CU48 Protocol And Introduction

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CONTENT

Version

Time	Version	Author	Updates
2020-03-20 Friday	V2.0	Wang Yonglin	Write the first version
2020-03-23 Monday	V2.1	Liang Guangbin	1. Add introduction of hardware 2. Add operation introduction

Abstract

1. This user manual is an introduction to CU48 board protocol.
2. Chapter One Introduction to CU48 protocol.
3. Chapter Two Introduction to CU48 hardware interface.

Chapter One Introduction to CU48 Protocol

1. Hardware Protocol

1.1 RS485 Protocol

Items	Description
Baud rate	19200
Data bites	8 bytes
Check bites	None
Stop bites	1 byte

2. Software Protocol

2.1 CU48 protocol data packet(from software)

1. Fixed length of the protocol packet is 32 bytes.

2. Protocol packet format: Big-endian.

General format is as below:

No.	Items	Description
1	STX（1byte）	Start code(fixed value): 0x02
2	ADDR（1byte）	ADDR of CU48 hardware: 0x00~0x0A. Eg.: ADDR=0x00, means to control CU48 which ADDR is 0x00 Notice: ADDR=0x0A, means send commands to all slaves of the bus.
3	LOCKNUM（1byte）	Lock number of CU48: 0x00~0x30. Eg.: LOCKNUM=0x00, means unlock No.0x01 lock. Notice: LOCKNUM=0x30, means unlock all 48pcs locks, No.0x01~0x30.
4	CMD（1byte）	Command,refer to protocol commands sheet
5	ETX（1byte）	End code(fixed value): 0x03
6	SUM（1byte）	The low byte of the whole command packet's Checksum. Eg.: SUM=STX+ADDR+LOCKNUM+CMD+ETX=0x125D, then SUM=0x5D

2.2 CU48 command protocol sheet (returned data from CU48 to software)

1. Fixed length of the protocol packet is 12 bytes.

2. Protocol packet format: Big-endian.

General format is as below:

No.	Items	Description
1	STX（1byte）	Start code(fixed value): 0x02
2	ADDR（1byte）	ADDR of CU48 hardware: 0x00~0x09. Eg.: ADDR=0x00, means get status of CU48 which ADDR is 0x00.
3	LOCKNUM（1byte）	In returned command, this value is nonsense, don't need to be dealt with.
4	CMD（1byte）	Returned command, please refer to the below sheet.
5	DATA1（1byte）	Means hook status of lock No.1~8, bit 0~7 is about hook status of lock No. 1~8. Eg.: bit 0=0, means hook of lock No. 1 is in unlocked

		status;bit 0=1, means hook of lock No. 1 is in locked status. Notice: bit value and hook status also can be opposite, it is Up to the hook detective switch is NO or NC. (Customers can Confirm with us in advance.)
6	DATA2（1byte）	Means hook status of lock No.9~16, bit 0~7 is about hook status Of lock No.9~16. Eg.: bit 0=0, means hook of lock No. 9 is in unlocked status;bit 0=1, means hook of lock No. 9 is in locked status. Notice: bit value and hook status also can be opposite, it is Up to the hook detective switch is NO or NC. (Customers can Confirm with us in advance.)
7	DATA3（1byte）	Means hook status of lock No.17~24, bit 0~7 is about hook status Of lock No.17~24. Eg.: bit 0=0, means hook of lock No. 17 is in unlocked status;bit 0=1, means hook of lock No. 17 is in locked status. Notice: bit value and hook status also can be opposite, it is Up to the hook detective switch is NO or NC. (Customers can Confirm with us in advance.)
8	DATA4（1byte）	Means hook status of lock No.25~32, bit 0~7 is about hook status Of lock No.25~32. Eg.: bit 0=0, means hook of lock No. 25 is in unlocked status;bit 0=1, means hook of lock No. 25 is in locked status. Notice: bit value and hook status also can be opposite, it is Up to the hook detective switch is NO or NC. (Customers can Confirm with us in advance.)
9	DATA5（1byte）	Means hook status of lock No.33~40, bit 0~7 is about hook status Of lock No.33~40. Eg.: bit 0=0, means hook of lock No.33 is in unlocked status;bit 0=1, means hook of lock No. 33 is in locked status. Notice: bit value and hook status also can be opposite, it is Up to the hook detective switch is NO or NC. (Customers can Confirm with us in advance.)
10	DATA6（1byte）	Means hook status of lock No.41~48, bit 0~7 is about hook status Of lock No.41~48. Eg.: bit 0=0, means hook of lock No. 41 is in unlocked status;bit 0=1, means hook of lock No. 41 is in locked status. Notice: bit value and hook status also can be opposite, it is Up to the hook detective switch is NO or NC. (Customers can Confirm with us in advance.)
11	ETX（1byte）	End code(fixed value): 0x03
12	SUM（1byte）	The low byte of the whole command packet's Checksum. Eg.:SUM=STX+ADDR+LOCKNUM+CMD+DATA1+DATA2+DATA3+ DATA4+DATA5+DATA6+ETX=0x125D，then SUM=0x5D
Remark	1byte=8bites, Eg.: 1byte number 0x59（hexadecimal）can be 01011001（binary）, start data O is bit 7, end data 1 is bit 0	

2.3 Command from software to CU48

No.	Command	Code	Description
Command（software——>CU48）			
1	Get status	0x50	Get lock status, please refer to the sheet CU48 command protocol sheet (returned data from CU48 to software)
2	Unlock	0x51	Unlock command, without returned data

2.4 Command from CU48 to software

No.	Command	Code	Description
Command（CU48——>software）			
1	Status response	0x65	Hook status of CU48

2.5 Description of Commands

Detailed description of commands for customers' understanding.

2.5.1 Get status

a) Protocol

Command: 0x50

b) Command function

Get hook status of CU48

c) Example

1. Get status of designated CU48 (Example for getting status of No. 0x00 CU48):

Command（software——>CU48）：02 00 00 50 03 55

Response（CU48——>software）：02 00 00 65 07 00 00 00 00 C0 03 31

2. Get status of all slaves of the bus (Example for getting status of CU48 No. 0x00 and 0x01):

Command（software——>CU48）：02 0A 00 50 03 5F

Response（CU48——>software）：02 00 00 65 07 00 00 00 00 C0 03 31

02 01 00 65 00 00 80 00 00 00 03 EB

d) Description

1. Example One: get hook status of CU48 No.0x00, 07 00 00 00 00 C0 means response data of hook status, hook No.0x01, 0x02, 0x03, 0x2F, 0x30 are in locked status, other 43pcs are in unlocked status.

2. Example Two: get hook status of CU48 No. 0x00 and 0x01, 07 00 00 00 00 C0 means response data of hook status of CU48 No.0x00, 00 00 80 00 00 00 means response data of hook status of CU48 No.0x01. For CU48 No.0x00, lock 0x01, 0x02, 0x03, 0x2F, 0x30 are in locked status, other 43pcs are in unlocked status. For CU48 No.0x01, lock 0x18 is in locked status, other 47pcs are in unlocked status.

2.5.2 Unlock

a) Protocol

Command: 0x51

b) Command function

Unlock designated lock on CU48

c) Example

1. Unlock designated lock on specific CU48 (unlock the first lock on CU48 which ADDR is 0x00):下行通讯 Command（software——>CU48）： 02 00 00 51 03 56

Response（CU48——>software）： None

2.Unlock all 48pcs locks on specific CU48 (unlock all 48pcs locks one CU48 which ADDR is 0x00):下行通讯 Command（software——>CU48）： 02 00 30 51 03 86

Response（CU48——>software）： None

3. Unlock all slaves on the bus:

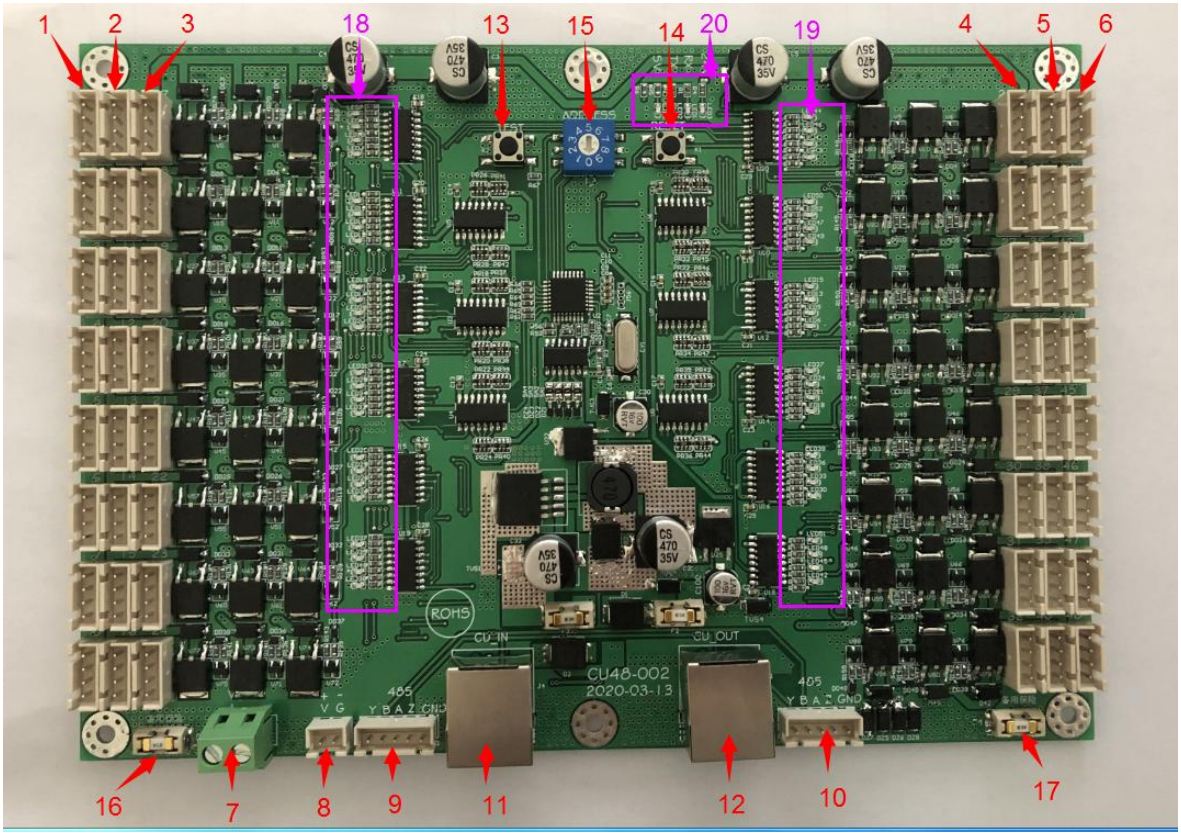
Command（software——>CU48）： 02 0A 30 51 03 90

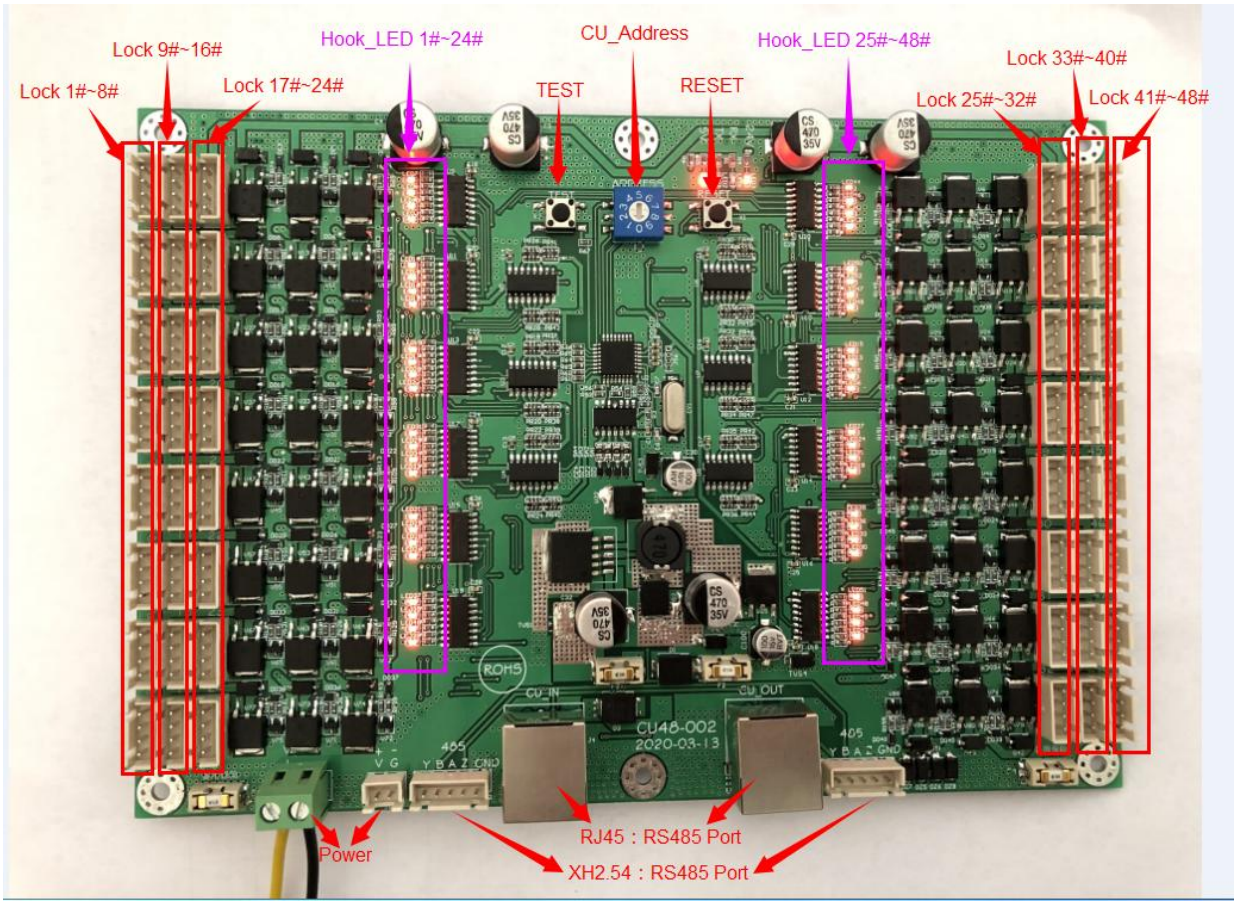
Response（CU48——>software）： None

d)Description

1. Example One: ADDR=0x00、LOCKNUM=0x00 means unlock the first lock on CU48 No. 0x00
2. Example Two: ADDR=0x00、LOCKNUM=0x30 means unlock all 48pcs locks on CU48 No.0x00
3. Example Three: ADDR=0x0A、LOCKNUM=0x30 means unlock all slaves of the bus

2.6 Introduction to Hardware





2.6.1 Connecting Port

1. Port【7、8】: Power(2Pin)
2. Port【1st column: lock 1#~8#】： 4Pin connector, 2Pin for power, 2Pin for hook detective switch
3. Port【2nd column: lock 9#~16#】: 4Pin connector, 2Pin for power, 2Pin for hook detective switch
4. Port【3rd column：lock 17#~24#】： 4Pin connector, 2Pin for power, 2Pin for hook detective switch
5. Port【4th column：lock 25#~32#】： 4Pin connector, 2Pin for power, 2Pin for hook detective switch
6. Port【5th column：lock 33#~40#】： 4Pin connector, 2Pin for power, 2Pin for hook detective switch
7. Port【6th column：lock 41#~48#】： 4Pin connector, 2Pin for power, 2Pin for hook detective switch
8. Port【9、10】： connecting port for RS485(5Pin)， connector type is XH2.54
9. Port【11、12】： communication for RS485, connector type is RJ45, also can for power supply, and connect other CU48.
10. Port【16、17】： spare fuse, if the fuse of board is burnt, can use this two spare fuses.

2.6.2 Address description

Setting address【15】： address for CU48

Notice: when connect more than 1pcs CU48, their address cannot be the same

2.6.3 Button description

1. Button【13】： TEST, press it can operate unlocking test
2. Button【14】： RESET

2.6.4 LED description

1. LED【20】： to show whether power input (12V-24V), power output(5V) is normal;

2. LED【18th column: hook 1#~24#】： LED for hook detective. Detective switch is on, red LED off; detective switch is off, red LED on.

3.LED【19th column：hook 25#~48#】： LED for hook detective. Detective switch is on, red LED off; detective switch is off, red LED on.

2.6.5 RS485 connecting description

Board port ——> RS485 adaptor:

A ——> T/R+

B ——> T/R-

Y ——> RXD+

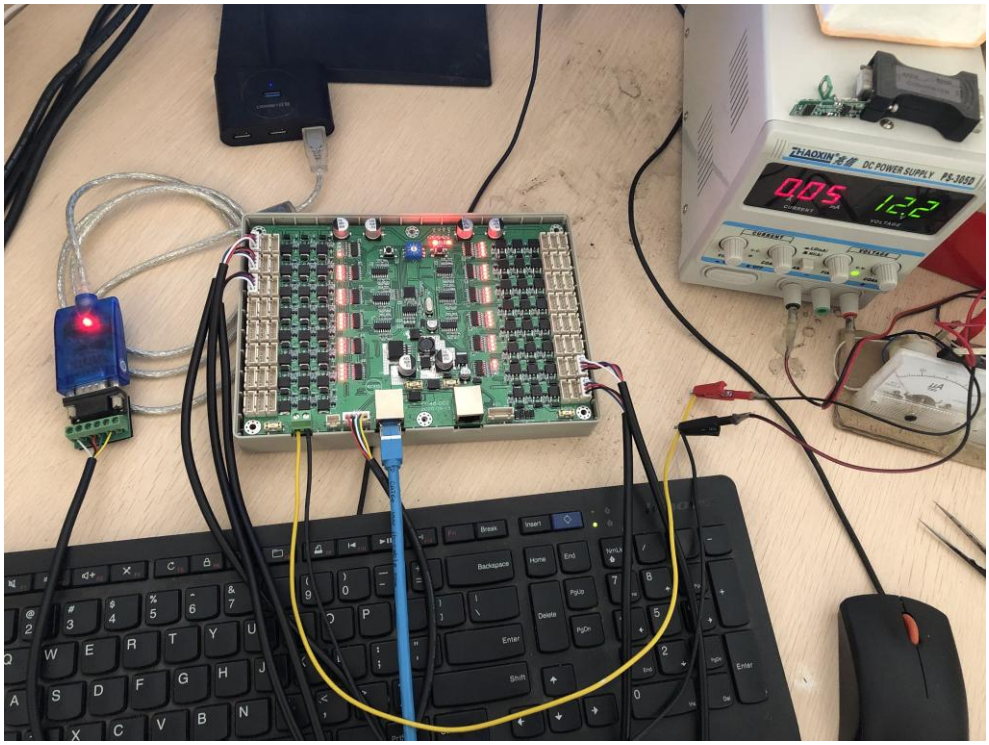
Z ——> RXD-

GND ——> GND

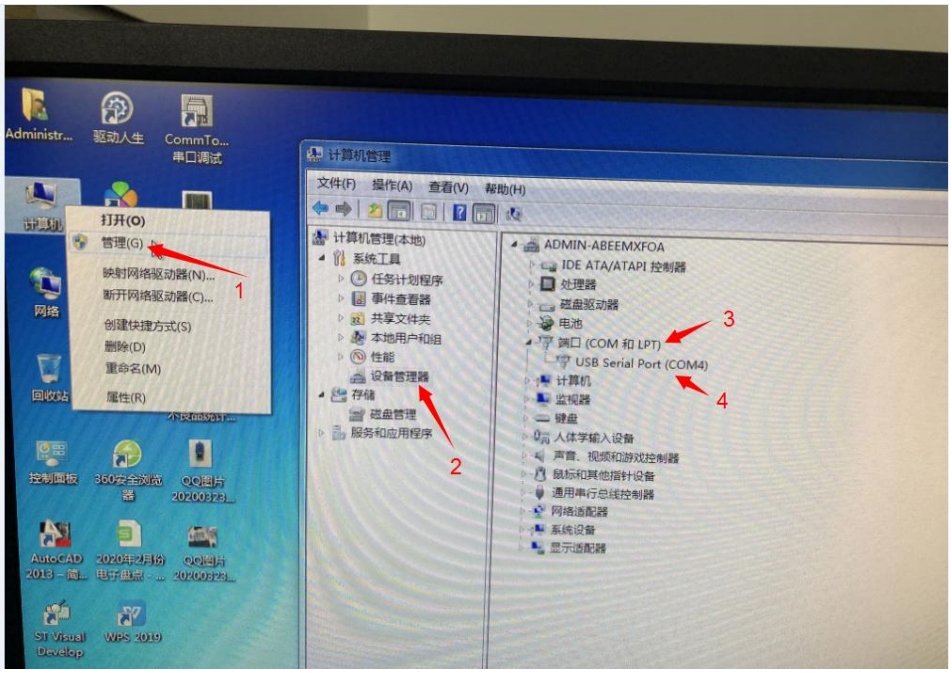
Chapter Two Operation of CU48

1. RS485 Connecting

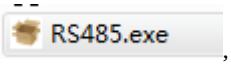
1.1 Connect RS485、CU48、PC as below:



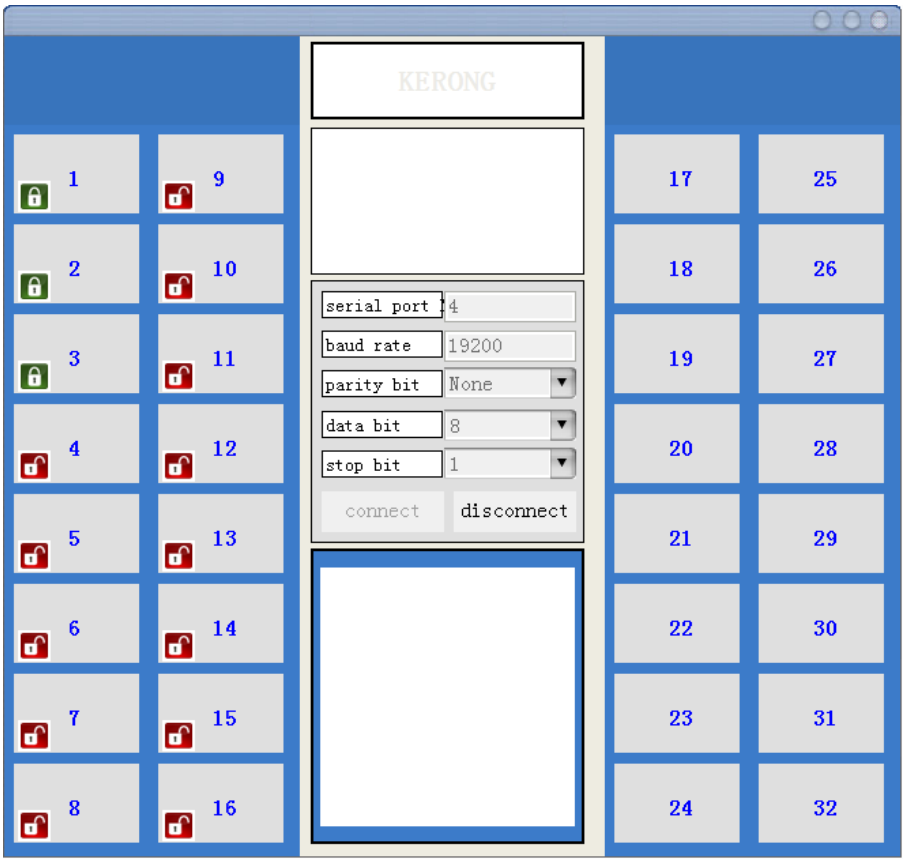
1.2 Check the PC port number of RS485.



1.3 Method one for test:

Open RS485 test software 

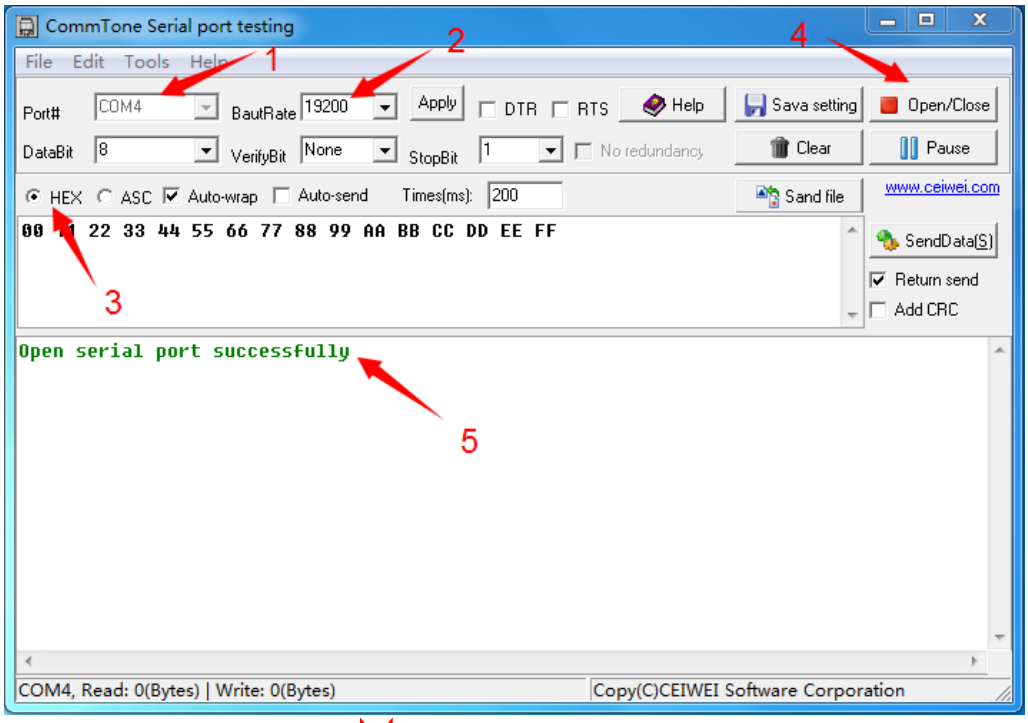
, check the correct serial port, for example COM4，baud rate: 19200, parity bit: None, data bit:8, stop bit: 1, show as below:



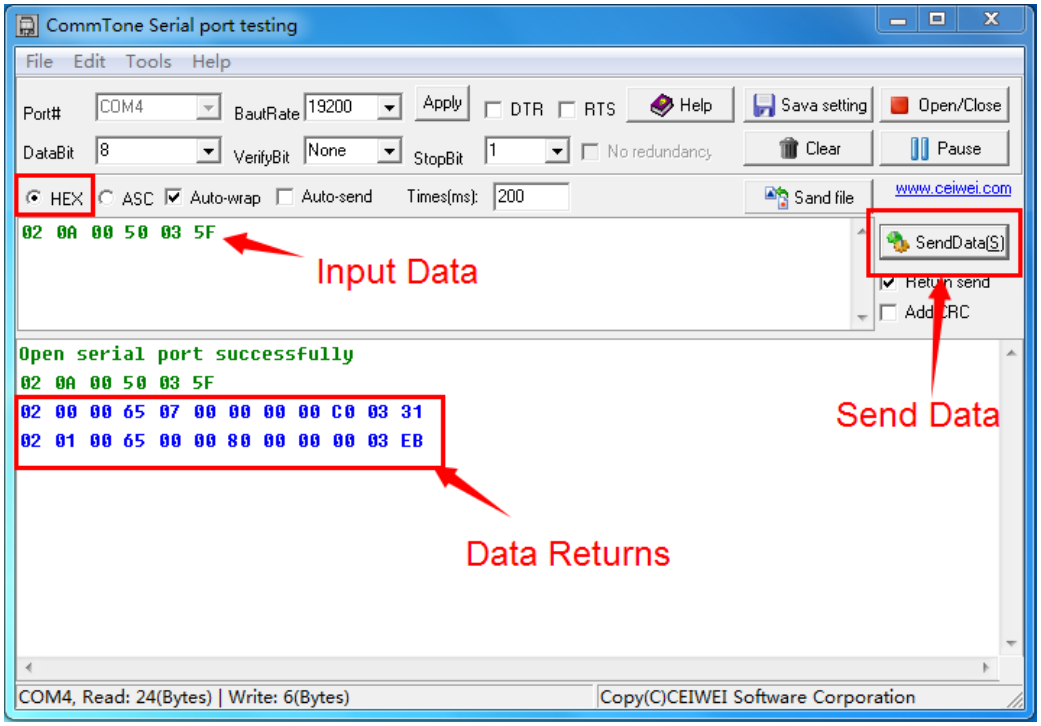
Notice: this test method only can test one CU48 and only first 16pcs locks.

1.4 Method two for test:

open the software , baud rate: 19200, format of sending command should be in HEX, show as below:

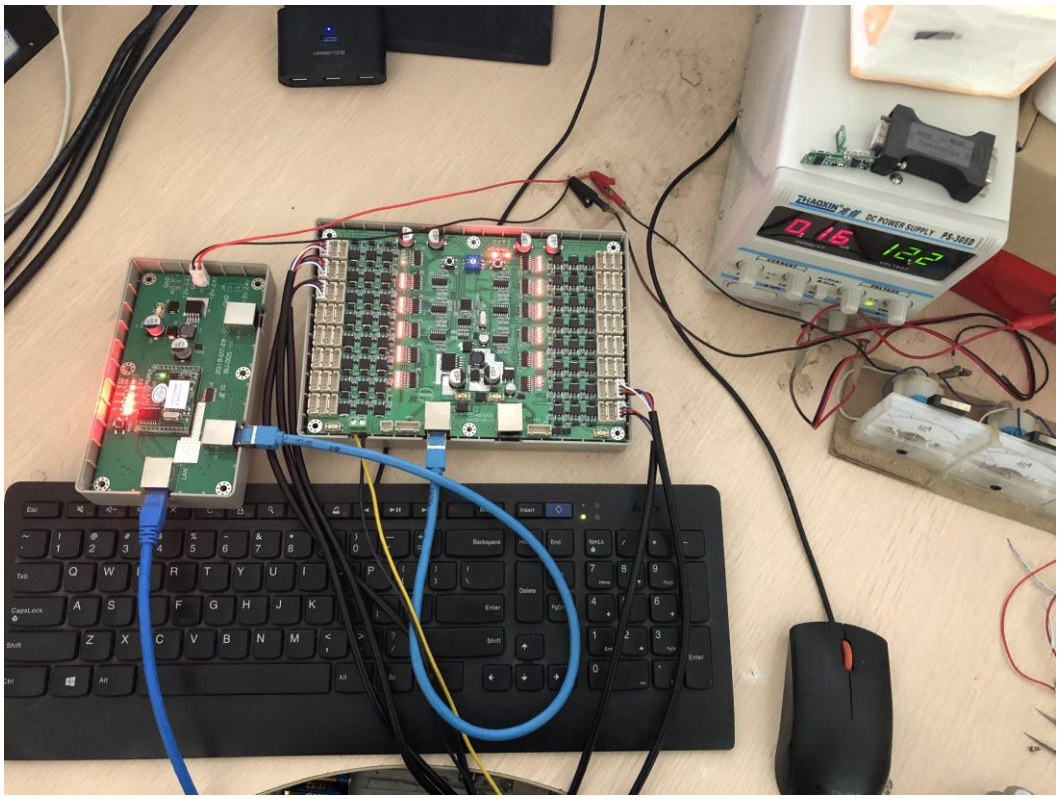


Test according to the protocol of CU48



2. TCP/IP Connecting

2.1 Connect BU、CU48、PC well, BU should connect with router, not any exchange, as below:

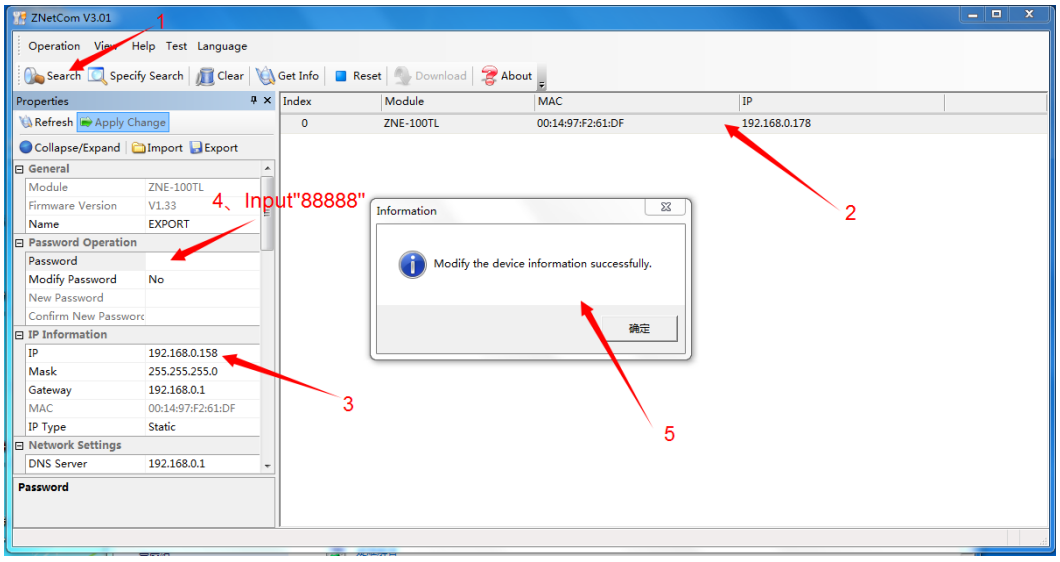


2.2 Set IP address of BU, cannot be the same as PC address, the last bit should be different.

Eg.: IP address of PC is 192.168.0.100, then IP address of BU can be set as 192.168.0.158, last bit is different.

① Open software ZHetCom Utility 

, as below:

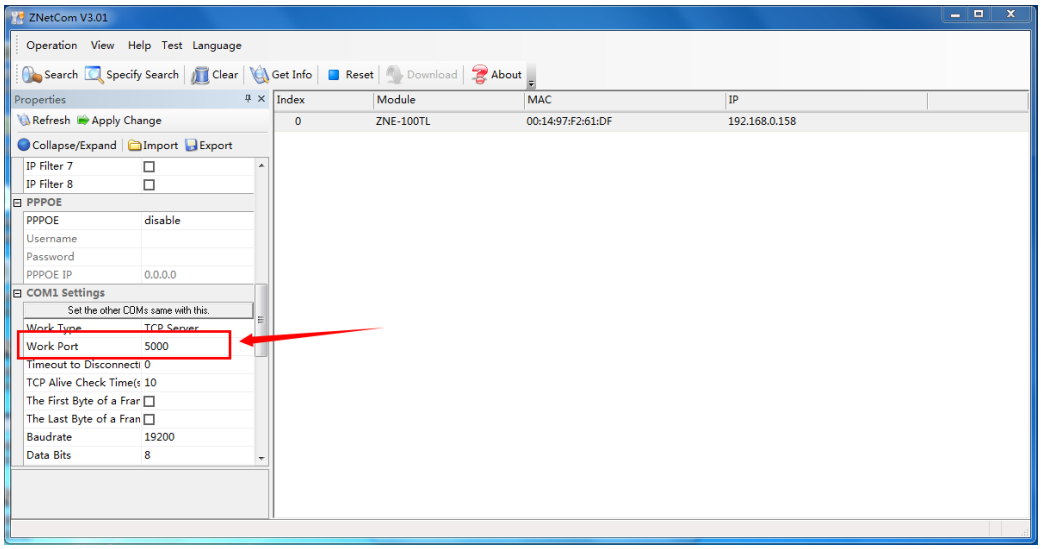


1 “<Search>”details of BU module →2 double click the details →3 set IP address of

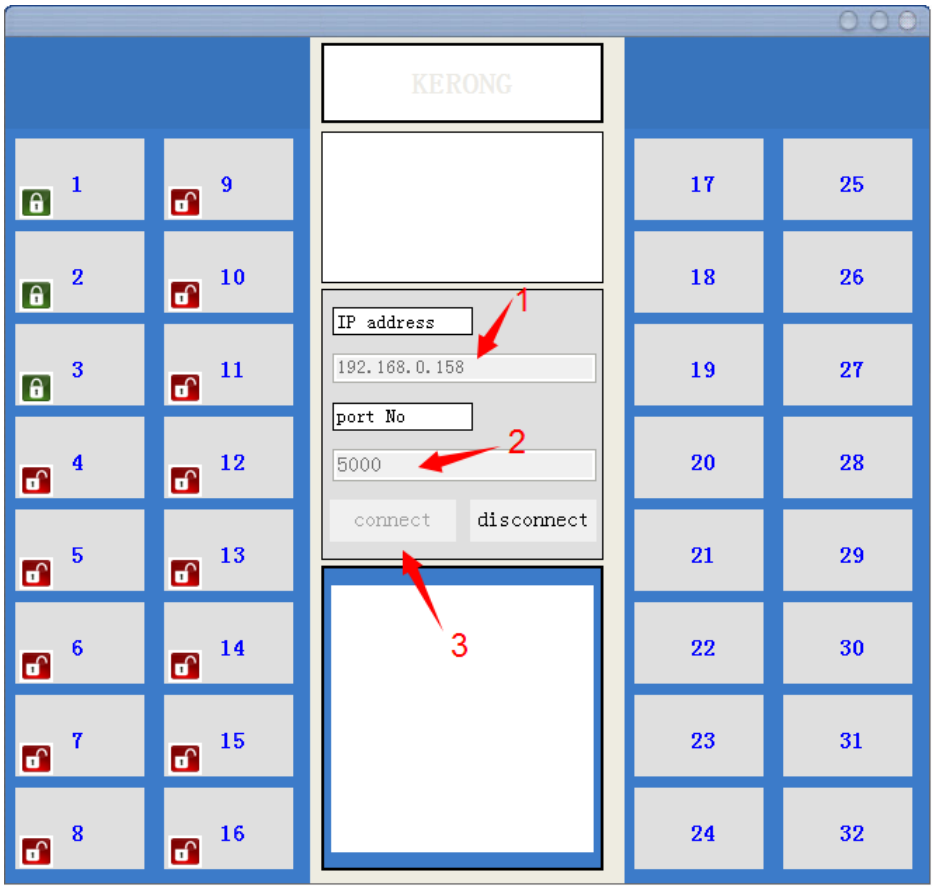
BU →4 input password “88888”→5 click “apply change”, then “confirm”.

Notice: After change, should reset BU.

② Check “work port” of BU, as below:

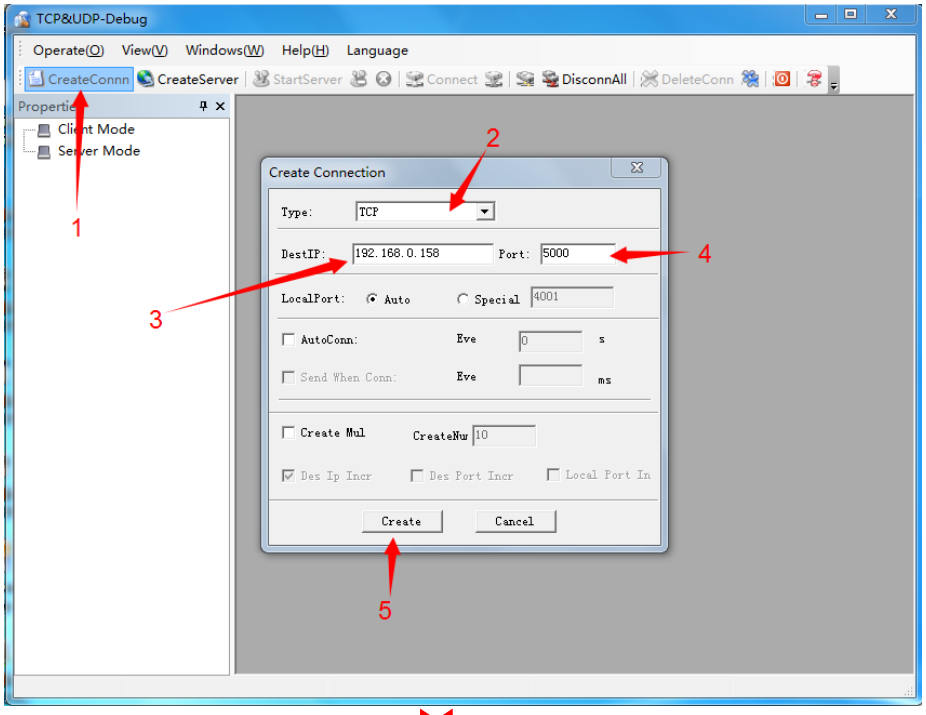


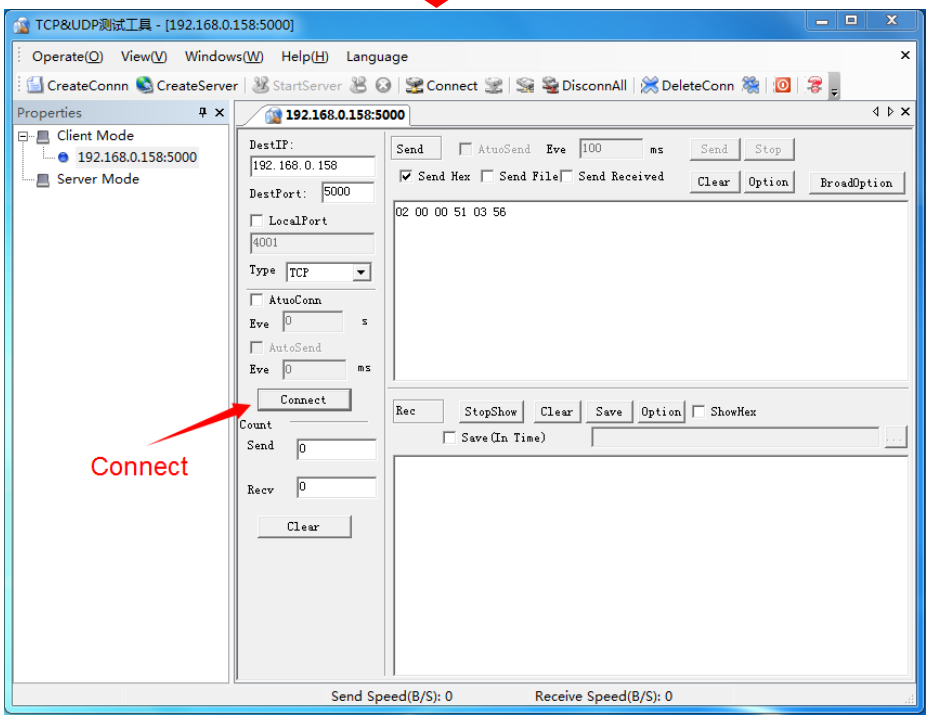
③ Method one for test: After set, open test software TCP.exe , then input correct IP address, port No., click “connect”, as below:



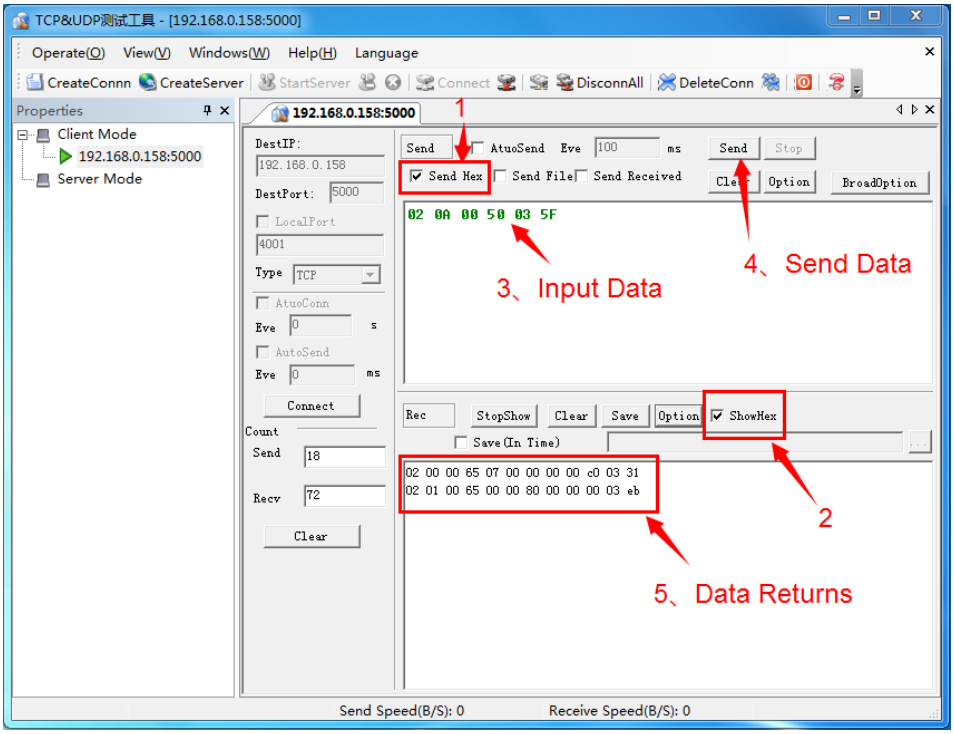
Notice: This test software only can test one CU48, and only first 16pc locks.

④ Method two for test: After set, open test software“TCP&UDPDebug”, then click “CreateConnn”, set as below (port is same as “work port”):





Test according to protocol of SCU, format must be HEX


TCP&UDP测试工具 - [192.168.0.158:5000]
Operate(O) View(V) Windows(W) Help(H) Language
CreateConnn CreateServer StartServer Connect DisconnAll DeleteConn
Properties
Client Mode
192.168.0.158:5000
Server Mode
192.168.0.158:5000
1
DestIP:
192.168.0.158
DestPort:
5000
LocalPort
4001
Type TCP
AtuoConn
Eve
AutoSend
Eve
Connect
Count
Send 18
Recv 72
Clear
Send
AtuoSend Eve 100 ms
Send
Stop
Send Hex
Send File
Send Received
Option
BroadOption
02 0A 00 50 03 5F
3、Input Data
4、Send Data
Rec
StopShow
Clear
Save
Option
ShowHex
Save(In Time)
02 00 00 65 07 00 00 00 00 c0 03 31
02 01 00 65 00 00 80 00 00 00 03 eb
2
5、Data Returns
Send Speed(B/S): 0
Receive Speed(B/S): 0