VoiceFinder AP1200
VoIP Gateway

Installation Guide

Release 1.0
April. 2004

[Contents]

[Table of Figures]

[Table of Tables]

About This Guide

This chapter outlines the structure of VoiceFinder AP1200 VoIP Gateway Installation Guide and explains the symbols and legends.

[Organization]

The VoiceFinder AP1200 VoIP Gateway Installation Guide is offered to assist the operation of VoiceFinder AP1200 VoIP Gateway. This manual is composed of 4 chapters.

Experienced users may refer directly to the related chapters. However, less experienced users are highly recommended to thoroughly review this guide before operating the gateway.

● Chapter 1 『**VoiceFinder AP1200 VoIP Gateway Overview**』 provides an introduction to the hardware and software features of VoiceFinder AP1200 VoIP Gateway and how to apply for the technical supports.

● Chapter 2 『**Before Installation**』 provides an explanation on the installation environment and cable requirements along with recommendations for safe operation of the equipment

● Chapter 3 『**Installation**』 explains the basic installation information on connecting the gateway with cables, using Console terminal and etc.

● Chapter 4 『**Appendix**』 includes the specification of the gateway and the cables.

For technical supports, please contact AddPac Technology Co. Ltd.

AddPac Technology Co., Ltd

2/ 3 Fl. Jeong-Am Bulding, 769-12

Yeoksam-Dong, Kangnam-Ku, Seoul, Korea

Phone (02) 568-3848

Fax (02) 568-3847

E-mail: info@addpac.com

http://www.addpac.com

The revision history of VoiceFinder AP1200 VoIP Gateway Installation Guide is as follows.
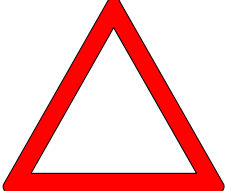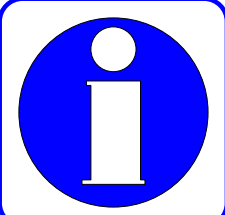
Revision No.	Date	Comments	Written by
Version 1.0	April 21, 2004	1st Edition	AddPac R&D Center

[Symbols and Legends]

The symbols and legends used in this installation guide 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 must be inputted.

The following conventions are also used to attract the user's attention.

Danger	**Danger**
	This symbol signals possible danger. Misuse could result in physical injuries. Please follow the instructions to avoid any electronic shocks.
Warning	**Warning**
	It warns the users to be careful with the operation. Otherwise, it could result in hardware damage of the equipment or loss of data.
Caution	**Caution**
	This symbol calls for the user's caution. Otherwise, it could result in hardware damage of the equipment, loss of data or system configuration.
Information	**Information**
	This symbol indicates additional information offering detailed information for understanding this user guide.

Chapter 1. VoiceFinder AP1200 VoIP Gateway Overview

Introduction to VoiceFinder AP1200 Gateway

VoiceFinder AP1200 VoIP Gateway is a standards-based communication device supporting 2-port 10/100Mbps Fast Ethernet that deliver true, next-generation Voice over IP (VoIP) service to SOHO and residences worldwide by connecting Local Area Networks or Wide Area Network.

The below is the network diagram using VoiceFinder AP1200 Gateway.
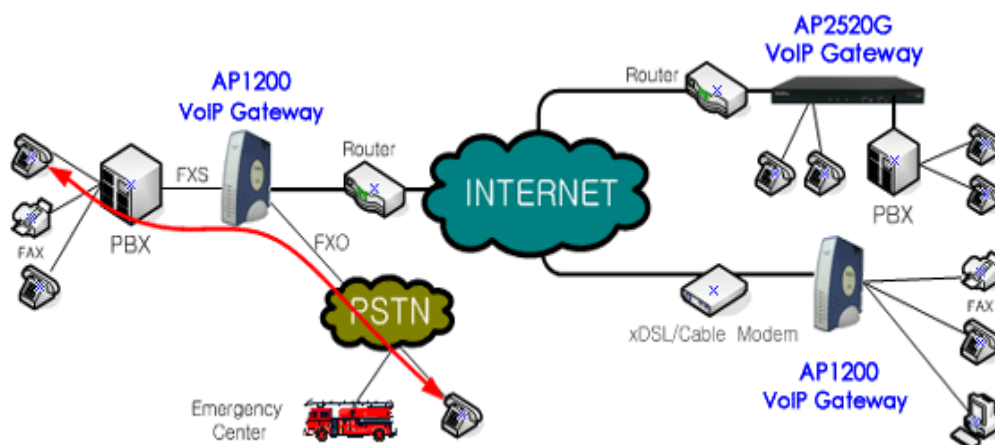
Figure 1-1: The network diagram using VoiceFinder AP1200 Gateway

It supports static RIP v1/v2, OSPF v2 standard routing protocols, IEEE Spanning Tree Bridging function and it can be used for routing of both small and large-scale networks.

As a supplementary service, VoiceFinder AP1200 Gateway provides Packet Filtering and Firewall function using Access List method. It restricts access to the local network from outside networks using source and destination IP address access list information at the Network Layer (IP Layer) and at the Transport Layer (TCP/UDP Layer).

Also, using DHCP (Dynamic Host Configuration Protocol), this equipment can assign

IP addresses to network clients automatically (DHCP server mode) and can receive a dynamically assigned IP address from a DHCP Server (DHCP client mode). VoiceFinder AP1200 Gateway solves the IP address shortage problem by using NAT (Network Address Translation) protocol.

VoiceFinder AP1200 Gateway supports inter-operability with carrier-class backbone gateways, gatekeepers and routers along with existing AddPac VoIP gateway series realizing easy installation and maintenance.

The below figure is the exterior view of VoiceFinder AP1200 Gateway.

Figure 1-2: The front view of VoiceFinder AP1200 VoIP Gateway
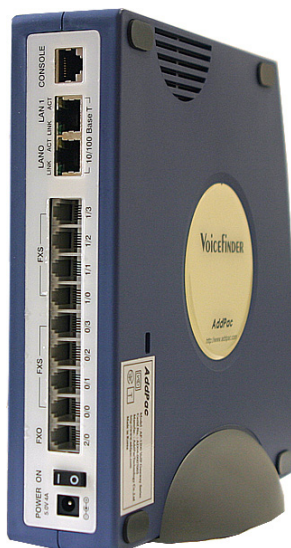
Figure 1-3: The rear view of VoiceFinder AP1200 VoIP Gateway

Main Features

Hardware Specification

VoiceFinder AP1200 VoIP Gateway is designed based on cutting-edge embedded hardware technology and supports 2-port 10/100Mpbs Fast Ethernet delivering high-speed WAN-to-LAN packet routing service. The below is the key hardware features of AP1200 VoIP Gateway.

Microprocessor
- High-end PowerPC RISC Microprocessor

Memory
- 4 Mbytes Flash ROM Memory
- 32 Mbytes System Memory
- 512 Kbytes Boot ROM Memory

Network Interface(RJ45)
- 2-port 10/100MBps Fast Ethernet interface

Analog Voice Interface (RJ11)
- Up-to 8-port FXS voice interface
- 1-port FXO voice interface

Console (RJ45)
- 1-port Async. serial interface

Software Specification

VoiceFinder AP1200 VoIP Gateway concurrently supports the triple stack of H.323, SIP and MGCP signaling protocols. Moreover, it delivers various network protocols and supplementary services to meet the needs of rapidly evolving networks. The below is the key software features of AP1200 VoIP Gateway

IP Packet Routing Protocol
- Static routing
- RIP V1,V2
- OSPF V2

LAN/WAN Service Protocol
- PPPoE Server & Client
- DHCP Server & Client
- 802.1Q VLAN
- Transparent Bridge for Ethernet
- Transparent Bridge for PPPoE
- PPTP

Management & Security Functions
- Standard/Extended Access List for Packet Filtering
- Account List
- Multi-Level User Account Management
- WEB Base Management
- SNMP Agent (MIB V2) and enterprise MIB for VoIP
- Telnet Server
- FTP Server & client

Voice Over IP Service Protocol
- H.323 Version 2, 3
- SIP Version 2 (RFC3261, RFC2543)
- MGCP Version 1.0
- T.38 G3 Fax Protocol
- G.723.1, G.729A, G.711, G726 voice compression codecs
- VAD(Voice Activity Detection), CNG (Comfort Noise Generation),
- H245, RTP2833, In-Band DTMF Relay
- G.168 Echo Cancellation
- Embeded GateKeeper.

Other Scalability Features

- Stacking
- QoS based Priority & Bandwidth Control.
- NAT/PAT/IP Share
- NTP

Hardware Configuration and Network Interfaces

This chapter explains the external form and network interfaces of VoiceFinder AP1200 Gateway.

VoiceFinder AP1200 Gateway Parts & Description

VoiceFinder AP1200 Gateway is made by the high intensity ABS with compact design. The front panel of VoiceFinder AP1200 Gateway includes various LEDs indicating the operational status of the device. On the rear panel, there is a LAN0 interface for WAN connection, LAN1 interface for LAN connection, and various voice interfaces.

Front View of AP1200

The front panel of VoiceFinder AP1200 Gateway includes various LEDs indicating the operational status of the device. The following figure is the external form of VoiceFinder AP1200 Gateway
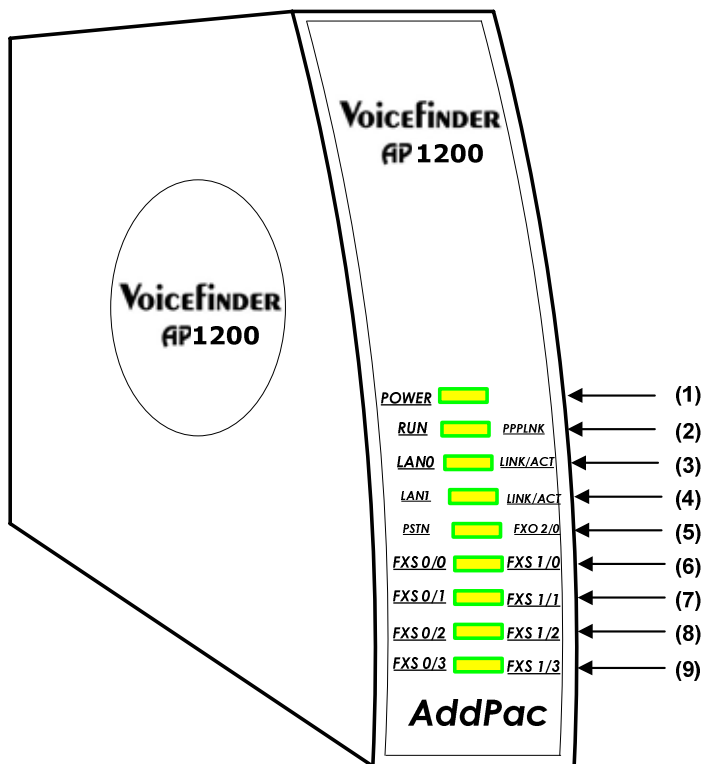
Figure 1-4: VoiceFinder AP1200 Gateway front view

Table 1-1 shows the functional explanation on each LED of VoiceFinder AP1200 Gateway.

Table 1-1: The interfaces and explanation of the front panel of AP1200 Gateway

No.	LED	Description
(1)	**POWER**	Power LED, display whether external power is supplied normally or not. **(Green)**
(2)	**RUN**	RUN LED, display the normal operation of the gateway. **(Green)**
	PPPLINK	PPP LINK, display the PPP line status. **(Orange)**
(3)	**LAN0**	LAN0 LED, display the status of WAN networks. **(Yellow)**
	LINK/ACT	
(4)	**LAN1**	LAN1 LED, display the status of Local networks. **(Yellow)**
	LINK/ACT	
(5)	**PSTN**	Display the status of 2/0 port. **(Green)**
	FXO 2/0	
(6)	**FXS 0/0**	Display the status of 0/0 port. **(Green)**
	FXS 1/0	Display the status of 1/0 port. **(Orange)**
(7)	**FXS 0/1**	Display the status of 0/1 port. **(Green)**
	FXS 1/1	Display the status of 1/1 port. **(Orange)**
(8)	**FXS 0/2**	Display the status of 0/2 port. **(Green)**
	FXS 1/2	Display the status of 1/2 port. **(Orange)**
(9)	**FXS 0/3**	Display the status of 0/3 port. **(Green)**
	FXS 1/3	Display the status of 1/3 port. **(Orange)**

Rear View of AP1200

The rear side of VoiceFinder AP1200 VoIP Gateway includes two (2) 10/100Mbps Ethernet Interface ports for WAN and LAN, RS-232C serial port for management, and four (4) or eight (8) FXS ports and one (1) FXO interface port for voice signal processing.

There are two types of AP1200 VoIP Gateway; AP1200 Type-A with eight (8) FXS ports and AP1200 Type-B with four (4) FXS ports.
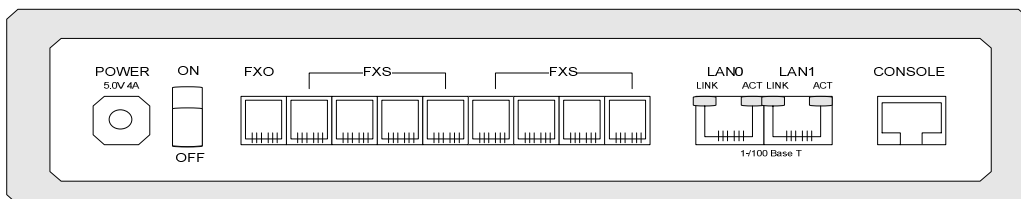
Figure 1-5: The rear panel image of VoiceFinder AP1200 Type-A Gateway
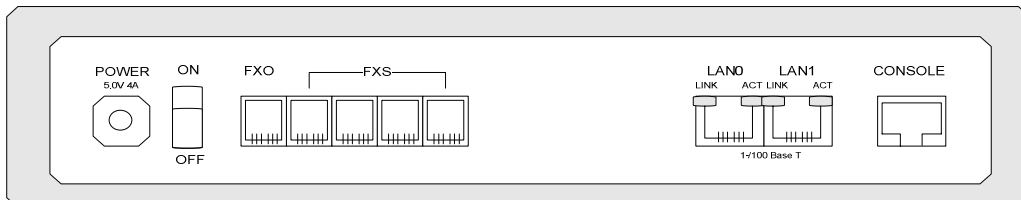
Figure 1-6: The rear panel image of VoiceFinder AP1200 Type-B Gateway

The following Table 1-2 explains the rear side panel interface of AP1200 VoIP gateway.

Table 1-2: The interfaces and explanation of the rear panel of AP1200 Gateway

Interface	Explanation
POWER	DC 5V 4A Power adapter terminal and a power switch.
FXO	1-port FXO voice interface. Can be connected to the extension line of PBX. (1 x RJ11)
FXS (0/0 ~ 1/3)	4 or 8-port FXS voice interface. Can be connected to analog phones and FAX machines. (8 x RJ11)
LAN0	10/100Mbps Ethernet Port for WAN interface (RJ45)
LAN1	10/100Mbps Ethernet Port for LAN interface (RJ45)
Console	RS-232C serial port for system management (RJ45)

Table 1-3: The interfaces of VoiceFInder AP1200 VoIP Gateways

Model	WAN	LAN	FXS	FXO	Console
AP1200 Type A	1 x 10/100Mbps	1 x 10/100Mbps	8	1	1
AP1200 Type B	1 x 10/100Mbps	1 x 10/100Mbps	4	1	1

Network Interface

VoiceFinder AP1200 Gateway supports the following network interfaces.

- **2-port 10/100Mbps Ethernet Interface for WAN/LAN**
- **1-port RS232C Asynchronous Serial Interface**

With the above network interfaces, VoiceFinder AP1200 Gateway can establish WAN and LAN network supporting TCP/IP network protocol. So it can easily form VoIP network on the lease line or the broadband network of ADSL and Cable Modem.   Also, the Console port offers easy configuration of the gateway.

The next section explains the network interfaces of VoiceFinder AP1200 Gateway.

2-Port 10/100Mbps Fast Ethernet WAN/LAN Interface (RJ45)
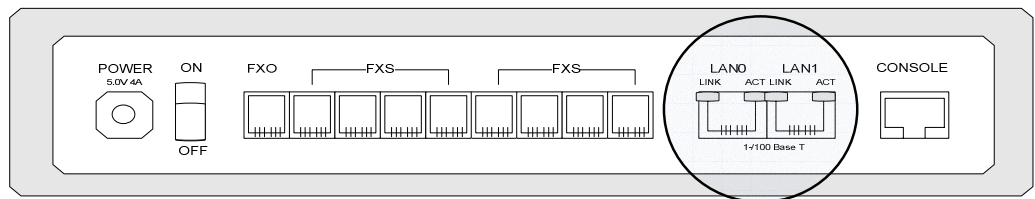
Figure 1-7: VoiceFinder AP1200 VoIP Gateway WAN/LAN Interface

VoiceFinder AP1200 Gateway supports two (2) 10/100Mbps Fast Ethernet Interfaces for WAN/LAN environment formation. (2* RJ45 type standard interface).

1-Port Async Serial Interface for Console Port (RJ45)
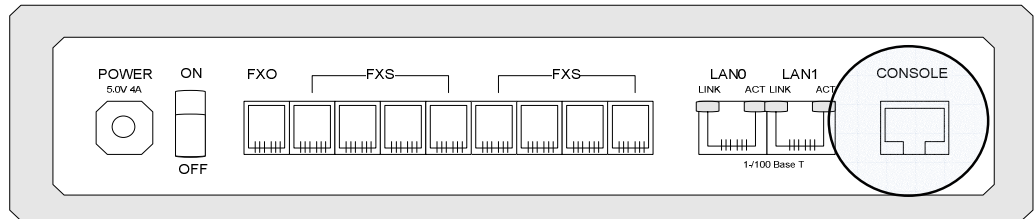
Figure 1-8: VoiceFinder AP1200 VoIP Gateway console Interface

VoiceFinder AP1200 Gateway provides network management feature using an RS-232C asynchronous serial interface port. (RJ45)

Voice Processing Interface

The voice interfaces of VoiceFinder AP1200 Gateway can be connected to the ordinary telephones, fax machines and PBX.

AP1200 Type A
- **8-Port FXS voice interface ports**
- **1-Port FXO voice interface ports**

AP1200 Type B
- **4-Port FXS voice interface ports**
- **1-Port FXO voice interface ports**

FXS interfaces directly connect to analog telephones and FAX machines. Also, the FXO interface connects to a PBX extension line or a PSTN line directly.

8-Port FXS Voice Interface

Figure 1-9: VoiceFinder AP1200 VoIP Gateway FXS Interface

VoiceFinder AP1200 Gateway supports eight (8)-port FXS (Foreign Exchange Station) Voice Interfaces. Using these FXS Voice Interfaces, VoiceFinder AP1200 Gateway provides analog line interface solutions, which can interface with general phones, FAX machines, and etc.

1-Port FXO Voice Interface

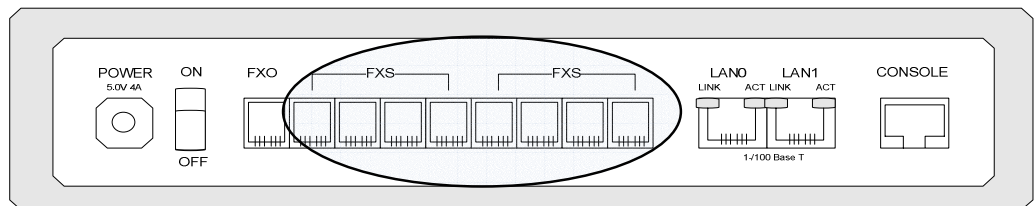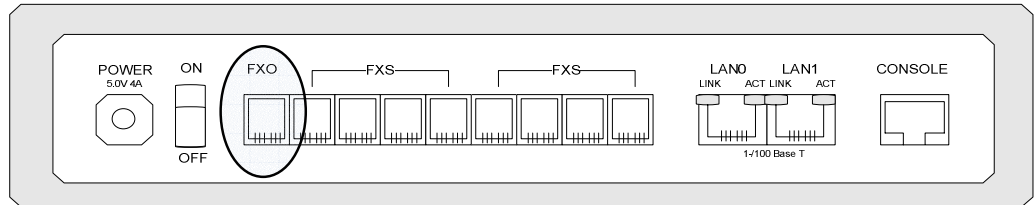**Figure 1-10: VoiceFinder AP1200 VoIP Gateway FXO Interface**

VoiceFinder AP1200 Gateway supports one (1)-port FXO (Foreign Exchange Office) Voice Interface. Using this FXO voice interface, VoiceFinder AP1200 Gateway provides analog line interface solutions that can interface with PBX, PSTN Line, etc.

Chapter 2. **Before Installation**

Installation Requirements

Warning

STOP

The following recommendation should be followed for safe operation of the product.

- Ensure VoiceFinder AP1200 Gateway is in a dust-free environment before and after installation.

- Make sure to install VoiceFinder AP1200 Gateway on a flat and safe surface.

- To prevent accidents, be careful with ties, scarf, sleeves, and any other loose clothing from entangling with the chassis.

- Avoid any actions that may effect the equipment or the operator.

Danger

Electrical Requirements

There are two main sources of electrical problems with VoiceFinder AP1200 Gateway: the power supply and static electricity.

This section describes safety recommendations for each case.

- **Electrical Safety**
  - ✓ Operate at a position where immediate shut-off of power supply is possible.
  - ✓ Turn off the power while installing the equipment.
  - ✓ Avoid operating the equipment alone at potentially dangerous environment.
  - ✓ Do not assume the power is switched off, but always confirm the power status.
  - ✓ Be extremely cautious when operating in a humid environment or with an ungrounded power extension cable.

- **Prevention of Static Electricity**

✓ The main chip-set of the gateway is very delicate and misuse may result in static electrical damage.

✓ If a static prevention wrist strap is available, strap it around the wrist and earth the cord before operating the equipment.

✓ If no wrist strap is available, earthening by holding a metal part of the Chassis will help prevent static electricity.

Warning   General Requirements

STOP

VoiceFinder AP1200 Gateway is ready for use where other electronic products can be used. However, the following conditions are recommended for maximum performance.

- A flat and well ventilated location.
- Secure the equipment safely at the desired place to install
- Do not place any objects on top of the equipment.
- A location without direct sunlight.
- Keep away from flammable, chemical, or magnetic objects.

Network Connection Requirements

Warning

STOP

Consider EMI Standard and distance limitation while installing VoiceFinder AP1200 Gateway.

The below explains Ethernet cable and Console Cable of VoiceFinder AP1200 Gateway.

Necessaries

Unless ordered in advance, the tools and certain cables are not provided in the package. Prepare the following equipments and tools before the installation.

- Standard screwdriver set

- Cables for LAN and Console port connection
    - ✓ RJ-45 to RJ-45 cable for LAN port
    - ✓ RS-232C Console cable with RJ-45 connector (included in the package)

- Cable to connect Phone port
    - ✓ RJ-11 to RJ-11 ordinary telephone cable

Ethernet Port

VoiceFinder AP1200 Gateway offers two (2) RJ45 type 10/100Mbps Fast Ethernet ports on the rear panel and LEDs are indicating the port status are on the front panel. For the PIN information of the Ethernet cable, refer to Chapter 4.

RS-232C Serial Console Port

VoiceFinder AP1200 Gateway offers one (1) RJ-45 type RS-232C connector on the rear panel. This port is for the initial configuration, monitoring and debugging. For the PIN information of the RS-232C Console cable, refer to Chapter 4.

Chapter 3. **Gateway Installation**

Unpacking

Before unpacking, check for external damage of the packaging box.

If no external damages are found, confirm if the following items are enclosed.

Table 3-1: VoiceFinder AP1200 Gateway package

No.	Item	Contents	Q'ty
1	VoiceFinder AP1200 Gateway Main Body		1
2	Ethernet Cable (for RJ45 to RJ45)		1
3	Console Cable (for RJ45 to DB9)		1
4	Power supply External Adapter (100V/220V)		1

If any item is missing, immediately contact AddPac Technology Co. Ltd. customer support.

VoiceFinder AP1200 Interfaces and Cable connection

- Install VoiceFinder AP1200 Gateway at the suitable place illustrated at Chapter 2.

Async Serial Interface Connection

- Connect RJ45 connector of RS-232C serial console cable to the Console port and connect the other side of the cable at the serial port of the PC.
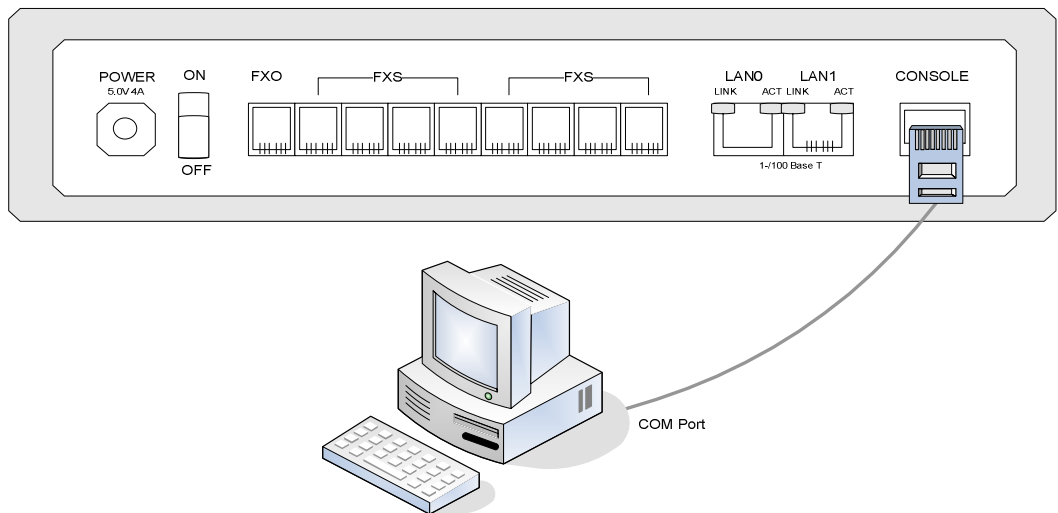
Figure 3-1: RS-232C Console port interface diagram between AP1200 VoIP Gateway and PC or notebook computer

Ethernet Interface Connection

● With RJ45 UTP cable, connect LAN0 Interface of VoiceFinder AP1200 Gateway to the LAN interface of the WAN equipment such as a Router.
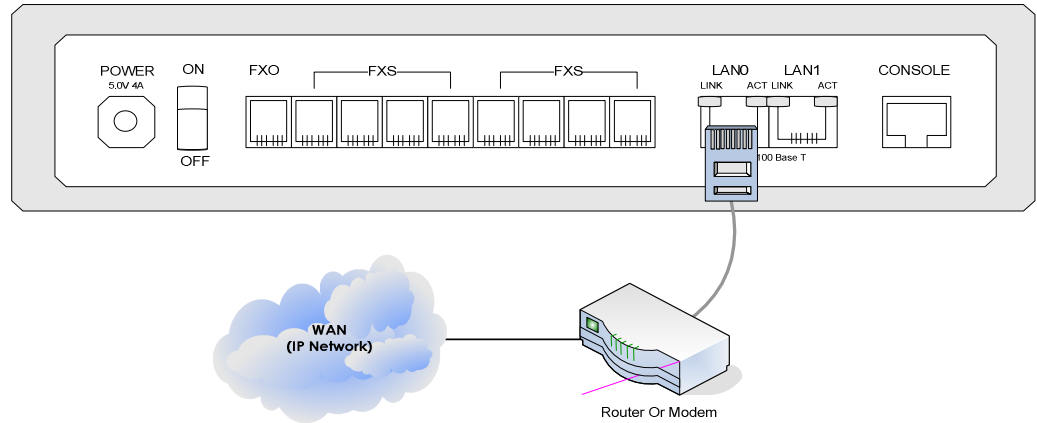
Figure 3-2: Network connection diagram between AP1200 gateway and WAN network

- In case of IP share mode, connect PC directly to the LAN1 Interface.   In case of NAT/PAT, connect a local HUB. For the detailed configuration, refer to Operation Manual or Quick Operation Manual.

- Use a crose cable to connect a user PC

- Use a direct cable to connect a HUB.
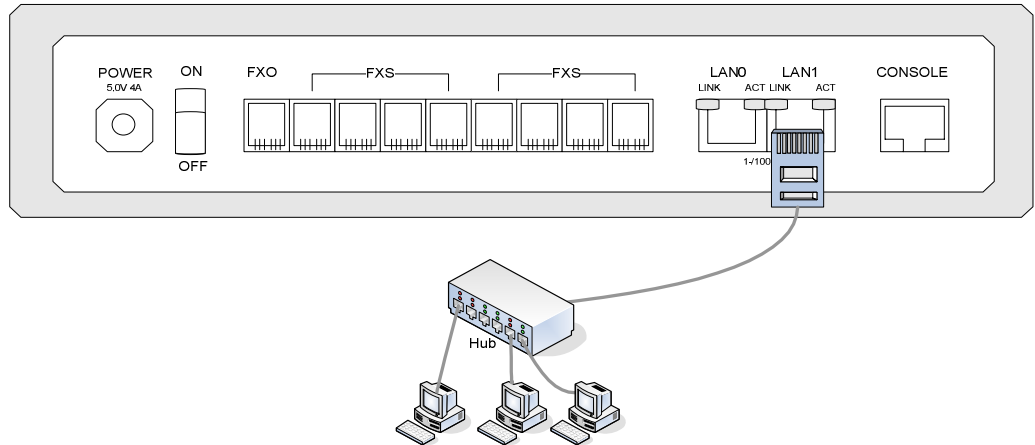
Figure 3-3: Network connection diagram between AP1200 VoIP Gateway and local LAN network

FXS Voice Interface Connection

- FXS Interfaces can connect directly to standard analog telephones, FAX machines or similar devices and supplies ring, voltage and dial tone. This interface is an RJ-11 connector that allows connections to basic telephone service equipment, keyphones, and PBXes.
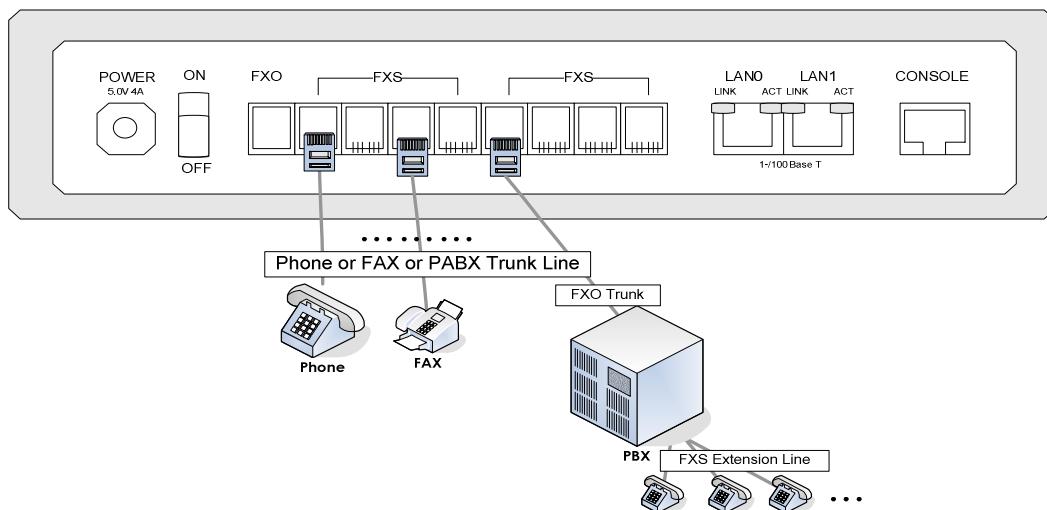
Figure 3-4: FXS analog voice port interface diagram between AP1200 VoIP gateway and phone, Fax and PBX access lines

FXO Voice Interface Connection

● FXO interface is an RJ-11 connector that allows an analog connection to be directed at the public switched telephone network's (PSTN's) central office or to a station interface on a PBX. The FXO sits on the PSTN switch end of the connection. It plugs directly into the line side of PSTN switch so PSTN switch thinks the FXO interface is a telephone.
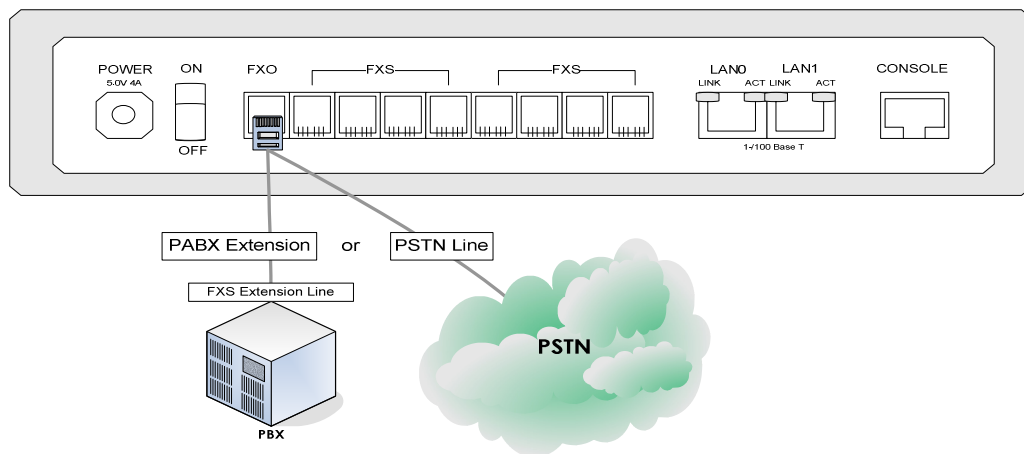
Figure 3-5: FXO analog voice port interface diagram between AP1200 VoIP gateway and PBX or PSTN

Booting

When power is supplied, the system is booted as described below

- VoiceFinder AP1200 Gateway performs a self-test and checks basic operations of the CPU, the memory and interfaces.

- The boot loader is executed, and the boot loader seeks for proper software image files.   The boot loader loads the gateway software from the flash memory.

- If the boot loader cannot find proper software image file from the flash memory, the boot loader stands by in the boot mode until it receives proper software from the remote system.   (At this time, the boot loader can download software through TFTP or FTP protocol.)

- When the software is loaded, the gateway starts to operate according to configuration information.   However, if there is no configuration information, it operates according to the default values, and in this case, the operator shall set up necessary parameters for normal operation of the network.

Danger

After connecting all the interfaces, supply power to VoiceFinder AP1200 Gateway. Supply the power after connecting the adapter to VoiceFinder AP1200 Gateway.   Do not connect the adapter to the power supply before connecting it to the gateway.   Also, use 110V adapter in case the power supply is 110V.   However, the gateway detects both 110V and 220V, so there is no additional setting required.

Use Console terminal with HyperTerminal

● To use a PC as a Console terminal, the communication emulator application should be installed. When the PC is MS-Windows line, use the HyperTerminal Application.
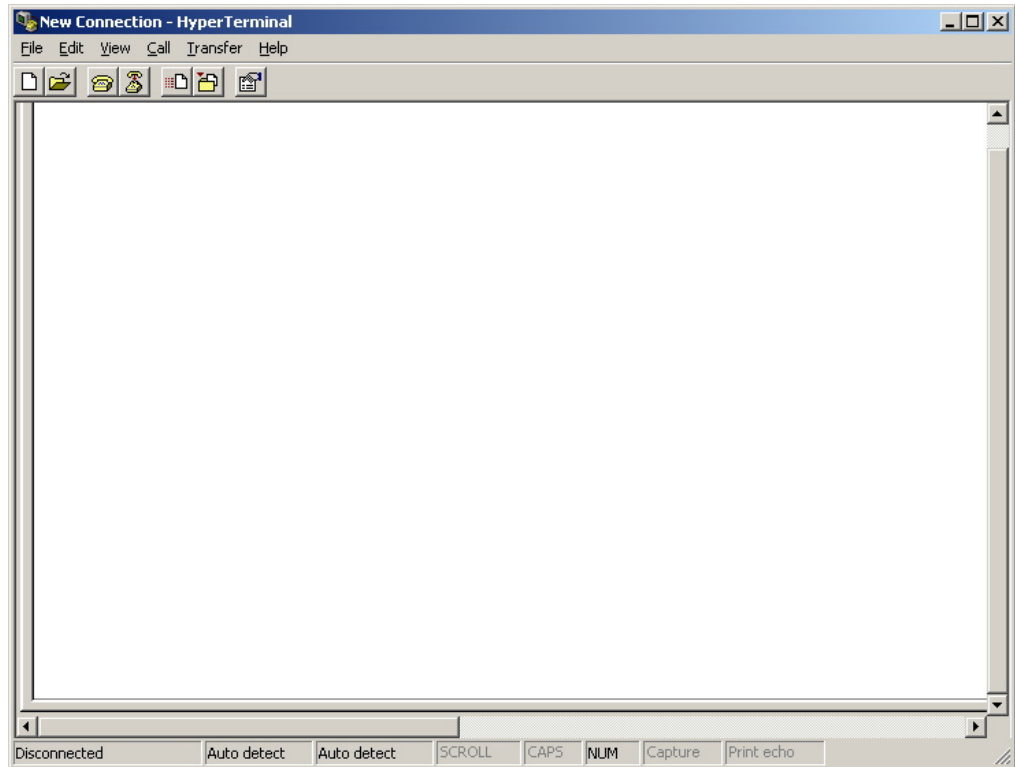
Figure 3-6: MS-Windows Communication Emulator HyperTerminal

- Assign a name to the connection. "AddPac" is used at the below example.
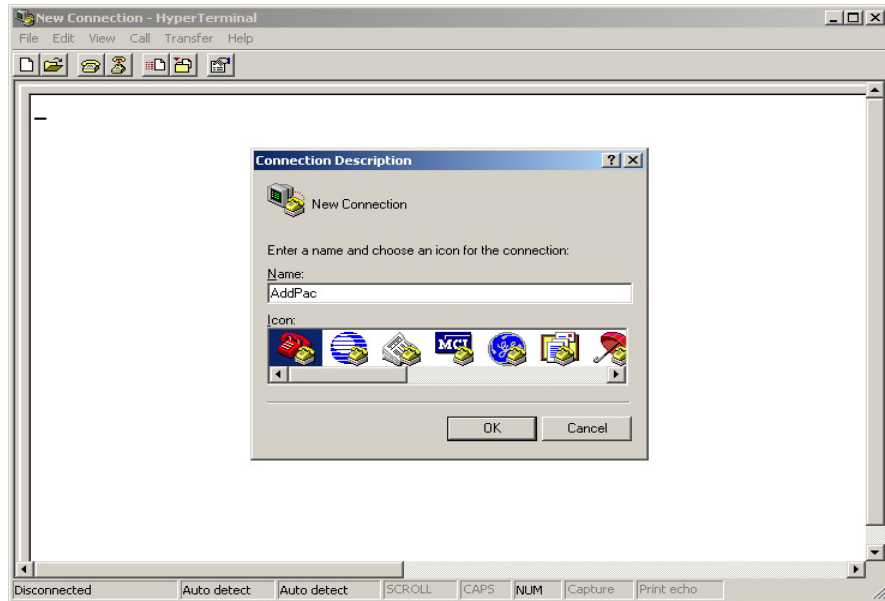
Figure 3-7: Assign a name for the new connection

● Select the interface where the Console cable is connected. Typically, the Console cable is connected to the RS-232C 9Pin Serial Port, so select the right port according to the user environment. "COM1" is selected at the below example.
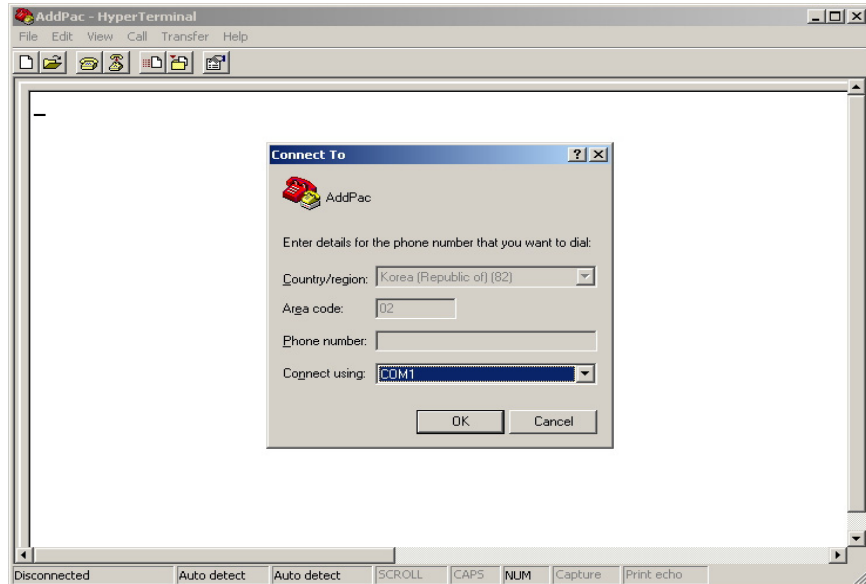
Figure 3-8: Select the interface for Console cable

● Set the port information.   The below examples is based on "COM1" port.
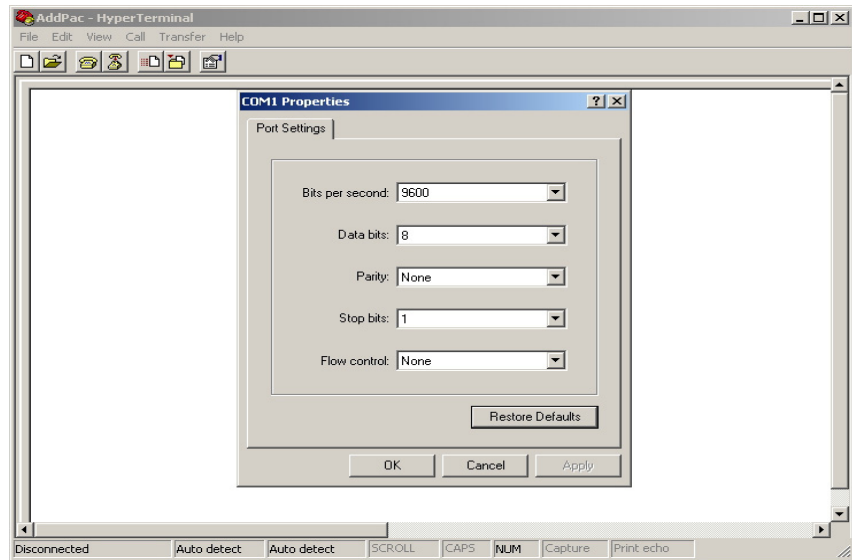
Figure 3-9: COM1 Properties

● After the configuration, press "Enter" button, then the below message will be displayed on the HyperTerminal. This message shows the S/W version, Gateway H/W test result, memory and etc.

```
System Boot Loader, Version 2.2.3/5
Copyright (c) by AddPac Technology Co., Ltd. Since 1999.

System Bootstrap, Version 1.2
Decompressing the image:
###################################################
###################################################
###############################################[OK]

VoiceFinder Gateway Series (AP1200J)
Serial Number: AP1200-XXXXXX
32BIT RISC Processor With 198MHz Clock
32 Mbytes System Memory.
512 Kbytes System Boot Flash Memory
4 Mbytes System Flash Memory
Real-Time Clock Device with EEPROM

1 RS232 Serial Console Interface
2 Ethernet/IEEE 802.3 Interface (100BaseTX)

AP1200J System software Revision 8.00
Released at Wed Mar 10 15:35:25 2004
Program is 2674072 bytes, checksum is 0x152e48db

Local Time : Wed Apr 21 23:38:46 2004
Copyright (c) by AddPac Technology Co., Ltd. Since 1999.

Voice Module type (0): FXS
Voice Module type (1): FXS
Voice Module type (2): FXO
Voice Module Ready
DSP S/W download (0): .... OK
DSP S/W download (1): .... OK
DSP S/W download (2): .. OK

The System is ready. Please login to system.
VoipGateway::Init1   - No IP address on the VoIP Interface
login: root
password:
AP1200   -   Login   : root at Console on Wed Apr 21 23:42:55 2004
AP1200J#
```

- With the log-in message, input the user name "root" and the password "router". After the log-in process, the prompt "AP1200#" is displayed on the console terminal.

- There are two types of prompts used for VoiceFinder AP1200 Gateway: "AP1200>" and "AP1200#". The " **>** " prompt indicates that the user is not an administrator. With this prompt, the user is unable to use certain commands: particularly the configuration commands. The " **#** " prompt indicates that the user is an administrator (or root), and the user is authorized to use all the functions and commands.

- Log-in as "Admin" allows changing settings. Therefore, it is advised to change the default password for security purposes. Refer to Quick Operation Guide & APOS Operation Guide for password change and detailed configuration

Chapter 4. Appendix

VoiceFinder AP1200 Gateway Technical Description

This chapter explains the supported Technical Specification of VoiceFinder AP1200 VoIP Gateway.   (* means that the item is not yet implemented.)

IP Routing Service

IP Routing Protocols	Static
	Routing Information Protocol (RIP) v1/2
	Open Shortest Path First (OSPF) v2 Protocol
	IEEE 802.1Q VLAN Routing

LAN Service

Ethernet Interface	10/100Mbps Ethernet Interface
Configuration Management	Port Configuration
	Secondary/Subnet Support
	MTU Size Change
	ARP Entry Revalidate Function
	Transmit/Receive Connection Recovery Function

Voice over IP Service

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

Network Managements

SNMP	Standard SNMP Agent MIB v2
Web	Web Based Management using HTTP Server Interface
Others	Traffic Queuing
	Frame-Relay Flow Control

Security Functions

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 Managements

Console Port	RS-232C Based Async Serial Interface Support
Remote Manegement	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 Booting, Auto-rebooting 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	High-end PowerPC RISC Microprocessor
Network Interface	2-Ports 10/100Mbps Fast Ethernet Interface for WAN/LAN (RJ45)
	1-Port Async Serial Interface for RS-232C Console Port (RJ45)
Voice Interface	Up-to 8-port FXS Voice Interface (8 x RJ11)
	Fixed 1-Port FXO Voice Interface (1 x RJ11)
Memory	4MB Flash Memory
	32MB SDRAM / Main Memory
	512KB Boot Flash Memory
System LED	Power, LAN, WAN, Voice Ports (Front Panel)
Power Supply	DC External Power Supply (5V x 4A)
Power Requirement	20 Watt
Operating Temperature	0°C ~ 45°C
Storage Temperature	-40°C ~ 85°C
Relative Humidity	5% ~ 95%
Cooling Method	Internal heat resistance
Width x Height x Depth	50 x 210 x 210 (mm)
Weight	800g

Cable Specification

This Appendix provides information about the Pinout specifications of the following cables used with VoiceFinder AP1200 Gateway.

- Console Port Signal and Pinout (RJ-45 to DB9)
- Ethernet Cable Assemble (RJ-45 to RJ-45) Pinout

[Console Port Signal & Pinout]

In order to connect the gateway console port with the Terminal Emulating PC, the RJ-45 to DB9 (Female DTE Connector) cable is used. The transferred signal and Pinout specifications are enlisted in the following table.

Table 4-1: The transferred signal and Pinout specification

Gateway Console (DTE)	RJ-45	DB-9	Console Device (PC)
Signal	RJ-45 Pin	DB-9 Pin	Signal
RTS	1	8	CTS
DTR	2	6	DSR
TxD	3	2	RxD
GND	4	5	GND
GND	5	5	GND
RxD	6	3	TxD
DSR	7	4	DTR
CTS	8	7	RTS

[Ethernet Cable Assemble (RJ-45 to RJ-45) Pinout]

In order to connect the gateway with other equipments (i.e. HUB), the RJ-45 to RJ-45 Ethernet Cable is used. The RJ-45 Connector Pin sequence is provided below and the transferred signal and Pinout specifications are enlisted at the below table.
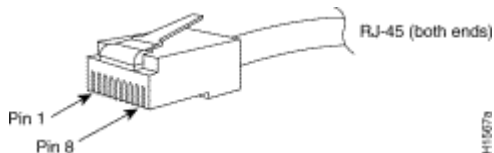

Figure 4-1: 10Base-T RJ-45 Connector

Table 4-2: Signal and Pinout of Direct Ethernet Cable

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

1. These specifications are for serial cables connecting the gateway and the HUB.
2. For gateway to gateway or gateway to PC connection, the Cross Cable must be used.