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User Manual 2-Port Modbus TCP to RTU Gateway, Model SC10MK2 MT W

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Introduction

SC10MK2 MT W W RTU/ASCII to TCP Gateway provides the easy way of connecting Modbus Serial devices to Ethernet LAN in Modbus TCP and RTU/ASCII networks at the same time. 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 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.

SC10MK2 MT W 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.

Overview

SC10MK2 MT W 2-Port Modbus RTU/ASCII To Modbus TCP Gateway provides a perfect solution to make your industrial Serial devices connect to Internet instantly via Ethernet LAN.

SC10MK2 MT W 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 LAN, and making it possible for your software to access Serial interface devices anywhere and anytime.

SC10MK2 MT W 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.

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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

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

Other Features

- ✧ Led Lamp : SYS, Wi-Fi, 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

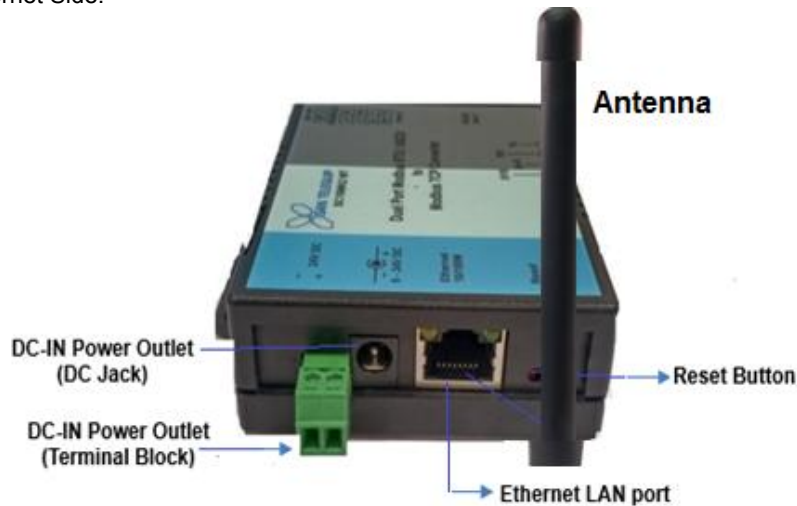
- ✧ Warranty period: 1 year.

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Product Panel Views

Ethernet Side:



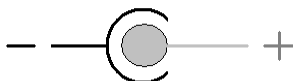
Serial Interface Side:



DC-IN Power Outlet

The Serial to Ethernet 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



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LED Indicators



SYS (Green):

Power indicator. When the power is on, the LED will be on and blink per second.

Wi-Fi (Red):

Wi-Fi indicator. When the Wi-Fi is working, this LED will be blinking.

Tx (Green):

Data sending indicator. When data sending to the device from LAN or Wi-Fi, this LED will blink.

Rx (Red):

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

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.

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

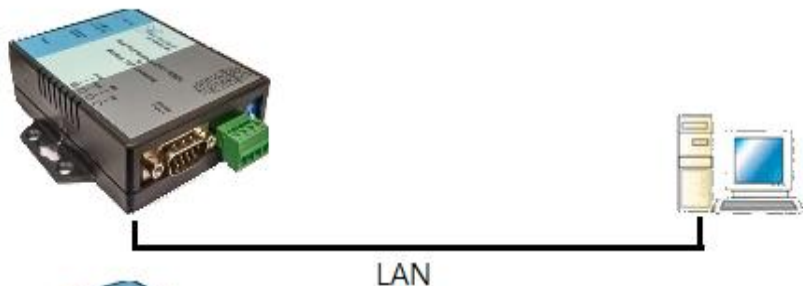


2. RS-422/RS-485

RS-422 Wiring

Serial Device

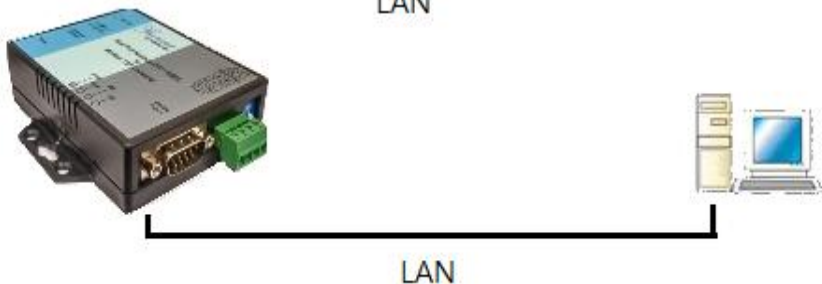
T - ——— R -
 T + ——— R +
 R - ——— T -
 R + ——— T +



RS-485 Wiring

Serial Device

D + ——— D +
 D - ——— D -



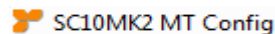
When you finish the steps mentioned above and the LED indicators are as shown, the converter is install correctly. You can check the Software Setup CD OR download from our web site "www.santelequip.com/download" to find IP Search Utility. To proceed with the parameters setup, please use a web browser (IE or Chrome) to continue the detailed settings.

Configuration

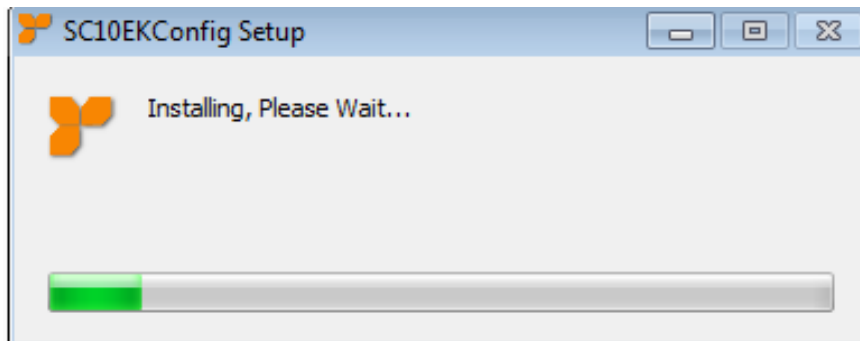
When setting up your Gateway for the first time, the first thing you should do is to configure the IP address. The following topics are covered in this chapter:

IP Search Utility Setup

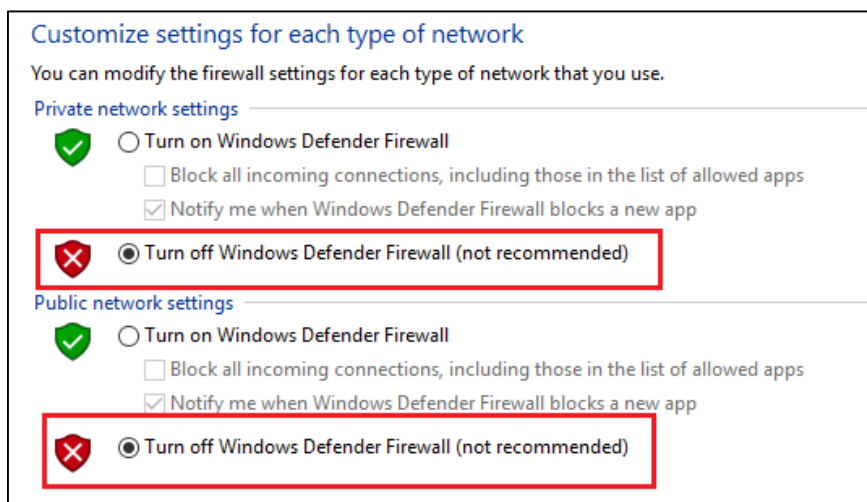
- Web Browser Configuration
- IP Search Utility Setup



1. Copy "IP search config Utility from Our Web site" [www. Santelequip.com](http://www.Santelequip.com) / download" to your host computer.
2. "SC10MK2 MT W" 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 Utility SC10MK2 MT W, if a firewall warning pop up, please click to accept the program pass through firewall.



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4. SC10MK2 MT W will pop up on the screen after installation or you may double click the icon on desktop of host computer to open this tool.

SC10EKConfig 1.0.9

Find Clear

Devices

Product	Version	Name	Description	IP & MAC	Go To
---------	---------	------	-------------	----------	-------

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

SC10EKConfig 1.2.0

Find Clear

Devices

Product	Version	Name	Description	IP & MAC	Go To
Modbus Gateway	1.2.8	SC10MK2 MT	Dual port Modbus RTU to Modbus TCP Converter	192.168.1.100 9c:65:f9:46:de:2c	Go To Setup

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 PCenable to use web browser open configuration page.

Setup

MAC	Name & Description	IP & Netmask
9c:65:f9:46:de:2c	SC10MK2 MT Dual port Modbus RTU to Modbus TCP Converter	192.168.1.100 255.255.255.0

USERNAME:

PASSWORD:

Setup

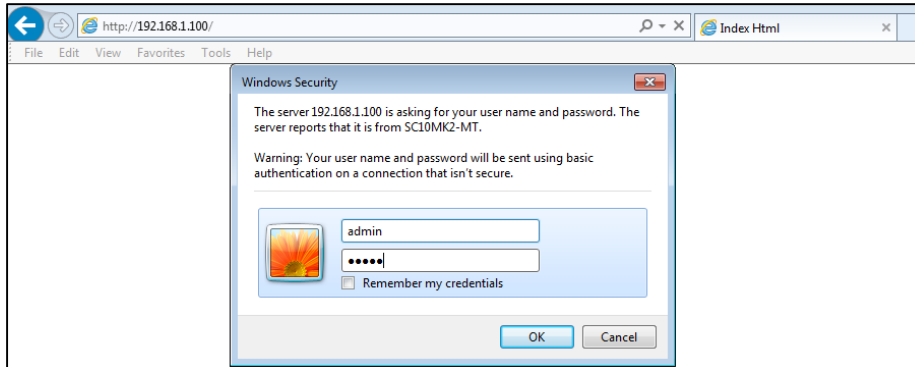
Close

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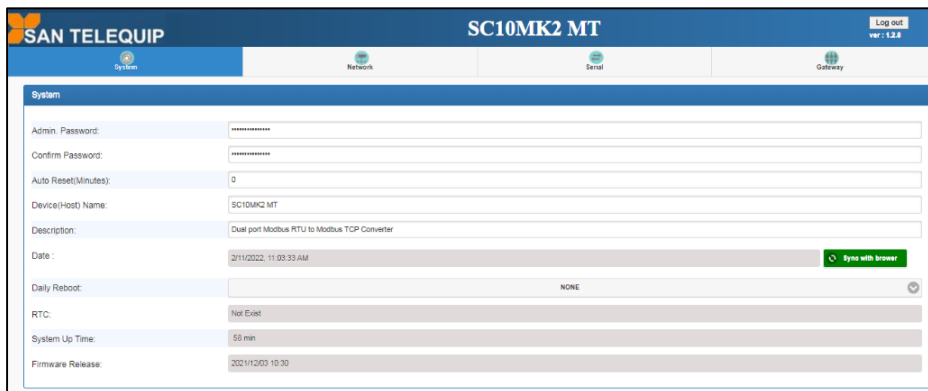
7. Click “GoTo” button will open a web page of configuration. (Default ID: admin; password: admin).

Login:



User : admin
Password : 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”.



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1. System Setup

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

The screenshot shows the 'System' configuration page of the San Telequip web interface. The page has a blue header with the San Telequip logo and a 'System' tab. Below the header, there is a 'System' section with various configuration fields. The fields are arranged in a table-like structure with labels on the left and values on the right. The values are displayed in a light gray box, indicating they are read-only or the current state. The fields include: Admin. Password (masked with dots), Confirm Password (masked with dots), Auto Reset(Minutes) (0), Device(Host) Name (SC10MK2 MT), Description (Dual port Modbus RTU to Modbus TCP Converter), Date (2/11/2022, 11:03:33 AM), Daily Reboot (empty), RTC (Not Exist), System Up Time (58 min), and Firmware Release (2021/12/03 10:30).

System	
Admin. Password:	*****
Confirm Password:	*****
Auto Reset(Minutes):	0
Device(Host) Name:	SC10MK2 MT
Description:	Dual port Modbus RTU to Modbus TCP Converter
Date :	2/11/2022, 11:03:33 AM
Daily Reboot:	
RTC:	Not Exist
System Up Time:	58 min
Firmware Release:	2021/12/03 10:30

1.2 Appearance of Wireless and Ethernet setup.

The screenshot shows the 'Wireless' and 'Ethernet' configuration pages of the San Telequip web interface. The 'Wireless' section is at the top, followed by the 'Ethernet' section. Both sections have a blue header with the respective title. Below the header, there is a table-like structure with labels on the left and values on the right. The values are displayed in a light gray box, indicating they are read-only or the current state. The fields include: Ssid, Quality, IP Address, Subnet Mask, Gateway, and MAC Address for both Wireless and Ethernet.

Wireless	
Ssid:	SAN_9e_65_f9_06_e5_fc
Quality:	100%
IP Address:	10.0.0.1
Subnet Mask:	255.255.255.0
Gateway:	*
MAC Address:	9e:65:f9:06:e5:fc

Ethernet	
IP Address:	192.168.1.100
Subnet Mask:	255.255.255.0
Gateway:	*
MAC Address:	9c:65:f9:46:de:2c

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

Services

HTTP Port: 80

NTP Enabled: Disabled

NTP Server: openwrt.pool.ntp.org

NTP Offset: UTC

1.4 Firmware update:

If necessary, click "Choose File" to open file manager.

Firmware

Firmware: Choose File No file chosen

Update

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

Name	Date modified	Type	Size
MK2 MT Multihost	26-11-2021 15:11	Outlook Item	63 KB
SAN_MBG-UPGRADE-1.2.8-2021-11-23-22-30	26-11-2021 15:07	BIN File	800 KB
SC10MK2 MT Multihost problem- 28_11_2021	28-11-2021 11:23	Microsoft Word D...	475 KB

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

Firmware

Firmware: Choose File SAN_MBG-UPGRADE-1.2.8-2021-11-23-22-30.bin

Update

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

Save Save and Reboot Restore to factory settings Reboot

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2. Network setup

SAN TELEQUIP SC10MK2 MT

System Network Serial Gateway

Wireless

Type: ACCESS POINT

SSID: SAN_RL_RL_RL_RL_RL

Password:

Encrypt: NONE

Mode: STATIC

IP Address: 10.0.0.1

Subnet Mask: 255.255.255.0

Ethernet

Mode: STATIC

IP Address: 192.168.1.100

Mask: 255.255.255.0

2.1 Wireless section: (Optional)

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

SAN TELEQUIP SC10MK2 MT

System Network Serial Gateway

Wireless

Type: INFRASTRUCTURE

SSID:

Password: DISABLED

Encrypt: NONE

Mode: STATIC

IP Address: 10.0.0.1

Subnet Mask: 255.255.255.0

Ethernet

Mode: STATIC

IP Address: 192.168.1.100

Mask: 255.255.255.0

2.1.2 If select, "ACCESS POINT", input password for the AP and assign IP address with "DHCP" or "STATIC".

SAN TELEQUIP SC10MK2 MT

System Network Serial Gateway

Wireless

Type: ACCESS POINT

SSID: SAN_RL_RL_RL_RL_RL

Password:

Encrypt: NONE

Mode: STATIC

IP Address: 10.0.0.1

Subnet Mask: 255.255.255.0

Ethernet

Mode: STATIC

IP Address: 192.168.1.100

Mask: 255.255.255.0

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- 2.1.3 When selected "ACCESS POINT" this Device acts as an Access Point, which is allow to be connected by PC .It supports DHCP server function. Soft AP broadcasts its SSID "SAN_9e_65_f9_06_e5_fc". PC 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

Wireless

Type: ACCESS POINT

SSID: SAN_9e_65_f9_06_e5_fc

Password:

Encrypt: NONE

Mode: STATIC

IP Address: 10.0.0.1

Subnet Mask: 255.255.255.0

2.1.5 Encrypt

Encrypt: NONE

Mode: NONE

IP Address: 10.0.0.1

2.1.6 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: 192.168.1.100

Mask: 255.255.255.0

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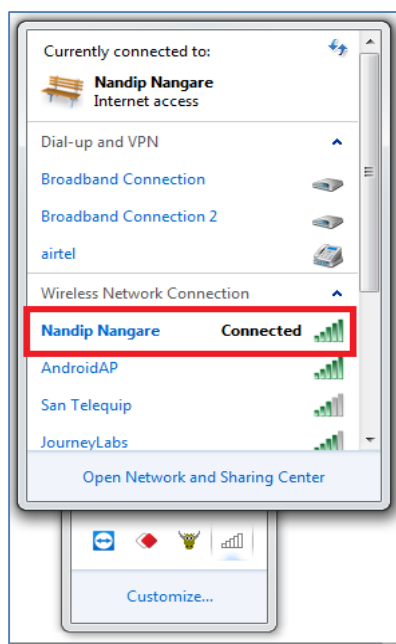
2.1.7 If The Type selected with “Infrastructure”, set SSID of Router and the other inputs.

Wireless configuration page for SC10MK2 MT. The Type is set to INFRASTRUCTURE. The SSID is SANTELEQUIP. The Password is empty. The Encrypt is set to WPA2. The Mode is set to STATIC. The IP Address is 10.0.0.1. The Subnet Mask is 255.255.255.0.

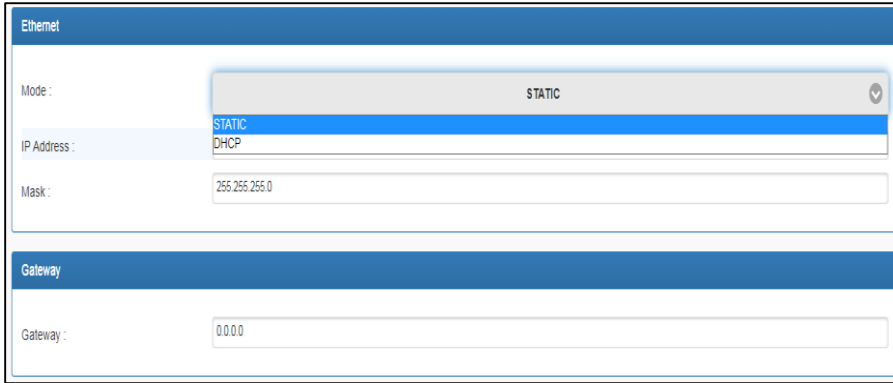
2.1.8 Go to item SSID, click “Scan” will get list of available SSID of Access Points, select the one in your network to link. For example:

Wireless configuration page for SC10MK2 MT. The Type is set to INFRASTRUCTURE. The SSID is SANTELEQUIP. The Password is empty. The Encrypt is set to WPA2. The Mode is set to STATIC. The IP Address is 10.0.0.1. The Subnet Mask is 255.255.255.0. A pop-up window titled 'Wi-Fi List' shows a table with columns SSID, MAC, and Strength. The first entry is SANTELEQUIP with MAC PC0:74:AD:7B:CA:1D and Strength 34%.

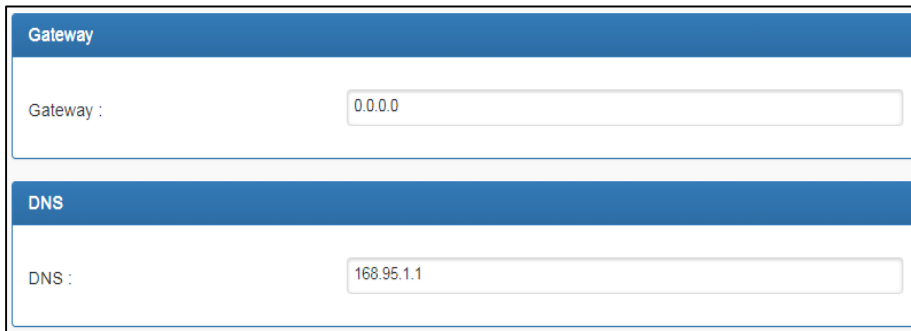
2.1.9 On the LAPTOP/PC, choose same SSID to link. LAPTOP/PC must close Ethernet in advance otherwise; the data transmission would not work.



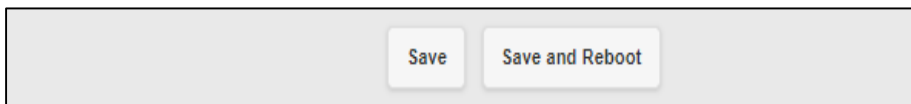
2.2 Ethernet section: select “STATIC” or “DHCP” to assign IP address.



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 configure. 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.



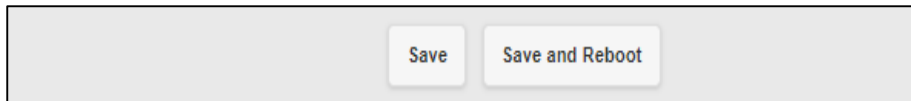
3. Serial Port page

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 configure. 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. Modbus Gateway page

4.1 There are “Modbus Gateway” #1 and #2 port.

SAN TELEQUIP SC10MK2 MT Log out ver: 1.2.8

System Network Serial Gateway

Modbus Gateway 1

Gateway Type : TCP To RTU Slave

Message Timeout (ms): 500

Min time interval of queries (ms): 500

TCP Properties

Listener Port : 501

TCP inactive timeout (Minutes): 5

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

Modbus Gateway 1

Gateway Type : RTU To TCP Slave
 ASCII To TCP Slave
TCP To RTU Slave
 TCP To ASCII Slave
 DISABLED

Message Timeout (ms):

Min time interval of queries (ms):

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

Gateway Type : RTU To TCP Slave

Message Timeout (ms): 500

Min time interval of queries (ms): 500

TCP Slave map

No.	ID Start	ID End	IP[:Port] (ex:192.168.1.100 or 192.168.1.100:502)
1	1	32	
2	33	64	

Up to now, Setup is successfully configure. Please click “Save” and go to other pages for configuration or click “Save and Restart” to run new configuration.

4.2 After configured all parameters, click “Save and Restart” to reboot system.

Save Save and Reboot

Inquire ...

Save Save and Reboot

5. Reset (if needed)

- 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.
- Press reset key after 5 seconds until both SYS LED and Wi-Fi LED flash then release the key will make all parameters back to factory default.
- Press reset key within 5 seconds without LED flash will reboot the equipment. Last configuration no change



Serial Port Connection details

RS232 Connection details

SC10MK2 MT W	COM Port Side
TX	RX
RX	TX
RTS	CTS
CTS	RTS
DSR	DTR
DTR	DSR

RS-422 Connection details

SC10MK2 MT W	Will Connect to
T+	RX+ of your device
T-	RX- of your device
R+	TX+ of your device
R-	TX- of your device

RS485 2 Wire Connection details

SC10MK2 MT W	Will Connect to
D+	D+ of your device
D-	D- of your device