

TRP-C37

Ethernet to RS232/422/485 Converter



User's Manual

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1. Introduction

TRP-C37 is suitable industrial environment Ethernet serial server, wide range power input and serial communication protection, Built-in surge, over current, over voltage ensure RS422/485 serial communication quality; Increase watchdog function will auto reset when Ethernet serial server or power fail, if careless lost password or wrong setting value that can fast back to factory by external switch.

TRP-C37 support 3 operates mode, "Direct IP Mode", "Virtual COM Mode", and "Paired Mode", RS232 interface has one D-SUB 9pin connector and screw terminal block for RS422/485. The Ethernet port support Auto-MDIX and Auto-select 10/100MB.

TRP-C37 offers maximum connection 16 host clients to link the one serial server, it is easy to operate in Modscan32 and Modbus Poll many application uses Virtual-COM mode and Pair Mode.

TRP-C37 provides a watchdog timer function, The Watchdog timer allows the system to automatically recover from a system crash. When the TRP-C37 MCU stop working correctly, the watchdog timer waits for a preset period of time, and performs a hardware reset. When TRP-C37 working at unstable voltage industrial environment, the power detection circuit can prevent the power fail cause of the boot fail then auto re-boot.

1-1 Features

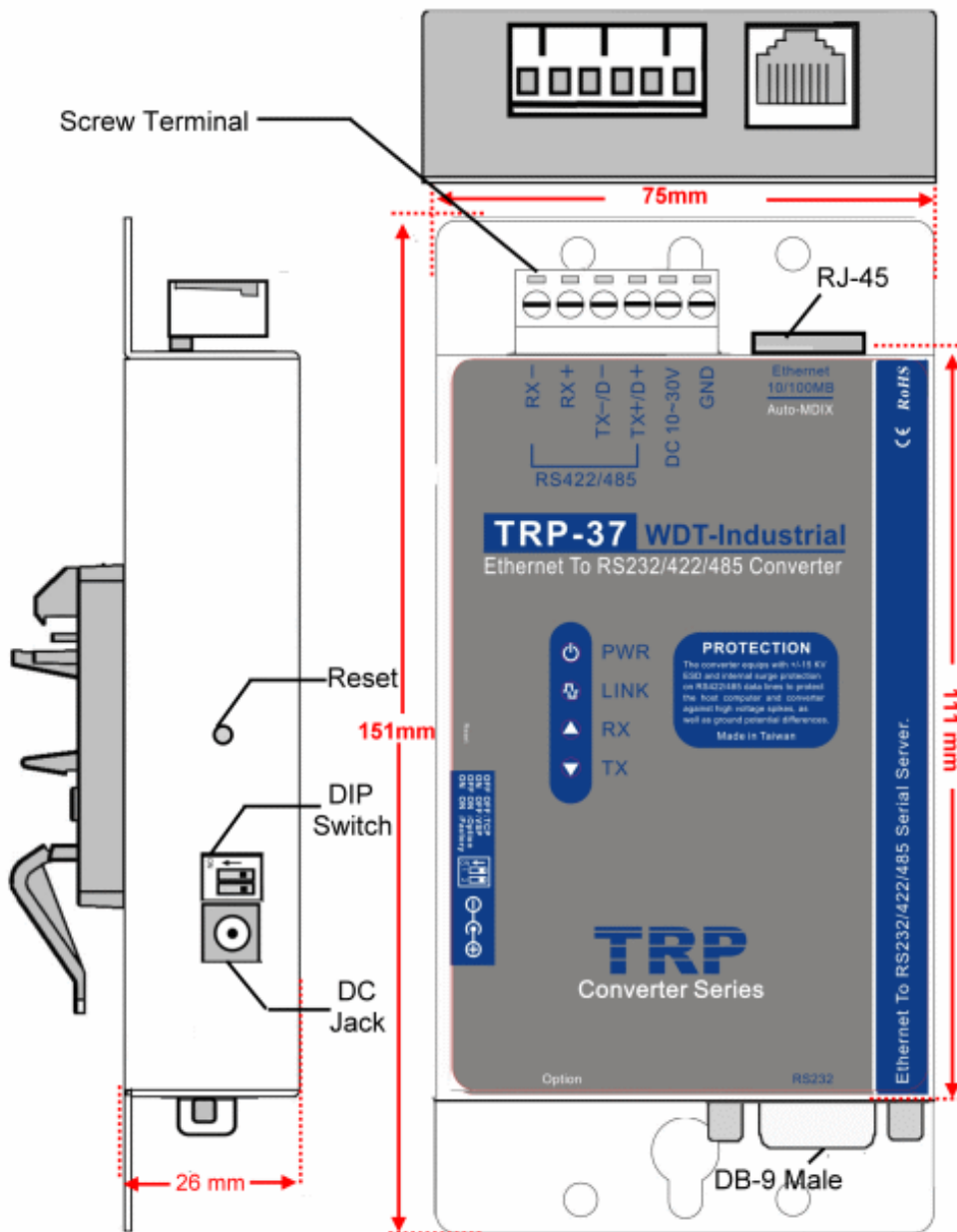
- Wide range DC input power supply.
- Support watchdog function prevents system fail.
- Support Auto-MDIX twisted pair crossover detection and Auto-Correction.
- Maximum Connection 16 Client PC at Server Mode.
- Auto fast Bi-direction RS485 hardware.
- Surge protection and over current and over voltage on RS-422/485 data lines.
- Support baud rate from 1200~921600Kbps.
- Auto switching RS-232/422/485 signal.
- Virtual COM drivers for Windows 98/WIN2000/WIN XP/Vista/WIN2003/WIN 7.
- Virtual Com Support Server, Client, UDP mode.
- Fully compatible with Ethernet and TCP/IP protocol.
- Supports 10/100 Mbps Ethernet.
- Power/Link/RX/TX mode LED indicator.
- Heart Beat function ensures a reliable communicating connection.
- Auto Pair-mode when power or Ethernet fail.
- Back to factory by external switch.
- Support configuration by serial console.
- Update the firmware from Ethernet.
- Dual power input select from screw terminal or DC-jack.

1-2 Specification.

- Power Input Voltage: DC +10V to +30V.
- LAN: Auto-MDIX, 10/100 Mbps Auto-detecting.
- RS-232: TX, RX, RTS, CTS, DTR, DSR, DCD, GND.
- RS485 signal: differential 2 half-duplex wires (DATA+, DATA-).
- RS422 signal: differential 4 full-duplex wires.(TX+,RX+,TX-,RX-)
- Data Rate: 1200,2400,4800,9600,19200,38400,57600,115200,921600 K bps .
- Parity: none, even, odd.
- Data Bits: 5, 6, 7 or 8.
- Stop Bits: 1, 1.5 or 2.
- Protocol: TCP, IP, ARP, DHCP, Telnet, HTTP, UDP, ICMP
- External switch: OFF OFF :TCP and VSP mode.
 ON OFF : Option .
 OFF ON :Option.
 ON ON :Back to Factory.
- Virtual-Com mode support RS232 TXD,RXD,GND.
 RS422 TX+,TX-,RX+,RX-.
 RS485 DATA+,DATA-.
- Power supply: Screw terminal or DC jack.
- Serial interface: +/-15 KV ESD.
- RS422/485 interface: Surge, over current, over voltage protection.
- Power consumption: 12V/140mA.
- Operating Temperature:-10 to 65 °C.
- Humidity: 0~90% Non-Condensing.
- Dimensions: 151(L)*75(W)*26(H) mm.
- Weight: 395g with packing.

2. Hardware Description

2-1. Panel layout



Notice: User can only choose either external DC-Jack or Screw terminal DC input. Do not use external DC-Jack and screw terminal DC input simultaneously.

2-2. LED indicator

PWR LED: System is ready.(Blinking)

LINK LED: Ethernet cable connection and data active.

TX/RX LED: UART Transmitting/Receiving Indicator.

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

2-3. Reset Button

Push the reset button will Re-Boot.

2-4. DIP Switches

A double DIP switch allows the TRP-C37 to be placed into TCP/Option/Factory Mode.

- OFF OFF: Normal mode.
- ON OFF: Option.
- OFF ON: Option.
- ON ON: Back to factory.

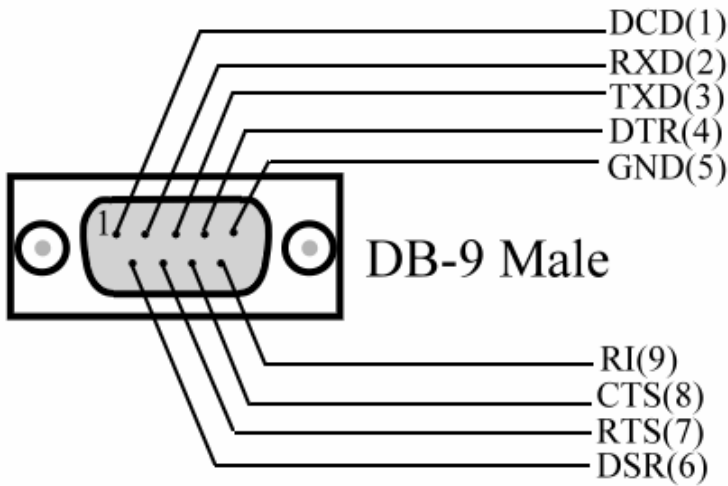
2-5.Factory Setting

Factory Setting: ***Adjust the external switch to ON ON will back to factory.**

Device Name	<input type="text" value="TRP-C37"/>	Module Name	<input type="text" value="TRP-C37"/>
MAC Address	<input type="text" value="00-0E-C6-00-02-15"/>	Netmask	<input type="text" value="255.255.255.0"/>
DHCP	<input type="text" value="Enable"/>	Gateway	<input type="text" value="192.168.1.3"/>
<input checked="" type="radio"/> Server/Master		DNS Server	<input type="text" value="168.95.1.1"/>
Listening IP	<input type="text" value="192.168.1.1"/>	Transmit Timer (ms)	<input type="text" value="10"/>
Data listening port	<input type="text" value="4000"/>	Heart Beat	<input type="text" value="Disable"/>
<input type="radio"/> Client/Slave		Maximun Connection	<input type="text" value="1"/>
UID Range		TCP Keep Alive Timer	<input type="text" value="7"/>
Client/Slave IP Address		New Password	<input type="text" value="*mask*"/>
Port		Firmware Version	<input type="text" value="355"/>
<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="192.168.1.2"/>	<input type="text" value="4000"/>	
<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	
		Data Packet Type	Management Packet Type
		<input type="checkbox"/> UDP	<input checked="" type="checkbox"/> Broadcast
		<input type="checkbox"/> Auto connect after reboot	<input type="checkbox"/> Multicast
		<input checked="" type="checkbox"/> TCP	

Network Setting	Serial Port Setting
Baud rate	<input type="text" value="9600"/>
Data bits	<input type="text" value="8"/>
Parity	<input type="text" value="None"/>
Stop bits	<input type="text" value="1"/>
Flow Control	<input type="text" value="None"/>

2-6. D-sub 9 Pin male Configuration



3. Install TRP-C37 Hardware

STEP1: Connect power source with TRP-C37, the PWR LED will blinking.

STEP2: Connect TRP-C37 with LAN port by RJ45 cable.

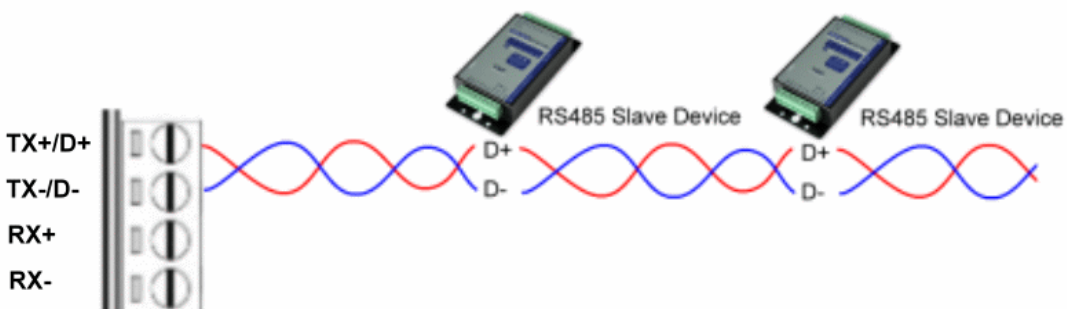
If the cable is properly connected the "LINK" LED will light up.

*The TRP-C37 Support Auto-MDIX, A straight-through or crossover RJ45 cable can be used to make a connection directly to the HUB/Router/PC LAN port.

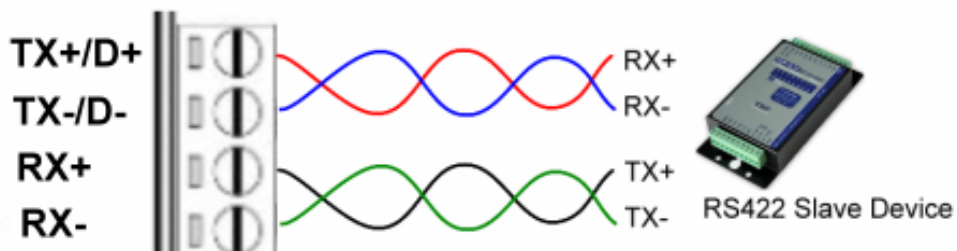
STEP3: Connect TRP-C37 to RS232 device by Null-Modem cable (Maximum 15M).

Connect TRP-C37 to RS422/485 by AWG #12~30 wires (Maximum 1.2KM).

3-1. RS485 Wiring

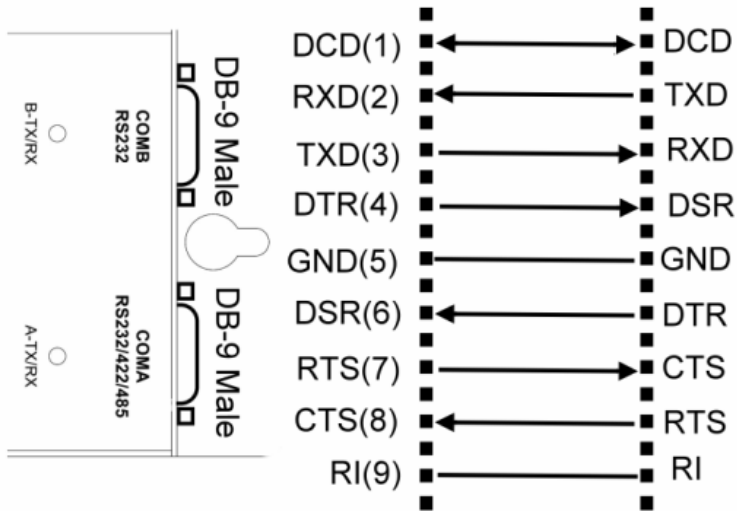


3-2. RS422 Wiring



3-3. RS232 Wiring

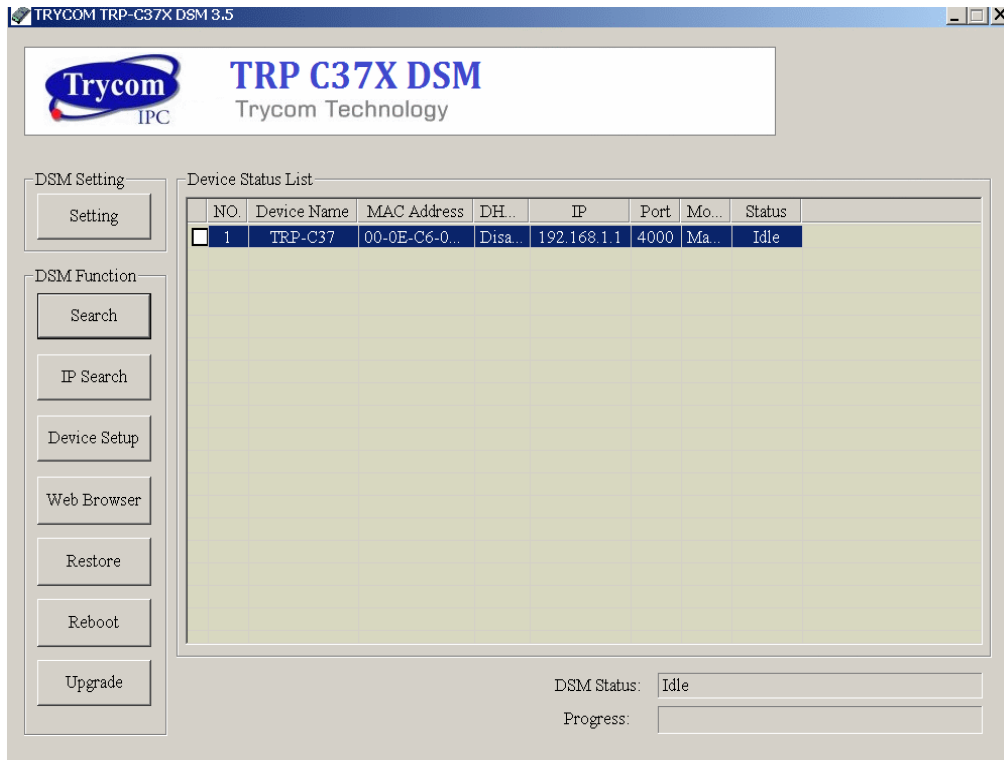
Refer to the Pin out table for connections.



4. How to configure TRP-C37

There are 3 ways to access the TRP-C37.

a. TRP-C37X DSM Software.



b. WEB Server



TRP-C37
WDT-Inside

Ethernet to RS232/422/485 Serial Server

Serial Settings

Data Baud Rate	9600
Data Bits	8
Data Parity	None
Stop Bits	1
Flow Control	None

Network Settings

<input checked="" type="checkbox"/> Enable DHCP	
Static IP Address	192.168.1.1
Static Subnet Mask	255.255.255.0
Static Default Gateway	192.168.1.3
Static DNS Server	168.95.1.1
Connection Type	TCP
Transmit Timer	10

Server/Client

Server/Client	Server
Server:	
Server Listening Port	4000
Client:	
Destination IP	192.168.1.2
Destination Port	4000

New Password

<input type="password" value="...."/>
<input type="checkbox"/> Enable Reboot
Apply Reset

c. Serial Console.

```

CONSOLE.EXE
-----
Trycom Technology Co.,Ltd
TRP-C3X Console Ver 2.0

-----
Firmware Version : 1126

-----
Device Name      : TRP-C37
MAC Address      : 00-0E-C6-00-01-B7
DHCP             : Enable
Server          : Enable
  Listening IP    : 192.168.1.1
  Listening Port  : 4000
Client          : Disable
  Destination IP : 192.168.1.2
  Destination Port : 4000
UDP            : Disable
  Auto Connect  : Disable
TCP           : Enable
Broadcast     : Enable
Multicast     : Disable
Netmask       : 255.255.255.0
Gateway      : 192.168.1.3
DNS          : 168.95.1.1
Transmit Timer : 10
Heart Beat   : Disable
Maximun Connection : 1
TCP Keep Alive : 1
New Password : XXXX

Serial Port Setting
Baud Rate    : 9600
Data Bits    : 8
Parity       : NONE
Stop Bits    : 1
Flow Control : NONE

Note :
(↑↓) Move , (←) Select , (→) Back , F2 Save , (ESC) For Exit

```

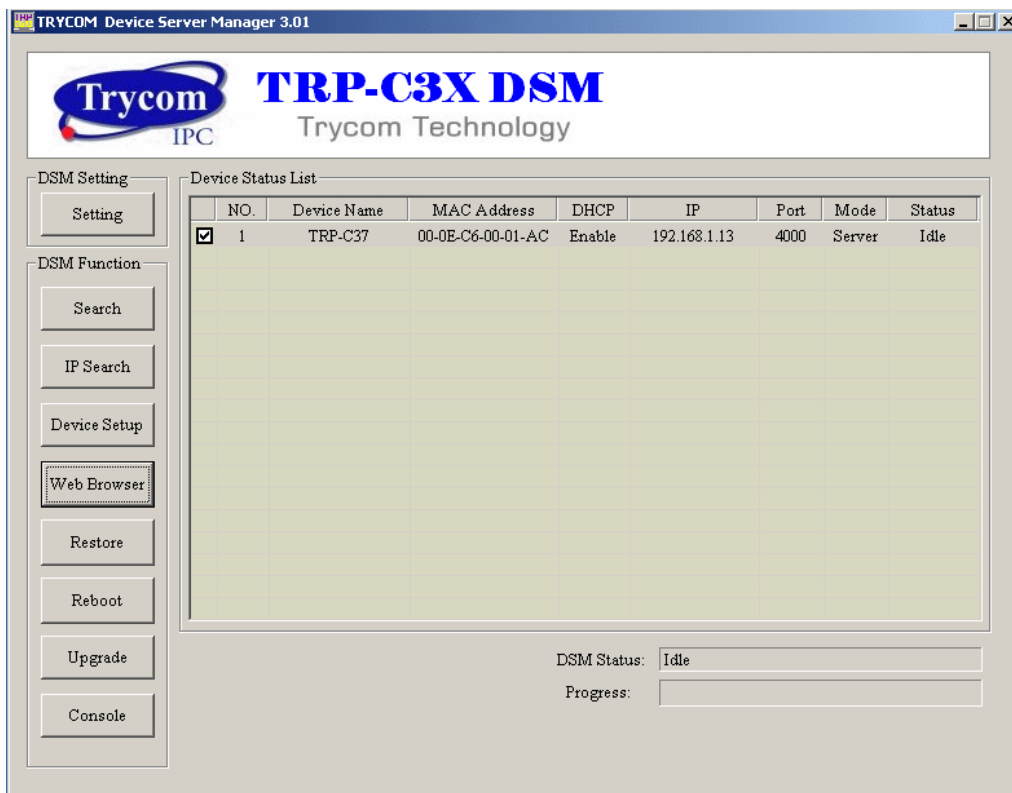

4-1. Using TRP-C37X DSM Utility.

The “TRP-C37X DSM utility” software performs several functions:

- A: Searching for TRP-C37 connected to the network.
- B: Displaying and changing the configuration of TRP-C37.
- C: Upgrading the TRP-C37 firmware.
- *Refer the Firmware upgrade help file.
- D: Saving and Loading Configuration from external log File or EEPROM.

4-2. Searching LAN for TRP-C37

Once TRP-C37 is connected to the LAN the TRP-C37X DSM software will search it and display it in a window by name, IP address, Mac....Information.



4-3. Configuring Server Properties

Select the “NO.” item and Double click to open the Server configuration, after setting then click “Submit” will save the configuration to EEPROM.

Device Name	<input type="text" value="TRP-C37"/>			Module Name	<input type="text" value="TRP-C37"/>
MAC Address	<input type="text" value="00-0E-C6-00-02-15"/>			Netmask	<input type="text" value="255.255.255.0"/>
DHCP	<input type="text" value="Enable"/>			Gateway	<input type="text" value="192.168.1.3"/>
<input checked="" type="radio"/> Server/Master	Listening IP <input type="text" value="192.168.1.1"/>			DNS Server	<input type="text" value="168.95.1.1"/>
	Data listening port <input type="text" value="4000"/>			Transmit Timer (ms)	<input type="text" value="10"/>
<input type="radio"/> Client/Slave	UID Range	Client/Slave IP Address	Port	Heart Beat	<input type="text" value="Disable"/>
	<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="192.168.1.2"/>	<input type="text" value="4000"/>	Maximun Connection	<input type="text" value="1"/>
	<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	TCP Keep Alive Timer	<input type="text" value="7"/>
	<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	New Password	<input type="text" value="joklok"/>
	<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	Firmware Version	<input type="text" value="355"/>
	<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	Data Packet Type <input type="checkbox"/> UDP <input type="checkbox"/> Auto connect after reboot <input checked="" type="checkbox"/> TCP	
	<input type="text" value="0"/> To <input type="text" value="0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	Management Packet Type <input checked="" type="checkbox"/> Broadcast <input type="checkbox"/> Multicast	

Device Name

Device server name, Maximum 10 chars.

Model Name:

TRP-C37.

MAC Address

The Device server MAC address.

DHCP

If DHCP is disabled, it allows user setting the IP address, Subnet mask, Gateway.

If DHCP is enabled ,the IP address, Subnet mask, Gateway address will be dynamically configuration by DHCP server such router.

When “DHCP” is enabled ,but the DHCP server is not available on the network, the TRP-C37 will timeout then back to factory setting IP=192.168.1.1.

Server Listening IP

The TRP-C37 IP address.

Server Data listening port

RS232/422/485 port address.

Client Destination IP

When user using the paired mode, the client setting need to input Server IP and PORT which one need to connect.

Client Destination port

RS232/422/485 port address.

Port: 16 bit number. (1 ~ 65535)

Netmask

The default LAN Netmask is configured for a Class C address. This maybe reconfigured by the user.

Gateway

Input the gateway IP address that can be allows users to access the serial server from internet.

DNS

Short for Domain Name System, an Internet service that translates domain names into IP addresses. Because domain names are alphabetic, they're easier to remember. The Internet however, is really based on IP addresses. Every time you use a domain name, therefore, a DNS service must translate the name into the corresponding IP address.

Transmit timer:1~500 ms/Unit

Time interval to send out serial data char packet.

**The function main support serial data input to TRP-C37 RS232/422/485 port, if serial data is a mass of serial data over 1K Byte ,Trying to adjust the Timer to 200ms.*

Hear Beat: Disable /Enable

When Hear Beat enable, the TRP-C37 allows user open a TCP 5300 port, 10 sec interval to send out data char packet that provides a easy way to ensure the communications between Host PC Client and server devices.

Maximum Connection: 1~16

The function allows the user to configure the TRP-C37 in Server mode adjust 1~16 TCP client host connections.

TCP Keep Alive: 1~7 /Minute

When TRP-C37 in Server mode, the TRP-C37 without data over the 1~7 Min setting value, The TRP-C37 will be disconnect TCP.

When TRP-C37 in Client mode, the TRP-C37 without data over the 1~7 Min setting value, The TRP-C37 will be reconnecting TCP.

New Password: 1234

It only accepts value from1000~9999 integer, if input the wrong password over 5 times, the WEB-Page will lock until the TRP-C37 re-boot.

Firmware Version: ABC

AB: Suitable DSM utility version

C: Release Version

Example: If the firmware version is 351.

Please run the DSM utility is Version:3.5

Serial Port setting

Baud Rate: UART Speed from 1200,2400,4800,9600,19200,38400,57600,115200,921600 K bps

Data Bit: 5,6,7,8

Parity: Odd, Even, None

Stop Bits: 1, 1.5,2.

Flow Control: Xon/Xoff, Hardware, None

Submit

Save the setting value to EEPROM.

Save

Save the setting value to external log file.

Load

Load the setting value to external log file.

Upgrade

Upgrade the TRP-C37 firmware

**Wrong way the upgrade firmware will cause the TRP-C37 system fail.*

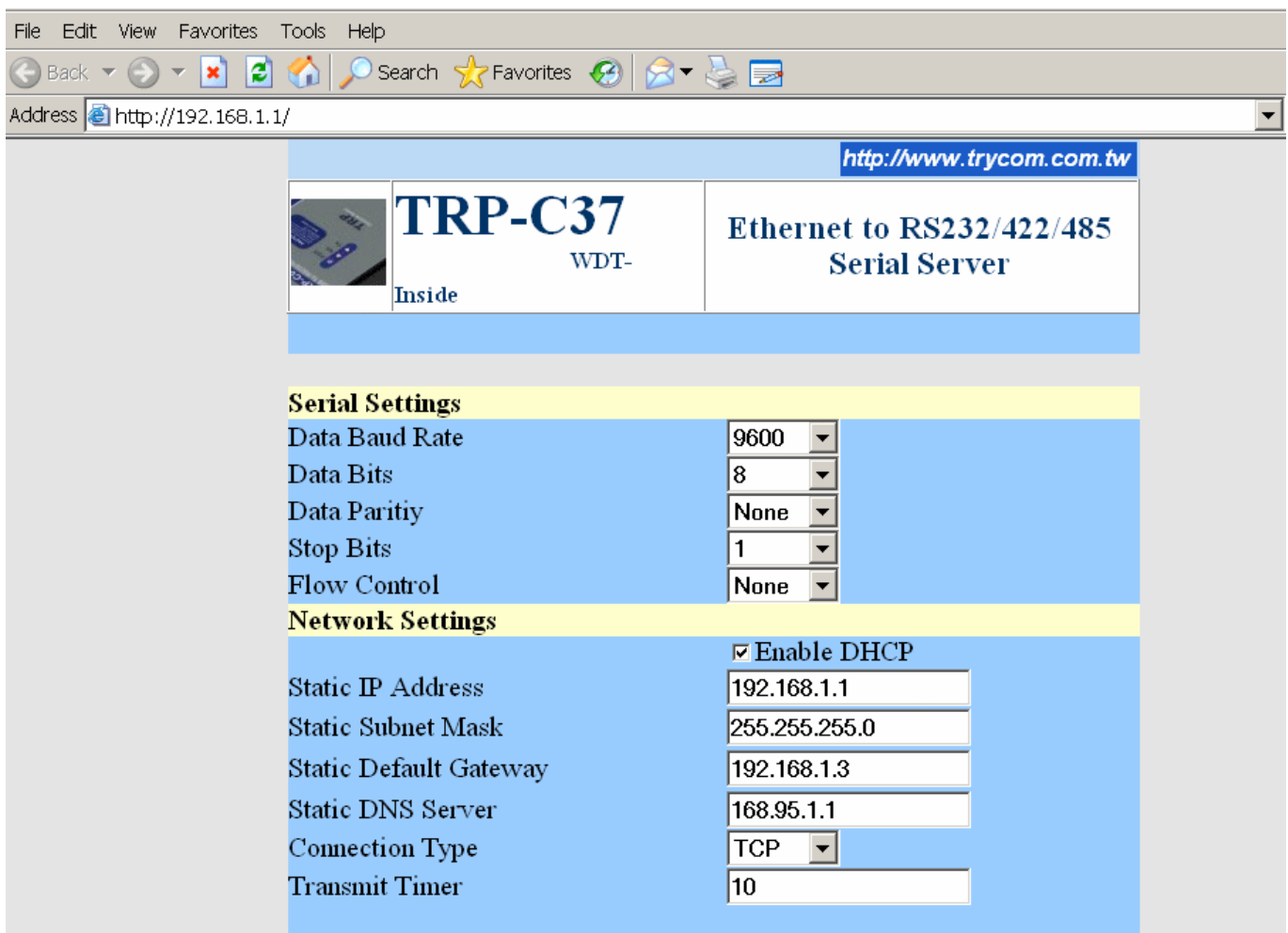
4-4 using the WEB Server mode

The Web Server can be used to configure the TRP-C37 Serial Server from any web browser software (such as I.E).

In Internet Explorer type the IP Address of the Serial Server into the address field and press the **Enter** key. The following window will appear:

Example:

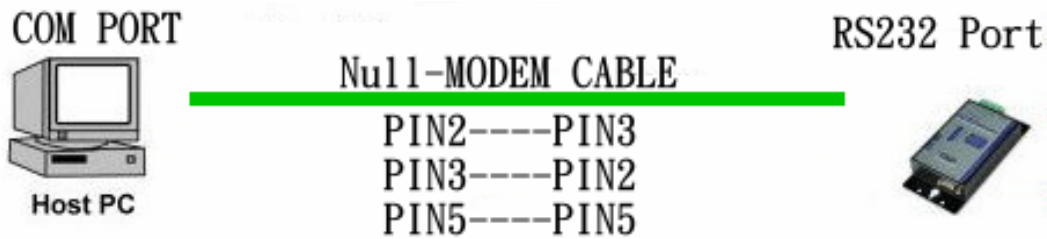
If TRP-C37 IP is 192.168.1.1 Please Input the 192.168.1.1 then enter at web address, the web-page will appear..... See diagram below.



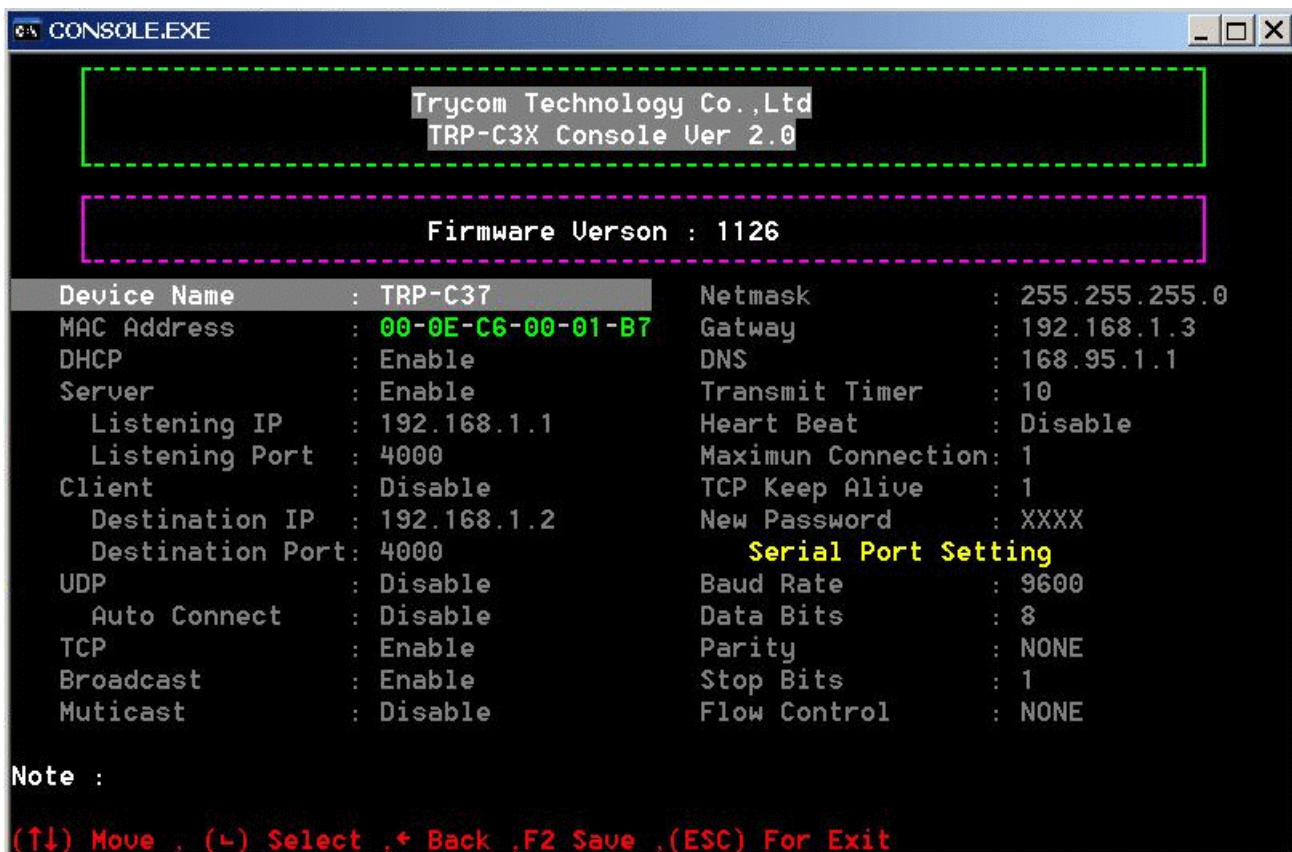
4-5 Using the serial console mode

The serial console can be used to configure the TRP-C37 Serial Server from DB-9 connector link

the HOST PC by null modem cable.



Insert the TRP-Serial CD then find the CONSOLE.exe, The CONSOLE file support all windows O.S include MS-DOS, Run the CONSOLE file and **Re-boot** the TRP-C37 then select correct host COM port number and data format.



5. Install the Virtual-COM

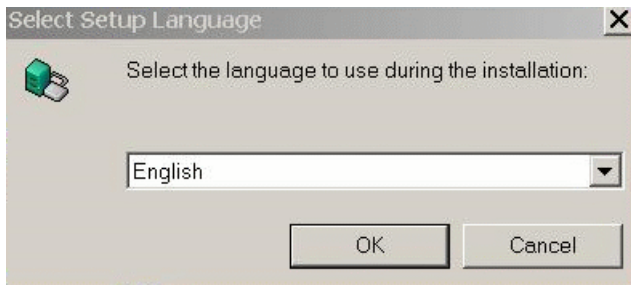
The Virtual-COM utility support TCP/IP 、 UDP data mapping to the HOST PC virtual-com, it can creative Maximum 512~1024 virtual-com port, Support Server 、 Client 、 UDP mode, Support all Windows O.S include Win98/Win2000/WinXP/Vista/Win2003/WIN7,Support Multi-virtual com at different PC to one serial server; Support Ethernet and Internet , If TRP-C37 off line or power fail, The Virtual-Com utility will try to Reconnection.

Step 1. Adjust the switch to “OFF, OFF”... The switch position at Normal-mode.

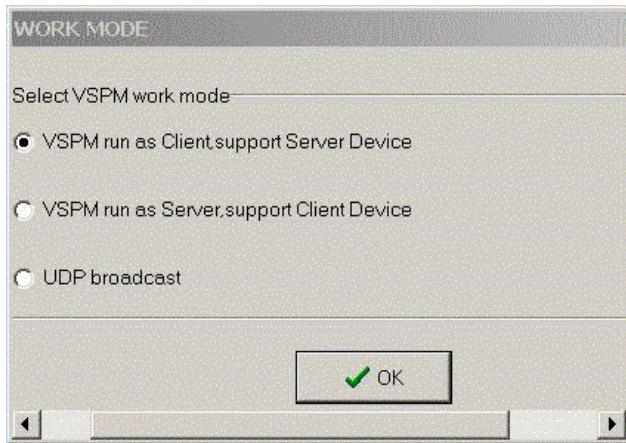
Step 2. Insert the TRP-Serial CD and find the TRP-C37 folder.

Step 3. Click “Vcomm.exe” icon then install Virtual-COM utility.

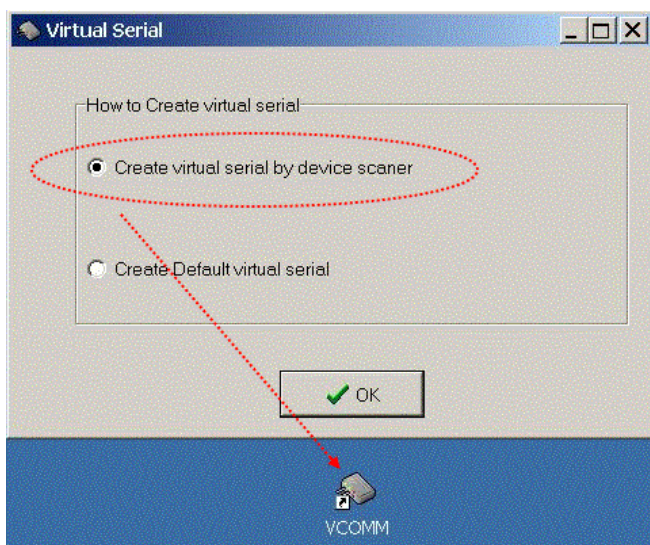
*The Virtual COM utility support multi-language, please select which language do you need.



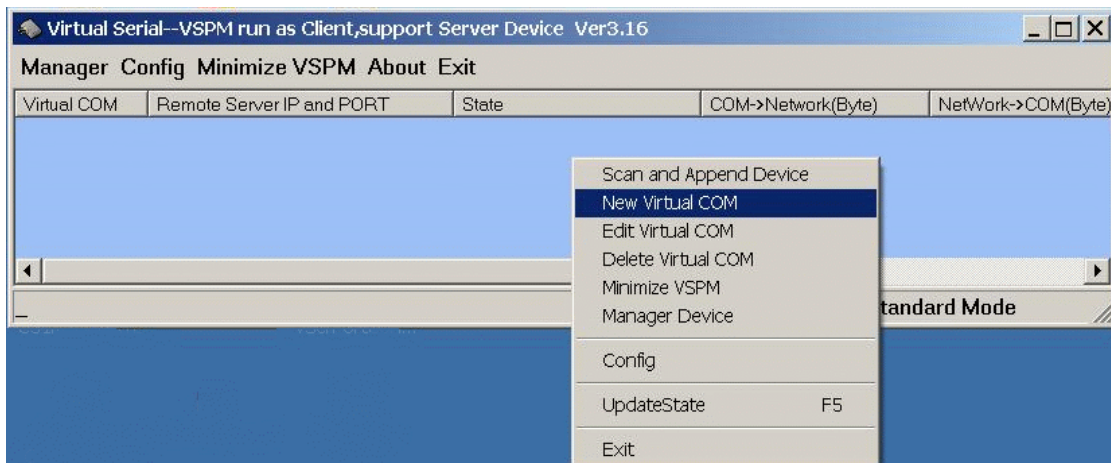
Step4. Click “OK” button and select “VSPM run as Client support Server Device”.



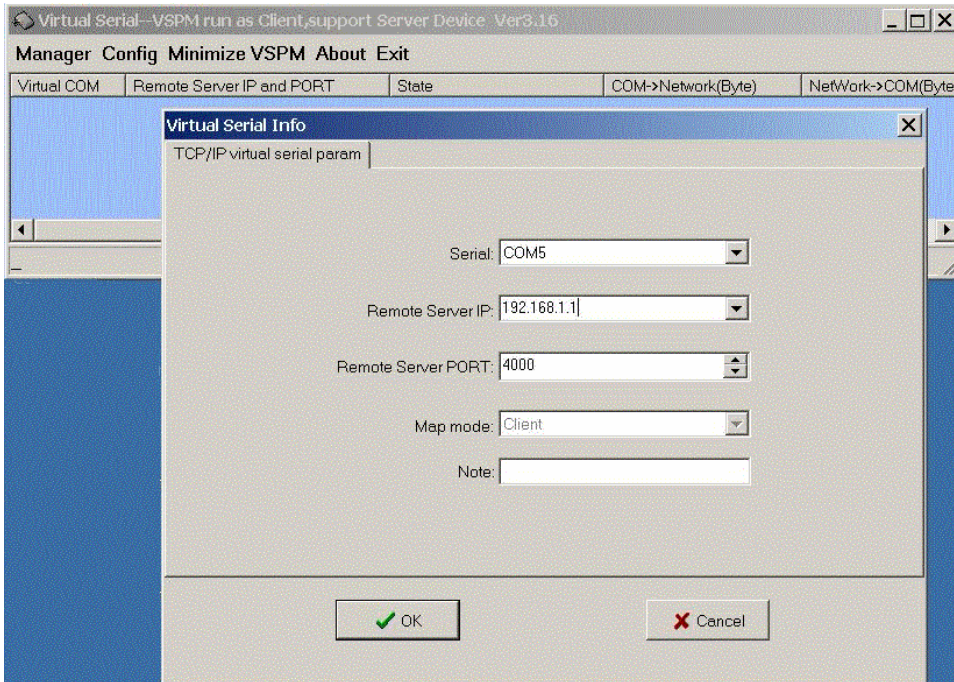
Step5. Select “Create virtual serial by device scanner”, then press “OK”



Step6. Run VCOMM.exe then click right button select “New Virtual COM”

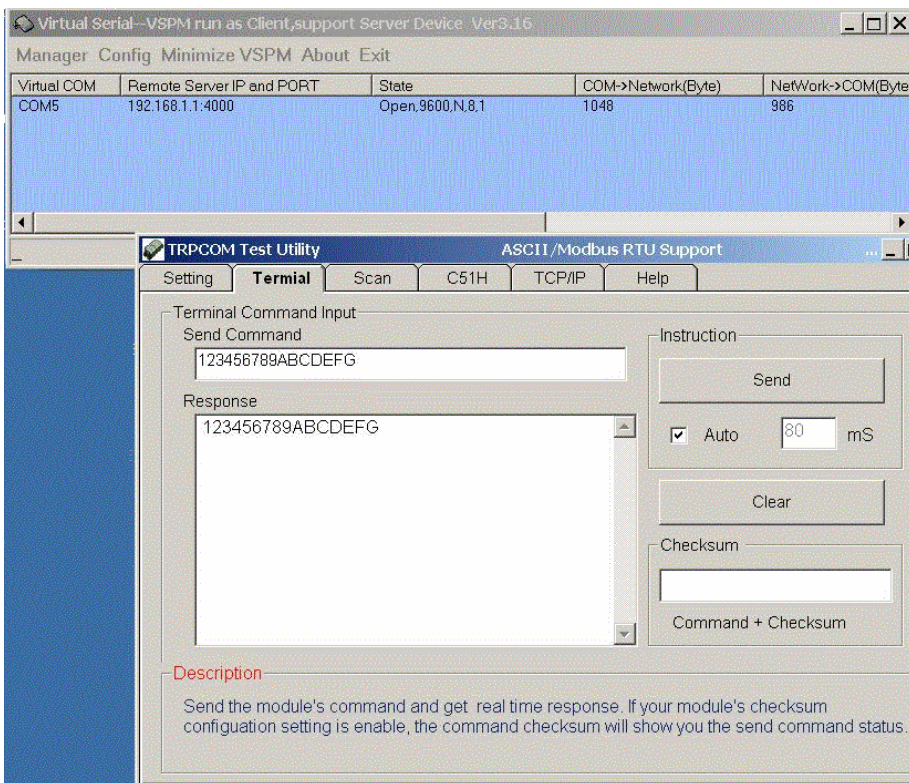


Step7. Select “Select Serial Port” and input TRP-C37 IP and port then press “OK”.

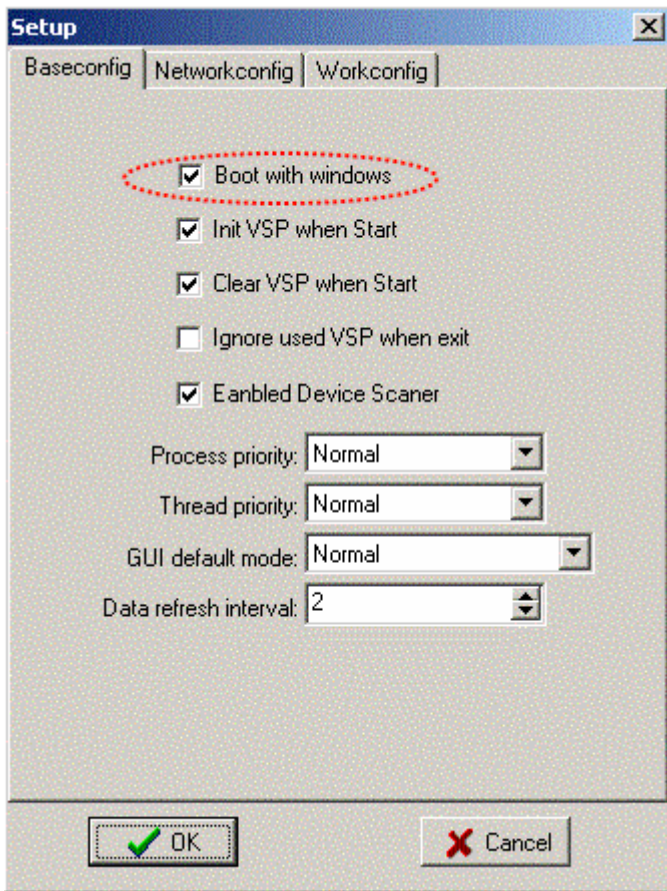


Step8. If Virtual-Com setting success, the display will appear bellow.

Step9. Run TRPCOM utility then select virtual-com port make a TRP-C37 loop test.



*If in VCOMM's configuration select "Boot with windows", the virtual-com will Auto-connection when windows start.



6. Application

6-1 Direct IP Mode

**Keep DIP switch to the OFF, OFF Position.*

key-in IP & Port



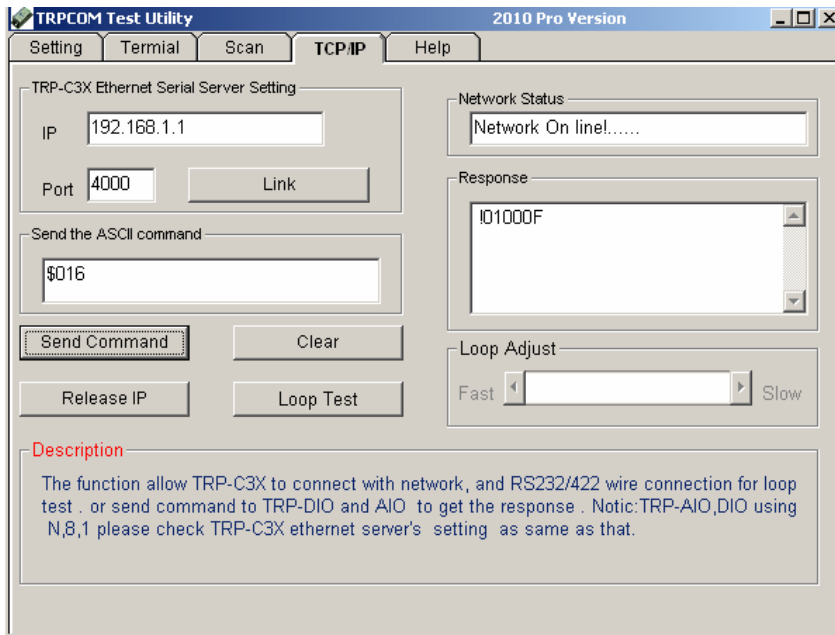
Direct IP Mode



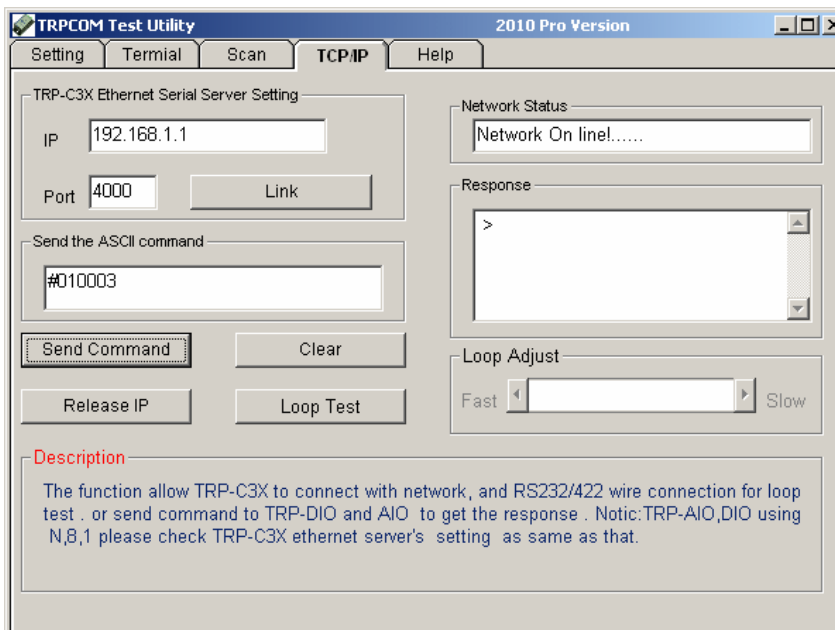
Example:

Step1: Connect PC----Ethernet----TRP-C37----RS485---TRP-C28 (RS485 ID=01)

Step2.Run TRPCOM utility and input IP/Port, click “Link” button, then Send Command , The Response will appear TRP-C28 I/O Status.



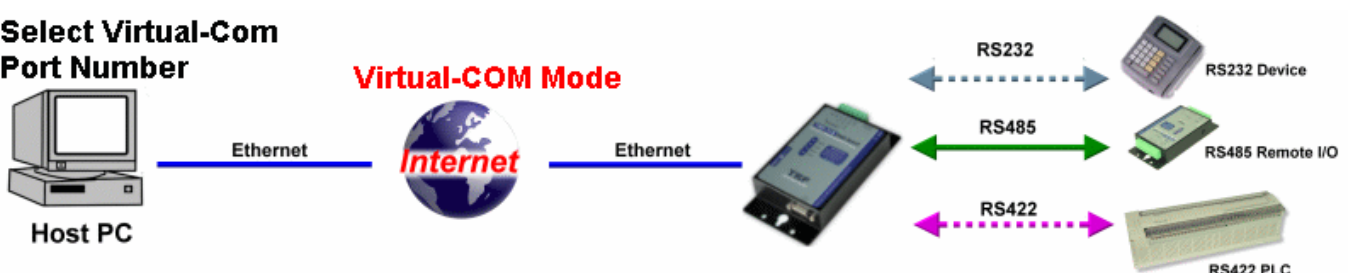
Step3. Send Command “#010003”, The Response will enable TRP-C28 Relay1 and Relay2 enable.



6-2 Virtual COM Mode

**Keep DIP switch to the OFF, OFF Position.*

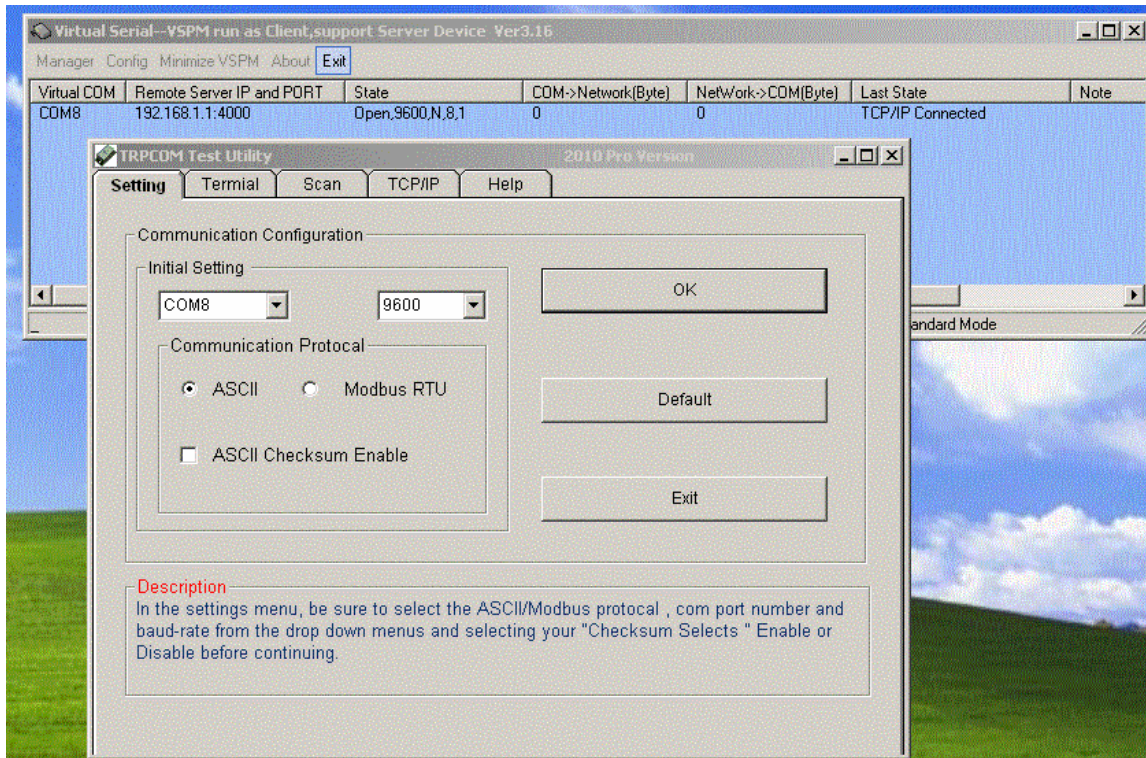
Select Virtual-Com Port Number



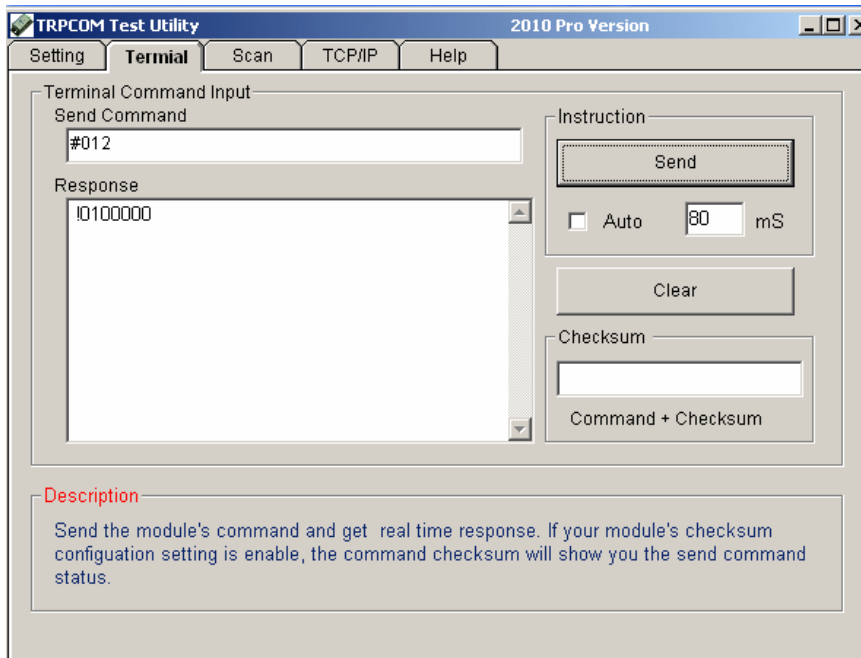
Example:

Step1. Connect PC-----Ethernet-----TRP-C37-----RS485---TRP-C28 (RS485 ID=01).

Step2. Run Virtual-COM utility and make a virtual-COM port, Run TRPCOM utility and input com port number, press “OK”.



Step3. Select “Terminal” and send command, the response will appear TRP-C28 channel 2 counter value.



6-3 Paired Mode

****Keep DIP switch to the OFF, OFF Position.***

Paired Mode



Example:

Step1. Connect PC---RS232---TRP-C37-----Ethernet-----TRP-C37---RS422 (loop back TX+→RX+,TX-→RX-).

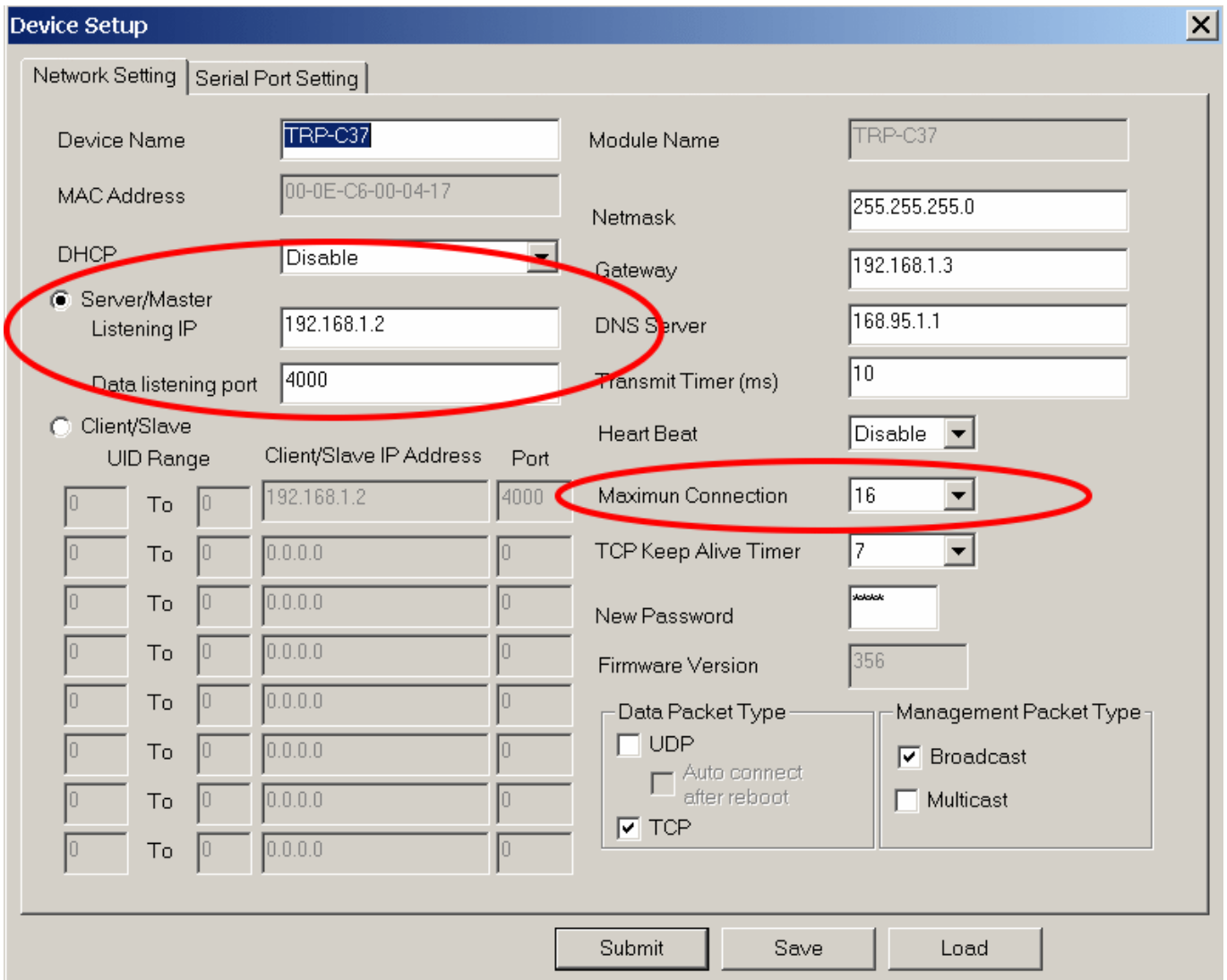
Step2.Run DSM set up **TRP-C37 Client**, Input destination IP and Port.

The screenshot shows the 'Device Setup' window for a TRP-C37 device. The 'Serial Port Setting' tab is active. The 'Client/Slave' mode is selected. The 'Data listening port' is set to 4000. The 'Client/Slave IP Address' is set to 192.168.1.2. The 'Port' is set to 4000. The 'Maximum Connection' is set to 1. The 'Management Packet Type' is set to Broadcast. The 'Data Packet Type' is set to TCP. The 'Firmware Version' is 356. The 'New Password' field is empty. The 'Heart Beat' is set to Disable. The 'TCP Keep Alive Timer' is set to 7. The 'UDP' and 'Auto connect after reboot' options are unchecked. The 'Multicast' option is unchecked. The 'Submit', 'Save', and 'Load' buttons are visible at the bottom.

UID Range	Client/Slave IP Address	Port
0 To 0	192.168.1.2	4000
0 To 0	0.0.0.0	0
0 To 0	0.0.0.0	0
0 To 0	0.0.0.0	0
0 To 0	0.0.0.0	0
0 To 0	0.0.0.0	0
0 To 0	0.0.0.0	0
0 To 0	0.0.0.0	0

Step3.Run DSM set up **TRP-C37 Server** and be sure the IP and port as same as client setting.

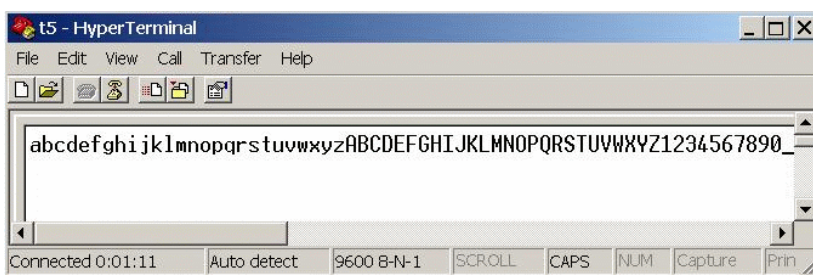
***Adjust Maximum Connection to 16.**



Step4. Run the windows utility “hyper Terminal” and select com port number, and press “OK”.

Step5. Key-in some chars the hyper terminal will show loop back.

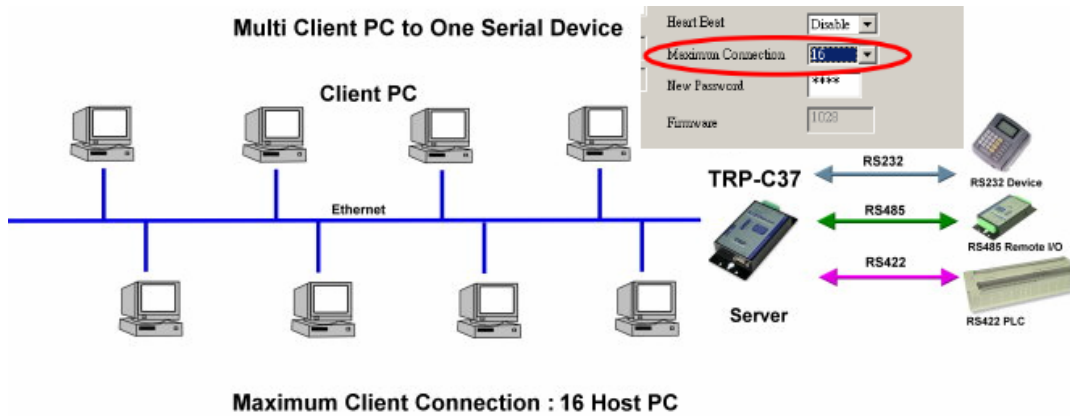
****Try to disconnect power or RJ45 cable, the TRP-C37 will Auto Re-connection.***



6-4 Multi-Client PC to 1 TRP-C37 Server

****Keep DIP switch to the OFF, OFF Position.***

****The function main support serial data input to TRP-C37 RS232/422/485 port, if serial data is a mass of serial data over 1K Byte ,Trying to adjust the” Transmit Timer” to 200ms.***



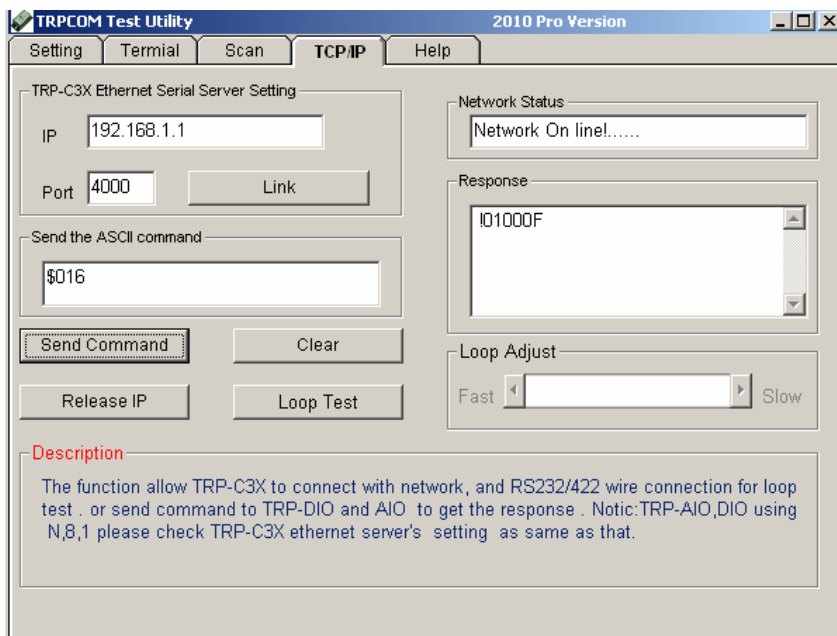
Example:

****Running at Multi-Direct IP Mode***

Step1. Connect Multi-PC ---Ethernet----TRP-C37 Server----TRP-C28 (RS485 ID=1)

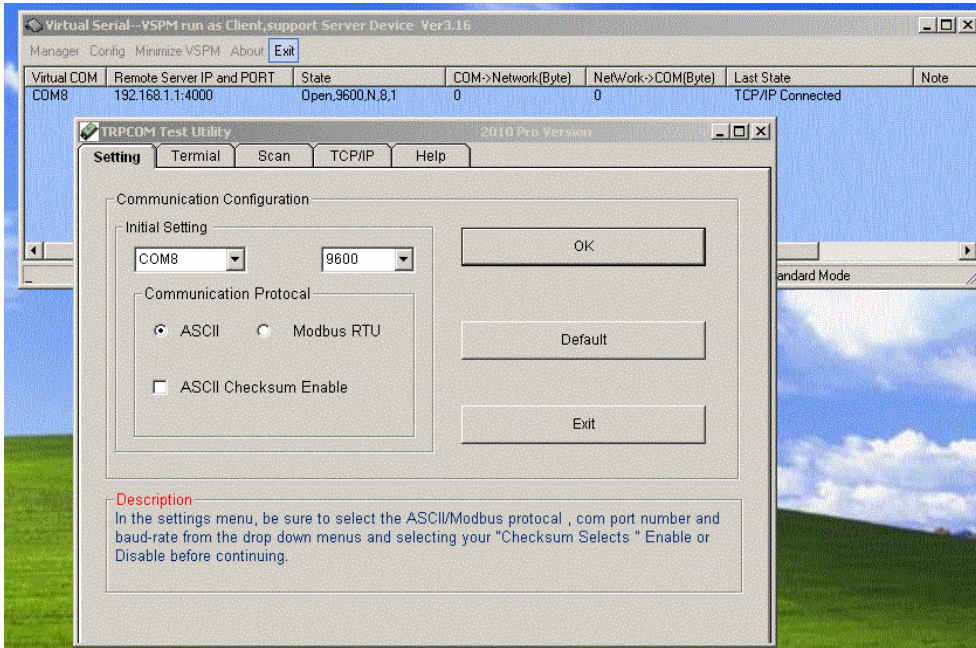
Step2. Run DSM Set up **TRP-C37** Maximum connection=8.

Step3. All host PC run TRPCOM and input IP, Port, click “Link” button, then Send Command, The Response will appear TRP-C28 I/O Status.

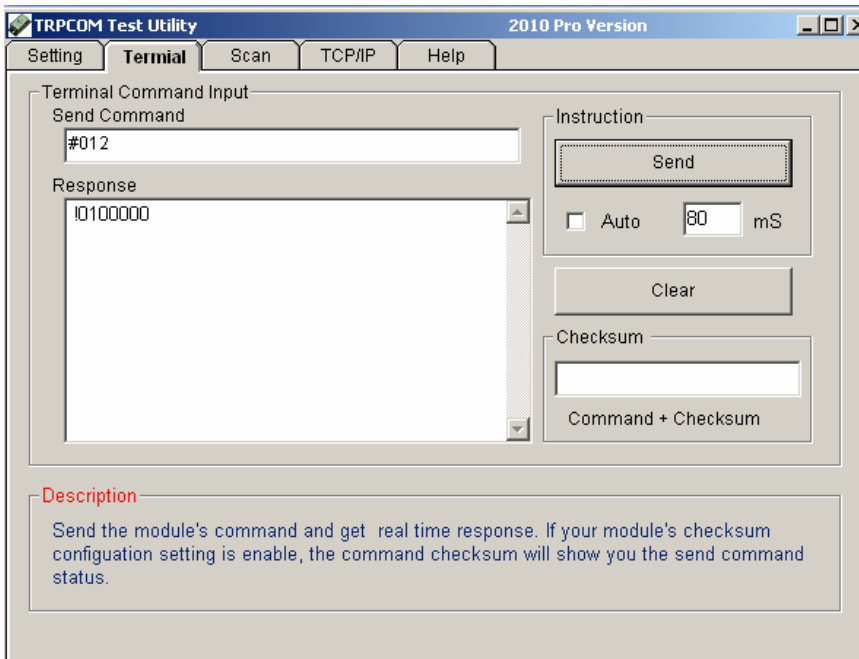


****Running at Multi-Virtual COM Mode***

Step1. All PC run Virtual com utility and make a self virtual-COM port, Run TRPCOM utility and select com port number, and press “OK”.

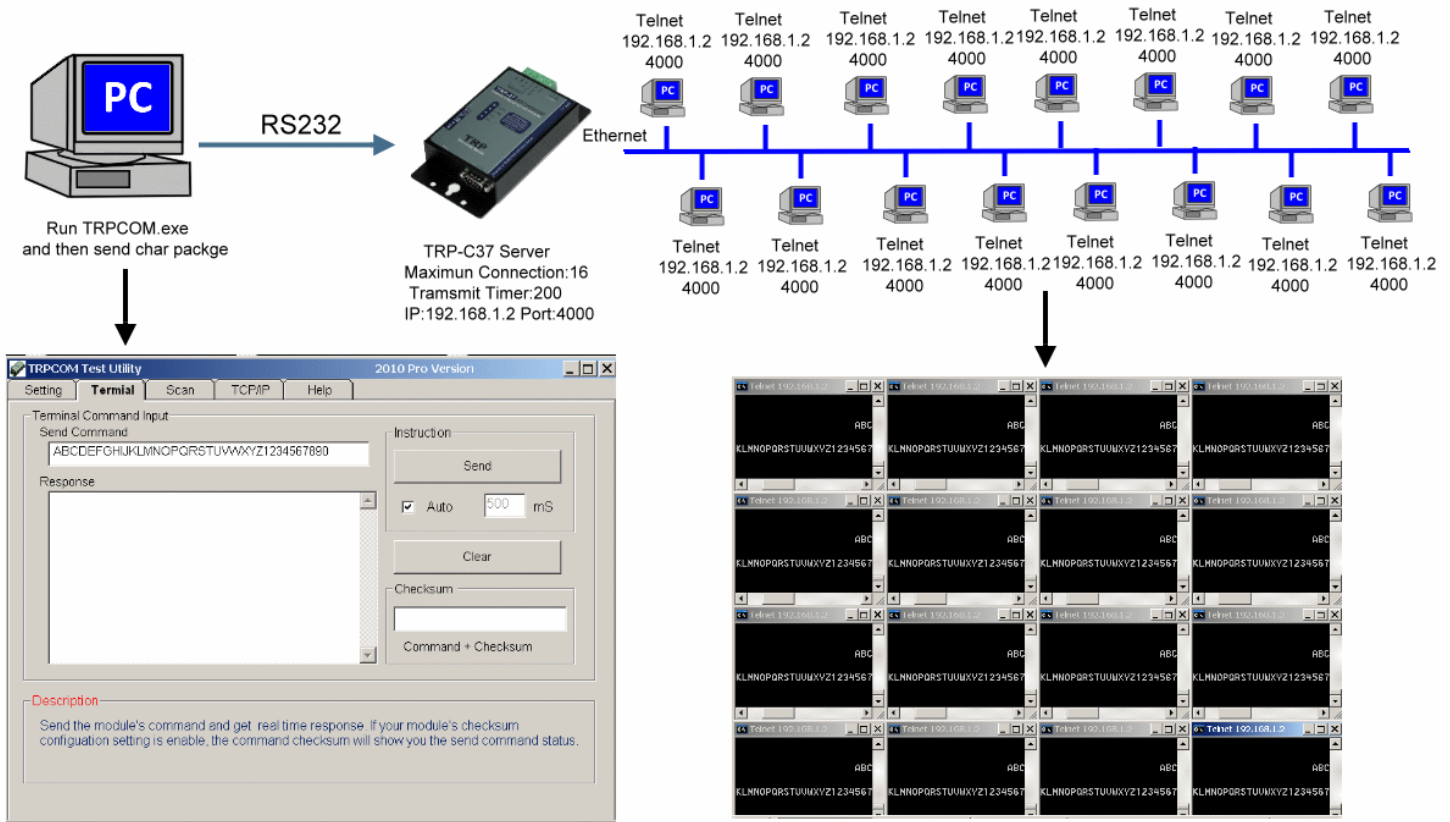


Step3.Select “Terminal” and send command, the response will appear TRP-C28 channel 2 counter value.



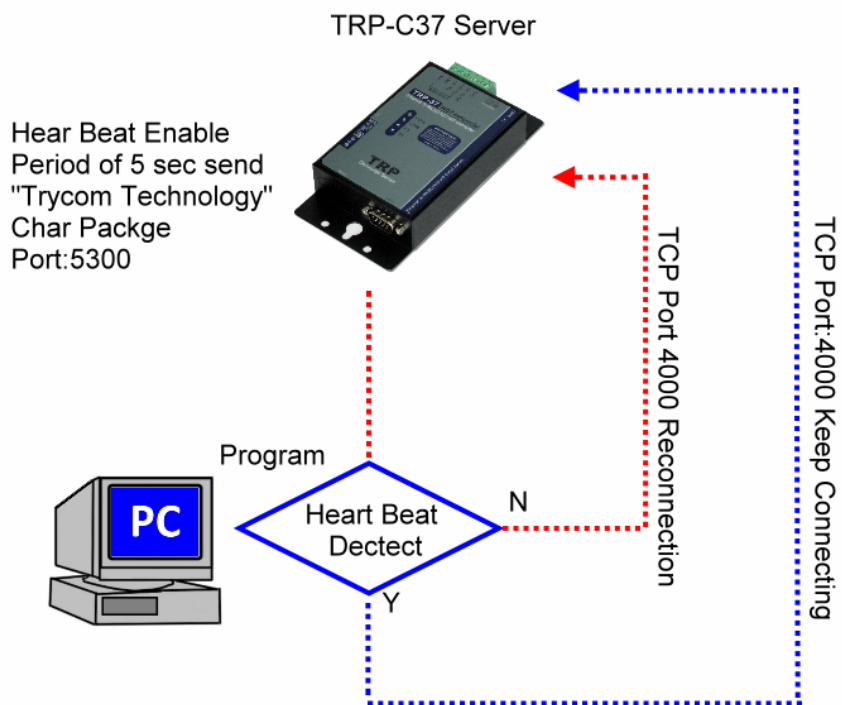
6-5 Broadcast Mode

**The function main support serial data input to TRP-C37 RS232/422/485 port, if serial data is a mass of serial data over 1K Byte ,Trying to adjust the” Transmit Timer” to 200ms.*

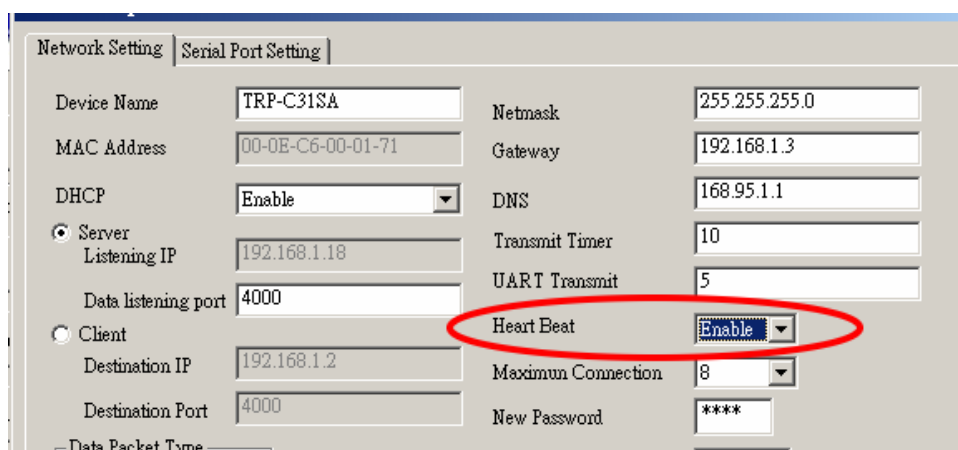


6-6 Heart Beat

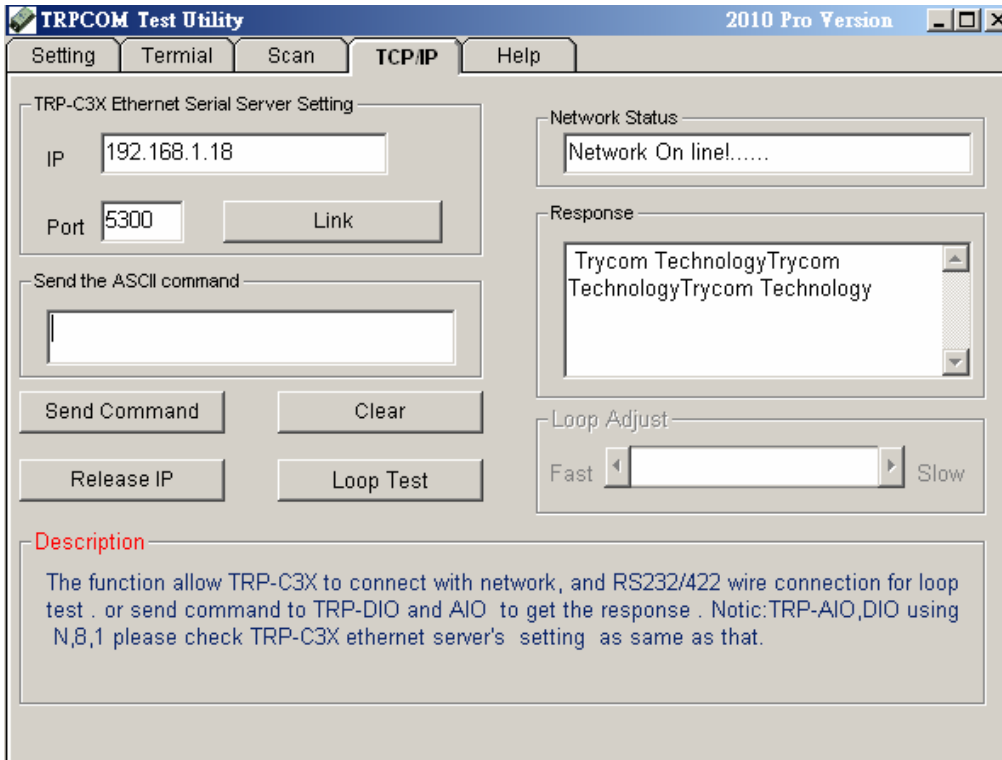
The heart Beat function help customer detection the TRP-C37 LAN on-line or off-line, User can open one 5300 port, if TRP-C37 on line, the 5300 port will send a char package period of 5 sec.



Step1: Run TRP-C37X DSM.exe to set up the heart beat enable.



Step2: RUN TRPCOM then click "Link" button
Wait until the Response screen appear the message

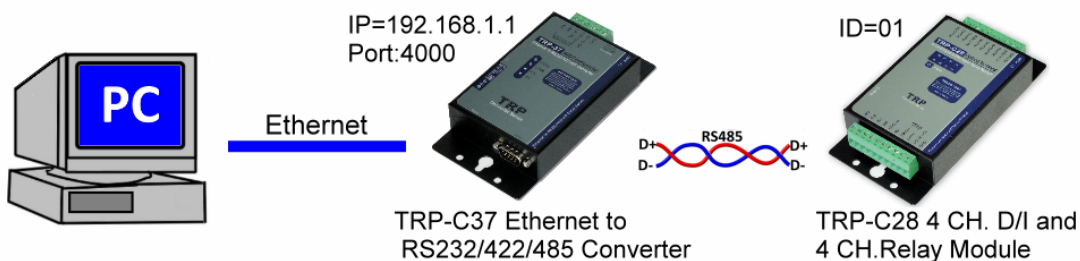


7. Using TRPCOM Utility test TRP-C37.

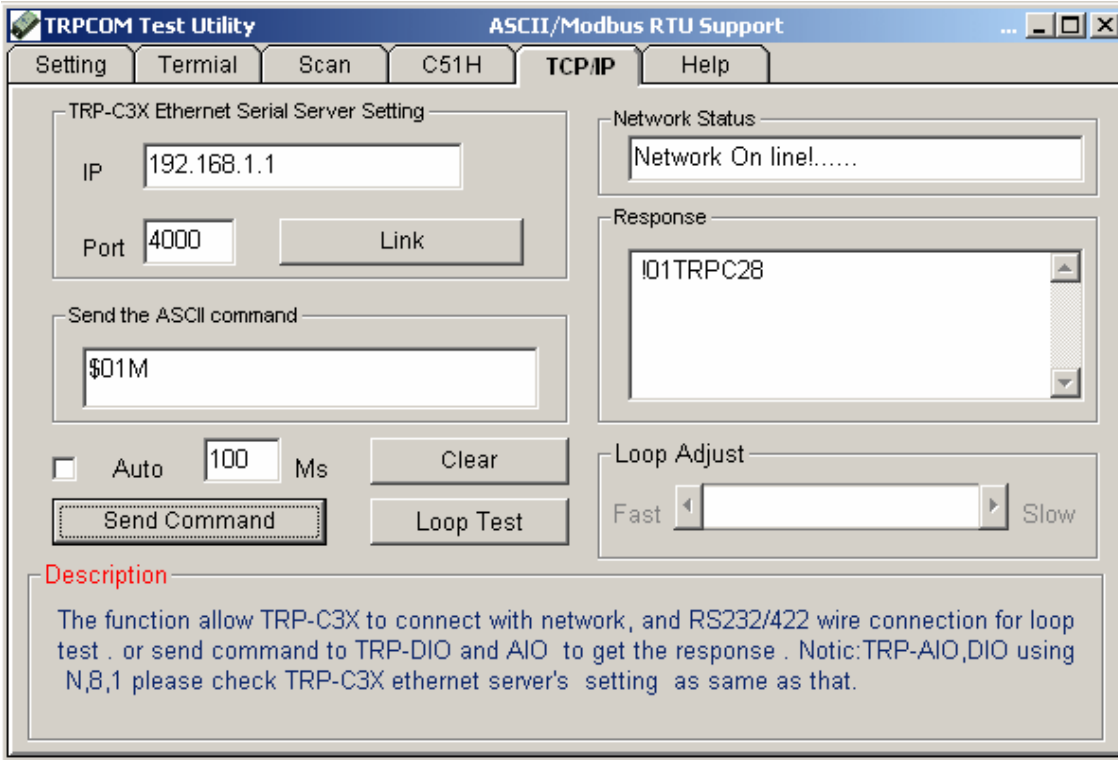
TRP-Serial Test Utility is demo utility which may help to test direct IP Mode .User may find the utility in the TRP-C37 support CD. Double click “TRPCOM Utility”, the installShield Wizard will guide you complete installation.

User can directly link TRP-C37 to TRP-Serial Remote IO Modules by RS485, The basic wiring connect.

RS485 Test



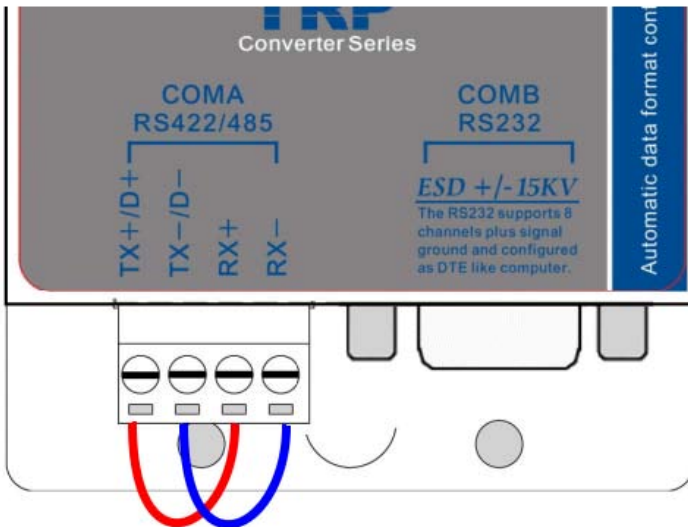
Run TRPCOM and send command “\$01M” and get response.



RS422 Loop Test

Hardware wiring connection for RS422 loop test.

TX+ to RX+, TX- to RX-

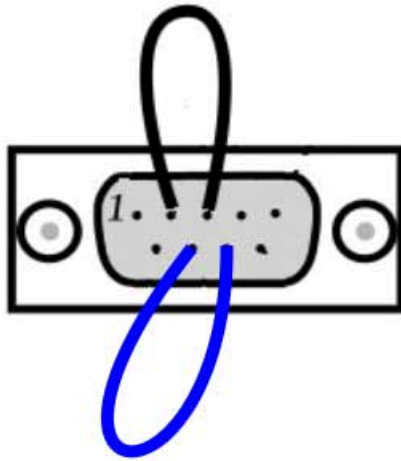


RS232 Loop Back Test

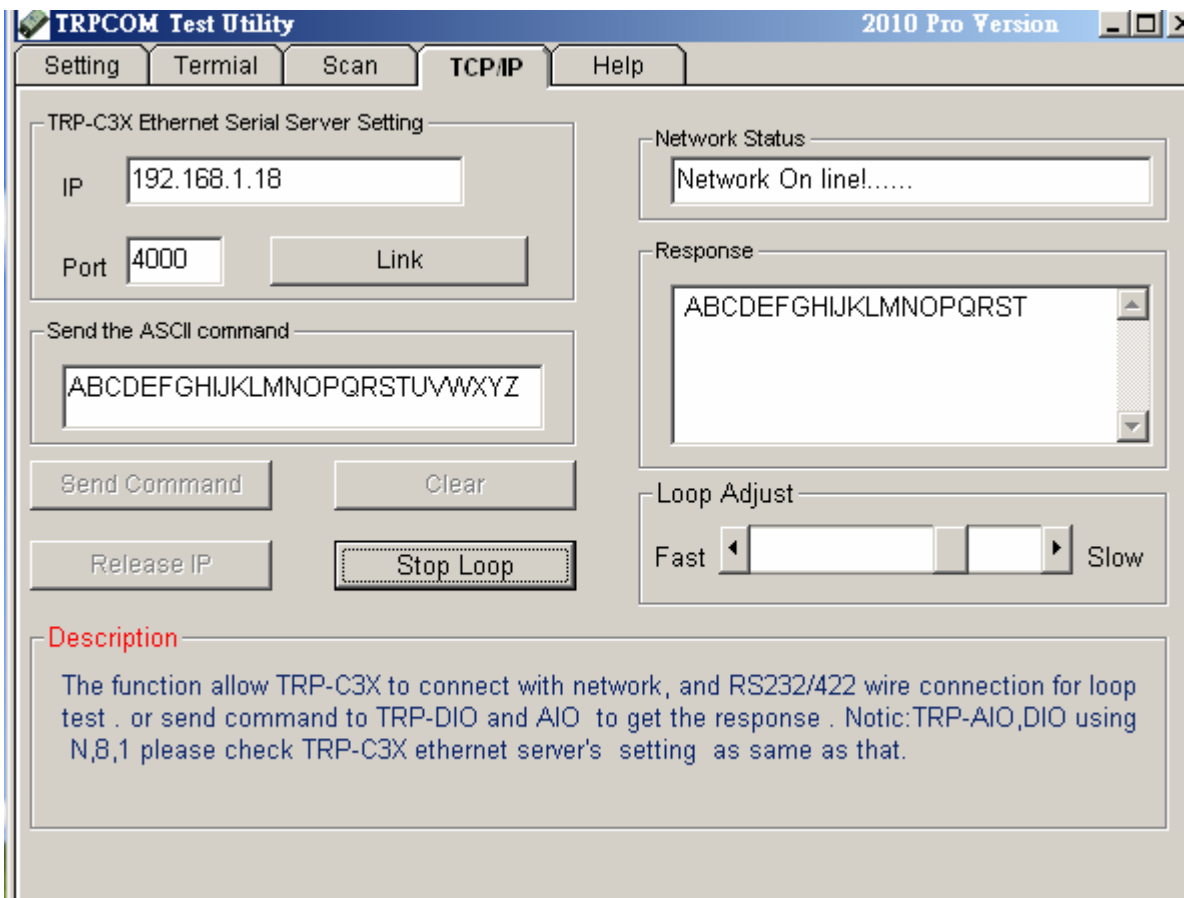
Hardware wiring connection for RS232 Loop Test.

TXD to RXD, RTS to CTS.

Pin2,3 Short
Pin7,8 Short



RUN TRPCOM test utility then connect correct IP and Port then click the “Loop Test” button”



8. Application

