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1 Introduction

1.1 Overview

The Modbus Gateway is an interface between Modbus Gateway and computer hosts running Modbus/TCP on Ethernet networks. Fully compliant with Modbus/TCP, the Modbus Gateway offers a convenient solution to connect existing devices or controllers running Modbus serial protocol (Modbus/ASCII or Modbus/RTU) to an Ethernet network. The SC10E4NI M /SC10E08AM / SC10E16AM / SC10E16 AM / SC10E08 AM Series are standard Modbus gateways that convert between Modbus TCP and Modbus RTU/ASCII protocols.

The SC10E4NI M /SC10E08AM / SC10E16AM / SC10E16 AM / SC10E08AM Series support 16 simultaneous TCP master and 32 simultaneous requests for each TCP master. Each RS-232/422/485 serial port can be individually configured for Modbus RTU or Modbus ASCII operation or even different baud rate, allowing both types of networks to be fully integrated with Modbus TCP within one package.

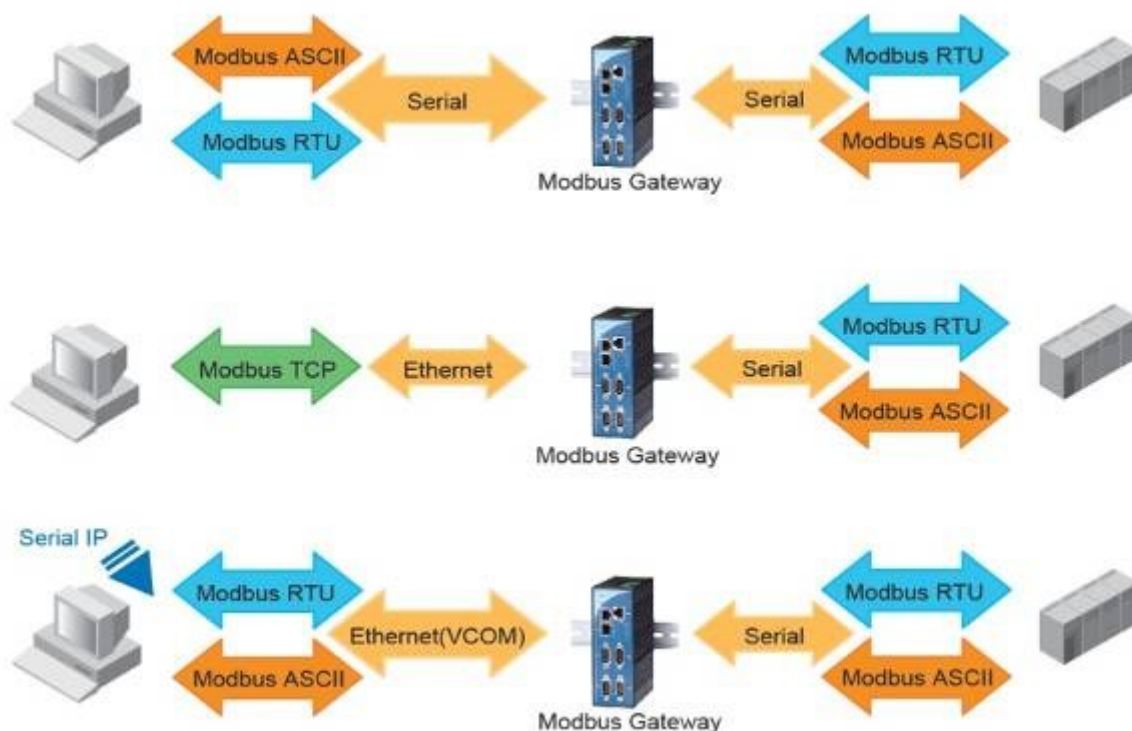


Fig. 1. 2

Features

- RISC 32-bit 266 MHz CPU
- Standard 19-inch rack-mounted 1U high metal housing (SC10E08AM / SC10E16AM) DIN-Rail mounting (SC10E4NI M)
- Software selectable RS-232/RS-485/RS-422 interface (Depends on Model)
- Dual 10/100 Mbps Ethernet ports for network redundancy
- Configurable via Liquid Crystal Matrix (LCM) buttons (SC10E08AM / SC10E16AM), Serial console, Telnet, Web and Windows-based utility program Device Management Utility
- LCM indication with 4-keypad settings (SC10E08AM / SC10E16AM)
- Convert between Modbus TCP and Modbus RTU/ASCII protocol.
- 2 Ethernet port and 4/8 or 16 RS-232/422/485 ports
- Easy hardware setup and configuration

2 Getting Started

2.1 Inside the Package

Inside the purchased you will find the following items.

Item	Quantity	Description
SC10E4NI M /SC10E08AM / SC10E16AM /SC10E08AM/SC10E16AM	1	Modbus Gateway
Din Rail / Rack mount	1	Panel Mounting, Din rail
Documentation + CD		Inside the CD you will find: ● User's Manual ● Installation Guide OR download from link: www.santelequip.com/download

Table 2. 1

Factory Default Settings

Network Defaults

Note that the Modbus Gateway comes with one IP address for redundant Ethernet interfaces.

Interface	Device IP	Subnet mask	Gateway IP
LAN 1	10.0.50.100	255.255.0.0	10.0.0.254

Table 2. 2

Parameter	Default Values
Modbus Master	
TCP Settings	TCP Master ● Mode: TCP Master ● Port: 502
Modbus Slave	
SC10E4NI M /SC10E08AM / SC10E16AM /SC10E16AM	Mode: RTU Slave Serial Configuration: RS-232, 9600 bps, 8 data bits, None Parity bit, 1 stop bit, None Flow Control, Buffer Disabled,

Table 2. 3

Other Default Settings are shown in the following table:

Parameter	Default Values
Security	
User Name	Admin
Password	Null (<i>blank</i>)
SNMP	
SysName of SNMP	0060E9-XXXXXX
SysLocation of SNMP	Location
SysContact of SNMP	Contact
SNMP	Enable
Read Community	Public
Write Community	Private
SNMP Trap Server	0.0.0.0

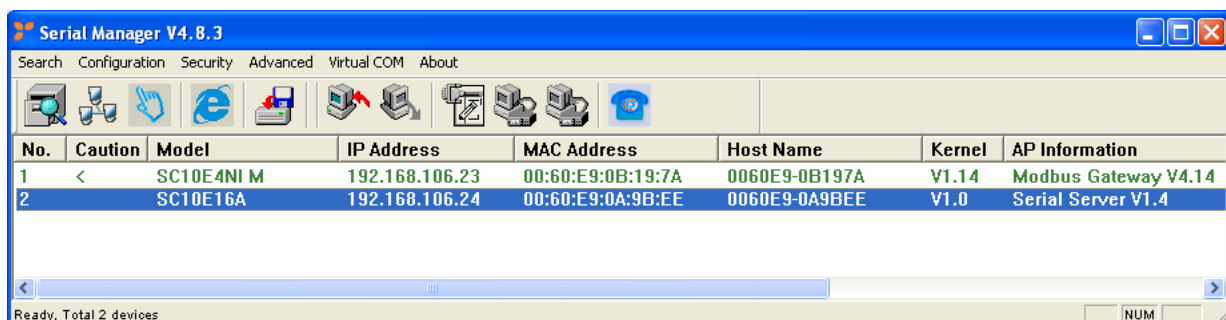
Table 2. 4

Note: you can press the “**Reset**” button on the front panel for 5 seconds (see Sec. [3.8.8](#) and [3.9](#)), to restore the server to factory default settings.

3 Configuration and Setup

3.1 Locating and IP configuring using Utility

First, please install our configuration utility program that comes with the Product CD. For more information on how to install, please refer to the manual that comes in the utility CD. To find the Modbus Gateway device on your network, press “**Scan**”, a list of devices currently connected to the network will be shown in the window.



3.2 Configuration using Web Interface

Every SC10E4NI M /SC10E08AM / SC10E16AM Modbus Gateway device is equipped with a built-in Web server in the firmware. Therefore, it can be accessed by using a browser for configuration by entering the device’s IP (see [Sec. 2.4](#) for default value).

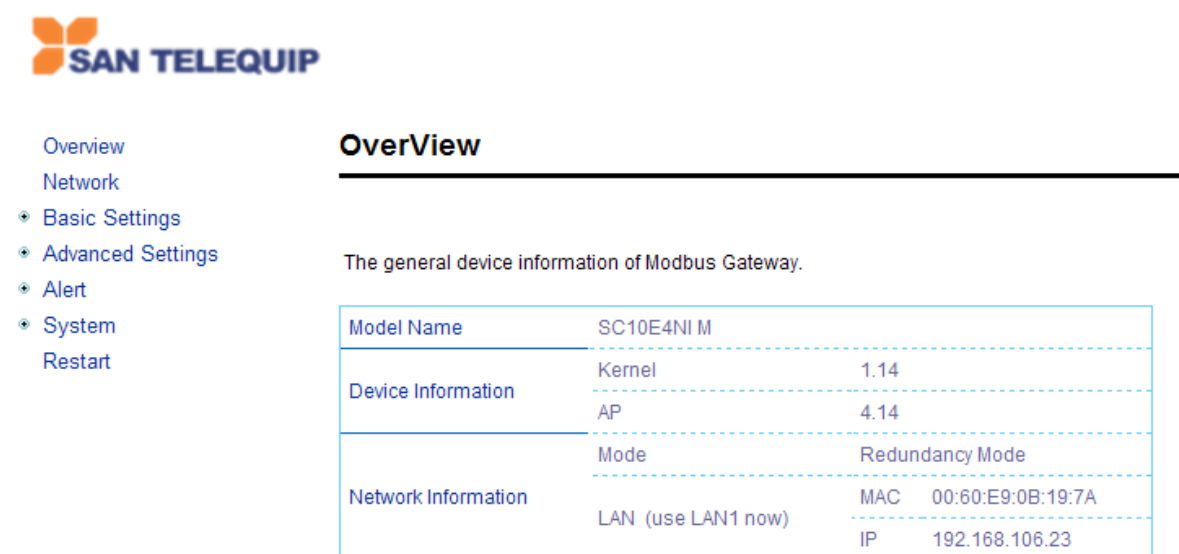


Fig. 3. 1

- Overview
- Network
- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
 - SNMP Settings
 - Modbus
- Alert
 - SMTP Settings
 - Alert Events
- System
 - Log Settings
 - System Log
 - Data Log
 - Modbus Statistic
 - Time
 - Security
 - Import/Export
 - Factory Default
- Restart

Fig. 3. 2

This type of configuration is the most user-friendly, most recommended and most common method used on your SC10E4NI M /SC10E08AM / SC10E16AM Modbus Gateway. Please go to its corresponding section for a detailed explanation.

3.2.1 Configure Automatic IP Assignment with DHCP

A DHCP server can automatically assign addresses to LAN1 or LAN2, the Subnet Mask, and the Gateway. You can simply check “**DHCP**” box in the Network Setting dialog using our **Utility** and then restart it; once restarted it will be automatically configured.

3.3 Web Overview

In this section, only current information on the device’s status and settings will be displayed.



Overview

Network

- Basic Settings
- Advanced Settings
- Alert
- System
- Restart

OverView

The general device information of Modbus Gateway.

Model Name	SC10E4NI M		
Device Information	Kernel	1.14	
	AP	4.14	
Network Information	Mode	Redundancy Mode	
	LAN (use LAN1 now)	MAC	00:60:E9:0B:19:7A
		IP	192.168.106.23

Fig. 3. 3

- **Model Name** as its name implies, shows the device’s model.
- **Device Information** displays information on the Kernel version, as well as the AP
- **Network Information** here you may find the Mode in which the device is currently working on (Dual Subnet, Redundancy Mode), and both LANs respective MAC and IP addresses.
- **Dual Subnet Mode: in which** two Ethernet ports have separate IP addresses of different class and subnets
- **Redundancy Mode:** the system will just use one Ethernet port for data transfer, if this port is disconnected, the whole system will change to another port automatically. Both the ports of SC10E4NI M /SC10E08AM / SC10E16AM will carry the same IP address

3.4 Network Configuration

In this section, IP, Subnet Mask and overall connectivity settings can be accessed. When on **Redundancy Mode** the device will have the two LAN ports connected¹ to the Network, but the signal will flow through one of them. In the case one line is out due to any reason there will still be another route so the signal can keep flowing.



Overview

Network

- Basic Settings
- Advanced Settings
- Alert
- System
- Restart

NetWork

To configure network settings of Modbus Gateway. After saving configuration you have to restart the device to make the settings effective.

☒ Redundancy Mode ☐ Dual Subnet Mode

LAN Settings				
DHCP	☐ Obtain an IP automatically			
IP Address	192	168	106	215
Subnet Mask	255	255	255	0
Default Gateway	192	168	106	50

DNS Settings				
DNS 1	202	54	10	1
DNS 2	202	54	29	5

Save Configuration

Fig. 3. 4

Note¹: you can connect only one LAN port to the device. There won't be a **Redundancy** function.

When the device is set on **Dual Subnet Mode**, a set of two IP addresses can be used without having **Redundancy**. This is especially useful when using two different networks.



NetWork

Overview

Network

- Basic Settings
- Advanced Settings
- Alert
- System
- Restart

To configure network settings of Modbus Gateway. After saving configuration you have to restart the device to make the settings effective.

☐ Redundancy Mode ☒ Dual Subnet Mode

LAN 1 Settings				
DHCP	☐ Obtain an IP automatically			
IP Address	192	168	106	23
Subnet Mask	255	255	255	0
Default Gateway	10	0	0	254

LAN 2 Settings				
DHCP	☐ Obtain an IP automatically			
IP Address	192	168	106	9
Subnet Mask	255	255	0	0
Default Gateway	192	168	106	50

Default Gateway Select	
Default Gateway Select	☒ LAN1 ☐ LAN2

DNS Settings				
DNS 1	168	95	1	1
DNS 2	0	0	0	0

Save Configuration

Fig. 3. 5

3.5 Basic Settings

3.5.1 COM Settings

This section is responsible for settings on your physical ports, (may them be COM or serial).



Basic Settings > COM Settings

- Overview
- Network
- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
- Alert
- System
- Restart

To configure COM 1 port parameters.

Modbus Setting	
Operation Mode	RTU Master
Serial Configuration	
Interface	☒ RS232 ☐ RS422 ☐ RS485(2-Wire) ☐ RS485(4-Wire)
Baud Rate	9600 bps
Parity	☒ None ☐ Odd ☐ Even ☐ Mark ☐ Space
Data Bits	☐ 7 bits ☒ 8 bits
Stop Bits	☒ 1 bit ☐ 2 bits
Flow Control	☒ None ☐ Xon/Xoff ☐ RTS/CTS
☐ Apply To All Serial Ports	

Save Configuration

COM Number	Operation Mode	Interface	Baud Rate	Parity	Data Bits	Stop Bits	Flow Control
01	RTU Master	RS232	9600	None	8	1	None
02	RTU Master	RS232	9600	None	8	1	None
03	RTU Master	RS232	9600	None	8	1	None
04	RTU Master	RS232	9600	None	8	1	None

Fig. 3. 6

3.5.2 Operation Mode

- **RTU Slave:** when working as a slave node, the device will wait and accept request from its master; data transfer is done under an RTU format.
- **RTU Master:** when working as a master node, the device will issue commands to the slave node; data transfer is under an RTU format.
- **ASCII Slave:** when working as a slave node, the device will wait and accept request from its own master; data transfer is under an ASCII format.
- **ASCII Master:** when working as a master node, the device will issue commands to the slave node; data transfer is under an ASCII format.

3.5.3 Serial Settings

This section has the following selections:

- RS-232/RS-422/RS-485 Software Selectable (Default: RS-232)
- Baud-rate: 110 bps ~ 921600 bps
- Parity: None, Even, Odd, Mark, or Space
- Data Bits: 5, 6, 7, or 8
- Stop Bits: 1 or 2
- Flow Control: None, Hardware CTS/RTS, Software Xon/Xoff

Apply to all Serial Ports Alternatively, the settings can be chosen to apply to all Serial Ports if needed by checking the last box on the options.

3.5.4 VCOM Settings

Generates a virtual Serial (COM) port within the device by the network connection, it is a **TCP connection** but the encoding is an SAN's exclusive private protocol. There is the choice to set your device as either a Master or a Slave in your network.

You will need a VCOM setting, proceed to go to **Basic Settings** → **VCOM Settings** and tick on the VCOM's "**Enable**" box to allow configuration on the port selected.

The options for Master are similar, the only difference being on the device's function.



Overview

Network

Basic Settings

COM Settings

VCOM Settings

TCP Settings

Slave ID Map

Advanced Settings

Alert

System

Restart

Basic Settings > VCOM Settings

To configure VCOM 1 parameters.

VCOM	☒ Enable
VCOM Port	4660 (1~65535, default=4660)
VCOM Mode	RTU Slave ☐ Enable Caching
VCOM Inactivity Time Out	0 (0~36000 seconds)
☐ Apply to All VCOMs	

Save Configuration

Fig. 3. 7

Choose whether your device conforms as an RTU or ASCII, which is the VCOM Mode.

- **VCOM Port** Using the TCP, the device listens whether there are any clients (VCOM clients), connecting (Serial-IP) to its ports.
- **VCOM Mode** Its definition is analogous to the one in [Sec. 3.5.2](#).

Note: Windows has its own restrictive Serial-IP software installed for use.



Overview

Network

- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
- Alert
- System
- Restart

Basic Settings > VCOM Settings

To configure VCOM 1 parameters.

VCOM	☒ Enable
VCOM Port	4660 (1~65535, default=4660)
VCOM Mode	RTU Slave RTU Slave RTU Master ASCII Slave ASCII Master ☐ Enable Caching
VCOM Inactivity Time Out	0 (0~600 seconds)
☐ Apply to All VCOMs	

Save Configuration

Fig. 3. 8

- VCOM inactivity's Time Out can be set as well (which is the period of time allowed between actions), with a maximum of 600 minutes or 10 hours. If no action has been taken after this period, VCOM connection will be automatically interrupted by the system.

It is important to note that alternatively, these settings can be chosen to be applied to All VCOMs if needed by checking the last box on the options.



Overview

Network

- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
- Alert
- System
- Restart

Basic Settings > VCOM Settings

To configure VCOM 1 parameters.

VCOM	☒ Enable
VCOM Port	4660 (1~65535, default=4660)
VCOM Mode	RTU Slave RTU Slave RTU Master ASCII Slave ASCII Master ☐ Enable Caching
VCOM Inactivity Time Out	0 (0~36000 seconds)
☐ Apply to All VCOMs	

Save Configuration

Fig. 3. 9

Click on Save Configuration to keep all changes made.

3.5.5 TCP Settings

Settings for representing a **Modbus TCP connection** using the internet are set here. First go to **Basic Settings** ↔ **TCP Settings**, then proceed to choose whether to enable **TCP** ticking on the “**Enable**” box.



Overview

Network

• Basic Settings

COM Settings

VCOM Settings

TCP Settings

Slave ID Map

• Advanced Settings

• Alert

• System

Restart

Basic Settings > TCP Settings

To configure TCP 1 parameters.

Add New Modbus TCP					
TCP	☒ Enable				
Operation Mode	☒ TCP Slave ☐ Enable Caching ☐ TCP Master				
Remote IP Address	192 168 106 24				
TCP Port	502 (1~65535, default=502)				
TCP Inactivity Time Out	0 (0~36000 seconds)				

Save Configuration

☐	TCP No.	Operation Mode	Remote IP Address	TCP Port	Inactivity Time Out
☐	01	TCP Slave	192.168.106.24	502	0 seconds
☐	16	TCP Master		502	0 seconds

Remove

Fig. 3. 10

- **TCP Slave:** When on this mode, the device will run on Slave mode and wait to receive Modbus requests from the Master; data transmission is done under a Modbus TCP format.
- **Remote IP Address** shows the device's slave node IP address.
- **TCP Port** shows the device's slave node TCP port.
- **TCP inactivity's Time Out** can be set as well (which is the period of time allowed between actions), with a maximum of 600 minutes or 10 hours. If no action has been taken after this period, Modbus TCP connection will be automatically terminated by the system.



Basic Settings > TCP Settings

Overview

Network

• Basic Settings

COM Settings

VCOM Settings

TCP Settings

Slave ID Map

• Advanced Settings

• Alert

• System

Restart

To configure TCP parameters.

Add New Modbus TCP	
TCP	☒ Enable
Operation Mode	☐ TCP Slave ☐ Enable Caching ☒ TCP Master
TCP Port	502 (1~65535, default=502)
TCP Inactivity Time Out	0 (0~36000 seconds)

Save Configuration

☐	TCP No.	Operation Mode	Remote IP Address	TCP Port	Inactivity Time Out
☐	01	TCP Master		502	0 seconds
☐	16	TCP Master		502	0 seconds

Remove

Fig. 3. 11

On Operation Mode choose whether the device is going to be a Slave or a Master.

Remote IP Address refers to the IP belonging to the device that is going to be controlled from SC10E4NI M /SC10E08AM / SC10E16AM. This option is not available when the device is set as a Master.

TCP Port is the port through which the signal is going to be relayed upon.

And again, there is a TCP Inactivity Time Out with the same 10 hours maximum value as stated on the last [section](#).

Configuration can be saved as well.

Slave ID Map

The system uses the Modbus ID to route Modbus' request commands (from the master node) to the respective slave node; it is paramount to define ID maps for each slave node. For every slave node, there must be a correct Virtual ID (Alias ID) and Real ID defined in the maps.

In Alias Mode we can use only 32 devices on all the 4 Ports put together
 In the Offset mode we can use 128 Devices in all the 4 Ports

Slave No.17 is namely the Entry No.17



Entry No.	Protocol	Source	Mode	Slave ID Range (Virtual<->Real)
05	Modbus/RTU	COM2	Alias	001 <-> 001
06	Modbus/RTU	COM4	Alias	002 <-> 002
17	Modbus/RTU	COM1	Alias	030 <-> 030

Fig. 3. 12

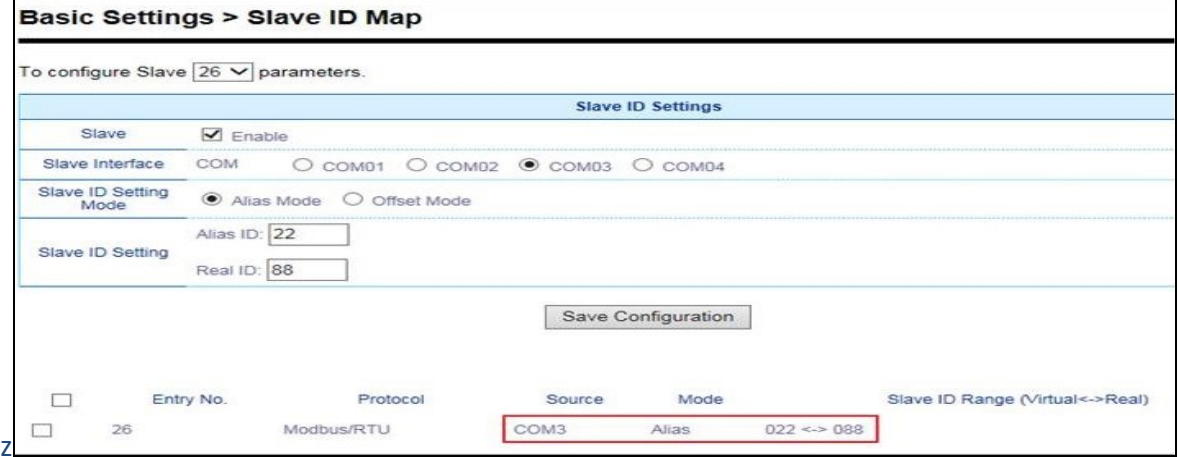
The Slave No. (Top Red box) is actually a Entry No. , just a rule, and should not be confused with Slave ID. it control what slave ID input and what slave ID output.

For example,

The rule No.26 setting is Alias ID 22 <-> Real ID 88 in COM3.

This means data of Slave ID 88, from serial side COM3 is taken by SC10E4 I M and it will translate the slave ID of data from 88 to 22 and then SC10E4I M send the Slave ID 22 to Ethernet side.

The behavior is also called routing rule.



Entry No.	Protocol	Source	Mode	Slave ID Range (Virtual<->Real)
26	Modbus/RTU	COM3	Alias	022 <-> 088

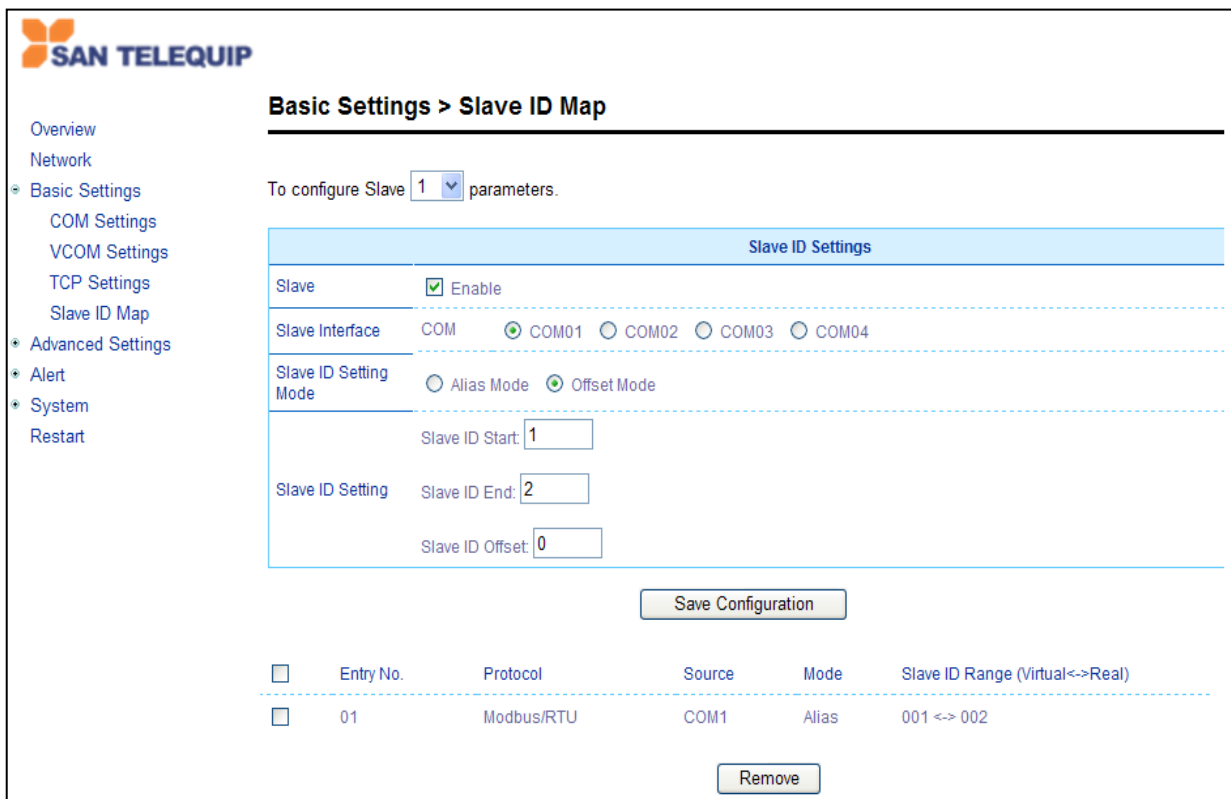
Fig. 3. 133

Slave Interface

When a port is set to slave mode, a Slave interface will be then created for you. Select the **Slave Interface**, which is the **COM/VCOM/TCP port**; then select **Alias Mode** or **Offset Mode** to modify the range and offset as you needed.

- **Alias Mode** maps a virtual ID to a real ID each at the time.
 - **Alias ID** which refers to a Virtual ID for the reading Master node.
 - **Real ID** which is the real ID from the slave node.
- **Offset Mode** which refers to a range of defined ID maps.
 - **Slave ID Start** Virtual ID's start number.
 - **Slave ID End** Virtual ID's end number.
 - **Slave ID Offset** Real ID range, which is from (Slave ID Start -Offset) to (Slave ID End-Offset).

As mentioned before, In Alias Mode we can use only 32 devices on all the 4 Ports put together
 In the Offset mode we can use 128 Devices in all the 4 Ports



Basic Settings > Slave ID Map

To configure Slave 1 parameters.

Slave ID Settings	
Slave	☒ Enable
Slave Interface	COM ☒ COM01 ☐ COM02 ☐ COM03 ☐ COM04
Slave ID Setting Mode	☐ Alias Mode ☒ Offset Mode
Slave ID Start	1
Slave ID End	2
Slave ID Offset	0

☐	Entry No.	Protocol	Source	Mode	Slave ID Range (Virtual<->Real)
☐	01	Modbus/RTU	COM1	Alias	001 <-> 002

Fig. 3. 144

Note: on VCOM, TCP and COM, Master and Slave IDs can be set, while on COM and VCOM work only with Serial ports.

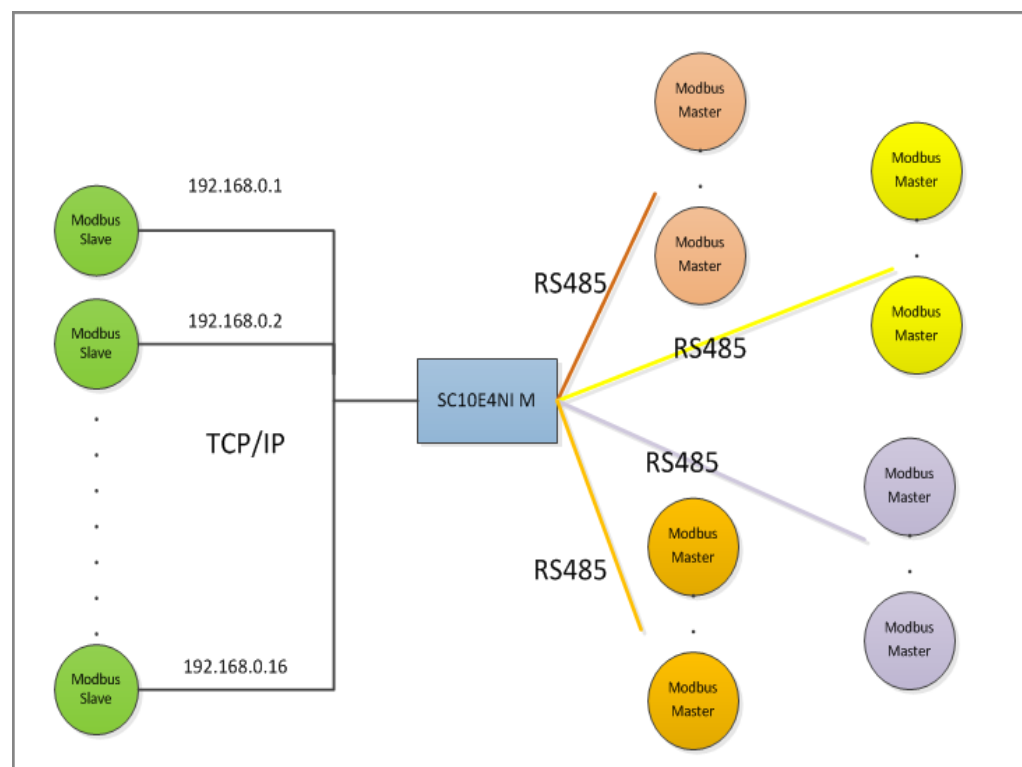
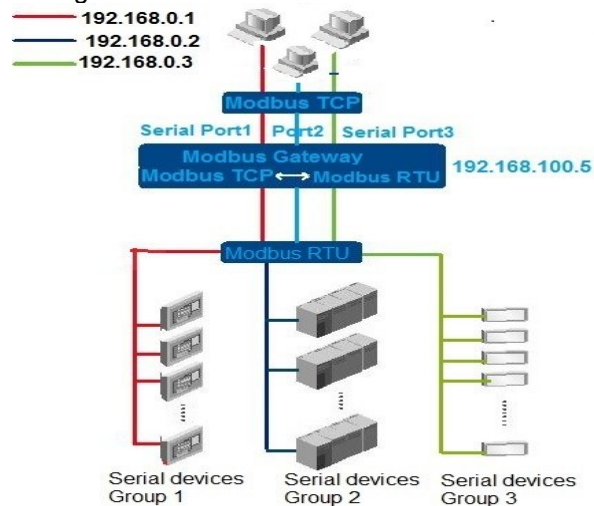
Offset mode can be used when device IDs to be mapped for Modbus master and slaves are sequential whereas Alias mode can be used when Modbus master and slave IDs are not in sequence.

4. Applied Modes of Multiple Protocols

4.1. Assign different IP to each serial device

Serial side devices is Master & Modbus TCP side device is slave,

Configuration :-



SC10E4NIM can support maximum up to 16 TCP connections as per picture in the previous page

To configure TCP **1** parameters.

TCP	☒ Enable
Operation Mode	☒ TCP Slave ☐ TCP Master
Remote IP Address	10 . 0 . 63 . 11
TCP Port	502 (1~65535, default=502)
TCP Inactivity Time	0 (0~36000 seconds)

Save Configuration

COM Settings



Basic Settings > COM Settings

- Overview
- Network
- Basic Settings
 - COM Settings**
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
 - SNMP Settings
 - Modbus
- Alert
- System
- Restart

To configure COM **1** port parameters.

Modbus Setting	
Operation Mode	RTU Master
Serial Configuration	
Interface	☒ RS232 ☐ RS422 ☐ RS485(2-Wire) ☐ RS485(4-Wire)
Baud Rate	9600 bps
Parity	☒ None ☐ Odd ☐ Even ☐ Mark ☐ Space
Data Bits	☐ 7 bits ☒ 8 bits
Stop Bits	☒ 1 bit ☐ 2 bits
Flow Control	☒ None ☐ Xon/Xoff ☐ RTS/CTS
☐ Apply To All Serial Ports	

Save Configuration

COM Number	Operation Mode	Interface	Baud Rate	Parity	Data Bits	Stop Bits	Flow Control
01	RTU Master	RS232	9600	None	8	1	None
02	RTU Slave	RS232	9600	None	8	1	None
03	RTU Slave	RS232	9600	None	8	1	None
04	RTU Slave	RS232	9600	None	8	1	None



VCOM Settings

Basic Settings > VCOM Settings

Overview

Network

Basic Settings

COM Settings

VCOM Settings

TCP Settings

Slave ID Map

Advanced Settings

SNMP Settings

Modbus

Alert

System

Restart

To configure VCOM **1** parameters.

VCOM	☐ Enable
VCOM Port	4660 (1~65535, default=4660)
VCOM Mode	RTU Slave
VCOM Inactivity Time Out	0 (0~36000 seconds)
☐ Apply to All VComs	

Save Configuration

TCP Settings

Basic Settings > TCP Settings

Overview

Network

Basic Settings

COM Settings

VCOM Settings

TCP Settings

Slave ID Map

Advanced Settings

SNMP Settings

Modbus

Alert

System

Restart

To configure TCP **1** parameters.

Add New Modbus TCP

TCP	☒ Enable
Operation Mode	☒ TCP Slave ☐ TCP Master
Remote IP Address	192 . 168 . 106 . 42
TCP Port	100 (1~65535, default=502)
TCP Inactivity Time Out	0 (0~36000 seconds)

Save Configuration

☐	TCP No.	Operation Mode	Remote IP Address	TCP Port	Inactivity Time Out
☐	01	TCP Slave	192.168.106.42	100	0 seconds
☐	02	TCP Slave	192.168.106.7	101	0 seconds
☐	16	TCP Master		502	0 seconds

Remove



Basic Settings > Slave ID Map

- Overview
- Network
- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
 - SNMP Settings
 - Modbus
- Alert
- System
- Restart

To configure Slave 1 parameters.

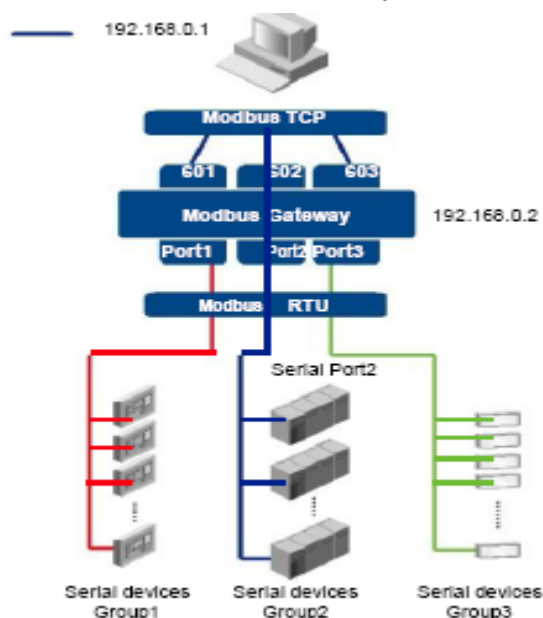
Slave ID Settings	
Slave	☒ Enable
Slave Interface	COM ☐ COM02 ☐ COM03 ☐ COM04 TCP ☒ TCP01 ☐ TCP02
Slave ID Setting Mode	☐ Alias Mode ☒ Offset Mode
Slave ID Setting	Slave ID Start: 1 Slave ID End: 1 Slave ID Offset: 0

Entry No.	Protocol	Source	Mode	Slave ID Range (Virtual<->Real)
01	Modbus/TCP	192.168.106.42:100	Offset	001 - 001 <-> 001 - 001
02	Modbus/TCP	192.168.106.7:101	Alias	002 <-> 002

Slave ID MAP

4.2. Assign same IP but different I/O Ports.

SC10E4NIM Modbus TCP side is Master & Serial side is slave
 SC10E4NIM to listen TCP port 501, 502, 503,





COM Setting



- Overview
- Network
- Basic Settings
 - COM Settings**
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
 - SNMP Settings
 - Modbus
- Alert
- System
- Restart

Basic Settings > COM Settings

To configure COM **1** port parameters.

Modbus Setting	
Operation Mode	RTU Slave
Serial Configuration	
Interface	☒ RS232 ☐ RS422 ☐ RS485(2-Wire) ☐ RS485(4-Wire)
Baud Rate	9600 bps
Parity	☒ None ☐ Odd ☐ Even ☐ Mark ☐ Space
Data Bits	☐ 7 bits ☒ 8 bits
Stop Bits	☒ 1 bit ☐ 2 bits
Flow Control	☒ None ☐ Xon/Xoff ☐ RTS/CTS
☐ Apply To All Serial Ports	

Save Configuration

COM Number	Operation Mode	Interface	Baud Rate	Parity	Data Bits	Stop Bits	Flow Control
01	RTU Slave	RS232	9600	None	8	1	None
02	RTU Slave	RS232	9600	None	8	1	None
03	RTU Slave	RS232	9600	None	8	1	None
04	RTU Slave	RS232	9600	None	8	1	None

VCOM Setting



- Overview
- Network
- Basic Settings
 - COM Settings
 - VCOM Settings**
 - TCP Settings
 - Slave ID Map
- Advanced Settings
 - SNMP Settings
 - Modbus
- Alert
- System
- Restart

Basic Settings > VCOM Settings

To configure VCOM **1** parameters.

VCOM	☐ Enable
VCOM Port	4660 (1~85535, default=4660)
VCOM Mode	RTU Slave
VCOM Inactivity Time Out	0 (0~36000 seconds)
☐ Apply to All VComs	

Save Configuration

TCP Settings



Basic Settings > TCP Settings

- Overview
- Network
- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings**
 - Slave ID Map
- Advanced Settings
- Alert
- System
- Restart

To configure TCP **1** parameters.

Add New Modbus TCP	
TCP	☒ Enable
Operation Mode	☐ TCP Slave ☒ TCP Master
TCP Port	501 (1~65535, default=502)
TCP Inactivity Time Out	0 (0~36000 seconds)

Save Configuration

☐	TCP No.	Operation Mode	Remote IP Address	TCP Port	Inactivity Time Out
☐	01	TCP Master		501	0 seconds
☐	02	TCP Master		502	0 seconds
☐	03	TCP Master		503	0 seconds

Slave ID MAPPING



Basic Settings > Slave ID Map

- Overview
- Network
- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings
 - Slave ID Map**
- Advanced Settings
- Alert
- System
- Restart

To configure Slave **1** parameters.

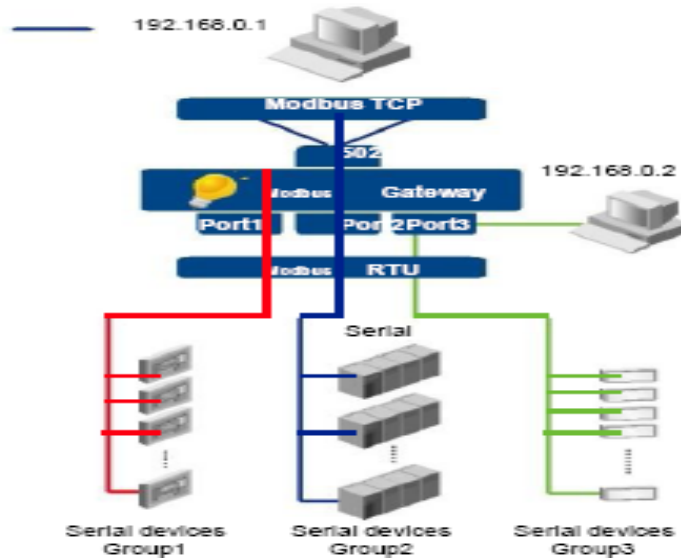
Slave ID Settings	
Slave	☒ Enable
Slave Interface	COM ☒ COM01 ☐ COM02 ☐ COM03 ☐ COM04
Slave ID Setting Mode	☒ Alias Mode ☐ Offset Mode
Alias ID:	2
Real ID:	2

Save Configuration

☐	Entry No.	Protocol	Source	Mode	Slave ID Range (Virtual<->Real)
☐	01	Modbus/RTU	COM1	Alias	002 <-> 002
☐	02	Modbus/RTU	COM1	Alias	004 <-> 004

4.3. Assign same IP and the same Port no

Modbus TCP side is Master & Serial side devices are Slave



COM Setting



- Overview
- Network
- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
 - SNMP Settings
 - Modbus
- Alert
- System
 - Restart

Basic Settings > COM Settings

To configure COM 1 port parameters.

Modbus Setting							
Operation Mode	RTU Slave						
Serial Configuration							
Interface	☒ RS232 ☐ RS422 ☐ RS485(2-Wire) ☐ RS485(4-Wire)						
Baud Rate	9600 bps						
Parity	☒ None ☐ Odd ☐ Even ☐ Mark ☐ Space						
Data Bits	☐ 7 bits ☒ 8 bits						
Stop Bits	☒ 1 bit ☐ 2 bits						
Flow Control	☒ None ☐ Xon/Xoff ☐ RTS/CTS						
☐ Apply To All Serial Ports							

Save Configuration

COM Number	Operation Mode	Interface	Baud Rate	Parity	Data Bits	Stop Bits	Flow Control
01	RTU Slave	RS232	9600	None	8	1	None
02	RTU Slave	RS232	9600	None	8	1	None
03	RTU Slave	RS232	9600	None	8	1	None

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VCOM Setting



Overview
Network
Basic Settings
COM Settings
VCOM Settings
TCP Settings
Slave ID Map
Advanced Settings
SNMP Settings
Modbus
Alert
System
Restart

Basic Settings > VCOM Settings

To configure VCOM 1 parameters.

VCOM	☐ Enable
VCOM Port	4660 (1~65535, default=4660)
VCOM Mode	RTU Slave
VCOM Inactivity Time Out	0 (0~36000 seconds)

☐ Apply to All VCOMs

Save Configuration

TCP Setting



Overview
Network
Basic Settings
COM Settings
VCOM Settings
TCP Settings
Slave ID Map
Advanced Settings
Alert
System
Restart

Basic Settings > TCP Settings

To configure TCP 1 parameters.

Add New Modbus TCP

TCP	☐ Enable
Operation Mode	☐ TCP Slave ☒ TCP Master
TCP Port	501 (1~65535, default=502)
TCP Inactivity Time Out	0 (0~36000 seconds)

Save Configuration

☐	TCP No.	Operation Mode	Remote IP Address	TCP Port	Inactivity Time Out
☐	16	TCP Master		502	0 seconds

Remove

Slave ID MAP



Overview
Network
Basic Settings
COM Settings
VCOM Settings
TCP Settings
Slave ID Map
Advanced Settings
SNMP Settings
Modbus
Alert
System
Restart

Basic Settings > Slave ID Map

To configure Slave 1 parameters.

Slave ID Settings

Slave	☒ Enable
Slave Interface	COM ☒ COM01 ☐ COM02 ☐ COM03 ☐ COM04
Slave ID Setting Mode	☒ Alias Mode ☐ Offset Mode
Alias ID	1
Real ID	1

Save Configuration

☐	Entry No.	Protocol	Source	Mode	Slave ID Range (Virtual<->Real)
☐	01	ModbusRTU	COM1	Alias	001 <-> 001
☐	02	ModbusRTU	COM2	Alias	002 <-> 002
☐	03	ModbusRTU	COM3	Alias	003 <-> 003

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4.4. Configuration for Virtual Serial Port COM Setting

Overview
 Network
 * Basic Settings
 COM Settings
 VCOM Settings
 TCP Settings
 Slave ID Map
 * Advanced Settings
 * Alert
 * System
 Restart

Modbus Setting

Operation Mode: **RTU Slave** ☐ Enable Caching

Serial Configuration

Interface: ☒ RS232 ☐ RS422 ☐ RS485

Baud Rate: **19200** bps

Parity: ☒ None ☐ Odd ☐ Even ☐ Mark ☐ Space

Data Bits: ☐ 7 bits ☒ 8 bits

Stop Bits: ☒ 1 bit ☐ 2 bits

Flow Control: ☒ None ☐ Xon/Xoff ☐ RTS/CTS

☐ Apply To All Serial Ports

Save Configuration

COM Number	Operation Mode	Interface	Baud Rate	Parity	Data Bits	Stop Bits	Flow Control
01	RTU Slave	RS232	19200	None	8	1	None
02	RTU Slave	RS232	19200	None	8	1	None
03	RTU Slave	RS232	19200	None	8	1	None
04	RTU Slave	RS232	19200	None	8	1	None

VCOM Settings

Overview
 Network
 * Basic Settings
 COM Settings
 VCOM Settings
 TCP Settings
 Slave ID Map
 * Advanced Settings
 * Alert
 * System
 Restart

Basic Settings > VCOM Settings

To configure VCOM **1** parameters.

VCOM: ☒ Enable

VCOM Port: **4660** (1-65535, default=4660)

VCOM Mode: **RTU Master** ☐ Enable Caching

VCOM Inactivity Time Out: **10** (0-36000 seconds)

☐ Apply to All VCOMs

Save Configuration

VCOM Number	VCOM Port	VCOM Mode	Inactivity Time Out
01	4660	RTU Master	10 seconds
02	4661	RTU Master	1 seconds
03	4662	RTU Master	1 seconds
04	4663	RTU Master	1 seconds

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TCP Setting

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Overview

Network

- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
- Alert
- System
- Restart

Basic Settings > TCP Settings

To configure TCP 1 parameters.

Add New Modbus TCP	
TCP	☒ Enable
Operation Mode	☒ TCP Slave ☐ Enable Caching ☐ TCP Master
Remote IP Address	0 . 0 . 0 . 0
TCP Port	0 (1-65535, default=502)
TCP inactivity Time Out	0 (0-36000 seconds)

Save Configuration

	TCP No.	Operation Mode	Remote IP Address	TCP Port	Inactivity Time Out
☒	16	TCP Master		502	0 seconds

Remove

Slave ID MAP

SAN TELEQUIP

Overview

Network

- Basic Settings
 - COM Settings
 - VCOM Settings
 - TCP Settings
 - Slave ID Map
- Advanced Settings
- Alert
- System
- Restart

Basic Settings > Slave ID Map

To configure Slave 1 parameters.

Slave ID Settings	
Slave	☒ Enable
Slave Interface	COM ☒ COM1 ☐ COM2 ☐ COM3 ☐ COM4
Slave ID Setting Mode	☒ Alias Mode ☐ Offset Mode
Slave ID Setting	Alias ID: 1
	Real ID: 1

Save Configuration

	Entry No.	Protocol	Source	Mode	Slave ID Range (Virtual<->Real)
☒	01	Modbus/RTU	COM1	Alias	001 <-> 001
☒	02	Modbus/RTU	COM2	Alias	002 <-> 002
☒	03	Modbus/RTU	COM3	Alias	003 <-> 003
☒	04	Modbus/RTU	COM4	Alias	004 <-> 004

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VCOM Port Mapping in Serial Manager (COM2, COM4, COM7, COM8)

Serial Manager V4.8.3							
Search Configuration Security Advanced Virtual COM About							
No.	Caution	Model	IP Address	MAC Address	Host Name	Kernel	AP Information
1		SC10E4NI M	0.0.0.0	08:00:06:05:50:01	0060E9-175776	V1.14	Modbus Gateway V4.16
2		SC10E4NI M	192.168.106.215	00:60:E9:17:57:76	0060E9-175776	V1.14	Modbus Gateway V4.16

Model	IP Address	Host Name	Port	Mapping	Remark
SC10E4NI M	192.168.106.215	0060E9-175776	1	COM2	TCP port = 4660, Server Mode
SC10E4NI M	192.168.106.215	0060E9-175776	2	COM4	TCP port = 4661, Server Mode
SC10E4NI M	192.168.106.215	0060E9-175776	3	COM7	TCP port = 4662, Server Mode
SC10E4NI M	192.168.106.215	0060E9-175776	4	COM8	TCP port = 4663, Server Mode

5. Advanced Settings

5.1 SNMP Settings

SNMP Settings determines whether your device settings can be viewed with standard SNMP software; by default it is disabled.

- **SysName** which is by default the MAC address
- **SysLocation** refers to the device's physical location.
- **SysContact** is the device administrator's contact information.

If you wish to make the information available for public viewing by a Read Community, simply check the **"Enable SNMP"** box and fill in **"Public_viewers"** in **Read Community** field. If you wish to allow a group of people called **"Power_users"** to change the information, enter **"Power_users"** in **Write Community**. If you allow a trap server to collect device information, please fill in **SNMP Trap Server** with its corresponding IP address (the trap server designed to collect all alarm information). Configuration will take effect after the device is restarted.

You will have to load a MIB Browser on a PC to see the Traps generated The IP address of this PC should be entered as SNMP Trap server in the below screen.

Select Receive Traps in the MIB Browser.



Advanced Settings > SNMP Settings

By enabling SNMP you allow the management utility to collect the information of Modbus Gateway. You can change the device network identity as well by changing the system name, location and contact.

SNMP Settings	
SysName	0060E9-175776
SysLocation	location
SysContact	contact
SNMP	☒ Enable
Read Community	public
Write Community	private
SNMP Trap Server	192 . 168 . 106 . 15

[Save Configuration](#)

Fig. 3. 155



Alert > Alert Events

To configure the Modbus Gateway to send alert by E-mail or trap.

Alert Event	
Cold Start	☒ E-mail ☒ Trap
Warm Start	☒ E-mail ☒ Trap
Authentication Failure	☒ E-mail ☒ Trap
IP Address Changed	☒ E-mail
Password Changed	☒ E-mail

[Save Configuration](#)

Fig. 3. 16

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Trap received in MIB Browser

The screenshot shows the 'iReasoning MIB Browser' application window. The 'Address' field is set to '192.168.106.15' and the 'OID' is '.1.3'. The 'Operations' dropdown is set to 'Get Next'. The 'MIB Tree' on the left shows 'iso.org.dod.internet.mgmt.mib-2'. The 'Trap Receiver' tab is active, displaying a table of traps. The table has four columns: 'Description', 'Source', 'Time', and 'Severity'. The traps listed are 'authenticationFailure', 'authenticationFailure', 'coldStart', and 'warmStart', all from source '192.168.106.215'. The 'coldStart' and 'warmStart' rows are highlighted with red underlines. Below the table, there is a section for 'Name', 'OID', 'MIB', 'Syntax', 'Access', 'Status', 'DefVal', and 'Indexes'.

Fig. 3. 17

5.2 Modbus

In **Modbus** settings, you could select whether to enable **Modbus Exception** or not. If the Modbus' slave produces no response, timeout occurs, it may then be necessary for the gateway to return an Exception, and setting the Response timeout as follows.

- Configure timeout for each COM port
- Configure timeout for TCP/ VCOM port



- Overview
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- Advanced Settings
 - SNMP Settings
 - Modbus
- Alert
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Advanced Settings > Modbus

Modbus Settings	
Modbus Exception	☐ Enable

Response Timeout	
COM 1 v	1000 (10-120000ms Default:1000ms)
☐ Apply to All Coms	
TCP/VCOM	1000 (10-120000ms Default:1000ms)

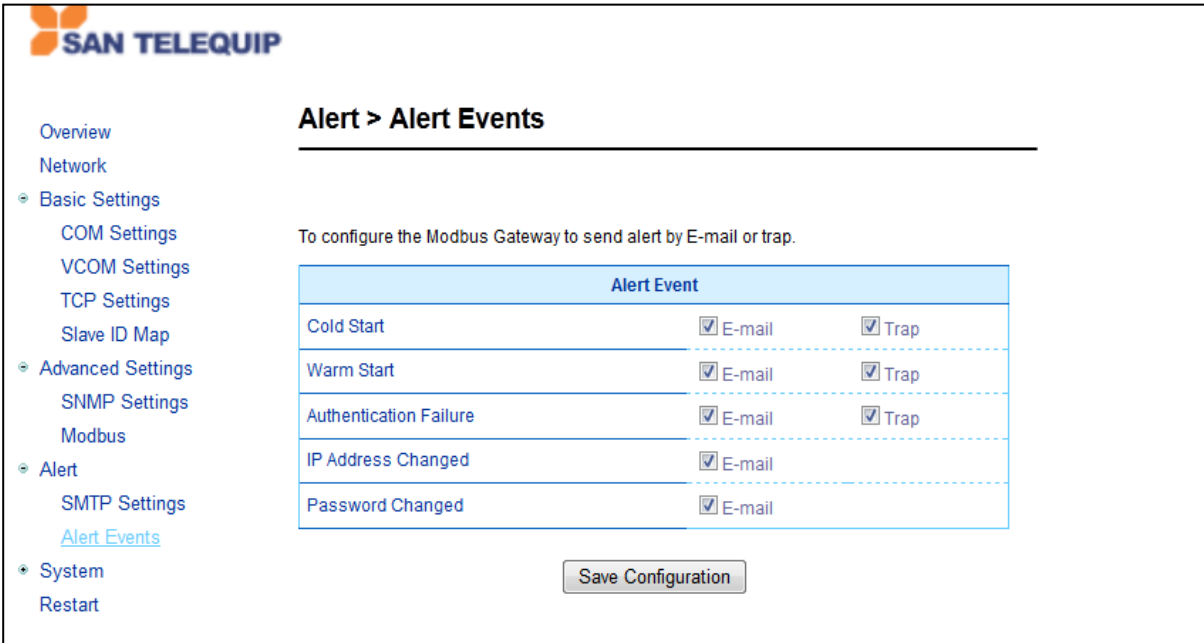
Fig. 3. 18

5.3 Alert Configuration

5.3.0 SMTP and Email Settings

In **Alert Events**, you can configure options to let your Modbus Gateway to send out device information to alert users, administrators, or responsible personnel. There are five anomalies defined in it to trigger alert functions.

- **Cold Start**, power supply is interrupted.
- **Warm Start**, the device Restart function is used, (either by pressing a button or by its interface).
- **Authentication Fail**, incorrect username and password are entered.
- **IP address change**, device's IP address is changed.
- **Password Changed**, authentication password is changed.



Alert > Alert Events

To configure the Modbus Gateway to send alert by E-mail or trap.

Alert Event		
Cold Start	☒ E-mail	☒ Trap
Warm Start	☒ E-mail	☒ Trap
Authentication Failure	☒ E-mail	☒ Trap
IP Address Changed	☒ E-mail	
Password Changed	☒ E-mail	

Fig. 3. 19

When enabled, an E-mail alert would be sent to the designated E-mail address in the **E-Mail Settings**. To setup an email alert function, you first need to configure the recipient's email address and the mail server. Please check the following:

1. Your email server should be valid, check with your system Admin.
2. Your system is Internet enabled else you will not receive emails.
3. Your email id is working properly and can receive & transmit emails Confirm that your system admin has not blocked this domain.
4. Check the User Name & Password of the email independently.
5. The User name & password to be filled in the below screen should be that of the Sender email id holder.
6. Use Test mail function to confirm your data fed in this screen shot is correct. Correct the data & recheck the Test mail function.
7. Check the authenticity of the DNS Server which you have entered during the configuration of this device Fig 3.4
8. Avoid using commercial email servers like Hotmail, Gmail etc.



Overview

Network

• Basic Settings

• Advanced Settings

SNMP Settings

Modbus

• Alert

SMTP Settings

Alert Events

• System

Restart

Alert > SMTP Settings

To configure the SMTP server where the E-mail notification will be sent.

E-mail Setting	
Sender's E-mail Address	response@santelequip.com
Receiver's E-mail Address 1	sandip@santelequip.com
Receiver's E-mail Address 2	purchase@santelequip.com
Receiver's E-mail Address 3	service@santelequip.com

Mail Server	
Mail Server	mail.santelequip.com
☒ Mail Server Authentication Required.	
User Name	response-santelequip
Password	••••••••

Fig. 3. 20

Note: Before configure the Email warning function, you must set a Mail Server.

Test Mail & Password change Event Mail Received.

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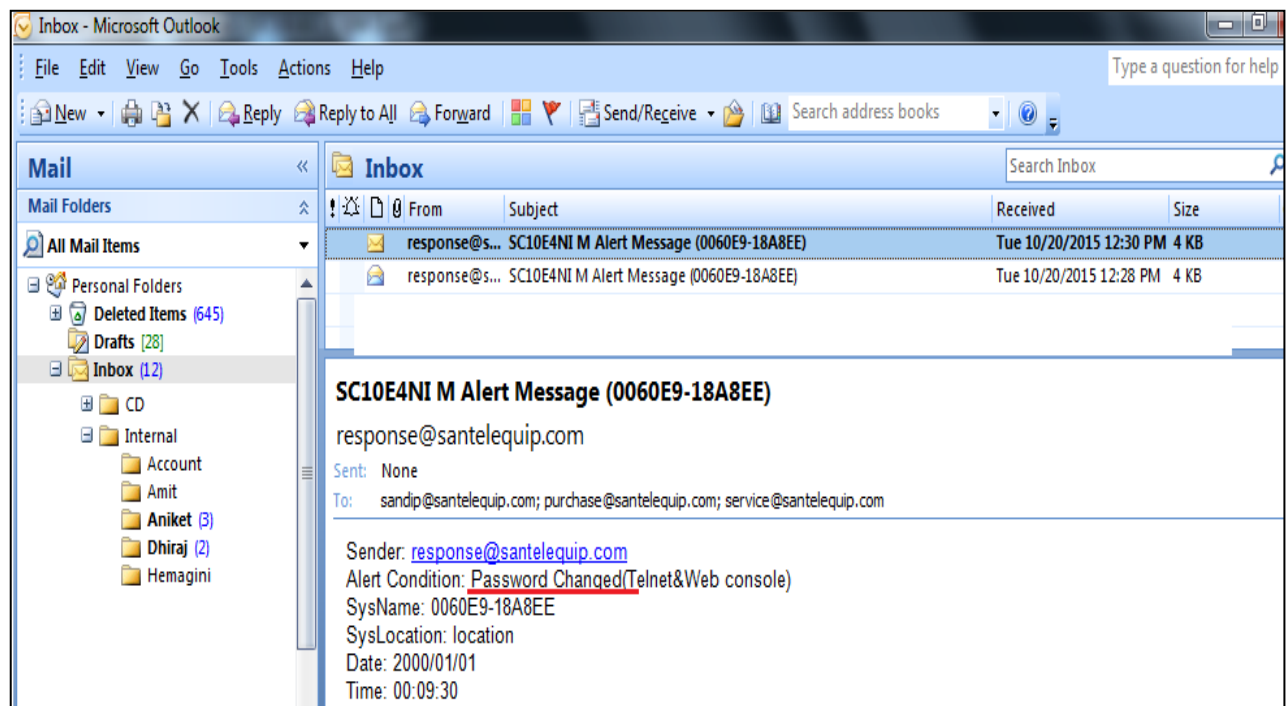


Fig. 3. 21

6 System

6.1 Log Settings

This section lets you change the way your report will be shown on your Log.

Enable Log Events to Flash: When tick this function, log information will store into device's flash and it will not be cleared even SC10E4NIM reboot.

Log Error, Log Warning, Log Info, Log Debug: Actually, those classes are from a daemon which call syslog. In addition to this syslog, there are also many daemons running simultaneously. When other daemons trigger an event, it will store this event into syslogd's database and we can see this entry from web page. Moreover, the event severity is defined on each daemon itself. Our device's daemon did not define level 1,2,5 severity. So, we will only see Error, Warning, Info, Debug four types.

Enable syslog server: Enabling this option would allow sending log events to a Syslog server.

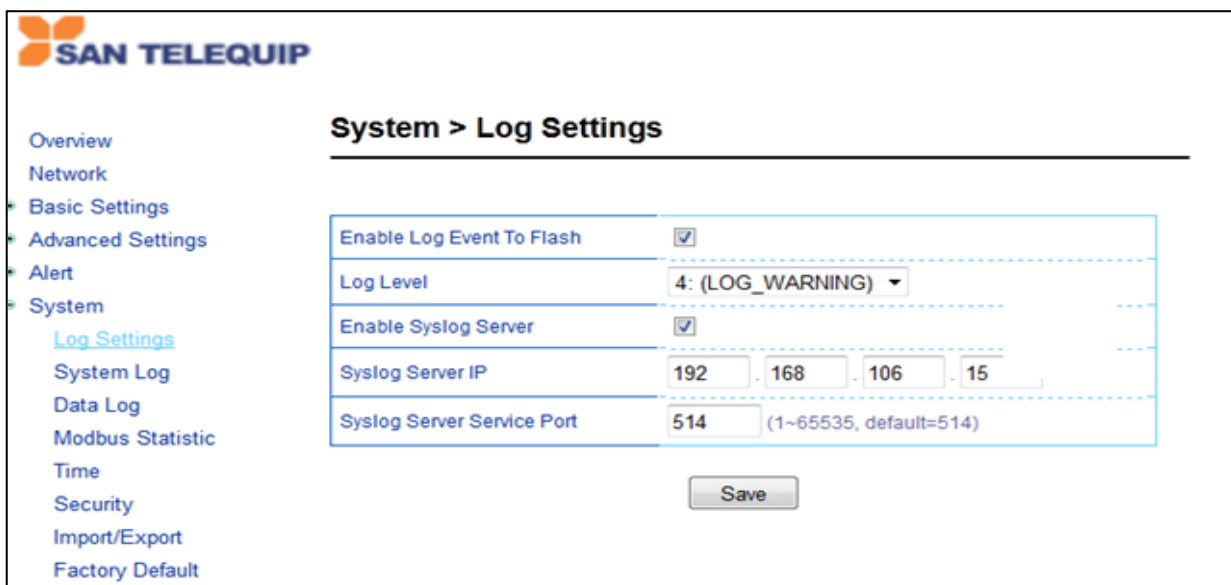
Syslog Server IP: Enter your PC IP address

Syslog Server Service Port : Specify the PC port.

Gateway start UP version: "gateway" is a daemon name on our device. The 3.0 is its version.

Gateway global transaction ID start 0x1111: When Modbus master is located in COM side and issue a polling command to TCP side. The original data is not included transaction ID information, because Modbus protocol does not contain this concept. So, we have to use this global transaction ID to encapsulate data and then send to TCP side.

Log level selection scenario: It is hard to provide a best scenario for log level selection. Debug level will display more message and it might waste flash buffer if message is garbage



The screenshot displays the 'System > Log Settings' configuration page in the San Telequip web interface. On the left, a sidebar menu lists various system settings: Overview, Network, Basic Settings, Advanced Settings, Alert, System, Log Settings (highlighted), System Log, Data Log, Modbus Statistic, Time, Security, Import/Export, and Factory Default. The main content area is titled 'System > Log Settings' and contains a table of configuration options:

Enable Log Event To Flash	☒
Log Level	4: (LOG_WARNING) ▼
Enable Syslog Server	☒
Syslog Server IP	192 . 168 . 106 . 15
Syslog Server Service Port	514 (1~65535, default=514)

Below the table is a 'Save' button.

Fig. 3. 22

6.2 System Log

This section merely shows a list of system running events currently (with every event's properties displayed), as well as the option to clear them all.



System > System Log

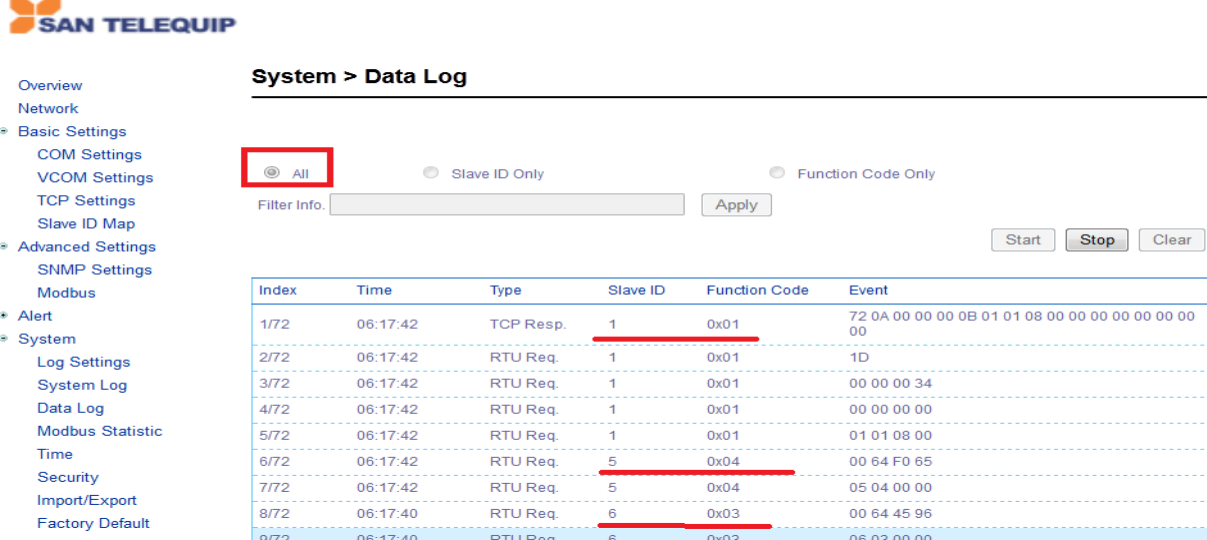
Index	Date	Time	Startup Time	Level	Event
1/4	2001.02.14	06:52:17	00d00h00m37s	warning	: Alert: Authentication Failure (Web console), SysName: 0060E9-1492F0, SysLocation: location
2/4	2001.02.14	06:52:07	00d00h00m26s	warning	: Alert: Warm Start, SysName: 0060E9-1492F0, SysLocation: location
3/4	2001.02.14	06:51:06	00d01h27m14s	warning	: Alert: IP Address Changed (eth0), New: DHCP off, IP 192.168.106.48, Netmask 255.255.255.0, Gateway 192.168.106.50, Old: DHCP off, IP 192.168.106.45, Netmask 255.255.255.0, Gateway 10.0.0.254, SysName: 0060E9-1492F0, SysLocation: location
4/4	2001.02.14	06:49:47	00d01h25m55s	warning	: Alert: Password Changed (Telnet&Web console), SysName: 0060E9-1492F0, SysLocation: location

Fig. 3. 23

Click on "Last Page" to go to the last page. Click on "Show All Events" to show all events in one page. Click on "Clear All Event" to clear the events stored in the device.

6.3 Data Log

Event filtering is available in this section for analysis; a number of options are available for a customized analysis. Traffic in the system can be done here as well.



System > Data Log

Overview
 Network
 Basic Settings
 COM Settings
 VCOM Settings
 TCP Settings
 Slave ID Map
 Advanced Settings
 SNMP Settings
 Modbus
 Alert
 System
 Log Settings
 System Log
 Data Log
 Modbus Statistic
 Time
 Security
 Import/Export
 Factory Default
 Restart

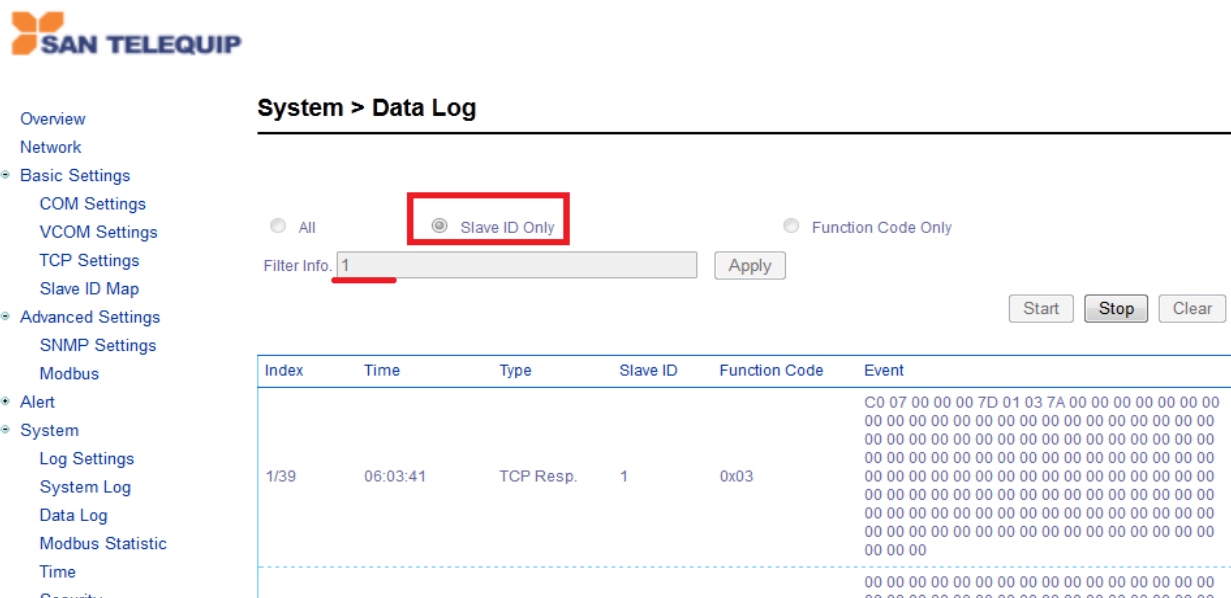
☒ All ☐ Slave ID Only ☐ Function Code Only

Filter Info.

Index	Time	Type	Slave ID	Function Code	Event
1/72	06:17:42	TCP Resp.	1	0x01	72 0A 00 00 00 0B 01 01 08 00 00 00 00 00 00
2/72	06:17:42	RTU Req.	1	0x01	1D
3/72	06:17:42	RTU Req.	1	0x01	00 00 00 34
4/72	06:17:42	RTU Req.	1	0x01	00 00 00 00
5/72	06:17:42	RTU Req.	1	0x01	01 01 08 00
6/72	06:17:42	RTU Req.	5	0x04	00 64 F0 65
7/72	06:17:42	RTU Req.	5	0x04	05 04 00 00
8/72	06:17:40	RTU Req.	6	0x03	00 64 45 96
9/72	06:17:40	RTU Req.	6	0x03	06 03 00 00

Fig. 3. 24

Filtering on Slave ID only: Select device ID1



System > Data Log

Overview
 Network
 Basic Settings
 COM Settings
 VCOM Settings
 TCP Settings
 Slave ID Map
 Advanced Settings
 SNMP Settings
 Modbus
 Alert
 System
 Log Settings
 System Log
 Data Log
 Modbus Statistic
 Time
 Security

☐ All ☒ Slave ID Only ☐ Function Code Only

Filter Info.

Index	Time	Type	Slave ID	Function Code	Event
1/39	06:03:41	TCP Resp.	1	0x03	C0 07 00 00 00 7D 01 03 7A 00

Fig. 3. 25

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Filter by Function code only: Selected 03 holding Resistance

Overview

Network

Basic Settings

COM Settings

VCOM Settings

TCP Settings

Slave ID Map

Advanced Settings

SNMP Settings

Modbus

Alert

System

Log Settings

System Log

Data Log

Modbus Statistic

Time

Security

Import/Export

Factory Default

Restart

System > Data Log

☐ All
 ☐ Slave ID Only
 ☒ Function Code Only

Filter Info:

Index	Time	Type	Slave ID	Function Code	Event
1/186	06:32:27	RTU Req.	5	0x03	00 64 45 A5
2/186	06:32:27	RTU Req.	5	0x03	05 03 00 00
3/186	06:32:23	RTU Req.	5	0x03	00 64 45 A5
4/186	06:32:23	RTU Req.	5	0x03	05 03 00 00
5/186	06:32:24	RTU Req.	6	0x03	00 64 45 96
6/186	06:32:24	RTU Req.	6	0x03	06 03 00 00
7/186	06:32:18	RTU Req.	5	0x03	00 64 45 A5
8/186	06:32:18	RTU Req.	5	0x03	05 03 00 00
9/186	06:32:19	RTU Req.	6	0x03	00 64 45 96
10/186	06:32:19	RTU Req.	6	0x03	06 03 00 00

Fig. 3. 26

6.4 Modbus Statistic

All ports' information is available in this section.

								
Overview	System > Modbus Statistic							
Network								
Basic Settings								
Advanced Settings								
Alert								
System								
Log Settings								
System Log								
Data Log								
Modbus Statistic								
Time								
Security								
Import/Export								
Factory Default								
Restart								
	Interface	Net_Connection	DataType	Mode	RxCnt	RxByte	TxCnt	TxByte
	COM01		RTU	SLAVE	000000	0000000000	000000	0000000000
	COM02		RTU	SLAVE	000000	0000000000	000000	0000000000
	COM03		RTU	SLAVE	000000	0000000000	000000	0000000000
	COM04		RTU	SLAVE	000000	0000000000	000000	0000000000
	TCP(502)	0.0.0.0:502	TCP	MASTER	000000	0000000000	000000	0000000000
	TCP(502)	0.0.0.0:502	TCP	MASTER	000000	0000000000	000000	0000000000

Fig. 3. 27

6.5 Time

Date and time can be set manually, or using **Network Time Protocol (NTP)** to automatically synchronizes with a **Time Server**. For auto-synching check the box below **NTP Server Settings** “**Obtain date/time automatically**” proceeding then to fill the **IP address** or hostname for it. If a hostname is entered, the **DNS server** must be configured properly; a **Time Zone** can be selected as



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Overview
 Network
 • Basic Settings
 • Advanced Settings
 • Alert
 • System
 Log Settings
 System Log
 Data Log
 Modbus Statistic
 Time
 Security
 Import/Export
 Factory Default
 Restart

System > Time

By enabling NTP you allow to adjust and set the device internal time, relative to Greenwich Mean Time.

Current System Time	
2013/5/16 Thu 07:00:31	<button>Refresh</button>

System Time Setting	
Time Zone	(GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London ▼
Time Setting	☐ NTP ☒ Manual

NTP Setting	
NTP Server	time.nist.gov

Manual Setting	
Date	Year: 2013 ▼ / Month: May ▼ / Day: 16 ▼
Time	Hour:(0~23): 7 ▼ Minute:(0~59): 0 ▼ Second:(0~59): 31 ▼

Daylight Saving Setting	
☐ Enable Daylight Saving Time	
Start Date	Month: Jan ▼ / Week: 1st ▼ / Day: Sun ▼ / Hour: 1 ▼
End Date	Month: Jan ▼ / Week: 1st ▼ / Day: Sun ▼ / Hour: 1 ▼
Offset	1 ▼ hour(s)

Save Configuration

well, Fig. 3.28.

Fig. 3. 28

6.6 Security

Password settings are available at this section, as well as device's console configuration settings



System > Security

The default password is null, you can change the password by filling in the new password to New Password and Verified Password fields, be aware that password is case sensitive.

Change Password	
Old Password	
New Password	
Verified Password	

allow one to change the access methods to protect it against intrusion. All password protect function will use same password of above 'Change Password' setting data.

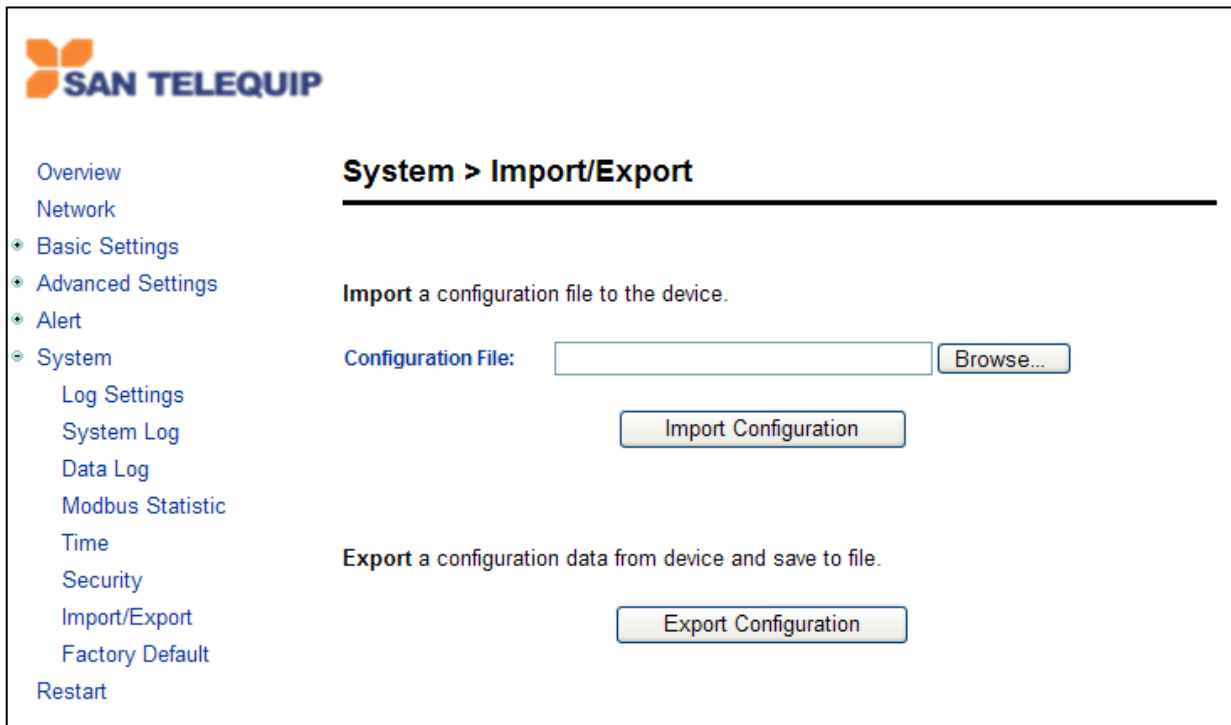
Security	
Web Console	☒ Enable ☐ Disable
Telnet Console	☒ Enable ☐ Disable
Reset Button Protect	☒ No ☐ Yes

allowing users to limit the way they are able to configure the device.

Fig. 3.29

6.7 Import/Export

Once all the configurations are set and the device is working properly, you may want to backup **(Export)** your configuration. Backup can be used when the new firmware is uploaded and it is reset to a factory default settings, it is done to prevent accidental loading of incompatible old settings. The backup file could also be used to efficiently deploy multiple Modbus Gateways of similar settings by restoring the settings to the devices by **Importing** the corresponding file.



The screenshot displays the San Telequip web interface. On the left is a navigation menu with the following items: Overview, Network, Basic Settings (selected with a blue diamond), Advanced Settings, Alert, System (selected with a blue diamond), Log Settings, System Log, Data Log, Modbus Statistic, Time, Security, Import/Export, Factory Default, and Restart. The main content area is titled "System > Import/Export" and contains two sections. The first section, "Import a configuration file to the device.", includes a "Configuration File:" label, a text input field, a "Browse..." button, and an "Import Configuration" button. The second section, "Export a configuration data from device and save to file.", includes an "Export Configuration" button.

Fig. 3. 30

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6.8 Factory Default

A simple return to **Factory Default** is available in our SC10E4NI M /SC10E08AM / SC10E16AM Series.

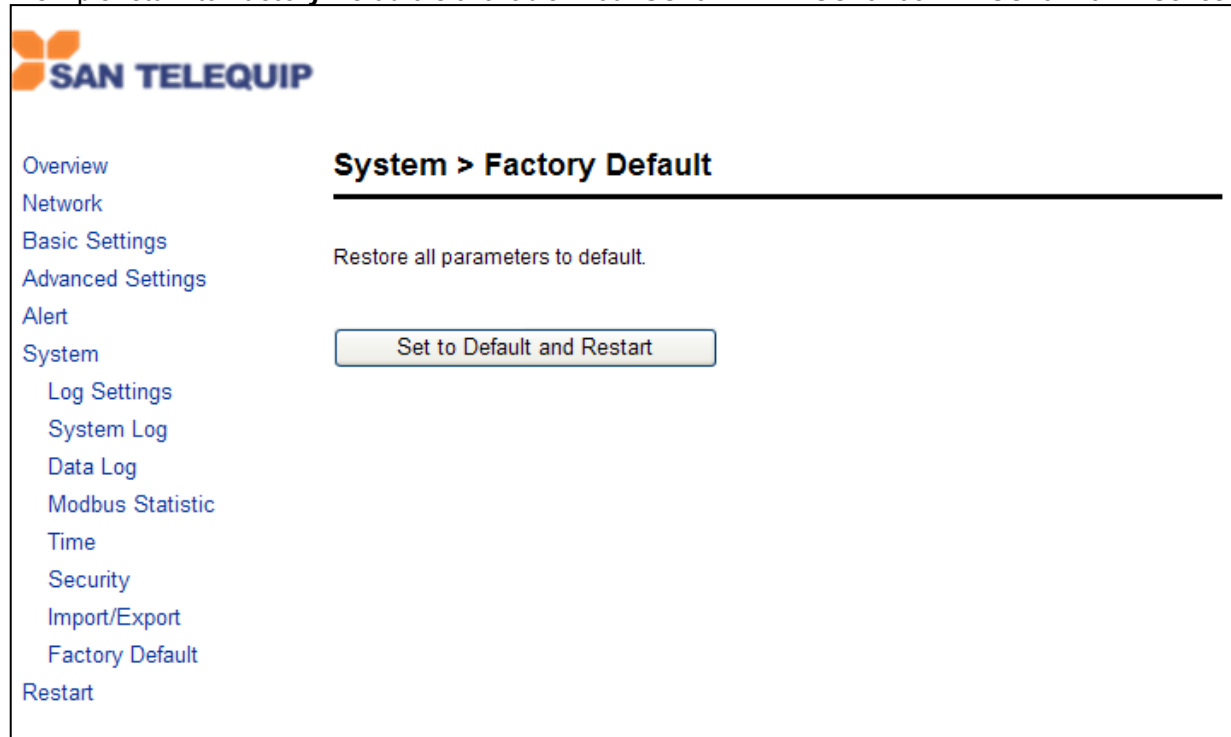
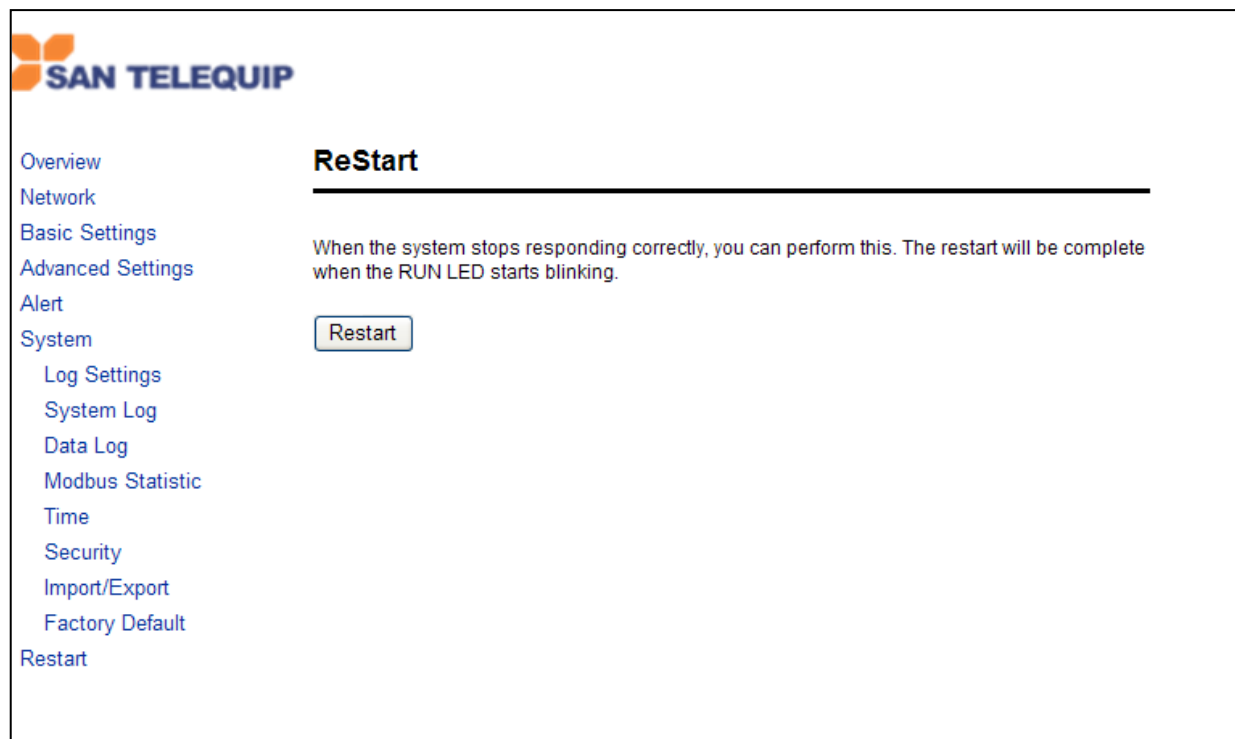


Fig. 3.31

6.9 Restart



Restart is just a click away in our Modbus Series.

Fig. 3.32

7 Applications and Examples

On your device two different ID mapping definitions are given by the system, both using Modbus ID to route the requesting command (from the Master) to the Slave node.

7.1 Using ID offset range mapping

If the Slave ID is continuous, it is recommended to use the Offset mode, Fig. 4.1.

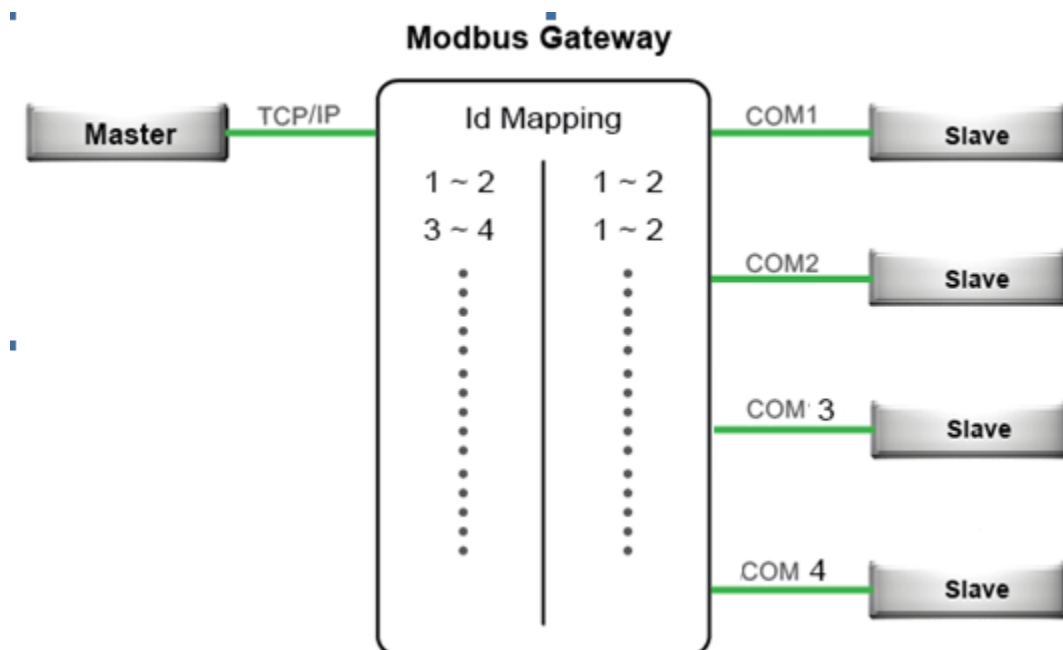


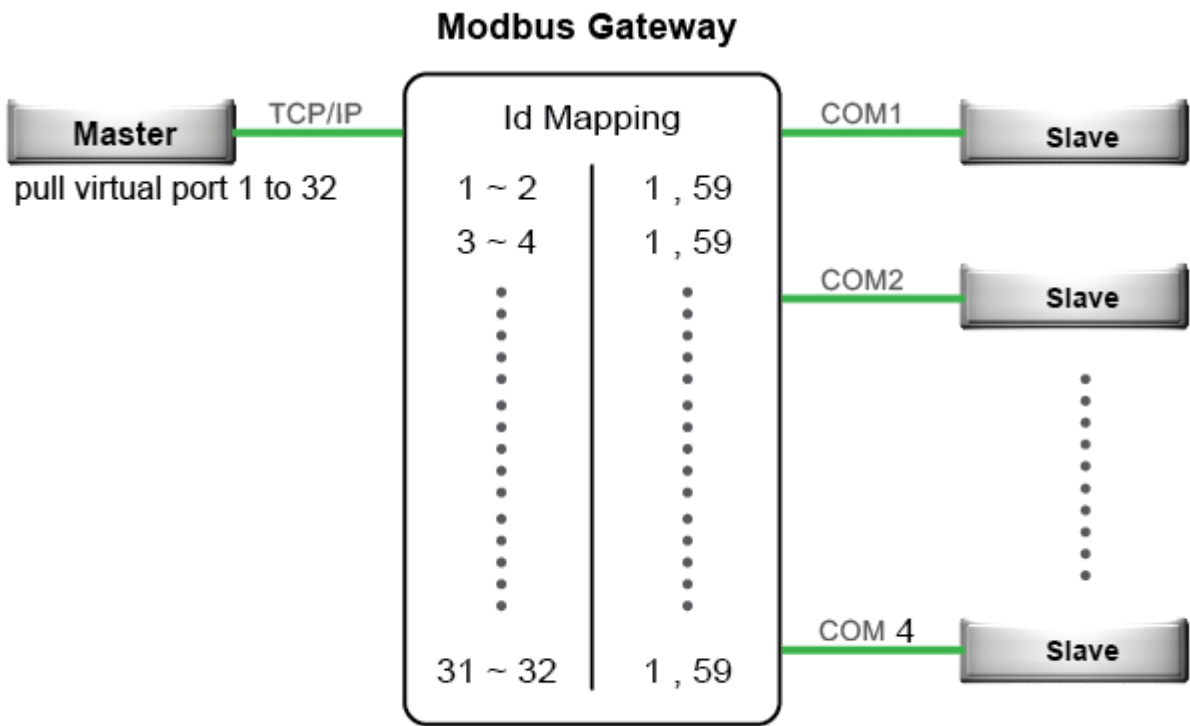
Fig. 4. 1

☐	Entry No.	Protocol	Source	Mode	Slave ID Range (Virtual<->Real)
☐	01	Modbus/RTU	COM1	Offset	001 - 002 <-> 001 - 002
☐	02	Modbus/RTU	COM2	Offset	003 - 004 <-> 001 - 002
☐	03	Modbus/RTU	COM3	Offset	005 - 006 <-> 001 - 002
☐	04	Modbus/RTU	COM4	Offset	007 - 008 <-> 001 - 002

Fig. 4. 2

7.2 Using Alias ID mapping

This is only recommended if the ID is not continuous, Fig. 4.3.



* Every slave will have two ID (1 and 59)

Fig. 4. 3

☐	03	Modbus/RTU	COM2	Alias	003 <=> 001
☐	04	Modbus/RTU	COM2	Alias	004 <=> 059

Fig. 4. 4

Specifications

7.3 Hardware

System	
CPU	32-bit 266MHz RISC Processor with MMU
Flash Memory	2 + 8 MB (2MB for Bootloader)
RAM	128 MB DDR
EEPROM	8 KB
Reset	Built-in Recessed Key (Restore to Factory Defaults)
Watchdog	Hardware built-in
Network	
Ethernet Interface	■ IEEE 802.3 Compliance ■ Dual Port 10/100Mbps Auto-Detection ■ Connection: RJ-45 ■ Auto MDI/MDI-X: No
Protection	Built-in 1.5 KV Magnetic Isolation
Protocol	■ ICMP, TCP/IP, UDP, HTTP, Telnet, DNS, DHCP Client, SNMP, SMTP, NTP, ARP
Serial	
Serial Interface	RS-232/RS-422/RS-485 Software Selectable (Depends on Model))
Serial Connector	SC10E4 NIM DB9 (9-pin) Connector SC10E08AM /SC10E16AM RJ45 Connector
Serial Port Communication	■ Baud-rate: 300 bps ~ 921600 bps ■ Parity: None, Even, Odd, Mark, or Space ■ Data Bits: 7, or 8 ■ Stop Bits: 1 or 2 ■ Flow Control: None, Hardware CTS/RTS, Software Xon/Xoff
LED Indicator	
LED indication	■ Power x 1, Ready x 1, COM port TX x 4, COM port RX x 4
Power Requirement & EMC	
Input	● DC9~48V (SC10E08/16AM 230V AC or 24V /48 DC)
Consumption	● 5.58W
Mechanical	
Dimensions W D H	53.4x145.7x119.9 ,436x200x43.5 mm
Casing	SECC sheet metal (1 mm)
Environmental	
Temperature	Operation: SC10E4NI M /SC10E08AM/SC10E16AM: -40°C ~ 80°C Storage : -40°C ~ 85°C
Humidity	5% ~ 95% Non-condensing

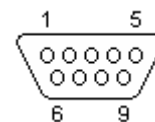
Table 5. 1

7.4 Power



SC10E4NIM has terminal connectors (G, V1 -, V + & V2 -, V +) for 9V DC ~48V DC input.

7.5 DB9 to RS232/RS485/RS422 connectors



Pin#	RS-232 Full Duplex	RS-422/4-Wire RS-485 Full Duplex	2-Wire RS-485 Half Duplex
1	DCD	N/A	N/A
2	RXD	TXD+	N/A (reserved)
3	TXD	RXD+	DATA+
4	DTR	N/A	N/A
5	SG (Signal Ground)	SG (Signal Ground)	SG (Signal Ground)
6	DSR	N/A	N/A
7	RTS	RXD-	DATA-
8	CTS	TXD-	N/A (reserved)
9	RI	N/A	N/A

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SC10E08AM / SC10E16AM Serial and RJ-45 Connectors

Pin Assignment for RJ-45 to Serial Connectors

RJ45	Ethernet	RS-232	RS-422 / 4-Wire RS-485	2-Wire RS-485
Pin 1	Tx+	RTS	-	-
Pin 2	Tx-	DTR ⁽¹⁾	TX-	-
Pin 3	Rx+	TXD	TX+	-
Pin 4	-	SG	SG	SG
Pin 5	-	SG	SG	SG
Pin 6	Rx-	RXD	RX+	Data+
Pin 7	-	DSR ⁽¹⁾	RX-	Data-
Pin 8	-	CTS	-	-

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For RS485 4 Wire /RS422

Signal of SC10EXXX	Will Connect to
TXD+	RX+ of your device
TXD-	RX- of your device
RXD+	TX+ of your device
RXD-	TX- of your device

For RS485 2 Wire

Signal of SC10EXXX	Will Connect to
DATA +	TX+ /D+ of your device
DATA -	TX- /D- of your device

For RS232

Connect a Cross cable from SC10EXXX DB9 RS232 Port connector to PC COM Port connector.

PC Side 9 Pin Male	Signal	SC10E4NIM Side 9 Pin Male
1	DCD	1
2	RXD	3
3	TXD	2
4	DTR	6
5	GND	5
6	DSR	4
7	RTS	8
8	CTS	7
9	RI	9

7.6 LED indicators

Name	Color	Message
Power	● (Steady Green)	Power ON
Ready	● (Steady Green)	Booting up
	⚡ (Blinking Green)	In Activity
TX (1-4)	⚡ (Blinking Green)	Serial Port Transmission
	● (Light Off)	No Data Transmission
RX (1-4)	⚡ (Blinking Green)	Serial Port Data Reception
	● (Light Off)	No Data Reception
LAN1/LAN2	● (Steady Amber)	100Mbps Ethernet connected
	● (Light Off)	10Mbps Ethernet Connection or 100 Mbps Disconnected
	⚡ (Blinking Green)	Ethernet Port in Activity

TX, RX LED: SC10E08AM (1-8), SC10E16AM (1-16)

Table 5. 2

7.7 Software

Software	
Utility	"Virtual COM" Driver "Serial-IP" for Windows 98/2000/XP/2003/Vista
Configuration Tool	■ Web-based, Telnet, Utility

Table 5. 3

8 Appendix Configuration using Telnet Interface

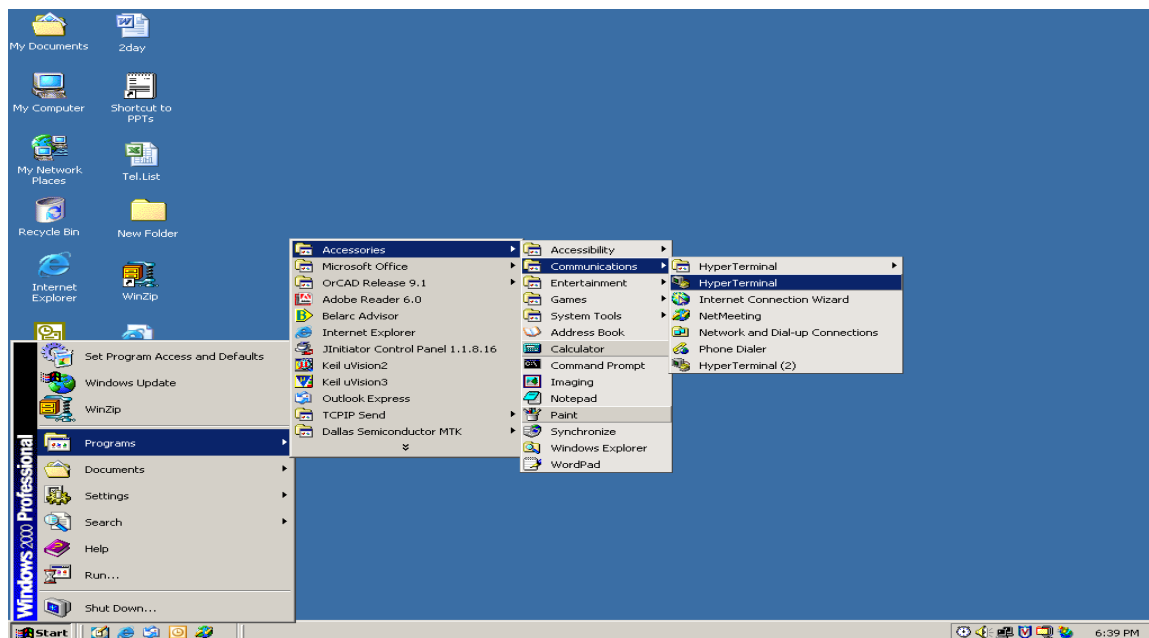
The SC10E4NI M /SC10E08AM / SC10E16AM Modbus Gateway device also has a built-in Telnet server program such that users can also configure the device using Telnet console software. To start the device configuration using Telnet console, please go to Windows Command software (Start→Run) and use “telnet” command to access the device. In the “Run” window, enter “*telnet device_IP_address*” (For example, telnet 10.0.50.100 if the device is connected to LAN1 port) as shown in Fig. The system will prompt for Username and Password. After the valid username and password are entered, the main menu shall appear as in Apx. 10. It shows all the configurations that can be used on the device. If Telnet is not yet configured, please follow the steps mentioned below to configure it.

Note:

- The steps described below are for **Windows®** platforms.
- You can always press “ESC” key to return to the upper layer menu.
- If the device does not receive any command within 3 minutes, Telnet connection will be automatically terminated.

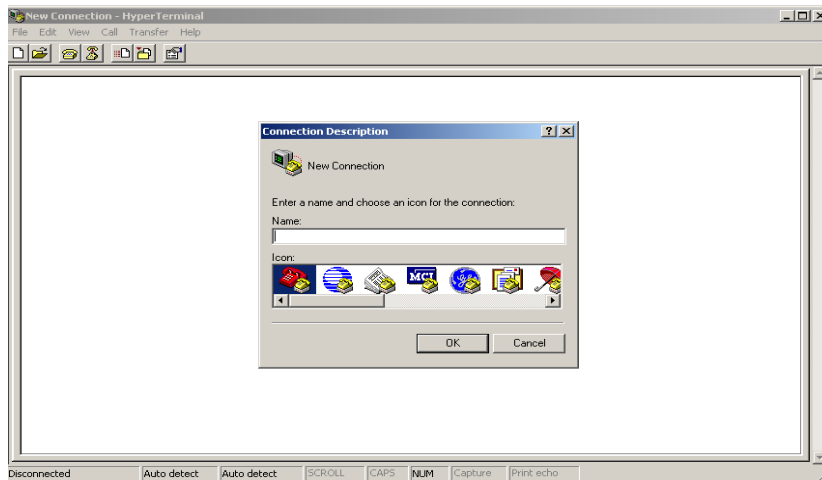
For Telnet interface configuring, please go to **Windows® Hyper Terminal** and follow the steps described below.

- On your Desktop go to “**Start → All Programs → Accessories → Communications → HyperTerminal**”.



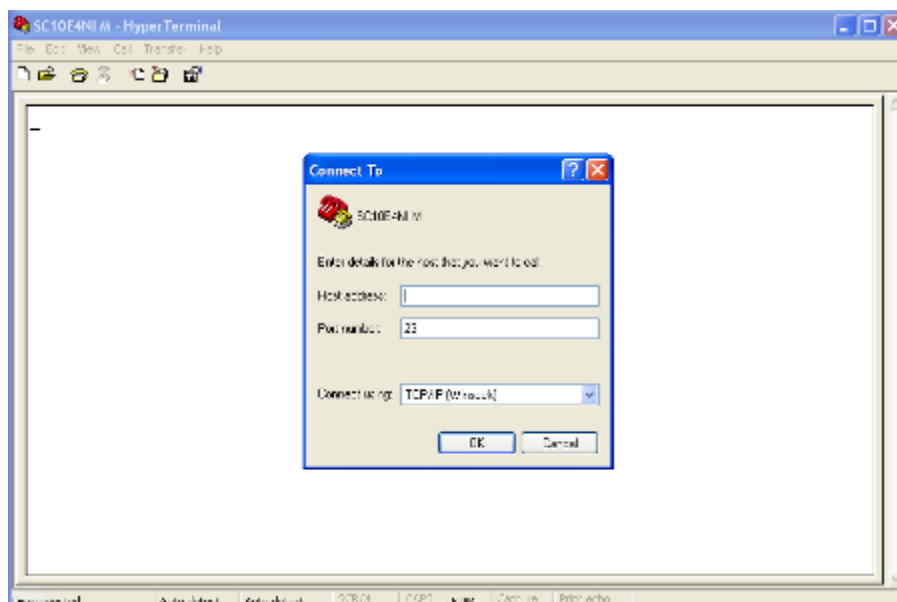
Apx. 1

- Fill the Name entry with a name of your choice, and select your favorite icon. The “**Connect to**” window will pop-out.



Apx.2

- Select “**TCP/IP Winsock**” on “**Connect using**”, then check “**OK**”. Here “**Session 1-Hyperterminal**” will appear, and then type “**telnet 10.0.XXX.XXX**” (device’s IP), to get into the device’s login menu.

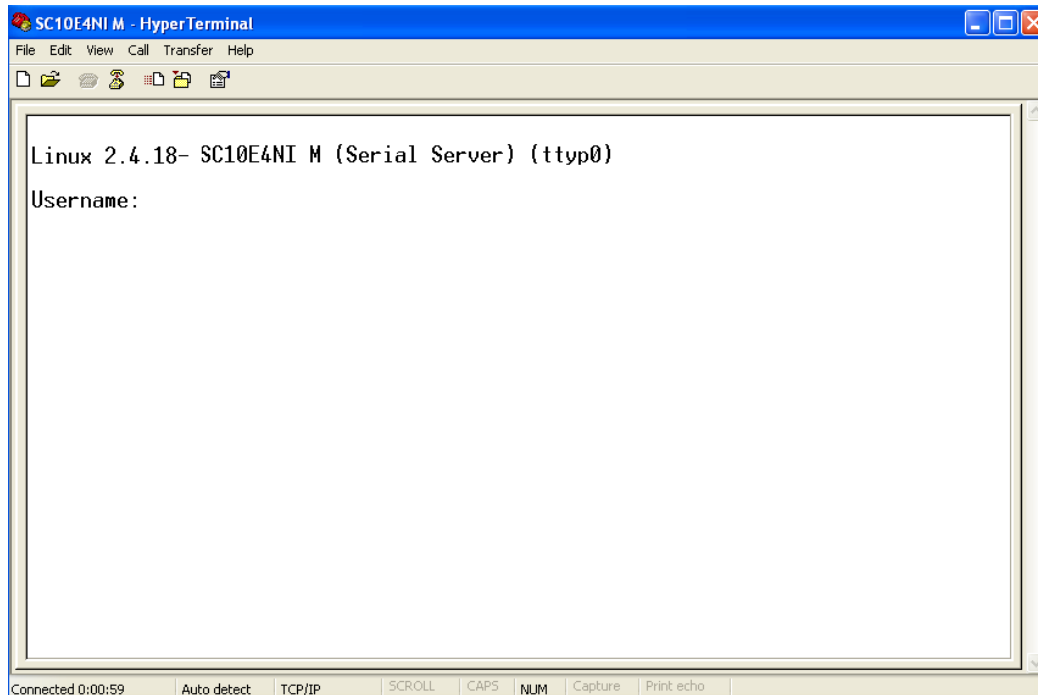


Apx. 3

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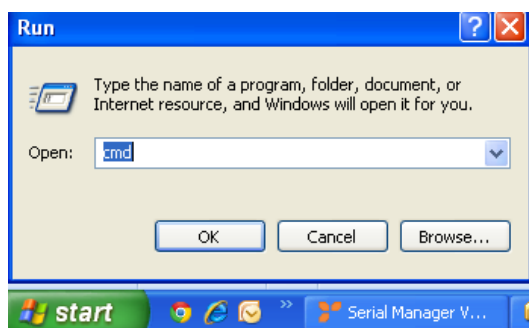
- Once the correct username and password are entered, you will see the configuration menu of the device on the display.



Apx. 4

The steps before mentioned are for Win XP, in order to enable telnet in Win 7 follow the steps below.

1. Go to **Start** and on the “**Run**” box type **cmd**, **Fig.**

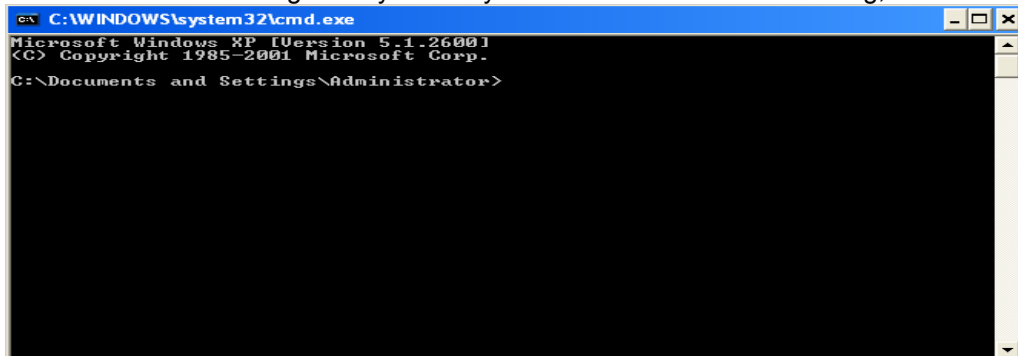


Apx. 5

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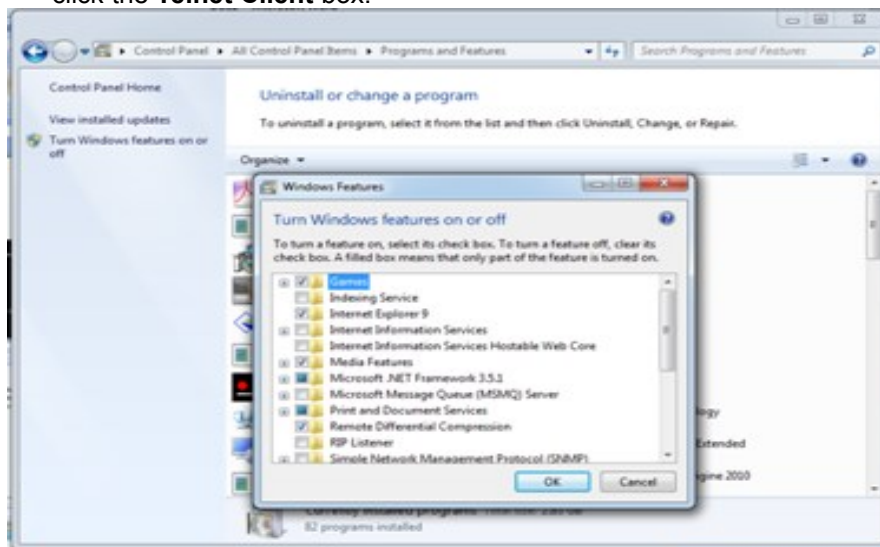


2. A pop out window will appear as follows, type “ **pkmgr /iu:"TelnetClient"** ” and press Enter, your Telnet must be configured by now. If you wish to confirm if it is working, follow the next step.



Apx. 6

3. Go to **Control Panel** under **Programs and Features** press **Turn Windows features on or off** and click the **Telnet Client** box.

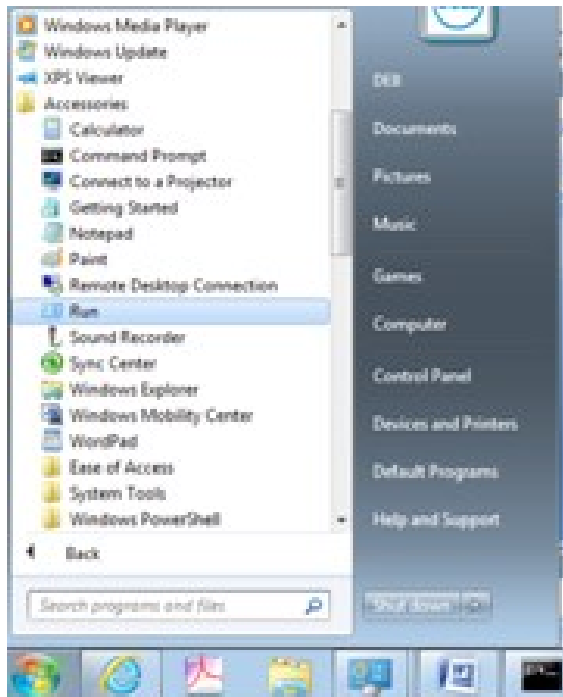


Apx. 7

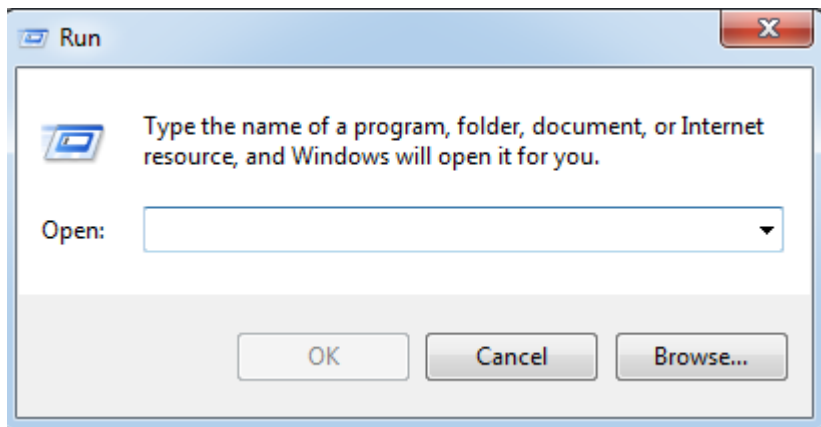
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After these steps are completed, telnet can be accessed by typing the device's IP using the **"Run"** command window on the Start programs.

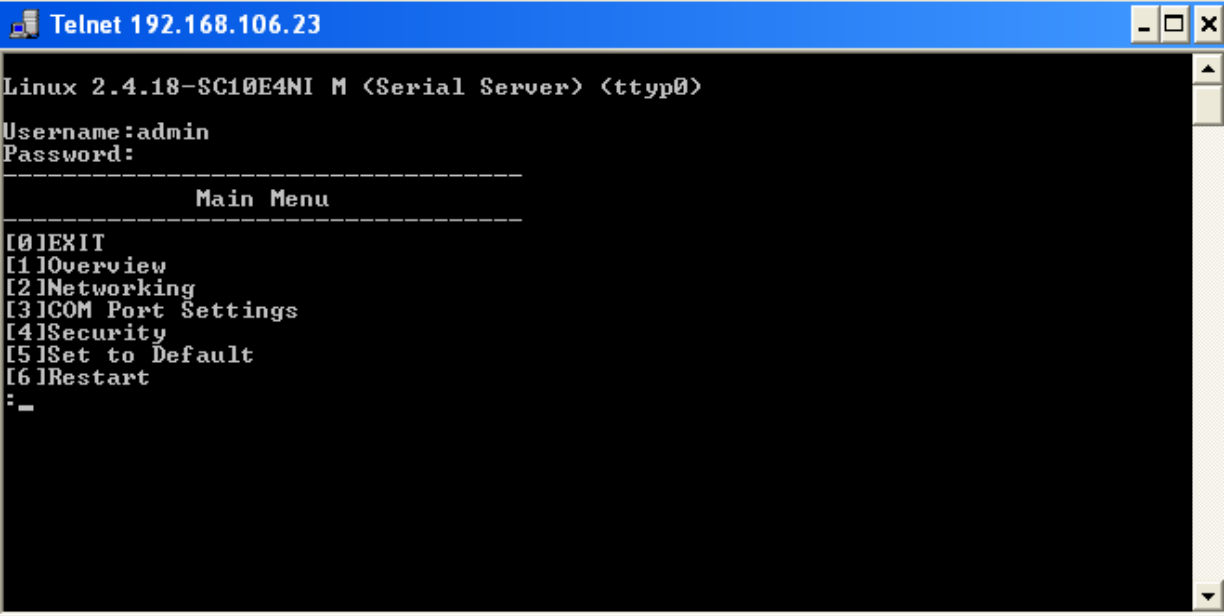


Apx. 8



Apx. 9

Its main menu is a command driven interface; it will look as follows.



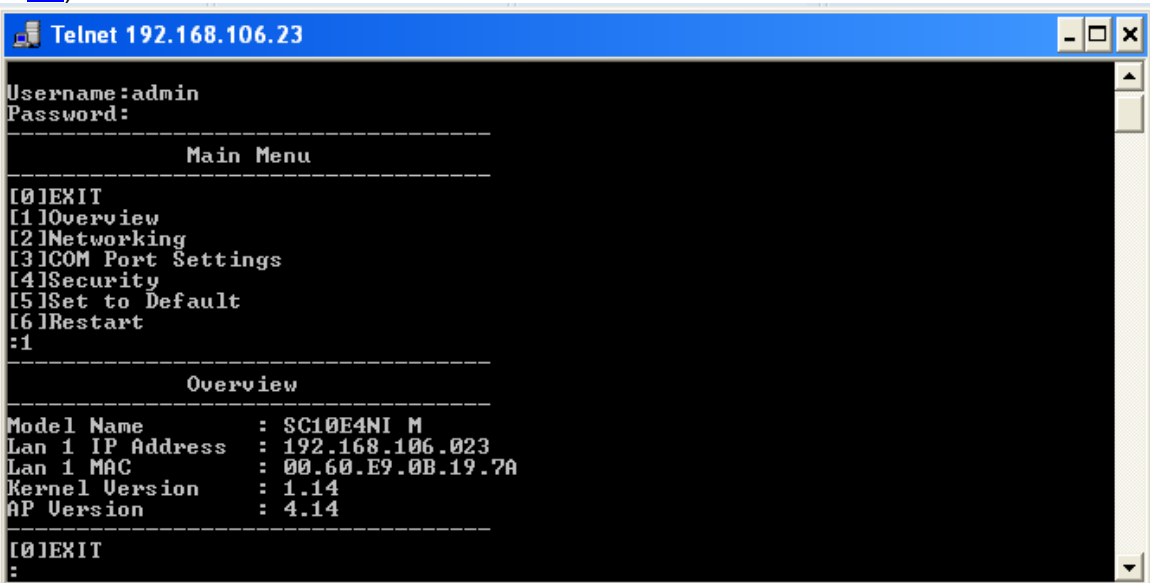
```
Telnet 192.168.106.23
Linux 2.4.18-SC10E4NI M <Serial Server> <ttyp0>
Username:admin
Password:
-----
Main Menu
-----
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:-
```

Apx. 10

Most options appear the same as the ones in web browsing mode, the difference being that they have to be accessed by entering the number corresponded to that option.

For accessing each function please follow the steps described below.

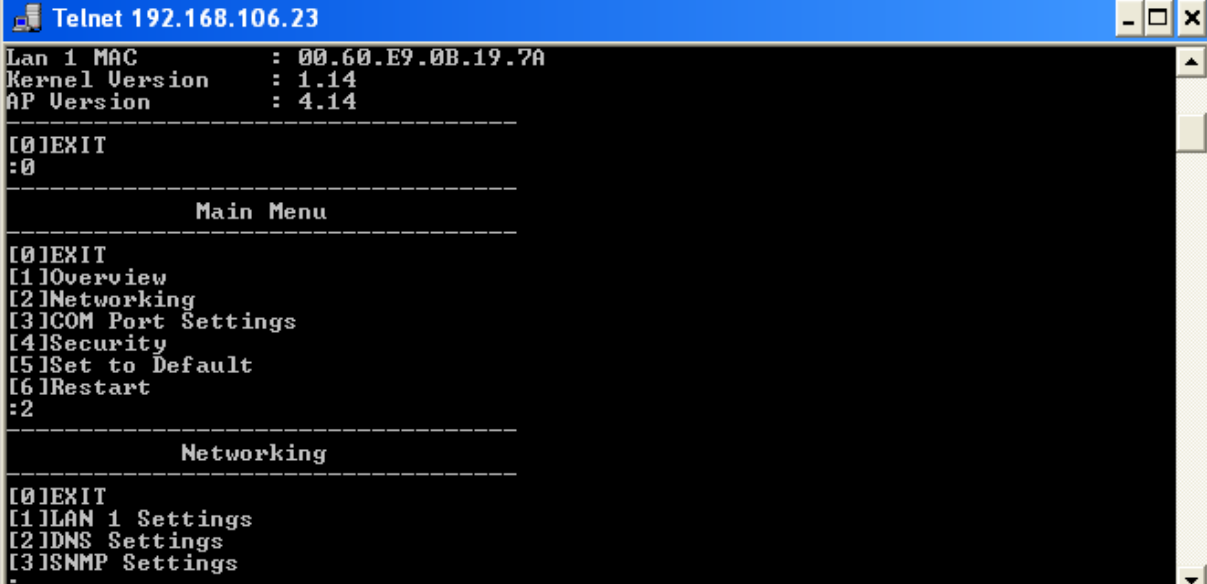
- On the **Main Screen** → **[1] Overview**, (a more detailed description of this section is given on [Sec. 3.3](#))



```
Telnet 192.168.106.23
Username:admin
Password:
-----
Main Menu
-----
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:1
-----
Overview
-----
Model Name       : SC10E4NI M
Lan 1 IP Address  : 192.168.106.023
Lan 1 MAC        : 00.60.E9.0B.19.7A
Kernel Version   : 1.14
AP Version       : 4.14
-----
[0]EXIT
:-
```

Apx. 11

Main Screen → [2] Networking, (a more detailed description of this section is given on [Sec. 3.4](#))



```
Telnet 192.168.106.23
Lan 1 MAC      : 00.60.E9.0B.19.7A
Kernel Version : 1.14
AP Version     : 4.14

-----
[0]EXIT
:0

Main Menu
-----
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:2

Networking
-----
[0]EXIT
[1]LAN 1 Settings
[2]DNS Settings
[3]SNMP Settings
:
```

Apx. 12

- Main Screen → [2] Networking → [1]LAN 1 Settings, (a more detailed description of this section is given on [Sec. 3.4](#))



```
Telnet 192.168.106.23

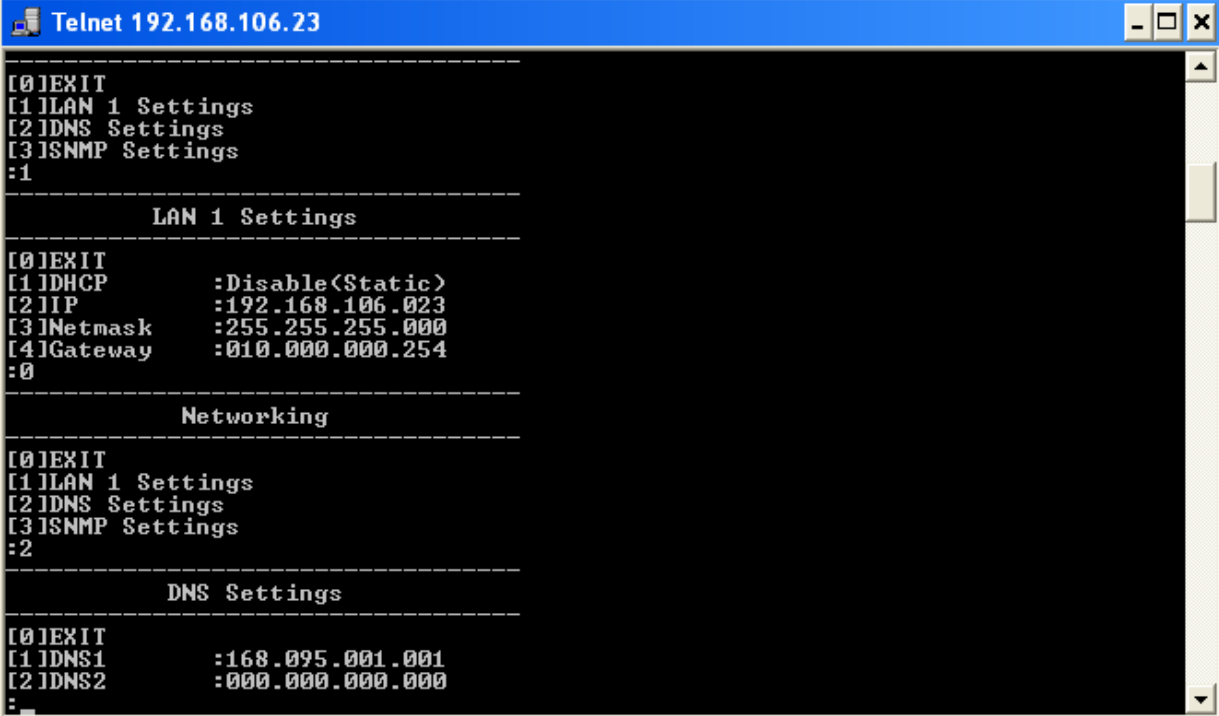
Main Menu
-----
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:2

Networking
-----
[0]EXIT
[1]LAN 1 Settings
[2]DNS Settings
[3]SNMP Settings
:1

LAN 1 Settings
-----
[0]EXIT
[1]DHCP      :Disable<Static>
[2]IP       :192.168.106.023
[3]Netmask  :255.255.255.000
[4]Gateway  :010.000.000.254
:
```

Apx. 13

- **Main Screen → [2] Networking → [2] DNS Settings**, (a more detailed description of this section is given on [Sec. 3.4](#))

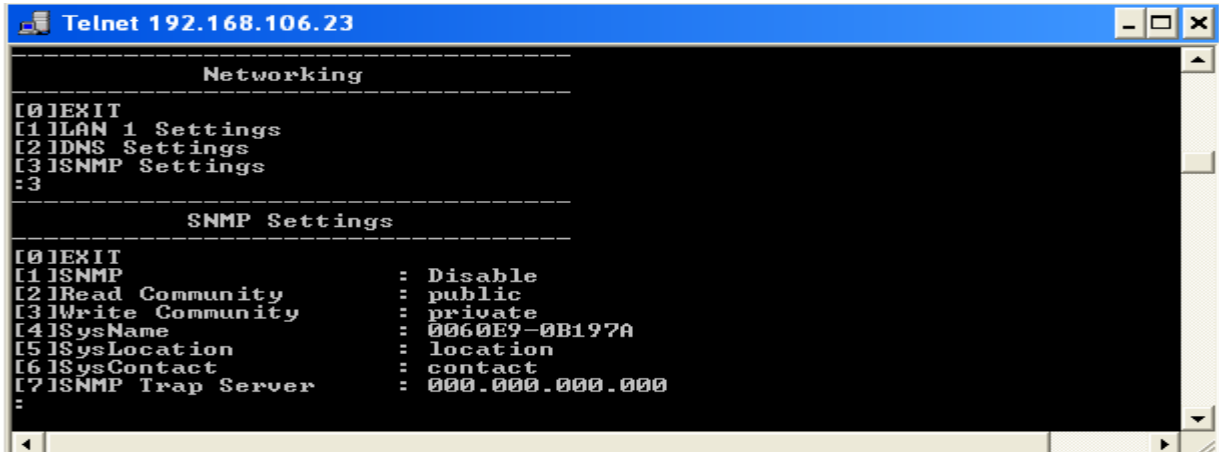


```

Telnet 192.168.106.23
-----
[0]EXIT
[1]LAN 1 Settings
[2]DNS Settings
[3]SNMP Settings
:1
-----
LAN 1 Settings
-----
[0]EXIT
[1]DHCP :Disable<Static>
[2]IP :192.168.106.023
[3]Netmask :255.255.255.000
[4]Gateway :010.000.000.254
:0
-----
Networking
-----
[0]EXIT
[1]LAN 1 Settings
[2]DNS Settings
[3]SNMP Settings
:2
-----
DNS Settings
-----
[0]EXIT
[1]DNS1 :168.095.001.001
[2]DNS2 :000.000.000.000
:
  
```

Apx. 14

- **Main Screen → [2] Networking → [3] SNMP Settings**, (a more detailed description of this section is given on [Sec. 3.6.1](#))



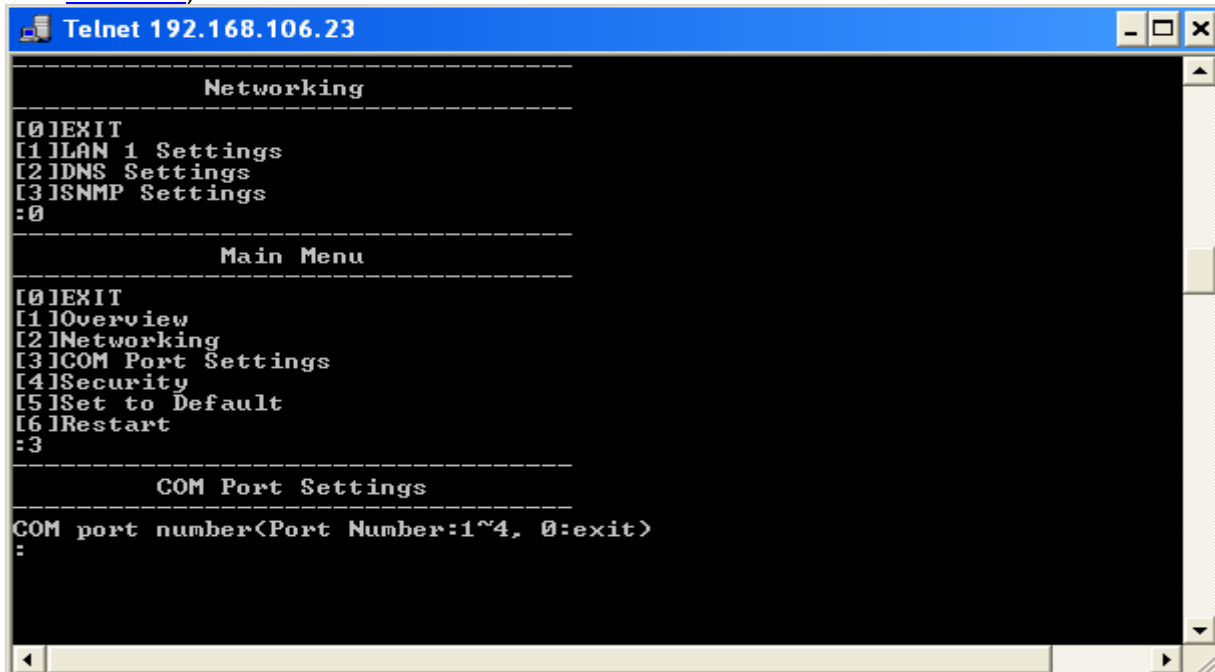
```

Telnet 192.168.106.23
-----
Networking
-----
[0]EXIT
[1]LAN 1 Settings
[2]DNS Settings
[3]SNMP Settings
:3
-----
SNMP Settings
-----
[0]EXIT
[1]SNMP : Disable
[2]Read Community : public
[3]Write Community : private
[4]SysName : 0060E9-0B197A
[5]SysLocation : location
[6]SysContact : contact
[7]SNMP Trap Server : 000.000.000.000
:
  
```

Apx. 15

COM Port Configuration: telnet

- **Main Screen → [3] COM Port Setting**, (a more detailed description of this section is given on [Sec. 3.5.1](#))



```
Telnet 192.168.106.23

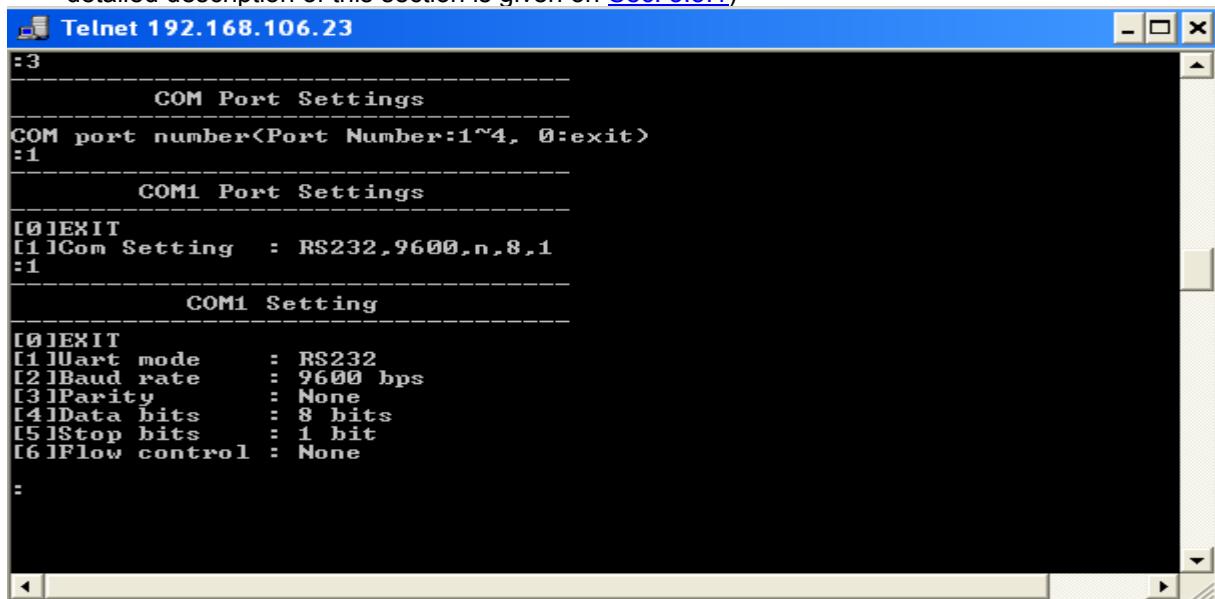
Networking
-----
[0]EXIT
[1]LAN 1 Settings
[2]DNS Settings
[3]SNMP Settings
:0

Main Menu
-----
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:3

COM Port Settings
-----
COM port number<Port Number:1~4, 0:exit>
:
```

Apx. 16

- **Main Screen → [3] COM Port Setting → [1-16] Select Port → [3] COM Port Settings**, (a more detailed description of this section is given on [Sec. 3.5.1](#))



```
Telnet 192.168.106.23

:3

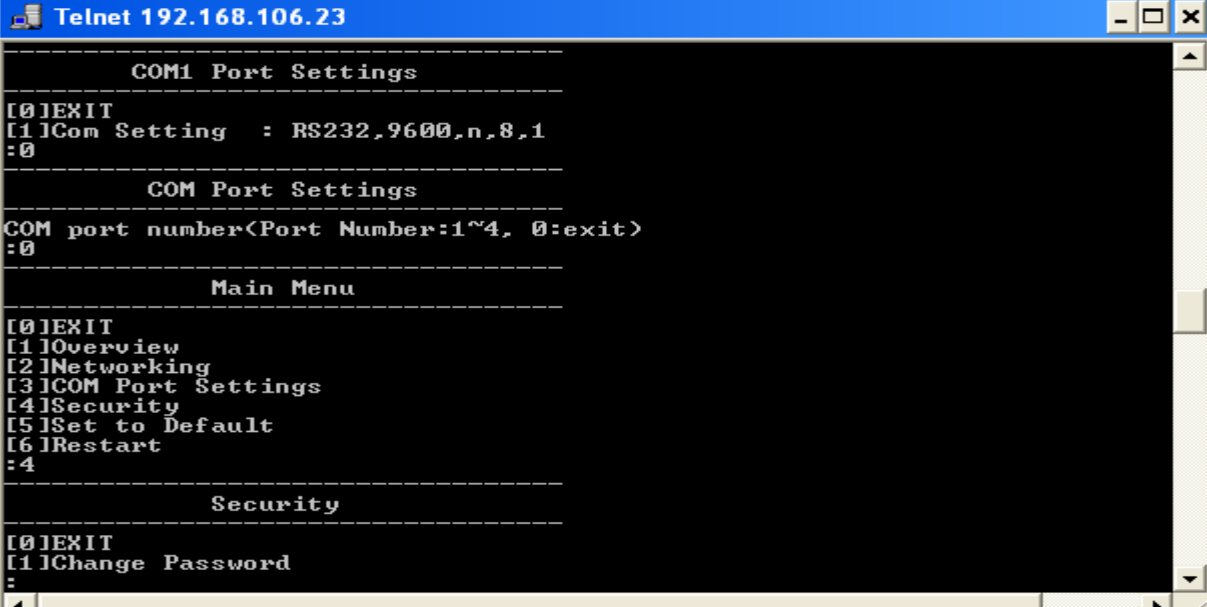
COM Port Settings
-----
COM port number<Port Number:1~4, 0:exit>
:1

COM1 Port Settings
-----
[0]EXIT
[1]Com Setting : RS232,9600,n,8,1
:1

COM1 Setting
-----
[0]EXIT
[1]Uart mode : RS232
[2]Baud rate : 9600 bps
[3]Parity : None
[4]Data bits : 8 bits
[5]Stop bits : 1 bit
[6]Flow control : None
:
```

Apx. 17

- **Main Screen → [4] Security**, (a more detailed description of this section is given on [Sec. 3.8.6](#))



```
Telnet 192.168.106.23

-----
COM1 Port Settings
[0]EXIT
[1]Com Setting : RS232,9600,n,8,1
:0
-----

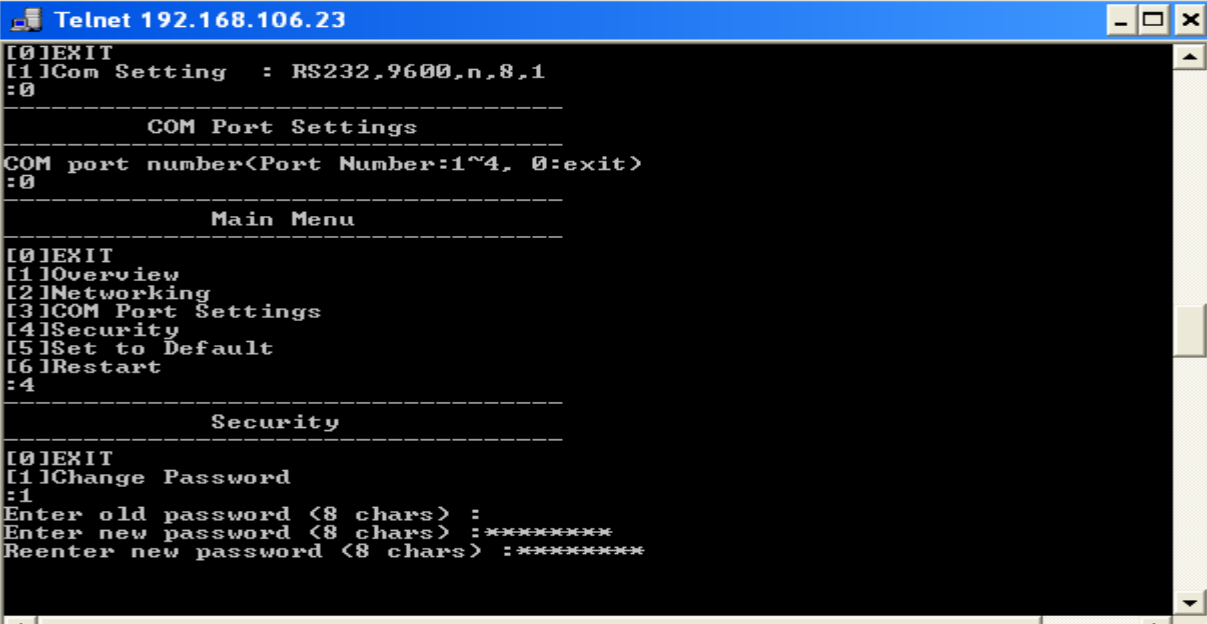
COM Port Settings
COM port number<Port Number:1~4, 0:exit>
:0
-----

Main Menu
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:4
-----

Security
[0]EXIT
[1]Change Password
:
```

Apx. 18

- **Main Screen → [4] Security → [1] Change Password**, (a more detailed description of this section is given on [Sec. 3.8.6](#))



```
Telnet 192.168.106.23

[0]EXIT
[1]Com Setting : RS232,9600,n,8,1
:0
-----

COM Port Settings
COM port number<Port Number:1~4, 0:exit>
:0
-----

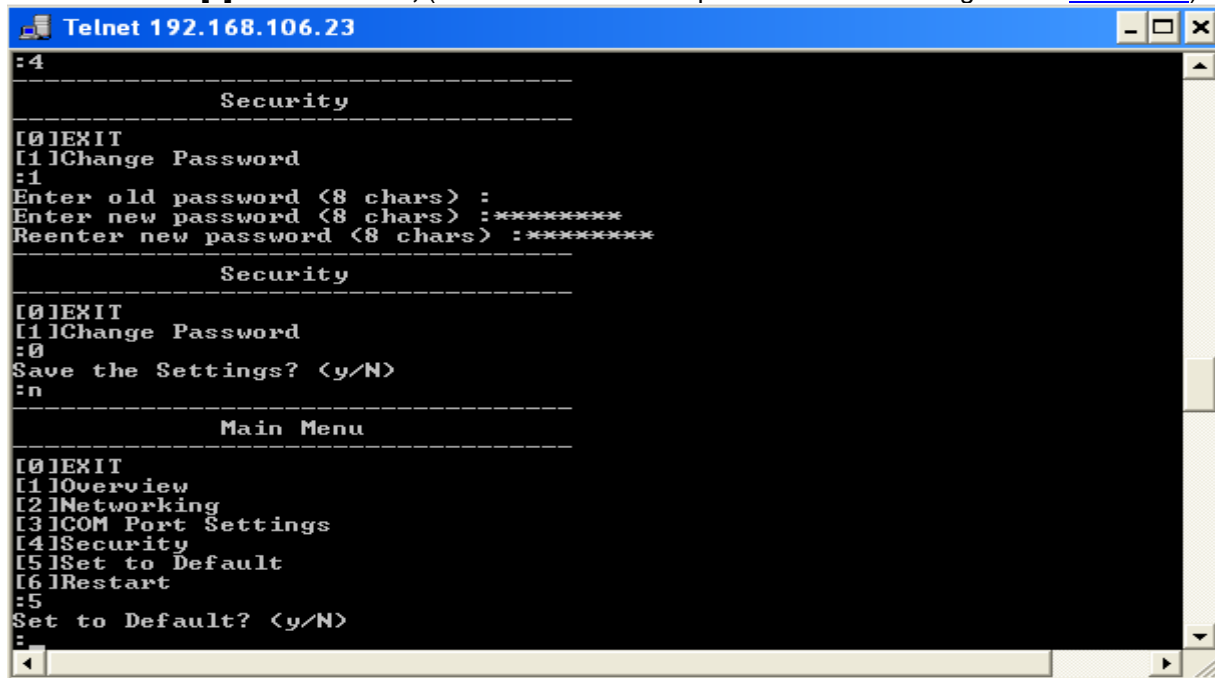
Main Menu
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:4
-----

Security
[0]EXIT
[1]Change Password
:1
Enter old password <8 chars> :
Enter new password <8 chars> :*****
Reenter new password <8 chars> :*****
```

Apx. 19

Reset to Factory Defaults

Main Screen → [5] Set to Default, (a more detailed description of this section is given on [Sec. 3.8.8](#))

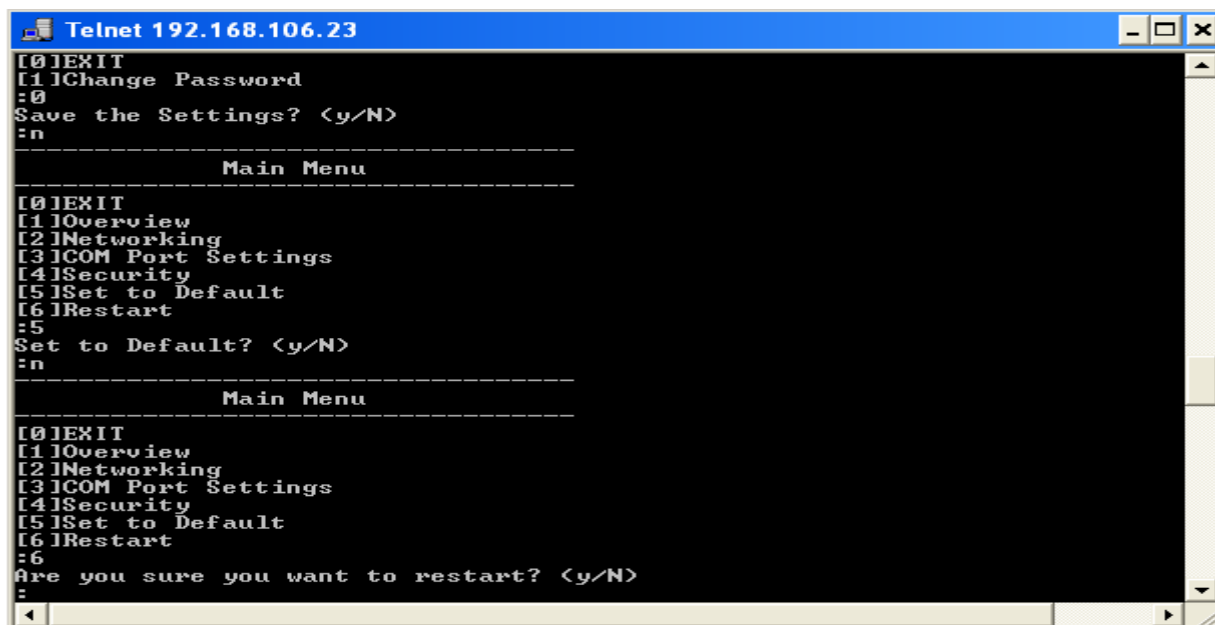


```
Telnet 192.168.106.23
:4
-----
Security
-----
[0]EXIT
[1]Change Password
:1
Enter old password (8 chars) :
Enter new password (8 chars) :*****
Reenter new password (8 chars) :*****
-----
Security
-----
[0]EXIT
[1]Change Password
:0
Save the Settings? (y/N)
:n
-----
Main Menu
-----
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:5
Set to Default? (y/N)
:
```

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Restart

Main Screen → [6] Restart, (a more detailed description of this section is given on [Sec.3.9](#))



```
Telnet 192.168.106.23
[0]EXIT
[1]Change Password
:0
Save the Settings? (y/N)
:n
-----
Main Menu
-----
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:5
Set to Default? (y/N)
:n
-----
Main Menu
-----
[0]EXIT
[1]Overview
[2]Networking
[3]COM Port Settings
[4]Security
[5]Set to Default
[6]Restart
:6
Are you sure you want to restart? (y/N)
:
```

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9 Warranty

Limited Warranty Conditions

Products supplied by SAN., are covered in this warranty for undesired performance or defects resulting from shipping, or any other event deemed to be the result of SAN's activities. The warranty doesn't cover however, equipment which has been damaged due to accident, misuse, abuse, such as:

- Use of incorrect power supply, connectors, or maintenance procedures
- Use of accessories not sanctioned by us
- Improper or insufficient ventilation
- Improper or unauthorized repair
- Replacement with unauthorized parts
- Failure to follow Our Operating Instructions
- Fire, flood, "Act of God", or any other contingencies beyond our control.

Limited Liability

SAN shall not be held responsible for any consequential losses from using our products.

Warranty

1 years Bring in Warranty