VoiceFinder

AP100 VoIP Gateway

[Installation Guide]

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Introduction

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Introduction

This Introduction describes the organization of this document and the symbols and legend used in the document.

[Document Organization]

The purpose of this document is to help you install AP100 Gateway easily. This document consists of four chapters.

If you have been used AP100 VoIP gateway before, refer to helpful chapters. If you are not familiar with AP100, or have not installed it before, you read this document carefully before handling AP100.

● Chapter 1 『 **VoiceFinder AP100 Overview** 』 provides an overview of the features of AP100, and describes its hardware and software specification.

● Chapter 2 『 **Preparatory Information on AP100 Installation** 』 describes the environment required for AP100 installation as well as safety recommendations and preparatory information on AP100 installation.

● Chapter 3 『 **AP100 Installation** 』 describes basic information on installation such as the methods of connecting cables to AP100 and of using the console terminals.

● Chapter 4 『 **Appendix** 』 describes the specification of AP100 and required cables used for each interface.

If you have any questions regarding AP100 or your product has any failures, please contact AddPac Technology Co., Ltd.

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The revision history of the VoiceFinder AP100 Installation Guide is as follows:

Edition No.	Date	Revision	Author
Edition 1.0	May 2nd, 2006	First Edition	Technical Laboratory of AddPac Technology
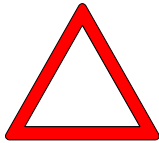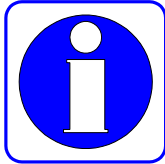
[Symbols and Legends]

The symbols and legends used in this document are as follows:

- Commands and keywords are typed in **Bold**.

- Variables that require user inputs are typed in Italic.

- Square brackets ([]) are optional values.

- Keywords that are required but need to be selected are grouped in braces ({}) and are separated by slashes (/).

- Angle brackets (<>) are required parameters. They need to be replaced with numbers.

The following conventions are also used to draw the user's attention:

Category	Description
Danger	**Danger** This symbol indicates possible danger. Misuse may result in physical injuries. Please follow the instructions to avoid any electric shocks.
Warning	**Warning** This symbol indicates that the users should be careful with the operation. Otherwise, it may result in hardware damage of the equipment or loss of data.
Caution	**Caution** This symbol calls for the user's caution. Otherwise, it may result in hardware damage of the equipment or loss of data or system configuration.
Information	**Information** This symbol indicates additional information for understanding this document.

CHAPTER 1 VoiceFinder AP100 Overview

1.1. Introduction to VoiceFinder AP100
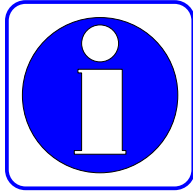
VoiceFinder AP100 VoIP Residential Gateway is a standard Voice over IP Gateway that allows you to use voice phones, facsimiles, or data communications by inter-connecting adjacent Local Area Network (LAN) or connecting LAN to Wide Area Network (WAN) or the broadband Internet such as ADSL and DOCSIS (Cable).

The figure below shows the example of a network using AP100 VoIP Residential Gateway:
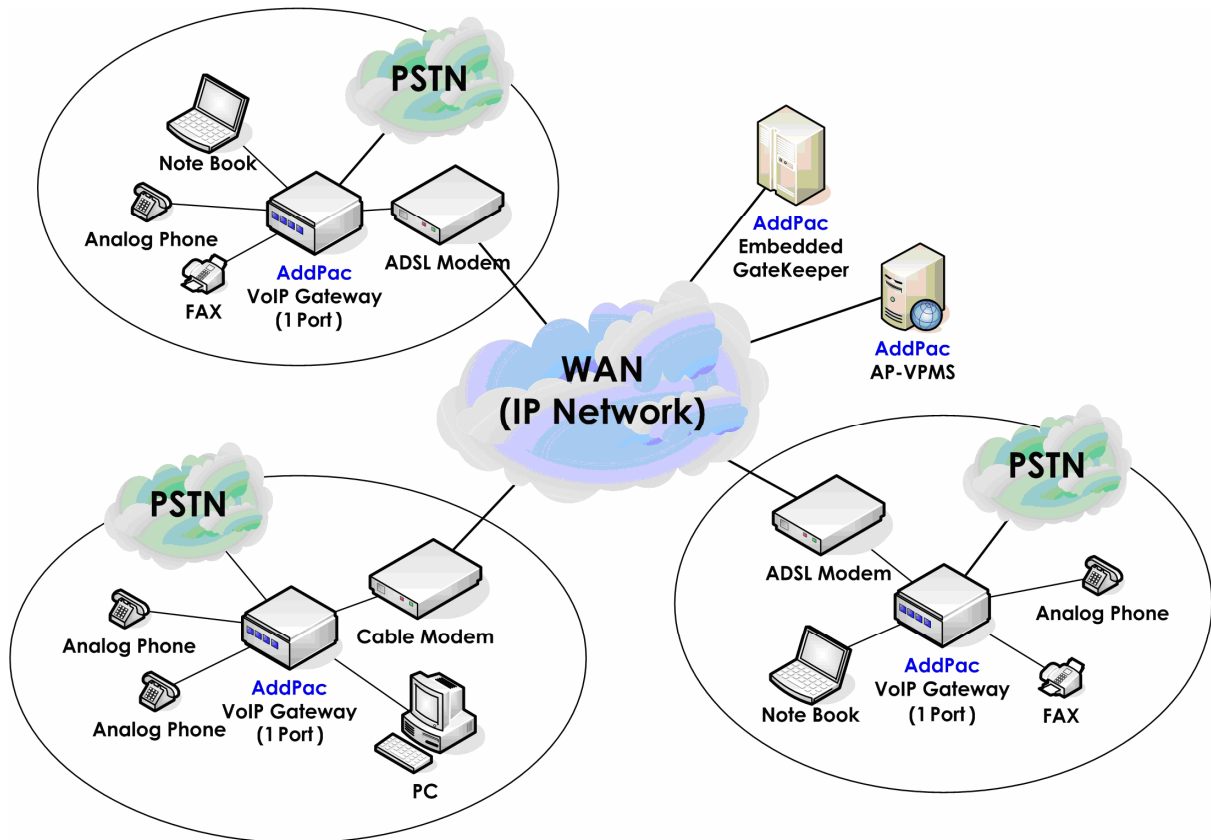
[Figure 1-1] Standard Configuration of Network Using VoiceFinder AP100 Gateway

Since this product provides the standard routing protocol for static routes and IEEE spanning tree bridging, it is available on a small routing network.

AP100 can inter-work with commonly used large-sized routers, VoIP gateways, and gatekeepers of the third party products reliably. Also, this product is the most cost-effective VoIP service solution

since it provides the same operation environment as the plain old AP VoIP gateway series to ensure very simple installation, operation, and maintenance, and can be used easily at home.

The figure below shows the exterior of AP200 VoIP Gateway:

[Figure 1-2] Exterior of VoiceFinder AP100 VoIP Gateway

The supplementary features are as follows: AP100 supports packet filtering and firewall in an access list method to control access from a external network by using the source and destination addresses of a packet in the network layer (IP layer) and transport layer (TCP/UDP).

Also, AP100 uses Dynamic Host Configuration Protocol (DHCP) to assign IP addresses automatically to network clients below the router, or uses Network Address Translation (NAT) to resolve the deficiency of IP addresses due to the explosive increase in Internet users and to improve security by hiding the internal IP address from outside.

1.2. Main Features and Characteristics
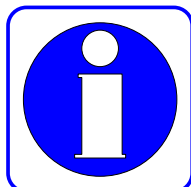
VoiceFinder AP100 Voice Gateway is a small VoIP gateway solution available for small business environments (e.g. SOHO), cyber apartments, Internet games, and Internet users at home. This high quality VoIP product supports both routing and Internet-based voice calling to allow you to easily use VoIP phones at an affordable price.

AP100 is based on a unique QoS algorithm, which is the proprietary technology of AddPac, and a state-of-the-art voice compression algorithm to ensure the best voice quality of low-speed Internet lines as well as high-speed ones. This product is designed based on high-performance RISC CPU and DSP, and supports higher rate, better quality, and various convenient features. In addition, AP100 ensures higher performance compared to its price.

VoiceFinder AP100 VoIP gateway provides two(2)-port 10/100 Base-T Fast Ethernet interfaces by default. Also, this product supports both static IP addresses and dynamic IP addresses for ADSL and cable modems in addition to reliable dedicated lines. Accordingly, you can make a selection depending on your environment. AP100 supports routing and Internet applications such as NAT/PAT, and enables VoIP and IP sharing equipments at one platform. In this regard, this product provides a cost-effective and efficient VoIP phone solution for a private use in a high-speed Internet access environment.

AP100	1-Port FXS Voice Interface for VoIP Services
	2-Port 10/100Mbps Ethernet Interface for LAN & WAN Interfaces
	Power ON/OFF Switch
AP100P	1-Port FXS Voice Interface for VoIP Services
	PSTN Backup Interface Port
	2-Port 10/100Mbps Ethernet Interface for LAN & WAN Interfaces
	Power ON/OFF Switch

AddPac VoiceFinder Operating System (APOS) is software that ensures the best scalability, authenticity, reliability, and QoS at an inter-networking solution in a VoIP or routing environment. APOS supports the industry-standard usage to ensure excellent performance as well as easy use, operation, and maintenance.

Hardware Description (Hardware Specification)

VoiceFinder AP100 VoIP gateway is based on state-of-the-art embedded hardware technologies, and supports various network interfaces and much system memory. The hardware specification is as follows:

- High performance WAN-to-LAN residential voice gateway
- High performance LAN-to-LAN routing solution
- High performance RISC microprocessor and Voice DSP
- 1-port 10/100 Mbps Ethernet interfaces for WAN (RJ45)
- 1-Port 10/100 Mbps Ethernet interface for LAN (RJ45)
- One FXS voice interface (RJ11)
- Optional 1-port PSTN backup port (RJ11)
- AC-DC external power supply adapter
- Various system LED displays
- Power ON/OFF Switch for System Stablility

Voice over IP Service (Integrated Voice and Data Services)

- Supports VoIP services, which are integrated voice and data services.
- Supports 1-channel voice ports, and inter-works with private phones, regular phones, and facsimiles to provide VoIP services.
- Supports industry-standard VoIP protocols such as H.323 v2, SIP, and MGCP.
- Provides various voice compression technologies such as G.723.1, G.729.A, G.726, and G.711 at high performance DSP hardware.
- Recognizes VAD, DTMF, and facsimile tones automatically. Processes various voices such as echo cancellation.
- Supports G3 facsimile relay of T.38 (Out-band and in-band).
- Inter-works with H.323-based gateways or gatekeepers to ensure flexible scalability and convenience.
- Supports SIP for inter-working with SIP-based proxy servers.
- Supports MGCP for inter-working with MGC.

IP Routing Protocols

The specification of the IP routing protocols supported by AP100 is as follows:

- Supports various IP routing and bridging protocols.
- Supports static and default routing protocols.

- Supports Transparent Bridging (IEEE Spanning Tree Protocol).

Network Administration

VoiceFinder AP100 VoIP Gateway supports the following network administration features for systematic management:

- Supports standard SNMP Agent, MIB II, and Bridge MIB for systematic management.
- Supports Telnet and Rlogin that enable remote control.
- Performs management based on Web.
- Ensures QoS through traffic queuing.

Security

VoiceFinder AP100 VoIP Gateway supports the following security features:

- Supports the standard & extended IP access list for primary network security.
- Enables or disables specific network protocols.
- Manages accounts for multi-level users.
- Disconnects Telnet/Console sessions automatically.
- Supports Password Authentication Protocol (PAP) and Challenge Handshake Authentication Protocol (CHAP) for PPP users.

PSTN Backup

VoiceFinder AP100 VoIP Gateway supports PSTN backup.

(Whether this feature can be supported or not may vary depending on models.)

- Switches over to a regular PSTN through real-time monitoring when a network failure occurs.
- Performs separate busyout action for each port through real-time monitoring when a network failure occurs.

Operation and Management

VoiceFinder AP100 VoIP Gateway supports the following operation and management features:

- Analyzes system performance for processes, CPU, and connection interfaces.
- Performs configuration backup and restoration for APOS management.
- Supports debugging features and system auditing.

- Performs system diagnostics, which allow you to analyze network packets.

- Performs automatic boot along with watchdog.

- Performs data logging and management.

- Performs IP statistics and accounting.

Other Scalability Features

VoiceFinder AP100 VoIP Gateway supports the following supplementary features:

- Supports the DHCP server, relay, and client for easy IP management.

- Supports NAT/PAT for efficient IP management.

- Supports remote software upgrade by TFTP and FTP.

- Supports the industry-standard operation method of Command Line Interface (CLI).

- Supports Network Time Protocol (NTP).

- Supports transparent bridging under the IEEE standard and the IEEE spanning tree protocol. Also, supports both routing and bridging.

1.3. Hardware Configuration and Network Interfaces
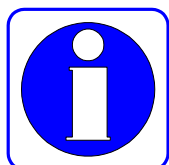
This section describes the exterior and network interfaces of VoiceFinder AP100 VoIP Gateway.

1.3.1. Names and Features of VoiceFinder AP100 Parts

AP100 VoIP gateway is a compact network product made of high-strength ABS. The front panel has main LEDs to allow you to observe the operation of the system, and the rear panel has 10/100 Base-T Fast Ethernet interfaces for WAN connections and various voice interfaces including the 10/100 Base-T Fast Ethernet interface for LAN.

Front View of AP100

The front panel of AP100 VoIP gateway is equipped with several LEDs for easy control. The figure below shows the exterior of the front panel:

[Figure 1-3] Front Panel of VoiceFinder AP100 VoIP Gateway

Each LED of VoiceFinder AP100 VoIP Gateway is described in the table below:

No.	LED	Description
①	**POWER**	Power LED. Displays whether the power is properly being supplied (Yellow).
②	**LAN0**	Shows that LAN0 is being used (Green).
③	**LAN1**	Shows that LAN1 is being used (Green).
④	**PHONE**	Shows that the phone is being used (Green).
⑤	**LINE**	Shows that the line is being used (Red).

※ The LEDs on the front panel may vary depending on models.

[Table 1-1] Front Panel of VoiceFinder AP100 VoIP Gateway

Rear View of AP100

The rear panel of AP100 VoIP gateway has the 10/100Mbps Fast Ethernet interface port for WAN/LAN, and phone interfaces for voice processing, and allows you to configure a network for WAN-to-LAN routing services.

Standard Configuration Model

The figure below shows the exterior of the rear panel:

[Figure 1-4] Rear Panel of VoiceFinder AP100 VoIP Gateway

The rear panel of the standard setup model of AP100 VoIP Gateway is described in the table below. (The configuration may vary depending on models.)

No.	LED	Description
①	**PHONE**	FXS voice interface I/O port that allows you to connect a regular phone or a facsimile (RJ11)
②	**SW**	Switches that supply or block the power to the system
③	**DC Input**	Connects to the external adapter of 5V 2A to supply power.
④	**LAN0**	10/100 Mbps Ethernet interface for WAN connections (RJ45)
⑤	**LAN1**	10/100 Mbps Ethernet interface for LAN connections such as Direct PC connection (RJ45)

[Table 1-2] Rear Panel of VoiceFinder AP100 VoIP Gateway

1.3.2. Fixed Network Interface

AP100 VoIP Gateway supports fixed network interfaces of high quality as follows:

- 1-Port 10/100Mbps Ethernet Interface for WAN
- 1-Port 10/100Mbps Ethernet Interface for LAN

The specification of the above network interfaces allows you to configure WAN and LAN that support network protocols based on TCP/IP and to configure networks for dedicated lines or VoIP networks on a broadband network through ADSL or cable modems. The LAN interface for WAN connections can be connected to a cable modem or ADSL; thus, you can easily configure a VoIP network environment at home or SOHOs.

The network interfaces supported by AP100 VoIP Gateway by default are described below:

1-Port 10/100 Mbps Ethernet WAN Interface (RJ45)
(1-Port 10/100 Mbps Ethernet Interface for WAN: RJ45)

AP100 VoIP gateway supports one 10/100Mbps Fast Ethernet interface, which allows you to configure WAN. The interface is defined as an RJ45-type standard interface.

1-Port 10/100 Mbps Ethernet LAN Interface (RJ45)
(1-Port 10/100 Mbps Ethernet Interface for LAN: RJ45)

AP100 VoIP gateway supports one 10/100Mbps Fast Ethernet interface, which allows you to configure LAN. The interface is defined as an RJ45-type standard interface.

1.3.3. Voice Processing Interfaces

The FXS voice processing interfaces of AP100 VoIP Gateway can be connected to regular phones, facsimiles, and PBXs.

- **FXS Interface-Type Voice Processing Port**
- **Optional PSTN Backup Port (AP100P Model)**

AP100 VoIP gateway is a network device that supports integrated services such as voice services and data services.

1-Port FXS Voice Interface
(1-Port FXS Voice Processing Interface)

AP100 VoIP gateway supports voice service interface based on Foreign Exchange Station (FXS) that can be used by being connected to regular phones or PBXs.

1-Port PSTN Backup Interface
(1-Port Telephone Network Connection Interface)

AP100 VoIP Gateway supports the PSTN backup port that allows you to make or answer a call to or from a public network such as Public Switched Telephone Network (PSTN) by being connected to the network.
(Whether this port can be supported or not may change depending on models.)

CHAPTER 2   Preparatory Information on AP100 Installation

2.1. Recommendations for Installation

Recommendations for the safe use of this product are as follows:

- Install and use this product in a clear and dust-free place.

- Open the cover in a flat and safe place.

- Do not wear loose clothes that may be stuck by the product chassis during operation. If you wear a necktie or a scarf, be wary of its falling. Also, tuck up your sleeves.

- Do not perform operation that may affect the other people or devices.

2.1.1. Electrical Safety Recommendations

Electrical problems that may occur during use are categorized into safety issues due to the power part and device damage due to Electrostatic Discharge (ESD).

This section describes safety recommendations for each case.

● **Electrical Safety**
   ✓ Perform operation at a location where you can turn off the power right away if an electrical accident occurs.
   ✓ Turn off the power if you are installing the device or take off the device cover.
   ✓ Do not operate alone in a potentially dangerous place.
   ✓ Check if the power is off. Do not assume that the power is off.
   ✓ Take special caution if you must operate in a dangerous environment such as a humid

place and an ungrounded power extension cable.

● **ESD Prevention**

  ✓ The main chipset of this product is very precise. If you handle its elements in a wrong method, the product may be damaged due to ESD.

  ✓ Wear a wrist strap for ESD prevention, if any, and ground the cord before handling the product.

  ✓ If you do not have a wrist strap, hold the metal part of the product chassis with one hand to prevent ESD.

2.1.2. General Requirements for Installation

STOP This product is available at any place where traditional electric appliances can be used. A place that meets the following criteria is recommended for the best performance:

  • Install the product at a flat and well-ventilated place.

  • Install the product safely and stably at the target place.

● Install the product at a cool place where a direct lay of light is not shed.

● Keep the product away from fire, inflammables, or magnetic objects.

● Do not put an object on the product.

2.2. Preparatory Information on Network Access

STOP

Conform to the EMI standard and distance limitations in accordance with the EIA standard during installation.

The following section describes the Ethernet cables and console cables supported by VoiceFinder AP100 as well as tools required for installation:

2.2.1. Tools for Installation

If you do not place an order on tools required for installation in addition to some cables and devices, they would not be contained in the product package box. Prepare the following tools and devices for installation:

● Standard screw driver set

● Cable for LAN and Console Port
  ✓ RJ-45 to RJ-45 cable for the LAN port

● Cable for Phone Port
  ✓ RJ-11 to RJ-11 cable for regular phone lines

2.2.2. Ethernet Port

The rear panel of VoiceFinder AP100 is equipped with two RJ45 10/100 Mbps Fast Ethernet ports, and the front panel is equipped with the LEDs that display LAN, FXS, PSTN port status. Use the standard cable and connector if you want to access the LAN network by using this port. Refer to the cable specification of Appendix for information on the pin specification of Ethernet cables.

CHAPTER 3 AP100 Installation

3.1. Unpacking and Verification

Check if the package box that prevents physical damage is broken before unpacking the product.

If you do not find damage, open the box and check if the following content is contained:

No.	Name	Shape	Quantity
1	Main Frame of VoiceFinder AP100 Gateway		1
2	Ethernet Cable (RJ45 to RJ45)		1
3	External Adapter for Power Supply (Power Cord for 220V)		1

[Table 3-1] Package of VoiceFinder AP100

If the product is broken while being moved or has any defects, contact the Technical Sales division or Customer Support team of AddPac (Representative phone number: 82-2-568-3848).

3.2. Sequence of Connecting Cables to AP100 Interfaces

● Install AP100 in an environment that conforms to the recommendations of Chapter 2.

3.2.1. Connecting Ethernet Interfaces

● Connect the LAN0 interface to the LAN interface of the WAN device by using an RJ45 UTP cable. Connect the LAN1 interface to the internal LAN of the PC.
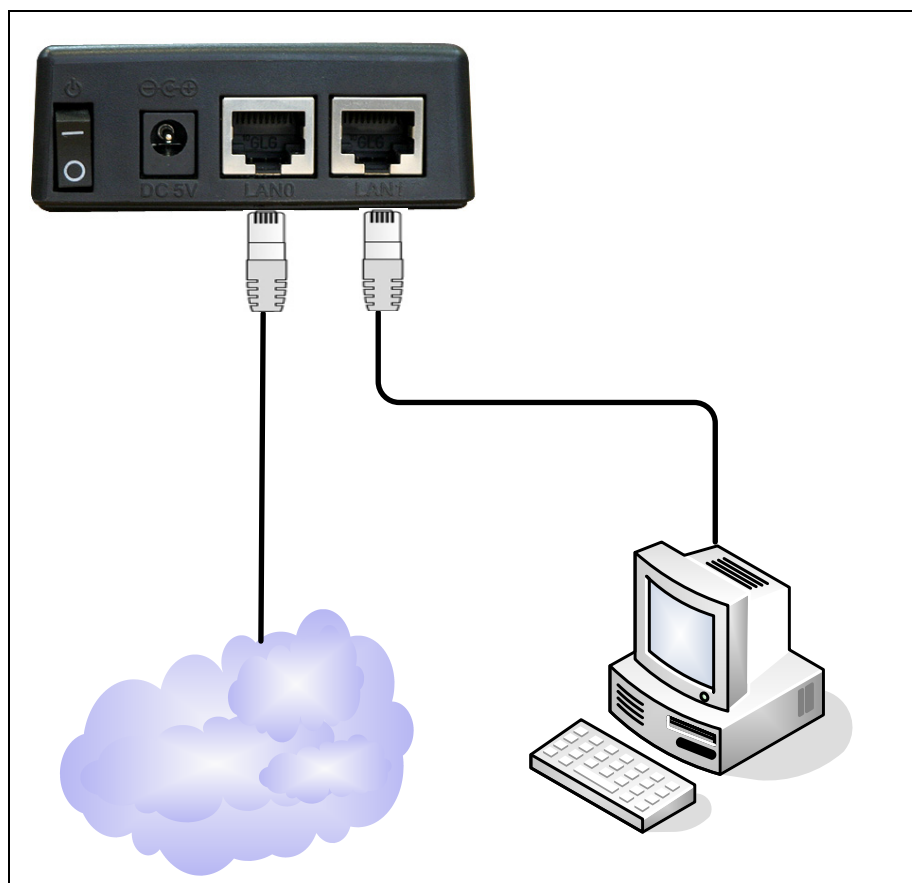
[Figure 3-1] Standard Network Configuration Using VoiceFinder AP100 Gateway

3.2.2. Connecting Phone Interfaces

● Connect voice devices for subscribers to the FXS port by using an RJ11 cable.

RJ11 to RJ11
Cable

Analog Phone
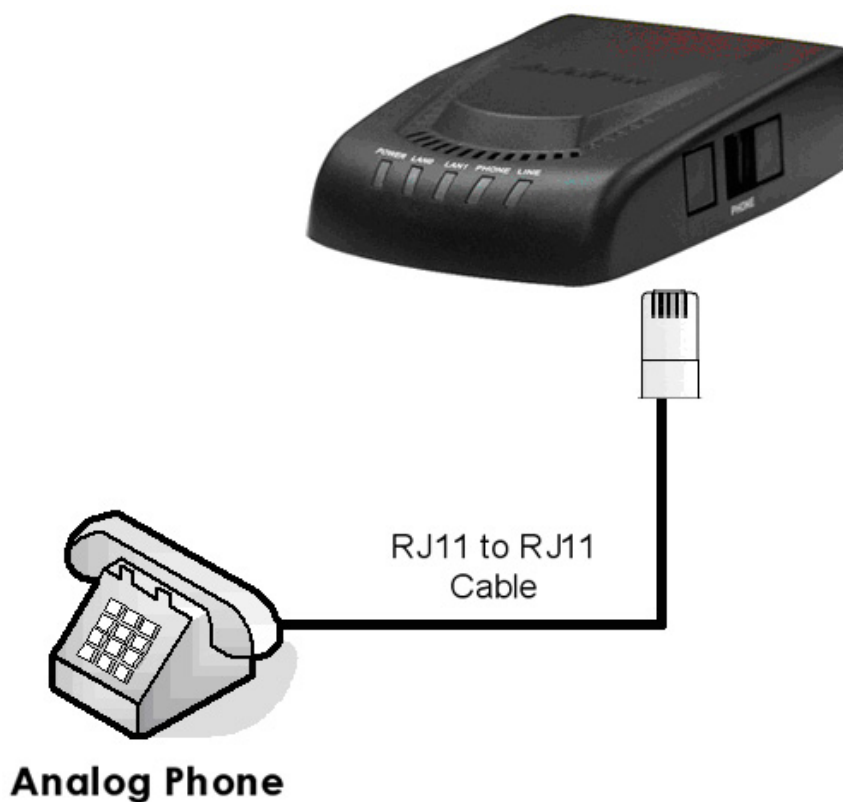
[Figure 3-2] Connecting a Regular Phone to VoiceFinder AP100

3.2.3. Connecting PSTN Interfaces

● Connect the external PSTN to the PSTN port by using a RJ11 cable.
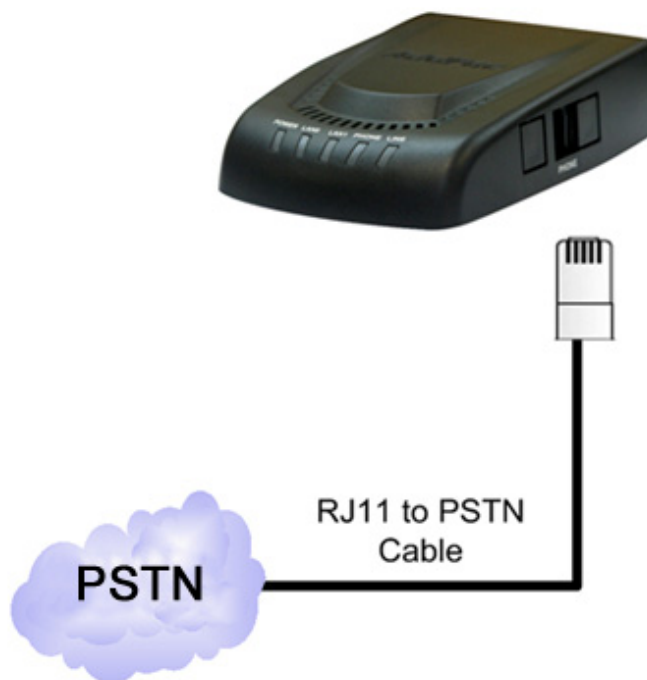
[Figure 3-3] Connecting PSTN to VoiceFinder AP100

3.3. Power Supply and Verification of Proper Operation

Before supplying the power, you should be aware of the following procedure for booting AP100:

- AP100 performs a self-test, and checks if the CPU, memory, and interfaces are properly operating.

- The boot loader operates, and finds an appropriate software image file. In the default configuration, the product loads the software in the flash memory.

- If the boot loader cannot find an appropriate software image file from the flash memory, it will wait in boot mode until it can download appropriate gateway software from an appropriate remote system. (In such a case, the boot loader can download the software by using TFTP or FTP.)

- Once the gateway software is loaded, AP100 will operate in accordance with its settings. If there are not any settings saved, the system will operate at the initial value and the manager must set related options for proper network operation.

 After AP100 is installed and the interfaces are connected, the power should be supplied. The external power adapter should be connected to AP100 before power supply. Do not connect the adapter to AP100 after supplying the power to the adapter. If the power of 110V is supplied, you should use an external power adapter for 110V. Since AP100 recognizes both 110V and 220V automatically, use an appropriate external power adapter without additional settings.

3.3.1. Using AP100 Web Server Using Web Browser

● To access from the user PC to AP100 Web Server, the IP address of 192.168.10.x should be set. (The IP address of AP100 Web Server is 192.168.10.1.)

● The user PC should be connected to the LAN1 interface of AP100 one to one in order to access AP100 Web Server.

● Run Internet Explorer, and then access AP100 Web Server. By default, the IP address of AP100 Web Server is 192.168.10.1, and the initial user name and password are root/router. You can change the user name and password after the initial access.
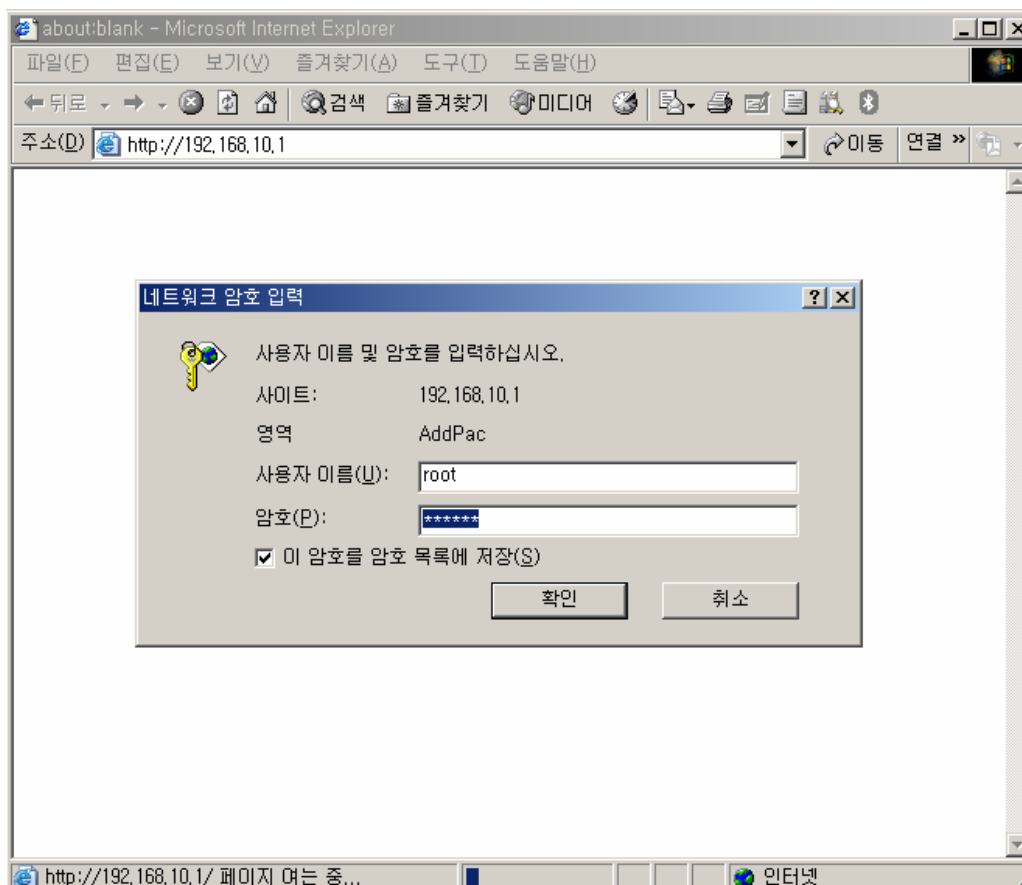
[Figure 3-4] Entering User Name and Password At Internet Explorer

● The options below can be set from the Web browser:
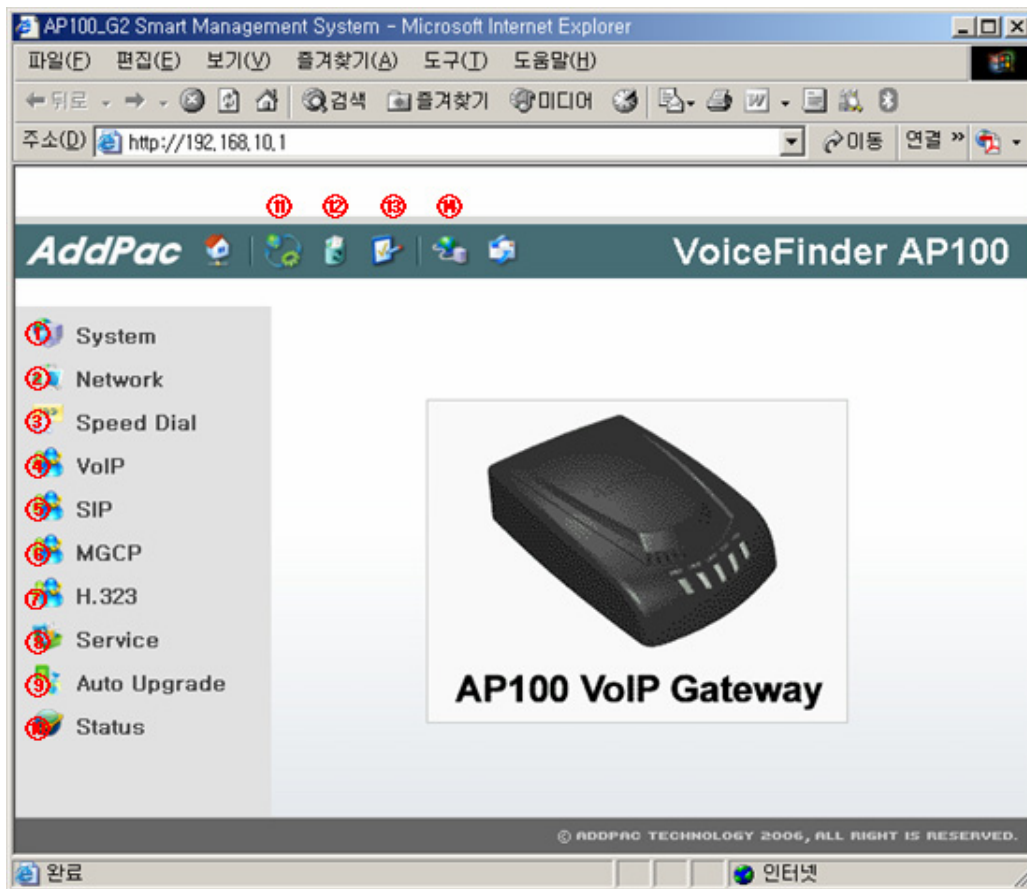
[Figure 3-5] Options on Web Browser

| No.	Option	Description
①	**System**	Allows you to check the current system information. Sets accounts.
②	**Network**	Sets WAN/LAN interfaces.
③	**Speed Dial**	Sets the speed dial.
④	**VoIP**	Sets voip-peer.
⑤	**SIP**	Sets the information on SIP register.
⑥	**MGCP**	Sets the information on MGCP register.
⑦	**H.323**	Sets the information on H323 register.
⑧	**Service**	Enables or disables FTP/HTTP/NTP.
⑨	**Auto Upgrade**	Sets up the auto-upgrade server.
⑩	**Status**	Checks the status of VoIP in the current system.
⑪	**Image Upgrade**	Uploads the APOS image.
⑫	**erase**	Deletes the current configuration, and returns to the default configuration.
⑬	**write**	Saves the current configuration.
⑭	**telnet**	Uses the HyperTerminal supported by Microsoft Windows to access the Telnet by using the IP address of AP100, which is 192.168.10.1.

[Table 3-2] Features of Web Browser

3.3.2. Connecting to Telnet Using HyperTerminal

- If you want to connect to Telnet from the PC, a terminal emulator application should be installed. If you use a Microsoft Windows operating system, use the built-in HyperTerminal application.

- Execute HyperTerminal, and name the connection in the New Connection dialog box randomly. For instance, name the connection AddPac.
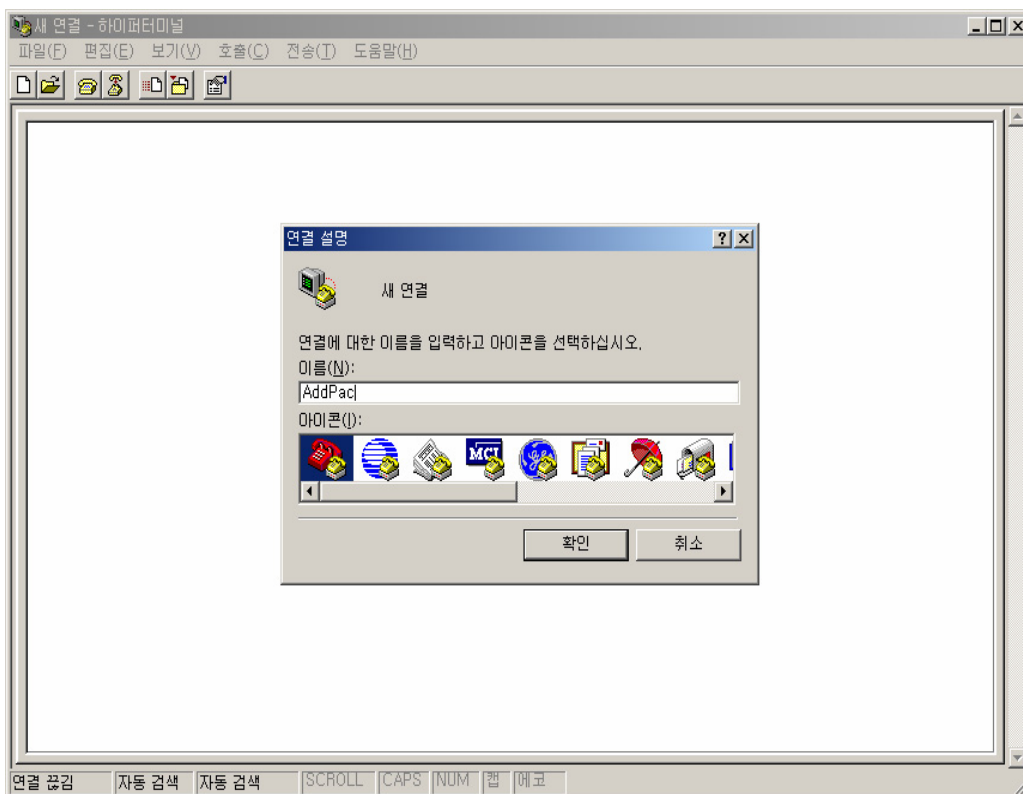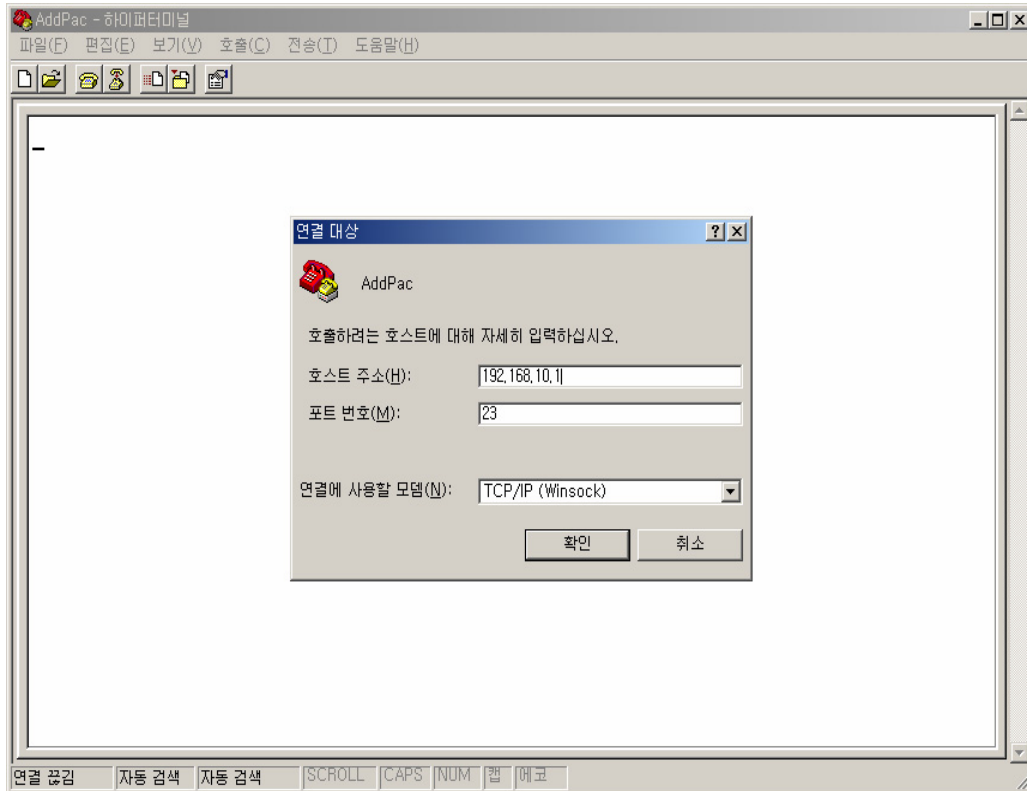

[Figure 3-6] Entering Connection Name in HyperTerminal

● Set Connect Using: to TCP/IP (Winsock) from Connect to:.

The IP address of the AP100 connected to the PC is, and the AP100 uses Port 23 by default.

[Figure 3-7] Settings for Telnet Connection

- Once the login message is displayed, enter the login default, **"_root_"** and the password default, **"_router_"**. Then, the login will be complete. Once the login is complete, a prompt, **"AP100>"** will be displayed on the console terminal.
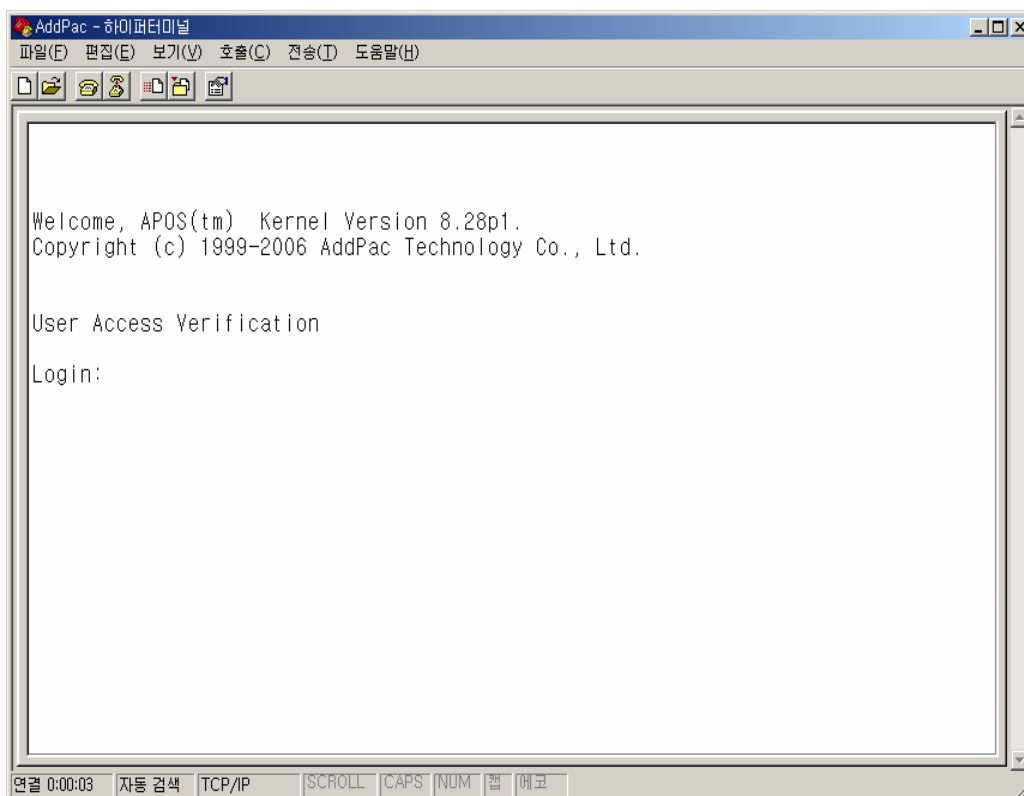
[Figure 3-8] Example of Telnet Connection

- The prompts displayed at AP100 Gateway are "AP100>" and "AP100#". If ">" is displayed at the prompt, it would mean that the login user has permissions other than "admin", cannot use a command that allows you to change the gateway settings, and has the minimum permission. If "#" is displayed at the prompt, it would mean that the login user has the "admin" privilege, and can use all of the gateway features, if required.

- If you login as Admin, you can change any and all of the gateway settings. It is recommended that you should change the default value of the admin account password for security. For detailed information on how to change the password and to set up AP100, refer to the Quick Operation Guide and APOS Operation Guide.

CHAPTER 4 Appendix

4.1. Specification of VoiceFinder AP100 VoIP Gateway

This Appendix describes the technical specifications of VoiceFinder AP100 VoIP Gateway. (* refers to 'To be enabled'.)

IP Routing Service

IP Routing Protocols	Static
	IEEE 802.1Q VLAN Routing

LAN Service

Ethernet Interface	10/100 Mbps Ethernet Interface
Configuration Management	Configures a port.
	Supports a secondary subnet.
	Changes the MTU size.
	Revalidates the ARP entry.
	Restores the connection between the Tx part and Rx part.

Voice over IP Service (Integrated Voice and Data Services)

VoIP Protocols	ITU-T H.323 v2 Protocol with ITU-T H.235 Security Feature
	Session Initiation Protocol (SIP)
	Media Gateway Control Protocol (MGCP)
Voice Compression	G.723.1 MP-MLQ, 6.3 Kbps, 5.3 Kbps
	G.729.A CS-ACELP, 8 Kbps
	G.711 PCM, 64 Kbps
Voice Processing	Voice Activity Detection (VAD)
	T.38 Protocol (FAX)
	Dual Tone Multi Frequency (DTMF)
	Comfort Noise Generation (CNG)
	Echo Cancellation

Network Management

SNMP	Standard SNMP Agent MIB v2
RMON	Remote Monitoring, RFC1271 Support
Web	Web Based Management using HTTP Server Interface
Others	Traffic Queuing

Security

IP Access List	Standard and Extended IP Access List, IP Packet Filtering
PPP User Authentication	Password Authentication Protocol (PAP)
	Challenge Handshake Authentication Protocol (CHAP)
Others	Access Control and Data Protections
	Enable/Disable for Specific Protocols
	Multi-level User Account Management
	Auto-disconnect for Telnet/Console Sessions

Operation and Management

Console Port	RS-232C Based Async Serial Interface Support
Remote Management	Console, RlogIn, Telnet
System Performance Analysis	Process, CPU, and Connection Interface
APOS Management	APOS Configuration Back-up and Restore
	Remote Upgrade Function using FTP/TFTP
Others	Debugging and System Auditing
	Data Logging and Diagnostics
	System Boot, Automatic Reboot with Watch-dog Timer
	IP Traffic Statistics with Accounting

Other Scalability Features

DHCP	Dynamic Host Configuration Protocol (DHCP) Server and Relay Functions
NAT/PAT	Network Address Translation (NAT) Protocol
	Port Address Translation (PAT) Protocol
Bridging	IEEE Standard Spanning Tree Bridging Protocol
	Remote Bridging Support
	Concurrent Bridging Support
User Interface	Industry Standard Command Line Interface (CLI)
Others	Network Time Protocol (NTP) Support

Hardware Specification

|	
Microprocessor	RISC Microprocessor and Voice DSP
Network Interface	1-Port 10/100 Mbps Ethernet Interface for WAN (RJ45)
	1-Port 10/100 Mbps Ethernet Interface for LAN (RJ45)
Voice Interface	Up-to 1-Port FXS Voice Interface (RJ11)
Memory	2 MB Flash Memory
	16 MB SDRAM / Main Memory
System LED	LEDs such as LAN and Power (on the Front Panel)
Power	External AC-DC Power Supplier: 5V x 2A
Power Consumption	10 Watt
Operation Temperature	-20°C ~ 60°C
Storage Temperature	-40°C ~ 85°C
Relative Humidity	Up to 90%
Cooling Method	Internal heatproof
H x W x D	28.8 mm x 77 mm x 111 mm

4.2. Cable Specification

This section describes the pinout specification of the following cable used for AP100:

● Pinout of Ethernet cable assembly (RJ-45 to RJ-45)

[Pinout of Ethernet Cable Assembly (RJ-45 to RJ-45)]

An RJ-45 to RJ-45 Ethernet cable is used to connect AP100 to another device (typically hub). The pin sequence of the RJ-45 connector is shown in Figure C-1. For the signals and pinout specification, refer to Table C-2, "Signals and Pinout of Serial Ethernet Cable".
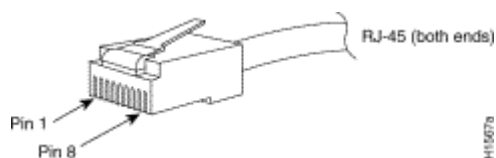
[Figure 4-1] 100 Base-T RJ-45 Connector

RJ-45	Signal	Direction	RJ-45 Pin
1	Tx +	→	1
2	Tx -	→	2
3	Rx +	←	3
4	-	-	4
5	-	-	5
6	Rx -	←	6
7	-	-	7
8	-	-	8

[Table 4-1] Signals and Pinout of Direct Ethernet Cable

1. This specification is about the serial cable that connects AP100 to the hub.
2. Use a cross cable to inter-connect AP100s or to connect AP100 to the PC.

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