

Model ATC-3001 1-port Modbus Gateway

User's Manual



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1. Introduction

Modbus is an industry adopted communication protocol based on RTU, ASCII, and TCP protocols for various applications; these three protocols are commonly used by hardware equipments in the industry, such as DCS, PLC, HMI, power load measurement, various sensor and measuring instruments. The Modbus Gateway is capable of implementing the Modbus environment between different hardware interfaces, thereby streamlining the process of management and application.

Diverse Hardware Infrastructure

Modbus Gateway supports the four most commonly used hardware communication interfaces, RS232, RS485, RS422, and Ethernet. The simple-to-use configuration software provided with Modbus Gateway can quickly modify the hardware interface to use, and easily switch to the existing hardware communication infrastructure.

Switching between Modbus Protocols

Modbus Gateway supports the standard Modbus protocol and is capable of converting any Modbus protocols between Modbus TCP and Modbus RTU or Modbus ASCII for all supported hardware interfaces.

Packaging

Please check ones package contains the following items:

- § ATC-3001 x 1
- § Power Adapter 9~24VDC x 1
- § Product CD containing configuration utility x 1
- § ATC-3001 1-port Modbus Gateway quick start guide x 1

2. Hardware Setup



Figure 2.1 ATC-3001 interfaces. mount

2.1 LED Indicators

2.1.1 LAN LED

Message	Description
Off	Ethernet Disconnected
Blinking with Green	Data is transmitting on Ethernet for 100Mbps
Blinking with Orange	Data is transmitting on Ethernet for 10Mbps

Table 1. LAN LED Message

2.1.2 COM Port LED

Message	Description
Off	No data is transmitting on COM port
Blinking	Data is transmitting on COM port

Table 2. COM Port LED Message

2.1.3 RUN LED

Message	Description
On	R1 are shorted to disable AP firmware running
Blinking (rate: 0.5 Sec)	AP firmware is running normally

Table 3. RUN LED Message

2.1.4 POWER LED

Message	Description
On	Power on
Off	Power off

Table4. PWR LED Message

2.2 Installation Procedures

Step 1: Connect ATC-3001 to power source using 9~24V DC Jack.

Step 2: Connect ATC-3001 to Ethernet network. Use a standard straight-through Ethernet cable when one connect it to a hub/switch, one also can connect it to ones PC's Ethernet port via a cross-over Ethernet cable for easy set up. However, in this case one need to make sure ones PC is in the same network sub-net as ATC-3001.

Step 3: Connect ATC-3001's serial port to a serial device.

Step 4: Placement options. One can mount ATC-3001 to a wall/panel (Mounting screws included) or Din-Rail rack.

3. Software Setup

ATC-3001 Modbus Gateway 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(leave it blank)
COM 1	9600,None, 8, 1, No flow control, buffer disabled, packet delimiter timer 2ms
Modbus	Type: Listen port 502
SysName of SNMP	name
SysLocation of SNMP	location
SysContact of SNMP	contact

3.1 Configuration by Device View

3.1.1 Static IP

Use **Device View** that comes with product CD to configure the network parameters of ATC-3001. Please click **“Configuration”** button (ref Figure 3.1) then give it a static IP information.(Figure 3.2)

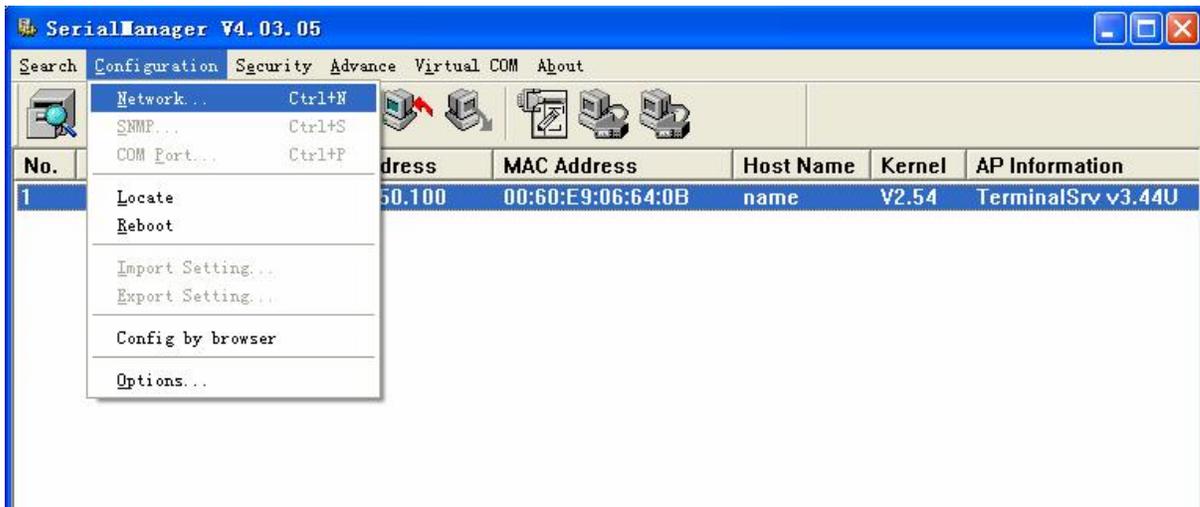


Figure 3.1 Configure by Device View

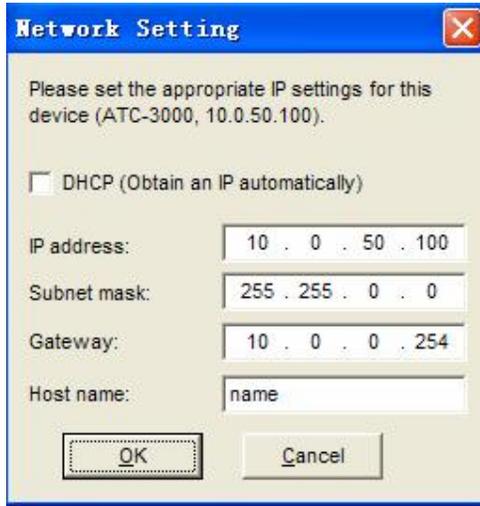


Figure 3.2 Static IP setup dialog window

3.1.2 Auto IP (Dynamic IP)

A DHCP server can automatically assign the IP address and network settings. ATC-3001 supports the DHCP function. By default, the DHCP function on ATC-3001 is disabled; one can use Device View software to search network information automatically by following steps :

- >Execute Device View (Figure 3.1)
- >Click on the IP address of ATC-3001 in Device View
- >Click “**Config**” button(It will pop-up Dialog Window)
- >Check “**Auto IP**” (Figure 3.3)
- >Click “ **Config Now**” button(The ATC-3001 will restart and get IP from DHCP server automatically)

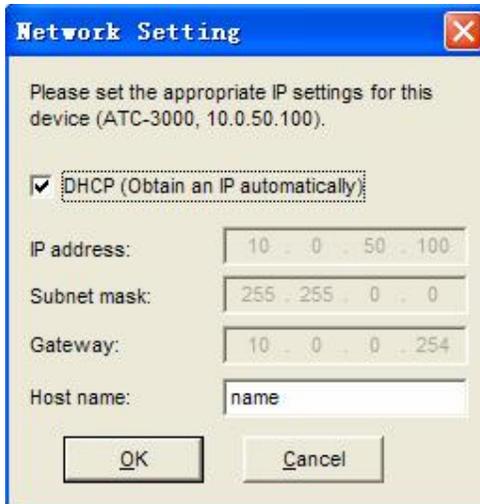


Figure 3.3 Device View Auto IP Dialog Window

3.2 Configuration by Telnet Utility

One can use Telnet utility to change configuration settings of ATC-3001 by following steps :

3.2.1 Login to the System

Open Ms-DOS command prompt window

Telnet to ATC-3001 using command "Telnet IP_address".(For example : Input **Telnet 10.0.50.100** in Ms-DOS command prompt window).After telnet to ATC-3001, system prompts for a password, the default password is left it blank. (Figure 3.4)

```
Ethernet-Serial Server
User name:admin
Password:_
```

Figure 3.4 Login to the system

Note: One can press the default button of ATC-3001 to reset the password to the default value.

1. After verifying the password, the following terminal screen appears.(Figure 3.5)

```
1.Show Configuration
2.IP Setup
3.Gateway Setup
4.Subnet Mask Setup
5.COM1 Setup
7.Exit With Save and Reset
8.Exit Without Save

a.LINK 1 Setup(Port=502,Lnk Cnt=2,Timeout=400,protocol=ASC,Retry=2)
c.Change Password
d.Change Name (name)
e.Change Location (location)
f.Change Contact (contact)

Input choice and enter(1~8,a~f):_
```

Figure 3.5 Main menu

Note: Changes to networking parameters will take effect only when one exit and restart ATC-3001.

->Select "1" from "Input choice and enter (1~8,a~f):" to enter show configuration page as following:(Figure 3.6)

```
Input choice and enter(1~8,a~f):1
1
*****
IP Addr=10.0.160.53
Gateway=10.0.0.254
Mask    =255.255.0.0
port 1=RS-232,9600,None,8,1
*****
```

Figure 3.6 Show Configuration

This page gives one the general information of ATC-3001 including IP address, Gateway, subnet mask, and serial information of the device.

3.2.2 IP Setup

Select “2” from “Input choice and enter (1~8,a~f):” to Setup IP:(Figure 3.7)

```
Input choice and enter(1~8,a~f):2
2
Please input New IP: _
```

Figure 3.7 IP Setup

3.2.3 Gateway Setup

Select “3” from “Input choice and enter (1~8,a~f):” to Setup Gateway:(Figure 3.8)

```
Input choice and enter(1~8,a~f):3
3
Please input New Gateway:
```

Figure 3.8 Gateway Setup

3.2.4 Subnet Mask Setup

Select “4” from “Input choice and enter (1~8,a~f):” to Setup Subnet Mask:(Figure 3.9)

```
Input choice and enter(1~8,a~f):3
3
Please input New Gateway:
```

Figure 3.9 Gateway Setup

3.2.5 COM1 Setup

Select “5” from “Input choice and enter (1~8,a~f):” to Setup COM1. One 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 one want to use flow control and the type of flow control one want to use. The following screen (Figure 3.10) illustrates how to setup 9600 baudrate, none parity, 8 data bits, and 1 stop bit.

```
Input choice and enter(1~8,a~f):5
5
(1)1200 (2)2400 (3)4800 (4)9600 (5)19200 (6)38400 (7)56000(8)115200(9)other
Please select baudrate(8):4
4
(1)None (2)Odd (3)Even (4)Mark (5)Space
Please select Parity(1):1
1
(1)7 bits (2)8 bits
Please select length(2):2
2
(1)1 bits (2)2 bits
Please select stop bit(1):1
1
```

Figure 3.10 COM1 Setup

3.2.6 Exit with Save and Reset

Select “7” from “Input choice and enter (1~8,a~f):” to Exit with Save. Please choose this option to save all the previous changes to EEPROM, the device will restart automatically.

3.2.7 Exit with Save and Reset

Select “8” from “Input choice and enter (1~8,a~f):” to Exit with Save. Please choose this option to discard all the previous changes the device will close telnet connection automatically.

3.2.8 Link 1 Setup

Select “a” from “Input choice and enter (1~8,a~f):” to Exit with Save. The following screen (Figure 3.11) illustrates how to set port to 502, connection to 2, input timeout to 400, protocol to ASCII, and retry to 2 times.

```
a.LINK 1 Setup(Port=502,Lnk Cnt=1,Timeout=200,protocol=ASC,Retry=1)
c.Change Password
d.Change Name (name)
e.Change Location (location)
f.Change Contact (contact)

Input choice and enter(1~8,a~f):a
a
Please input Modbus TCP_LISTEN_PORT(502):502
502
Please input Connect Count(1):2
2
Please input Timeout(200):400
400
(1)ASC (2)RTU
Please select Protocol(1):1
1
Please Input Retry Count(1):2
2
```

Figure 3.11 Link1 Setup

3.2.9 Change Password

1. Select “c” from “Input choice and enter (1~8,a~f):”. The following screen (Figure 3.12) illustrates how to change default empty password to “1111”.

```
Input choice and enter(1~8,a~f):c
c
Please input old password:

Please input new password:1111
****
Please verify new password:1111
****
add:1Password changed!
```

Figure 3.12 change the password

2. If one 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: One can press the default key of product to reset password to the default value.

3.2.10 SNMP Settings

- a. Select “d” from “Input choice and enter (1~8,a~f):” to change SNMP Name field.

Note that if you press enter, ATC-3001 will fill in a default name equal to its MAC.

- b. Select “e” from “Input choice and enter (1~8,a~f):” to change SNMP Location field.
- c. Select “f” from “Input choice and enter (1~8,a~f):” to change SNMP Contact field.

3.3 Configuration Using Web Browser

1. Make sure one PC is located on the same network sub-net as ATC-3001
2. Open a web browser, then type in the IP address of ATC-3001 to be configured. Default user name is **admin** and default password is **null (leave it blank)**.
3. ATC-3001'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 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 Log in to the System

1. From web browser, type in the IP address of ATC-3001 in the URL.

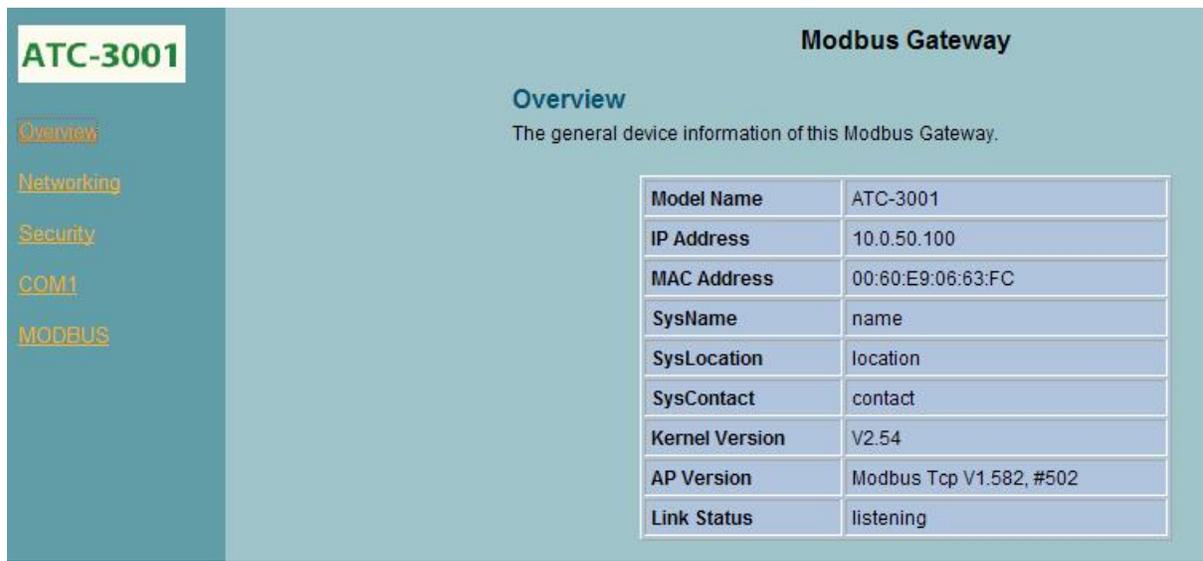
Example: <http://10.0.50.100>

2. The following authentication screen appears. (Figure 3.13) Please type in user name and password then click on OK. The user name is admin and password is left it blank by default.



Figure 3.13 login the system via Web

3. The following overview page appears.(Figure 3.14)



Modbus Gateway	
Overview	
The general device information of this Modbus Gateway.	
Model Name	ATC-3001
IP Address	10.0.50.100
MAC Address	00:60:E9:06:63:FC
SysName	name
SysLocation	location
SysContact	contact
Kernel Version	V2.54
AP Version	Modbus Tcp V1.582, #502
Link Status	listening

Figure 3.14 Overview

3.3.2 Change Password

1. Click on the “**Security**” link and the following screen appears.(Figure 3.15)



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	•••••
New Password	•••••
Verified Password	•••••

Save Configuration

Figure 3.15 Change the password

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

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

3.3.3 Network Setup

Click on the “**Networking**” link and the following screen appears. Fill in IP information under TCP/IP field. Alternatively, one can do the configuration by clicking 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 one restart ATC-3001.(Figure 3.17)

ATC-3001

Modbus Gateway

TCP/IP

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

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

Figure 3.16 TCP/IP setup

SNMP

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

SNMP	<input type="checkbox"/> Enable
SysName	name
SysLocation	location
SysContact	contact
Read Community	public
Write Community	private
Trap Server IP	0 . 0 . 0 . 0
Alert Event	<input type="checkbox"/> Cold/Warm Start <input type="checkbox"/> Link Down <input type="checkbox"/> Link Up

Save Configuration Restart

Figure 3.17 SNMP setup

3.3.4 Configure COM1 Settings

COM1	
To configure COM port parameters.	
Serial Interface	RS-232
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
Data Packet Delimiter	Inter-character Time Gap : 0 msec (0~30000, 0:Auto)
COM Type Selection	<input checked="" type="radio"/> RS232 <input type="radio"/> RS485 <input type="radio"/> RS422

Figure 3.18 Com1 Setup

Note :

1. The default Baud Rate of ATC-3001 is 9600 and it is associated with serial port COM respectively.
2. The default value for data packet delimiter is 0. When the delimiter is set to 0 (Auto), ATC-3001 will automatically chooses the optimal delimiter according to the baud rate.
3. The “COM Type Selection” will show different port interface according to its selected port type.
4. After configuring the parameters, click on the “Save Configuration” button to save the changes, please notice that the setting will not become effective until click “restart”.

3.3.5 Modbus Settings

MODBUS	
To configure the Modbus parameters.	
TCP Listen Port	502 (1~65535)
TCP Connection(s)	1 (1~4)
Serial Reply Timeout	200 msec (2~30000)
Serial Protocol	RTU
Serial Timeout Retry	1 (0~9)

Figure 3.19 Modbus Setup

TCP Listen Port: Modbus/TCP Listen port. Default is 502.

Please note that Ethernet interface only support Modbus Slave.

TCP Connections(s): Maximum of four simultaneous Modbus/TCP connections is allowed.

Serial Reply Timeout: If the serial side does not respond with the specified time, data would be dropped and not transmitted over TCP even if the gateway receives it later.

Serial Protocol: Select between Modbus/ASCII and Modbus/RTU.

Please note that Serial interface only support Modbus Master.

Serial Timeout Retry: If "0" is set, the gateway would not store TCP packets in the buffer. If the number is greater than "0", the gateway would store the TCP packets in the buffer and retries the specified times when the Modbus device on the serial side does not respond.

Note: After configuring the parameters, click on the "Save Configuration" button to save the changes, please note that the setting will not become effective until "restart" is clicked.

3.4 Assign a New IP Address by ARP Command

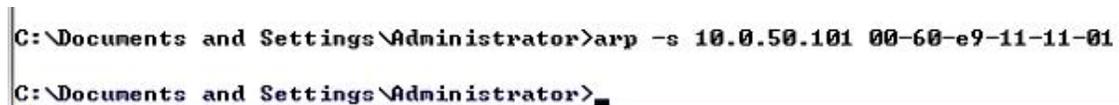
Use ARP command to assign a static IP address of ATC-3001 using its hardware MAC address. The MAC address is printed on the rear side of device in the format of "0060E9-xxxxxx". The following example shows how it works within MS-DOS command prompt window.

(For example change IP from 10.0.50.100 to 10.0.50.101, and the MAC address of ATC-3001 is 00-60-e9-11-11-01)

Step1: Add the new host IP to ARP table

->Open Ms-DOS command prompt window

->Input **arp -s 10.0.50.101 00-60-E9-11-11-01** (Figure 3.20)



```
C:\Documents and Settings\Administrator>arp -s 10.0.50.101 00-60-e9-11-11-01
C:\Documents and Settings\Administrator>
```

Figure 3.20. Ms-DOS command prompt window

Step2: Change to new IP via telnet port 1 (Figure 3.21)

->Input **telnet 10.0.50.101 1**

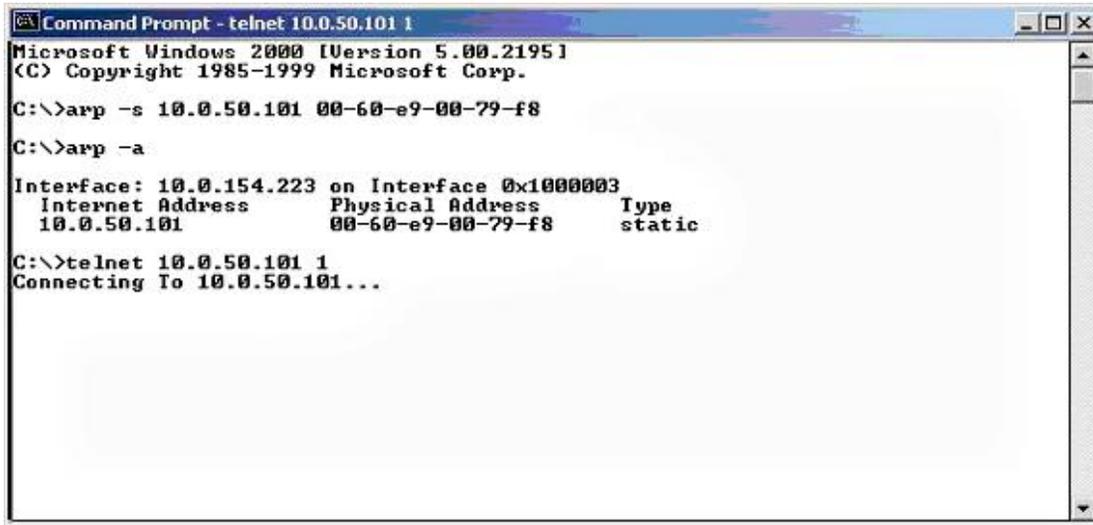
Note: The telnet will be fail and ATC-3001 will be restarted automatically, after restart the IP address should be change to 10.0.50.101

Step3: Using new IP to configure ATC-3001 via telnet

->Input **telnet 10.0.50.101**

Note 1: When using this method to change IP address, PC's IP address and ATC-3001's IP address must belong to the same subnet.

Note 2: The changed IP address must be legal, otherwise it will be changed back to the default value (10.0.50.100) after restart.



```
Command Prompt - telnet 10.0.50.101 1
Microsoft Windows [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

C:\>arp -s 10.0.50.101 00-60-e9-00-79-f8

C:\>arp -a

Interface: 10.0.154.223 on Interface 0x1000003
  Internet Address      Physical Address      Type
  10.0.50.101          00-60-e9-00-79-f8    static

C:\>telnet 10.0.50.101 1
Connecting To 10.0.50.101...
```

Figure 3.21 Assigning a new IP address by ARP command

4. SNMP Setup

4.1 SNMP Network Management Platform

ATC-3001 is an SNMP device that allows many popular SNMP Network management platforms such as HP Open View.

Depending on the network management tools one are using, device ATC-3001 information can be collected from running the management tools including IP address, DNS name, system descriptions and NIC information etc.

4.2 Using NetworkView as an Example

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.

First, download and install the tool on ones PC (**Windows 2000 and Windows XP**), then start NetworkView.

1. Click on the  button to open a new file. The following screen shall appear, in the Addresses field, Enter in the IP address range to search (Figure4.1).

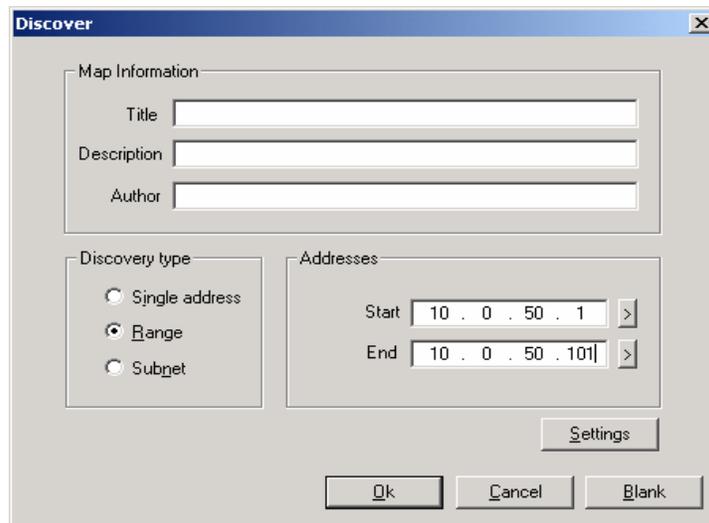


Figure 4.1 IP address searching

2. Click on “OK” and the following dialog box shall display the searching progress (Figure 4.2).

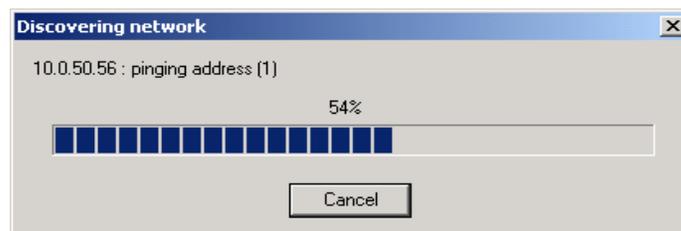


Figure 4.2 Searching progress

3. After the search is completed, NetworkView will display the devices found in the main window, as shown below (Figure 4.3).

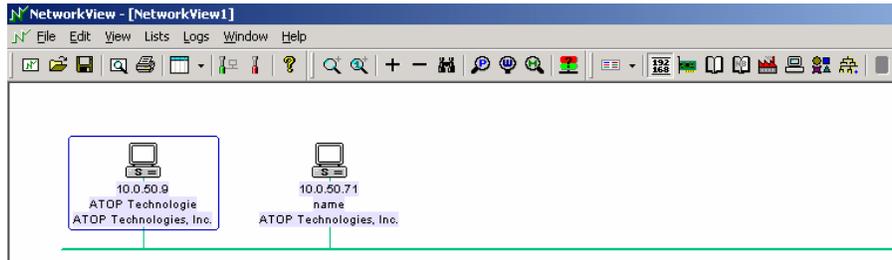


Figure 4.3 NetworkView display the devices found

4. 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 4.4).

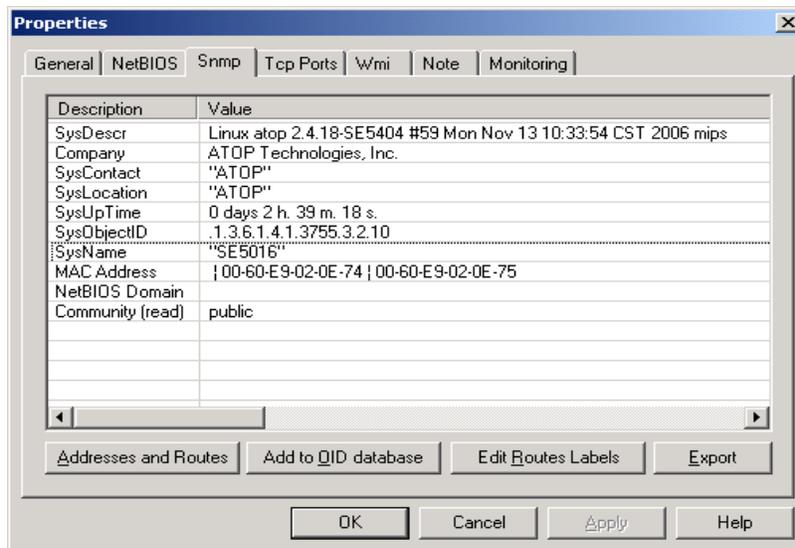


Figure 4.4 NetworkView display device information

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 DeviceView configuration utilities.

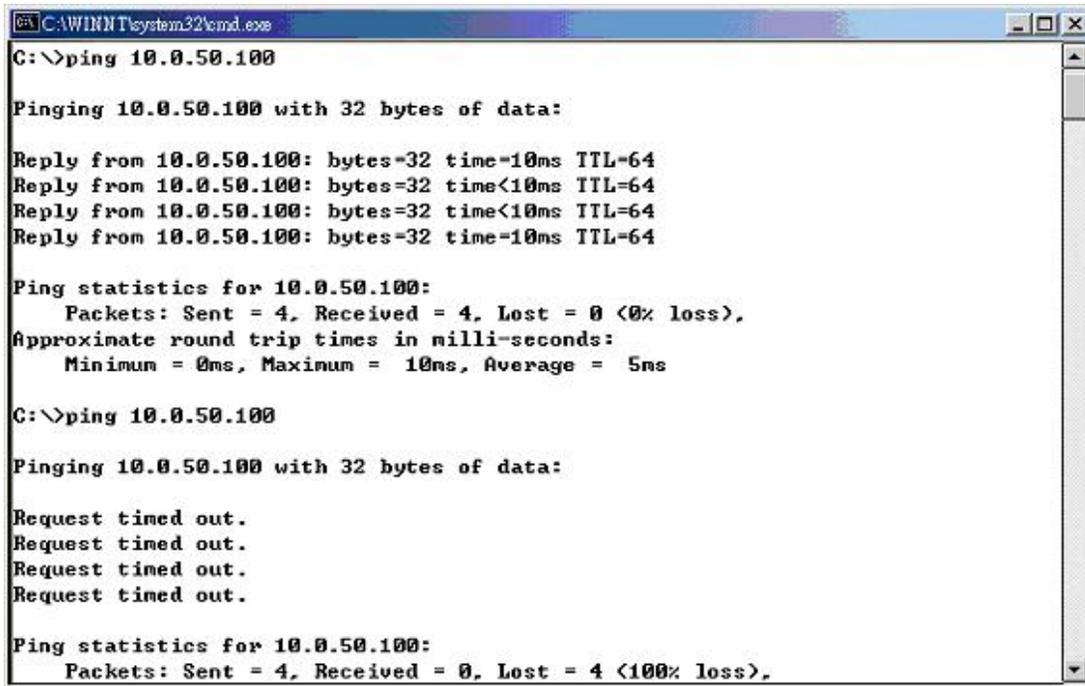
5. Diagnostics

There are several ways one can check on the status and availability of ATC-3001.

5.1 Use Standard TCP/IP Utility Ping Command

From Windows **Start** menu, select **Run** and type in “ping <TCP Server IP address>”.

If the connection is established, the Reply messages are displayed, otherwise it will indicate Request timed out (Figure 5.1).



```
C:\WINNT\system32\cmd.exe
C:\>ping 10.0.50.100

Pinging 10.0.50.100 with 32 bytes of data:

Reply from 10.0.50.100: bytes=32 time=10ms TTL=64
Reply from 10.0.50.100: bytes=32 time<10ms TTL=64
Reply from 10.0.50.100: bytes=32 time<10ms TTL=64
Reply from 10.0.50.100: bytes=32 time=10ms TTL=64

Ping statistics for 10.0.50.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 5ms

C:\>ping 10.0.50.100

Pinging 10.0.50.100 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.0.50.100:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Figure 5.1 Standard TCP/IP utility ping command

5.2 Use DeviceView Configuration Utility Program

Use **DeviceView** configuration program that comes with the product CD or diskette to check on the status of ATC-3001. The status and version can be read from the tool.

For example, ‘**listening**’ means that COM1 is still waiting for TCP connection (Figure 5.2).

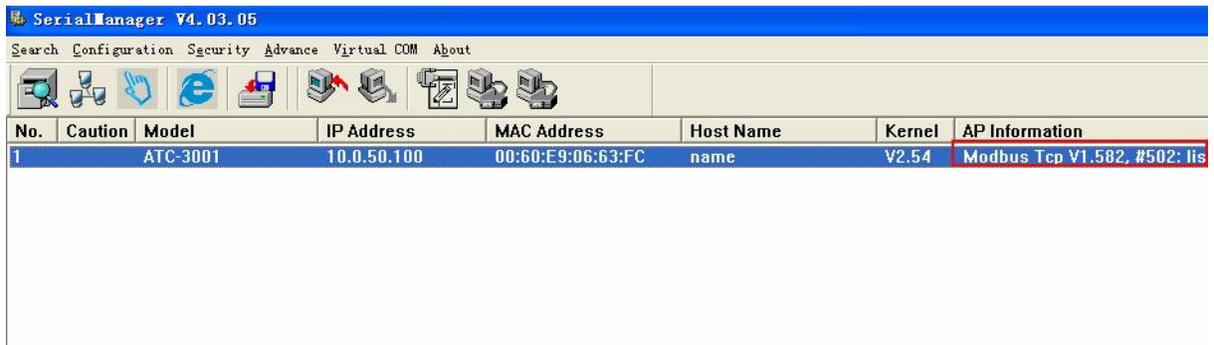


Figure 5.2 DeviceView configuration Utility

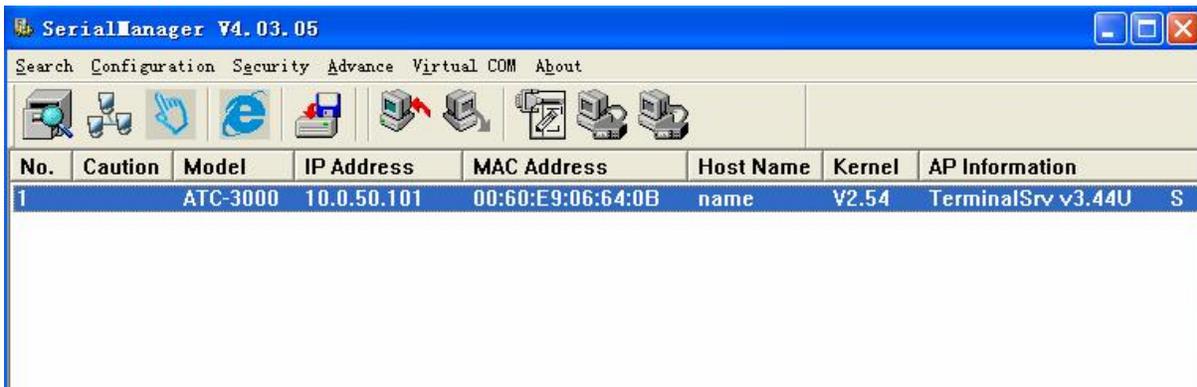
Appendix A: Management Utility

A.1. DeviceView utility Introduction

DeviceView utility. It can realize the daily management network devices for address search, device positioning, parameter configuring, and firmware downloading.

A.2. Interface

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

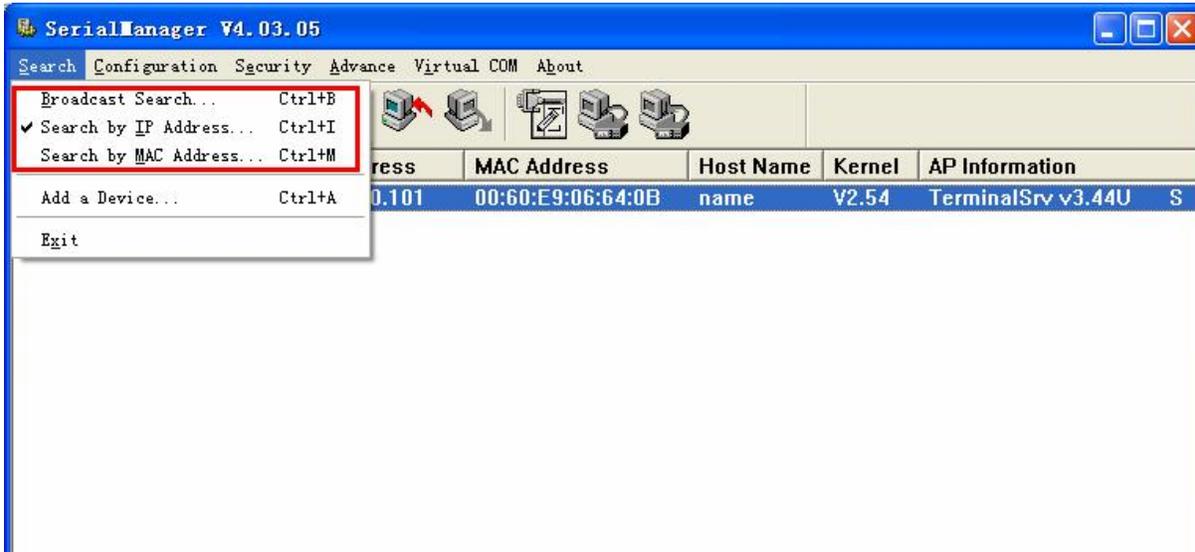


Caution Field	Description
!	IP conflict. There are two devices with the same IP address in the network.
@	The device is using DHCP.
<	The device is being located.
+	You have logged into the device.
?	MAC conflict. There are two devices with the same MAC address in the network.

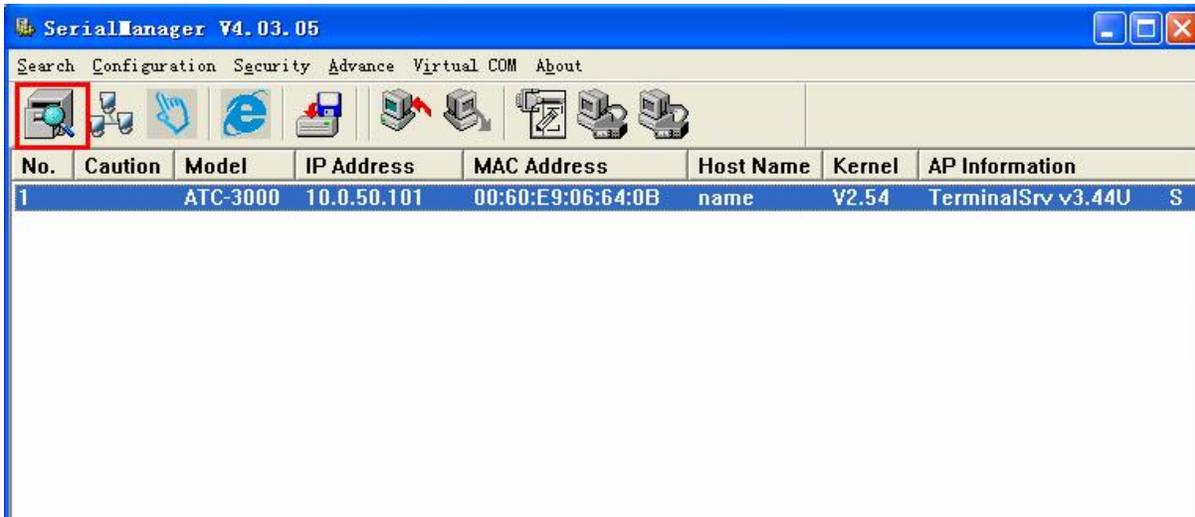
A.3. Functions

A.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.

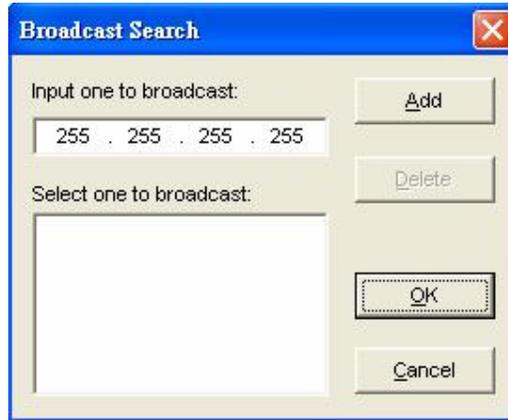


Alternatively, users can select by clicking the button on the toolbar as below.



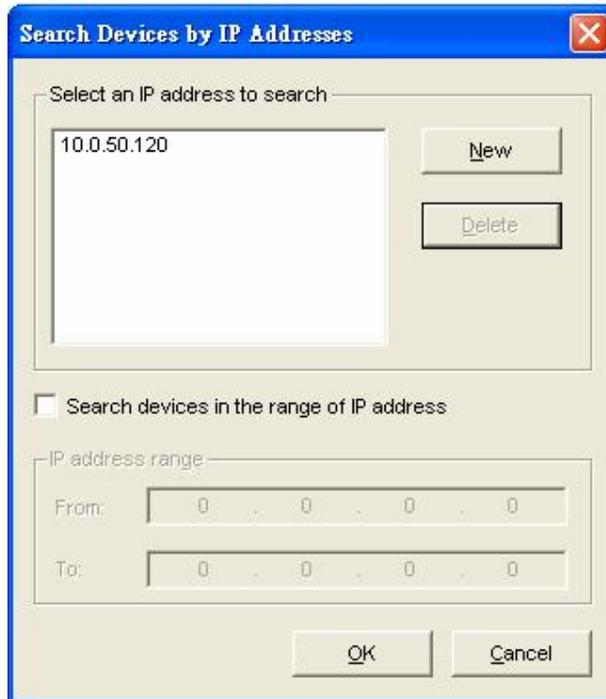
Broadcast Search

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



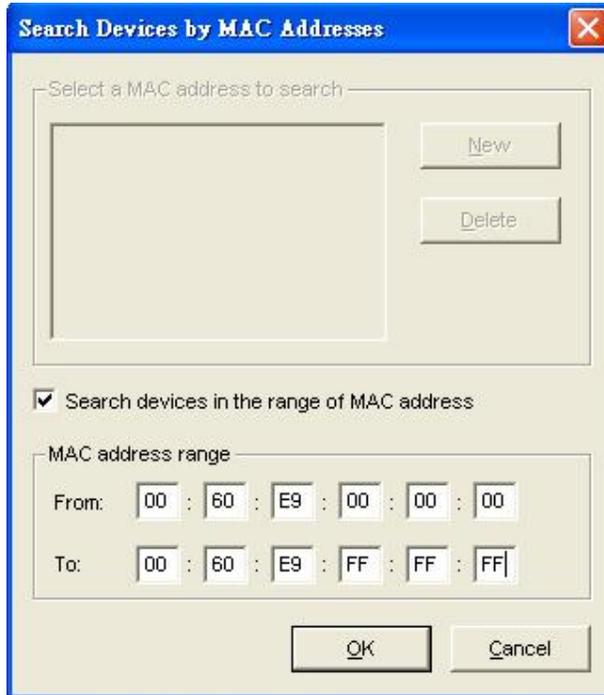
Search by IP address

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"

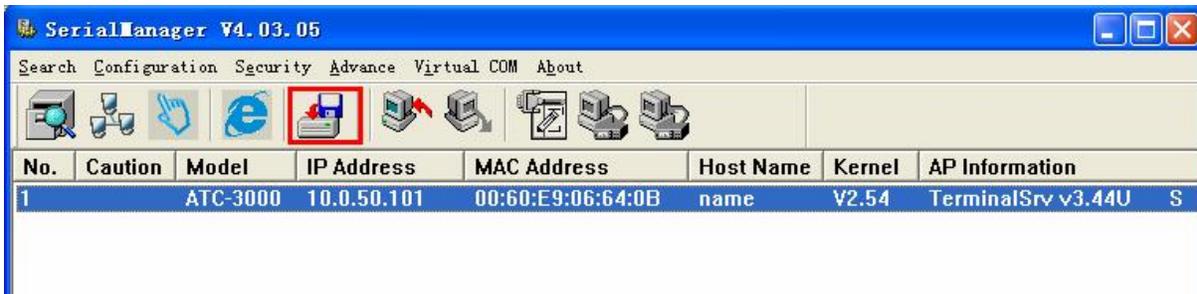


Rescan

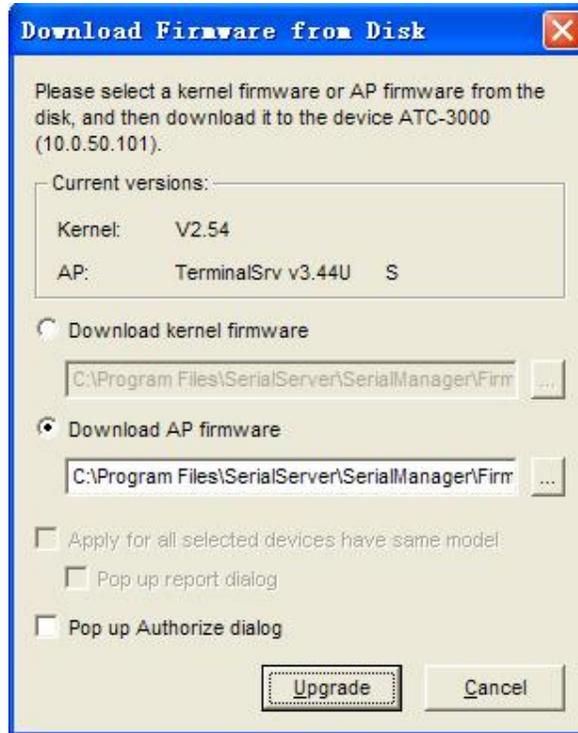
Once the user click the “Rescan” button on the toolbar, the DeviceView utility shall re-search devices by using the current search way.

A.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**.

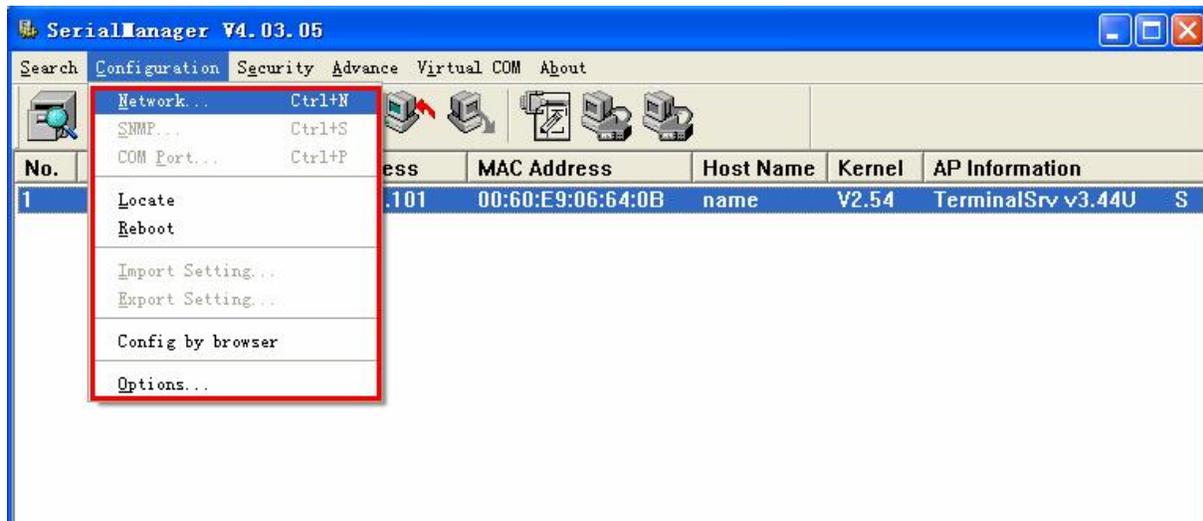


And then the user can select and download the required firmware from the disk, as shown in the figure below. The user can also select several same devices at one time, and realize the firmware updating for them by selecting **Apply for all selected devices have same model**.



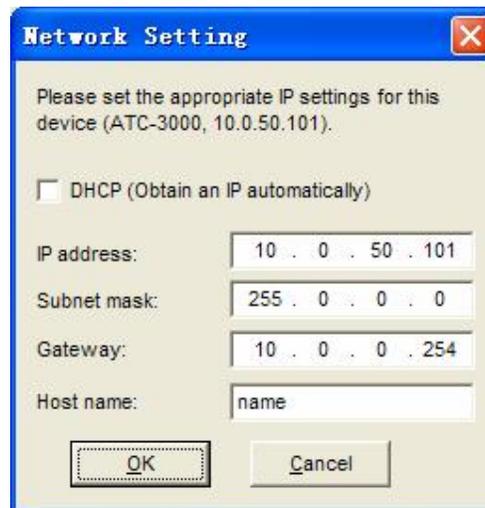
A.3.3. Configuration

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.



Locate

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

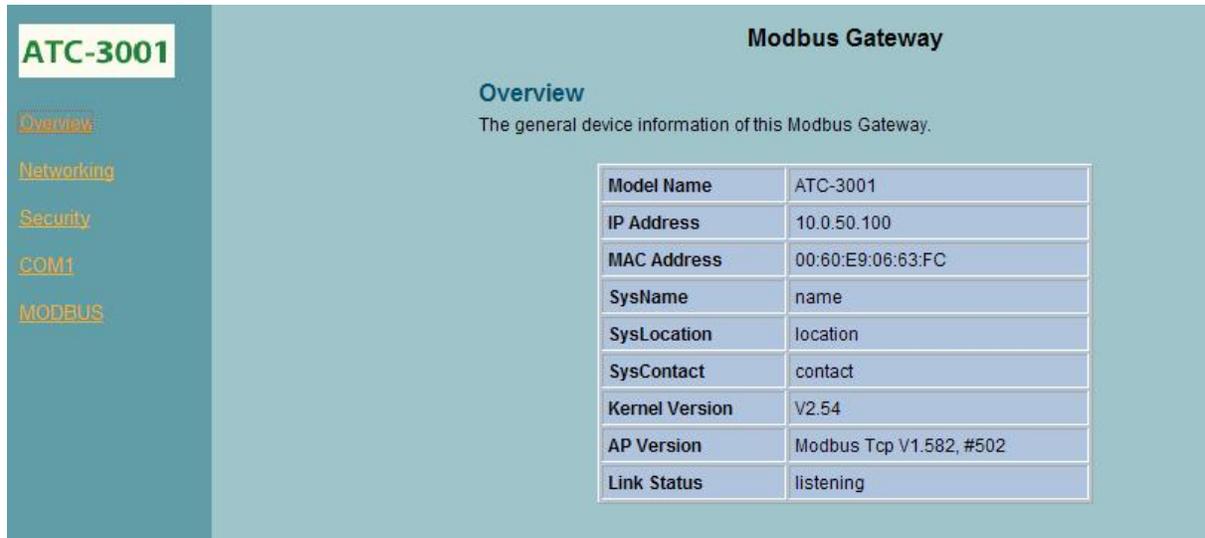
Reboot

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

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

Some devices are supplied with build-in Web servers, which will be used to configure similar to DeviceView software. 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.



Options

The option is mainly applied to setting some common working rules of DeviceView utility, such as the device search time interval or whether to display any device information tip. The dialog is shown in the figure below.



A.3.4. About

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



Appendix B: Specifications

B.1 Hardware Specifications

	Specifications
CPU	<ul style="list-style-type: none"> § 16-bit Embedded CPU § 100MHz
Flash Memory	<ul style="list-style-type: none"> § 512K Bytes
SDRAM	<ul style="list-style-type: none"> § 512K Bytes
EEPROM	<ul style="list-style-type: none"> § 512 Bytes
Host Communication	<ul style="list-style-type: none"> § IEEE802.3 base band § TCP/IP, UDP, SNMP, HTTP, Telnet, ARP, BOOTP, DHCP, ICMP
Reset	<ul style="list-style-type: none"> § Built-in default key to restore factory default settings
Watch Dog Timer	<ul style="list-style-type: none"> § 1.34 second hardware auto reset § Power failure threshold: 4.75V
SerialPort Communication	<ul style="list-style-type: none"> § One RS-232 and one RS-485/RS-422 selectable § RS-232: EIA-RS-232C standard, Full Duplex, DB9 § RS-485: 2/4 wires, Half/Full duplex, Terminal Block § RS-422: 4 wires, Half/Full duplex, Terminal Block § Parameters <ol style="list-style-type: none"> 1) Baud-rate: 1200 bps ~ 230Kbps 2) Parity: None, Even, Odd, Mark, Space 3) Data bits: 7,8 4) Stop bits: 1,2 5) Packet Delimiter: by inter-character timeout, by characters delimiter 6) Flow Control: None, Hardware CTS/RTS, Software Xon/Xoff
LED indication	<ul style="list-style-type: none"> § POWER x 1 § RUN x 1 § LAN x 1 § COM port1
Power Requirement	<ul style="list-style-type: none"> § 9VDC Jack with Power Adaptor, 2.8 Watt Max
Temperature	<ul style="list-style-type: none"> § Operation: 0°C to 60°C § Storage: -20°C to 70°C
Humidity	<ul style="list-style-type: none"> § 20%~90% non-condensing
Housing	<ul style="list-style-type: none"> § 95mm(L) x 65mm(W) x 25mm(H)

B.2 Software Specifications

Item	Specifications
Protocol	§ TCP/IP, UDP, HTTP, SNMP, ARP, Telnet, ICMP, BOOTP, DHCP
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 or RS-485/RS-422 receiving buffer size = 4K bytes § RS-232 or RS-485/RS-422 transmitting buffer size = 4K bytes

B.3 Panel Layout and Connector Pin Assignments

B.3.1 Pin Assignments

DB9 Pin Assignments

The pin assignments of DB9 connector on ATC-3001 are shown in the following table:

Pin#	RS-232 Full Duplex for ATC-3001 Model
1	DCD
2	RXD
3	TXD
4	DTR
5	SG (Signal Ground)
6	DSR
7	RTS
8	CTS
9	N/A

Terminal Block Pin Assignments

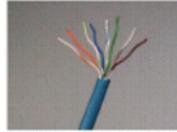
The pin assignments of Terminal Block connector on ATC-3001 are shown in the following table:

Pin#	RS422/4-Wire RS-485 Full Duplex For ATC-3001	2-Wire RS-485 Half Duplex For ATC-3001
1	T+	Data+
2	T-	Data-
3	R+	NC
4	R-	NC

5	VIN	VIN
6	SG (Signal Ground)	SG (Signal Ground)

B.3.2 Ethernet Port (RJ-45)

- Category 5 UTP cable, 8 core wire.



- RJ45 Connector.

- 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

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

B.4 LED Message

B.4.1 LAN LED

Message	Description
LED Off	Ethernet Disconnected
LED blinking with Green	Data is transmitting on Ethernet for 100Mbps
LED blinking with Orange	Data is transmitting on Ethernet for 10Mbps

Table 1. LAN LED Message

B.4.2 COM Port LED

Message	Description
LED off	No data is transmitting on COM port

LED on blinking state	Data is transmitting on COM port
Table 2. COM Port LED Message	

B.4.3 RUN LED

Message	Description
LED on	R1 are shorted to disable AP firmware running
LED blinking (rate: 0.5Sec)	AP firmware is running normally
Table 3. RUN LED Message	

B.4.4 POWER LED

Message	Description
On	Power on
Off	Power off
Table4. PWR LED Message	

Appendix C: Upgrade System Firmware

After the new version of firmware is released, customers can download it from <http://www.szatc.com> After one download the firmware, please follow these instructions listed below.

C.1 Upgrade Procedures

When one get a new software version, please follow the sequences below to upgrade ones ATC-3001.

1. Connect a PC (Windows 95/98/NT/2000/XP) and ATC-3001 one wish to upgrade the firmware in the same TCP/IP network. Use command **ping** or DeviceView program to verify their availability.
2. Prepare the download tool and press any key to edit its configuration file **dapdl.cfg**. **dapdl.cfg** file can be found in the product CD.

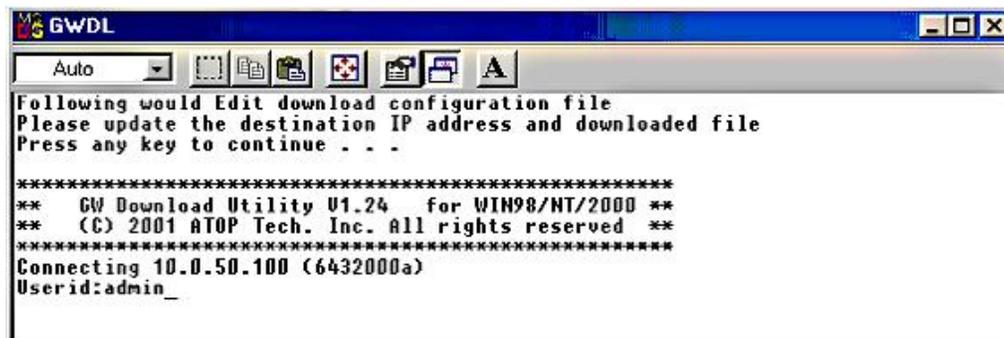


3. Edit the "**dapdl.cfg**" file to fit ones system need, the content of the file looks like as the following. Be sure to save ones modifications after the change is made.

```
Remote_IP 10.0.50.100
Load      U5001ap.hex
```

The first line identifies the IP address of ATC-3001, the second line identifies the firmware (.Hex file) name to be downloaded.

4. Execute the utility program **download.bat**, it can be found in the product CD.
5. Input the user name and password credential, the new firmware will be downloaded.



6. ATC-3001 will automatically restart each time the firmware is successfully downloaded.

C.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	
ATC-3001 handshaking problem	ATC-3001 ACK Start Address Error ATC-3001 ACK Length Error ATC-3001 Response Command Error	
Configuration file	Remote IP not found Open configuration file failure	

Appendix D: Disable System Firmware

The AP (application program) firmware of ATC-3001 can be disabled. This function is used in the situation that one downloaded a wrong version of firmware that caused the system crashed.

To disable the current version of firmware and prevent it from executing, please do the followings:

1. Turn the power off, open ATC-3001 case.
2. Short R1
3. Power on ATC-3001.
4. Download the correct AP firmware to ATC-3001.
5. Remove the R1 to enable AP firmware.
6. Close the case and continue ones operations.

Appendix E: Specification

Specifications	
System	
CPU	16-bit x86 Embedded CPU
Flash	512K Bytes
DRAM	512K Bytes
EEPROM	512 Bytes
Watchdog	Hardware built-in
Ethernet	
Compliance	IEEE802.3
Port	1-port
Transmission Rate	10/100Mbps Auto-detection
Connector	RJ45
Auto MDI/MDI-X	Yes
Serial	
Interface	RS232/422/485 software selectable(ATC-3001)
Ports	1-port DB9 and 1-port TB6
Baud Rate	1200bps to 230Kbps
Parity	None, Odd, Even, Mark, Space
Data Bits	7 or 8
Stop Bits	1 or 2
Data Packet Delimiter	0 to 30000 mini sec. (0:auto)
Connector	9-pin D-Sub(DB9) / Terminal Block(TB6)
Power	
Input	DC 9-24V for DC Jack
Consumption	Max. 2.7W (ATC-3001)
Environment	
Operating	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~70°C (-4°F~158°F), 5~95%RH,(non-condensing)
Dimension	
W x H x D	95mm x 25mm x 65mm.(ATC-3001)
Software	
Configuration	Web console, Telnet
Device View	For Windows
Support Protocol	Modbus RTU,ASCII and TCP

Ordering Information	
ATC-3000	TCP/IP to RS-232/RS-422/RS-485 converter
ATC-3001	1-port Modbus Gateway
Optional Accessories	
Power Adapter	US315-12(US/EU): AC100~240V / DC 9V, 5.08mm pitch terminal block AD5V1A(US/EU): DC9V for DC Jack