

Serial to Ethernet module

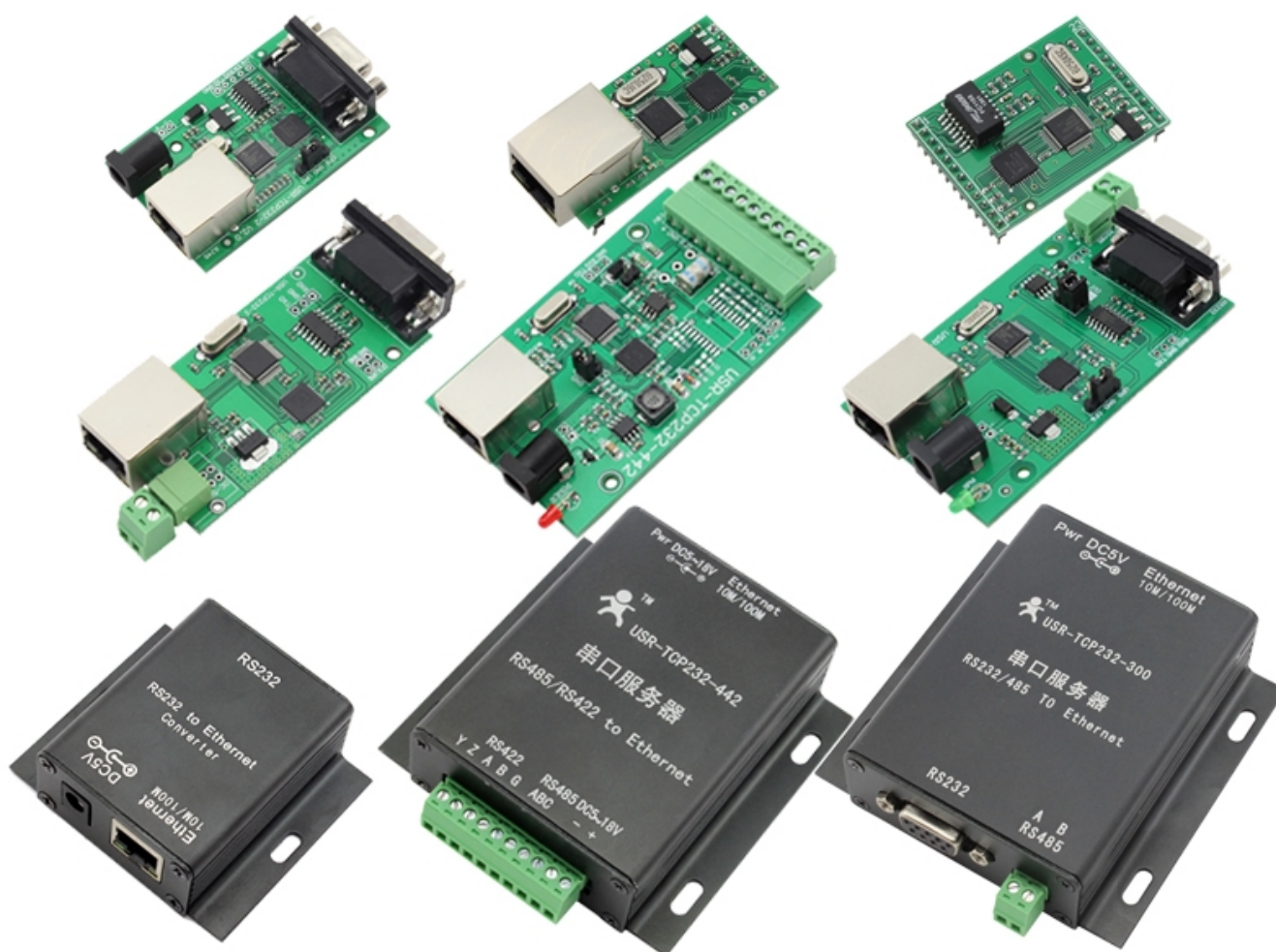
(USR-TCP232-T, USR-TCP232-2)
(USR-TCP232-S, USR-TCP232-D)
(USR-TCP232-24, USR-TCP232-200)
(USR-TCP232-300, USR-TCP232-442)

File version: V3.0

The USR-TCP232-T24 series is data transparent transmission equipment for convert TCP or UDP socket data to RS232 or RS485 or RS422, easy to use, small size, low power, powered by ARM processors, high speed , high Stability.

Our concept: simple functions, stable performance, reasonable price.

Jinan USR IOT Technology Limited 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. Product introduce

1.1 Introduction

USR-TCP232-T24 series is used to TCP network packet or UDP packet with the microcontroller / RS232/RS485/RS422 interface data transparent transmission equipment. The product is equipped with ARM processors, high speed, high stability. Module class of compact size, low power consumption; server refined aluminum metal shell, compression, anti-drop, anti-interference performance.

USR-TCP232-T244 series is more functional embedded Ethernet serial port data conversion products, it has built-in TCP/IP protocol stack, the user can use it easily to complete embedded devices network function, save manpower material resources and development time, make our products faster to market, enhance competitiveness.

There is 10/100M auto detected RJ45 interface, serial communication baud rate up to 230.4Kbps, can work at TCP Server, TCP Client, UDP and UDP server mode, setup easily via series or RJ45.

1.2 Function Features

- 100M high speed Ethernet card, 10/100M auto detect interface;
- support AUTO MDI/MDIX, Can use a crossover cable or parallel cable connection;
- RS232 bound rate can set up from 300 to 256000;
- RS485 bound rate can set up from 300 to 115200;
- Work mode TCP Server, TCP Client, UDP, UDP Server;
- Working model related parameters can be set via a serial port or network;
- 3.3 V and 5 V TTL level compatible (module products);
- Virtual serial port supported;
- Unique heartbeat package mechanism to ensure that the connection is reliable, put an end to connect feign death;
- across the gateway, across switches, routers;
- Can work in LAN, also can work on the Internet (external network);
- Transmission distance: RS232 - 15 meters, RS485 - 1000 meters, cable 200 meters (after the switches together through the Internet, no distance limit).

1.3 Product Features

- 32 bits ARM CPU inside;
- LAN : 10/100Mbps; protect: Built-2KV isolated electromagnetic;
- serial port baud rate: from 2400 to 256 KBPS can be set up, and up to 3 MBPS;
- network protocol: ETHERNET ARP IP UDP TCP ICMP;
- Software tool: configuration software, TCP/UDP test soft, RS232 debug soft;
- Configuration method: RS232 or via Ethernet, free software available;
- Operating temperature: -25~75°C;
- Save the environment: -40~85°C, 5~95%RH.

1.4 Applications Area

Serial device server module for connecting serial industrial automation equipment such as PLC, sensors, meters, motors, drives, bar code readers and displays and design.

Serial server module is widely used in attendance, access control systems, Canteen machines, POS systems, building control, fire control, the banking system, engine room monitoring, UPS monitoring, power, oil, environmental monitoring, industrial applications and other areas.

T24 Series products are suitable for internal LAN users in a simple to use, for complex network environments such as the Internet, a camera, a large group networks, fiber to Ethernet, etc., it is recommended to use E45 series.

1.5 Order information

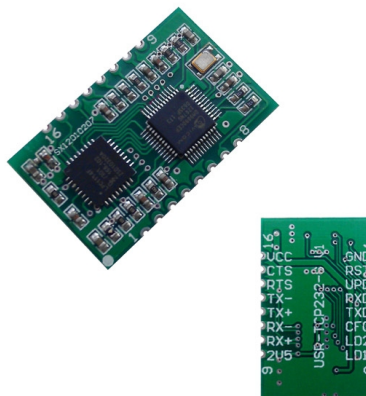
Model number	Power supply DC	Interface	Network port 10/100Mbps	Package Type (Module products)
USR-TCP232-S	3.3V	TTL	PHY chip network interface	Stamp Hole Package
USR-TCP232-T	5V/3.3V	TTL	Take 2kv magnetic isolation RJ45	Pin package (DIP package)
USR-TCP232-D	5V/3.3V	TTL	With 1.5KV PHY signal of electromagnetic separation	Pin package (DIP package)
USR-TCP232-2	B USB/5V terminal	RS232	Take 2 kv magnetic isolation RJ45	
USR-TCP232-200	5V power adapter/terminal	RS232	Take 2 kv magnetic isolation RJ45	
USR-TCP232-24	5V power adapter/terminal	RS232/R S485	Take 2 kv magnetic isolation RJ45	
USR-TCP232-300	5V power adapter/terminal	RS232/R S485	Take 2 kv magnetic isolation RJ45	
USR-TCP232-442	5V power adapter/terminal	RS485/R S422	Take 2 kv magnetic isolation RJ45	

Model Description: USR is our brand, TCP232 that TCPIP to serial module product, 2/4/T that serial-side level in the form.

2. Hardware Description

2.1 USR-TCP232-S

USR-TCP232-S Model Stamp Hole Package TTL serial port level, the PHY signal, the small size of the TCP/IP serial protocol module.



2.1.1 Technical Specifications

Major characteristic	Parameter
Package Type	Stamp hole encapsulation (SMD encapsulation)
Schematic diagram and PCB library	See the CD library file
Power Supply	VCC: 3.3 V DC typical values, minimum 3.15, the biggest 3.45 V, suitable for 3.3 V microcontroller system
Serial port level	TTL level
Network interface	PHY signal
Physical Size:	PCB size: 33*20mm (L*W)
Temperature and humidity range	Operating temperature: -25 to 75 ° C Storage temperature: -40 to 80 ° C Storage humidity: 5% to 95% RH
Warranty period	2 years

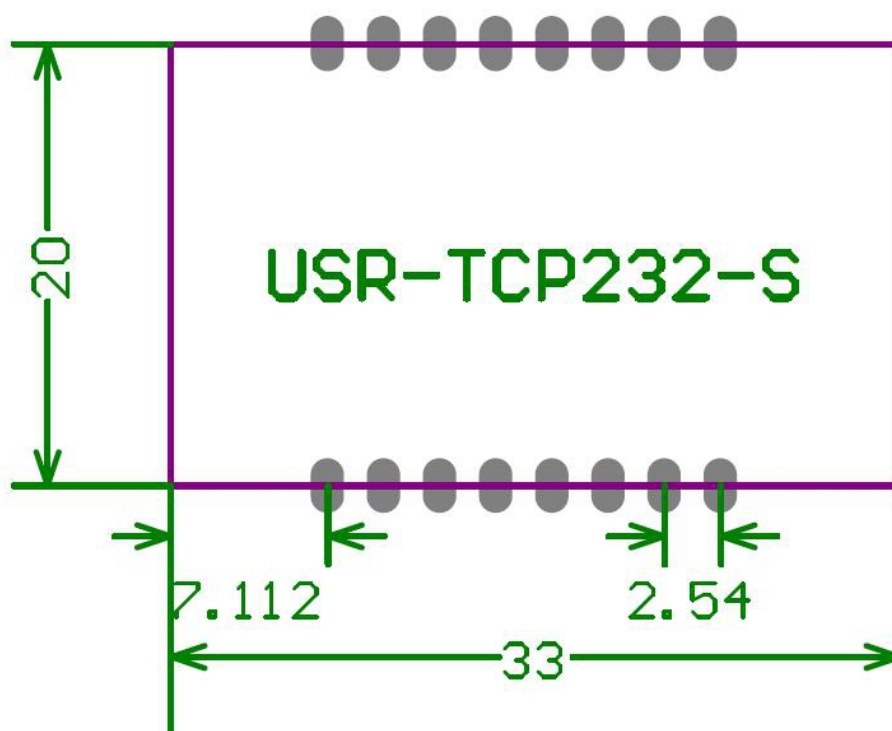
2.1.2 Hardware Description

2.1.21 Pin Description

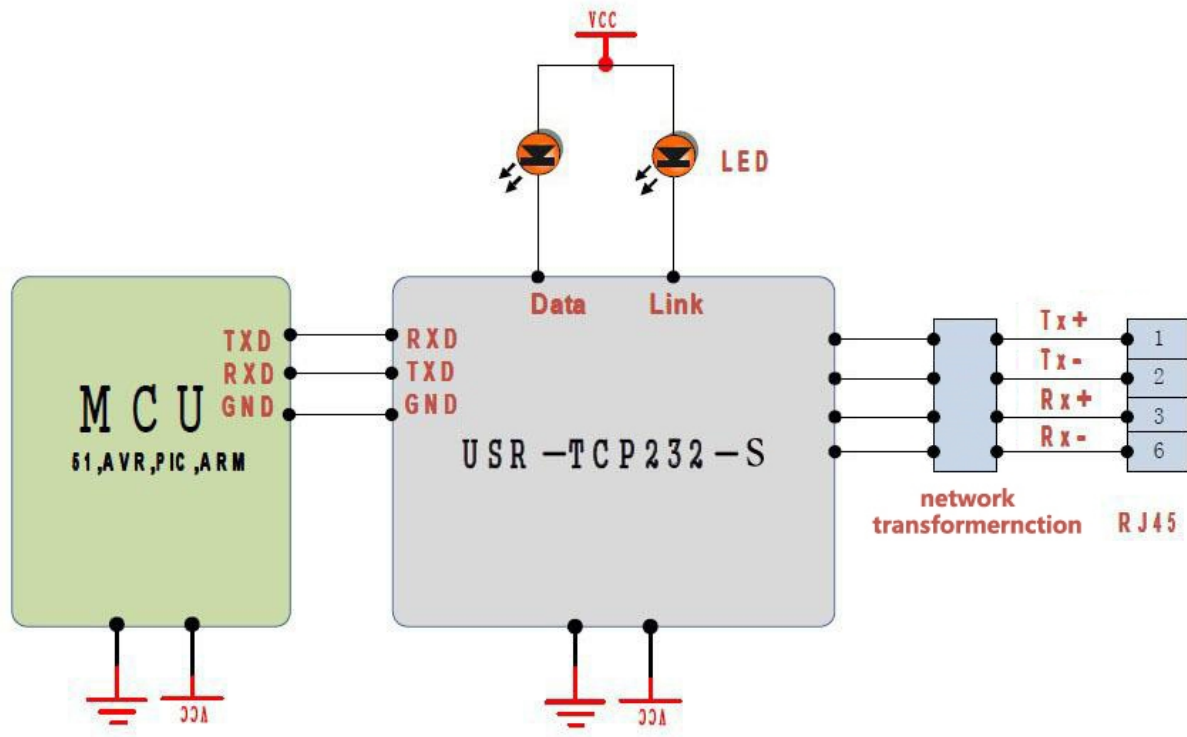
No.	Pin	Function	Descriptions
1	GND	Signal ground	GND
2	RST	RESET	Pin received 200ms low to reset the whole module. If you do not use, can be suspended. Note: The module is powered automatic reset, it is recommended that connect the MCU IO port, reset the MCU control module in a particular case.
3	ISP	Update pin	This pin to ground to the module power module can be upgraded. If you do not use, can be suspended.
4	RXD	Module data is received	Data receiving end of the module, TTL level 5V or 3.3V microcontroller
5	TXD	Module data transmission	Data transmission end of the module, TTL level can be connected to 5V or 3.3V microcontroller
6	CFG	Serial ports Configuration pins	Low, you can use the serial port module configuration. Normal working hours left floating or tied HIGH. Note: give the power module, and then pulled down the CFG pin to enter the serial configuration state.
7	LD2	Network data instructions	Network data indicator LED connected to VCC, without the current limiting resistance (module existing)
8	LD1	Network connection status indicator	Network connection status indicator LED connected to VCC, without the current limiting resistor (module already)
9	2V5	PHY chip Output voltage	PHY chip to control the voltage output, access networks transformer center tap
10	RX+	Received signal +	Receive Data+
11	RX-	Received signal -	Receive Data-
12	TX+	Transceiver Data+	Transceiver Data+
13	TX-	Transceiver Data-	Transceiver Data-
14	RTS	the alternate pin	Can be used as RS485 enable pin
15	CTS	the alternate pin	Can be used as a network connection status indicator pin
16	VCC	Power supply	Power supply: 3.3V @ 200mA

2.1.22 Mechanical Dimensions

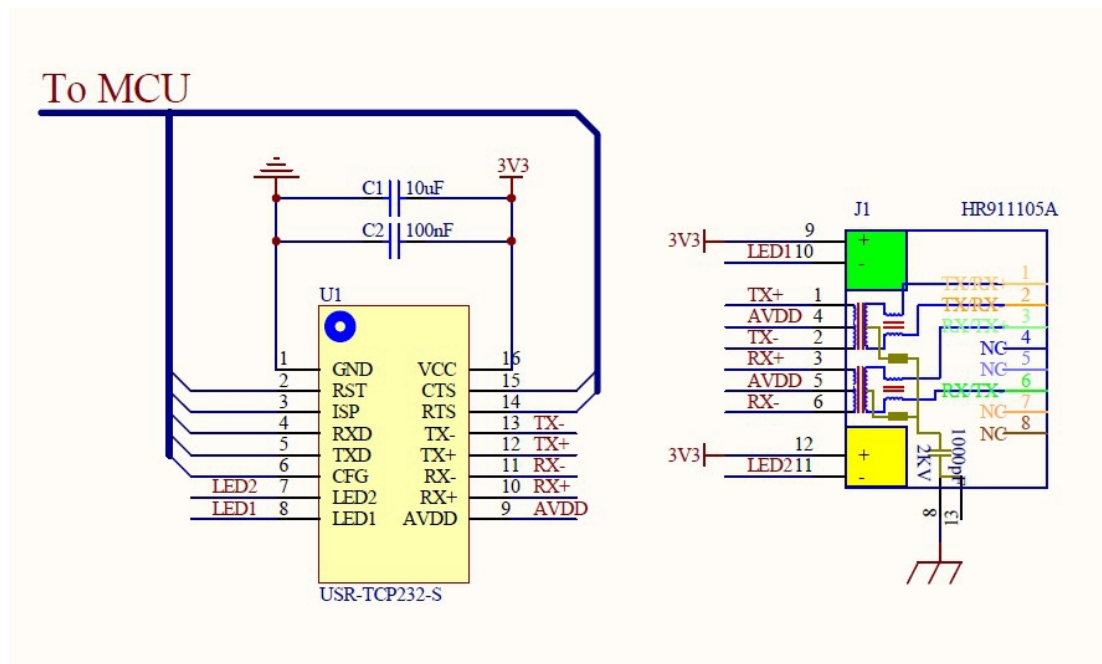
Unit: mm



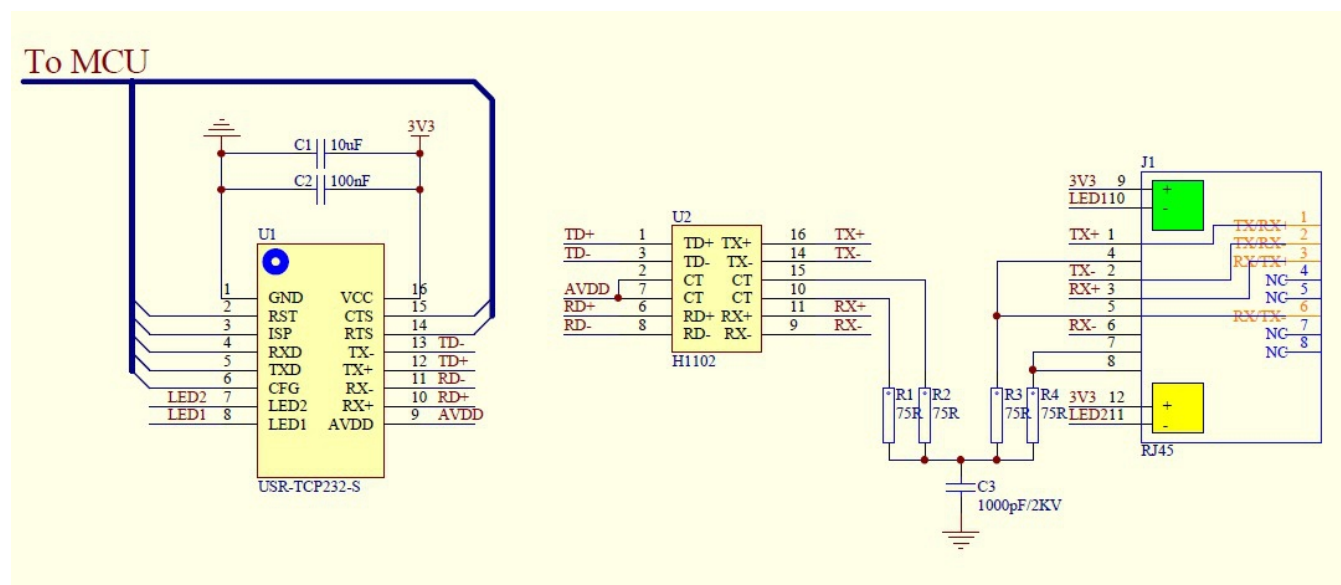
2.1.23 Connection Diagram



USR-TCP232-S+RJ45 of built-in network transformer:

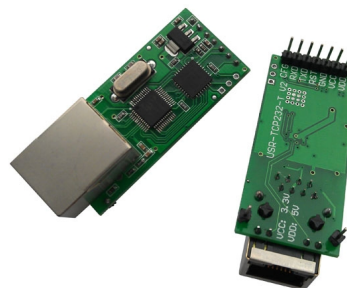


USR-TCP232-S+RJ45 of built-in network transformer:



2.2 USR-TCP232-T

USR-TCP232-T Model pin package, TTL serial port level, of 2KV electromagnetic isolation RJ45 interface, small size TCPIP serial protocol module.



2.2.1 Technical Specifications

Major characteristic	Parameter
Package Type	Pin type package (DIP package)
Schematic diagram and PCB library	See the CD library file
Power Supply	The module adopts double power supply interfaces, either is ok. VCC: 3.3 V DC typical values, minimum 3.15, the biggest 3.45 V, suitable for 3.3 V microcontroller system VDD: 5 V DC typical values, minimum 4.5, the biggest 5.5 V, suitable for 5 V microcontroller system
Working current	150 mA, the maximum 200 mA
Serial port level	TTL level
Network interface	PHY signal
Physical Size:	PCB size: 50.5*22.6mm (L*W) Module size: 55*23*23mm (L*W*H)
Temperature and humidity range	Operating temperature: -25 to 75 ° C Storage temperature: -40 to 80 ° C Storage humidity: 5% to 95% RH
Warranty period	2 years

2.2.2 Hardware Description

2.2.21 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

Module in the upper left four spare pins from right to left:



Pin	Name	Description
1:EN	EN alternate pin	RS485 enable pin
2: LINK	LINK alternate pin	Network connectivity status indicator pin
3: ISP	Update pin	This pin to ground to the module power module can be upgraded.

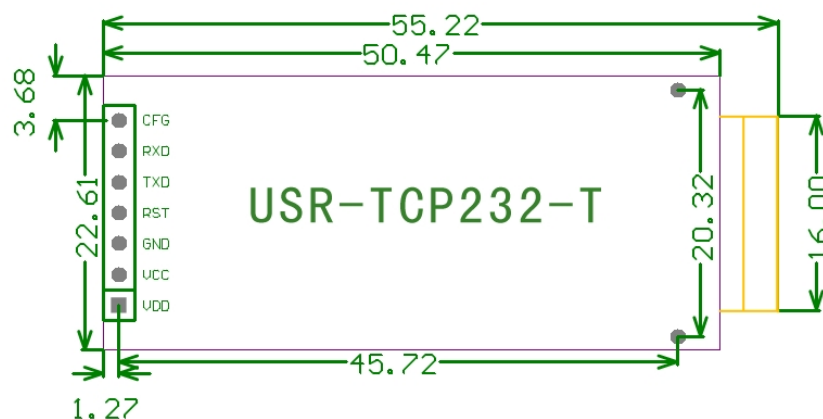
2.2.22 LED status

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

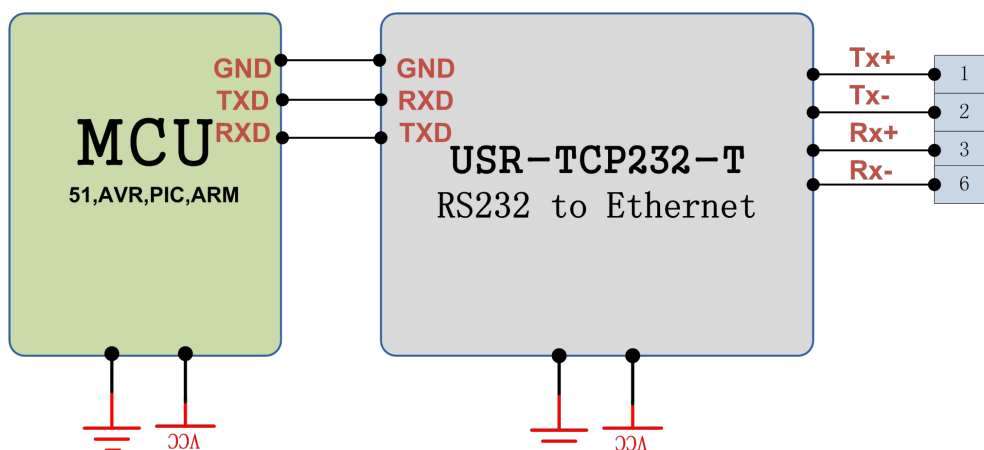
LED	Name	Description
green	Link state	Light when 100Mbps network linked
yellow	Data transfer	Blink when there is data in or out

2.2.23 Mechanical Dimensions

Unit: mm

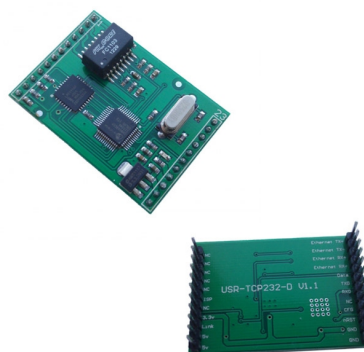


2.2.24 Connection Diagram



2.3 USR-TCP232-D

USR-TCP232-D models to pin package, TTL serial port level, 1.5KV electromagnetic isolation PHY signal, small size, TCP/IP compatible weeks meritorious product serial protocol module.



2.3.1 Technical Specifications

Major characteristic	Parameter
Package Type	Pin type package (DIP package)
Schematic diagram and PCB library	See the CD library file
Power Supply	The module adopts double power supply interfaces, either is ok. VCC : 3.3 V DC typical values, minimum 3.15, the biggest 3.45 V, suitable for 3.3 V microcontroller system VDD : 5 V DC typical values, minimum 4.5, the biggest 5.5 V, suitable for 5 V microcontroller system
Serial port level	TTL level
Network interface	PHY signal with 1.5KV Ethernet signal
Characteristic	Pin compatible ZLG products
Physical Size:	PCB size: 44*32mm (L*W) Module size: 44*32*15.4mm (L*W*H)
Temperature and humidity range	Operating temperature: -25 to 75 ° C Storage temperature: -40 to 80 ° C Storage humidity: 5% to 95% RH
Warranty period	2 years

2.3.2 Hardware Description

2.3.21 Pin Description

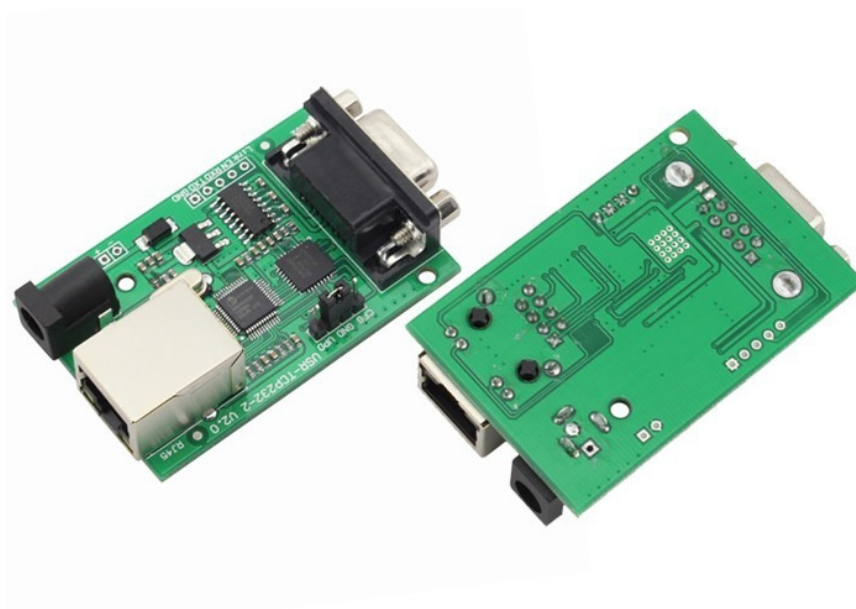
Pin	Name	Description	Pin	Name	Description
1	TX+	Transceiver Data+	A breach here		
2	TX-	Transceiver Data-	23	NC	
3	RX+	To RJ45 Pin3	22	NC	
4	RX-	To RJ45 Pin6	21	NC	
5	Data_LED	Link to yellow Led and through a resistance to VCC	20	NC	
6	TXD	Transmit data	19	NC	
7	RXD	Receive data	18	ISP	For Update
8	RTS	RS485 enable pin	17	NC	
9	CFG	Config enable port for RS232 Config	16	3.3V	DC3.3V input and 5V use 1 is ok.
10	RST	Reset pin, 200ms low for reset	15	LINK	Link to green Led and Through a resistance to VCC
11	GND	To GND	14	5V	DC5V input@200mA
12	GND	To GND	13	5V	DC5V input@200mA

2.3.22 LED status

USR-TCP232-D Red LED, If the indicator is energized, the module power input is correct.

2.4 USR-TCP232-2

USR-TCP232-2 Model is RS232 level, 2KV electromagnetic isolation RJ45 connector, 5.5 * 2.1 standard power supply or terminal power supply serial server.



2.4.1 Technical Specifications

Major characteristic	Parameter
Power Supply	DC5V@1A power adapter
Serial port level	RS232
Network interface	RJ45 ports with 2KV electromagnetic isolation
Physical Size:	PCB size: 67.3*34mm(L*W) Product size: 86.6×34×25mm (L*W*H)
Temperature and humidity range	Operating temperature: -25 to 75 ° C Storage temperature: -40 to 80 ° C Storage humidity: 5% to 95% RH
Warranty period	2 years

2.4.2 Hardware Description

2.4.21 Pin Description

There are two leds in RJ45 connector, one is green, and the other is yellow. And 1 power led.

LED	Name	Description
red	Power	Light When Power on
green	Link state	Light when 100Mbps network linked
yellow	Data transfer	Blink when there is data in or out

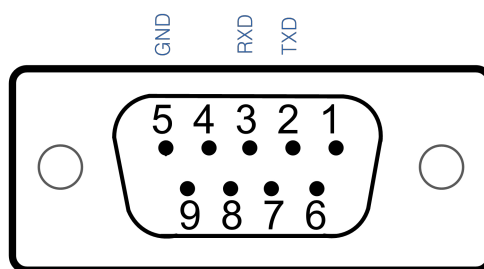
2.4.22 Interface Description

Power interface

DC5V power supply, you can make 5.5 * 2.1 standard power supply or 3.81mm pitch terminal blocks, the default state is 5.5 * 2.1 standard power supply, power input with TVS protection products.

RS232 interface

RS232 use 9 pin female (hole), only 3 pins in use, others are NC, the detail is below.



ID	Mark	Description
2	TXD	RS232 Send of module
3	RXD	RS232 Receive of module
5	GND	Ground

We can offer two kinds of serial cables, if needed, please choose to buy:

Male to Female direct serial cable: connect serial server and the computer directly to debugging and Testing.

Male to Male and Cross Pin2 and Pin3 serial cable: used to connect RS232 serial port server and general user equipment.

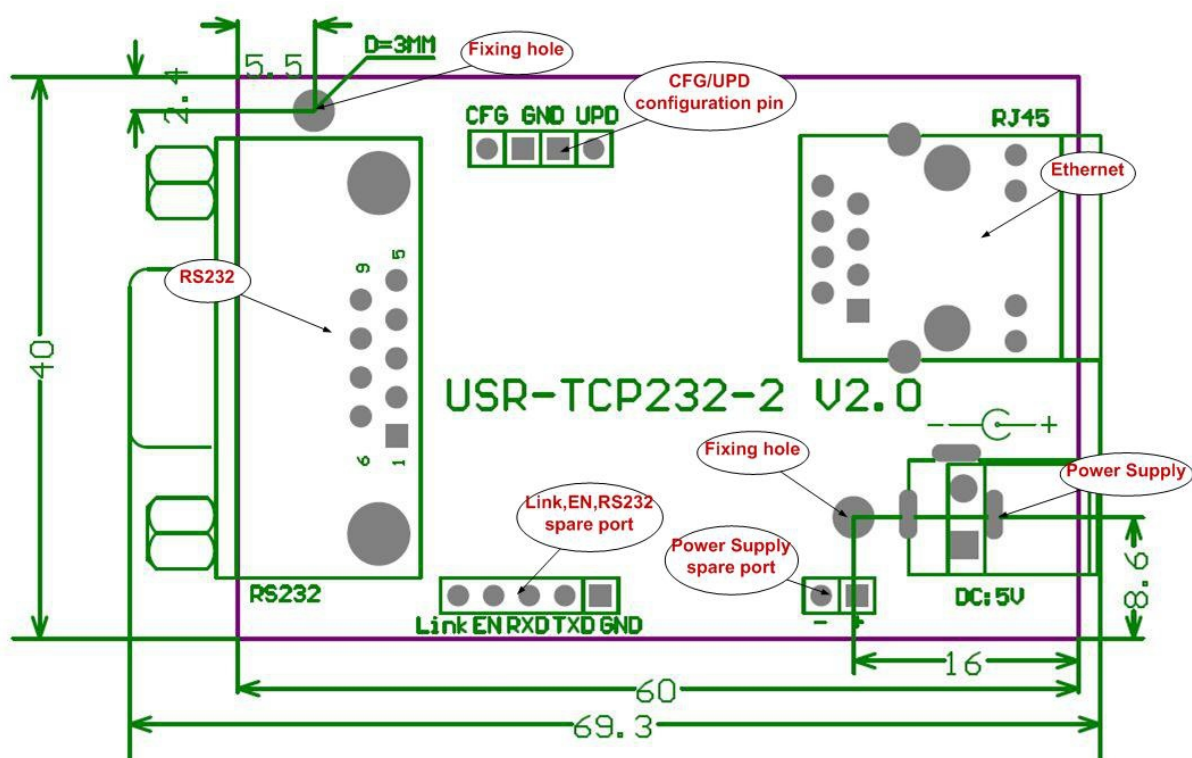
Note: You can DB9-9 feet supply. The PCB pads jumper need it with the power input a positive connection for the serial sensor supply via the serial line or external power to the device is not turned on by default.

RJ45 internet interface

Auto detected 10M/100M RJ45 interface, support AUTO MDI/MDIX, that is to say you can use crossover cable or a straight cable to connect it to PC for test.

Pin	Name	Description
1	TX+	Transceiver Data+
2	TX-	Transceiver Data-
3	RX+	Receive Data+
4	n/c	Not connected
5	n/c	Not connected
6	RX-	Receive Data-
7	n/c	Not connected
8	n/c	Not connected

2.4.23 Jumper usage Mechanical Dimensions



There are three jumpers and one Welding hole:

UPD: Update jumper, connect it and then power on the module to make module into update mode.

CFG: configuration jumper, when use RS232 for configuration, connect it to configuration mode ,and leave it free to go work mode.

Notice: CFG is needed only When config via RS232, when config via RJ45, it is no use.

2.5 USR-TCP232-200

USR-TCP232-200 Model RS232 level, the 2KV electromagnetic isolation RJ45 interface, 5.5 * 2.1 standard power supply or terminal power supply serial server.



2.5.1 Technical Specifications

Major characteristic	Parameter
Power Supply	DC5V@1A power adapter
Serial port level	RS232
Network interface	RJ45 ports with 2KV electromagnetic isolation
Physical Size:	PCB size: 60*40mm(L*W) Product size: 70×40×25mm (L*W*H)
Temperature and humidity range	Operating temperature: -25 to 75 ° C Storage temperature: -40 to 80 ° C Storage humidity: 5% to 95% RH
Warranty period	2 years

2.5.2 Hardware Description

2.5.21 Pin Description

There are two leds in RJ45 connector, one is green, and the other is yellow. And 1 power led.

LED	Name	Description
red	Power	Light When Power on
green	Link state	Light when 100Mbps network linked
yellow	Data transfer	Blink when there is data in or out

2.5.22 Interface Description

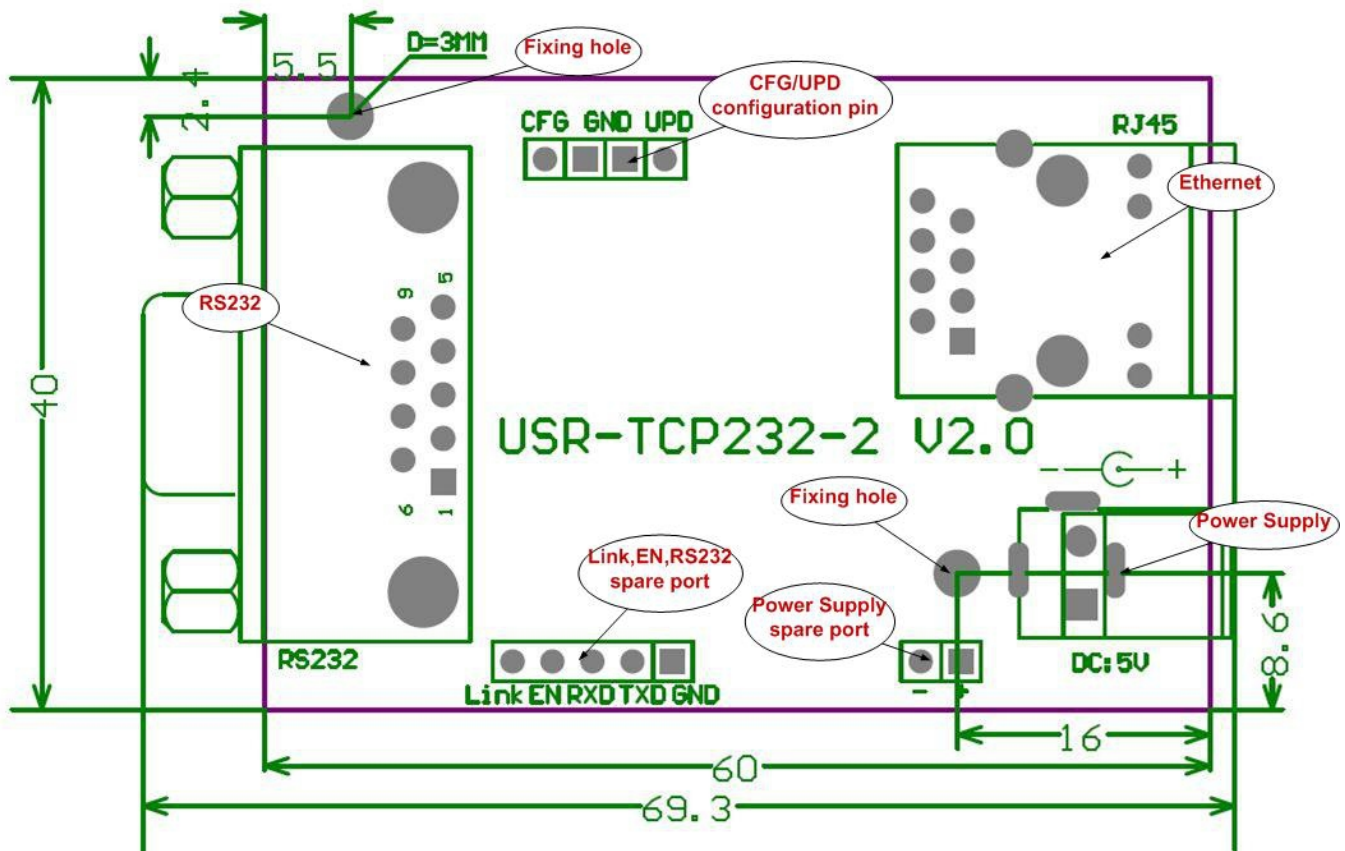
Power interface

DC5V power supply, you can make 5.5 * 2.1 standard power supply or 3.81mm pitch terminal blocks, the default state is 5.5 * 2.1 standard power supply, power input with TVS protection products.

RS232 interface The same as USR-TCP232-2.

RJ45 interface The same as USR-TCP232-2.

2.5.23 Jumper usage Mechanical Dimensions



There are three jumpers and one Welding hole:

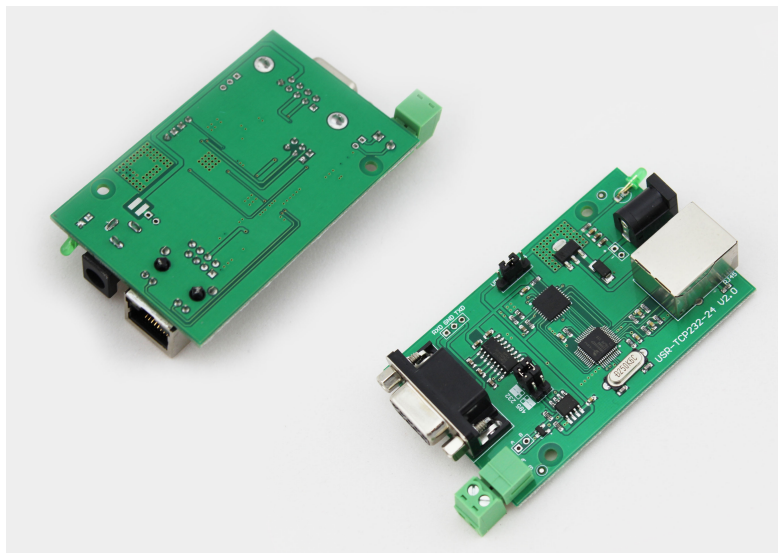
UPD: Update jumper, connect it and then power on the module to make module into update mode.

CFG: configuration jumper, when use RS232 for configuration, connect it to configuration mode ,and leave it free to go work mode.

Notice: CFG is needed only When config via RS232, when config via RJ45, it is no use.

2.6 USR-TCP232-24

USR - TCP232-24 models for RS232 or RS485 level, 2 kv RJ45 interface of electromagnetic isolation, 5.5 * 2.1 standard power supply serial server.



2.6.1 Technical Specifications

Major characteristic	Parameter
Power Supply	DC5V@1A power adapter
Serial port level	RS232 RS485
Network interface	RJ45 ports with 2KV electromagnetic isolation
Physical Size:	PCB size: 80*50mm(L*W) Product size: 89.2×50×23mm (L*W*H)
Temperature and humidity range	Operating temperature: -25 to 75 ° C Storage temperature: -40 to 80 ° C Storage humidity: 5% to 95% RH
Warranty period	2 years

2.6.2 Hardware Description

2.6.21 LED status

There are two leds in RJ45 connector, one is green, and the other is yellow. And 1 power led.

LED	Name	Description
green	Power	Light When Power on
green	Link state	Light when 100Mbps network linked
yellow	Data transfer	Blink when there is data in or out

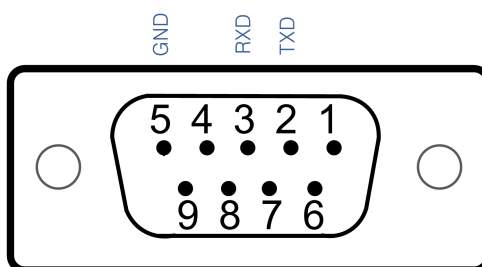
2.6.22 Interface Description

Power interface

DC5V power supply, you can make 5.5 * 2.1 standard power supply, power input with TVS protection products.

RS232 interface

RS232 use 9 pin female (hole), only 3 pins in use, others are NC, the detail is below.



ID	Mark	Description
2	TXD	RS232 Send of module
3	RXD	RS232 Receive of module
5	GND	Ground

We can offer two kinds of serial lines, if needed, please choose to buy:

1. Male to Female direct serial cable: connect serial server and the computer directly to debugging and Testing.
2. Male to Male and Cross Pin2 and Pin3 serial cable: used to connect RS232 serial port server and general user equipment.

Note: You can DB9-9 feet supply. The PCB pads jumper need it with the power input a positive

connection for the serial sensor supply via the serial line or external power to the device is not turned on by default.

RS485 interface

RS485 has two lines A(data+) and B(data-), 120 Ohms Termination Resistance on board.

Notice: this module user Jumpers to change work for RS232 or RS485, by default it work at RS232 mode.

RJ45 internet interface

Auto detected 10M/100M RJ45 interface, support AUTO MDI/MDIX, that is to say you can use crossover cable or a straight cable to connect it to PC for test.

Pin	Name	Description
1	TX+	Transceiver Data+
2	TX-	Transceiver Data-
3	RX+	Receive Data+
4	n/c	Not connected
5	n/c	Not connected
6	RX-	Receive Data-
7	n/c	Not connected
8	n/c	Not connected

2.7 USR-TCP232-300

USR-TCP232-300 model products for RS232 or RS485 level, 2 kv RJ45 interface of electromagnetic isolation, 5.5 * 2.1 standard power supply with a shell of a serial port server.



USR-TCP232-300 by USR-TCP232-24 shell, its specification please see USR-TCP232-24.

2.8 USR-TCP232-442

USR-TCP232-442 model products for RS485 or RS422 level, 2 kv RJ45 interface of electromagnetic isolation, 5.5 * 2.1 standard power supply or power supply terminal of a serial port server with shell.



2.8.1 Technical Specifications

Major characteristic	Parameter
Power Supply	DC5-18Vpower adapter
Serial port level	RS485 RS422
Network interface	RJ45 ports with 2KV electromagnetic isolation
Physical Size:	PCB size: 80*50mm(L*W) Product size: 95*85*25mm (L*W*H)
Temperature and humidity range	Operating temperature: -25 to 75 ° C Storage temperature: -40 to 80 ° C Storage humidity: 5% to 95% RH
Warranty period	2 years

2.8.2 Hardware Description

2.8.21 LED status

There are two leds in RJ45 connector, one is green, and the other is yellow. And 1 power led.

LED	Name	Description
red	Power	Light When Power on
green	Link state	Light when 100Mbps network linked
yellow	Data transfer	Blink when there is data in or out

2.8.22 Interface Description

Power interface

DC5V power supply, you can make 5.5 * 2.1 standard power supply and 3.81mm pitch terminal blocks, power input with TVS protection products.

RS485 interface

RS485 has two lines A(data+) and B(data-), the signal terminal 0.5A PTC Resettable Fuse, to prevent accidental high current burn out the motherboard; Professional TVS lightning protection circuit design; Internal 120R terminal matching resistor (the default is not used, the available short cap configured to use); Can allow up to 32 transceiver node connected to the bus.

RS422 interface

RS422 lead wires are respectively A (RX +), B (RX-), Y (TX +), Z (TX) G (GND). Signal end has characteristics of superheated tube, can prevent the output short circuit; Can allow up to 256 transceiver node connected to the bus.

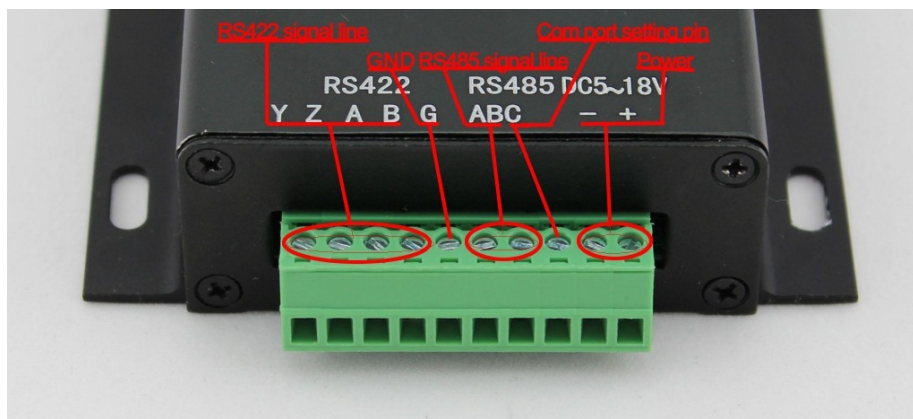
Notice: RS485 and RS422 cannot be used at the same time, by default it work at RS485 mode

RJ45 internet

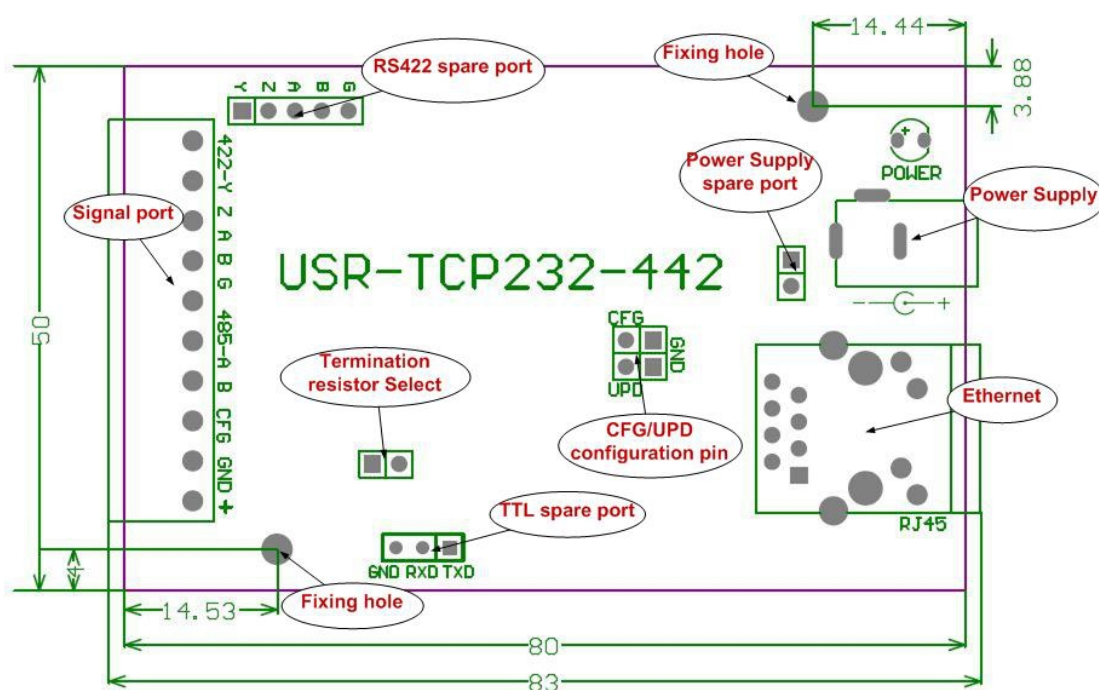
Auto detected 10M/100M RJ45 interface, support AUTO MDI/MDIX, that is to say you can use crossover cable or a straight cable to connect it to PC for test.

Pin	Name	Description
1	TX+	Transceiver Data+
2	TX-	Transceiver Data-
3	RX+	Receive Data+
4	n/c	Not connected
5	n/c	Not connected
6	RX-	Receive Data-
7	n/c	Not connected
8	n/c	Not connected

2.8.23 Terminal functional specifications



2.8.24 Jumper usage Mechanical Dimensions



There are three jumpers and one Welding hole:

1. UPD: Update jumper, connect it and then power on the module to make module into update mode.

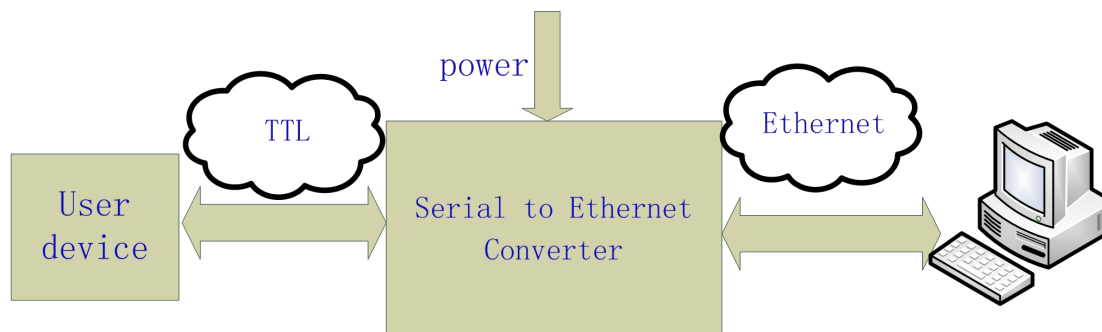
CFG: configuration jumper, when use RS232 for configuration, connect it to configuration mode, and leave it free to go work mode.

Notice: CFG is needed only When config via RS232, when config via RJ45, it is no use.

2. RS485 terminal resistance, the product is not added to the default state, if you want to use, please use short circuit mo short answer the corresponding pin.

3. Work Mode

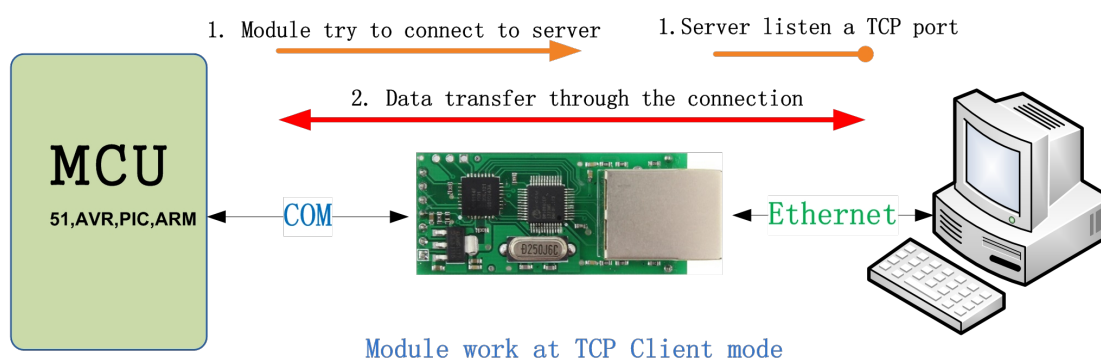
3.1 Block diagram



Take USR-TCP232-T for example, show demo application of module USR-TCP232-T

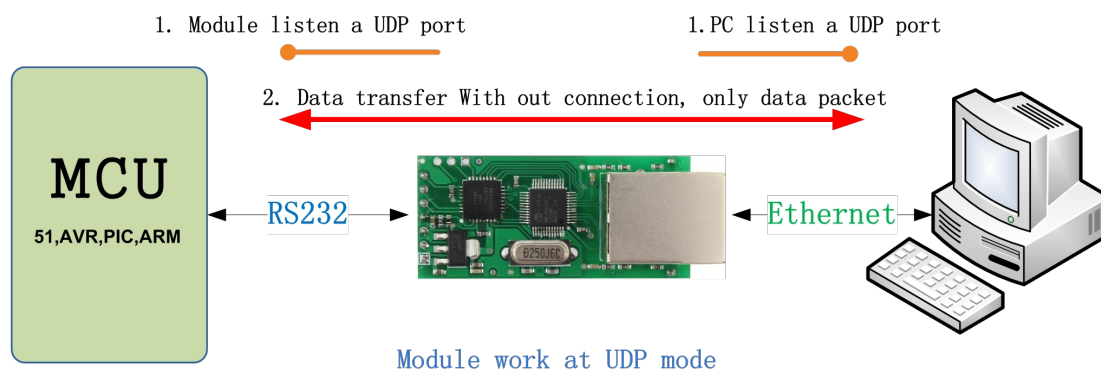
3.2 TCP Client Mode

In TCP client mode, after power on module according to their own Settings active TCP server to connect to the server, and then establish a long connection, data transparent transmission after this mode, the TCP server IP module would need to be visible and the visible means directly by module's IP can PING the server IP, server side can be fixed IP, the Internet can also be internal network IP and module in the same local area network.



3.3 UDP mode

In UDP mode, after the module is powered on listening on port Settings, not take the initiative to establish a connection, when data from by forwarding to the serial port, when a serial port receives the data sent over the network to the IP and port module Settings.

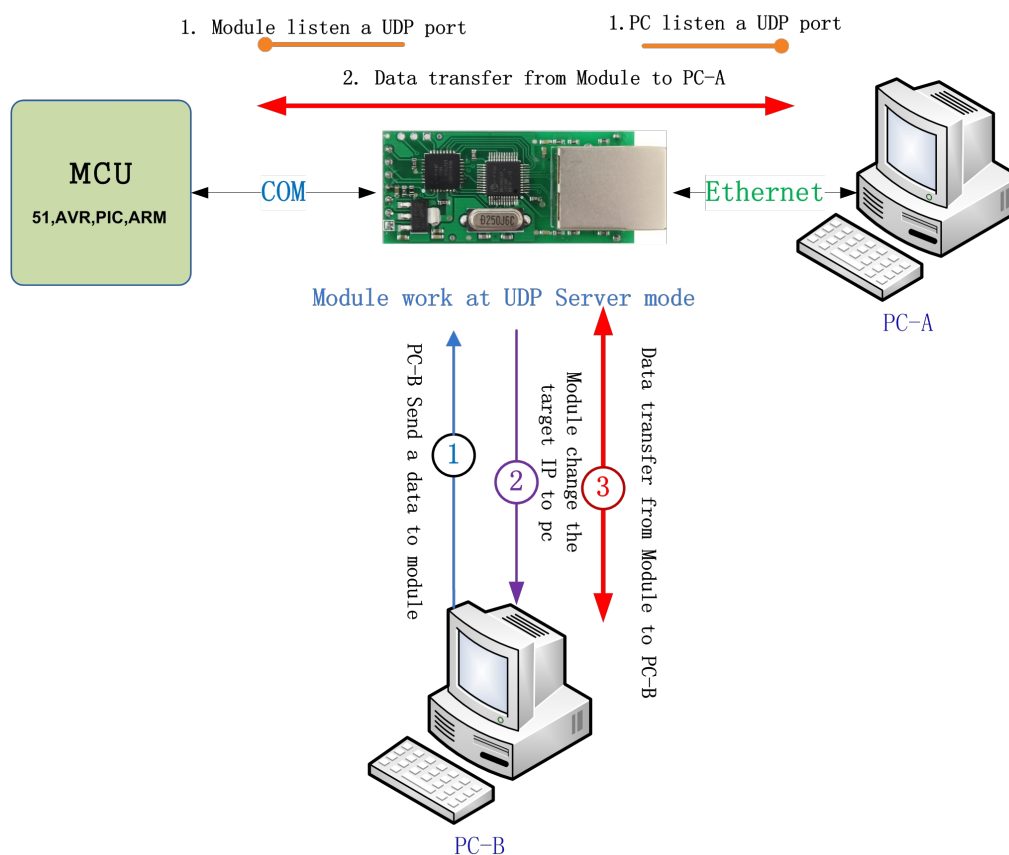


3.4 UDP server Mode

UDP server refers to the normal UDP are not validated on the basis of the source IP address, destination IP instead of the UDP packets are received data source IP, similar to TCP server functionality.

In this mode, the module by default record a destination IP, when a serial port data, to record the IP to send data, at the same time, the module at the server status, to accept the network packets sent to module, and adjust the target IP IP for the data source, suitable for multiple IP working mode for the module.

Use computer end program and UDP mode is exactly the same, no need to change.

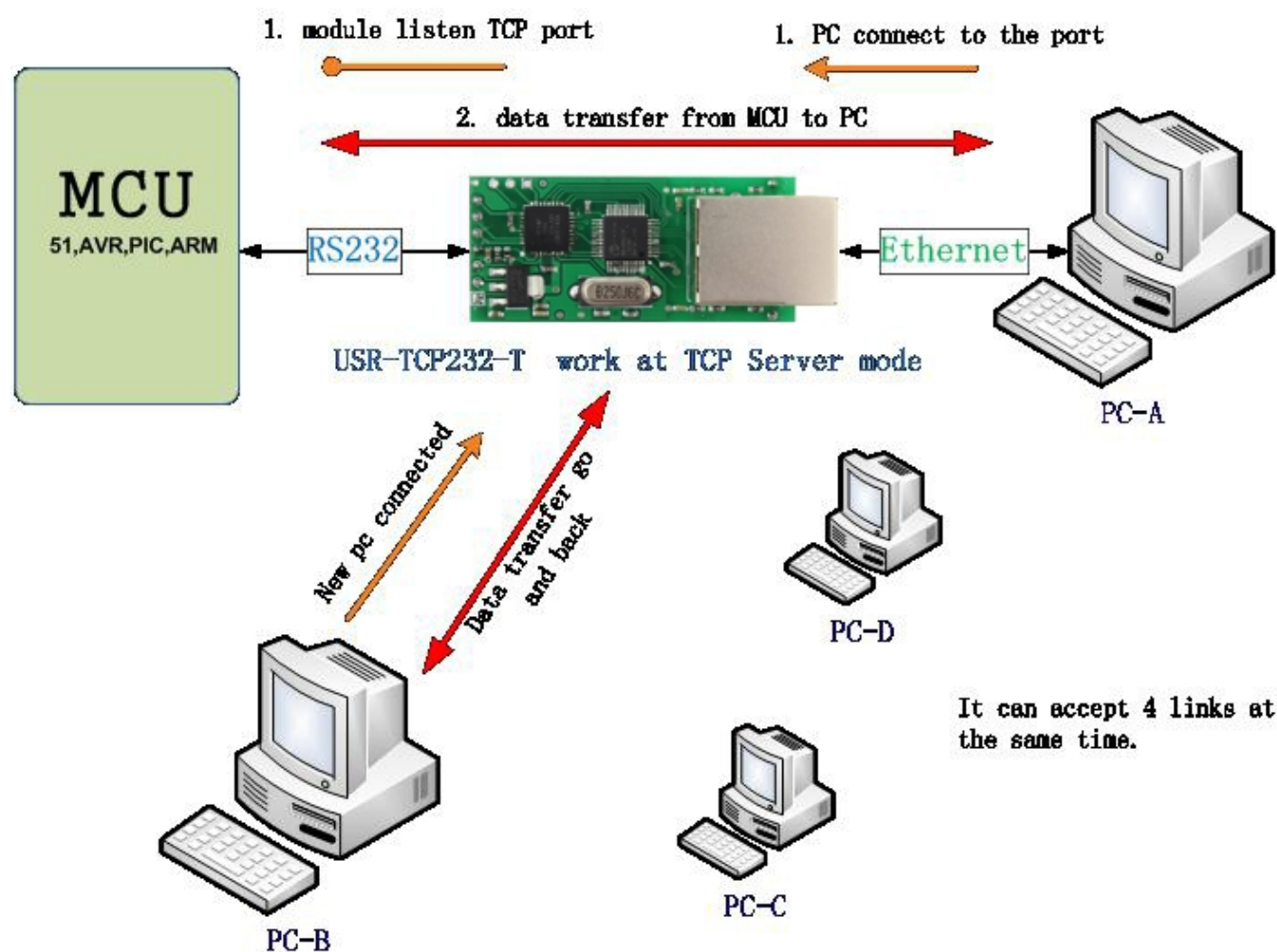


Note:UDP mode, UDP server mode with a single maximum length of 1472 bytes should be controlled at or below, if greater than this length, the module will automatically restart, the proposed subcontractor sent.

3.5 TCP server Mode

In TCP Server mode, module and gateway trying to communication first, and then monitor set up local port, there is connection request response and create a connection, can exist at the same time up to 4 links, a serial port after receipt of the data will be sent to all at the same time of establishing links with network module device.

USR-TCP232-SETUP software, set the Index function can be achieved when to establish a multi-channel connection, the module can identify communications equipment, and with the specified device to communicate.



3.6 Special functions

3.61 RS485

USR-TCP232-S, USR-TCP232-T, USR-TCP232-D products "RTS" Alternate Pin USR-TCP232-200 product "EN" alternate pin for RS485, external enable control pin.

Set the software interface:

Specail functions

☒ RS485
 ☐ RS422
 ☐ Reset

☐ Link
 ☐ Index
 ☐ rfc2217

3.62 Link

The Link pins for the module to establish a communication connection status indicates pin, establish the communication Link pin will output low level, no connection is established, output high level.

USR-TCP232-S "CTS" Alternate Pin USR-TCP232-T products, USR-TCP232-200 product "Link" alternate pin, external Link instructions.

Set the software interface:

Specail functions

☐ RS485
 ☐ RS422
 ☐ Reset

☒ Link
 ☐ Index
 ☐ rfc2217

3.63 Reset

When the module as a TCP Client-side, the module will take the initiative to connect TCP SERVER. When the Reset function, the module tries to connect to TCP Server-side 30 times, still unable to establish a connection, the module will automatically restart.

Set the software interface:

Specail functions

☐ RS485
 ☐ RS422
 ☒ Reset

☐ Link
 ☐ Index
 ☐ rfc2217

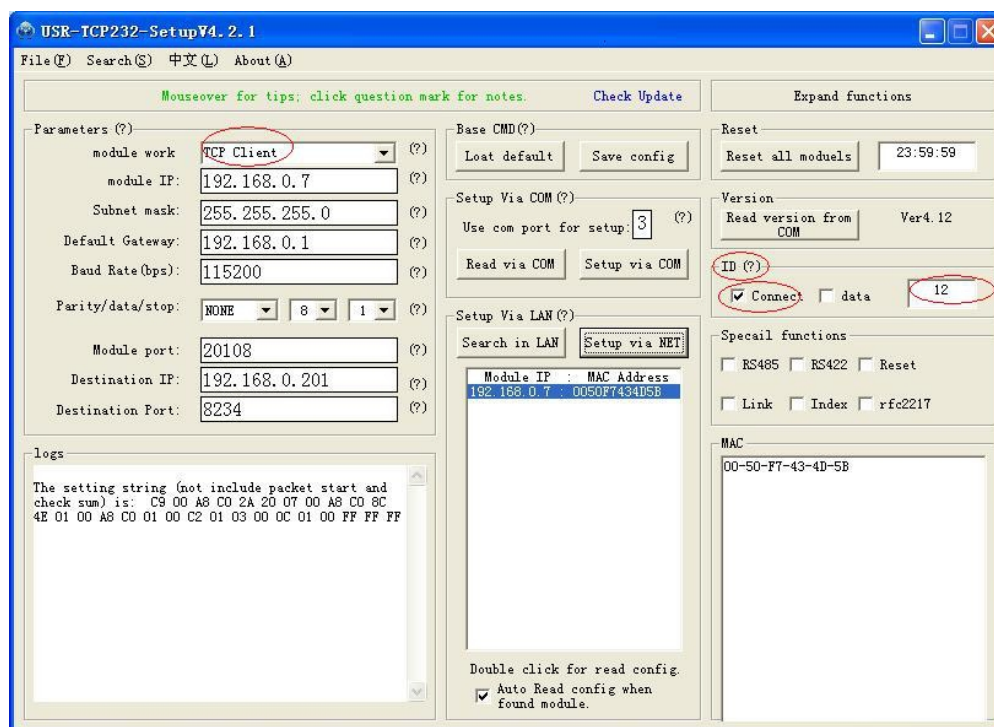
3.64 ID

Module as TCP Client-side ID function for TCP Server-side distinguish between data sources, to achieve the establishment of the connection or data communication process device ID will also be sent, the module ID number is set to decimal, range 0 - 65535, requires the receiving end HEX format.

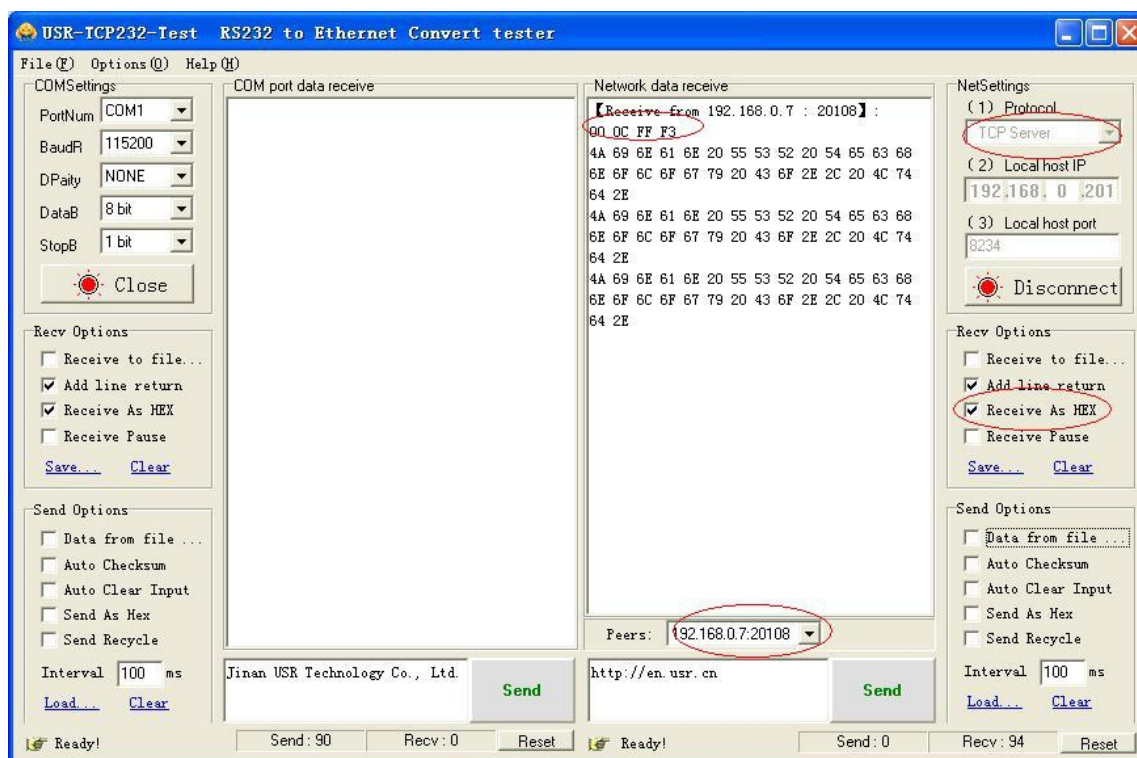
1.Select "Connect" to establish a communication connection, TCP Server-side will receive the

corresponding TCP Client-side ID (ID Description: The first four shows for the ID number, the last four digits of the display ID negated to authentication).

The following picture shows the module do TCP CLINENT establish a communication connection ID feature is enabled, the setup interface module ID number 12:

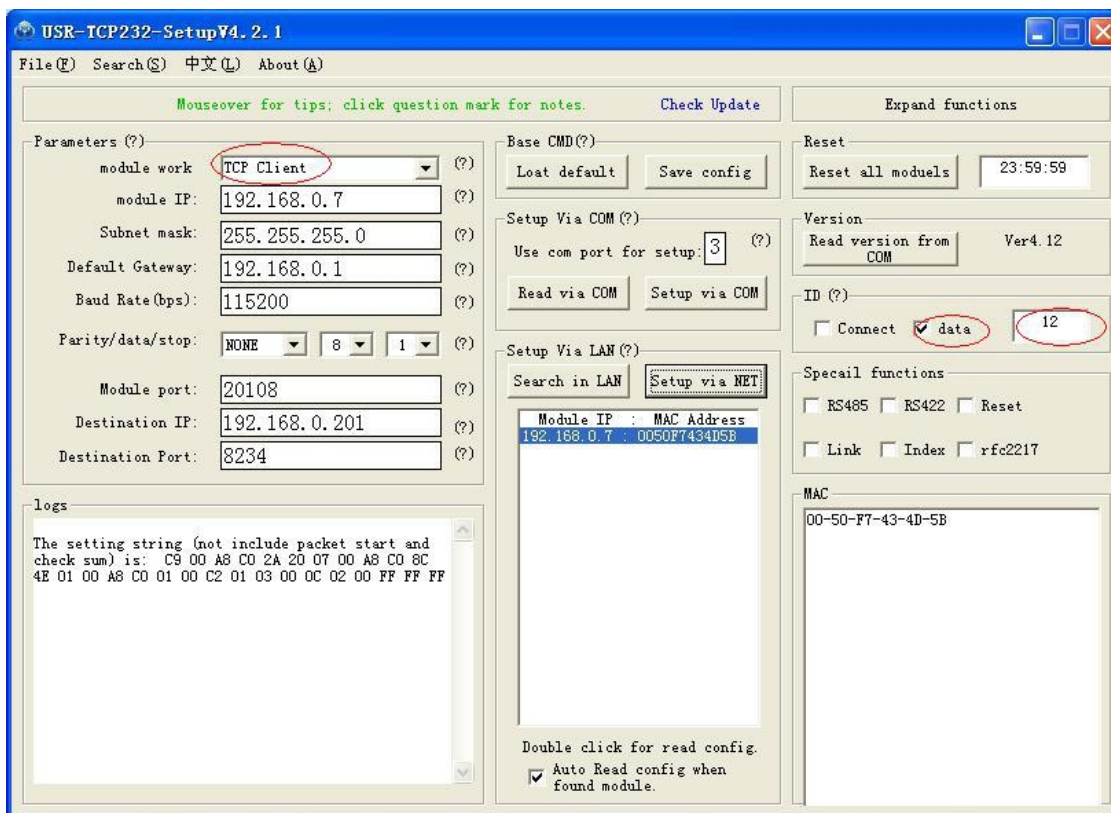


The figure below shows establish a communication connection ID function, the device through the serial communication interface to the TCP Server-side:

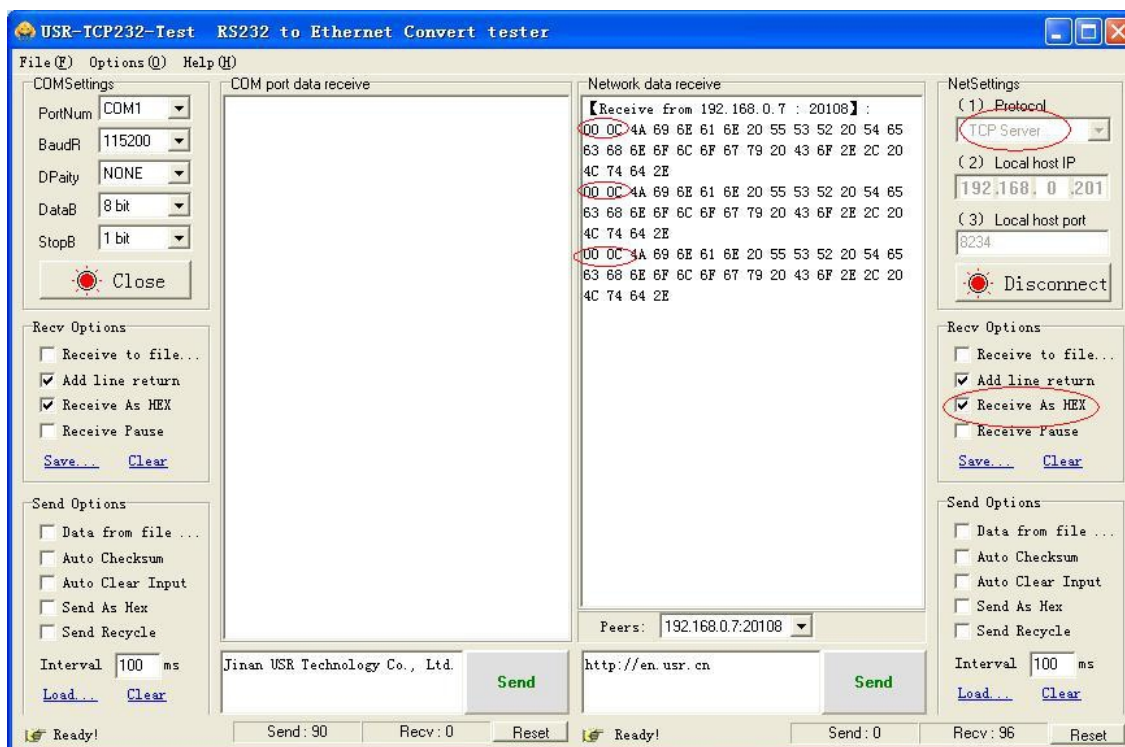


2. Select data during each data transfer, TCP Server-side will receive the corresponding TCP Client-side ID (ID Description: ID before data transmitted only display four-digit ID number).

The following picture shows the module do the TCP CLINENT ID feature is enabled, data transmission module ID number 12 setting interface:



The figure below shows the data communication ID function, the device through the serial port to TCP Server-side communication interface:



3.65 Index

Module as TCP SERVER end up at the same time to establish four connections, server-side at the same time send data to four CLIENT and SERVER the receiving Client-side data can not distinguish between sources of data, the Index function can send and receive data source selection.

Index function is enabled, communication data is displayed corresponding Client side device number, specific parameters are described below:

1. When receive data from ethernet, module will send data to serial port with head 49 N, followed by data. 49 represent incoming data, N represent client index.

2. When user MCU want send data to module serial port, start with head 4F N data... 4F represent send out, N represent which client.

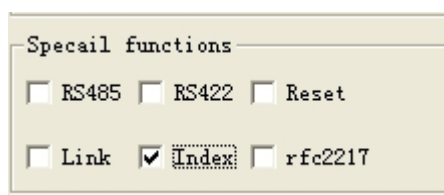
3. When new TCP connection incoming, module will send 43 N M to serial port, indicating that there is current link N accessed, total link number M.

4. When link number have exceed maximum, new link requirement will lead to message 46 46.

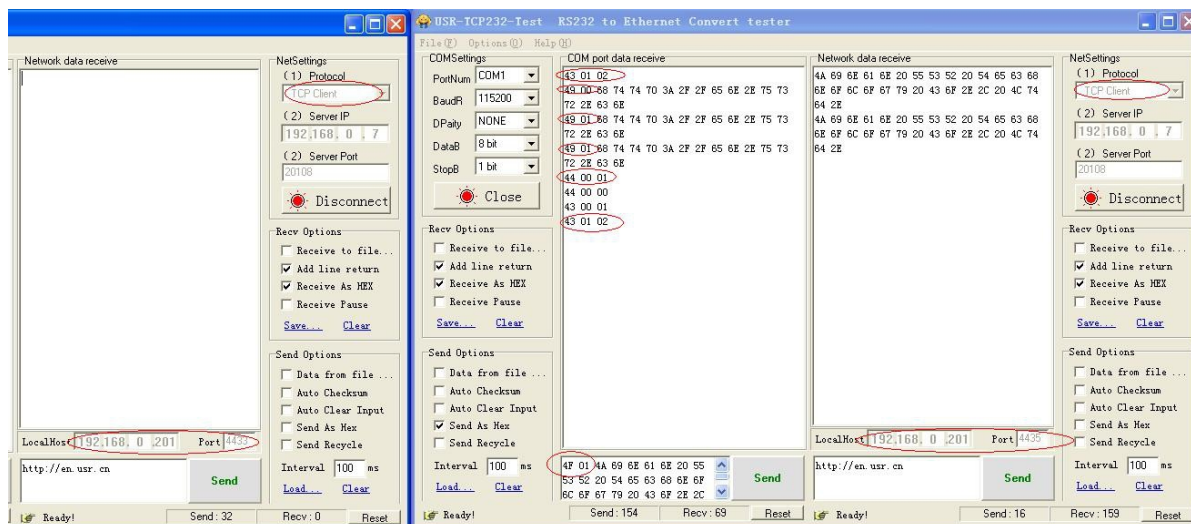
5. When disconnect, module will send 44 N M, represent current link N is delete, left link M.

Note: The above values set are HEX format

Set the software interface:



Data transmission as shown below:



3.66 RFC2217

RFC2217 is an agreement for setup com port settings via Ethernet by socket, Our product support an

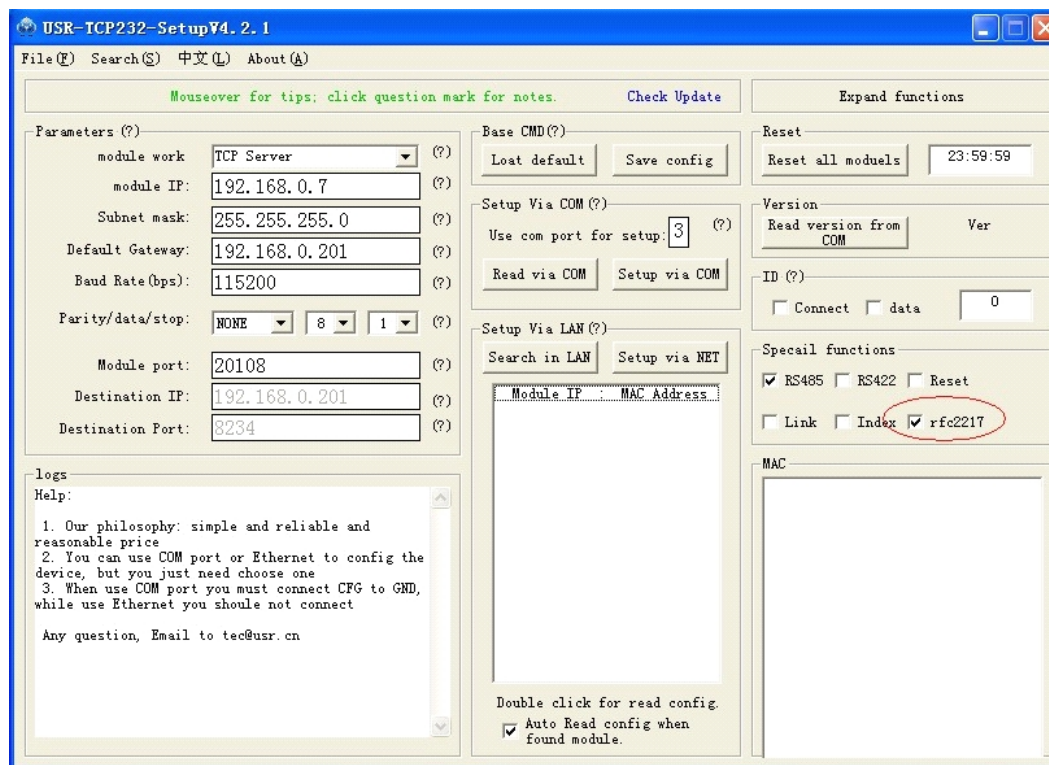
agreement like that, but not standard RFC2217, it is more sample and easy than RFC2217.

1. When module receive setup command, if is a valid command(right packet head and right checksum), the module will change self setting and answer nothing, else the data bits would be sent out at com port.

2. TCP Client, TCP Server, UDP Client, UDP Server, UDP broadcast support this function.

3. All changes will work at once, but not save to module, when power off will lose the settings.

USR-TCP232-Setup V4.2.1 and later version support this function. Like follow picture.



The command length is 8 bits, detail as follow table. The demo bytes are in hex mode:

Name	Packet header	Band rate	UART bits setting	Check sum
Bytes	3	3	1	1
Description	Three bytes	Band rate in hex mode, High byte first.	Parity/data/stop settings, see follow table.	Check sum of last 4 bytes
For example (115200,N,8,1)	55 AA 55	01 C2 00	83	83
For example (9600,N,8,1)	55 AA 55	00 25 80	83	83

Appendix: UART bits setting detail

Bit	Description	Value	Description
1:0	Data bits	00	5 bits
		01	6 bits
		10	7 bits
		11	8 bits
2	Stop bits	0	1 bits
		1	2 bits
3	Parity enable	0	Not enable Parity
		1	Enable Parity
5:4	Parity type	00	ODD
		01	EVEN
		10	Mark
		11	Clear
8:6	Not used	000	Please fill 0

Test bits

55AA5501C2008346 For 115200 N,8,1

55AA550025808328 For 9600 N,8,1

4. Configure

Module's working mode can be set as needed, we try my best to let the user work become simple, all did not open advanced parameters, if you have special requirements, please contact us.

You can set the work mode, the module IP and port, subnet mask, gateway, serial port baud rate, module port, destination IP and port, can be set through the serial port or network port are two ways to setup software (USR-TCP232-Setup).

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

In normal working condition, pulled down the CFG pin to enter the serial configuration state, through the network configuration to be airborne CFG pin module set through the serial port to receive instruction and to change the operating parameters.USR-TCP232-Setup software to be modified, as follows:

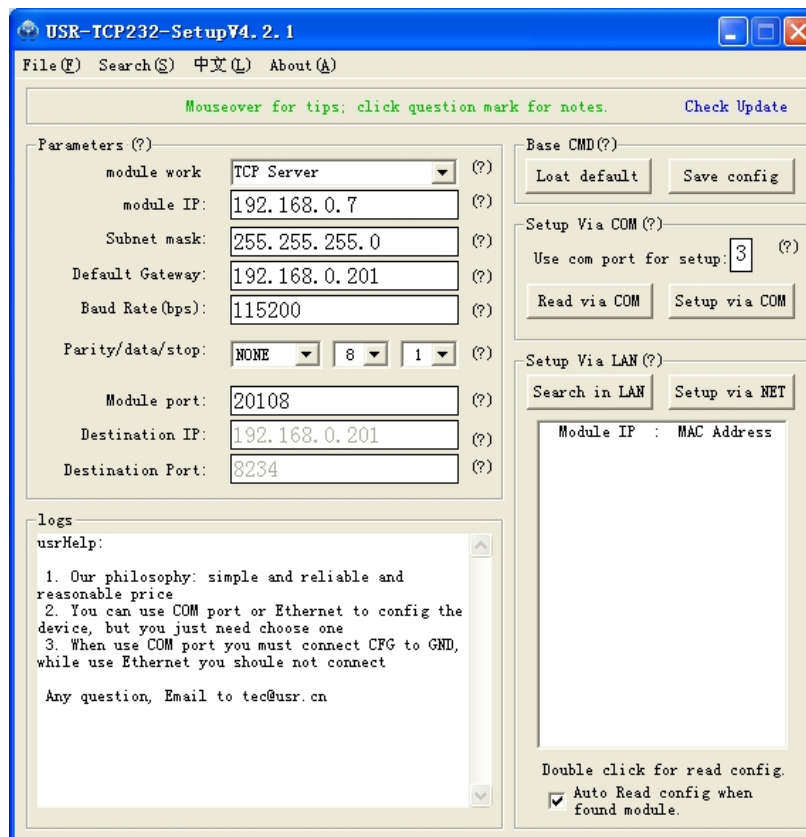
1. In "use com port for setup" fill in the correct COM number;
2. Click "read via com", the left side will display the current configuration parameters, can modify the parameters of the desired Settings;
3. Click "setup via com", to complete the module configuration;
4. After Setting, left CFG free or connect to VCC, module begin work.

4.3 Configure through RJ45

Under normal operating conditions, the module received through the network setting instruction, and change the operating parameters.USR-TCP232-Setup software to be modified, as follows:

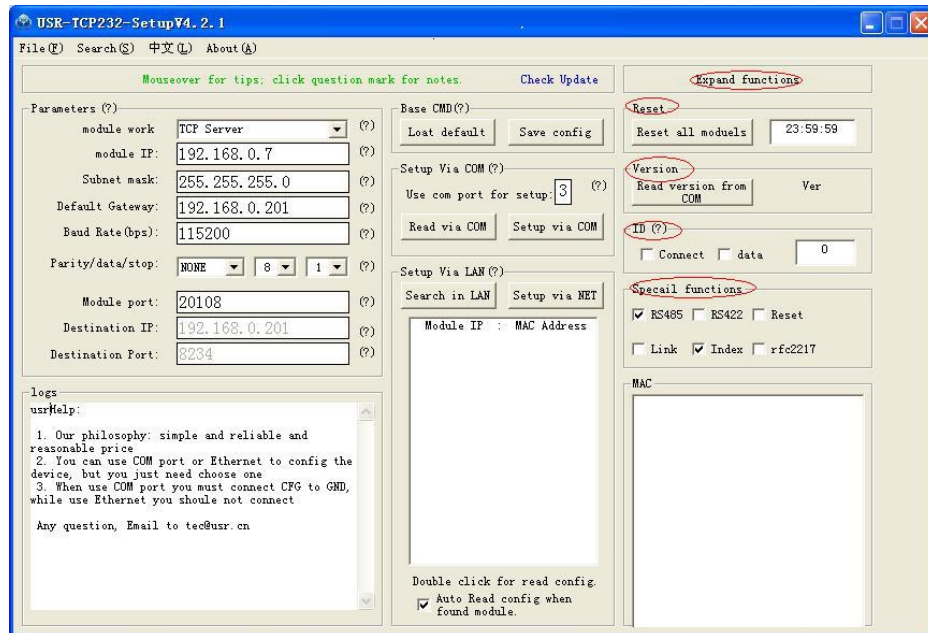
1. Click "search in LAN", the left side will display the current configuration parameters, can modify the parameters of the desired Settings;
2. Click "setup in net", to complete the module configuration.

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



4.4 USR-TCP232-SETUP

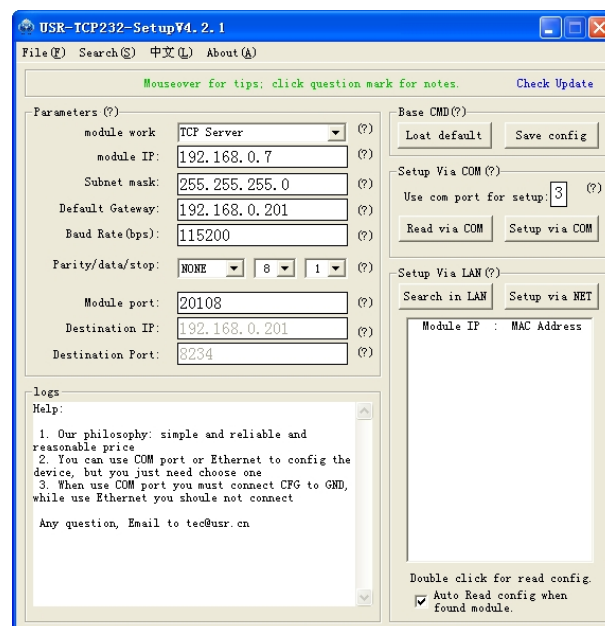
USR - TCP232 - the Setup software can be extended in functions to specific function module Settings, as shown in the figure below.



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).

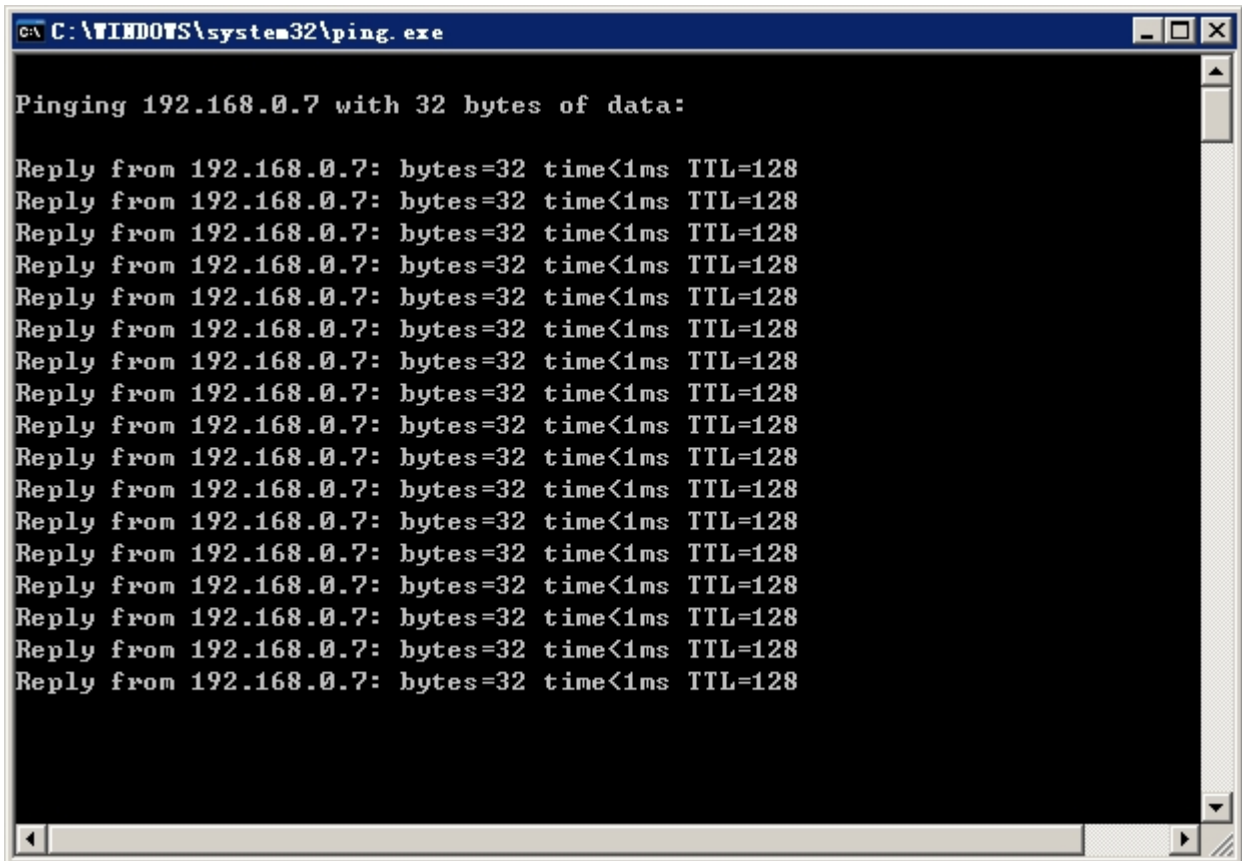
2. Connection: connect module rs232 to pc rs232, RJ45 to pc RJ45 or the same router (same subnet).

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)



```
C:\WINDOWS\system32\ping.exe

Pinging 192.168.0.7 with 32 bytes of data:

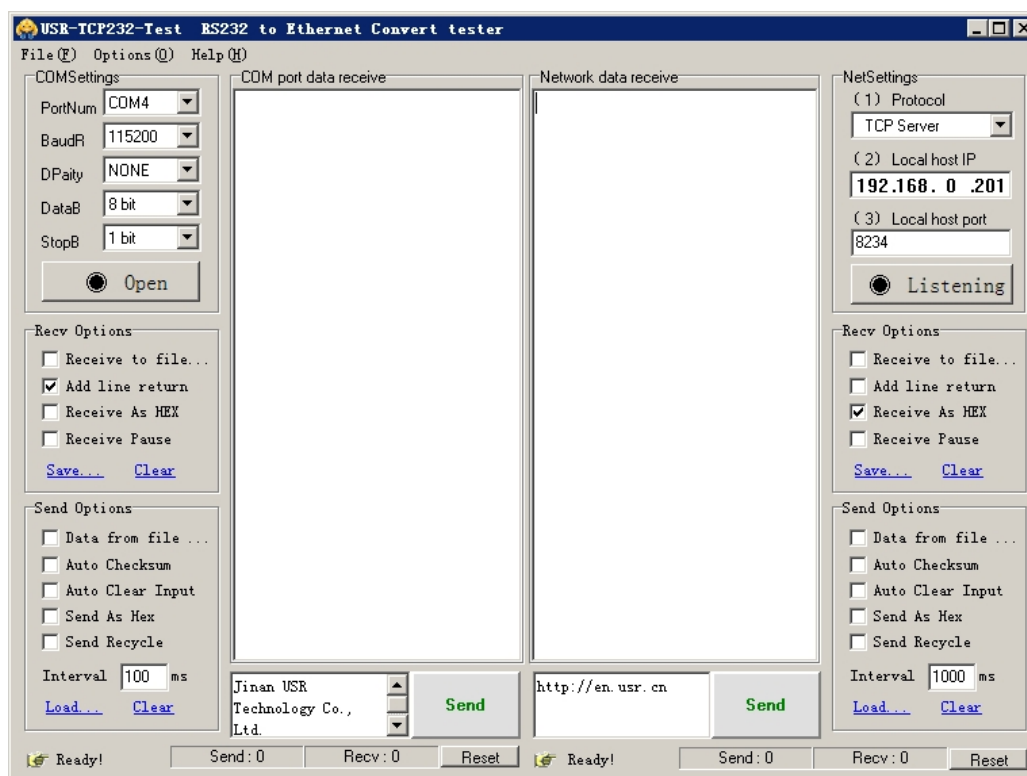
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
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Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
Reply from 192.168.0.7: bytes=32 time<1ms TTL=128
```



USR-TCP232-Test.exe

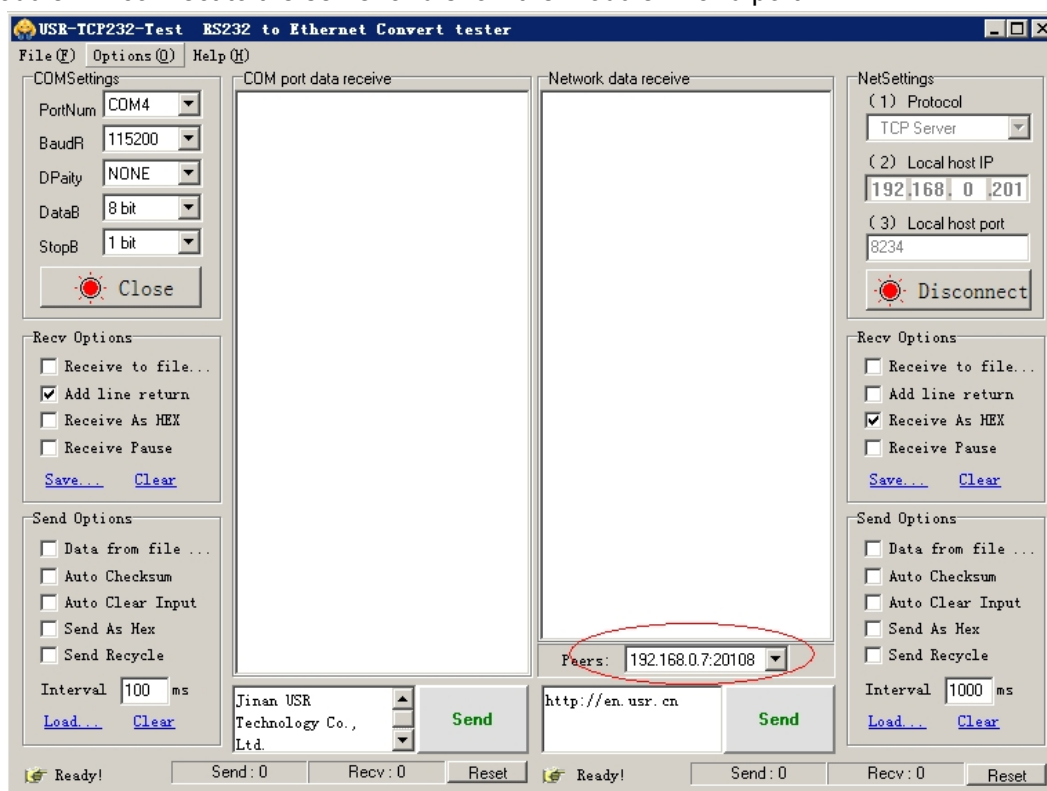
4. open the
follow picture.

software in CD, TCP server, listen port 8234, TCP server as

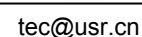


Click Listening, Open COM port.

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

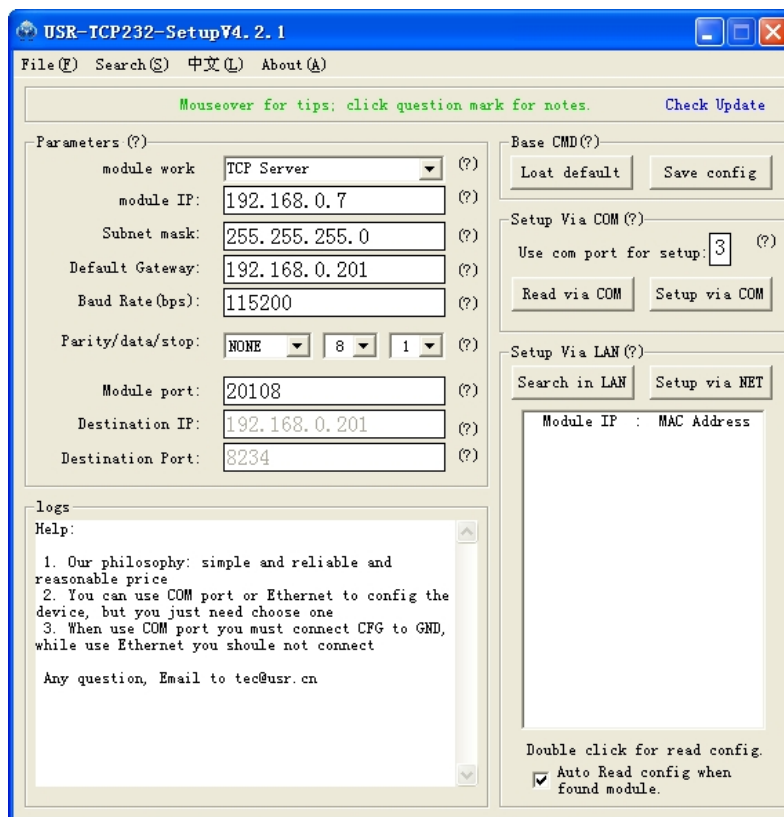


You can use other TCP UDP test software and COM port test software as you like.



5.2 Virtual COM

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

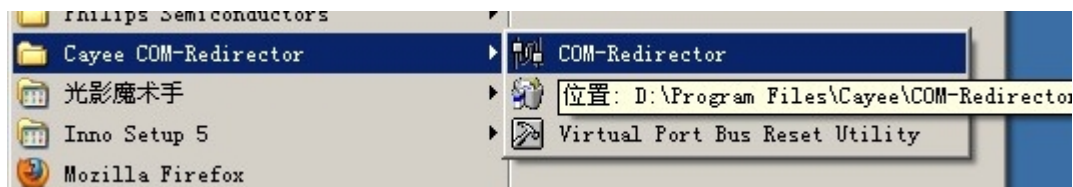


1. setup the module
2. Install VSPM

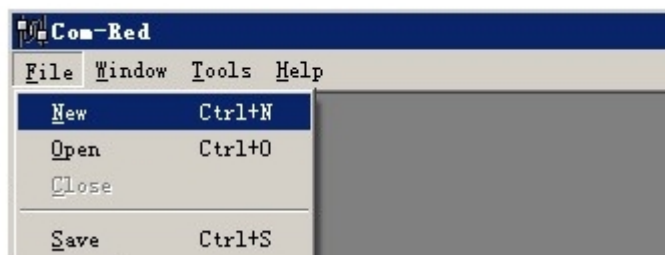


COM-Redirecter.EXE

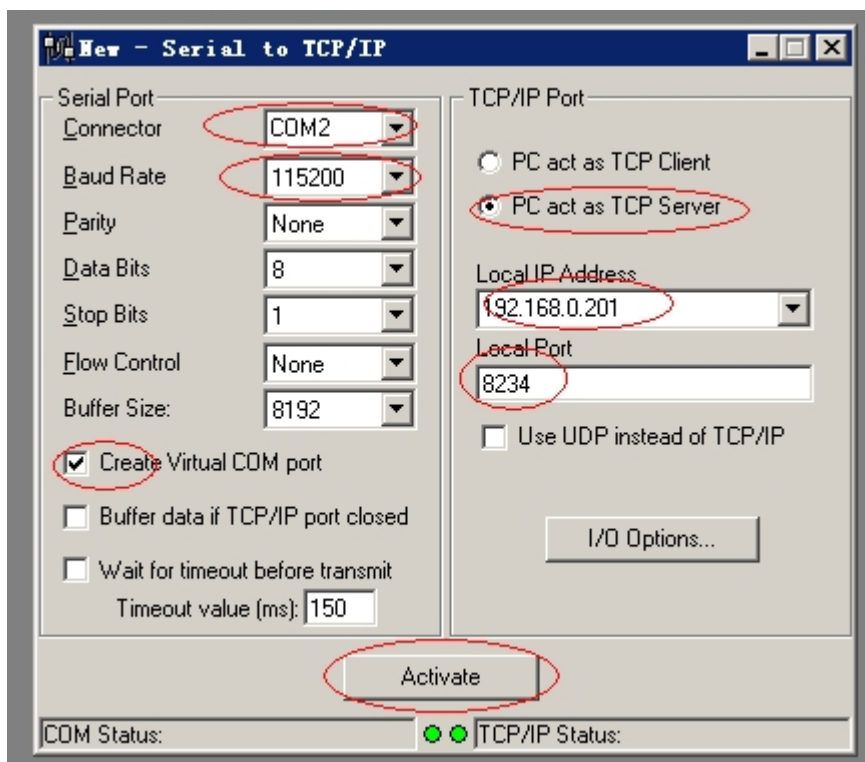
3. Open VSPM,



Add virtual COM.



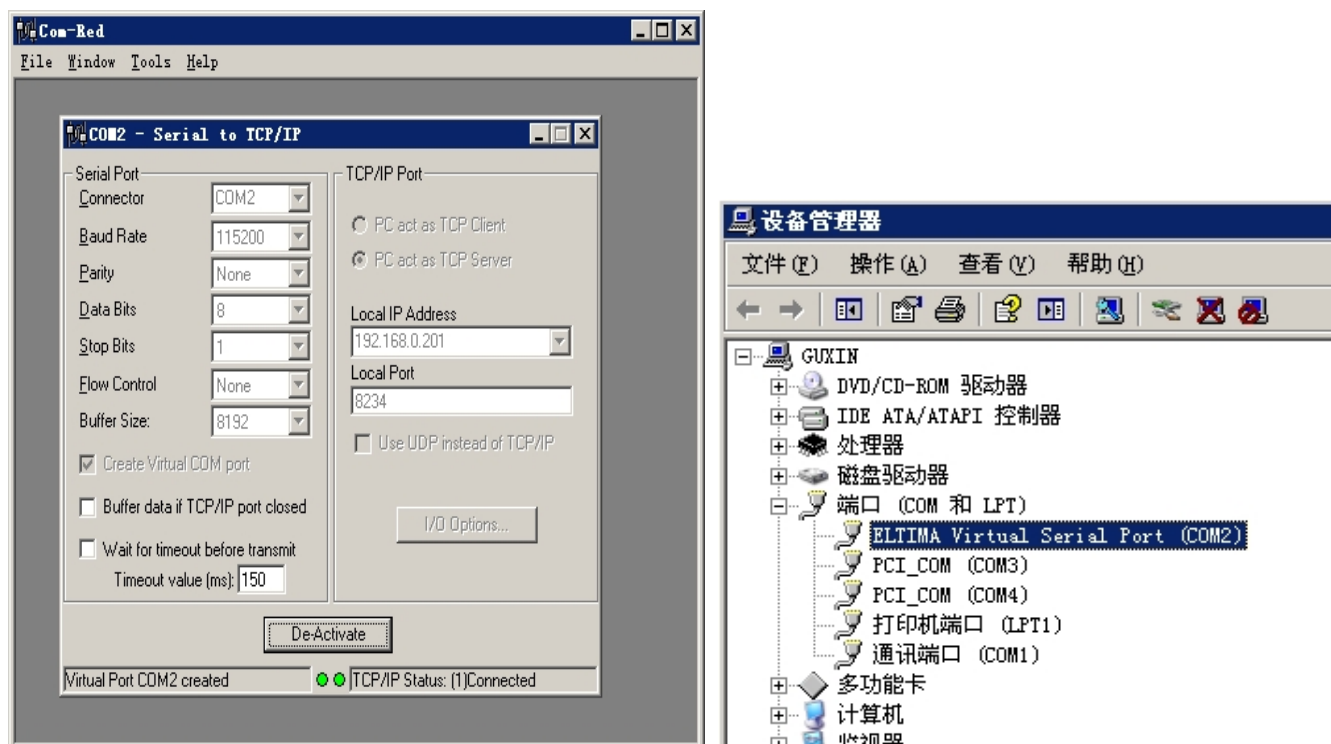
4. Setup as the follow pictures, you need to notice COM port, bond rate and work mode of PC, then click Activate.



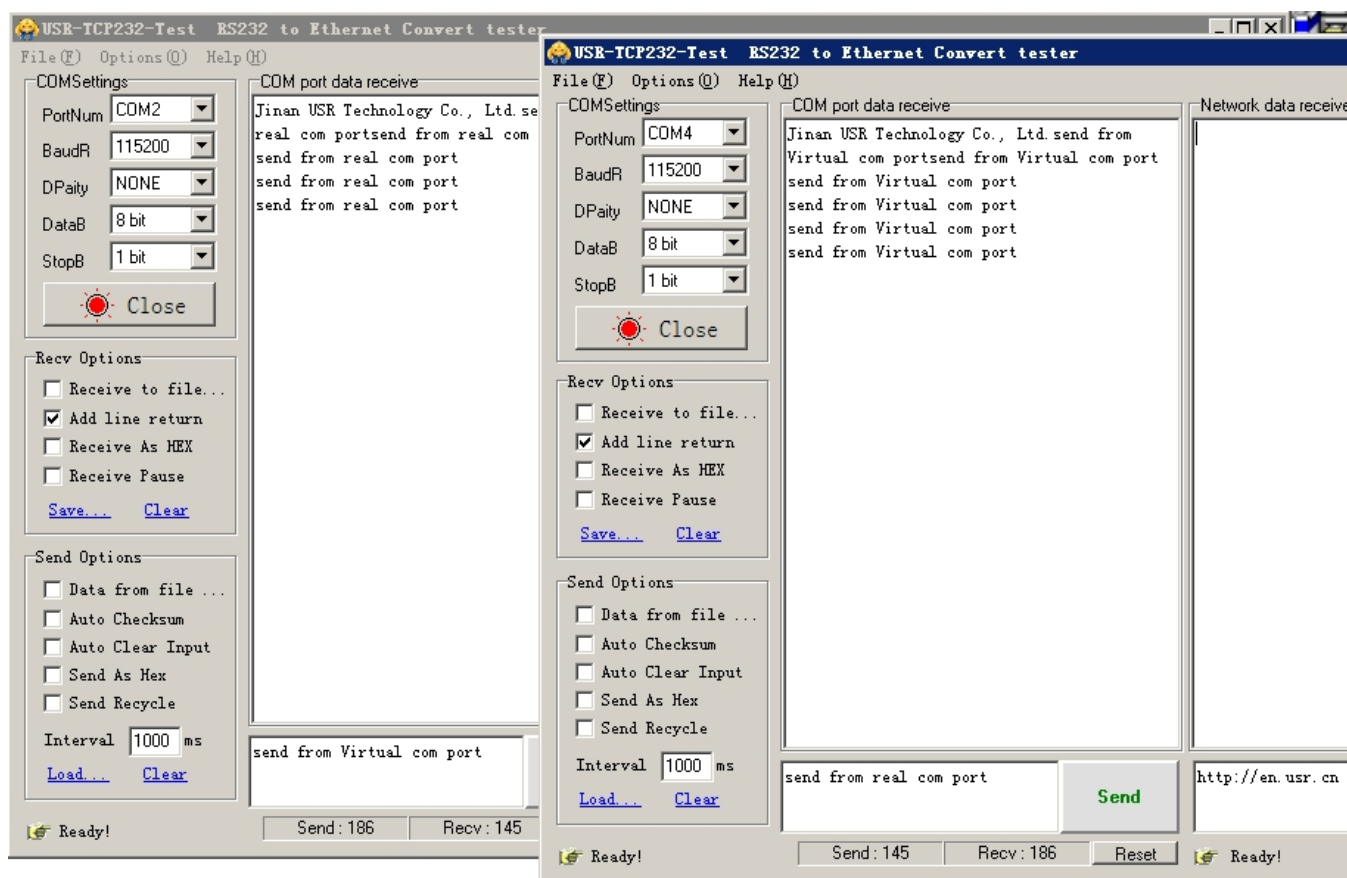
5. After Activate click, a Virtual COM port COM2, will be created, COM2 will receive data from TCPIP socket, and send data to COM2 will convert to TCPIP socket data to remote Equipment.

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.

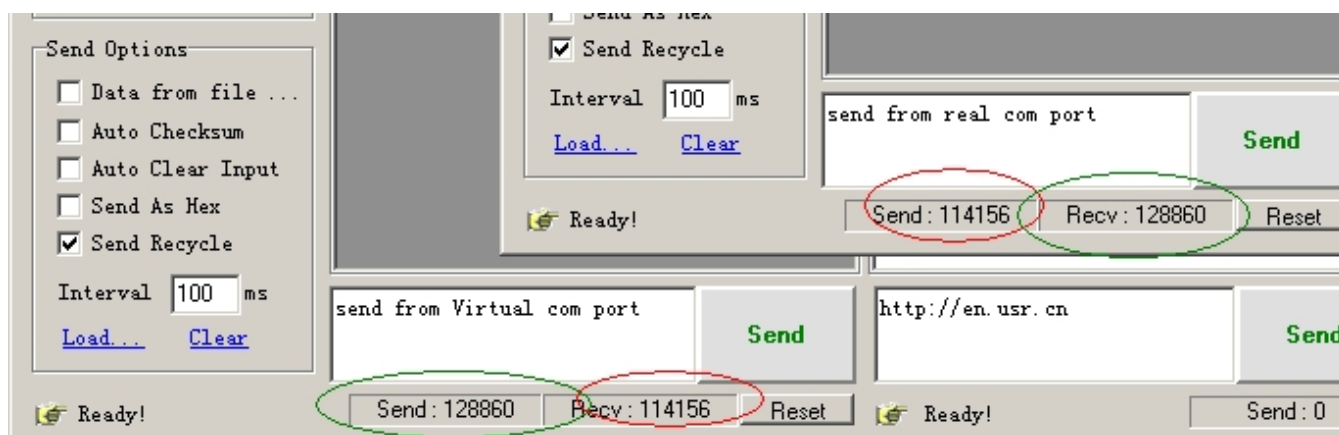
The success picture as follow:



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.

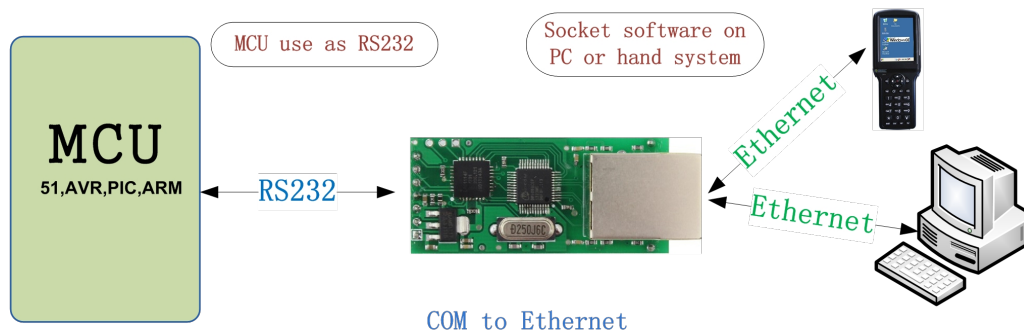


Test 100ms recycle send, send and receive 10,000 bytes, every thing is ok.



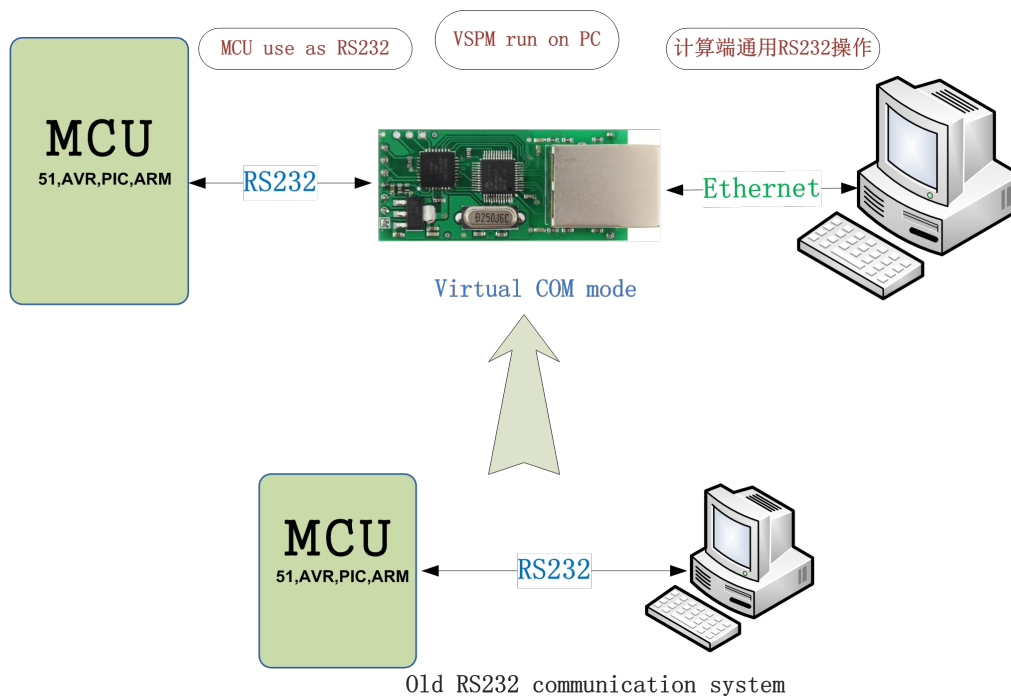
6. Apps

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

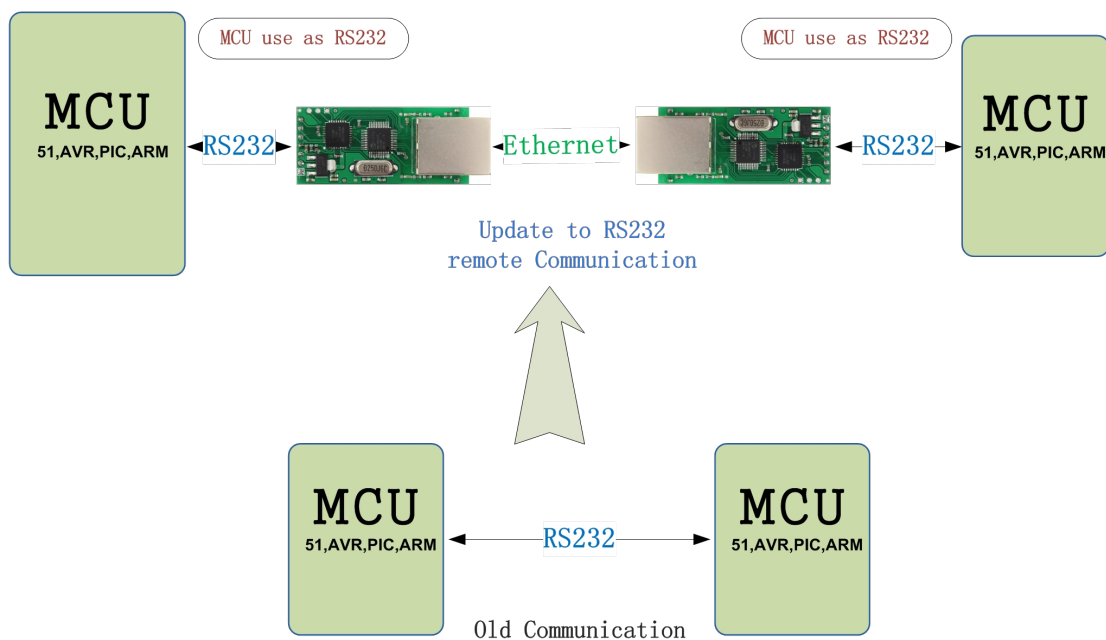


6.2 Virtual COM

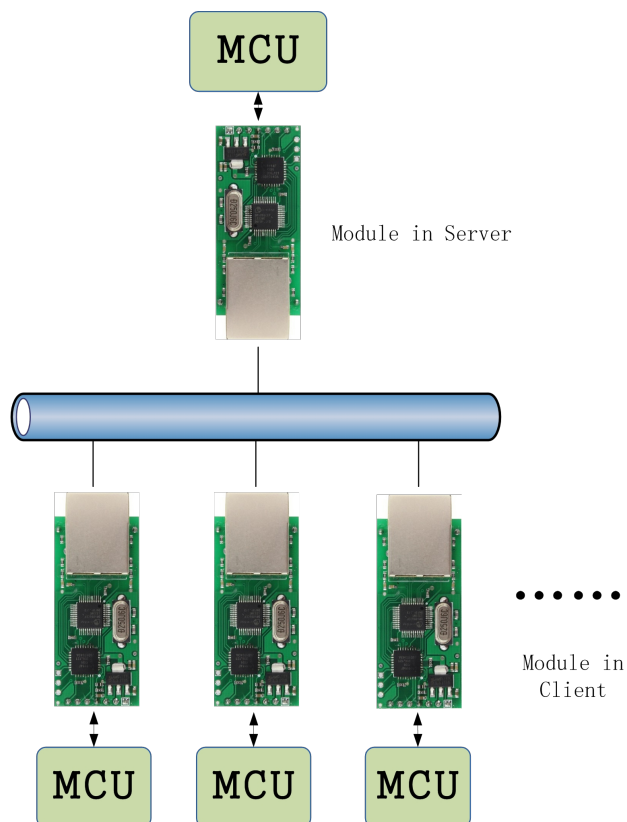
Install VSPM software. The COM like installed in the pc.



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



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

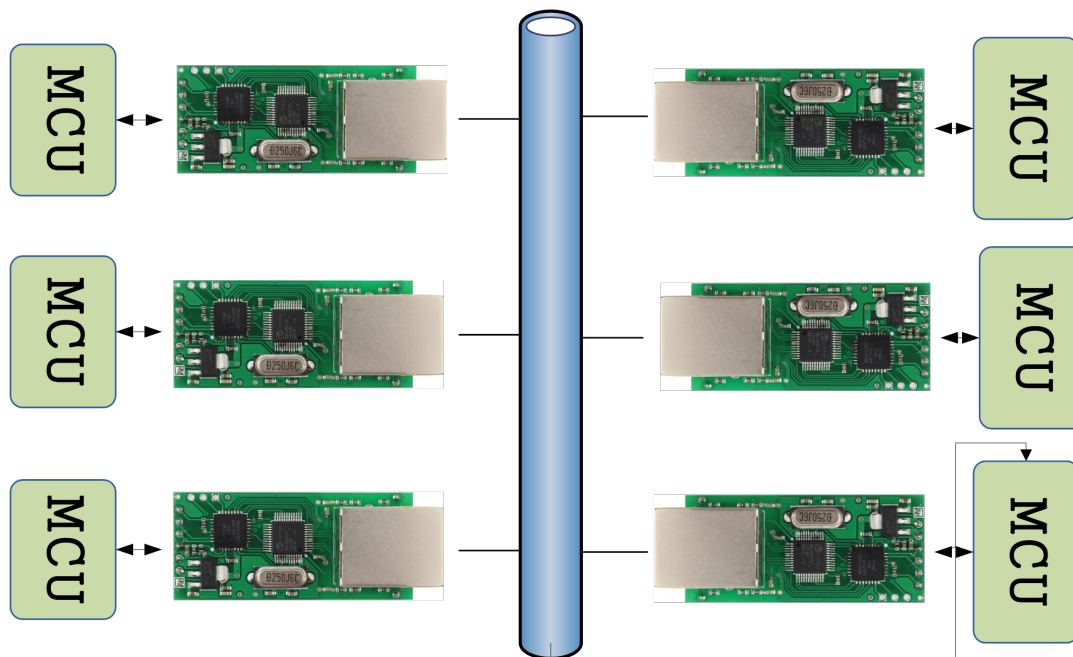


When the UDP server COM transfer data to one of the many COM, the last COM that transferred data will be

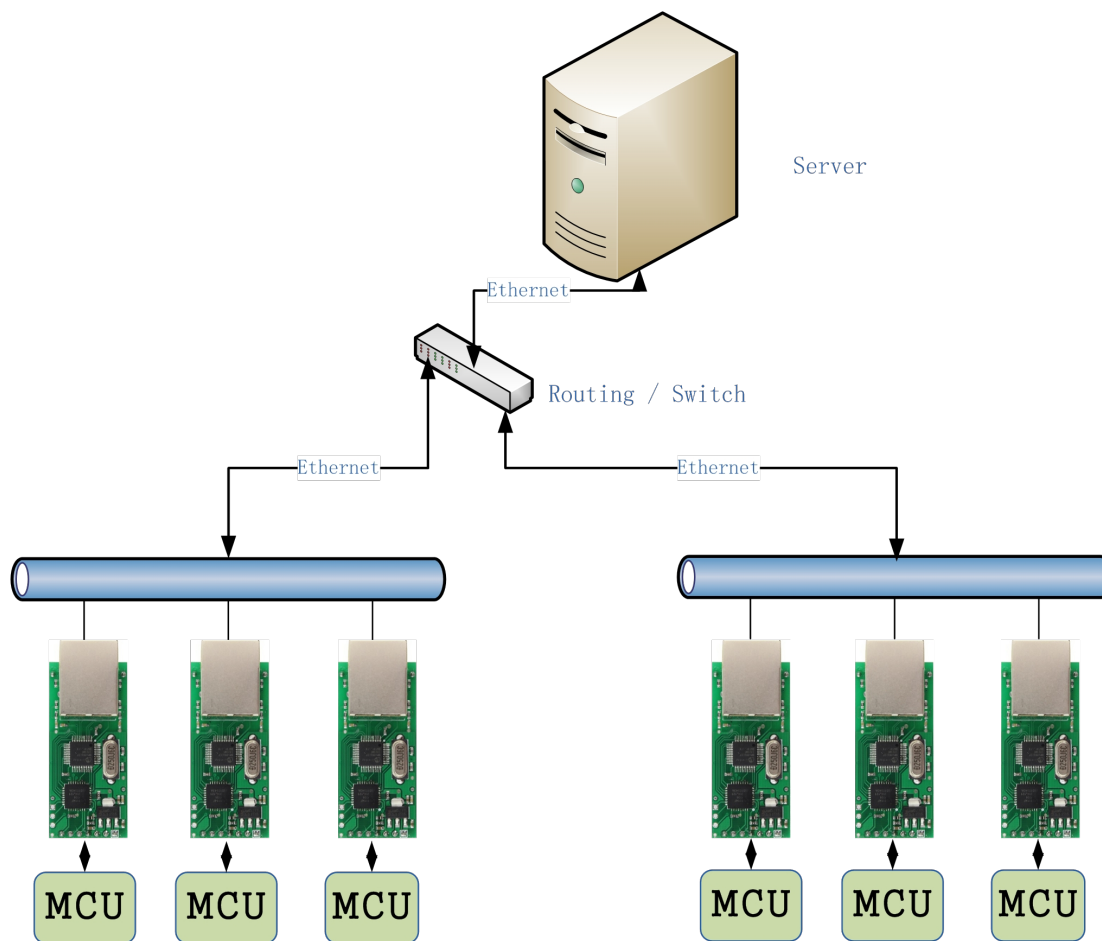
choose.

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. Contact us

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8. 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

Version 3.0 2013-04-25 T24 product series boil down to this specification