

User Manual

STE211W

Serial to Ethernet Device Server



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Introduction

STE211W Serial to Ethernet+WiFi Interface Converter provides the ways of connecting serial devices to both Ethernet and Wireless LAN (Wi-Fi 802.11 b/g/n). It is designed to operate serial ports through Ethernet (10/100Mbps) and wireless (Wi-Fi 802.11 b/g/n) over TCP/IP network. When the data is transmitted via TCP/IP protocol, data acquisition and controlling is available to go through Intranet and Internet. There are two serial ports as one is a RS-232 and the other is RS-422/485. Configuration is easy to operate via web page setup.

STE211W Serial to Ethernet+WiFi Converter is a high performance design consisting of carefully selected and 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**
- **Web Browser Configurations**

Overview

STE211W (hereunder called “This Device”) Serial to Ethernet+WiFi Converter provides a perfect solution to make your industrial Serial devices connect to Internet instantly via Wireless and Ethernet LAN. This device embedded with the powerful chipset is the ideal device for transmitting the data from your RS-232 or RS-422/485 Serial interface devices, such as PLCs, Meters or Sensors to an IP-based Ethernet and Wi-Fi host, and making it possible for your software to access Serial interface devices anywhere and anytime.

STE211W supports TCP Server Mode, TCP Client Mode, and UDP Mode for selection. It also provides manual configuration via web browser and offers various protocols including HTTP, DHCP, ICMP, and ARP. These are the best solution to coordinate your Serial interface devices.

Package Checklist

- 1 unit of STE211W device
- 1 unit of Power Adaptor (12V DC, 1A)
- 1 unit of dipole antenna(2.0dBi)

NOTE: Inform your sales representative if any one of the above items is 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

Ethernet

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

WiFi

- ✧ Standard: 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 only)
- ✧ Port: RS-422 / 485 *1 (Surge Protection)
- ✧ Speed: 300 bps ~ 921.6 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 Protection)
- ✧ RS-485: Data+, Data- (Surge Protection)
- ✧ 15KV ESD for all signals

Power

- ✧ DC 9~32 V, 1000mA@12V
- ✧ Support DC Jack & Terminal Block Input
- ✧ PoE: Power over Ethernet 802.3af
- ✧ Power Consumption: 2W

Mechanical and Environment

- ✧ Operating Temperature: -20°C~70°C
- ✧ Storage Temperature: -25°C~80°C
- ✧ Dimensions: 110mm (W) * 90mm (D) * 26 mm (H)
- ✧ Weight : 110 ± 5gm
- ✧ Housing: plastic

Other Features

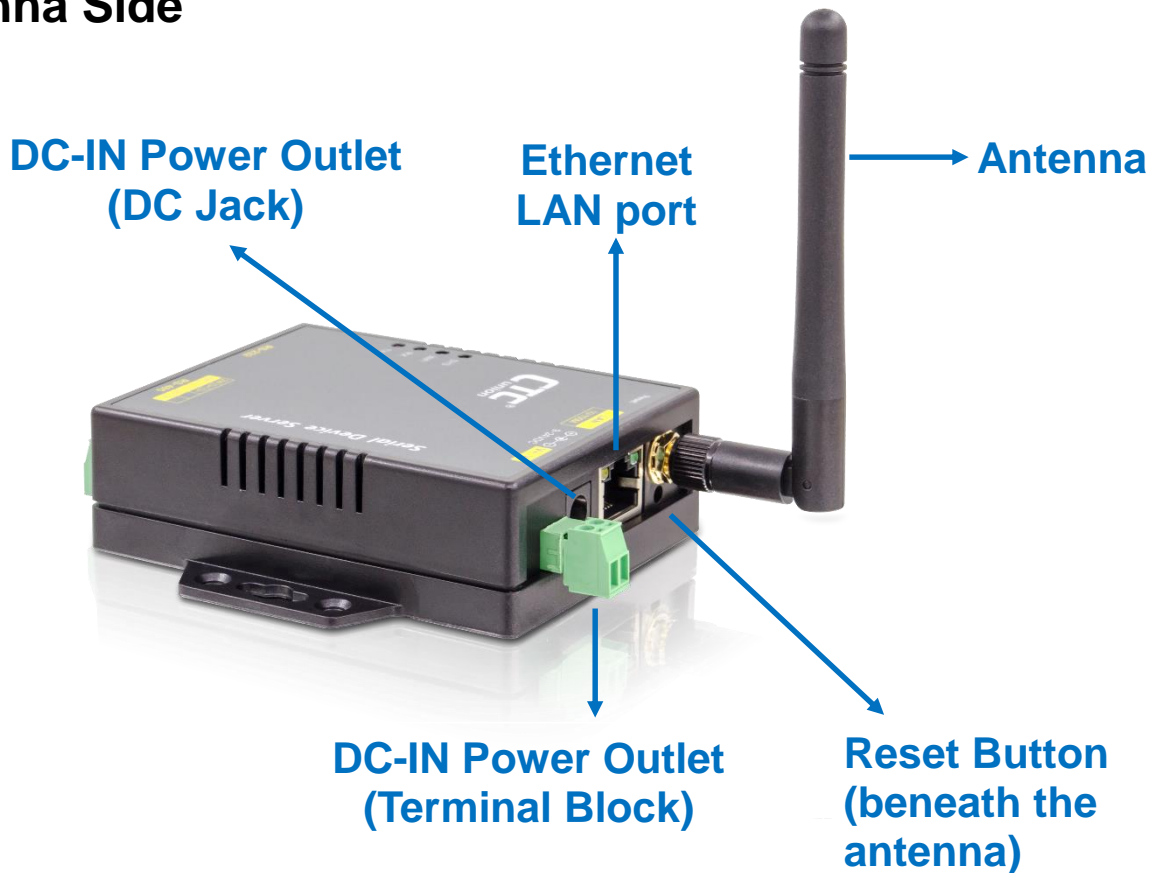
- ✧ LED Indicators: SYS, WiFi, RX, TX, LAN
- ✧ RTC: Real Time Clock
- ✧ Watch Dog Function

MTBF (MIL-HDBK-217)

- ✧ 60,000 Hours

Product Panel Views

Antenna Side



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.

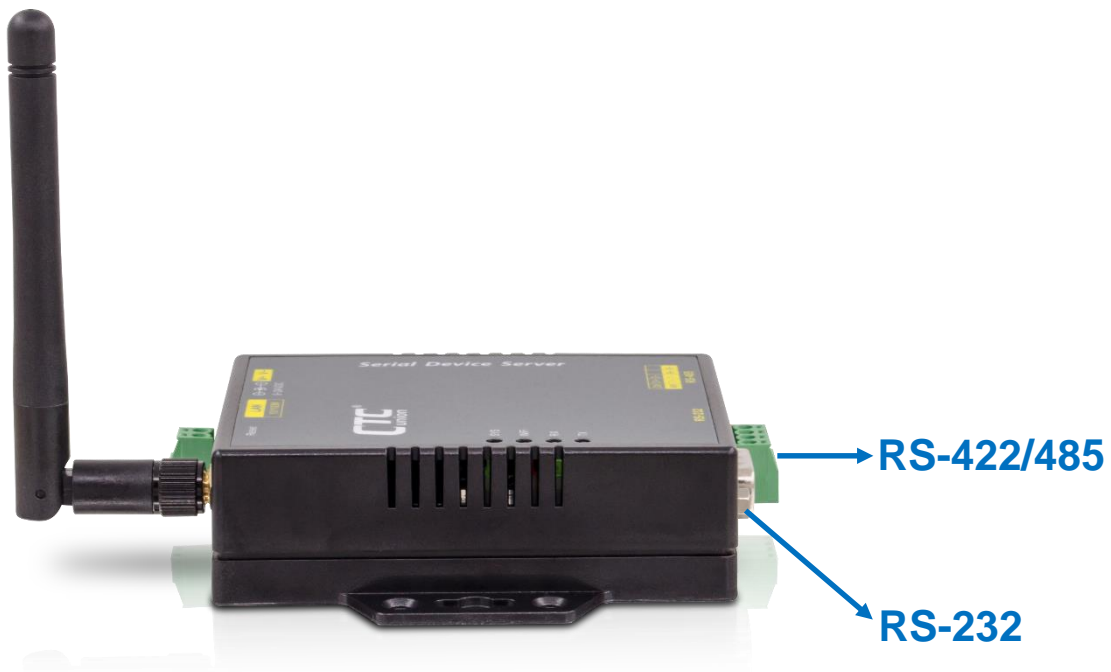
DC-IN Power Outlet

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.

Reset Button

- (1) Press reset key after 5 seconds until SYS LED flash then release the key will reset network default IP and gateway IP back to default. The other parameters keep same as last confirmation.
- (2) Press reset key after 5 seconds until both SYS LED and WiFi LED flash then release the key will make all parameters back to factory default.
- (3) Press reset key within 5 seconds without LED flash will reboot the equipment. Last configuration no change.

Serial Interface Side



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.

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 sends to the device from LAN, this LED will blink.

Rx (Red):

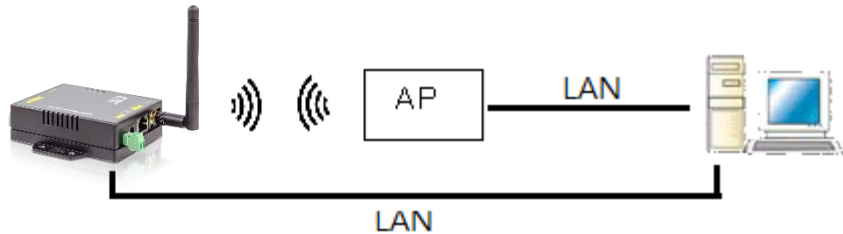
Data received indicator. When data sends to the device from Serial ports, this LED will blink.

Wiring Architecture

1. RS-232

RS-232 Wiring
Serial Device

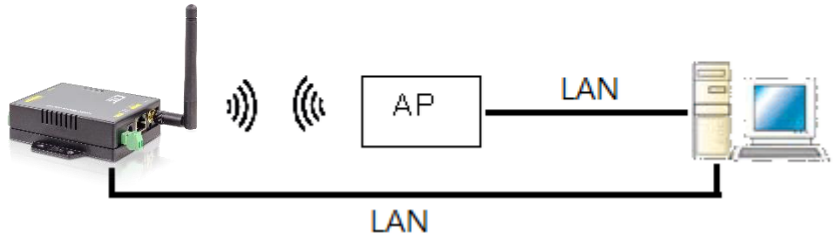
DB 9 ————— DB 9



2. RS-422/RS-485

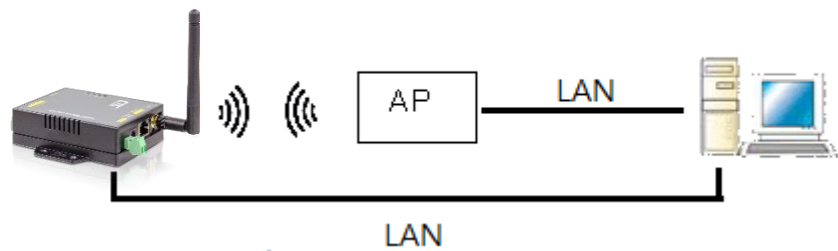
RS-422 Wiring
Serial Device

T- ————— R-
T+ ————— R+
R- ————— T-
R+ ————— T+



RS-485 Wiring
Serial Device

D+ ————— D+
D- ————— D-



When you complete the steps mentioned above, the LED indicators will be lit. This means that the converter is connected and installed correctly. To proceed with the parameters setup, please use a web browser (IE or Chrome) to configure the detailed settings.



Configuration

When setting up your converter for the first time, the first thing you should do is to configure the IP address. You can use IP Device Search tool to find the IP or simply use the default IP to login to the device.

The following topics are covered in this chapter:

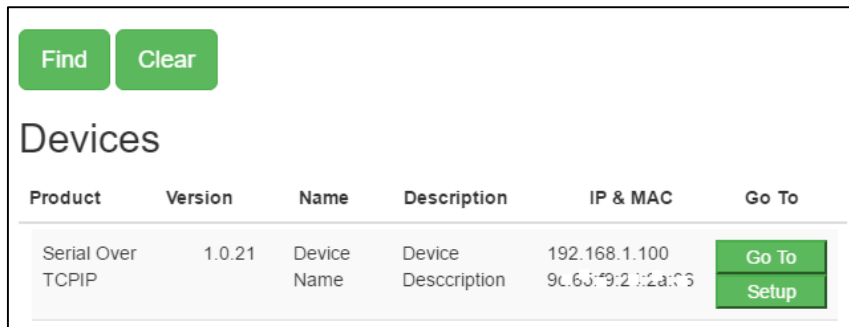
- **IP Search Utility Setup**
- **Web Browser Configuration**

IP Search Utility Setup

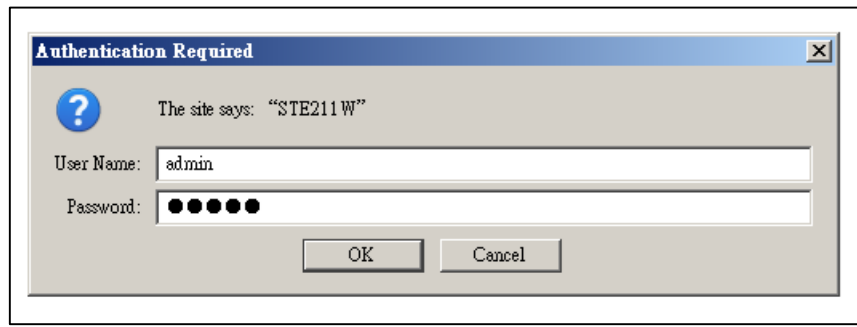
1. Copy  “Device Search Setup” to your host computer.
2.  “Device Search” is a self-extract-install program. Double click it to install this Wi-Fi IP Searching tool into host computer.
3. “Device Search” will pop up on the screen after installation or you may double click the icon on desk top of host computer to open this tool.



4. Click on “**Find**” button. It will scan the network and show up the IP of Gateway.

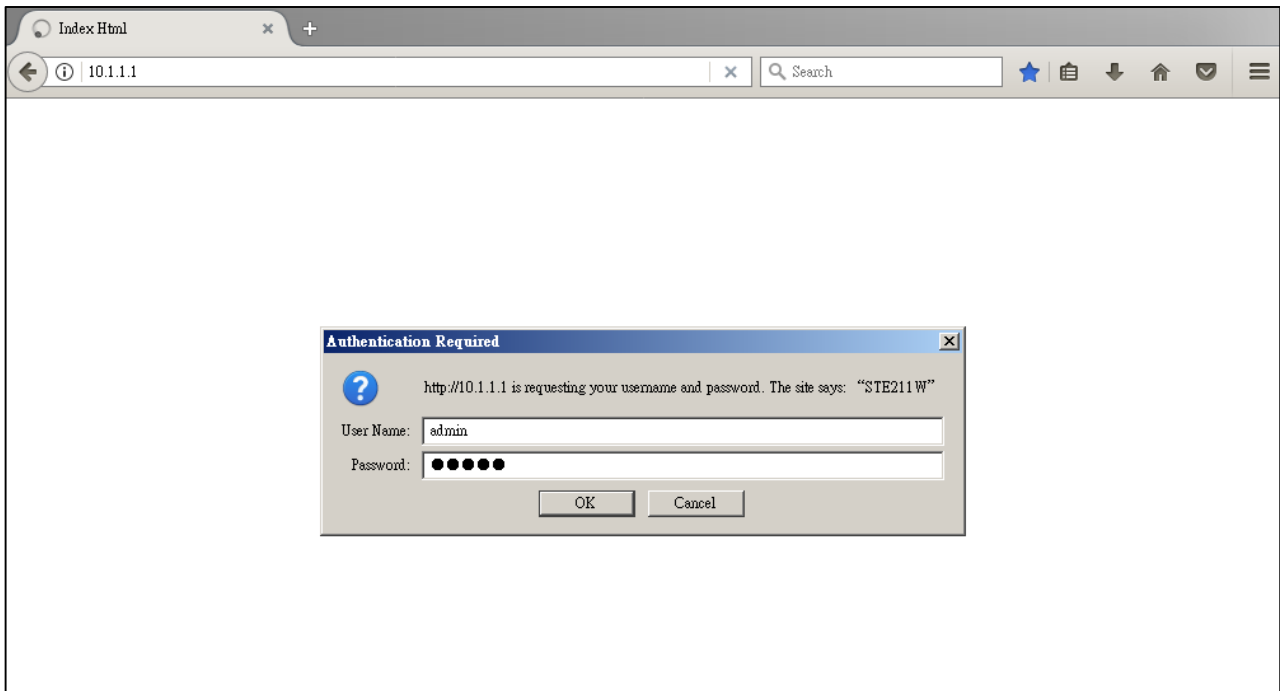


5. Click “Goto” button will open a web page of configuration. (Default Username: **admin**; Default Password: **admin**).

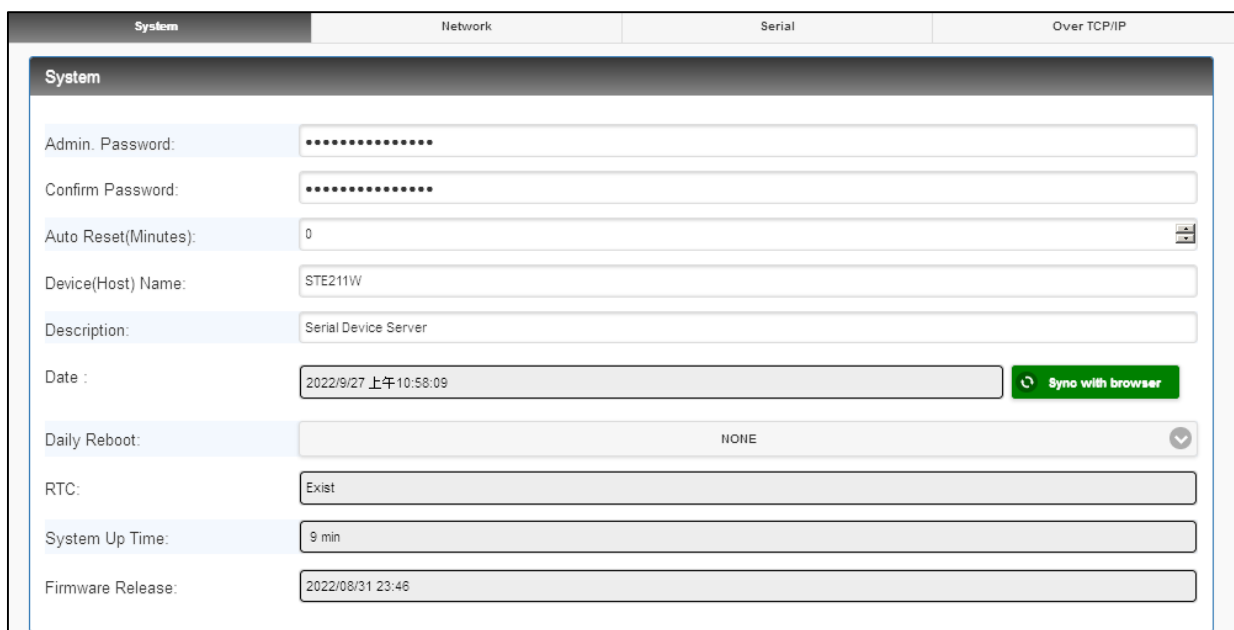


- You can also use the default IP address (**10.1.1.1**) of this device to login to the configuration webpage with the default Username: **admin** and Password: **admin**.

Note: The default Ethernet IP address is **10.1.1.1/24**; while, the default WiFi IP address is **10.0.0.1/24**.



- When you successfully login to the device, the following main screen will pop up.



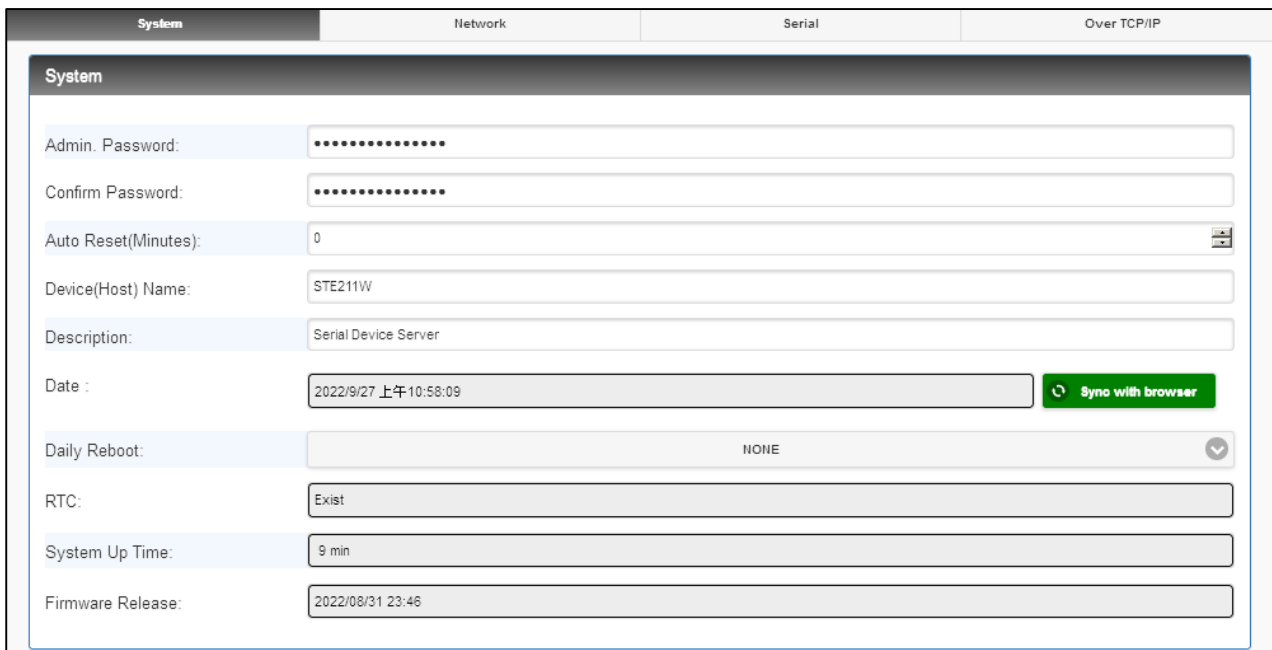
Web Browser Configuration

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



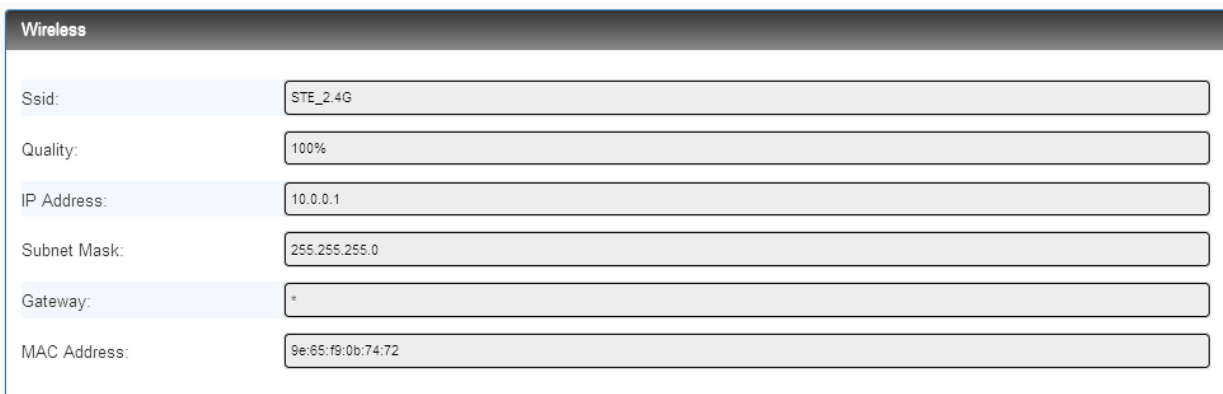
System Setup

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

A screenshot of the "System" configuration page. The page has a header with tabs for "System", "Network", "Serial", and "Over TCP/IP". The "System" tab is active. The form contains the following fields:

- Admin. Password: [password field]
- Confirm Password: [password field]
- Auto Reset(Minutes): [0] [dropdown arrow]
- Device(Host) Name: [STE211W]
- Description: [Serial Device Server]
- Date: [2022/9/27 上午10:58:09] [Syno with browser button]
- Daily Reboot: [NONE] [dropdown arrow]
- RTC: [Exist]
- System Up Time: [9 min]
- Firmware Release: [2022/08/31 23:46]

2. Appearance of Wireless and Ethernet setup. Please note that the default WiFi IP address is **10.0.0.1/24** and the default Ethernet IP address is **10.1.1.1/24**.

A screenshot of the "Wireless" configuration page. The page has a header with the title "Wireless". The form contains the following fields:

- Ssid: [STE_2.4G]
- Quality: [100%]
- IP Address: [10.0.0.1]
- Subnet Mask: [255.255.255.0]
- Gateway: [*]
- MAC Address: [9e:85:f9:0b:74:72]

Ethernet	
IP Address:	10.1.1.1
Subnet Mask:	255.255.255.0
Gateway:	*
MAC Address:	9c:65:f9:4b:66:8a

3. HTTP & NTP: Enable / Disable HTTP or NTP function; Set up NTP server and Time Zone.

Services	
HTTP Enabled:	Enabled
HTTP Port	80
NTP Enabled:	Disabled
NTP Server :	ol.ntp.org
NTP Offset :	UTC
dnsmasq Enabled :	Enabled
<small>(Support domain & WIFI AP DHCP service)</small>	

4. Firmware update: If necessary, click “Browse” to open file manager.

Firmware	
Firmware :	<input type="button" value="Browse..."/> No file selected.
<input type="button" value="Update"/>	

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

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

Firmware

Firmware : No file selected.

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.

Network Setup

System **Network** Serial Over TCP/IP

Wireless

Type : ACCESS POINT

SSID : STE_2.4G

Password : 1234567890

Encrypt : WPA

Mode : STATIC

IP Address : 10.0.0.1

Subnet Mask : 255.255.255.0

Country : TW

Ethernet

Mode : STATIC

1. Wireless section:

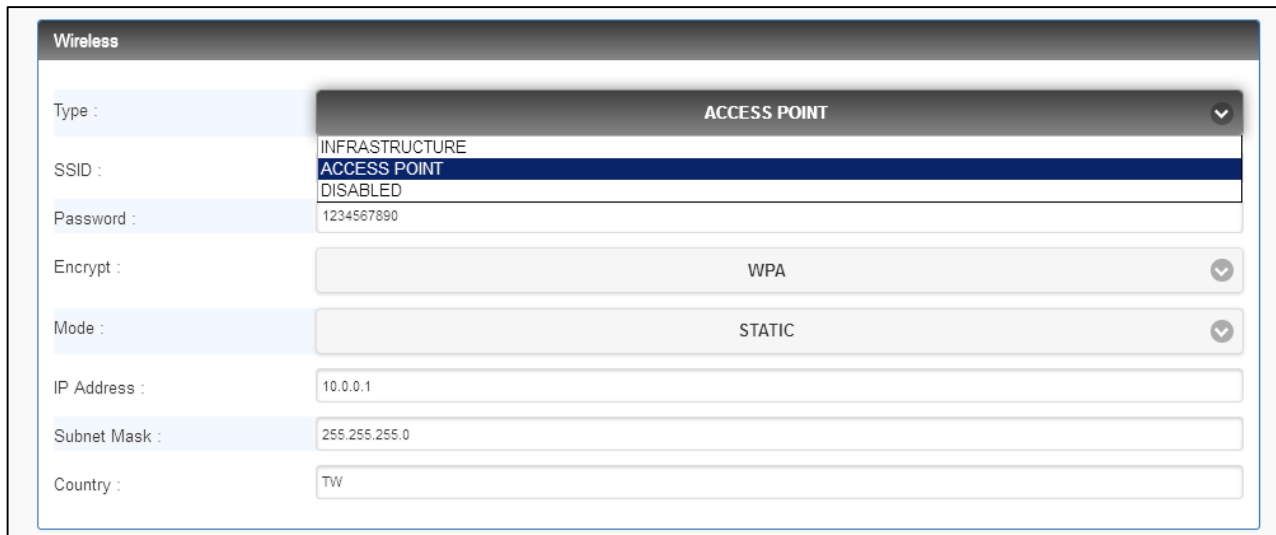
1.1 Type: Click to select “Access Point” or “Infrastructure”. “Infrastructure” is for connecting to a local Router.

The screenshot shows the 'Wireless' configuration page. The 'Type' dropdown menu is open, displaying three options: 'INFRASTRUCTURE', 'ACCESS POINT' (which is highlighted in blue), and 'DISABLED'. Other fields are visible: SSID is empty, Password is '1234567890', Encrypt is 'WPA', Mode is 'STATIC', IP Address is '10.0.0.1', Subnet Mask is '255.255.255.0', and Country is 'TW'.

1.2 If “ACCESS POINT” is selected, input password (1234567890) for the AP and assign IP address with “DHCP” or “STATIC”.

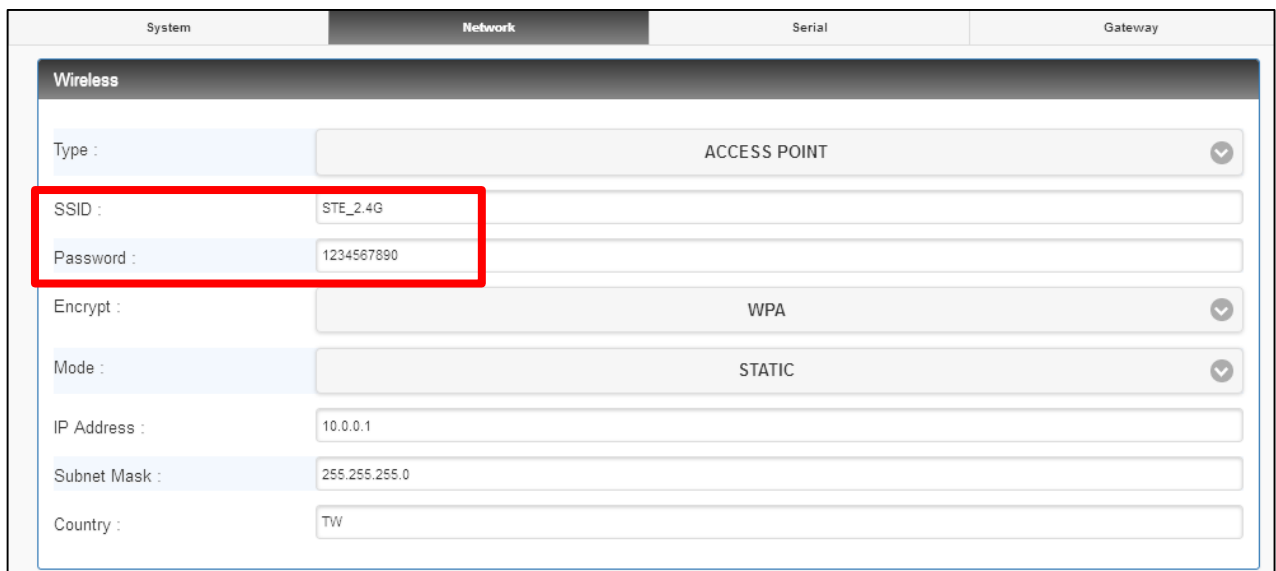
The screenshot shows the 'Wireless' configuration page with 'ACCESS POINT' selected in the 'Type' dropdown. The 'Mode' dropdown is set to 'STATIC'. Red boxes highlight the 'Password' field (containing '1234567890'), the 'Mode' dropdown (set to 'STATIC'), and the 'IP Address' (10.0.0.1) and 'Subnet Mask' (255.255.255.0) fields. The SSID is 'STE_2.4G' and the Country is 'TW'.

1.3 When “ACCESS POINT” is selected, 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 “STE_2.4G”. PC /NB /Smart Phone/PAD should connect to this SSID and then able to open web browser with default IP of this Device.



The screenshot shows the 'Wireless' configuration page. The 'Type' dropdown is set to 'ACCESS POINT'. The 'SSID' dropdown is also set to 'ACCESS POINT', with a list of options including 'INFRASTRUCTURE', 'ACCESS POINT', and 'DISABLED'. The 'Password' field contains '1234567890'. The 'Encrypt' dropdown is set to 'WPA', and the 'Mode' dropdown is set to 'STATIC'. The 'IP Address' field is '10.0.0.1', the 'Subnet Mask' is '255.255.255.0', and the 'Country' is 'TW'.

1.4 Password: Key in password for the selected AP.



The screenshot shows the 'Wireless' configuration page with the 'Type' dropdown set to 'ACCESS POINT'. The 'SSID' field is 'STE_2.4G' and the 'Password' field is '1234567890'. These two fields are highlighted with a red rectangular box. The 'Encrypt' dropdown is set to 'WPA', and the 'Mode' dropdown is set to 'STATIC'. The 'IP Address' field is '10.0.0.1', the 'Subnet Mask' is '255.255.255.0', and the 'Country' is 'TW'.

1.5 Encrypt

System	Network	Serial	Gateway
Wireless			
Type :	ACCESS POINT		
SSID :	STE_2.4G		
Password :	1234567890		
Encrypt :	WPA		
Mode :	NONE WEP WPA WPA2		
IP Address :	10.0.0.1		
Subnet Mask :	255.255.255.0		
Country :	TW		

1.5 Mode: select “DHCP” to let AP assign IP address to itself,

Mode :	DHCP
--------	------

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

Mode :	STATIC
IP Address :	10.0.0.1
Subnet Mask :	255.255.255.0
Country :	TW

2. Ethernet section: Select “STATIC” or “DHCP” to assign IP address.

The screenshot shows two configuration panels. The top panel, titled "Ethernet", has a "Mode" dropdown menu currently set to "STATIC". A dropdown menu is open below it, showing "STATIC" and "DHCP" options, with "DHCP" highlighted. Below the mode menu are input fields for "IP Address", "Subnet Mask" (containing "255.255.255.0"), and "Gateway". The bottom panel, titled "Gateway", has a "Gateway" input field containing "0.0.0.0".

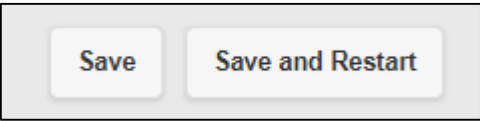
3. Gateway and DNS: To check with MIS for right IP address.

The screenshot shows two configuration panels. The top panel, titled "Gateway", has a "Gateway" input field containing "0.0.0.0". The bottom panel, titled "DNS", has a "DNS" input field containing "168.95.1.1".

4. TCP Keep Alive: Set up TCP keepalive time, interval and probes.

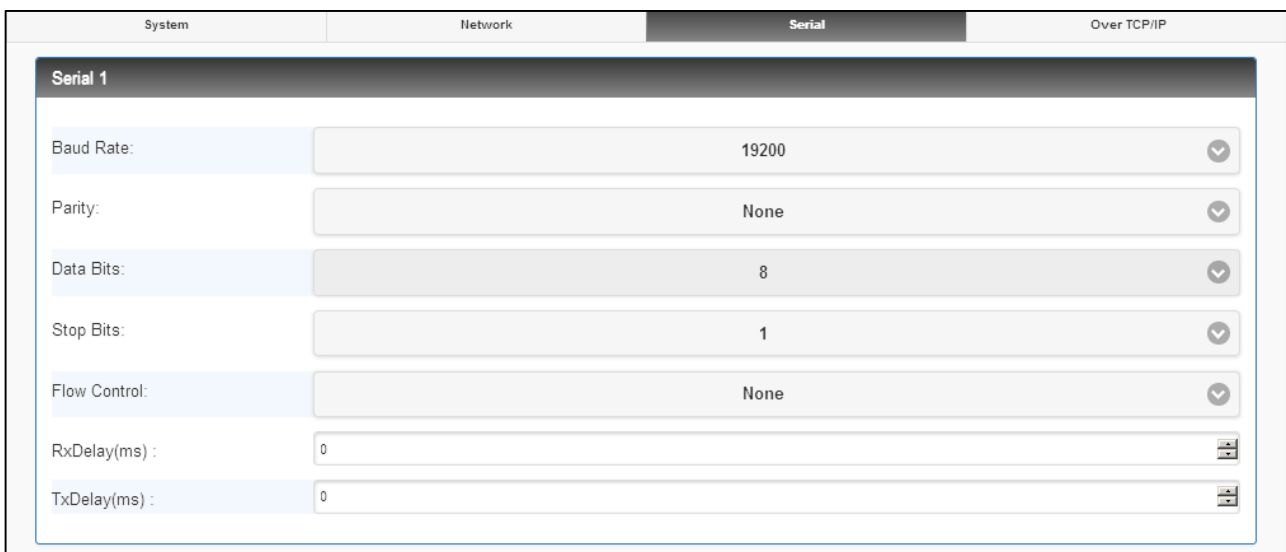
The screenshot shows a configuration panel titled "TCP KeepAlive(net.ipv4)". It contains three input fields: "tcp_keepalive_time" with the value "120", "tcp_keepalive_intvl" with the value "75", and "tcp_keepalive_probes" with the value "9". Each input field has a small icon to its right.

5. 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.



Serial Port Setup

Please correctly input each parameters to match with the remote terminal units.



Baud Rate: 300 bps to 921.6K bps

Parity: None, Even, Odd

Data Bits: 5, 6, 7, 8

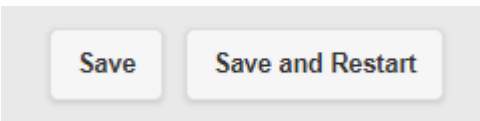
Stop Bits: 1, 2

Flow Control: None, XON/XOFF

RxDelay(ms)

TxDelay(ms)

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.**



Over TCP/IP Setup

1. There are TCP modes for selection: TCP Server / TCP Client / UDP.

The screenshot shows a configuration interface with four tabs: System, Network, Serial, and Over TCP/IP. The 'Over TCP/IP' tab is active. It contains two sections: 'Serial 1 Over TCP' and 'Serial 2 Over TCP'. Each section has three fields: 'Mode' (set to 'TCP Server'), 'Port' (set to 100 for Serial 1 and 101 for Serial 2), and 'Inactive Timeout (Minutes)' (set to 10). At the bottom, there are 'Save' and 'Save and Reboot' buttons.

2. TCP Server: Configure TCP server port number and message time out period. At this mode, this device will wait for client connection.

This is a close-up of the 'Mode' dropdown menu in the 'Serial 1 Over TCP' configuration. The dropdown is open, showing four options: 'TCP Server' (which is highlighted in blue), 'TCP Client', 'UDP', and 'DISABLED'. The 'Inactive Timeout (Minutes)' field is visible below the dropdown.

3. TCP Client: Allow to configure 4 remote destination host IP address, port number. At TCP client mode, this device establishes a connection with remote host and sends data to remote host actively.

The screenshot shows the configuration interface for 'Serial 1 Over TCP' in 'TCP Client' mode. The 'Mode' dropdown is set to 'TCP Client'. The 'Inactive Timeout (Minutes)' is set to 10. Below this is a table with 4 rows for destination hosts. The first row is populated with '10.1.1.101' and '100'. The other three rows are empty.

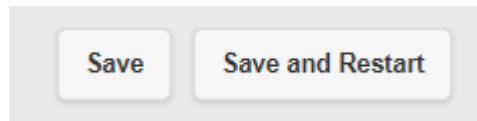
No.	Destination IP	Port
1	10.1.1.101	100
2		
3		
4		

4. UDP: Allow to configure 4 remote destination host IP address, port number. At UDP mode, this Device establishes a connection with remote host and sending data to remote host actively.

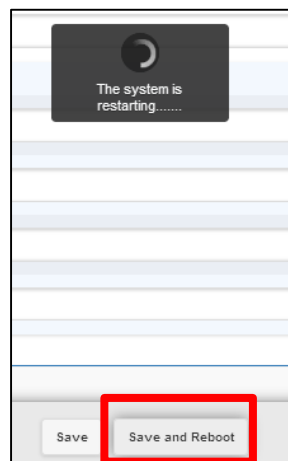
The screenshot shows the configuration interface for 'Serial 1 Over TCP' in 'UDP' mode. The 'Mode' dropdown is set to 'UDP'. The 'Port' is set to 100. Below this is a table with 4 rows for destination hosts. The first row is populated with '10.1.1.101' and '100'. The other three rows are empty.

No.	Destination IP	Port
1	10.1.1.101	100
2		
3		
4		

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.



6. After configuring all parameters, click “Save and Restart” to reboot system.



Reset Push Button

- (1) Press reset key for 5 seconds or longer until SYS LED flash. Then, releasing the reset key will reset network default IP and gateway IP back to default settings. The other parameters remain the same as the last confirmation.
- (2) Press reset key for 5 seconds or longer until both SYS LED and WiFi LED flash. Then, releasing the key will make all parameters back to factory default settings.
- (3) Press reset key within 5 seconds without LED flash will reboot the equipment. Changed settings of the last confirmation will have no change.



