

# Atop ABLELink® Wireless Serial Server SW2001 User Manual



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## **IMPORTANT ANNOUNCEMENT**

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## FCC WARNING

### Class B for Wireless Serial Server (Model: SW2001)

This SW2001 has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- I Reorient or relocate the receiving antenna.
- I Increase the separation between the equipment and receiver.
- I Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- I Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

### IMPORTANT NOTE:

#### FCC Radiation Exposure Statement:

This SW2001 complies with FCC radiation exposure limits set forth for an uncontrolled environment. This SW2001 should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IEEE 802.11b/g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

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## 1. Introduction

Atop SW2001 Wireless Serial Server is a gateway between Ethernet (TCP/IP) and RS-232/RS-485 communications. It allows almost any serial device to be connected to a new or existing wireless network. The information transmitted by SW2001 is transparent to both host computers (IP network over wireless LAN or Ethernet) and devices (RS-232/RS-485). Data coming from the wireless LAN or Ethernet (TCP/IP) is sent to the designated RS-232/RS-485 port and data being received from RS-232/RS-485 port is sent to the Wireless or Ethernet (TCP/IP) transparently.

In the computer integration manufacturing or industrial automation area, Atop SW2001 Wireless Serial Server is used for field devices to direct connect to Ethernet network. Terminal Server (main control program run in SW2001) transforms whatever data received from RS-232/RS-485 to TCP/UDP port then connects devices to the IP network via a single application program or multiple application programs.

Many control devices provide the ability to communicate with hosts through RS-232/RS-485 however RS-232/RS-485 serial communication has its limitations. For one, it is hard to transfer data through a long distance. With Atop SW2001, it is possible to communicate with a remote device in the Intranet environment or even in the Internet and thus, increases the communication distance dramatically.

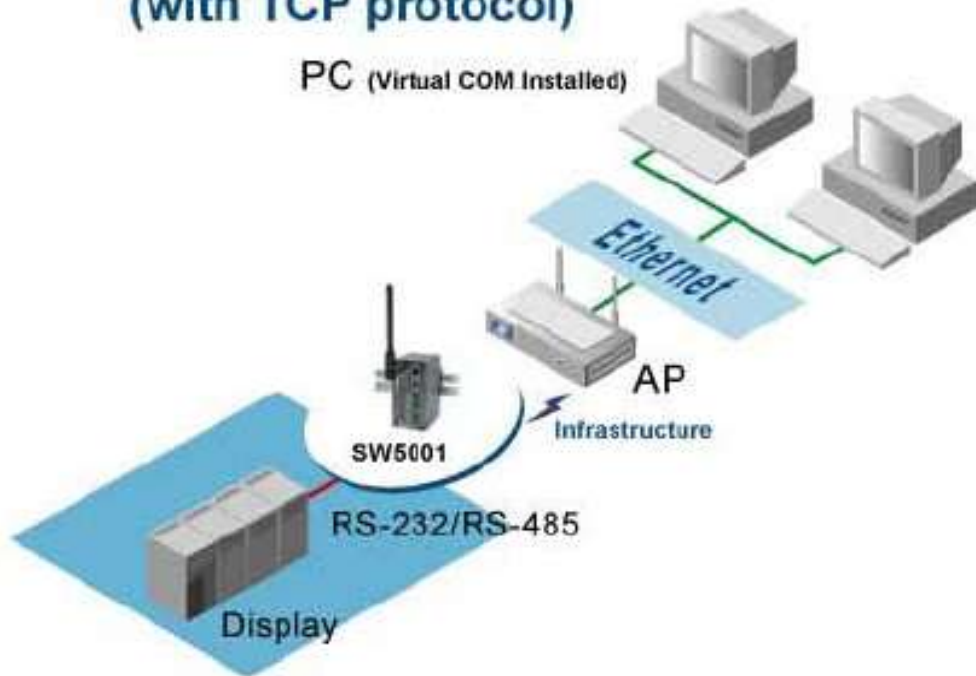
Flexible configuration options enable this unit to be setup remotely over IP network by Telnet, web browser, or Window utility. Packed in a rugged DIN Rail mountable case and 9~30V DC power input range, SW2001 is ideal for almost any industrial and manufacturing automation.

### 1.1 Packaging

- Atop S2001 Wireless Serial Server x 1
- Mini DIN to RS-232 DB 9 connector cable x 1
- Wall mount x 2
- Atop Wireless Serial Server quick start guide x 1
- Product CD containing configuration utility and other tools

## 1. 2 Application Connectivity

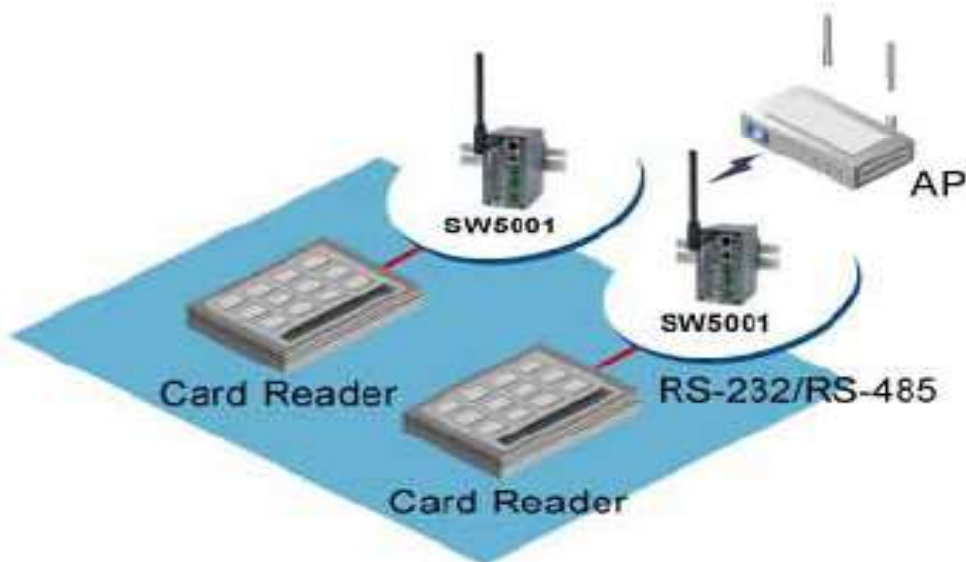
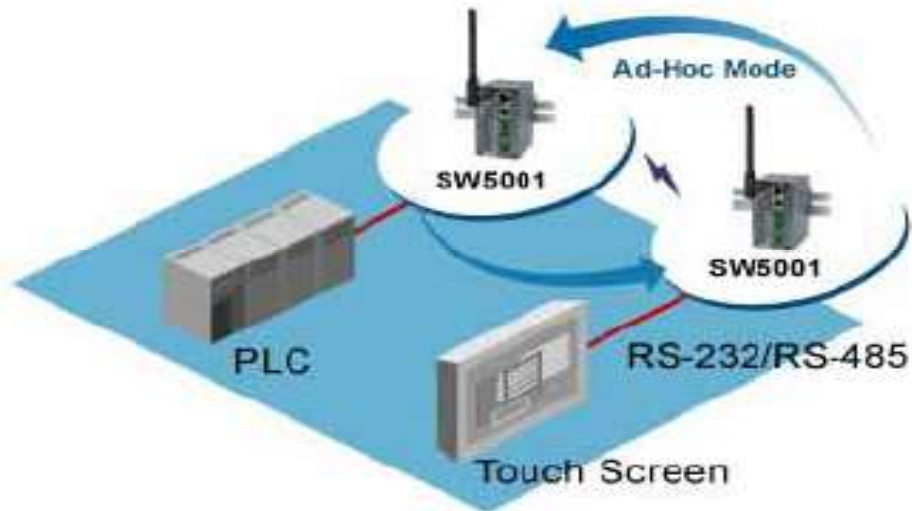
### Virtual COM Mode (with TCP protocol)



### NB (Virtual COM Installed)



## Tunneling Mode (with TCP or UDP protocol)





## 2. Nomenclature and Settings

### 2.1 Nomenclature of SW2001 Components

Figure 2.1 shows the names of SW2001 components. In the figure, the indicated switch settings represent factory settings.

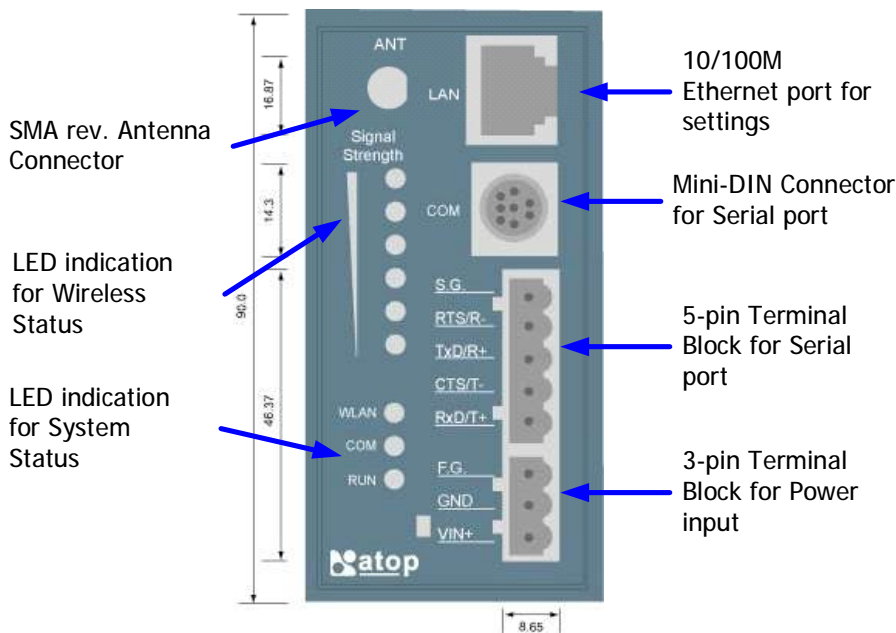


Figure 2.1. Nomenclature of SW2001 Components

### 2.2 MODE Switch

This sets or initializes the operating mode for the SW2001.

The factory default setting is RS-232 mode. You can use the software configurations to change the operating mode from the factory default settings to your desired mode by web or telnet tools.

SW2001 can be setup either RS-232, RS-485 or RS-422 mode by remote network tools, ex. Web browser and telnet.

## 3. Hardware Installation

- § Prepare necessary cables, hub, power cord and RS-232/RS-485 connector.
- § Place SW2001 to the area that an access point can cover, or connector it via Ethernet cable with RJ45 connector.
- § Connect a serial device to a serial port of SW2001, make sure the right connection of either RS-232 or RS-485.
- § Plug in DC-9-30V, the buzzer will beep and the RUN LED will blink if SW2001 functions normally. Please refer to Appendix A.5 to see all of LED messages.
- § Use **monitor.exe** configuration utility in the product CD or diskette to diagnose SW2001. If it starts up successfully, you are able to find the IP and MAC addresses of SW2001. You can change the network parameters of SW2001 to join your LAN by changing its IP address, gateway IP address and subnet mask.

**Note:** If there are more than one access points, the access point's ESSID must be the same.

### 3.1 Configuration

Atop SW2001 Wireless Serial Server is shipped with default settings shown in the following table:

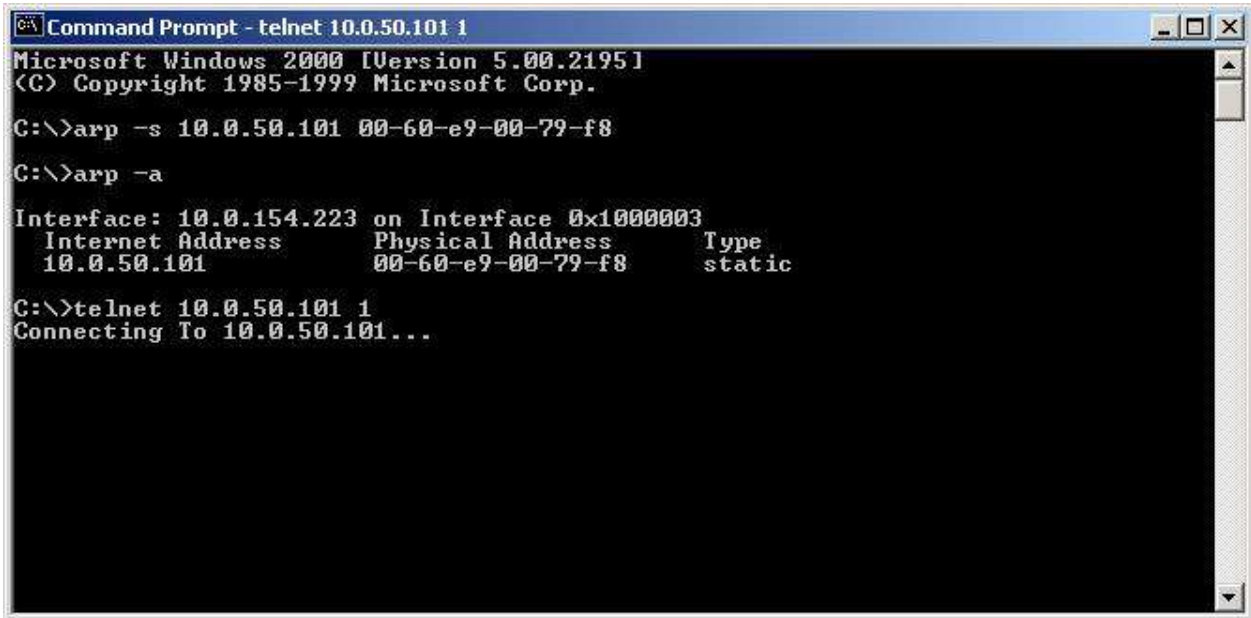
Property	Default Value
IP Address	10.0.50.100
Gateway	10.0.0.254
Subnet Mask	255.255.0.0
User Name	admin
Password	Null
COM 1	9600,None, 8, 1, No flow control, buffer disabled, packet delimiter timer 1ms
Link 1	Type: TCP Server, Listen port 4660, Filter=0.0.0.0, Virtual COM disabled
SysName of SNMP	name
SysLocation of SNMP	location
SysContact of SNMP	contact

**NOTE:** Atop provides a default button to restore system settings including IP address, gateway IP address and subnet mask etc. to the defaults. Press and hold the default button for 5 seconds till the server reboots.

### 3.2 Assigning a new IP Address by ARP command

**arp -s** is used to assign a static IP address of SW2001 and add this static entries to the ARP cache of the computer, when TCP/IP packet with destination port number 1 is sent to SW2001, it causes the device to check its MAC address with IP address, once SW2001 finds those two unmatched, it will reboot and change to the new IP address which was set by **arp -s** command. The following example uses ARP to assign a static IP address of SW2001 using its MAC address printed on the label of the rear panel, then

use Telnet to send the TCP/IP packet with destination port number 1 to SW2001, after SW2001 reboots it will change its IP address to the new one.

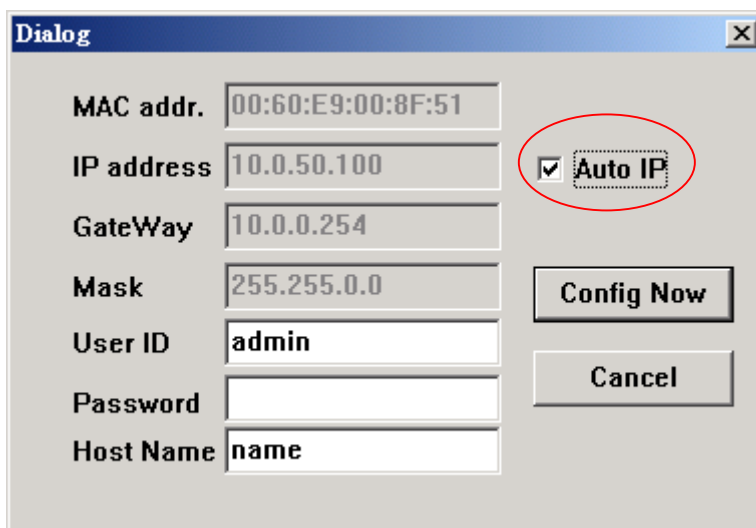


**Note:**

1. Arp command can only be used to set a static IP address of SW2001 using system reset user name admin and default password null.
2. Only TCP/IP packet with destination port number 1 will lead SW2001 to reboot and change the IP address.

### 3.3 Auto IP

A DHCP server automatically assigns the IP address and network settings. SW2001 supports DHCP. It will supply for the unit with an IP address gateway address, and subnet mask. You may use **Monitor.exe** software to search network information automatically by putting a check on **Auto IP** on Dialog window.



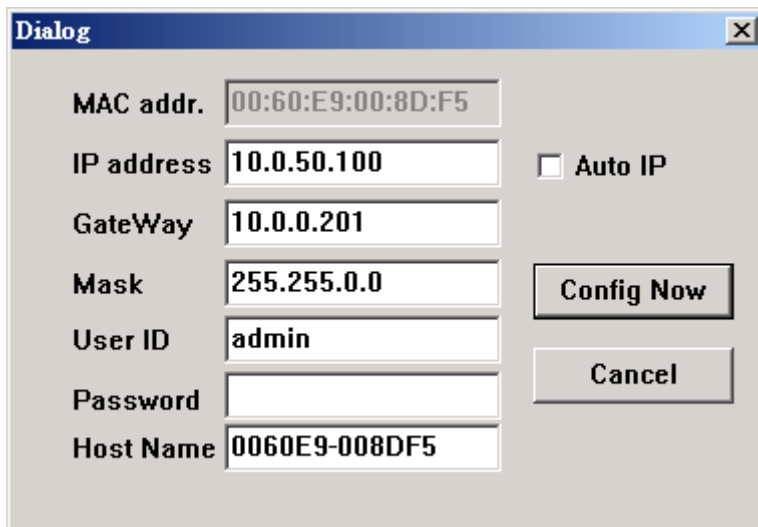
### 3.4 TCP/IP Port Number

Port number 4660 is default of SW2001 and is associated with serial port COM1. After your application program connects to the TCP port 4660 of SW2001, data being sent to this TCP connection from your application program are transparent to the COM1 of SW2001. Vice versa is also true.

## 4. Software Configuration

### 4.1 Configuration set by monitor.exe utility

Use **monitor.exe** that comes with the product CD or diskette to configure the network parameters of SW2001. As you can see from the following picture, you can change IP address, gateway IP address, subnet mask, user ID and password of SW2001 from the utility. For more details of the utility please refer to Appendix-D Configuration Utility.



### 4.2 Configuration set by Telnet utility

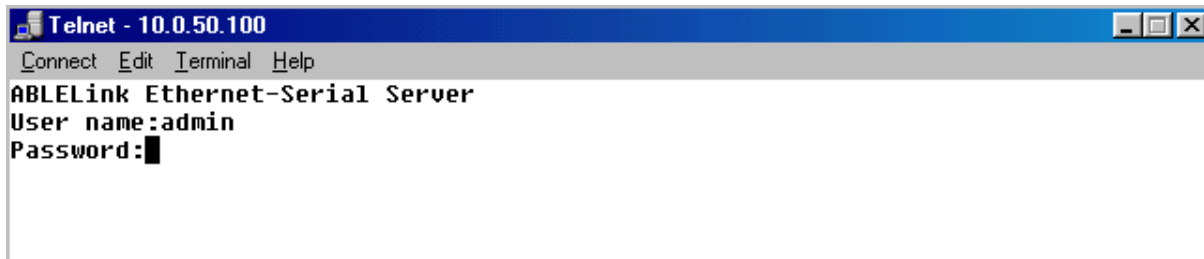
You can use Telnet utility to change configuration settings of SW2001. To do so, please do the following.

#### Log in to the system

§ Telnet to SW2001 using command "**Telnet IP\_address**".

For example **Telnet 10.0.50.100**

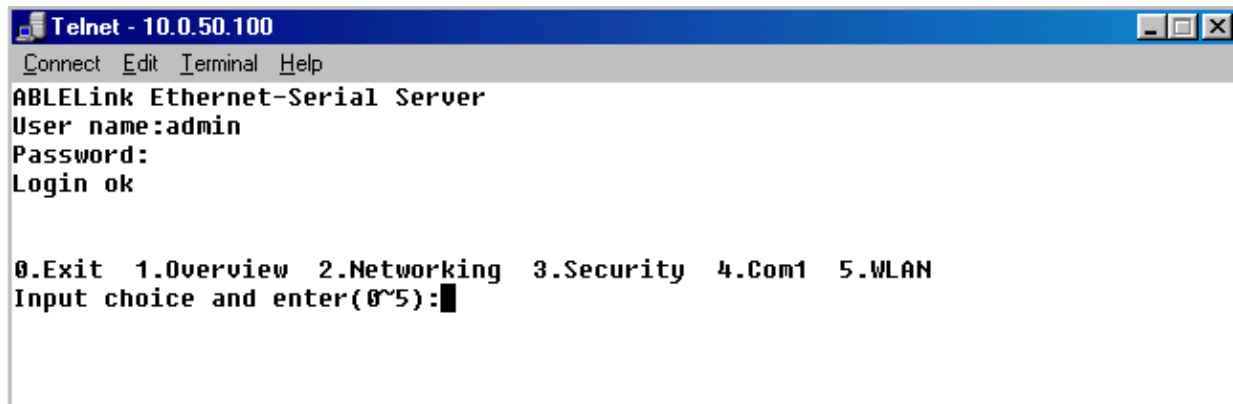
1. After Telnet to SW2001, system prompts for a password, the default password is null.



```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:█
```

**Note:** You can press the default button of SW2001 to reset the password to the default value.

2. After verifying the password, the following terminal screen appears.



```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN
Input choice and enter(0~5):█
```

**Notes:**

1. If SW2001 does not receive any command within 1 **minute**, Telnet will be terminated automatically.
2. The changes of networking parameters will take effect only when you exit and restart SW2001.
3. Select "1" from "Input choice and enter (0~5):" to enter overview page as following:

```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 1

Overview:
Model Name      : GW51W-MAXI
IP Address      : 10.0.50.100
MAC Address     : 00:60:E9:00:8D:F6
SysName         : name
SysLocation     : location
SysContact      : contact
Kernel Version : 2.20
AP Version      : TerminalSrv ver3.07
Link Status     : S

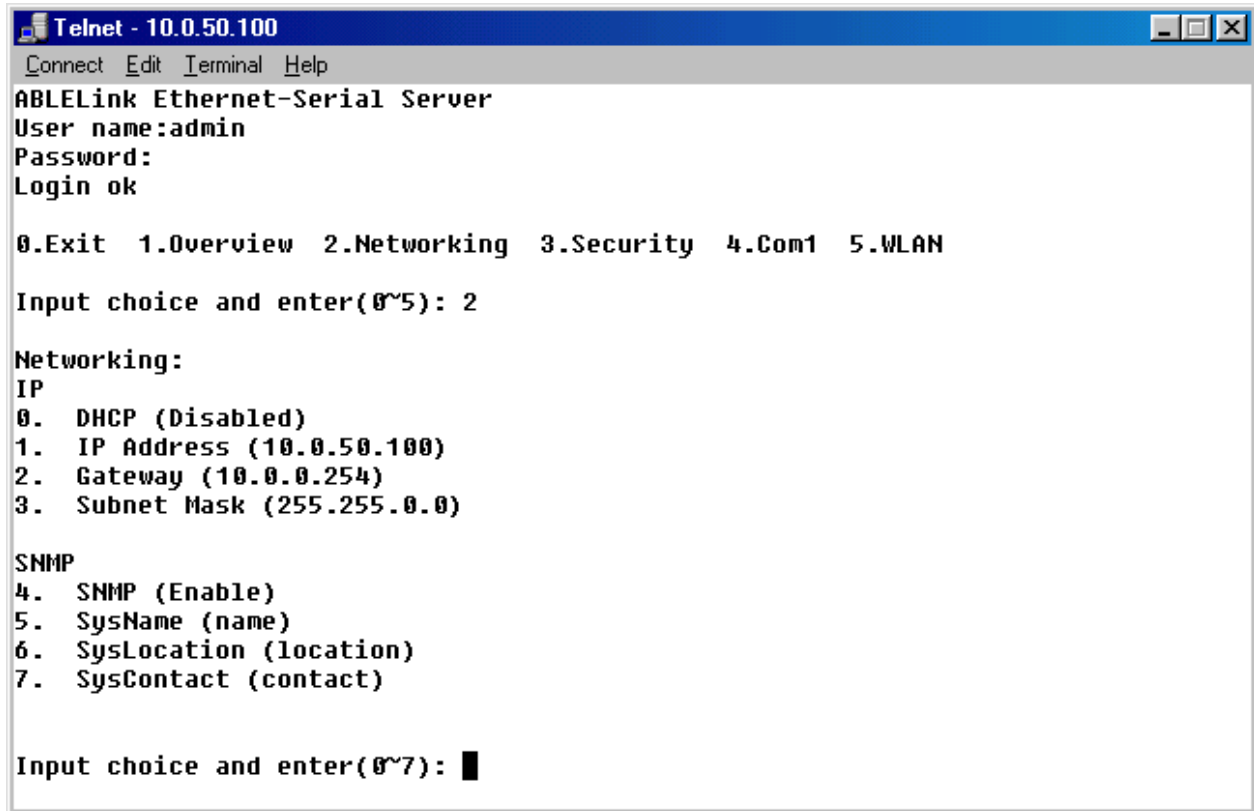
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): █
```

This page gives you the general information of SW2001 including IP and MAC address, SNMP information, kernel and AP version, and connection status of the device.

## Networking

Select “2” from “Input choice and enter (0~5):” to enter Networking page as following:



```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 2

Networking:
IP
0. DHCP (Disabled)
1. IP Address (10.0.50.100)
2. Gateway (10.0.0.254)
3. Subnet Mask (255.255.0.0)

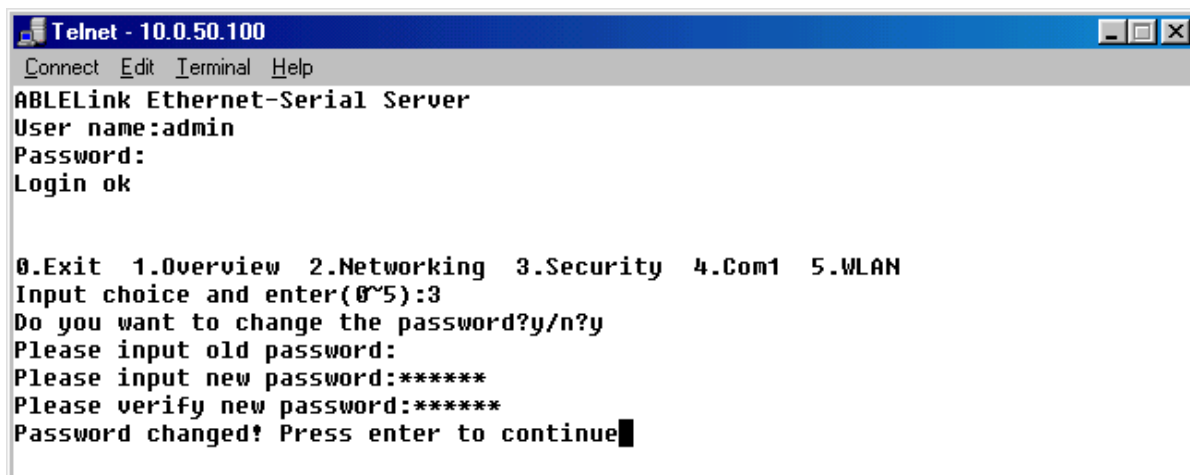
SNMP
4. SNMP (Enable)
5. SysName (name)
6. SysLocation (location)
7. SysContact (contact)

Input choice and enter(0~7): █
```

This page allows you to change network settings of the device including IP address, subnet mask, gateway IP address and SNMP information of SW2001. Please notice that any setting change made on this page won't take effect until you restart the device.

### Change the password

1. Select “3” from “Input choice and enter (0~5):” the following screen appears.



```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5):3
Do you want to change the password?y/n?y
Please input old password:
Please input new password:*****
Please verify new password:*****
Password changed! Press enter to continue█
```

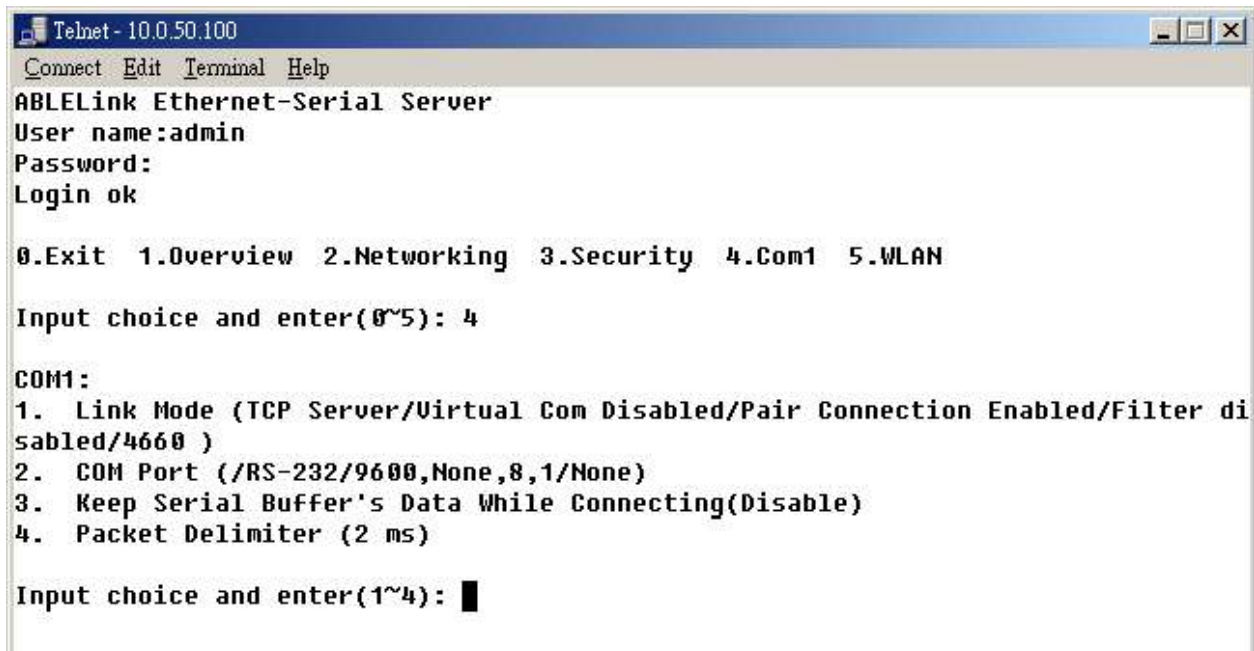
2. If you want to change the password, please type the old password in the “Please input old password”

field, type the new password in the “Please input new password” and the “Please verify new password” fields.

**Note:** You can press the default key of product to reset password to the default value.

### COM1 Setup

Select “4” from “Input choice and enter (0~5):” the following screen appears



```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 4

COM1:
1. Link Mode (TCP Server/Virtual Com Disabled/Pair Connection Enabled/Filter disabled/4660 )
2. COM Port (/RS-232/9600,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Disable)
4. Packet Delimiter (2 ms)

Input choice and enter(1~4): █
```

The page gives you an opportunity to configure parameters of COM1 setting which includes COM1 working mode, port parameters, enabling or disabling serial buffer’s data and setting packet delimiter.

### LINK1 Setup

Type 1 from “Input choice and enter (1~4):” of COM1, the following screen appears. Configure SW2001 as TCP server and the local port is 4660. IP filter is disabled by default, if IP filter is enabled, only source IP 10.0.0.154 can connect to SW2001.

**Note:** IP filtering function is disabled if setting FILTER\_IP to “0.0.0.0”.



```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 4

COM1:
1. Link Mode (TCP Server/Virtual Com Disabled/Pair Connection Disabled/Filter d
isabled/4660 )
2. COM Port (/RS-232/115200,None,8,1/RTS/CTS)
3. Keep Serial Buffer's Data While Connecting(Disable)
4. Packet Delimiter (2 ms)

Input choice and enter(1~4): 1
Link mode
1.TCP server
2.TCP client
3.UDP
4.Virtual Com(Disabled)
5.Pair Connection(Disabled)

Input choice (1 ~ 5) and enter: █
```

Configure SW2001 as TCP client, the destination IP is 10.0.29.123, destination port is 666.

```
Telnet - 10.0.50.100
Connect Edit Terminal Help

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 4

COM1:
1. Link Mode (TCP Server/Virtual Com Disabled/Pair Connection Disabled/Filter d
disabled/4660 )
2. COM Port (/RS-232/115200,None,8,1/RTS/CTS)
3. Keep Serial Buffer's Data While Connecting(Disable)
4. Packet Delimiter (2 ms)

Input choice and enter(1~4): 1
Link mode
1.TCP server
2.TCP client
3.UDP
4.Virtual Com(Disabled)
5.Pair Connection(Disabled)

Input choice (1 ~ 5) and enter: 2
TCP client
Please input destination IP:10.0.29.123
Please input destination port:666
mode changed! Press enter to continue
```

Configure SW2001 as UDP client, the local port is 4660, the destination IP is 10.0.29.254, destination port is 666.

```
Telnet - 10.0.50.100
Connect Edit Terminal Help
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 4

COM1:
1. Link Mode (TCP Client/Virtual Com Enabled[M-PLC]/Pair Connection Disabled/Remote 10.0.29.123/666)
2. COM Port (/RS-232/9600,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Disable)
4. Packet Delimiter (2 ms)

Input choice and enter(1~4): 1
Link mode
1.TCP server
2.TCP client
3.UDP
4.Virtual Com(Enabled[M-PLC])
5.Pair Connection(Disabled)

Input choice (1 ~ 5) and enter: 3
UDP
Please input local port:4660
Please input destination IP:10.0.29.254
Please input destination port:666
mode changed! Press enter to continue
```

### COM port setting

Type 2 from "Input choice and enter (1~4):" of COM1, the following screen appears, you can then give the COM port alias name, set the baud rate and parity, determine number of data bit and stop bit, and decide if you want to use flow control and the type of flow control you want to use.

```
Telnet - 10.0.50.100
Connect Edit Terminal Help
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 4

COM1:
1. Link Mode (TCP Client/Virtual Com Disabled/Pair Connection Disabled/Remote 1
0.0.29.123/666)
2. COM Port (/RS-232/9600,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Disable)
4. Packet Delimiter (2 ms)

Input choice and enter(1~4): 2

COM Port: RS-232
1. Alias name():
2. Baud rate(9600):
3. Parity(None):
4. Data bit(8):
5. Stop bit(1):
6. Flow control(None):

Input choice and enter(1~6): █
```

### Enabling serial data buffer

Type 3 from “Input choice and enter (1~4):” of COM1, by default COM port serial data buffer is enabled meaning that when TCP/IP Ethernet connection is broken, serial data collected from serial device will be kept in SW2001, once TCP/IP connection is resumed, the serial data will be sent through Ethernet connection, you can disable it if you wish.

```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 4

COM1:
1. Link Mode (TCP Client/Virtual Com Disabled/Pair Connection Disabled/Remote 1
0.0.29.123/666)
2. COM Port (/RS-232/9600,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Disable)
4. Packet Delimiter (2 ms)

Input choice and enter(1~4): 3

Keep serial Buffer's Data While Connecting
(1)Enable (2)Disable
Please select keep type:1
Keep type changed! Press enter to continue
```

### Setting packet delimiter

Packet delimiter is a way of controlling packets within serial communication. It can prevent packets from being cut thus keep the packets complete. SW2001 provides two ways of parameter setting as inter character timer and terminator. By default packet delimiter timer is 0 ms, you can change timer shown in the following figure:

```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

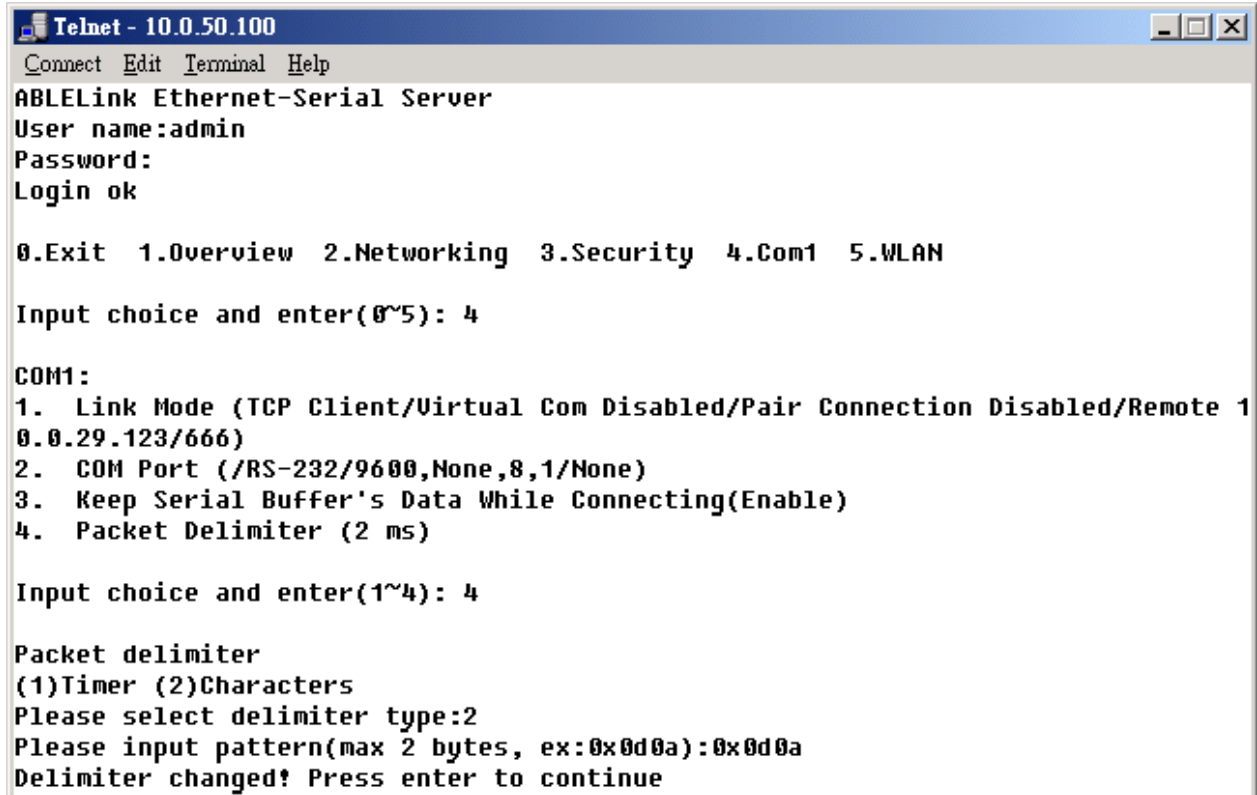
Input choice and enter(0~5): 4

COM1:
1. Link Mode (TCP Client/Virtual Com Disabled/Pair Connection Disabled/Remote 1
0.0.29.123/666)
2. COM Port (/RS-232/9600,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Enable)
4. Packet Delimiter (2 ms)

Input choice and enter(1~4): 4

Packet delimiter
(1)Timer (2)Characters
Please select delimiter type:1
Please input timer(0 ~ 30000 ms):2
Delimiter changed! Press enter to continue
```

You can also choose character pattern as the packet delimiter indicated in the following figure:



```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 4

COM1:
1. Link Mode (TCP Client/Virtual Com Disabled/Pair Connection Disabled/Remote 1
0.0.29.123/666)
2. COM Port (/RS-232/9600,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Enable)
4. Packet Delimiter (2 ms)

Input choice and enter(1~4): 4

Packet delimiter
(1)Timer (2)Characters
Please select delimiter type:2
Please input pattern(max 2 bytes, ex:0x0d0a):0x0d0a
Delimiter changed! Press enter to continue
```

### Accessing Wireless LAN setting

Select "5" from "Input choice and enter (0~5):" the following screen appears.

```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 5

WLAN:
Access Point Name : default
Access Point MAC : 00:80:C8:17:4A:3E
Current channel : 6
Current Tx Rate : 11 Mbps
BSS Quality : 100%
Signal Strength : 100%

1. Topology (Infrastructure)
2. Transmission Rate (Full Auto)
3. Ad-hoc Channel [USA: 1~11] (Channel 3)
4. ESSID ( )
5. WEP (OFF)
6. Enable to detect BSS Quality by beeper automatically

Input choice and enter(1~6):
```

The above page gives you the general information about SW2001 wireless configurations including the access point it connects to, the current channel and transmitting rate it communicates with the other wireless devices, topology it uses, and what the ESSID (extended service set identifier) and WEP (wireless encryption protocol) are if you use them.



## Wireless LAN topology

You can choose either infrastructure or ad-hoc mode for SW2001 as indicated in the following figure:

```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 5

WLAN:
Access Point Name : default
Access Point MAC : 00:80:C8:17:4A:3E
Current channel : 6
Current Tx Rate : 11 Mbps
BSS Quality : 100%
Signal Strength : 100%

1. Topology (Infrastructure)
2. Transmission Rate (Full Auto)
3. Ad-hoc Channel [USA: 1~11] (Channel 3)
4. ESSID ( )
5. WEP (OFF)
6. Enable to detect BSS Quality by beeper automatically

Input choice and enter(1~6): 1
Topology
(1)Infrastructure (2)Ad-hoc Please select Topology type:1
Topology type setted
It is affected,after restart the device
Press enter to continue
```

## Wireless LAN Transmission Rate

You can set SW2001 transmission rate as 1 Mbps, 2Mbps, 5.5Mbps, 11Mbps, or full auto based on 802.11 standard shown in the following figure:

```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN
Input choice and enter(0~5):5
WLAN:
Access Point Name : default
Access Point MAC : 00:80:C8:17:4A:3E
Current channel : 6
Current Tx Rate : 11 Mbps
BSS Quality : 100%
Signal Strength : 100%

1. Topology (Infrastructure)
2. Transmission Rate (Full Auto)
3. Ad-hoc Channel [USA: 1~11] (Channel 3)
4. ESSID ( )
5. WEP (OFF)
6. Enable to detect BSS Quality by beeper automatically

Input choice and enter(1~6): 2
Transmission Rate
(1)1Mbps (2)2Mbps (3)Auto 1/2 (4)5.5Mbps (5)11Mbps (6)Full Auto
Please select Transmission Rate type:4
Transmission Rate type setted
It is affected,after restart the device
Press enter to continue
```

### Wireless LAN Ad-hoc channel

You have to select the same channel for two wireless devices to talk to each other as indicated in the following figure:

```
Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN
Input choice and enter(0~5):5

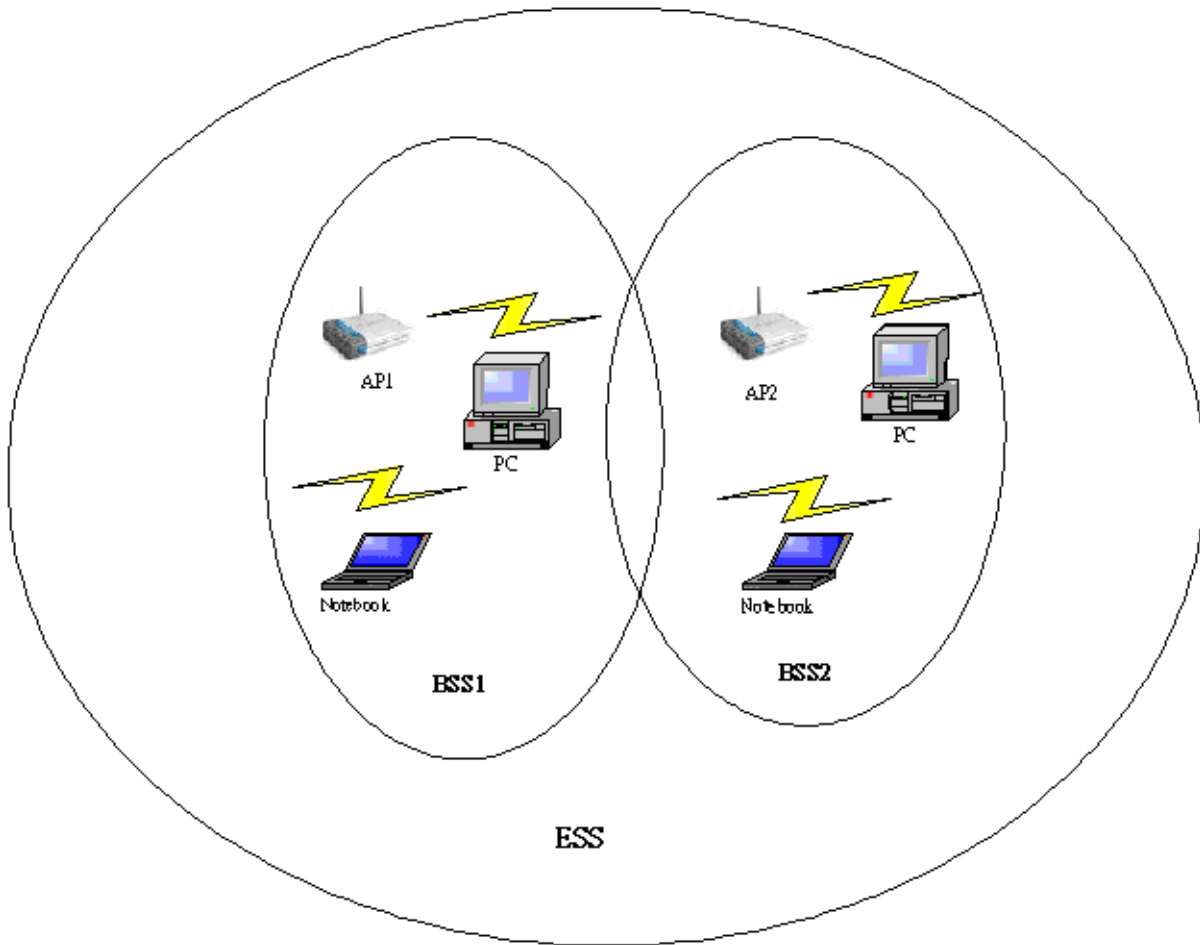
WLAN:
Access Point Name : default
Access Point MAC  : 00:80:C8:17:4A:3E
Current channel   : 6
Current Tx Rate   : 11 Mbps
BSS Quality       : 100%
Signal Strength   : 100%

1. Topology (Infrastructure)
2. Transmission Rate (5.5 Mbps)
3. Ad-hoc Channel [USA: 1~11] (Channel 3)
4. ESSID ( )
5. WEP (OFF)
6. Enable to detect BSS Quality by beeper automatically

Input choice and enter(1~6): 3
Input Ad-hoc Channel 1~11:5
Ad-hoc channel setted
It is affected,after restart the device
Press enter to continue
```

### Wireless LAN ESSID

ESSID (extended service set identification) is used to identify all of the computers in the wireless LAN system, it is different from BSSID (basic service set identification) which contains a single access point (AP) and several other nodes. The following diagram illustrates this concept:



By default, SW2001's ESSID is NULL meaning that it can connect to any access point it detects regardless of SSID of the access point. However if there are two access points within the coverage of SW2001, it will not connect to either of them, in this case you have to specifically input the ESSID of one of the access points for connection. From telnet you can input ESSID as indicated in the following figure:

```
Telnet - 10.0.50.100
Connect Edit Terminal Help

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 5

WLAN:
Access Point Name : default
Access Point MAC  : 00:80:C8:17:4A:3E
Current channel   : 6
Current Tx Rate   : 11 Mbps
BSS Quality       : 100%
Signal Strength   : 100%

1. Topology (Infrastructure)
2. Transmission Rate (5.5 Mbps)
3. Ad-hoc Channel [USA: 1~11] (Channel 5)
4. ESSID ( )
5. WEP (OFF)
6. Enable to detect BSS Quality by beeper automatically

Input choice and enter(1~6): 4
Input ESSID:atop
ESSID changed
It is affected,after restart the device
Press enter to continue
```

### Wireless Encryption Protocol or Wired Equivalent Protocol ( WEP ) Setting

For security reason, SW2001 can set up to use WEP key of 40 bits or 128 bits to securely communicate in the wireless network. Telnet WEP key set up screen is as following:

```
Telnet - 10.0.50.100
Connect Edit Terminal Help

0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.WLAN

Input choice and enter(0~5): 5

WLAN:
Access Point Name : default
Access Point MAC : 00:80:C8:17:4A:3E
Current channel : 6
Current Tx Rate : 11 Mbps
BSS Quality : 100%
Signal Strength : 100%

1. Topology (Infrastructure)
2. Transmission Rate (5.5 Mbps)
3. Ad-hoc Channel [USA: 1~11] (Channel 5)
4. ESSID (atop)
5. WEP (Wep40,Usekey=*****)
6. Enable to detect BSS Quality by beeper automatically

Input choice and enter(1~6): 5
Wep
(1)OFF (2)Wep40 (3)wep128
Please select Wep type:2

Input Key No 1~4:1
Do you want to change Wep key character?Y/Ny
*****
* Format Example: *
* 12345 or 0x3132333435 *
*****
Please Input 5 bytes:abcde
Wep is Setted
It is affected,after restart the device
Press enter to continue
```

## 4.4 Configuration set by web browser

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

### Log in to the system

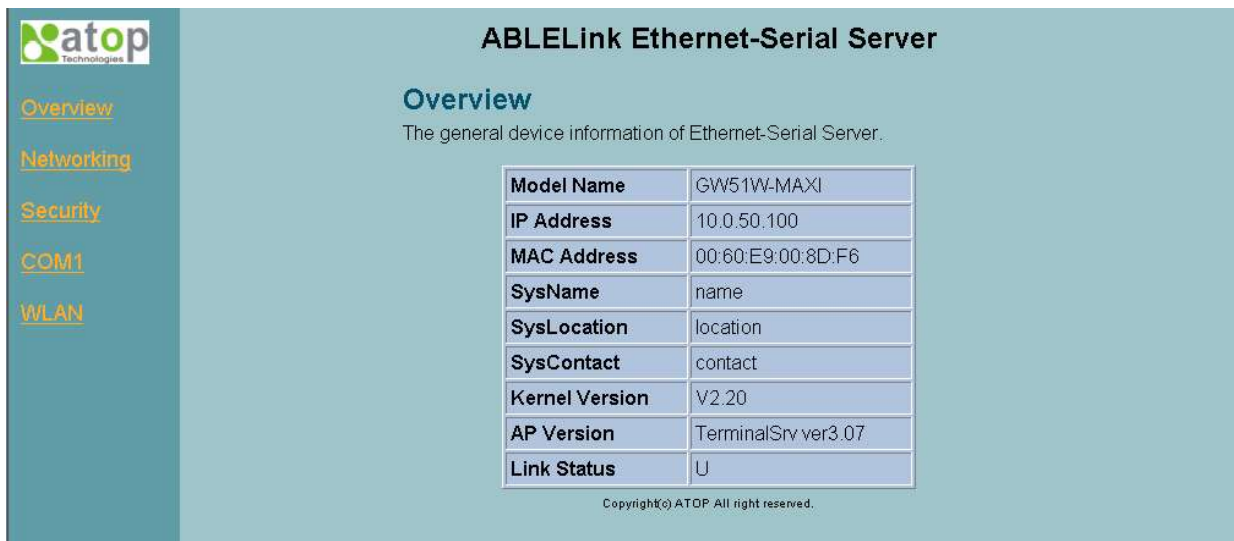
1. From web browser, type in the IP address of SW2001 in the URL.

**Example: <http://10.0.50.100>**

2. The following authentication screen appears. Please type in user name and password then click on "OK". The user name is **admin** and password is **null** by default.



3. The following overview page appears.

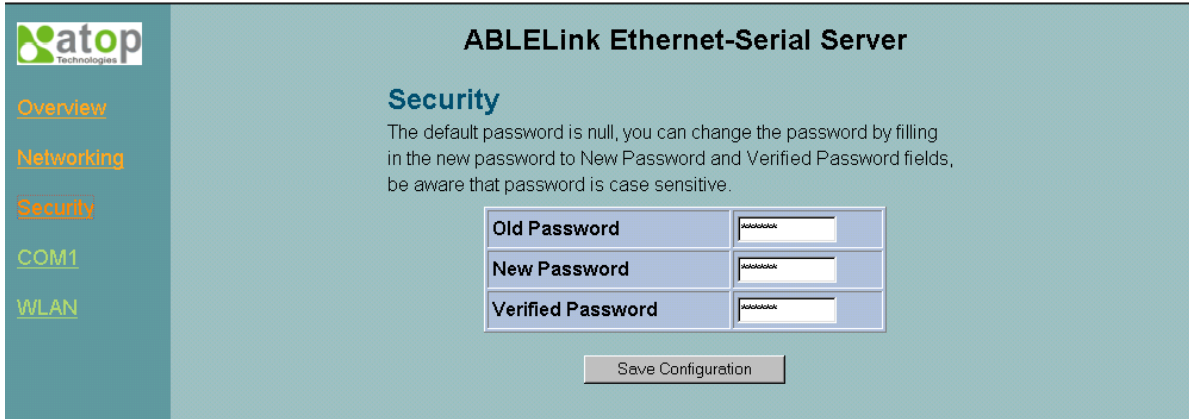


Model Name	GW51W-MAXI
IP Address	10.0.50.100
MAC Address	00:60:E9:00:8D:F6
SysName	name
SysLocation	location
SysContact	contact
Kernel Version	V2.20
AP Version	TerminalServer3.07
Link Status	U

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## Change the password

1. Click on the “Security” link and the following screen appears.



**ABLELink Ethernet-Serial Server**

### Security

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

Old Password	<input type="password"/>
New Password	<input type="password"/>
Verified Password	<input type="password"/>

Save Configuration

2. Please input the old password in the “Old Password” field, input the new password in the “**New Password**” and the “**Verified Password**” fields. Then click on “**Save Configuration**” to update the password.

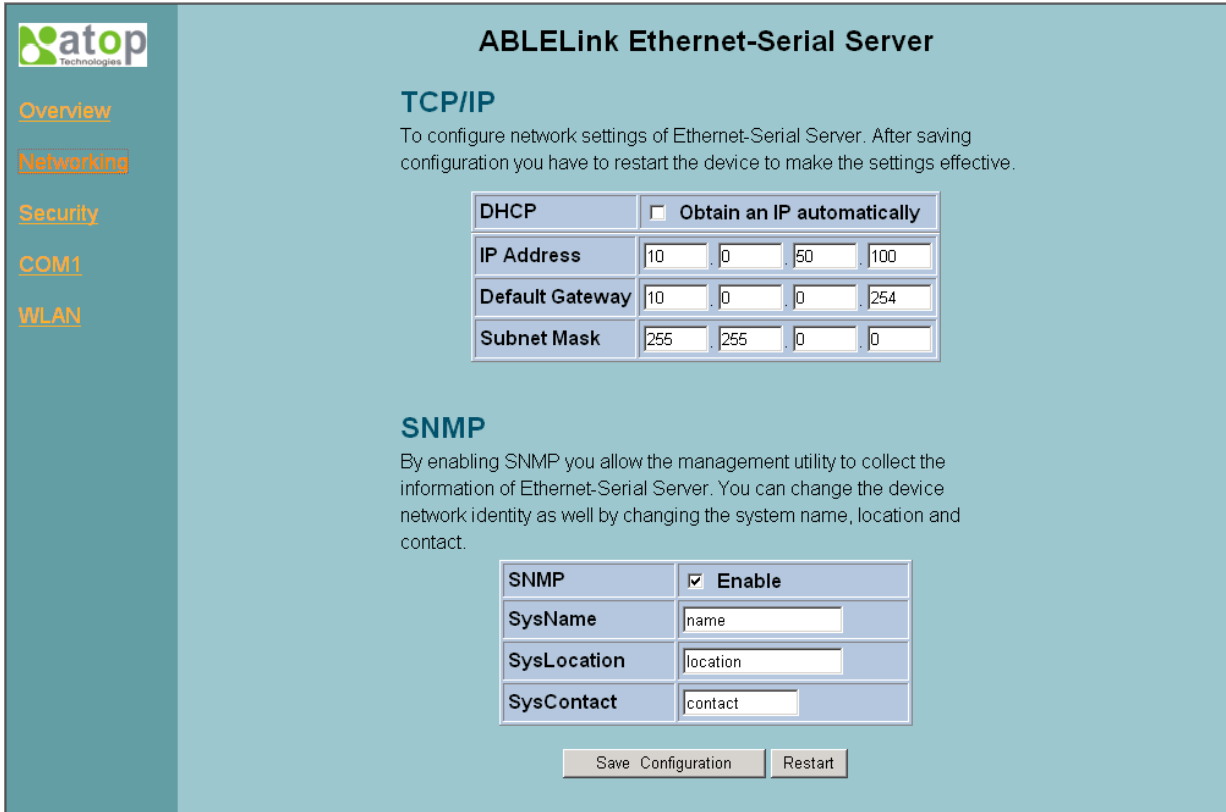
**Note:** You can press the default key of product to reset password to the default value.



## Network setup

Click on the “Networking” link and the following screen appears. Fill in IP information under TCP/IP field. Alternatively, you can do the configuration by putting a check on DHCP to obtain auto IP address, gateway and subnet mask information.

Enable SNMP by checking “Enable”, fill in network identification information under SNMP field and click on the “Save Configuration” button to save the changes, please notice that the setting will not become effective until you restart SW2001.



DHCP	
<input type="checkbox"/>	Obtain an IP automatically

IP Address	10	0	50	100
Default Gateway	10	0	0	254
Subnet Mask	255	255	0	0

SNMP	
<input checked="" type="checkbox"/>	Enable
SysName	name
SysLocation	location
SysContact	contact

Save Configuration   Restart

## COM1 Setup

Click on the “COM1” link and the following screen appears. Fill in COM1 parameter information under COM1 field then click on “Save Configuration” button to save the changes.



The screenshot shows the configuration interface for the ABLELink Ethernet-Serial Server. On the left is a navigation menu with links for Overview, Networking, Security, COM1, and WLAN. The main content area is titled 'ABLELink Ethernet-Serial Server' and contains two sections: 'LINK1' and 'COM1'.

**LINK1**  
To choose specific working mode for COM port.

Mode selection:  TCP Server,  TCP Client,  UDP

Virtual COM	<input type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Mitsubishi A-Series PLC	<input checked="" type="checkbox"/> Enable

Local Port	4660
IP Filter	<input type="checkbox"/> Enable
Source IP	10.0.29.254

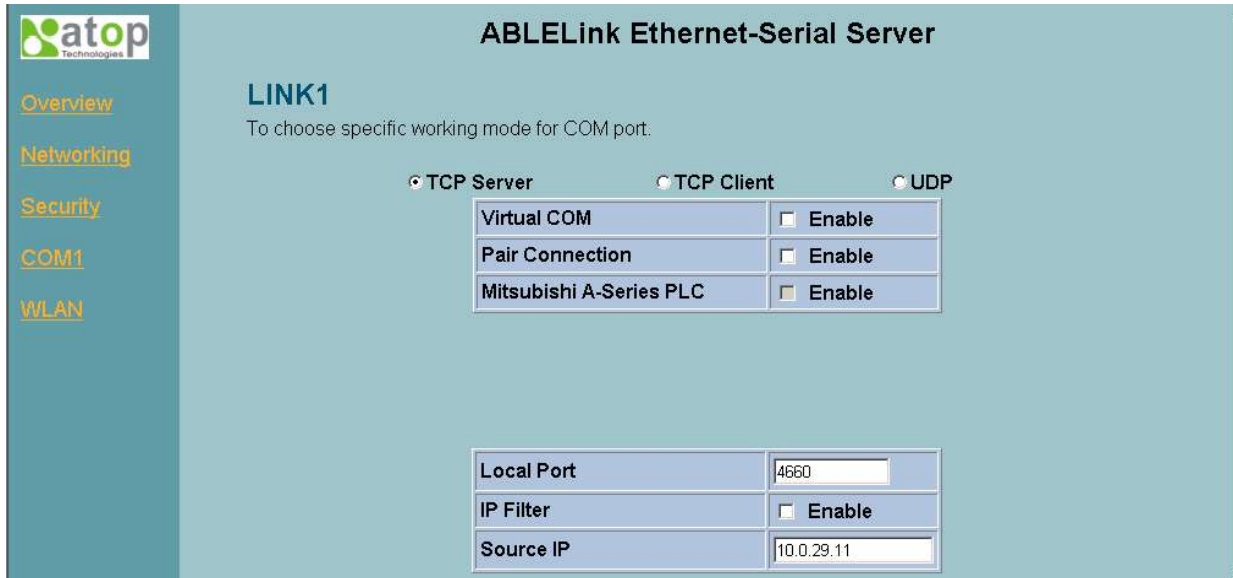
**COM1**  
To configure COM port parameters.

Serial Interface	RS-232
Alias Name	
Baud Rate	9600
Parity	<input checked="" type="radio"/> None <input type="radio"/> Odd <input type="radio"/> Even <input type="radio"/> Mark <input type="radio"/> Space
Data Bits	<input type="radio"/> 7 bits <input checked="" type="radio"/> 8 bits
Stop Bits	<input checked="" type="radio"/> 1 bit <input type="radio"/> 2 bits
Flow Control	<input checked="" type="radio"/> None <input type="radio"/> RTS/CTS <input type="radio"/> DTR/DSR <input type="radio"/> Xon/Xoff
Keep Buffer While Connecting	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Packet Delimiter	<input checked="" type="radio"/> Timer 2 (0~30000 msec) <input type="radio"/> Characters 0x0d ("0x"+ASCII Code, Ex. 0x0d or 0x0d0a)

Save Configuration

## LINK1 Setup

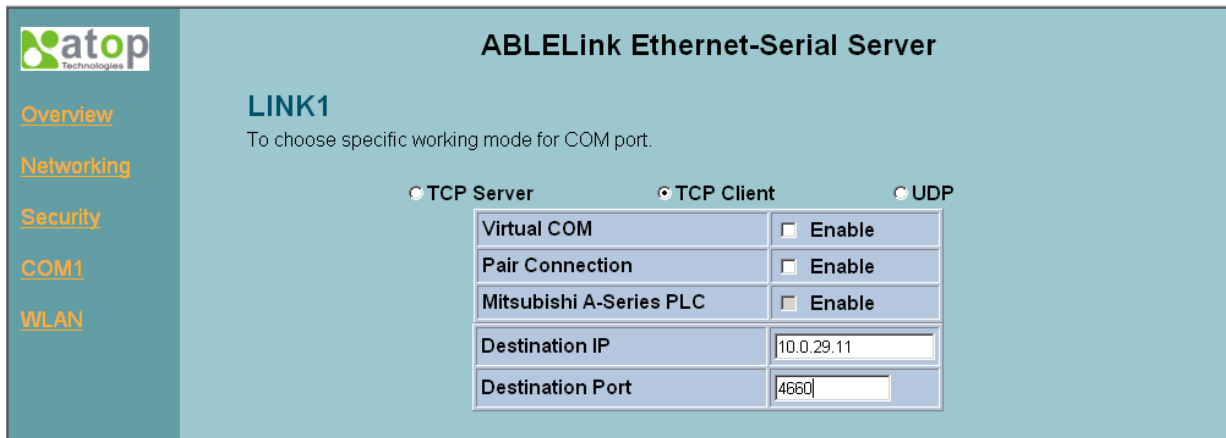
1. Click on the “COM1” link and the following screen appears, you can configure SW2001 as transparent mode by default. Configure SW2001 as TCP server and the local port is 4660, IP filter is disabled by default, if IP filter is enabled, only source IP 10.0.29.11 can connect to SW2001.



The screenshot shows the configuration page for LINK1 in TCP Server mode. The interface includes a sidebar with navigation links (Overview, Networking, Security, COM1, WLAN) and a main content area with the following settings:

ABLELink Ethernet-Serial Server		
<b>LINK1</b> To choose specific working mode for COM port.		
<input checked="" type="radio"/> TCP Server <input type="radio"/> TCP Client <input type="radio"/> UDP		
Virtual COM	<input type="checkbox"/>	Enable
Pair Connection	<input type="checkbox"/>	Enable
Mitsubishi A-Series PLC	<input type="checkbox"/>	Enable
Local Port	4660	
IP Filter	<input type="checkbox"/>	Enable
Source IP	10.0.29.11	

Configure SW2001 as TCP client, the destination IP is 10.0.29.11, destination port is 4660.

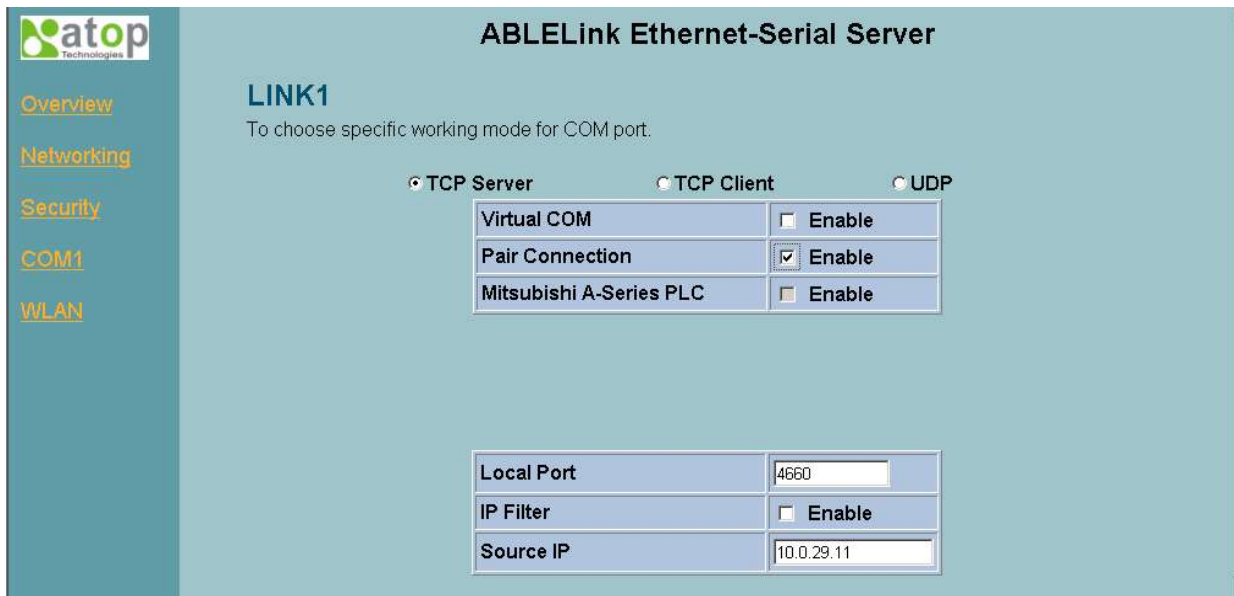


The screenshot shows the configuration page for LINK1 in TCP Client mode. The interface includes a sidebar with navigation links (Overview, Networking, Security, COM1, WLAN) and a main content area with the following settings:

ABLELink Ethernet-Serial Server		
<b>LINK1</b> To choose specific working mode for COM port.		
<input type="radio"/> TCP Server <input checked="" type="radio"/> TCP Client <input type="radio"/> UDP		
Virtual COM	<input type="checkbox"/>	Enable
Pair Connection	<input type="checkbox"/>	Enable
Mitsubishi A-Series PLC	<input type="checkbox"/>	Enable
Destination IP	10.0.29.11	
Destination Port	4660	

## Pair Connection

In the case of the serial connection is established with two or more SW2001 to send data over Ethernet network, i.e. pair connection mode, you can choose “pair connection” which is indicated in the following figure to cope with any type of serial device.



**ABLELink Ethernet-Serial Server**

**LINK1**  
 To choose specific working mode for COM port.

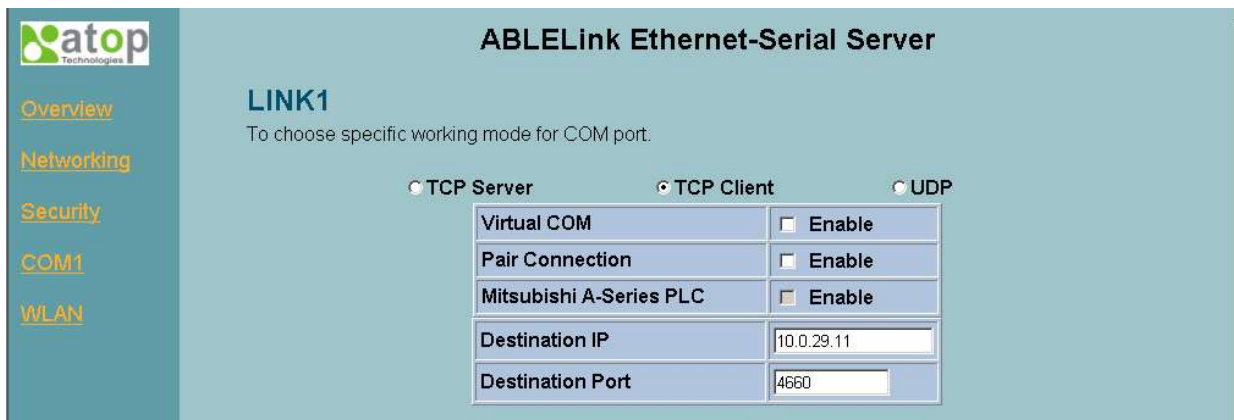
TCP Server     
  TCP Client     
  UDP

Virtual COM	<input type="checkbox"/> Enable
Pair Connection	<input checked="" type="checkbox"/> Enable
Mitsubishi A-Series PLC	<input type="checkbox"/> Enable

Local Port	4660
IP Filter	<input type="checkbox"/> Enable
Source IP	10.0.29.11

Configure SW2001 as TCP client, the destination IP is 10.0.29.11, destination port is 4660.



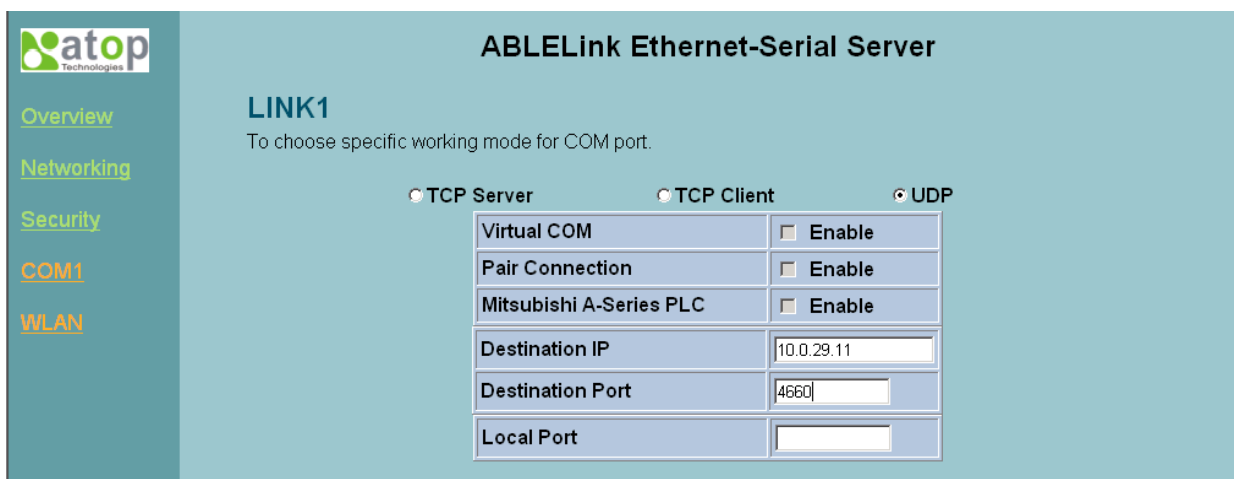
**ABLELink Ethernet-Serial Server**

**LINK1**  
 To choose specific working mode for COM port.

TCP Server     
  TCP Client     
  UDP

Virtual COM	<input type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Mitsubishi A-Series PLC	<input type="checkbox"/> Enable
Destination IP	10.0.29.11
Destination Port	4660

Configure SW2001 as UDP mode. Local port is 666, destination IP is 10.0.50.100 and destination port is 4660.



**ABLELink Ethernet-Serial Server**

**LINK1**  
 To choose specific working mode for COM port.

TCP Server     
  TCP Client     
  UDP

Virtual COM	<input type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Mitsubishi A-Series PLC	<input type="checkbox"/> Enable
Destination IP	10.0.29.11
Destination Port	4660
Local Port	

2. Click on “Save Configuration” to save the changes.
3. If the update is successful, the following screen appears.

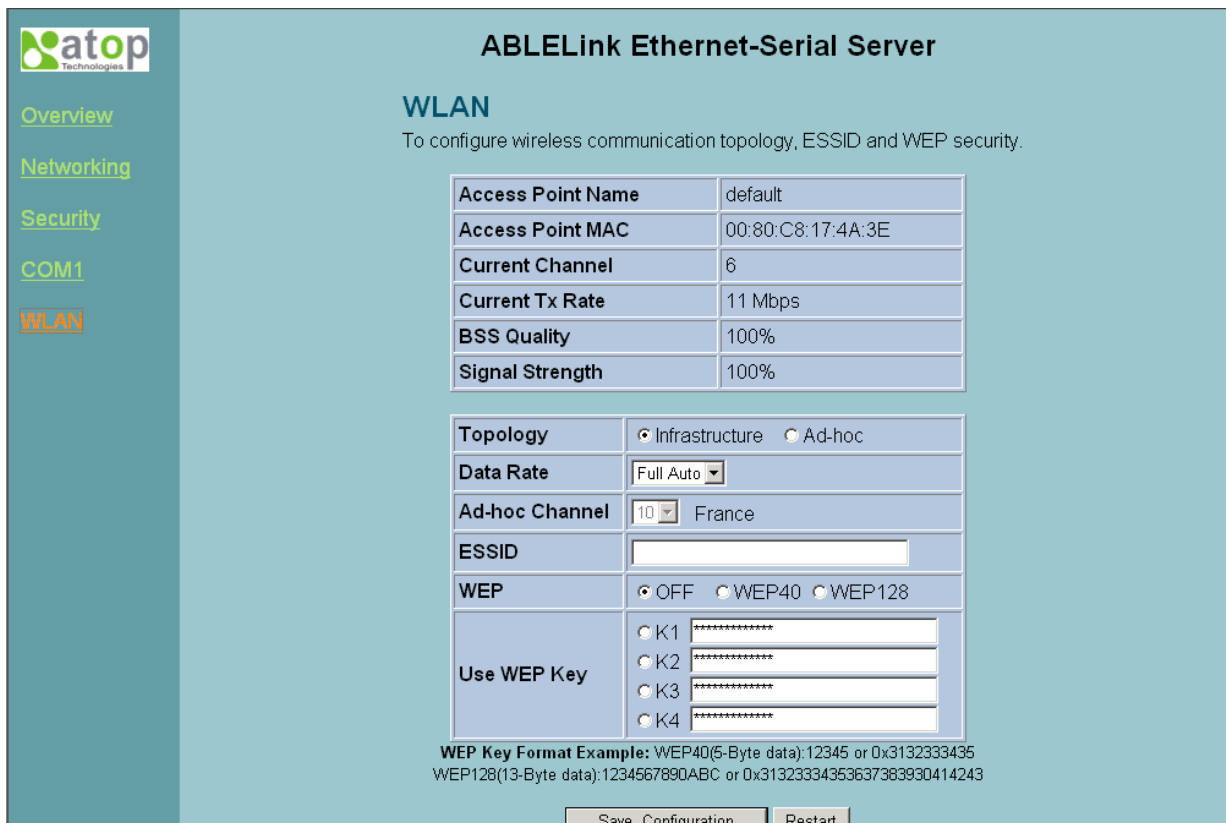
Successful

Configure Saved

[Back](#)

### Wireless LAN Setup

You can configure wireless LAN parameters through web pages, the following page gives you the information of the access point SW2001 is connected to, it also allows you to configure SW2001's wireless topology, ESSID and WEP security. In addition, the BSS Quality and Signal Strength will indicate you the situation of signal.



**ABLELink Ethernet-Serial Server**

### WLAN

To configure wireless communication topology, ESSID and WEP security.

Access Point Name	default
Access Point MAC	00:80:C8:17:4A:3E
Current Channel	6
Current Tx Rate	11 Mbps
BSS Quality	100%
Signal Strength	100%

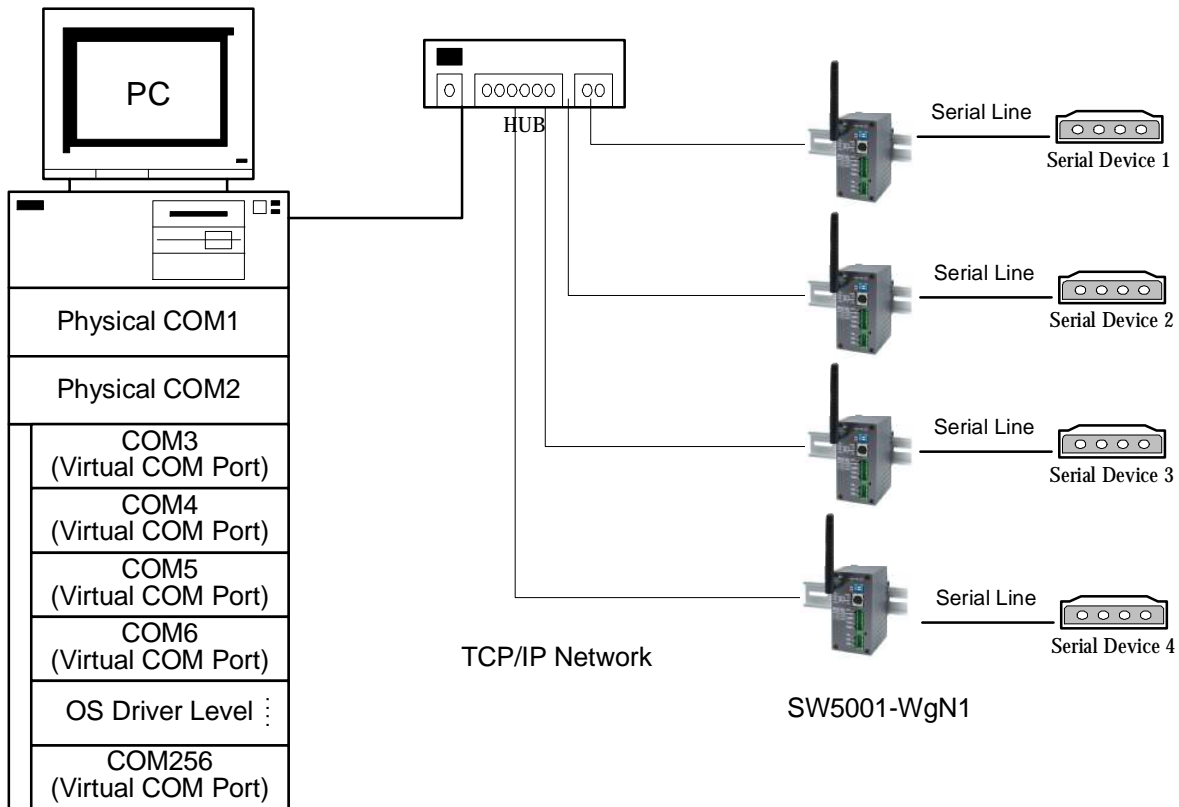
Topology	<input checked="" type="radio"/> Infrastructure <input type="radio"/> Ad-hoc
Data Rate	Full Auto
Ad-hoc Channel	10 France
ESSID	
WEP	<input checked="" type="radio"/> OFF <input type="radio"/> WEP40 <input type="radio"/> WEP128
Use WEP Key	<input type="radio"/> K1 ***** <input type="radio"/> K2 ***** <input type="radio"/> K3 ***** <input type="radio"/> K4 *****

WEP Key Format Example: WEP40(5-Byte data):12345 or 0x3132333435  
WEP128(13-Byte data):1234567890ABC or 0x31323334353637383930414243

[Save Configuration](#) [Restart](#)

## 4.5 Virtual COM Mode

Virtual COM driver mode for windows converts COM data to IP data to control the RS-232C port on a SW2001 via the IP. By creating Virtual COM ports on the PC, Atop Virtual COM redirects the communications from the Virtual COM ports to an IP address and port number on a SW2001 that connects the serial line device to the network. The following figure is Atop Virtual COM connection diagram.



### 4.5.1 Setup of a Virtual COM driver

#### 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
- Windows Installer 2.0
- Network: Microsoft TCP/IP networking software

## Applying to the serial server

### Cautions on Use

Atop Virtual COM supports firmware AP v3.4 and above of ABLELink Wireless Serial Servers.

### Limitation

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

### Installation

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

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

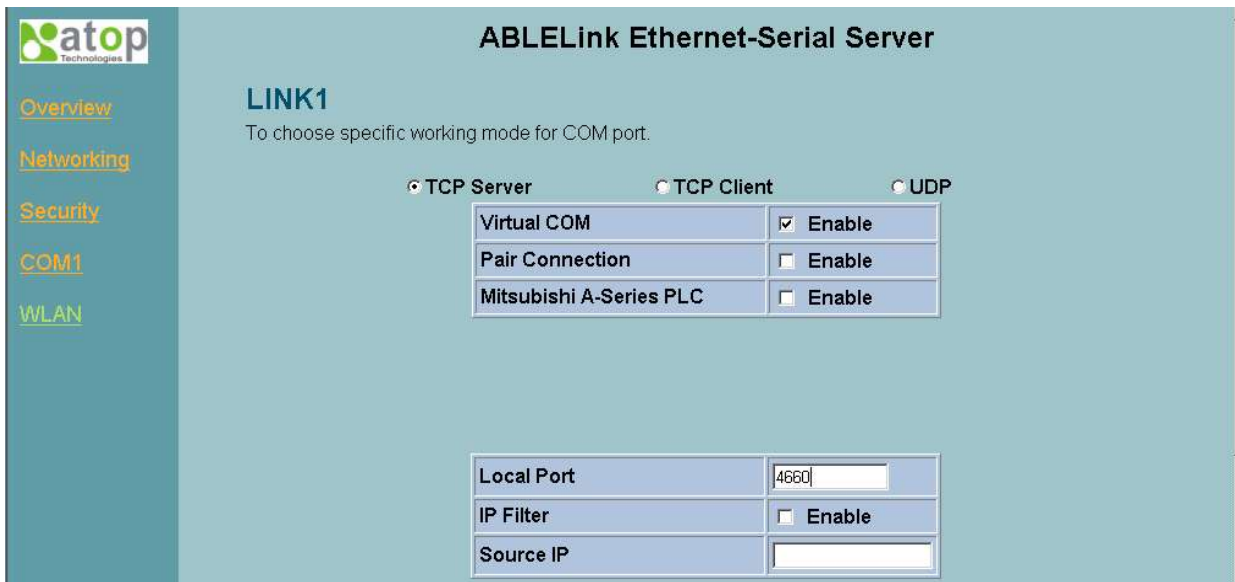
### Uninstalling

1. From Windows Start menu select Setting, Control Panel, Add/Remove Programs.
2. Select **Serial IP for ATOP** 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 for ATOP** to remove the program.

## 4.5.2 Virtual COM communication

### 4.5.2.1 Enable Virtual COM on SW2001

From web browser access to SW2001 by typing its IP address, click on COM1 link to access COM1 page, on the top half of the page click on **"TCP Server"** and enable Virtual COM by putting a check in front of the "Enable" button, then type in the local port number in the **"Local Port"** field as indicated in the following figure:



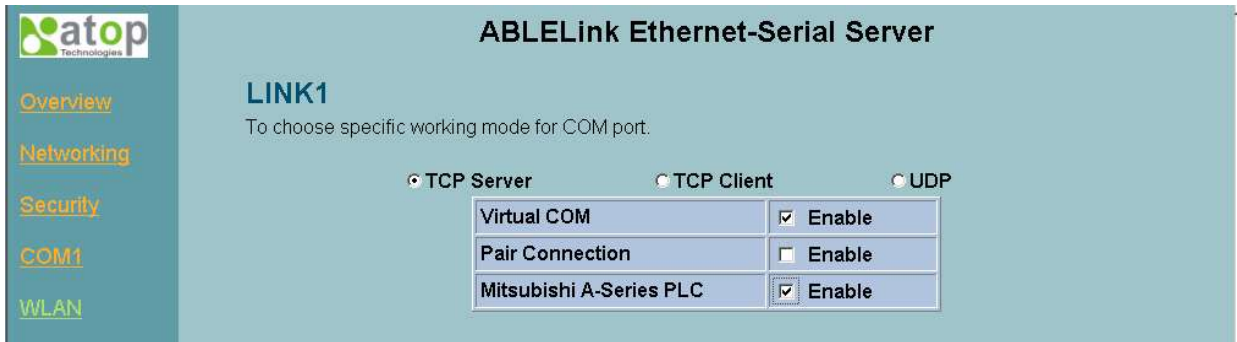
The screenshot shows the web interface for the ABLELink Ethernet-Serial Server. The page title is "ABLELink Ethernet-Serial Server" and the sub-page is "LINK1". Below the title, it says "To choose specific working mode for COM port." There are three radio buttons for working modes: "TCP Server" (selected), "TCP Client", and "UDP". Below these are three tables of settings:

Virtual COM	<input checked="" type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Mitsubishi A-Series PLC	<input type="checkbox"/> Enable

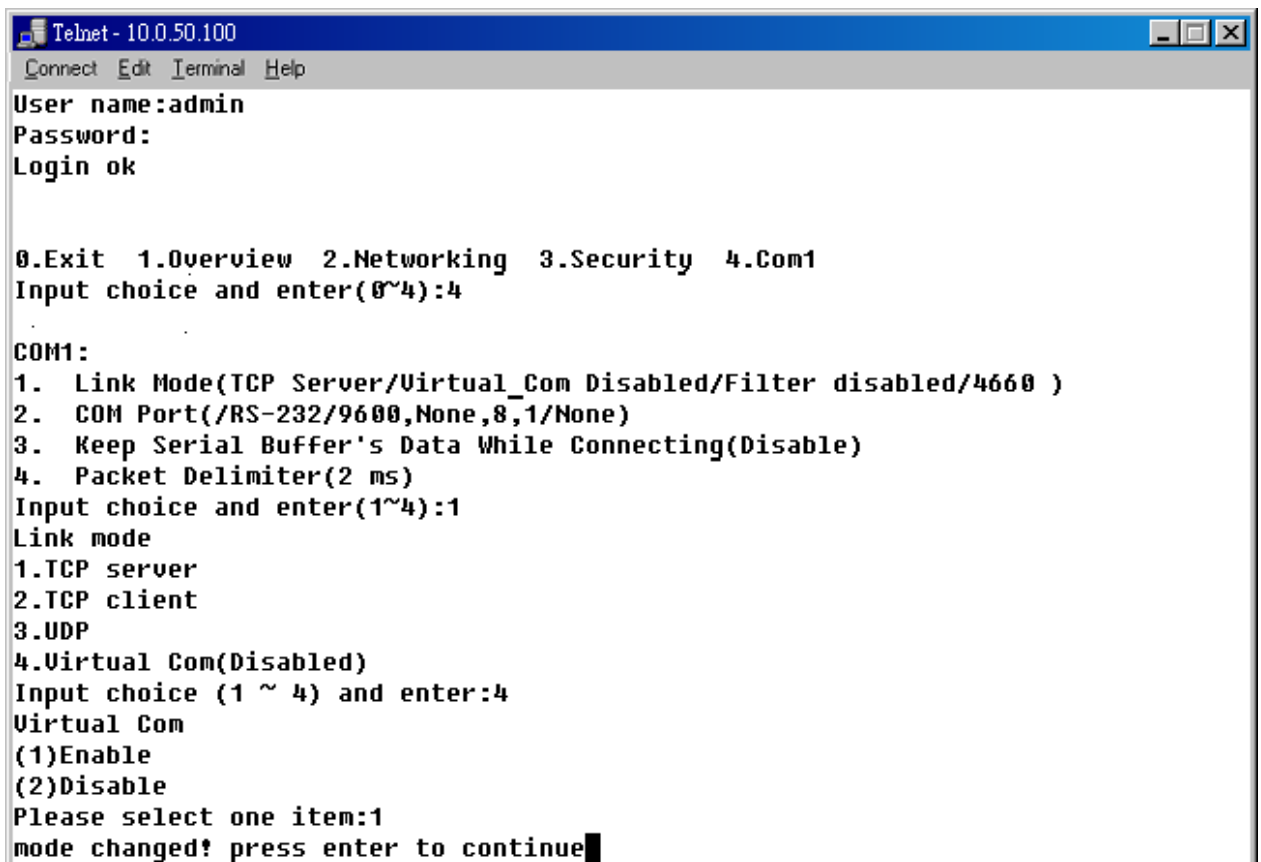
  

Local Port	<input type="text" value="4660"/>
IP Filter	<input type="checkbox"/> Enable
Source IP	<input type="text"/>

For the users of Mitsubishi A-Series PLC, it may be recommended to enable **"Mitsubishi A-Series PLC"** in the case of some connection problems occurred.



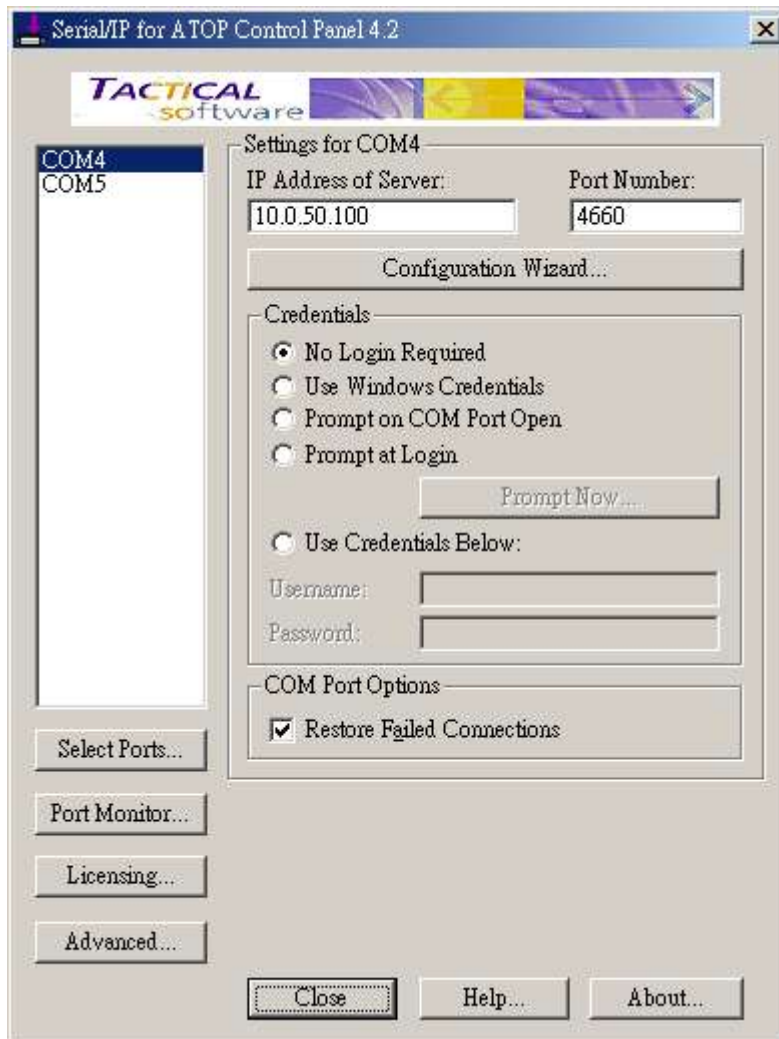
Or you can enable Virtual COM through telnet configuration by setting COM1 as TCP server, and type in the local port number for COM1, then enable virtual COM as shown in the following figure:



#### 4.5.2.2 Run Serial/IP for ATOP program on monitoring PC

In the Window Start Menu, select the Serial/IP for ATOP program group and select **Serial/IP for ATOP Configuration**. The configuration window is shown as following:





At right is a sample Virtual COM Control Panel window. At the left 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.

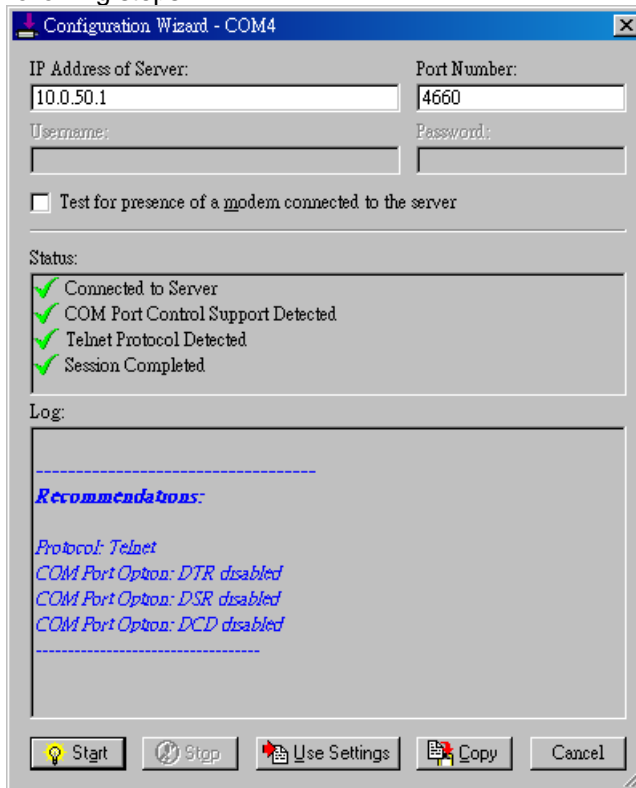
### Configuring Virtual COM Ports

You configure each Serial/IP COM port as follows:

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.



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

Atop SW2001 is an SNMP device that allows many popular SNMP network management platforms such as HP OpenView and SunNet Manager to conduct monitoring on the device.

Depending on the network management tools you are using, device (SW2001) information can be collected from running the management tools including IP address, DNS name, system descriptions and NIC information etc.

## Appendix A: SW2001 Wireless Serial Server Specifications

### A.1. Hardware Specifications

	Specifications
CPU	150MHz RISC with MMU support
Memory	Flash: 8MB /2MB for Bootloader / SDRAM: 16MBytes.
Interface	Mini-PCI Slot (for Wireless Module)
Watchdog	Hardware Watchdog Reset
Debug Port	CPU Build in Com.
Wireless LAN	Compliance for IEEE802.11b/g WEP 64-bit/128-bit data encryption WPA Compatible (TKIP/AES Encryption) Mobile for Fast Roaming Modulation Type: CCK, DQPSK, DBPSK, OFDM (11g) Tx Power 11b: 14 dBm / 11g: 13 dBm Rx Sensitivity: -66 dBm @ 54 Mbps, -80 dBm @ 11Mbps Transmission Rate: 54 Mbps (max.) with auto fallback Transmission distance: Up to 300 meters (@12 Mbps, in open areas) Antenna Connector: Reverse SMA Topologies: Infrastructure, Ad-Hoc
Ethernet	10/100M LAN (for Redundancy & Configuration) Protection: Built-in 1.5 KV magnetic isolation Configuration with Telnet Protocol
Serial Port	Support RS232/485/422 & Software Selection Baud Rate: 1200~921Kbps Parity Check: None/Odd/Even/Mark/Space Data Length: 7/8 Bit Stop Bit: 1/2 Flow Control: None/ Software/ Hardware: RTS/CTS Terminal Block or DB9 Connector with 15KV ESD
Power	Input: DC 9V-30V Consumption: 4.5 W (Tx Mode)
Software	Protocols: ICMP, IP, TCP, UDP, DHCP Client, Telnet, DNS, SNMP, HTTP, SMTP, SNTF Utilities: Windows utility for Windows 98/2000/XP/2003 Virtual COM for Windows 98/2000/XP/2003

Configuration	Web browser Telnet Console Windows utility
Mechanical	HxWxD: 90mm x 45mm x 75mm Plastic Housing for IP40 Standard
Environment	Operating: 0 to 60°C (32 to 140°F), 5 to 95% RH Storage: -20 to 85°C (-4 to 185°F), 5 to 95%RH

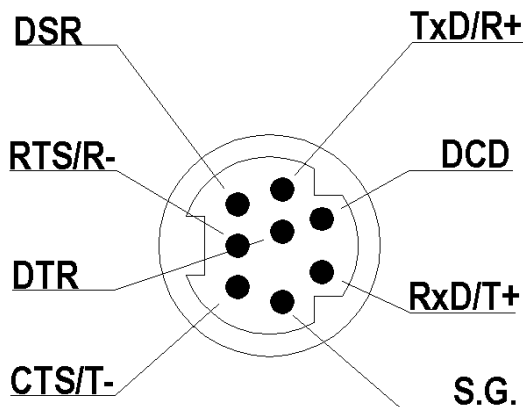
## A.2. Software Specifications

Item	Specifications
Protocol	ICMP, IP, TCP, UDP, DHCP Client, Telnet, DNS, SNMP, HTTP, SMTP, SNTP
Configuration	Configuration information for both TCP/IP and serial ports is kept in the EEPROM. Configuration utilities of Windows 95/98/2000/NT/XP/2003 are provided for configuring settings.
Internal Buffer Size	TCP receiving buffer size = 8K bytes TCP transmitting buffer size = 16K bytes RS-232/RS-485 receiving buffer size = 4K bytes RS-232/RS-485 transmitting buffer size = 4K bytes

## A.3 Connector Pin Assignments

### A.3.1 COM Port

1. 8 pin Mini DIN connector



Pin assignments of Mini DIN connector is shown in the following table:

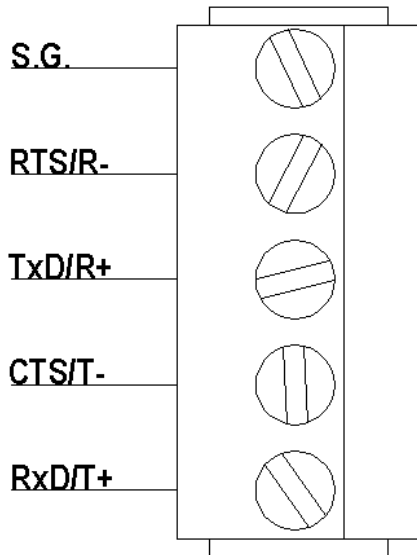
Pin#	RS-232 Full Duplex	RS-485 2 wire, Half Duplex	RS-485 4 wire, Full Duplex
1	DCD	N/A	N/A
2	RXD	N/A	<b>RxD/T+</b>
3	TXD	<b>TxD/R+</b>	<b>TxD/R+</b>
4	DTR	N/A (reserved)	N/A
5	SG (Signal Ground)	SG (Signal Ground)	SG (Signal Ground)
6	DSR	N/A	N/A
7	RTS	<b>RTS/R-</b>	<b>RTS/R-</b>
8	CTS	N/A	<b>CTS/T-</b>
9	N/A	N/A(reserved for Atop devices)	N/A

Atop provides Mini DIN connector to DB9 connector cable, the pin assignments of DB9 connector is shown in the following table:

Pin#	RS-232 Full Duplex	RS-485 2 wire, Half Duplex	RS-485 4 wire, Full Duplex
1	DCD	N/A	N/A
2	RXD	N/A	N/A
3	TXD	<b>DATA-</b>	<b>RXD-</b>
4	DTR	N/A (reserved)	<b>TXD-</b>
5	SG (Signal Ground)	SG (Signal Ground)	SG (Signal Ground)
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	<b>DATA+</b>	<b>RXD+</b>
9	RI	N/A(reserved for Atop devices)	<b>TXD+</b>

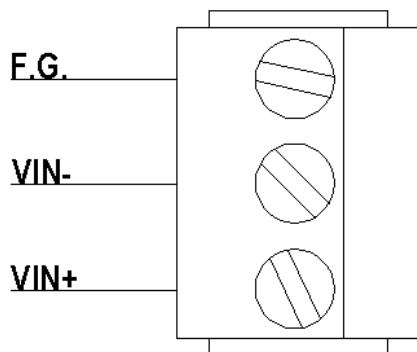
**Note that RS-485 2 or 4 pins assignments of DB9 connector are different from those of Mini DIN connector.**

## 2. Terminal Block Connector



RS-485 only uses RTS/R- and TxD/R+ for data communication while RS-232 or RS-422 uses RTS/R-, TxD/R+, CTS/T- and RxD/T+ for communicating data.

### A.3.2 Power terminal block connector



## A.4 LED Indication for Link Status

### A.4.1 Detect SW2001 startup

“ ^ “ : Beep twice

“ = “ : Beep off

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

**Table 1. Buzzer indication**

### A.4.2 Detect SW2001 Signal Strength

The BSS quality can be detected by LED indication in SW2001.

#### Run-time

When run-time, if the default key is pressed and then released, one of the specified actions will be down depending on the released time after you heard how many beeps.

BSS quality is indicated by count of LEDs, which is shown as bellowed:

Blink RED	There is no signal detected
One RED	The quality is between is 0%~20%
2 LEDs	The quality is between is 20%~40%
3 LEDs	The quality is between is 40%~60%
4 LEDs	The quality is between is 60%~80%
5 LEDs	The quality is between is 80%~100%

#### LAN LED

Message	Description
LED Off	No data is transmitting on Ethernet
LED blinking	Data is transmitting on Ethernet

**Table 2. LAN LED Message**

#### COM Port LED

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Message	Description
LED off	No data is transmitting on COM port
LED on blinking state	Data is transmitting on COM port

**Table 3. COM Port LED Message**

RUN LED

Message	Description
LED on	Jumper JP7 and JP8 are short to disable AP firmware in the flash memory.
LED blinking (rate: 0.5Sec)	AP firmware is running

**Table 4. RUN LED Message**

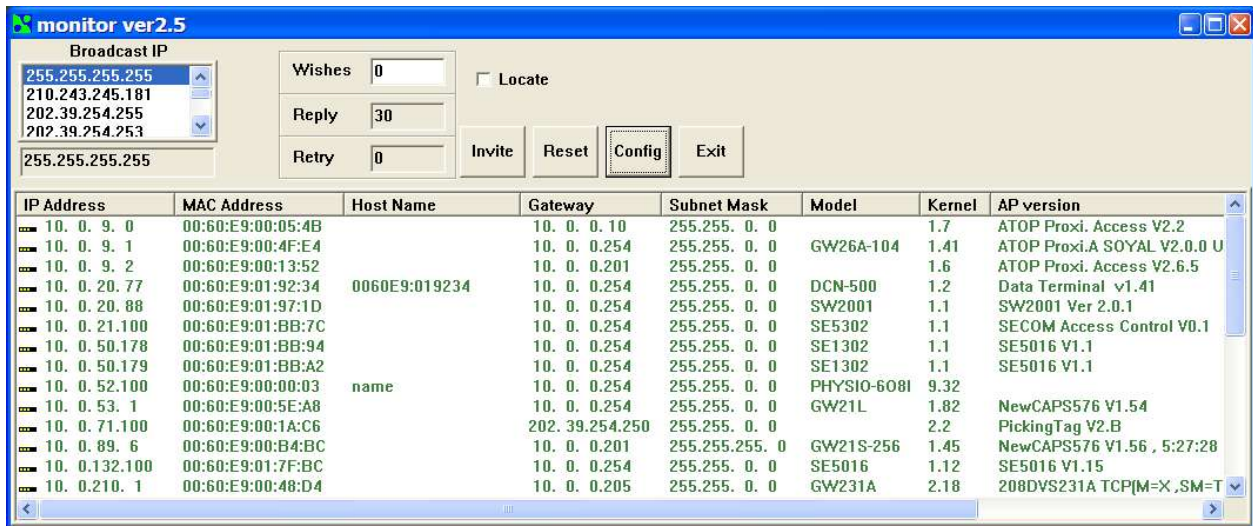


## Appendix B Configuration Utility

The configuration utility **monitorXX.exe** (XX: Version number) comes with the product CD or diskette is the main utility program to demonstrate and configure SW2001's settings.

### D.1 Run the utility

Start the program under environment and the following window appears.



### D.2 Detect Operational Devices

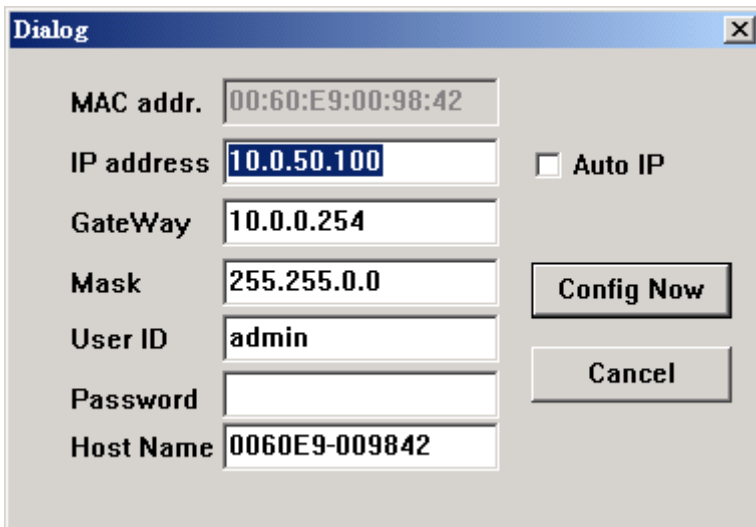
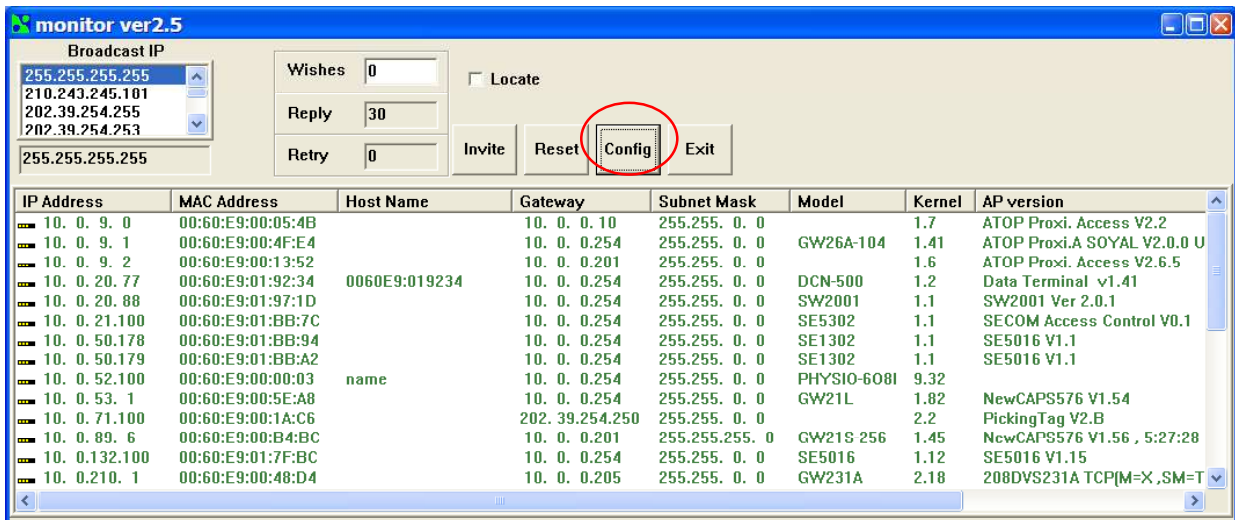
You may do the following steps to detect devices currently available on the network.

1. Start **monitorXX.exe** utility program.
2. Select an item from the **Broadcast IP** list.
3. Specify a number in the **Wishes** box.
4. Click on the **Invite** button. This will display all the devices information you have requested.

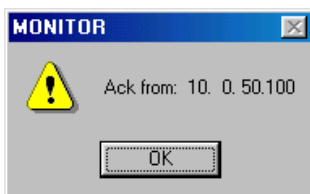
### D.3 Configure Devices

You may use **monitorXX.exe** configuration utility to configure the settings of devices on the network. To do so, please follow the steps below.

1. Repeat the steps in the section of **D.2** to bring up the devices information.
2. Select the device you want to configure from the **IP Address** column, click on the **Config** button, a configuration window will popup as shown in Figure D2:



3. After you click the “Configure Now” button, the target device will return an ACK message indicating the modification is successful as shown in the following:



Please note **monitor25.exe** version 2.5 and above requires **gw21le.dll** library to function properly.

The following table lists the functional descriptions for all the fields.

Field Name	Field Descriptions
<b>Broadcast IP</b>	Except for the default IP 255.255.255.255, other items (IPs) are read from the file "seg.cfg". This field specifies a detecting IP range. It may be a designated IP or a broadcast IP.
<b>Wishes</b>	Specifies minimum number of the devices you wish to get reply from after sending an <b>Invite</b> request. If there is not as many as devices responding to your invitation, the system repeatedly sends invitation until your request is fulfilled.
<b>Reply</b>	Indicates the actual number of devices this utility program detected.
<b>Retry</b>	Specify the number of times that an Invite request is re-sent.
<b>Locate</b>	Locate the specified device.
<b>Reset</b>	Reset the selected device.
<b>Config</b>	Configure the selected device.
<b>Exit</b>	Exit this utility.
<b>IP Address</b>	Indicate the IP address of the device that replied to your request.  Y Leading tag "!" stands for IP address collision, possibly caused by duplicated IP addresses on the network.  Y Leading tag "?" stands for Mac address collision, possibly caused by duplicated Mac addresses on the network.
<b>MAC Address</b>	Indicates the MAC address of responding device.
<b>Gateway</b>	Indicates the IP address of the gateway.
<b>Subnet Mask</b>	Indicates the TCP/IP network mask.
<b>OS</b>	Indicates the OS version of the responding device.
<b>AP Version</b>	Indicates the AP version of the responding device.
<b>Model</b>	Indicates the model number of the responding device. This field is only available for monitor.exe version 2.0 and above.