

# TRP-C36

## User's Manual

### Ethernet to RS232/422/485 Isolated Converter



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# 1. Introduction

TRP-C36, a high speed, single-port serial device, is designed to instantly convert data from RS-232/422/485 interfaces to a Ethernet network running at the TCP/IP protocol. By using a standard COM port and existing network infrastructure the device allow you to link together a distant serial peripheral. You can reach TRP-C36 from Windows and Linux without the need to modify existing software. TRP-C36 support 10/100Mbps auto-detecting, and auto RS-485 data direction flow control, it also provides with 3000V DC isolation and internal surge protection to protect the host computer and converter against high voltage spikes, as well as ground potential difference. The industry standard DIN rail design enables fast and professional installation.

## 1-1. Features

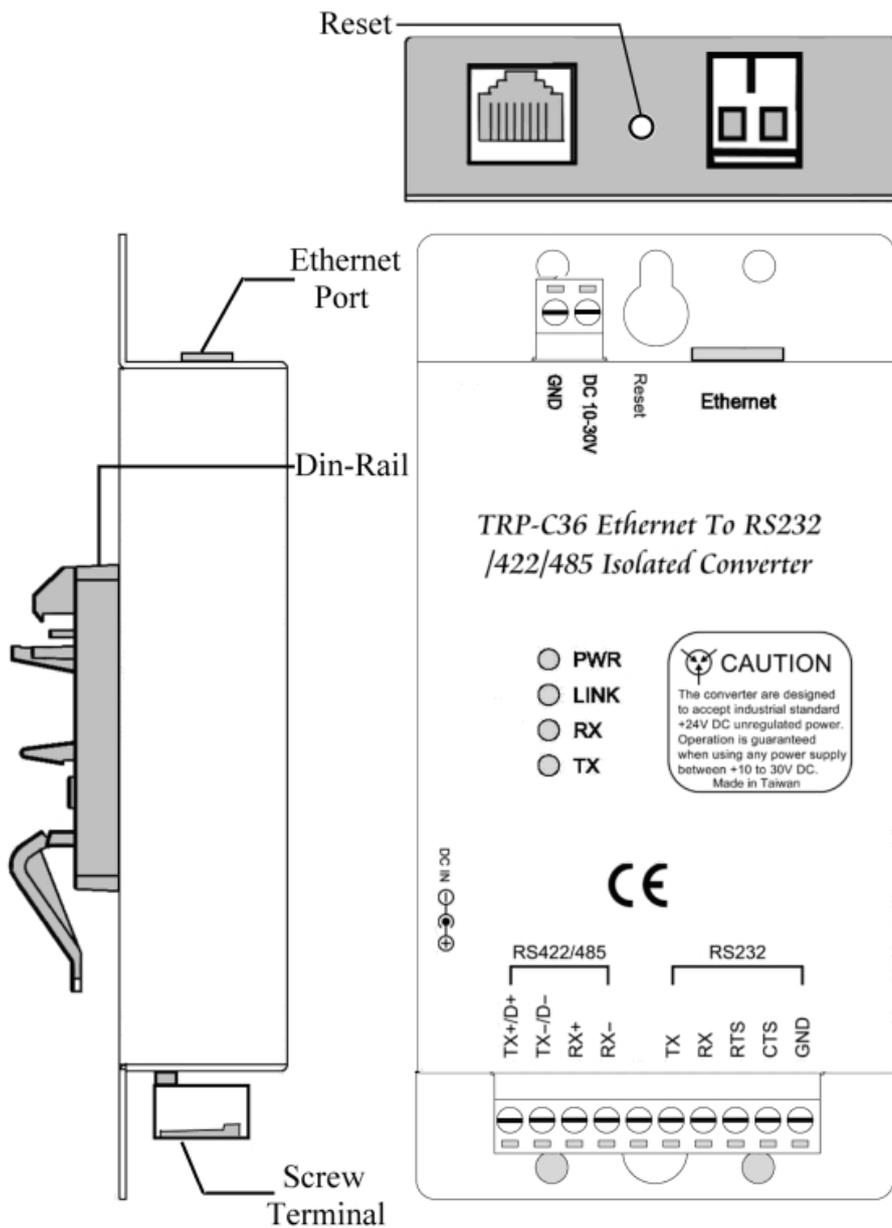
- Wide input range DC power supply.
- Fully compatible with Ethernet and TCP/IP protocol.
- Support 3000V DC isolation protection.
- Auto direction flow control on RS-485.
- Supported baud rate up to 230.4Kbps.
- Power/Link/TX /RX mode LED indicator.
- Support intranet and internet system setting function.
- Support screw terminal and external DC power adaptor.
- Operation system: Windows/Linux/Mac
- DIN rail and panel mount support.

## 1-2. Specification.

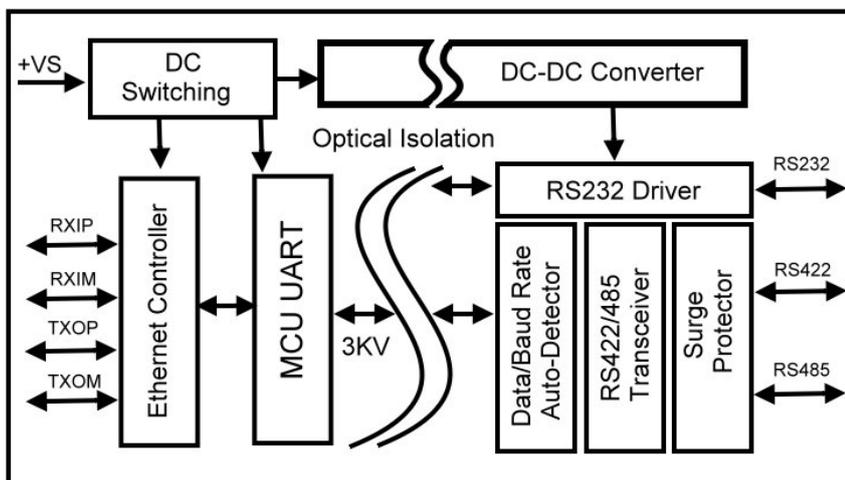
- Power Input Voltage: DC +10V to +30V
- Interface Standard RJ45 LAN port.
- RS-232: 5 full-duplex (TXD,RXD,CTS,RTS,GND).
- RS-422: Differential 4 full-duplex wires.
- RS-485: Differential 2 half-duplex wires.
- Connection type: Screw terminal accepts AWG# 12~30 wires.
- Data Format: Asynchronous data with all common combination of bits, parity, stop.
- RS-422/485 line protection: Against surge, short circuit, voltage peak.
- Connection type: Screw terminal accepts AWG #12~30 wire
- Signal LED: Power on , Link, TX , RX
- Power supply: Screw terminal, or external DC adapter.
- Power consumption: 1.6W
- Isolation Voltage: 3000V DC
- Operating environment: 0 to 60°C
- Storage temperature: -20 to 70°C
- Humidity: 10~90% Non-condensing
- Dimension:151mm X 111mm X 26mm.
- Weight: 375g

## 2. Hardware Description

### 2-1. TRP-C36 Panel Layout



### 2-2. Block Diagram



### 2-3. LED Indicator

**PWR-**: Power LED

**LINK LED**: Ethernet Connection

**RX LED**: RS-232/422/485 data receiving

**TX LED**: RS-232/422/485 data transmitting

**DC Jack**: Input from +10V to +30V. (Please use the 5.5\*2.1\*12 mm DC JACK).

### 2-4. Reset Button

Return to the factory default, user may find the button between the 2-pin terminal block and RJ-45 port.

## 3. Install TRP-C36

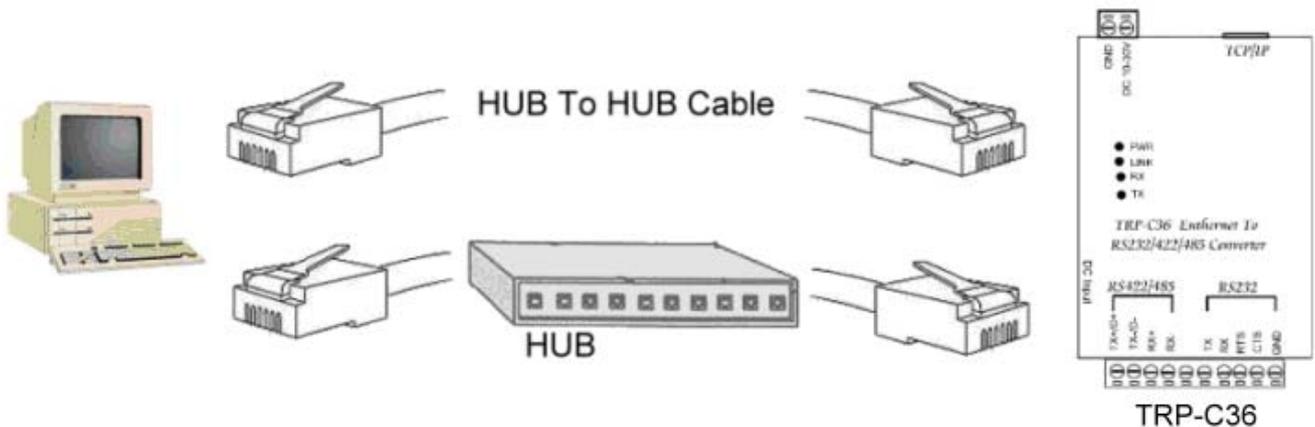
### 3-1. Power Connection

Connect power source with TRP-C36. The TRP-C36 has a two pins terminal block and power jack. Power can apply on either terminal block or the power jack. It supports +10-+30V DC/500mA power supply. When power is properly supplied the PWR LED will run indicating the power is up reading.

**Warning: User can only choose one of 2 power source, External DC-Jack or Screw terminal DC input. Do not use external DC-Jack and screw terminal DC input simultaneously**

### 3-2. Ethernet Connection

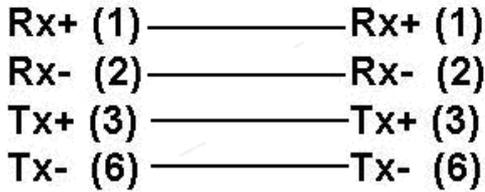
A straight-through Ethernet cable can be used to connect TRP-C36 to an Ethernet hub, switch, or wall plate. A crossover Ethernet cable can be used to make a connection directly to the NIC (Network Interface Card) on a PC or laptop. When the cable connection properly be made the "LINK" LED will turn on.



HUB to HUB: Using crossover Ethernet cable.

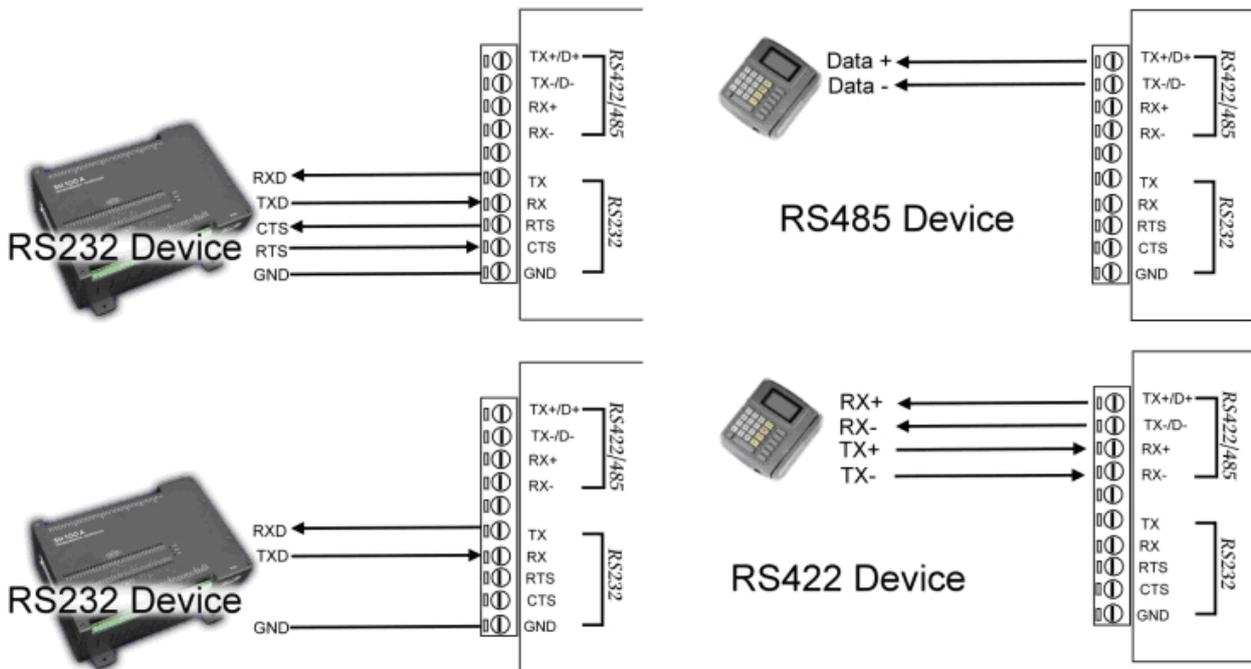


HUB: Using straight through cable



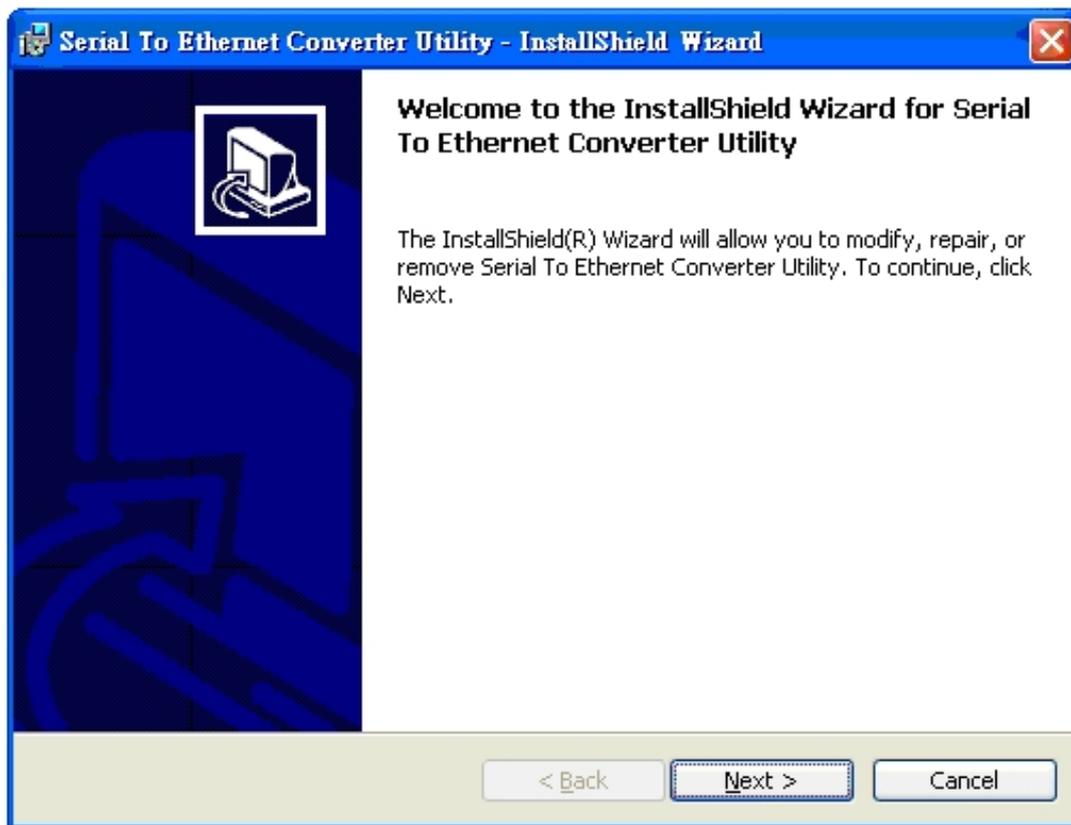
### 3-3. Serial connection

Connect TRP-C36 with RS-232 or RS-422/485 serial device. The wiring connection diagram is as below.



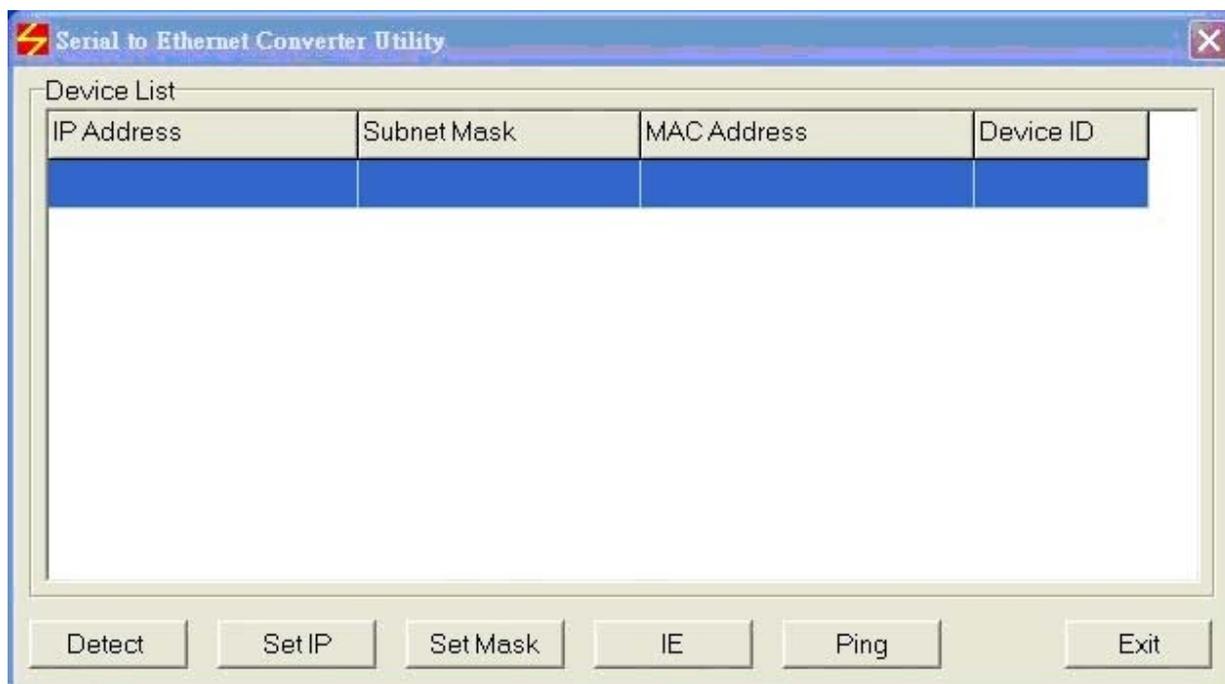
## 4. Install software

“STOEC” is the tool for user to configure the on-line TRP-C36. User may find the utility in the TRP-C36 support CD. Double click STOEC, the install Shield Wizard will appear and guide you to complete installation.



#### 4-3. Introduction of ETM utility..

Run STOEC utility

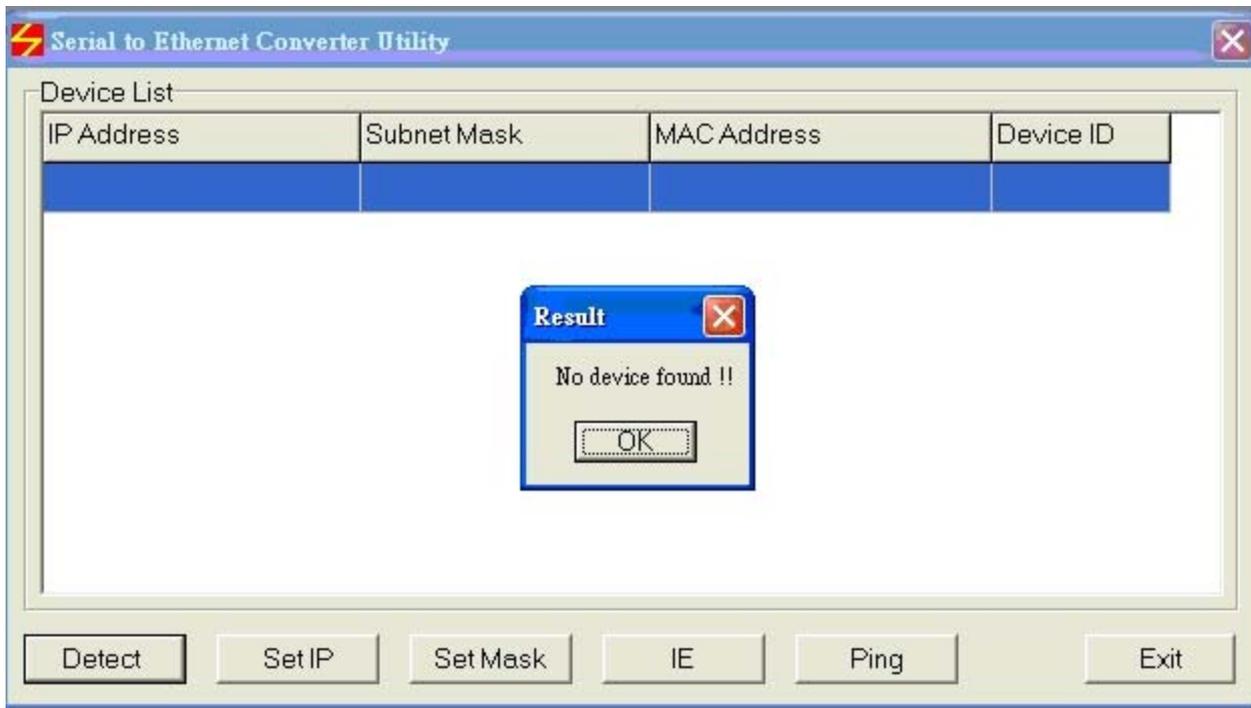


## Detect

Click [Detect] button to search the on-line TRP-C36 status. If TRP-C36 was properly installed it will be detected and found.



If TRP-C36 was improperly installed it will not be found or detected.

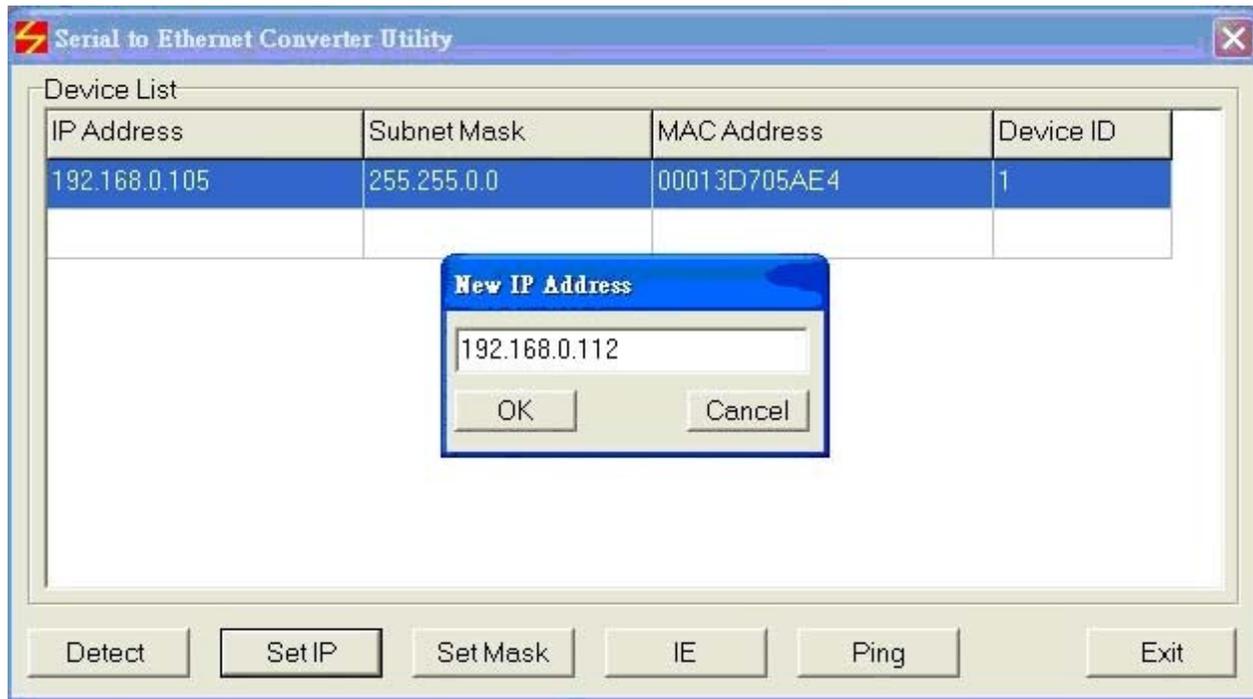


## Notice:

To assure STOEC utility run detecting process it is highly recommended user close XP firewall protection software.

## Set IP

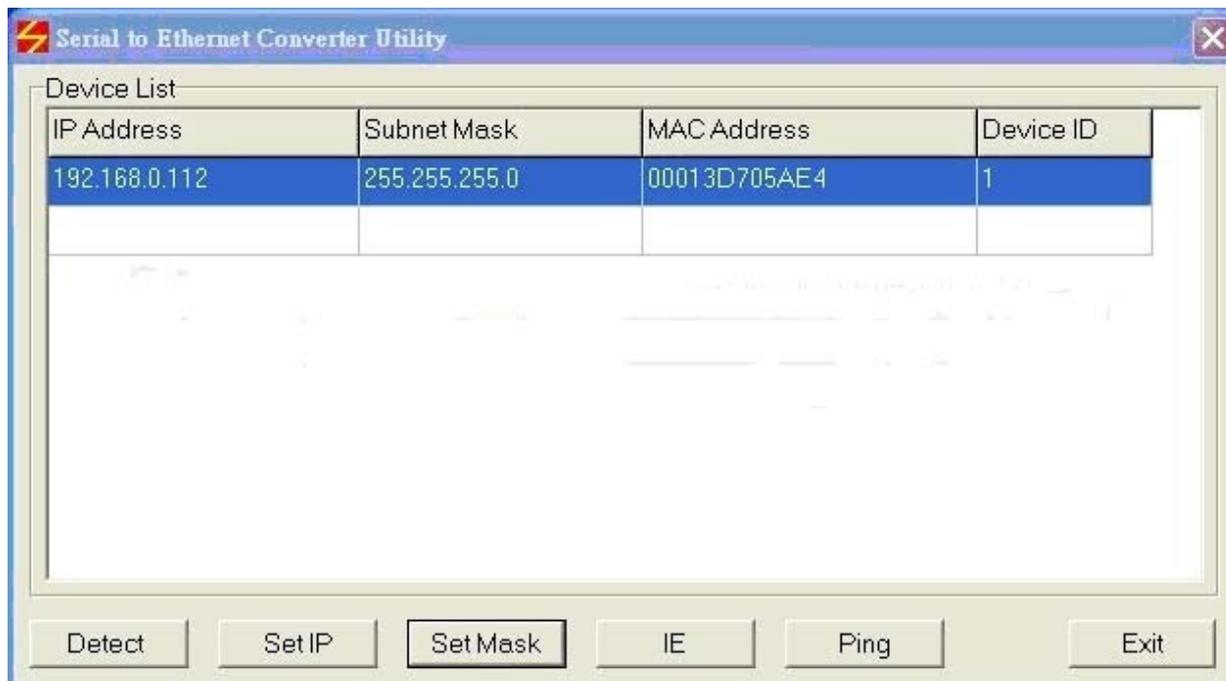
Click [Set IP] button



User can set IP address here. Suppose user set IP address to be 192.168.0.112, Press [OK]



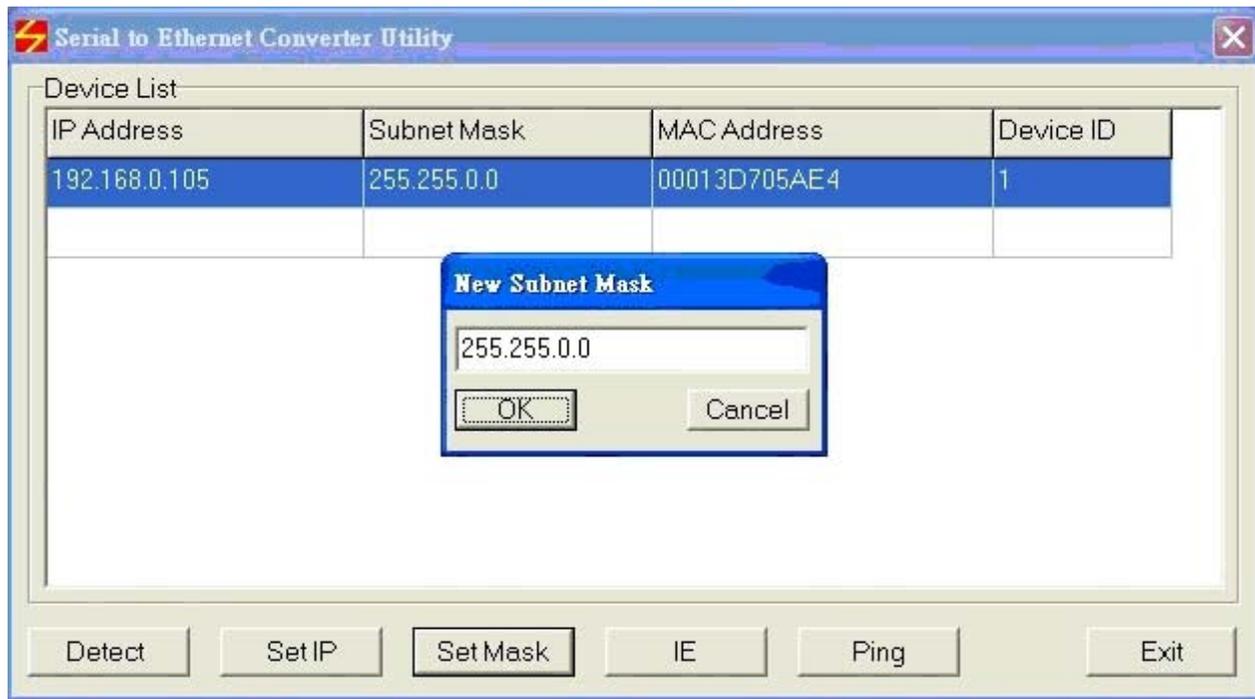
The IP address change to 192.168.0.112



Warning : **\*\*\*.\*\*\*.\*\*\*.0** and **\*\*\*.\*\*\*.\*\*\*.255** are invalid IP address for TRP-C36. If we input these IP address TRP-C36 will be locked

## Set Mask

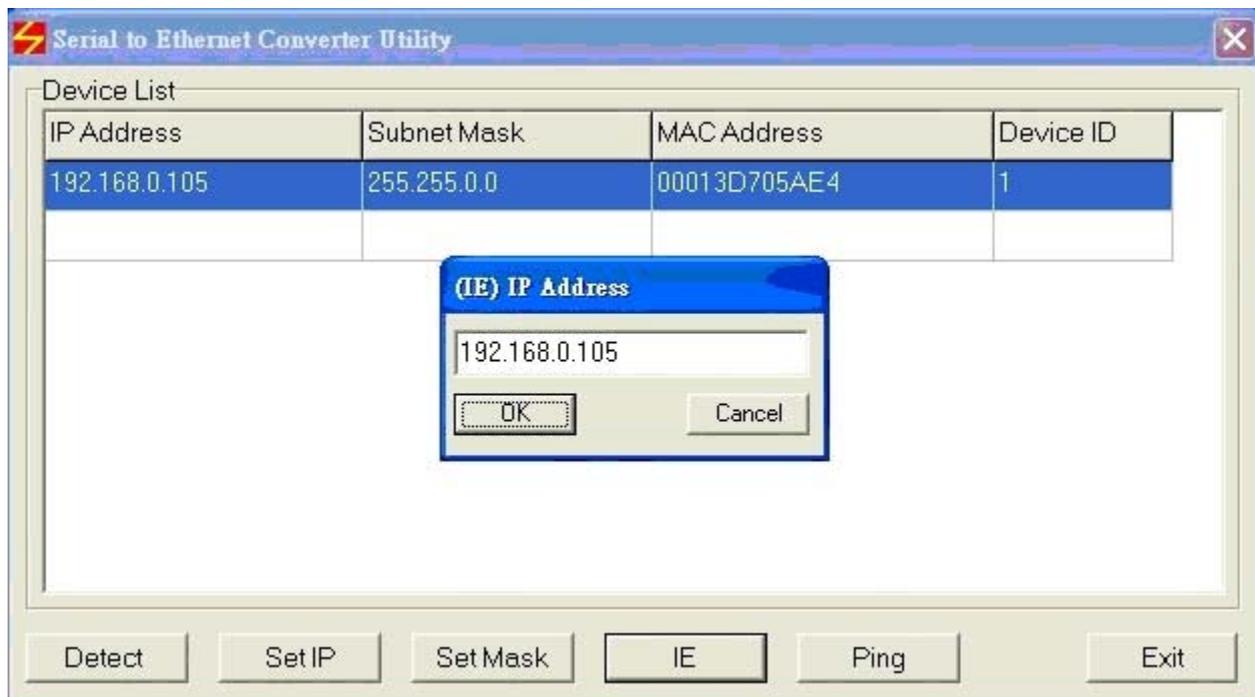
Click [Set Mask] button



User can set Subnet Mask, the process is same as **Set IP**

## IE

Click [IE] button



If the IP address same as TRP-C36 IP address, then Press [OK] into the login page. .

## Controller Status

System time elapsed	00:00:10
Firmware version	Jan 19 2005 15:58
Serial number	N51B3A-3D705AE4

## Setup Login

Password

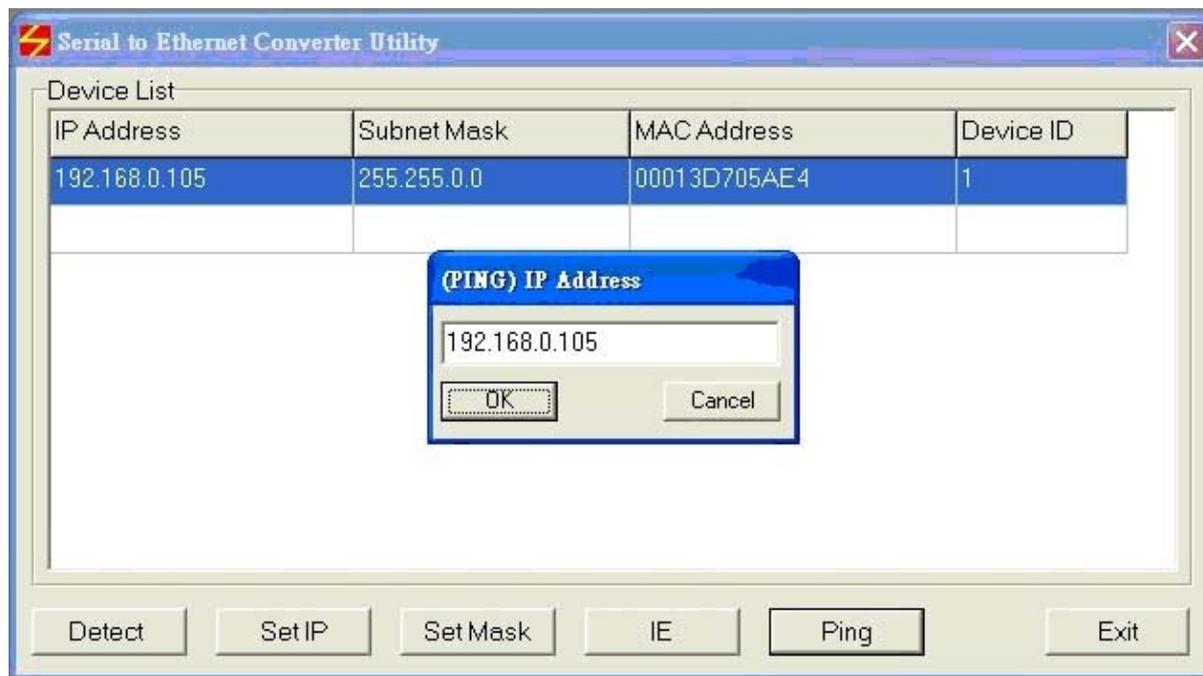
Login

### NOTICE:

TRP-C36 hardware Gateway address must be same as the computer Gateway address, or the Login frame will not be found.

### Ping

Click [Ping] button



Press [OK], if ping successfully following page will be shown.

```
Pinging 192.168.0.105 with 32 bytes of data:

Reply from 192.168.0.105: bytes=32 time=9ms TTL=128
Reply from 192.168.0.105: bytes=32 time=9ms TTL=128
Reply from 192.168.0.105: bytes=32 time=9ms TTL=128
```

If ping fail following page will be shown

```
Pinging 192.168.0.106 with 32 bytes of data:

Destination host unreachable.
Destination host unreachable.
Destination host unreachable.
```

**EXIT**

Press [EXIT] button to stop setting

**5. How to configure TRP-C36**

Setup of TRP-C36 is as easy as surfing on WWW, no special software will be required. The setup process can be easily done by popular Browsers, such as IE, or Netscape. In the browser URL field, set the IP address of device directly, the login page will be shown:

**Controller Status**

System time elapsed	00:00:10
Firmware version	Jan 19 2005 15:58
Serial number	N51B3A-3D705AE4

**Setup Login**

Password

**System time elapsed:**

The time elapsed since start of this device in [Day Hour: Minute: Second] format. This information can be useful in identifying the reliability of system.

**Firmware release date:**

TRP-C36 firmware is identified by date code. This information will be required by original manufacturer when technical support.

**Ethernet address:**

This is an unique MAC (Media Access Control) address used by Ethernet in hex format, 6 digits.

**Password:**

This field is the administration password for authentication. Factory default is empty. However, it is not recommended leave it empty in field operation.

**TRP-C36 uses the same password protection mechanism commonly used in Windows NT or UNIX. If there are more than 3 consecutive times failure in password check during the login process, the login function will be disabled, even if user supply correct password, the login will not proceed. This prevents intruders find password by computer to generate program. User may revert TRP-C36 to factory default by pressing reset button, and login again.**

**5-1. Start to Setup**

After successfully login, the setup page will be shown as following:

## Controller Setup

IP address	<input type="text" value="192.168.0.105"/>
Subnet mask	<input type="text" value="255.255.0.0"/>
Gateway address	<input type="text" value="0.0.0.0"/>
DHCP client	<input type="text" value="Disable"/>
Socket port of HTTP setup	<input type="text" value="80"/>
Socket port of serial I/O	<input type="text" value="100"/> <input type="text" value="TCP Server"/>
Socket port of digital I/O	<input type="text" value="101"/> <input type="text" value="TCP Server"/>
Destination IP address / socket port (TCP client and UDP)	<input type="text" value="0.0.0.0"/> <input type="text" value="0"/>
Serial I/O settings (baud rate, parity, data bits, stop bits)	<input type="text" value="9600"/> <input type="text" value="N"/> <input type="text" value="8"/> <input type="text" value="1"/>
Interface of serial I/O	<input type="text" value="RS 485 (Half Duplex)"/>
Console command control	<input type="text" value="Disable"/>
Packet mode of serial input	<input type="text" value="Disable"/>
Device ID	<input type="text" value="1"/>
Report device ID when connected	<input type="text" value="Disable"/>
Setup password	<input type="text"/>
Access password	<input type="text"/>

### IP Address

The IP address of TRP-C36 device is 4 digits, separated by '.' (xxx.xxx.xxx.xxx). If DHCP client mode is enabled and there's DHCP server on the network, this field will be assigned by DHCP server automatically.

### Subnet mask

Subnet mask of the network which TRP-C36 device connected to, 255.255.255.0 is usually used for small network, 255.255.0.0 for larger network. If DHCP client mode is enabled and there's DHCP server on the network, this field will be assigned by DHCP server automatically.

### Gateway address

Gateway IP addresses. 'Gateway' is a device which connects local network to external network. If there's no gateway on the network, just leave it as 0.0.0.0. If DHCP client mode is enabled and there's DHCP server on the network, this field will be assigned by DHCP server automatically.

## DHCP client

DHCP client mode enable/disable. If DHCP is disabled, IP address, Subnet mask, Gateway address should be manually assigned.

## Socket port of HTTP setup

The socket port used in the setup of TRP-C36. Normally, HTTP protocol use TCP port 80 for communication. Change this field may move HTTP port to 81, and leave port 80 for user's own Web.

**If HTTP port is changed to 81, the URL used for setup of TRP-C36 should be changed to "http://x.x.x.x:81", where x.x.x.x is the device IP address.**

## 5-1-6 Socket port of serial I/O

Socket port of UART data

Port: 16 bit number, from 1 to 65535

Socket type:

TCP Server	TCP protocol, passive open to be connected from TCP client.
TCP Client	TCP protocol, active open to connect to TCP server.
UDP	UDP protocol, connectionless

## 5-1-7 Socket port of digital I/O

Socket port of extra digital I/O.

## 5-1-8 Destination IP addresses / Socket port

The server IP address and socket port to be connected in TCP Client and UDP mode.

## 5-1-9 Serial I/O settings (baud rate, parity, data bits, stop bits).

Baud Rate	1200 - 115200 bps
Parity	None, Even, Odd
Data bits	7 or 8
Stop Bit	1 or 2

Due to the limitation of 8051 series UART hardware, the total length of asynchronous frame (start + data + parity + stop ) can only be either 10 or 11 bits, so the possible combinations are:

10 bits: N,7,2 E,7,1 O,7,1 N,8,1

11 bits: E,7,2 O,7,2 E,8,1 O,8,1 N,8,2

## 5-1-10 Interface of serial I/O

Auto	
RS-232	TxD, RxD for data stream, no flow control
RS-232 (RTS/CTS)	TxD, RxD for data stream, RTS/CTS for flow control
RS-232 (RTS/CTS, DTR/DSR)	TxD, RxD for data stream, RTS/CTS for flow control. DTR for socket status, DSR for socket open/close control

RS-485 (Half duplex)	Half duplex RS-485 interface, RTS for driver enable/disable
RS-422 (Full duplex)	Full duplex RS-422 interface.

**TRP-C36 can auto detect interface of serial I/O, Select “Auto’ user may neglect others selections.**

### 5-1-11 Console command control

This feature will be available soon. The default value is “disable”

### 5-1-12 Packet mode of serial input

- Disable : Disable packet mode.
- Enable: Packet mode enable.

If packet mode is enabled, the data input from UART will be deferred until input buffer full, or, detection of packet gap in which no more characters arrived.

- Packet mode inter-packet timeout

Packet gap detection time constants, ranging from 10 to 3000 ms

### 5-1-13 Device ID

User assigned ID number. 0 - 65535

### 5-1-14 Report device ID when connected

In TCP mode, if report device ID enabled, when socket connected, TRP-C36 will immediately report device ID in following formats.

Serial I/O socket	nnnnnA[LF][CR]
Digital I/O socket	nnnnnB[LF][CR]

The total length is 8 bytes. Where nnnnn is 5 digit device ID assigned by user, [LF] is decimal 10, [CR] is decimal 13

### 5-1-15 Setup password

Administration password used in Login. The password can be empty or up to 15 character long.

### 5-1-16 Access password

Authentication password during socket connection can be empty or up to 15 character long. If password is empty, authentication is disabled. Otherwise, if authentication failed or no password supplied with 10 seconds, socket will be closed.

**Notice: Access password doesn’t mean Login password. But the Setup password is always same as Login password.**

## 5-2 Setup completely

Press [Update] Button, TRP-C36 will save all parameters into internal non-volatile memory and

then reboot. It takes about 5 seconds to complete the whole process, and a new login page will be presented. Press [Login] for double checking, or close the window to complete setup.



The screenshot shows a blue background with white text. At the top, the title "Controller Status" is centered. Below it is a table with three rows. The first row shows "System time elapsed" as "00:00:10". The second row shows "Firmware version" as "Jan 19 2005 15:58". The third row shows "Serial number" as "N51B3A-3D705AE4". Below the table, the title "Setup Login" is centered. Underneath, the word "Password" is followed by a white rectangular input field. Below the input field is a "Login" button.

Controller Status	
System time elapsed	00:00:10
Firmware version	Jan 19 2005 15:58
Serial number	N51B3A-3D705AE4

**Setup Login**

Password

## 6. Reset Settings to Factory Default

If by chance, you forget the setup password, or the incorrect settings making TRP-C36 unable to open, the following procedures can be used to return the TRP-C36 to factory default setting:

1. Turn off the power of TRP-C36 device.
2. Press the reset button and hold..
3. Turn on the power (DC Jack) of TRP-C36 device.

## 7. Firmware Upgrade

As TRP-C36 firmware always keeps on enhancing with latest technologies and network standards, if your applications need the latest release of firmware, you will receive a Win32 executable software to upgrade the firmware in TRP-C36 through network:

Connect TRP-C36 device to LAN. Firmware upgrade of TRP-C36 will not work on Internet. Set the target TRP-C36 device to have IP address in the same subnet as your host computer. In the DOS Prompt environment of Windows, execute the upgrade software you received with target TRP-C36 device IP address as the optional parameter. If you omit the target IP address, the upgrade software will try to find one automatically.

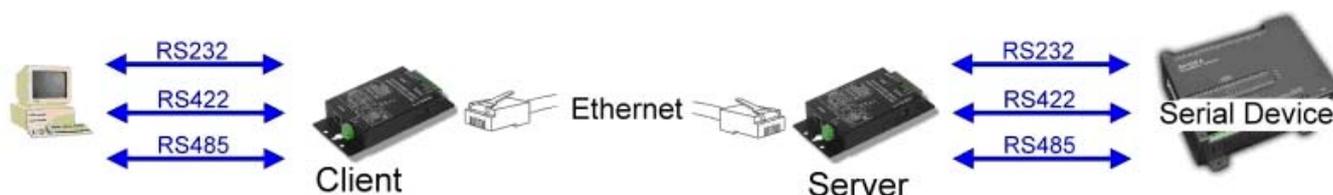
The upgrade will start immediately with percent finished display on screen. Wait until 100% complete. Please note during upgrade, do not stop the software or remove the power of TRP-C36 devices, it will cause permanent damage of firmware and can not be recovered.

## 8. Application

The TRP-C36 Ethernet serial server connects RS-232, RS-422 or RS-485 serial devices to an Ethernet LAN/WAN providing a reliable communication connection. The TRP-C36 Windows driver installs virtual COM ports in the Device Manager of the operating system. The virtual COM port is designed to establish a connection with the TRP-C36. This in turn will allow communications with the connected serial device in the same manner as a device connected to the COM port in a PC. The LAN becomes transparent to the serial device and the software running on the PC. TRP-C36 also offers a Heart Beat feature to insure a reliable communications connection.

The TRP-C36 can be configured as a TCP Client/Server or UDP. The TRP-C36 operates in “Paired Mode“, “Virtual COM” Mode”, and “Direct IP Mode”.

## 8.1 Paired Mode



Paired mode is also called serial tunneling. When this type of configuration is selected, No additional software is needed to install in a host PC. In fact a PC is not required to make the connection. Any two dumb serial devices that can communicate with each other through a serial link will be able to communicate using two TRP-C36 and the LAN.

Two TRP-C36 are configured with one setup as a TCP or UDP client and the other to TCP/UDP server. When setting up the Server, the Remote IP address section must contain the address of the Client. This will allow the Client’s IP address to pass the IP address-filtering feature of the Server. Conversely, the Remote IP address of the Client must contain the Server’s IP address.

### How to Setup TRP-C36 paired mode

#### 1. Configure TRP-C36 server.

IP address : 192.168.0.106 (for example)

Socket port of serial I/O: Port 1001 ,TCP Server

Socket port of digital I/O: port 101 , TCP Server

TRP-C36 Server		Controller Setup	
IP address	192.168.0.106		
Subnet mask	255.255.0.0		
Gateway address	0.0.0.0		
DHCP client	Enable		
Socket port of HTTP setup	80		
Socket port of serial I/O	1001	TCP Server	
Socket port of digital I/O	101	TCP Server	
Destination IP address / socket port (TCP client and UDP)	0.0.0.0	0	
Serial I/O settings (baud rate, parity, data)	9600 N 8 1		

## 2. Configure TRP-C36 Client.

IP address: 192.168.0.109 (for example)

**“TRP-C36 Client IP address must be different from TRP-C36 Server IP address”**

Socket port of serial I/O : 1001, TCP Client.

Socket port of digital I/O: 101, TCP Client

Destination IP address/Socket port (TCP client and UDP): 192.168.0.106, port 1001.

**The Client Destination IP address must be same as Server IP address (192.168.0.106), the Socket port number must be same as Server Socket port number” (1001)**

TRP-C36 Client		Controller Setup	
IP address	192.168.0.109		
Subnet mask	255.255.0.0		
Gateway address	0.0.0.0		
DHCP client	Enable		
Socket port of HTTP setup	80		
Socket port of serial I/O	1001	TCP Client	
Socket port of digital I/O	101	TCP Client	
Destination IP address / socket port (TCP client and UDP)	192.168.0.106	1001	
Serial I/O settings (baud rate, parity, data)	9600 N 8 1		

## 8.2 Virtual Com Mode



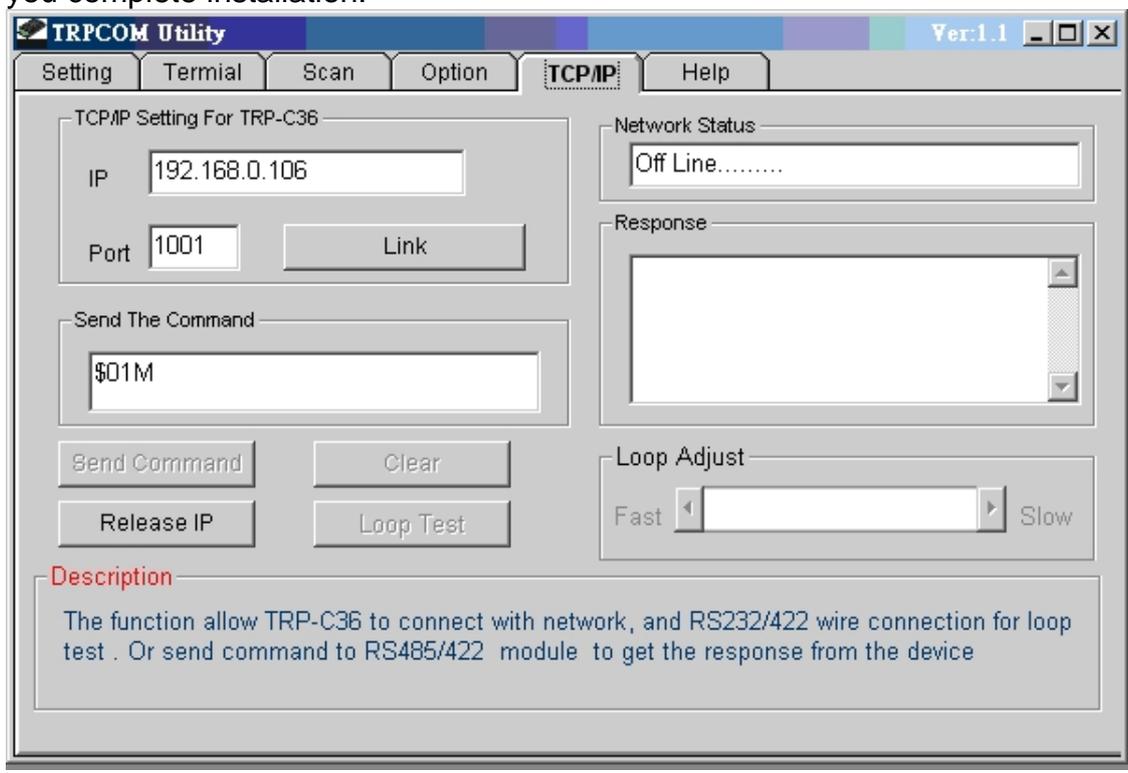
The Virtual COM mode requires the installation of a virtual COM port device driver. In this mode, the TRP-C36 must be set to either TCP/server or UDP/server in the menu with a designated communication port number.

The virtual COM driver is a TCP or UDP client. Once the connection is made, the LAN is transparent to the serial device. Applications work just as if the serial device is connected a host's physical COM port. The virtual COM port converts the application's data into IP packet destined for the TRP-C36, which in turn converts the IP packet back to serial data. Point # 9 will guide you setup Virtual COM mode.

### 8.3 Direct IP Mode mode

Direct IP connections allow applications using TCP/IP or UDP/IP network socket programs to communicate with the asynchronous serial port on the TRP-C36. In this type of application the TRP-C36 is configured to TCP or UDP server. The socket program running on the PC establishes a communication connection with the TRP-C36. The raw data is sent directly to and from the serial port.

**“TRPCOM Test Utility”** is demo utility which may help to test direct IP Mode .User may find the utility in the TRP-C36 disk. Double click **“Trycom Utility”**, the installShield Wizard will guide you complete installation.



## 9. About Virtual COM

User can find the virtual COM software in TRP-C36 disk.  
VserPortConsole\_2000 for Windows 2000

VSerPortConsole\_XP for Windows XP

TRP-C36 Virtual COM software do not support Windows 98/Me

How to set Virtual COM port

Run the "VserPortConsolem2000" utility.

**\*\* If user's operating system is Win XP or XP sp2 , it is strongly recommended to disable XP firewall before running VserPortConsole,\*\***

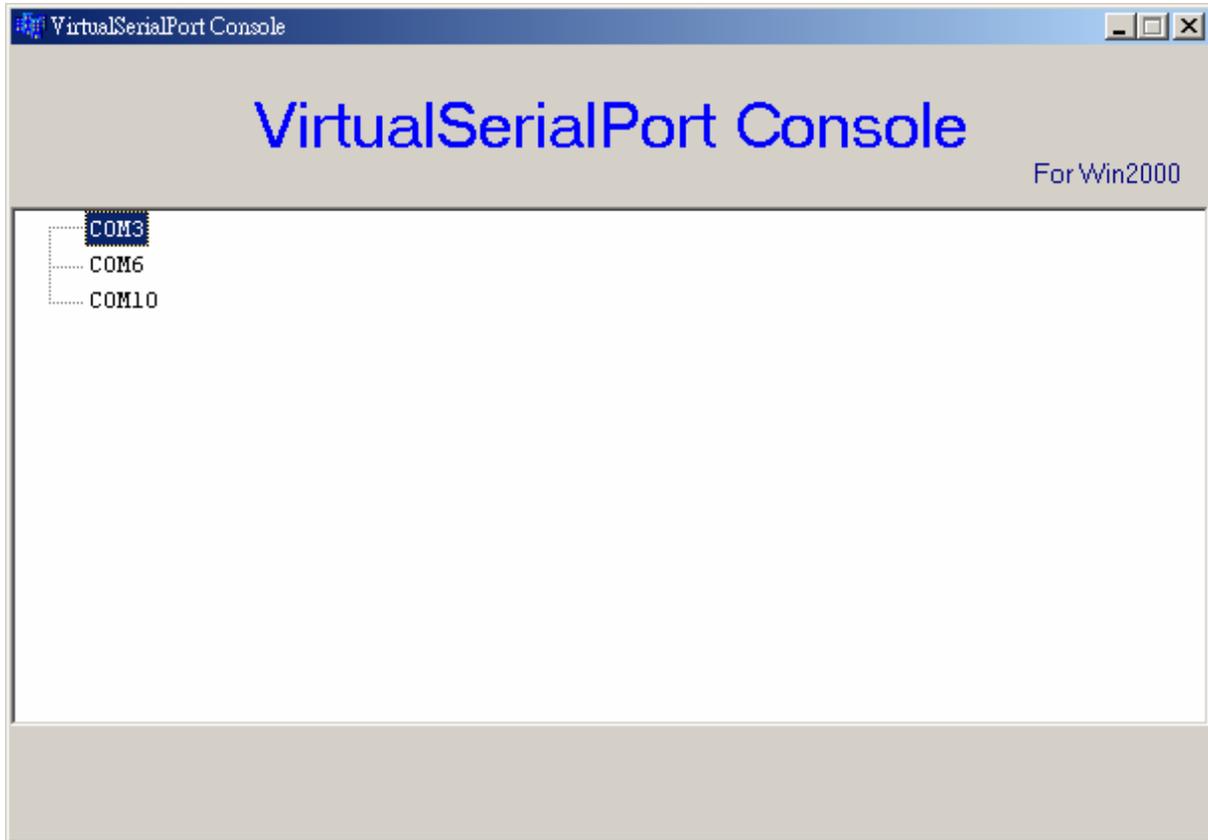


Fig.1

If no Virtual RS-232 port exist , the dialogue window is empty . Move your mice cursor to the place under VirtualSerialPort Console click the mice right button, you will see Fig.2 .

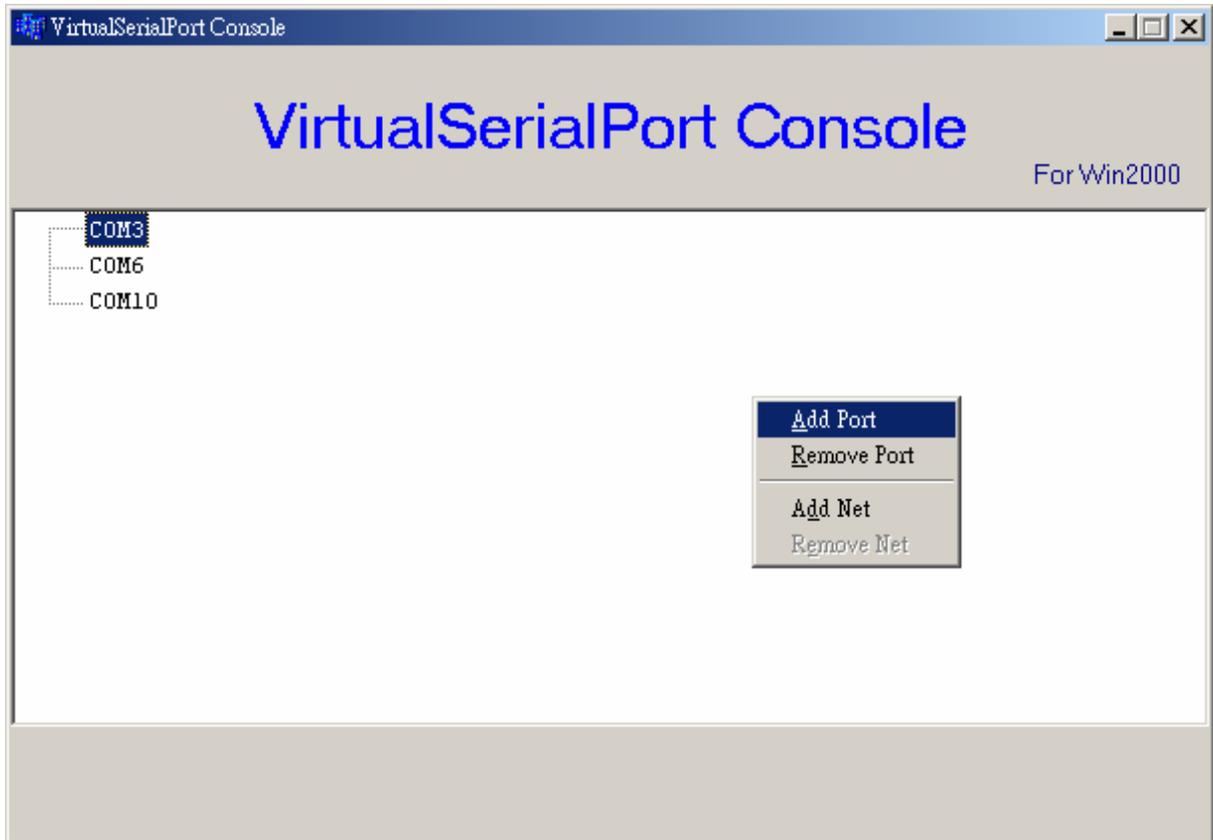


Fig.2

.Select “ Add Port” , wait for a while , you will see Fig.3. ◦

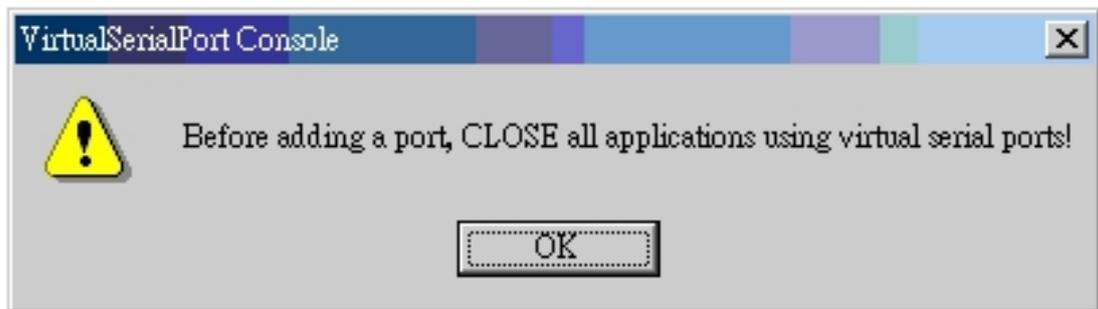


Fig.3

Click  you will see Fig.4



Fig.4

Click  go to Fig.5 , you will find there is a Virtual RS-232 port ◦

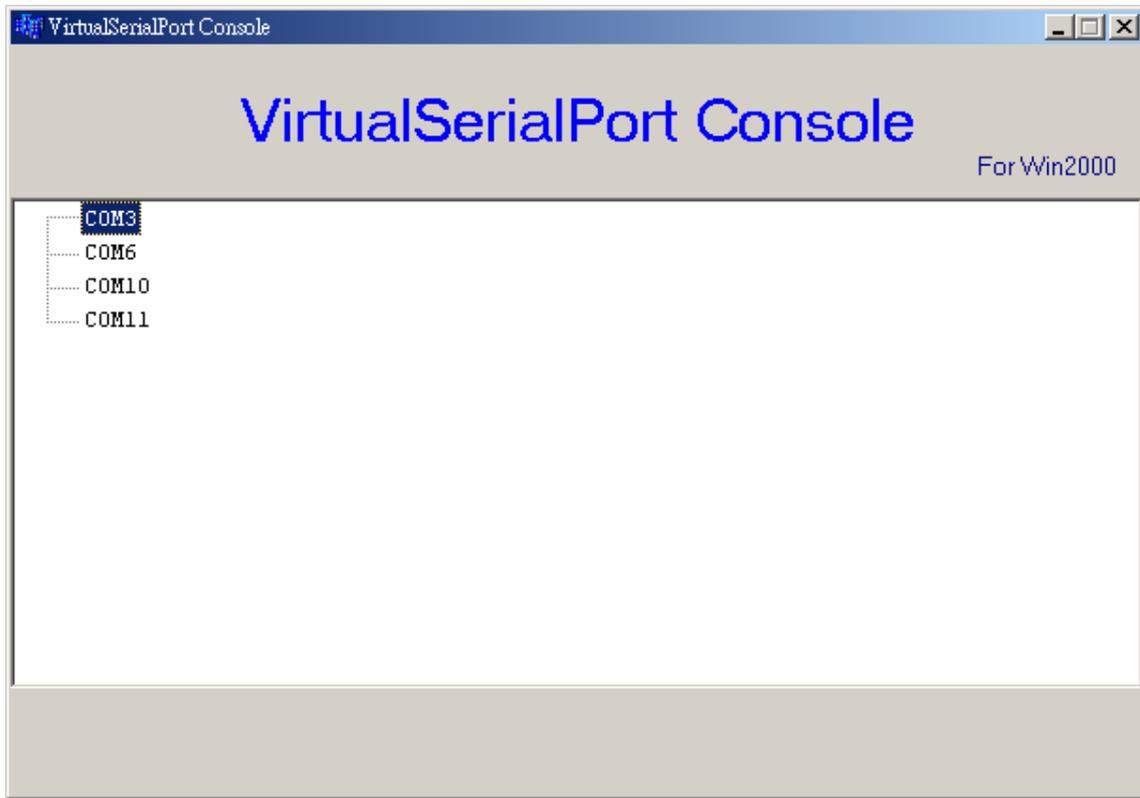


Fig.5

Move your mice cursor to the RS-232 port that you want to use (for example COM 11), and click the mice right button, you will see Fig.6. t

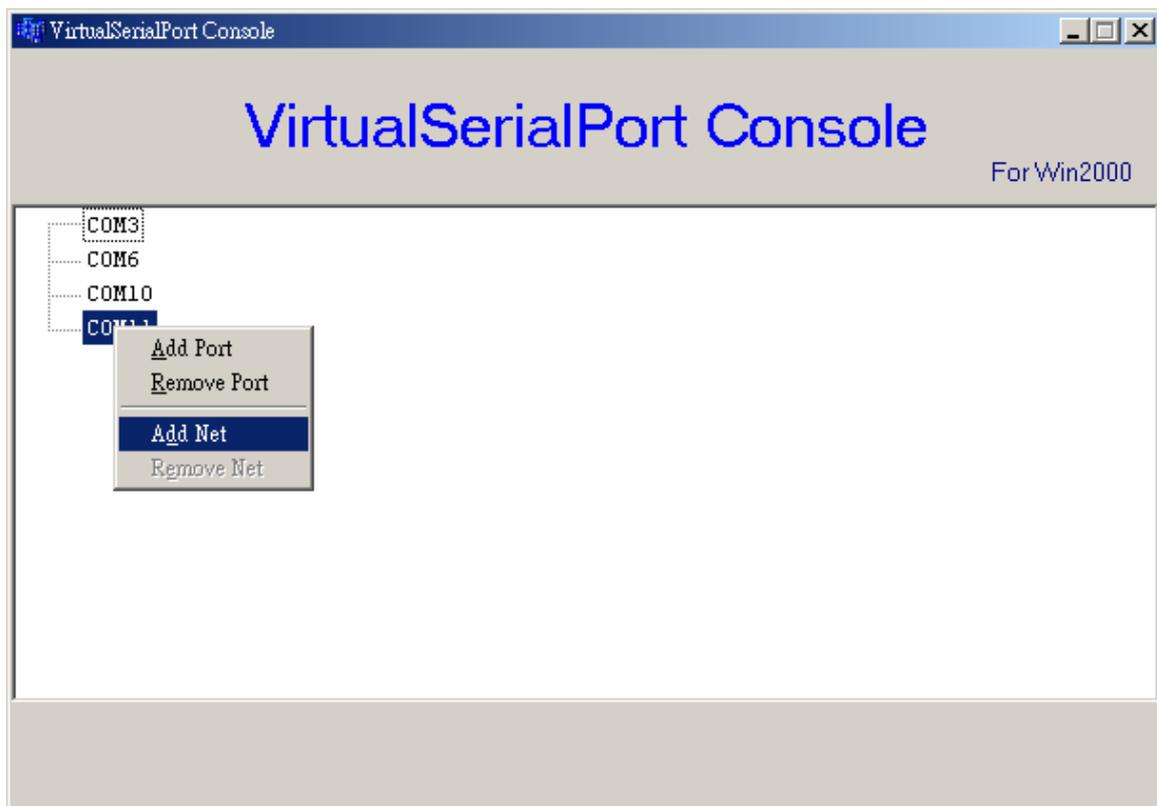


Fig.6

Select Add Net , you will see Fig.7. You can start the RS-232 port's TCP server 、TCP xlient or UDP setting ◦

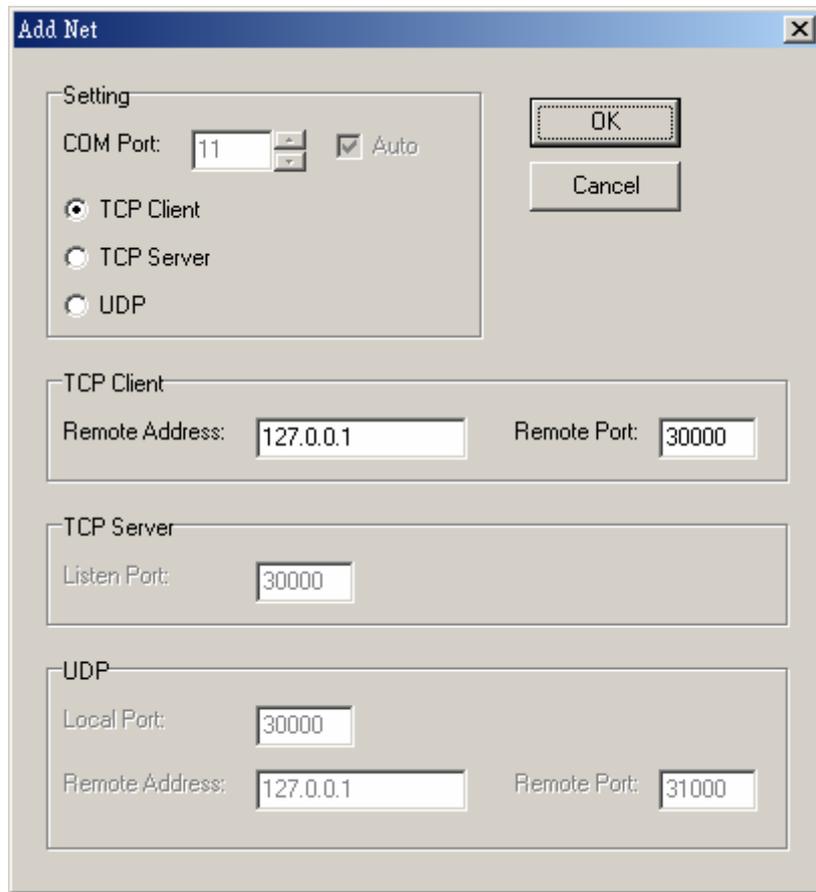


Fig.7

**Example:**

We select COM6 and COM10 for data communication by UDP protocol.

COM6.

Go to Fig.6, select COM6. for Add Net setting

Select UDP. (Fig.8)

Set Local port=30000 , IP = 127.0.0.1 , Remote port=31000 ◦

COM10

Go to Fig.6, Select COM10 for Add Net setting.

Select UDP. (Fig.8)

Set Local port=31000 , IP = 127.0.0.1 , Remote port=30000 ◦

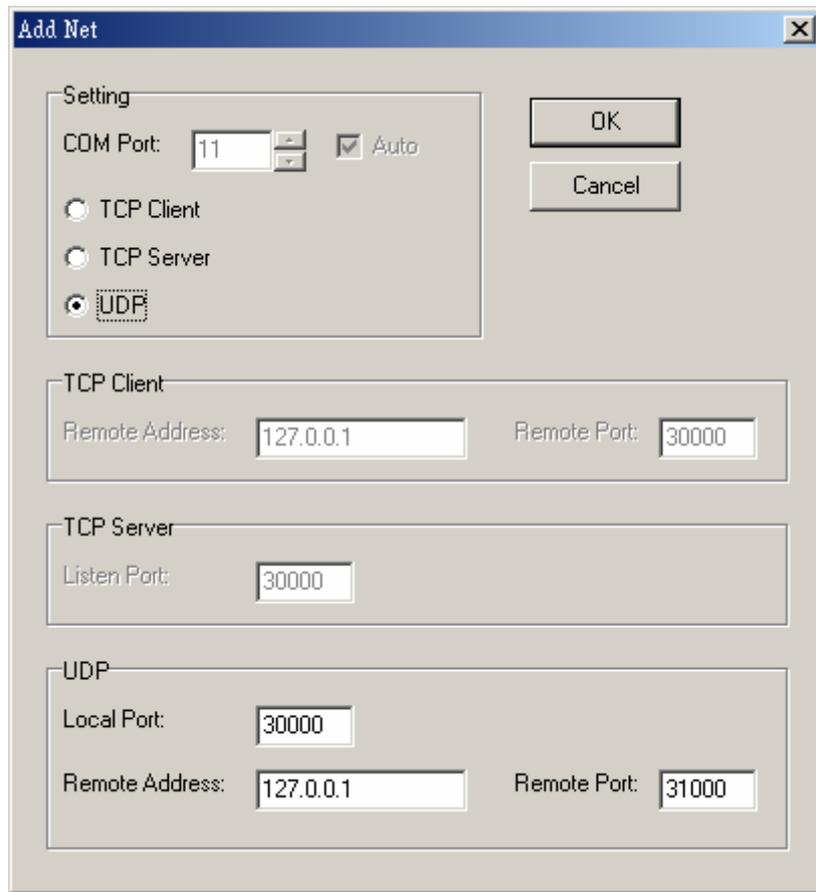


Fig.8

After COM6 and COM10 setting , you will see the Fig.9 .

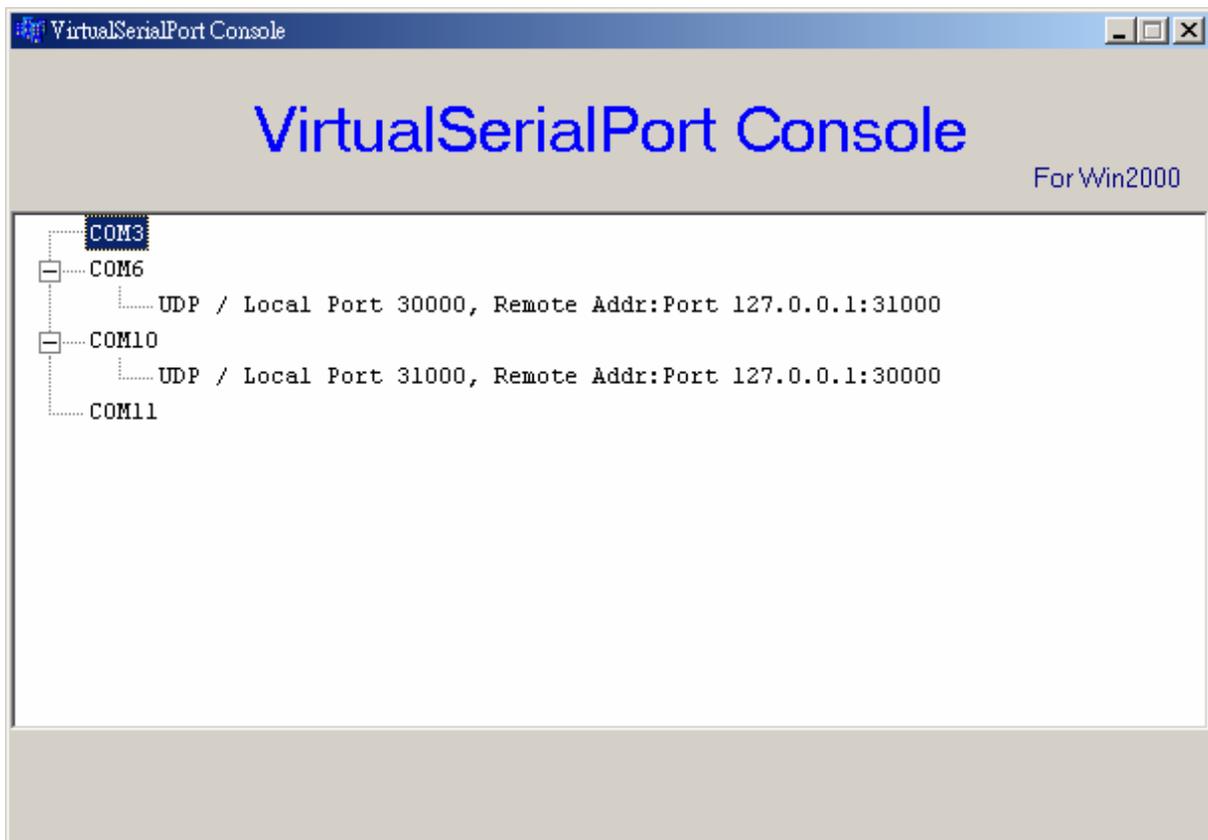


Fig.9

Use **TRPCOM utility** to open the com port that you had already assigned. You are able to proceed with data communication. See Fig 10.

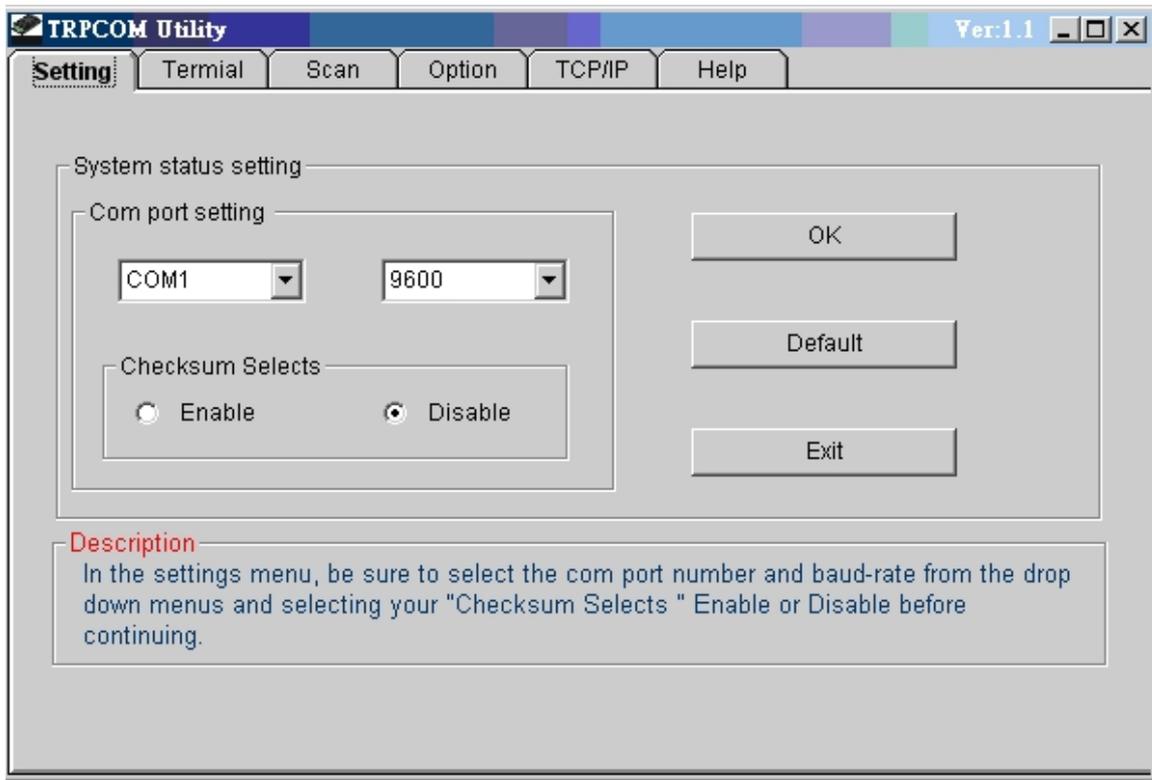


Fig.10

.Click [Terminal] then input the command to RS-485 device or Test loop back, you'll get response.

See

fig

11..

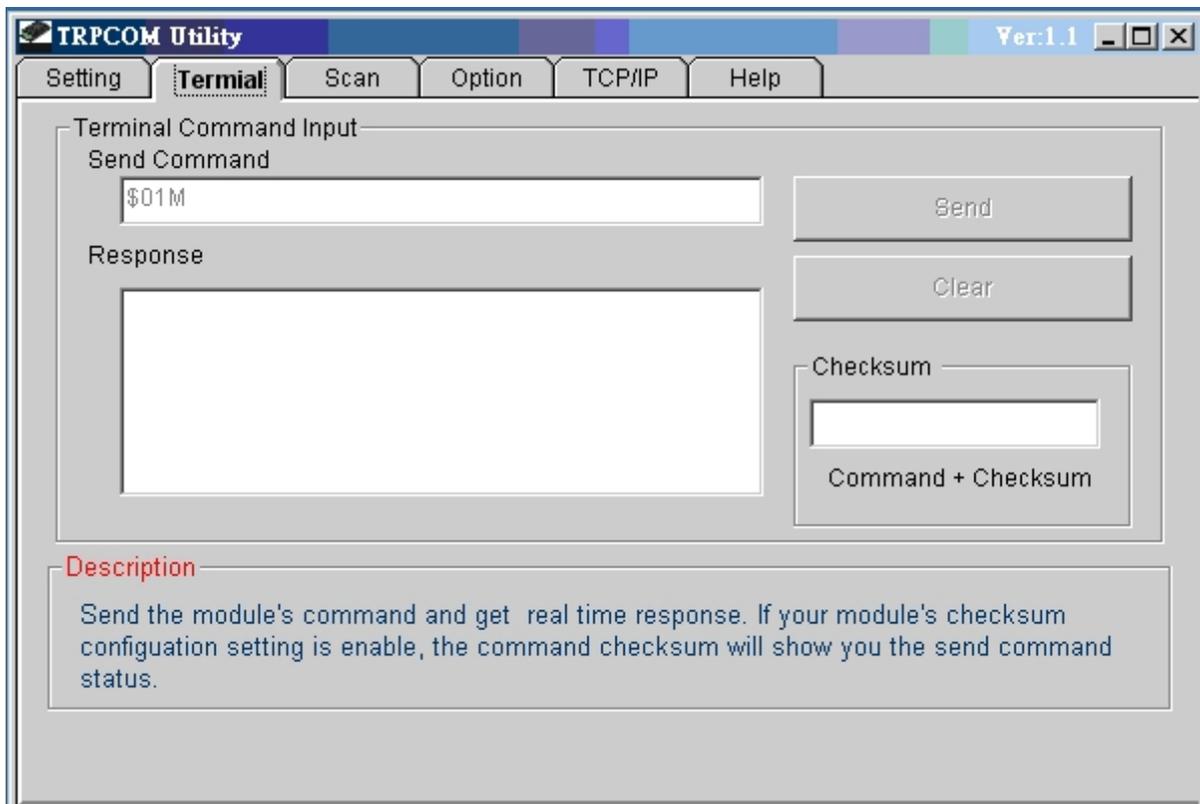


Fig 11

User can directly link TRP-C36 to Trycom Remote IO Modules by RS-485 , The basic wiring

connect See Fig 12

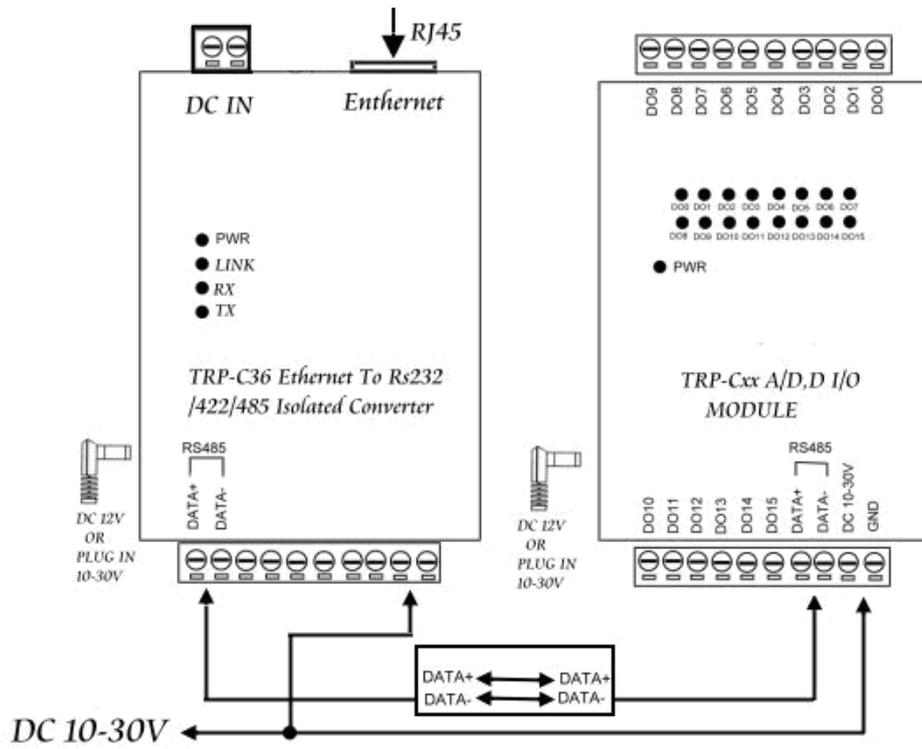


Fig 12