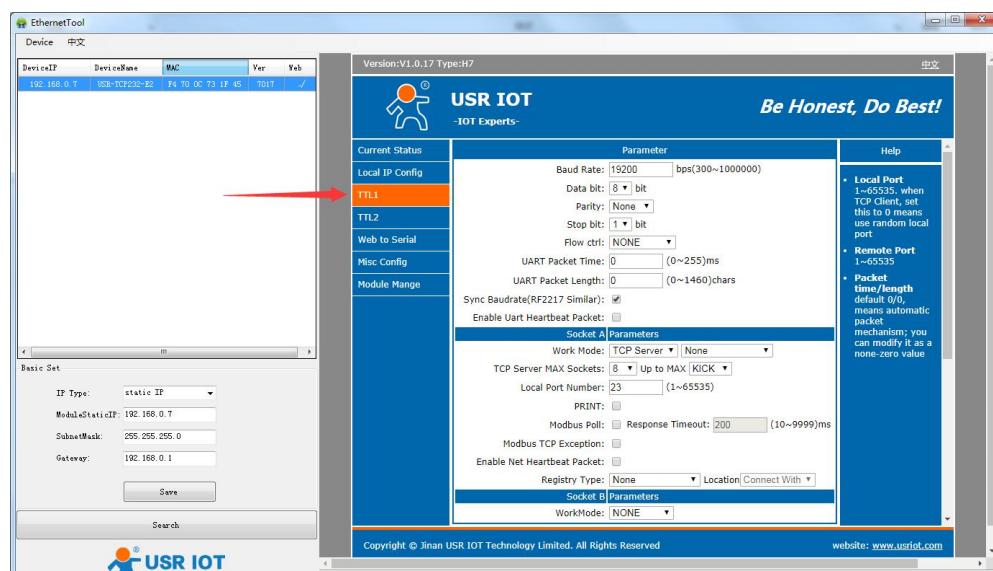
Click is;



8. Modify the port rate; double-click to search for the BU module IP

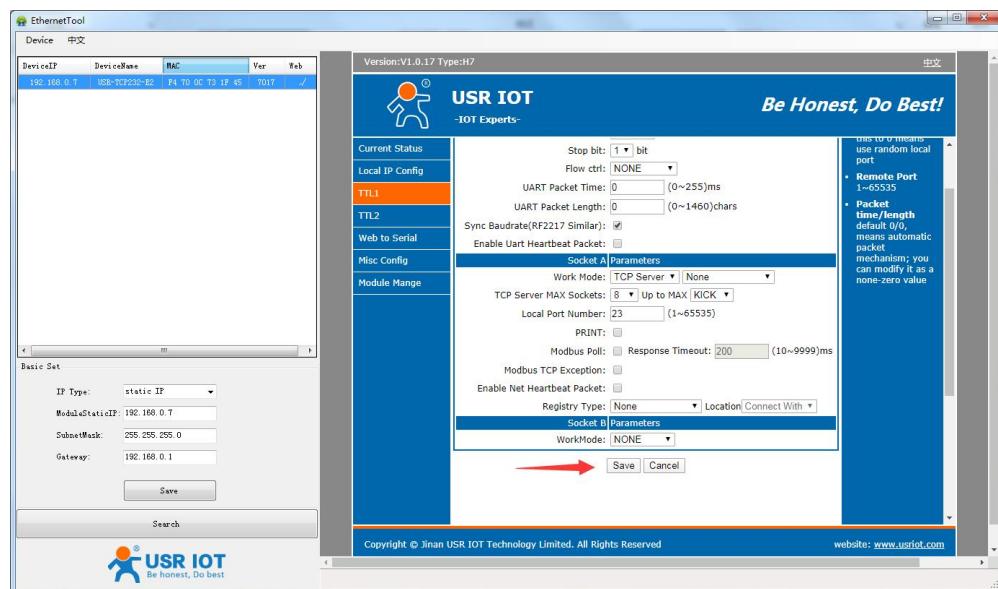


9. Modify the baud rate of BU and CU control board and the working port of BU on this

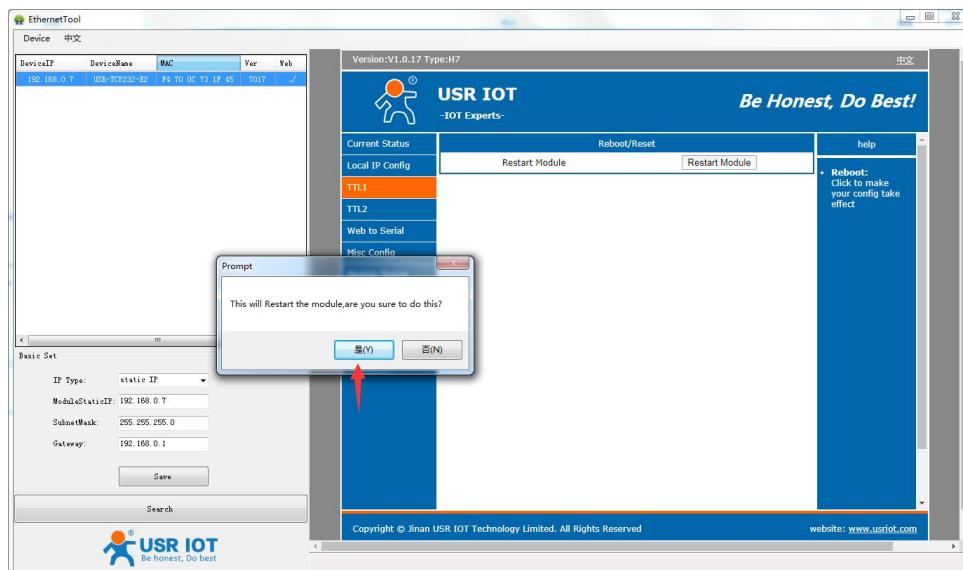


page;

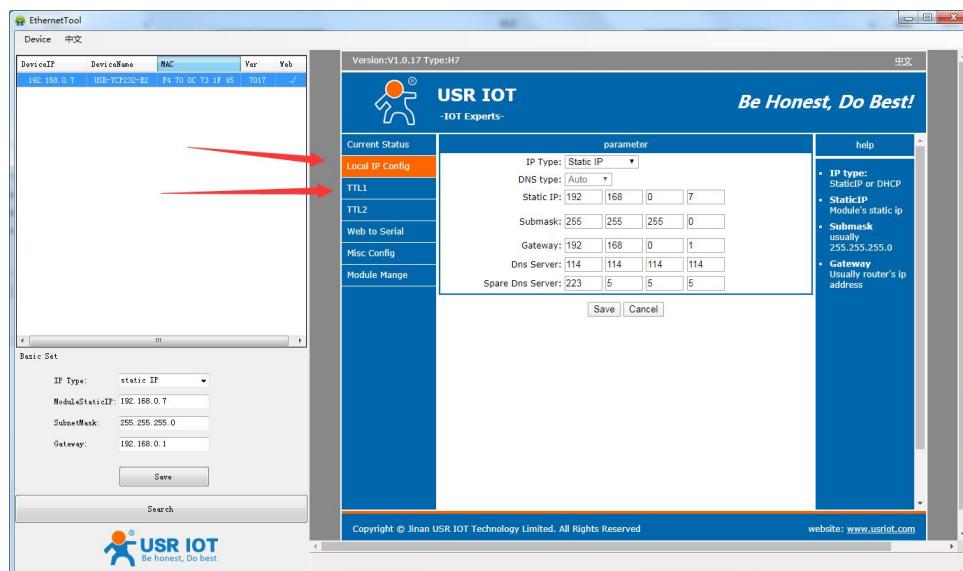
10. Click on Save Settings;



11. Click the restart module and click Yes;



12. Double-click to search for the changed BU module IP, click on the two pages, and see whether the change takes effect;



③ MCU OTA Upgrade

1. Connect the control board interface with the serial port communication tool, insert the computer USB interface, and check the port number;
2. Clear the original application and enter the OTA upgrade status

- ① Open the serial port tuning software



Select the correct port and open, the port rate selection of 19200, send F5 B5 00 04 5F E7 35 36 37 38, this command is to let the address 0x00 dashboard into the upgrade state.

After successful return to F5 B5 00 00 5F 09, it will continuously return to FF, sending and successfully disconnect the serial port;

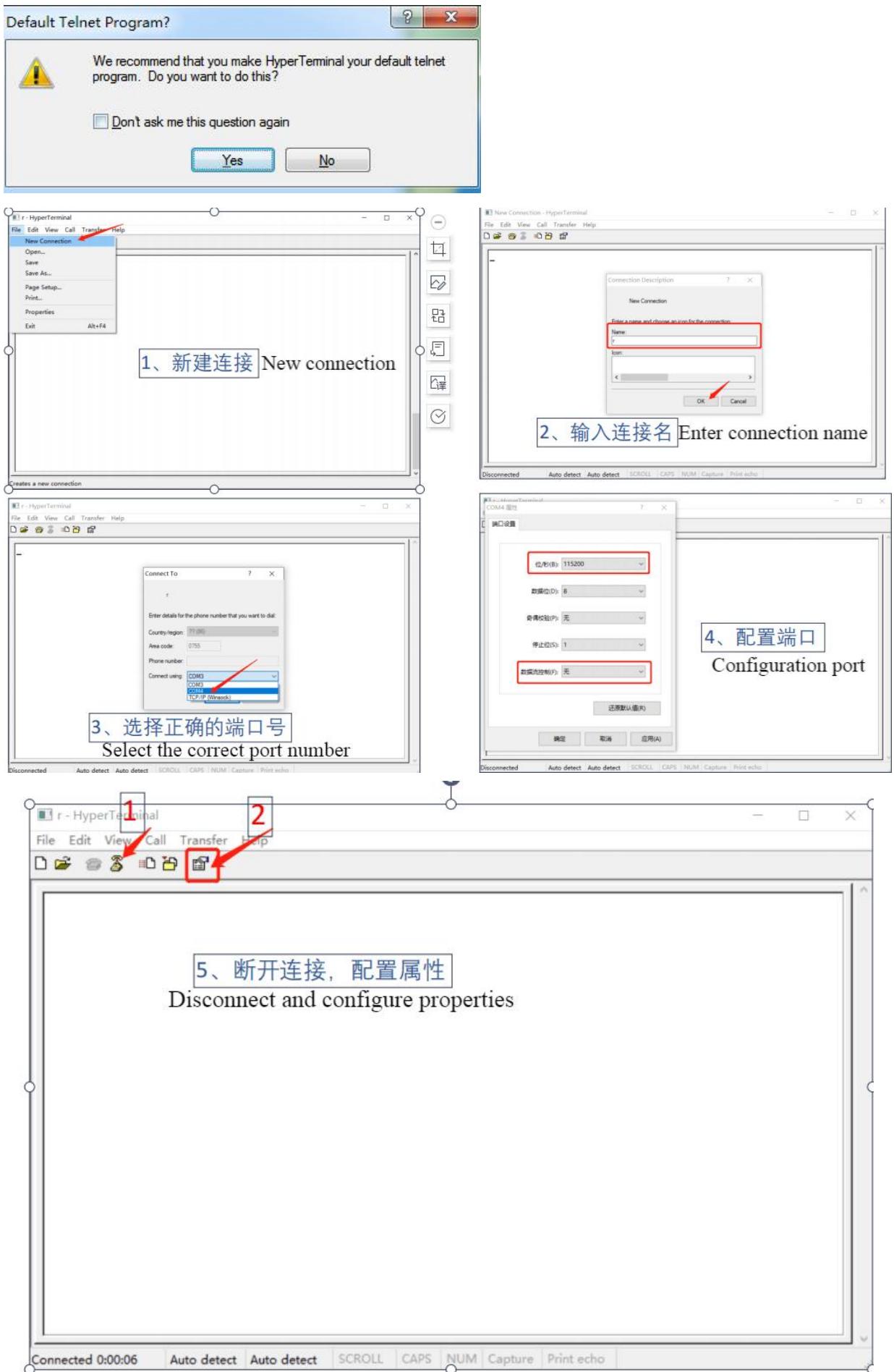


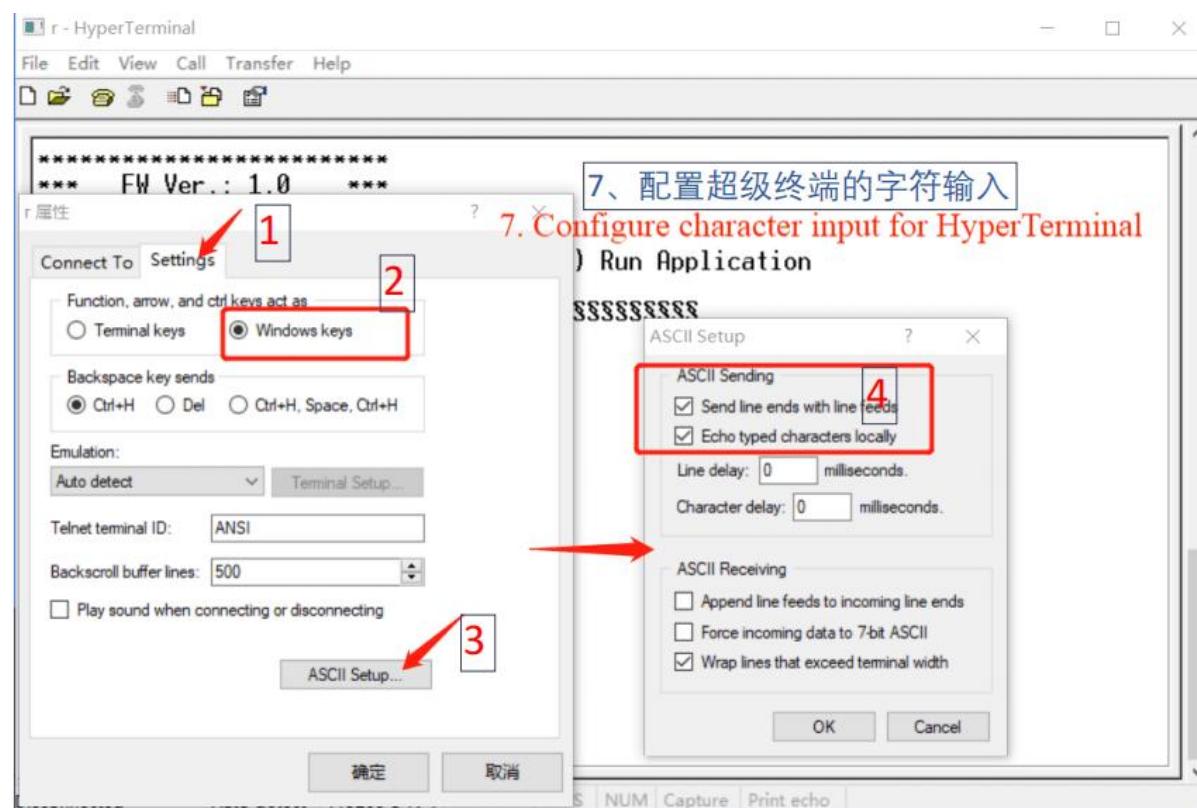
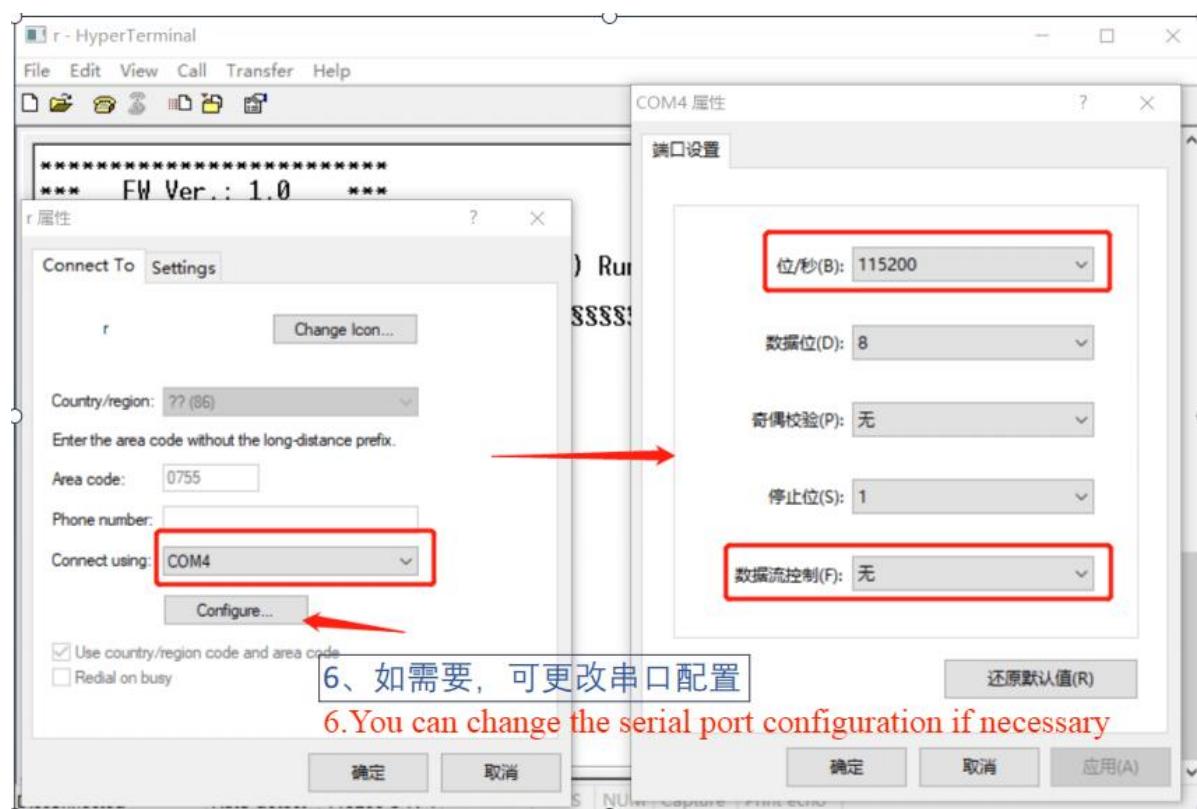
3. Upgrade the new application with the Superterminal OTA

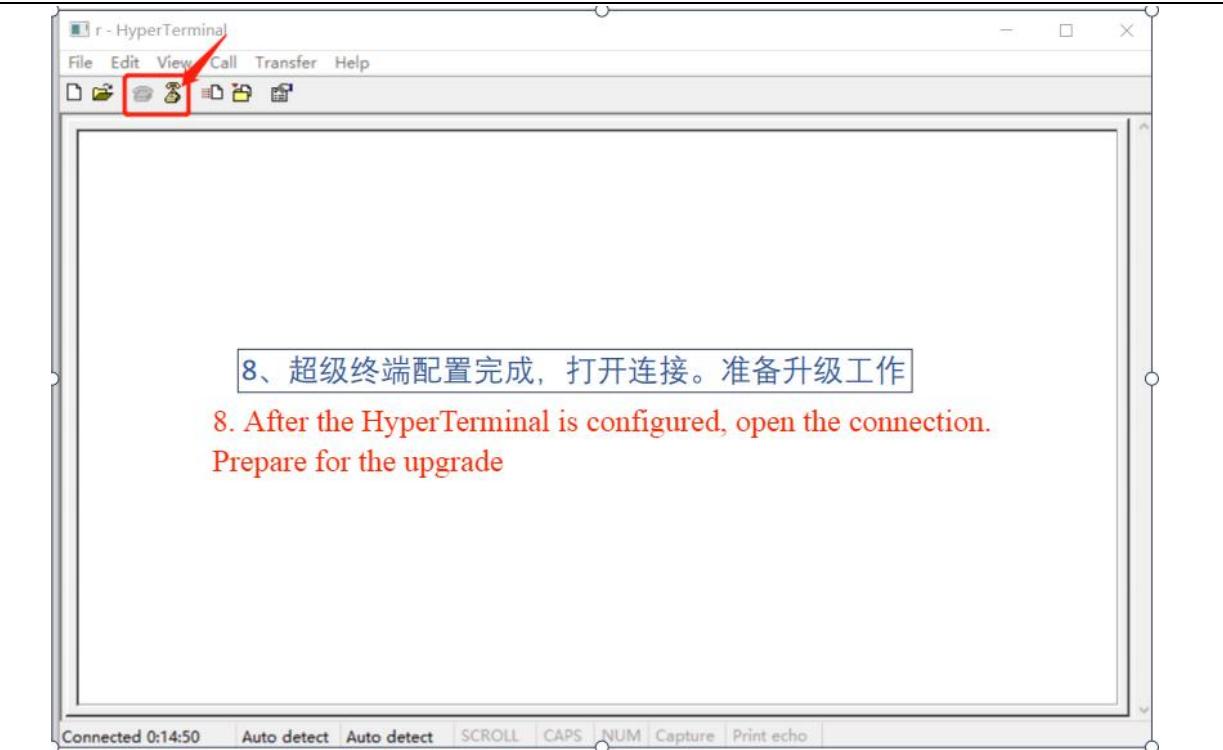
- ① Click to open the OTA Upgrade software



- ② Click YES and operate according to the following below

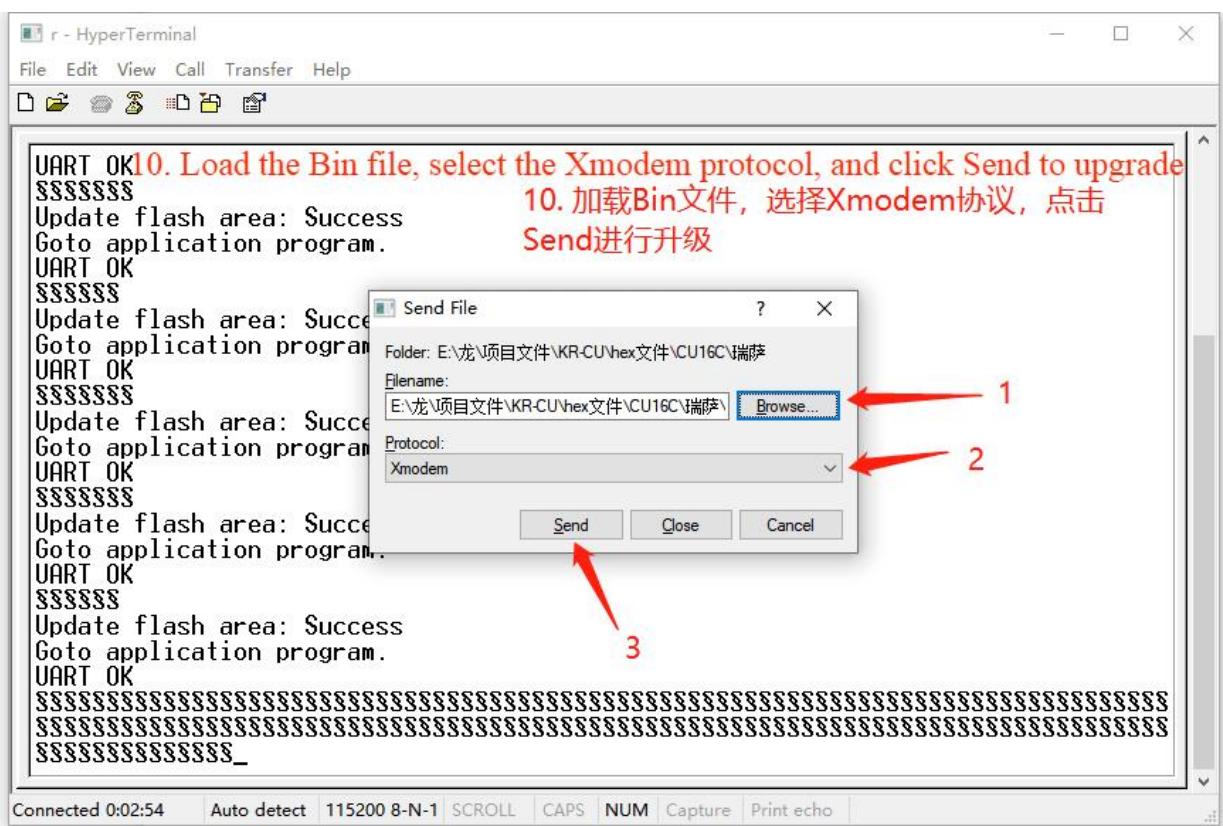
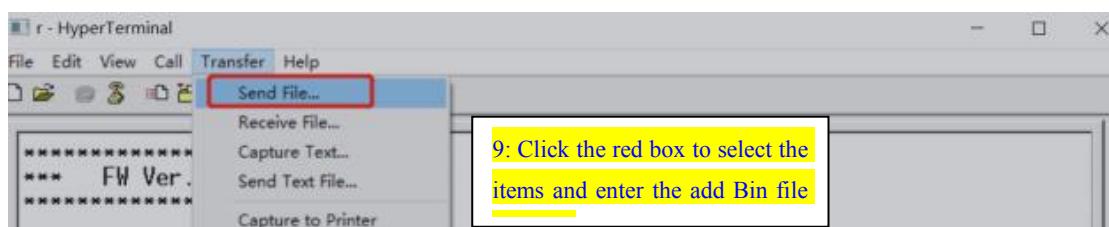


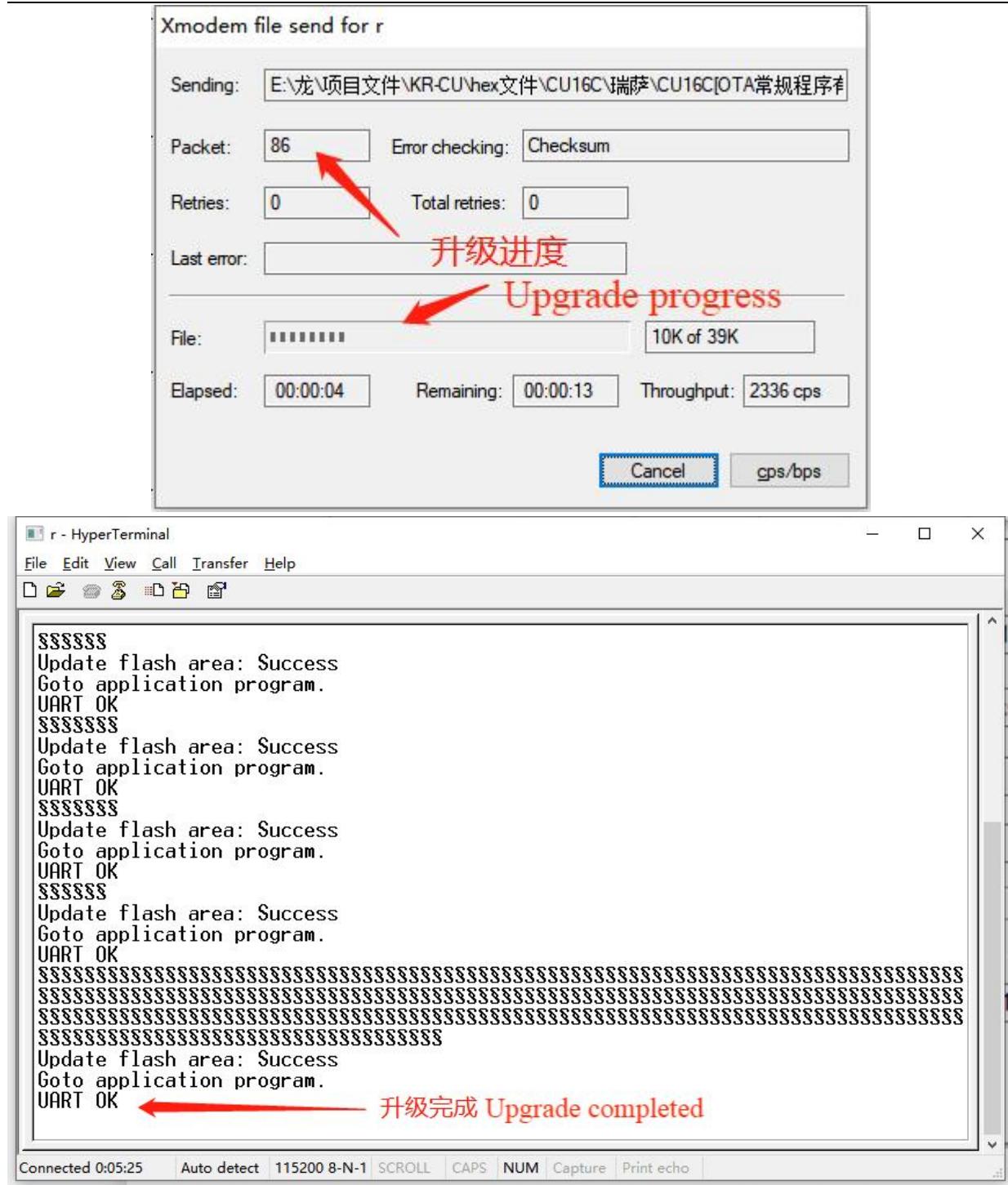




8、超级终端配置完成，打开连接。准备升级工作

8. After the HyperTerminal is configured, open the connection.
Prepare for the upgrade





5、Schematic diagram of installation

