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Connecting. Converting. Leading!

User Manual for 4 Port Modbus RTU/ASCII to Modbus TCP Gateway, SC10E4M K & SC10E4IM K

Introduction

SC10E4M K 4-Ports Modbus RTU/ASCII To Modbus TCP Gateway providing new ways of connecting serial devices to a Wireless LAN (Wi-Fi 802.11 b/g/n). This Gateway is designed to operate 4 serial ports through wireless (Wi-Fi 802.11 b/g/n) over 10/100Mbps Ethernet network. As the data is transmitted via TCP/IP protocol, data acquisition and controlling is available to go through Intranet and Internet. 4 Serial ports operate in common RS-232, RS-422 and RS-485 auto selection modes configuration.

SC10E4M K is 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.

SC10E4IM K provides Modbus TCP Server and Modbus TCP Client Mode for selection. It supports manual configuration via web browser and support various protocols including TCP, IP, HTTP, DHCP, ICMP and ARP. These are the best solution to coordinate your Serial interface devices.

Product Specifications

System

- CPU : MT7688AN MIPS CPU, 580 MHz
- RAM : 128M Bytes DDR2 RAM
- ROM : 32M Bytes Flash ROM
- OS : Open Wrt Linux OS
- Support 8 TCP Master each 32 simultaneous request or 8 TCP Slave on each RTU 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 : Modbus TCP Server and Client, Modbus RTU Master and Slave
- Setup : HTTP Browser Setup (IE & Netscape), Console
- Security : Setup Password
- Protection : Built-in 1.5KV Magnetic Isolation

WiFi port

- 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 / Serial Master / Serial Slave
- Setup : HTTP Browser Setup (IE, Chrome, Firefox)
- Security : Login Password

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Serial Ports * 4

- Port : RS232/422/485 * 4 Port (RS-232 - RX/TX only)
- Port : RS422 / 485 (Surge Protect)
- Speed : 300 bps ~ 230.4Kbps
- 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
- 3000V DC Isolation (option)

Software : TCP to RTU Slave, RTU Master to TCP Slave
TCP to ASCII Slave, ASCII Master to TCP Slave

Utility : Built-in Web server Setup, Easy Operation

Watch Dog Function

Power : DC 9~24V, 200mA@12V, support DC Jack & Terminal Input

Led Lamp : SYS, PWR, Wi-Fi, RX, TX, LAN

Environment : Operating Temperature: -20°C to 70°C

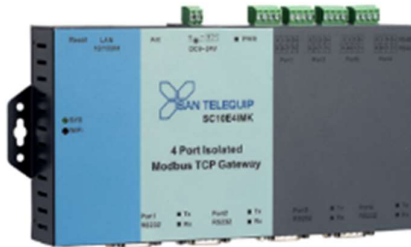
Storage Temperature : -25°C to 80°C

Dimensions : 195 * 120 * 35 mm (W * D * H), W+16mm x2 for din rail extension.

Weight : 660 gm

WARRANTY : 1 year

Product Panel Views



Antenna Connector

The connector for antenna is a standard reverse SMA jack. Simply connect it to a 2.0dBi dipole antenna (Standard Rubber Duck) and 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 light on. When data traffic (Rx/Tx) occurs on the network, yellow color LED will blink during data transferring.

Serial Port of RS232/RS422/RS485

Connect the serial data cable between the SC10E4M K Gateway and the Serial interface device. Follow the web page parameter setup procedures to configure the Gateway.

DC-IN Power Outlet

The Serial to Ethernet +Wi-Fi Gateway is powered by a single 12V DC (Inner positive, outer negative) power supply and 1.0mA of 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

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supplied. Terminal Block 2 wires power supply is an option.

DC Power outlet



Reset Button(Wi-Fi)

If any chance you forgot the login password, or have incorrect settings making Gateway inoperable. When the power is on and the "SYS" LED light on, use a point tip to press this button and hold it and wait for more than 25 seconds. All the parameters will be reset to the factory default.

LED Indicators

PWR (Red) : After power on, this LED is always On.

SYS (Green) : After power on and system working, this LED start blinking

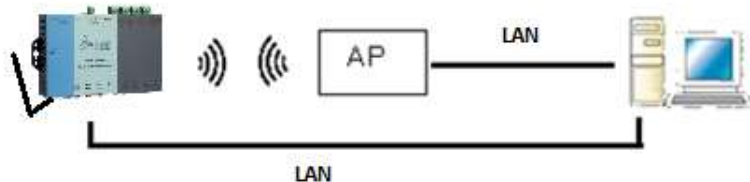
Wi-Fi (Red) : LED is ON after power on, then off a while. It starts blinking after Wi-Fi module is

ONTX TX/ RX (Green/Green): Upon data sending or receiving indicator, the LED will blink.

Wiring Architecture

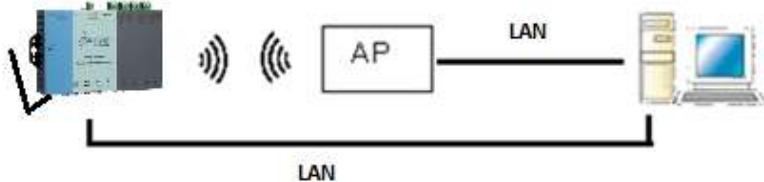
RS232 Wiring

Serial Device	SC10E4IGL Wi-Fi
DB 9	DB 9
2	3
3	2
5	5



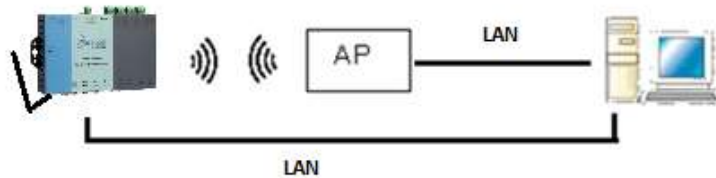
RS-422 Wiring

Serial Device	SC10E4IGL Wi-Fi
TX+	RX+
TX-	RX-
RX+	TX+
RX-	TX-



RS485 Wiring

Serial Device	SC10E4IGL Wi-Fi
D+	D+
D-	D-




When you finish the steps mentioned above and the LED indicators are as shown, the Gateway is installed correctly. You can check the Software Setup in CD or Our Web site www.santelequip.com/download to find Utility to setup the IP Address.

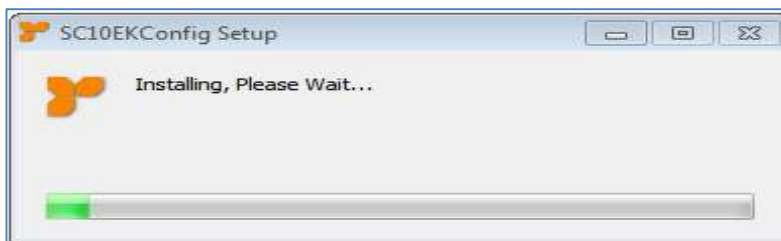
To proceed with the parameters setup, please use a web browser (IE or Chrome) to continue

Configuration

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

IP Search Utility Setup

1. Copy  SC10E4IMK "SC10E4IMK Utility" from CD ROM or our Web site to your host computer.
2. "SC10E4IMK" is a self-extract-install program. Double click it to install this Wi-Fi IP Searching tool into host computer.



SC10E4IMK Finder 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.

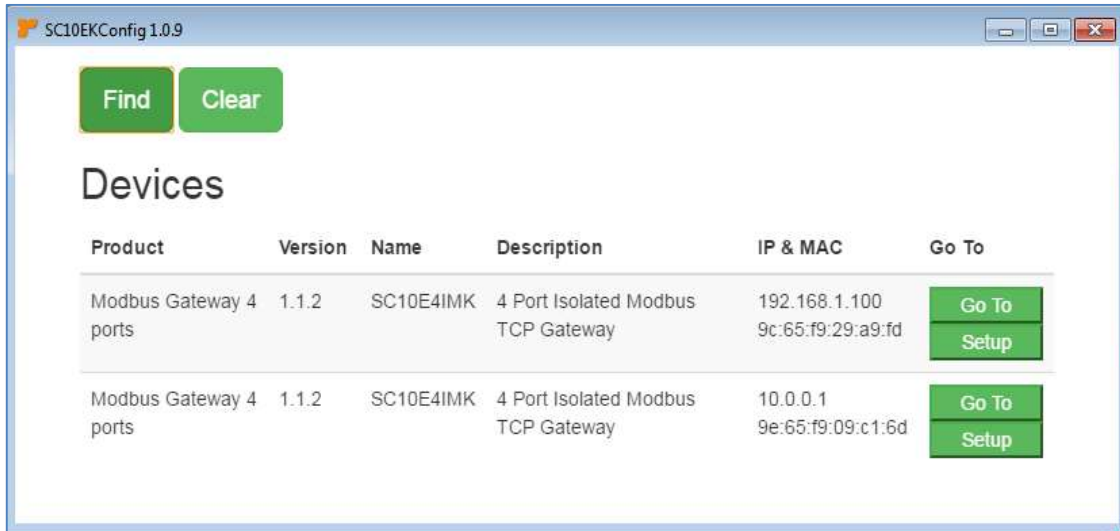
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Click on "**Find**" button. It will scan the network and show up the IP of Gateway.
Ethernet IP Address :192.168.1.100
Wi-Fi IP Address :10.0.0.1



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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.

The "Setup" window contains the following fields and buttons:

MAC	Name & Description	IP & Netmask
9c:65:f9:29:a9:fd	SC10E4IMK 4 Port Isolated Modbus TC	192.168.106.215 255.255.255.0

USERNAME: admin
PASSWORD: admin

Buttons: Setup, Close

SC10EKConfig dialog box with the text "changed." and an OK button.

Click "Goto" button will open a web page of configuration. (default ID: admin; password: admin).

The screenshot shows a web browser window at <http://192.168.106.215/>. A Windows Security dialog box is overlaid on the browser, displaying the following text:

Windows Security

The server 192.168.106.215 is asking for your user name and password. The server reports that it is from SC10E4IMK.

Warning: Your user name and password will be sent using basic authentication on a connection that isn't secure.

User name: _____
Password: _____
 Remember my credentials

Buttons: OK, Cancel

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Now you have successfully connected to the Gateway.

System	
Admin. Password:	*****
Confirm Password:	*****
Auto Reset(Minutes):	0
Device Name:	SC10E4IMK
Description:	4 Port Isolated Modbus TCP Gateway
System Up Time:	12 min
Firmware Release:	2019/03/14 20:05

Configuration

There are 4 setup pages as "System", "Network", "Serial" and "Gateway".

System Setup

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

System	
Admin. Password:	*****
Confirm Password:	*****
Auto Reset(Minutes):	0
Device Name:	SC10E4IMK
Description:	4 Port Isolated Modbus TCP Gateway
System Up Time:	12 min
Firmware Release:	2019/03/14 20:05

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Appearance of Wireless & Ethernet setup.

The image shows two screenshots of a configuration interface. The top screenshot is titled "Wireless" and contains four rows of configuration fields: "IP Address" with value "10.0.0.1", "Subnet Mask" with value "255.255.255.0", "Gateway" (empty), and "MAC Address" with value "98:65:10:00:e1:8d". The bottom screenshot is titled "Ethernet" and contains four rows of configuration fields: "IP Address" with value "192.168.106.215", "Subnet Mask" with value "255.255.255.0", "Gateway" (empty), and "MAC Address" with value "9c:85:79:29:a9:fd".

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

The image shows a screenshot of the "Services" configuration page. It contains four rows of configuration fields: "HTTP Port" with value "80", "NTP Enabled" with a dropdown menu set to "Enabled", "NTP Server" with value "openwrt.pool.ntp.org", and "NTP Offset" with a dropdown menu set to "UTC".

Firmware update: Click "Browse" to open file manager

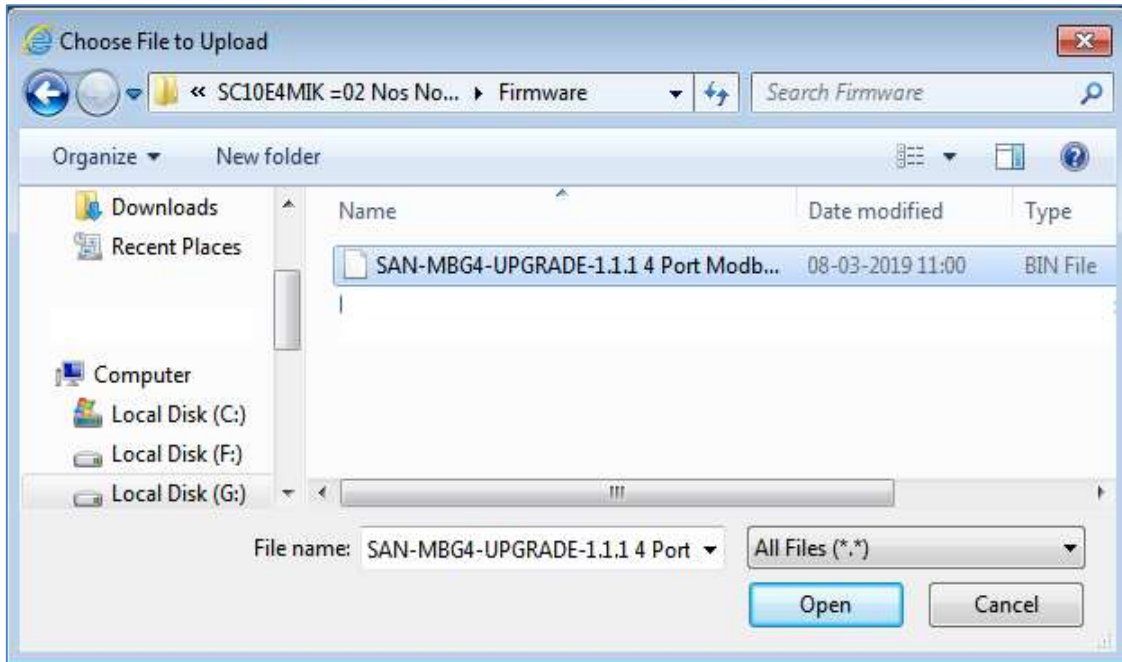
The image shows a screenshot of the "Firmware" update page. It contains a "Firmware:" label followed by an empty text input field and a "Browse..." button. Below the input field is a large red button labeled "Update".

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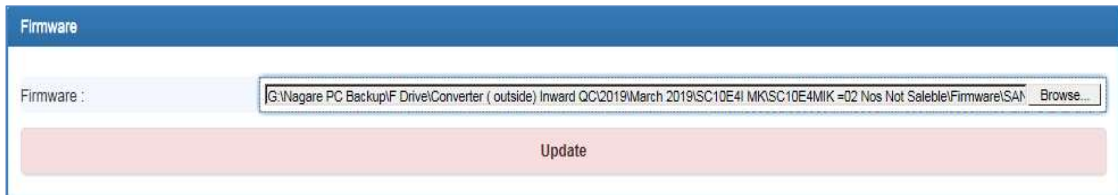


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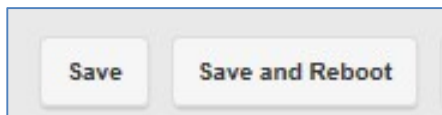
Click to select the file with specified version and click "Confirm" button.



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



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



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Network setup

The screenshot shows the 'Modbus Gateway 4 Ports' configuration interface. The 'Wireless' section is active, displaying the following configuration:

Type	ACCESS POINT
SSID	SAN_9e_85_8f_c1_Rd
Password	
Encrypt	NONE
Mode	STATIC
IP Address	10.0.0.1
Subnet Mask	255.255.255.0

Wireless section

Type: to select "INFRASTRUCTURE" or "ACCESS POINT"

The screenshot shows the 'Modbus Gateway 4 Ports' configuration interface. The 'Wireless' section is active, and the 'Type' dropdown menu is open, showing the following options:

- INFRASTRUCTURE
- ACCESS POINT
- DISABLED

The other configuration fields remain the same as in the previous screenshot.

When selected "INFRASTRUCTURE" go to **SSID**, click "Scan" will get list of available SSID, select one to link.

The screenshot shows the 'Modbus Gateway 4 Ports' configuration interface. The 'Wireless' section is active, and the 'Wi-Fi List' dialog box is open, displaying a table of available SSIDs:

SSID	MAC	Strength
Sany	BA:92:ED:0F:AF:5226	
Orange	78:3F:28:AA:25:84	0%
Intel	38:3F:28:AA:25:84	0%

The 'Close' button is visible at the bottom of the dialog box.

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Input password and select mode DHCP or STATIC



In LAPTOP / PC choose same SSID to link.



When selected "ACCESS POINT", Gateway 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 "SANXX_XX_XX_XX_XX_XX". PC /NB /Smart Phone/PAD should connect to this SSID and then open web browser with default IP for Gateway setup.

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SAN TELEQUIP Modbus Gateway 4 Ports Log out ver: 1.1.2

Wireless

Type : ACCESS POINT

SSID : SAN_Sa_05_09_c1_0d

Password :

Encrypt : WPA2

Mode : STATIC

IP Address : 10.0.0.1

Subnet Mask : 255.255.255.0

Password: Key in selected AP log in password

Wireless

Type : ACCESS POINT

SSID : SAN_Sa_05_09_c1_0d

Password :

Encrypt : WPA2

Encrypt

Wireless

Type : ACCESS POINT

SSID : SAN_Sa_05_09_c1_0d

Password :

Encrypt : NONE
WEP
WPA
WPA2

Mode: "STATIC": To input assigned IP address, Subnet Mask.

Wireless

Type : ACCESS POINT

SSID : SAN_Sa_05_09_c1_0d

Password :

Encrypt : WPA2

Mode : STATIC

IP Address : 10.0.0.1

Subnet Mask : 255.255.255.0

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Ethernet: select STATIC or DHCP to assign IP address.

A screenshot of the "Modbus Gateway 4 Ports" configuration interface. The page has a blue header with the "SAN TELEQUIP" logo and the title "Modbus Gateway 4 Ports". Below the header is a navigation bar with icons for "System", "Network", "Serial", and "Gateway". The "Network" tab is active. Under the "Ethernet" section, there is a "Mode:" label and a dropdown menu currently showing "STATIC".

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

A screenshot of the configuration page showing two input fields. The first is labeled "Gateway:" and contains the IP address "192.168.1.1". The second is labeled "DNS:" and contains the IP address "168.95.1.1".

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

Two buttons are displayed side-by-side. The first button is labeled "Save" and the second button is labeled "Save and Reboot".

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Serial Port 1 to 4 Setting

The screenshot shows the 'Modbus Gateway 4 Ports' configuration page for 'Serial 1'. The page has a blue header with the 'SAN TELEQUIP' logo and the title 'Modbus Gateway 4 Ports'. Below the header is a navigation bar with four tabs: 'System', 'Network', 'Serial', and 'Gateway'. The 'Serial' tab is selected. The main content area is titled 'Serial 1' and contains the following configuration fields:

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

Please clearly set each parameters from Serial 1 to Serial 4 (default 19200, n, 8, 1)

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) : 0
TxDelay(ms) : 0

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

Two buttons are displayed: 'Save' and 'Save and Reboot'.

Gateway Setup

There are "Modbus Gateway" 1,2, 3, 4

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Four Modes are selectable. Please select Gateway type as per your setup.

The screenshot shows the 'Modbus Gateway 4 Ports' configuration page. The 'Gateway Type' dropdown menu is open, displaying the following options: RTU To TCP Slave, ASCII To TCP Slave, TCP To RTU Slave, TCP To ASCII Slave, and DISABLED. The 'Message Timeout (ms)' field is set to 500. The 'TCP Properties' section includes a 'Listener Port' field set to 502 and a 'TCP inactive timeout (Minutes)' field set to 5.

The screenshot shows the 'Modbus Gateway 4 Ports' configuration page with two gateway configurations. The first configuration, 'Modbus Gateway 1', has 'Gateway Type' set to 'TCP To RTU Slave' and 'Message Timeout (ms)' set to 500. The second configuration, 'Modbus Gateway 2', also has 'Gateway Type' set to 'TCP To RTU Slave' and 'Message Timeout (ms)' set to 500. The 'TCP Properties' section for the first gateway shows 'Listener Port' as 502 and 'TCP inactive timeout (Minutes)' as 5.

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1. **TCP to RTU Slave:** TCP Master Device (e.g. Modscan / SCADA system) sends query to RTU Slave device then RTU Slave device response back to TCP Master's requirement. Inside the Modbus gateway, there are TCP Slave & RTU Master counterparts respectively

The screenshot shows the configuration interface for a Modbus Gateway. The title bar reads "SAN TELEQUIP Modbus Gateway 4 Ports" with a "Log out" button and version "ver: 1.1.2". The navigation menu includes "System", "Network", "Serial", and "Gateway". The main content area is titled "Modbus Gateway 1" and contains the following fields:

- Gateway Type: TCP To RTU Slave
- Message Timeout (ms): 500
- TCP Properties section:
 - Listener Port: 502
 - TCP inactive timeout (Minutes): 5

2. **TCP to ASCII Slave:** TCP Master Device (ex. Modscan / SCADA system) sends query to ASCII Slave device then ASCII Slave device response back to TCP Master's requirement. Inside the Modbus gateway, there are TCP Slave & ASCII Master counterparts respectively

The screenshot shows the configuration interface for a Modbus Gateway. The title bar reads "SAN TELEQUIP Modbus Gateway 4 Ports" with a "Log out" button and version "ver: 1.1.2". The navigation menu includes "System", "Network", "Serial", and "Gateway". The main content area is titled "Modbus Gateway 1" and contains the following fields:

- Gateway Type: TCP To ASCII Slave
- Message Timeout (ms): 500
- TCP Properties section:
 - Listener Port: 502
 - TCP inactive timeout (Minutes): 5

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- RTU to TCP Slave:** RTU Master Device (ex. PLC / Modscan) sends query to TCP Slave device; then TCP Slave device response back to RTU Master's requirement. Inside the Modbus gateway, there are TCP Master & RTU Slave counterparts respectively. Set up to 8 slaves on each port

The screenshot shows the configuration interface for a Modbus Gateway. The title is "Modbus Gateway 4 Ports" and the version is "1.1.2". The "Gateway Type" is set to "RTU To TCP Slave". The "Message Timeout (ms)" is set to 500. Below this is a "TCP Slave map" table with 8 rows for slave configuration.

No.	ID Start	ID End	IP:Port
1	1	32	
2	33	64	
3	65	96	
4	97	128	
5	129	160	
6	161	192	
7	193	224	
8	225	256	

- ASCII to TCP Slave:** ASCII Master Device (ex. PLC / Modscan) sends query to TCP Slave device; then TCP Slave device response back to ASCII Master's requirement. Inside the Modbus gateway, there are TCP Master & ASCII Slave counterparts respectively Set up to 8 slaves on each port.

The screenshot shows the configuration interface for a Modbus Gateway. The title is "Modbus Gateway 4 Ports" and the version is "1.1.2". The "Gateway Type" is set to "ASCII To TCP Slave". The "Message Timeout (ms)" is set to 500. Below this is a "TCP Slave map" table with 8 rows for slave configuration.

No.	ID Start	ID End	IP:Port
1	1	32	
2	33	64	
3	65	96	
4	97	128	
5	129	160	
6	161	192	
7	193	224	
8	225	256	

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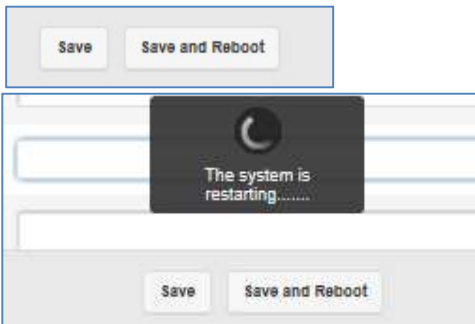


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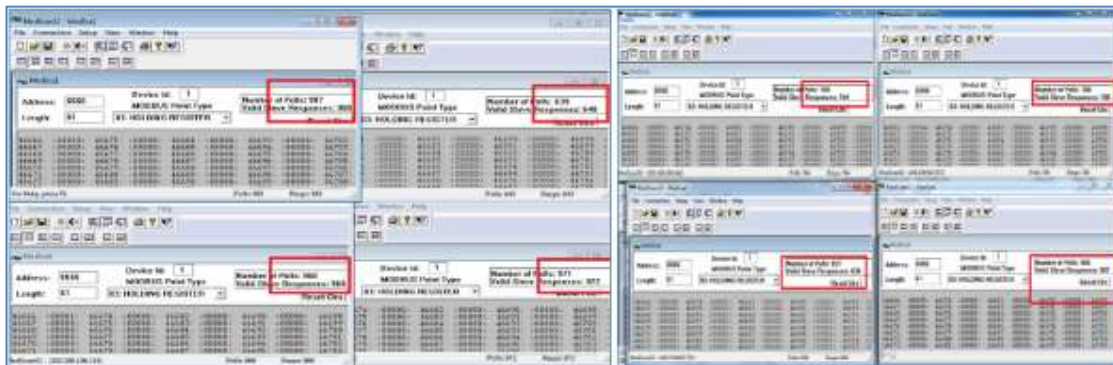
Now Setup is successfully configured. Please click “Save” and go to other pages for configuration or click “Save and Restart” to run new configuration.



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



Support 8 TCP Master



Reset button (if needed)

Ensure power is on, press “Reset” button for over 20 seconds then release. SC10E4IM K will set configuration back to default.

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