2-Port Modbus RTU/ASCII To Modbus TCP Gateway

WPC-832-2-Modbus
User Manual

v.201812b

http://www.tcpipweb.com

*** this user manual is subject to change without prior notice.

Table of Contents

Introduction

WPC-832-2-Modbus RTU/ASCII to TCP Gateway provides the easy way of connecting Modbus Serial devices to Wireless and Ethernet LAN in Modbus TCP and RTU/ASCII networks at the same time. The wireless supports 802.11 b/g/n in AP/Station mode with WEP/WPA/WPA2 encryption for data transmission security. Ethernet support 10/100 Mbps auto-detecting communication speeds. This Gateway is designed to operate 2 Serial ports (RS-232 and RS-422/485 respectively) over wireless and Ethernet network. It allows users to integrate Modbus/RTU and Modbus/ASCII Serial devices to the TCP/IP network-based devices from host to remote site with 8 TCP Masters simultaneously and 32 requests simultaneous per Master.

WPC-832-2-Modbus 2-Port Modbus RTU/ASCII To Modbus TCP Gateway is a high performance design composed with carefully selecting qualified components from reliable and certified sources. This operation manual will guide you to configure functions step by step.

The following topics are covered in this chapter:

☐ **Overview**
☐ **Package Checklist**
☐ **Product Features**
☐ **Hardware Specifications**

Overview

WPC-832-2-Modbus 2-Port Modbus RTU/ASCII To Modbus TCP Gateway provides a perfect solution to make your industrial Serial devices connect to Internet instantly via Wireless and Ethernet LAN.

WPC-832-2-Modbus embedded with MT7688AN MIPS chipset makes it become the ideal device for transmitting the data from your RS-232 or RS-422/485 Serial interface devices, such as PLCs, various Meters and/or Sensors to an IP-based Wi-Fi LAN, and making it possible for your software to access Serial interface devices anywhere and anytime.

WPC-832-2-Modbus provides TCP Server Mode, TCP Client Mode, and UDP Mode for selection.   It supports manual configuration via web browser and support various protocols including TCP, IP, UDP, HTTP, DHCP, ICMP, and ARP.   These are the best solution to coordinate your Serial interface devices.

Package Check List

WPC-832-2-Modbus 2-Port Modbus RTU/ASCII To Modbus TCP Gateway product attached with the following items:

☐ 1 unit of Serial to WPC-832-2-Modbus Gateway

☐ 1 unit of Power Adaptor (12V DC, 1A) is an option

☐ 1 unit of dipole antenna(2.0dBi)

☐ Documentation & Utility CD

NOTE: Inform your sales representative if any of the above items missing or damaged.

Product Specifications

System

- CPU : MT7688AN MIPS CPU, 580 MHz
- RAM : 128M Bytes DDR2 RAM
- ROM : 32M Bytes Flash ROM
- OS : OpenWrt Linux OS
- TCP to RTU support 8 simultaneous TCP Master, 32 simultaneous requests per Master.
- RTU to TCP support 8 TCP Slaves on each port.

Ethernet

- Port Type : RJ-45 Connector
- Speed : 10 /100 M bps (Auto Detecting)
- Protocol : ARP , IP , ICMP , UDP , TCP , HTTP , DHCP
- Protocol : NTP, FTP
- Mode : TCP Server / TCP Client / UDP
- Setup : HTTP Browser Setup (IE, Chrome, Firefox)
- Security : Setup Password
- Protection : Built-in 1.5KV Magnetic Isolation

WiFi port

- Support AP / Station
- Standard :   2.4G IEEE 802.11b/g/n
- Data Rate :   11/54/72.2 Mbps @ 20Mhz Band Width
- Modulation : DSSS; OFDM
- Frequency : 2.4GHz
- Tx Power 11b : Max. 22dBm
- Tx Power 11g/n :   Max. 19dBm
- Rx Sensitivity : -76dBm @ 54Mbps; -89.5dBm @ 11Mbps
- Tx Rate : Max. 54Mbps with auto fallback
- Tx Distance : Up to 100m
- Security : WEP 64-bit / 128-bit data encryption, WPA / WPA2 personal
- Antenna : 2 dBi ; RP-SMA connector
- Network Mode: Infrastructure; Soft AP (for Setup)
- Mode : TCP Server / TCP Client / UDP / Virtual Com / Pairing
- Setup : HTTP Browser Setup (IE, Chrome, Firefox)
- Security : Login Password

Serial Ports *2

- Port : RS-232 *1 (RS-232 with RX/TX/GND only)
- Port : RS-422 / 485 *1 (Surge Protect)
- Speed : 300 bps ~ 230.4 K bps
- Parity : None , Odd , Even , Mark , Space
- Data Bit : 5 , 6 , 7 , 8
- Stop Bit : 1 , 2
- RS-232 Pins : Rx , Tx , GND
- RS-422 : Rx+ , Rx- , Tx+ , Tx- (Surge Protect)
- RS-485 : Data+ , Data- (Surge Protect)
- 15KV ESD for all signals

Power

- DC 9~32 V, 1000mA@12V
- support DC Jack & Terminal Block Input

Mechanical and Environment

- Operating Temperature : -20℃～70℃
- Storage Temperature: -25℃～80℃
- Dimensions : 110 * 90 * 26 mm (W * D * H)

- ♦ Weight : 110 ± 5gm
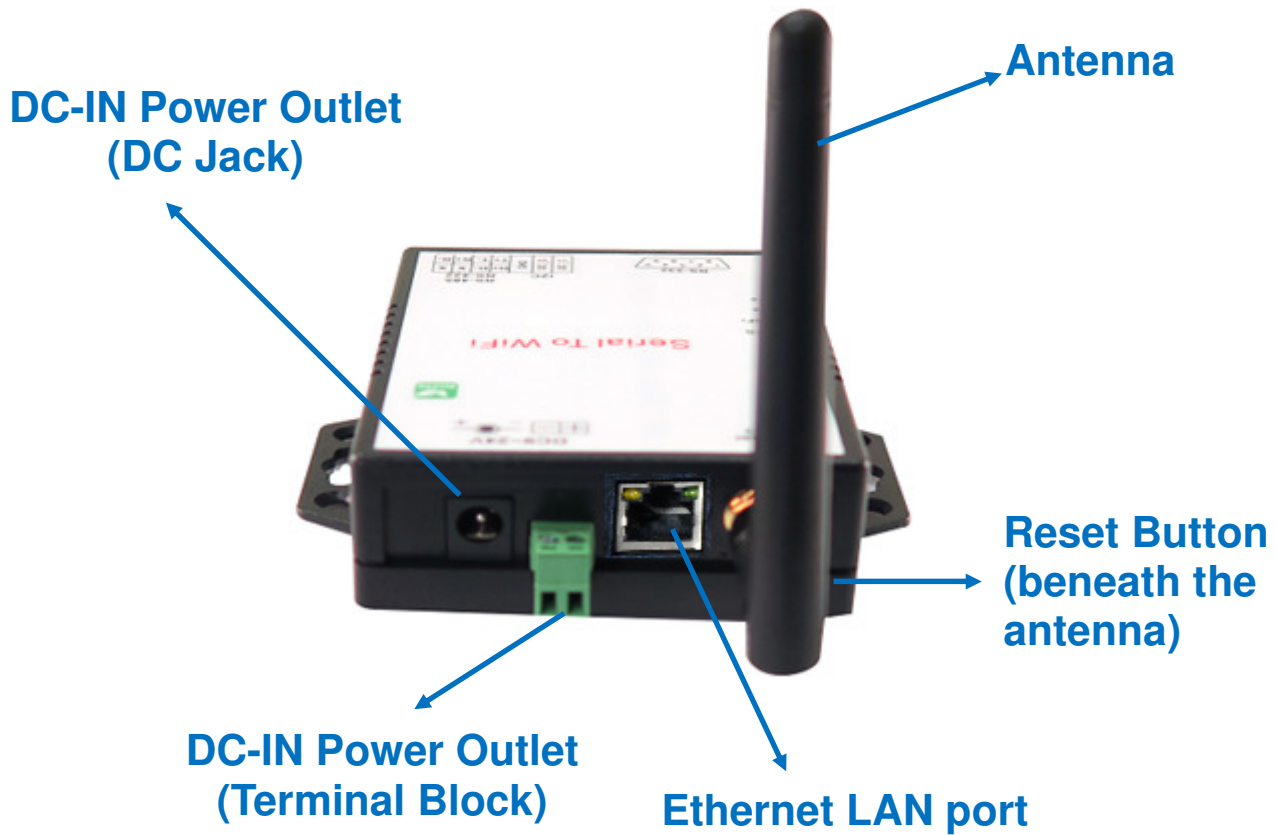- ♦ Housing: plastic.

Other Features

- ♦ Led Lamp : SYS, WiFi, RX, TX, LAN
- ♦ RTC : Real Time Clock
- ♦ Watch Dog Function
- ♦ Software : TCP TO RTU Slave, RTU Master TO TCP Slave ,
       TCP TO ASCII Slave, ASCII Master TO TCP Slave

Warranty

- ♦ Warranty period : 1 year.

Product Panel Views

Antenna Side

**DC-IN Power Outlet
(DC Jack)**

Antenna

**Reset Button
(beneath the
antenna)**

**DC-IN Power Outlet
(Terminal Block)**

Ethernet LAN port

Serial Interface Side

RS-422/485

RS-232

DC-IN Power Outlet

The Serial to Ethernet+WiFi Converter is powered by a single 12V DC (Inner positive, outer negative) power supply and 1A Current.   Connect the power adaptor to the AC power socket and put the DC Jack plug into the outlet of device.   The "SYS" green color LED will be ON when power is properly supplied.   Terminal Block 2 wires power supply is an option.

☐ **DC Power outlet**
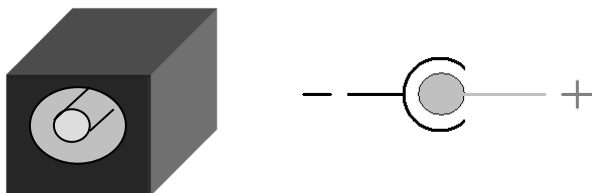
Reset Button

If any chance you forgot the login password or have incorrect settings making this Device inoperable, upon the power is on and the "SYS" LED light on, use a point tip to press this button and hold it for more than 20 seconds the release the point tip.   The Device will reboot and all the parameters will be reset to the factory default.

LED Indicators

SYS (Green):
Power indicator.   When the power is on, the LED will be on and blink per second.

WiFi (Red):
WiFi indicator.   When the WiFi is working, this LED will be blinking.

Tx (Green):
Data sending indicator. When data sending to the device from LAN or WiFi, this LED will blink.

Rx (Red):
Data received indicator.   When data sending to the device from Serial ports, this LED will blink.

Antenna Connector

The connector for antenna is a standard reverse SMA jack. Simply connect it to a 2.0dBi dipole antenna (Standard Rubber Duck).   It is 50 Ohms impedance and can support 2.4GHz frequency.

Ethernet Port

The connector for network is the usual RJ45.   Simply connect it to your network switch or Hub. When the connection is made, the green color LED of Ethernet port will blink. When data traffic (Rx/Tx) occurs on the network, yellow color LED will blink during data transferring.

DC-IN Power Outlet

The Device is powered by a 12V DC (Inner positive, outer negative) , 1.0A power supply.   Plugging the power adaptor to the AC power socket and put the DC Jack plug into the outlet of the Device.   The "SYS" green color LED will be ON when power is properly supplied.   Terminal Block 2 wires power supply is an option.

Serial Port of RS-232/RS-422/RS-485
Connect the Serial data cable between the device and the Serial interface device. Follow the procedure of web page configuration to set up parameters.

Wiring Architecture

1. RS-232

RS-232 Wiring
Serial Device

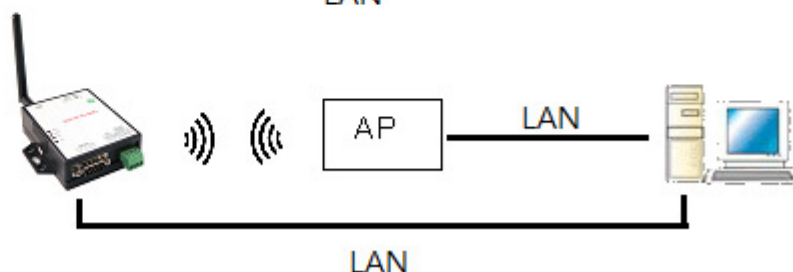DB 9 ——————— DB 9
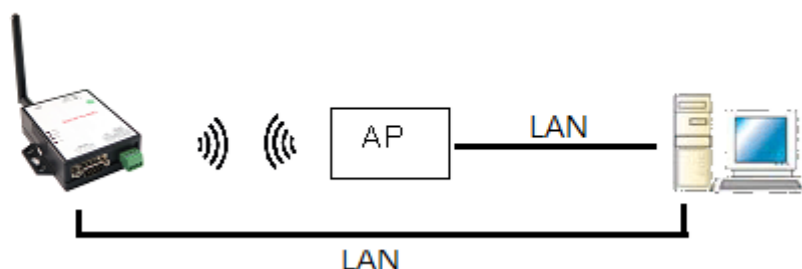
2. RS-422/RS-485

RS-422 Wiring
Serial Device

T -	———————	R -
T +	———————	R +
R -	———————	T -
R +	———————	T+
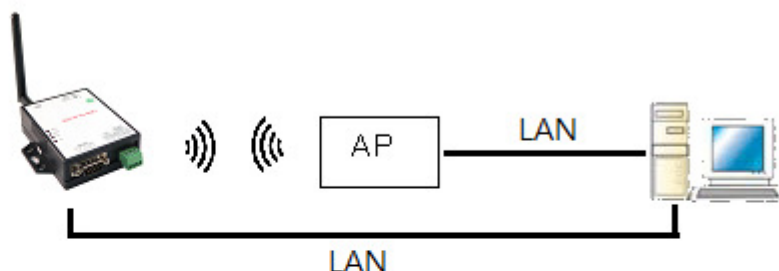
RS-485 Wiring
Serial Device

| D + | ——————— | D + |
| D - | ——————— | D - |

When you finish the steps mentioned above and the LED indicators are as shown, the converter is installed correctly. You can check the Software Setup CD to find IP Search Utility.   To proceed with the parameters setup, please use a web browser (IE or Chrome) to continue the detailed settings.

Configuration

When setting up your Gateway for the first time, the first thing you should do is to configure the IP address.

The following topics are covered in this chapter:

☐ **IP Search Utility Setup**

☐ **Web Browser Configuration**

IP Search Utility Setup

1. Copy "CvIotFinder Setup.exe" from CD ROM to your host computer.
2. "CvIotFinder" is a self-extract-install program.   Double click it to install this Wi-Fi IP Searching tool into host computer.
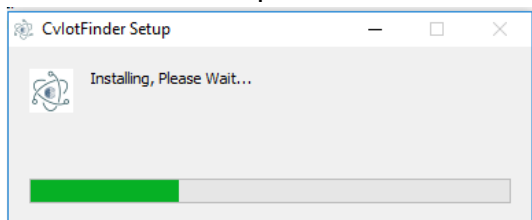
3. Upon running IP search tool (CvIotFinder), if a firewall warning pop up, please click to accept the program pass through firewall.

4. CvIotFinder will pop up on the screen after installation or you may double click the icon on desk top of host computer to open this tool.

5. Click on "**Find**" button.   It will scan the network and show up the IP of Gateway.

6. Click "Setup" button will pop up a window.   You may change Name, Description, IP, Netmask of device.   Click "Setup" to save setup.   The device's IP must be same subnet with host PC/NB enable to use web browser open configuration page.

7. Click "Goto" button will open a web page of configuration. (default ID: admin; password: admin).
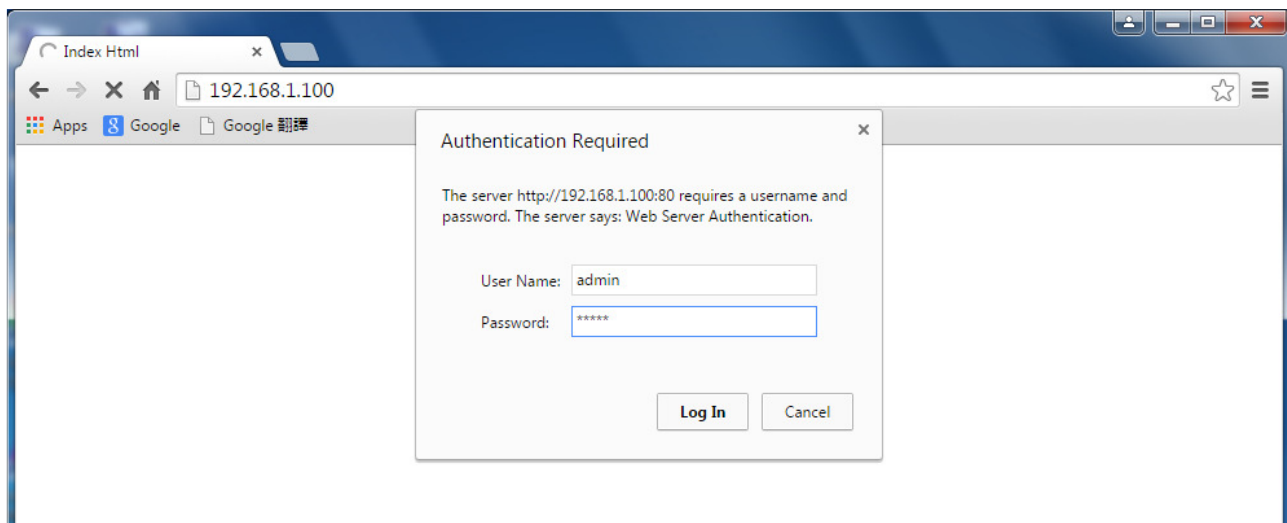
Login:
   User: "admin"
   Password: (none or "admin")

8. Follow #5 step, now you have successfully connected to the Gateway.

Web Browser Configuration

There are 4 setup pages as "System", "Network", "Serial" and "Over TCP/IP".

1. System Setup

1.1 System: where you can change Password, set up Auto Reset time and modify Device Name, Description of device.

1.2 Appearance of Wireless and Ethernet setup.

1.3 NTP: Enable / Disable NTP function; Set up NTP server and Time Zone.

SERVICES

HTTP Port	80
NTP Enabled:	Enabled ⌄
NTP Server :	openwrt.pool.ntp.org
NTP Offset :	UTC ⌄

1.4 Firmware update:
   If necessary, click "Browse" to open file manager.

Firmware

Firmware :	[ ] Browse...
Update	

Then, select the file with specified version and click "open" button.

> This PC > Data (D:) > KSH -Customers客戶 > SanTelequip -India U031 > Products測試,文件 > WPC-832-485 > Firmware

	Name	Date modified	Type	Size
☆ Quick access				
☑	SAN-U2E-UPGRADE-'1.0.21'.bin	11/16/2017 11:48	BIN File	861 KB
☁ OneDrive	SAN_U2E-UPGRADE-'1.0.20'.bin	10/16/2017 4:19 PM	BIN File	1,683 KB
🖥 This PC	SAN_U2E-UPGRADE-'1.0.19'.bin	9/29/2017 3:29 PM	BIN File	834 KB
🖧 Network				

When the selected file name appears on the input column, click "Update" button.

Firmware

Firmware :	[ ] Browse...
Update	

1.5 Up to now, Setup is successfully configured. Please click "Save" and go to other pages for configuration or click "Save and Restart" to run new configuration.

Save	Save and Restart

2. Network setup

2.1 Wireless section:

2.1.1 Type: Click to select "Access Point" or "Infrastructure".   "Infrastructure" is for connecting to a local Router.

2.1.2 If select "ACCESS POINT", input password for the AP and assign IP address with "DHCP" or "STATIC".
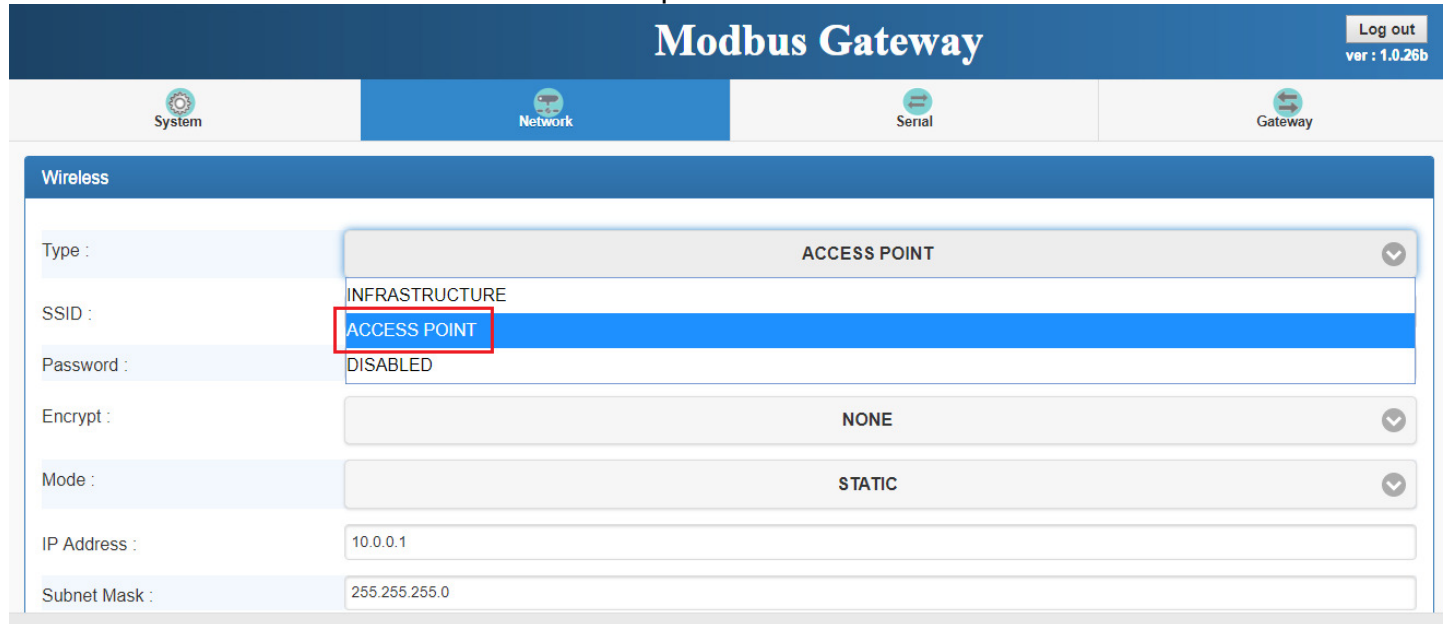
2.1.3 When selected "ACCESS POINT", this Device acts as an Access Point which is allowed to be connected by PC /NB /Smart Phone/ PAD.   It supports DHCP server function.   Soft AP broadcasts its SSID "CVIoT_XX_XX_XX_XX_XX_XX".   PC /NB /Smart Phone/PAD should connect to this SSID and then able to open web browser with default IP of this Device.
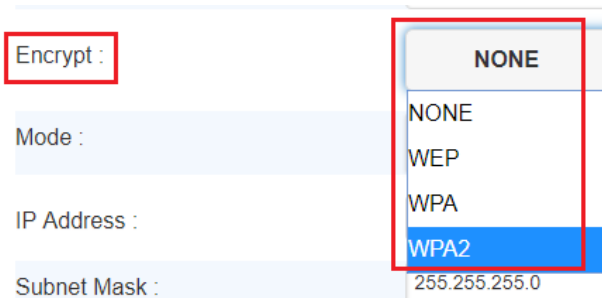
2.1.4 Password: Key in selected AP log in password
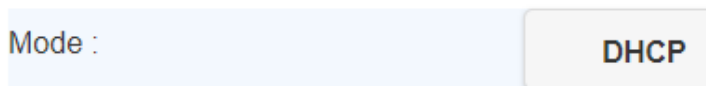
2.1.5 Encrypt
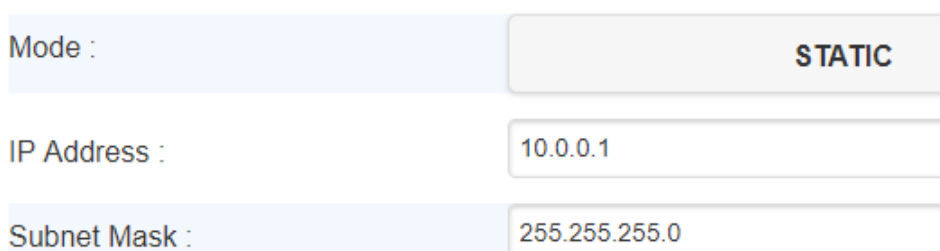
2.1.6 Mode: select "DHCP" to let AP assign IP address to itself,

or select "STATIC" to input assigned IP address, Subnet Mask manually.

2.1.7 If The Type selected with "Infrastructure", set SSID of Router and the other inputs.

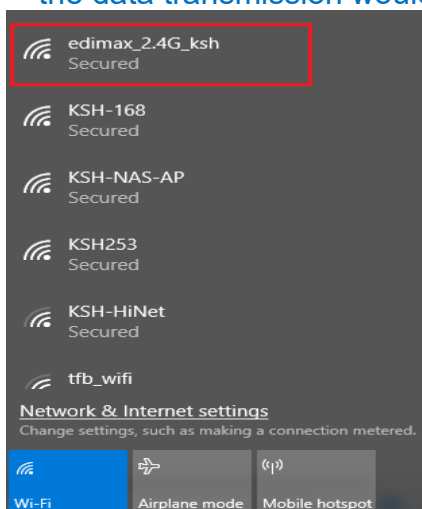**2.1.8** Go to item SSID, click "Scan" will get list of available SSID of Access Points, select the one in your network to link. For example:

2.1.9 On the NB/PC, choose same SSID to link. NB/PC must close Ethernet in advance otherwise the data transmission would not work.

2.2 Ethernet section: select "STATIC" or "DHCP" to assign IP address.

2.3 Gateway and DNS section: check with MIS for right IP address of Ethernet or Wi-Fi.   The Gateway must be set with correct IP enable to connect with other devices.

2.4 Up to now, Setup is successfully configured. Please click "Save" for this page temporarily and go to other pages for configuration or click "Save and Restart" to run this Device with new settings.

3. Serial Port page

Please clearly set each parameters from Serial 1 to Serial 2 (default 9600,n,8,1).

3.1 Baud Rate: 300 bps to 921.6K bps
3.2 Parity: None, Even, Odd
3.3 Data Bits: 5, 6, 7, 8
3.4 Stop Bits: 1, 2
3.5 Flow Control: None, XON/XOFF
3.6 RxDelay(ms)
3.7 TxDelay(ms)

3.8 Up to now, Setup is successfully configured. Please click "Save" for this page temporarily and go to other pages for configuration or click "Save and Restart" to run this Device with new settings.

4. Gateway page (Serial port over TCP/IP)

4.1 There are "Modbus Gateway" #1 and #2 port.

4.2 Gateway Type: 4 types for selection or to disable.

4.3 For RTU To TCP Slave can set up to 8 slaves.

4.2 Up to now, Setup is successfully configured. Please click "Save" and go to other pages for configuration or click "Save and Restart" to run new configuration.

4.3 After configued all parameters, click "Save and Restart" to reboot system.
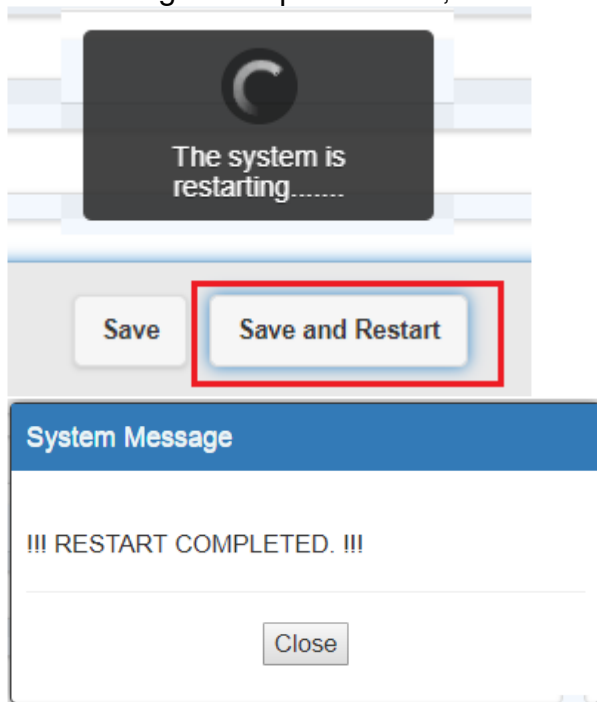
5. Testing Verification

After completing the wiring and parameter setting, we should verify if the setting is correct.   This chapter will introduce how to use a single computer to test whether the converter work well.

The operating system can be Window 7/8/10.   The "Hyper Terminal" utility should be installed on host PC/NB.
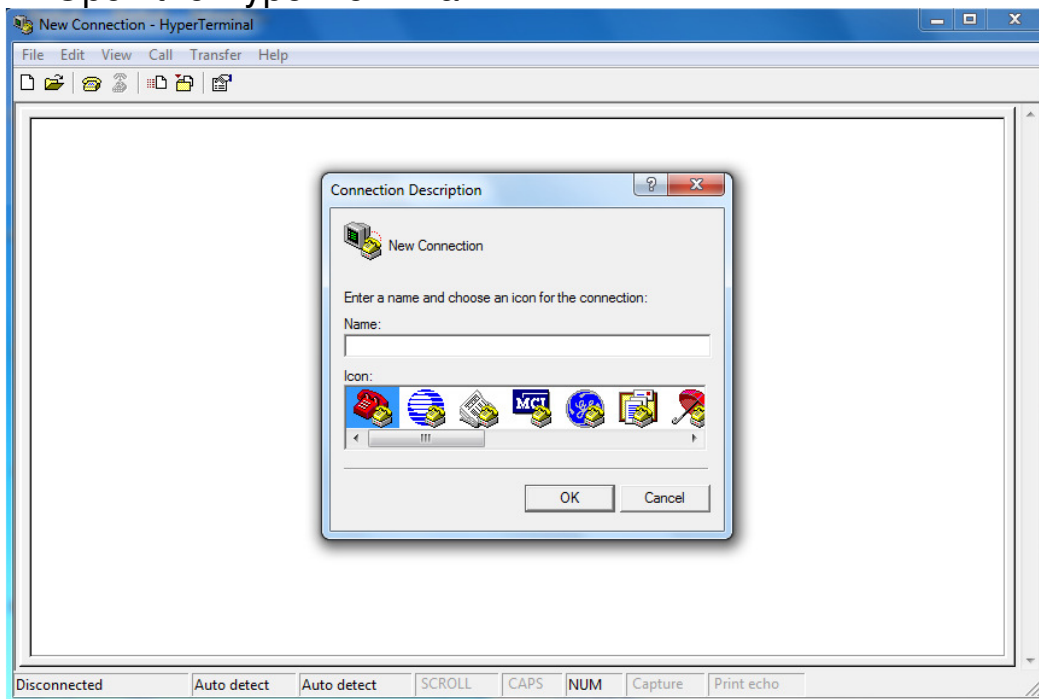
The following topics are covered in this chapter:

- □ **Hyper Terminal for TCP/IP**
- □ **Hyper Terminal for COM Port**
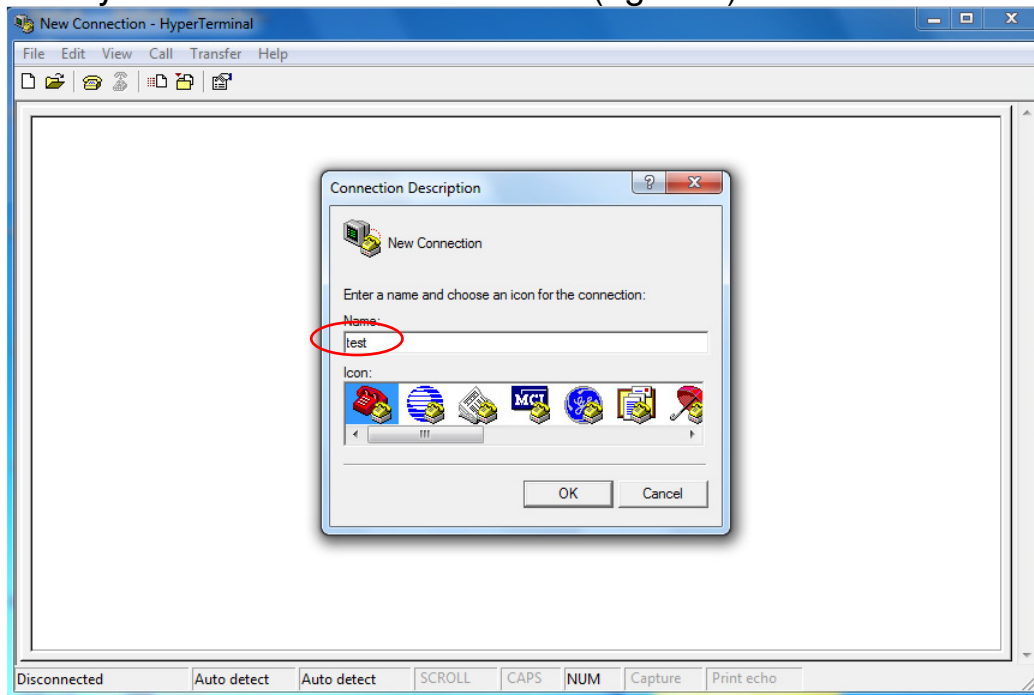- □ **Data Transmission**
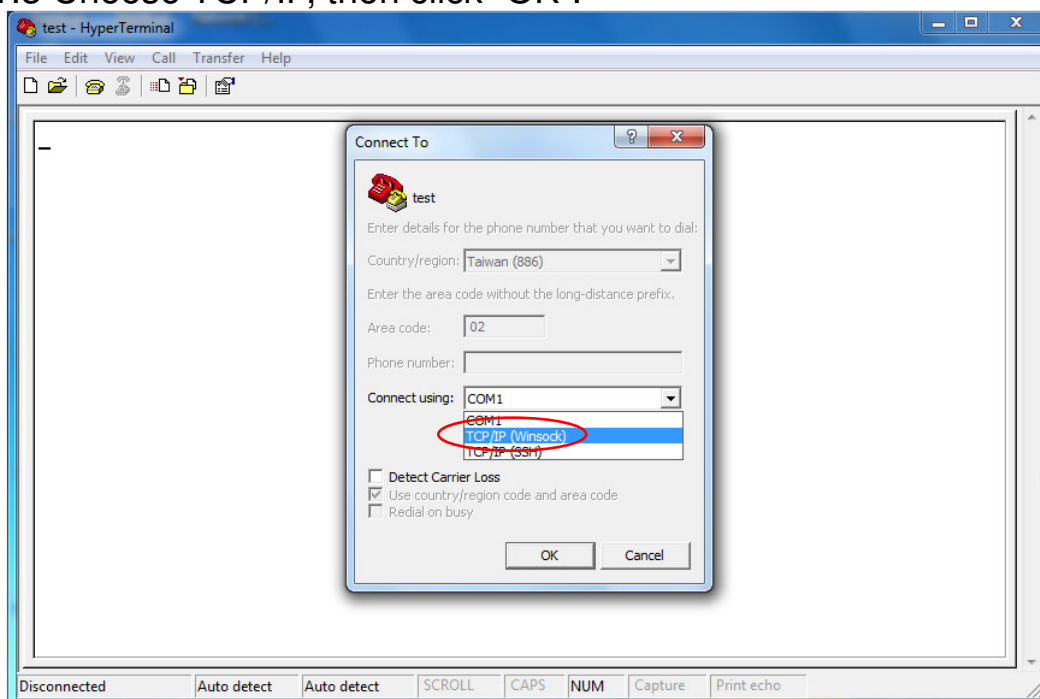
5.1 Hyper Terminal for TCP/IP

5.1.1 Open the Hyper Terminal

5.1.2 Key in a file name of connection (eg. test) and then click "OK".
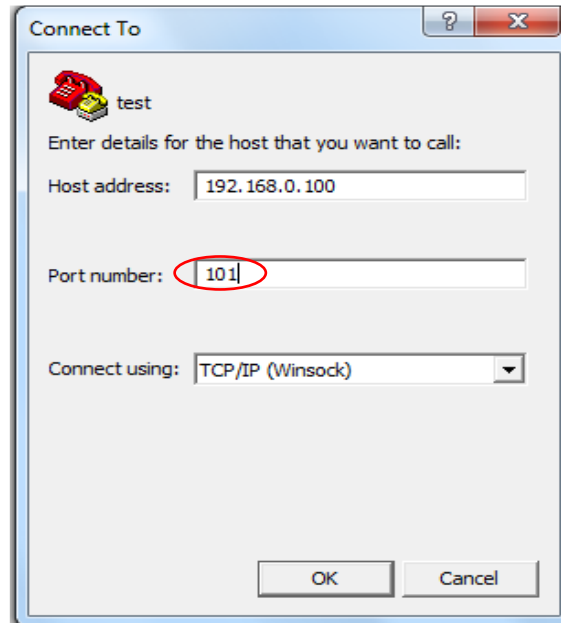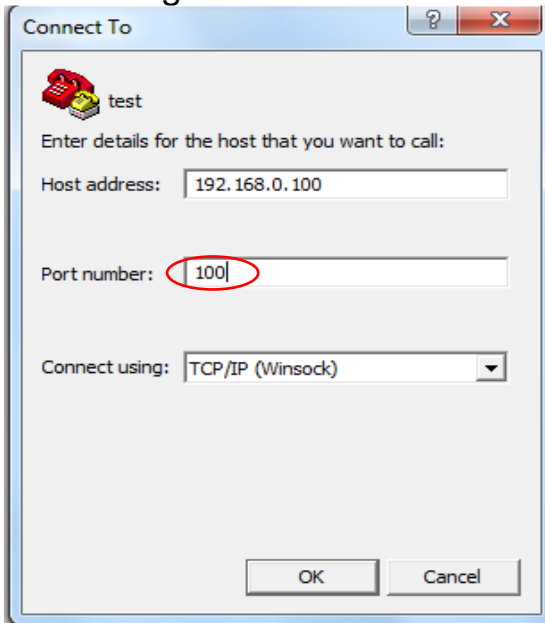

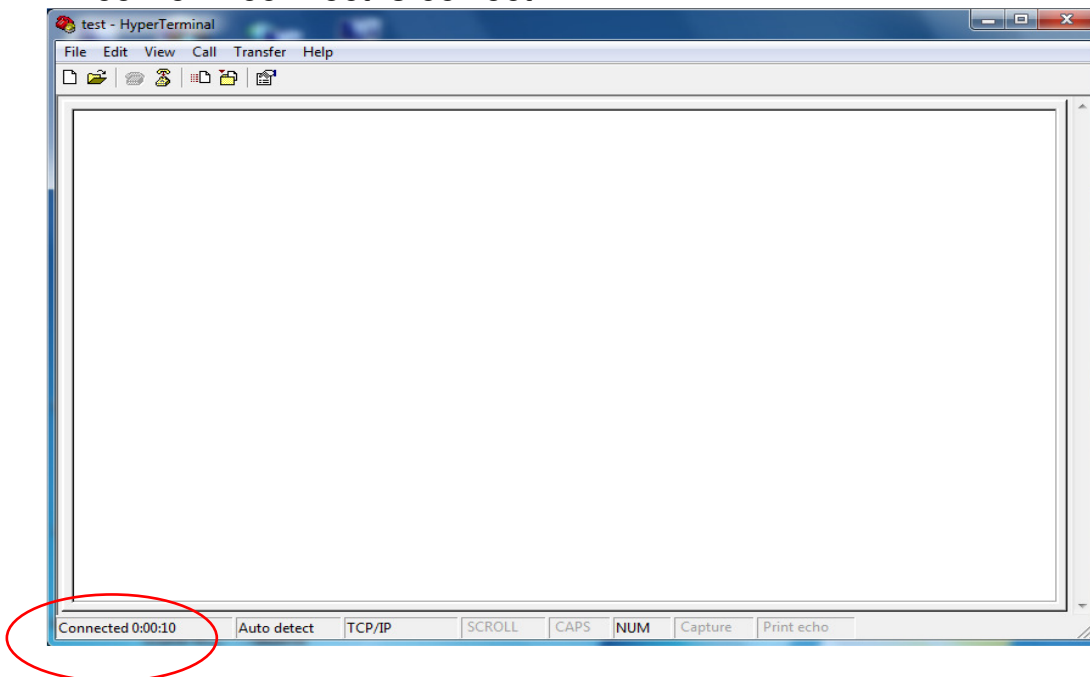## 5.1.3 Choose TCP/IP, then click "OK".

5.1.4 Key in the Converter's IP address and Socket port then click "OK".
   *for testing RS-232: default Port Number is 100
   *for testing RS-422/485: default Port number is 101

5.1.5 A HyperTerminal window will show up.   The time counter start at the down left corner if connect is correct.

5.1.6 Echo Loop Test
   ● For RS-232 testing: Short DB9 connector #2 pin and #3 pin as circuit.
   ● For RS-422 testing: Short the green Terminal Block T+ to R+ and T- to R- or TX to RX. In RS-422/485 setup page: choose RS422 firstly.
   ● Key in any characters. If those characters show on the screen means the loop test is successful.
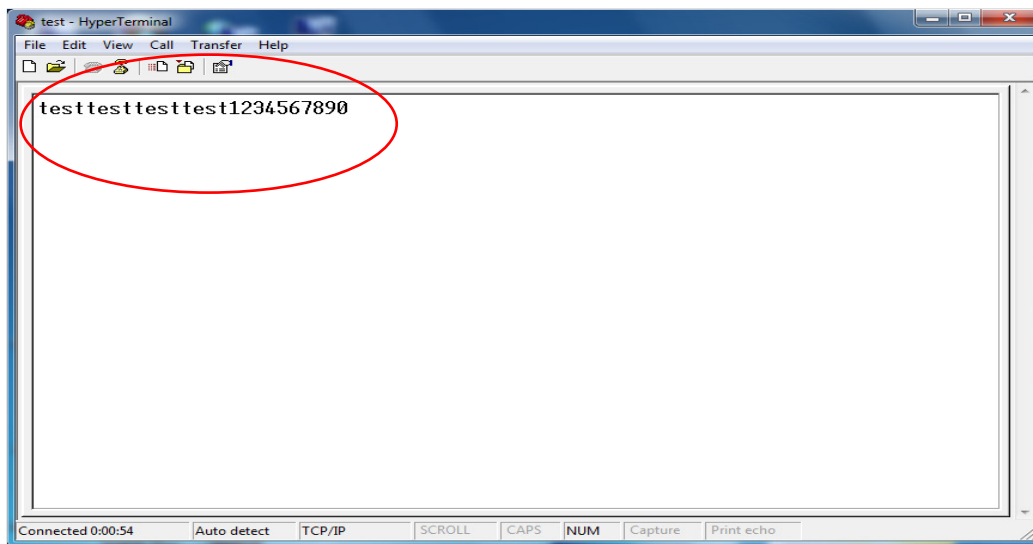
5.1.7 If not able to type or not seen any character present in the window, please check every step from beginning of this procedure.

5.2   Hyper Terminal for COM Port

5.2.1 For RS-485 testing:
It needs two devices to connect the Terminal Block D+ to D+ and D- to D-.
In RS-422/485 setup page: choose RS485.

5.2.2 Sock ports must be different between two devices.

5.2.3 Run HyperTerminal as per RS-232 or RS-422 for two socket ports. Key in any characters show on the screen of another socket port means the loop test is successful.
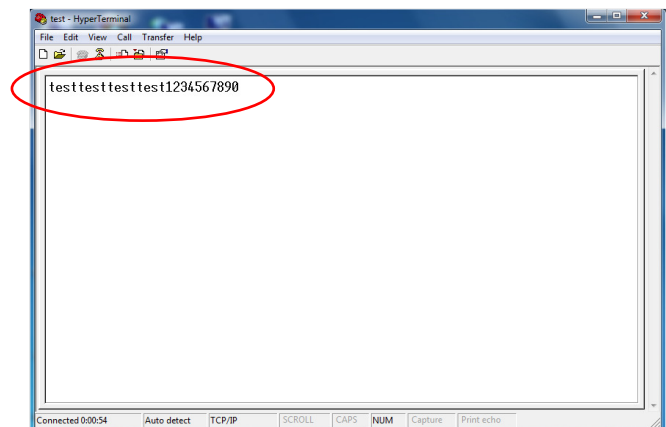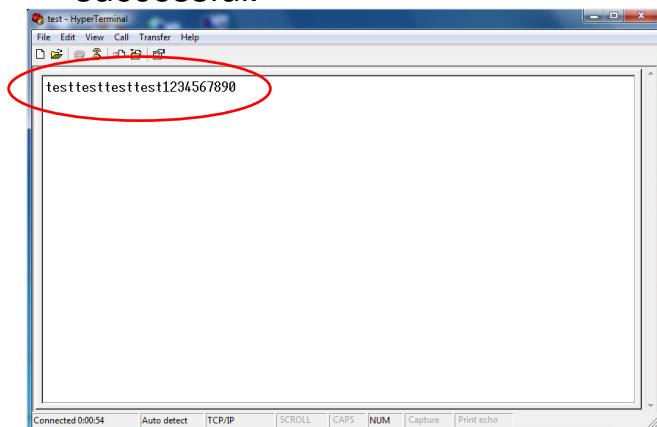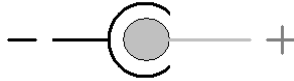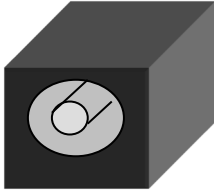
6. Reset (if needed)

Ensure power is on, press "WiFi Reset" button for over 25 seconds then release.   WPC-832 will set configuration back to default.
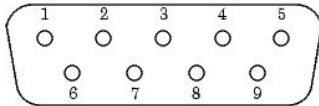
Reset Button (beneath the antenna)

Pin Assignment

□ **DC Power outlet**

□ **RS-232 Pin Assignment**

The pin assignment scheme for a 9-pin male connector on a DTE is given below.

PIN 1 : DCD   PIN 2 : RXD   PIN 3 : TXD   PIN 4 : DTR

PIN 5 : GND   PIN 6 : DSR   PIN 7 : RTS   PIN 8 : CTS

PIN 9 : X

□ **RS-422 Wiring Diagram**

Serial Device	Converter
R-	T-
R+	T+
T-	R-
T+	R+

□ **RS-485 Wiring Diagram**

Serial Device	Converter
D+	D+
D-	D-

Please look our website http://www.tcpipweb.com/ for more information.