TRP-C37A

Ethernet to RS232/422/485 Converter

With Remote Monitoring

User's Manual

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1. Introduction

The TRP-C37A Ethernet serial server is suitable for industrial environment, providing wide range power input and serial communicate protection, Built-in surge, over current and over voltage ensure long distance serial quality, Specify hardware can keep on line RS485 device working fine; Increase external watchdog function will auto reset when Ethernet serial server or power fail, if careless lost password or IP that can easy to back to factory by external switch. The TRP-C37A operates in "Direct IP Mode", "Virtual COM Mode", and "Paired Mode". The Ethernet port support Auto-MDIX and Auto-select 10/100MB. TRP-C37A also offers a Heart Beat feature to ensure a reliable communicating connection.

The TRP-C37A support maximum connection 16 host clients to link the one serial server that is easy to operate in Modscan32 and Modbus Poll application uses Virtual-COM mode and Pair Mode.

When TRP-C37A working at industrial environment, if the voltage is unstable, The TRP-C37A built-in power detection circuit can prevent the power fail cause of the system boot fail.

In network security, the TRP-C37A is able to setup 8 sets host IP, only these host IP can access the TRP-C37A.

In addition to serial server function, The TRP-C37A is able to remote monitoring serial device.

There are 2 models to choose from:

Automatic monitoring mode:

The Serial device must be sends a single pulse to TRP-C37A continually per 30 seconds.

 If serial device do not send a single pulse over 30 seconds, the TRP-C37A will be actives the relay.

Manual mode:

If the serial device needs to restart, user can feel free to set the relay enable through the TRP-C37 A web configuration.

1-1 Features

- Automatic remote monitoring serial device.
- Automatic restart the serial device.
- Direct active the relay by web page.
- Read the counter value and DI status from web page.
- Adjustable relay latch time from web page.
- Wide input range DC power supply.
- Power Input detection circuit.
- External watchdog function prevents system or power fail.
- Support Auto-MDIX twisted pair crossover detection and Auto-Correction.
- Maximum Connection 16 Client PC at Server Mode.
- Maximum 8 sets host IP that limits network access.
- Surge protection and over current and over voltage on RS-422/485 data lines.
- Support baud rate form1200~921600Kbps.
- Auto switching RS-232/422/485 signal interface.

- Virtual COM drivers for WIN 98/2000/XP/Vista/2003/7/8/8.1 and WIN10.
- 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 fails.
- Back to factory by external switch.
- Support configuration by serial console.
- Update the firmware from LAN.
- 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 1, 2: OFF/OFF: TCP and VSP mode.
  - ON/ OFF: Option.
  - OFF/ON: Option.
  - ON/ON　 : Back to Factory.
- Virtual-Com 　　 RS232 TXD, RXD, GND.
 - RS422 TX+, TX-, RX+, RX-.
  - RS485 DATA+, DATA-.
- Heartbeat function: TCP 5300 port send a strings per 5 seconds.
- Maximum TCP connections at the same time: 16.
- Digital I / O connector: D-type 9PIN female.
- Digital input an effective voltage: DC +/- 4 ~ 30V.
- Digital Input count : 0~65535.
- Relay setting start to closing time: 1 ~ 255 (ms / unit).
- Relay specifications: two independent NC, COM, NO.
- Relay contact capacity: AC 125V / 0.5A, DC 30V / 2A, DC110V / 0.3A.
- Power supply: Screw terminal or DC jack.
- Serial interface: +/-15 KV ESD.
- RS422/485 interface: Surge, over current, over voltage protection.

- Power consumption: 12V/150mA.
- Operating Temperature:-10 to 65 °C.
- Humidity: 0~90% Non-Condensing.
- Dimensions: 151(L)*75(W)*26(H) mm.
- Weight: 410g with packing.

2. Hardware Description
2-1. Panel layout
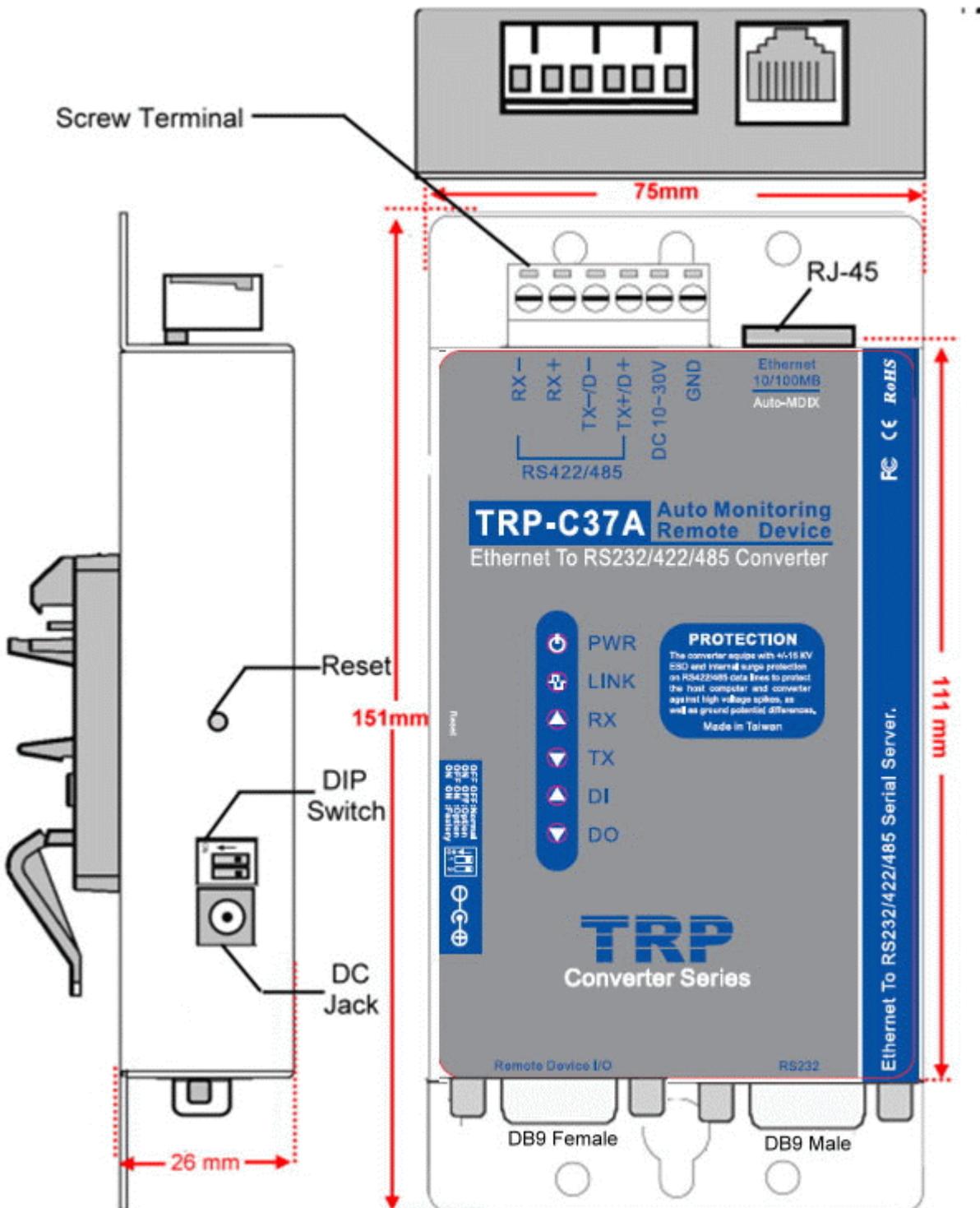
2-2. LED indicator

PWR LED: System is ready.(Blinking)

LINK LED: Ethernet cable connection and data active.

TX/RX LED: UART Transiting/Receiving Indicator.

DI LED: Digital Input.

DO LED: Relay Active.

2-3. Power Input

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

There are two types power input.

a. Use the plug of power adaptor than plug in the DC jack on the side.

This approach also allows the user to provide additional power to other devices using the terminal from EU regulation.

b .Wiring terminals on the EU regulation

2-4. Reset Button

Pushing the reset button will Reboot.

2-5.DIP Switch Function
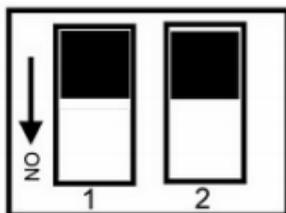

```
OFF  OFF :Normal
OFF  ON   :Option
ON    OFF :Option
ON    ON   :Back to Factory
```

2-6. How to factory reset

Please adjusts the switch 1,2 to ON ON position then power on till the PWR LED blinking. Meanwhile relay will self-test per second, and then adjust the switch1,2 to OFF OFF original position.

2-7.Factory Setting

Device Setup

Network Setting | Serial Port _Modbus Setting

Device Name	TRP-C37A
MAC Address	00-0E-C6-00-02-AB
DHCP	Enable
● Server/Master Listening IP	192.168.0.135
Data listening port	4000

○ Client/Slave

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

Module Name	TRP-C37A
Netmask	255.255.255.0
Gateway	192.168.1.3
DNS	168.95.1.1
Transmit Time/Plus	10
Heart Beat	Disable
Maximun Connection	1
TCP Keep Alive	7
New Password	***** (0~65535)
Firmware Version	609

Data Packet Type
☐ UDP
   ☐ Auto connect after reboot
☑ TCP

Management Packet Type
☑ Broadcast
☐ Multicast

Submit   Save   Load

Network Setting | Serial Port Setting

Baud rate	9600
Data bits	8
Parity	None
Stop bits	1
Flow Control	None

2-8. D-sub 9 Pin connector pin assignment.

RS232

DB-9 Male

- DCD(1)
- RXD(2)
- TXD(3)
- DTR(4)
- GND(5)
- RI(9)
- CTS(8)
- RTS(7)
- DSR(6)

Remote Device I/O

DB-9 Female

- RL1-COM(5)
- RL1-NC(4)
- IN-COM(2)
- DI(1)
- RL1-NO(6)
- RL2-NC(7)
- RL2-COM(8)
- RL2-NO(9)
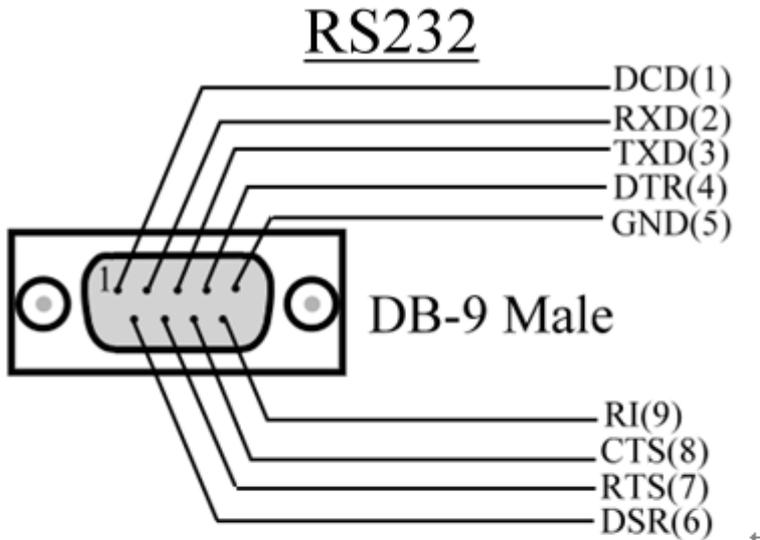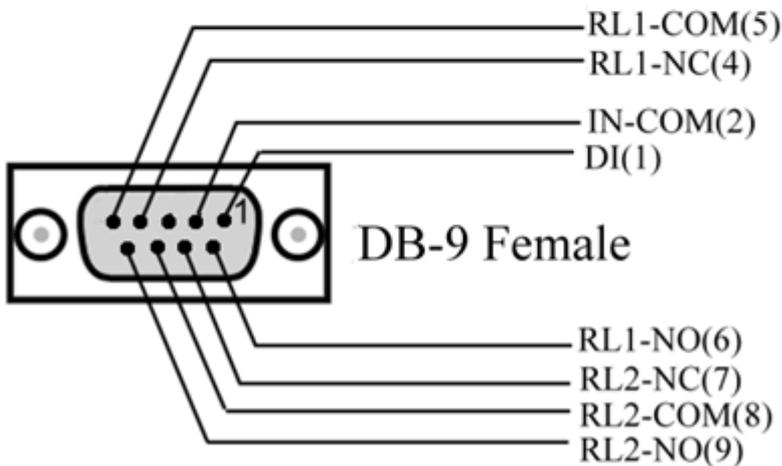
3. Install TRP-C37A Hardware

STEP1: Connect power source with TRP-C37A, the PWR LED will blinking.

STEP2: Connect TRP-C37A with LAN port by RJ45 cable.

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

*The TRP-C37A 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-C37A to RS232 device by Null-Modem cable (Maximum 15M).

Connect TRP-C37A to RS422/485 by AWG #12~30 wires (Maximum 1.2KM).

STEP4: The serial device should connect to the DB 9 PIN female connector, The pin1,2 is the digital input from the serial device, The DI input which can accepts +/- 4~30V DC input .

The DO is relay that can connect the AC or DC power or dry contact to serial device.

3-1. RS485 Wiring
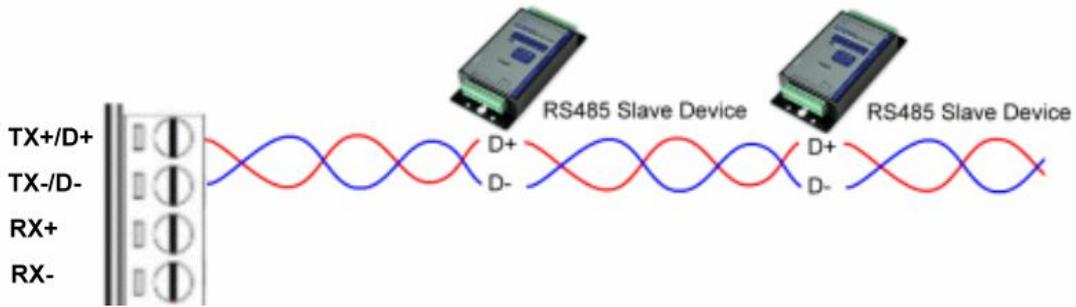
3-2. RS422 Wiring
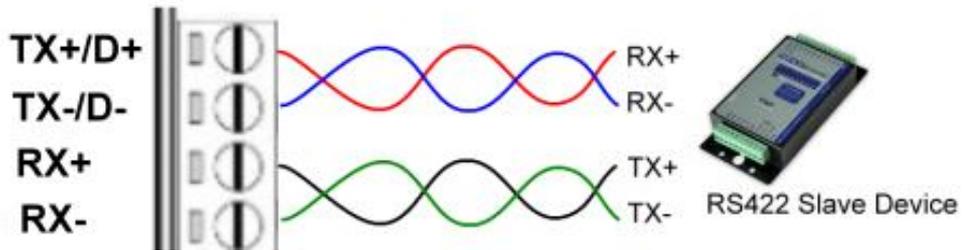

3-3. RS232 Wiring

Refer to the Pin out table for connections.

DCD(1)	→	DCD
RXD(2)	←	TXD
TXD(3)	→	RXD
DTR(4)	→	DSR
GND(5)	—	GND
DSR(6)	←	DTR
RTS(7)	→	CTS
CTS(8)	←	RTS
RI(9)	—	RI

VARIABLE FREQUENCY
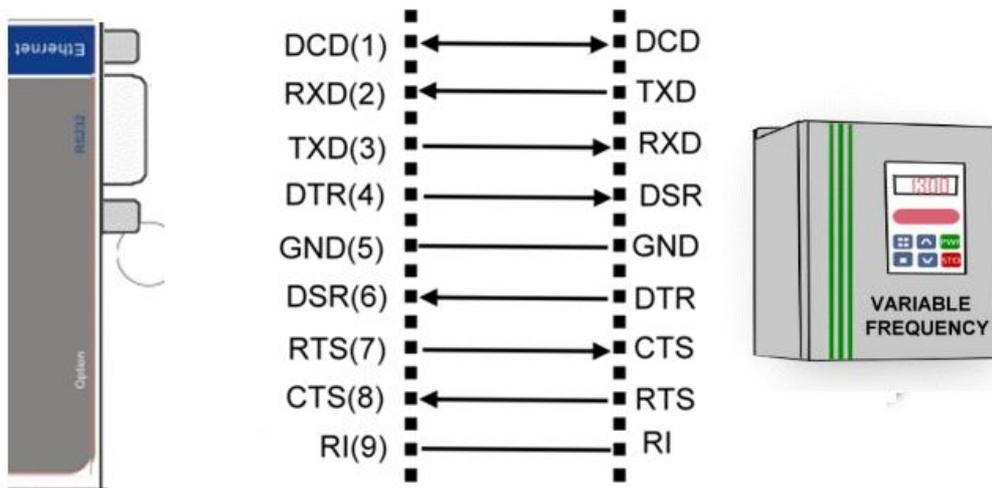
3-4. Remote Device I/O Wiring
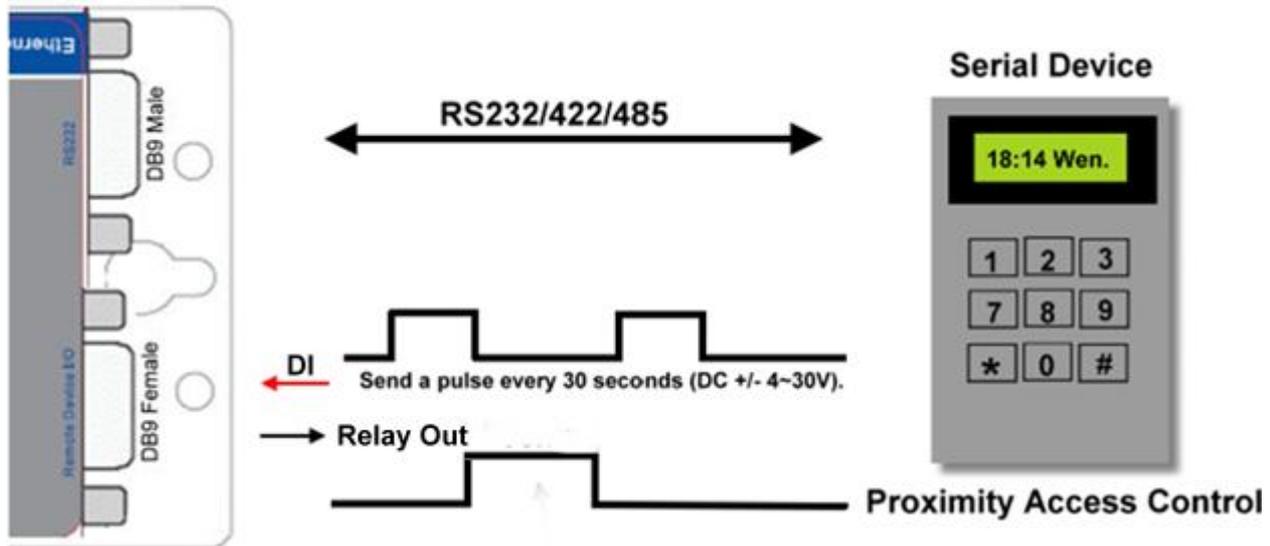
4. How to configure TRP-C37A

There are 2 ways to access the TRP-C37A.

a. TRP-C37AX DSM Software.
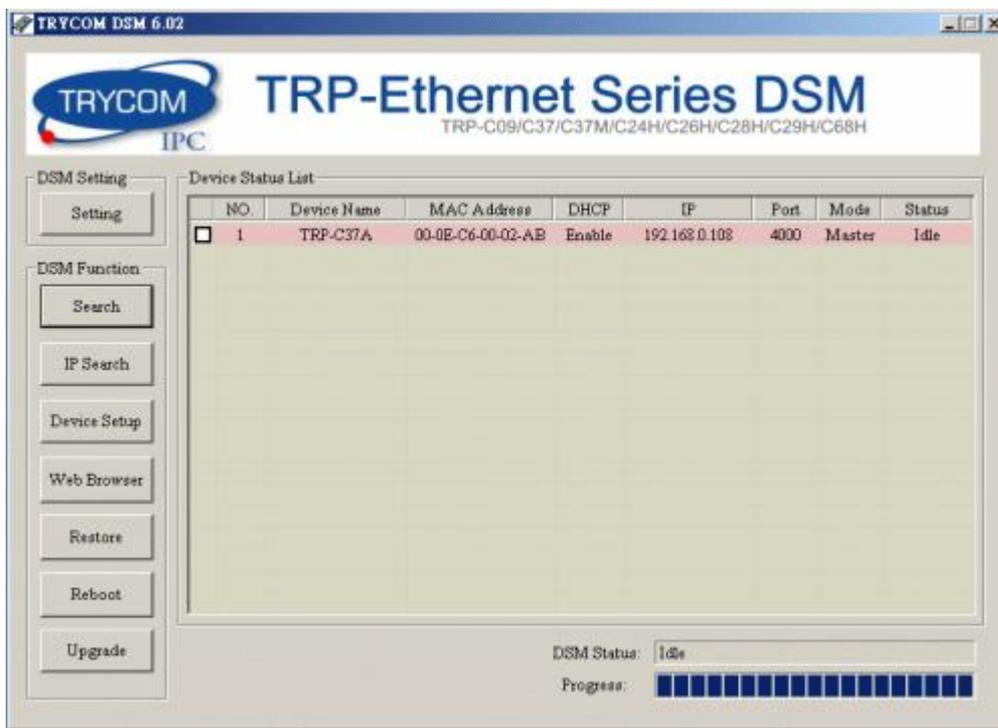
b. Web-based utility

TRP-C37A
WDT- Inside

Ethernet to RS232/422/485 Serial Server

Serial Settings

Data Baud Rate	9600 ▼
Data Bits	8 ▼
Data Paritiy	None ▼
Stop Bits	1 ▼
Flow Control	None ▼

Network Settings

	☑ 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 ▼
Server:	
Server Listening Port	4000
Client:	
Destination IP	0.0.0.0
Destination Port	4000
DI Status	0
DI Counter	0
Pulse Timer	200
DO Controller	0
New Password	····· (0~65535)
	☐ Enable Reboot
	Apply Reset

4-1. Using TRP-C37A DSM Utility.

The **"TRP-C37A DSM utility"** software performs several functions:

    A: Searching for TRP-C37A connected to the network.

    B: Displaying and changing the configuration of TRP-C37A.

    C: Upgrading the TRP-C37A firmware.

    *Refer the Firmware upgrade help file.

D: Saving and Loading Configuration from external log File or EEPROM.
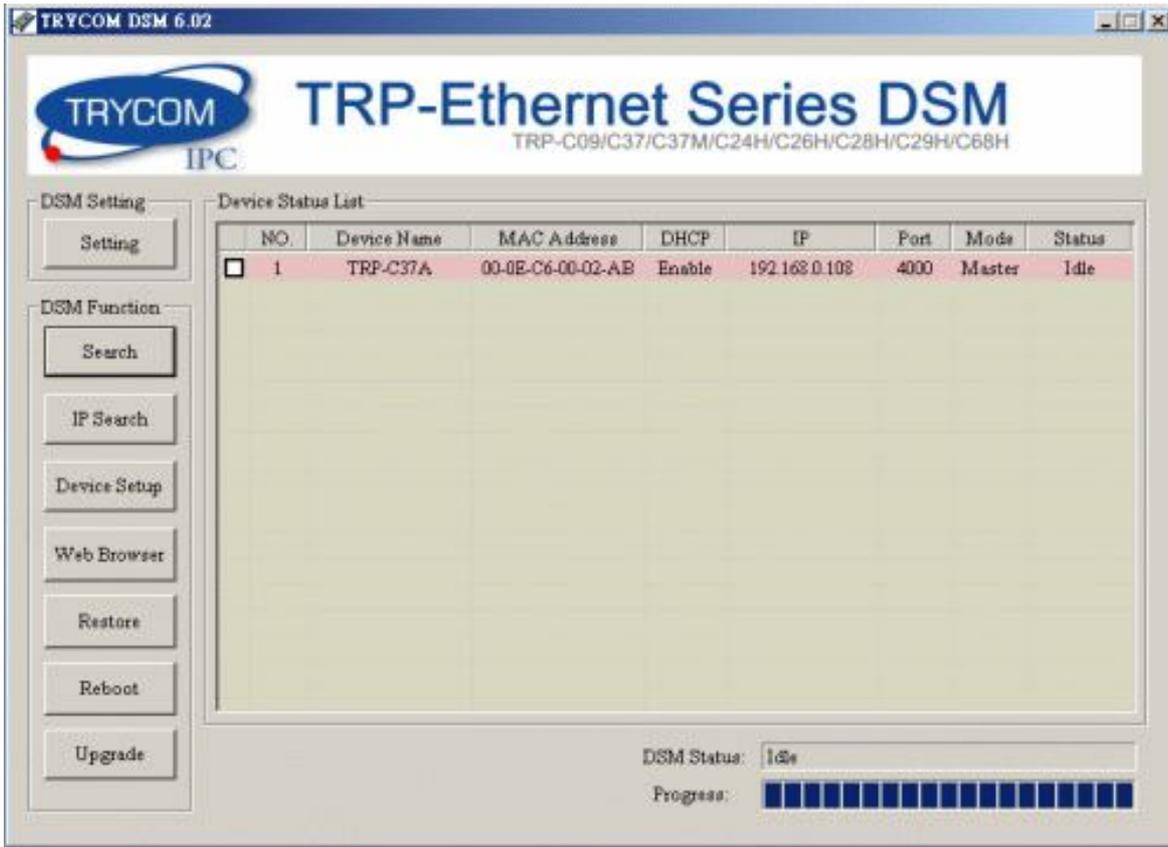
4-2. Searching LAN for TRP-C37A

Once TRP-C37A is connected to the LAN the **TRP-C37A 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

Device server name, Maximum 10 chars.

Model Name:

TRP-C37A.

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-C37A will timeout then back to factory setting IP=192.168.1.1.

Server Listening IP

The TRP-C37A 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-C37A 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-C37A 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-C37A in Server mode adjust 1~16 TCP client host connections.

TCP Keep Alive: 1~7 /Minute

When TRP-C37A in Server mode, the TRP-C37A without data over the 1~7 Min setting value, The TRP-C37A will not connect TCP.

When TRP-C37A in Client mode, the TRP-C37A without data over the 1~7 Min setting value, The TRP-C37A will be reconnecting TCP.

New Password: 12345

It only accepts value from 0~65535 integer, if input the wrong password over 5 times, the WEB-Page will lock until the TRP-C37A 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 configuration

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 parameter value to EE-PROM.

Save

Save parameter value to external log file.

Load

Load parameter value from external log file.

Upgrade

Upgrade the firmware

WEB-based utility configuration
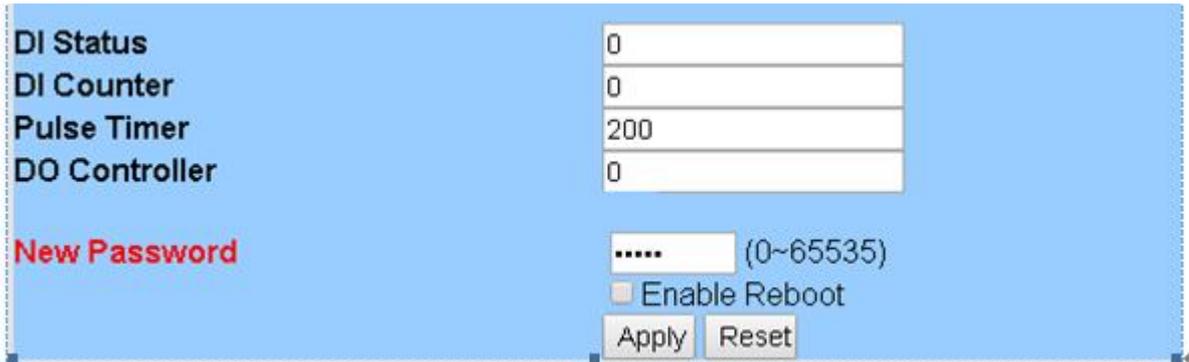
DI Status:0~1

Digital Input status.

0: Low; 1: High.

DI Counter:0~65535

Counter value 0~65535.

Pulse Timer:0~255 (100ms/Unit).

0 : Normal relay mode

1~255(100ms~25.5sec):

When DO Controller=1 Relay will ON a period of time then OFF, It depends on the Pulse timer value.

DO Controller:0~3

   0: Relay OFF.

   1: Relay ON a period of time then OFF, It depends on the Pulse timer value.

   2. Auto remote serial device enable.

      Relay will enable a period of time when DI does not receive the pulse within 30 sec.

      Relay enable time depends on the "Pulse Timer" Parameters.

   3. Auto remote serial device enable.

      Relay will be keep ON when DI does not receives the pulse within 30 sec.

4-4. Using the Web-based utility

The Web-based utility that can be used to configure the TRP-C37A Serial Server from different web browsers.

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-C37A IP is 192.168.1.1 Please Input them which will appears the following.
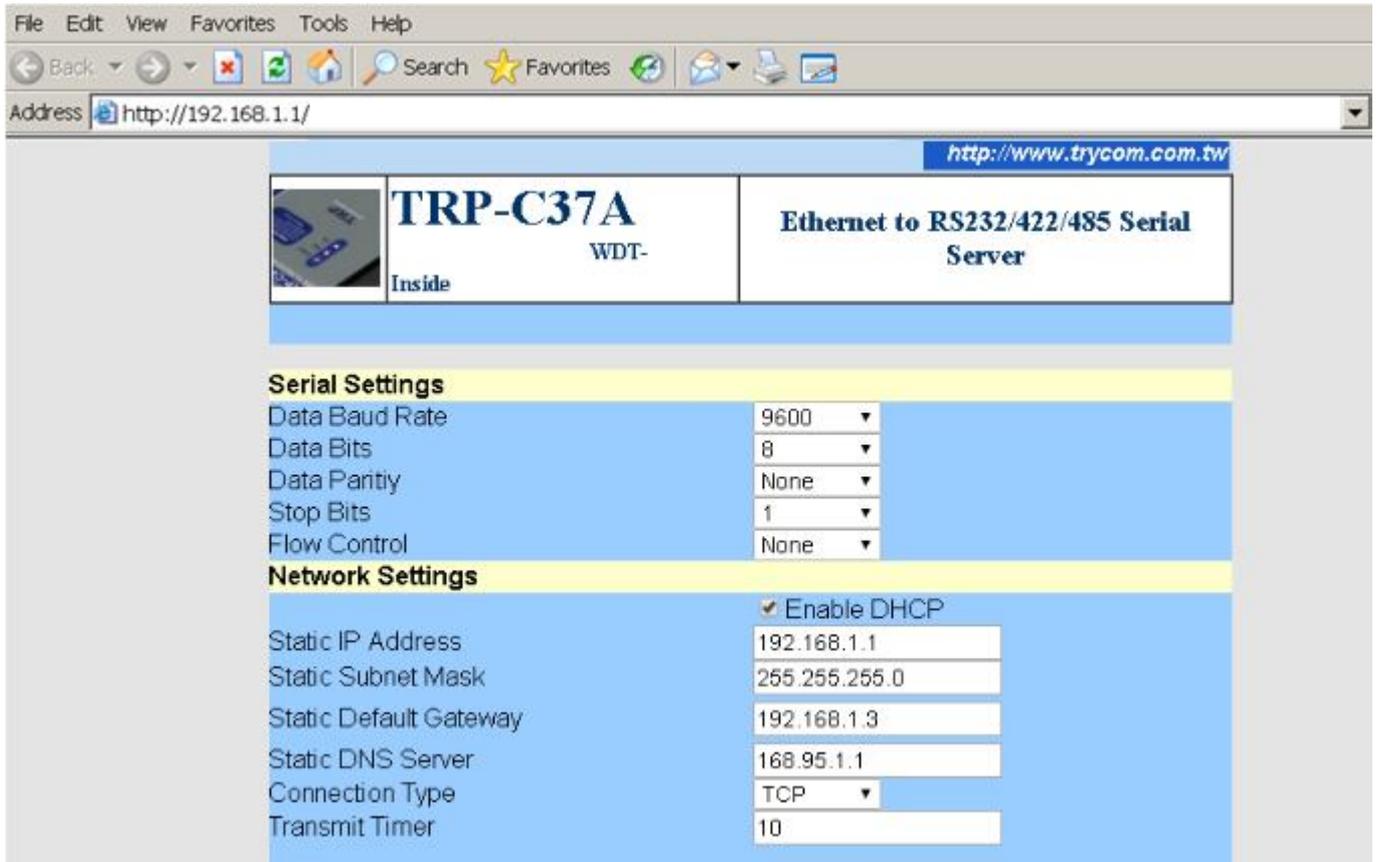
4-5 .How to setup the network security

In network security, the TRP-C37AM is able to setup 1~ 8 sets host IP, only these host IP can access the TRP-C37A.

The TRP-C37A actually can make connections with any Host IP,

Once the user has filled in the Host IP, these IP are valid, the TRP-C37A will be pass with them.

Other host IP will not pass.

Refer to the following example illustrates.

*Please upgrade the DSM utility version to 6.01 above.

Maximum 8 sets host IP that limits network access.

TRP-C37A Server

Acces pass
Network

Host IP 192.168.0.101~192.168.0.108

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-C37A off line or power fail, The Virtual-Com utility will try to Reconnection.

Step 1. Insert the TRP-Serial CD and find the TRP-C37A folder.
Step 2.Click "Vcomm.exe" icon then install Virtual-COM utility.
*The Virtual COM utility support multi-language, please select which language do you need.

Step3. Click "OK" button and select "VSP run as Client support Server Device".
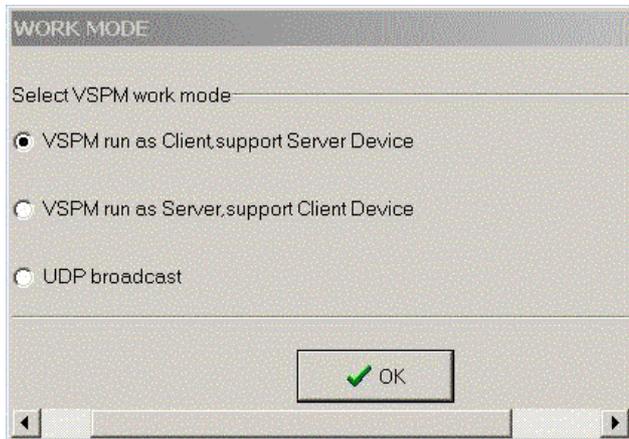
Step4. Select "Create virtual serial by device scanner", then press "OK"
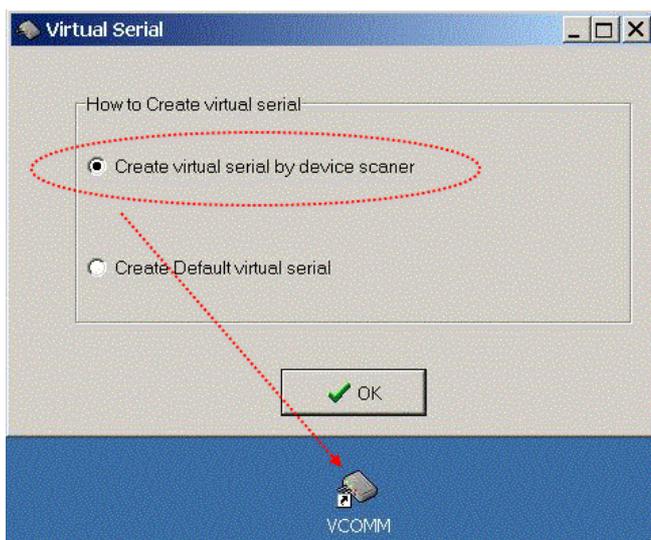
Step5. Run VCOMM.exe then click right button select "New Virtual COM"

Step6. Select "Select Serial Port" and input TRP-C37A IP and port then press "OK".
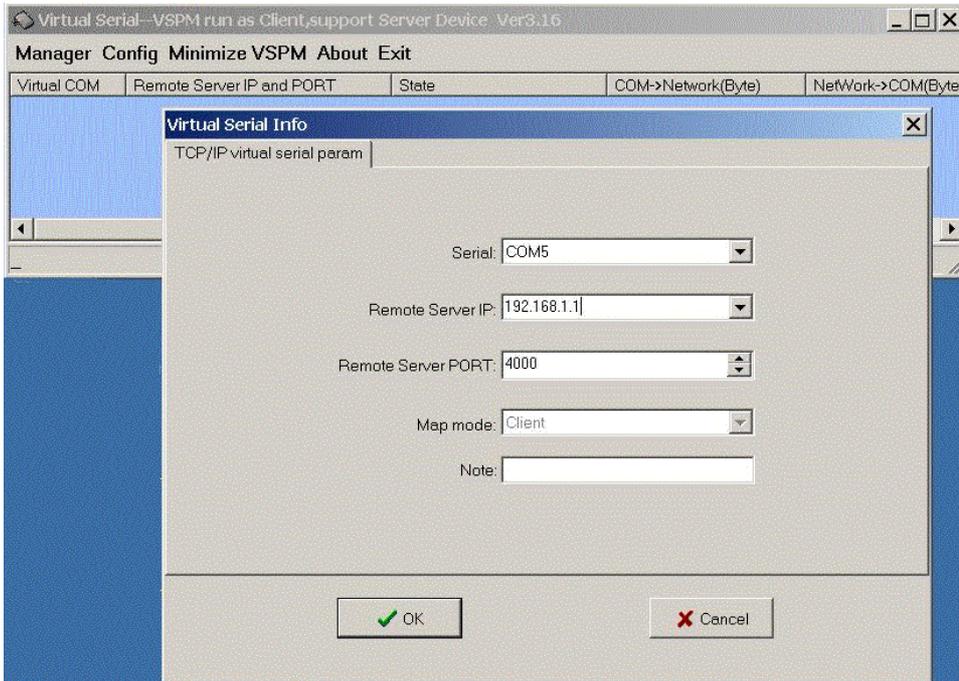
Step7. If Virtual-Com setting success, the display will appear bellow.

Step8. Run TRPCOM utility then select virtual-com port make a TRP-C37A loop test.
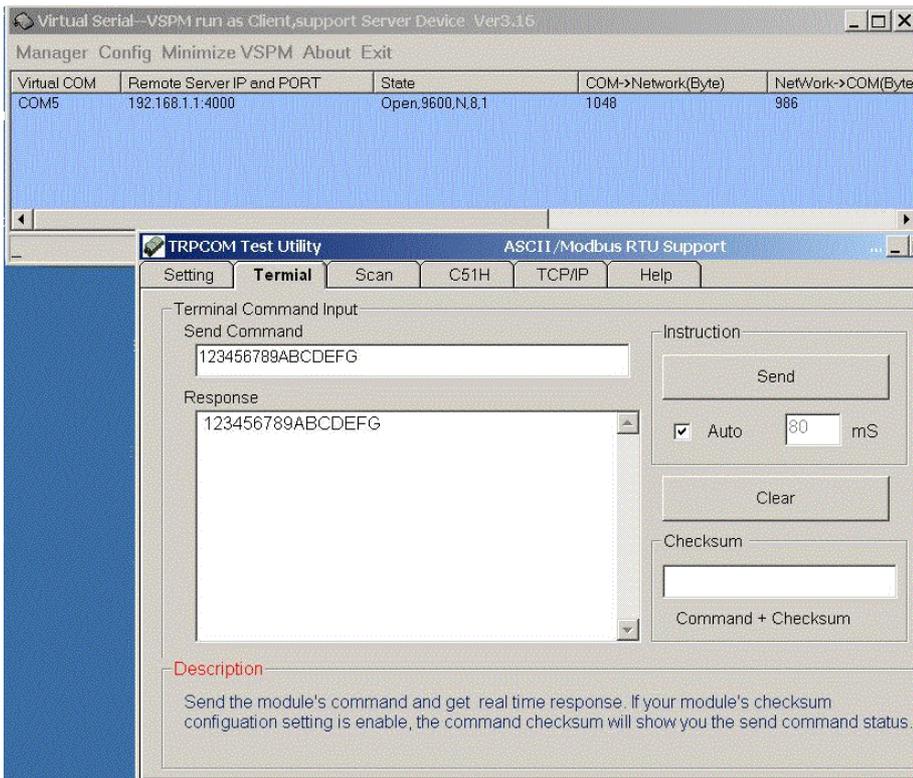
*If in VCOMM's configuration select "Boot with windows", the virtual-com will Auto-connection when windows start.
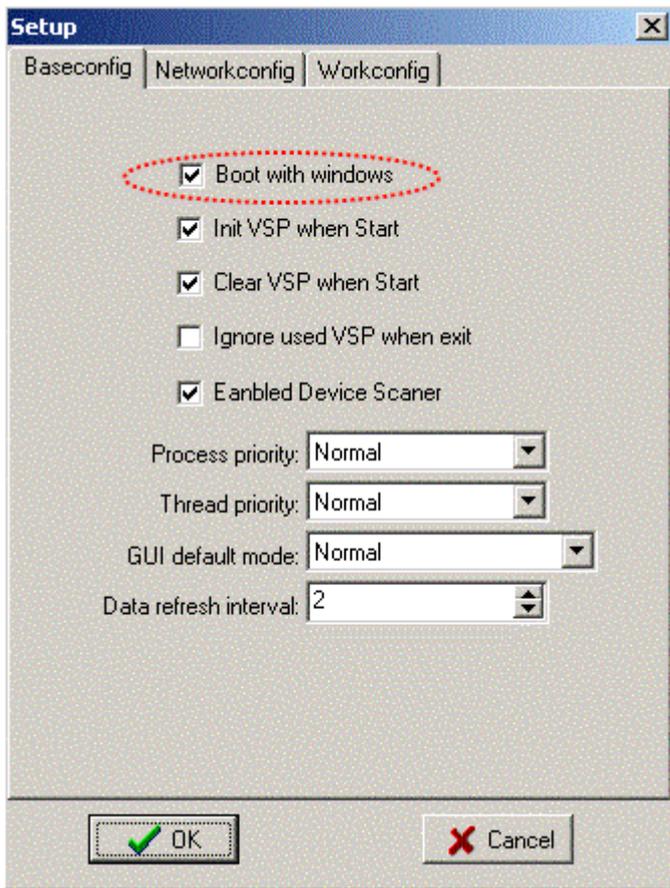
6. Application

6-1 Direct IP Mode
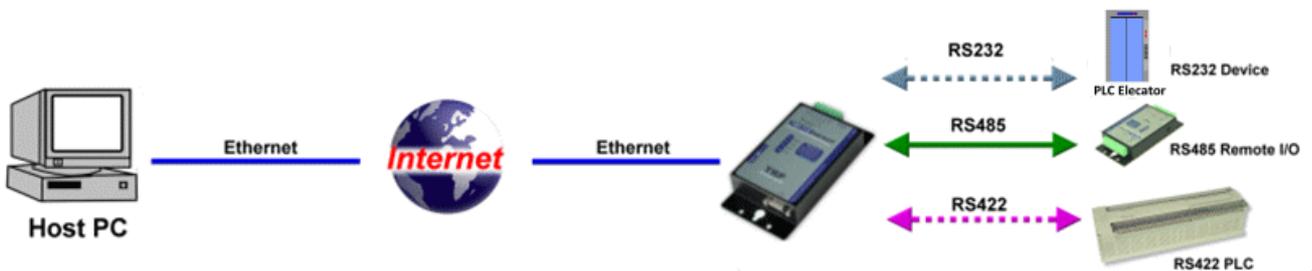
Example:

Step1: Connect PC-----Ethernet-----TRP-C37A-----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.
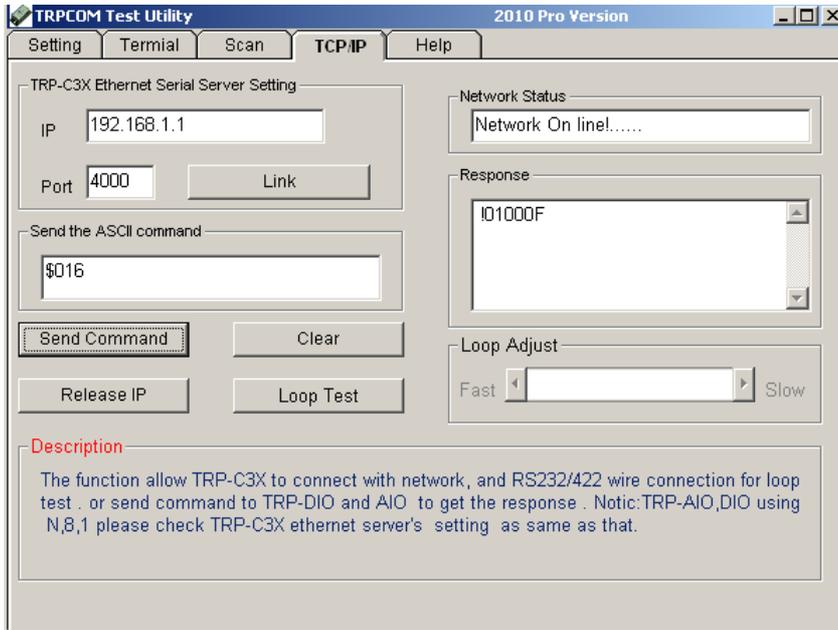
Step3.Send Command "#010003", The Response will enable TRP-C28 Relay1 and Relay2 enable.
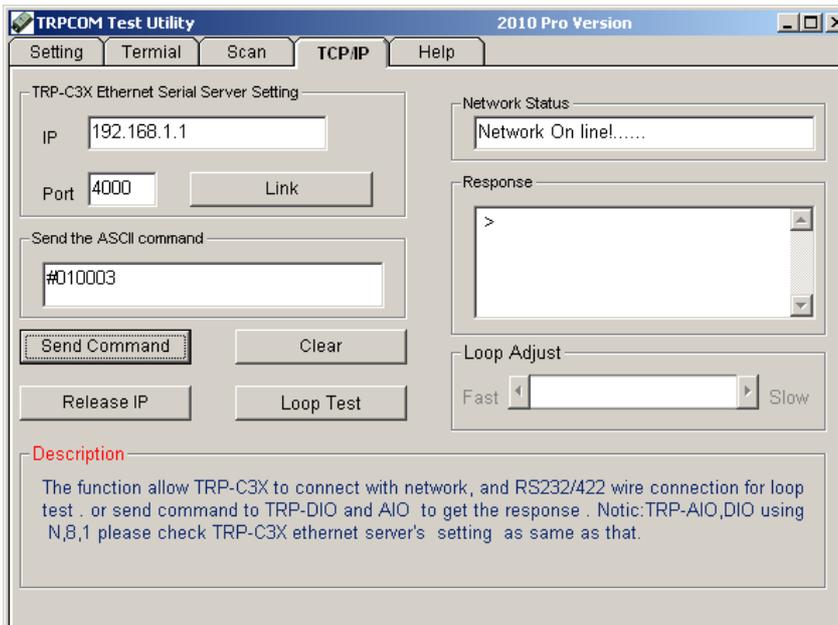
6-2 Virtual COM Mode

Support Modbus RTU/ASCII and ASCII Protocol
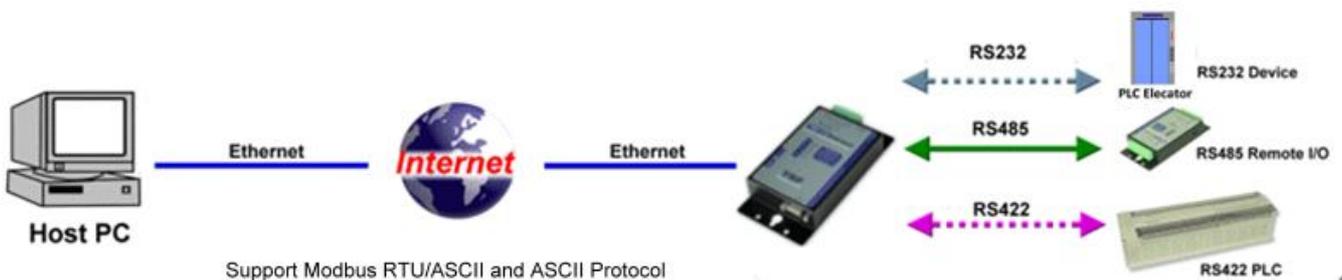
Example:
Step1. Connect PC-----Ethernet------TRP-C37A-----RS485---TRP-C28 (RS485 ID=01).

Step2. Run Virtual-COM utility and make a virtual-COM port, Run TRPCOM utility and input com port number, press "OK".
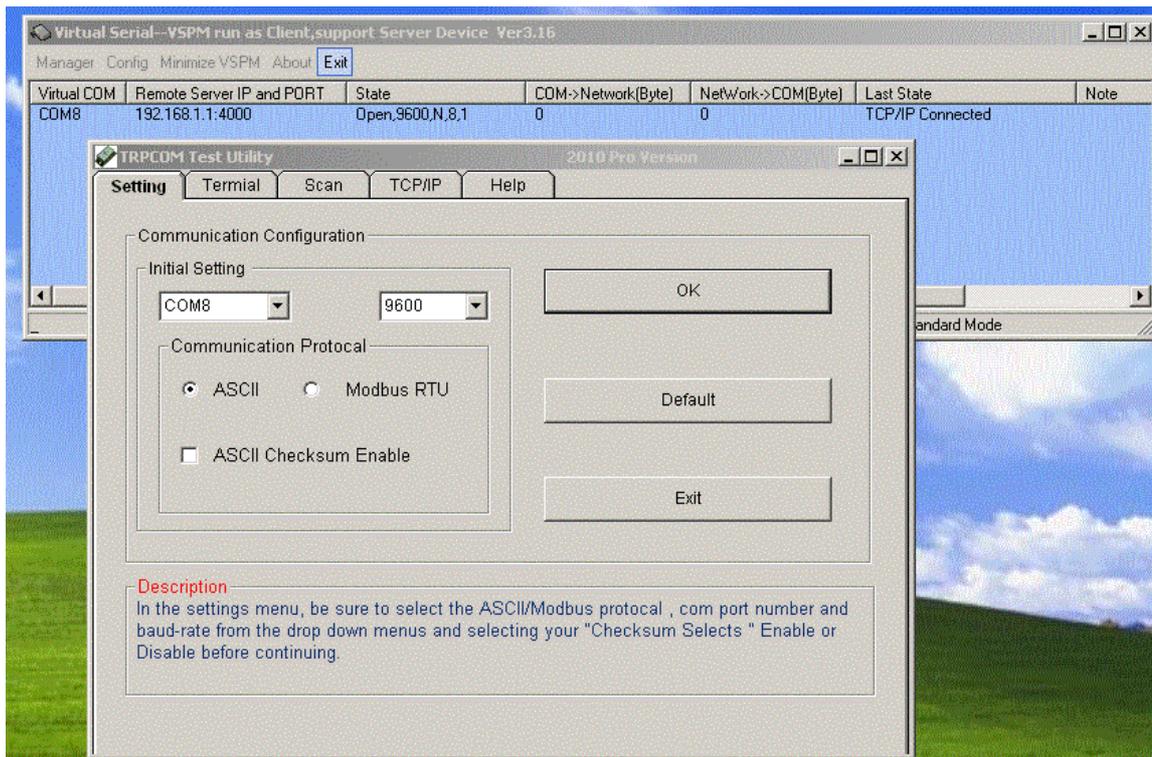
Step3.Select "Terminal" and send command, the response will appear TRP-C28 channel 2 counter value.

6-3 Paired Mode

Paired Mode

Support Modbus RTU/ASCII Protocol and ASCII Protocol
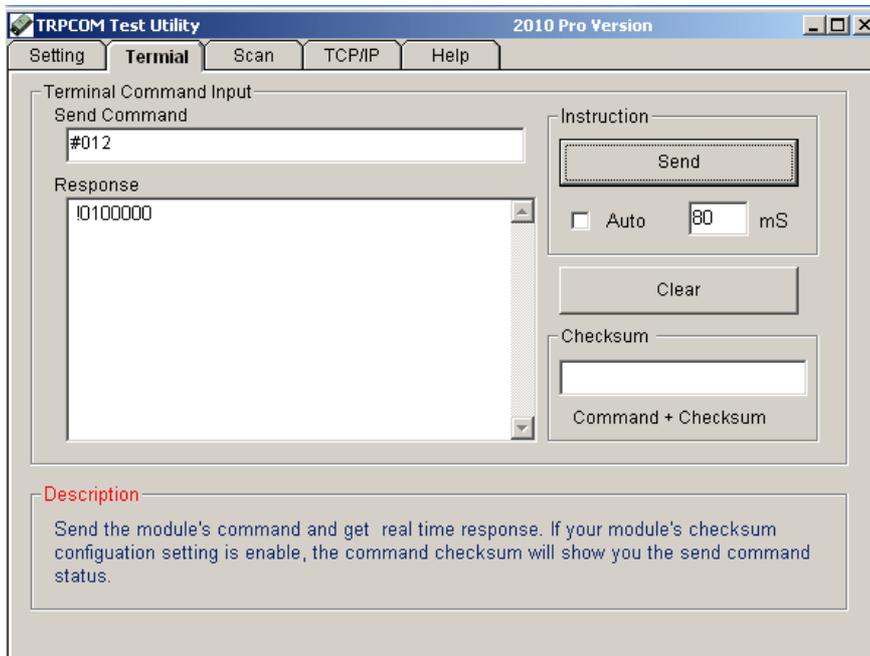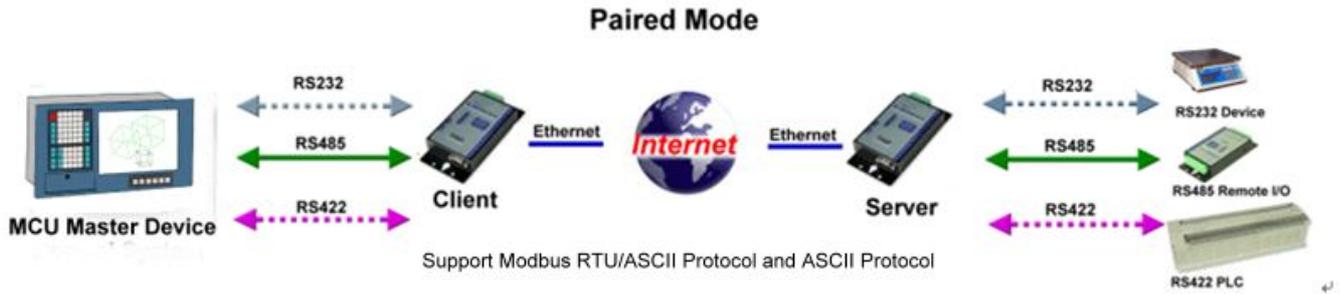
Example:

Step1. Connect PC---RS232---TRP-C37A-----Ethernet------TRP-C37A----RS422 (loop back TX+→RX+,TX-→RX-).

Step2.Run DSM set up *TRP-C37A Client*, Input destination IP and Port.

Step3.Run DSM set up *TRP-C37A Server* and be sure the IP and port as same as client setting.
*Adjust Maximum Connection to 16.
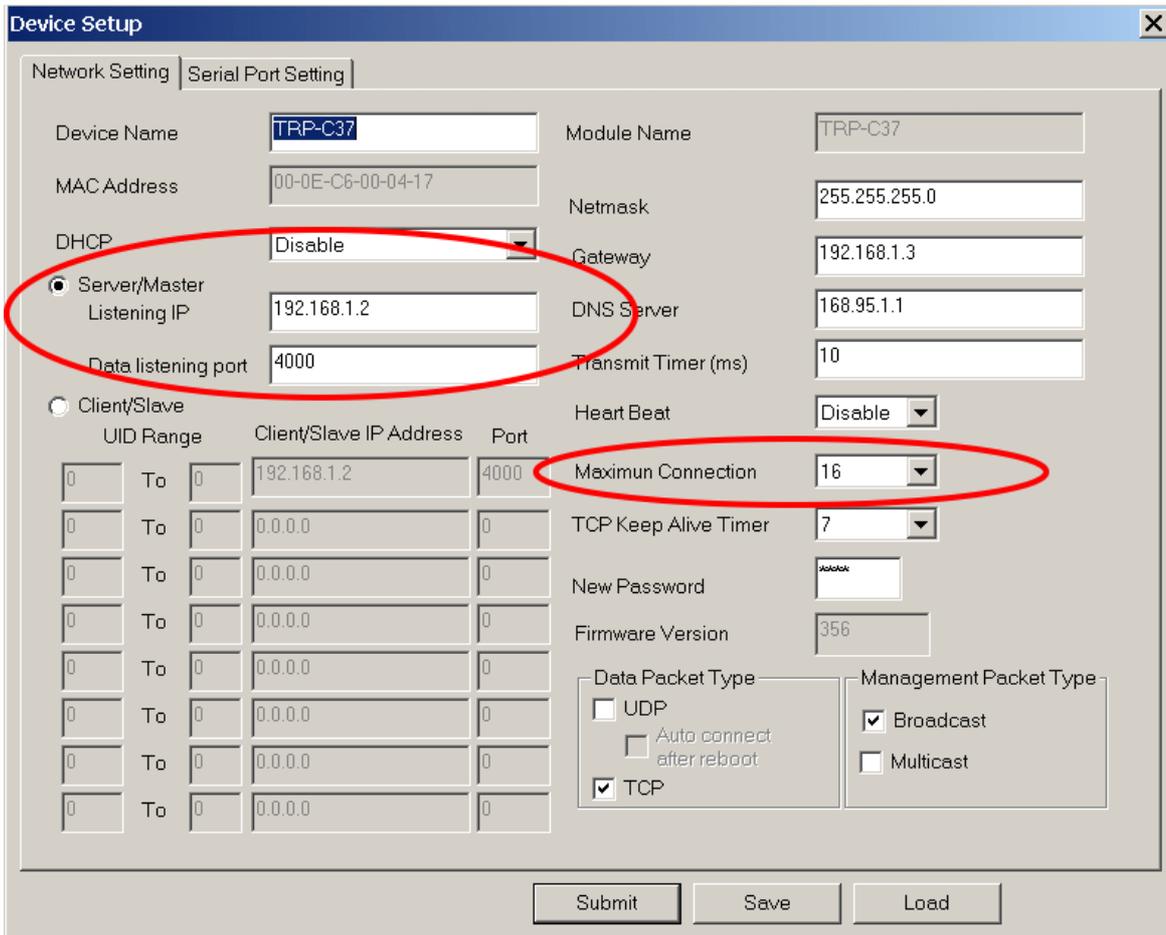
Step4. Run the windows utility "hyper Terminal" and select com port number, and press "OK".

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

Try to disconnect power or RJ45 cable, the TRP-C37A will Auto Re-connection.

6-4 Multi-Client PC to 1 TRP-C37A Server

The function main support serial data input to RS232/422/485 port of TRP-C37A, If serial data is a mass of serial data over 1K Byte ,Trying to adjust the" Transmit Timer" to 200ms.

Multi Client PC to One Serial Device

Maximum Client Connection : 16 Host PC
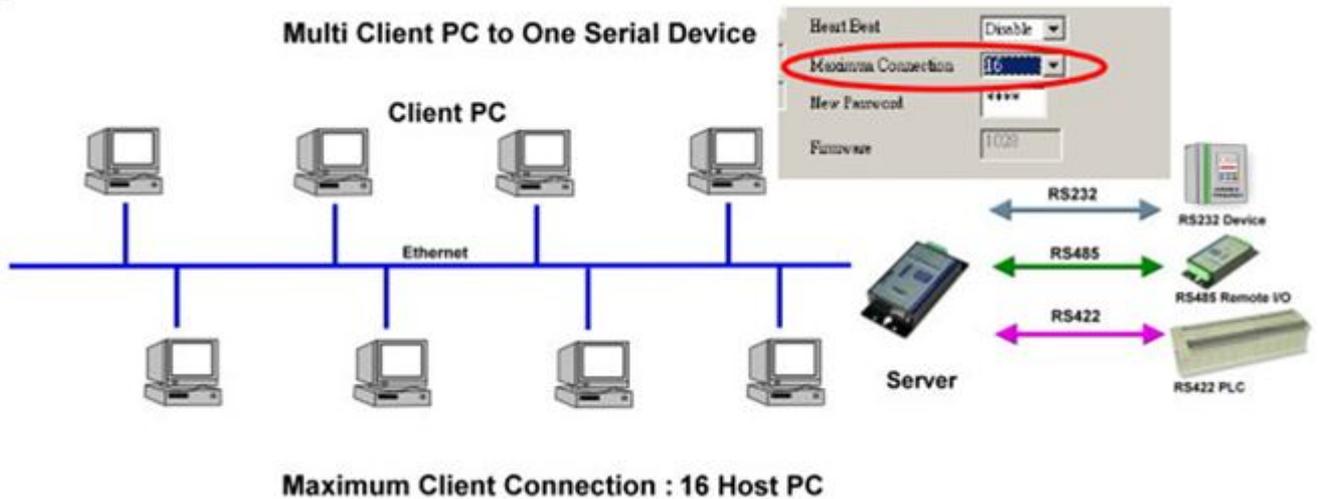
Example:

Running at Multi-Direct IP Mode

Step1.Connect Multi-PC ---Ethernet----TRP-C37A Server----TRP-C28 (RS485 ID=1)

Step2.Run DSM Set up **TRP-C37A** 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.
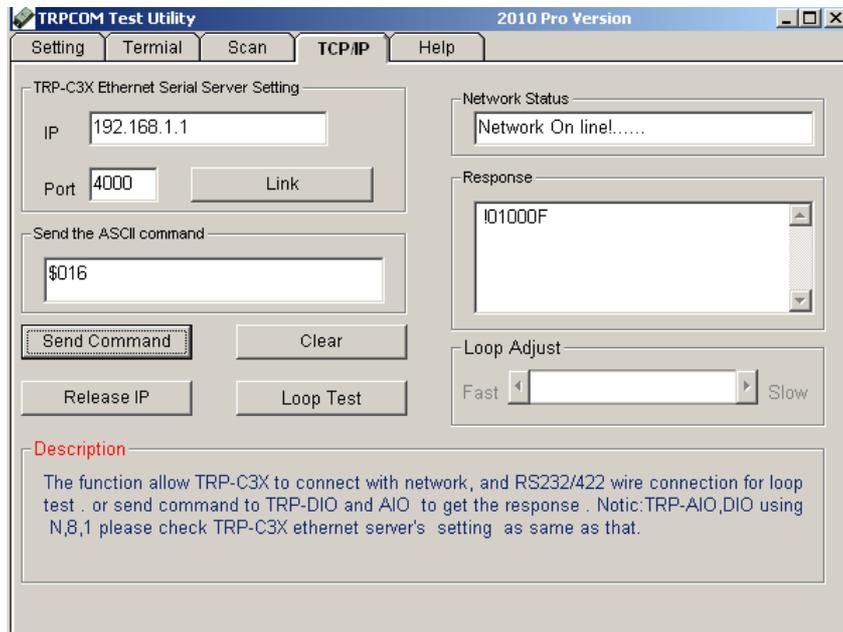

Running at Multi-Virtual COM Mode

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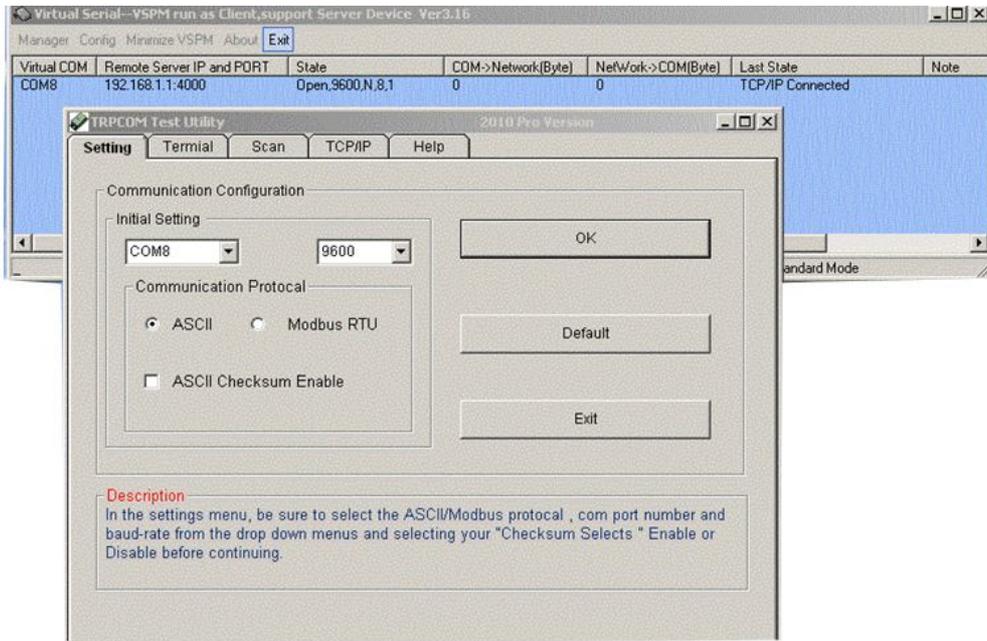
Step3.Select "Terminal" and send command, the response will appear TRP-C28 channel 2 counter value.
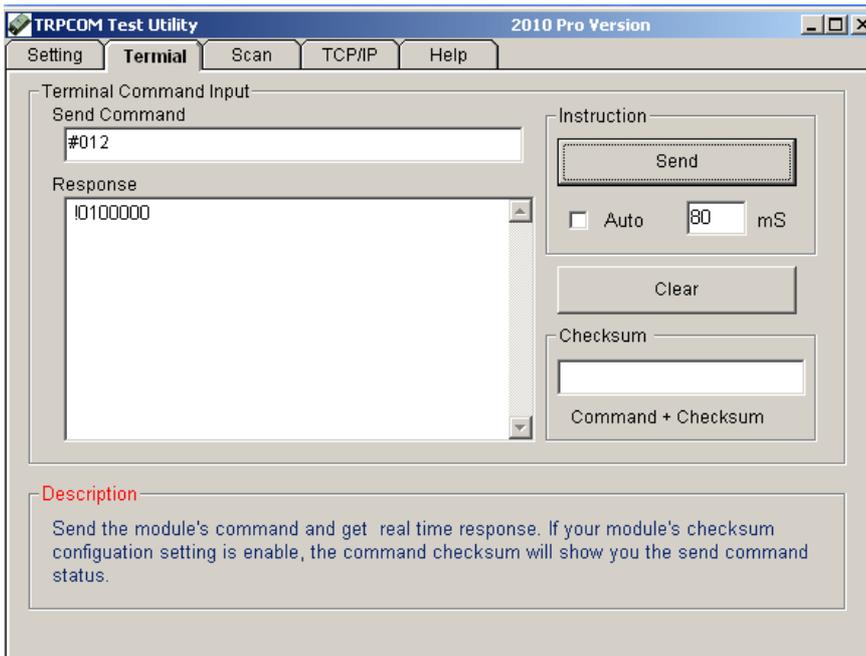

6-5 Broadcast Mode

The function main support serial data input to RS232/422/485 port of TRP-C37A, If serial data is a mass of serial data over 1K Byte ,Trying to adjust the" Transmit Timer" to 200ms.
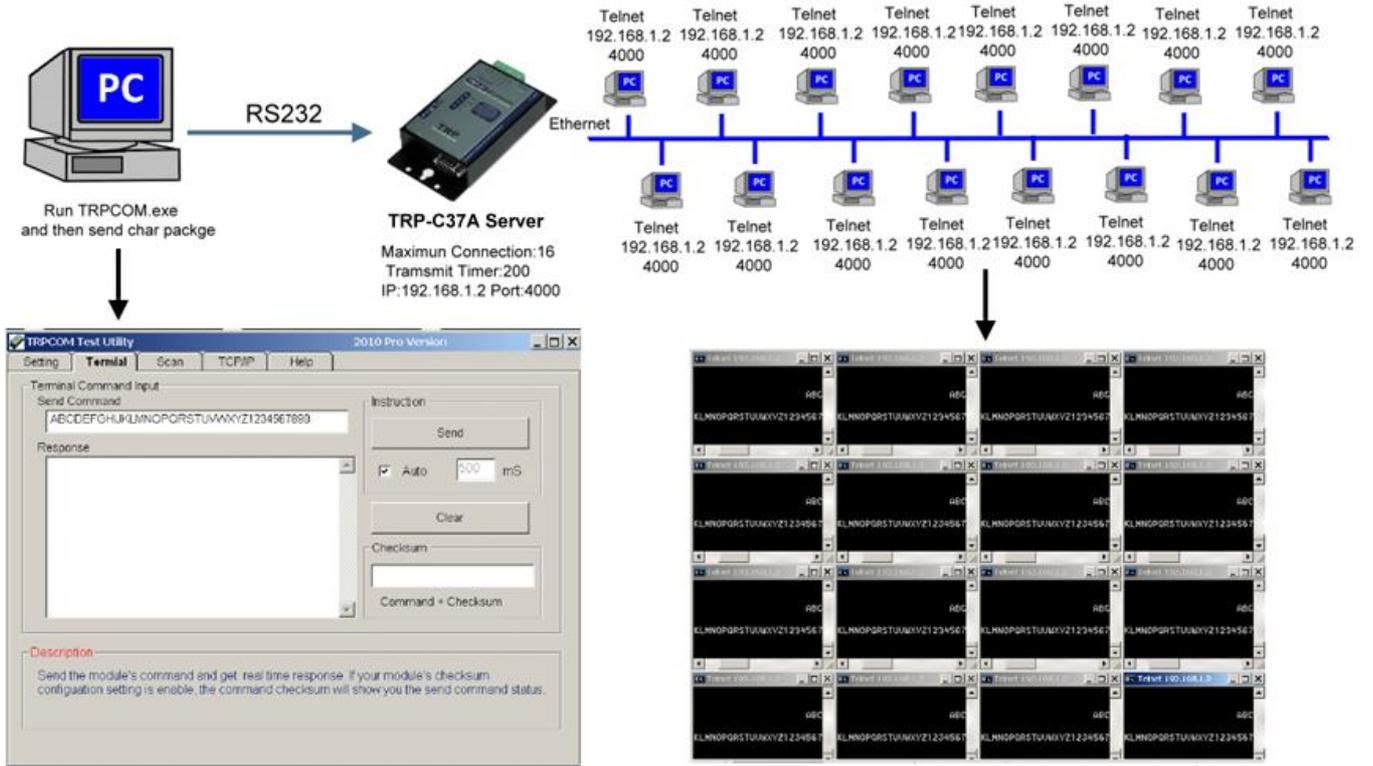
6-6 Heart Beat

The heart Beat function help customer detection the TRP-C37A LAN (on–line or off-line), User can open one 5300 port, if TRP-C37A on line, the 5300 port will send a char package period of 5 sec.

TRP-C37A Server

Hear Beat Enable
Period of 5 sec send
"Trycom Technology"
Char Packge
Port:5300

TCP Port 4000 Reconnection

TCP Port:4000 Keep Connecting

Program

PC

Heart Beat
Dectect

N

Y
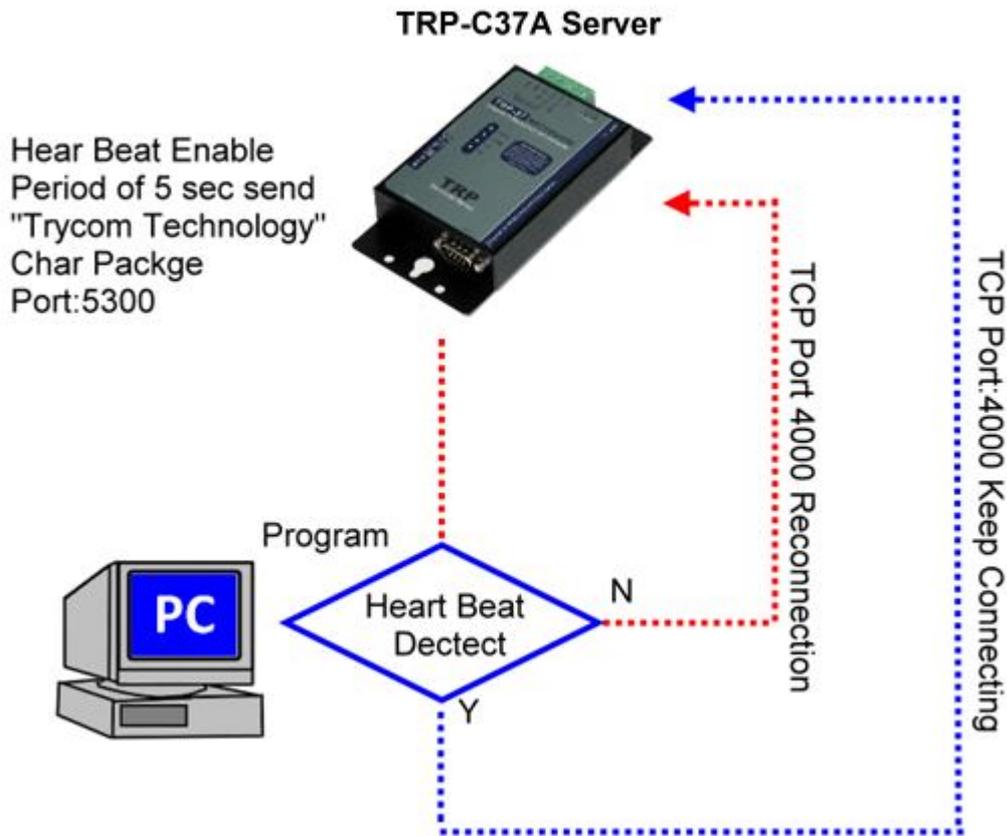
Step1: Run TRP-C37A DSM.exe to set up the heart beat enable.
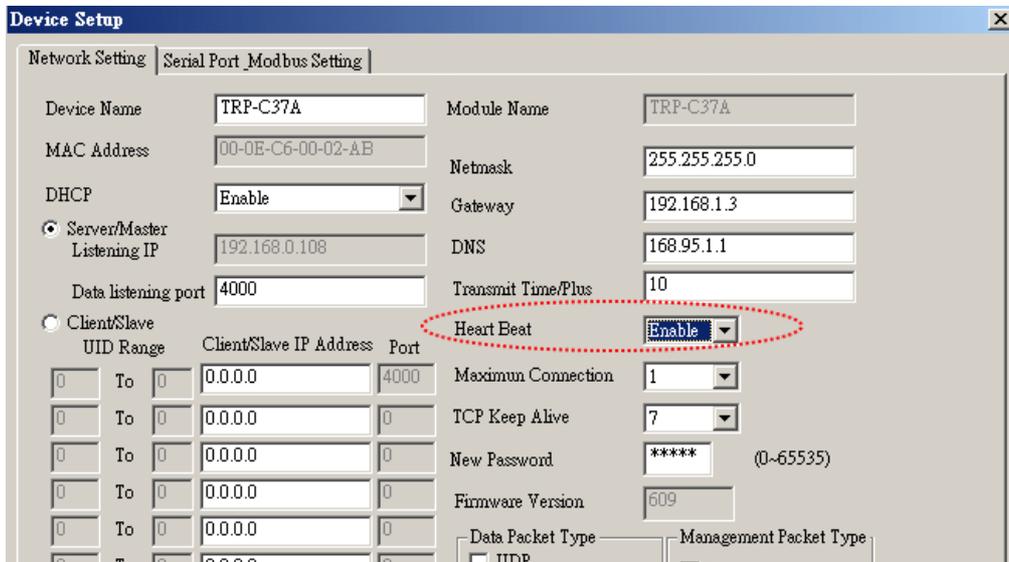
Step2: RUN TRPCOM then click "Link" button
Wait until the Response screen appear the message
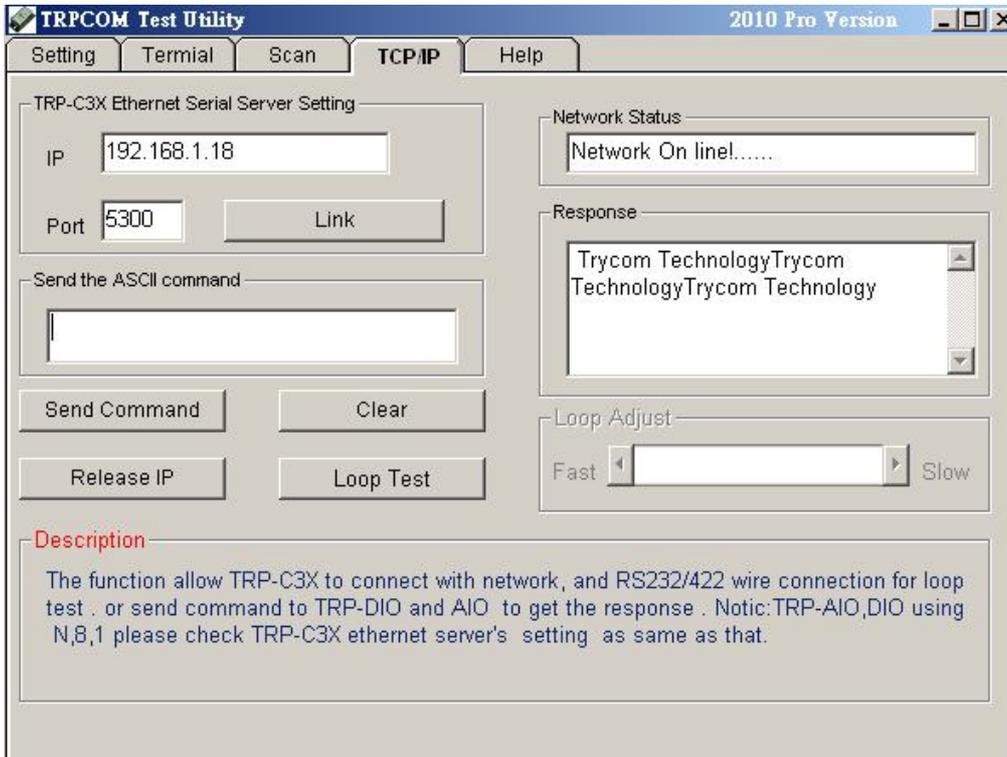
## 7. How to use the TRPCOM Utility with testing TRP-C37A.

TRP-Serial Test Utility is demo utility which may help to test direct IP Mode .User may find the utility in the TRP-C37A support CD. Double click "TRPCOM Utility", the installShield Wizard will guide you complete installation.

User can directly link TRP-C37A to TRP-Serial Remote IO Modules by RS485, The basic wiring connect.

RS485 Test

Run TRPCOM and send command "$01M" and get response.
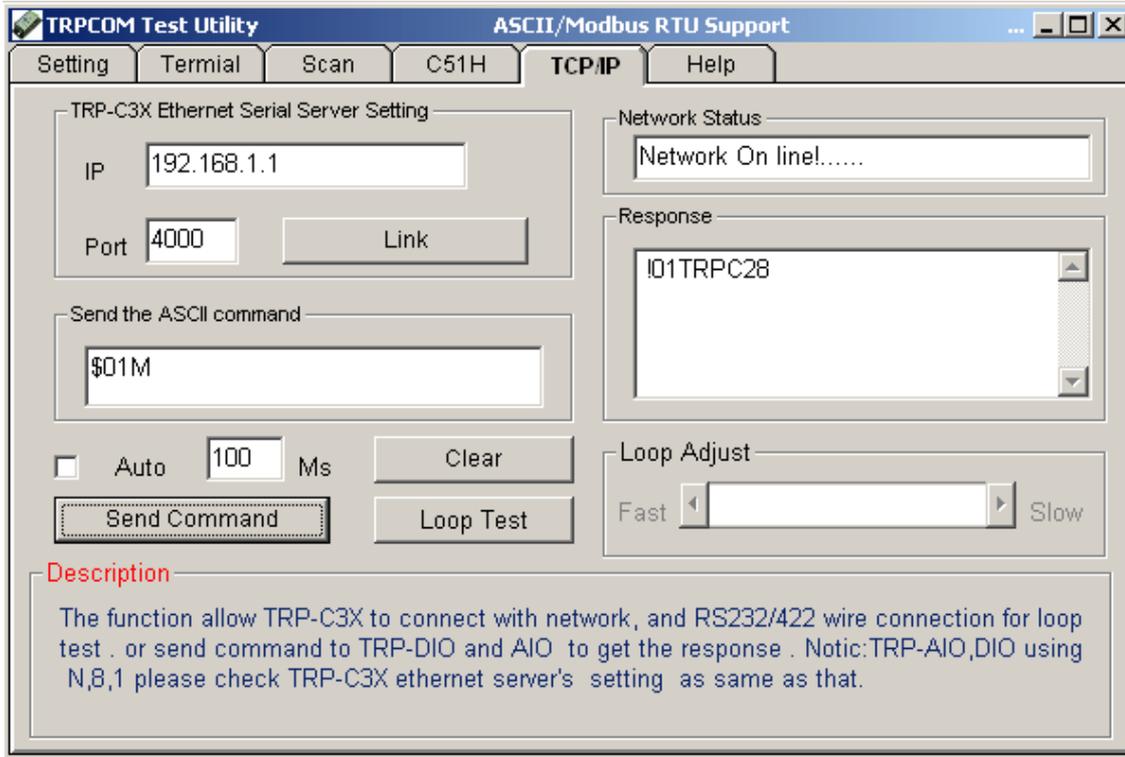
RS422 Loop Test

Hardware wiring connection for RS422 loop test.

TX+ to RX+, TX- to RX-
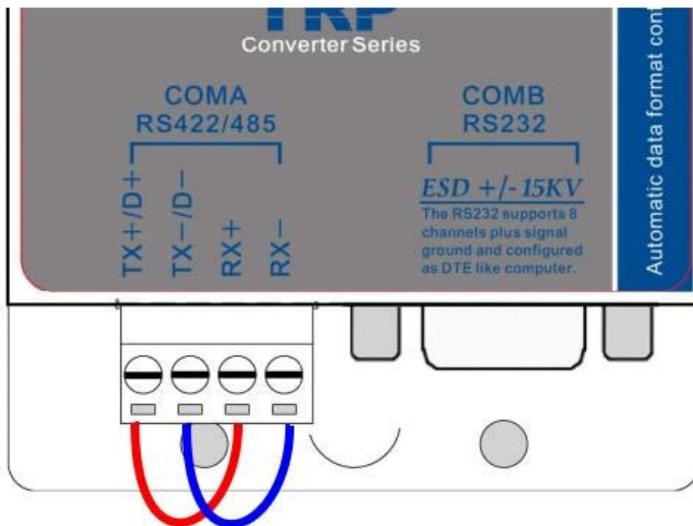
RS232 Loop Back Test

Hardware wiring connection for RS232 Loop Test.

TXD to RXD, RTS to CTS.

Pin2,3 Short
Pin7,8 Short
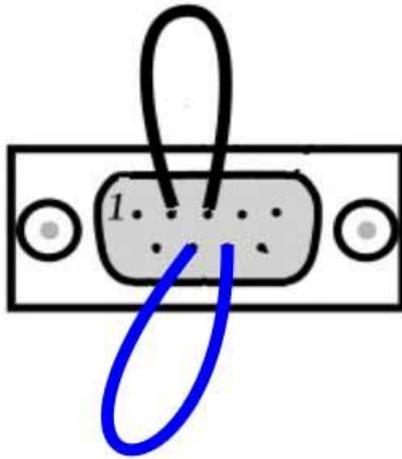
RUN TRPCOM test utility then connect correct IP and Port then click the "Loop Test" button"
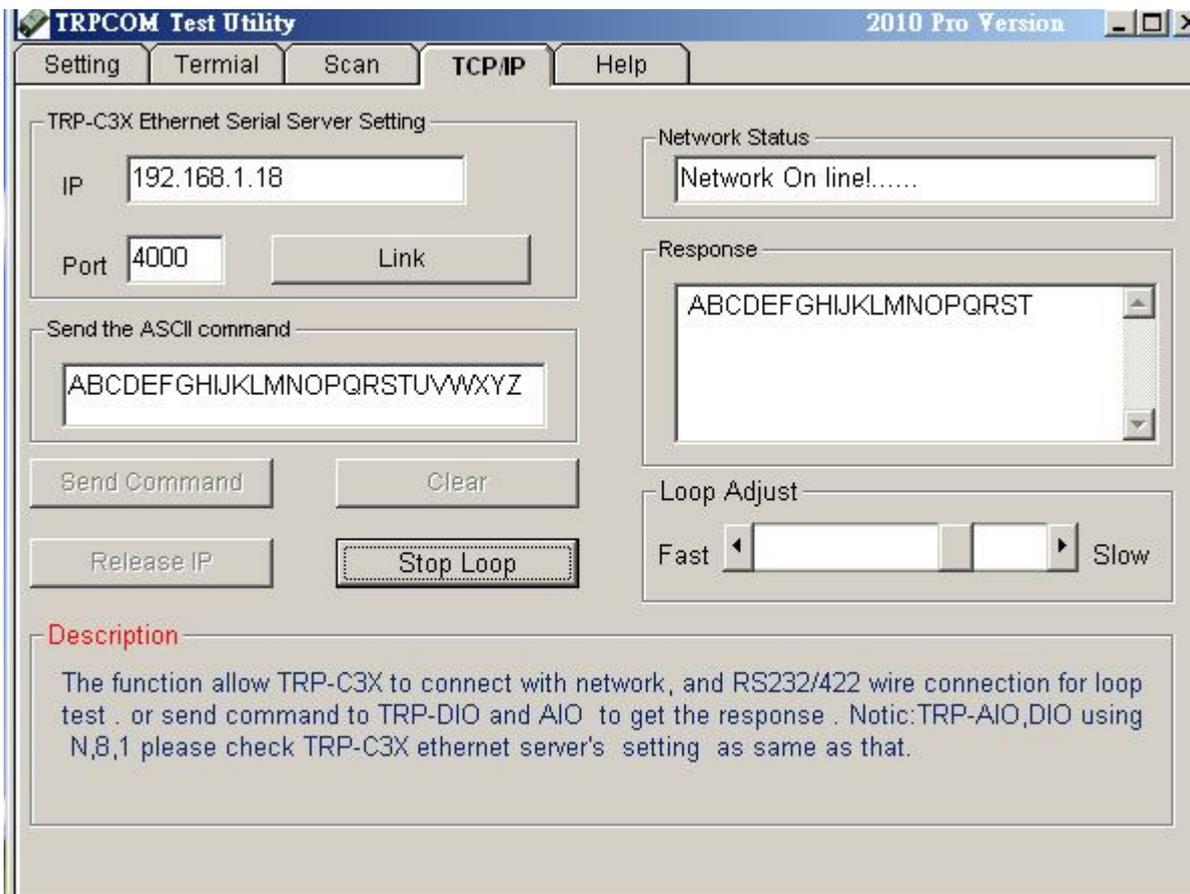
8. How to remote the serial device

8-1 Automatic monitoring mode:

The Serial device must be sends a single pulse to TRP-C37A continually per 30 seconds.

If serial device does not send a single pulse over 30 seconds, the relay will enable.
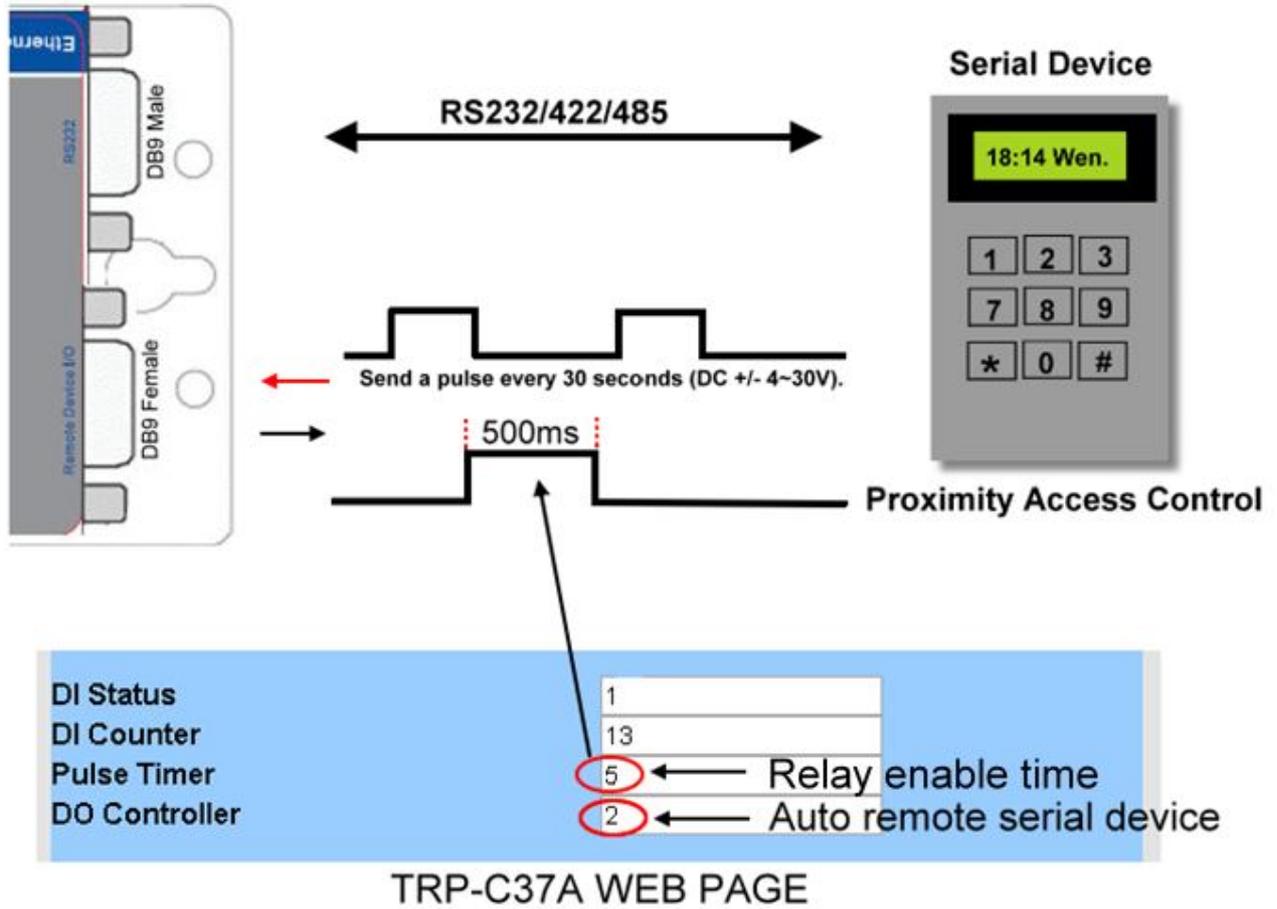

TRP-C37A WEB PAGE

8-2 Manual Remote the serial device.

If the serial device needs to restart, user can feel free to set the relay enable through the TRP-C37 A web-based utility configuration.


TRP-C37A WEB PAGE

9. Application

Direct or Virtual-Com Mode

Pair Mode

Multi Client PC to One Serial Device
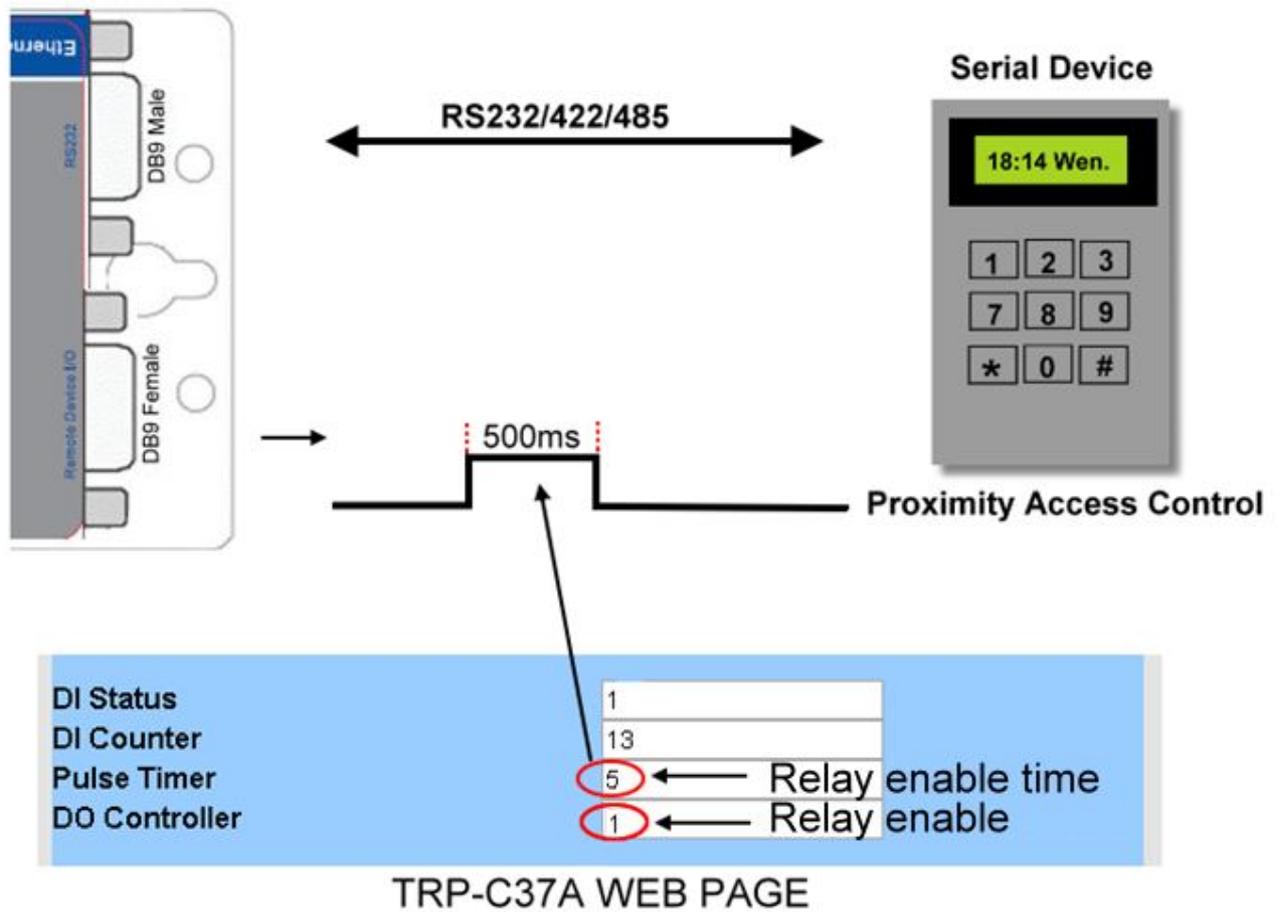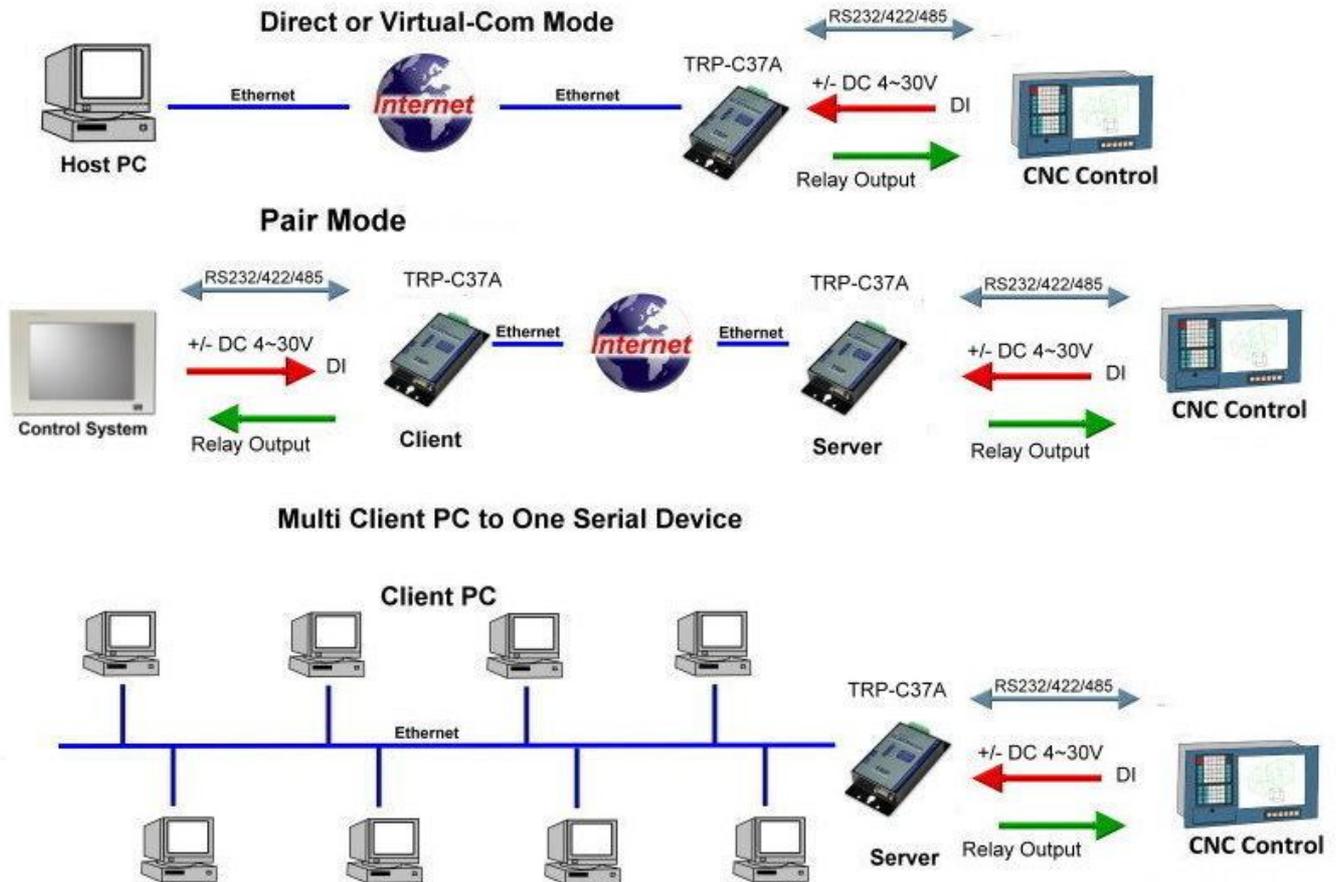
Remote automatic monitoring
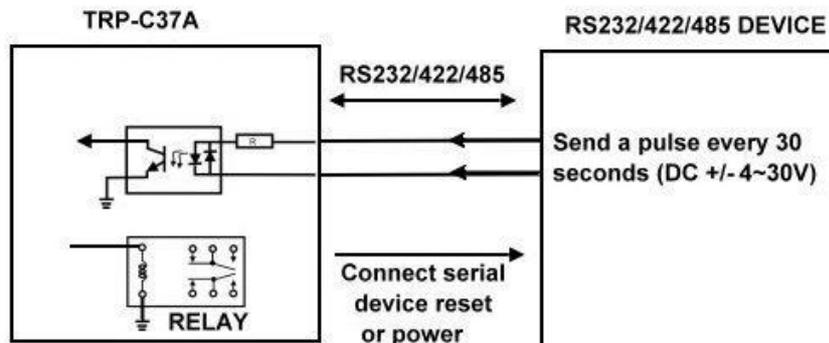
It will be causes the relay active when the TRP-C37A does not receives a pulse over 30 sec.
The relay actuation time is adjustable by the TRP-C37A WEB interface.

10. Appendix
What is different between TRP-C37A and TRP-C37MA

TRP-C37A RS232/422/485 Serial Device Server

The **TRP-C37A** which is only to send the data between the TCP and Serial, it cannot process the

data and perform operations.

This means that no matter what it received any data that can only be responsible for two-way

Transmission.

TRP-C37MA Modbus TCP to RTU/ASCII Gateway

The **TRP-C37M** which is able to analyzes the protocols between Modbus TCP and Modbus

RTU / ASCII.

  The TRP-C37AM can assign the UID of Modbus TCP slave from Modbus Serial Master.

TRP-C37AM has all the features of TRP-C37A.

Modbus TCP Master to Modbus RTU/ASCII serial Device

Modbus RTU/ASCII Serial Master to Modbus TCP Slave Device