Operation Manual of EX9486C-W-MTCP

Wi-Fi to Modbus Gateway(Modbus RTU/ASCII to Wi-Fi)

Version 2.0

24th April 2018

Introduction

Modbus RTU/ASCII to Wi-Fi(Modbus TCP)converter is provided new ways of connecting serial devices to a Wireless LAN(Wi-Fi 802.11 b/g). Serial(Modbus RTU/ASCII) to Wi-Fi(Modbus TCP) Converter is designed to operate serial ports through wireless (Wi-Fi 802.11 b/g) over 10/100Mbps Ethernet networks. The data is transmitted via TCP/IP protocol. Therefore control is available via Ethernet, Intranet and Internet. Serial (Modbus RTU/ASCII) to Wi-Fi(Modbus TCP) 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 EX9486C-W-MTCP of Modbus RTU/ASCII to Wi-Fi (Modbus TCP) converter product is a more competitive price by careful selecting high quality with competitive prices components in the world, the product design is 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 EX9486C-W-MTCP product.

The following topics are:

- Overview
- Package Checklist
- Product Features
- Product Specifications
- Wiring architecture

Overview

Modbus RTU/ASCII to Wi-Fi(Modbus TCP) Converter is provided a perfect solution to make your industrial serial devices Internet ready instantly via wireless LAN. Model EX9486C-W-MTCP with ARM chipset, Modbus RTU/ASCII to Wi-Fi(Modbus TCP) 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.

Modbus RTU/ASCII to Wi-Fi(Modbus TCP) Converter support manual configuration via the handy web browser console and many protocols including DHCP, HTTP, Modbus RTU/ASCII Slave to Modbus TCP Master Modbus TCP Slave to Modbus RTU/ASCII Master. They are the best solution to network your serial devices.

Package Check List

Serial to Wi-Fi(Modbus TCP) 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.
Dual LAN Speed
Support 10/100 Mbps Ethernet, auto-detected.

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：∥192.168.0.115)

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: 802.11b/g/n

Data Rate:11/54/72.2 Mbps @ 20Mhz Band Width

Modulation: DSSS; OFDM

Frequency: 2.4GHz

Tx Power 11b: Max. 22db

Tx Power 11g/n: Max. 19db

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,   AES, WPA / WPA2 personal, WPS2.0, WAPI

Antenna: 2 dBi ; RP-SMA connector

Network Mode: Infrastructure; ACCESS POINT(for Setup)

Mode: TCP Server / TCP Client / UDP

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

Security: Login Password

Ethernet

Port Type : RJ-45 Connector

Speed: 10 /100 M bps   (Auto Detecting)

Protocol: ARP , IP , ICMP , UDP , TCP , HTTP , DHCP, PPPoE , DDNS , NTP , FTP , Telnet

Mode: TCP Server / TCP Client / UDP

Setup: HTTP Browser Setup (IE & Netscape) , Console

Security: Setup Password

Protection: Built-in 1.5KV Magnetic Isolation

Serial Communication Parameters

No. of ports : 1 * RS-232(Male DB9), 1 * RS-422/485(4-pin Terminal Block)

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, 2

Speed: 300 bps to 230.4K bps

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 over 25 seconds.   All the parameters will be reset to the factory default (ACCESS POINT mode).

Reset button
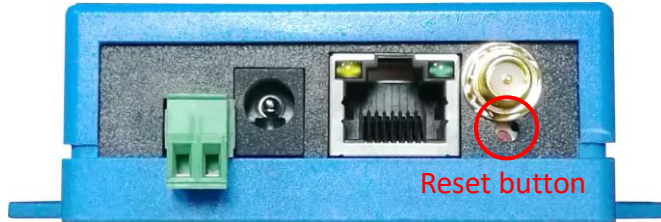
Power Requirements

Power input : 9~24V, 200mA@12 VDC
note: pin assignment of Power Supply if you select the Terminal Block

Environmental

Operating Temperature : -20 to 70°C , 10 to 95% RH
Storage Temperature : -25 to 80°C , 5 to 95%RH
Regulatory Approvals
RoHS
FCC, CE

Software Features

Protocols : DHCP, HTTP, Modbus RTU/ASCII Slave to Modbus TCP Master
               Modbus TCP Slave to Modbus RTU/ASCII Master
Mode : Modbus TCP Master/ Slave
Support 8 TCP Masters simultaneously
Support serial Master access to 8 TCP Slaves
Utilities : Windows 2000/2003/VISTA/WIN 7/WIN 8/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-MTCP Wi-Fi Converter Configuration

Installation of IP Search Tool

1. Please copy EXiot Setup 1.0.10.exe to your PC. You can find the file in the CD ROM.

2. Double click EXiot Setup 1.0.10.exe. The program will be extracted and installed in PC.

3. After successful installation, the shortcut of EXiot.exe will be on the desktop
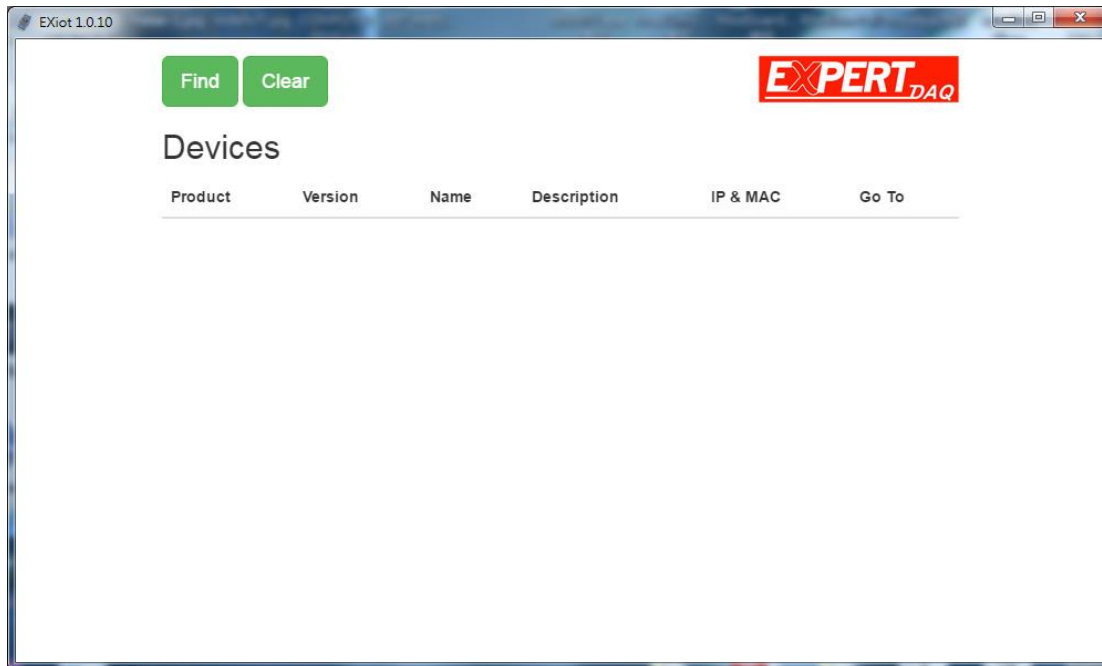
Connection and Configuration

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

1. Connecting EX9486C-W-MTCP Gateway

1-1. EX9486C-W-MTCP have ethernet port & wi-fi port, so the user can config EX9486C-W-MTCP by ethernet or wi-fi

1-2. EX9486C-W-MTCP's wi-fi default as a "ACCESS POINT" when first connected to power. Its broadcast SSID is EXiot_+MAC address

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

1-3. Key in Soft AP password. Default is 12345678
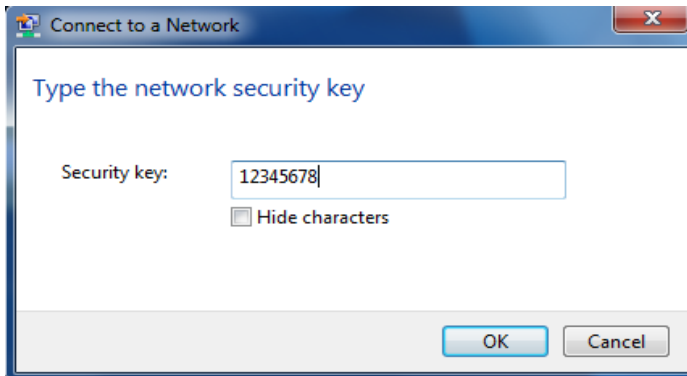
1-4. Connecting to EX9486C-W-MTCP Gateway
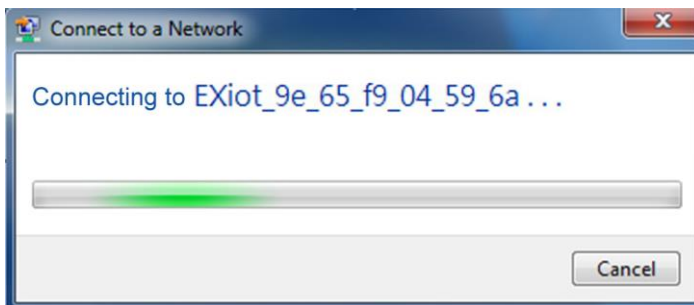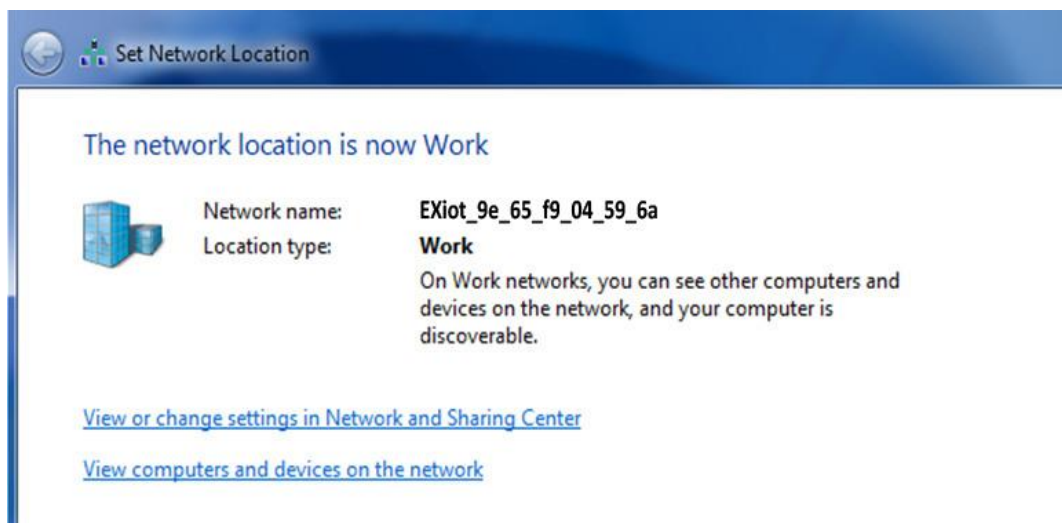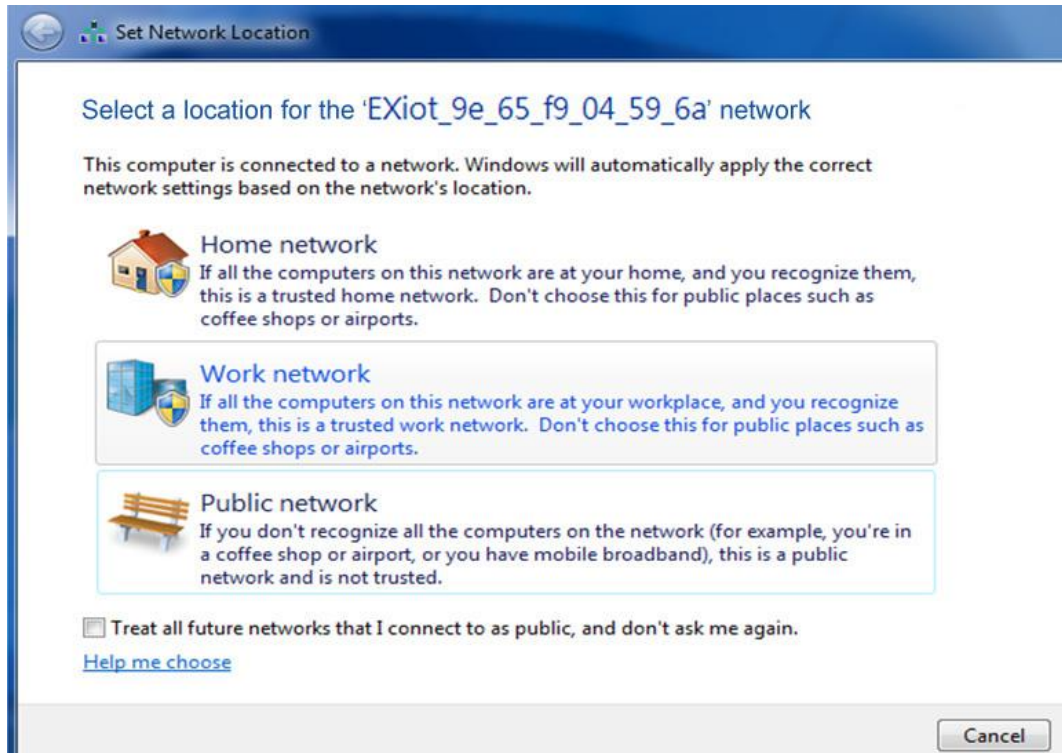
Now you have successfully connect to EX9486C-W-MTCP

2. Searching & Configuring EX9486C-W Gateway

2-1. IP Searching

2-1-1. Double Click on to execute EXiot.

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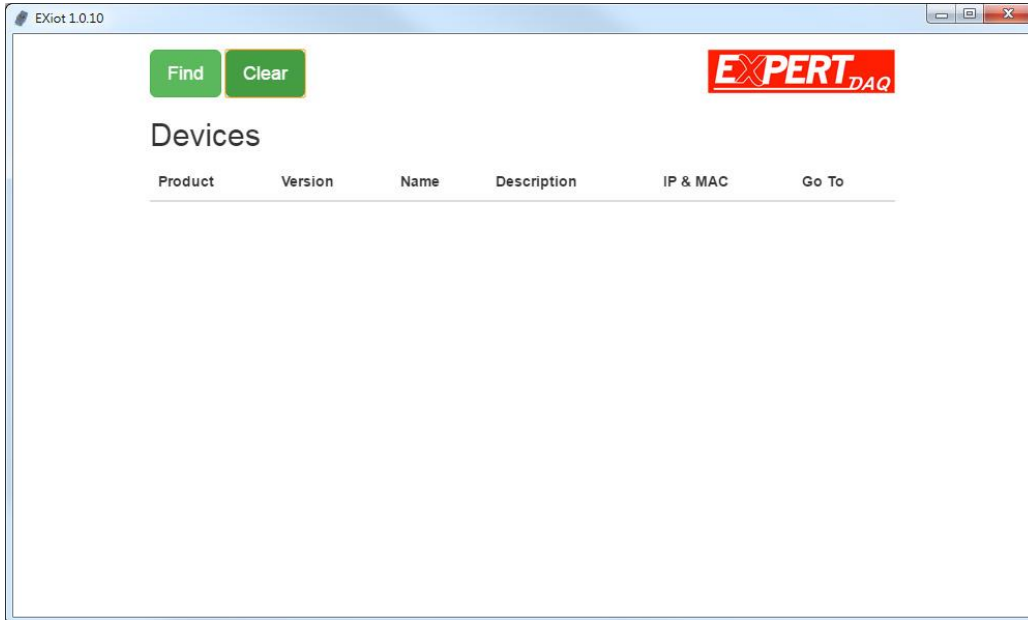
2-1-3. Device found
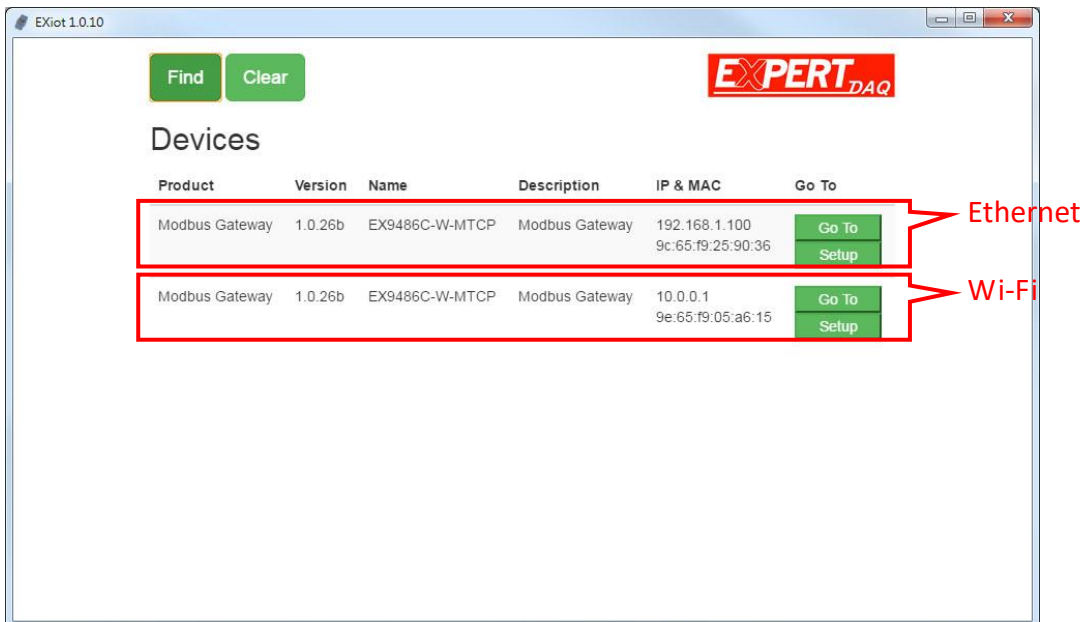
2-1-4. Single click on device IP address. Then click "Goto" to open browser.
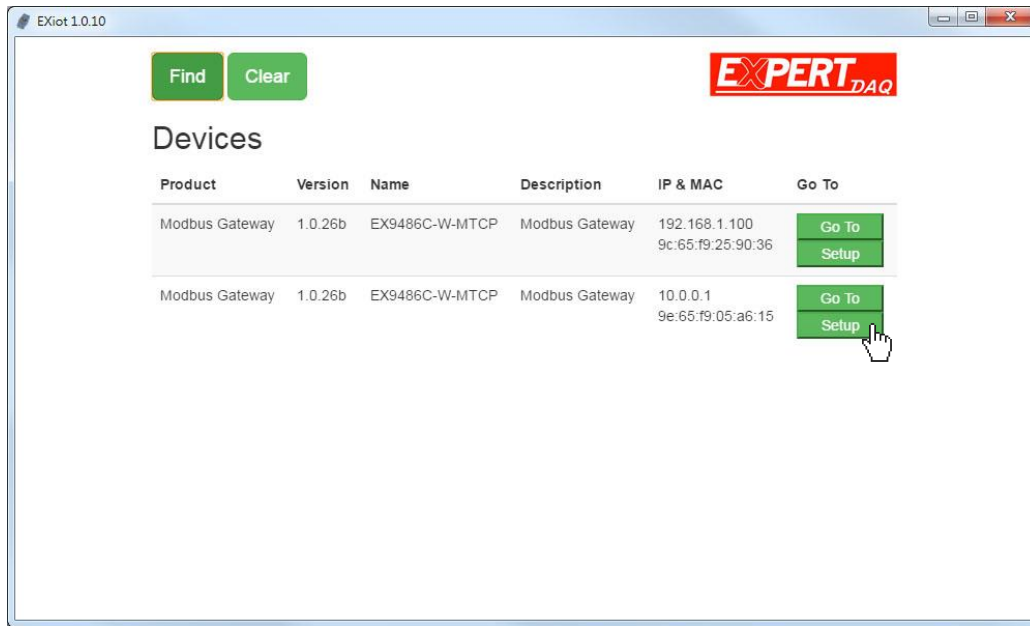
2-1-5. Login page is shown. Please input ID and Password. (default ID: **admin**; password: **admin**).
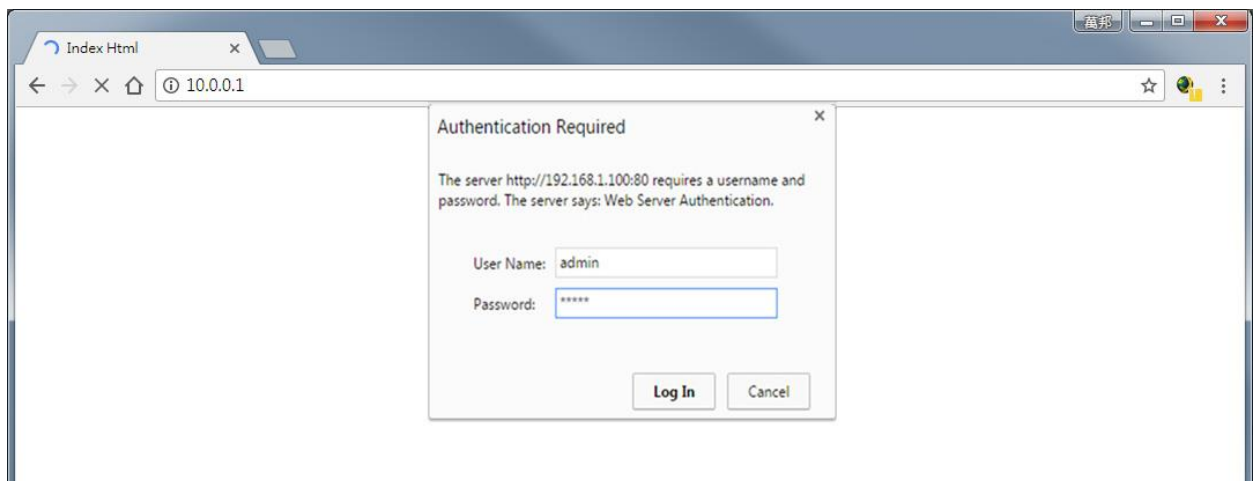
Now you have successfully searched the device

2-2. Configuring

2-2-1. Modbus Gateway 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.
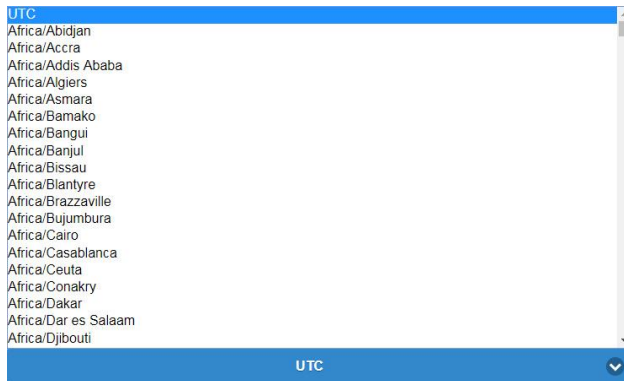
2-2-3. Network Setup Page

There is Network Type configuration
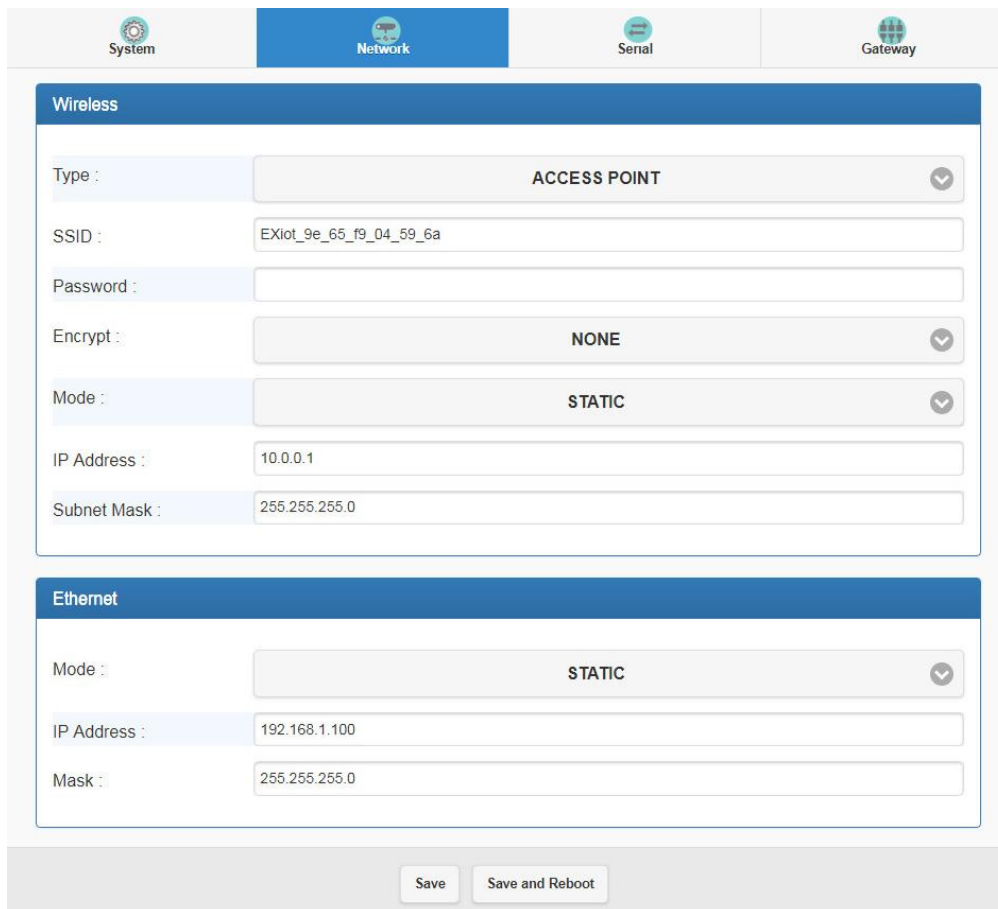
2-2-3-1.Wireless Network Type

There are 2 network types: INFRASTRUCTURE / ACCESS POINT.

A. "ACCESS POINT" 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 "EXiot_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
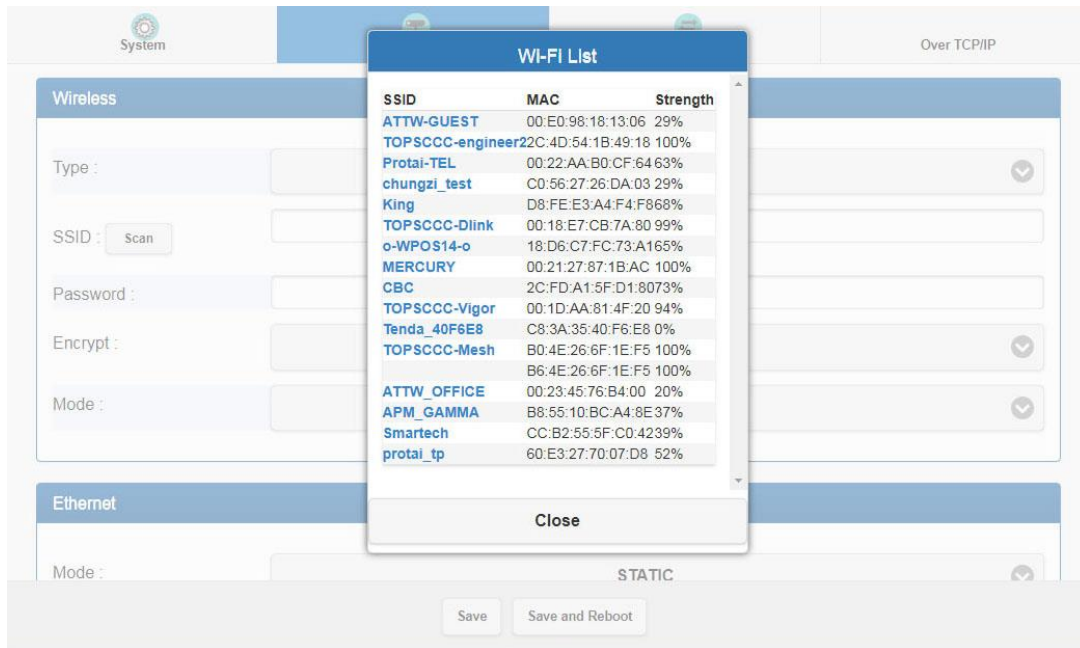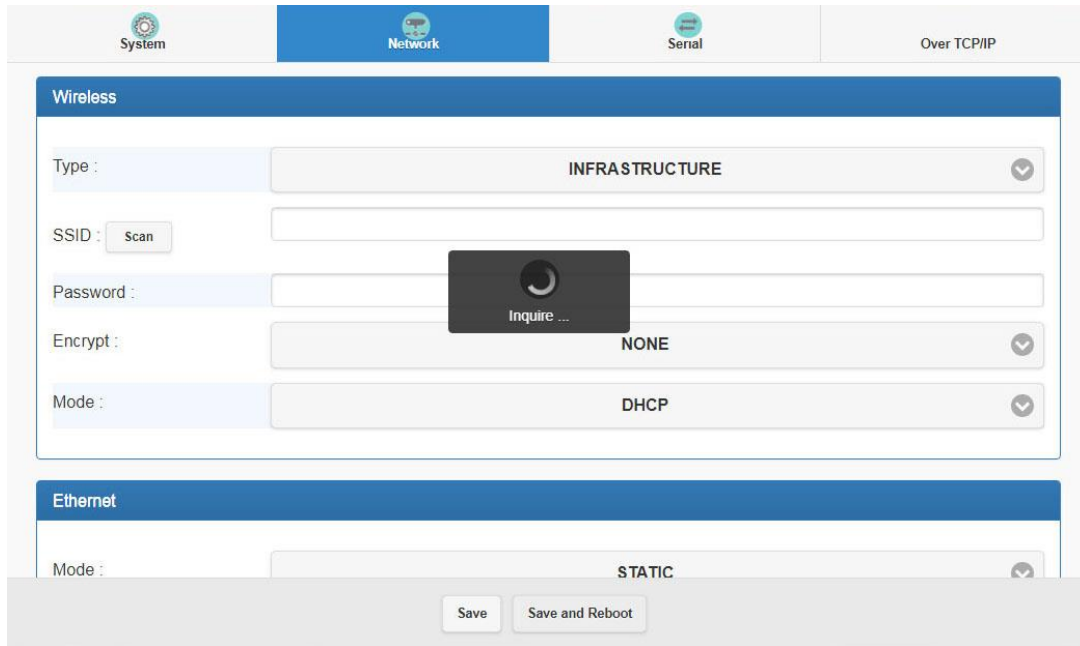
2-2-3-3. Encrypt

There are 3 Encrypt Modes

2-2-3-4. Password

Key in password for selected AP

2-2-3-5. IP Address Mode

Configure IP Address Mode – Suggest choosing "DHCP" – Let AP to assign IP address to Modbus

Gateway. You can also choose "STATIC" to input fixed IP address, Subnet Mask, Gateway address.

STATIC parameters setting

Now, Network Setup is successfully configured.

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

DHCP Mode

2-2-3-6. Ethernet configuration

Note: Wireless and Ethernet can not be in the same subnet.

2-2-4. Serial

Setup Serial device parameters - Baud Rate, Parity, Data Bits, Flow Control, RxDelay(ms) and TxDelay(ms). Then click " Save" to save the Settings.

Serial 1

Baud Rate:	19200
Parity:	None
Data Bits:	8
Stop Bits:	1
Flow Control:	None
RxDelay(ms) :	0
TxDelay(ms) :	0

Serial 2

Baud Rate:	19200
Parity:	None
Data Bits:	8
Stop Bits:	1
Flow Control:	None
RxDelay(ms) :	0
TxDelay(ms) :	0

2-2-5. Gateway Setup

There are 5 Modbus modes for selection.

TCP to RTU Slave;   TCP to ASCII Slave; TCP Client to RTU Slave

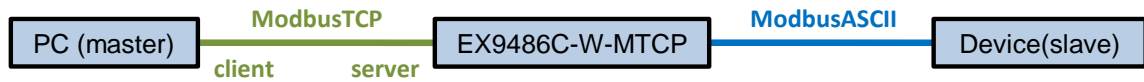RTU to TCP Slave;   ASCII to TCP Slave
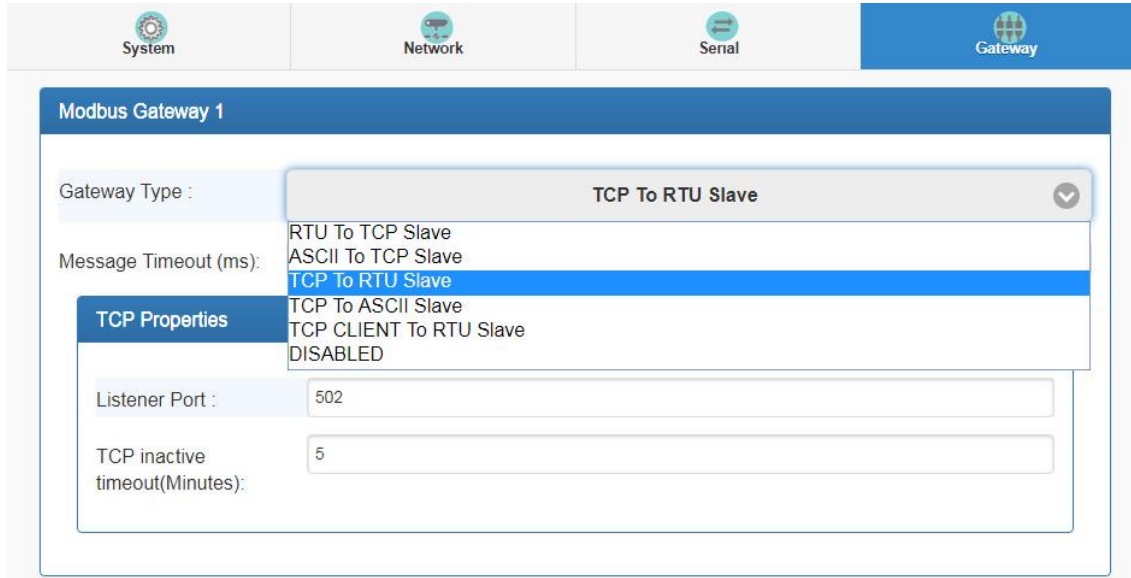
2-2-5-1. TCP to RTU Slave [ModbusTCP(server) to ModbusRTU(slave)]
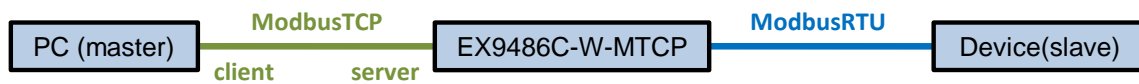
Configure TCP server port number and message time out period
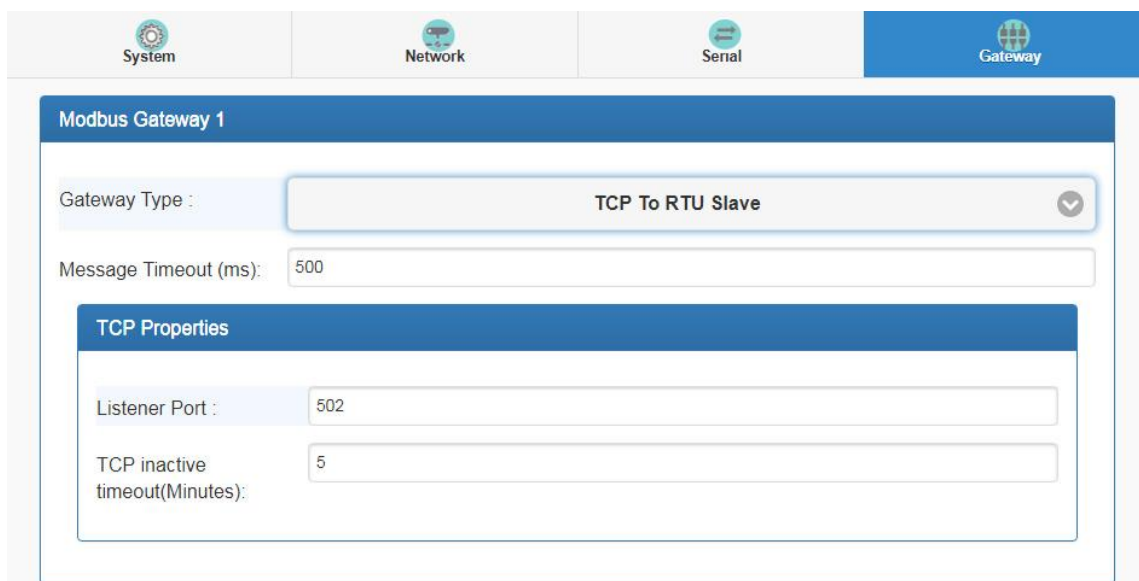
2-2-5-2. TCP to ASCII Slave [ModbusTCP(server) to ModbusASCII(slave)]

| PC (master) | **ModbusTCP**
client   server | EX9486C-W-MTCP | **ModbusASCII** | Device(slave) |

2-2-5-3. RTU to TCP Slave [ModbusTCP(client) to ModbusRTU(master)]

| Device(slave) | **ModbusTCP**
server   client | EX9486C-W-MTCP | **ModbusRTU** | PC(master) |
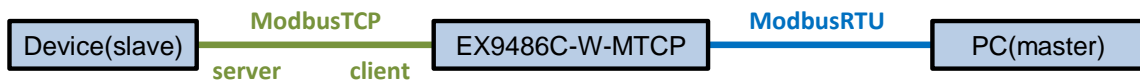
Configure TCP slave IP address, port number and message time out period

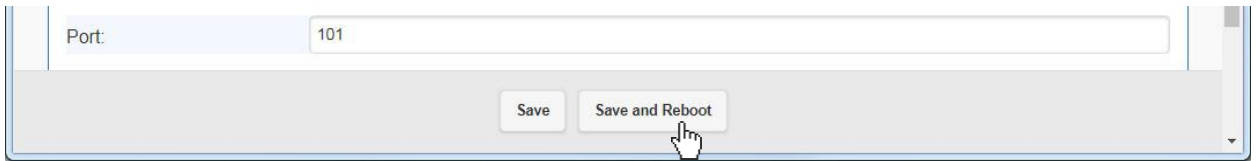2-2-5-4. ASCII to TCP Slave [ModbusTCP(client) to ModbusASCII(master)]
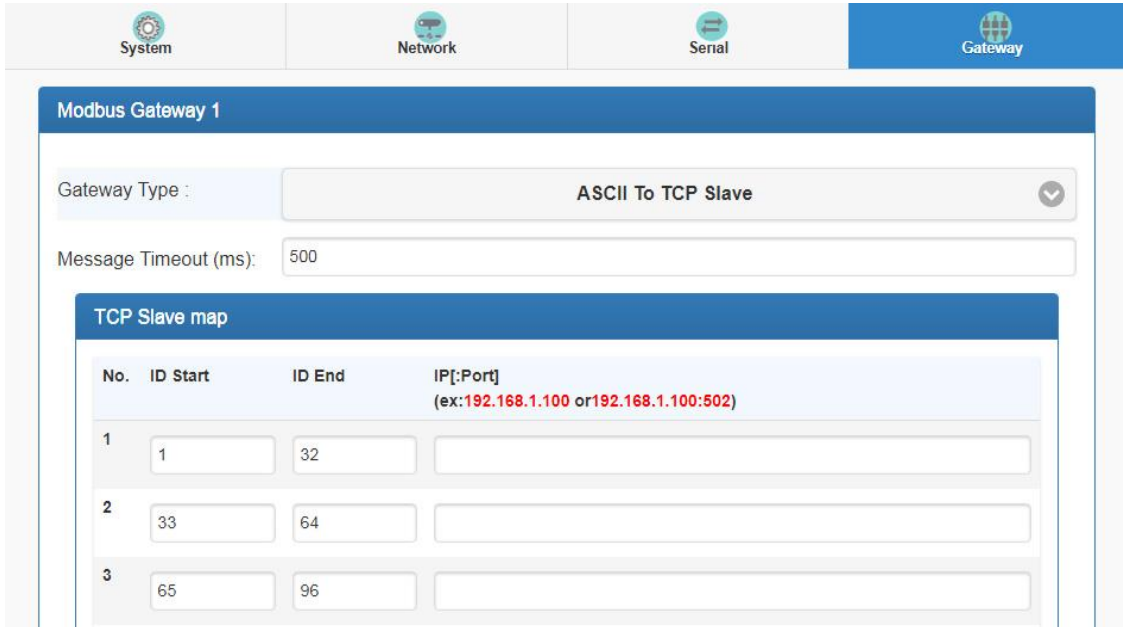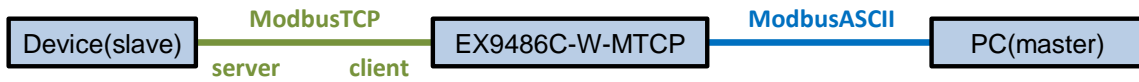
2-2-5-5. TCP Client to RTU Slave [ModbusTCP(client) to ModbusRTU(slave)]
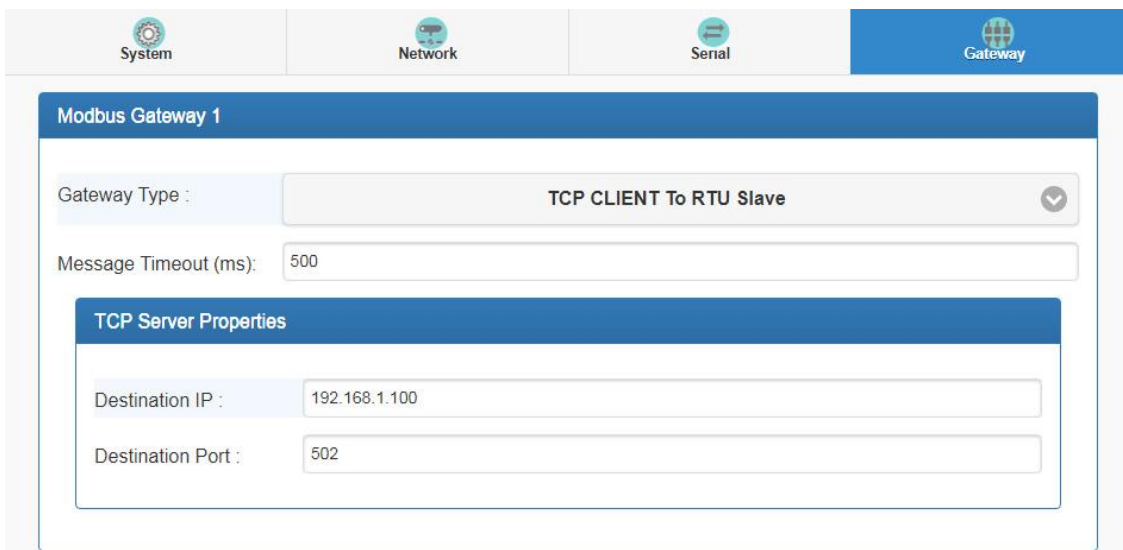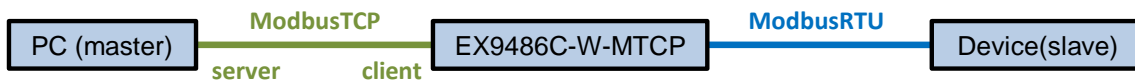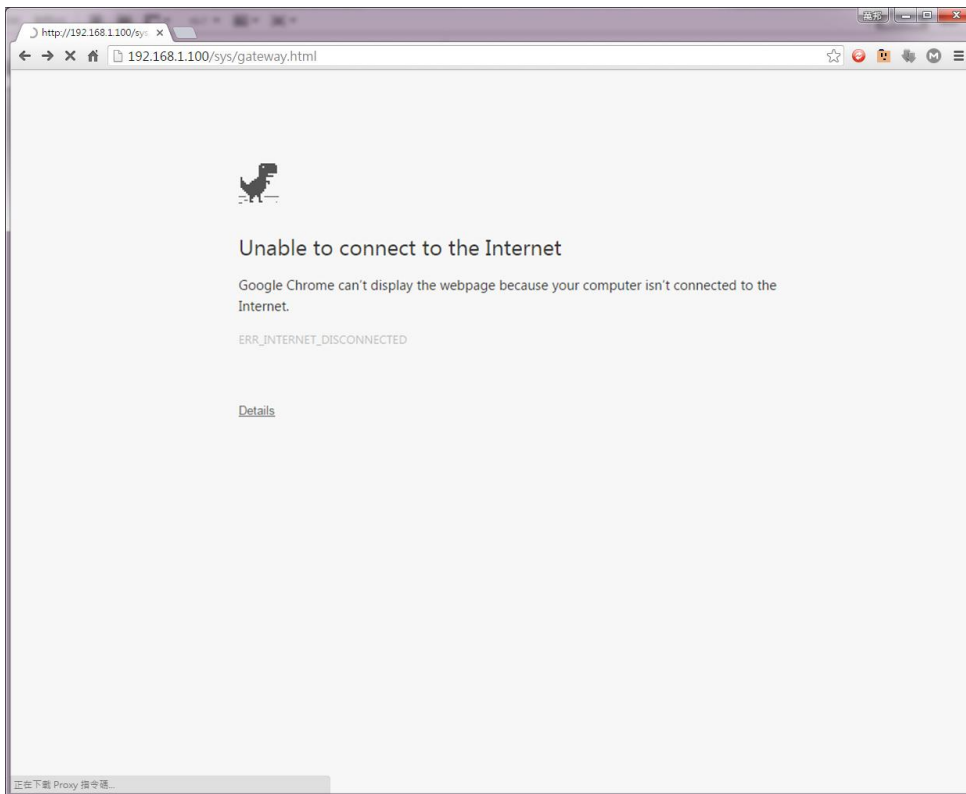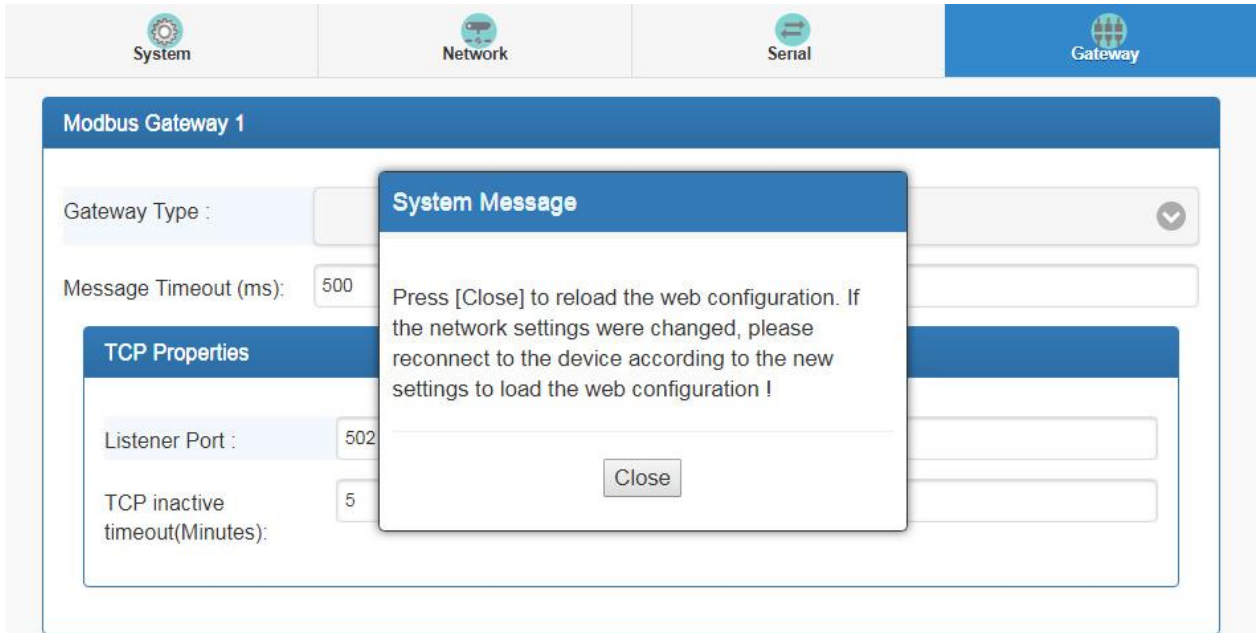

Now, Gateway Setup is successfully configured.

2-2-6. Then click "Reboot" to re-start the converter.

2-2-7. After device reboot, the original wireless connection will be disconnect.
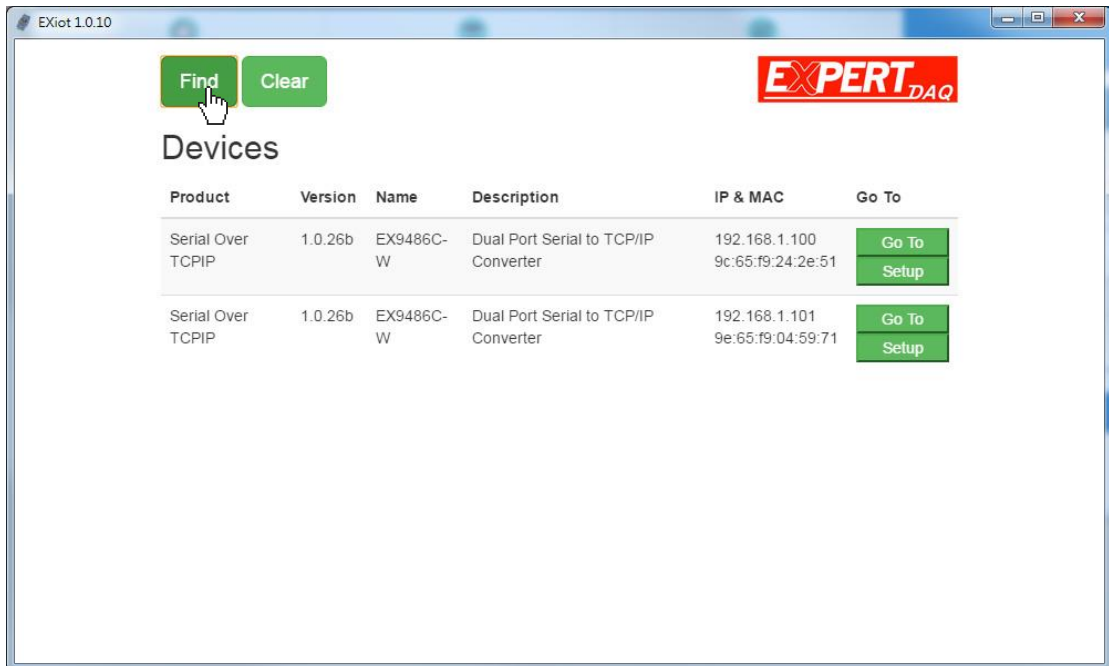
2-3. Reconnect to EX9486C-W-MTCP Gateway

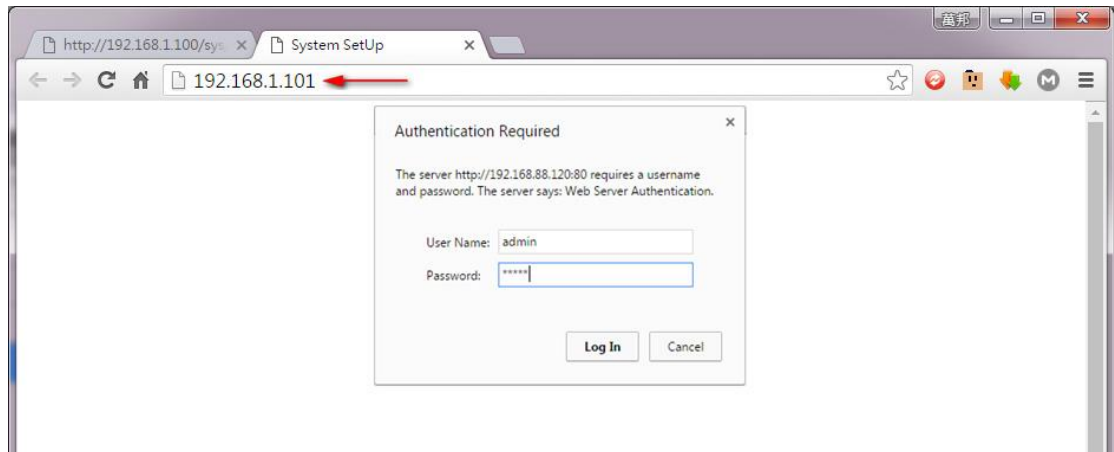2-3-1. Search the selected AP which EX9486C-W-MTCP connect with

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
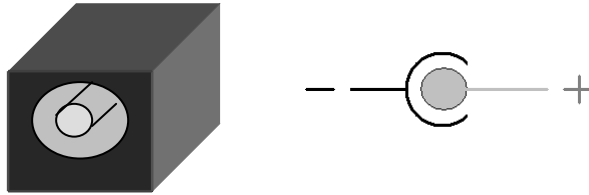

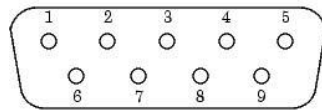You have successfully re-connected to EX9486C-W-MTCP Gateway

Appendix A

Pin outs and Cable Wiring

▣ DC Power outlet

▣ RS-232 Pin Assignment

The pin assignment scheme for a 9-pin male connector

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

▣ 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+