SC5404D Series

4-Port DIN-Rail Serial Device Server

User's Manual

Version 0.1

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IMPORTANT ANNOUNCEMENT

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Thank you for purchasing SE5404D Serial Device Server product. This document intends to provide customers with brief descriptions about the product and to assist customers to get started. For detail information and operations of the product, please refer to the product user's manual in the product CD or diskette.

FCC WARNING

Class A for Serial Device Server (Model SE5404D series)

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expenses.

A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord can be used.

Use only shielded cables to connect other devices to this equipment by RS-232 or RS-485 ports.

Be cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Contents

1. Introduction

Many industrial and Commercial devices equipped with slow serial communication ports—RS-232, RS-485, and RS-422—are limited in their transmission distance of 15 m. Examples of these devices are PLC controllers, card readers, display signs, security controls, CNC controller, etc. ATOP Technologies has overcome the limit with a family of SE5404D Series Serial Device Servers. The SE5404D sever family is designed to transmit data between one-or-more serial device and one-or-more TCP/IP device through Ethernet, and hence enhance the accessibility of the serial device through the ubiquitous TCP/IP based Ethernet.

Of the SE series, the SE5404D is for RS-232/RS-422/RS-485 9 pin D-Sub without isolation protection built-in and SE5404D-TB is for RS-422/RS-485 5 pin Terminal Block without isolation protection built-in, while SE5404D-Sis is for RS-422/ RS-485 with built-in isolation protection.

1.1 Packaging

Please check your package contains the following items:

- ◎ SE5404D/ SE5404D-TB / SE5404D-Sis Serial Device Server
- ◎ Quick Start Guide with Warranty Card
- ◎ Product CD
- ◎ 7-pin Terminal Block (2ESDV-07P) x1
- ◎ Four 5-pin Terminal Block for COMs (SE5404D-TB / SE5404D-Sis only)

Optional Accessories		
Name	Part Number	Description
WMK-459-Black	202EH731000003G	Metal Wall Mount Kit, Black
CDK-459-Silver	201EH731000005G	Conductive metal DIN-Rail Kit, Silver
CBL-RJ45(8P)-DB9(F)-90-C	50891971G	90cm RJ-45 to DB9 female console cable
GDC-120	59906861G	120mm copper woven grounding cable
US315-12(US) Power Adapter	50500151120009G	Y-Type (5.08 mm) power adaptor, 100-240VAC input, 1.25A @ 12VDC output, US plug
US315-12(EU) Power adapter	50500151120019G	Y-Type (5.08 mm) power adaptor, 100-240VAC input, 1.25A @ 12VDC output, EU plug

1.2 Application Connectivity

TCP Server Mode：SE5404D can be configured as a TCP server on TCP/IP Network to wait for other applications (clients) in host computer to establish a connection with the serial device. After the connection is established between serial device and host computer, data can be transmitted in both directions Figure 1.1.

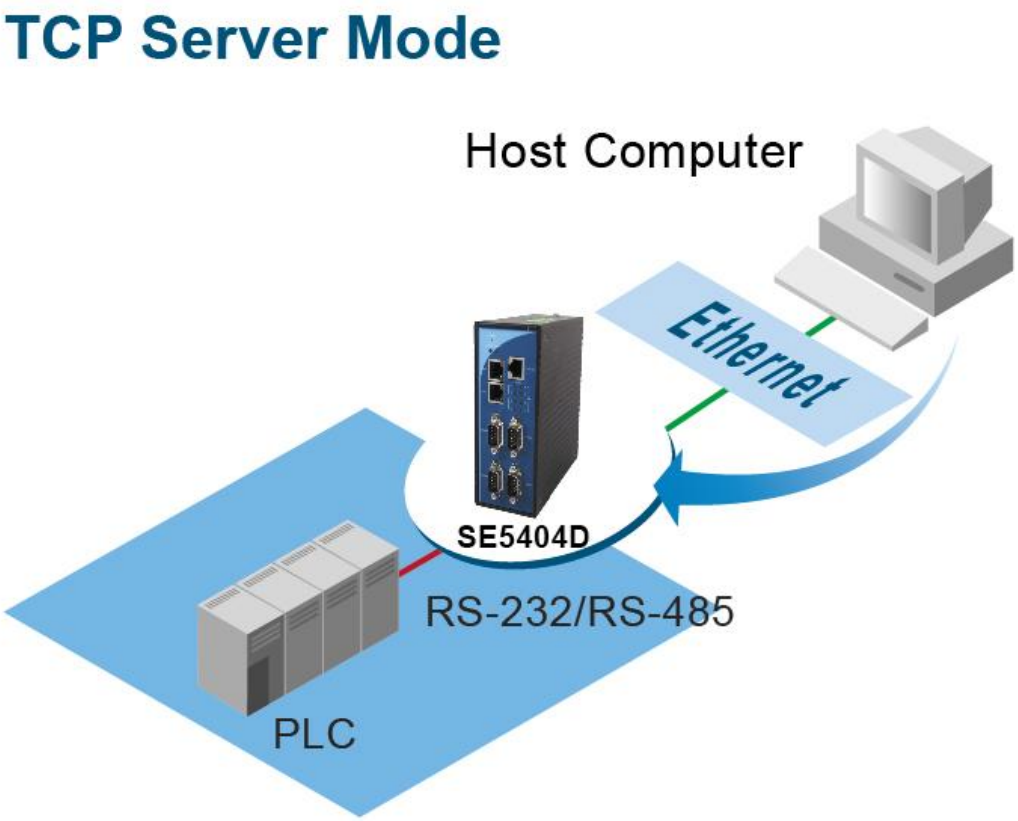


Figure 1.1 TCP Server Mode

TCP Client Mode：SE5404D can be configured as a TCP client on TCP/IP Network to actively establish a connection with other applications(server) in host computer. After the connection is established, data can be transmitted between serial device and host computer in both directions (Figure 1.2).

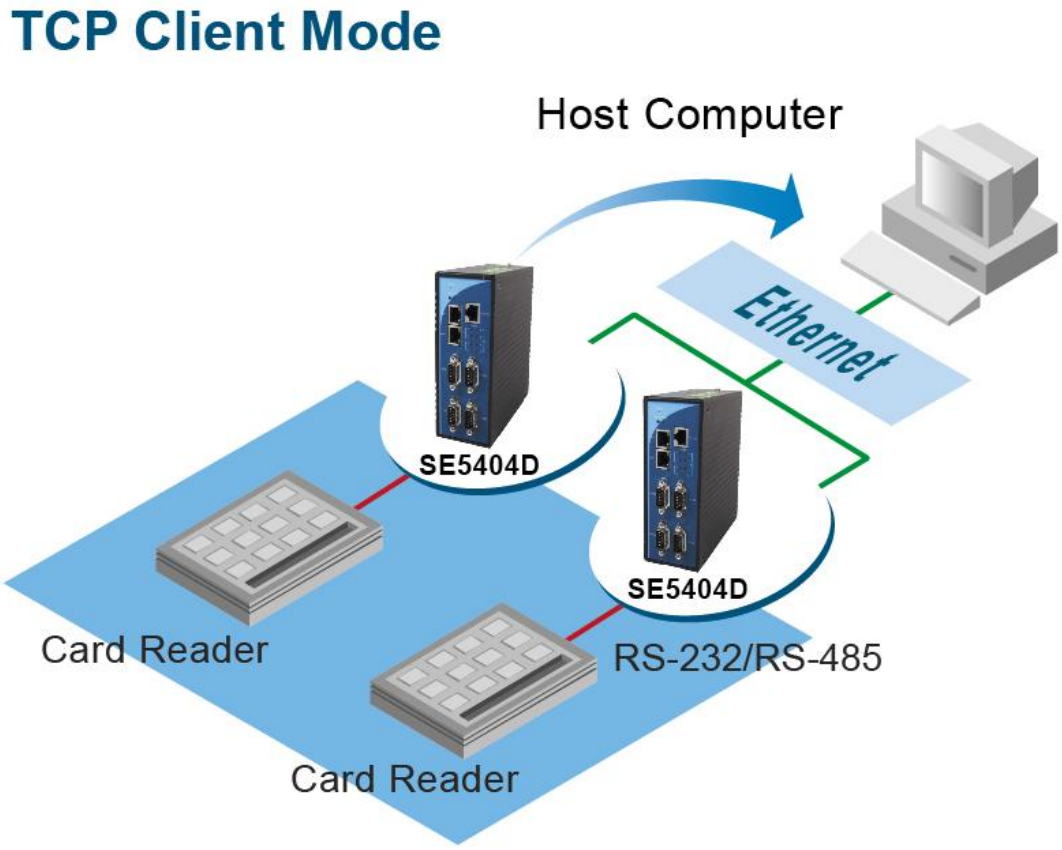


Figure 1.2 TCP Client Mode

UDP Mode：UDP is a faster but non-guaranteed datagram delivery protocol.SE5404D can be configured as a UDP mode on TCP/IP Network to establish a connection using unicast data from the serial device to one or multiple host computers (Figure 1.3) Vice versa is also true.

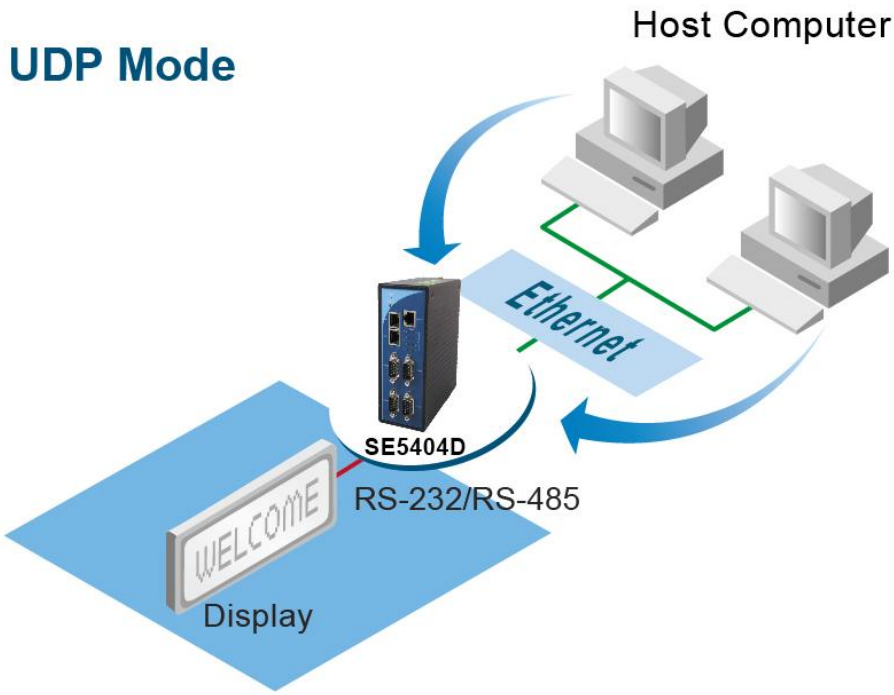


Figure 1.3 UDP Mode

Tunneling Mode: You can manually pair up two Atop serial servers using TCP Server and TCP Client modes and our server would transparently bridge between your serial devices.

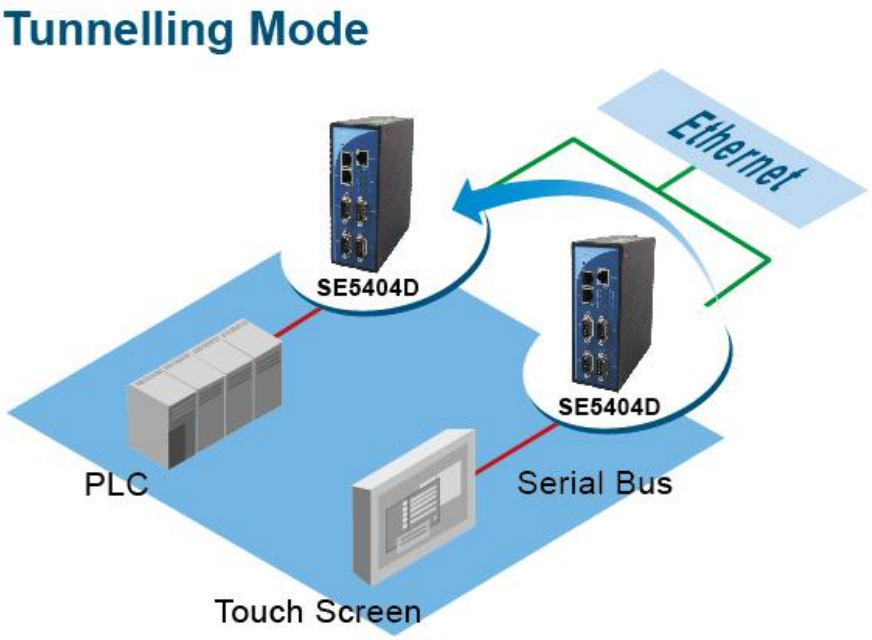


Figure 1.4 Tunneling Mode

2. Hardware Setup

NOTE:

1. **SE5404D** (RS-232/422/485 DB9 without isolation),
2. **SE5404D-TB** (RS422/485 TB5 with isolation)
3. **SE5404D-Sis** (RS422/485 TB5 with isolation)
4. You can press the **Default** button of SE5404D to reset the settings to the default value

Figure 2.1 Show the names of SE5404D components.

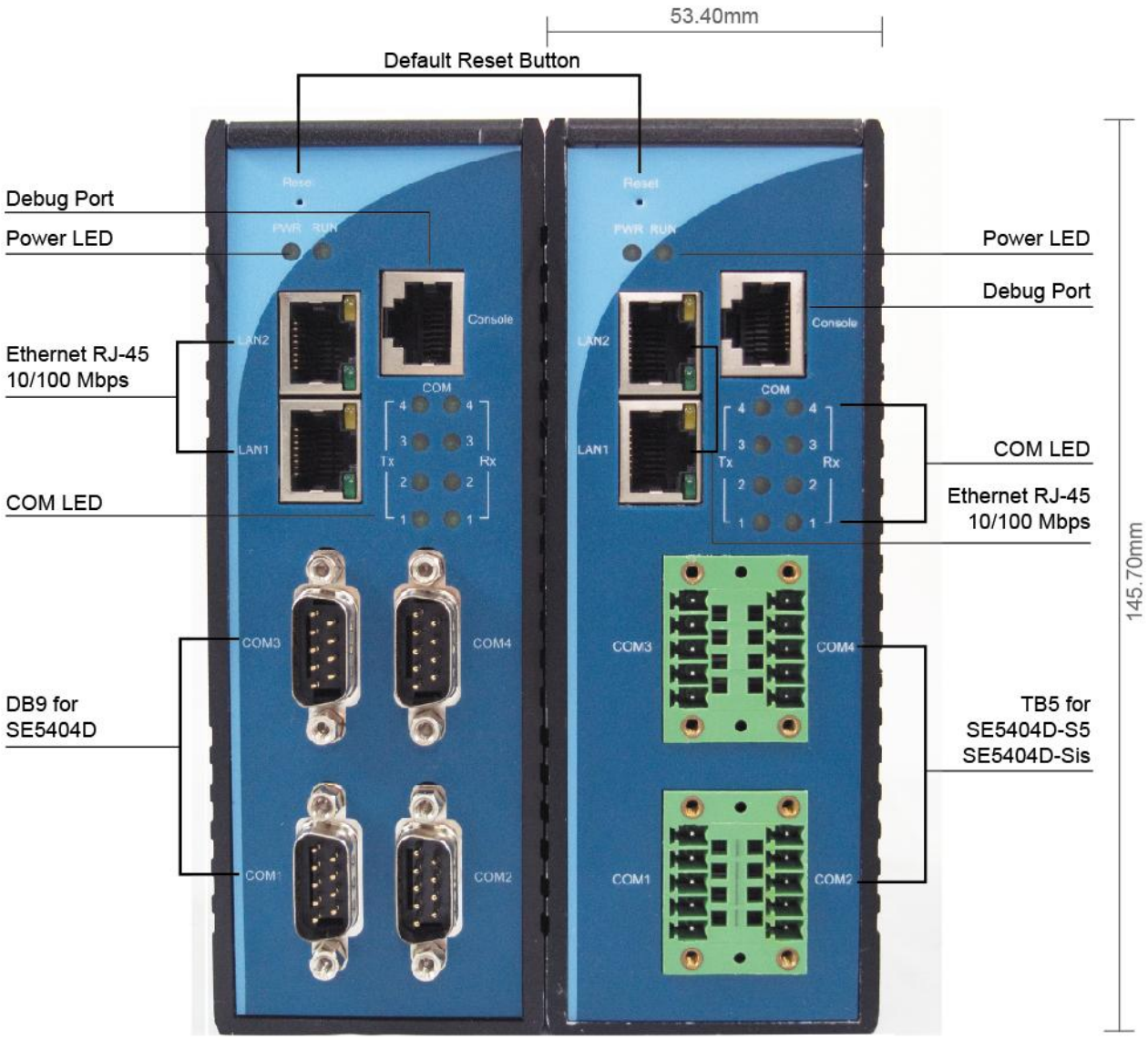


Figure 2.1 Front Panel Interfaces

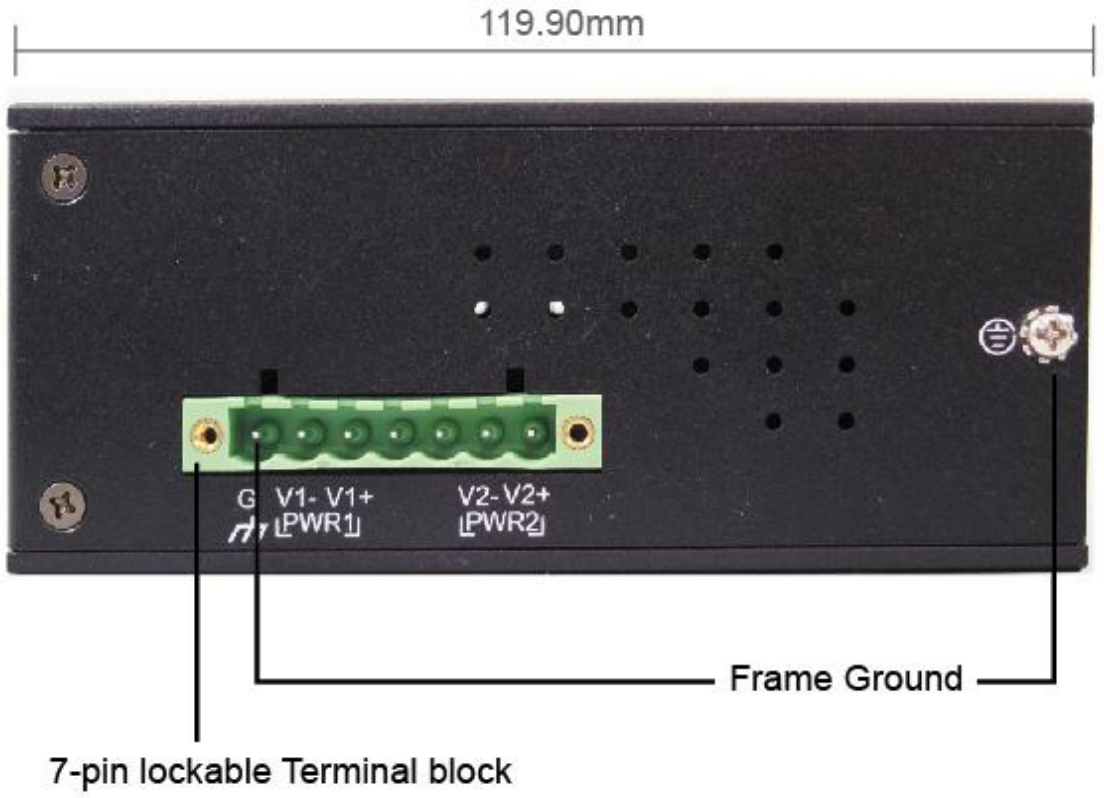


Figure 2.2 7-Pin Terminal Block DC Power on Top Plate

Attention

This product is intended to be grounded properly. Please do so via the Frame Ground.

2.1 LED Indicators

Name	Color	Status	Description
Power	Green	Off	Power is not connected
		On	Power is connected
LAN	Green	Off	Ethernet Disconnected
		Blinking	Data is transmitting on Ethernet for 100Mbps
	Orange	Blinking	Data is transmitting on Ethernet for 10Mbps
COM	Green	Off	No data is transmitting on COM port
		Blinking	Data is transmitting on COM port
RUN	Green	Off	System is not ready or halt

		Blinking	AP firmware is running normally

2.2 Installation Procedures

Step 1: Connect SE5404D to power source

Step 2: Connect SE5404D to the Ethernet network. Use a standard straight-through or cross-over Ethernet cable Always make sure the PC is on the same network subnet as SE5404D.

Step 3: Connect SE5404D's serial port to a serial device.

Step 4: Mount SE5404D to a Din Rail.

Attention

Disconnect the device from power source completely before installing and wiring the server.

Do not exceed the maximum allowable current of the power cord and common wire. Applying the wire over its specification would cause the wire to overheat and cause serious damage to the connected and neighboring equipment.

The casing could become too hot to touch when operating in harsh environments. Please handle with care.

RESTRICTED ACCESS AREA: The equipment should only be installed in a

Restricted Access Area.

3. Software Setup

SE5404D Serial Device Server is shipped with default settings shown in the following table:

Property		Default Value
LAN1	IP Address	**10.0.50.100**
	Gateway	**10.0.0.254**
	Subnet Mask	**255.255.0.0**
LAN2	IP Address	**192.168.1.1**
	Gateway	**192.168.1.254**
	Subnet Mask	**255.255.255.0**
User Name		**admin**
Password		**null (leave it blank)**
COM (1/2/3/4)		9600,None, 8, 1, No Flow Control, Serial packet delimiter enabled
COM (1/2/3/4)Link Mode		Type: TCP Server, Listen port 4660, Filter=0.0.0.0, Virtual COM disabled
SysName of SNMP		name
SysLocation of SNMP		location
SysContact of SNMP		contact

3.1 Configuration by SerialManager Utility

3.1.1.Static IP

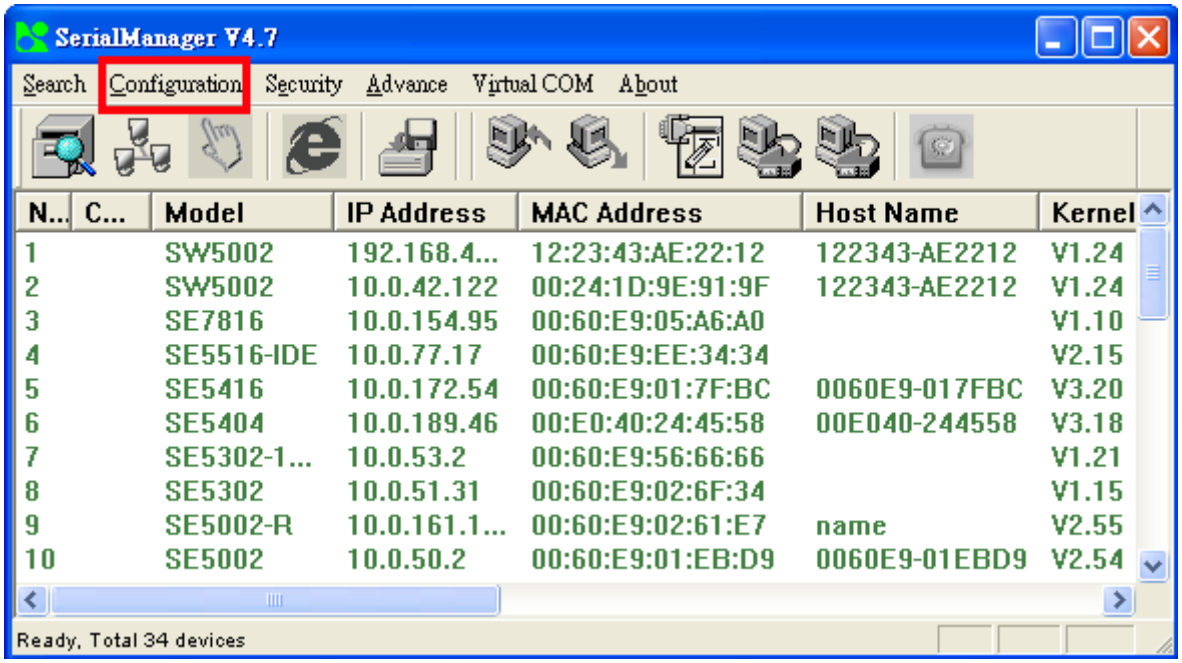


Figure 3.1 Configure by SerialManager Utility

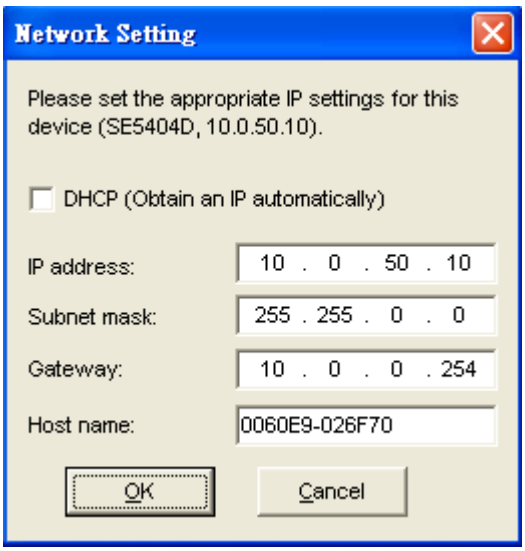


Figure 3.2 Static IP setup dialog window

3.1.2 DHCP client (Dynamic IP)

A DHCP server can automatically assign the IP address and network settings. SE5404D supports the DHCPclient function. By default, the DHCP client function on SE5404D is disabled; one can client use SerialManager Utility software to search network information automatically by putting a check on **Auto IP** on Dialog window. (ref Figure 3.1)SE5404D (Figure 3.2) (ref Figure 3.3)SE5404D

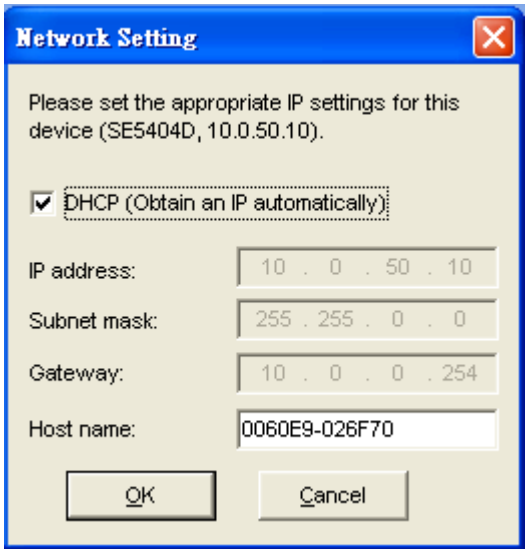


Figure 3.3 SerialManager Utility Auto IP

3.2 Telnet Configuration

One may also use Telnet utility to change configuration settings.

- Open MS-DOS command prompt window or other telnet tools
- Enter the "Telnet IP_address" (For example, Telnet 10.0.50.100). The system will prompts for a user and password, the default User is "admin" and password is Null *(Leave it blank)*.

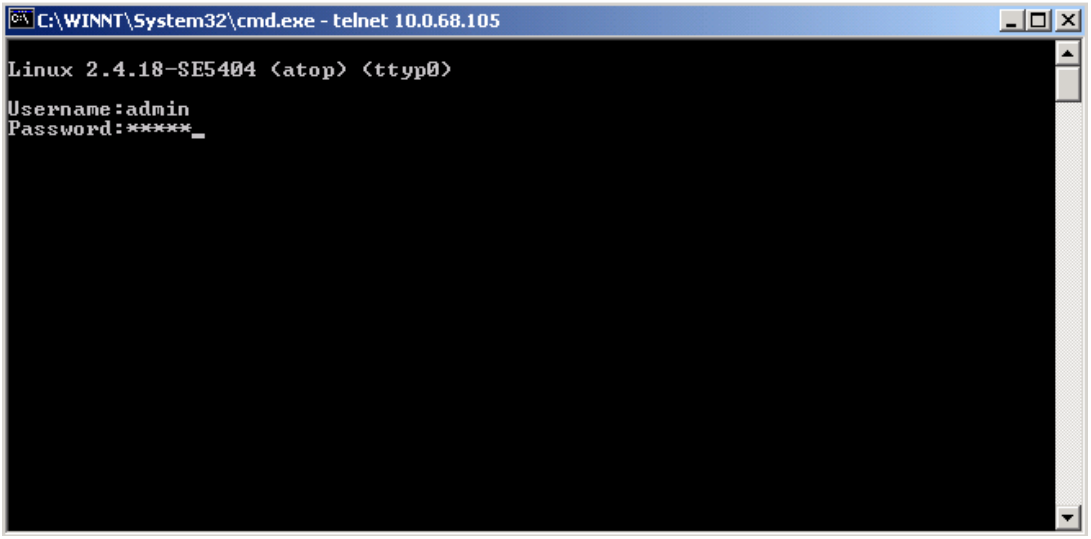


Figure 3.4 System Login by Telnet

Then the following main menu shall appear.

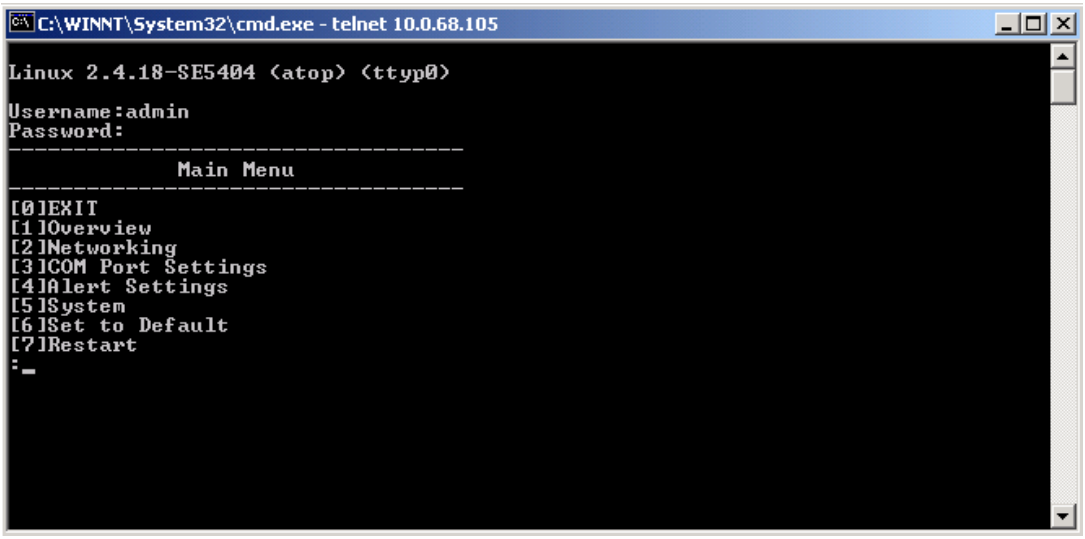


Figure 3.5 Main menu of Telnet

❋ **Note: If the Serial Server does not receive any command within 3 minutes, Telnet will be terminated automatically.**

3.2.1 General Information

Operation: Main→[1]Overview

This system overview window gives the general information on Ethernet, MAC address, kernel and AP version,ERPS, spanning tree.

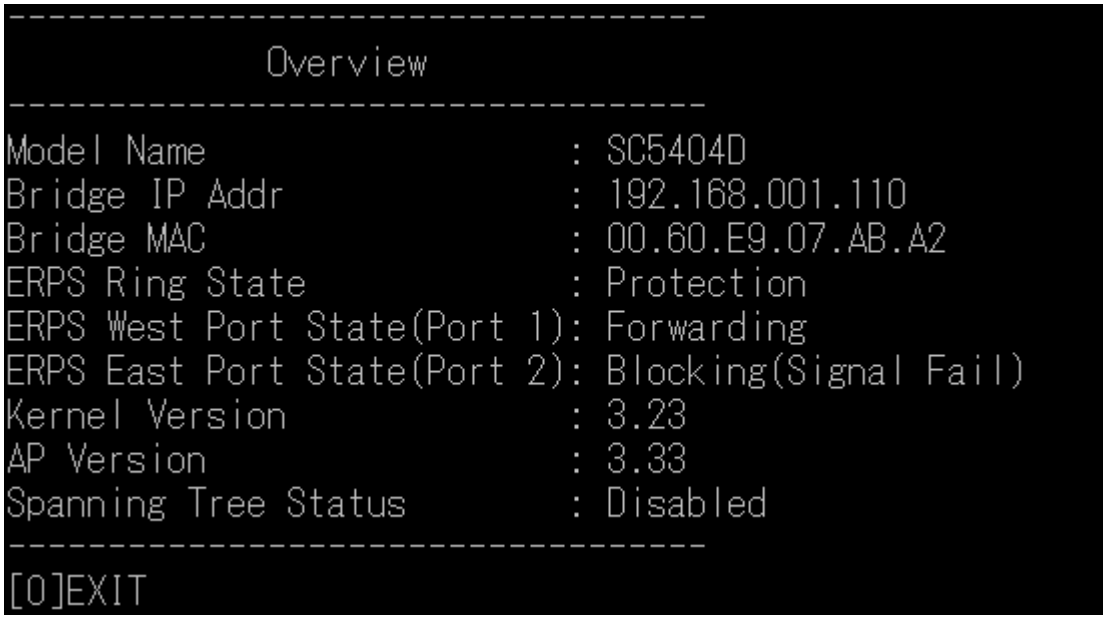


Figure 3.6 Overview Information by Telnet

3.2.2 Networking Configuration

Operation: Main→[2]Networking

This section allows for changes in **IP address, subnet mask, gateway IP address and SNMP** information. Please note that setting changes will not take effect until the device is restarted.

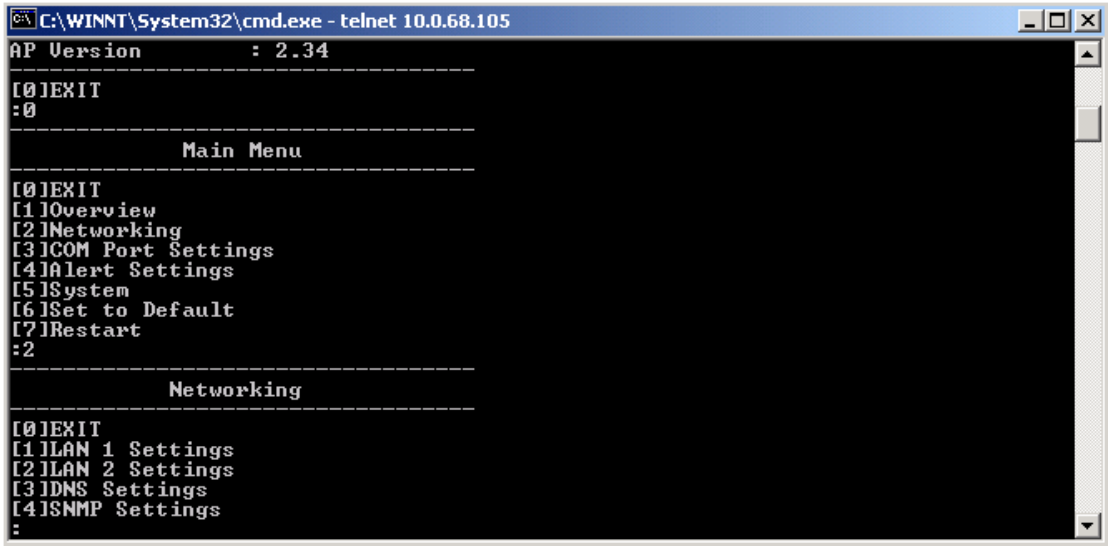


Figure 3.7 Network Settings by Telnet

❋ **Note: Press "*ESC*" key to return to the previous menu**

3.2.3 LAN Settings

Operation: Main→[2]Networking→[1]LAN 1 Settings

Enter "***LAN 1 settings***", and there is all information at this section about IP address, gateway, subnet mask and IP mode (static/DHCP) of LAN 1.

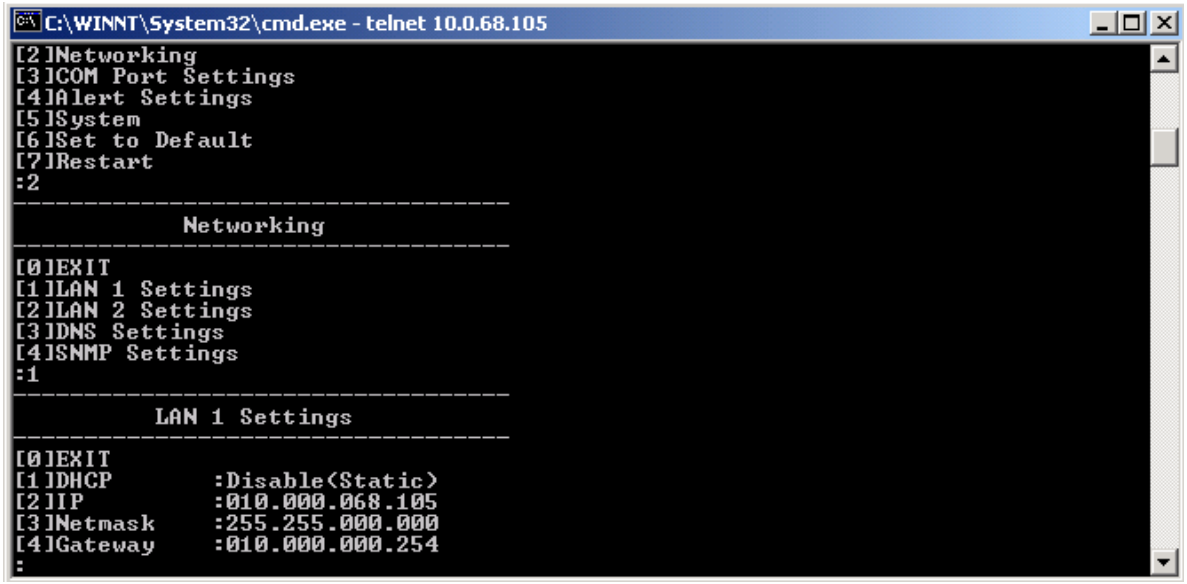


Figure 3.8 LAN 1 Settings by Telnet

Operation: Main→[2]Networking→[2]LAN 2 Settings

Enter "*LAN 2 settings*", and there is all information at this section about IP address, gateway, subnet mask and IP mode (static/DHCP) of LAN 2.

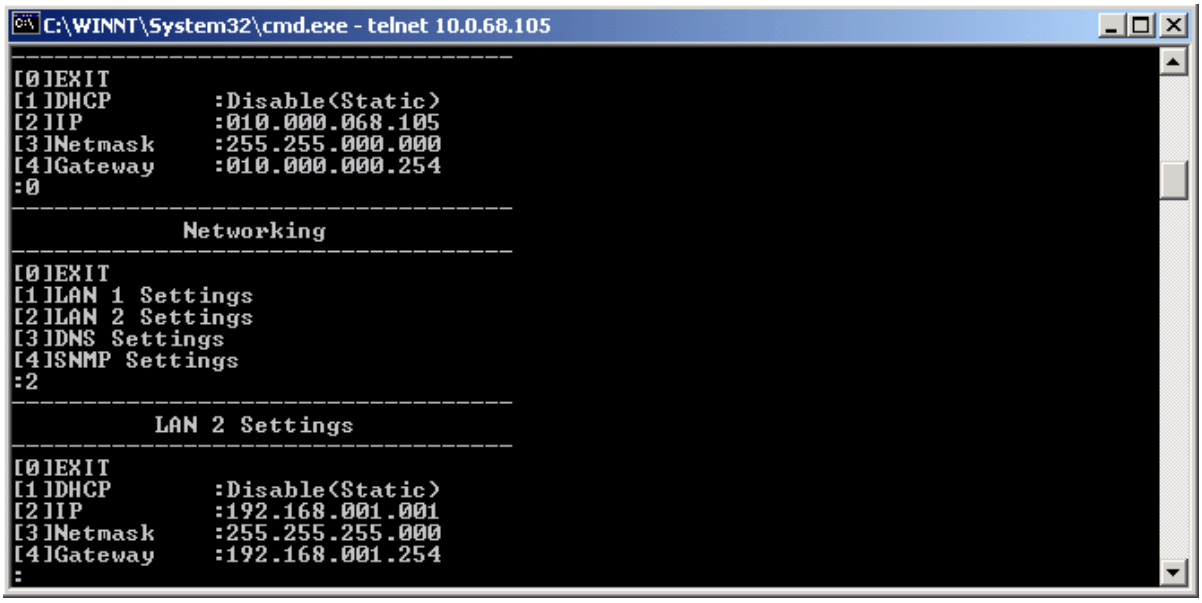


Figure 3.9 LAN 2 Settings by Telnet

3.2.4 DNS Settings

Operation: Main→[2]Networking→[3]DNS Settings

Serial Server is able to configure the DNS1 or DNS2 Server IP Address manually. Alternatively, you can set the Serial Server to receive DNS server IP address from DHCP server automatically by enabling the DHCP of "***LAN 1 Settings***".

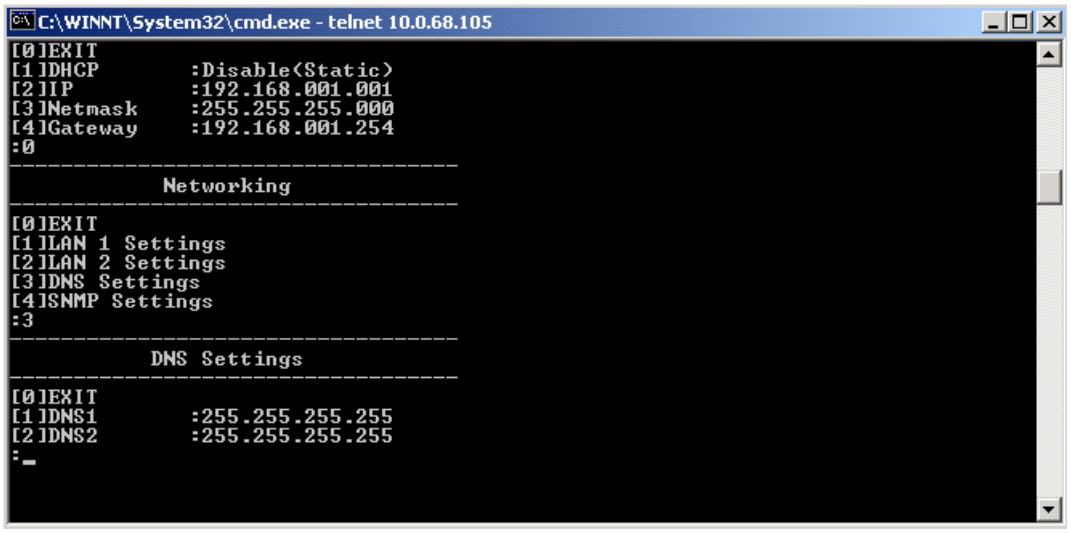


Figure 3.10 DNS Settings by Telnet

3.2.5 DDNS Settings

Operation: Main→[2]Networking→[4]DDNS Settings

Serial Server allows the user to configure DDNS related parameters including DDNS status(Enable/Disable), user name, password and host name.

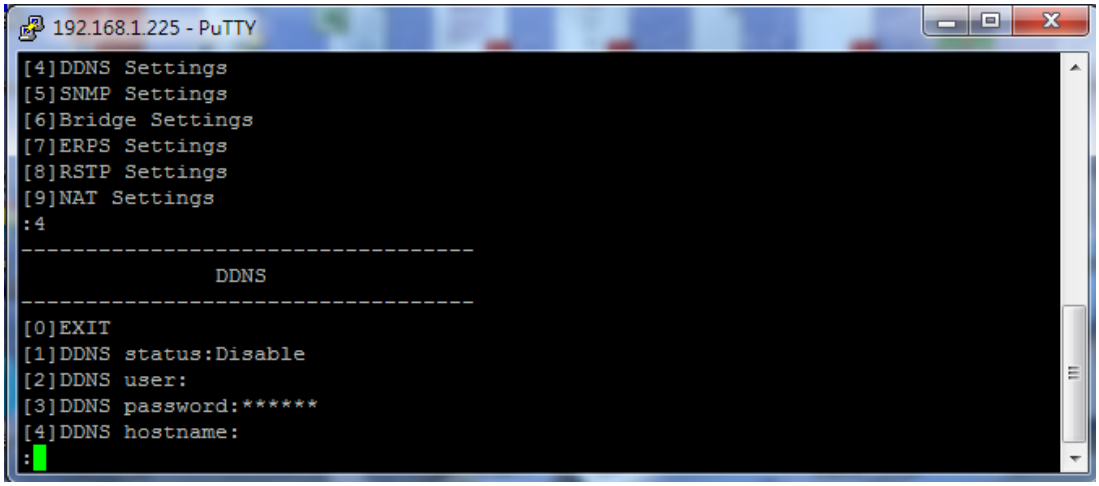


Figure 3.11 DDNS Settings by Telnet

3.2.6 SNMP Settings

Operation: Main→[2]Networking→[4]SNMP Settings

Serial Server allows the user to Enable or Disable the SNMP function by choose the "***[4] SNMP: Disable***" and select "***Enable***" to enable the **SNMP** operation. The changes will effective immediately.

Serial Server supports basic SNMP function about system MIB (Management Information Base). It is able to definite the SNMP Trap server, Read/Write Community, SysName (System Name), SysLocation (System Location) and SysContact (System Contact) via Telnet console.

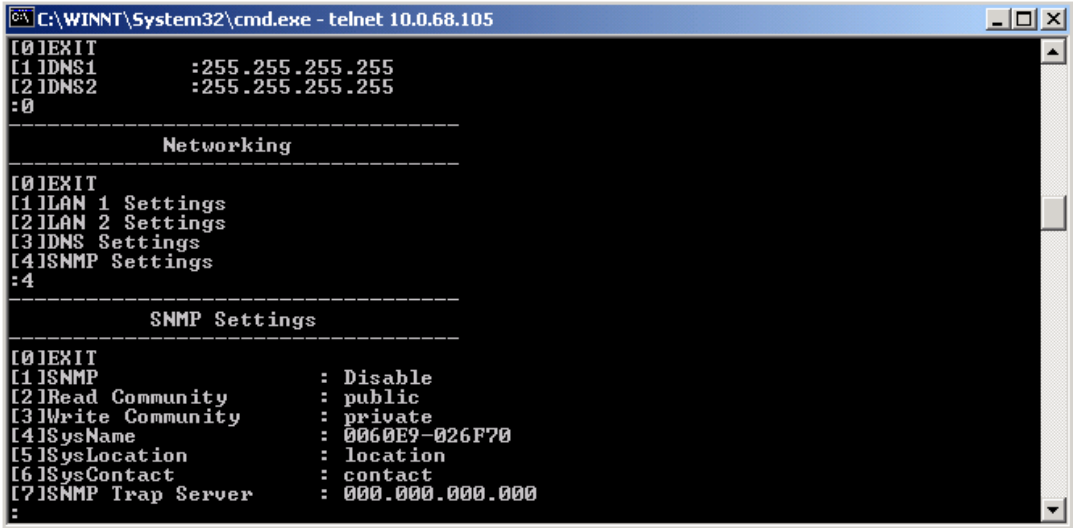


Figure 3.12 SNMP Settings by Telnet

3.2.7 Bridge Settings

Operation: Main→[2]Networking→[6]Bridge Settings

Bridge settings are used to configure the bridge function in the device. The bridge function integrates more one Ethernet interfaces as one bridge intenerate and forward traffic from one Ethernet traffic to other Ethernet interface. Enter “Bridge Settings”, and there is all information at this section about IP address, gateway, subnet mask and IP mode (static/DHCP) of Bridge.

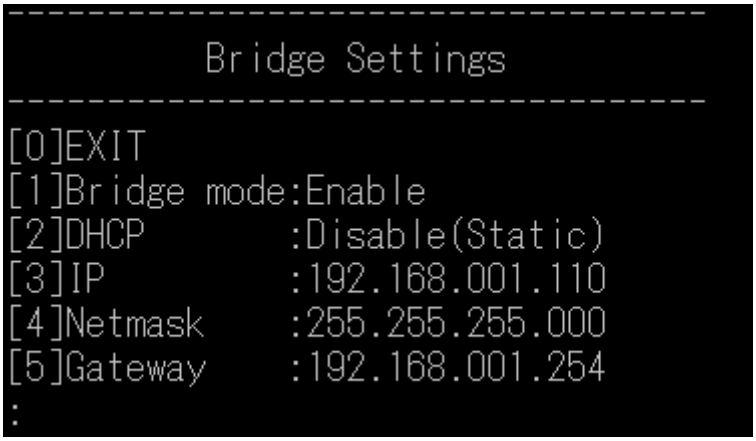


Figure 3.11 Bridge Settings by Telnet

3.2.8 ERPS Settings

Operation: Main→[2]Networking→[7]ERPS Settings

Serial Server supports ERPS function. It is able to definite ERPS status, RAPS VLAN, RPL owner, RPL port, WTR timer, holdoff timer, guard timer , MEL.

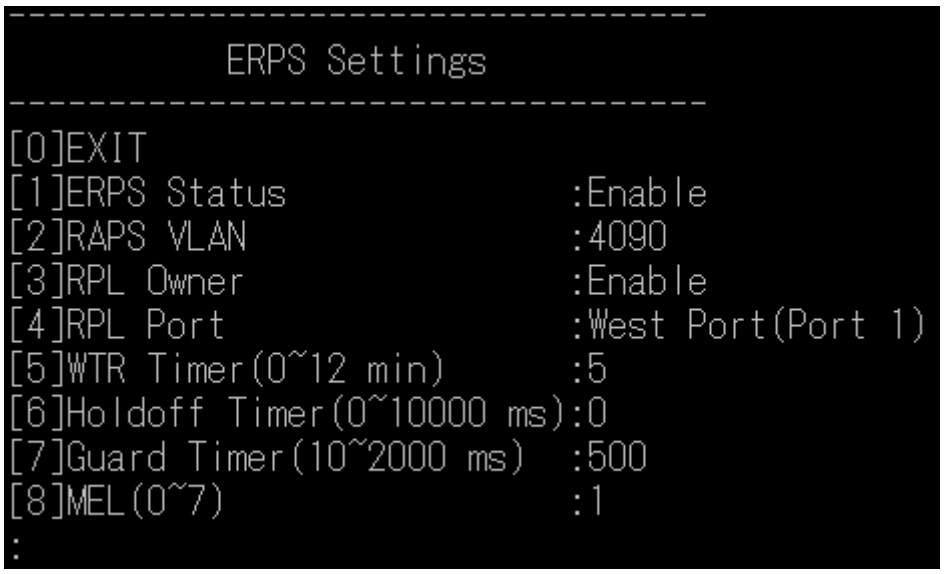


Figure 3.11 ERPS Settings by Telnet

3.2.9 STP Settings

Operation: Main→[2]Networking→[8]STP Settings

Serial Server supports STP function. It is able to definite spanning tree status, force version, priority, maximum age, hello time, forward delay, port1 path cost, port1 priority, port1 P2P, port1 Edge, port2 path cost, port2 priority, port2 P2P, port2 edge.

3.2.10 NAT Settings

Operation: Main→[2]Networking ->[9]NAT Settings

Serial Server supports NAT function. It is able to definite NAT status, virtual server port, virtual server destination IP, virtual server destination port.

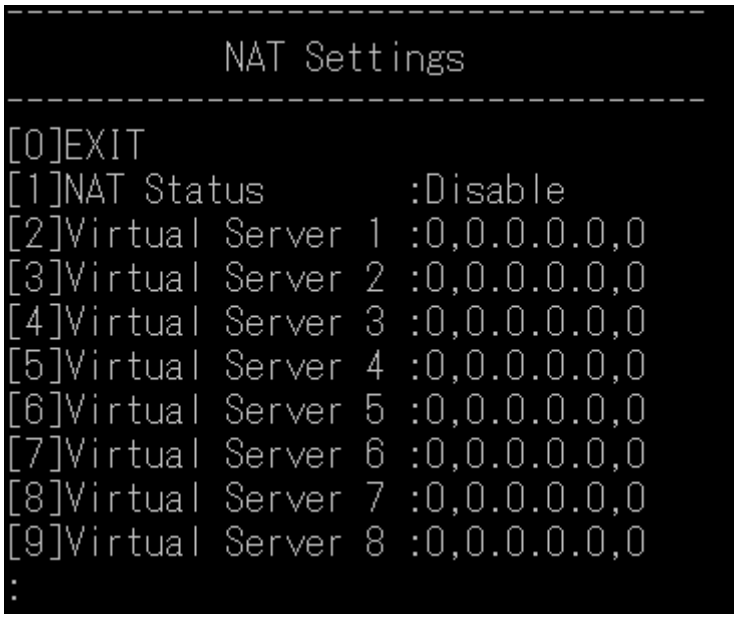


Figure 3.11 NAT Settings by Telnet

Figure 3.11 Virtual Server Settings by Telnet

3.2.7 GSM Module Configuration

Operation: Main→[3]GSM Module

Serial Server supports connecting Internet with GSM module. This section allows for changes in **GSM module status, Dial when reboot, COM port Settings, Phone number Settings and PIN Settings**. Please note that setting changes will not take effect until the device is restarted.

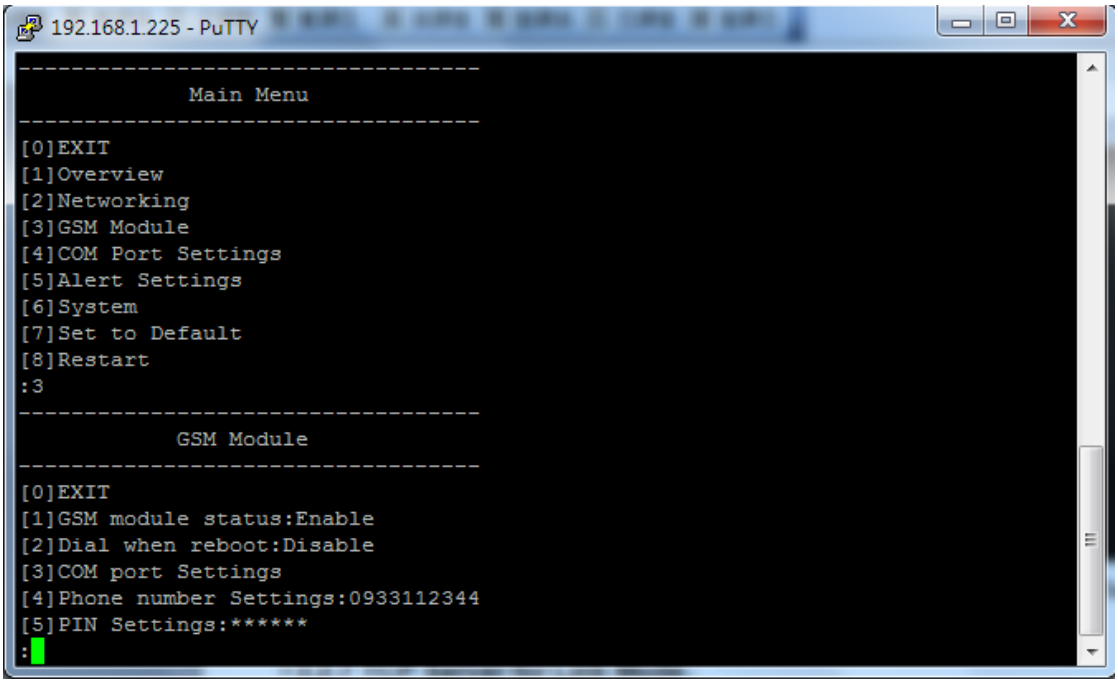


Figure 3.12 GSM Module Settings by Telnet

3.2.8 PPPOE Configuration

Operation: Main→[4]PPPOE

Serial Server supports connecting Internet with PPPOE. This section allows for changes in **Dial when reboot, PPPOE user, PPPOE password and PPPOE interface**. Please note that setting changes will not take effect until the device is restarted.

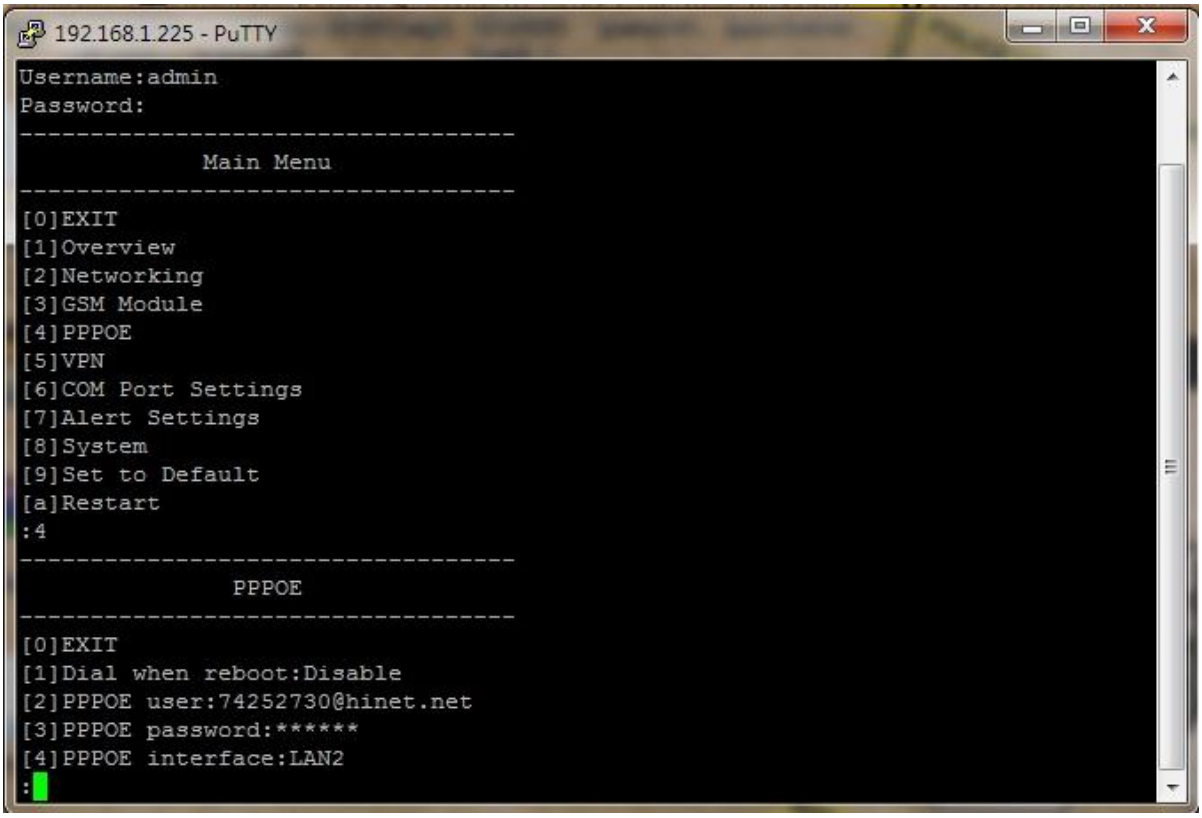


Figure 3.13 PPPOE Settings by Telnet

3.2.9 VPN Configuration

Operation: Main→[5]VPN

Serial Server supports VPN. This section allows for changes in **VPN state, VPN user, VPN password, VPN PSK, Local IP, Assign IP start, Assign IP end, VPN interface and Protect serial port server**. Please note that setting changes will not take effect until the device is restarted.

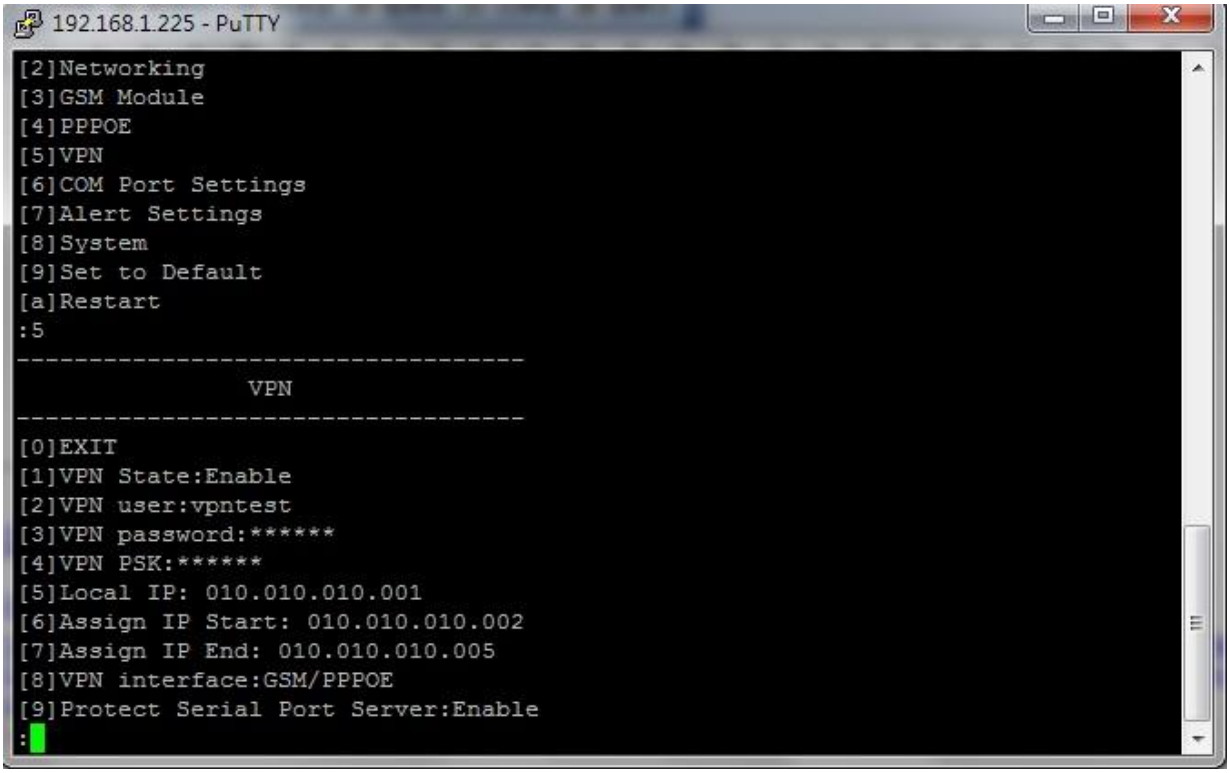


Figure 3.14 VPN Settings by Telnet

3.2.10 COM Port Configuration

SE5404D series allow one to configure the parameters of COM port including COM working mode, port parameters, enabling or disabling serial buffer's data and packet delimiter setting.

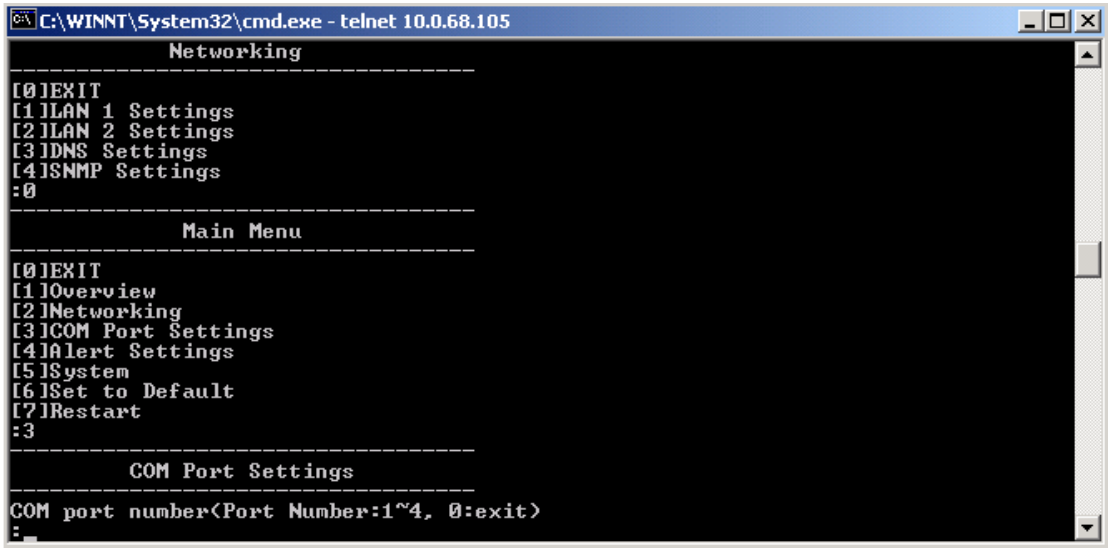


Figure 3.14 Select COM Port from Serial Settings by Telnet

3.2.10 TCP Server for Link Mode

Operation: Main→ [3]COM Port Setting→[1-16]Select Port→[1]Link Mode→[1]TCP Server

TCP Server mode is default setting for Link mode of serial settings, and it can be configured in a TCP server mode on an Ethernet Network to waiting for the host computers to establish a connection with the serial device (the client). After the connection is established, data can flow in both directions and can wait for connect request from remote PC with installed "serial-to IP" tool or counter-pair Serial server in tunneling mode. It needs to configure listening port to establish connection, Default Port number of Serial Server is 4660 and it is associated with the serial port COM1. After the application program being connected to the TCP port 4660 on the Serial Server, data of your application program are transparent to both COM1 and Serial Server.

IP filtering function is a simple ACL (Access Control List). Set FILTER_IP to "0.0.0.0" for disabling the "***IP filtering function***".

One may configure one or group IPs for source IP. If IP filter is enabled, only source IP assigned is connected to Serial Server.

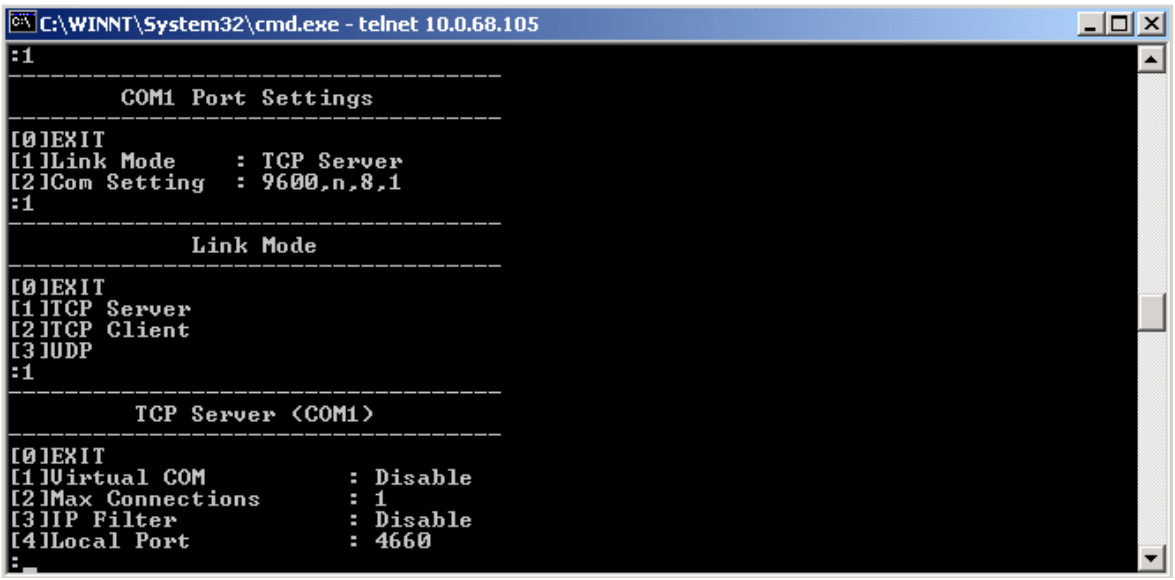


Figure 3.15 TCP Server for Link mode

❋ **Note: Enable Virtual COM mode if the remote site PC's "Serial to IP" tool installed.**

3.2.11 TCP Client for Link Mode

Operation: Main→ [3]COM Port Setting→[1-16]Select Port→[1]Link Mode→[2]TCP Client

On destination IP & port enter desired destination IP and port as a TCP client (For example, another serial server, or PC for data-collection). The Serial Server can support two destination host computers simultaneously.

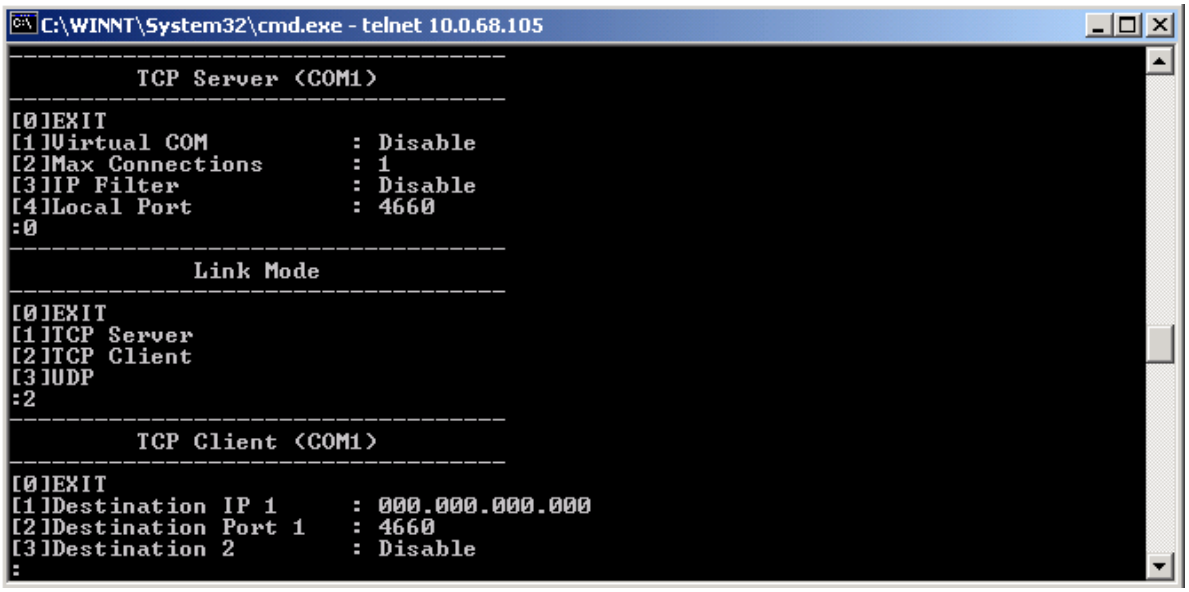


Figure 3.16 TCP Client for Link mode

3.2.12 UDP Link Mode

Operation: Main→ [3]COM Port Setting→[1-16]Select Port→[1]Link Mode→[3]UDP

Serial Server can be configured in a UDP mode to establish connection using uni-cast or broadcast the data from the serial device to one or multiple host computers. Vice versa is also true. For example, The original RS-422/ RS485 bus is transferred and extended connecting distance by serial servers, The destination IP is assigned by single IP or group IPs, The configuration is limited by the Local Listening Port (For example, on the COM1 of Serial Server listening port is 4660 which receive data sending from the host computer)

Serial Server can support up to 8-group IPs for UDP connection, if users needed.

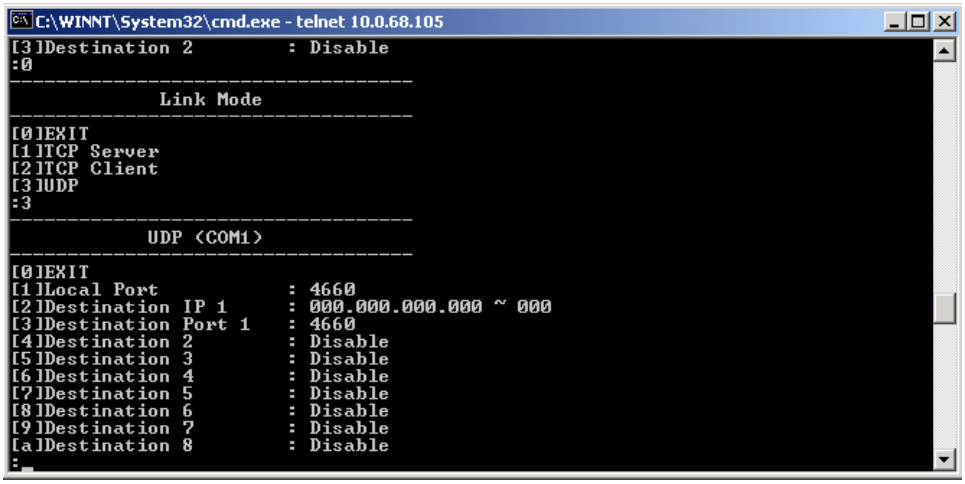


Figure 3.17 UDP for Link mode

❋ **Note: UDP mode doesn't support Virtual COM mode yet.**

3.2.13 Serial Settings

Operation: Main→ [3]COM Port Setting→[1-16]Select Port→[2]Com Settings

❋ **Here one may configure baud rate, parity, data bit, stop bit, flow control, and UART mode as defined by the user.**

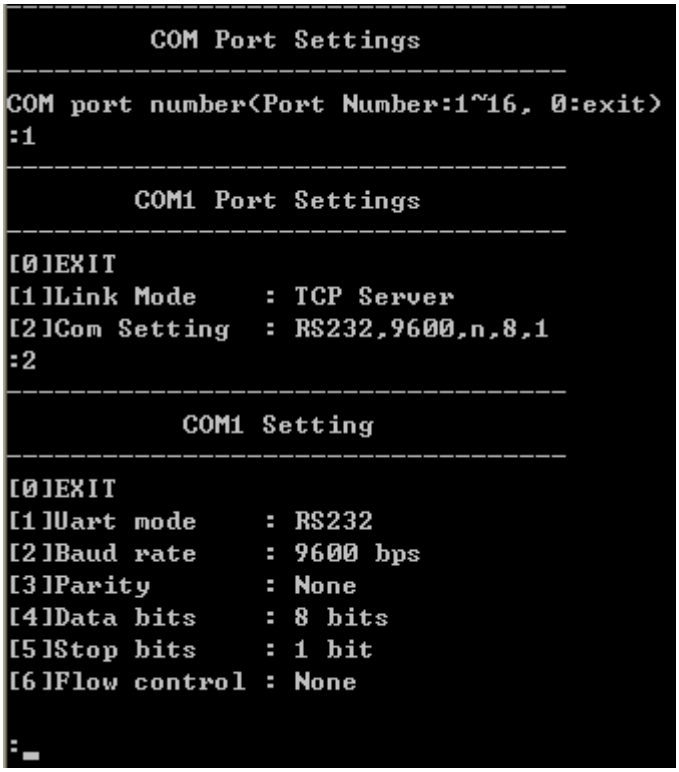


Figure 3.18 Serial Setting by Telnet

3.2.14 Alert Settings

There are two subsystem settings include E-mail and Alert Event.

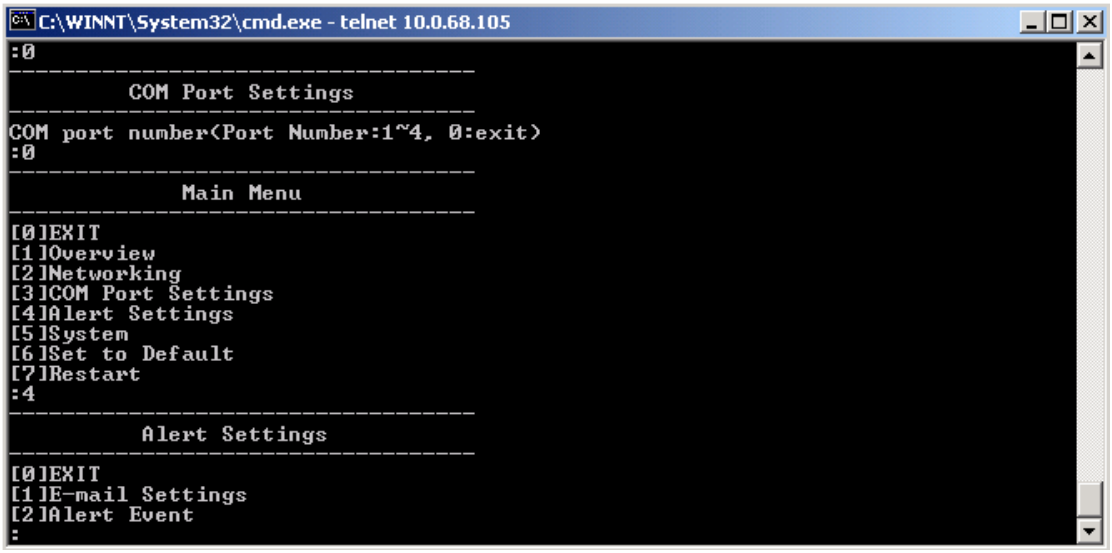


Figure 3.19 Alert Settings by Telnet

3.2.15 Configuring E-mail

Operation: Main→ [4]Alert Settings→[1]E-mail Settings

One may configure the "***Sender's E-mail address***" that it should have on the SMTP server (Mail Server) where allowed to sent out the email by sender's E-mail address. The SE5404D allow to definite the receiver up to 5. Also the E-mail notification will be sent to the e-mail account their obtained in "Receiver's E-mail address 1", "Receiver's E-mail address 2", "Receiver's E-mail address 3", "Receiver's E-mail address 4" and "Receiver's E-mail address 5".

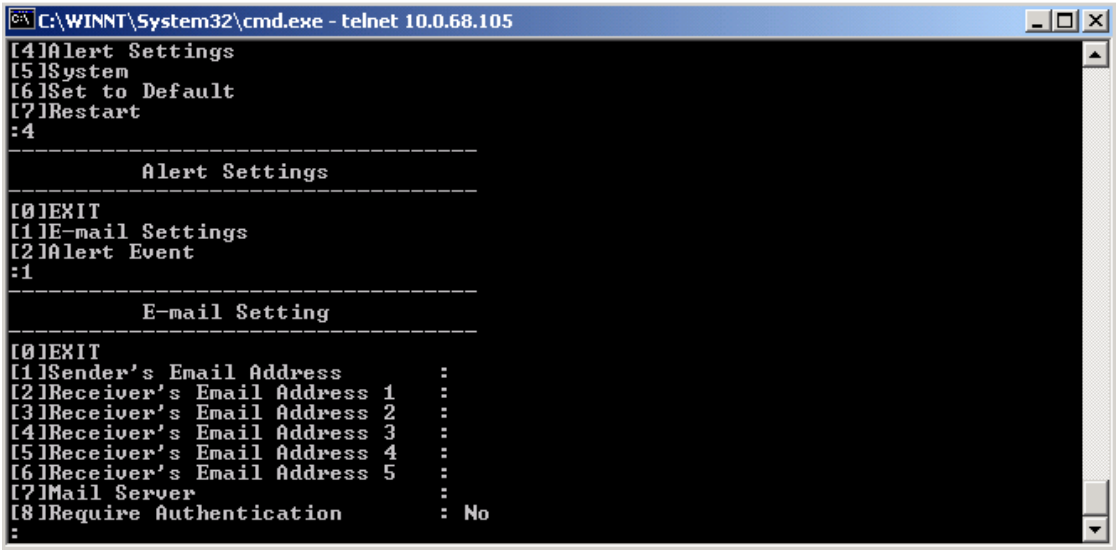


Figure 3.20 Configuring E-mail by Telnet

One may configure Mail Server and checking on "***My mail server requests authentication***" field to obtain User name and Password.

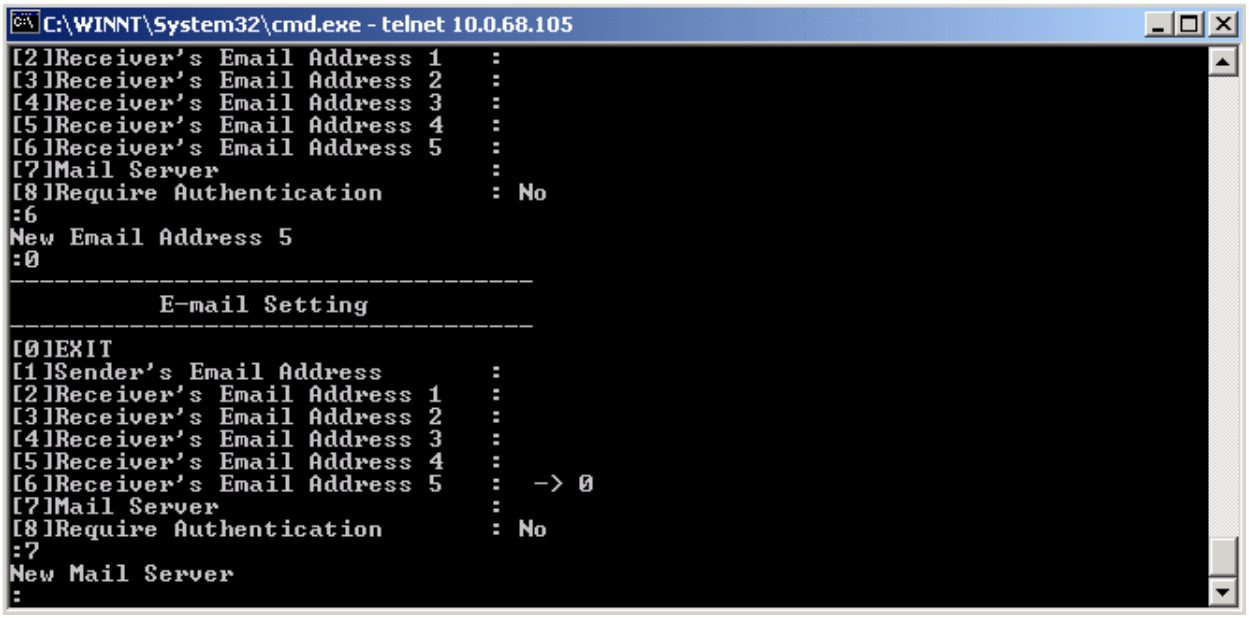


Figure 3.21 Configuring Mail Server by Telnet

3.2.16 Configuring Alert Event

Operation: Main→ [4]Alert Settings→[2]Alert Event

Choose the Alert event to configure SE5404D Series to send the alert notification by E-Mail, SNMP Trap or SMS(See Fig. 3.27).

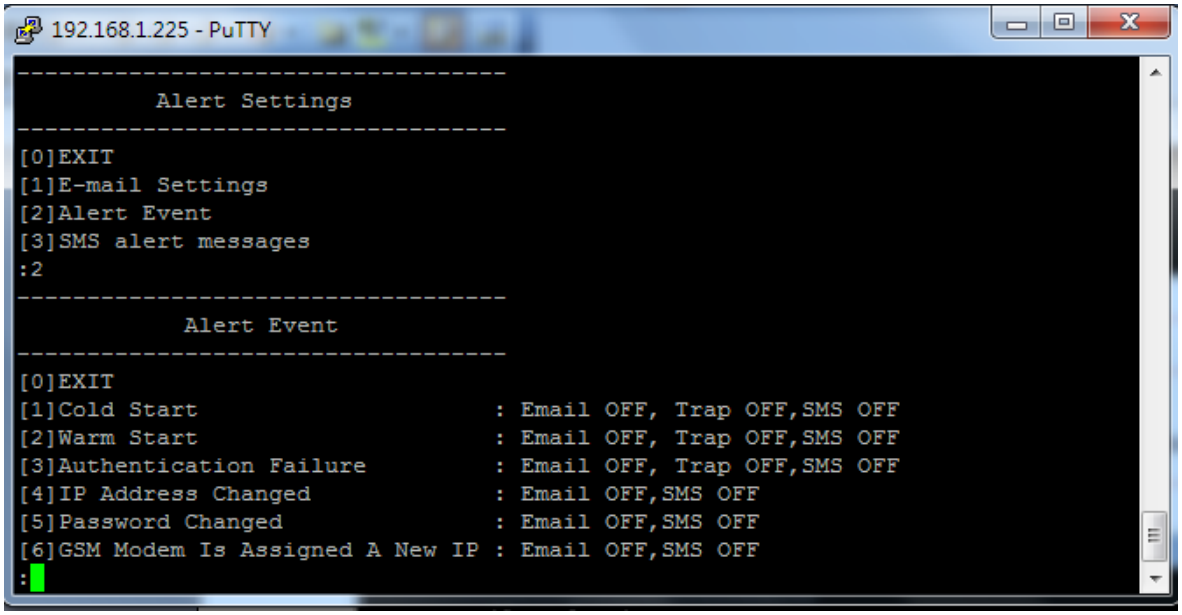


Figure 3.22 Configuring Alert Event by Telnet

3.2.17 SMS Alert Messages

Operation: Main→ [4]Alert Settings→[3]SMS alert messages

Choose the SMS alert messages to configure what text you want to send in different alert event (See Fig. 3.28).

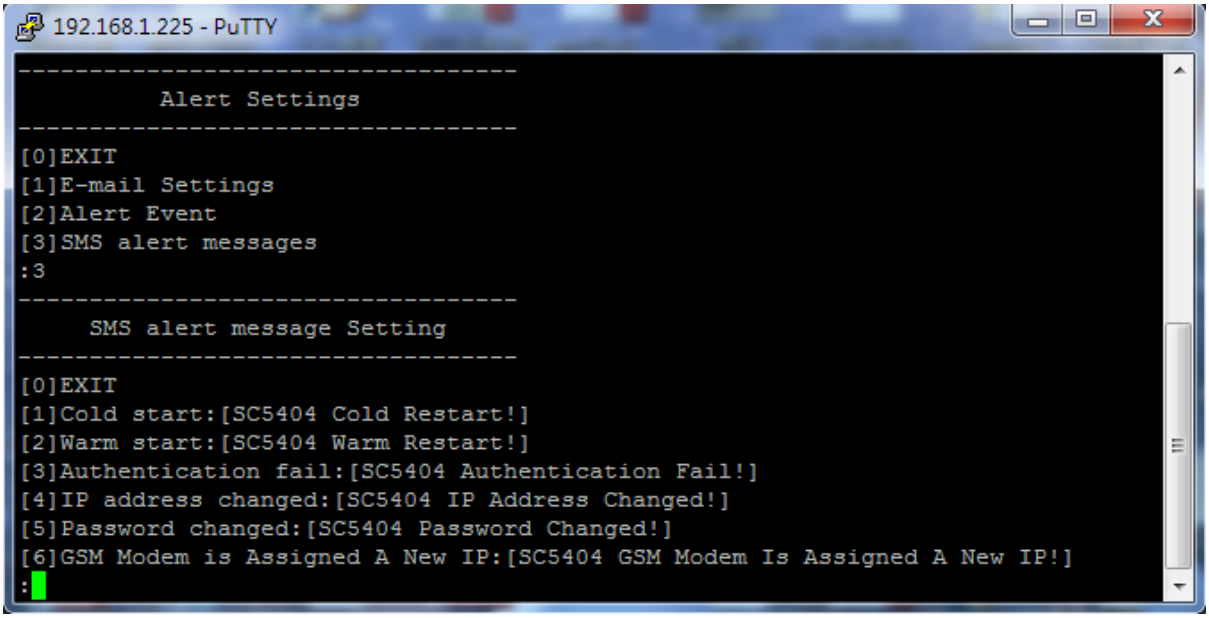


Figure 3.23 Configuring SMS Alert Messages by Telnet

3.2.18 System Configuration

Operation: Main→ [5]System

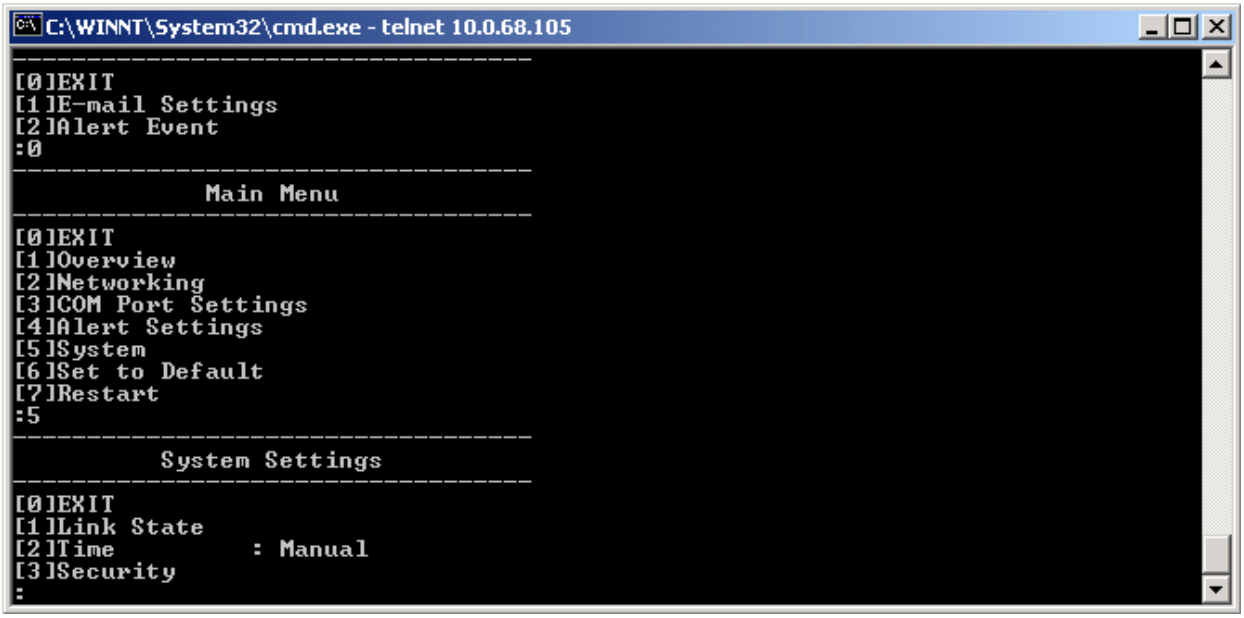


Figure 3.24 Security settings by Telnet

3.2.19 Link State

Operation: Main→ [5]System→[1]Link State

Link State is display information by Link mode (TCP Server, TCP Client and UPD) and status of each connection for all serial port.

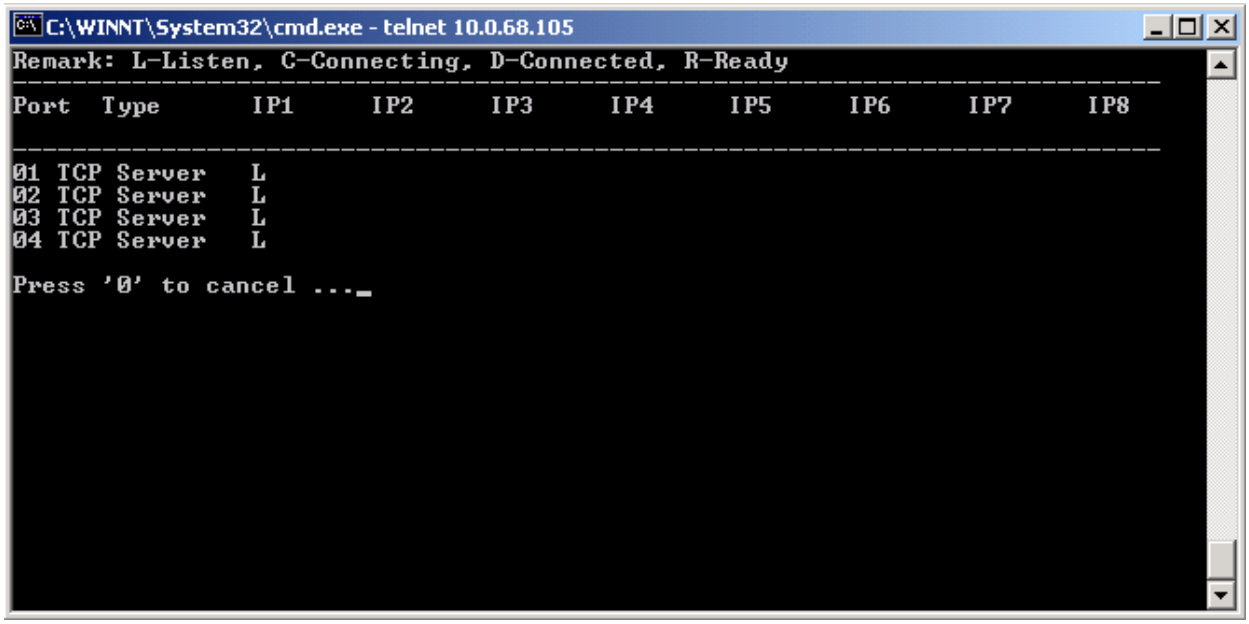


Figure 3.25 Display Link State by Telnet

3.2.20 Time Settings

Operation: Main→ [5]System→[2]Time

One may configure time to Manual Settings or NTP services. The changed will take effect immediately when saved successful.

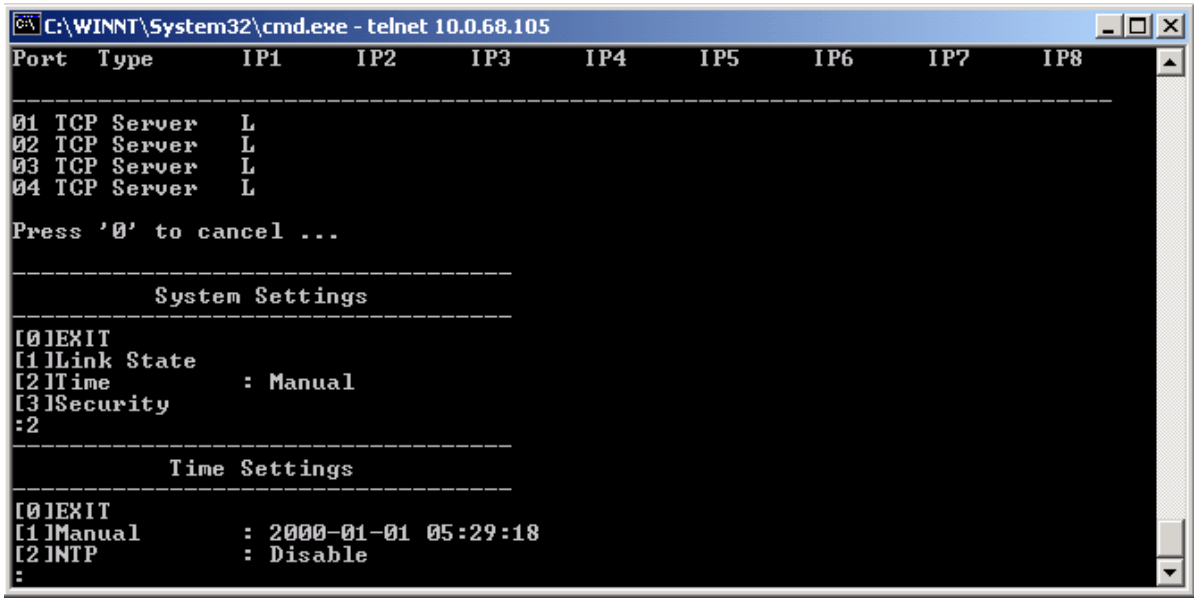


Figure 3.26 Time settings by Telnet

3.2.21 Security Settings

Operation: Main→[5]System→[3]Security

SE5404D serials allow one to change the access methods to protect it against intrusion.

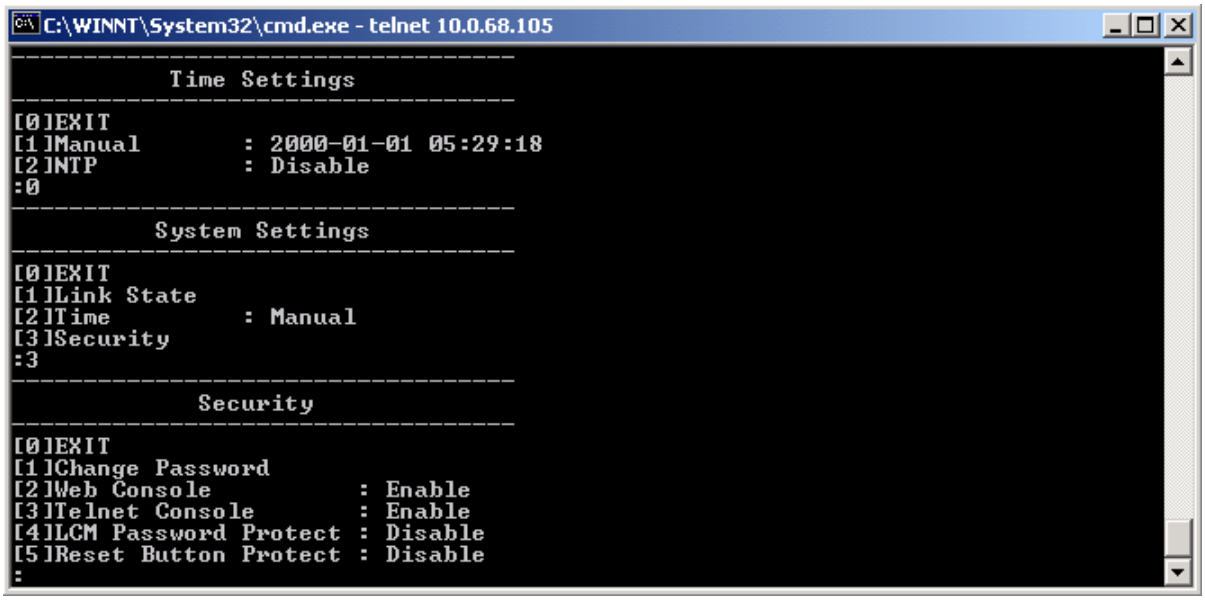


Figure 3.27 Security Settings by Telnet

3.2.22 Restoring Factory Default

Operation: Main→ [6]Set to Default

Choose this menu to restore Serial Server's settings to Factory Default Settings.

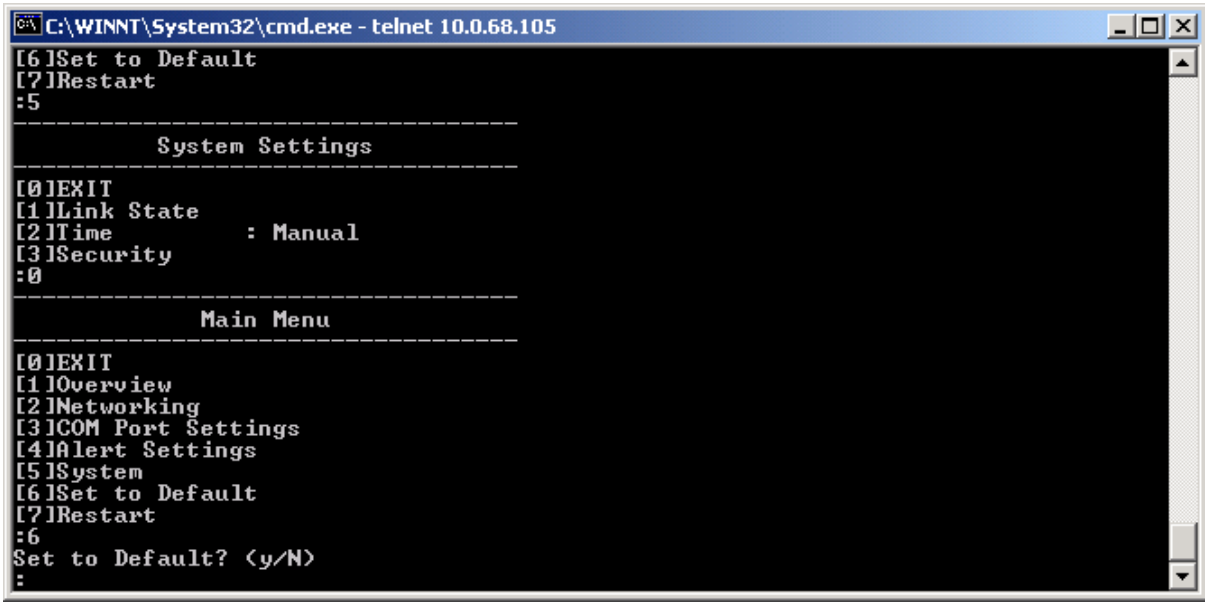


Figure 3.28 Restore Factory Default by Telnet

3.2.23 Restart System

Operation: Main→ [7]Restart

Choose this menu to restart the SE5404D series.

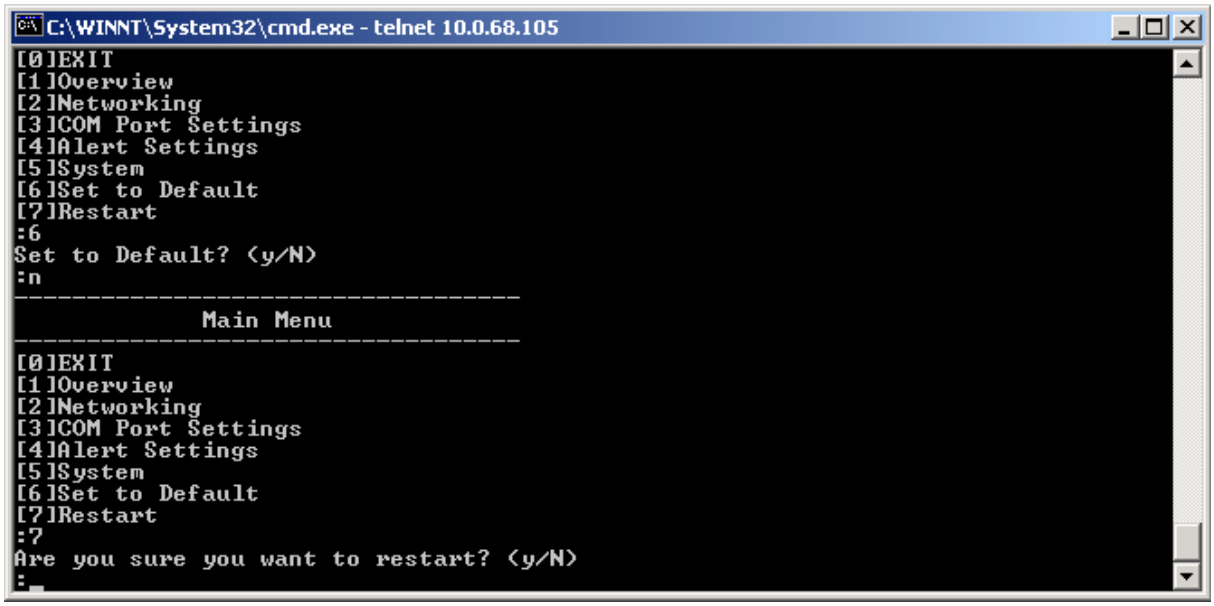


Figure 3.29 Restart System by Telnet

3.3 Web Configuration

1. Make sure your PC is located on the same network sub-net as SE5404D
2. Open a web browser, then Enter in the IP address of SE5404D to be configured. Default user name is **admin** and default password is **null (leave it blank)**.
3. SE5404D's **network**, **link mode** and **COM ports settings** can be configured in different web pages.
4. Click "***Save Configuration***" to save settings.
5. Click "***Restart***" button in "***System***" link to make the change effective if necessary.

It is also possible to modify various settings through the web server interface. To do so, please follow the steps below.

3.3.1 Login to System

While on the web browser, ex. Microsoft IE, Firefox or any other web browser, enter the IP address of Serial Server on the URL bar. **Example:** *http://10.0.50.100*

The following authentication screen shall appear. Enter the **user name** and **password** then click on "**OK**". The default user name is **admin** and password is Null *(Leave it blank)*.

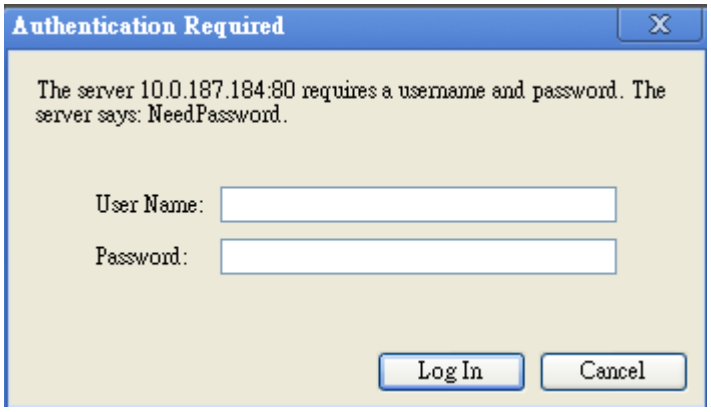


Figure 3.19 Authorization Request for System Security

3.3.2 General Information

This system overview window gives the general information on Device and Network information (See Fig 3.20)

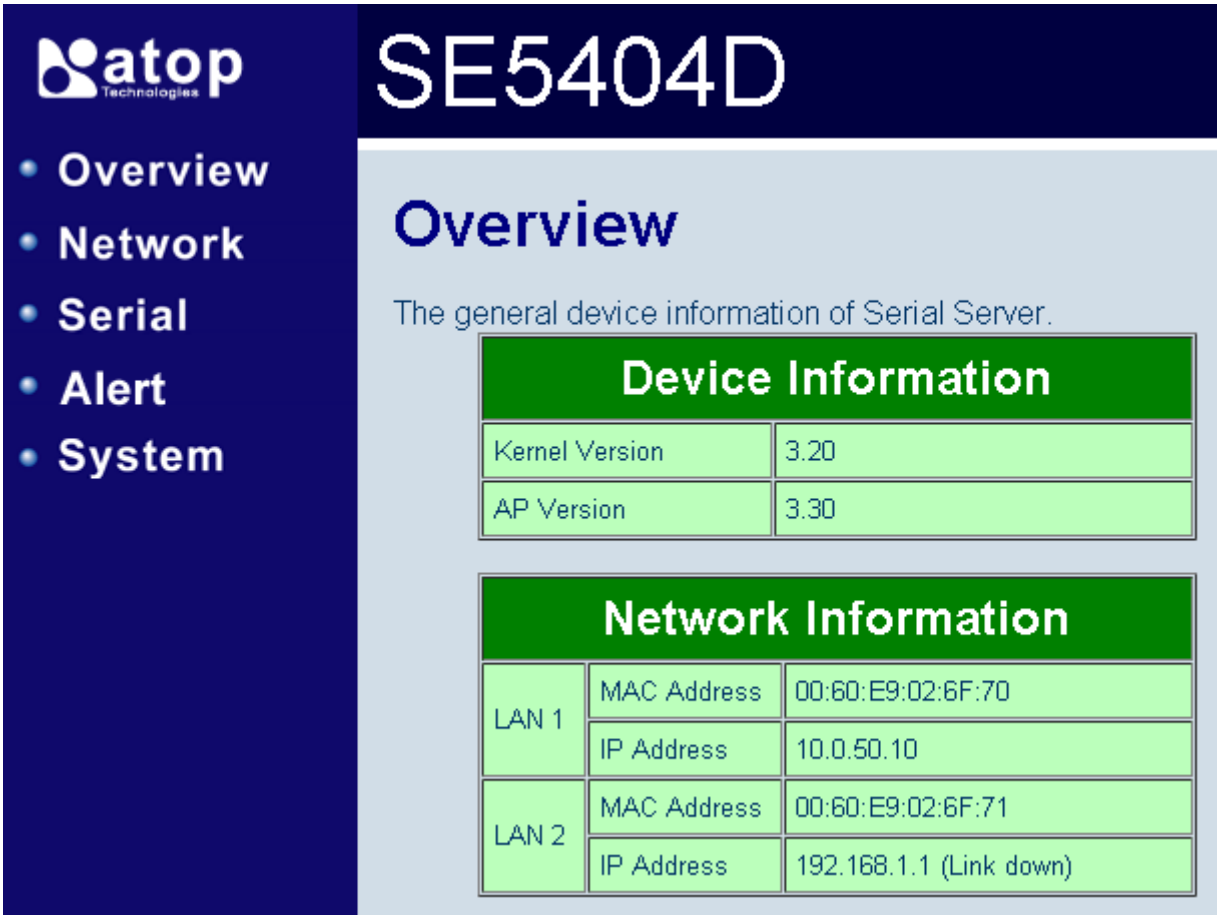


Figure 3.20 Overview by Web page

Device Information

SE5404D Serial Server's displays system information Kernel version and AP version. The information are read only

and attributed from another setting page or system status (See Fig. 3.21)

Device Information	
Kernel Version	3.20
AP Version	3.30

Figure 3.21 Device Information by Web page

Networking information

Networking information fields are displayed both 'LAN 1 and LAN 2' s information on overview page. The information provided with networking settings (See Fig. 3.22).

Network Information		
LAN 1	MAC Address	00:60:E9:02:6F:70
	IP Address	10.0.50.10
LAN 2	MAC Address	00:60:E9:02:6F:71
	IP Address	192.168.1.1 (Link down)

Figure 3.22 Network Information by Web page

Bridge information

Bridge information fields are displayed bridge information on overview page.

Network Information		
Bridge	MAC Address	00:60:E9:07:AB:A2
	IP Address	192.168.1.110

Figure 3.22 Bridge of Network Information by Web page

ERPS information

ERPS information fields are displayed ERPS information on overview page.

ERPS Information	
Ring State	Protection
West Port State(Port 1)	Forwarding
East Port State(Port 2)	Blocking(Signal Fail)

Figure 3.22 ERPS of Network Information by Web page

Spanning Tree Information

Spanning Tree information fields are displayed spanning tree information on overview page.

Spanning Tree Information	
Spanning Tree Status	Disabled
Force Version	RSTP
Priority	32768
Maximum Age	20
Hello Time	2
Forward Delay	15
Root MAC Address	0:60:e9:7:ab:a2
Root Priority	32768
Root Path Cost	0
Root Port	Port1
Root Maximum Age	20
Root Hello Time	2
Root Forward Delay	15
Topology Changes	0
Last Topology Change	0

Figure 3.22 Spanning Tree of Network Information by Web page

3.3.3 Network Configuration

There are four items allowed to change on Network page in which include LAN 1, LAN 2, DNS and SNMP Information.

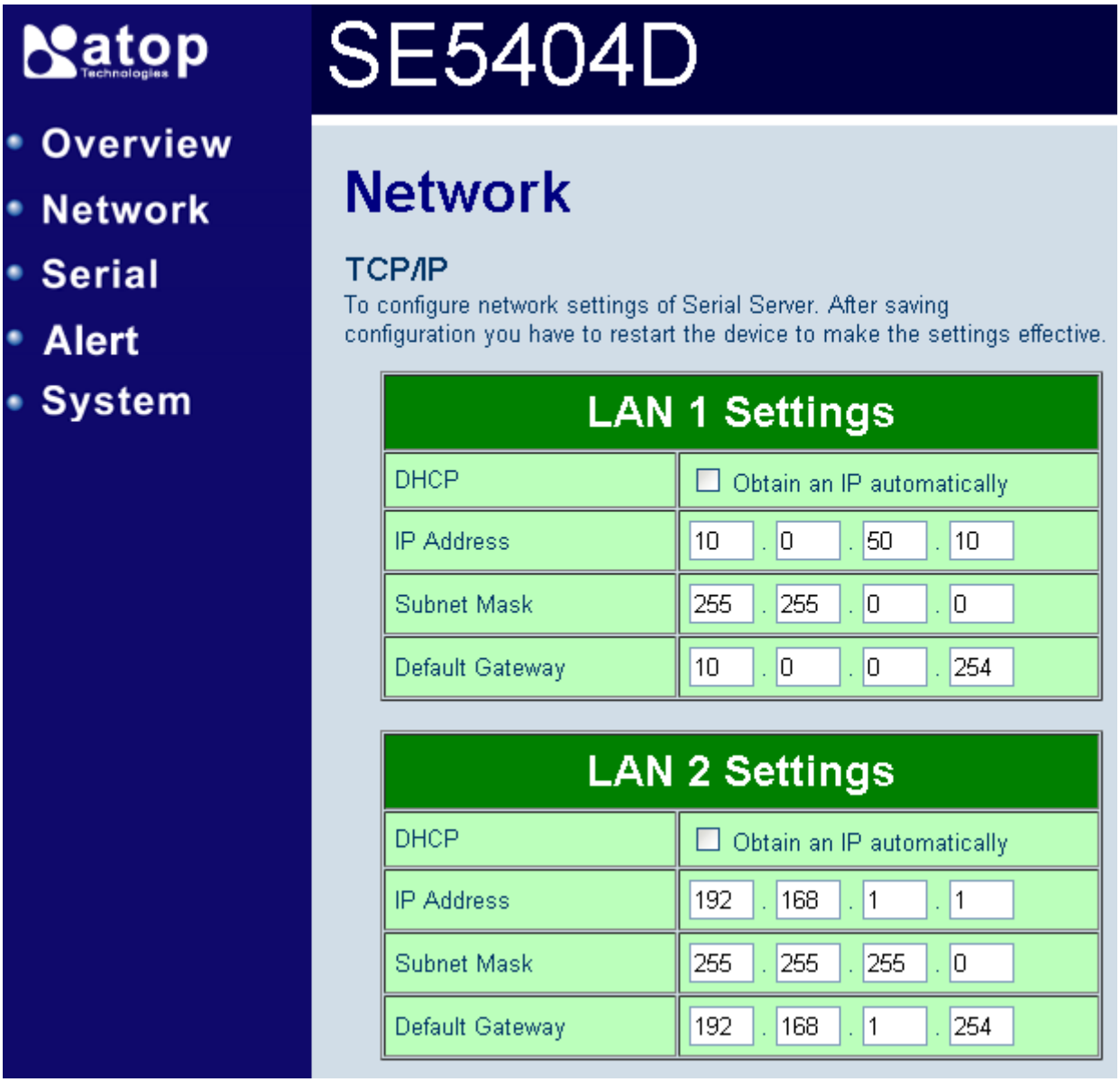


Figure 3.23 Network Configuration by Web page

3.3.5 Bridge Settings

Click on the ***"Network"*** link. If the bridge function is enabled, the following screen shall appear. Fill in Bridge information on bridge settings fields. Alternatively, one may activate DHCP client function by checking on "***Obtain an IP automatically***" field to obtain IP address, gateway and subnet mask from DHCP server automatically.

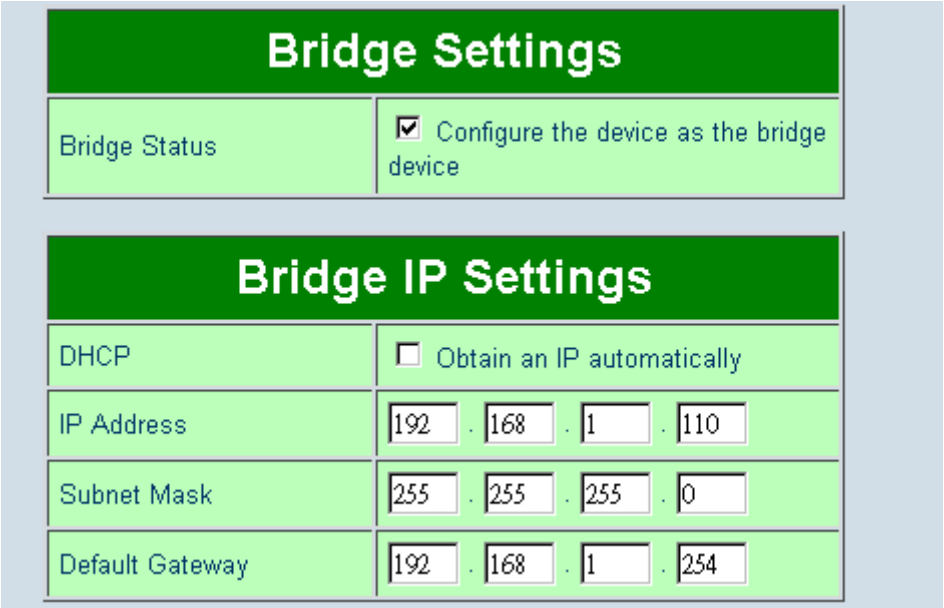


Figure 3.23 Bridge Configuration by Web page

3.3.4 LAN 1 Settings

Click on the "***Network***" link and the following screen shall appear. Fill in LAN 1 IP information on LAN 1 TCP/IP field. Alternatively, one may activate DHCP client function by checking on "***Obtain an IP automatically***".

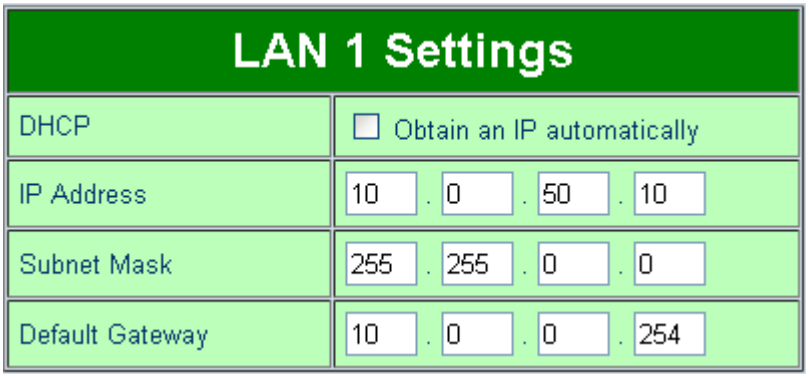


Figure 3.24 LAN 1 Setting by Web page

3.3.5 LAN 2 Settings

Click on the ***"Network"*** link and the following screen shall appear. Fill in LAN 2 IP information on LAN 2 settings fields. Alternatively, one may activate DHCP client function by checking on "***Obtain an IP automatically***" field to obtain IP address, gateway and subnet mask from DHCP server automatically.

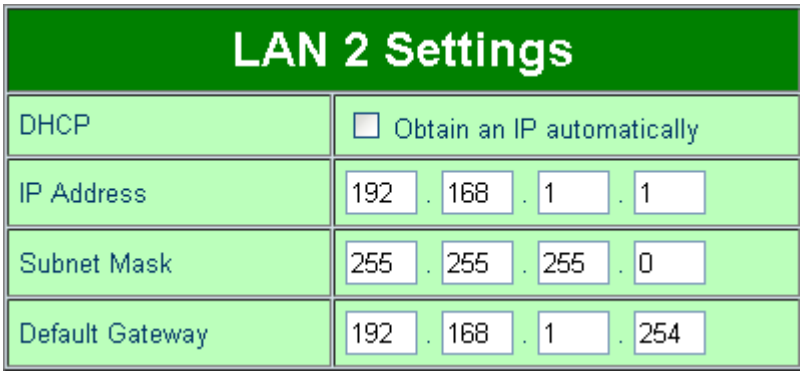


Figure 3.25 LAN 2 Setting by Web page

3.3.6 DNS Settings

Click on the ***"Network"*** link and the following screen shall appear. Fill in DNS information. Alternatively, you can set the Serial Server to receive DNS server IP address from DHCP server automatically by enabling the DHCP of "***LAN 1 Settings***".

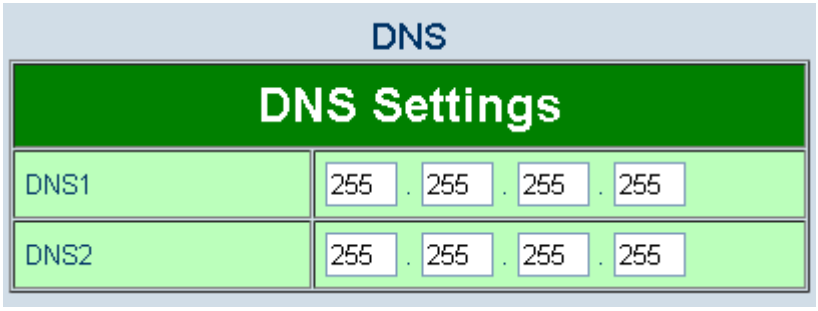


Figure 3.26 DNS Setting by Web page

3.3.7 DDNS Settings

Click on the ***"Network"*** link and the following screen shall appear. The DDNS configurations including user name, password and host name. These configurations must match to the ones you register to DDNS provider. Besides, you can choose to enable or disable DDNS function.

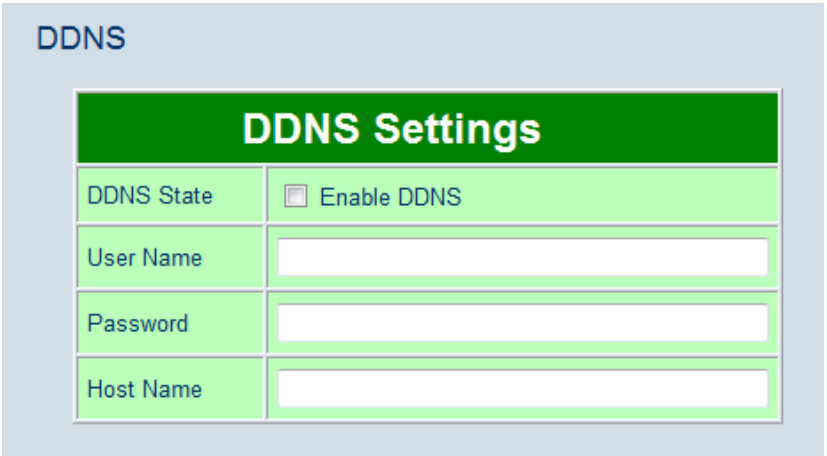


Figure 3.27 DDNS Setting by Web page

3.3.7 SNMP Settings

Click on the ***"Network"*** link and the following screen shall appear. Fill in SNMP information on third field. Alternatively, to settings SysName, SysLocation, SysContact fields and one may configure by Checking on "***Enable SNMP***" field. Fill in Read Community, Write Community, SNMP Trap Server information on SNMP Settings fields. The changes of SNMP Settings will take effect immediately when saved successful.

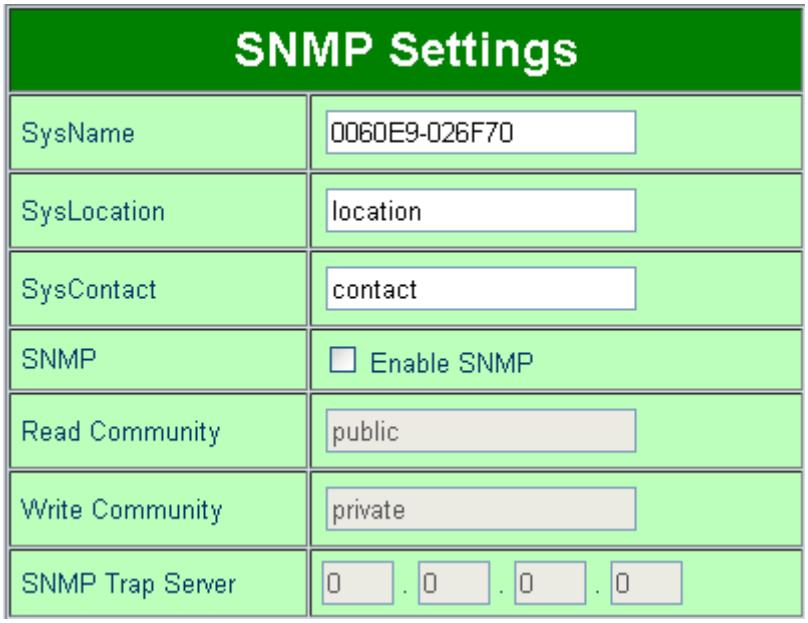


Figure 3.28 SNMP Setting by Web page

3.3.8 ERPS Settings

Click on the "***Network***" link and the following screen shall appear. Fill in ERPS information.

Ethernet Ring Protection Switching (ERPS) is a protocol for Ethernet layer network rings, and it specifies protection mechanism. The ring topology provides multipoint connectivity economically, but it has the traffic looping issue. ERPS provides highly reliable and stable protection in the ring topology, and it never forms loops, which can affect network operation. Each Ethernet Ring Node is connected to adjacent Ethernet Ring Nodes participating in the same Ethernet Ring using two independent links (i.e. two ways). In the Ethernet ring, loops can be avoided by guaranteeing that traffic may flow on all but one of the ring links at any time. This particular link is called Ring Protection Link (RPL). A control message called R-APS coordinates the activities of switching on/off the RPL. Under normal conditions, this link is blocked by the Owner Node. Thus loops can be avoided by this mechanism. In case an Ethernet ring failure occurs, the RPL Owner node will be responsible to unblock its end of the RPL to allow RPL to be used for traffic. The RPL is as the backup link when one link failure occurs.

The following table describes the setting items.

Label	Description
ERPS	Choose whether to enable ERPS or not.
RAPS VLAN	The ring is specified the R-APS VLAN ID of the ring. VLAN ID ranges from 1 to 4094.

RPL Owner	Choose to enable Owner Function.
RPL Port	Select the *Owner Port*.
WTR Timer	Set the wait-to-restore (WTR) time of the ring in minutes. Range from 0 to 12 minutes.
Holdoff Timer	Set the holdoff time of the ring. Range from 0 to 10000 milliseconds.
Guard Timer	Set the guard time of the ring. Range from 0 to 2000 milliseconds.
MEL	Set the maintenance entity group level (MEL) of the ring. Range from 0 to 7.

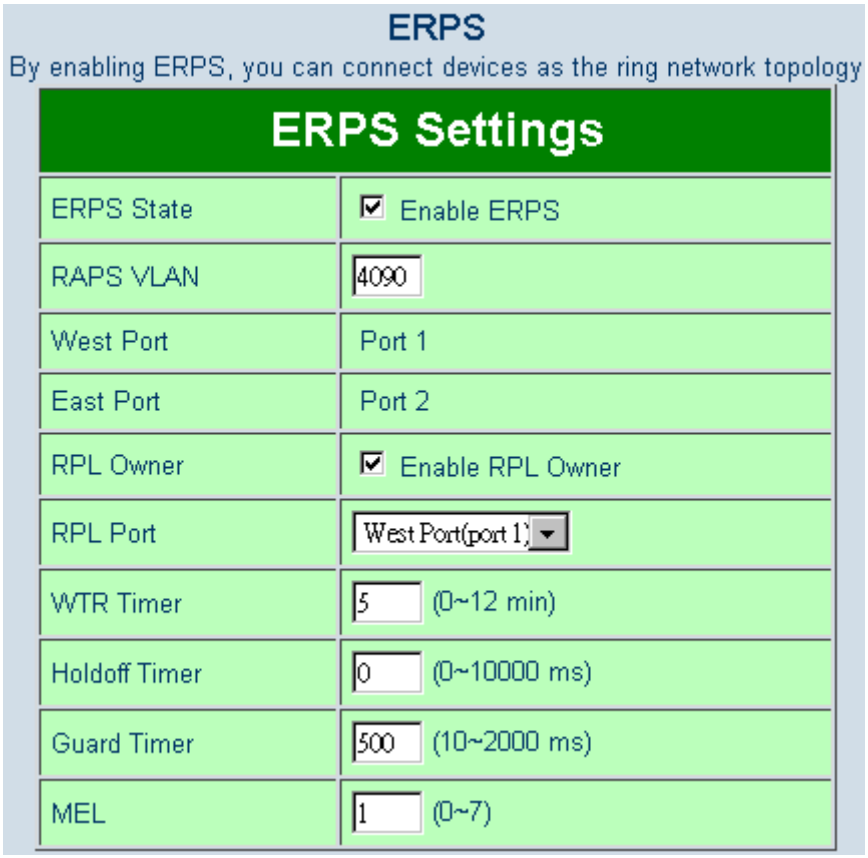


Figure 3.23 ERPS Configuration by Web page

3.3.8 Spanning Tree Settings

Click on the "***Network***" link and the following screen shall appear. Fill in Spanning Tree information.

IEEE Standard Spanning tree functionality is provided. The **S**panning **T**ree **P**rotocol (**STP**) provides function to prevent switching loops and ensuring broadcast radiation. A switching loop occurs in network when there are multiple

connections between two network switches or two ports. The loop creates broadcast radiation, the accumulation of broadcast and multicast traffic on a computer network. As broadcasts and multicasts are forwarded by bridges/switches to every port, the bridges/switches will repeatedly rebroadcast the broadcast messages, and this can floods the network. STP creates a spanning tree and disables those links of the network that are part of the spanning tree, which leaves only a single active path between two nodes. This function avoids flooding and increases network efficiency.

RSTP (**R**apid **S**panning **T**ree **P**rotocol) are also supported. It is an evolution of the STP. It has a slightly changed topology, which helps to provide a much faster spanning tree convergence.

The following table shows how to configure the Spanning Tree and indicates the parameters' status.

Label	Description
Spanning Tree	Choose to enable or disable Spanning Tree.
Force Version	Select **STP** or **RSTP.**
Priority	Configures the bridge priority in the range of 0 ~ 61440.The switch with lower bridge priority has more chance to become a root bridge.
Maximum Age	If a device is not the root and it doesn't receive hello message in "Max. Age", it will reconfigure itself as a root. See note below for "hello message". Range from 6 to 40 seconds.
Hello Time	Amount of time the root waits between sending hello messages. See note below. Range from 1 to 10 seconds.
Forward Delay	Configures the amount of time to wait before checking to see if the device should change from the learning state to the forwarding state. Less delay time means changing state quickly. Range from 4 to 30 seconds.
Port1 Path Cost	Configures the port path cost in the range 1~200000000. This value will affect the combination path cost. The lowest combination path cost will be the l path to the Root Bridge
Port1 Priority	Configures the port priority in the range 0~240. The port has the best route to the root bridge with the lowest priority value.
Port1 P2P	Selects P2P Point to point connection type: Force No: Force port P2P link to false. Force Yes: Force port P2P link to true. Auto: Select port P2P link to auto detection.
Port1 Edge	Choose whether it is an edge connection.
Port2 Path Cost	Configures the port path cost in the range 1~200000000. This value will affect the combination path cost. The lowest combination path cost will be the l path to the Root Bridge
Port2 Priority	Configures the port priority in the range 0~240. The port has the best route to the root bridge with the lowest priority value.

Port2 P2P	Selects P2P Point to point connection type: Force No: Force port P2P link to false. Force Yes: Force port P2P link to true. Auto: Select port P2P link to auto detection.
Port2 Edge	Choose whether it is an edge connection.

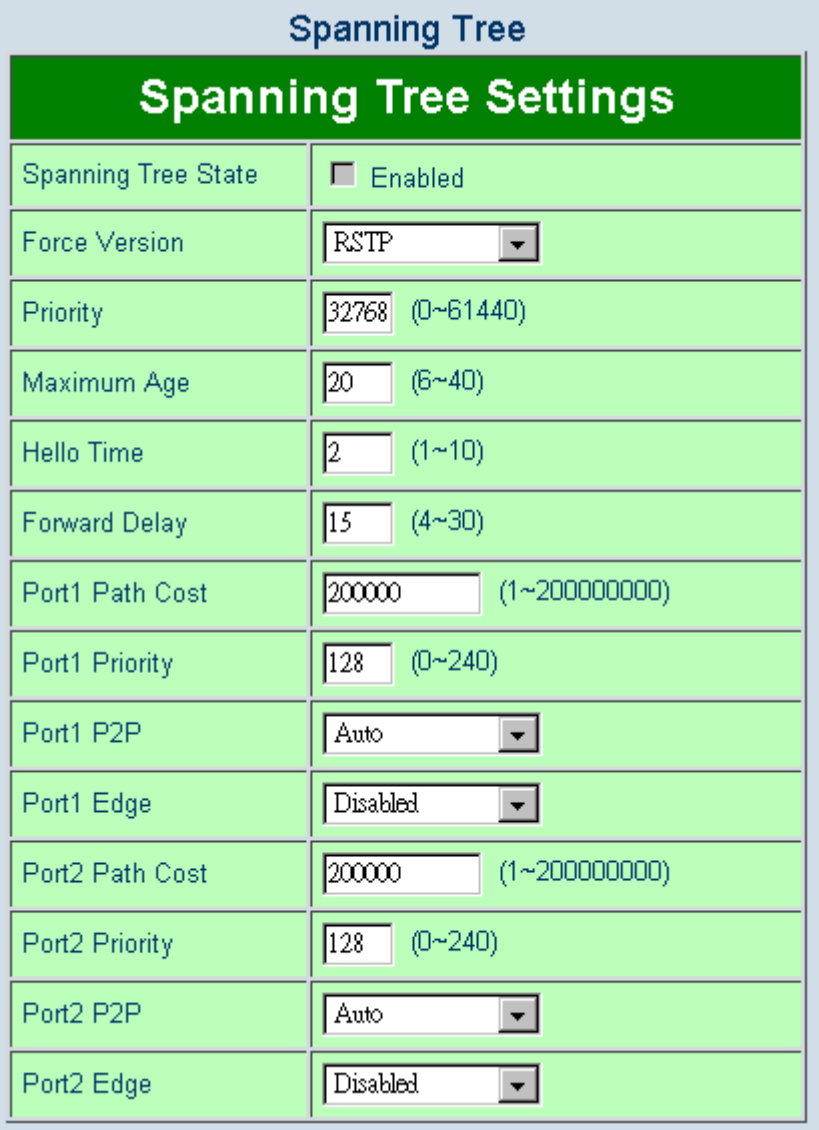


Figure 3.23 Spanning Tree Configuration by Web page

3.3.8 PPPOE Settings

Operation: Netwark→PPPOE

Click on the "***PPPOE***" link and the following screen shall appear

This configuration page including two section, one is PPPOE status and the other is PPPOE setting.

PPPOE Status

This section shows the PPPOE connection status and the IP address while connect to PPPOE.

In this section, you can also connect to PPPOE manually by the “Connect PPPOE” button.

Figure 3.29 PPPOE status

PPPOE Setting

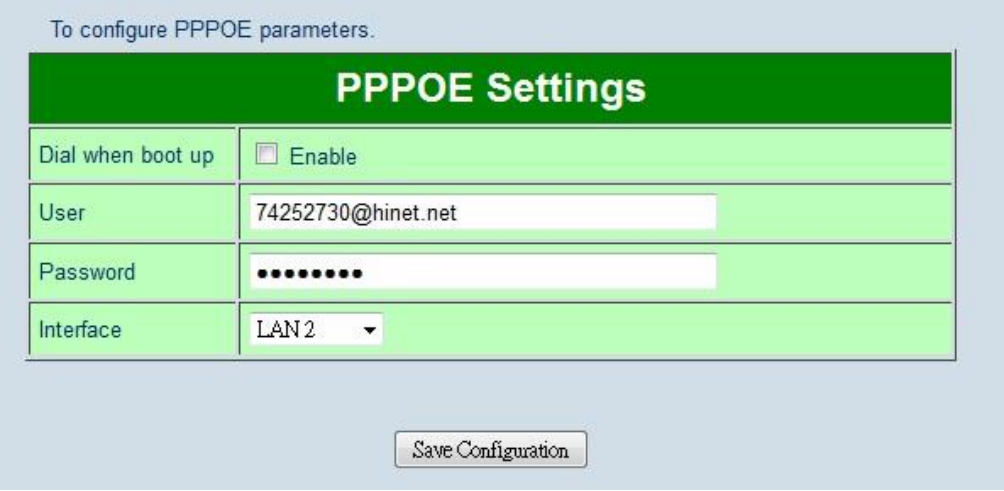


Figure 3.30 PPPOE Setting page

- **Dial when boot up:** enable dial on the PPPOE network when system boot up
- **User:** The User name used to connect PPPOE
- **Password:** The password used to connect PPPOE
- **Interface:** The Ethernet interface used to connect PPPOE. You can choose LAN1 or LAN2

3.3.9 GSM Modem Settings

Operation: Netwark→GSM Modem

Click on the "***GSM Modem***" link and the following screen shall appear

This configuration page including two section, one is GSM status and the other is GSM module setting.

GSM Status

This section shows the GPRS connection status, PIN (personal identification number) status, the IP address while connect to GPRS and total traffic statistic.

There are two actions you can do in this section. One is connect to GPRS manually and the other is clear the traffic statistic.

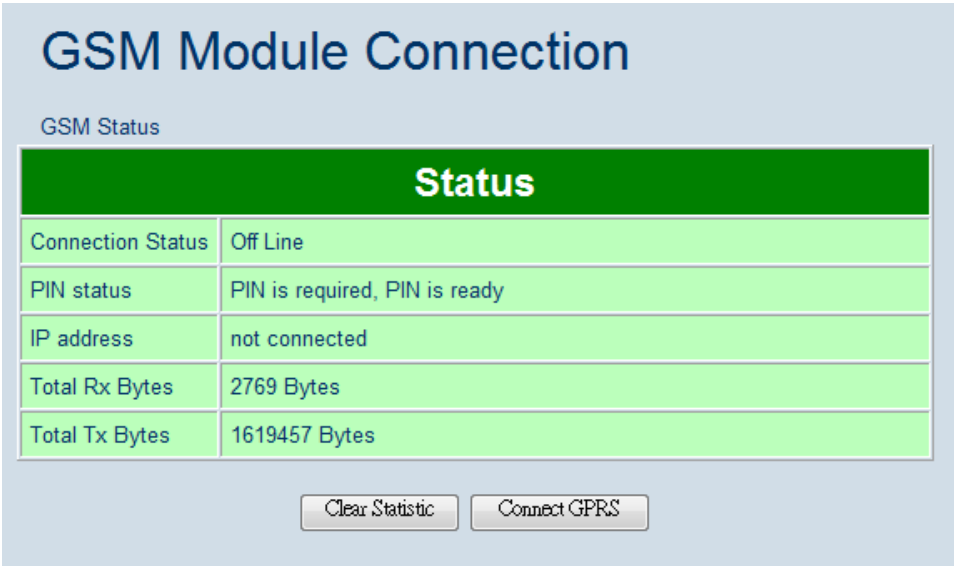


Figure 3.29 GSM module status

GSM Module Setting

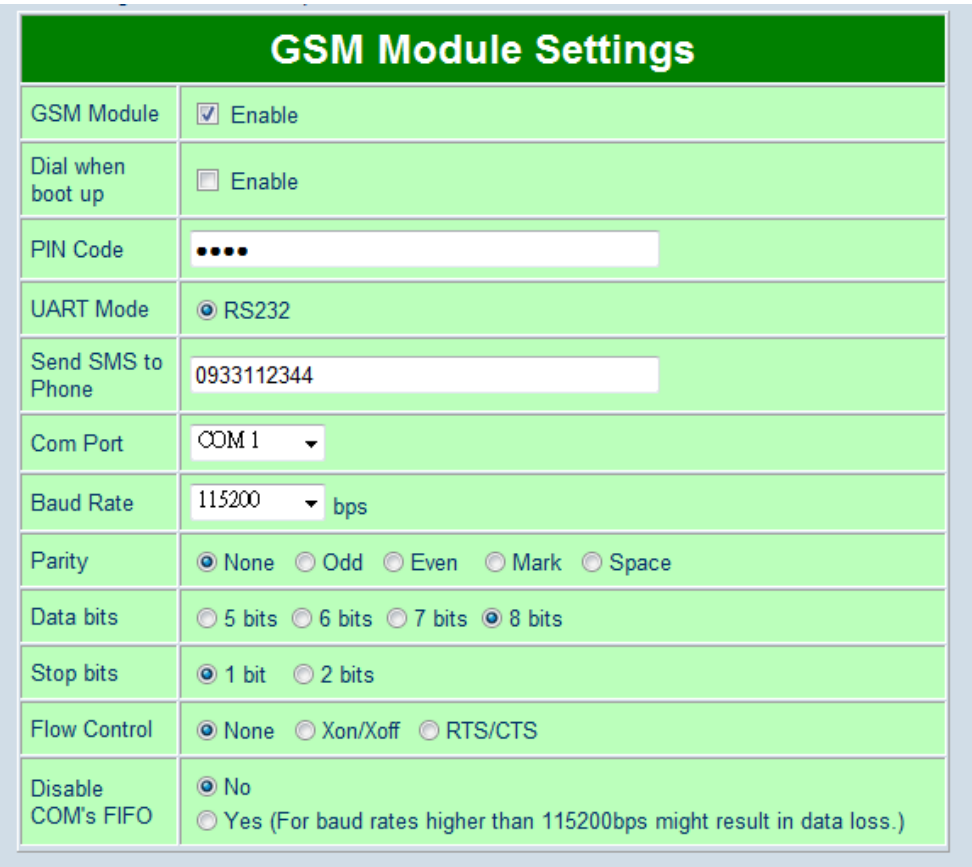


Figure 3.30 GSM module Setting page

- **GSM Module:** choose to enable GSM module or not
- **Dial when boot up:** enable dial on the GPRS network when system boot up
- **PIN code:** PIN code that is required by SIM card inserting in the GSM module
- **Configuring UART Mode:** only RS-232
- **Send SMS to phone:** the phone number that user want their alert SMS to send
- **COM port:** which COM port use to connect GSM module
- **Baud rate:** 300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200 / 230400 / 460800 / 500000 / 576000 / 921600
- **Parity:** None or Odd or Even or Mark or Space
- **Data bits:** 7 or 8
- **Stop bits:** 1 or 2
- **Flow control:** None or Xon/Xoff or Hardware (RTS/CTS)
- **Disable FIFO:** No/Yes. For serial devices that are very sensitive to the amount of data that they receive, FIFO should be disabled. For regular applications, we recommend to enable FIFO (default) to achieve optimal performance.

3.3.8 NAT Settings

Click on the "***Network***" link and click on the "***NAT***" link the following screen shall appear. Fill in NAT information.

NAT (network address translation) is the process of modifying IP address information in IP packet headers while in transit across a traffic routing device. NAT function changes IP address information of the traffic of the network devices connecting the Ethernet interface and forwards the traffic through GSM Modem to the internet. Virtual server function changes the IP and the port of the income traffic from GSM Modem and forwarded the traffic to the Ethernet interface.

The following table shows how to configure the NAT.

Label	Description
NAT Status	Enable/Disable NAT function
Virtual Server	Display virtual server configuration and to set the virtual server. The display format is "server port","destination IP", "destination port"

The following table shows how to configure the particular virtual server.

Label	Description
Server Port	Specify the port of the income traffic from the GSM modem is forwarded.
Destination IP	Specify the destination IP that is the income traffic forwarded to.
Destination Port	Specify the destination port that is the income traffic forwarded to.

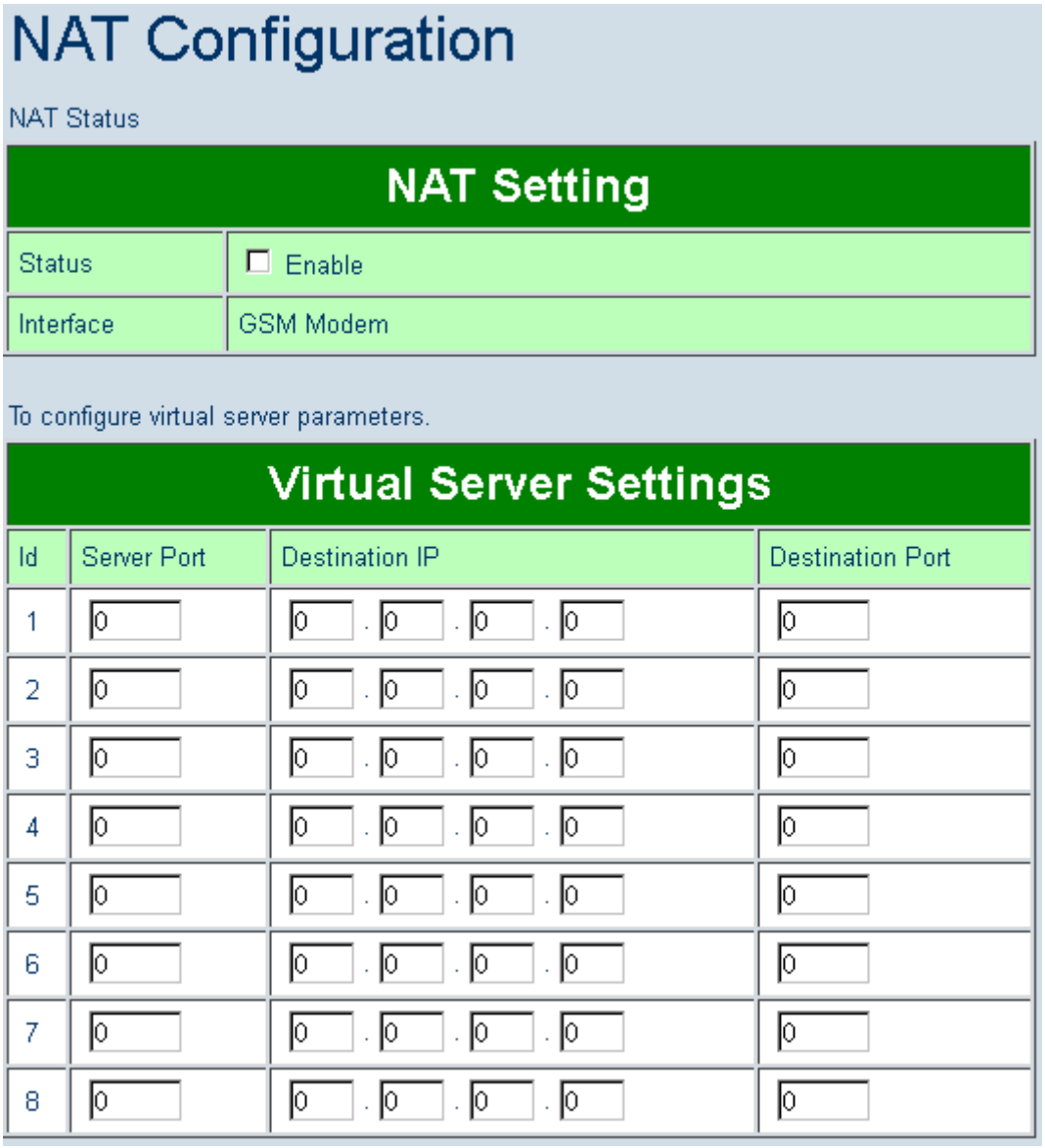


Figure 3.23 Nat Configuration by Web page

3.3.11 VPN Settings

Operation: Netwark→VPN

Click on the "***VPN***" link and the following screen shall appear

This configuration page including two section, one is VPN status and the other is VPN setting.

VPN Status

This section shows the VPN running status, VPN connection status, local IP address and assigned IP address.

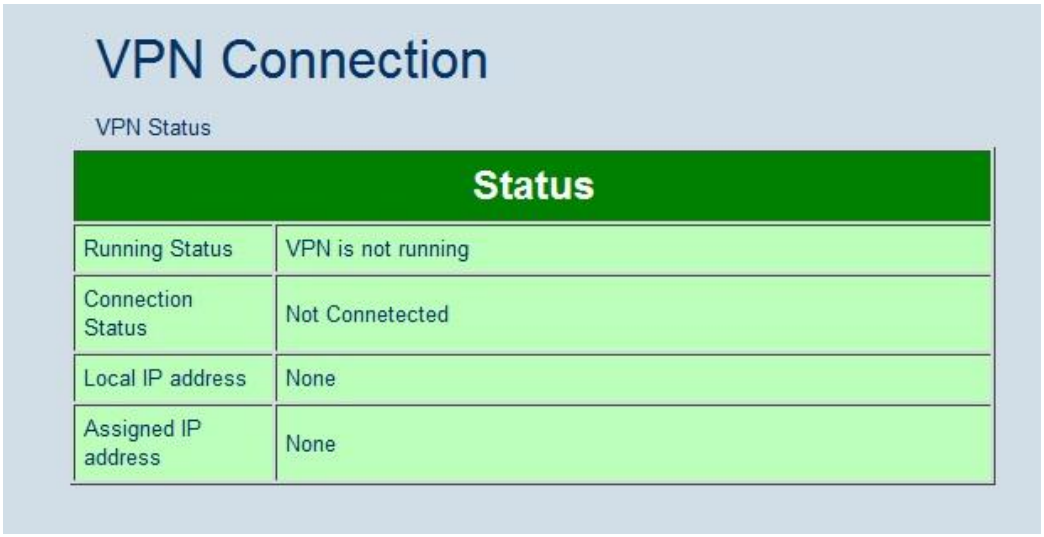


Figure 3.29 VPN status

VPN Setting

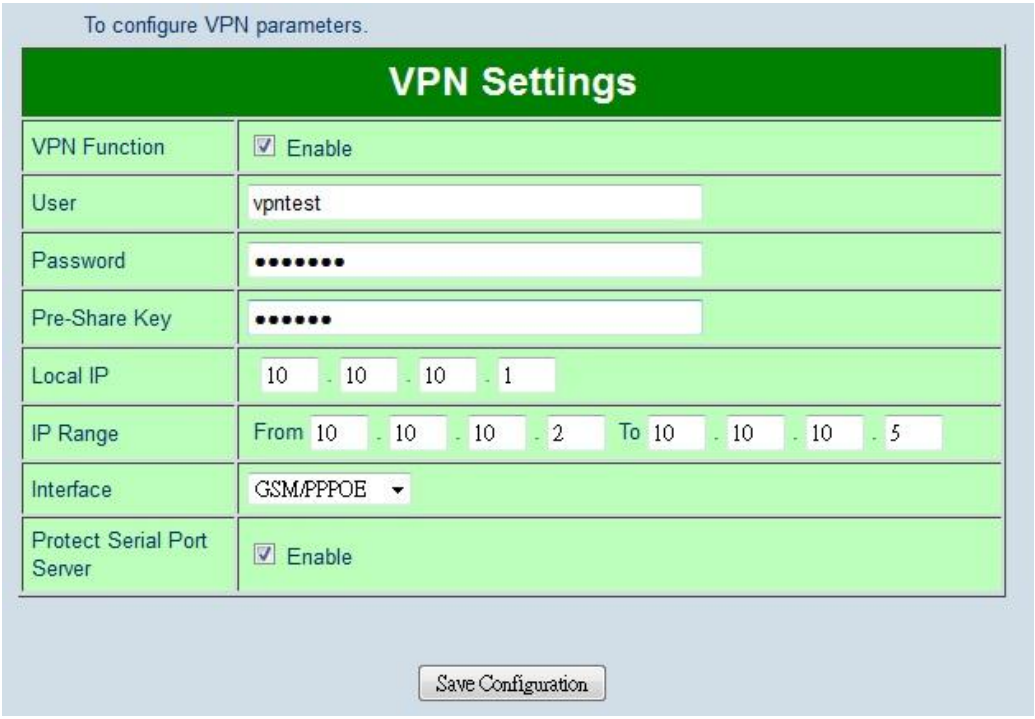


Figure 3.30 VPN Setting page

- **VPN Function:** choose to enable VPN function or not
- **User:** The user name that VPN client used to connect VPN network
- **Password:** The password that VPN client used to connect VPN network
- **Pre-Share Key:** The pre-share key that VPN client used to connect VPN network

- **Local IP:** The IP address for this device in the VPN network
- **IP Range:** The IP range that used to assign to VPN client
- **Interface:** The interface co-operate with VPN. You can choose LAN1, LAN2 and GSM/PPPOE
- **Protect Serial Port Server:** choose to enable serial server protection function. By enabling this, serial server is only available through VPN connection

3.4 COM Port Configuration

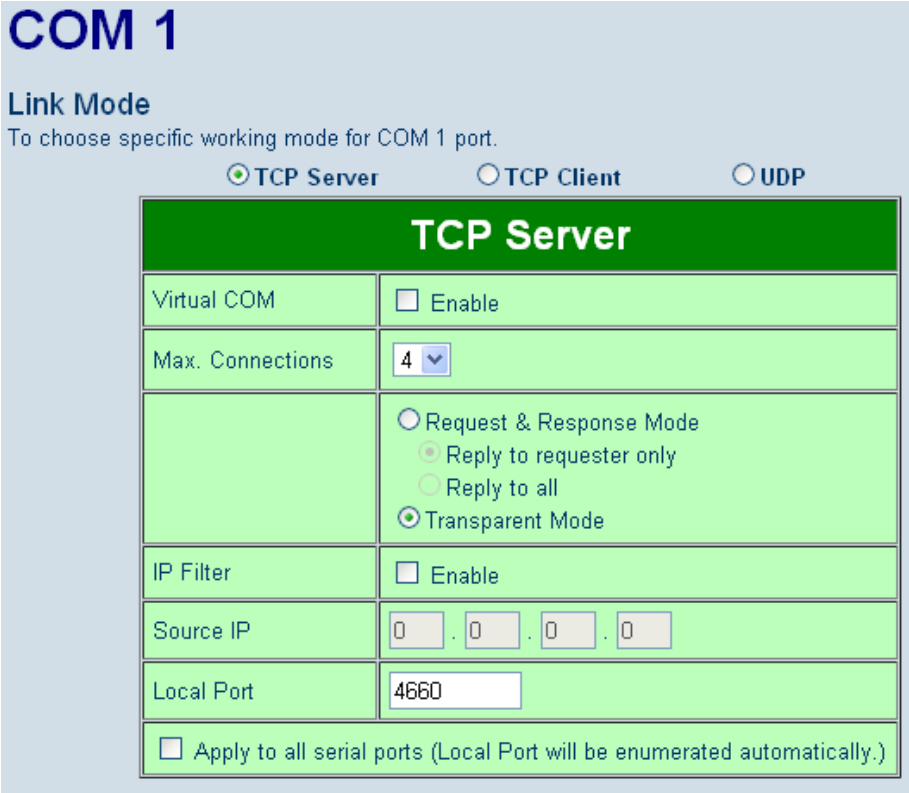


Figure 3.31 COM Port Configuration by Web page

3.4.1 TCP Server for Link Mode

TCP Server mode is the default Link mode of serial settings, and it can wait for connecting requirement from remote host PC which "serial-to IP" tool installed or counter-pair SE5404D Serial servers in tunneling mode. One shall configure listening port to allow establishing connection; Default port numbers of Serial Server are 4660 – 4667/4675.

If you wish to setup two SE5404Ds in tunneling mode, one SE5404D should run as a TCP Server and the other should run as a TCP Client. Server's Local Port should match Client's Destination Port. Client's Destination IP should match Server's IP. Detailed steps are described below.

1. Prepare two SE5404Ds (A and B). Note that you can treat each COM port as an independent device.

2. SE5404D A= 10.10.50.100. SE5404D B = 10.10.50.101 (You can use different IPs, but both SE5404Ds need to be in the same subnet).
3. When connecting SE5404D to the instrument or to the PC over RS-232, please use a cross-over cable.
4. Enable “Virtual COM” on the WebUI for both SE5404Ds (First option in COM settings).
5. Set SE5404D A COM1 to TCP Server mode. Set SE5404D B COM1 to TCP Client mode IP and port equal to SE5404D A COM1’s settings (Default Destination IP=10.10.50.100, Default Destination Port = 4660).
6. (optional) Repeat for remaining COMs: Set SE5404D A COM2 to TCP Server mode. Set SE5404D B COM2 to TCP Client mode IP and port equal to SE5404D A COM2’s settings (Default Destination IP=10.10.50.100, Default Destination Port = 4661).

Max Connections (default=1):

This option is used if you need to receive data from different hosts simultaneously. When set to 1, only a single host may open the TCP connection to the serial port. When set to 2 or greater, up to the specified number of hosts may open this port at the same time.

Attention

When **Max. Connections** is greater than 1, the Serial server will apply multi connection application (i.e., 4 hosts are allowed access to the port at the same time). When using a multi connection application, all hosts connected to the port must use identical serial settings. If one of the hosts opens the COM port with different serial settings, data will not be transmitted properly

Request and response Mode

This option determines how the port will proceed if multiple hosts are connected and one or more of the hosts stop responding when the port is transmitting data. If you select **Reply to requester only**, the port will keep other hosts’ request data in the buffer and continue data transmission to the request host only. If you select **Reply to all**, the port will transmit reply data to all connected hosts**.**

Transparent Mode

The port will allow the other hosts and continue data transmission to all hosts. This mode does not take “Response Interval Timeout” into consideration.

IP filtering function is a simple ACL (Access Control List) disabled by setting FILTER_IP to “0.0.0.0”.

One may configure one or group IP for source IP. If IP filter is enabled, only source IP assigned is connected to Serial Server.

If you check “***Apply to all serial ports***”, it will configure all of the serial ports.

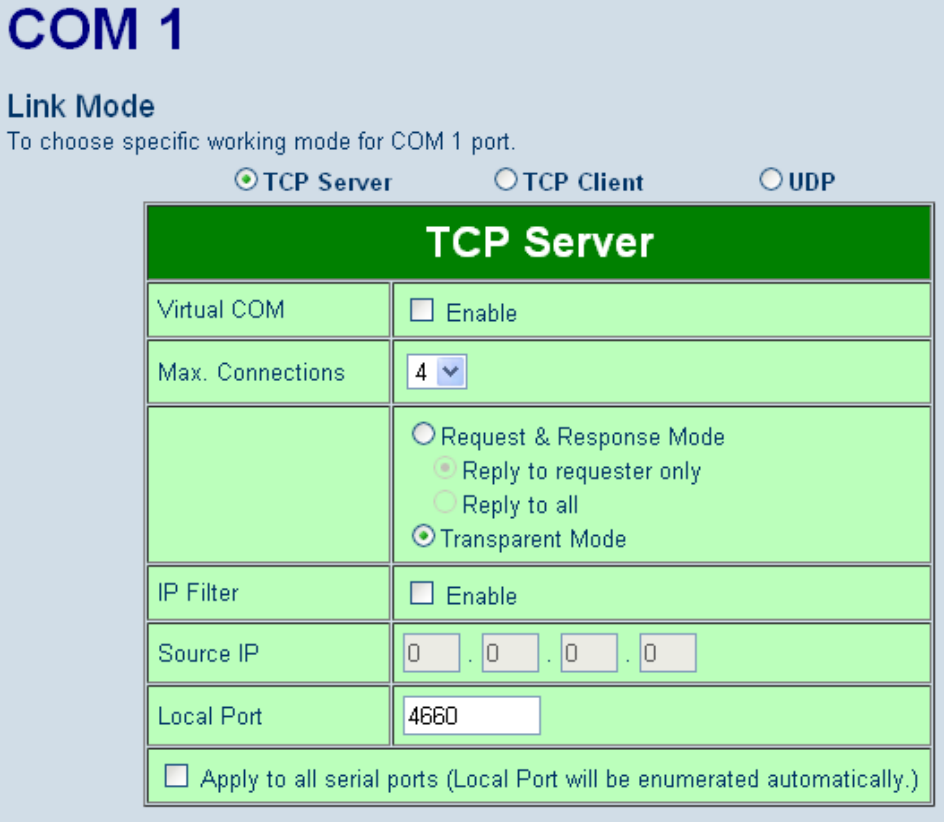


Figure 3.32 TCP Server in Link mode

❋ **Note: Enable Virtual COM mode if the remote site PC's "Serial to IP" tool installed**

3.4.2 TCP Client for Link Mode

One may enter destination IP & port (default: 4660) to establish connection of counter-pair (remote) host (For example, another serial server, or PC for data-collection). Serial Server can support two destination hosts simultaneously.

If you check "***Apply to all serial ports***", it will configure all of the serial ports.

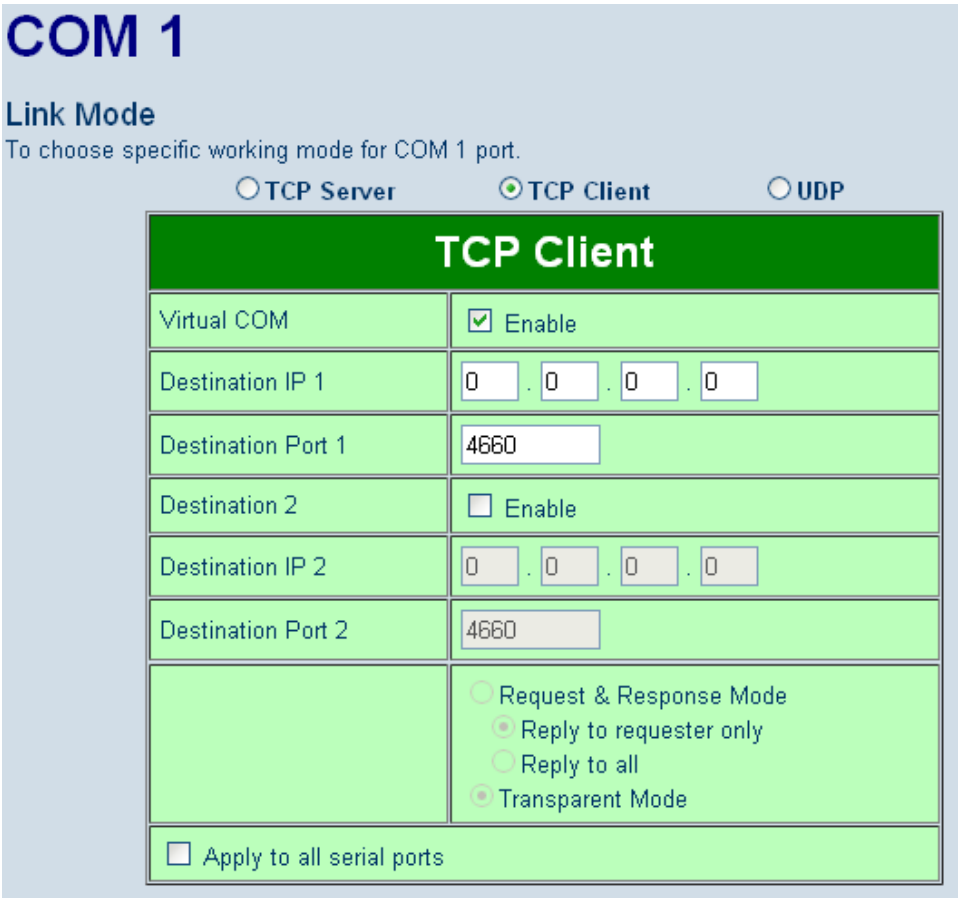


Figure 3.33 TCP Client in Link mode

3.4.3 UDP for Link Mode

UDP is a fast but non-guaranteed datagram delivery protocol. Serial Server can be configured in a UDP mode on a TCP/IP Network to establish a connection, using uni-cast or broadcast data to and from a serial device to one or multiple host computer,.

Serial Server can be configured in a UDP mode to establish connection using uni-cast or broadcast data from the serial device to one or multiple host computers. Vice versa is also true. For example, The original RS-422/ RS485 bus is transferred and extended connecting distance by Serial Servers, The destination IP is assigned by single IP or group IPs, The configuration is limited by the Local Listening Port (For example, on Serial Server listening port is 4660 which receive data sending from the host computers) Serial Server can support up to 8-group IP for UDP connection, if users needed.

If you check "***Apply to all serial ports***", it will configure all of the serial ports.

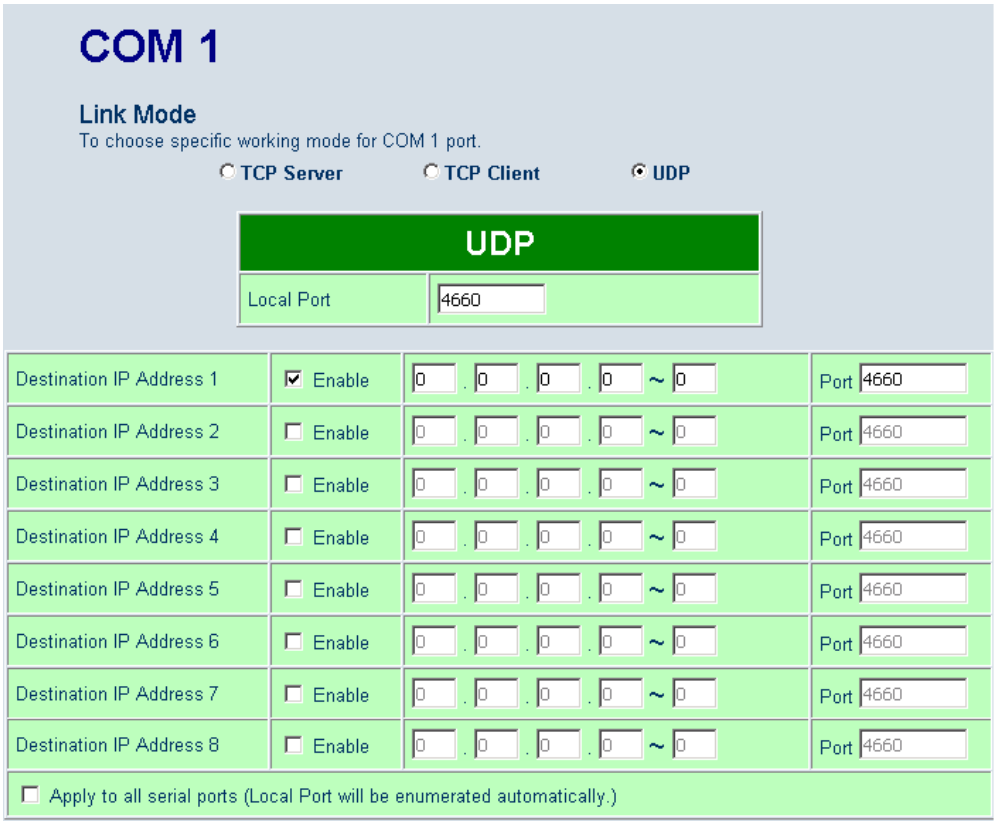


Figure 3.34 UDP in Link mode

❋ **Note: UDP mode doesn't support Virtual COM mode yet**

3.4.5 Serial Settings

This filed can configure serial parameters for Serial Server. Here one may configure Serial parameters, include UART Mode, baud rate, parity, data bit and type of flow control you wanted

- **Configuring UART Mode:** RS-232 or RS-485 or RS-422
- **Baud rate:** 300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200 / 230400 / 460800 / 500000 / 576000 / 921600
- **Parity:** None or Odd or Even or Mark or Space
- Data bits: 7 or 8
- Stop bits: 1 or 2
- **Flow control:** None or Xon/Xoff or Hardware (RTS/CTS)
- Disable FIFO: No/Yes. For serial devices that are very sensitive to the amount of data that they receive, FIFO should be disabled. For regular applications, we recommend to enable FIFO (default) to achieve optimal performance.

❋ **If you check "*Apply to all serial ports*", it will configure all of the serial ports.**

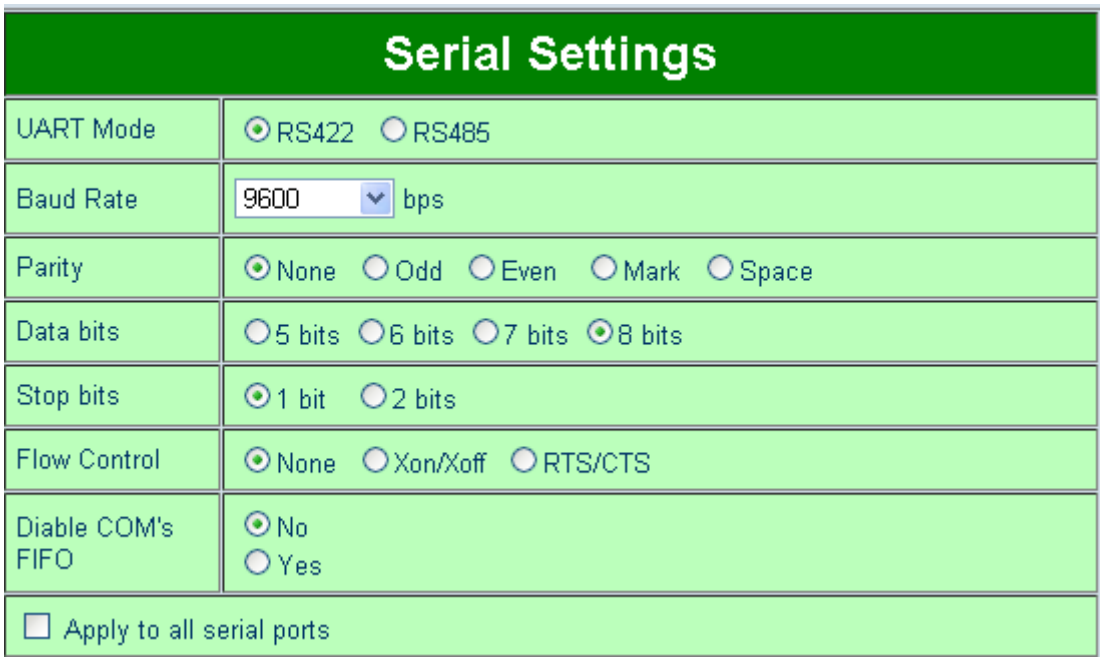


Figure 3.35-1 Serial Settings by Web page

3.4.6 Advanced Settings

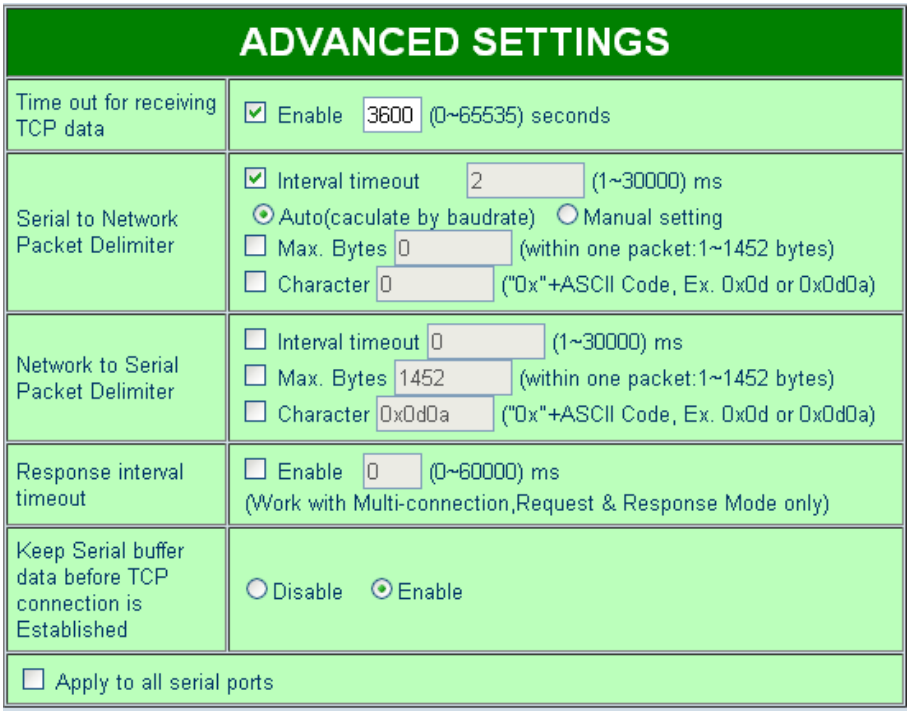


Figure 3.35-1 Advanced Settings by Web page

Time out for receiving TCP data (Default: Disabled): This field specifies how long the serial device server will wait for a response to “keep alive” packets before closing the TCP connection. The serial device server checks

connection status by sending periodic “keep alive” packets. If the remote host does not respond to the packet within the time specified in this field, the serial device server will force the existing TCP connection to close. If this setting is set to 0, the TCP connection will remain open even if there is no response to the “keep alive” packets.

Serial to Network Packet Delimiter

Packet delimiter is a way of packing data in the serial communication. It is designed to keep packets in track. Serial device server provides three patterns in parameter setting: (1) **packet delimiter by** (1) **Interval timeout,** (2) **Max Byte** and (3) **Character pattern**.

1. **By Time** – The device will transmit the serial data in its buffer when the specified time interval has reached and no more serial data comes in.
2. **By Max Bytes** – The device will transmit the serial data when the data in the buffer has reached the specified length.
3. **By Character** - The device will transmit the serial data in its buffer when it sees the specified character.

If one or more of the delimiters are selected, data would be transmitted if any of the conditions are met.

Attention

Packet delimiter by Interval timeout

This parameter defines how large a gap in serial communication the serial device server will allow before packing the serial data in its internal buffer for network transmission.

The optional “Internal timeout” transmit time depends on your application, but it must be at least larger than one character interval within the specified baud rate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is (10 (bits) / 1200 (bits/s)) × 1000 (ms/s) = 8.3 ms.

Therefore, you should set the “Interval timeout” to be larger than 8.3 ms, so in this case, it must be greater than or equal to 10 ms. If it is necessary to send a series of characters in the same packet, the serial device will need to send that series of characters within the specified transmit time, and the total length of data must be less than or equal to the serial device server internal UART buffer size (4K per port).

Network to Serial Packet Delimiter

Network to Serial Packet Delimiter is used less often compared to Serial to Network Delimiter because Ethernet has better speeds. Packet delimiter is a way of packing data in a serial communication. It is designed to keep packets in track. Serial device server provides three patterns in parameter setting: (1) **packet delimiter by** (1) **Interval timeout,** (2) **Max Byte** and (3) **Character pattern**.

1. **By Time** – The device will transmit the network data in its buffer when the specified time interval has reached and no more network packet comes in.
2. **By Max Bytes** – The device will transmit the network data when the data in the buffer has reached the specified length.
3. **By Character** - The device will transmit the network data in its buffer when it sees the specified character.

If one or more of the delimiters are selected, data would be transmitted if any of the conditions are met.

Response interval timeout (Default: 1000ms):

This option only work in Request & Response Mode. When TCP data is received (request) and passed to Serial side, the device will wait for the set time before transferring another TCP data if the Serial side did not receive any data (response).

Keep serial buffer data before TCP connection is Established (Default: Disable):

If “Enable” is selected, the device will store received data in buffer and sent them out when connection is establish. Otherwise, data will be discarded when “Disable” is selected.

3.4.7 Alert Settings

There are two subsystem settings include E-mail and Alert Event.

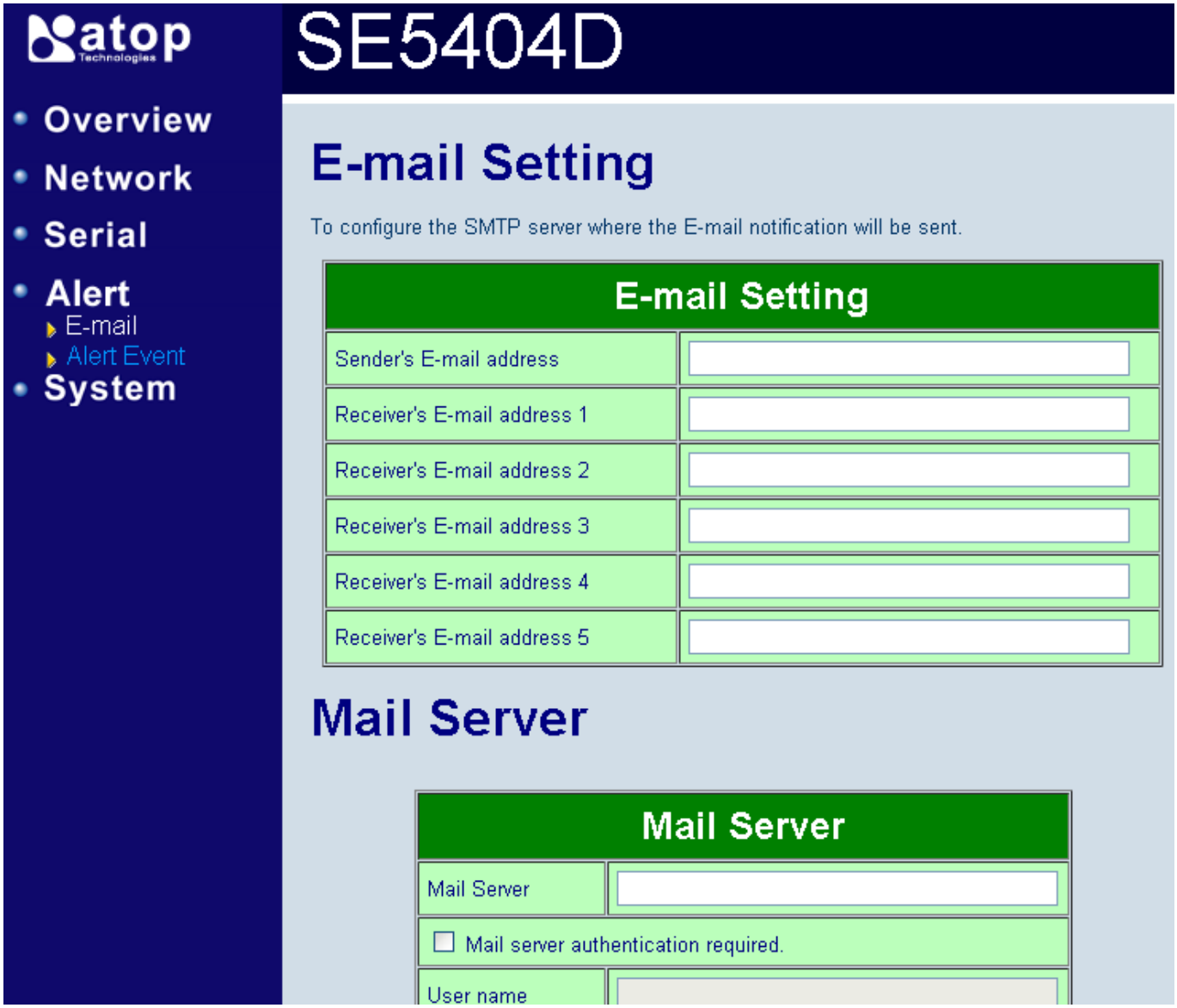


Figure 3.36 Alert settings by Web page

3.4.8 Configuring E-mail

Operation: Alert→E-mail

Click on the "***E-mail***" link and the following screen shall appear

One may configure the "***Sender's E-mail address***" that it should have on the SMTP server (Mail Server) where allowed to sent out the email by sender's E-mail address. The SE5404D allow to definite the receiver up to 5. Also the E-mail notification will be sent to the e-mail account their obtained in "Receiver's E-mail address 1", "Receiver's E-mail address 2", "Receiver's E-mail address 3", "Receiver's E-mail address 4" and "Receiver's E-mail address 5".

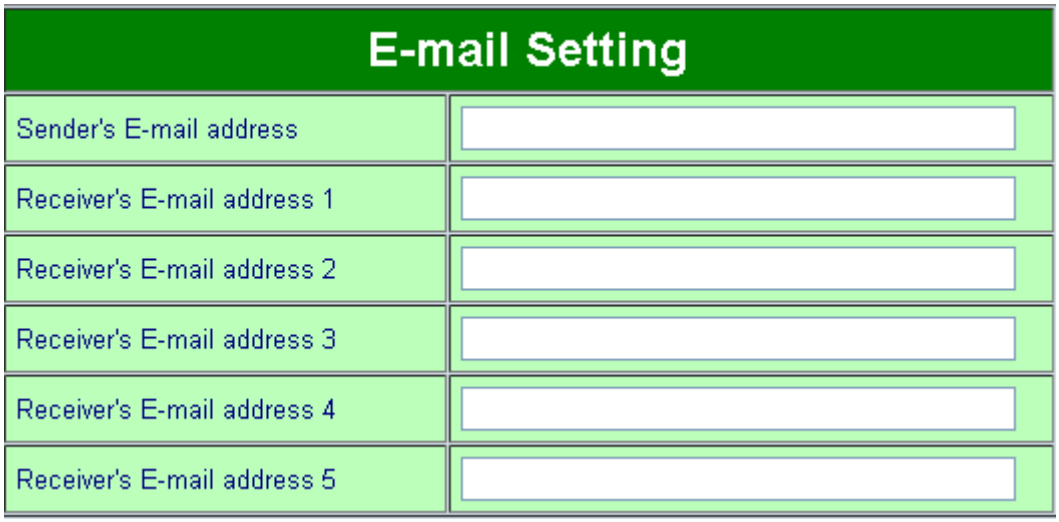


Figure 3.37 Configuring E-mail by Web page

One may configure Mail Server and checking on "***My mail server requests authentication***" field to obtain User name and Password.

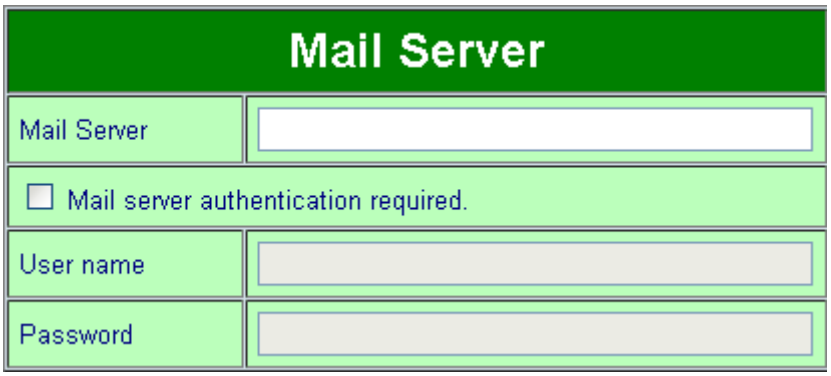


Figure 3.38 Configuring Mail Server by Web page

3.4.9 Configuring Alert Event

Operation: Alert→Alert Event

Click on the "***Alert Event***" link and the following screen shall appear

Choose the Alert event to configure SE5404D Series to send the alert notification by E-Mail, SNMP Trap or SMS(See Fig 3.36).

Figure 3.39 Configuring Alert Event by Web page

3.5 System Configuration

There are six subsystem settings for system configuration including Link State, Time, Security, Set to Default and Restart.

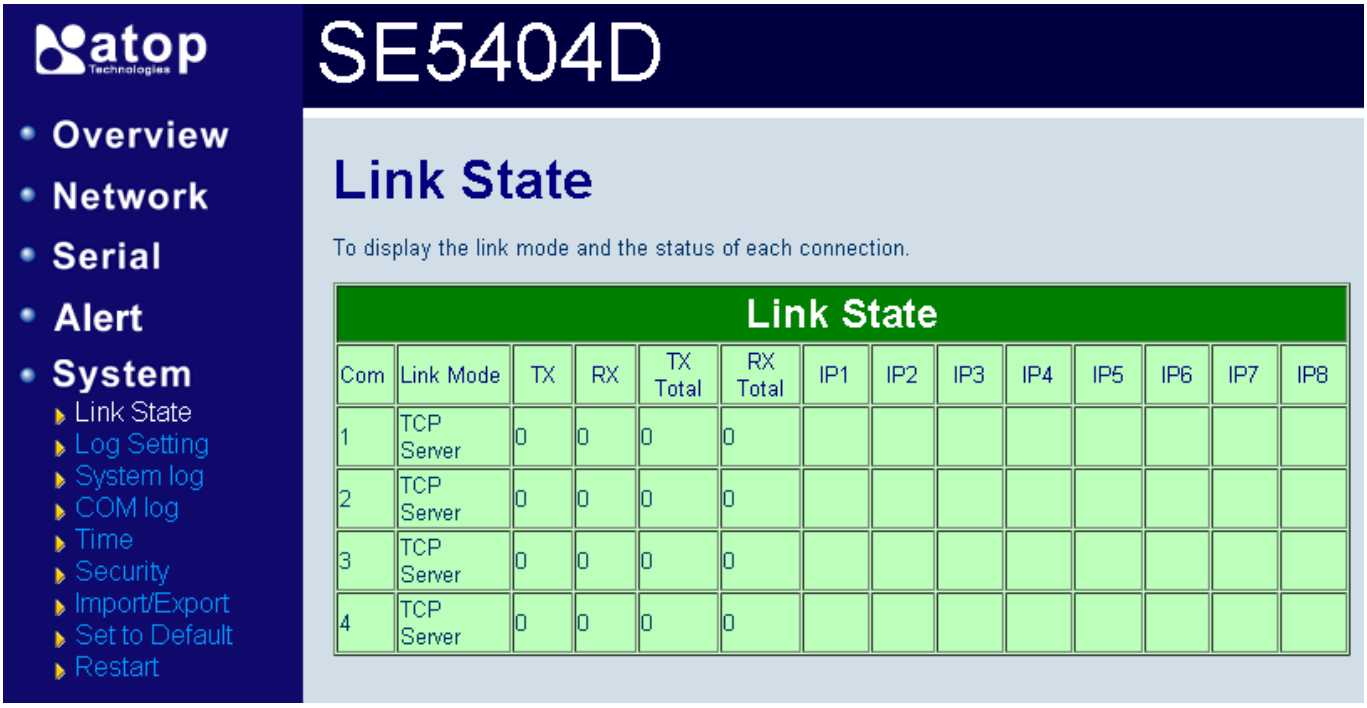
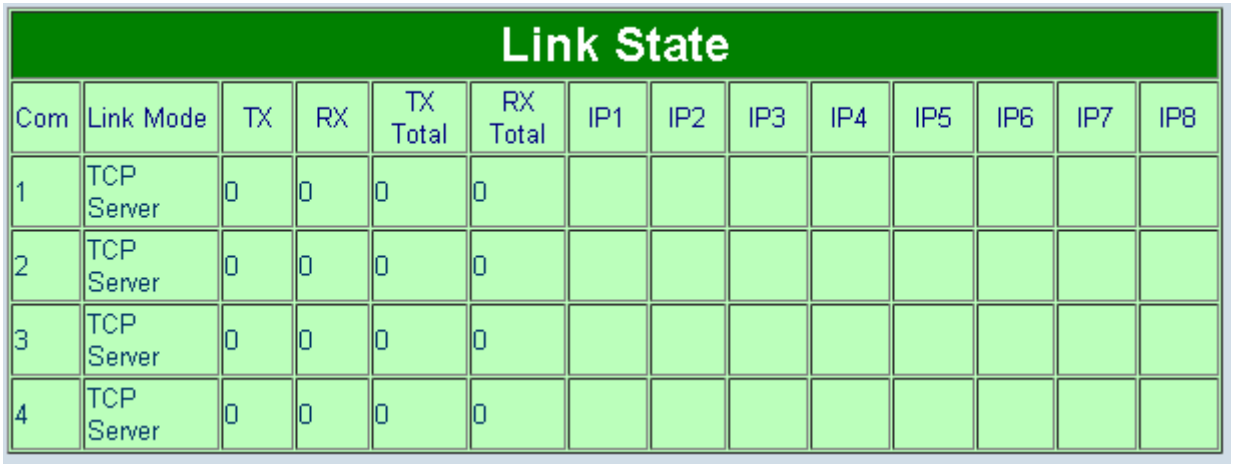


Figure 3.40 System Configuration by Web page

3.5.1 Link State information

Operation: System→Link State

Link State is display information by Link mode (TCP Server, TCP Client and UPD) and status of each connection for all serial port.



Link State

Com	Link Mode	TX	RX	TX Total	RX Total	IP1	IP2	IP3	IP4	IP5	IP6	IP7	IP8
1	TCP Server	0	0	0	0								
2	TCP Server	0	0	0	0								
3	TCP Server	0	0	0	0								
4	TCP Server	0	0	0	0								

Figure 3.41 Link State Information by Web page

3.5.2 Log Settings

Operation: System→Log Setting

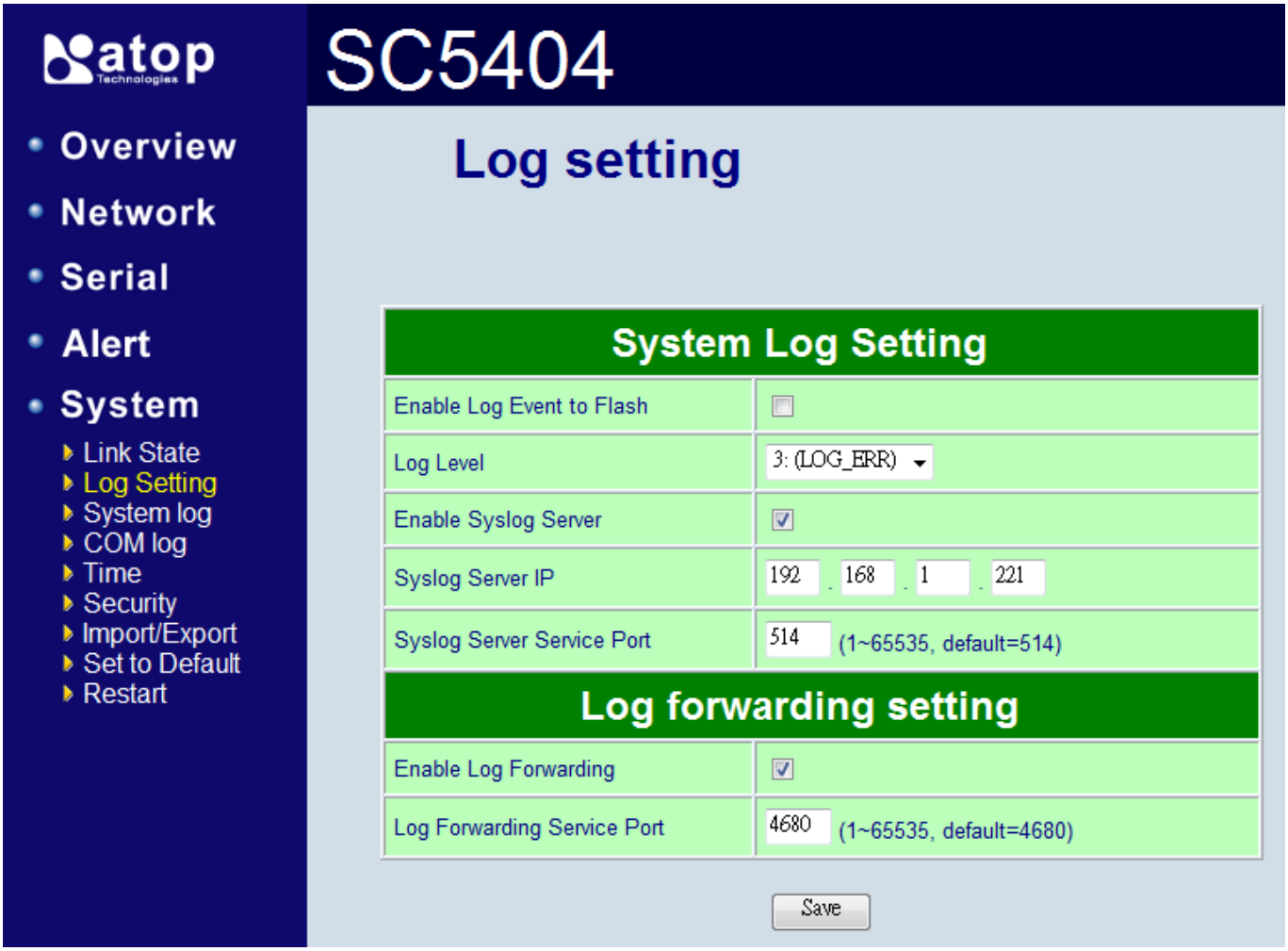


Figure 3.42 System Log Setting WebUI

Enable Log Event to Flash: This would write log events to the local flash.

Log Level: 3 (Currently we only allow this level)

Enable Syslog Server: Enabling this option would allow you to send Syslog events to a remote Syslog server.

Syslog Server IP: Please specify the remote Syslog Serve IP.

Syslog Server Service Port: Please specify the remote Syslog Serve Port.

Enable Log Forwarding: To enable log forwarding server.

Log Forwarding Service Port: Please specify the log forwarding service port.

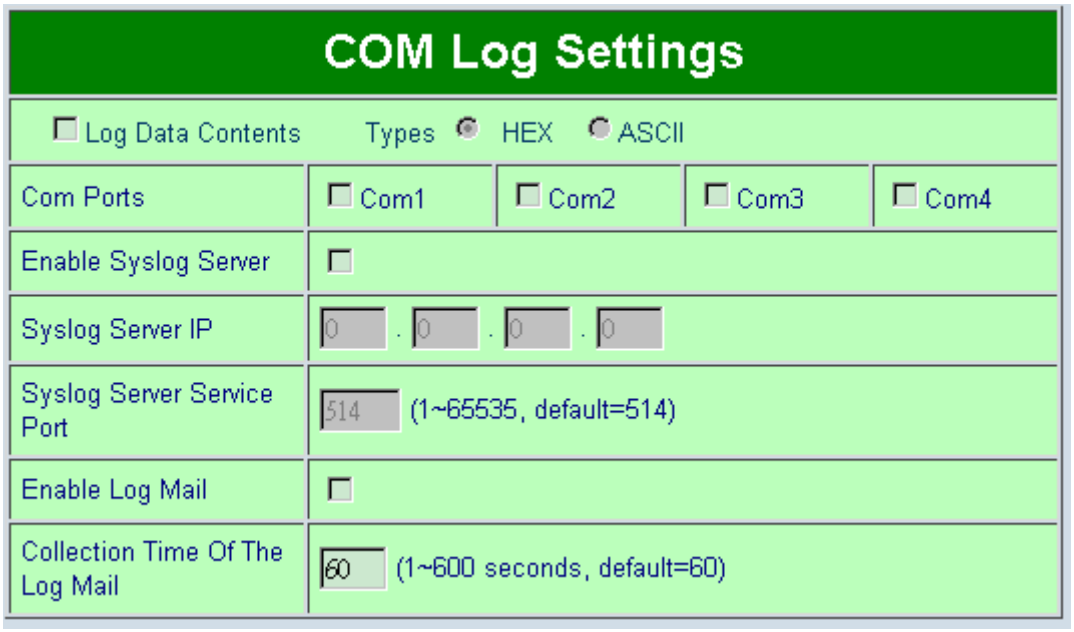


Figure 3.43 COM Log Setting WebUI

Log Data Contents: If enabled, the COM logging function will log data content. If disabled, COM logging function will only log data length to reduce system load. Note that the local flash storage has a very limited space. If the reserved space is full new logs will replace the old logs. We strongly recommend sending COM logs to a remote Syslog server.

Data Log Types: Hex or ASCII

COM 1~4 : Choose which port to log.

Enable Syslog Server: Enabling this option would allow you to send COM logs to a remote Syslog server. You can send COM logs to the same Syslog server used previously.

Syslog Server IP: Please specify the remote Syslog Serve IP.

Syslog Server Service Port: Please specify the remote Syslog Serve Port.

Enable Log Mail: Enable/Disable to mail COM LOG.

Collection Time Of The Log Mail: Specify collection time. The com log mail will be collected and sent together when the collection time is expired.

3.5.3 System Log

Operation: System→System Log

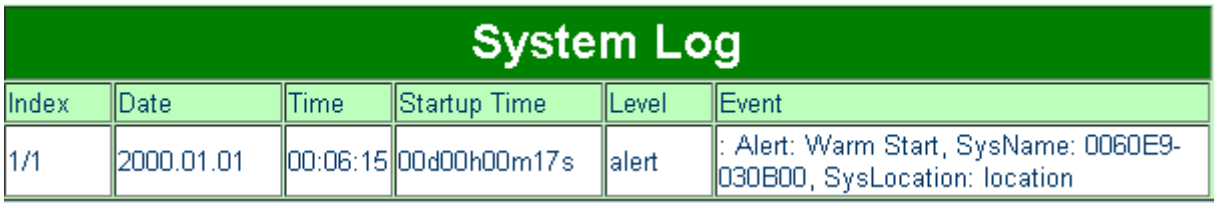


Figure 3.44 COM Log Setting WebUI

3.5.4 COM Log

Operation: System→COM Log

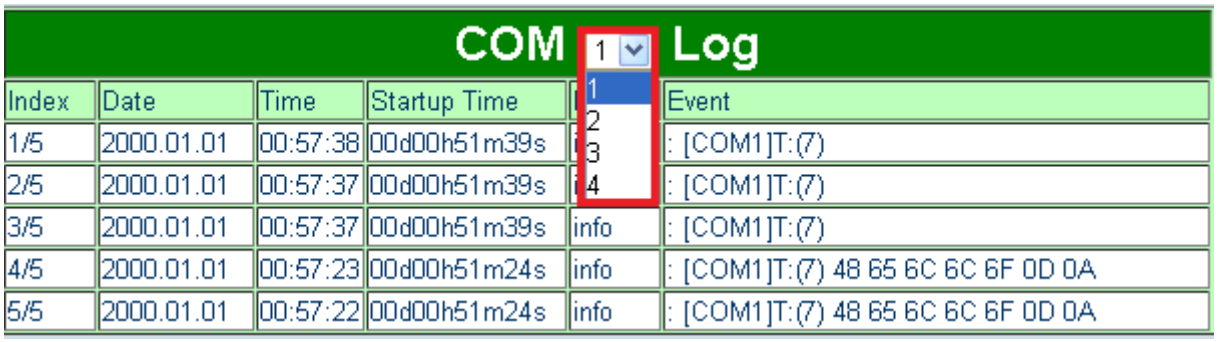


Figure 3.45 COM Log Setting WebUI

You can select which COM to be displayed. The first three logs were set to log data length and the last two logs were set to log data content. COM logs can be retrieved from the device via FTP. FTP login is the same as the WebUI. They are located in /var/log/logcomxx (xx is the port number).

3.5.5 Time Settings

Operation: System→Time

One may configure "***NTP Server***" to obtain Network time automatically or Set it manually by fill in "***Set Date and Time manually***" field. You can enable and specify the Daylight Saving Time if you are located in a DST region. All the settings on the page require a restart.

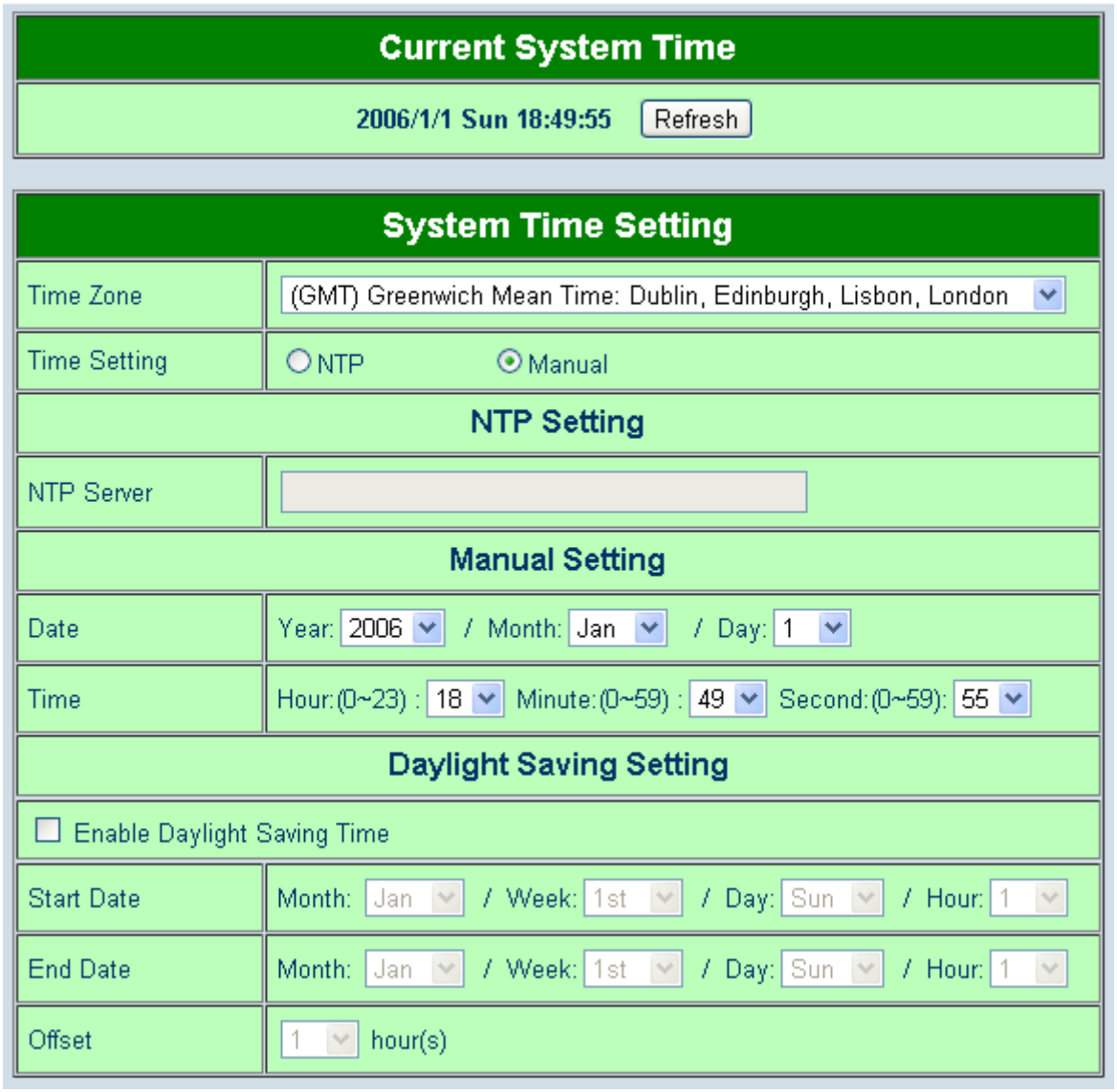


Figure 3.46 Time Settings by web page

3.5.6 Security Configuration

Operation: System→Security

Click on the "***Security***" link and the following screen shall appear

Figure 3.47 Security Configuration by Web page.

Enter the old password on "***Old Password***" field; enter the new password on "***New Password***" and the "***Verified Password***" fields, and then click on "***Save Configuration***" to update the password.

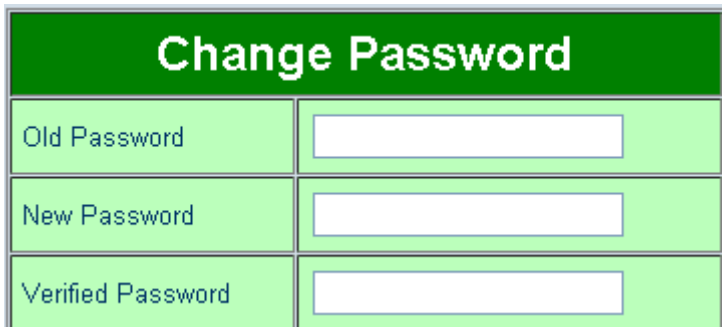


Figure 3.48 Change password by Web page

❋ **Note: One may press the reset key on product to reset password to the default value**

SE5404D serials allow one to change the access methods to protect it against intrusion.

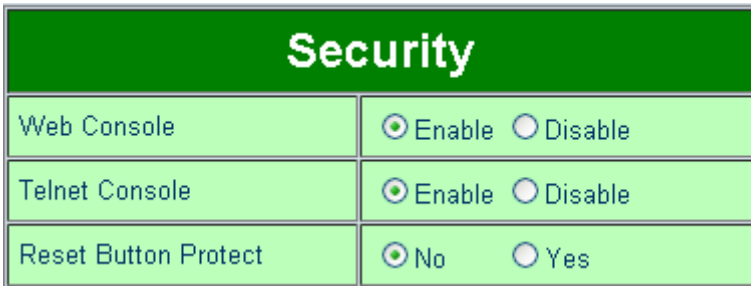


Figure 3.49 Security Configuration by Web page.

3.5.7 Import/Export

Operation: System→Import/Export

Please select a setting file to be imported or a file path for the settings to be exported on the WebUI.

Figure 3.50 Import/Export WebUI

3.5.8 Restore Factory Default

Operation: System→ Set to Default

One may click on "***set to default and restart***" button to restore Serial Server's settings to Factory Default Settings.

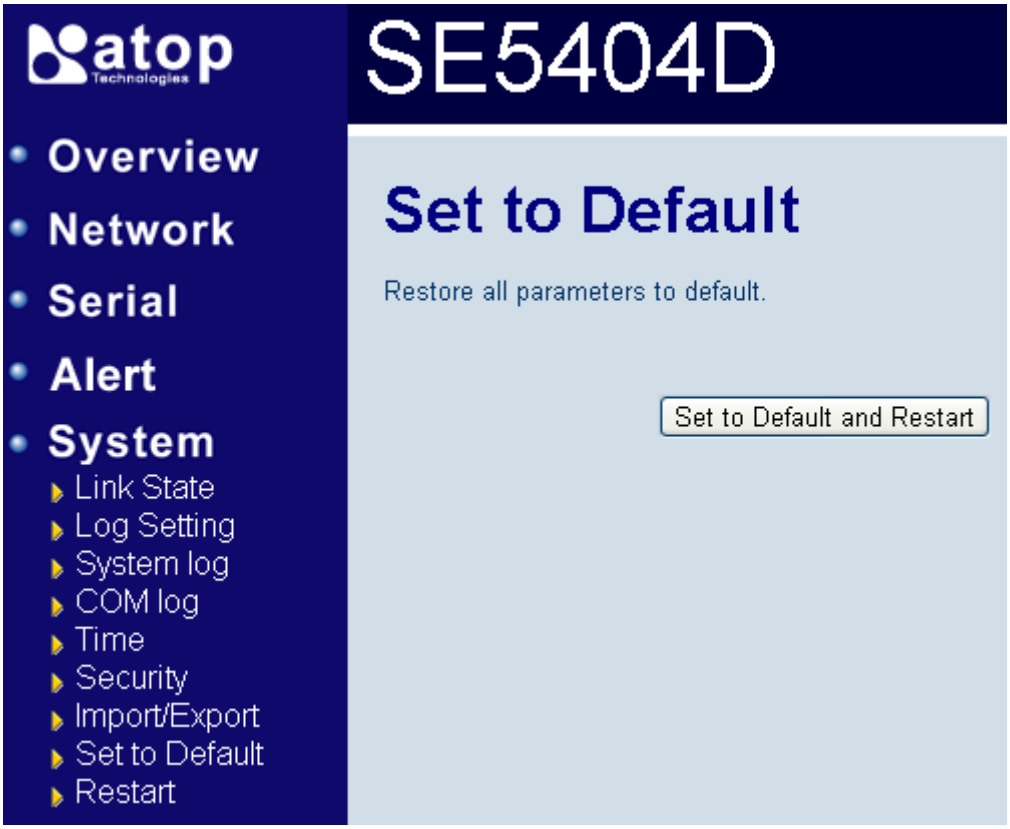


Figure 3.51 Restore Factory Default by Web page

3.5.9 Restart System

Operation: System→ Restart

One may press "***Restart***" button to restart the SE5404D series. The web page will be refreshing after it reboot.

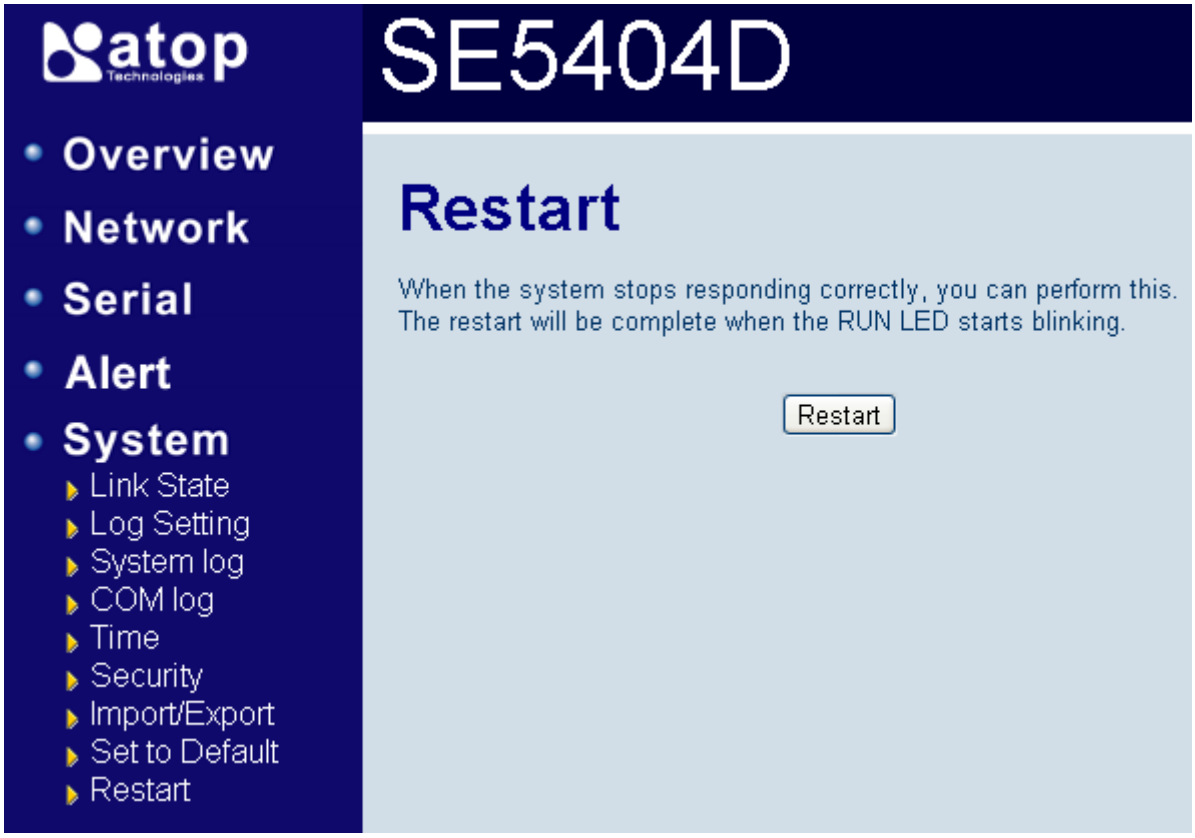


Figure 3.52 Restart System by Web page

4. Using Virtual COM

Virtual COM driver mode for windows converts COM data to LAN data to control the COM port on a SE5404D via the LAN. By creating virtual COM ports on the PC, the Virtual COM driver redirects the communications from the virtual COM ports to an IP address and port number on a SE5404D that connects the serial line device to the network. The following figure is Virtual COM connection diagram. (ref Figure 4.1)

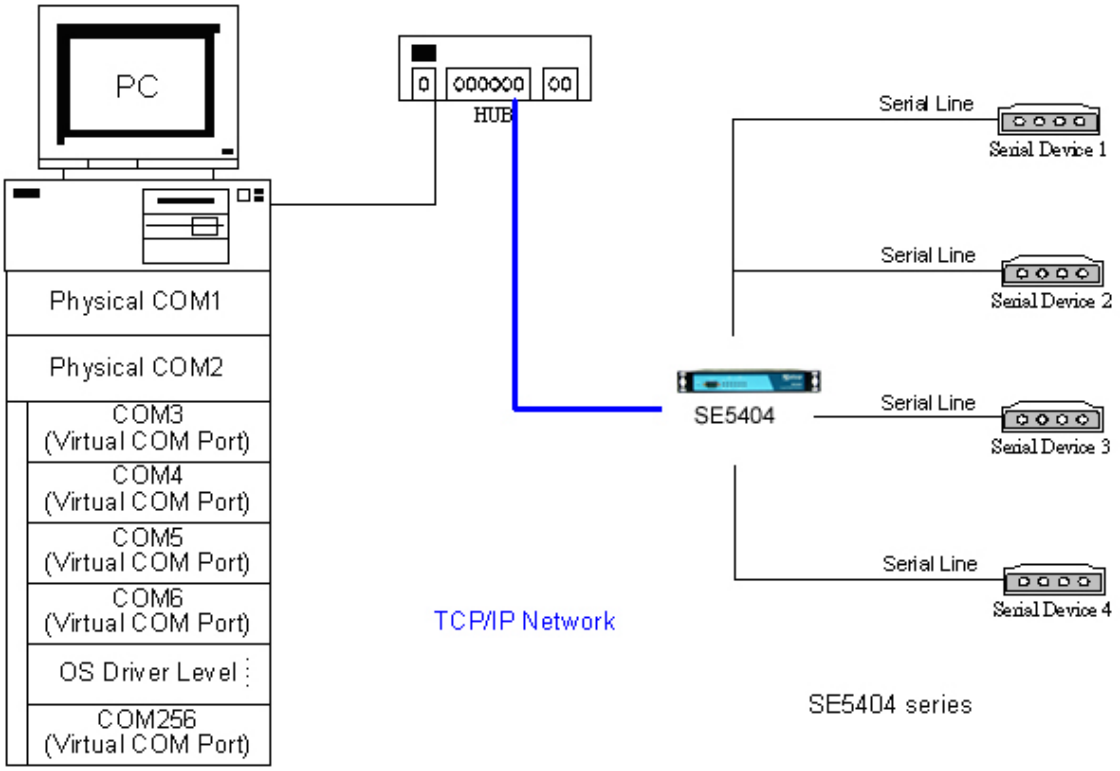


Figure 4.1 Virtual Com connection diagram

4.1 Setup of a virtual COM driver

4.1.1 Pre-installation requirements

Please check the operation system on your PC complied with the following requirements:

- Processor: Intel-compatible, Pentium class
- Operation system: Windows Server 2003, Windows XP, Windows 2000, Windows NT 4.0 SP5 or later, Windows Me, Windows 98, Windows 95, Microsoft NT/2000 Terminal Server, Citrix MetaFrame

4.1.2 Cautions on Use

The Virtual COM driver supports firmware AP v3.0 and later of SE5404D Serial Device Server-Ethernet Servers.

4.1.3 Limitation

The Virtual COM driver provides user to select up to 256 **COM ports** as Virtual COM ports in a SerialManager Utility PC. User can select them from a list of COM ports, which is from COM1 up to COM256.

4.1.4 Installation

Make sure you have turned off all anti-virus software before beginning the installation. Run the Virtual COM setup file included in the CD to install Virtual COM driver for your operating system.

In the end of the installation, please select one or two COM ports to become the Virtual COM ports.

4.1.5 Uninstalling

1. From Windows Start menu select Setting, Control Panel, Add/Remove Programs.
2. Select **Serial IP** in the list of installed software.
3. Click the **Add/Remove** button to remove the program, or From Windows Start menu select Programs, Serial IP for ATOP, **Uninstall Serial IP** to remove the program.

4.2 Virtual COM communication

4.2.1 Enable Virtual COM on SE5404D

From web browser access to SE5404D by typing its IP address,

- ➔ click on "***COM1"*** link to access COM1 page,
- ➔ on the top half of the page click on "***TCP Server***"
- ➔ C***Virtual COM*** to Enable COM driversenable **Virtual COM** by putting a check in front of the "Enable" button, then t
- ➔ Enter in the local port number in the "***Local Port***" field as indicated in the following figure: (ref Figure 4.2)

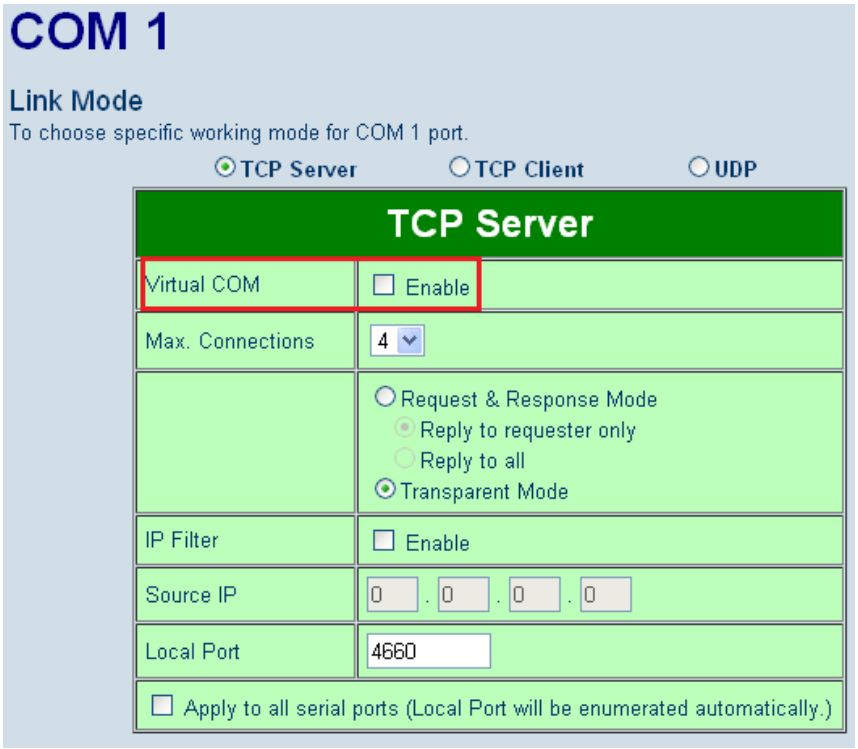


Figure 4.2 Enable Virtual Com Or you can

4.2.2 Run Serial/IP on PC

In the Window Start Menu, go to “Programs”, select “Serial/IP” and select “Control Panel”. When “Select Port” windows pop-up, please select the serial port you want to configure. Then the configuration window will appear. (ref Figure 4.4)

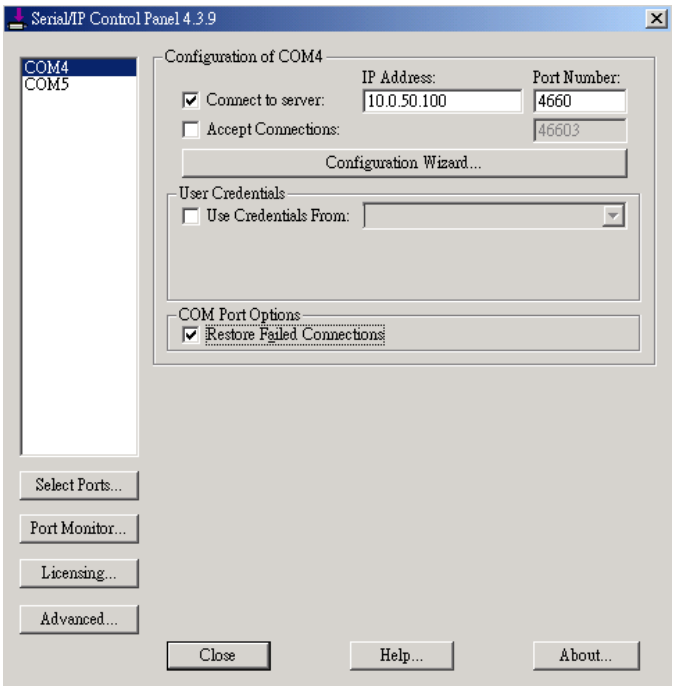


Figure 4.4 Serial/IP configuration

At the right side of Figure 4.4 is a sample Virtual COM Control Panel window. At the left side is the list of the COM ports that you have selected (in the **Select Ports** window) for use by the Virtual COM Redirector. If you wish to change which ports appear in this list, use the **Select Ports** button.

Each COM port has its own settings. When you click on a COM port, the Control Panel display changes to reflect the settings for that COM port.

NOTE: When you change settings for a COM port, the changes are effective immediately. There is no separate confirmation dialog to confirm or cancel your changes.

4.3 Configuring Virtual COM Ports

You configure each Serial/IP COM port as follows: (ref Figure 30)

1. Select a COM port in the list.
2. For **IP Address of Server**, enter a numeric IP address for the serial server.
3. For **Port Number**, enter the TCP port number that the serial server uses to provide its serial ports to the network.
4. For **Server Credentials**, the default is **No Login Required**. If your serial server does require a login by the Virtual COM Redirector, the Virtual COM Redirector needs to provide a username and/or password every time an application tries to use the serial server.
5. Click the **Configuration Wizard** button and then click the **Start** button that appears in the wizard window. This important step verifies that the Virtual COM Redirector can communicate with the serial server using

the settings you have provided. If the **Log** display does not show errors, click the **Use Settings** button in the wizard, which makes the recommended settings effective and returns you to the Control Panel to continue with the following steps.(ref Figure 4.5)

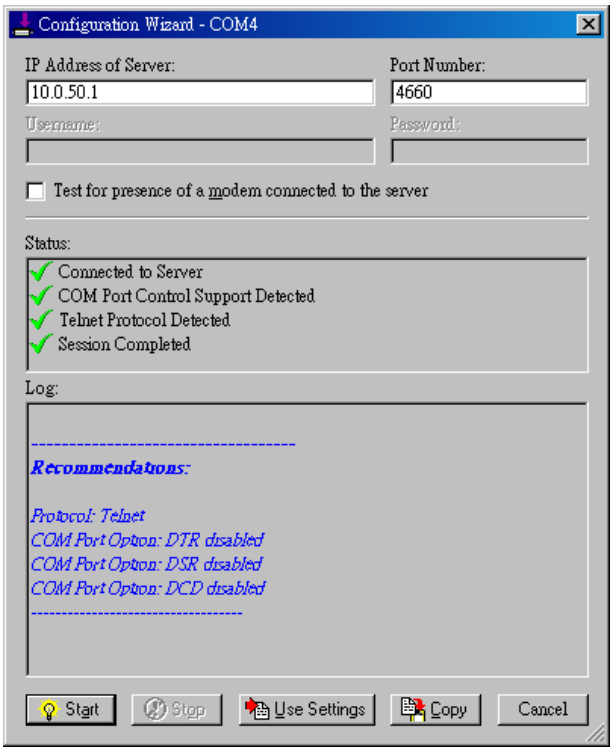


Figure 4.5 Configuration Wizard

6. For **Connection Protocol**, the setting must match the TCP/IP protocol that the serial server supports. The Configuration Wizard is usually able to determine the correct setting.
7. For **COM Port Options**, the settings must match the COM port behavior expected by the PC application that will use this COM port. The Configuration Wizard will recommend a combination of settings.

5. SNMP Setup

5.1 SNMP Network Management Platform

SE5404D is an SNMP device that allows many popular SNMP Network management platforms such as HP OpenView and SunNet Manager to conduct on the SerialManager Utility.

Depending on the network management tools you are using, device (SE5404D) information can be collected from running the management tools including **IP address, DNS name, system descriptions and NIC** information etc.

5.2 Using NetworkView As An Example

The NetworkView is a compact network management tool from NetworkView Software, Inc. (www.networkview.com). It discovers all TCP/IP nodes in a network using DNS, SNMP and ports information and documents with printed maps and reports for future use. You may visit their web sites and get a free download.

To use NetworkView, you will need to download and install the tool on ones PC (**Windows NT and Windows 9x only**). Please refer to the installation instructions that come with the tool.

After you have done the NetworkView installation, start NetworkView.

1. Click on the  button to open a new file. The following screen appears, in the **Addresses field**, Enter in the IP address range to search(Figure 5.1).

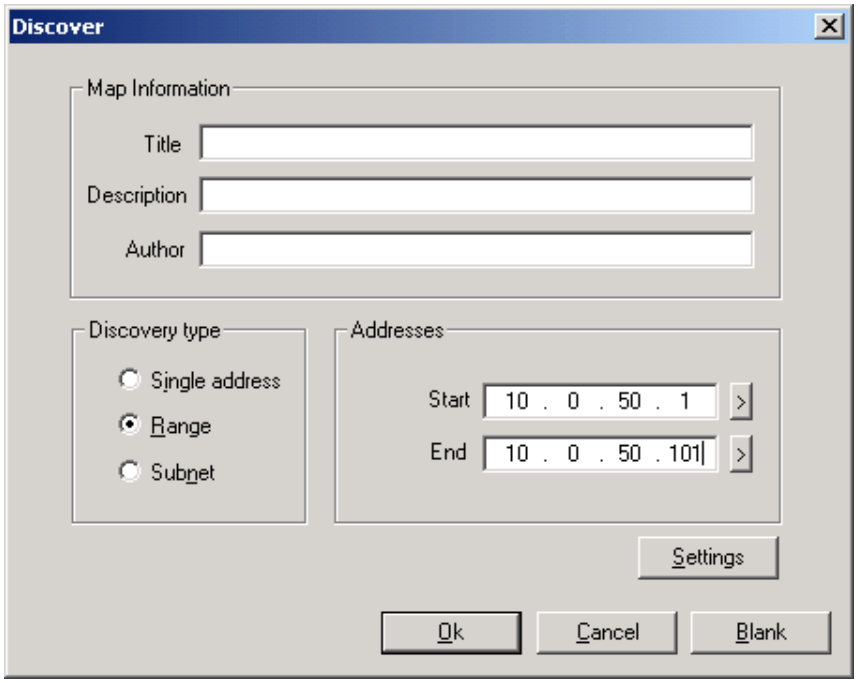


Figure 5.1 NetworkView-IP discovery parameters setup

Click on “OK” and the following dialog box appears. It displays the searching progress(Figure 5.2).

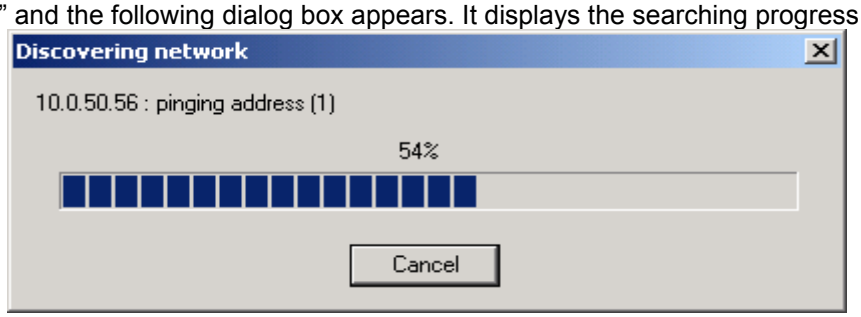


Figure 5.2 Discovering network

2. When the search is completedd, NetworkView will display the devices found in the main window, as shown in the following diagramFigure 5.3.

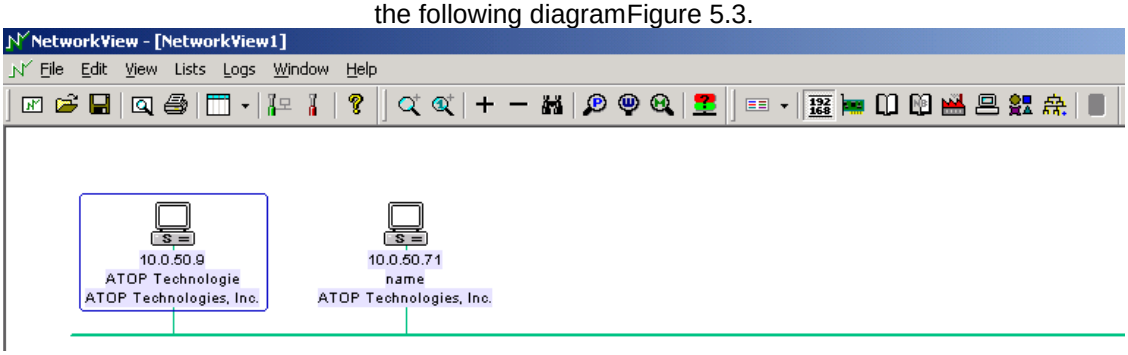


Figure 5.3 NetworkView- main window

3. Double-click on the device icon to display information about the device, including IP Address, Company, SysLocation (Max 15 characters), SysName (Max 9 characters) and types etc(Figure 5.4).

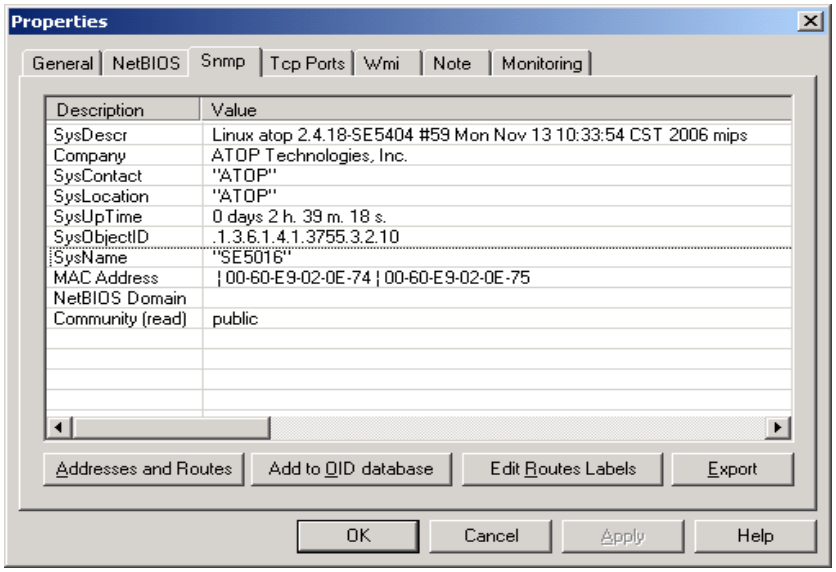


Figure 5.4 NetworkView-Node details

NOTE:

1. The NetworkView tool is limited to information extracting and viewing only.
2. To modify the configurations please use the web server, Telnet or SerialManager configuration utilities.

6. Start Writing Ones Own Applications

Before you start writing ones host applications or programs to interact with SE5404D, please make sure one have done the following.

6.1 Preparing The System

1. Properly connect SE5404D hardware including power, Ethernet and serial cable
2. Properly configure the parameters of SE5404D including connection type, IP address, gateway IP address, and network mask accordingly (see chapter 3 **Hardware Installation** section).
3. Configure SE5404D as TCP Server using default TCP port number 4660.
4. The host (PC) application program must be configured as a TCP client and connects to SE5404D with designated TCP port number 4660 for COM1.
5. Make sure SE5404D is running by checking theSE5404D running status through **SerialManager** configuration utility.

6.2 Running The Sample Program

Sample programs written in VB and VC++ included in package are provided for your reference, source codes are also included. Test program can be found in the product CD or diskette under the directory of ***sample**vb_ap*** and ***sample**vc_ap*** respectively.

There are two test programs, TCPTEST written in Visual Basic and TCPTEST2 written in Visual C++.

6.2.1 TCPTEST in Visual Basic

This sample program (Figure 6.1) is written in Visual Basic 5.0 with Winsock Controls. It shows you how to send and receive data between host (PC) and SE5404D via Ethernet in two socket ports.

Run Visual Basic and open sample program tcptest.vbp, after the program is started successfully, you can start testing functions. For more information, please press **Help** in the program to get detail explanation.

NOTE: Please be sure the Microsoft visual studio family or its equivalent software is installed on the computer. Otherwise the sample program will not run.

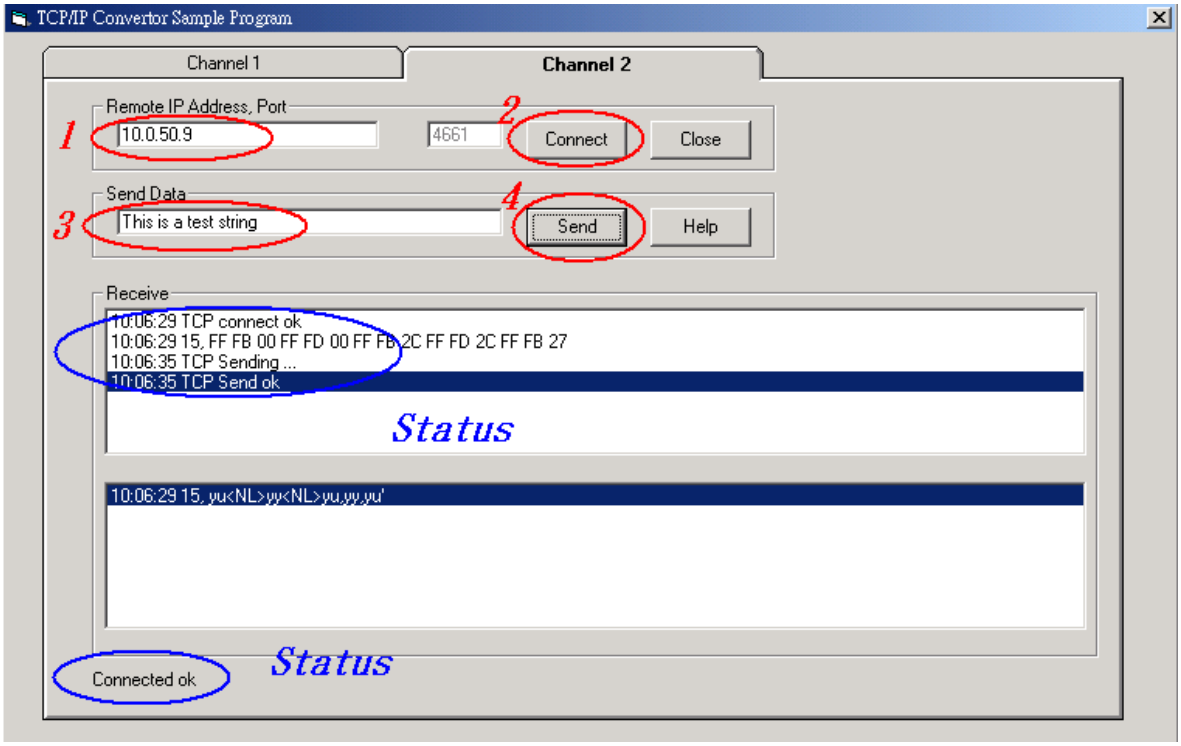


Figure 6.1 TCP test sample program in Visual B

6.2.2 TCPTEST2 in Visual C

Enter in the following command in the command line prompt(Figure 6.2):

TCPTEST2 IP_Address Port_Number

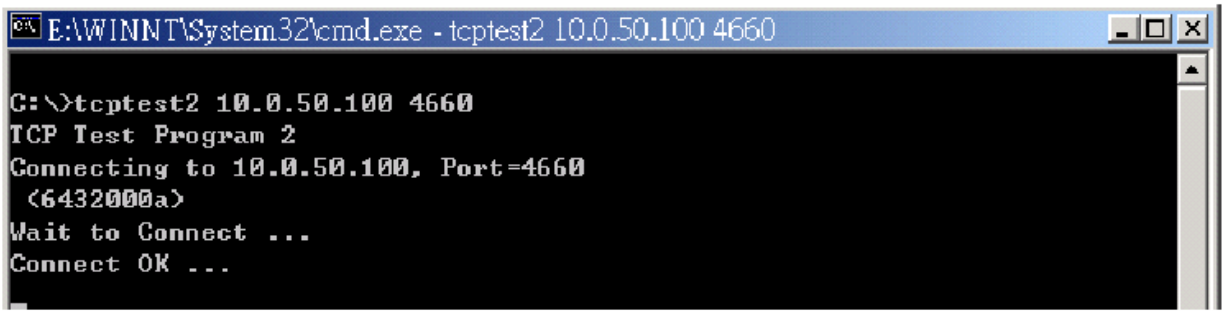


Figure 6.2 TCP test sample program in Visual C

The command ***tcptest2 10.0.50.100 4660*** brings you to connect to a TCP server of IP address *10.0.50.100* and port number *4660*, the received data is displayed on the screen and the data typed in is sent to the TCP server of the designated port number. You can also send binary data in hex format with a leading character "\". For example, "\00" and "\FF" represent ASCII code 0 and 255 respectively.

You can also use modem to connect to the serial server. Command "***AT\Od***" sends standard AT command to the modem which in return responds with "***OK\0D\0A***" message to the host application.

Always use '**=**' then **Enter** key to exit the program.

7. Diagnostics

There are several ways you can check on the status and availability of SE5404D.

7.1 Use Standard TCP/IP Utility *ping* Command

From Windows **Start** menu, select **Run** and Enter in "**ping <TCP Server IP address>**"(Figure 7.1).

If the connection is established, the Reply messages are displayed, otherwise it will indicate Request timed out.

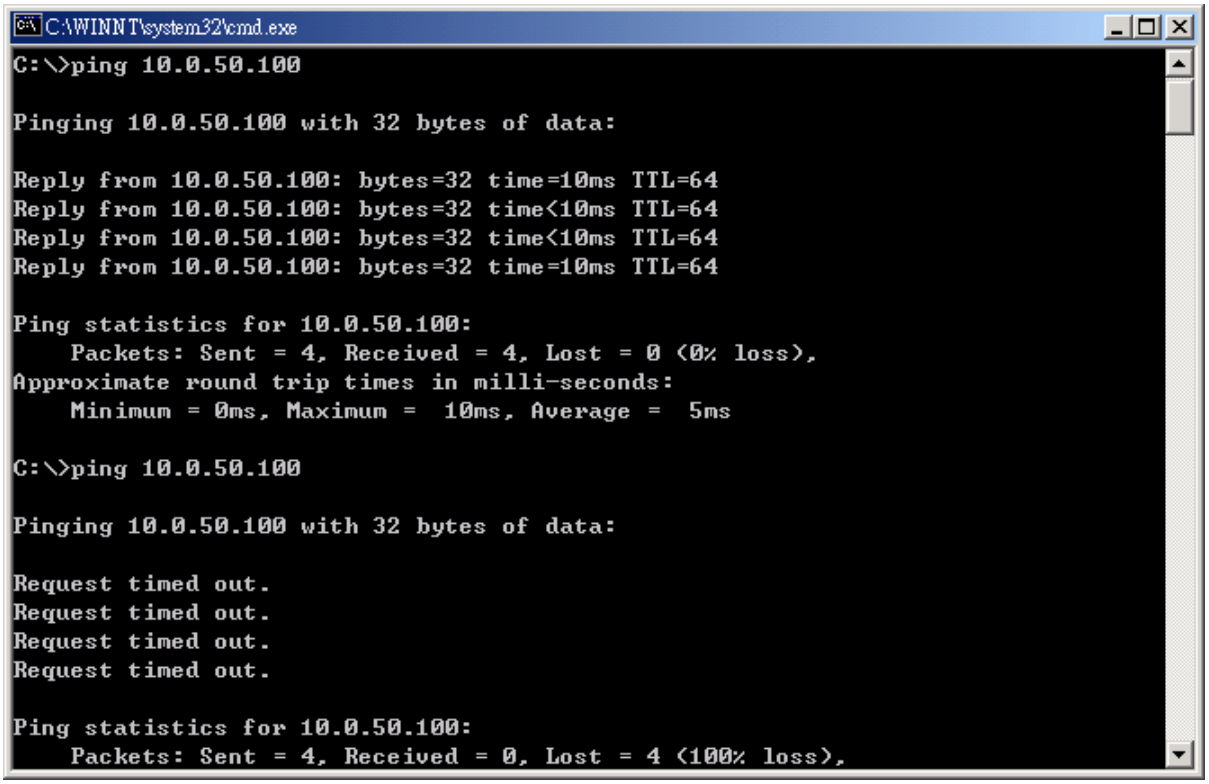


Figure 7.1 Standard TCP/IP utility ping command

7.2 Use SerialManager Configuration Utility Program

Use SerialManager Utility configuration program that comes with the product CD or diskette to check on the status of SE5404D. The status and version can be read from the tool.

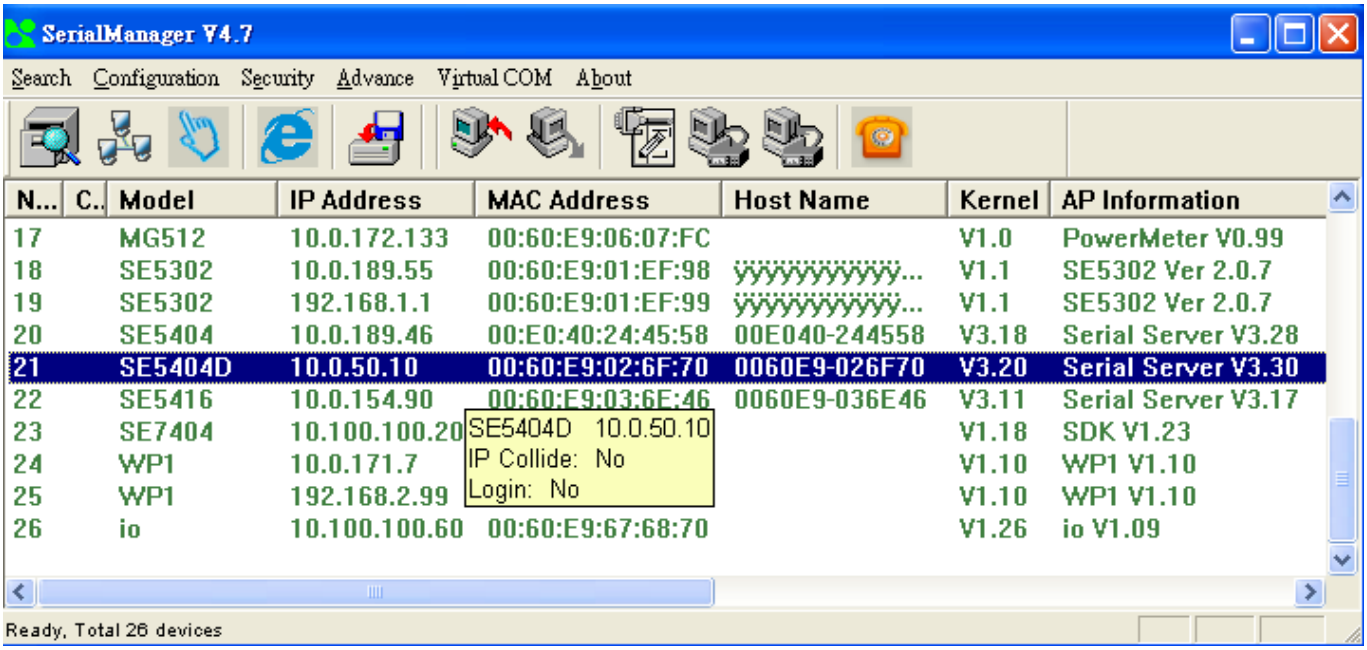


Figure SerialManager configuration utility

7.3 Use TCPTEST.EXE or TCPTEST2.EXE Sample Program

Use sample programs TCPTEST.EXE and TCPTEST2.EXE that comes with the product CD or diskette to check on the status of SE5404D. Please refer to chapter 6.2 to run the sample programs.

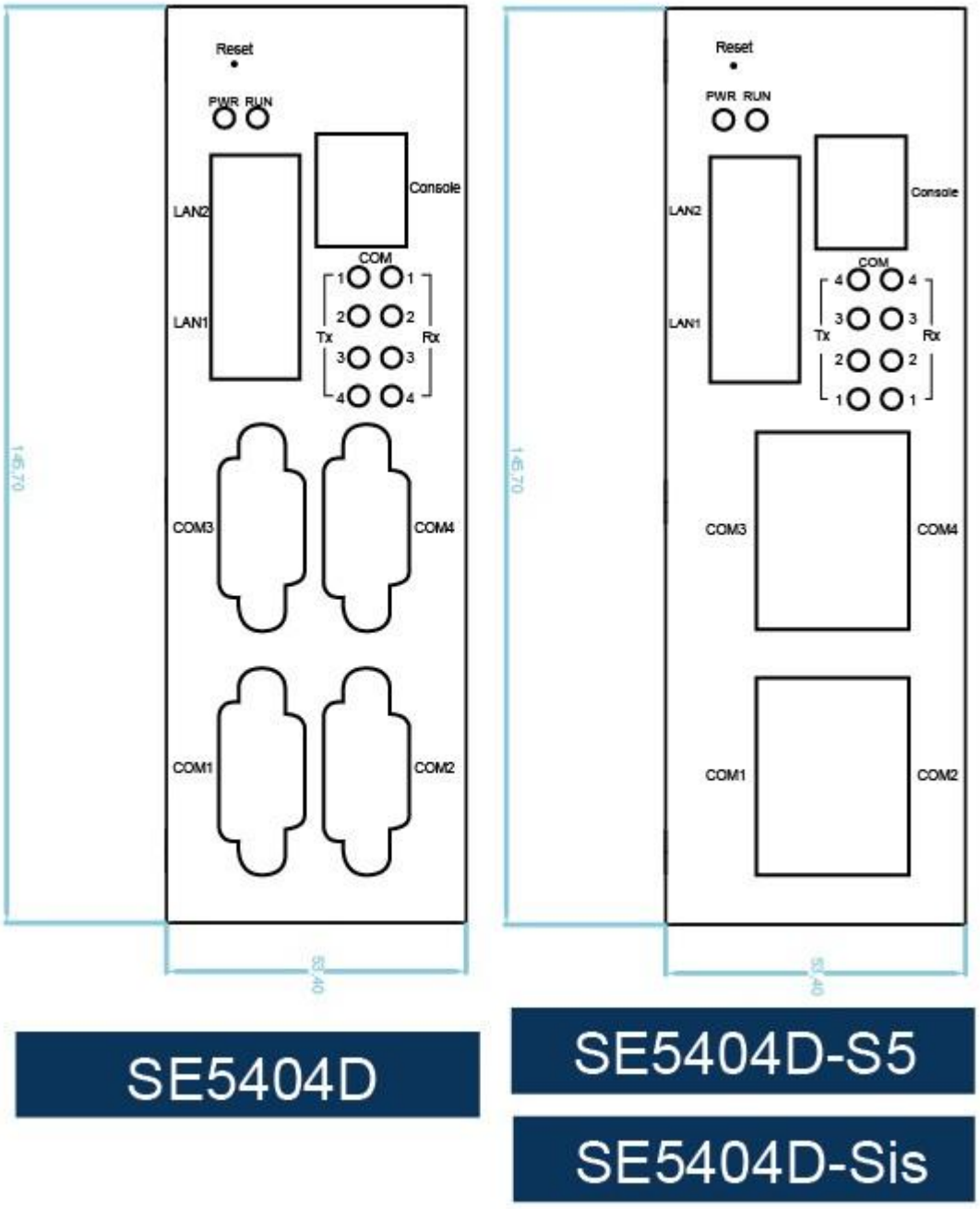
Appendix A: Specifications

Specifications		
Ethernet		
	Compliance	IEEE802.3
	Network Interface	10/100 Mbps Fast Ethernet
	Port	2
	Transmission Rate	10/100 Mbps Auto-detection
	Connector	RJ-45
	Auto MDI/MDI-X	Yes
Link Mode		
	TCP Server	Up to 8 connections or Virtual COM / Reverse Telnet modes
	TCP Client	Up to 2 destination or Virtual COM mode
	UDP	Up to 8 Ranges of IPs
Serial		
	Interface	RS-232/422/485 (SE5404D) RS-422/485 (SE5404D-TB/SE5404D-Sis) software selectable
	Ports	4 Ports
	Baud Rate	300bps~921.6kbps(SE5404D/SE5404D-TB) 300bps~230kbps (SE5404D-Sis)
	Parity	None, Odd, Even, Mark, Space
	Data bits	5, 6, 7, 8
	Stop Bit	1,2
	Flow Control	None, Software: Xon/Xoff, Hardware: RTS/CTS
	Protection	15KV ESD 2KV Magnetic Isolation (SE5404D-Sis only)
	Connector	9-Pin lockable D-Sub 5-Pin 5.08mm lockable Terminal Block
Power		
	Input	9-48DCV, 0.65A max
	consumption	Max. 5.85W
	Connector	7-pin 5.08mm connector for redundant power input
LED		

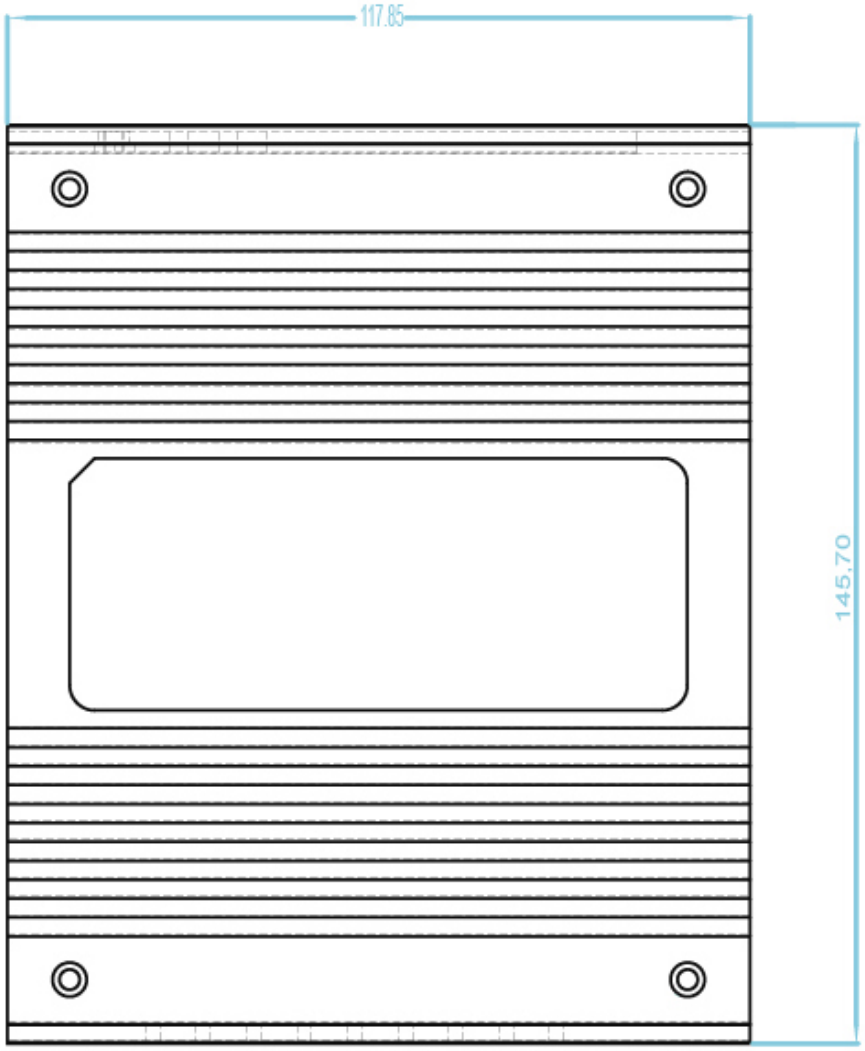
	Indicator	COM, LAN, RUN
Approval		
	EMC	CE Class A, FCC Class A
	Protection	IP50 Rated IEC/EN60529
	Vibration	IEC60068-2-64
	Shock	IEC60068-2-27
	Free-fall	IEC60068-2-32(ISTA Test Procedure 2A)
Environment		
	Operating	-40℃~85℃(-40˚F ~176˚F)
	Storage	-40℃~85℃(-40˚F ~185˚F)
	Humidity	5%~95% Non-condensing
Dimension		
	(WxHxD)	53.4mm x 145.7mm x 119.9mm
Physical		
	Weight	900g
	Installation	DIN-Rail mounting or Wall mount (optional)
	Warranty	5 years
MTBF		
	Preceding	TBD
Software		
	Configuration	Web Page / Telnet / Serial console / Windows Utility
	Virtual COM	Windows & Linux port redirection software
	Support Protocol	ICMP, TCP/IP, UDP, DHCP Client, NTP, DNS, SNMP, HTTP, Telnet, SMTP

A.3 Panel Layout and Connector Pin Assignments
A.3.1. Panel Layout

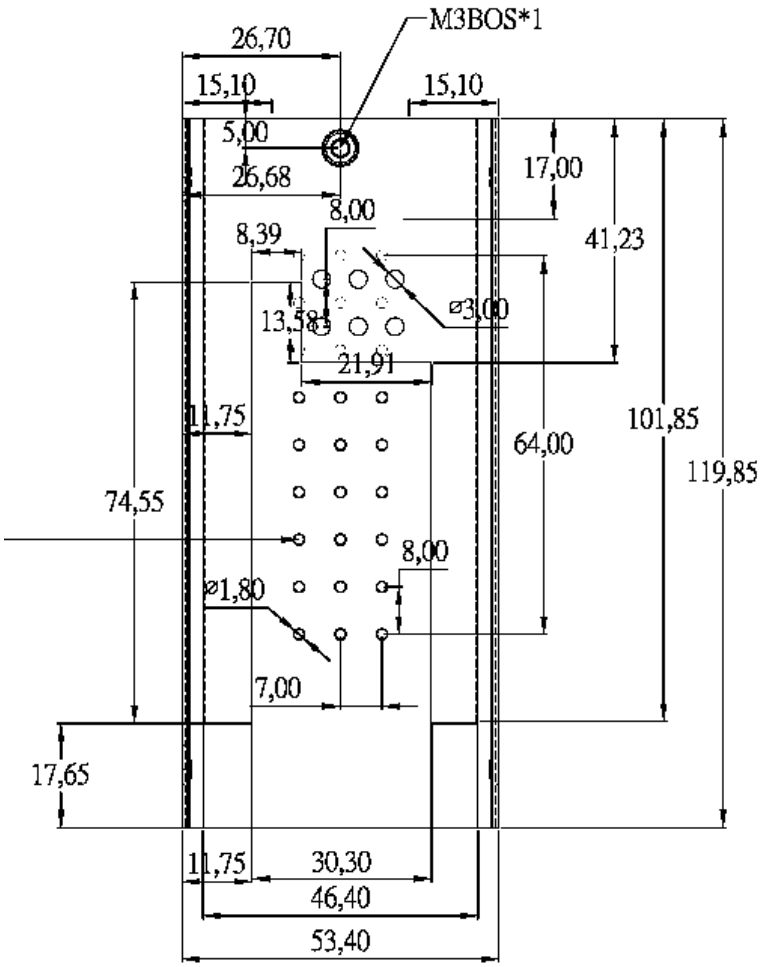
A.3.1.1 SE5404D Front Panel

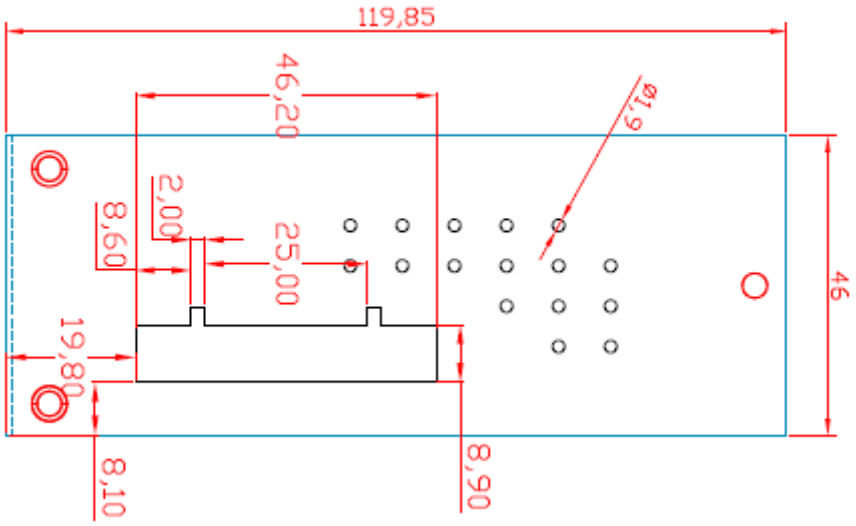


A.3.1.2 SE5404D Side View

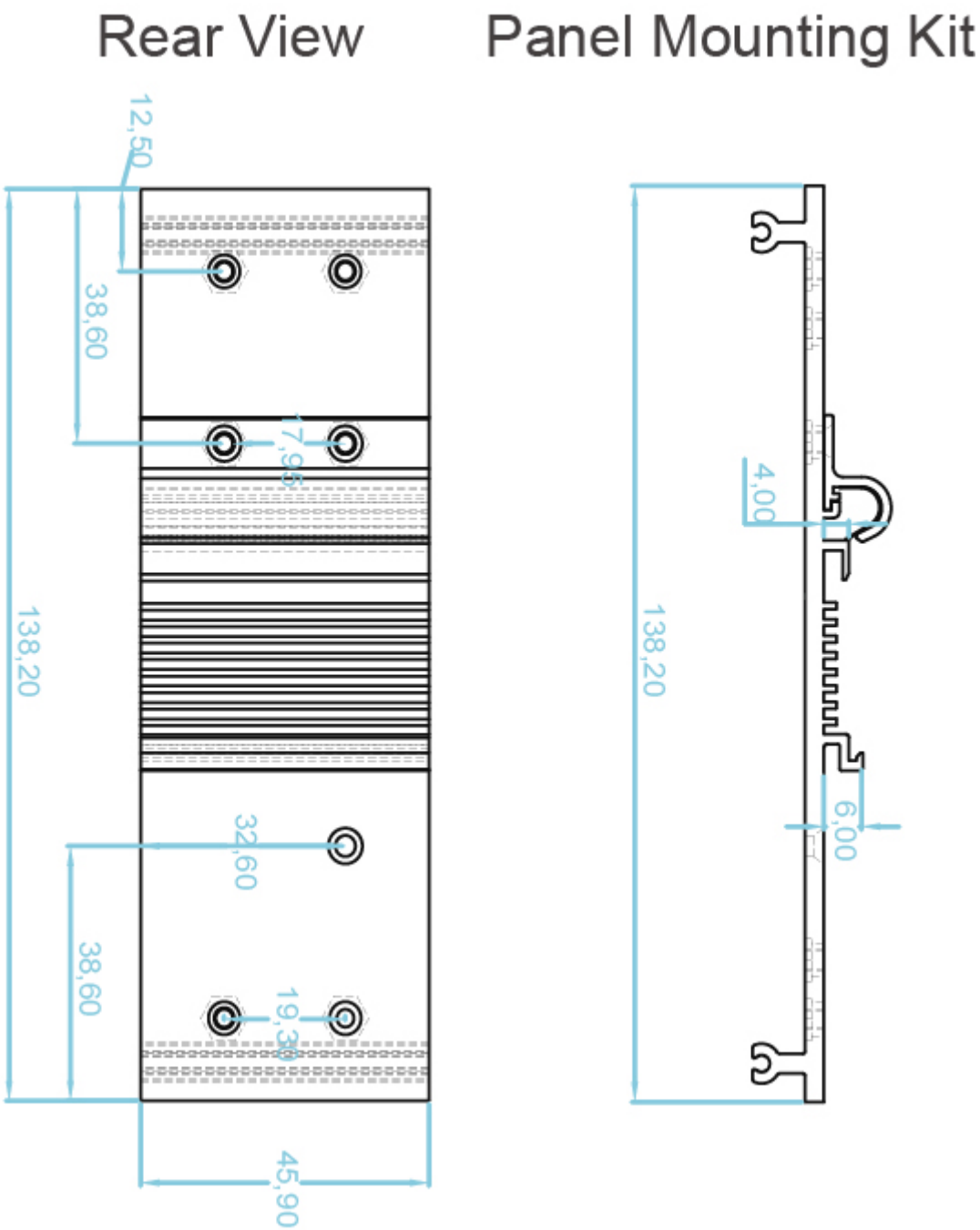


A.3.1.3 SE5404D Top View





A.3.1.4 SE5404D Rear and Mounting View



A.3.2.1 DB9 Pin Assignments

The pin assignments of DB9 connector on SE5404D is shown in the following table:

Pin#	RS-232 **Full Duplex** for SE5404D	RS-422/4-Wire RS-485 **Full Duplex** for SE5404D	2-Wire RS-485 **Half Duplex** for SE5404D
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

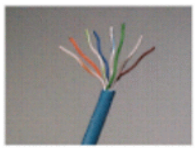
A.3.2.2 Terminal Block Pin Assignments

The pin assignments of Terminal Block connector on SE5404D-TB / SE5404D-Sis is shown in the following table:

Pin#	RS-422/4-Wire RS-485 **Full Duplex** for SE5404D-TB / SE5404D-Sis	2-Wire RS-485 **Half Duplex** For SE5404D-TB / SE5404D-Sis
1	T+	NC
2	T-	NC
3	R+	Data+
4	R-	Data-
5	SG (Signal Ground)	SG (Signal Ground)

A.3.3.1 Ethernet Port (RJ-45)

1. Category 5 UTP cable, 8 core wires.



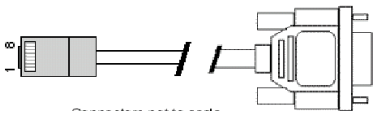
2. RJ45 Connector. 

3. RJ45 Pin Assignment

Pin Assignment	568A Definition	568B Definition
Pin1	Green-White	Orange-White
Pin2	Green	Orange
Pin3	Orange-White	Green-White
Pin4	Blue	Blue
Pin5	Blue-White	Blue-White
Pin6	Orange	Green
Pin7	Brown-White	Brown-White
Pin8	Brown	Brown

You can choose either 568A or 568B definition. If you want to make a crossover cable, you should use 568A and 568B definition respectively in each terminal of a UTP cable.

A.3.4.1 Console Port (RJ-45)

RJ45			**Cross-over Female DB9**	
				
RTS	Pin 1	⇔	Pin 8	CTS
DTR	Pin 2	⇔	Pin 6	DSR
TXD	Pin 3	⇔	Pin 2	RXD
SG	Pin 4	⇔	Pin 5	GND
SG	Pin 5	⇔		
RXD	Pin 6	⇔	Pin 3	TXD
DSR	Pin 7	⇔	Pin 4	DTR
CTS	Pin 8	⇔	Pin 7	RTS

A.4 Buzzer/LED Message

A.4.1 Buzzer

“ ^ “: Beep twice

“ = “: Beep off

Message	Description
^==^========^^^ (5sec.)	Startup OK and AP firmware is enabled

Table 1. Buzzer Message

Appendix B: Upgrade System Firmware

After the new version of firmware is released, customers can download from www.Atop.com.tw. After you download the firmware, please follow these instructions listed below.

B.1 Upgrade Procedure

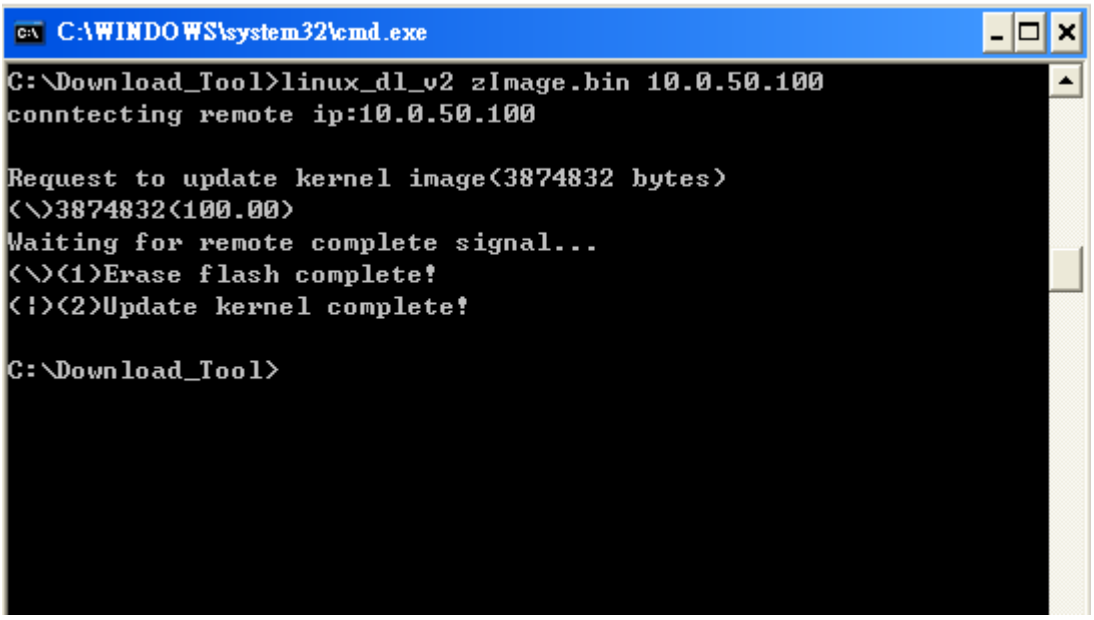
Please follow Appendix C if you want to use **SerialManager** to upgrade firmware. Follow the upgrading procedures below to upgrade to the latest firmware using a batch file:

- Make sure the PC and the SE5404D series on the same network. Use command **ping** or **SerialManager** Utility program to verify their availability.
- Edit “dll.bat ” to fit the system requirements, Be sure to save ones modification
- Run linux_dl ,the following screen shall appear .

  For example：**linux_dl_v2 zImage.bin 10.0.50.100**

- **Note : “linux_dl_v2”** is the upgrade executable and **zImage.bin** is the firmware file name;
  xxx.xxx.xxx.xxx is the IP address of SE5404D seriess

SE5404D will automatically restart each time the firmware is successfully download completed. When you get a new software version, please follow the procedure below to upgrade your SE5404D.



B.2 Critical Issues of Upgrading

If the upgrade is successful, SE5404D shall program the flash memory and the buzzer will beep 1 time before

restarting. It takes around 30 seconds to complete the programming process. If an error occurs during the programming process, SE5404D will clear the corresponding memory and the system remains the same before the process.

B.3 Error Messages

Firmware upgrade may not be successful if errors occur during the process.

Error Cause	Message	Comments
Illegal Hex file format	Hex File Text Error	
	Hex File Check-Sum Error	
	Hex File Format Error	
	Hex File End of Record Error	
SE5404D handshaking problem	SE5404D ACK Start Address Error	
	SE5404D ACK Length Error	
	SE5404D Response Command Error	
Configuration file	Remote IP not found	
	Open configuration file failure	

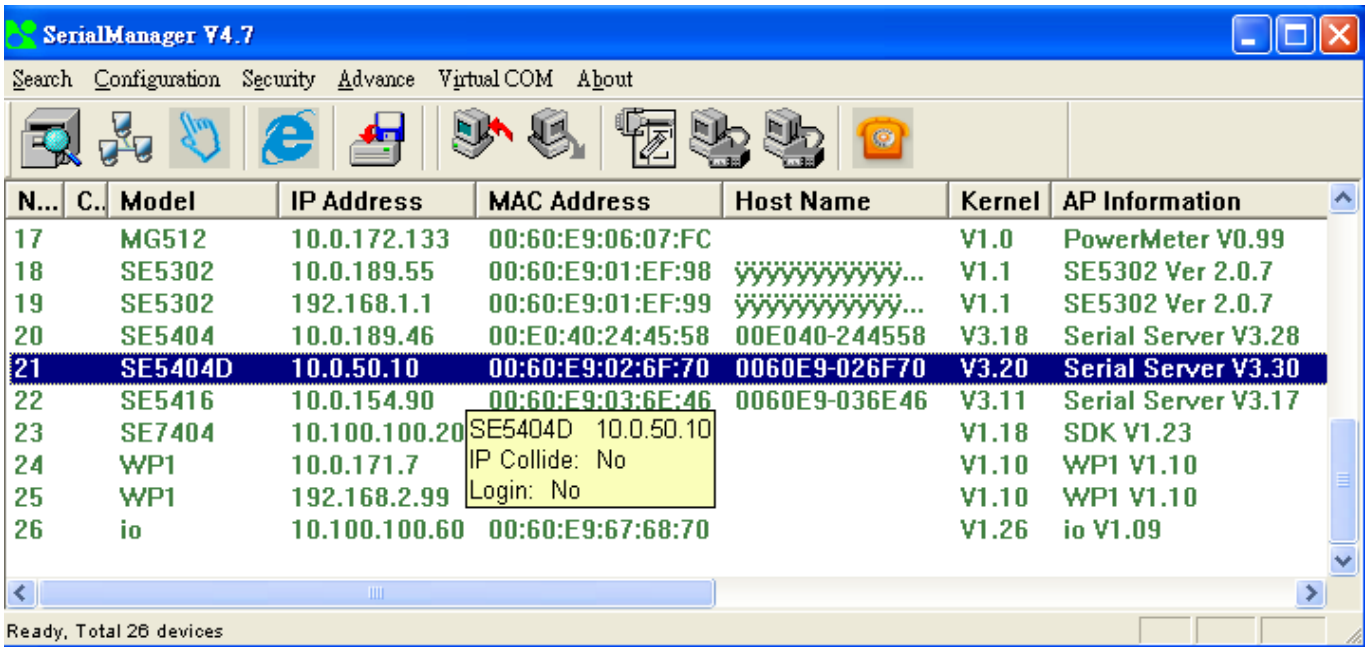
Appendix C: Using SerialManager Utility

C.1. SerialManager utility Introduction

SerialManager utility, developed by ATOP, is a special tool for device management and configuration. It can realize the daily management on various ATOP network devices for address search, device positioning, parameter configuring, and firmware downloading. Note that EW5302 is used to demonstrate the functionality of SerialManager instead of SE5404D.

C.2. Interface

The operating interface of the **SerialManager utility** is shown below:



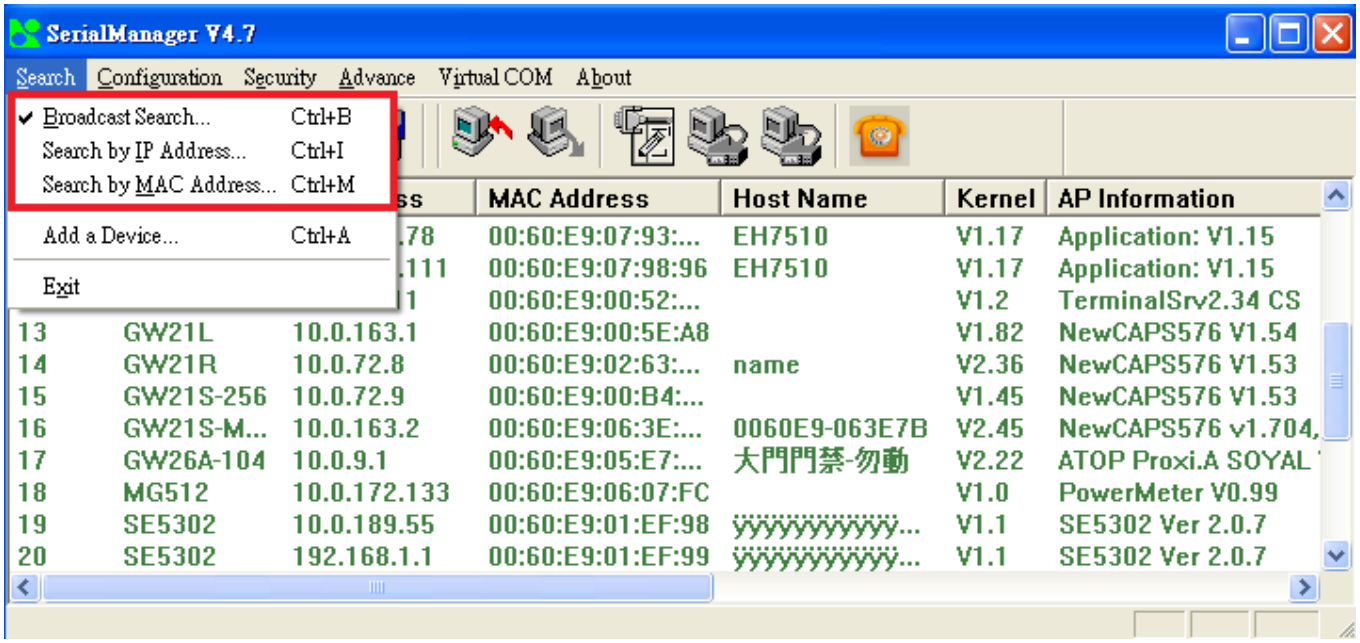
Caution Field	Description
!	IP conflict. There are two devices with the same IP address in the network.
@	The device is using DHCP.
<	The device is being located.
+	You have logged into the device.
?	MAC conflict. There are two devices with the same MAC address in the network.

C.3. Functions

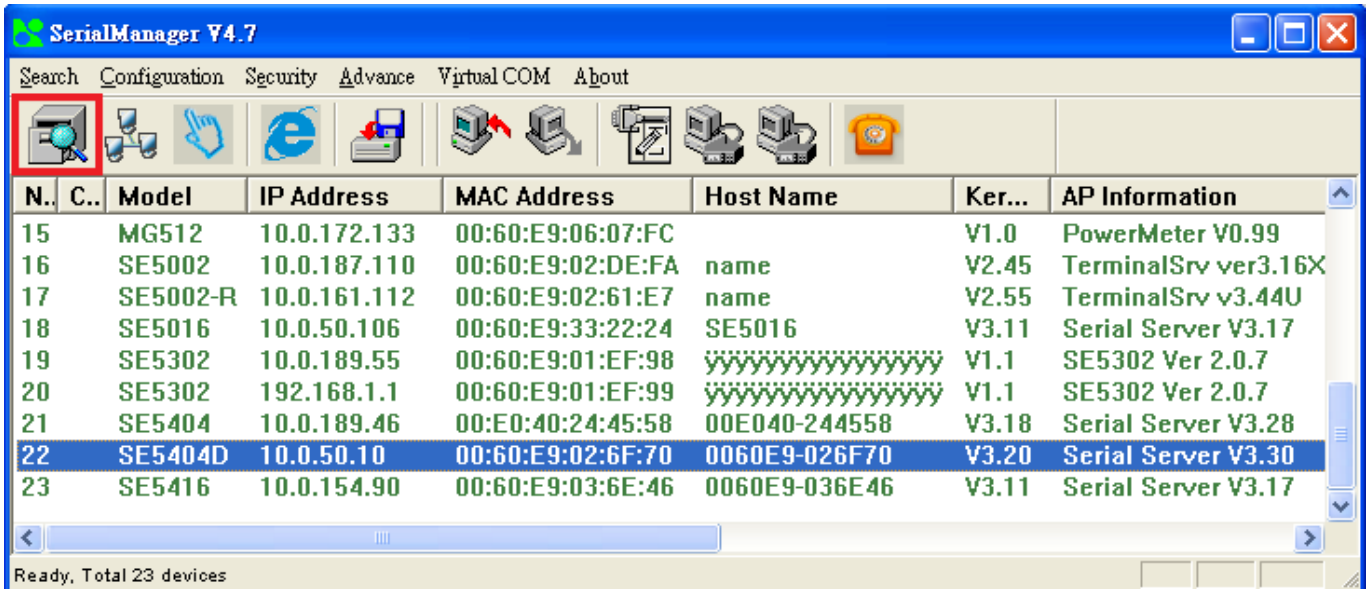
C.3.1. Device Search

This function is applied to search devices in the network. There are four methods to search devices, Search by Broadcast, Search by IP addresses, Search by MAC addresses and Rescanning devices by using the

current search method. To select the search methods, users click the “Search” on the main menu which is shown below.



Alternatively, users can select by clicking the Rescan button on the toolbar as below.

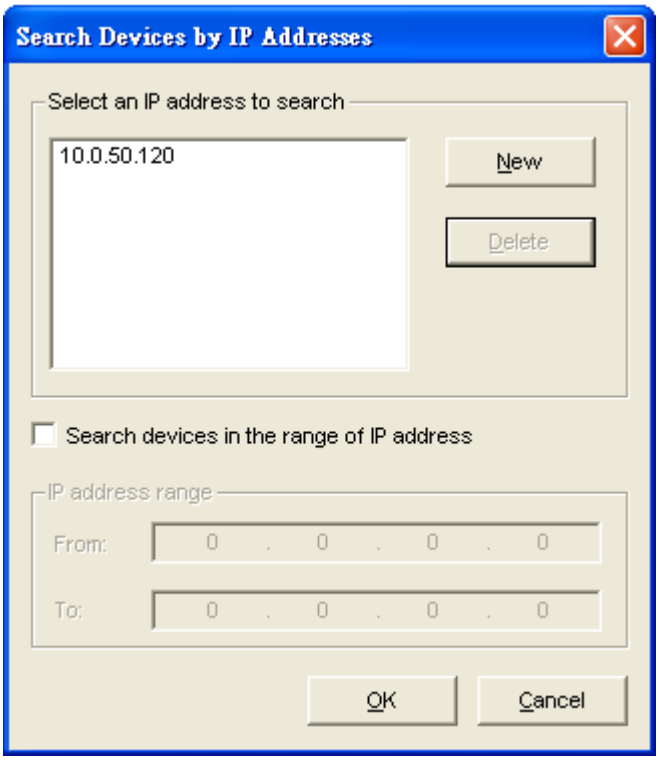


Broadcast Search

Once “Broadcast Search” is selected, a box will pop up as below. The user may type in or select different broadcast address based on the requirement.

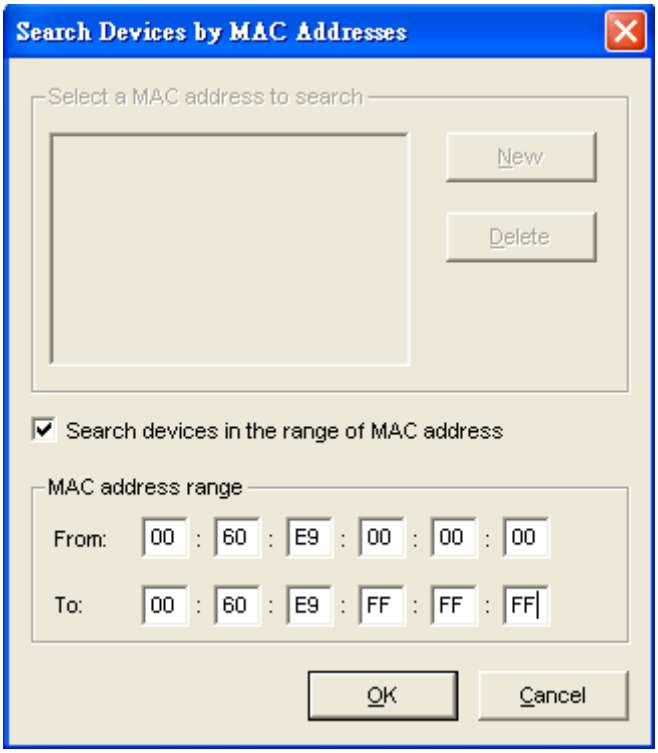
Search by IP address

Once “Search by IP Address” is selected, an interface will pop up as below. Here user may have two options: Select an IP address to search or Search device in the range of IP address.



Search by MAC Address

If “Search by MAC Address” is selected, another box will pop up as below. Here the user may search in two ways: “Search a MAC address to search” or “Search devices in the range of MAC address”

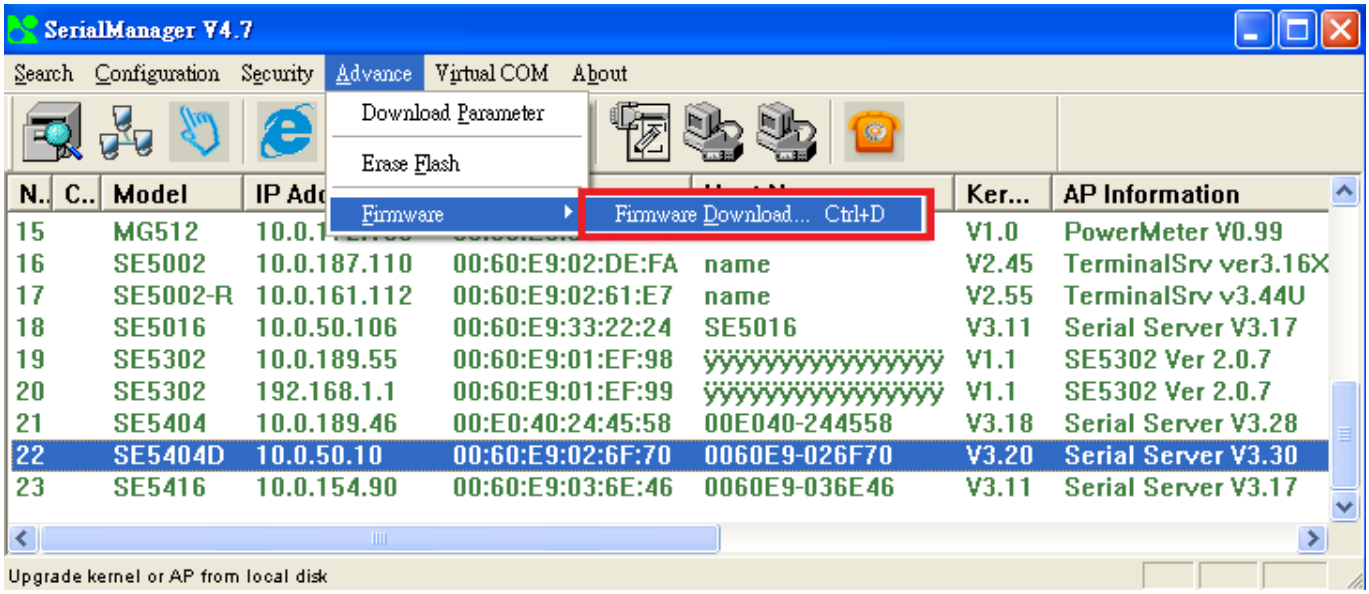


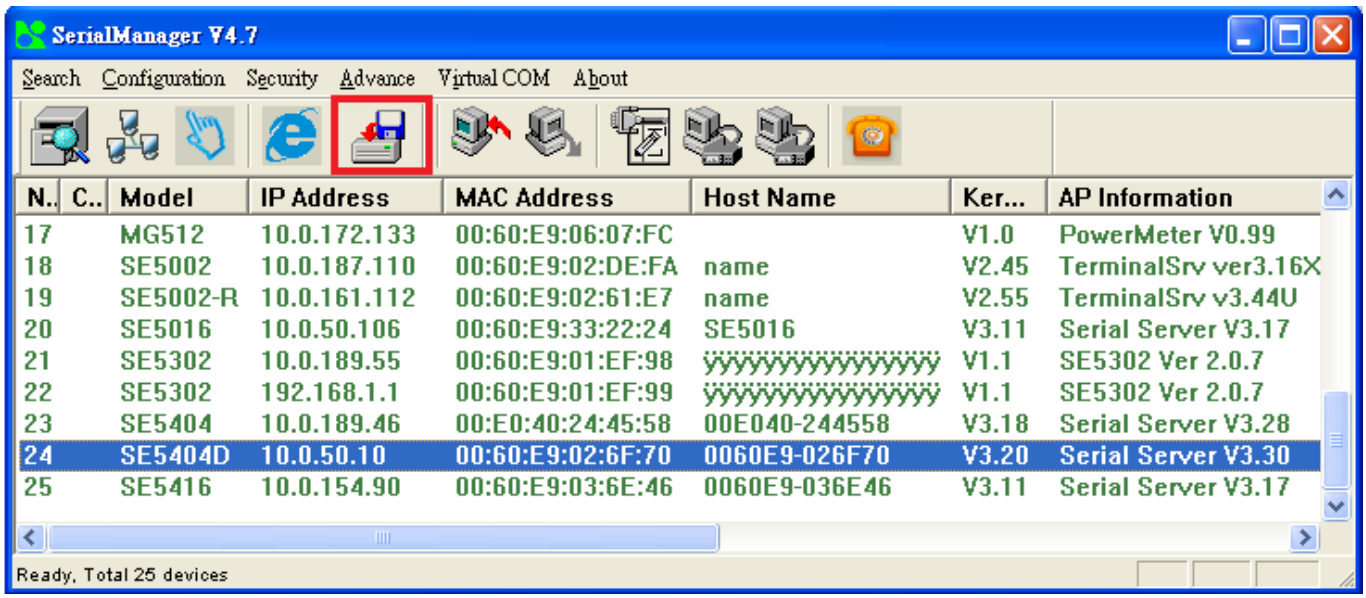
Rescan

Once the user click the “Rescan” button on the toolbar, the SerialManager utility shall re-search devices by using the current search way.

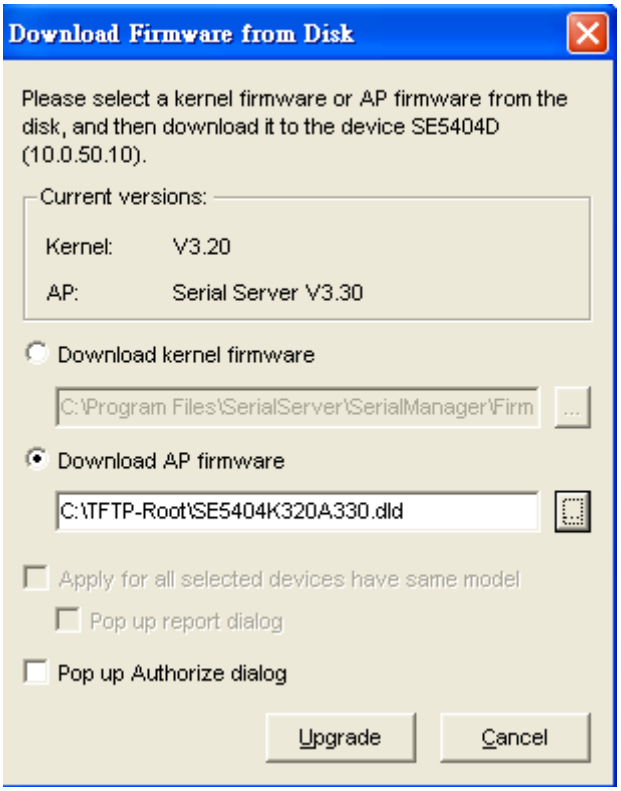
C.3.2. Firmware

This function is applied to downloading a firmware into the selected device. The user can enter the window for downloading by firstly clicking a designated network device, and then selecting the submenu option “Firmware Download” in the main menu option “Firmware”, or directly clicking the button **Upgrade from disk**.



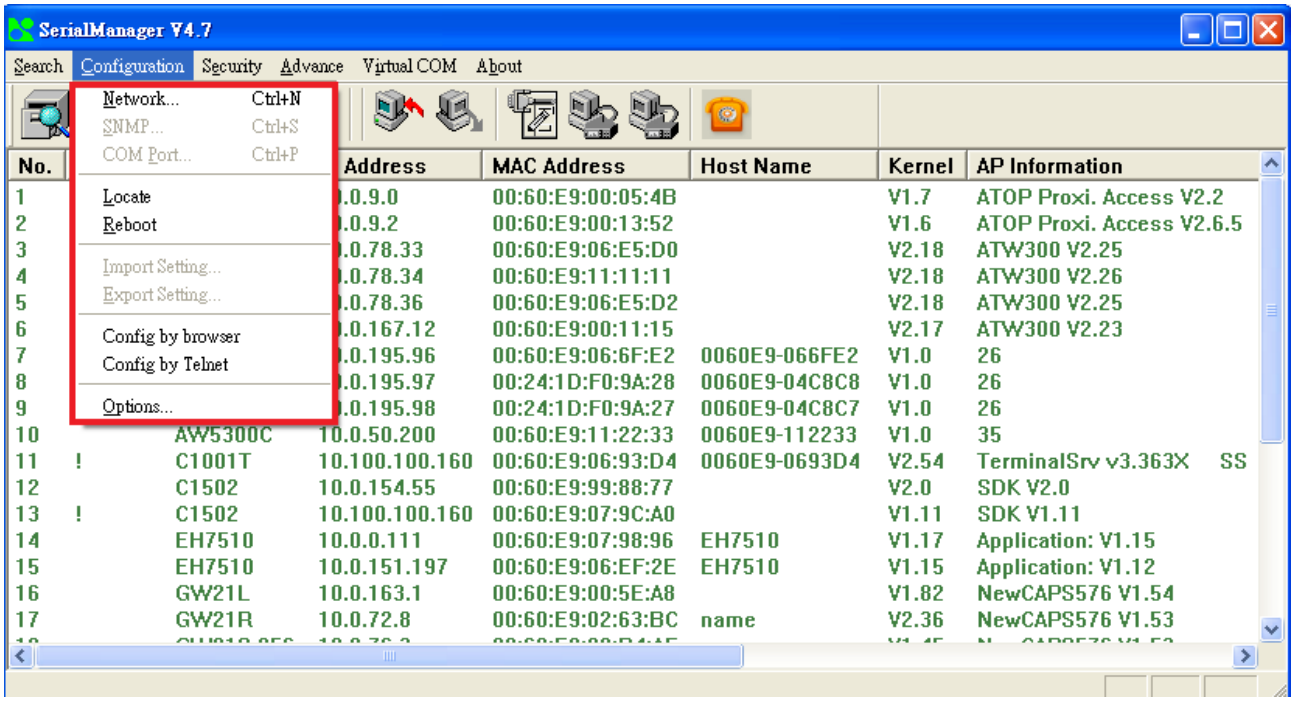


And then the user can select and download the required firmware from the disk, as shown in the figure below. The user can also select several same devices at one time, and realize the firmware updating for them by selecting **Apply for all selected devices have same model**.



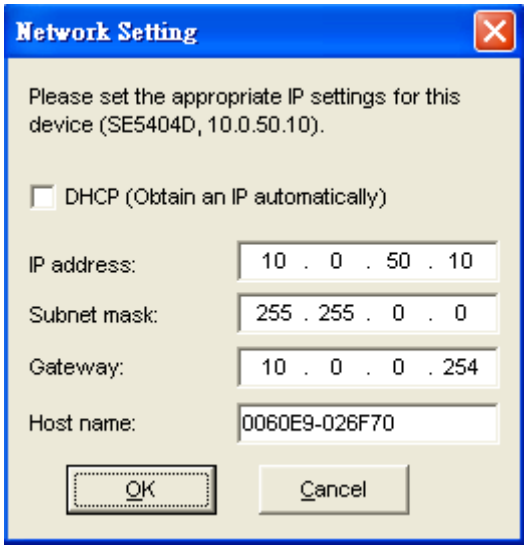
C.3.3. Configuration

This function is for device configuration to set up parameters, to import and to export the parameters, and to set up some options. Here is the list of configurations: “Network”, “SNMP”, “COM Port”, “Locate”, “Reset”, “Import Setting”, “Export Setting”, “Virtual COM”, “Config by browser” and “Options.” Users can carry out a configuration operating through menu or by clicking the corresponded button on the toolbar, shown as the figure below:



Network

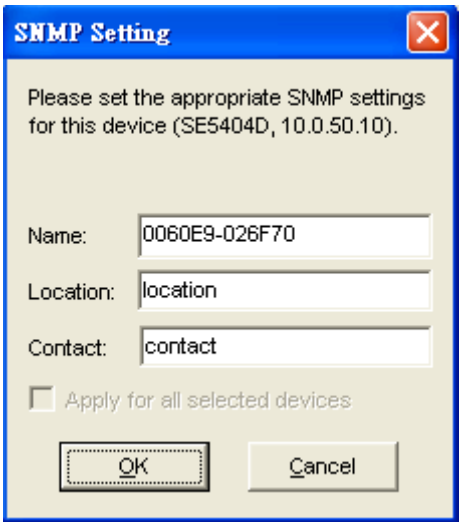
The user can modify the IP address of any selected device, shown as the figure below. You can statically assign IP address, Subnet mask, and Gateway. Optionally, you can set up the device with a host name. You can select DHCP option to obtain an IP address automatically.



SNMP

The user can modify SNMP settings of any selected device, shown as the figure below. The support SNMP fields are Name, Location, and Contact.

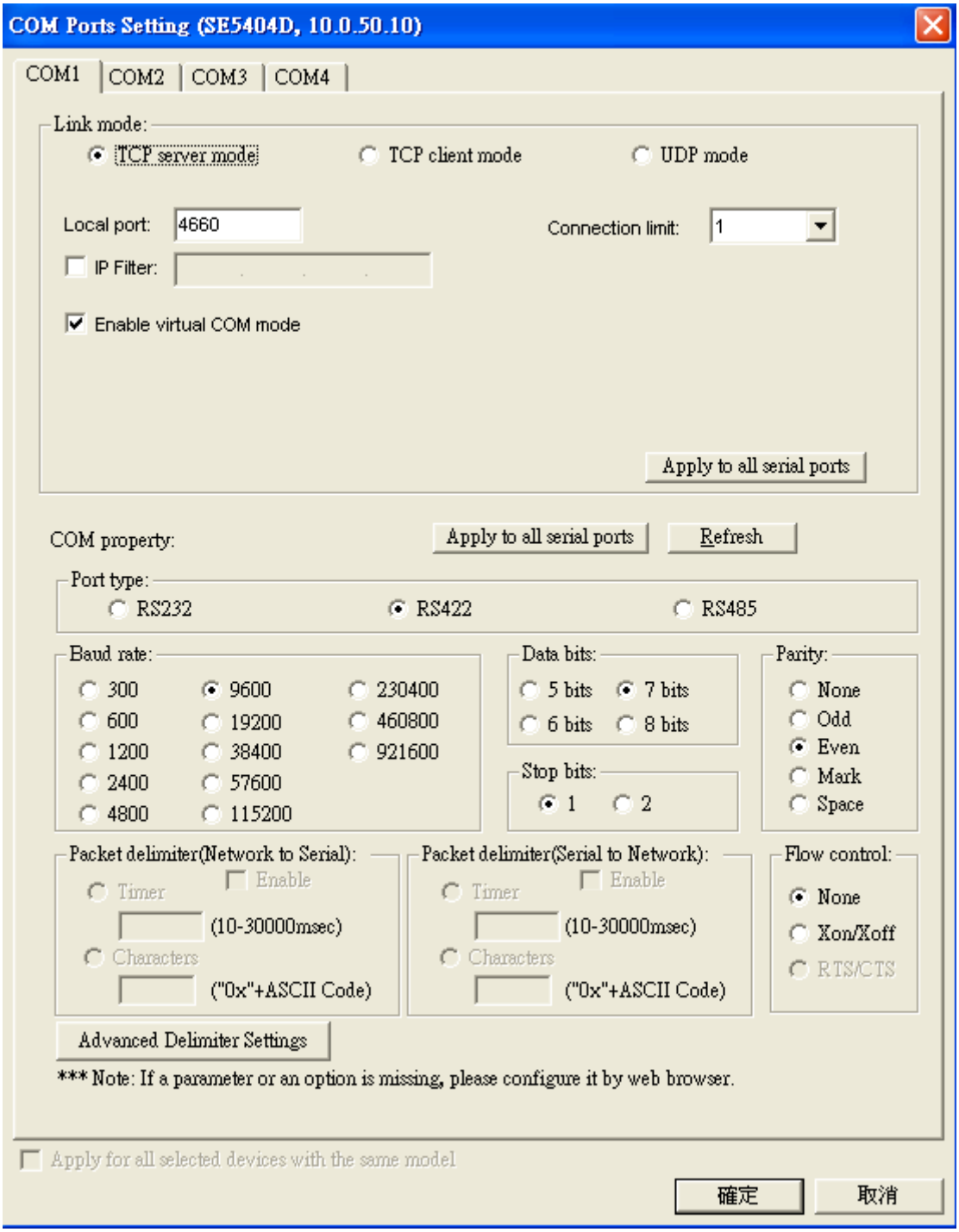
❋ **Note: This function will be enabled after a successful login.**



COM Port

ATOP has developed various Serial server products, and some of the ATOP devices are specially applied to some serial-port servers, while this function is applied to the configuration of COM port parameters only. The COM Port setting dialog is shown below.

❋ **Note: This function will be enabled after a successful login.**



The user can also select several devices at once, and carry out the configuration for them at the same time by selecting “Apply for all selected devices with the same model”

❋ **Note: COM tabs: Generated automatically according to the COM port number of the device. If a device has 4 COM ports, there will be, for example, 4 tabs, COM1, COM2, COM3, and COM4.**

Link mode: this is to set up a TCP or UDP connection between the Serial port and the other network devices. Each COM port corresponds to a link mode, TCP or UDP, which is used to transfer data. The user can set each link mode and the working parameters according to requirements.

COM property: this is to represent the working parameter of the Serial port including: Serial port type, baud rate, data bit, stop bit, parity bit, data packet delimiter and flow control, etc.

Locate

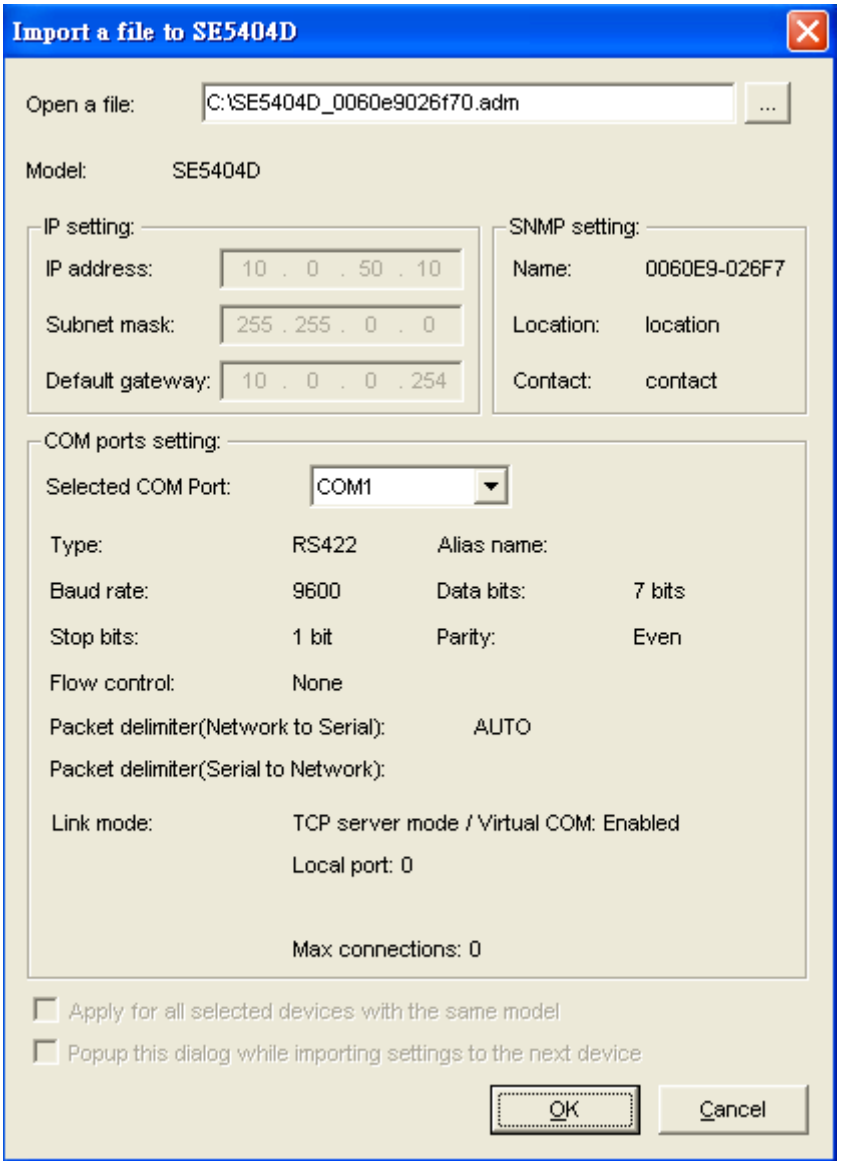
The user can apply this function to locate a device when its IP address is known, but its position is unknown. If you locate the device, it will beep. Users can locate the device by selecting the Configuration submenu **Locate** or clicking the **Locate** button on the toolbar.

Reset

The device should be restarted after a successful modification of parameter configuration. Users can also carry out a restart through the submenu option **Reset**.

Import Setting

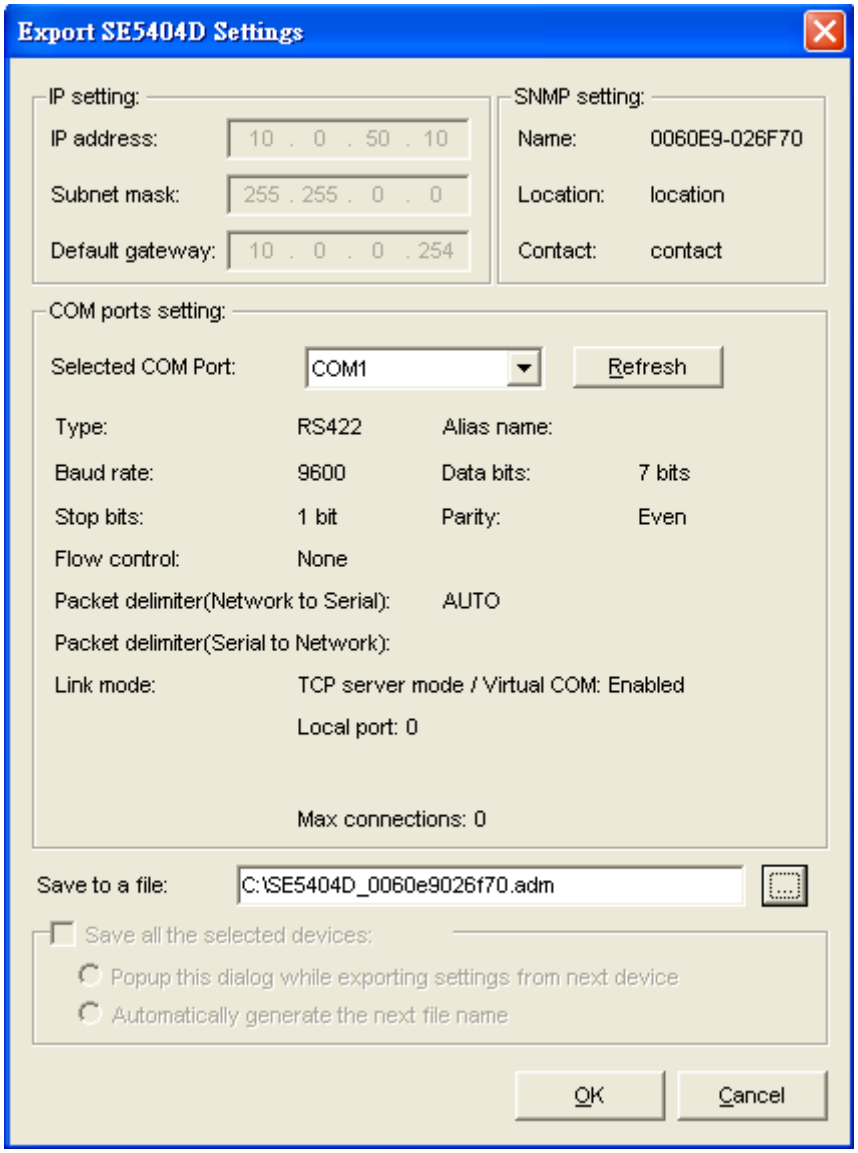
If a network has a large number of devices which are used for a same purpose, it would be very complicated to carry out the parameter configuration for each device in the network one by one. Users can import the parameter configuration from a parameter file directly into all the devices in the network through the submenu option **Import setting** or by clicking the **Import setting** button on the toolbar. The dialog of import parameter settings is shown below.



The user can also select several devices at once, and upload the configuration file into all the selected devices by selecting “Apply for all selected devices have same model.”

Export Setting

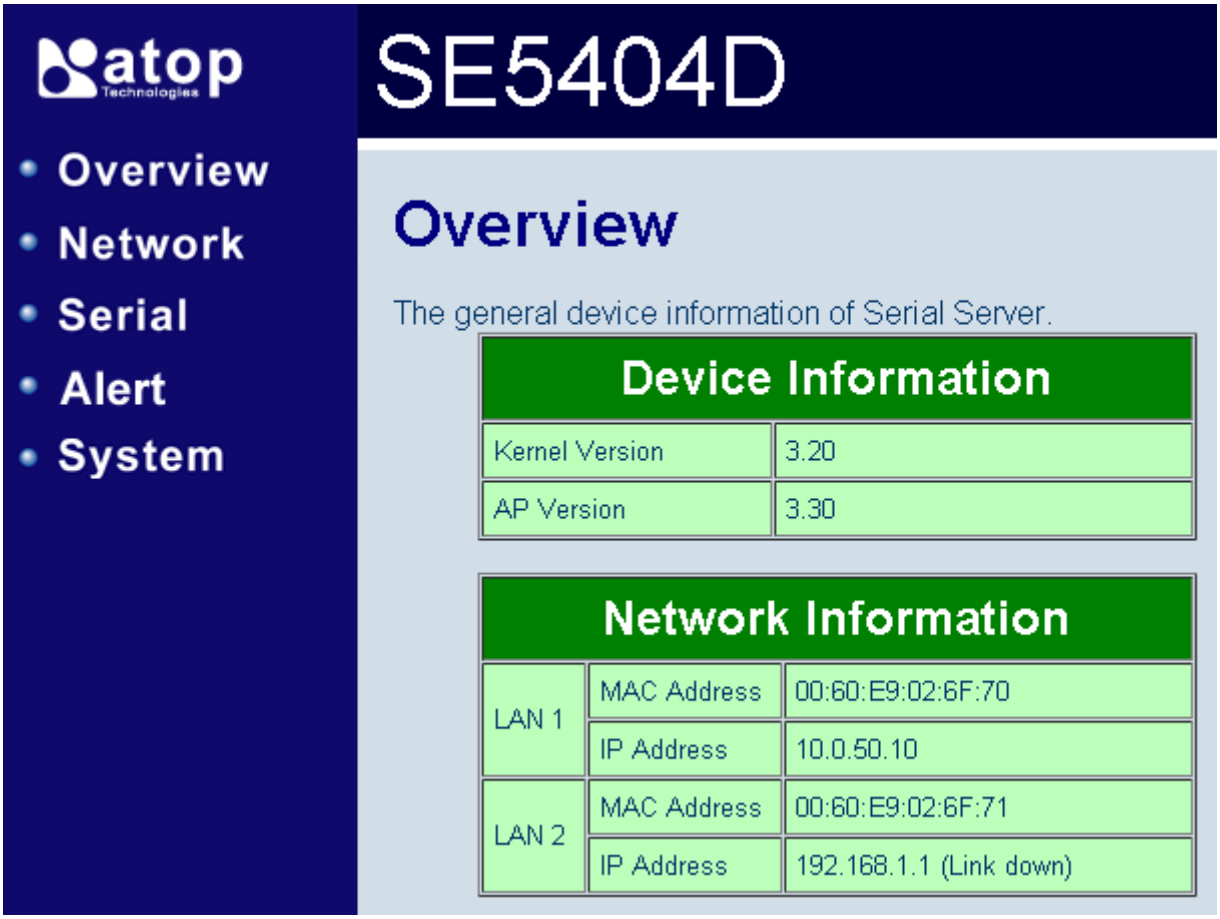
Users can save the parameter information to a standard device into a parameter file through the submenu option **Export setting** or clicking the **Export setting** button on the toolbar for backup purpose or to be imported to other device. The dialog of Export Setting is shown in the figure below.



The user can also select several devices at one time, and save the parameter information of these selected devices into a designated parameter file by selecting "Save all the selected devices".

Configure by Browser

If the device has a Web server build-in, it will provide additional device-specific parameters that SerialManager does not supply. Users can carry out any parameter setting directly through the submenu option “Config by Browser”, and a Web browser is shown in the figure below.



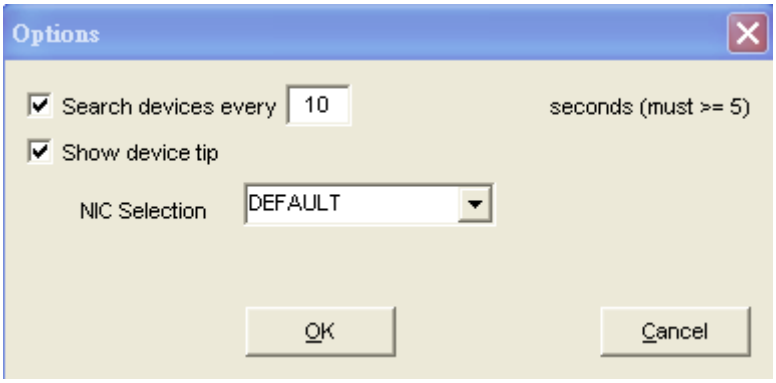
Configure by Telnet

Most device supports Telnet login, it will provide additional device-specific parameters that SerialManager does not supply. Users can carry out any parameter setting directly through the submenu option “Config by Browser”, and a Web browser is shown in the figure below.

Option

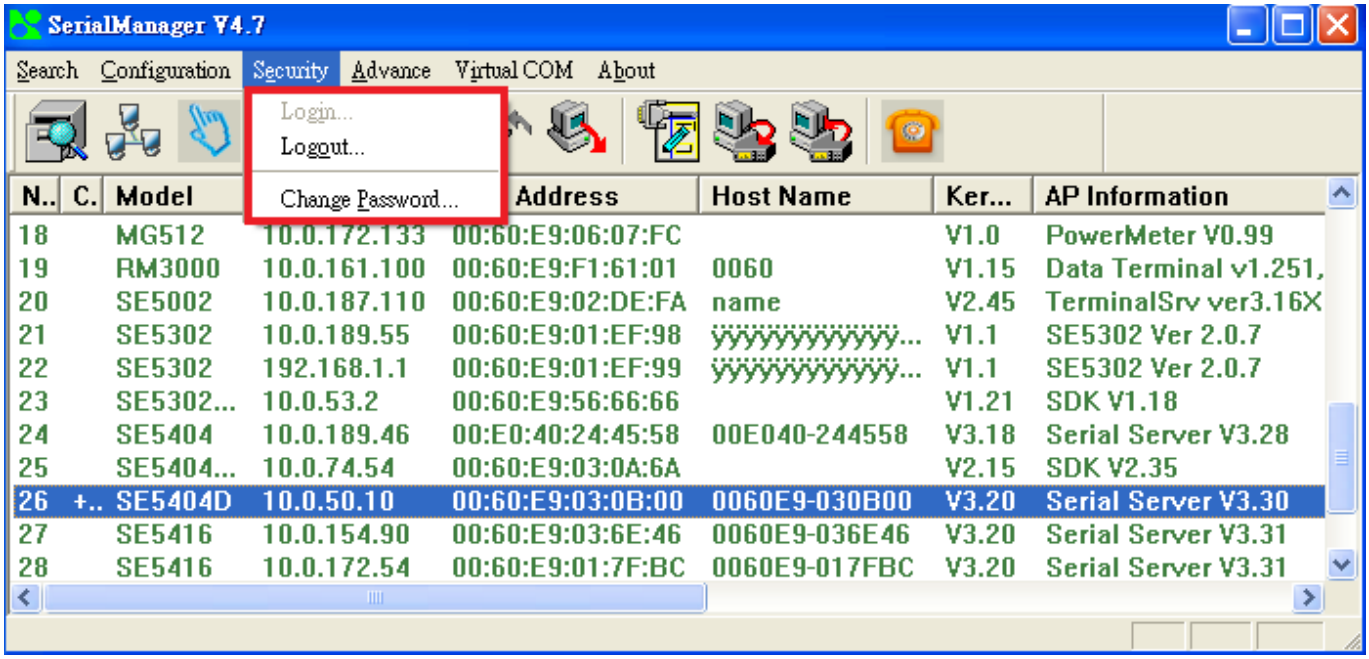
In this dialogue, you can

1. Set the SerialManager’s scan interval
2. If device tip option is turned on, SerialManager will show additional information when your mouse cursor stays on the device.
3. You can select which Network Interface Card that SerialManager uses. If this option is set to DEFAULT, SerialManger will uses the default NIC that the operating system assigns.



C.3.4. Security

This function is applied to the security protection for the network devices, so as to supply some necessary protection to a device for configuration modifying, configuration leading-in and leading-out, and some other important functions. Here three functions are mainly supplied, including: **Login**, **Logout** and **Change Password**, shown in the figure below.



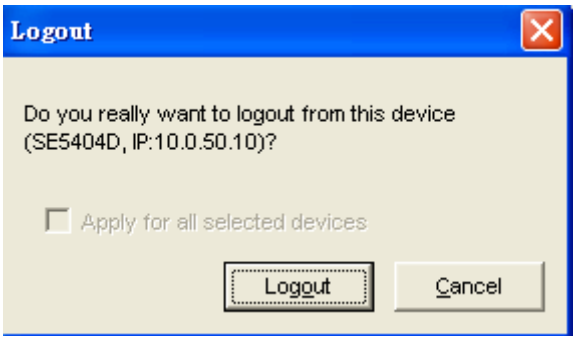
Login

This function is applied to login to any network device, as some sensitive functions can only be operated after a successful login, shown in the figure below. The user can also select several devices at one time, and log into them at the same time by selecting “Apply for all selected devices.”

Note: Double clicking on the device would also login/log out from the device.

Logout

This function is applied to the logout from any network device, as the user should always carry out a logout after he/she has finished the operating action to any important device, shown in the figure below. The user can also select several devices at one time, and log out them at the same time by selecting “Apply for all selected devices.”

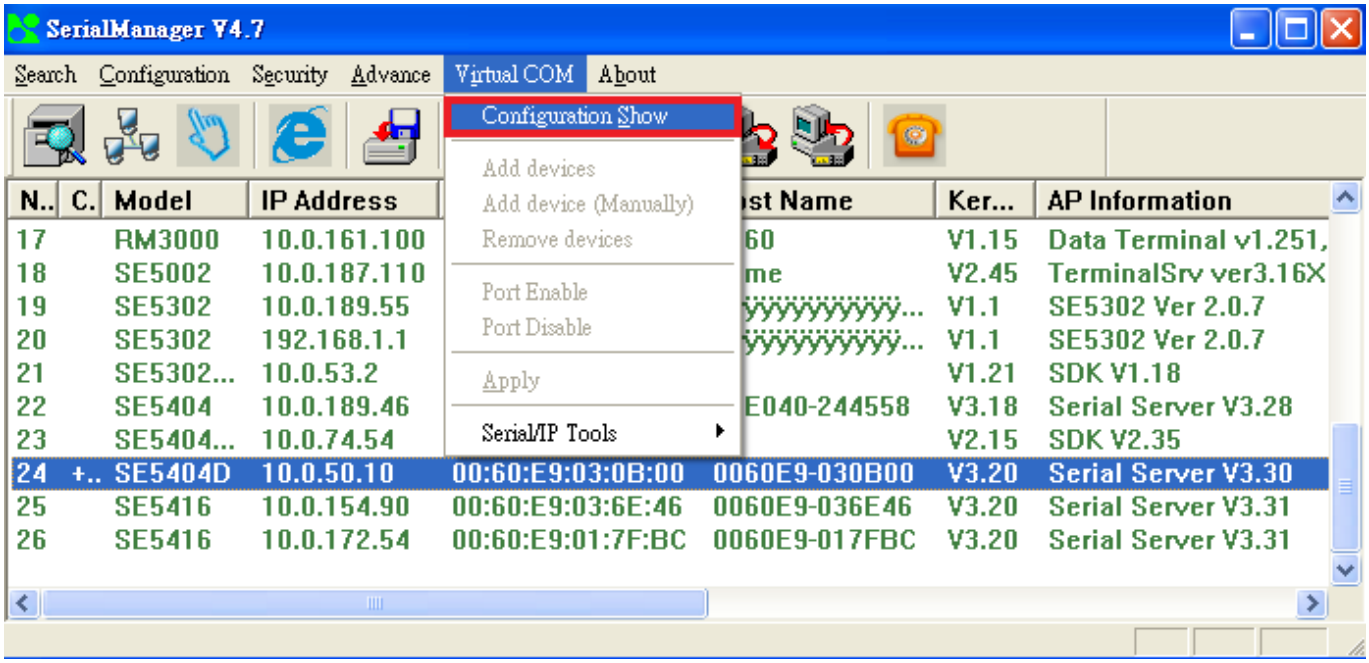


Change Password

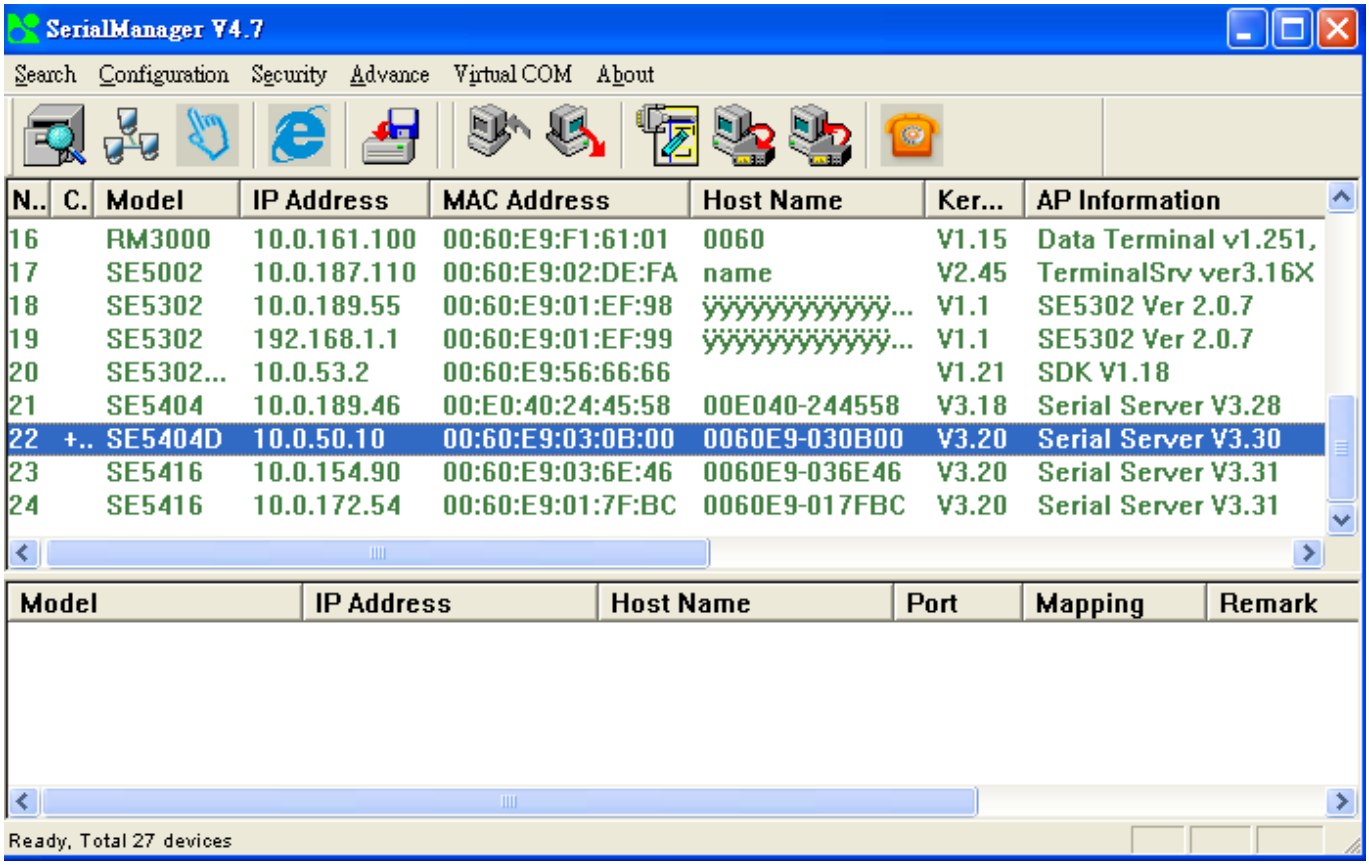
This function is applied to modifying the password for logging in any network device, but can only be realized after a successful log-in, shown in the figure below. The user can also select several devices at one time, and modify their pins at the same time by selecting “Apply for all selected devices.”

C.3.5. Virtual COM

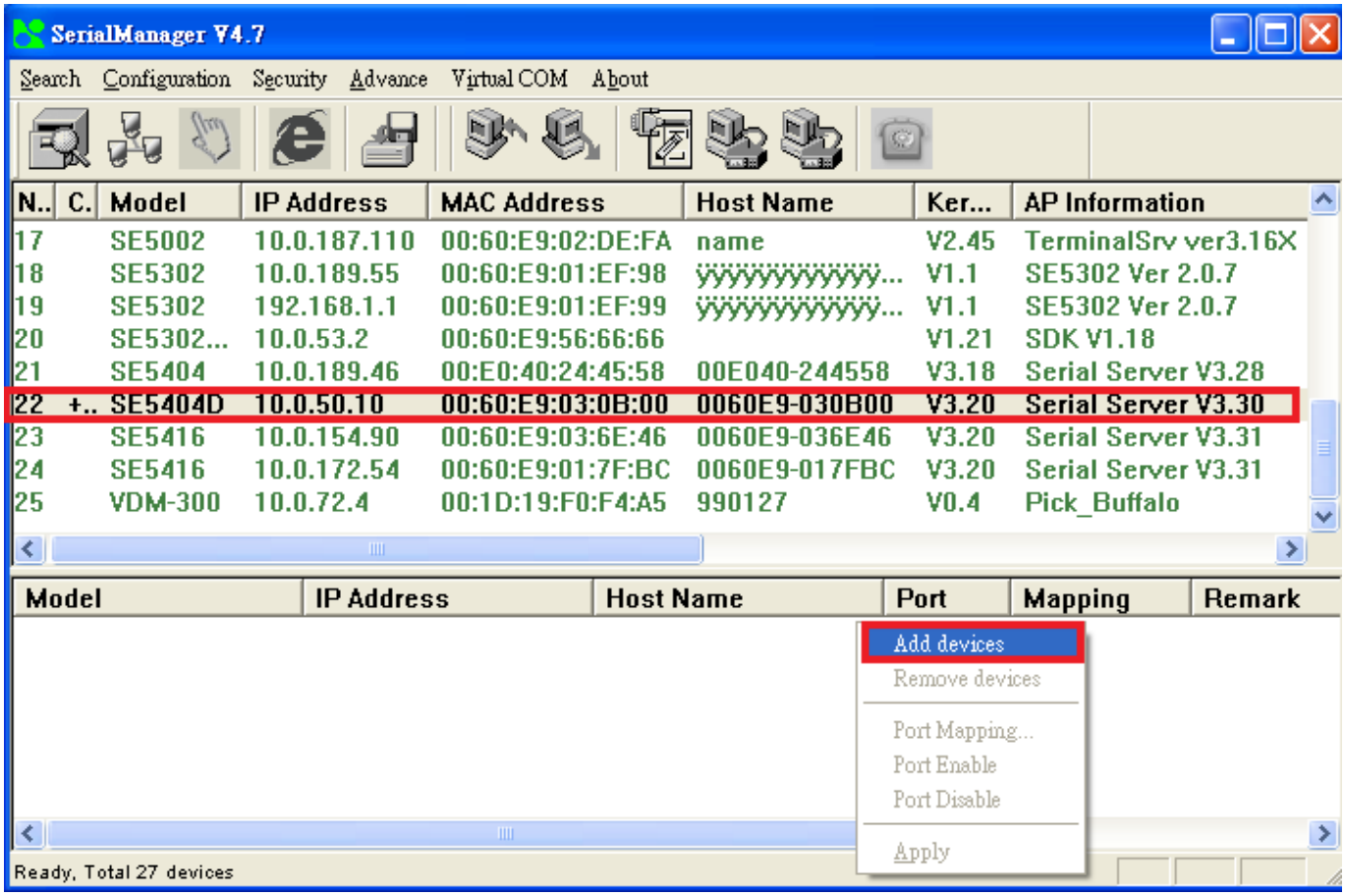
Some devices are supplied with the function of virtual serial port, and the user can carry out any related setting through the option "Virtual COM". We have integrated Virtual COM settings in the Serial Manager. You can still select “Serial/IP Tools” to call original Virtual COM configuration utilities. You can either use this integrated Virtual COM working area or the original Serial/IP Tools to configure Virtual COM.



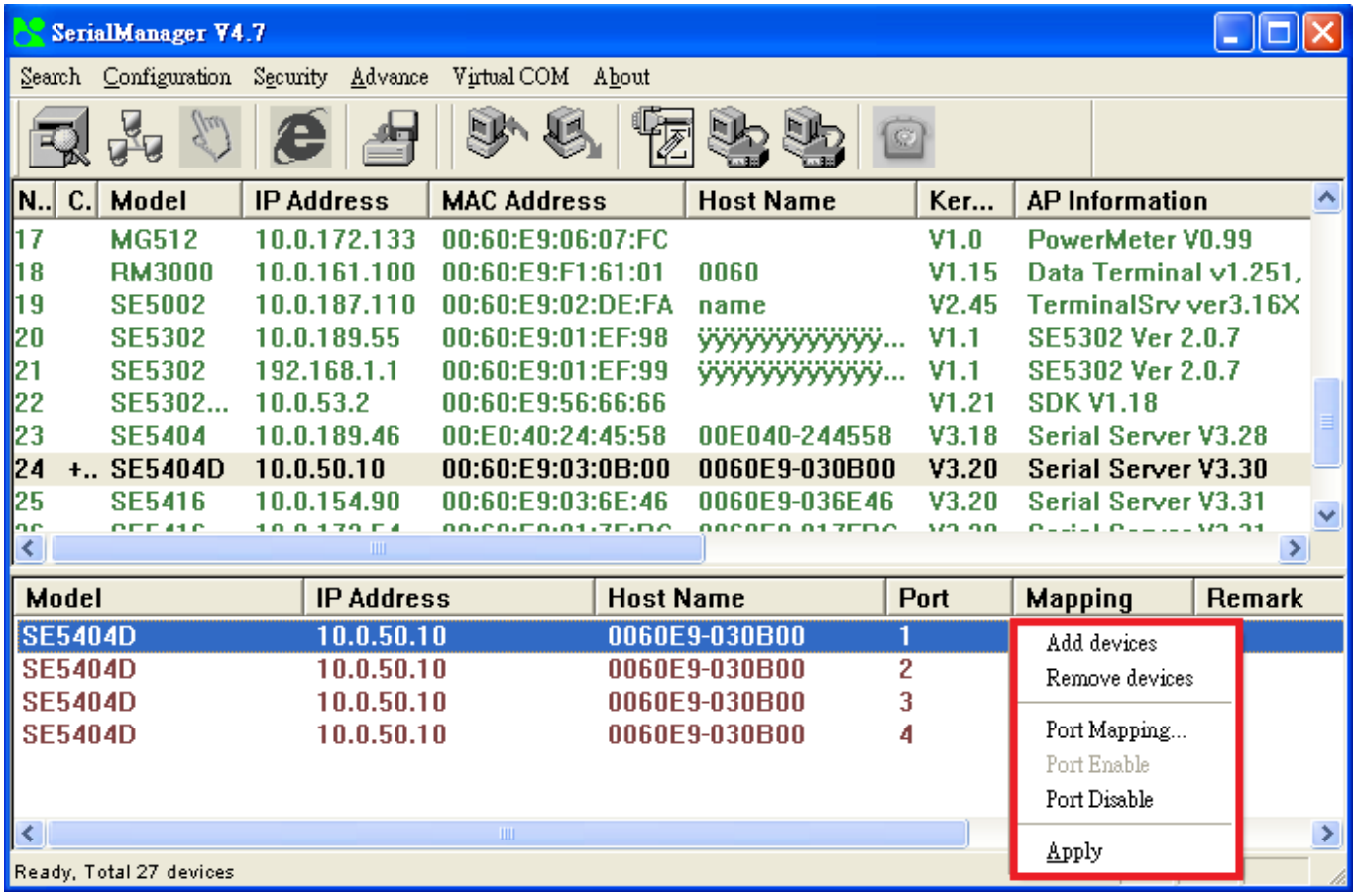
After you select Configuration Show, a new **Virtual COM working area** would appear.



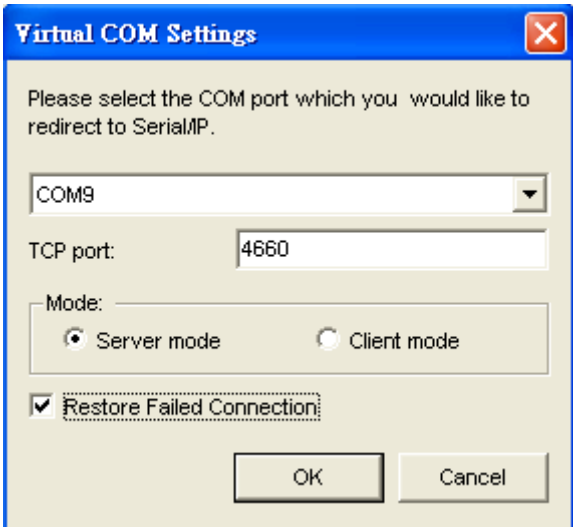
Select the device you want to establish a Virtual COM connection with, you can select multiple devices. After the device is selected, right click in the blank working area and select “Add devices”.



The device would be added. Right click on any port and a menu with show. You can remove the device from the Virtual COM working area by selecting “Remove devices.” You can disable Virtual COM for a specific port by selecting “Port Disable”. Remember to click **Apply** to apply any changes.



If you select Port Mapping… , a new window would show. You can setup the Virtual COM accordingly.



C.3.6. About

This function is mainly applied to displaying information of the **SerialManager** utility, shown in the figure below.