San Telequip Private Limited.,
504 & 505 Deron Heights, Baner Road
Pune 411045, India
Phone : +91-20-27273455, 9764027070, 8390069393
email : info@santelequip.com

Connecting. Converting. Leading!

User Manual for SC10MK2 Series Dual Port Modbus RTU to Modbus TCP Converter.

SC10MK2 is Two Port Modbus RTU /ASCII to Modbus TCP Converter.

TECHNICAL SPECIFICATIONS

Communication Interfaces	
Ethernet Interface	10 / 100 Base Mbps (Auto Detecting)
Serial Interface	2 Ports COM1 is RS232 and COM2 is RS485 / RS422
Baud Rates	300 bps to 230400 bps
Network Protocols	ARP, IP,UDP, TCP, ICMP, HTTP, DHCP
Operation Mode	TCP Server/ TCP Client / UDP
Configuration	Through a Utility on a PC and through HTTP
Mechanical : Connectors	
RS232	DB9 Male
RS485/RS422	4 Pin Howder
Ethernet	RJ45
Dimensions	35 * 128 * 115 mm (W * D * H)
Mounting	DIN Rail
Power Supply	
External Power Supply	230V AC Range 90 to 270V AC OR 24/48/110/220V DC
Environmental	
Operating Temperature	0°C to 50°C

Table – 1

INSTALLATION PROCEDURE

⇒ Power ON the device.
⇒ The “SYS” LED (Green) will glow and flash.
⇒ Insert RJ45 jack into the RJ45 socket of the converter.
⇒ Green LED on RJ45, is blinking & Amber LED is On.
⇒ When you finish these procedures and LED displays are as shown, the hardware is properly installed and On-line. You can use the Setup Tool **SC10Config** to setup the IP Address, Subnet Mask . For the advance setup/device setting please use the IE or other Browsers. Refer to the section below for details.

LED INDICATIONS

SYS : CPU health. Flashes once a second.
Port1 : While Port 1 is connected transmitting / receiving any signal from network the LED will blink.
Port2 : While Port 2 is connected transmitting / receiving any signal from network the LED will blink.

RESET BUTTON

Press the Reset button. Turn ON the power and wait for 3 seconds. Converter will reset to factory default.

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CONFIGURATION OF SC10MK2 USING TOOL SC10 CONFIG V1.30

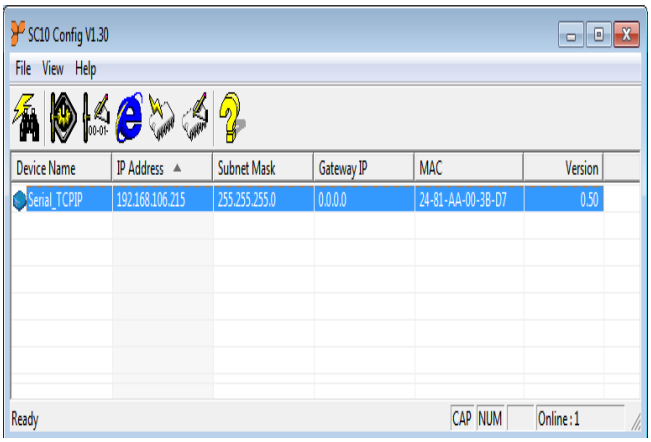

Figure 1

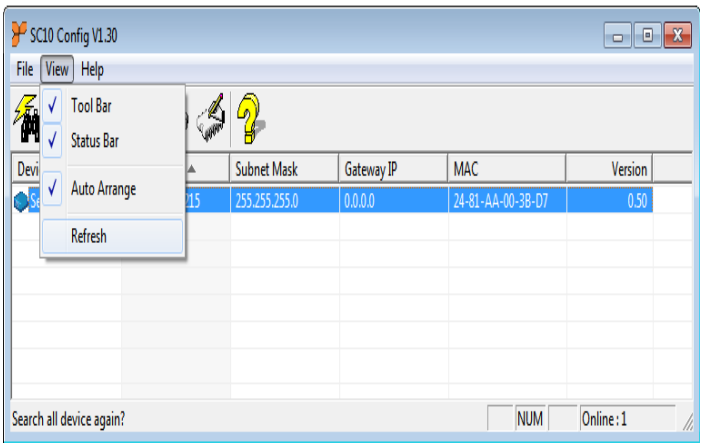

Figure 2

SC10Config utility used to detect and setup the SC10MK2 on the Network as shown in figure 1. Run the program from SC10MK2 folder provided in the CD. When you activate the tool it will detect the installed SC10MK2 as shown in the Figure 2. The SC10Config Tool can setup only one SC10MK2 at a time.

The Default IP address is 192.168.0.100
View -- Refresh (Figure 2).
File--- Exit
Note: Configuration happens only when the device password is empty.

SC10CONFIG SETUP TOOL FUNCTIONS

Right click on the device selected & select “Modify IP” to change the IP Address as shown in Figure 3 Similarly repeat for Config, Gateway IP address and MAC address setup. When done it will show the confirming message as shown in figure 4.

Remark: Always run the View -- Refresh after any changes for confirmation as shown in Figure 2

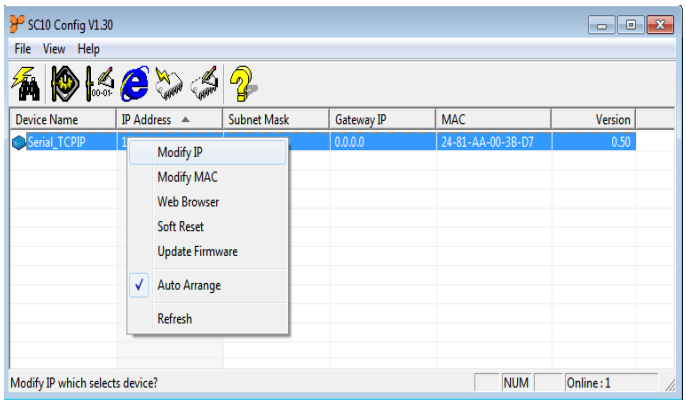

Figure 3

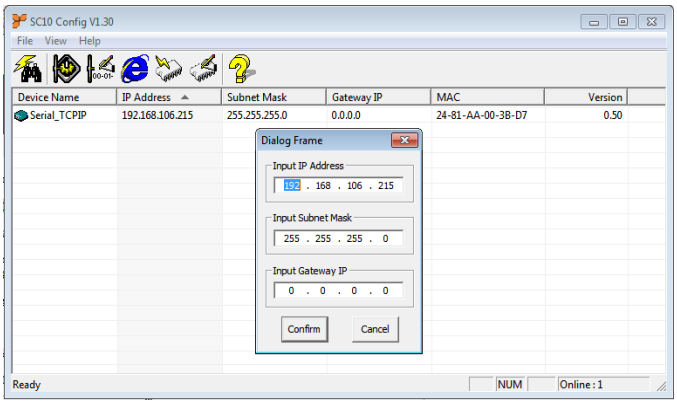

Figure 4

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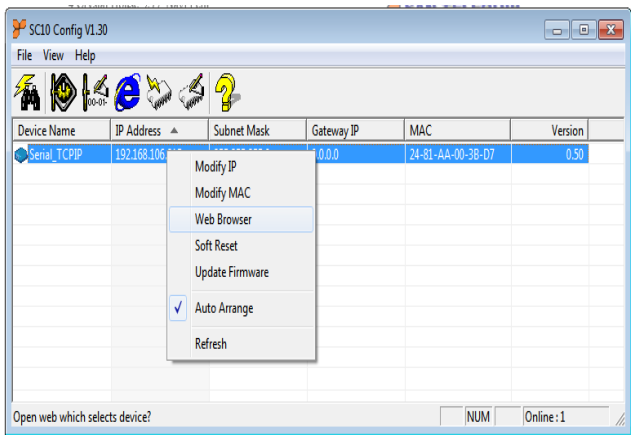
CONFIGURATION THROUGH HTTP (IE OR OTHER BROWSERS)

In addition of IP address and Subnet mask, specific device settings can be set through HTTP protocol. No special software will be required. By right click on device detected & click on “Web Browser” figure5, will open a new window in browser to login into the device figure6. Alternatively, if IP address of the converter is already known, you can connect to the converter directly by providing IP address in the URL field of browser.



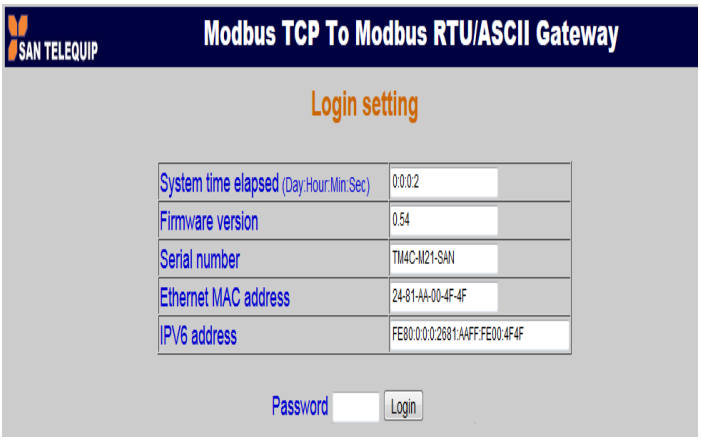


Figure 5 Figure 6

- Activated IE
- Key in the IP address of the SC10MK2 hardware that is going to setup frame and press Enter.
- The first Login frame will show up. You do not have to key in any Password, just press Login
- If you cannot login, it means you have to key in the password.
- If you do not know the password, you can reset the device by using reset button.

Note: If the domain of the converter is different from the computer running the browser, the login page won’t appear unless the converter’s “Gateway Address” has been correctly set.

Login Screen Parameters (fig 6 above)

√ System time elapsed : The time elapsed since start of this device [Day Hour: Minute: Second] format. This information can be useful in identifying reliability of system.

√ Firmware release date.

√ Serial Number: It shows the serial number of the device.

√ Ethernet address : Unique MAC (Media Access Control) address

√ Password : Factory default is “empty”. However, it is not recommended to leave empty in field operation. If you cannot login, it means you have to key the password. If you do not know the password, you can turn off the power and then use any point tip to press “Reset” button and hold it and turn on the power. The password will be reset to the factory default as “empty”.

The converter uses the same password protection mechanism commonly used in Windows NT or UNIX. If there are more than “3 consecutive failures” in password check during login, the login function will be disabled for “15 minutes”. During this 15 minutes’ period, even if you supply a correct password, login will not proceed. This prevents intruder from finding the password by computer generated program.

Advance setup frame Parameters (Fig 7 below)

1. IP address : If DHCP client mode is enabled and there is a DHCP Server on the network, this field will be assigned by DHCP server automatically otherwise enter manually.
2. Subnet mask : If DHCP client mode is enabled and there is a DHCP Server on the network, this field will be assigned by DHCP server automatically otherwise enter manually.

3. Gateway address : Gateway is a device which connects local network to external network. Please type it correctly. If there is no Gateway on the network, just leave as “0.0.0.0”. If DHCP client mode enabled and there is a DHCP Server on the network, this field will be assigned by DHCP server automatically.
4. Network Link speed : Auto by default (to be confirmed)

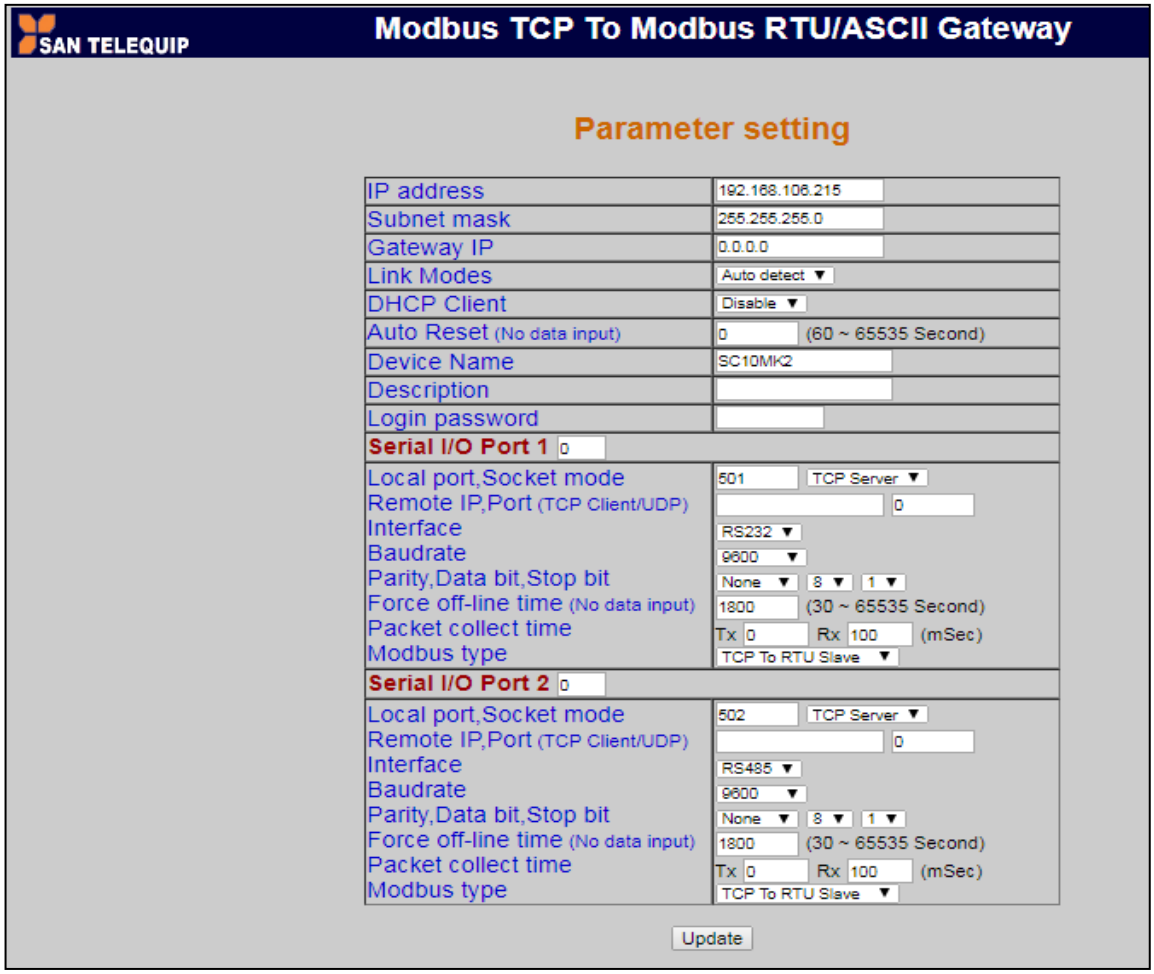


Figure 7

5. DHCP client: DHCP client mode could be enabled / disabled. If DHCP enabled, there should be a DHCP Server on the network. If DHCP disabled IP address, Subnet mask and Gateway address should be manually assigned.
6. Auto Reset (No Data Input): If the device has been disconnected or for some reasons the data did not transmit a while, you can Soft restart the device after waiting a while (60～65535 Second) as your settings - Set 120 (seconds) at least or more is better
7. Device Name : User assigned ID name for the converter.
8. Login password : It may be empty or up to 15 long characters.
9. Serial I/O Port 1 : The first serial port is RS-232 port :
10. Socket Mode : Port can be specified, if not specified will use default value 501
11. Socket type : TCP Server, TCP Client, UDP Client.
12. Remote IP, Port : Enter relevant destination IP address & Port no’s
13. Interface : RS232
14. Baud rate, parity, data bits, stop bits.

a. Baud Rate : 300 bps to 230400 bps
b. Parity: None, Even, Odd, Mark, Space
c. Data Bits: 5, 6, 7, 8
d. Stop Bit: 1 or 2

15. Force offline time : When the converter is a TCP Server, the socket maybe dead or hang. The converter will not know the socket is not alive. We need extra control to close the socket if the socket connects and does not transfer data. The converter will wait till the setup value minutes and then close the socket automatically. "(30～65535" in "Second".
16. Packet Collect Time : The data from internal serial UART to Ethernet port will be sent until the input buffer is full or the Packet collect time has expired, whichever is earlier.
17. Modbus Type : TCP to RTU Slave, TCP to ASCII Slave, RTU to TCP Slave, ASCII to TCP slave.
18. Serial I/O Port 2 : The second serial port is RS485/RS422
19. Socket port : Port can be specified, if not specified will use default value 502
20. Socket type : TCP Server, TCP Client, UDP.
21. Interface : RS485 /RS422
22. Baud rate, parity, data bits, stop bits: Same as Serial I/O Port 1.
23. Force offline time : When the converter is a TCP Server, the socket maybe dead or hang. The converter will not know the socket is not alive. We need extra control to close the socket if the socket connects and does not transfer data. The converter will wait till the setup value minutes and then close the socket automatically. "0 to 99" in "minute".
    If time is not known & It is fixed in the SCADA then Set 300 seconds. If there is a query from remote TCP within 300 seconds, then watchdog will recount from the time of receiving query. If no query from remote TCP above 300 seconds, then watchdog will reboot the device
24. Packet Collect Time : Packet Collect Time : The data from internal serial UART to Ethernet port will be sent until the input buffer is full or the Packet collect time has expired, whichever is earlier.
25. Modbus Type : TCP to RTU /ASCII Slave, RTU to TCP Slave, ASCII to TCP slave.

Four modes are selectable as below pictures

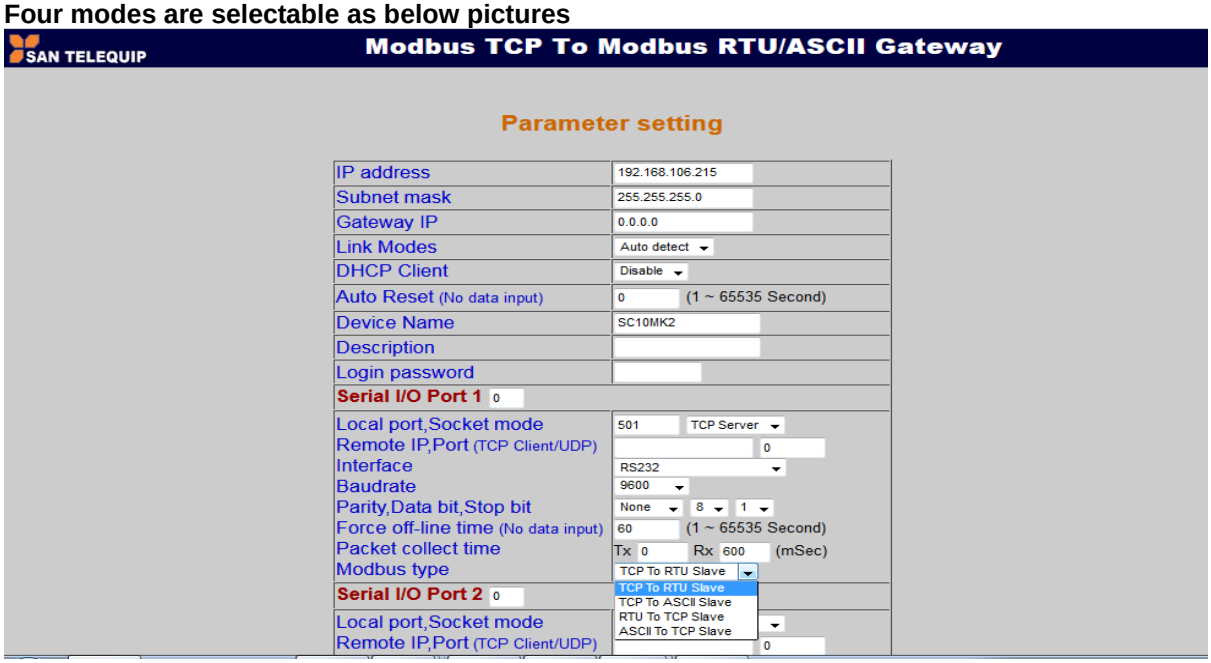


Figure 8

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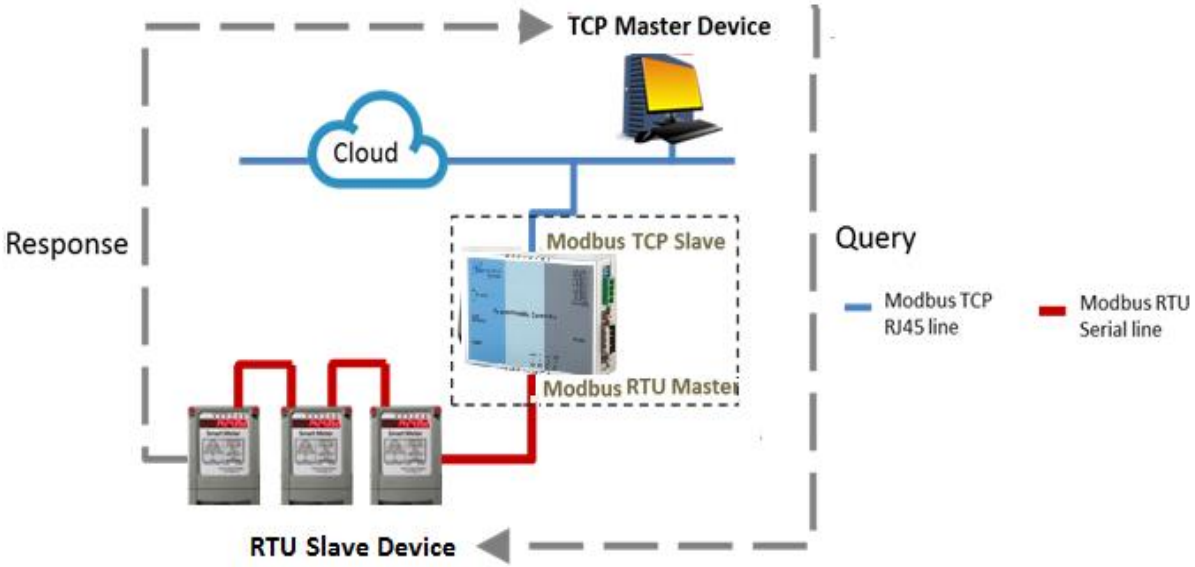
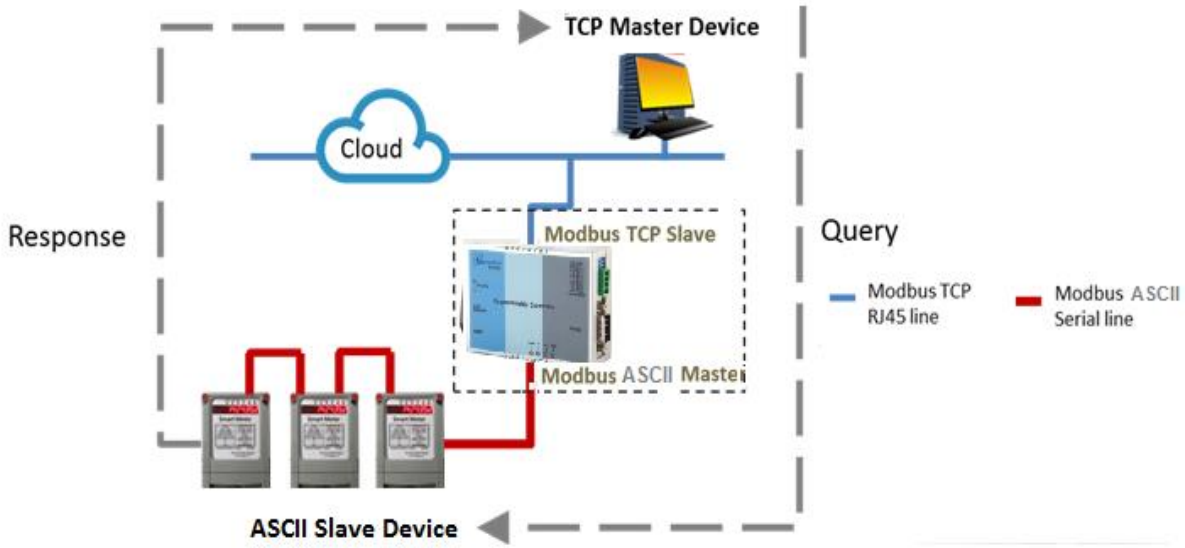
TCP to RTU Slave **:** Diagram as below. TCP Master Device (ex. Modscan / SCADA system) sends query to RTU Slave device then RTU Slave device response back to TCP Master's requirement. Inside the Modbus gateway, there are TCP Slave & RTU Master counterparts respectively



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



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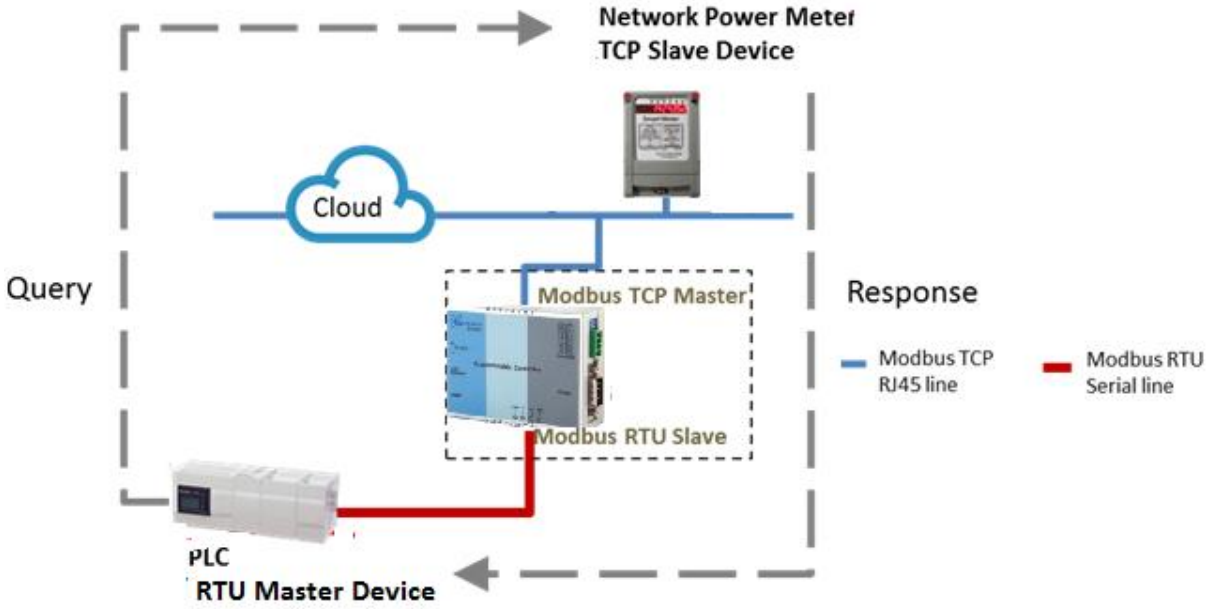
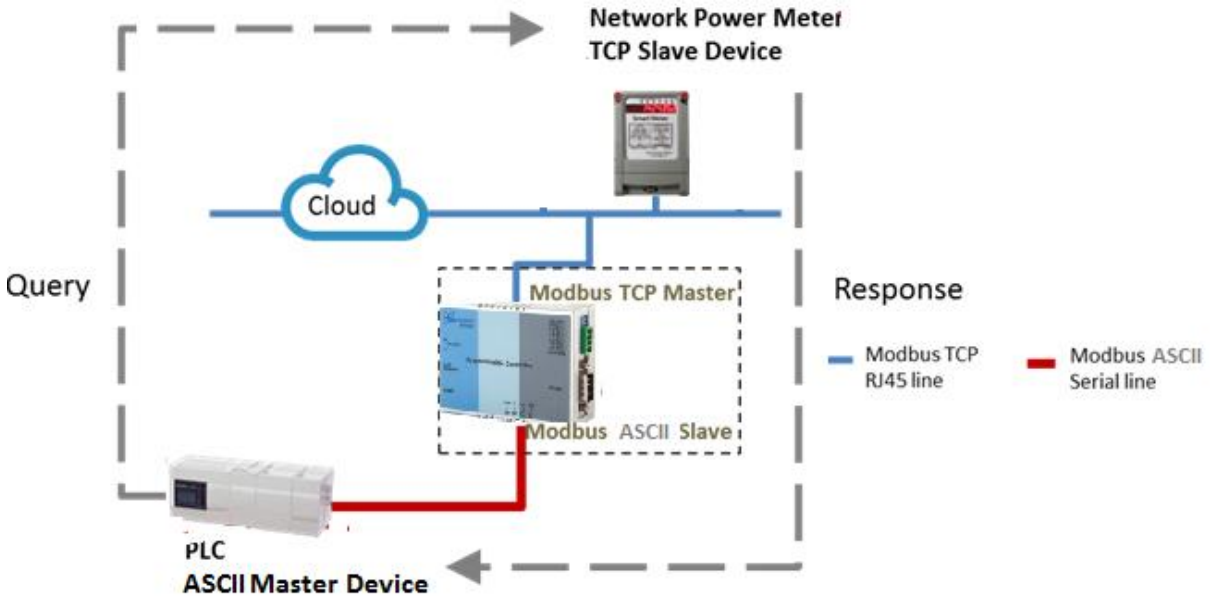
RTU to TCP Slave **: D**iagram as below. RTU Master Device (ex. PLC / Modscan) sends query to TCP Slave device; then TCP Slave device response back to RTU Master's requirement. Inside the Modbus gateway, there are TCP Master & RTU Slave counterparts respectively.

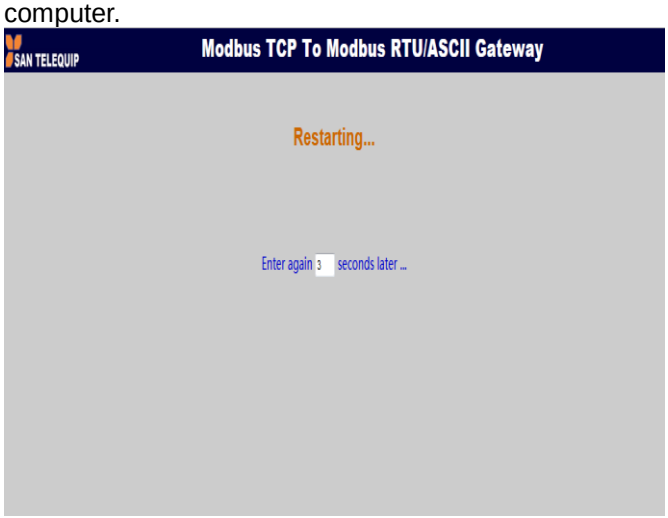


ASCII to TCP Slave **:** ASCII Master Device (ex. PLC / Modscan) sends query to TCP Slave device; then TCP Slave device response back to ASCII Master's requirement. Inside the Modbus gateway, there are TCP Master & ASCII Slave counterparts respectively.



Attention: If the SC10MK2 Gateway address is not same as the computer that is doing the setup,

then the Login frame will not appear unless the SC10MK2 Gateway address is setup same as the computer.



When finished, please press Update. The "Controller updated now restarting ..." frame will show (Figure 9).
When the frame is back to the Login frame which means the advance setup it done, you can close the browser.

Figure 9

FACTORY DEFAULT SETTING

By the chance, if you forget to setup password or have made incorrect settings, making the converter inoperable, there are two ways to reset the setting. The following procedures can also be used to reset all settings to factory default:

Turn Off the power of the converter and Press the reset button of the converter. Turn ON the power of the converter and wait for 3 seconds. The password will RESET to the factory default. (Empty).

Log in the web page. Press the RESET button of the converter. Select the UPDATE button. After all LED's light flashes, release the Reset button. The password will reset to the factory default (empty).

POWER SUPPLY

230V AC Range 90 to 270V AC
OR 24/48/110/220V DC.

PORT 1: RS232 COMMUNICATION PORT DETAILS

Pin No.	SIGNAL of SC10MK2
9 Pin D Male	
2	RX
3	TX
5	GND
7	RTS
8	CTS
4	DTR
6	DSR
9	DCD

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CABLE DETAILS OF SC10MK2

For RS232 Side

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

PORT 2: RS485/422 COMMUNICATION PORT DETAILS

For RS422

SIGNAL of SC10MK2	Will Connect to
T + / D+	RX + of your device.
T - / D-	RX -- of your device.
R +	TX + of your device.
R --	TX – of your device.

For RS485, 2 wire

SIGNAL of SC10MK2	Will Connect to
T+ / D+	TX + of your device.
T- / D -	TX -- of your device.