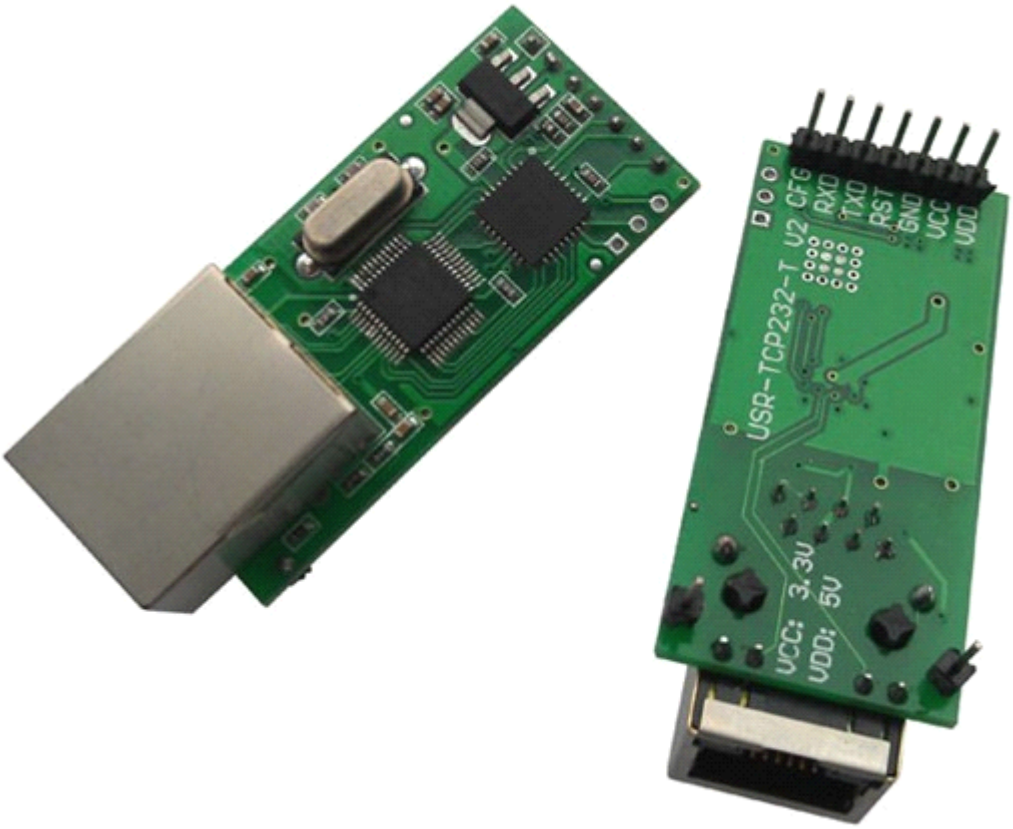
RS232 Serial to Ethernet convert Module

USR-TCP232-T
Hard Version: V2.0
Doc Version: V1.1
2011-08-16



Jinan USR IOT Technology Co., Ltd. works on LAN and WAN and wireless for MCU to Ethernet Solutions, Ethernet, WIFI, GPRS, Zigbee and Wireless modules, we can supply custom design for those usage, looking forward to cooperate with you.

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1. Introduction

1.1 Overview

The USR-TCP232-T is an intelligent plug-and-play RS232 to Ethernet adapter that enables any device or machine with a serial port, to become Ethernet network and Internet enabled. Go from Ethernet to serial with the USR-TCP232-T. It features a powerful built-in device server, so you can access your serial device from anywhere in the world over internet! The USR-TCP232-T is easily configured via Ethernet, and can also be set up through the serial port.

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1.2 Features

- Auto detected 10/100M High speed Ethernet
- AUTO MDI/MDIX, Use crossover cable or parallel cable connection
- Baud rate 300 ~ 25600 bps
- TCP Server, TCP Client, UDP client , UDP server
- Can work as Virtual COM
- Auto reconnect TCP connection
- Socket program reference
- Free setup software and setup Agreement available
- Agreement: ETHERNET, ARP, IP, UDP, TCP
- 3.3V and 5V two power input interface
- OEM and custom versions available

1.3 Applications

- Fire and Security Panels
- Vending Machines
- Point of Sale Terminals
- Remote equipment management
- IT management services
- Access Control
- Industrial Control
- Home Automation
- Instrumentation
- Building Control
- Power Management

1.4 Order information

Type	Part Numbers	Electric interface
Serial to Ethernet Adapter	USR-TCP232-T	TTL
Serial to Ethernet Adapter	USR-TCP232-4	RS485
Serial to Ethernet Adapter	USR-TCP232-2	RS232
Serial to Ethernet Adapter	USR-TCP232-24	RS232/RS485 choose by jumper
Serial to Ethernet Adapter	USR-TCP232-D	DIP module in TTL version, without RJ45 on board.

Modbus, Ethernet/IP and Encrypted Versions are also available

1.5 Electrical Characteristics

DC Power Supply Voltage: Two DC Voltage can be choose

VCC：type: 3.3V, min: 3.15，max: 3.45 V

VDD：type: 5V, min: 4.5V，max: 5.5V

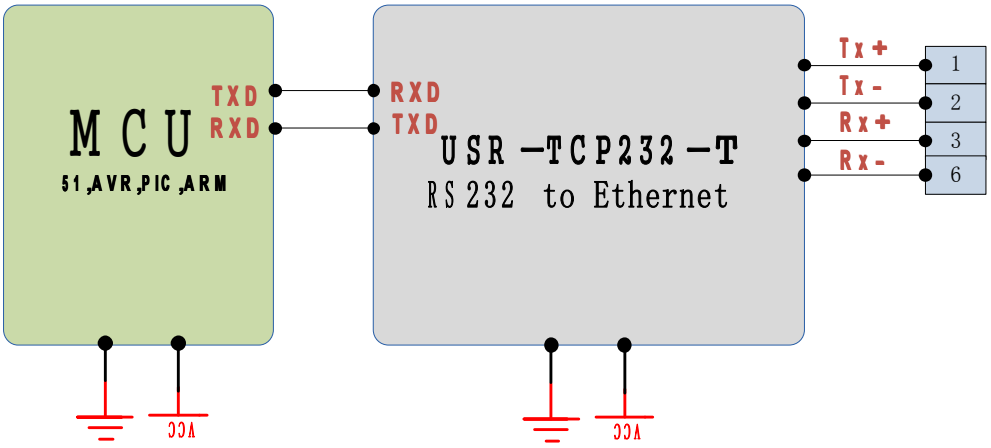
Operating supply current : Max: 180 MA

Operating Temperature: 0~75 °C (business version) -25-80°C (industry version)

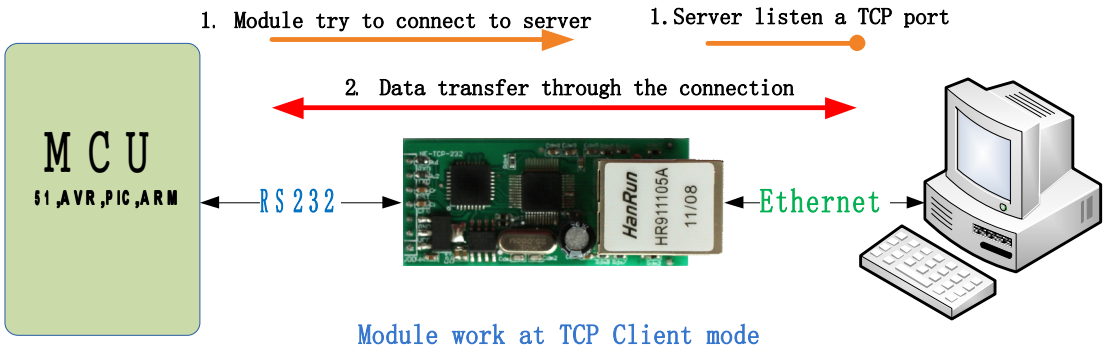
Storage temperature: -40~85 °C

2. Work Mode

2.1 Block diagram

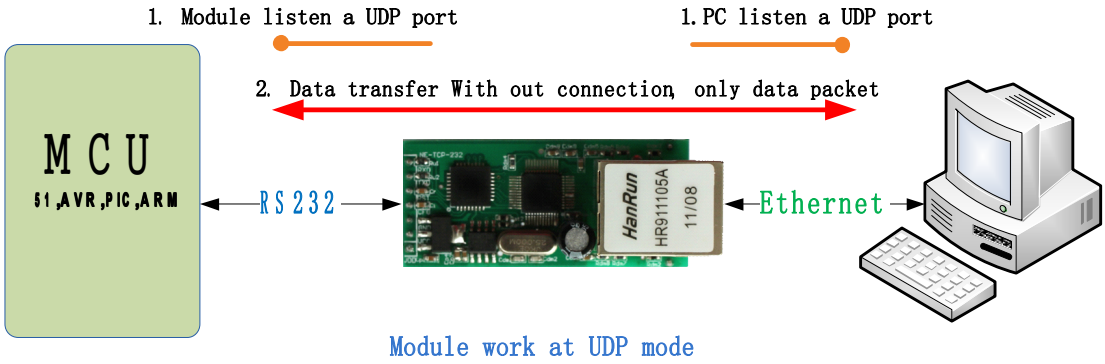


2.2 TCP Client Mode



Module work at TCP Client mode

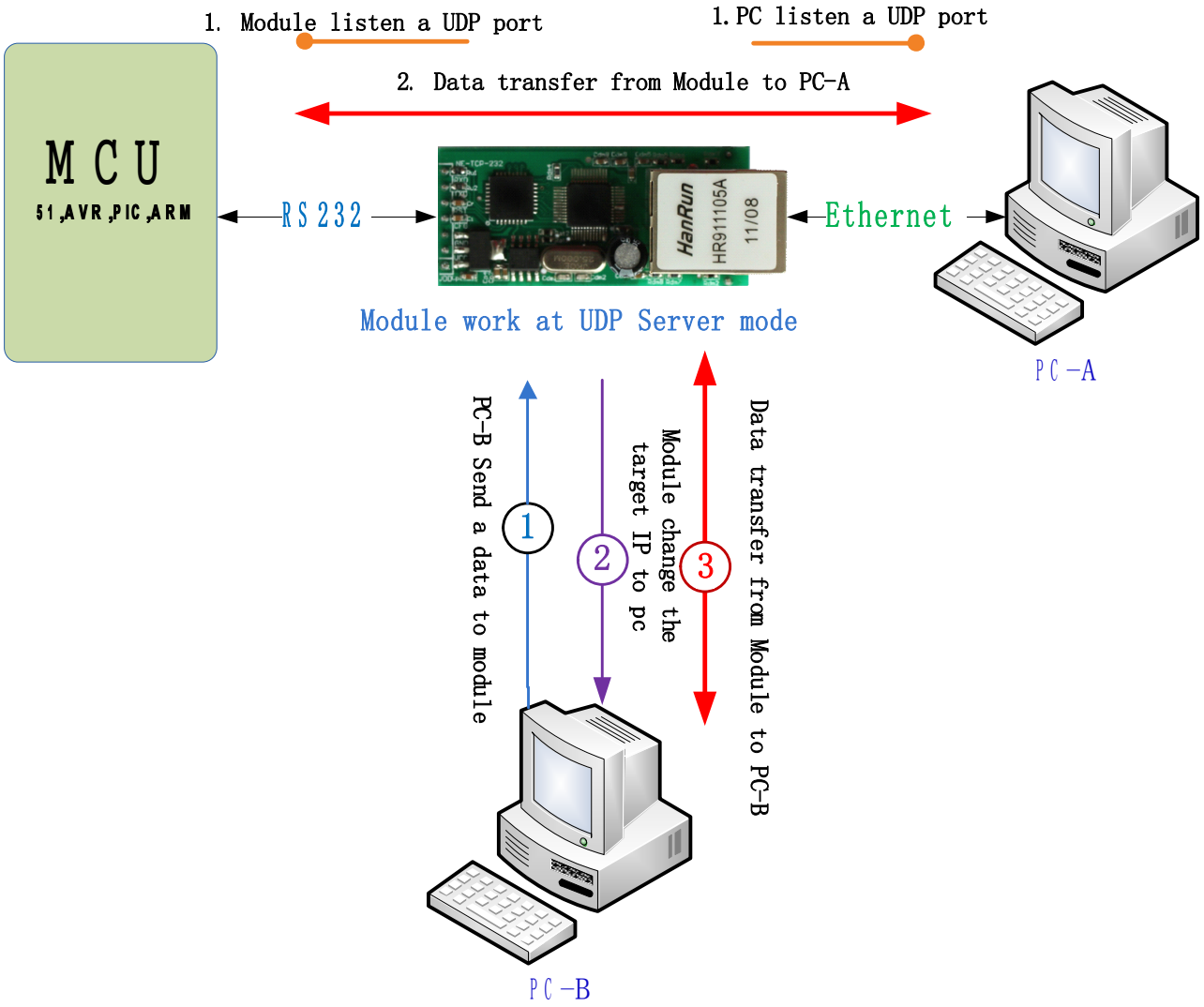
2.3 UDP client mode



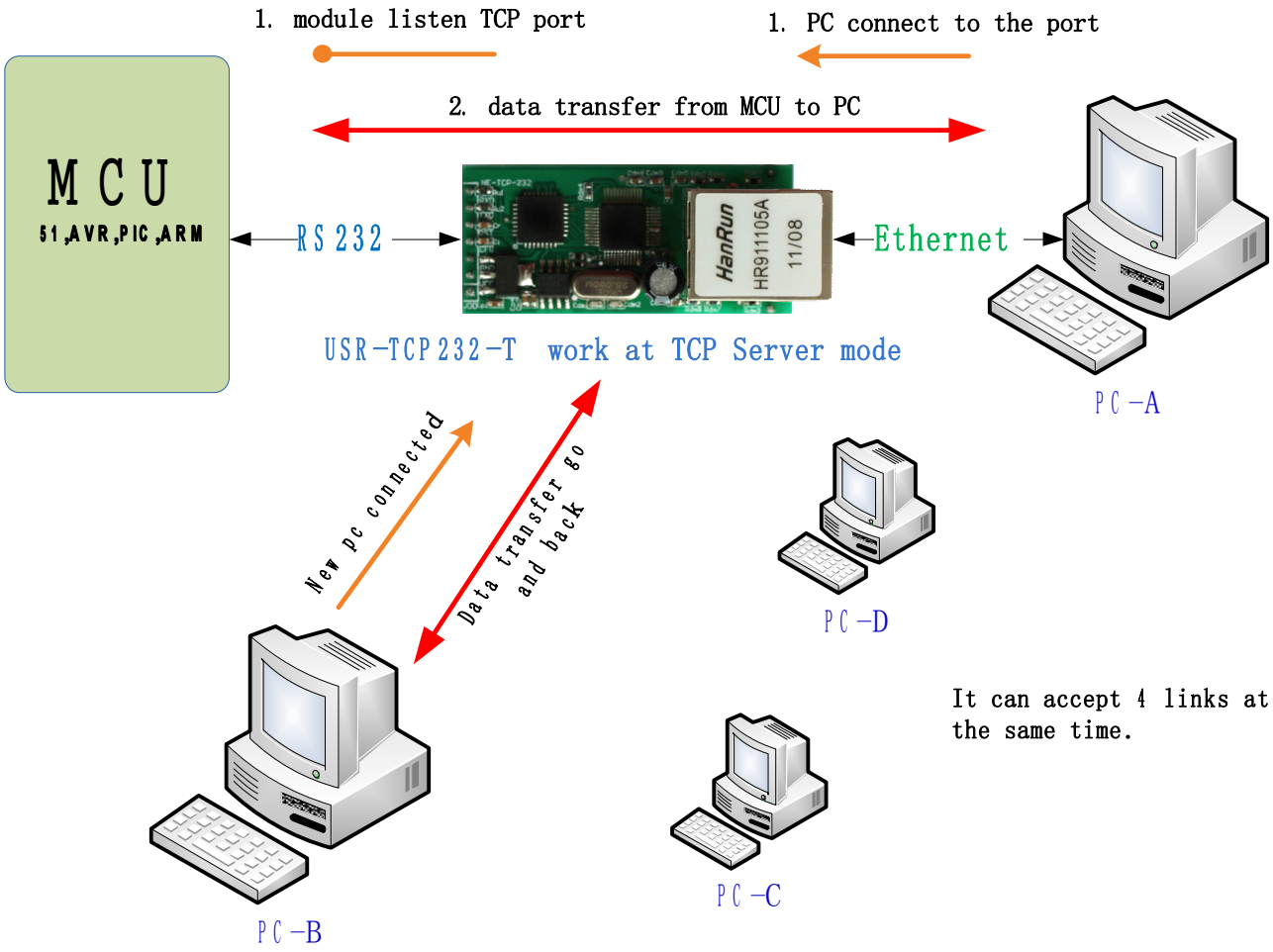
Module work at UDP mode

2.4 UDP server Mode

Like the socket UDP server in pc API. Many to one data transfer supported, the data from uart/232/485 part will be transformed to the last UDP packet's address.


1. Module listen a UDP port
1. PC listen a UDP port
2. Data transfer from Module to PC-A
MCU
51,AVR,PIC,ARM
RS232
Ethernet
HanRun
HR911105A
11/08
Module work at UDP Server mode
PC-A
PC-B Send a data to module
Module change the target IP to pc
Data transfer from Module to PC-B
1
2
3
PC-B

2.5 TCP server Mode



3. Hardware Description

3.1 LED status

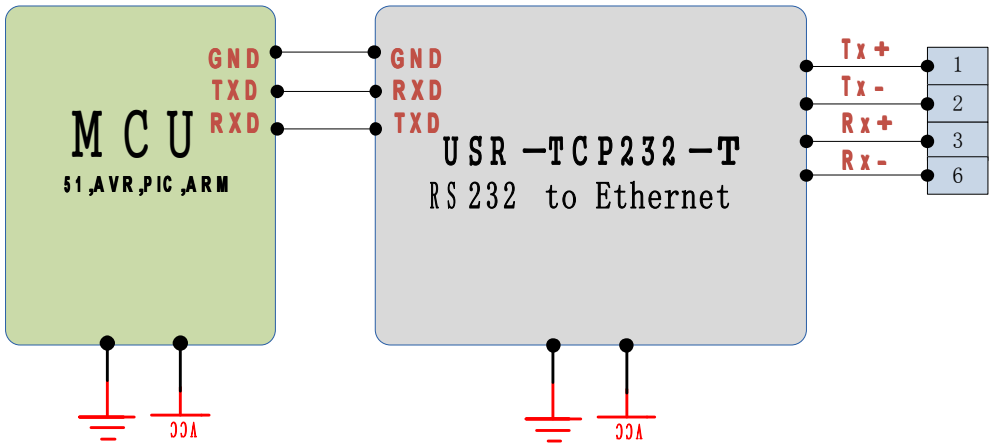
There is two leds in RJ45 connector, one is green, and the other is yellow.

LED	name	description
green	Link state	Light when 100Mbps network linked
yellow	Data transfer	Blink when there is data in or out

3.2 Pin description

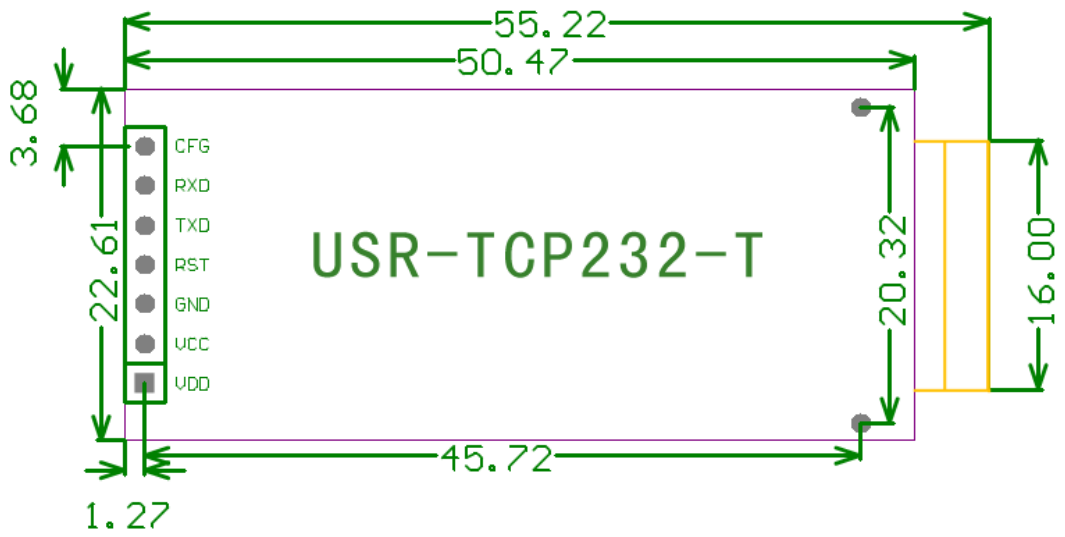
pin	name	description
VDD	Power 1	4.5~5.5V
VCC	Power 2	3.3V
GND	GND	Power and Communications Ground
RST	Reset pin	200ms GND reset the module
TXD	UART transmission pin	5v tolerance
RXD	UART receive pin	5v tolerance
CFG	Configure pin	Configure mode when this pin GND, normal mode when VCC or idle

3.3 Connection Diagram



3.4 Package

Unit: mm,



Allegro / protel / pads / CAM PCF files available for your project design.

4. Configure

parameters: work mode， source IP, source port， net mask，gateway，UART baud rate，destination IP，destination port.

Configure command is 24byte length.

Pull down CFG pin change the module into configuration mode when use UART to config.

4.1 configure command format

Configure mode UART interface: 9600bps,n,8,1

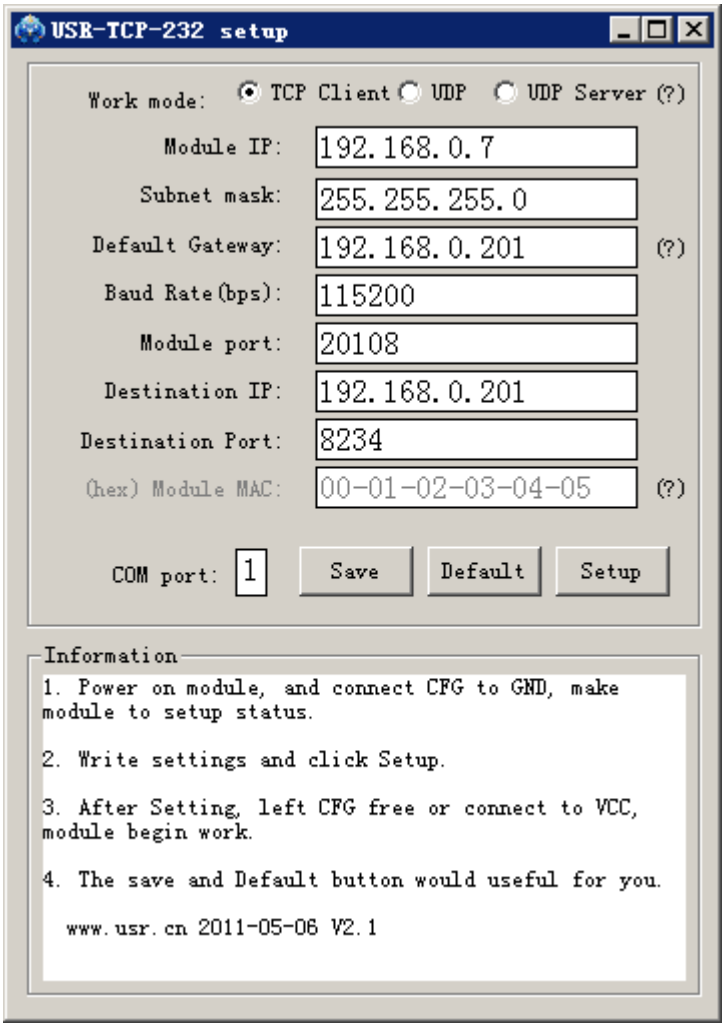
part	bytes	description	example	hex
prefix	2	0x55 0xAA	0x55 0xAA	0x55 0xAA
destination IP	4	destination IP	192.168.0.201	0xC9 0x00 0xA8 0xC0
destination port	2	Destination port	8234	0x2A 0x20
Host IP	4	The IP module hold	192.168.0.7	0x07 0x00 0xA8 0xC0
Host port	2	TCP/UDP source port	20108	0x8C 0x4E
Gateway	4	Gateway IP	192.168.0.201	0xC9 0x00 0xA8 0xC0
Work mode	1	0x01: TCP Client 0x00: UDP 0x02: UDP Server	TCP mode	0x01
baud rate	3	UART baud rate	115200	0x00 0xC2 0x01
Reserved	1	Reserved	00	0x00
checksum	1	Sum(destination IP, destination port, host IP, host port, gateway, work mode, baud rate, reserved)	0xB9	0xB9
Full example：00 A8 C0 2A 20 07 00 A8 C0 8C 4E C9 00 A8 C0 01 00 C2 01 00 B9				

* once in configure mode, the UART parameter change to 9600bps,n,8,1, and a ‘U’ ascii character is send out to ensure the control MCU that in the configure mode. If the 24byte command has effect， a ‘K’ ascii character is send back to control MCU. If configure command format error, an ‘E’ character will be send back to control MCU. If the error is the checksum not match , the 1byte right checksum will be send back to control MCU also.

4.2 configure through rs232

1. Power on module, and connect CFG to GND, make module to setup status.
2. Write settings and click Setup.
3. After Setting, left CFG free or connect to VCC, module begin work.
4. The save and Default button would useful for you.

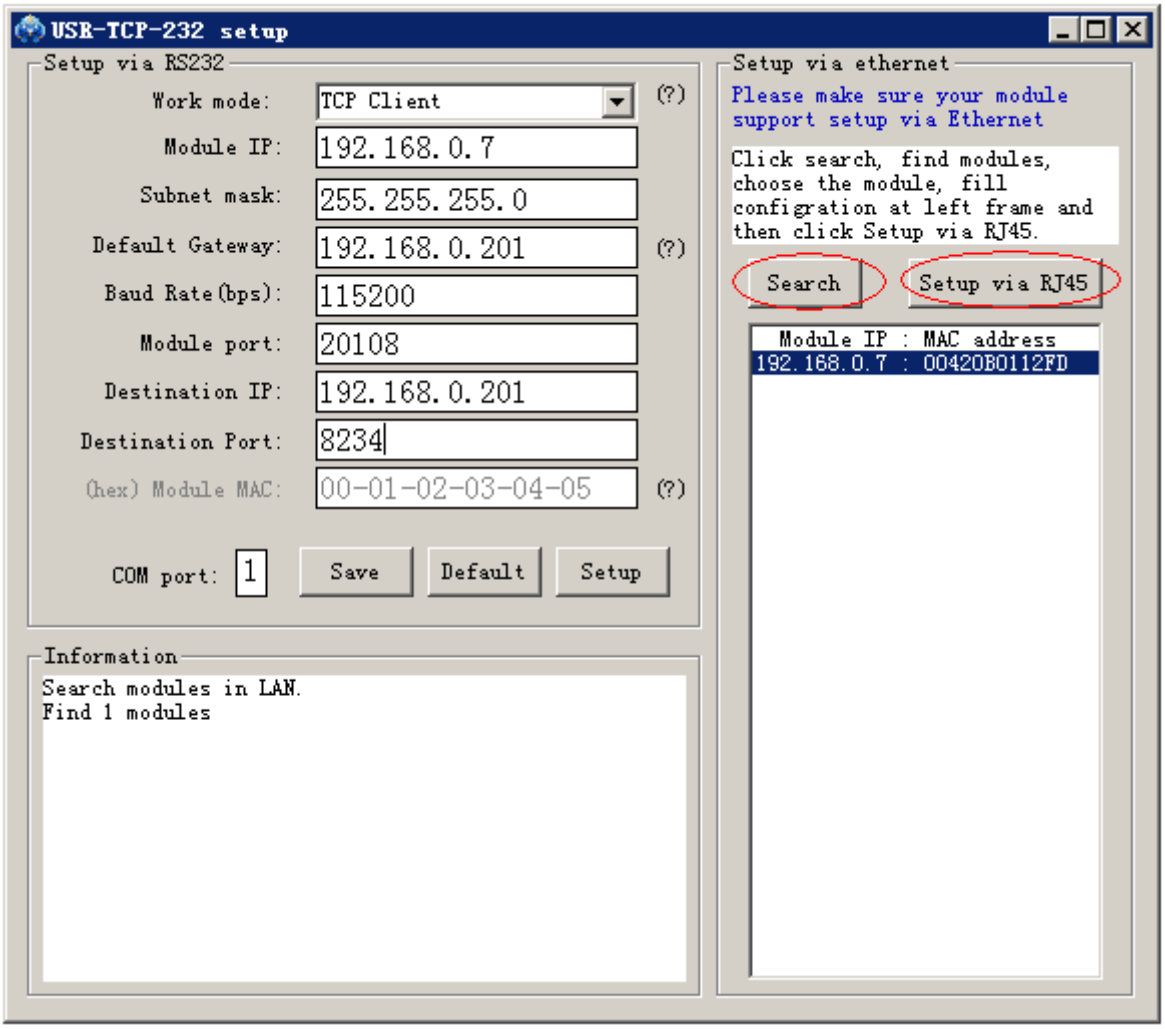
Note: the module RS232 is TTL lever, you need a RS232 to TTL convert to connect it to you PC.



4.3 Configure through RJ45

Since 2011-08-02, the new version modules support Setup via RJ45.

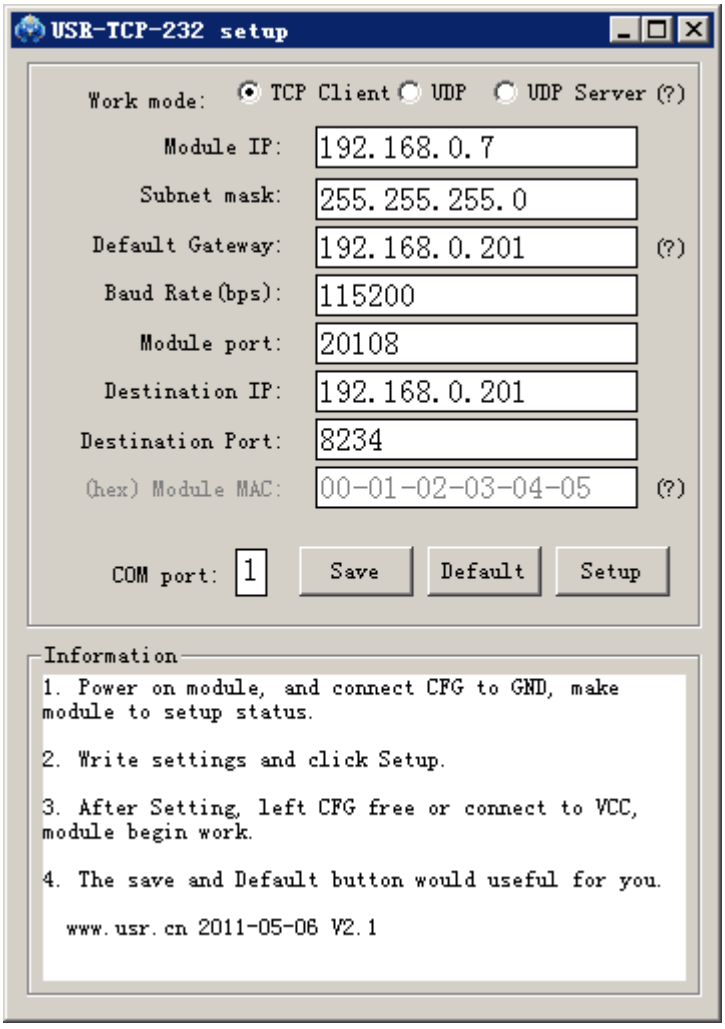
Click search, find modules, choose the module, fill configration at left frame and then click Setup via RJ45.



5. Test Methods

5.1 General Test

Default setup is as below picture.



Test:

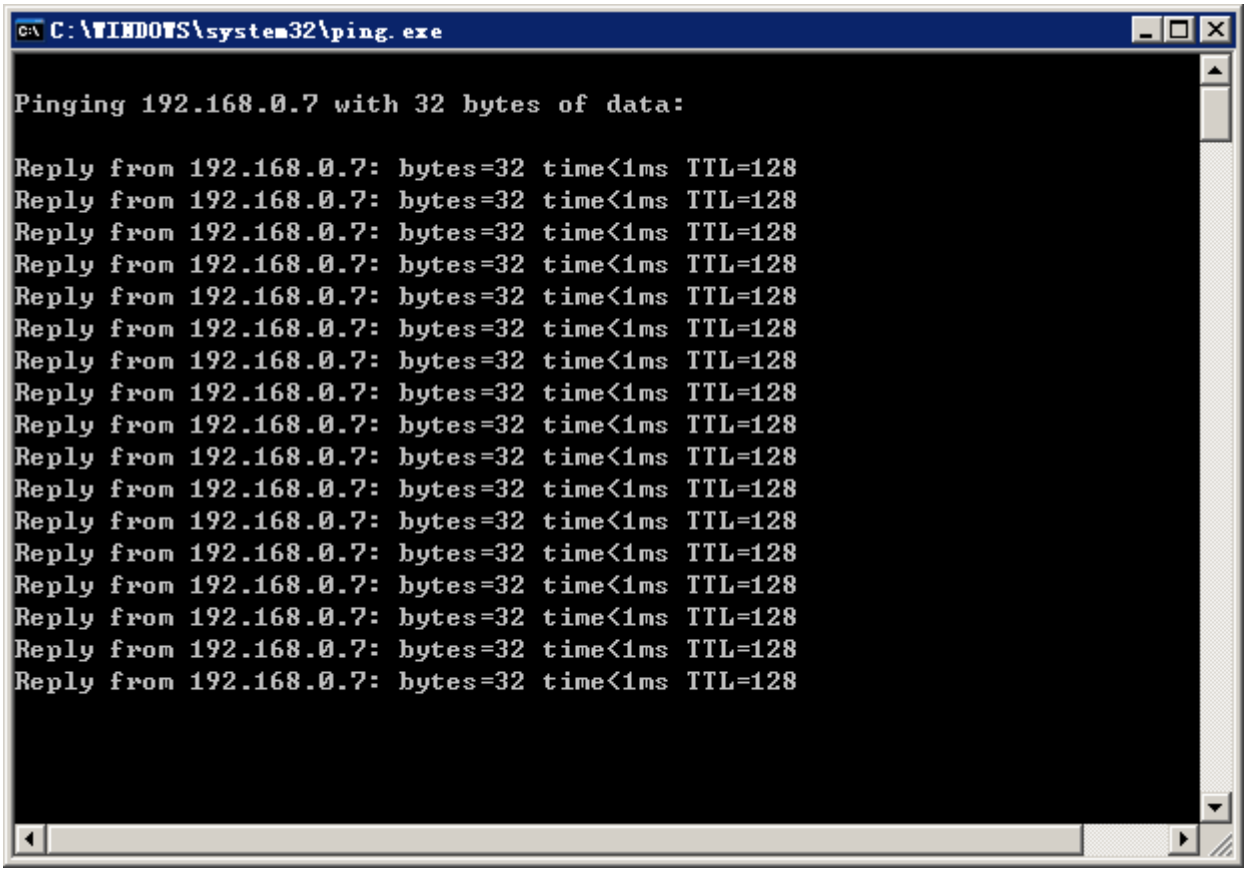
1. material: pc with rs232(or use USB to rs232 cable)，3.3V or 5V power，rs232 cable，Network Cable, COM debug software, TCPIP debug software(in CD, also can be download).

2. Connection: connect module rs232 to pc rs232, RJ45 to pc RJ45 or the same router (same subnet). **Notice : USE TTL to USB convert or TTL to RS232 convert**

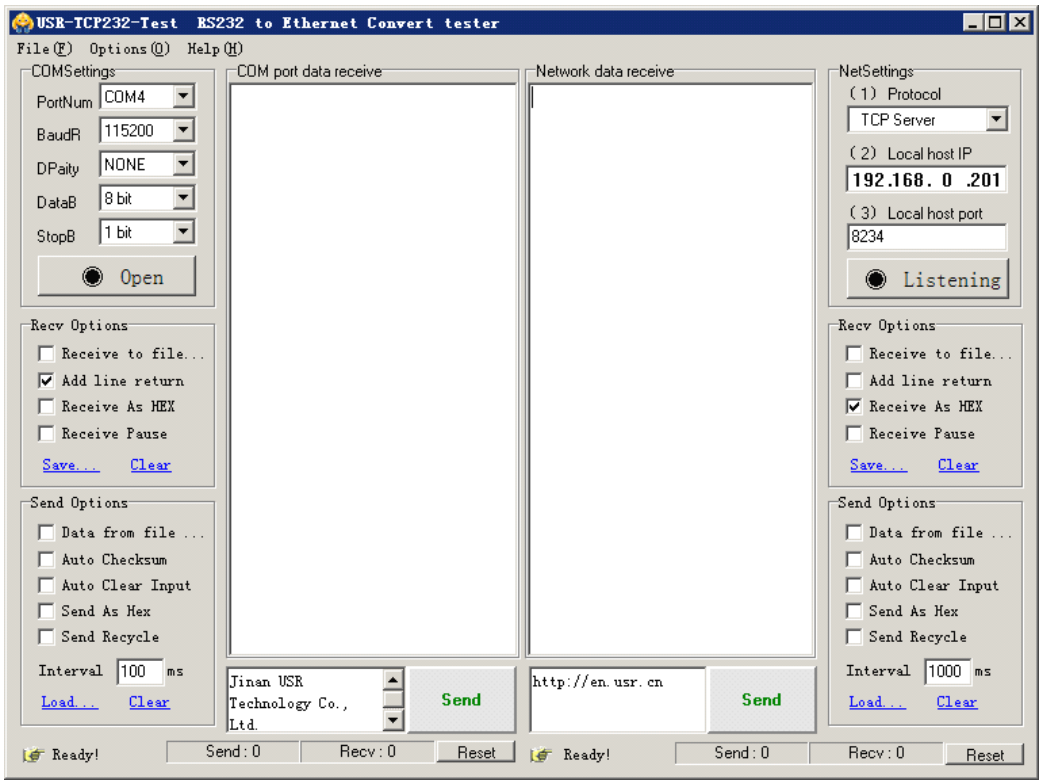
3. Power on the module 3.3V on VCC or 5V on VDD.

3. Setup PC IP to 192.168.0.201.

4. PING 192.168.0.7 (it is optional action)

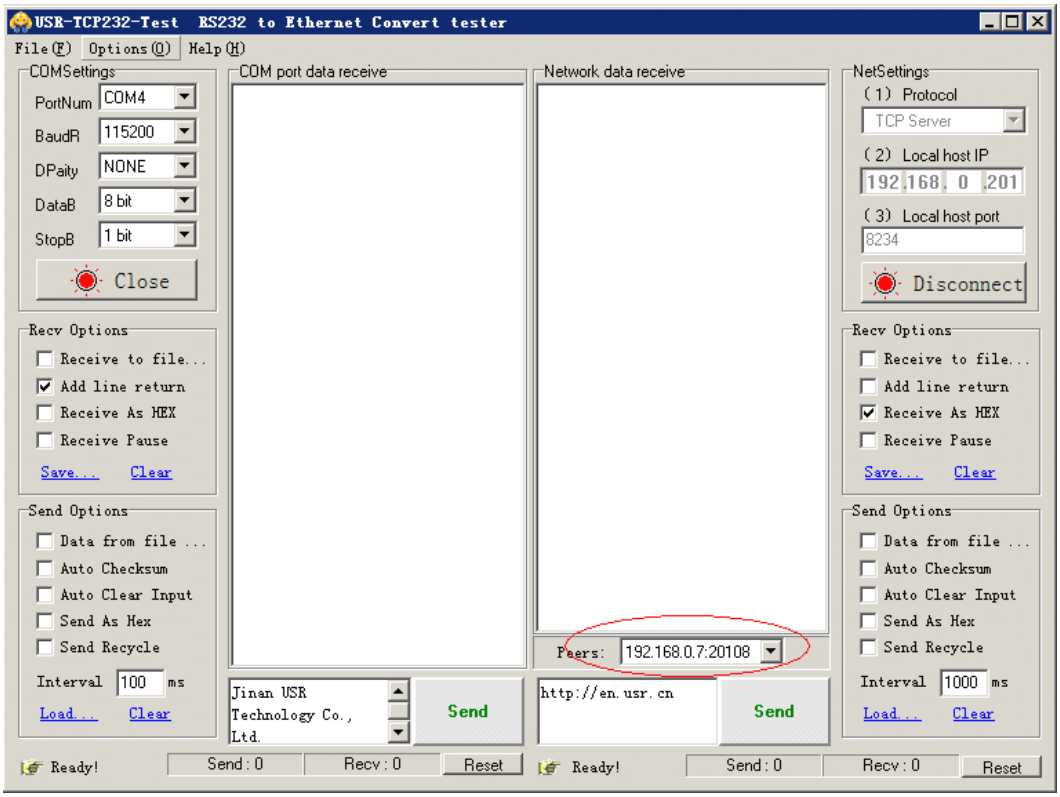


4. open the software in CD, TCP server, listen port 8234, TCP server as follow picture.



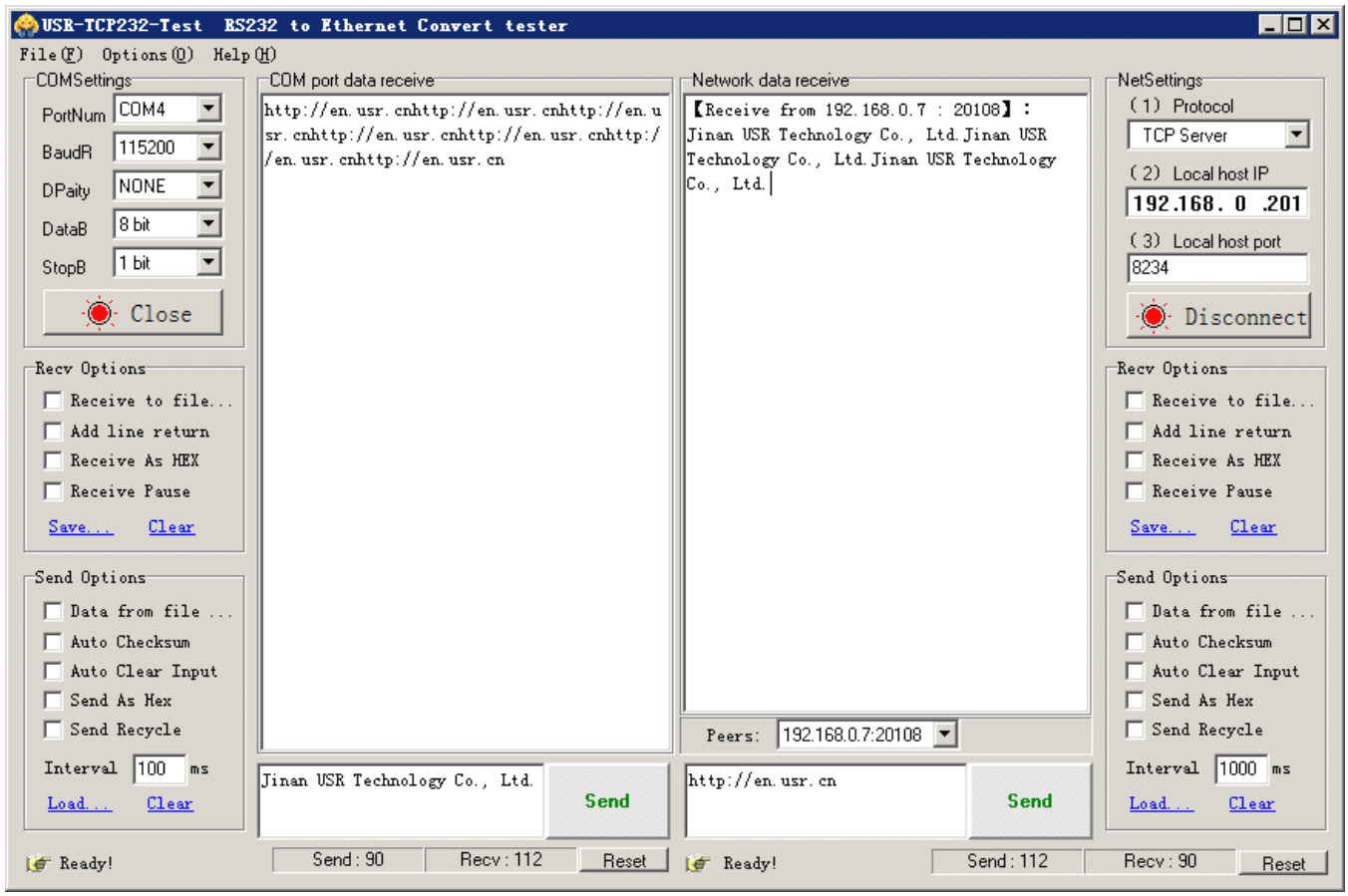
Click Listening, Open COM port.

The module will connect to the server and show the module IP and port.



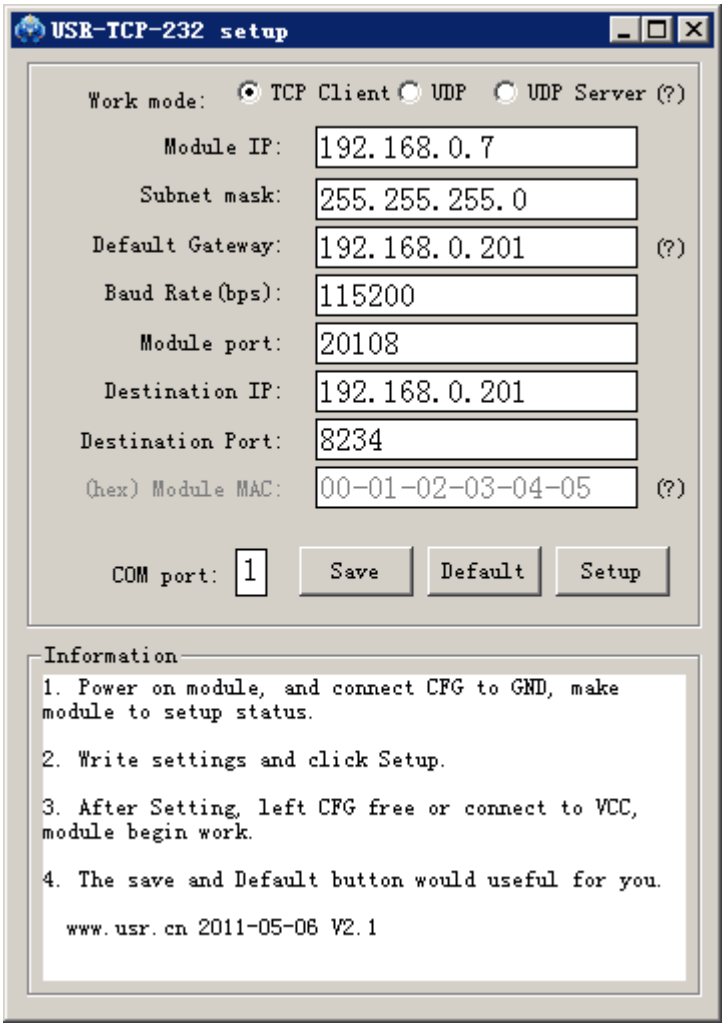
5. Now you can transfer data from PC RS232 to Ethernet.

You can use other TCP UDP test software and COM port test software as you like.

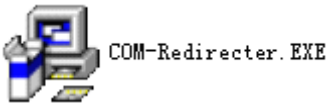

USR-TCP232-Test RS232 to Ethernet Convert tester
File(F) Options(O) Help(H)
COMSettings
PortNum COM4
BaudR 115200
DPaity NONE
DataB 8 bit
StopB 1 bit
Close
Recv Options
Receive to file...
Add line return
Receive As HEX
Receive Pause
Save... Clear
Send Options
Data from file ...
Auto Checksum
Auto Clear Input
Send As Hex
Send Recycle
Interval 100 ms
Load... Clear
COM port data receive
http://en.usr.cnhttp://en.usr.cnhttp://en.usr.cnhttp://en.usr.cnhttp://en.usr.cnhttp://en.usr.cn
Jinan USR Technology Co., Ltd.
Send
Send:90 Recv:112 Reset
Ready!
Network data receive
【Receive from 192.168.0.7 : 20108】:
Jinan USR Technology Co., Ltd.Jinan USR Technology Co., Ltd.Jinan USR Technology Co., Ltd.
Peers: 192.168.0.7:20108
http://en.usr.cn
Send
Ready!
Send:112 Recv:90 Reset
NetSettings
(1) Protocol
TCP Server
(2) Local host IP
192.168. 0 .201
(3) Local host port
8234
Disconnect
Recv Options
Receive to file...
Add line return
Receive As HEX
Receive Pause
Save... Clear
Send Options
Data from file ...
Auto Checksum
Auto Clear Input
Send As Hex
Send Recycle
Interval 1000 ms
Load... Clear

5.2 virtual COM

Single-port TCP/IP - serial bridge (RFC 2217)

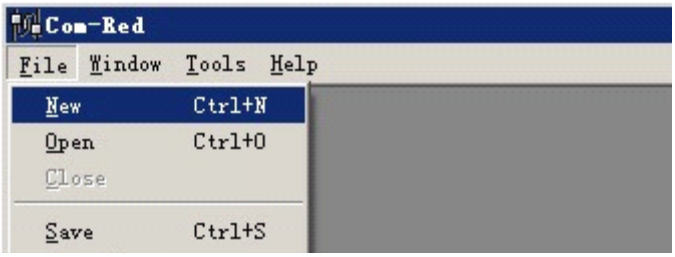


1. setup the module
2. Install VSPM

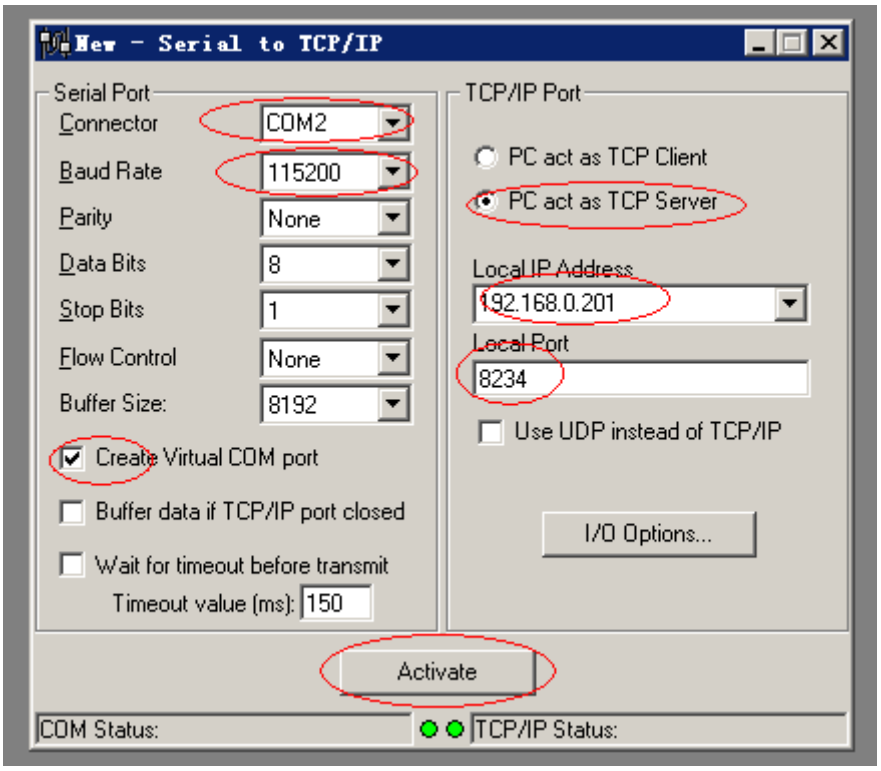


3. Open VSPM,

Add virtual COM.



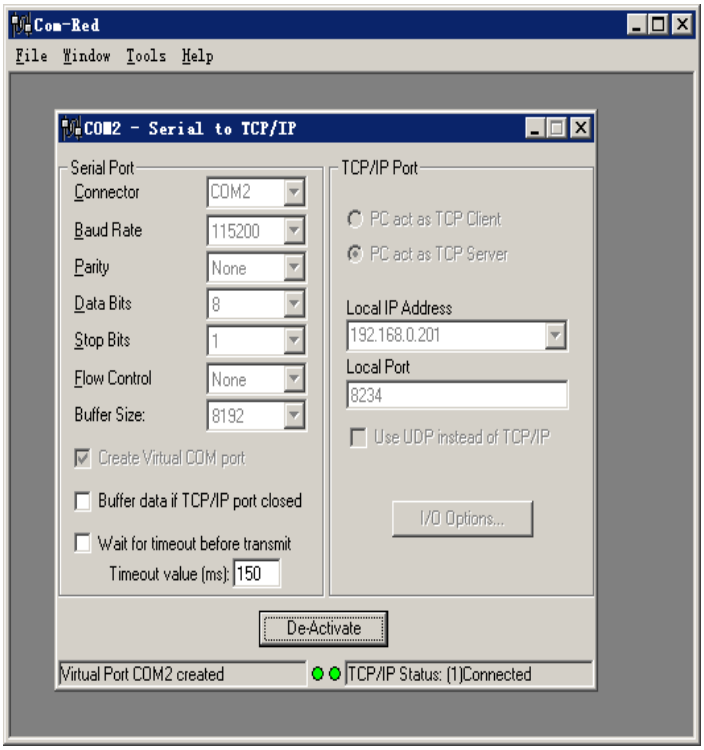
4. Setup as the follow pictures, you need to notice COM port, bond rate and work mode of PC, then click **Activate**.

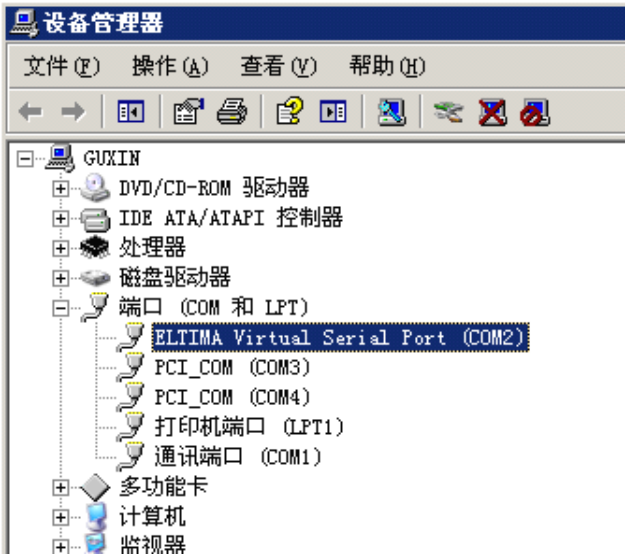


5. After Activate click, a Virtual COM port COM2, will be created, COM2 will receive data from TCPIP socket, and send data to COM2 will convert to TCPIP socket data to remote Equipment.

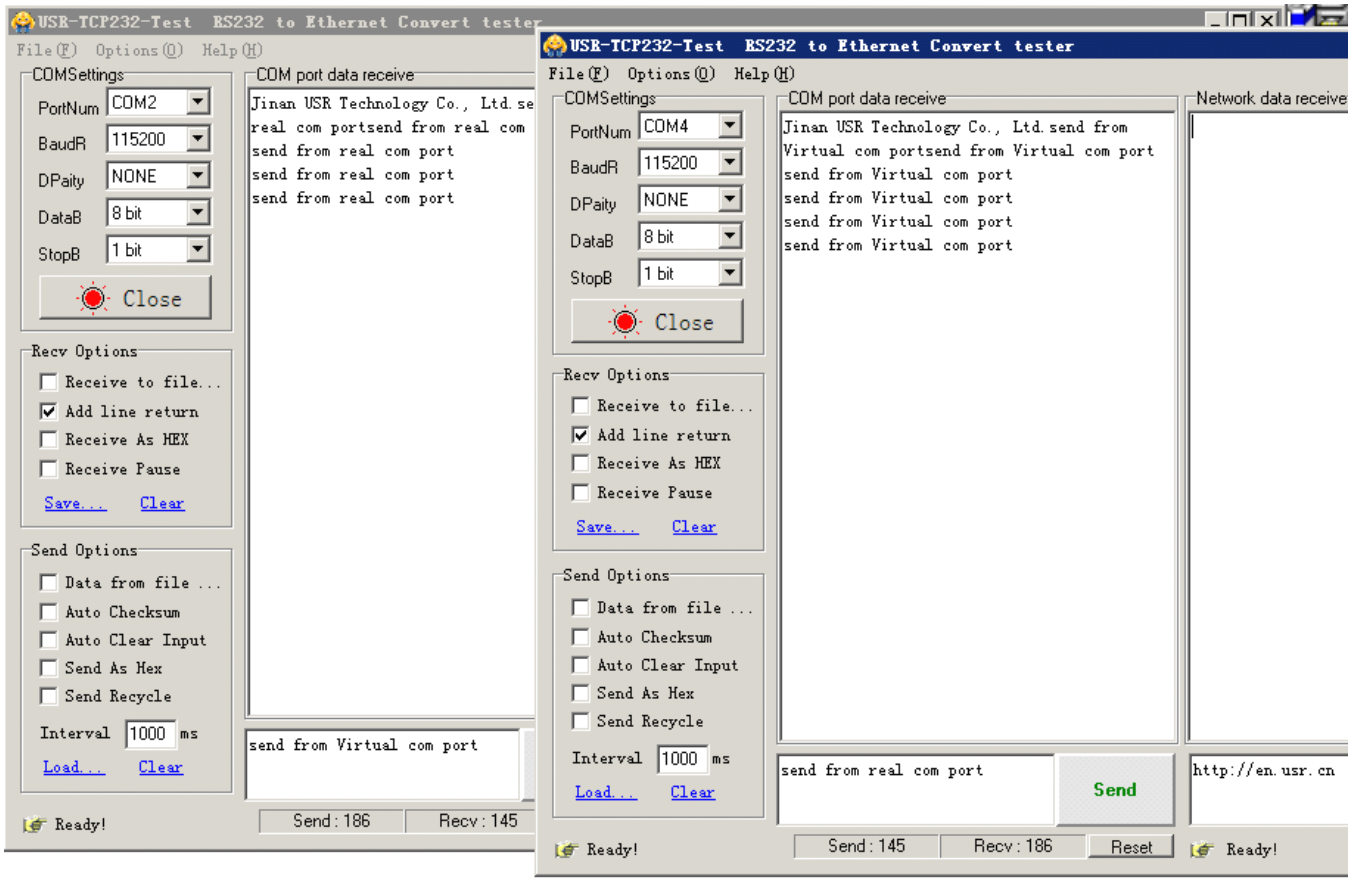
If create failed, please notice to see error notice and log, when use Virtual COM Port, you should close other software who use the same TCPIP port.

The success picture as follow:

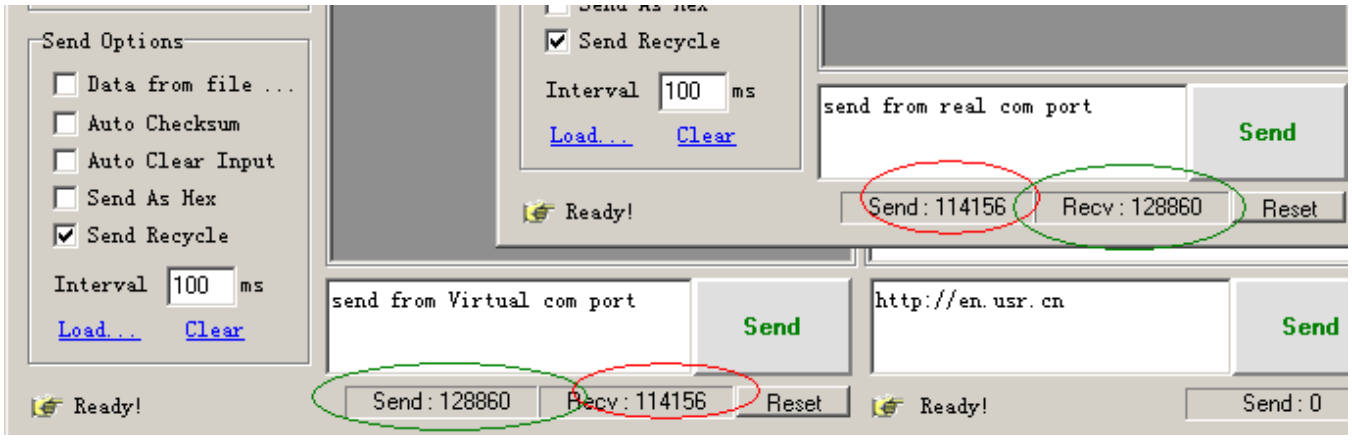




At this point, you can use your equipment as an ordinary serial port, and operate of local virtual serial port will converted to operation of the remote module RS232. The figure is show send data between the two serial port.

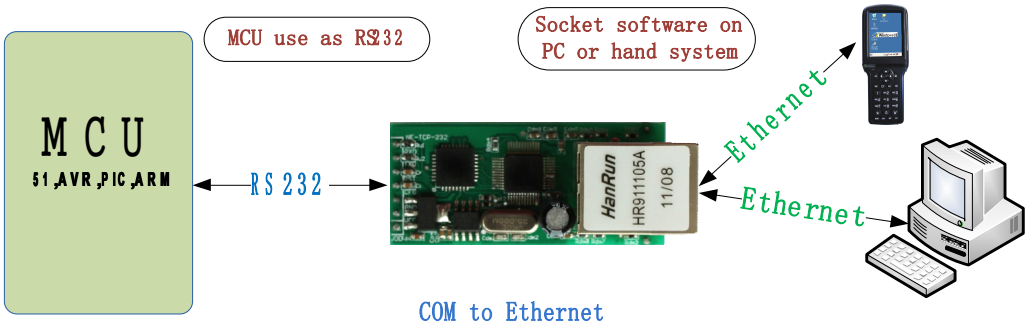


Test 100ms recycle send, send and receive 10,0000 bytes, every thing is ok.



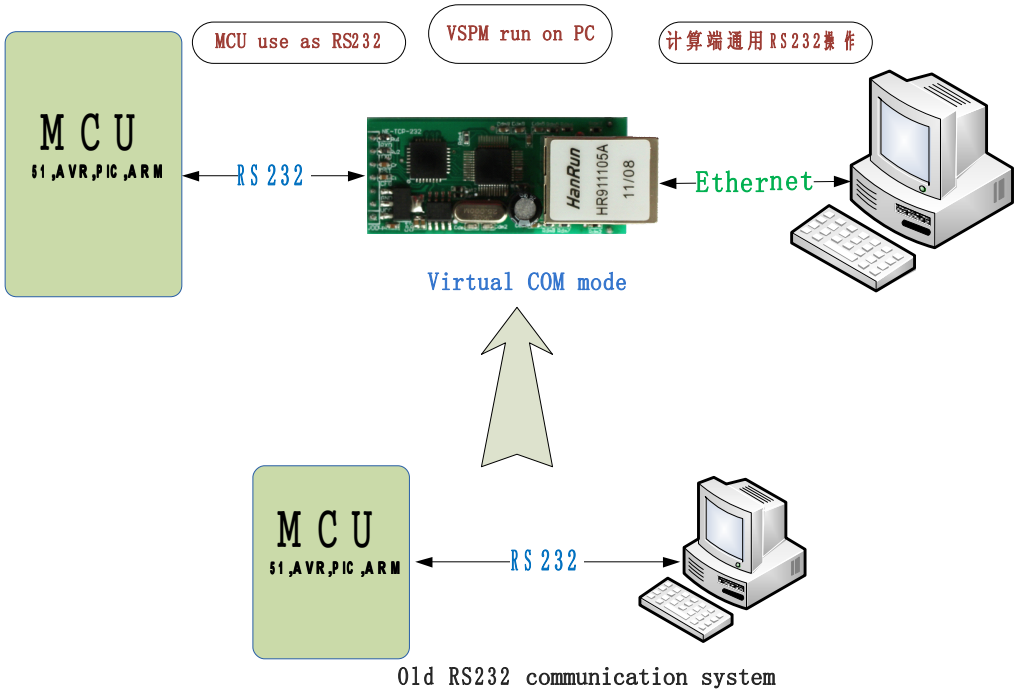
6. Apps

6.1 COM<->TCP/UDP<->server

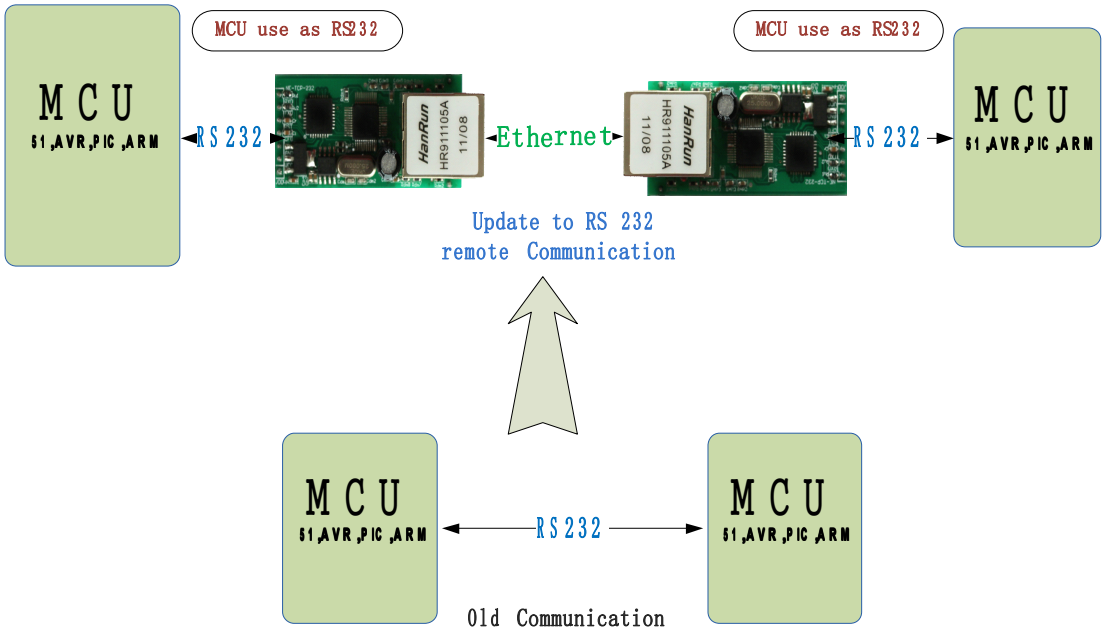


6.2 Virtual COM

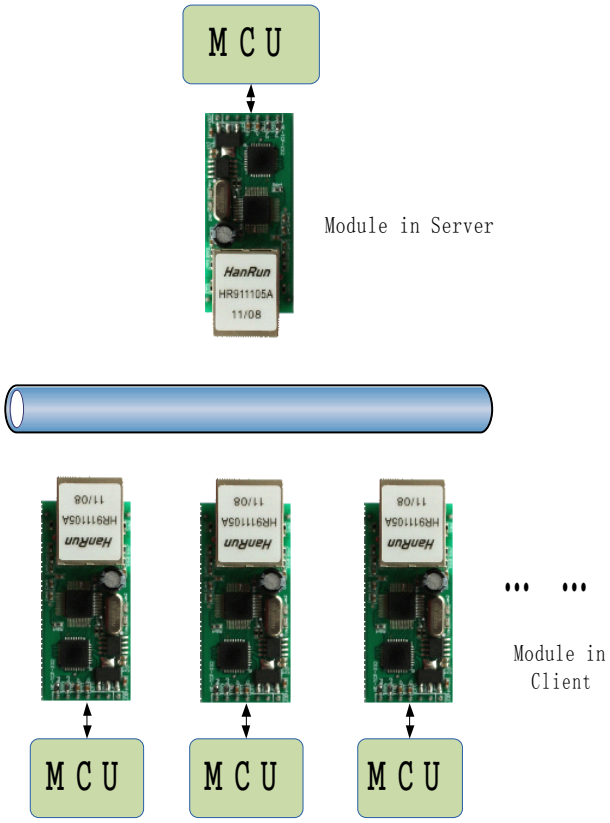
Install VSPM software. The COM like installed in the pc.



6.3 COM <-> TCP/UDP <-> COM



6.4 many COM <-> UDP server <-> COM

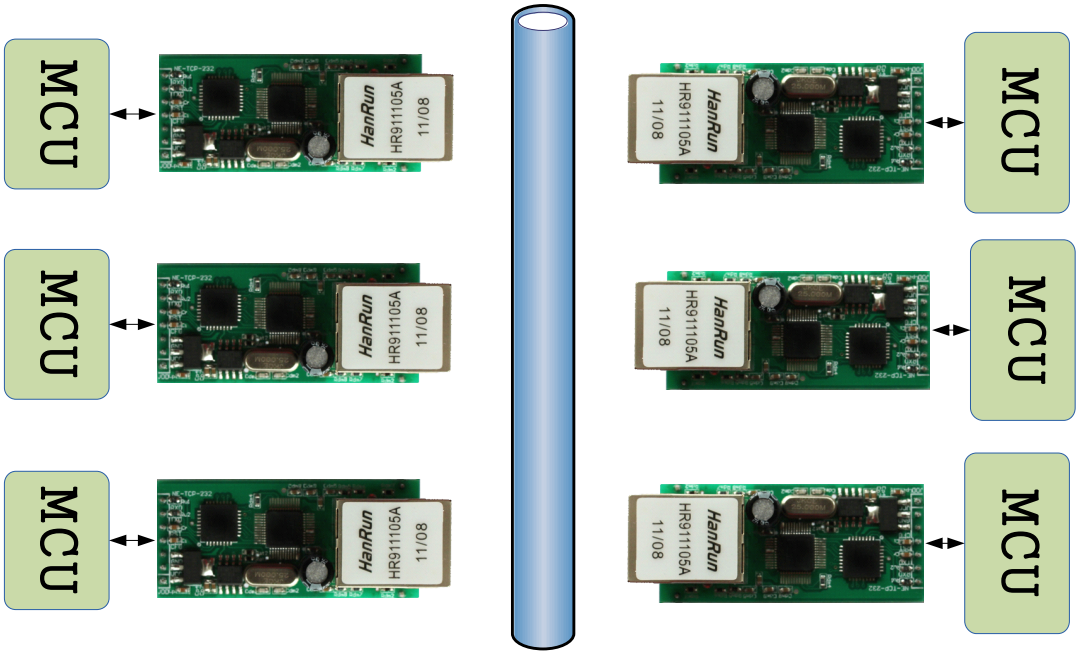


When the UDP server COM transfer data to one of the many COM, the last COM that transferred data will be

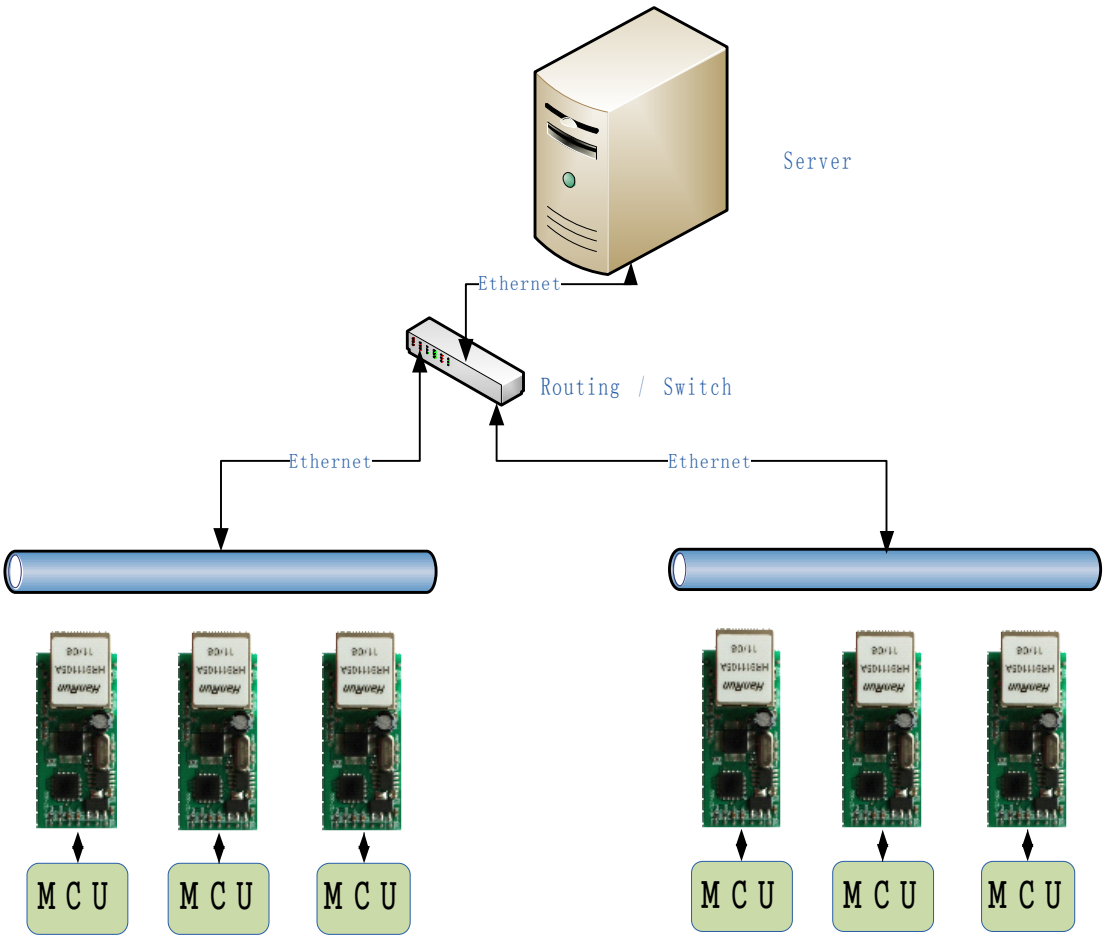
choose.

6.5 COM<-> TCP/UDP<->proxy server <->TCP/UDP<->COM

You can use a proxy server to treat the data form one module to other, or just use you MCU to control the module IP and destination IP Real-time. The method is pull CFG PIN to GND, and send the new configuration data, then pull CFG pin to VCC to use new settings.



6.6 COM <-> TCP/UDP <-> server



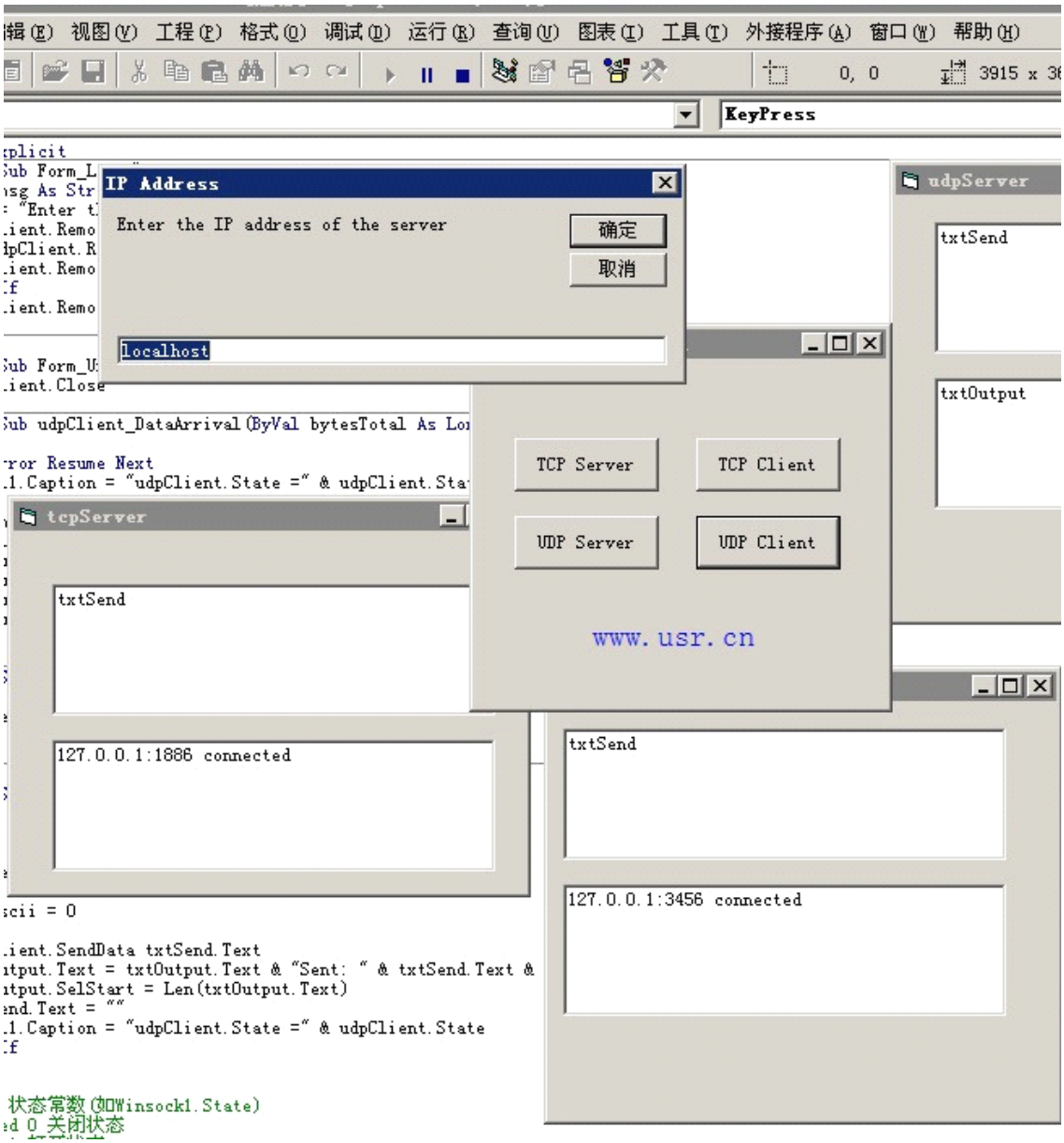
7. Background Knowledge

7.1 socket program example

TCP client

UDP Mode

For VB, VC, OCX, Linux



You can use Winsock.ocx for your project program.

If needed, we can help you on work for this, only a little cost needed.

8. Contact us

Company: Jinan USR IOT Technology Co., Ltd

Address: 1-523, Huizhan Guoji Cheng, Gaoxin Qu, Jinan, Shandong, China

Tel: 86-531-55507297 86-531-88826739-803

Web: www.tcp232.net

9. Doc History

Version 1.0 2011-05-26

Version 1.1 2011-08-16 Add TCP Server mode, Add set via RJ45, modify virtual COM