Operation Manual of EX9486C-W

Serial to Wi-Fi converter

Version 1.0

03th Jun 2017

Introduction

Serial to Wi-Fi converter is provided new ways of connecting serial devices to a Wireless LAN (Wi-Fi 802.11 b/g). Serial to Wi-Fi Converter is designed to operate serial ports through wireless (Wi-Fi 802.11 b/g). The data is transmitted via TCP/IP protocol. Therefore control is available via Ethernet, Intranet and Internet. Serial to Wi-Fi Converter is packaged in a case well suited for industrial environments. All serial ports operate in common RS-232 mode, industrial RS-422 and RS-485 modes configuration.

With the maturity of Wi-Fi technology of 802.11b/g, delivering cost effective becomes increasingly important. Model EX-9486C-W of Serial to Wi-Fi converter product is a more competitive price by careful selecting high quality with competitive prices components in the world, the product design is adopted ARM single-chip, made network connectivity possible with affordable cost for virtually all kinds of devices. This user manual will guide you step by step for setting the various functions of model EX-9486C-W product.

The following topics are covered in this chapter:

† ☐ Overview

† ☐ Package Checklist

† ☐ Product Features

† ☐ Product Specifications

Overview

Serial to Wi-Fi Converter is provided a perfect solution to make your industrial serial devices Internet ready instantly via wireless LAN. Model EX-9486C-W with ARM chipset, Serial to Wi-Fi Converter makes them the ideal choice for connecting your RS-232 or RS-422/485 serial devices such as PLCs, meters, and sensors to an IP-based Wi-Fi／ Ethernet LAN, making it possible for your software to access serial devices anywhere and anytime over a wireless local LAN or the Internet. For RS-232 pin assignment of ARM Series, it just provides TxD, RxD and GND pins only without others like TXRTS, CTS, DTR, DSR and DCD.

Serial to Wi-Fi Converter support manual configuration via the handy web browser console and many protocols including TCP, IP, UDP, HTTP, DHCP, ICMP, and ARP. They are the best solution to network your serial devices.

Package Check List

Serial to Wi-Fi Converter product is shipped with the following items:

☐ 1 unit of Serial to Wi-Fi Converter

☐ 1 unit of dipole antenna(2.0dBi)

☐ 1 unit CD(Operation Manual & Utility)

☐ Din Rail Mounting Kit & Power Adaptor :Optional

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

Product Features

Data Conversion between RS-232/422/485 and Wireless Lan

Convert serial device (RS-232, RS-422, RS-485) data/signal into the TCP/IP package data/signal and send them out with the Ethernet DataStream via Wi-Fi wireless; or convert the TCP/IP package data/signal into serial device data/signal.

Wi-Fi Wireless LAN(802.11 b/g)

It based on the latest industry standard Wi-Fi Certified IEEE 802.11b / g specification; it offers maximum channel speeds of up to 54 Mbps. The Wi-Fi function maintains interoperability within the 2.3～2.5 GHz frequency band, offering full compatibility with 802.11b / g networks. This integrated wireless solution of Serial to Ethernet Converter is widely deployed in business environments and is the standard for wireless access in public places. It also supports key security features like Wi-Fi Protected Access (WPA), WEP and 802.1x.

Dynamic IP Configuration

Support DHCP client mode, simplifying network address configuration and management.

Server / Client Dual Modes

Series can be configured as network server or network client. In the client mode, it can be installed in network which is protected by NAT router or firewall, without the need of a real IP address.

Web-based Setup

Parameters setup is based on HTTPS protocol by using standard browsers (IE and Netscape). No special software would be required. To use https to enter Web-Server of converter
(For example https：∥192.168.1.100)

Built-in Security Control

It is protected by both setup password and access password to prevent intruders.

Remote updated

Firmware can be reprogrammed directly via Ethernet network to keep up with latest network standards.

Product Specifications

Hardware specification

WLAN

Standard Compliance : IEEE 802.11 b / g

Spread Spectrum Technology: DSSS, OFDM

Tx Power 11b: Maximum 19 dBm

Tx Power 11g/n: Maximum 16 dBm

Rx Sensitivity: -73 dBm @ 54Mbps, -86dBm @ 11Mbps

Transmission Rate: 54 Mbps (max.) with auto fallback (54,48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps)

Transmission distance: Up to 100 meters (@12 Mbps, in open areas)

Security: WEP 64-bit/128-bit data encryption, AES, WPA2, WPS2.0, WAPI

Antenna Connector: Reverse SMA, 2 dbi Antenna

Network Mode: Infrastructure, Ad-Hoc, Soft AP(Setup)

Setup: HTTP Browser Setup(IE, Chrome, Firefox)

Security: Login Password

Serial Communication Parameters

No. of ports : 1 * RS-232/422/485 port, Male DB9/ 4-pin Terminal Block, S/W selectable

RS-232 Signals : TxD, RxD and GND only

RS-422 Signal : Tx+ , Tx- , Rx+ , Rx –

RS-485 Signal : Data+ , Data-

Serial Line Protection : 15 KV ESD for all signals

Parity: None, Even, Odd, Space, Mark

Data bits: 5, 6, 7, 8

Stop bits: 1, 1.5, 2

Flow control: XON/XOFF

Speed: 110 bps to 115.2+ Kbps

Built-in: RTC(Real Time Clock)

Reset Button

If by any chance, you forget the setup password, or have incorrect settings making converter inoperable. First, turn on the power. Second, use any point tip to push this button and hold it about 5 seconds All the parameters will be reset to the factory default(software AP mode).

Power Requirements

Power input : 9~24V, 200mA@12 VDC

note: pin assignment of Power Supply if you select the Terminal Block

Reset button

Environmental

Operating Temperature : -10 to 65°C , 10 to 95% RH

Storage Temperature : -20 to 70°C (-4 to 185°F), 5 to 95%RH

Regulatory Approvals

RoHS

FCC, CE

Software Features

Protocols : ARP, IP, ICMP, UDP, TCP, HTTP, DHCP, ICMP

Mode : TCP Server / TCP Client / UDP Client / Virtual COM / Pairing

Utilities : Windows 2000/2003/VISTA/WIN7/WIN8/WIN10

Wiring Architecture

RS-232 Wiring Architecture

RS-422/RS-485 Wiring Architecture

When you finish the steps mentioned above and the LED indicators are as shown, the converter is installed correctly.   You can use the Utility Setup CD to setup the IP Address.

To proceed the advanced parameter setup, please use a web browser (IE or Netscape) to continue the detailed settings.

EX9486C-W Wi-Fi Converter Configuration

Installation of IP Search Tool

1. Please copy EX9486C-W.exe to your PC. You can find the file in the CD ROM.

2. Double click EX9486C-W.exe. The program will be extracted and installed in PC.

3. After successful installation, the shortcut of WiFi-Module Utility.exe will be on the desktop
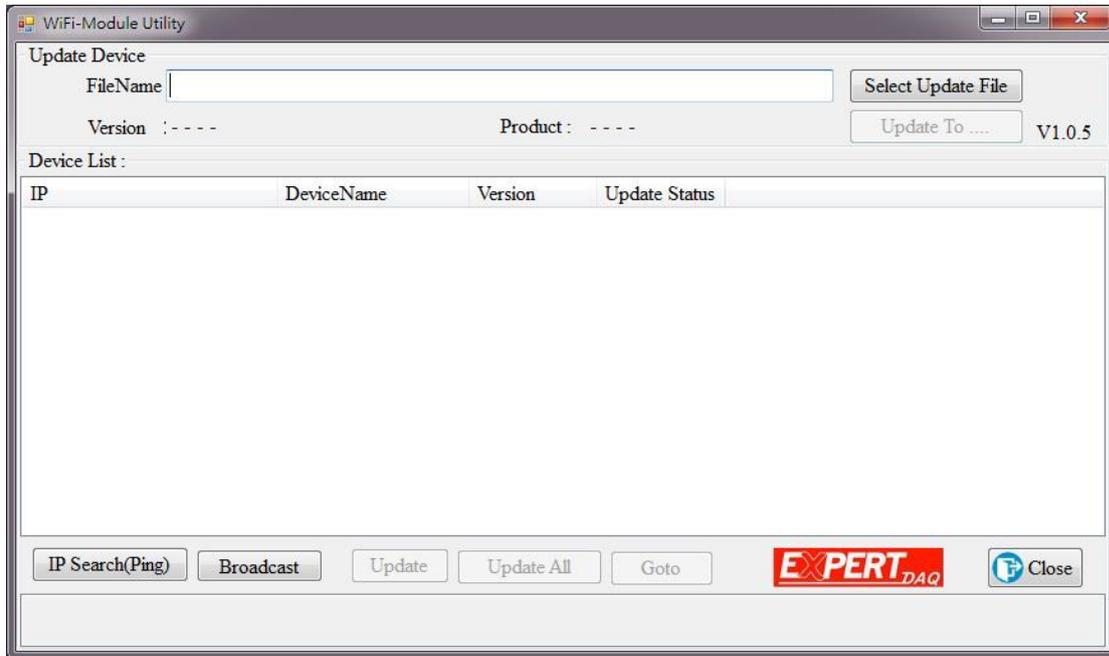
Connection and Configuration

Please prepare a PC/NB with Wireless adapter, a Wireless Access Point and EX9486C-W.

1. Connecting EX9486C-W Gateway

Note: EX9486C-W has no Ethernet port and is default as a Soft AP.

1-1. EX9486C-W Gateway is default as a "Soft AP" when first connected to power. Its broadcast SSID is AJ+MAC address

1.2. Please use PC/NB (with Wi-Fi adapter) to conduct SSID site survey. Looking for a SSID shown as MAC address. (ie. AJ:XX:XX:XX:XX:XX:XX) Then Click Connect

1-3. Key in Soft AP password. Default is 12345678

1-4. Connecting to EX9486C-W Gateway
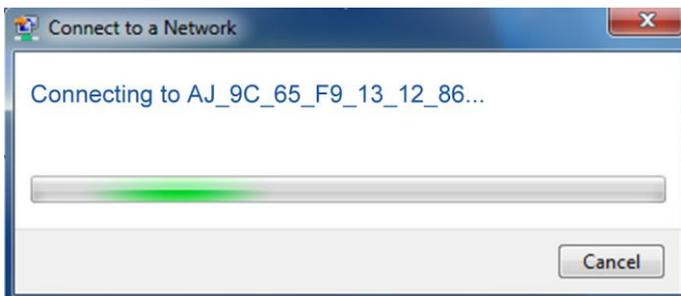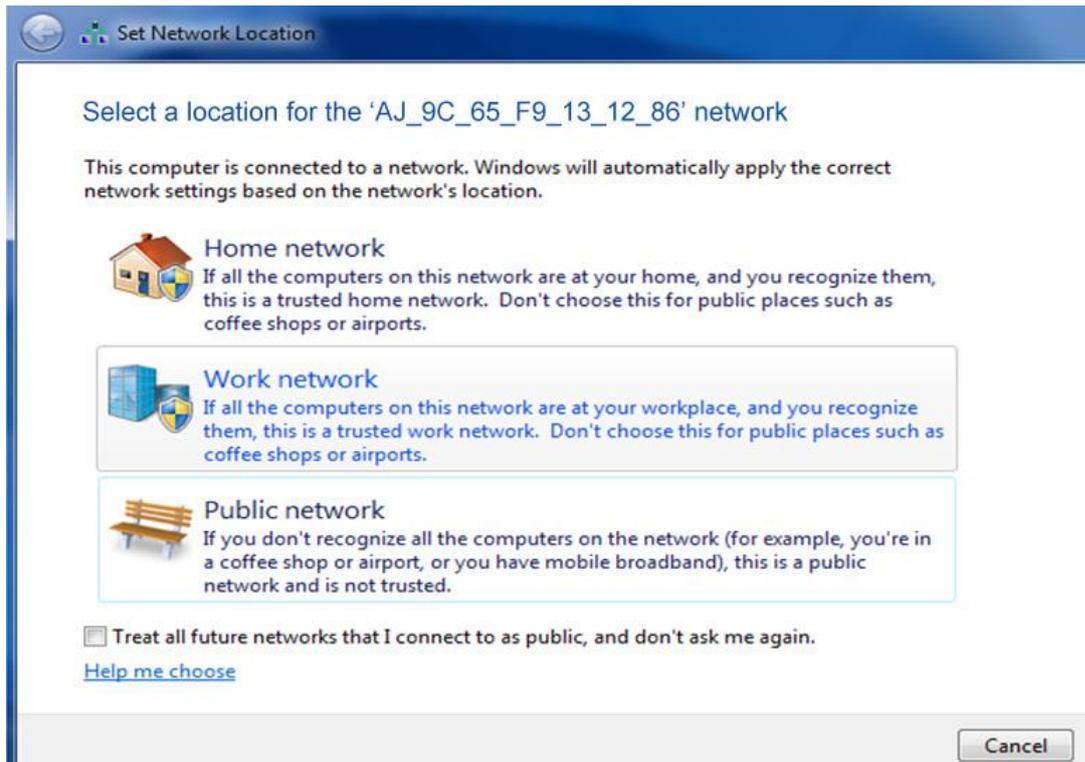
Now you have successfully connect to EX9486C-W

2. **Searching & Configuring EX9486C-W Gateway**

2-1. IP Searching

2-1-1. WiFi-Module Utility.exe Double Click on to execute IP search tool

2-1-2. Click on "IP Search" or "Broadcast". WiFi-Module Utility will start to scan the network.
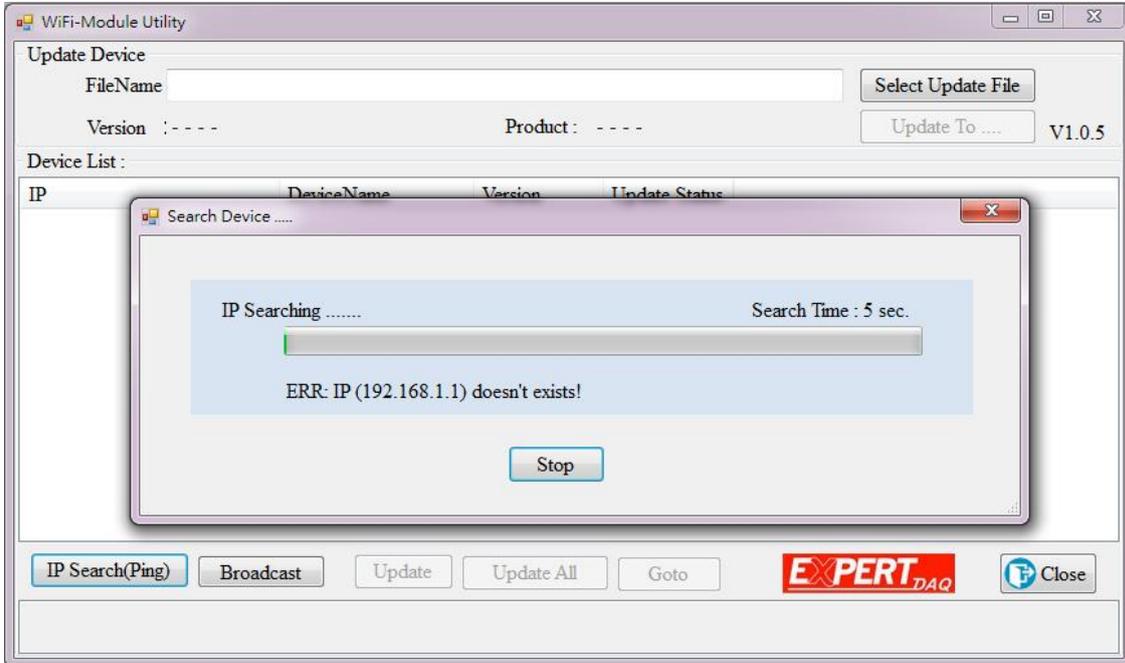
2-1-3. Device found
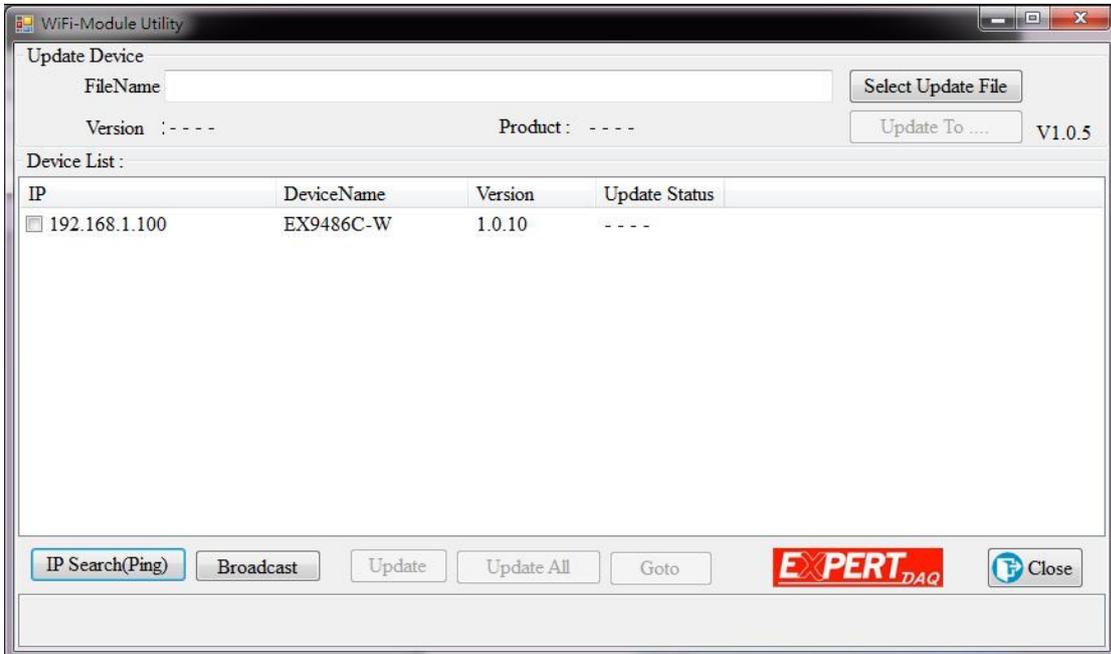
2-1-4. Single click on device IP address. Then click "Goto" to open browser.
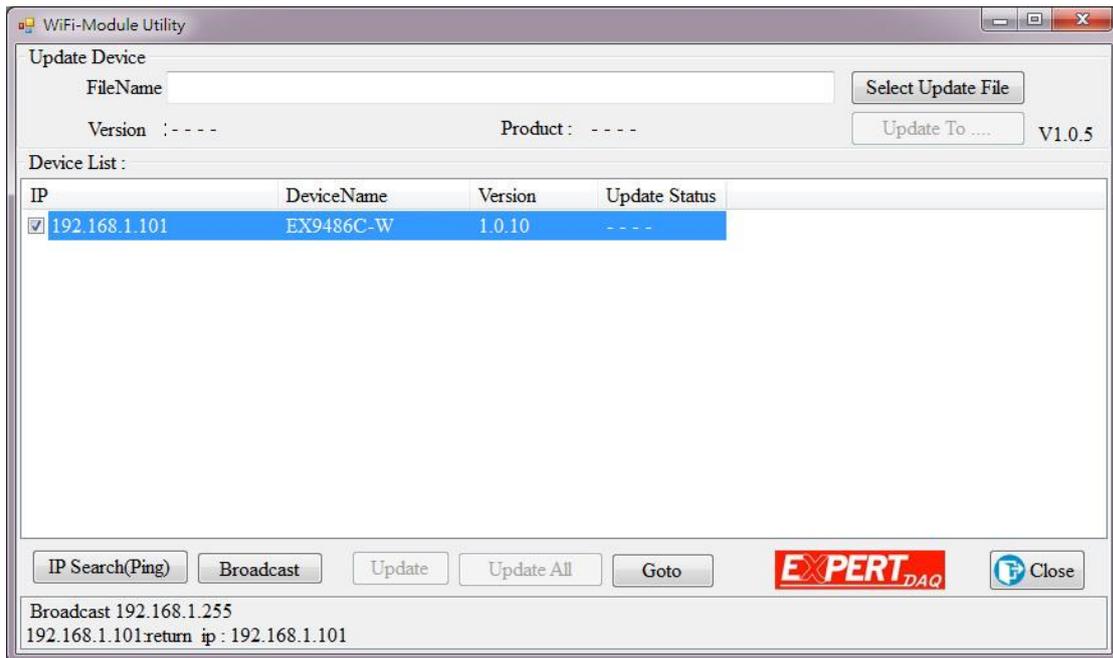
2-1-5. Login page is shown. Please input ID and Password. (default ID: admin; password: admin).
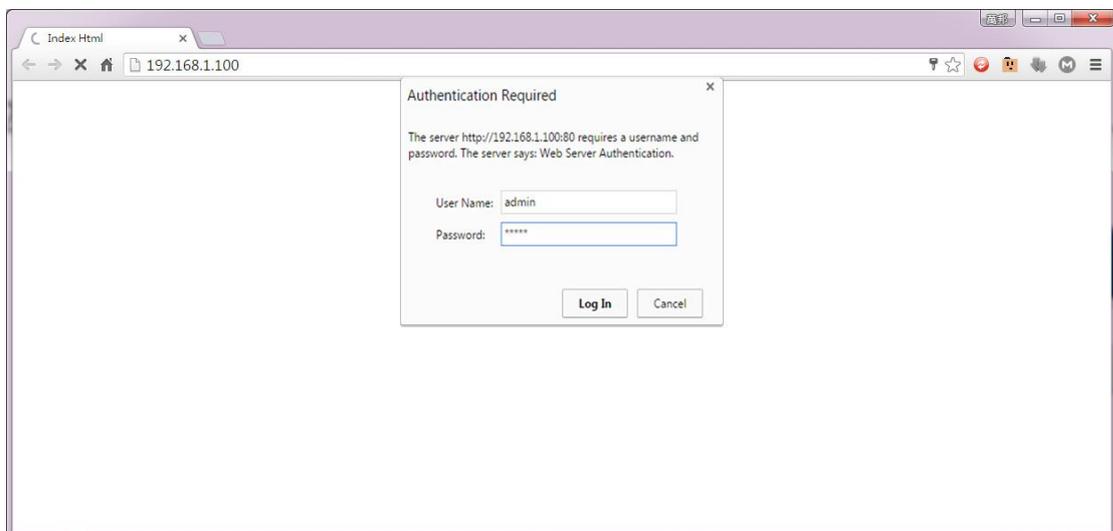
Now you have successfully searched the device

2-2. Configuring

2-2-1. Serial Over Wi-Fi Index Page

2-2-2. System Setup Page

2-2-2-1. System

Where you can change Password and set up reset time period.

2-2-2-2. NTP

Enable/Disable NTP function; setup NTP server and choose Time zone.
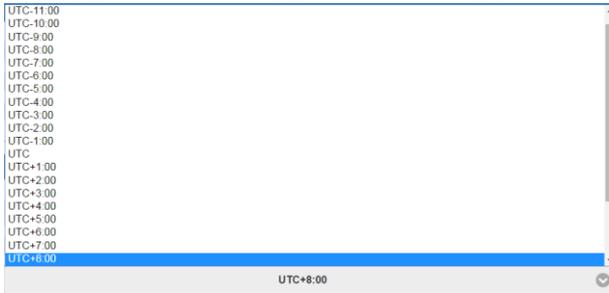
2-2-2-3. Serial

Setup Serial device parameters - Baud Rate, Parity, Data Bits and Stop Bits. Then click " Save" to save the Settings.

Serial	
Baud Rate:	9600
Parity :	None
Data Bits :	8
Stop Bits :	1
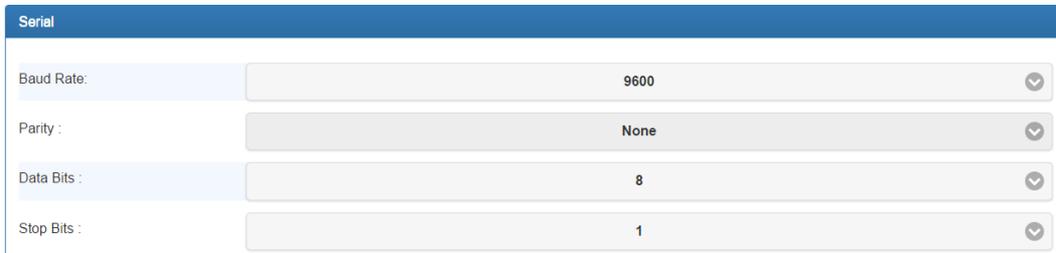
2-2-3. Network Setup Page

There is Network Type configuration
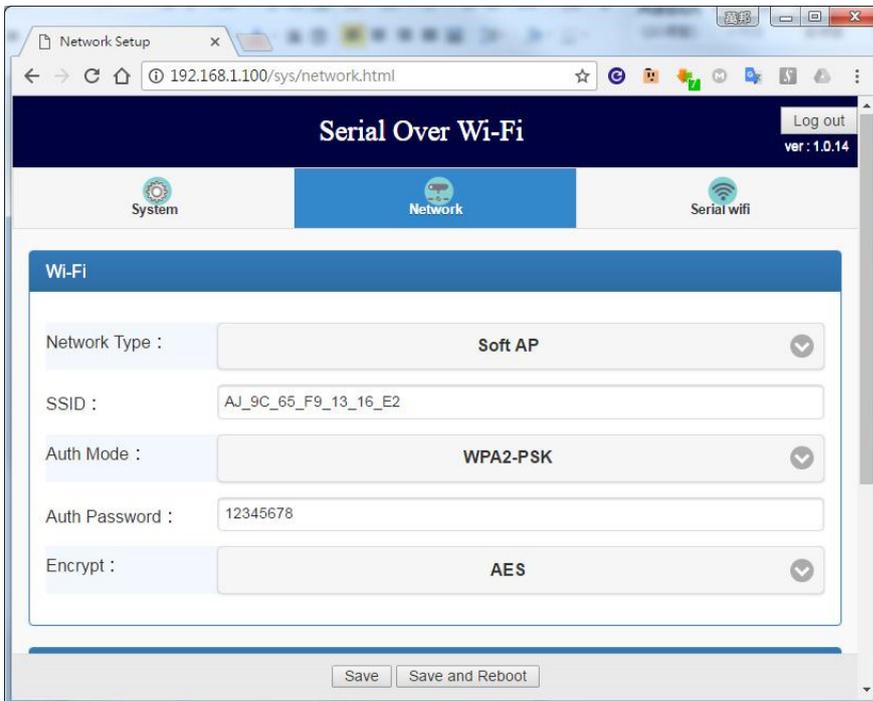
WiFi Configuration

2-2-3-1.Network Type

There are 2 network types: Infrastructure / Soft AP.
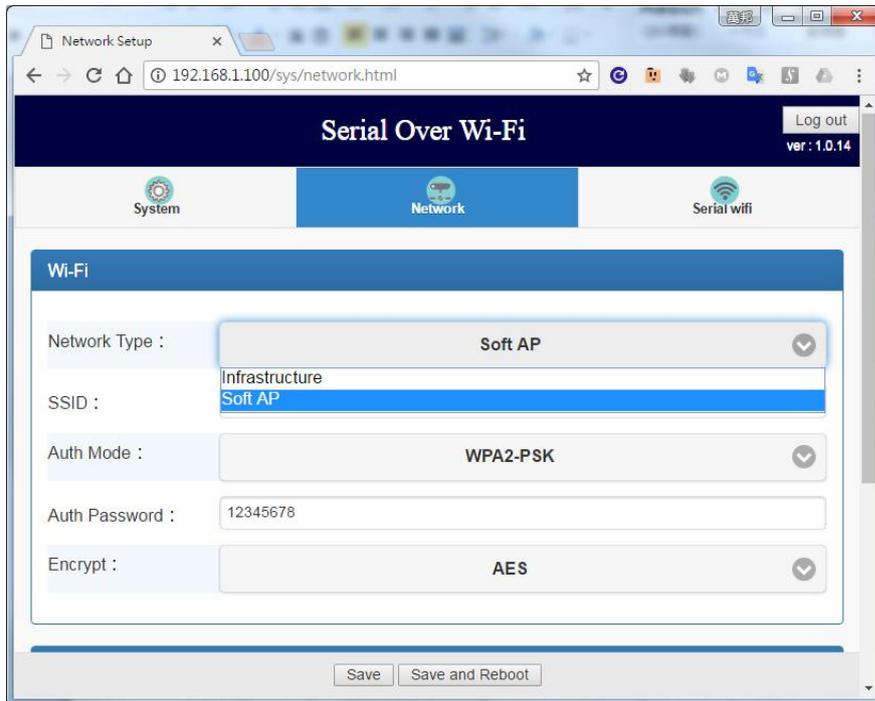
A. "Soft AP" mode – This is factory default mode. Device acts as an Access Point which is allow to be connected by various PC /NB /Smart Phone/ PAD. Support DHCP server function. Soft AP broadcasts its SSID "AJ_XX_XX_XX_XX_XX_XX". PC /NB /Smart Phone is requested to connect to this SSID for device setup.

B. "Infrastructure" mode –Choose this mode for connecting to other Access Point.
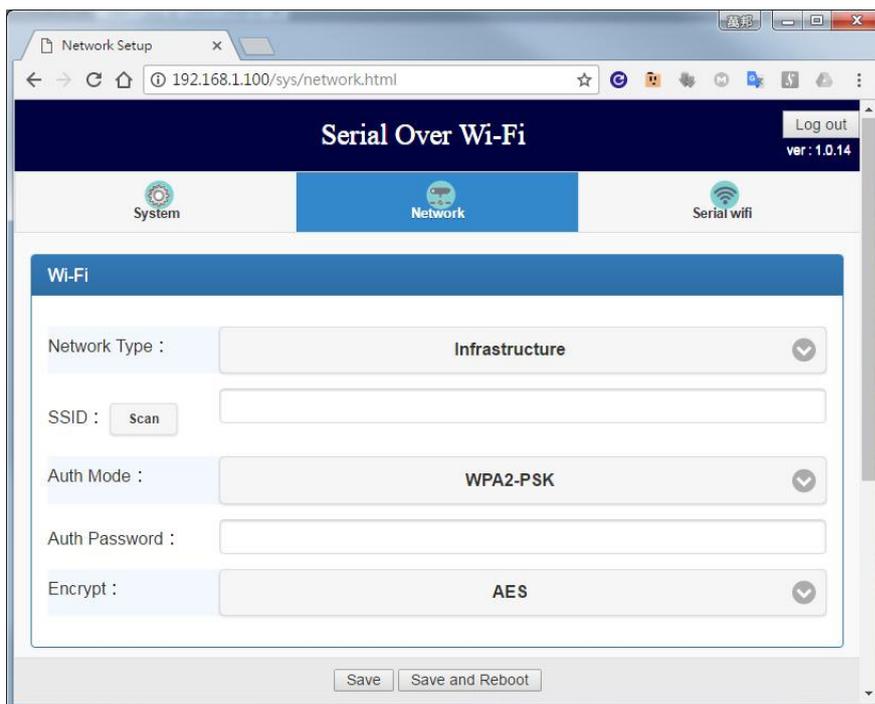
2-2-3-2. SSID Scan

Click "Scan" for existing Access Point site survey. Choose a suitable SSID, Authentication and Encryption. Then key in password for AP
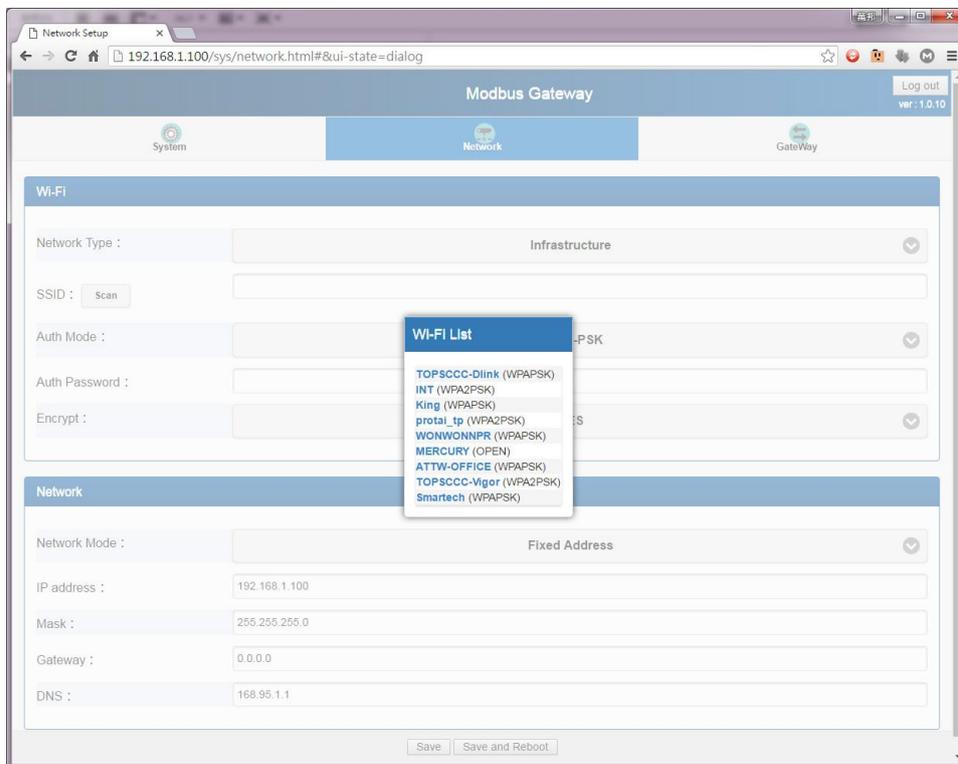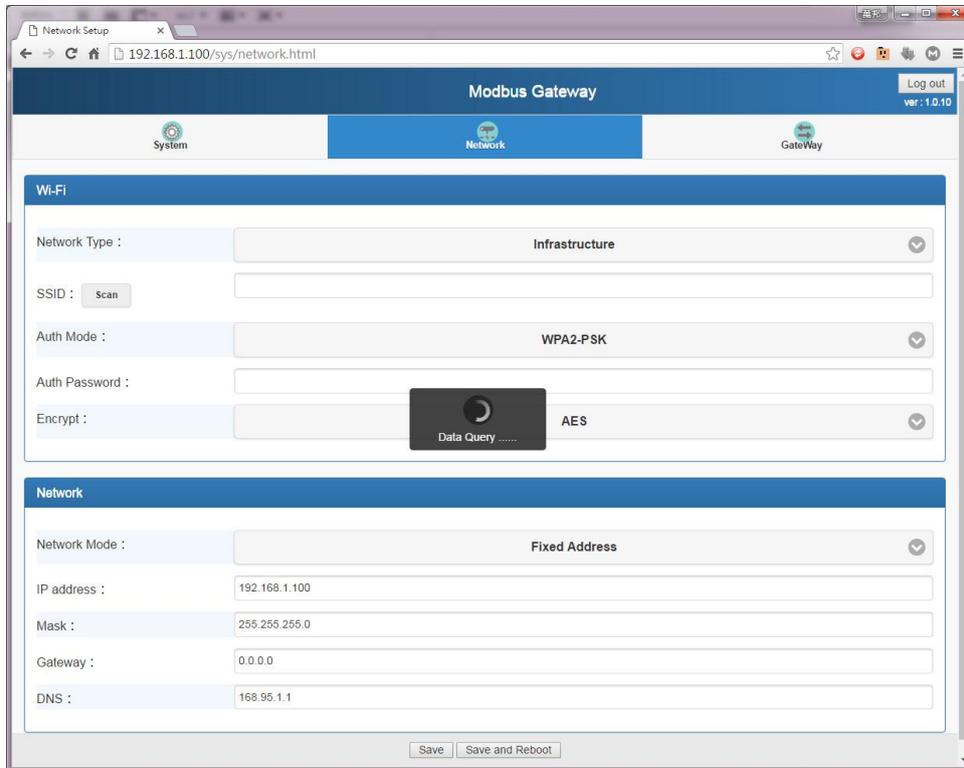
2-2-3-3. Authentication

There are 4 authentication Modes

2-2-3-4. Encryption

Choose suitable cipher suite

2-2-3-5. Password

Key in password for selected AP

2-2-3-6. IP Address Mode

Configure IP Address Mode – Suggest choosing "DHCP" – Let AP to assign IP address to Modbus Gateway. You can also choose "Fixed Address" to input fixed IP address, Subnet Mask, Gateway address.

Fixed Address parameters setting

Now, Network Setup is successfully configured.

Please click "Save" to keep the settings in memory.
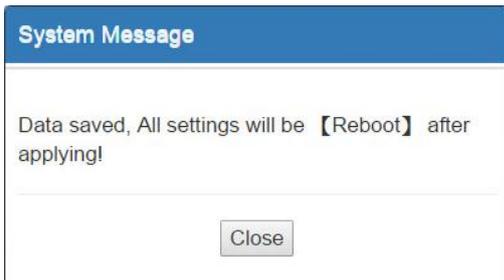
DHCP Mode

2-2-4. Mode Setup

There are 3 modes for selection, TCP server / TCP client / UDP
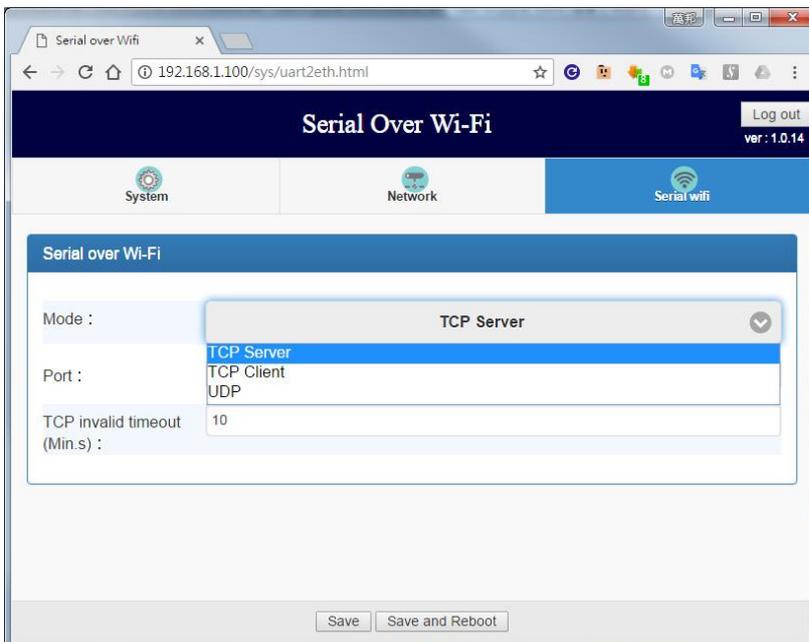
2-2-4-1. TCP Server (TCP protocol, passive open, to be connected from the TCP clients.)

The port number is depend on your requirement. (Exp. Open socket port as 100)

2-2-4-2. TCP Client (TCP protocol, active open, connect to the TCP server)

Destination address & port: would be connected in TCP Client mode for a certain serial port.

2-2-4-3. UDP (UDP protocol, connectionless)

Destination address & port: would be connected in UDP Client mode for a certain serial port.

Now, Converter Setup is successfully configured.

Please click "Save" to keep the settings in memory.

2-2-5. Click " Home". Go to home page. Then click "Reboot" to re-start Modbus Gateway.

 Click yes to reboot system

2-2-6. After device reboot, the original wireless connection will be disconnect.
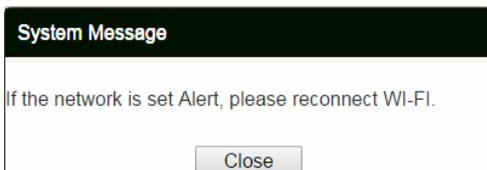
2-3. Reconnect to EX9486C-W

2-3-1. Search the selected AP which EX9486C-W connect with

2-3-2. Key in password

2-3-3. Execute WiFi-Module Utility to search device
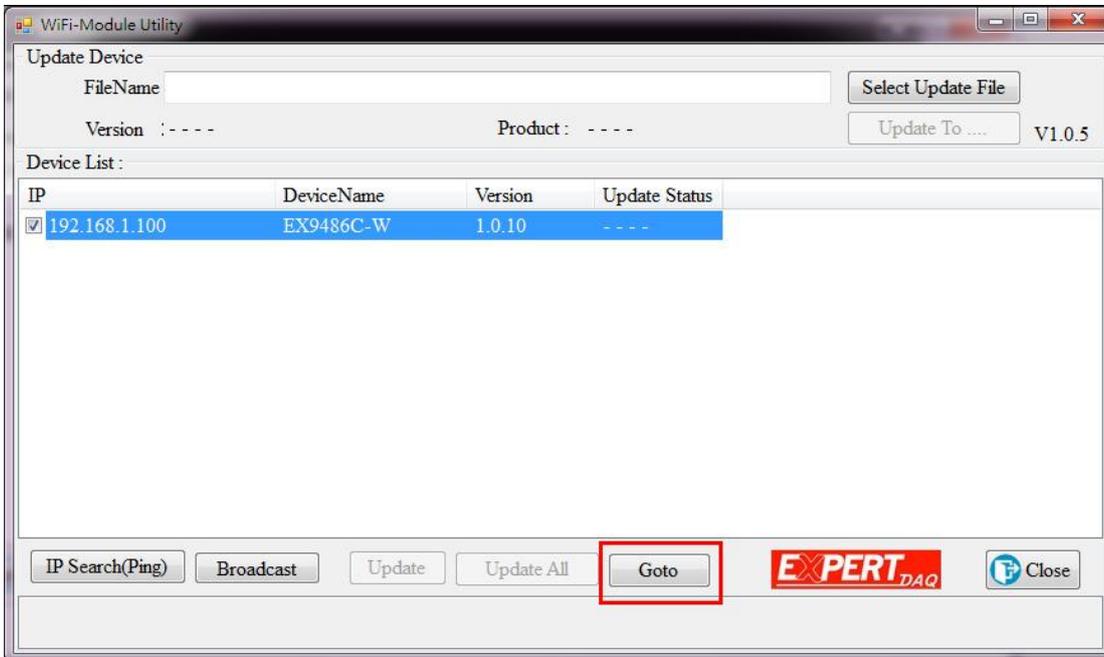
2-3-4. Single click device IP address then click "Goto" Device login page will be shown
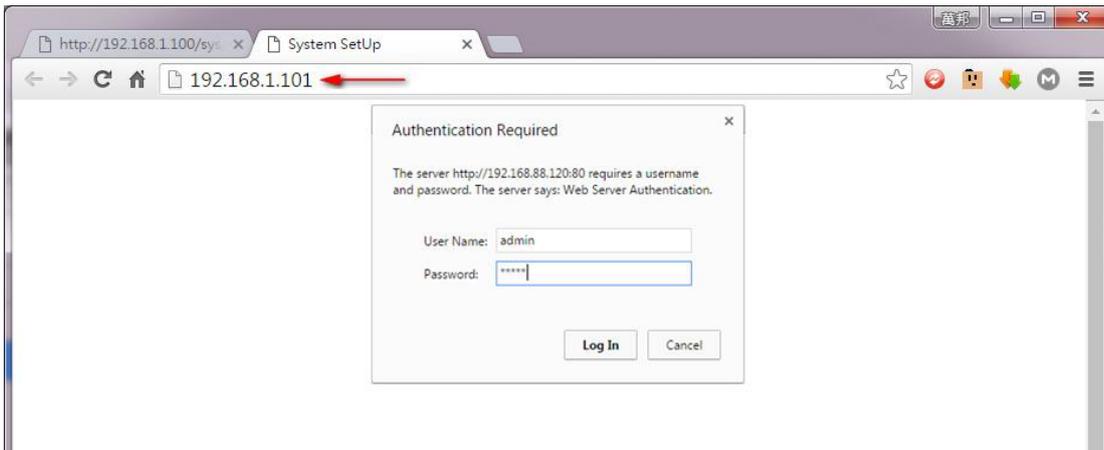
You have successfully re-connected to EX9486C-W

Testing procedure of data transmission

1. Open the Hyper Terminal
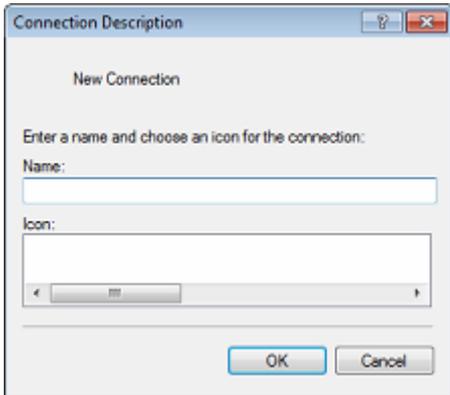
2. Key in a name for connection (ex. test) and then press OK
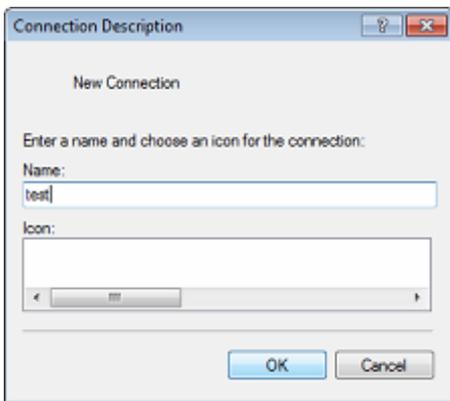
3. You will see following page. Choose TCP/IP, then press OK

4. Key in the Converter IP address and Socket port and then press OK
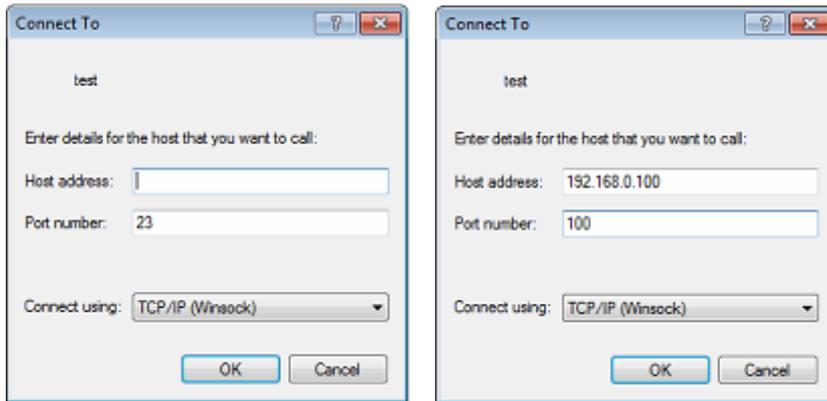
5. You will see HyperTerminal window
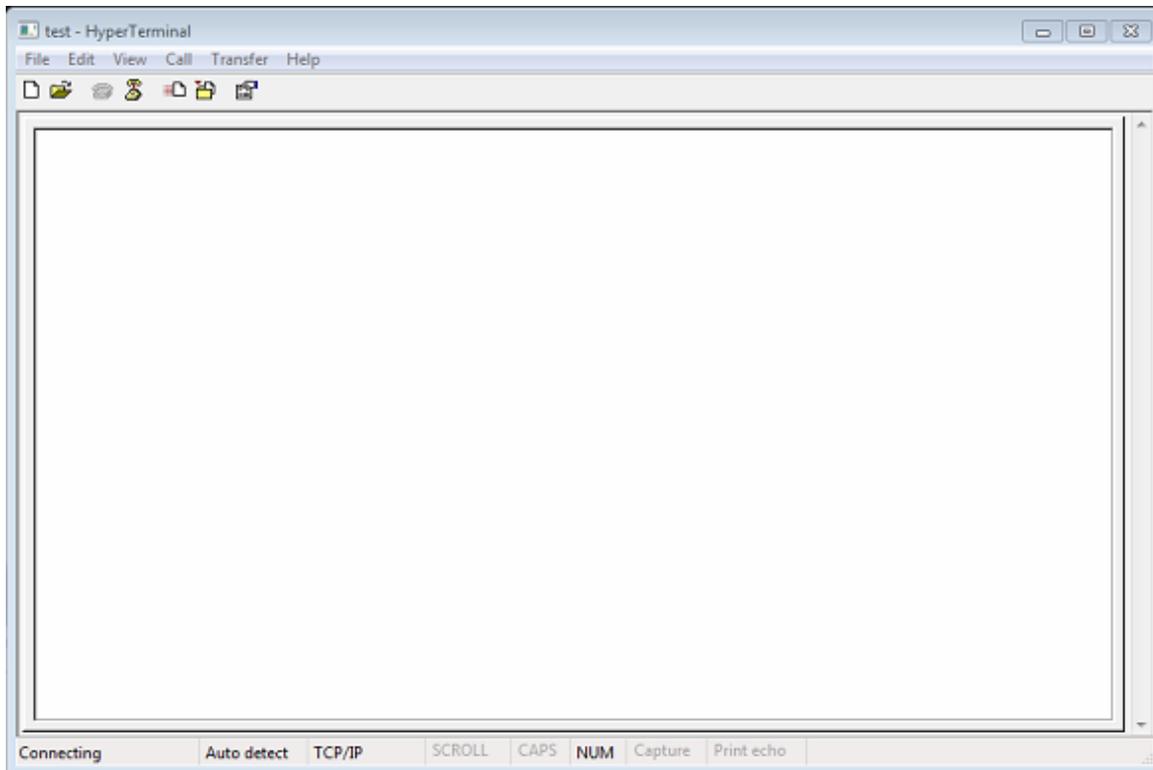
5-1. Echo Loop Test

Please short DB9 NO. 2 pin and NO.3 pin circuit, (in green Terminal Block - T+ connect to R+, T- connect to R- or TX connect to RX.)

5-2. Key in characters. the converter will echo back of the characters and shown on the screen
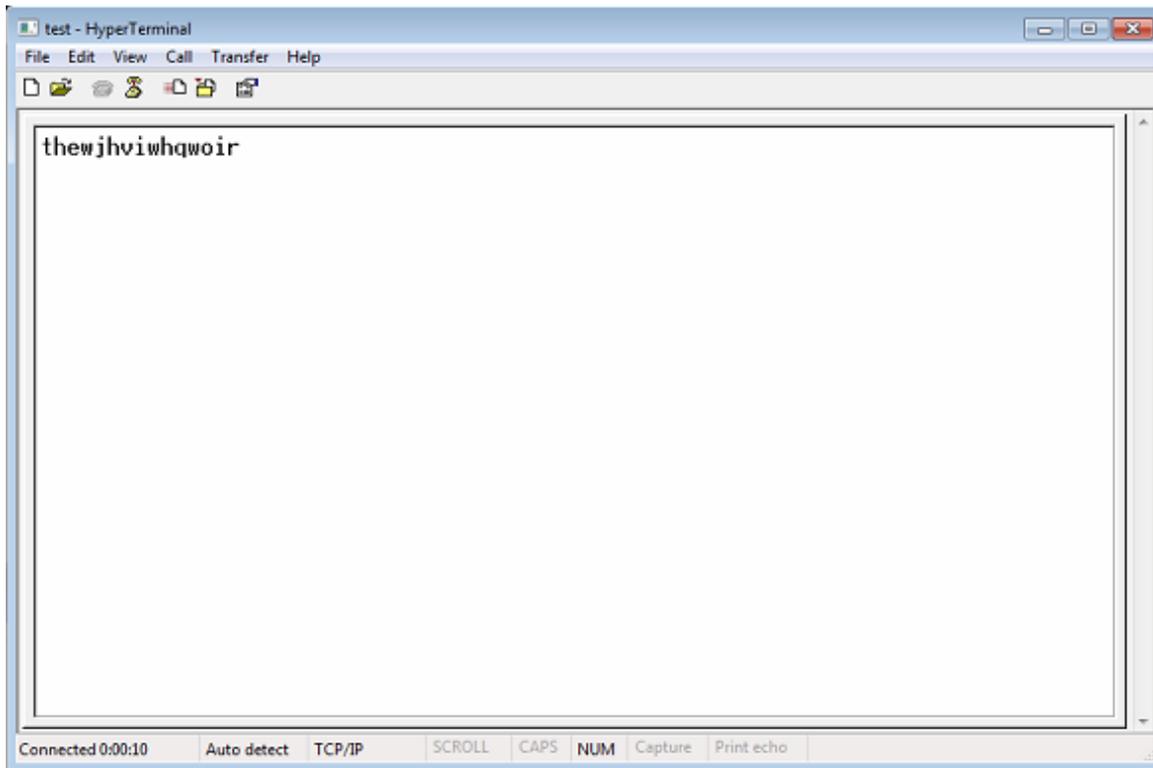
Congratulation. You had successfully set up the converter and start to use it

Pin outs and Cable Wiring

□ DC Power outlet
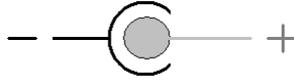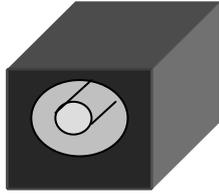
□ RS-232 Pin Assignment

The pin assignment scheme for a 9-pin male connector on a DTE is given below.
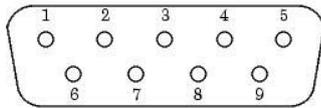
PIN 1 : X   PIN 2 : RXD   PIN 3 : TXD   PIN 4 :   X

PIN 5 : GND   PIN 6 : X   PIN 7 :   X   PIN 8 :   X

PIN 9 : X   （DC+5V Power Output- For Option）

□ RS-422 Pin Assignment

The pin assignment scheme for a 4-pin RS-422 is given below.

 PIN 1 : R-   PIN 2 : R+   PIN 3 : T-   PIN 4 : T+

□ RS-485 Pin Assignment

The pin assignment scheme for a 4-pin RS-485 is given below.

PIN 1 : X   PIN 2 : X   PIN 3 : D-   PIN 4 : D+

□ RS-422 Wiring Diagram

Serial Device   EX9486C-W Converter

R- ———————————————— 3   T-

R+ ———————————————— 4   T+

T- ———————————————— 1   R-

T+ ———————————————— 2   R+

□ RS-485 Wiring Diagram

Serial Device   EX9486C-W Converter

D- ———————————————— 1   D-

D+ ———————————————— 2   D