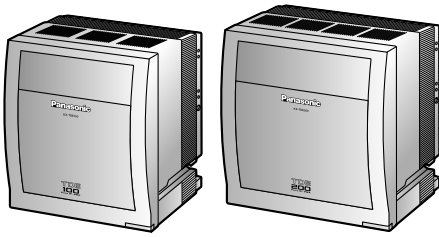# Panasonic®

Installation Manual
Pure IP-PBX

Model No. KX-TDE100
KX-TDE200

Thank you for purchasing a Panasonic Pure IP-PBX.
Please read this manual carefully before using this product and save this manual for future use.

KX-TDE100/KX-TDE200: PMMPR Software File Version 5.0000 or later

System Components

System Components Table

Category	Model No.	Description
Shelves	KX-TDE100	Basic Shelf
	KX-TDE200	Basic Shelf
Main Processing Card		IP Convergence Main Processing Card (IPCMPR)
IPCMPR Option Cards	KX-TDE0105	Memory Expansion Card (IPCMEC)
	KX-TDE0110	16-Channel VoIP DSP Card (DSP16)
	KX-TDE0111	64-Channel VoIP DSP Card (DSP64)
	KX-TDA0196	Remote Card (RMT)
Activation Key Codes[1]	KX-NCS4102	2-Channel IP Trunk Activation Key (2 IP Trunk)
	KX-NCS4104	4-Channel IP Trunk Activation Key (4 IP Trunk)
	KX-NCS4201	1-Channel IP Softphone/IP Proprietary Telephone Activation Key (1 IP Softphone/IP PT)
	KX-NCS4204	4-Channel IP Softphone/IP Proprietary Telephone Activation Key (4 IP Softphone/IP PT)
	KX-NCS4208	8-Channel IP Softphone/IP Proprietary Telephone Activation Key (8 IP Softphone/IP PT)
	KX-NCS4216	16-Channel IP Softphone/IP Proprietary Telephone Activation Key (16 IP Softphone/IP PT)
	KX-NCS4501	1-Channel IP Proprietary Telephone Activation Key (1 IP PT)
	KX-NCS4504	4-Channel IP Proprietary Telephone Activation Key (4 IP PT)
	KX-NCS4508	8-Channel IP Proprietary Telephone Activation Key (8 IP PT)
	KX-NCS4516	16-Channel IP Proprietary Telephone Activation Key (16 IP PT)
	KX-NCS4701	1-Channel SIP Extension Activation Key (1 SIP Extension)
	KX-NCS4704	4-Channel SIP Extension Activation Key (4 SIP Extension)
	KX-NCS4708	8-Channel SIP Extension Activation Key (8 SIP Extension)
	KX-NCS4716	16-Channel SIP Extension Activation Key (16 SIP Extension)
	KX-NCS4910	Activation Key for Software Upgrade to Enhanced Version (Software Upgrade 01)

Category	Model No.	Description
	KX-NCS2201	Activation Key for CA PRO for 1 User (CA Pro 1user)
	KX-NCS2205	Activation Key for CA PRO for 5 Users (CA Pro 5users)
	KX-NCS2210	Activation Key for CA PRO for 10 Users (CA Pro 10users)
	KX-NCS2240	Activation Key for CA PRO for 40 Users (CA Pro 40users)
	KX-NCS2249	Activation Key for CA PRO for 128 Users (CA Pro 128users)
	KX-NCS2301	Activation Key for CA ACD Monitor for 1 ICD Supervisor (CA Supervisor 1user)
Virtual CO Line Cards	-	Virtual 16-Channel VoIP Gateway Card (V-IPGW16)
	-	Virtual 16-Channel SIP CO Line Card (V-SIPGW16)
Virtual Extension Cards	-	Virtual 32-Channel VoIP Extension Card (V-IPEXT32)
	-	Virtual 32-Channel SIP Extension Card (V-SIPEXT32)
	-	Virtual 4 IP Cell Station Interface Card (V-IPCS4)
Physical CO Line Cards	KX-TDA0180	8-Port Analog Trunk Card (LCOT8)
	KX-TDA0181	16-Port Analog Trunk Card (LCOT16)
	KX-TDA0187	T-1 Trunk Card (T1)
	KX-TDA0193	8-Port Caller ID Card (CID8)
	KX-TDA0290	PRI Card (PRI23)
	KX-TDA0484	4-Channel VoIP Gateway Card (IP-GW4E)
	KX-TDA0490	16-Channel VoIP Gateway Card (IP-GW16)

Category	Model No.	Description
Physical Extension Cards	KX-TDA0143	4 Cell Station Interface Card (CSIF4)
	KX-TDA0144	8 Cell Station Interface Card (CSIF8)
	KX-TDA0170	8-Port Digital Hybrid Extension Card (DHLC8)
	KX-TDA0171	8-Port Digital Extension Card (DLC8)
	KX-TDA0172	16-Port Digital Extension Card (DLC16)
	KX-TDA0173	8-Port Single Line Telephone Extension Card (SLC8)
	KX-TDA0174	16-Port Single Line Telephone Extension Card (SLC16)
	KX-TDA0175	16-Port Single Line Telephone Extension with Message Lamp Card (MSLC16)
	KX-TDA0177	16-Port Single Line Telephone Extension Card with Caller ID (CSLC16)
	KX-TDA0470	16-Channel VoIP Extension Card (IP-EXT16)
	KX-TDA1176	16-Port Single Line Telephone Extension with Caller ID and Message Lamp Card (MCSLC16)
	KX-TDA1178	24-Port Single Line Telephone Extension with Caller ID and Message Lamp Card (MCSLC24)
Other Physical Cards	KX-TDA0161	4-Port Doorphone Card (DPH4)
	KX-TDA0164	4-Port External Input/Output Card (EIO4)
	KX-TDA0166	16-Channel Echo Canceller Card (ECHO16)
	KX-TDA0168	Extension Caller ID Card (EXT-CID)
	KX-TDA0190	Optional 3-Slot Base Card (OPB3)
	KX-TDA0191	4-Channel Message Card (MSG4)
	KX-TDA0194	4-Channel Simplified Voice Message Card (ESVM4)
Power Supply Units (PSUs)	KX-TDA0103	L-Type Power Supply Unit (PSU-L)
	KX-TDA0104	M-Type Power Supply Unit (PSU-M)
	KX-TDA0108	S-Type Power Supply Unit (PSU-S)

Category		Model No.	Description
Cell Stations (CSs)	**2.4 GHz**	KX-T0141	2-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for 2.4 GHz Portable Station
		KX-TDA0142	3-Channel Cell Station Unit Using a CSIF Card for 2.4 GHz Portable Station
		KX-T0151	2-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for 2.4 GHz Portable Station
		KX-TDA0152	3-Channel Cell Station Unit Using a CSIF Card for 2.4 GHz Portable Station
	DECT 6.0	KX-T0155	DECT 6.0 2-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for DECT 6.0 Portable Station
		KX-TDA0156	DECT 6.0 4-Channel Cell Station Unit Using a CSIF Card for DECT 6.0 Portable Station
		KX-T0158	DECT 6.0 8-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for DECT 6.0 Portable Station
		KX-NCP0158	DECT 6.0 8-Channel IP Cell Station Unit Using a V-IPCS4 Card for DECT 6.0 Portable Station
Proprietary Equipment		KX-A258	Blank Slot Cover
		KX-T30865	Doorphone
		KX-T7765	
		KX-T7775	

[*1] Note that the types of activation keys are subject to change without notice. For CA activation keys, refer to the documentation for CA.

Equipment Compatibility

Compatible Panasonic Proprietary Telephones

The PBX supports the following telephones:
- IP proprietary telephones (e.g., KX-NT300 series)
- IP softphones (e.g., KX-TDA0350)
- Digital proprietary telephones (e.g., KX-DT300 series)
- Analog proprietary telephones (e.g., KX-T7700 series)
- Portable stations (e.g., KX-WT125, KX-TD7690)
- DSS consoles (e.g., KX-T7640)

Incompatible Panasonic Proprietary Telephones

The PBX does not support the following telephones:
- KX-T30800 series proprietary telephones and DSS consoles
- KX-T61600 series proprietary telephones and DSS consoles
- KX-T123200 series proprietary telephones and DSS consoles

Note

- For the equipment (e.g., Add-on Key Module, USB Module, Headset[*1]) that can be connected to a particular telephone, refer to the telephone's manual.
- For other equipment that can be connected to the PBX, refer to "1.1.2 System Connection Diagram".
- [*1] The KX-T7090 headset can be connected to the KX-T7000, KX-T7200, KX-T7300, and KX-T7400 series telephones.

Notice

- This PBX supports SIP Extensions. However, some PBX features may not be available for SIP Extensions, depending on your telephone type.
- Under power failure conditions, the connected telephones may not operate. Please ensure that a separate telephone, not dependent on local power, is available for emergency use.
- Prior to connection of this product, please verify that the intended operating environment is supported. Satisfactory performance cannot be guaranteed for the following:
  – interoperability and compatibility with all devices and systems connected to this product
  – proper operation and compatibility with services provided by telecommunications companies over connected networks

List of Abbreviations

- APT → Analog Proprietary Telephone
- CA → Communication Assistant
- DPT → Digital Proprietary Telephone
- IP-PT → IP Proprietary Telephone
- PS → Portable Station
- PT → Proprietary Telephone
- SIP Extension → Session Initiation Protocol Extension (SIP hardphones/SIP softphones)
- SLT → Single Line Telephone

Safety Notices

Please observe the safety notices in this manual in order to avoid danger to users or other people, and prevent damage to property.
The notices are classified as follows, according to the severity of injury or damage:

⚠	**WARNING**

This notice means that misuse could result in death or serious injury.

⚠	**CAUTION**

This notice means that misuse could result in injury or damage to property.

Important Information

<u>SAVE THESE INSTRUCTIONS</u>

⚠   **WARNING**

SAFETY REQUIREMENTS

<u>For All Telephone Equipment</u>

- Do not install the product in any other way than described in relevant manuals.
- The product must only be installed and serviced by qualified service personnel. The product should be used as-is from the time of purchase; it should not be disassembled or modified. Disassembly or modification can cause a fire, electric shock, or damage to the product.
- Do not install the product in a place exposed to rain or moisture, or a place where water, oil, or other liquids can drip or splash onto on the product. Such conditions can lead to fire or electric shock, and may impair the performance of the product.
- Follow all warnings and instructions marked on the product.
- Do not place the product on an unstable or uneven surface. If the product were to fall over, it may cause injury or damage to the product.
- Products that require a power source should only be connected to the type of electrical power supply specified on the product label. If you are not sure of the type of power supply to your home, consult your dealer or local power company.
- For safety purposes some products are equipped with a grounded plug. If you do not have a grounded outlet, please have one installed. Do not bypass this safety feature by tampering with the plug.
- Do not supply power to a combination of devices that exceeds the total rated capacity of the wall outlets or extension cables used. If outlets, power strips, extension cords, etc. are used in a manner that exceeds their rated capacity, they emit large amounts of heat, which could cause a fire.
- Unplug the product from the wall outlet and have it serviced by qualified service personnel in the following cases:
  - **a.** When the power supply cord or plug is damaged or frayed.
  - **b.** If liquid has been spilled into the product.
  - **c.** If the product has been exposed to rain or water.
  - **d.** If the product does not operate according to the operating instructions. Adjust only the controls that are explained in the operating instructions. Improper adjustment of other controls may result in damage and may require service by a qualified technician to restore the product to normal operation.
  - **e.** If the product has been dropped or the cabinet has been damaged.
  - **f.** If product performance deteriorates.

<u>For the PBX</u>

- If damage to the unit exposes any internal parts, disconnect the power supply cord immediately and return the unit to your dealer.
- To prevent fires, electric shock, injury, or damage to the product, be sure to follow these guidelines when performing any wiring or cabling:
  - **a.** Before performing any wiring or cabling, unplug the product's power cord from the outlet. After completing all wiring and cabling, plug the power cord back into the outlet.
  - **b.** When laying cables, do not bundle the product's power cord with the power cords of other devices.
  - **c.** Do not place any objects on top of the cables connected to the PBX.
  - **d.** When running cables along the floor, use protectors to prevent the cables from being stepped on.
  - **e.** Do not run any cables under carpeting.

- Unplug this unit of the system from the AC outlet if it emits smoke, an abnormal smell or makes unusual noise. These conditions can cause fire or electric shock. Confirm that smoke has stopped and contact an authorized Panasonic Factory Service Center.
- Danger of explosion exists if a battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the battery manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- Make sure that the wall that the shelf will be attached to is strong enough to support the shelf. If not, it is necessary for the wall to be reinforced.
- Only use the wall-mounting equipment (anchor plugs, screws, metal bracket) included with the PBX.
- Do not insert objects of any kind into this product, as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock.

⚠ CAUTION

SAFETY REQUIREMENTS

For All Telephone Equipment
- The product should be kept free of dust, moisture, high temperature (more than 40 °C [104 °F]) and vibration, and should not be exposed to direct sunlight.
- Unplug the product from the wall outlet before cleaning. Wipe the product with a soft cloth. Do not clean with abrasive powders or with chemical agents such as benzene or thinner. Do not use liquid cleaners or aerosol cleaners.

For the PBX
- Before touching the product (PBX, cards, etc.), discharge static electricity by touching ground or wearing a grounding strap. Failure to do so may cause the PBX to malfunction due to static electricity.
- When driving the screws into the wall, be careful to avoid touching any metal laths, wire laths or metal plates in the wall.
- When relocating the equipment, first disconnect the telecom connection before disconnecting the power connection. When the unit is installed in the new location, reconnect the power first, and then reconnect the telecom connection.
- The power supply cord is used as the main disconnect device. Ensure that the AC outlet is located near the equipment and is easily accessible.
- The SD Memory Card poses a choking hazard. Keep the SD Memory Card out of reach of children.
- Slots and openings in the front, back and bottom of the cabinet are provided for ventilation; to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface while in use. The product should never be placed near or over a radiator or other heat source. This product should not be placed in a sealed environment unless proper ventilation is provided.
- When this product is no longer in use, make sure to detach it from the wall.

SECURITY REQUIREMENTS

In order to use the PBX safely and correctly, the Security Requirements below must be observed. Failure to do so may result in:
- Loss, leakage, falsification or theft of user information.
- Illegal use of the PBX by a third party.
- Interference or suspension of service caused by a third party.

What is User Information?

User Information is defined as:
1. Information stored on the SD Memory Card
   Phonebook data, user IDs, system settings data, passwords (User/Administrator/Installer), Personal Identification Numbers (PINs), etc.
2. Information sent from the PBX to a PC or other external device:
   Phone call data (including telephone numbers of outside parties), call charge data, etc.

Requirements
1. The SD Memory Card contains software for all the processes of the PBX and all customer data. It can be easily removed and taken away from the PBX by a third party. Therefore, do not allow unauthorized access to prevent data leakage.
2. Always make backups of data stored on the SD Memory Card. For details, refer to "2.6.2 Utility—File Transfer PC to PBX (SD Card)" and "2.6.3 Utility—File Transfer PBX (SD Card) to PC" in the PC Programming Manual.
3. To prevent illegal access from the Internet, activate a Firewall.
4. To avoid unauthorized access and possible abuse of the PBX, we strongly recommend:
   a. Keeping the password secret.
   b. Selecting a complex, random password that cannot be easily guessed.
   c. Changing your password regularly.
5. Perform the following when sending the PBX for repair or handing it over to a third party.
   a. Make a backup of data stored on the SD Memory Card.
   b. Using an SD formatter, format the SD Memory Card so that information cannot be retrieved from it.
6. To prevent data leakage, render the SD Memory Card physically unusable before disposal.
7. When user information is sent from the PBX to a PC or other external device, the confidentiality of that information becomes the responsibility of the customer. Before disposing of the PC or other external device, ensure that data cannot be retrieved from it by formatting the hard disk and/or rendering it physically unusable.

Notice

SAFETY REQUIREMENTS
For All Telephone Equipment
• Read and understand all instructions.

For the PBX
• When placing the metal bracket, make sure that the "TOP" arrow is pointing upward.
• Keep the unit away from heating appliances and devices that generate electrical noise such as fluorescent lamps, motors and televisions. These noise sources can interfere with the performance of the PBX.
• If you are having problems making calls to outside destinations, follow this procedure to test the CO lines:
   a. Disconnect the PBX from all CO lines.
   b. Connect known working SLTs to those CO lines.
   c. Make a call to an external destination using those SLTs.
   If a call cannot be carried out correctly, there may be a problem with the CO line that the SLT is connected to. Contact your telephone company.
   If all SLTs operate properly, there may be a problem with your PBX. Do not reconnect the PBX to the CO lines until it has been serviced by an authorized Panasonic Factory Service Center.

Important Safety Instructions

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

- Do not use the product near water, for example, near a bathtub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
- Avoid using wired telephones during an electrical storm. There is a remote risk of electric shock from lightning.
- Do not use a telephone in the vicinity of a gas leak to report the leak.

SAVE THESE INSTRUCTIONS

Precaution

<div style="border: red">

<u>WARNING</u>

DO NOT REMOVE SD MEMORY CARD WHILE POWER IS SUPPLIED TO THE PBX

Doing so may cause the PBX to fail to start when you try to restart the system.

</div>

Password Security

CAUTION

To the Administrator or Installer regarding the system password

1. Please provide all system passwords to the customer.

2. To avoid unauthorized access and possible abuse of the PBX, keep the passwords secret, and inform the customer of the importance of the passwords, and the possible dangers if they become known to others.

3. The PBX has default passwords preset. For security, change these passwords the first time that you program the PBX.

4. Change the passwords periodically.

5. It is strongly recommended that passwords of 10 numbers or characters be used for maximum protection against unauthorized access. For a list of numbers and characters that can be used in system passwords, refer to "1.1.2 Entering Characters" in the PC Programming Manual.

6. If a system password is forgotten, it can be found by loading a backup of the system data into a PC, and checking the password using the Maintenance Console software. If you do not have a backup of the system data, you must reset the PBX to its factory defaults and reprogram it. Therefore, we strongly recommend maintaining a backup of the system data. For more information on how to back up the system data, refer to "2.5.1 Tool—SD memory backup" in the PC Programming Manual.
However, as system passwords can be extracted from backup copies of the system data file, do not allow unauthorized access to these files.

Notice for users in California

This product contains a CR coin cell lithium battery that contains perchlorate material—special handling may apply.

See   www.dtsc.ca.gov/hazardouswaste/perchlorate

Introduction

This Installation Manual is designed to serve as an overall technical reference for the Panasonic Pure IP-PBX, KX-TDE100/KX-TDE200. It provides instructions for installing the hardware, and programming the PBX using the Maintenance Console.

The Structure of this Manual

This manual contains the following sections:

Section 1 System Outline
Provides general information on the PBX, including the system capacity and specifications.

Section 2 Activation Key Installation
Describes information on activation keys, including how to obtain an activation key and install it in the SD Memory Card.

Section 3 Installation
Describes the procedures to install the PBX. Detailed instructions for planning the installation site, installing the shelves and optional service cards, and cabling of peripheral equipment are provided. Further information on system expansion and peripheral equipment installation is included.

Section 4 Guide for the Maintenance Console
Explains the installation procedure, structure, and basic information of the Maintenance Console.

Section 5 Troubleshooting
Provides information on the PBX and telephone troubleshooting.

About the Other Manuals

Along with this Installation Manual, the following manuals are available:

Feature Manual
Describes all basic, optional and programmable features of the PBX.

PC Programming Manual
Provides step-by-step instructions for performing system programming using a PC.

PT Programming Manual
Provides step-by-step instructions for performing system programming using a PT.

Operating Manual
Provides operating instructions for end users using a PT, SLT, PS, or DSS Console.

About the software version of your PBX

The contents of this manual apply to PBXs with a certain software version, as indicated on the cover of this manual. To confirm the software version of your PBX, see "How do I confirm the software version of the PBX or installed cards?" in 2.7.1 Frequently Asked Questions (FAQ) of the PC Programming Manual, or "[190] Main Processing (MPR) Software Version Reference" in the PT Programming Manual.

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- Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation.

F.C.C. REQUIREMENTS AND RELEVANT INFORMATION

1. **Notification to the Telephone Company**
   This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the side of this equipment is a label that contains, among other information, a product identifier in the format US: ACJMF03AKX-TDA100. If requested, this number must be provided to the telephone company. Installation must be performed by a qualified professional installer. If required, provide the telephone company with the following technical information:
   * Telephone numbers to which the system will be connected
   * Make: Panasonic
   * Model: KX-TDE100 and KX-TDE200
   * Certification No.: found on the side of the unit
   * Ringer Equivalence No.: 0.3A
   * Facility Interface Code: 02LS2, 04DU9.BN/DN/1KN/1SN
   * Service Order Code: 9.0F, 6.0P
   * Required Network Interface Jack: RJ21X, RJ48C, RJ2HX

2. **Ringer Equivalence Number (REN)**
   The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US: ACJMF03AKX-TDA100. The digits represented by 03 are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

3. **Incidence of Harm to the Telephone Lines**
   If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

4. **Changes in Telephone Company Communications Facilities, Equipment, Operations and Procedures**
   The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

5. **Trouble with this equipment**
   If trouble is experienced with this equipment, for repair or warranty information, please see the attached warranty, which includes the Service Center Directory. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

6. **Connection to Party Line**
   Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

7. **Combined Use with Alarm Equipment**
   If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

<u>Note</u>

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful

interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

CAUTION

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

When programming emergency numbers and/or making test calls to emergency numbers:
1. Remain on the line and briefly explain to the dispatcher the reason for the call before hanging up.
2. Perform such activities in the off-peak hours, such as early morning hours or late evenings.

WARNING

The software contained in the ARS and TRS features to allow user access to the network must be upgraded to recognize newly established network area codes and exchange codes as they are placed into service. Failure to upgrade the premises PBXs or peripheral equipment to recognize the new codes as they are established will restrict the customer and the customer's employees from gaining access to the network and to these codes.
KEEP THE SOFTWARE UP-TO-DATE WITH THE LATEST DATA.

Table of Contents

Section 1
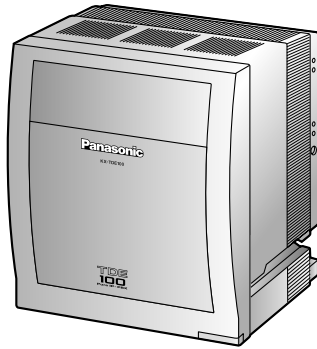
System Outline

This section provides general information on the PBX, including the system capacity and specifications.
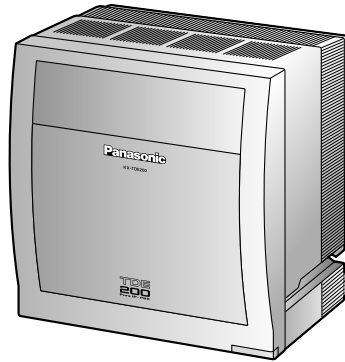
1.1 Basic System Construction

1.1.1 Basic Shelf

The basic shelf contains an IPCMPR card for controlling the PBX. To use the system, install a power supply unit (PSU) in the PSU Slot and optional service cards in the basic shelf.
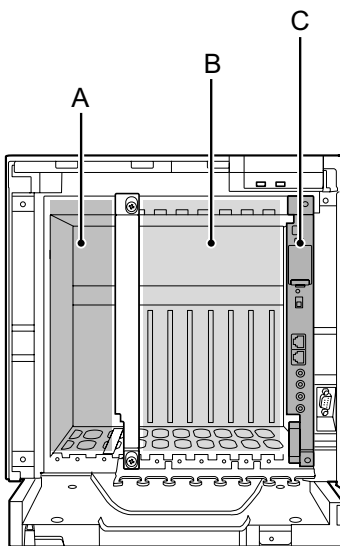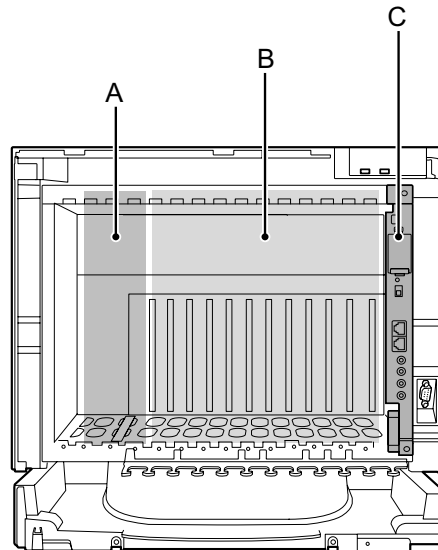
KX-TDE100   KX-TDE200

Construction of the Basic Shelf

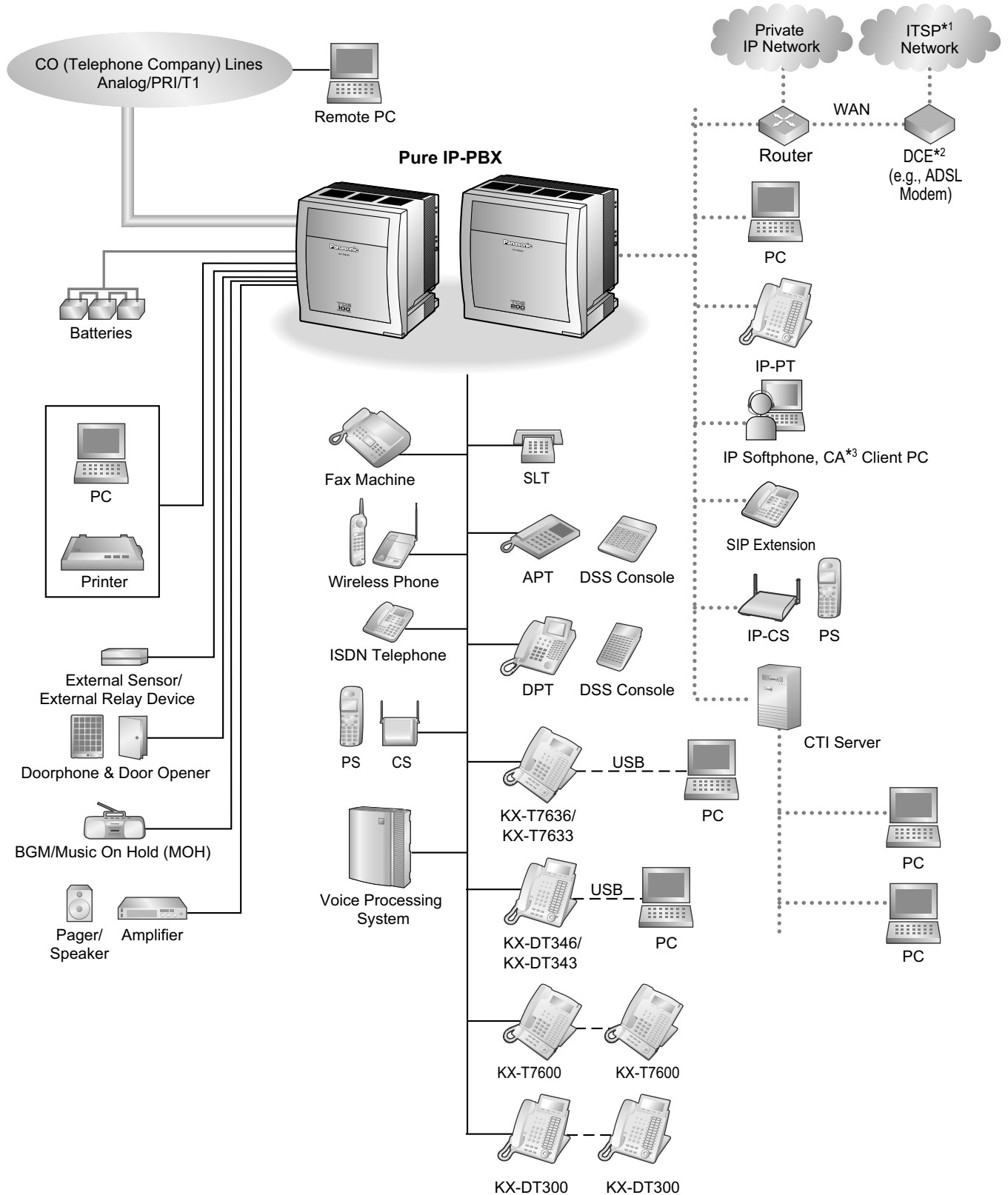**A.** PSU Slot
B. Free Slots
C. IPCMPR Card

KX-TDE100   KX-TDE200

1.1.2 System Connection Diagram

CO (Telephone Company) Lines
Analog/PRI/T1

Remote PC

Pure IP-PBX

Private IP Network

ITSP*1 Network

WAN

Router

DCE*2 (e.g., ADSL Modem)

PC

IP-PT

IP Softphone, CA*3 Client PC

SIP Extension

IP-CS   PS

CTI Server

Batteries

PC

Printer

External Sensor/ External Relay Device

Doorphone & Door Opener

BGM/Music On Hold (MOH)

Pager/ Speaker   Amplifier

Fax Machine

Wireless Phone

ISDN Telephone

PS   CS

Voice Processing System

SLT

APT   DSS Console

DPT   DSS Console

KX-T7636/ KX-T7633

USB   PC

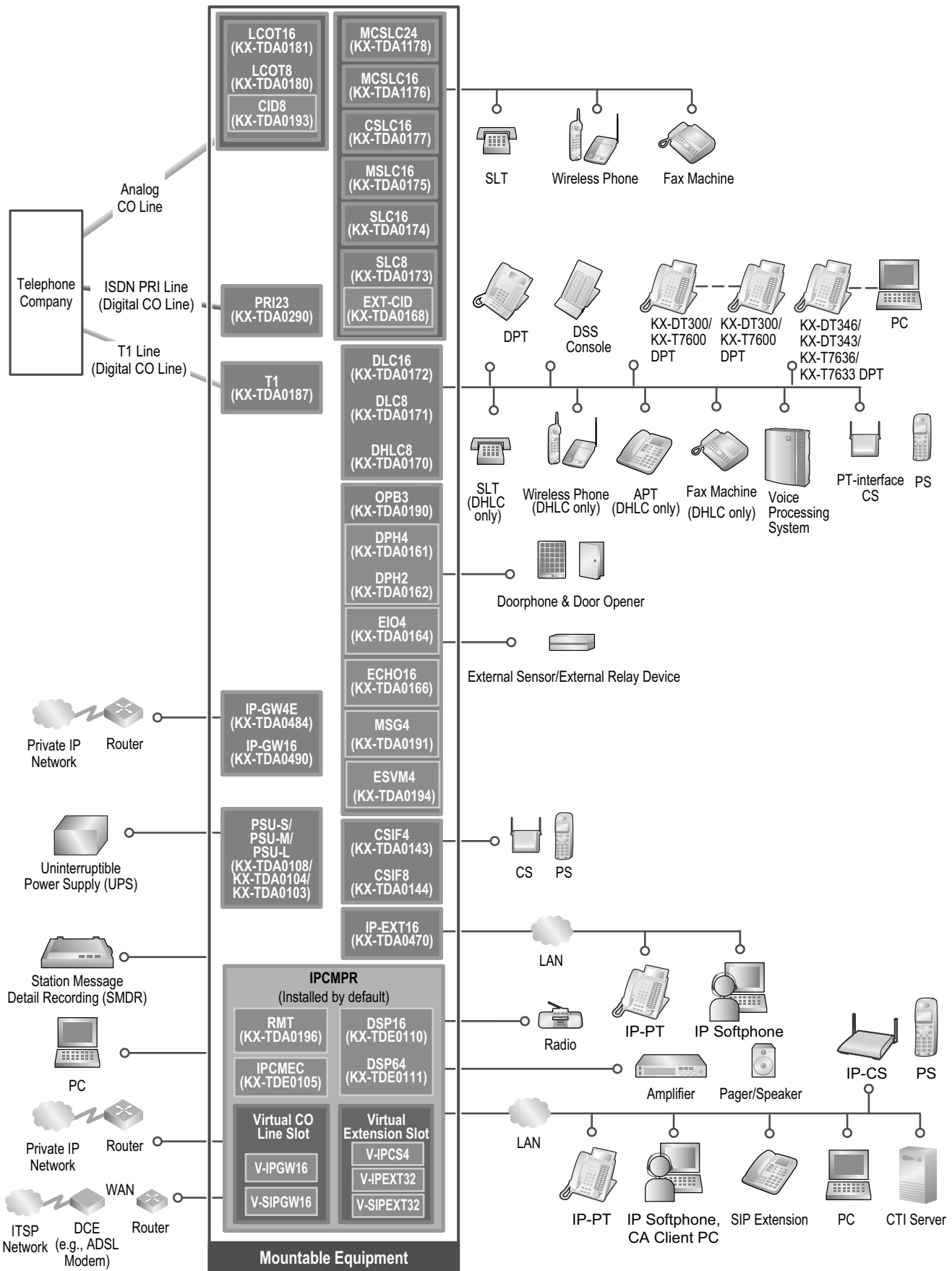KX-DT346/ KX-DT343

USB   PC

PC

PC

PC

KX-T7600   KX-T7600

KX-DT300   KX-DT300

*1   ITSP: Internet Telephony Service Provider
*2   DCE: Data Circuit Terminating Equipment
*3   CA: Communication Assistant

Mountable Equipment	Connected Devices

LCOT16 (KX-TDA0181)
LCOT8 (KX-TDA0180)
CID8 (KX-TDA0193)

MCSLC24 (KX-TDA1178)
MCSLC16 (KX-TDA1176)
CSLC16 (KX-TDA0177)
MSLC16 (KX-TDA0175)
SLC16 (KX-TDA0174)
SLC8 (KX-TDA0173)
EXT-CID (KX-TDA0168)

SLT
Wireless Phone
Fax Machine

DPT
DSS Console
KX-DT300/ KX-T7600 DPT
KX-DT300/ KX-T7600 DPT
KX-DT346/ KX-DT343/ KX-T7636/ KX-T7633 DPT
PC

Analog CO Line

ISDN PRI Line (Digital CO Line)

PRI23 (KX-TDA0290)

T1 Line (Digital CO Line)

T1 (KX-TDA0187)

Telephone Company

DLC16 (KX-TDA0172)
DLC8 (KX-TDA0171)
DHLC8 (KX-TDA0170)

SLT (DHLC only)
Wireless Phone (DHLC only)
APT (DHLC only)
Fax Machine (DHLC only)
Voice Processing System
PT-interface CS
PS

OPB3 (KX-TDA0190)
DPH4 (KX-TDA0161)
DPH2 (KX-TDA0162)

Doorphone & Door Opener

EIO4 (KX-TDA0164)

External Sensor/External Relay Device

ECHO16 (KX-TDA0166)
MSG4 (KX-TDA0191)
ESVM4 (KX-TDA0194)

IP-GW4E (KX-TDA0484)
IP-GW16 (KX-TDA0490)

Private IP Network
Router

PSU-S/ PSU-M/ PSU-L (KX-TDA0108/ KX-TDA0104/ KX-TDA0103)

Uninterruptible Power Supply (UPS)

CSIF4 (KX-TDA0143)
CSIF8 (KX-TDA0144)

CS
PS

IP-EXT16 (KX-TDA0470)

LAN

Station Message Detail Recording (SMDR)

IPCMPR (Installed by default)
RMT (KX-TDA0196)
DSP16 (KX-TDE0110)
IPCMEC (KX-TDE0105)
DSP64 (KX-TDE0111)

Radio
IP-PT
IP Softphone

PC

Amplifier
Pager/Speaker

IP-CS
PS

Private IP Network
Router

Virtual CO Line Slot
V-IPGW16
V-SIPGW16

Virtual Extension Slot
V-IPCS4
V-IPEXT32
V-SIPEXT32

LAN

IP-PT
IP Softphone, CA Client PC
SIP Extension
PC
CTI Server

ITSP Network
DCE (e.g., ADSL Modem)
WAN
Router

Mountable Equipment

1.2 Optional Equipment

1.2.1 Optional Equipment

Model No.	Model Name	Description
KX-TDE0105	Memory Expansion Card (IPCMEC)	Memory expansion card to increase system data storage space. To be mounted on the IPCMPR card.
KX-TDE0110	16-Channel VoIP DSP Card (DSP16)	16-channel digital signal processor card with a 4-Channel IP Trunk activation key and a 8-Channel IP Proprietary Telephone activation key preinstalled. Compliant with ITU-T G.729A and G.711 codec methods. To be mounted on the IPCMPR card.
KX-TDE0111	64-Channel VoIP DSP Card (DSP64)	64-channel digital signal processor card with four 4-Channel IP Trunk activation keys and four 8-Channel IP Proprietary Telephone activation keys preinstalled. Compliant with ITU-T G.729A and G.711 codec methods. To be mounted on the IPCMPR card.
KX-TDA0103	L-Type Power Supply Unit (PSU-L)	Power Supply Unit for the KX-TDE200. Total power output of 279 W. Safety Class 1 compliant.
KX-TDA0104	M-Type Power Supply Unit (PSU-M)	Power Supply Unit for the KX-TDE100 and KX-TDE200. Total power output of 140.4 W. Safety Class 1 compliant.
KX-TDA0108	S-Type Power Supply Unit (PSU-S)	Power Supply Unit for the KX-TDE100. Total power output of 74 W. Safety Class 1 compliant.
KX-TDA0143	4 Cell Station Interface Card (CSIF4)	4-port CS interface card for 4 CSs.
KX-TDA0144	8 Cell Station Interface Card (CSIF8)	8-port CS interface card for 8 CSs.
KX-TDA0161	4-Port Doorphone Card (DPH4)	4-port doorphone card for 4 doorphones and 4 door openers. To be mounted on the OPB3 card.
KX-TDA0164	4-Port External Input/Output Card (EIO4)	4-port external input/output card. To be mounted on the OPB3 card.
KX-TDA0166	16-Channel Echo Canceller Card (ECHO16)	16-channel card for echo cancellation during conferences. To be mounted on the OPB3 card.
KX-TDA0168	Extension Caller ID Card (EXT-CID)	Sends Caller ID signals (FSK) to extension ports. To be mounted on the SLC8 card only.
KX-TDA0170	8-Port Digital Hybrid Extension Card (DHLC8)	8-port digital hybrid extension card for DPTs, APTs, SLTs, DSS consoles, and PT-interface CSs, with 2 power failure transfer (PFT) ports.
KX-TDA0171	8-Port Digital Extension Card (DLC8)	8-port digital extension card for DPTs, DSS consoles, and PT-interface CSs.

Model No.	Model Name	Description
KX-TDA0172	16-Port Digital Extension Card (DLC16)	16-port digital extension card for DPTs, DSS consoles, and PT-interface CSs.
KX-TDA0173	8-Port Single Line Telephone Extension Card (SLC8)	8-port extension card for SLTs with 2 power failure transfer (PFT) ports.
KX-TDA0174	16-Port Single Line Telephone Extension Card (SLC16)	16-port extension card for SLTs with 4 power failure transfer (PFT) ports.
KX-TDA0175	16-Port Single Line Telephone Extension with Message Lamp Card (MSLC16)	16-port extension card for SLTs with Message Waiting Lamp control and 4 power failure transfer (PFT) ports. Maximum power output of 160 V/90 V (open voltage with no external load) for Message Waiting Lamp control.
KX-TDA0177	16-Port Single Line Telephone Extension Card with Caller ID (CSLC16)	16-port extension card for SLTs with Caller ID (FSK) and 4 power failure transfer (PFT) ports.
KX-TDA1176	16-Port Single Line Telephone Extension with Caller ID and Message Lamp Card (MCSLC16)	16-port extension card for SLTs with Caller ID (FSK), Message Waiting Lamp control, and 2 power failure transfer (PFT) ports. Maximum power output of 90 V (open voltage with no external load) for Message Waiting Lamp control. IPCMEC card required to install this card.
KX-TDA1178	24-Port Single Line Telephone Extension with Caller ID and Message Lamp Card (MCSLC24)	24-port extension card for SLTs with Caller ID (FSK), Message Waiting Lamp control, and 2 power failure transfer (PFT) ports. Maximum power output of 90 V (open voltage with no external load) for Message Waiting Lamp control. IPCMEC card required to install this card.
KX-TDA0180	8-Port Analog Trunk Card (LCOT8)	8-port analog CO line card with 2 power failure transfer (PFT) ports.
KX-TDA0181	16-Port Analog Trunk Card (LCOT16)	16-port analog CO line card with 4 power failure transfer (PFT) ports.
KX-TDA0187	T-1 Trunk Card (T1)	1-port T1 CO line card. EIA/TIA standard compliant.
KX-TDA0190	Optional 3-Slot Base Card (OPB3)	Optional 3-slot base card for mounting a maximum of 3 option cards from the following: MSG4, ESVM4, DPH4, EIO4, or ECHO16 card.
KX-TDA0191	4-Channel Message Card (MSG4)	4-channel message card. To be mounted on the OPB3 card.
KX-TDA0193	8-Port Caller ID Card (CID8)	8-port Caller ID signal type FSK/FSK (with Call Waiting Caller ID [Visual Caller ID])/DTMF. To be mounted on the LCOT8/LCOT16 cards.

Model No.	Model Name	Description
KX-TDA0194	4-Channel Simplified Voice Message Card (ESVM4)	4-channel simplified voice message card for Simplified Voice Message feature. Also supports MSG card features. To be mounted on the OPB3 card.
KX-TDA0196	Remote Card (RMT)	Analog modem card for remote communication with the PBX. ITU-T V.90 support. To be mounted on the IPCMPR card.
KX-TDA0290	PRI Card (PRI23)	1-port ISDN Primary Rate Interface card (23B channels). NI (North American standard ISDN protocol) compliant.
KX-TDA0470	16-Channel VoIP Extension Card (IP-EXT16)	16-channel VoIP extension card. Compliant with Panasonic proprietary protocol, and ITU-T G.729A and G.711 codec methods.
KX-TDA0484	4-Channel VoIP Gateway Card (IP-GW4E)	4-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729A, G.723.1 and G.711 codec methods.
KX-TDA0490	16-Channel VoIP Gateway Card (IP-GW16)	16-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729A, G.723.1 and G.711 codec methods.

Note

For the maximum number of optional service cards that can be installed in the PBX, refer to "1.3.3 System Capacity".

1.3 Specifications

1.3.1 General Description

Control Bus		Original bus (16-bit, 8 MHz, 10 megabytes per second)
Communication Bus		H.100 bus conformity (1024 time slots)
Switching		Non-blocking
Power Input	**PSU-S**	100 V AC to 130 V AC; 1.4 A/200 V AC to 240 V AC; 0.8 A; 50 Hz/60 Hz
	PSU-M	100 V AC to 130 V AC; 2.5 A/200 V AC to 240 V AC; 1.4 A; 50 Hz/60 Hz
	PSU-L	100 V AC to 130 V AC; 5.1 A/200 V AC to 240 V AC; 2.55 A; 50 Hz/60 Hz
Maximum Power Failure Tolerance[1]		300 ms
Memory Backup Duration		7 years
Dialing	**CO Line**	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialing
	Extension	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialing
Mode Conversion		DP-DTMF, DTMF-DP
Ring Frequency		20 Hz/25 Hz (selectable)
Central Office Loop Limit		1600 Ω maximum
Operating Environment	**Temperature**	0 °C to 40 °C (32 °F to 104 °F)
	Humidity	10 % to 90 % (non-condensing)
Conference Call CO Line		From 10 × 3-party conference call to 4 × 8-party conference call
Music on Hold (MOH)		2 ports (Level Control: -11 dB to +11 dB in 1 dB steps) MOH1: External Music Source port MOH2: Selectable Internal/External Music Source port
Paging	**Internal**	Level Control: -15 dB to +6 dB in 3 dB steps
	External	2 ports (Volume Control: -15 dB to +15 dB in 1 dB steps)
Serial Interface Port	**RS-232C**	1 (maximum 115.2 kbps)
RJ45 Port	**MNT Port**	1 (for PC connection)
	LAN Port	1 (for LAN connection)

Extension Connection Cable		SLT	1-pair wire (T, R)
		DPT	1-pair wire (D1, D2) or 2-pair wire (T, R, D1, D2)
		APT	2-pair wire (T, R, D1, D2)
		PT-interface CS (2-channel)	1-pair wire (D1, D2)
		PT-interface CS (8-channel)	4-pair wire (D1, D2)
		DSS Console and Add-on Key Module	1-pair wire (D1, D2)
Dimension	**KX-TDE100**	334 mm (W) × 390 mm (H) × 272 mm (D) (13-1/3 in × 15-3/5 in × 10-3/4 in)	
	KX-TDE200	430 mm (W) × 415 mm (H) × 276 mm (D) (17-1/5 in × 16-3/5 in × 10-7/8 in)	
Weight (when fully mounted)	**KX-TDE100**	Under 12 kg (26.4 lb)	
	KX-TDE200	Under 16 kg (35.2 lb)	

[*1]   If tolerance may be exceeded, an Uninterruptible Power Supply (UPS) is recommended.

1.3.2 Characteristics

Terminal Equipment Loop Limit	• PT: KX-DT300/KX-T7600 series DPT: 90 Ω; all other DPTs/APTs: 40 Ω • SLT: 600 Ω including set • Doorphone: 20 Ω • CS: 130 Ω; PT-interface CS: 65 Ω
Minimum Leakage Resistance	15 000 Ω minimum
Maximum Number of Extension Instruments per Line	1. for PT or SLT 2. by Parallel or eXtra Device Port connection of an APT/DPT and an SLT 3. by Digital eXtra Device Port connection of 2 DPTs and an SLT
Ring Voltage	75 Vrms at 20 Hz/25 Hz depending on the Ringing Load
Central Office Loop Limit	1600 Ω maximum
Hookswitch Flash Timing Range	24 ms to 2032 ms
Door Opener Current Limit	24 V DC/30 V AC, 1 A maximum
External Relay Current Limit	24 V DC/30 V AC, 1 A maximum
External Sensor Current Limit	Power to the external sensor is provided from the EIO4 card and must be grounded through the EIO4 card. For the connection diagram, refer to "3.7.3 EIO4 Card (KX-TDA0164)". The PBX detects input from the sensor when the signal is under 100 Ω.
Paging Terminal Impedance	600 Ω
MOH (Music on Hold) Terminal Impedance	10 000 Ω

1.3.3 System Capacity

Type and Maximum Number of Slots

The PBX supports the following type and number of slots.

Slot Type		Maximum Number	
		KX-TDE100	KX-TDE200
IPCMPR Card Slot		1	1
Free Slot		6	11
Virtual Slot	Virtual CO Line Slot	4	4
	Virtual Extension Slot	4	4

IPCMPR Card Slot and Free Slots
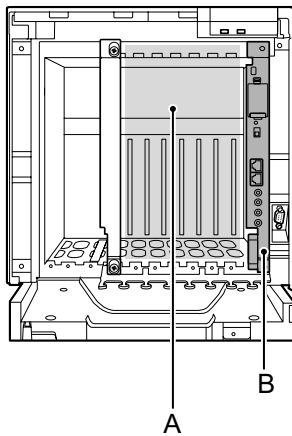
KX-TDE100   **KX-TDE200**
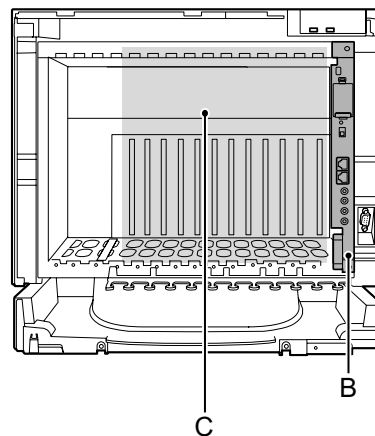
A. Free Slots 1 to 6 (from the left)
B. IPCMPR Card Slot
C. Free Slots 1 to 11 (from the left)

Virtual Slots of the IPCMPR Card

IPCMPR Card

Virtual CO Line Slots

Virtual Extension Slots
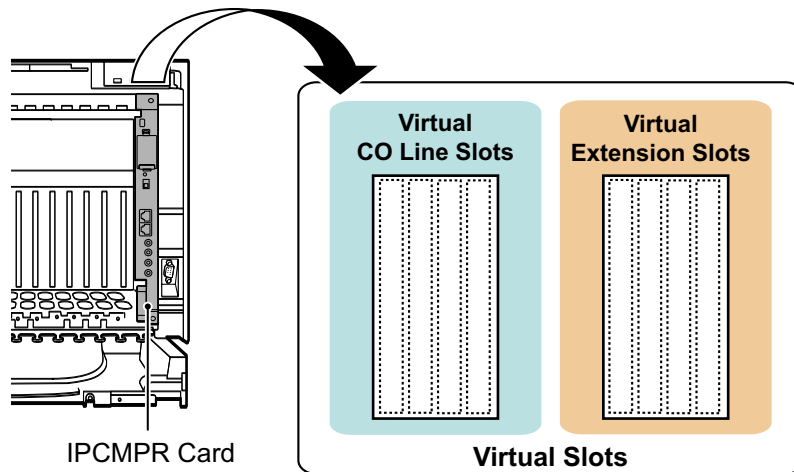
Virtual Slots

Maximum Optional Service Cards

The following number of cards can be installed in the Free Slots or Virtual Slots of the PBX.

Note

- Any card that exceeds the capacity of the PBX will be ignored.
- When the PBX starts up with an invalid configuration, some cards will be ignored.

Cards Installed in Free Slots or Virtual Slots

Card Type			Maximum Number	
			KX-TDE100	KX-TDE200
IPCMPR			1	1
	CO Line Card		8	8
		Virtual CO Line Card	4	4
		V-IPGW16	2	2
		V-SIPGW16	4	4
		Physical CO Line Card	Total 6 [*1]	Total 8 [*2]
		LCOT8	6	8
		LCOT16		
		T1	4	4
		PRI23		
		IP-GW4E	4	4
		IP-GW16		
	Extension Card		8	8
		Virtual Extension Card	4	4
		V-IPEXT32	4	4
		V-SIPEXT32		
		V-IPCS4		
		Physical Extension Card	Total 6	Total 8
		DHLC8	6	8
		DLC8		
		DLC16		
		SLC8		
		SLC16		
		CSLC16		
		MSLC16		
		MCSLC16 [*3]		
		IP-EXT16		
		MCSLC24 [*3]	5	5
		CSIF4	4	4
		CSIF8		
	OPB3		4	4
Total			14	16

[*1] When installing T1 and PRI23 cards, make sure that the number of these cards × 2 + the number of the other cards does not exceed 8.

[*2] One T1 or PRI23 card counts as 2 cards.

[*3] The IPCMEC card must be installed in order to install a MCSLC16/MCSLC24 card.

Cards Mounted on Other Optional Service Cards

Card Type	Maximum Number		Mounted on
	KX-TDE100	**KX-TDE200**	
DSP16	1	1	IPCMPR Card
DSP64			
IPCMEC	1	1	
RMT	1	1	
CID8	12	16	LCOT8 Card/LCOT16 Card
EXT-CID	6	8	SLC8 Card
DPH4	4	4	OPB3 Card
ECHO16	2[*1]	2[*1]	
MSG4	4	4	
ESVM4			
EIO4	4	4	

[*1]   Only 1 ECHO16 card can be mounted on each OPB3 card.

Maximum CO Lines and Extensions

The PBX supports the following number of CO lines and extensions.

Type	KX-TDE100	KX-TDE200
Total Number of CO Lines	128	128
CO Line (Physical CO Line Card)	112	128
CO Line (Virtual CO Line Card)	64	64
H.323 CO Lines	32	32
SIP CO Lines	64	64
Total Number of Extensions	256	256
Extension (Physical Extension Card)	160	256
Extension (Virtual Extension Card)	128	128
IP-PT and IP Softphone	128	128
SIP Extension		

DSP Card Resources

The maximum number of simultaneous calls using IP protocols is determined by the type of call, codec(s) used, and digital signal processor (DSP) card installed in the PBX.
Below are some example configurations and the maximum number of simultaneous calls for each.

For Calls between Virtual CO Lines and Virtual Extensions

Codec(s) Used	Maximum Number of Simultaneous Calls	
	DSP16 Card	DSP64 Card
G.711	32	64
G.711+G.729A[*1]	12	42
G.729A	8	32

[*1]   For example, when a virtual extension uses G.711 and a virtual CO line uses G.729A for the same call.

For Calls between Virtual CO Lines and Physical Card Extensions (e.g., DPTs, etc.)

Codec Used	Maximum Number of Simultaneous Calls	
	DSP16 Card	DSP64 Card
G.711	32	64
G.729A	12	50

For Calls between Virtual Extensions and Physical Card Extensions/CO Lines (e.g., PRI, etc.)

Codec Used	Maximum Number of Simultaneous Calls	
	DSP16 Card	DSP64 Card
G.711	64	113
G.729A	16	64

Note

For non-peer-to-peer calls via the DSP card, calls cannot be made or received when all of the card's resources are being used.

Maximum Terminal Equipment

The following shows the number of each terminal equipment type supported by the PBX.

Terminal Equipment Type		KX-TDE100	KX-TDE200
Telephone		256	256
	SLT	128	168
	KX-DT300/KX-T7600 series DPT	128	256
	Other DPT	32	128
	APT	24	64
	IP-PT	192	192
	IP-PT[*1] (supported by IP-EXT16 card)	96	128
	IP-PT[*2] (supported by IPCMPR card)	128[*3]	128[*3]
	SIP Extension	128	128
DSS console		8	8
CS		32[*4]	32[*4]
	PT-interface CS (2-channel)/CS for CSIF card	32	32
	PT-interface CS (8-channel)	16	16
	IP-CS (8-channel)	16	16
PS		128	128
Voice Processing System (VPS)		2	2
Doorphone		16	16
Door Opener		16	16
External Sensor		16	16
External Relay		16	16

[*1] KX-NT300 series (except KX-NT366/KX-NT305), KX-NT265, and KX-NT136
[*2] KX-NT400, KX-NT300 series and KX-NT265 (software version 2.00 or later only)
[*3] For the KX-NT400, the maximum number of extensions that can be connected to the PBX is 64.
[*4] One 8-channel PT-interface CS or IP-CS counts as 2 CSs for the total number of CSs.

Note for KX-NT265 IP-PT users

The supported card varies depending on the software version of your KX-NT265 IP-PT. To confirm the version, follow the procedure below:

While starting up

PROGRAM ▶ ▽ ▶ SP-PHONE ▶ ▽ ▶ SP-PHONE ▶ `"AP Version"`. ▶▶

Select "Maintenance".   Select "Version display".

▶▶ SP-PHONE ▶ Software version is displayed.

To exit the programming mode
▶ HOLD ▶ HOLD ▶ HOLD ▶ HOLD
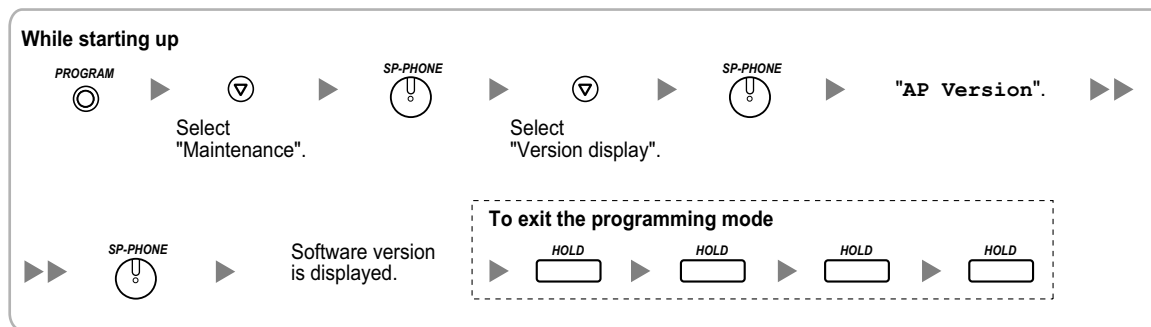
Power Supply Unit Selection

The PBX needs a power supply unit (PSU) suitable for its configuration. Calculate the load figure from the type and number of items of equipment to be connected, and determine the type of PSU that will be required.

Load Figure Calculation

Equipment Type		Load Figure
PT	KX-DT300 series DPT/KX-DT300 series DSS console/KX-T7600 series DPT/KX-T7600 series DSS console	1
	Other DPT/Other DSS console	4
	APT	4
	IP-PT	0
	SIP Extension	0
Extension Card[1]	DHLC8	8
	SLC8	8
	SLC16/MSLC16/CSLC16/MCSLC16	16
	MCSLC24	24
PT-interface CS (2-channel)/CS for CSIF card (1 unit)		4
PT-interface CS (8-channel) (1 unit)		8
IP-CS (8-channel) (1 unit)		0
VPS (1 port)		1

[1] Only the extension cards that can support SLTs count for the load figures.

PSU Capacity

Each PSU supports a different load figure.

PSU Type	Maximum Load Figure
PSU-S (for KX-TDE100 only)	64
PSU-M	128
PSU-L (for KX-TDE200 only)	512

Calculation Example (KX-TDE200)

Equipment Type		Load Figure
KX-T7600 series DPT	48 units	48
Other DPT	2 units	8
SLC16	1 card	16
MSLC16	1 card	16
VPS	8 ports	8
Total		96

The total load figure is 96. As this is between 64 and 128, you should install the PSU-M. But if you expect expansion in the future, it may be better to install the PSU-L. There is no harm in installing a PSU that is larger than is required for the current configuration.

Section 2

Activation Key Installation

This section describes information on activation keys, including how to obtain an activation key and install it in the SD Memory Card.

2.1 Information about the Activation Keys

2.1.1 Activation Keys

To use IP CO lines and IP telephones on a private IP network using the IPCMPR card or to upgrade the software for enhanced features, you need the appropriate activation keys.

Type and Maximum Number of Activation Keys

The PBX supports the following type and number of activation keys:

Activation Key Type	Description	Maximum Number	Supported IP CO lines/ IP Telephones/CA Users
2 IP Trunk[1]	Allows the use of 2 IP CO lines (H. 323/SIP).	32	64 IP CO lines (H.323/ SIP)
4 IP Trunk[1]	Allows the use of 4 IP CO lines (H. 323/SIP).	16	
1 IP Softphone/IP PT[2]	Allows the use of 1 IP-PT/IP softphone.	128	128 IP-PTs/IP softphones
4 IP Softphone/IP PT[2]	Allows the use of 4 IP-PTs/IP softphones.	32	
8 IP Softphone/IP PT[2]	Allows the use of 8 IP-PTs/IP softphones.	16	
16 IP Softphone/IP PT[2]	Allows the use of 16 IP-PTs/IP softphones.	8	
1 IP PT	Allows the use of 1 IP-PT.	128	128 IP-PTs
4 IP PT	Allows the use of 4 IP-PTs.	32	
8 IP PT	Allows the use of 8 IP-PTs.	16	
16 IP PT	Allows the use of 16 IP-PTs.	8	
1 SIP Extension	Allows the use of 1 SIP Extension.	128	128 SIP Extensions
4 SIP Extension	Allows the use of 4 SIP Extensions.	32	
8 SIP Extension	Allows the use of 8 SIP Extensions.	16	
16 SIP Extension	Allows the use of 16 SIP Extensions.	8	
CA Pro 1user	Allows the use of CA Pro for 1 user.	128	128 users
CA Pro 5users	Allows the use of CA Pro for 5 users.	25	125 users
CA Pro 10users	Allows the use of CA Pro for 10 users.	12	120 users
CA Pro 40users	Allows the use of CA Pro for 40 users.	3	120 users
CA Pro 128users	Allows the use of CA Pro for 128 users.	1	128 users

Activation Key Type	Description	Maximum Number	Supported IP CO lines/ IP Telephones/CA Users
CA Supervisor 1user	Allows the use of CA ACD Monitor for 1 ICD Supervisor.	4	4 users
Software Upgrade 01	Upgrades software to use enhanced features.	1	-

[*1] You need to set the number of the installed activation key to be used for H.323 CO lines through system programming. By default, all the installed activation keys will be used for SIP CO lines.

[*2] You can set how many IP softphones can be used with the installed activation keys through system programming. By default, only IP softphones can be used with the installed activation keys.

Preinstalled Activation Keys in the DSP16/DSP64

The following type and number of activation keys are preinstalled on the DSP16/DSP64 card:

Card Type	Activation Key		Supported IP CO lines/IP-PTs
DSP16	**4-Channel IP Trunk**	1	4 IP CO lines (H.323/SIP)
	8-Channel IP Proprietary Telephone	1	8 IP-PTs
DSP64	**4-Channel IP Trunk**	4	16 IP CO lines (H.323/SIP)
	8-Channel IP Proprietary Telephone	4	32 IP-PTs

Depending on the number of IP CO lines and IP-PTs to be used, you need to select either the DSP16 or DSP64 card.

Additional Activation Keys in the SD Memory Card (Activation Key Files)

When the number of preinstalled activation keys on the DSP16/DSP64 card is not enough for the desired configuration or when you wish to use enhanced features, additional activation keys in the form of activation key files can be installed on the SD Memory Card.
The following type and number of additional activation keys can be installed on the SD Memory Card:

Activation Keys for IP CO Lines

Model No.	Activation Key Type	Maximum Number/Supported IP CO Lines			
		with DSP16		with DSP64	
KX-NCS4102	**2 IP Trunk**	30	60 IP CO lines (H.323/SIP)	24	48 IP CO lines (H.323/SIP)
KX-NCS4104	**4 IP Trunk**	15		12	

Activation Keys for IP Telephones

Model No.	Activation Key Type	Maximum Number/Supported IP Telephones			
		with DSP16		with DSP64	
KX-NCS4201	**1 IP Softphone/IP PT**	120	120 IP-PTs/IP softphones	96	96 IP-PTs/IP softphones
KX-NCS4204	**4 IP Softphone/IP PT**	30	120 IP-PTs/IP softphones	24	96 IP-PTs/IP softphones
KX-NCS4208	**8 IP Softphone/IP PT**	15	120 IP-PTs/IP softphones	12	96 IP-PTs/IP softphones
KX-NCS4216	**16 IP Softphone/IP PT**	7	112 IP-PTs/IP softphones	6	96 IP-PTs/IP softphones
KX-NCS4501	**1 IP PT**	120	120 IP-PTs	96	96 IP-PTs
KX-NCS4504	**4 IP PT**	30	120 IP-PTs	24	96 IP-PTs
KX-NCS4508	**8 IP PT**	15	120 IP-PTs	12	96 IP-PTs
KX-NCS4516	**16 IP PT**	7	112 IP-PTs	6	96 IP-PTs
KX-NCS4701	**1 SIP Extension**	128	128 SIP Extensions	128	128 SIP Extensions
KX-NCS4704	**4 SIP Extension**	32		32	
KX-NCS4708	**8 SIP Extension**	16		16	
KX-NCS4716	**16 SIP Extension**	8		8	

Activation Keys for CA Users

Model No.	Activation Key Type	Maximum Number	Supported CA Users
KX-NCS2201	**CA Pro 1user**	128	128 users
KX-NCS2205	**CA Pro 5users**	25	125 users

Model No.	Activation Key Type	Maximum Number	Supported CA Users
KX-NCS2210	**CA Pro 10users**	12	120 users
KX-NCS2240	**CA Pro 40users**	3	120 users
KX-NCS2249	**CA Pro 128users**	1	128 users
KX-NCS2301	**CA Supervisor 1user**	4	4 users

Activation Keys for Software Upgrading

Model No.	Activation Key Type	Maximum Number
KX-NCS4910	**Software Upgrade 01**	1

Note

- For information about how to obtain the additional activation keys, refer to "2.1.2 Activation Key Code and Key Management System".
- For information about how to install the activation key files on the SD Memory Card, refer to "2.1.3 Activation Key File".

Activation Key Installation Example

The following shows an example of when using 16 H.323 CO lines, 16 SIP CO lines, 32 IP-PTs, 32 IP softphones, and 64 SIP Extensions on a private IP network using the IPCMPR card.
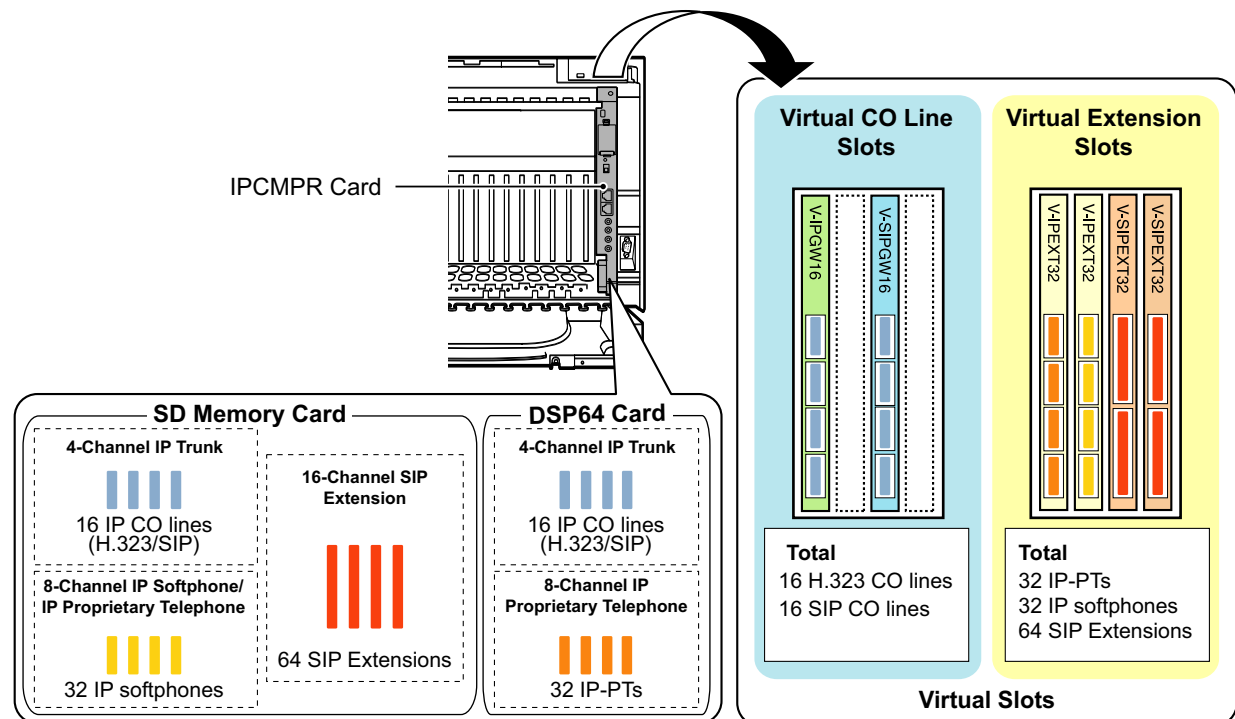
2.1.2 Activation Key Code and Key Management System

To obtain additional activation keys, you need to purchase the appropriate activation key codes and access the Key Management System. You can download the activation keys as an activation key file from the Key Management System.
To download the activation keys, enter the MPR ID number shown on the IPCMPR card in the PBX, and activation key number and registration ID provided on each activation key code.
For information about the type of activation key codes available, refer to "Additional Activation Keys in the SD Memory Card (Activation Key Files)".

Note

- You can only download the activation key file once using the activation key number and registration ID provided on the activation key code.
- Up to 8 activation keys can be downloaded as one activation key file.
- Up to 100 activation key files can be installed on the SD Memory Card.
- It is possible to send the activation key file to a specified e-mail address at the same time as downloading it to a PC.
- Make sure to backup the downloaded activation key files on your PC.
- In the event of a system malfunction, you need a temporary activation key for maintenance purposes. The temporary activation key can only be used for a limited time period, and can be downloaded from the Key Management System in the same way as downloading activation key files.

2.1.3 Activation Key File

The corresponding number of IP CO lines and IP telephones or enhanced features can be activated by installing the downloaded activation key file(s) in the SD Memory Card of the IPCMPR card using the Maintenance Console.

Installing the Activation Key File in the SD Memory Card

Make sure to install the Maintenance Console on the PC in advance, and connect the PC to the PBX. For details about the Maintenance Console, refer to "Section 4 Guide for the Maintenance Console".

1. Start the Maintenance Console from the Start menu on the PC.
2. From the **Utility** menu, select **File Transfer PC to PBX (SD Card)**.
   A dialog box will be displayed.
3. Select the file to upload.
   A window showing the upload progress will be displayed.
   While transferring files to the SD memory card, the PBX automatically renames them according to the header information.
   A message will be displayed when the transfer is complete.
4. Click **OK**.
5. Under **Configuration**, click **Slot**.
6. Click **Activation Key**.
7. For IP trunk activation key file(s), click **Execute**.
   A confirmation message will be displayed. Click **Yes**.

Notice

The activation key file can only be installed in the PBX with the MPR ID number entered when the activation key file was downloaded. The activation key file cannot be reissued unless the IPCMPR card crashes.

Note

- When the virtual cards are changed back to INS, the PC temporarily loses connection to the network.
- It is necessary to restart the PBX to activate the Software Upgrade 01 activation key after performing the procedure above. To restart the PBX, refer to "5.1.4 Using the Reset Button".
- For information about programming activation keys using the Maintenance Console, refer to "SIP Extension" in the PC Programming Manual.

2.1.3 Activation Key File

Section 3

Installation

This section describes the procedures to install the PBX. Detailed instructions for planning the installation site, installing the shelves and optional service cards, and cabling of peripheral equipment are provided. Further information on system expansion and peripheral equipment installation is included.

3.1 Before Installation

3.1.1 Before Installation

Please read the following notes concerning installation and connection before installing the PBX and terminal equipment.
Be sure to comply with all applicable laws, regulations, and guidelines.

Safety Installation Instructions

WARNING

When installing telephone wiring, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:
- **Never install telephone wiring during a lightning storm.**
- **Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.**
- **Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.**
- **Use caution when installing or modifying telephone lines.**
- **Anti-static precautions should be taken during installation.**

Installation Precautions

This set is made for wall mounting (KX-TDE100/KX-TDE200) or floor standing (KX-TDE200 only), and should be installed in a location where it is accessible for inspections and maintenance. To prevent malfunction, noise, or discoloration, follow the instructions below:

WARNING

Do not install the system in the following locations:
- **Areas where shocks or vibrations are frequent or strong. Such activity may lead to the product falling over and causing injury, or may impair the product's performance.**
- **Areas with high amounts of dust. High amounts of dust can lead to fire or electric shock, and impair the performance of the product.**

CAUTION

Do not install the system in the following locations:
- In direct sunlight and hot, cold, or humid places. Temperature range: 0 °C to 40 °C (32 °F to 104 °F)
- Areas where sulfuric gases may be present, such as near thermal springs.
- Near devices that generate high frequencies, such as sewing machines or electric welders.
- Locations where other objects will obstruct the area around the PBX. Be especially careful to leave at least 20 cm (8 in) of space above and 10 cm (4 in) to the sides of the PBX for ventilation.

Notice

Do not install the system in the following locations:
- On or near computers, telexes, or other office equipment, as well as microwave ovens or air conditioners. (It is preferable not to install the system in the same room as the above equipment.)
- Within 1.8 m (6 ft) of radios and televisions. (Both the PBX and PTs should be at least 1.8 m (6 ft) away from such devices).

Do not perform the following:
- Do not block the openings of the PBX.

- Do not stack up the optional service cards.

Wiring Precautions

Be sure to follow these instructions when wiring the unit:

CAUTION

- Avoid using the same AC outlet for computers, telexes, and other office equipment, as noise generated by such equipment may hamper system performance or interrupt the system.
- Unplug the system from its power source when wiring, and plug the system back in only after all wiring is completed.
- CO Lines should be installed with surge protectors. For details, refer to "3.2.13 Surge Protector Installation".

Notice

- Use 2-pair telephone cables when connecting PTs.
  Use 1-pair telephone cables when connecting SLTs, data terminals, answering machines, computers, Voice Processing Systems, etc.
- Mis-wiring may cause the PBX to operate improperly. Refer to Section 2 "Section 3 Installation" when wiring the system.
- If an extension does not operate properly, disconnect the telephone from the extension line and connect it again, or turn off the PBX using the power switch, then turn it on again.
- Use twisted pair cable for CO line connection.
- To prevent signal noise from interfering with the performance of the product, do not run unshielded telephone cables near AC power cables, computer cables, AC power sources, etc. When running cables near other noise-generating devices or cables, use shielded telephone cables or shield the telephone cables with metal tubing.
- To assure good quality telephone connection, it is recommended new and modifications to existing installation of customer premise wiring shall use solid twisted pair copper conductors with minimum 24 gauge that comply with the electrical specifications for Category 3 wiring as detailed in ANSI/EIA/TIA-570A Building Wiring Standards.

3.2 Installation of the PBX

3.2.1 Unpacking

Unpack the box and check the items below:

	KX-TDE100	**KX-TDE200**
Main Unit	1	1
Ferrite Core (for the IPCMPR card)	2	2
Metal Bracket	1	1
Screw A	3	4
Screw B (Black)	2	6
Anchor Plug	3	4
Mini Plug (for pager and music source)	4	4
SD Memory Card	1	1

3.2.2 Names and Locations

Inside View
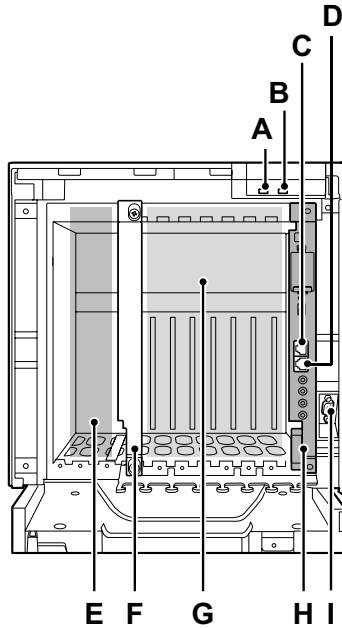
KX-TDE100   **KX-TDE200**
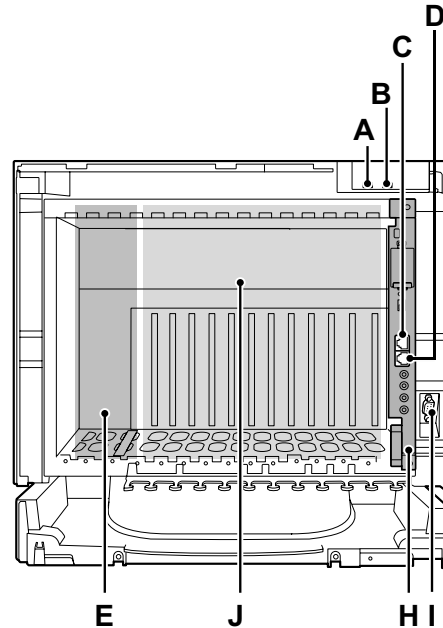
A. RUN Indicator
B. ALARM Indicator
C. MNT Port
D. LAN Port
E. PSU Slot
F. Null Slot (not available for any optional service card)
G. Free Slots 1 to 6 (from the left)
H. IPCMPR Card Slot
I. RS-232C Port
J. Free Slots 1 to 11 (from the left)

3.2.3 Opening/Closing the Front Cover

Opening the Front Cover

1. Insert a flathead screwdriver into the opening (on the left of the screw cover) and unlatch the screw cover.

Screw Cover
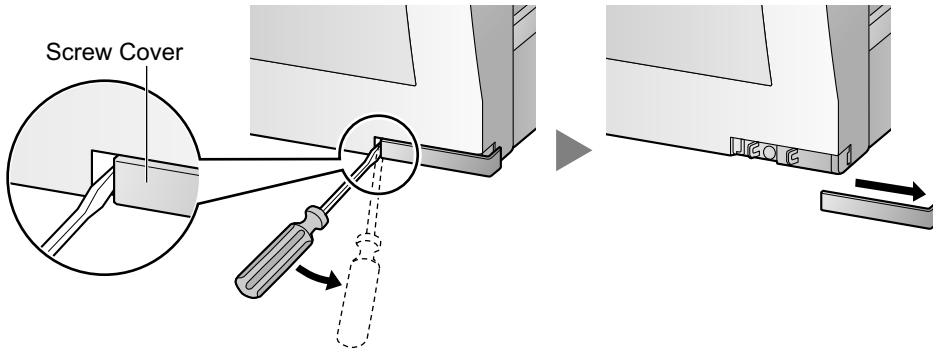
2. Turn the screw anticlockwise to loosen.
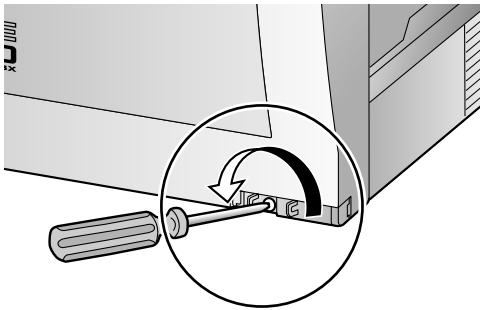
3. Slide the front cover to the right until it stops, then lift the front cover.
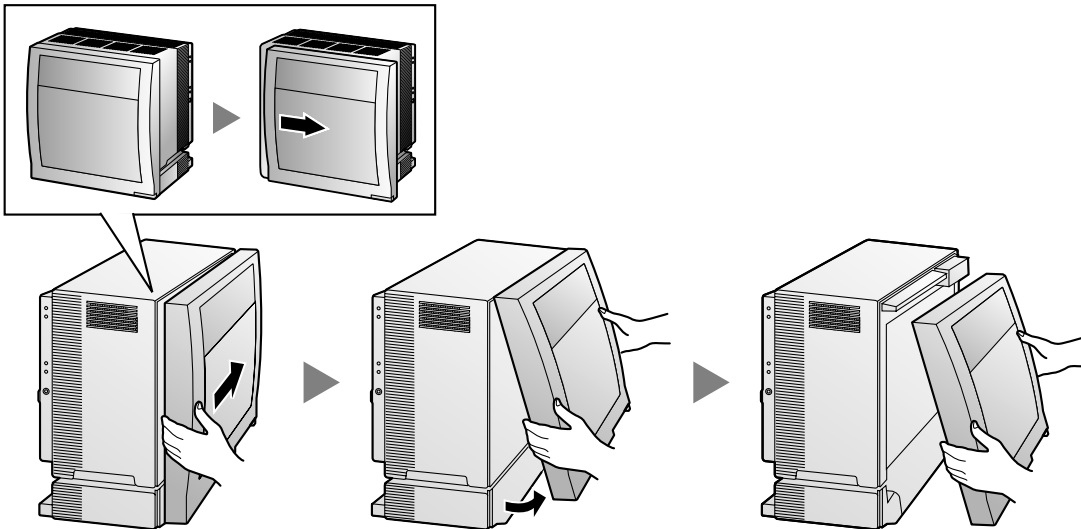
Closing the Front Cover

1. Hook the front cover onto the shelf (line up the protrusions on the cover with the receptacles on the shelf). Then slide the front cover to the left until it locks.
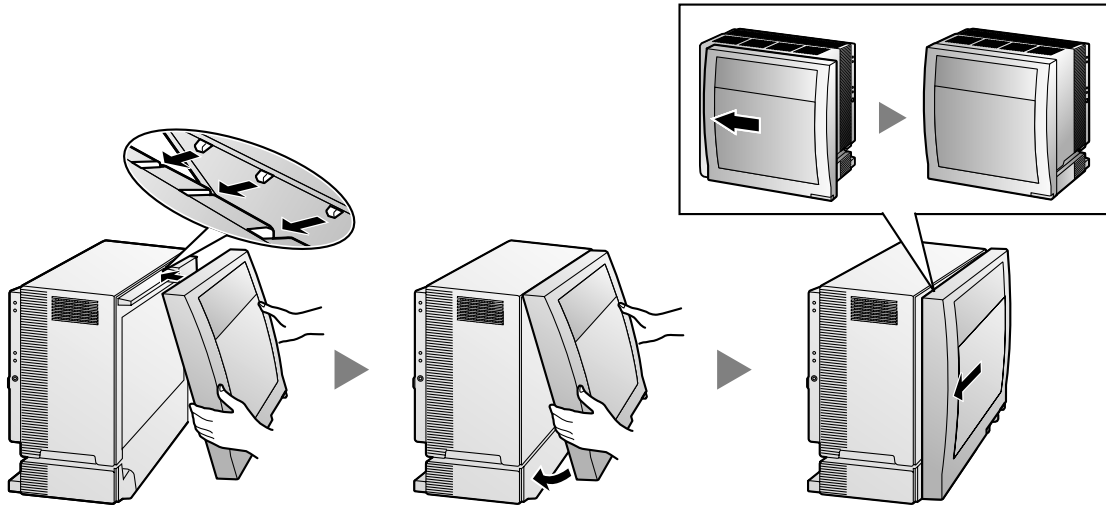
2. Turn the screw clockwise to tighten.
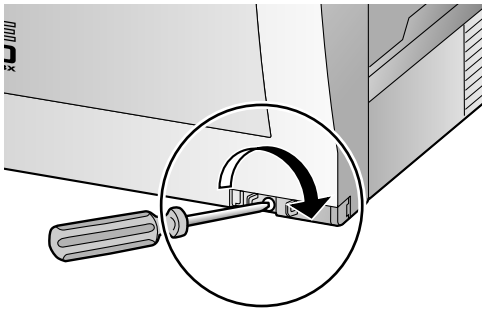
3. Secure the screw cover.
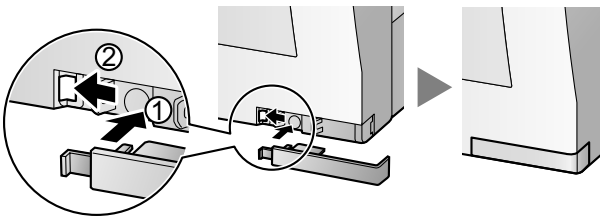
CAUTION

- For safety reasons, close the front cover and tighten the screw before operating the PBX.
- Do not forget to tighten the screw before securing the screw cover.

3.2.4 Installing/Replacing the Power Supply Unit

Function

PSU Type	Lower/Upper Input Voltage Range	Current	Input Frequency
PSU-S (for KX-TDE100)	Lower: 100 V AC to 130 V AC	1.4 A	50 Hz or 60 Hz
	Upper: 200 V AC to 240 V AC	0.8 A	
PSU-M (for KX-TDE100/ KX-TDE200)	Lower: 100 V AC to 130 V AC	2.5 A	
	Upper: 200 V AC to 240 V AC	1.4 A	
PSU-L (for KX-TDE200)	Lower: 100 V AC to 130 V AC	5.1 A	
	Upper: 200 V AC to 240 V AC	2.55 A	

PSU-S   PSU-M/PSU-L

Power Switch

Ground Terminal
AC Inlet

Ground Terminal

Power Switch
AC Inlet
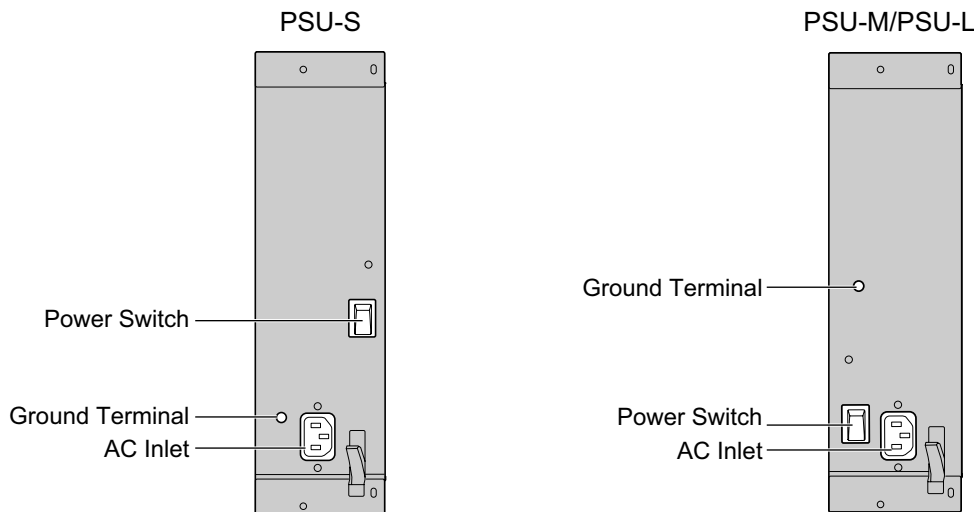
Accessories and User-supplied Items

Accessories (included): Screws × 4, AC power cord × 1
User-supplied (not included): Grounding wire

WARNING

- **Each PSU complies with Safety Class 1 of IEC60950, EN60950, UL60950, CAN/CSA-C22.2 No. 60950, AS/NZS60950, and GB4943; therefore a protective ground connection exists between the mains outlet ground and the PSU case. To ensure the PBX chassis is safely grounded, it is essential that the PSU case be securely fastened to the PBX chassis with the 4 screws provided with each PSU.**
- **Never install or replace a PSU during a lightning storm.**
- **Never install or replace a PSU in wet locations.**
- **Never install or replace a PSU unless at least 20 s has elapsed after the AC supply is disconnected.**
- **To protect the back board from static electricity, do not touch parts on the back board in the main unit and PSU. To discharge static electricity, touch ground or wear a grounding strap.**

Notice

When installing or replacing a PSU, read **Important Safety Instructions** and **Important Information** in this manual carefully, and always follow these guidelines to reduce the risk of fire, electric shock and injury.

Note

For details about frame ground connection, refer to "3.2.5 Frame Ground Connection".

The following procedures are for installing or replacing a PSU only. Do not replace or remove the PSU for any other purpose.

Installing the Power Supply Unit

1. Insert the PSU along the guide rails.

CAUTION

For safety reasons, do not touch parts in the PSU.

Guide Rail
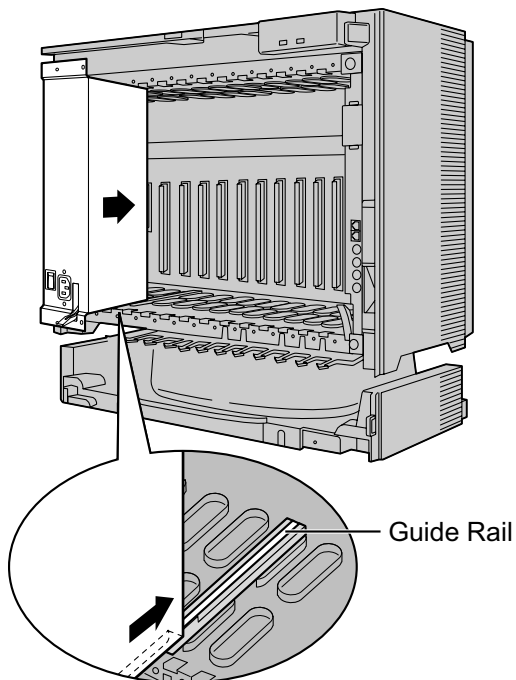
2. Push the release lever in the direction of the arrow, so that the PSU engages securely with the connector on the back board.

Back Board
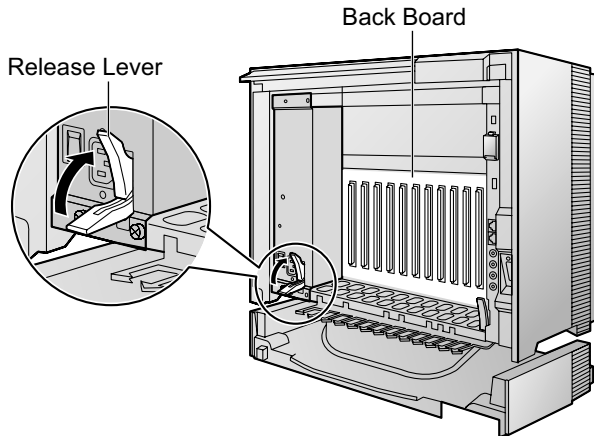
Release Lever

3. Turn the 4 screws clockwise, in the order indicated by the numbers 1 to 4, to fix the PSU.
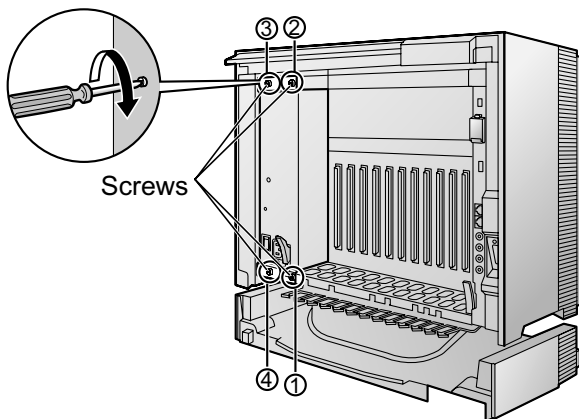
Screws

Replacing the Power Supply Unit

1. Unplug the AC power cord.
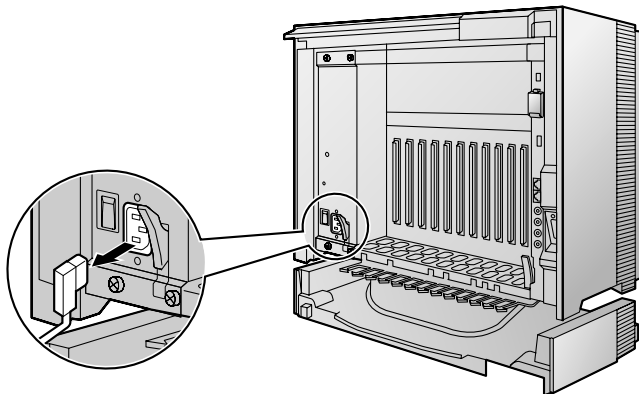
2. Turn the 4 screws anticlockwise to loosen them.
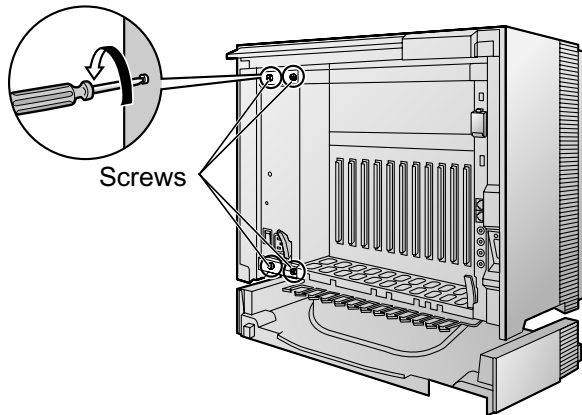
Screws

3. Pull the release lever in the direction of the arrow to disconnect the PSU from the back board.

Back Board

Release Lever
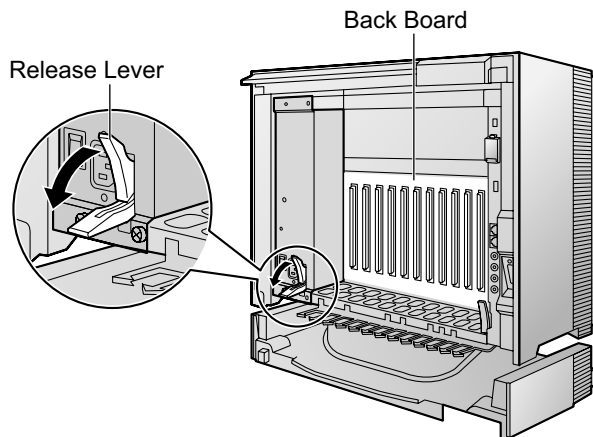
4. Replace the PSU.

New PSU   Current PSU
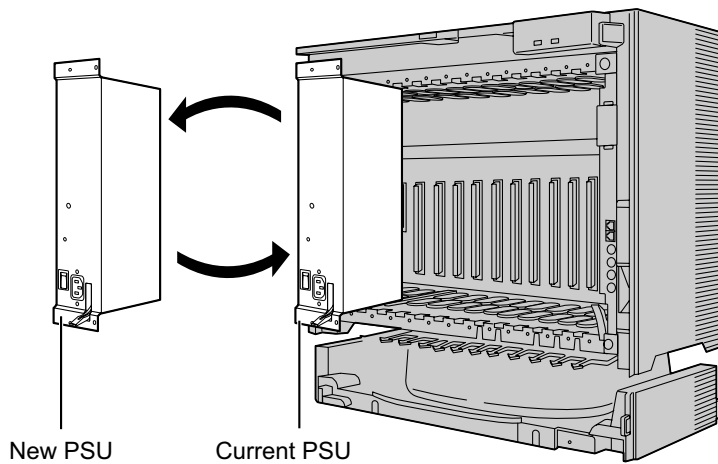
5. Follow the steps in "Installing the Power Supply Unit".

3.2.5 Frame Ground Connection

1. Loosen the screw.
2. Insert a grounding wire (user-supplied).
3. Tighten the screw.
4. Connect the grounding wire to ground.

Screw

Grounding wire
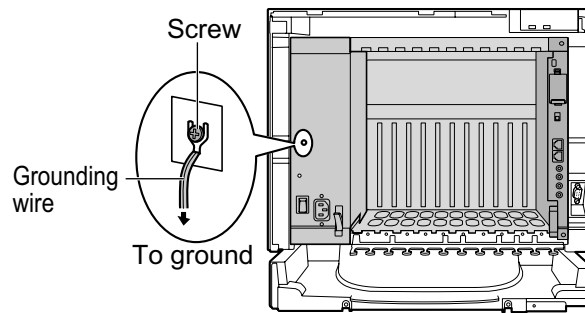
To ground

WARNING

- **Proper grounding (connection to ground) is very important to protect the PBX from the bad effects of external noise or to reduce the risk to the user of electrocution in the case of a lightning strike.**
- **The grounding wire of the AC cable has an effect against external noise and lightning strikes, but it may not be enough to protect the PBX. A permanent connection between ground and the ground terminal of the PBX must be made.**

CAUTION

For grounding wire, green-and-yellow insulation is required, and the cross-sectional area of the conductor must be more than 0.75 mm^2 or 18 AWG.

Notice

Be sure to comply with applicable local regulations (e.g., laws, guidelines).

In most of the continental United States, the ground provided by the "Third wire ground" at the commercial power outlet will be satisfactory. However, in a small percentage of cases this ground may be installed incorrectly. Therefore, the following test procedure should be performed.

Test Procedure

1. Obtain a suitable voltmeter and set it for a possible reading of up to 250 V AC.
2. Connect the meter probes between the 2 main AC voltage points on the wall outlet. The reading obtained should be 108 V AC to 132 V AC.
3. Move one of the meter probes to the 3rd prong terminal (GND).
   Either the same reading or a reading of 0 volt should be obtained.
4. If a reading of 0 volt at one terminal and a reading of 108 V AC to 132 V AC at the other terminal is not obtained, the outlet is not properly grounded.
   This condition should be corrected by a qualified electrician (per article 250 of the National Electrical Code).
5. If a reading of 0 volt at one terminal and a reading of 108 V AC to 132 V AC at the other terminal is obtained, then set the meter to the "OHMS/RX1" scale, place one probe at the GND Terminal and the other probe at the terminal which gave a reading of 0 volt.
   A reading of less than 1 ohm should be obtained. If the reading is not obtained, the outlet is not adequately grounded. See qualified electrician.

3.2.6 Installing/Removing the Optional Service Cards

CAUTION

- To protect the back board from static electricity, do not touch parts on the back board in the main unit and on the optional service cards. To discharge static electricity, touch ground or wear a grounding strap.
- When installing or removing the IPCMPR card, the DC power supply must be turned off.

Note

The optional service cards can be installed or removed while the DC power is supplied.

Installing Optional Service Cards

1. Insert the card along the guide rails.

Guide Rail

2. Holding the card as shown below, push the release lever in the direction of the arrow so that the card engages securely with the connector on the back board.

Back Board

Release Lever

3. Turn the 2 screws clockwise to fix the card in place.
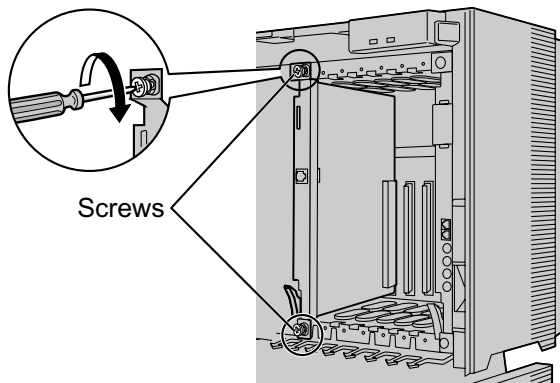
Screws

Note

Make sure the screws are tightened to ground the card securely.

Covering the Blank Slots

Be sure to cover each slot in which no optional service card is installed by using a Blank Slot Cover.

CAUTION

Failure to install the Blank Slot Cover may cause electromagnetic interference.
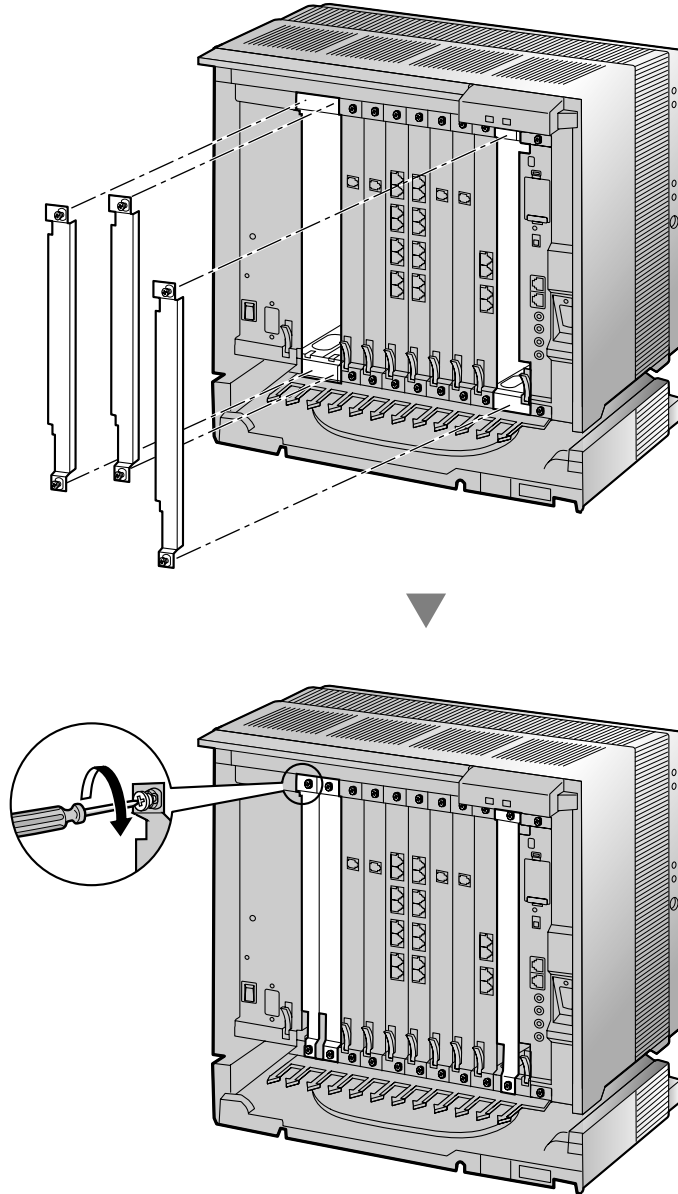
Handling of the Cables

When cables are connected to the PBX, run the cables to either the right or the left and then towards the back of the shelf as shown below.
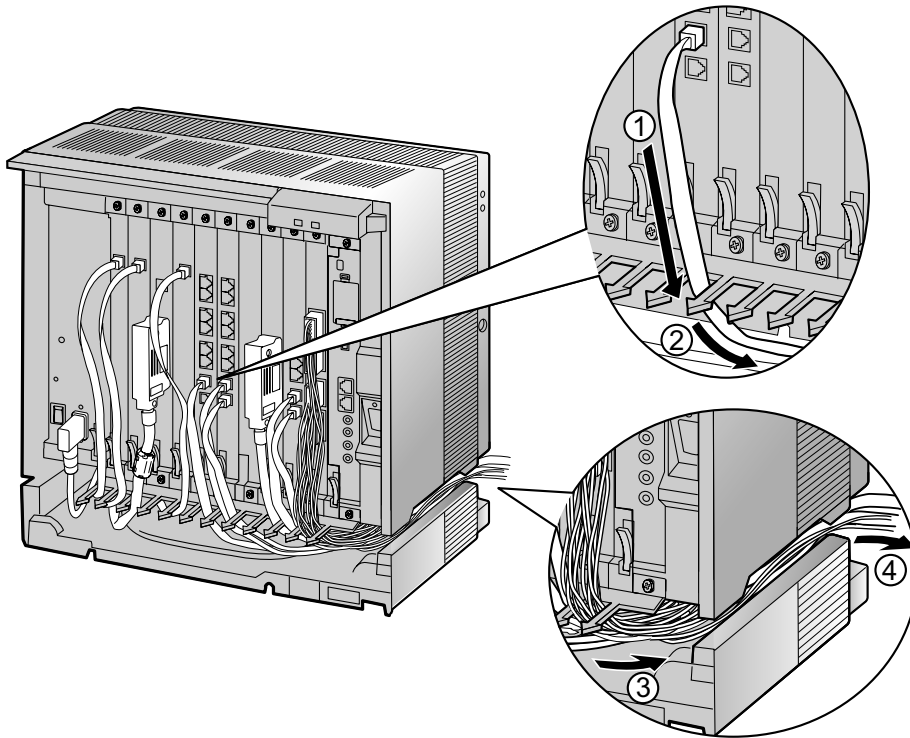
Note

> For safety reasons, do not stretch, bend, or pinch the AC power cord.

Removing the Optional Service Cards
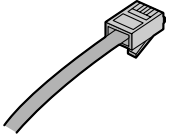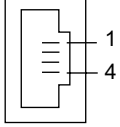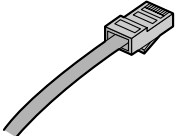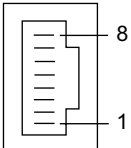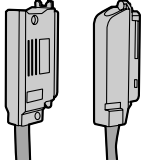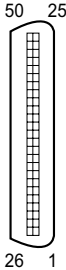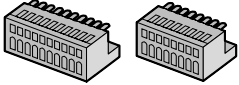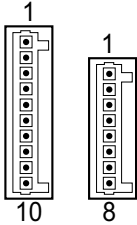
1. Turn the 2 screws anticlockwise to loosen them.

Screws
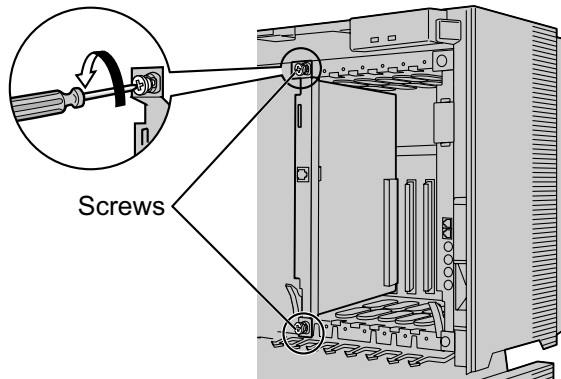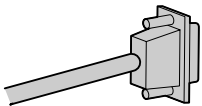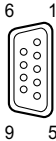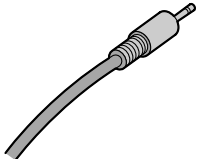
2. Pull the release lever in the direction of the arrow to disconnect the card from the back board. Pull the card from the shelf to remove it.

Back Board

Release Lever
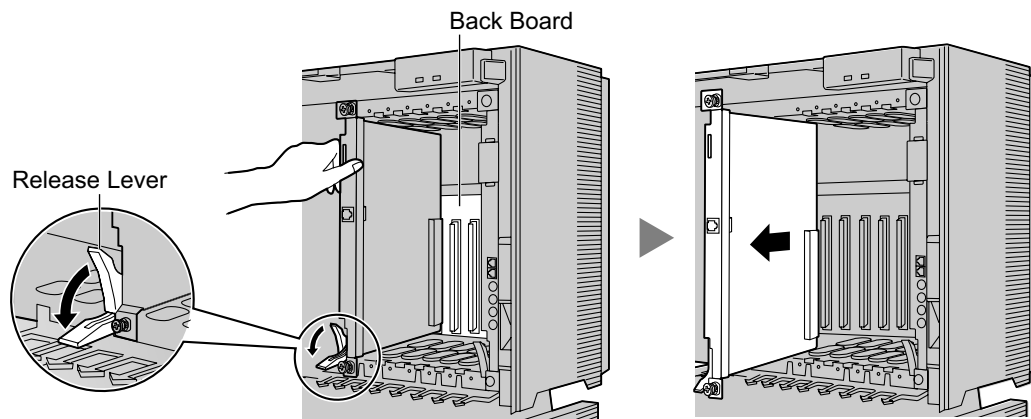
3.2.7 Types of Connectors

Connector Type	Pin Number	Used for
RJ11 (Twisted pair cable)	1 4	• DHLC8 (KX-TDA0170) • SLC8 (KX-TDA0173) • SLC16 (KX-TDA0174) • MSLC16 (KX-TDA0175) • CSLC16 (KX-TDA0177) • MCSLC16 (KX-TDA1176) • MCSLC24 (KX-TDA1178) • LCOT8 (KX-TDA0180) • LCOT16 (KX-TDA0181)
RJ45 (Twisted pair cable)	8 1	• IPCMPR • CSIF4 (KX-TDA0143) • CSIF8 (KX-TDA0144) • T1 (KX-TDA0187) • PRI23 (KX-TDA0290) • IP-EXT16 (KX-TDA0470) • IP-GW4E (KX-TDA0484) • IP-GW16 (KX-TDA0490)
Amphenol Type A Type B (Shielded twisted pair cable)	50 25 26 1	• DHLC8 (KX-TDA0170) • DLC8 (KX-TDA0171) • DLC16 (KX-TDA0172) • SLC8 (KX-TDA0173) • SLC16 (KX-TDA0174) • MSLC16 (KX-TDA0175) • CSLC16 (KX-TDA0177) • MCSLC16 (KX-TDA1176) • MCSLC24 (KX-TDA1178) • LCOT8 (KX-TDA0180) • LCOT16 (KX-TDA0181)
10-pin 8-pin Terminal Terminal Block Block	1 1 10 8	• DPH4 (KX-TDA0161) • EIO4 (KX-TDA0164)

Connector Type	Pin Number	Used for
RS-232C (Shielded cable)	6 1 9 5	• Basic Shelf
Mini Plug	2 4	• IPCMPR

3.2.8 Attaching a Ferrite Core

A ferrite core must be attached when:
*   an RJ45 connector is connected to an IPCMPR, IP-GW16 or IP-EXT16 cards, or
*   an Amphenol connector is connected to an extension card.

Attaching to an RJ45 Connector

For the IPCMPR Card

Wrap the cable once around the ferrite core, then close the case of the ferrite core. Attach the ferrite core 3 cm (1-3/16 in) away from the connector. The ferrite core is included with the PBX.
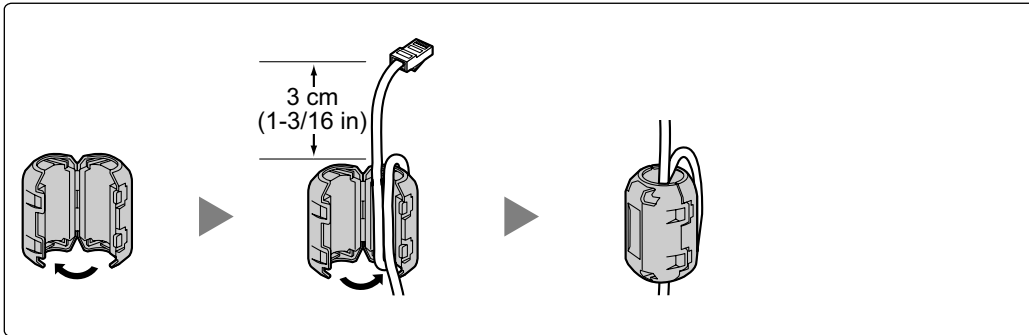
For IP-GW16/IP-EXT16 Cards

Wrap the cable once around the ferrite core, then close the case of the ferrite core. Attach the ferrite core 5 cm (1-15/16 in) away from the connector. The ferrite core is included with the card.
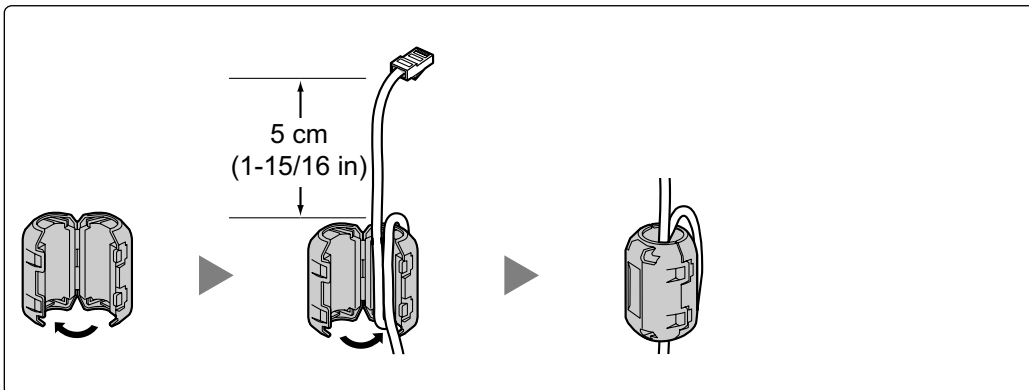
Attaching to an Amphenol Connector

For Extension Cards

Pass the cable through the ferrite core, then close the case of the ferrite core. Attach the ferrite core 3 cm (1-3/16 in) away from the connector. The ferrite core is included with the card.
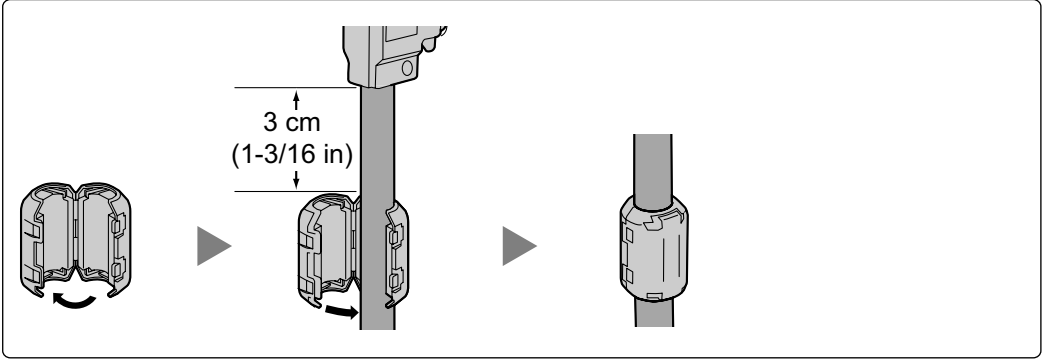
If you need to open the ferrite core, use a flathead screwdriver to unlatch the case of the ferrite core.
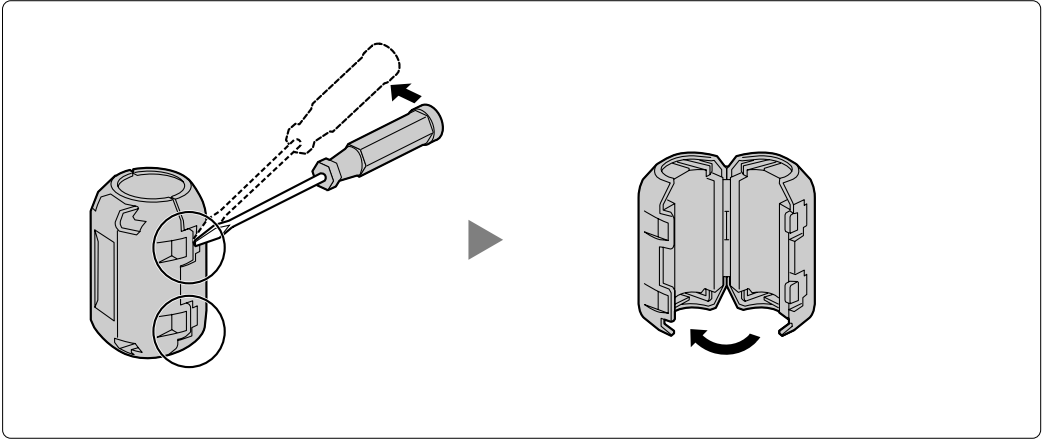
3.2.9 Fastening an Amphenol Connector

An Amphenol 57JE-type connector is used on some of the optional service cards.
To connect an Amphenol connector, use the spring latch or screw to fix the upper part and use Velcro® tape to fix the lower part of the connector.

Type A (Spring Latch + Velcro Tape)	Type B (Screw + Velcro Tape)
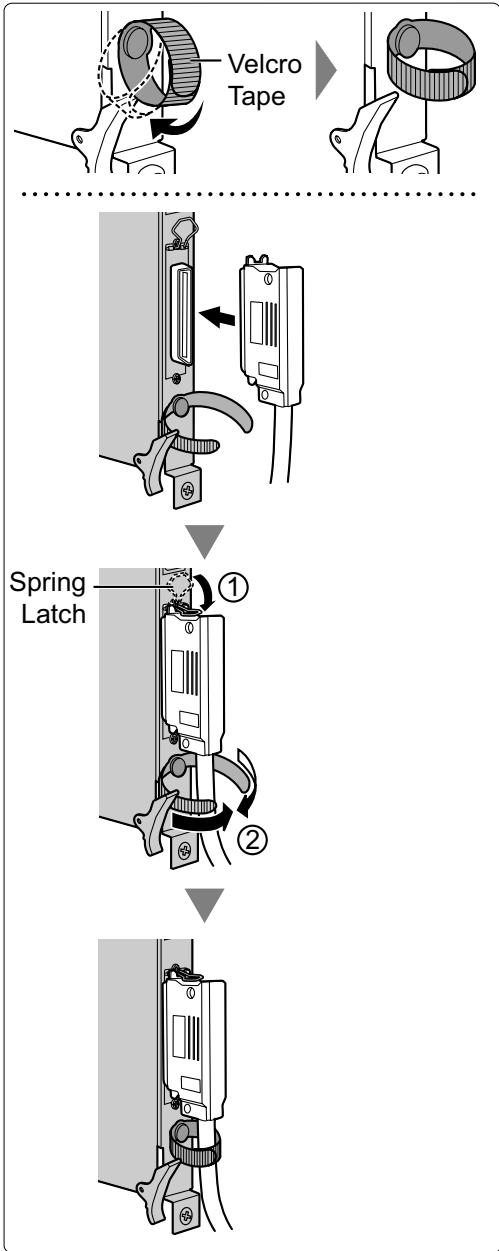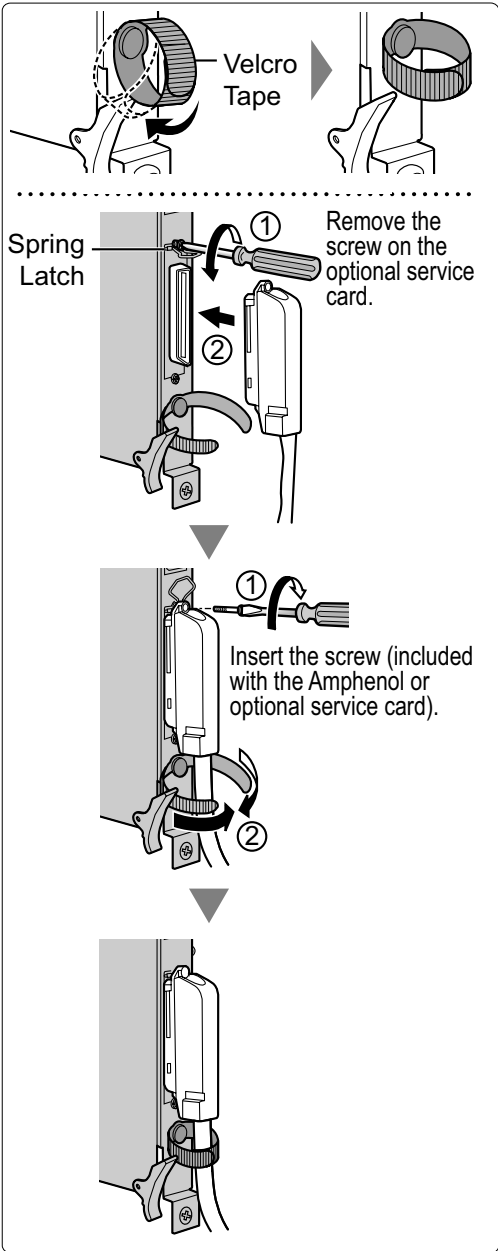
Amphenol Connector Pin Assignment Chart

Below is an Amphenol connector pin assignment chart for all optional service cards that use the Amphenol connector. For more details, refer to the appropriate section in "3.5 Information about the Physical CO Line Cards" and "3.6 Information about the Physical Extension Cards".

Pin No.	LCOT8	LCOT16	DHLC8	DLC8	DLC16	MCSLC24	MCSLC16/MSLC16/CSLC16/SLC16	SLC8
1	RA	RA	RA		D2A	RA	RA	RA
26	TA	TA	TA		D1A	TA	TA	TA
2	RB	RB	D2A	D2A	D2B	RB	RB	
27	TB	TB	D1A	D1A	D1B	TB	TB	
3	RC	RC			D2C	RC	RC	
28	TC	TC			D1C	TC	TC	
4	RD	RD	RB		D2D	RD	RD	RB
29	TD	TD	TB		D1D	TD	TD	TB
5	RE	RE	D2B	D2B	D2E	RE	RE	
30	TE	TE	D1B	D1B	D1E	TE	TE	
6	RF	RF			D2F	RF	RF	
31	TF	TF			D1F	TF	TF	
7	RG	RG	RC		D2G	RG	RG	RC
32	TG	TG	TC		D1G	TG	TG	TC
8	RH	RH	D2C	D2C	D2H	RH	RH	
33	TH	TH	D1C	D1C	D1H	TH	TH	
9		RI			D2I	RI	RI	
34		TI			D1I	TI	TI	
10		RJ	RD		D2J	RJ	RJ	RD
35		TJ	TD		D1J	TJ	TJ	TD
11		RK	D2D	D2D	D2K	RK	RK	
36		TK	D1D	D1D	D1K	TK	TK	
12		RL			D2L	RL	RL	
37		TL			D1L	TL	TL	
13		RM	RE		D2M	RM	RM	RE
38		TM	TE		D1M	TM	TM	TE
14		RN	D2E	D2E	D2N	RN	RN	
39		TN	D1E	D1E	D1N	TN	TN	
15		RO			D2O	RO	RO	
40		TO			D1O	TO	TO	
16		RP	RF		D2P	RP	RP	RF
41		TP	TF		D1P	TP	TP	TF
17			D2F	D2F		RQ		
42			D1F	D1F		TQ		
18						RR		
43						TR		
19			RG			RS		RG
44			TG			TS		TG
20			D2G	D2G		RT		
45			D1G	D1G		TT		
21						RU		
46						TU		
22			RH			RV		RH
47			TH			TV		TH
23			D2H	D2H		RW		
48			D1H	D1H		TW		
24						RX		
49						TX		
25								
50								

3.2.10 Wall Mounting (KX-TDE200)

WARNING

- **Make sure that the wall that the shelf will be attached to is strong enough to support the shelf. If not, it is necessary for the wall to be reinforced.**
- **Only use the wall-mounting equipment (anchor plugs, screws, metal bracket) included with the PBX.**
- **Be careful not to drop any components. Dropping components may damage them or cause an injury.**

CAUTION

- Do not block the openings of the shelf. Allow space of at least 20 cm (8 in) above and 10 cm (4 in) at the sides of the shelf.
- Make sure that the surface behind the shelf is flat and free of obstacles, so that the openings on the back of the shelf will not be blocked.
- Make sure that the surface behind the shelf is not made of wood.
- When driving the screws into the wall, be careful to avoid touching any metal laths, wire laths or metal plates in the wall.
- When this product is no longer in use, make sure to detach it from the wall.

Notice

When placing the metal bracket, make sure that the "TOP" arrow is pointing upward.

Note

- Make sure to remove the front cover from each shelf before installing the shelves (refer to "3.2.3 Opening/Closing the Front Cover").
- Do not install any optional service cards or a PSU in the shelves before installation.
- For details about the dimensions and weight of the PBX, refer to "1.3.1 General Description."

1. Install 4 anchor plugs in the wall, using the metal bracket as a template. Fix the metal bracket with 4 screws (A).

Anchor Plug

Wall

Metal Bracket

TOP

Screw (A)

Hammer

Anchor Plug

8 mm
(5/16 in)

30 mm
(1-3/16 in)

Screw (A)

Metal Bracket

Drive the screw to this point.
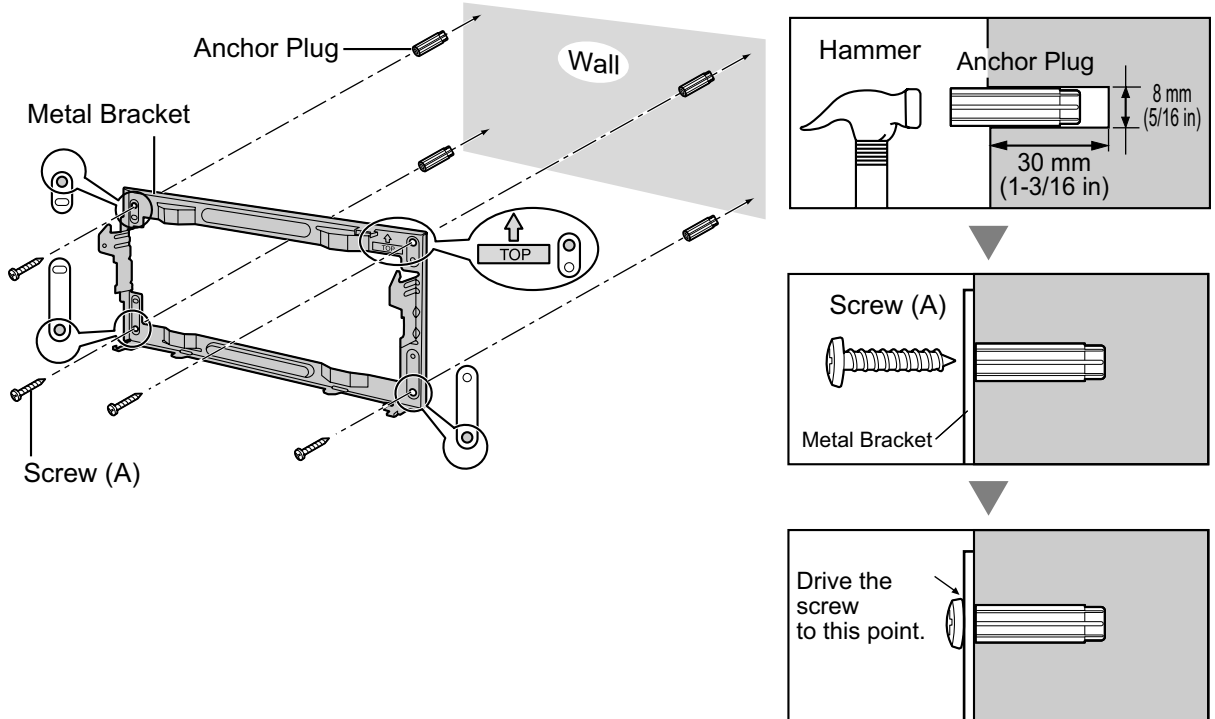
2. Hook the shelf onto the metal bracket, making sure that the shelf slides down and onto the hooked parts of the metal bracket. Use 2 screws (B) to fix both sides of the shelf.

Screw (B)

3.2.11 Wall Mounting (KX-TDE100)

WARNING

- **Make sure that the wall that the shelf will be attached to is strong enough to support the shelf. If not, it is necessary for the wall to be reinforced.**
- **Only use the wall-mounting equipment (anchor plugs, screws, metal bracket) included with the PBX.**
- **Be careful not to drop any components. Dropping components may damage them or cause an injury.**

CAUTION

- Do not block the openings of the shelf. Allow space of at least 20 cm (8 in) above and 10 cm (4 in) at the sides of the shelf.
- Make sure that the surface behind the shelf is flat and free of obstacles, so that the openings on the back of the shelf will not be blocked.
- Make sure that the surface behind the shelf is not made of wood.
- When driving the screws into the wall, be careful to avoid touching any metal laths, wire laths or metal plates in the wall.
- When this product is no longer in use, make sure to detach it from the wall.

Notice

When placing the metal bracket, make sure that the "TOP" arrow is pointing upward.

Note

- Make sure to remove the front cover from each shelf before installing the shelves (refer to "3.2.3 Opening/Closing the Front Cover").
- Do not install any optional service cards or a PSU in the shelves before installation.
- For details about the dimensions and weight of the PBX, refer to "1.3.1 General Description."

1. Install 3 anchor plugs in the wall, using the metal bracket as a template. Fix the metal bracket with 3 screws (A).
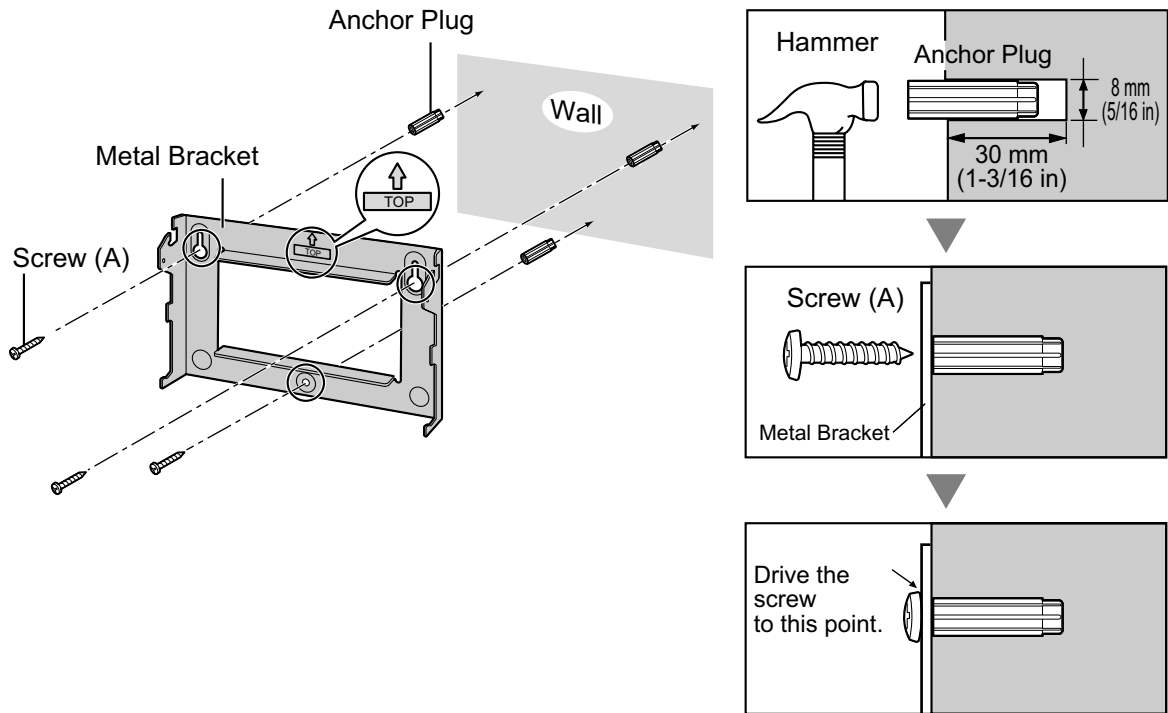
2. Hook the shelf onto the metal bracket, making sure that the shelf slides down and onto the hooked parts of the metal bracket. Use 2 screws (B) to fix both sides of the shelf.
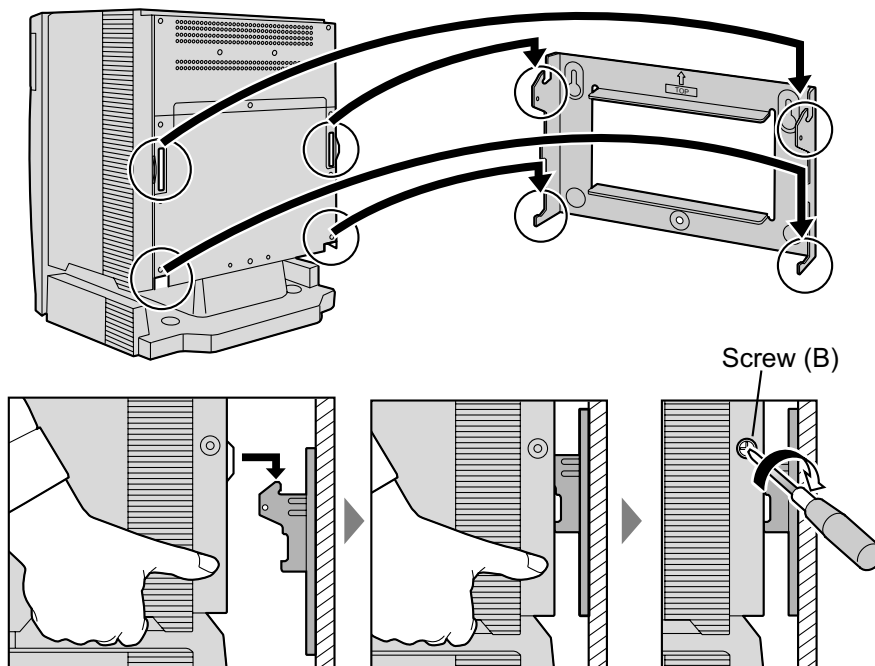
3.2.12 Floor Standing (KX-TDE200 Only)

WARNING

Be careful not to drop any components. Dropping components may damage them or cause an injury.

CAUTION

- Do not block the openings of the shelf. Allow space of at least 20 cm (8 in) above and 10 cm (4 in) at the sides of the shelf.
- Make sure that the surface behind the shelf is flat and free of obstacles, so that the openings on the back of the shelf will not be blocked.
- Make sure that the surface behind the shelf is not made of wood.

1. Install 4 anchor plugs in the floor, using the metal bracket as a template. Fix the metal bracket with 4 screws (A).
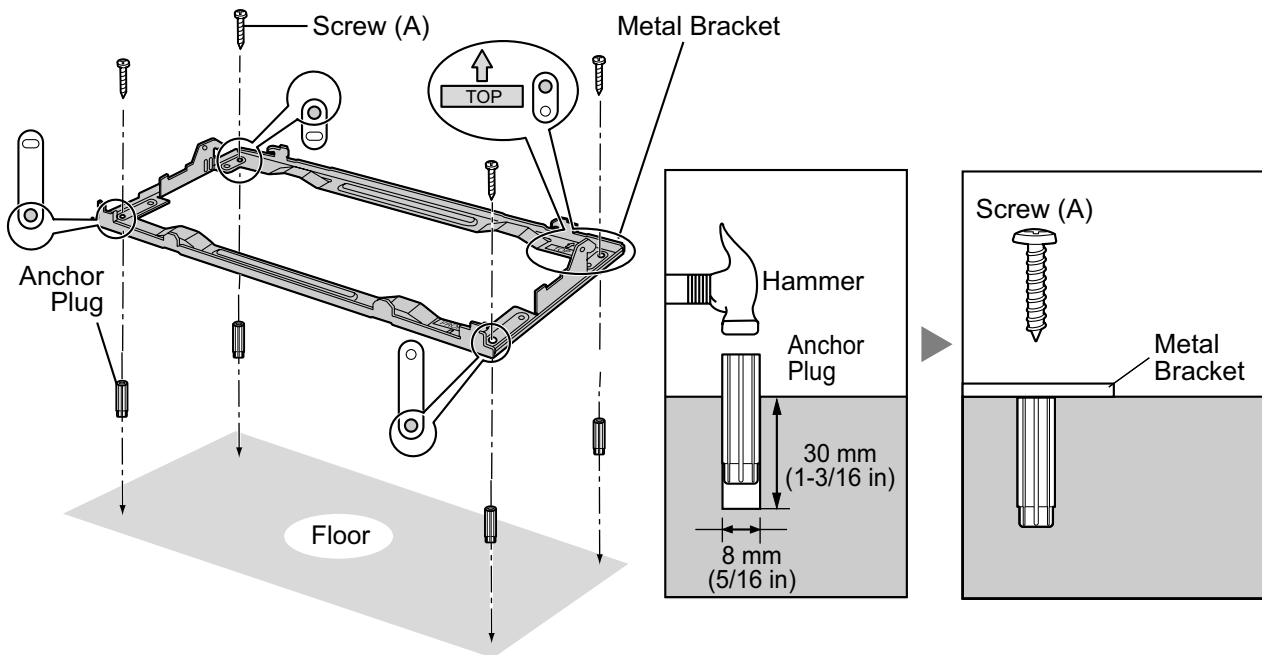
2. Remove the front cover of the shelf (refer to "3.2.3 Opening/Closing the Front Cover").

3. Lift the shelf, attach it to the metal bracket, slide it backwards until it locks, and retain it with 2 screws (B).

Screws (B)

Metal Bracket
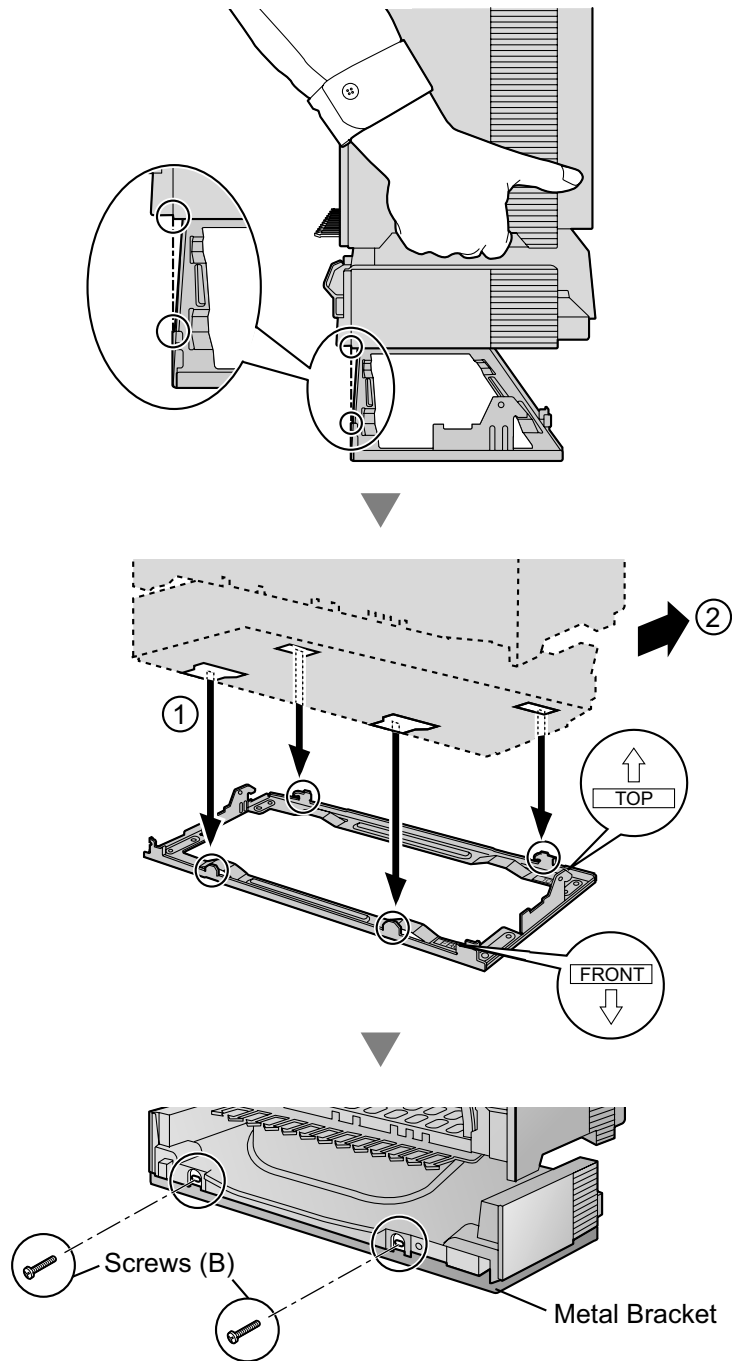
4. Fix the front cover on the shelf (refer to "3.2.3 Opening/Closing the Front Cover").

3.2.13 Surge Protector Installation

CAUTION

   Performing surge protection is essential. Make sure to follow the instructions in this section.

Overview

A massive electrical surge can be caused if lightning strikes a telephone cable 10 m (33 ft) above ground, or if a telephone line comes into contact with a power line. A surge protector is a device that is connected to a CO line to prevent potentially dangerous electrical surges from entering the building via the CO line and damaging the PBX and connected equipment.

To protect the system from electrical surges, we strongly recommend connecting the system to a surge protector that meets the following specifications:
–   Surge arrestor type: 3-electrode arrestor
–   DC spark-over voltage: 230 V
–   Maximum peak current: at least 10 kA
Additionally, proper grounding is very important for the protection of the system (refer to "3.2.5 Frame Ground Connection").

Many countries/areas have regulations requiring surge protection. Be sure to comply with all applicable laws, regulations, and guidelines.

Installation
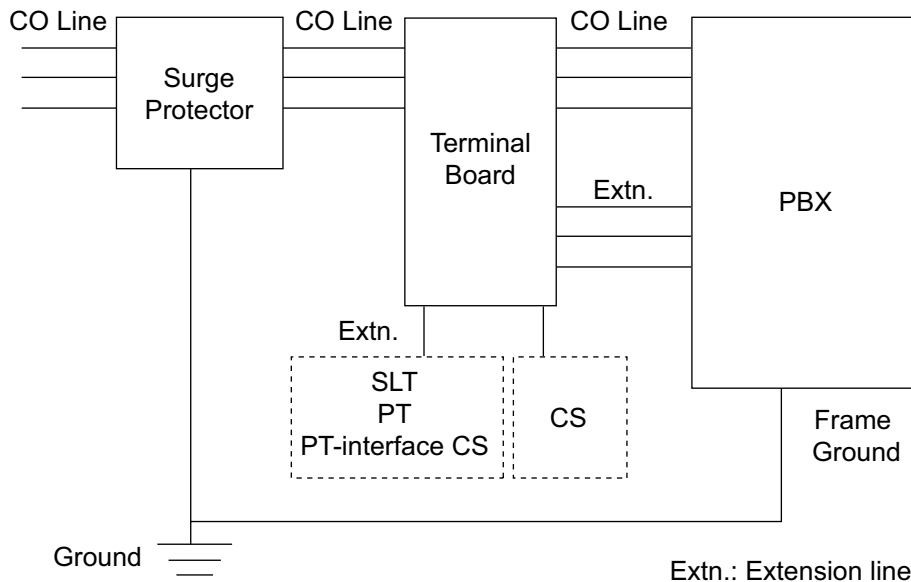
Outside Installation

Extn.: Extension Line
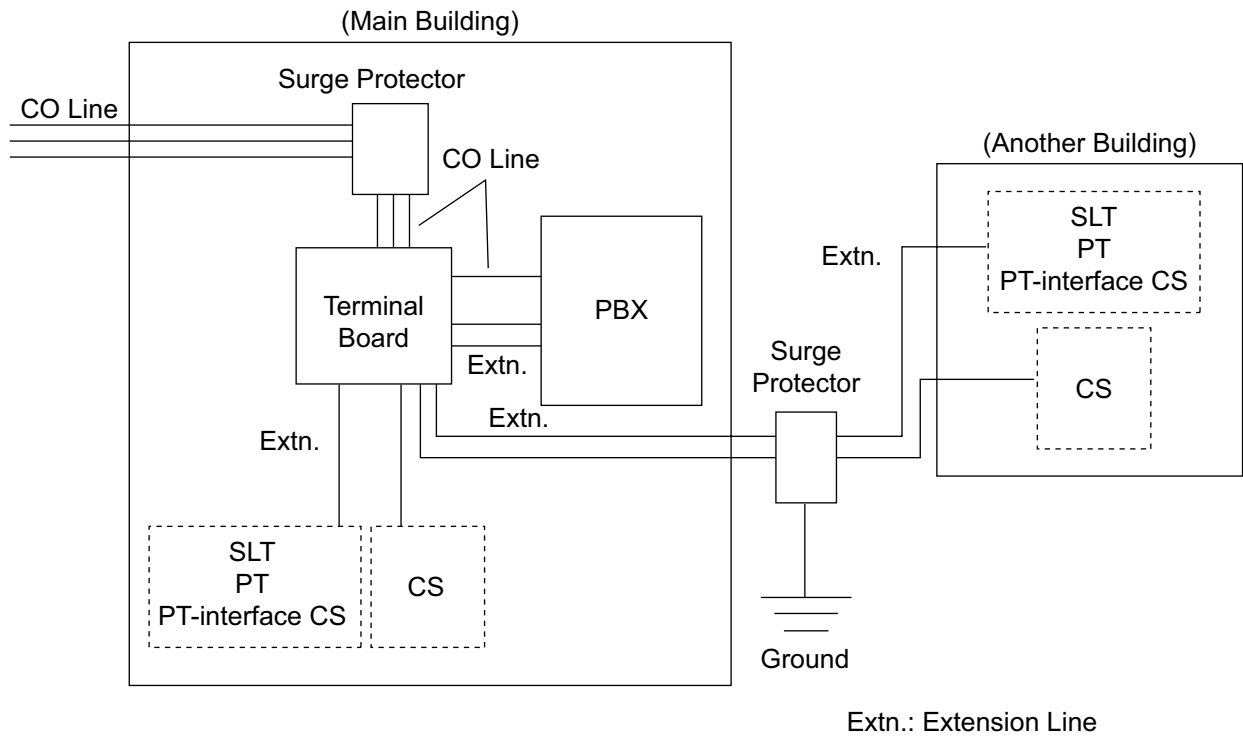
If you install an extension outside of the building, the following precautions are recommended:

a. Install the extension wire underground.

b. Use a conduit to protect the wire.

Note

The surge protector for an extension and CS is different from that for CO lines.

Installation of a Ground Rod
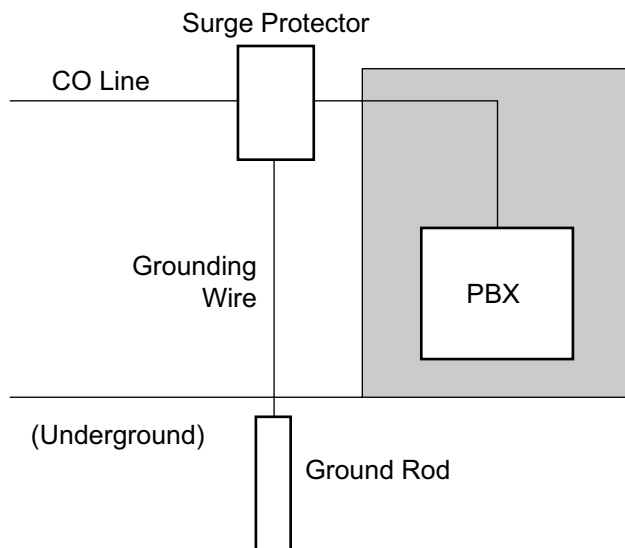
1. Connect the ground rod to the surge protector using a grounding wire with a cross-sectional area of at least 1.3 mm^2.
2. Bury the ground rod near the protector. The grounding wire should be as short as possible.
3. The grounding wire should run straight to the ground rod. Do not run the wire around other objects.
4. Bury the ground rod at least 50 cm (20 in) underground.

<u>Note</u>

- The above figures are recommendations only.
- The length of ground rod and the required depth depend on the composition of the soil.

3.3 Information about the Main Processing Card

3.3.1 IPCMPR Card

Function

The IPCMPR card is the preinstalled main processing card with built-in ESVM card feature (2-channel). The Virtual Cards (CO line/extension) can be installed in Virtual Slots of the IPCMPR card and can be activated with the activation keys. Also, the IPCMPR supports LAN connection so that IP telephones (IP-PTs, IP softphones, SIP Extensions) and PCs can be connected on a private IP network.

Mountable Cards

*   Either one of the DSP16 or DSP64 cards (refer to "3.3.2 DSP16 Card (KX-TDE0110) and DSP64 Card (KX-TDE0111)")
*   IPCMEC card (refer to "3.3.3 IPCMEC Card (KX-TDE0105)")
*   RMT card (refer to "3.3.4 RMT Card (KX-TDA0196)")
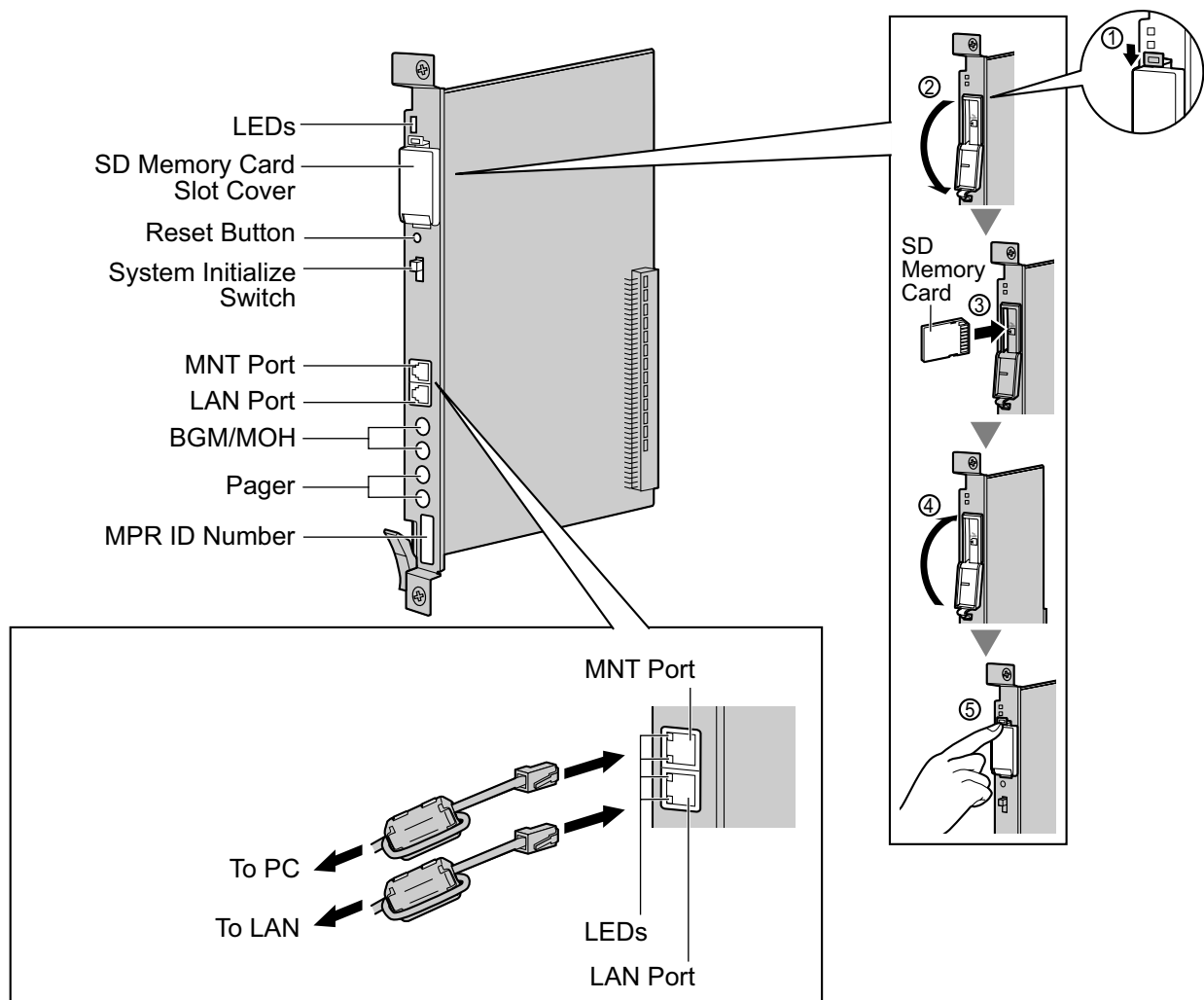
WARNING

A lithium battery is used in the IPCMPR card. There is a risk of explosion if the battery is replaced with the incorrect type. Dispose of used batteries according to the manufacturer's instructions.

CAUTION

- The SD Memory Card contains software for all the processes of the PBX and all the customer data. It can be easily removed and taken away from the PBX by a third party. Therefore, do not allow unauthorized access to prevent data leakage.
- Do not remove the SD Memory Card while power is supplied to the PBX. Doing so may cause the PBX to fail to start when you try to restart the system.
- To prevent data leakage, render the SD Memory Card physically unusable before disposal.
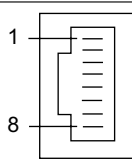
Notice

- Use only the SD Memory Card included with the PBX.
- The SD Memory Card must be inserted in the SD Memory Card slot of the IPCMPR card before startup.

Note

- Make sure to use the MNT port for PC connection, and the LAN port for LAN connection.
- The maximum length of the cable to be connected to the IPCMPR card is 100 m (328 ft).
- When connecting the RJ45 connector, attach the ferrite core included with the PBX. Refer to "3.2.8 Attaching a Ferrite Core".
- For details about Virtual Slots, refer to "1.3.3 System Capacity".
- For details about the activation keys, refer to "2.1 Information about the Activation Keys".
- For details about connecting to a LAN, refer to "3.11 LAN Connection".
- For details about connecting peripherals, refer to "3.10.1 Connection of Peripherals".
- For details about System Initialize Switch, refer to "3.13.1 Starting the PBX".
- For details about Reset Button, refer to "5.1.4 Using the Reset Button".
- Portions of this product contains software of Datalight, Inc. Copyright 1993–2000 Datalight,Inc., All Rights Reserved.

Pin Assignments

MNT Port/LAN Port (10BASE-T/100BASE-TX)

	No.	Signal Name	Input (I)/Output (O)	Function
1 _____ 8	1	TPO+	O	Transmit data+
	2	TPO-	O	Transmit data-
	3	TPI+	I	Receive data+
	4-5	Reserved	–	–
	6	TPI-	I	Receive data-
	7-8	Reserved	–	–

LED Indications

Indication				Color	Description
BATT ALARM				Red	Battery alarm indication • OFF: Normal ON: Alarm
SD ACCESS				Green	SD memory card status • ON: Accessing
10BASE-T/ 100BASE-TX	MNT	2	LINK	Green	Link status indication • OFF: Off-line • ON: Linked normally • Flashing: In communication
			100	Yellow	Data transmission speed indication • OFF: 10 Mbps • ON: 100 Mbps
	LAN	1	LINK	Green	Link status indication • OFF: Off-line • ON: Linked normally • Flashing: In communication
			100	Yellow	Data transmission speed indication • OFF: 10 Mbps • ON: 100 Mbps

3.3.2 DSP16 Card (KX-TDE0110) and DSP64 Card (KX-TDE0111)

Function

DSP16:   16-channel digital signal processor card with a 4-Channel IP Trunk activation key and a 8-Channel IP Proprietary Telephone activation key preinstalled. Compliant with ITU-T G. 729A and G.711 codec methods. To be mounted on the IPCMPR card.

DSP64:   64-channel digital signal processor card with four 4-Channel IP Trunk activation keys and four 8-Channel IP Proprietary Telephone activation keys preinstalled. Compliant with ITU-T G.729A and G.711 codec methods. To be mounted on the IPCMPR card.
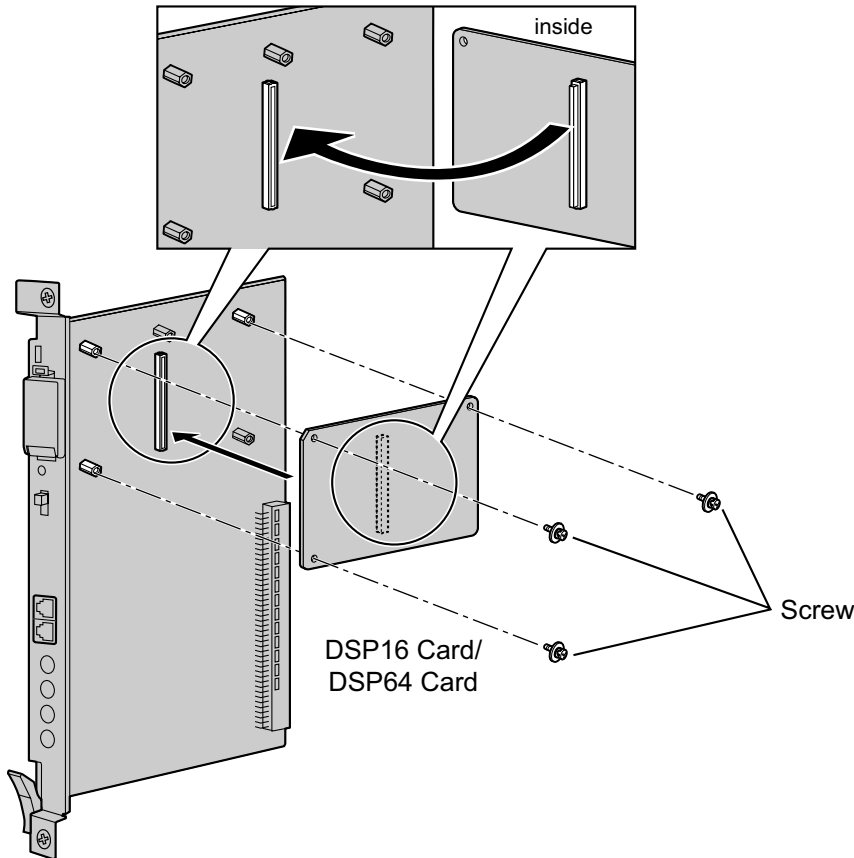
Accessories and User-supplied Items

Accessories (included): Screws × 3
User-supplied (not included): none

Note

- Depending on the number and the type of IP CO lines and IP telephones you wish to use, required activation keys are determined, and either the DSP16 or DSP64 card is selected to be installed.
- If the preinstalled activation keys on the DSP16 or DSP64 cards are not enough for the desired configuration, you need to purchase activation key codes. For details about the activation keys, refer to "2.1 Information about the Activation Keys".

• When installing the DSP16 or DSP64 card, hold down the shaded areas of the card to connect it firmly.
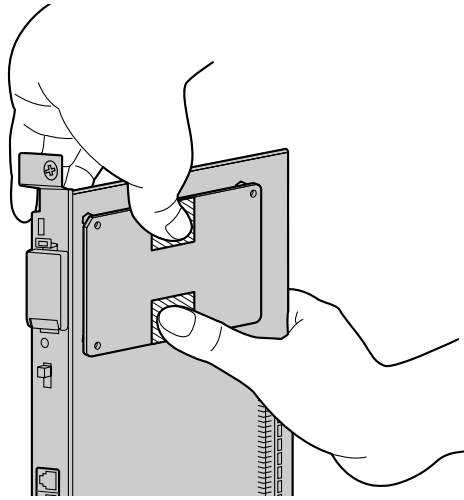
3.3.3 IPCMEC Card (KX-TDE0105)

Function

Memory expansion card to increase system data storage space. To be mounted on the IPCMPR card.
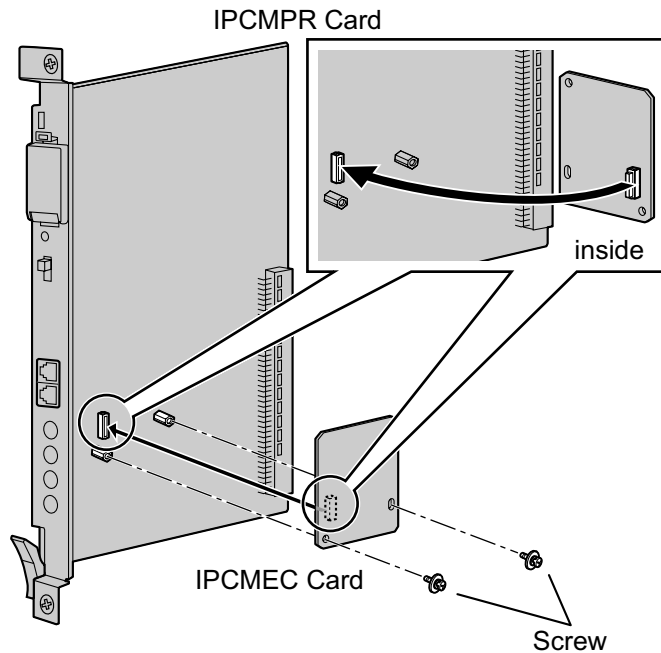
Accessories and User-supplied Items

Accessories (included): Screws × 2
User-supplied (not included): none

CAUTION

- Before installing the IPCMEC card, be sure to back up the system data. For details, refer to "2.5.1 Tool —SD memory backup" and "2.6.3 Utility—File Transfer PBX (SD Card) to PC" in the PC Programming Manual.
- After installing the IPCMEC card, the PBX must be initialized. For details about the initialization procedure, refer to "3.13.1 Starting the PBX".
- After initialization, even after restoring system data, some data (e.g., SMDR data) will not be restored. For further information about which data will not be restored, refer to Saving Modified Data in "2.7.1 Frequently Asked Questions (FAQ)" in the PC Programming Manual.
- It is recommended to output the SMDR data before installing the IPCMEC card.

3.3.4 RMT Card (KX-TDA0196)

Function

Analog modem card for remote communication with the PBX. ITU-T V.90 support. To be mounted on the IPCMPR card.

IPCMPR Card

inside

RMT Card   Screw
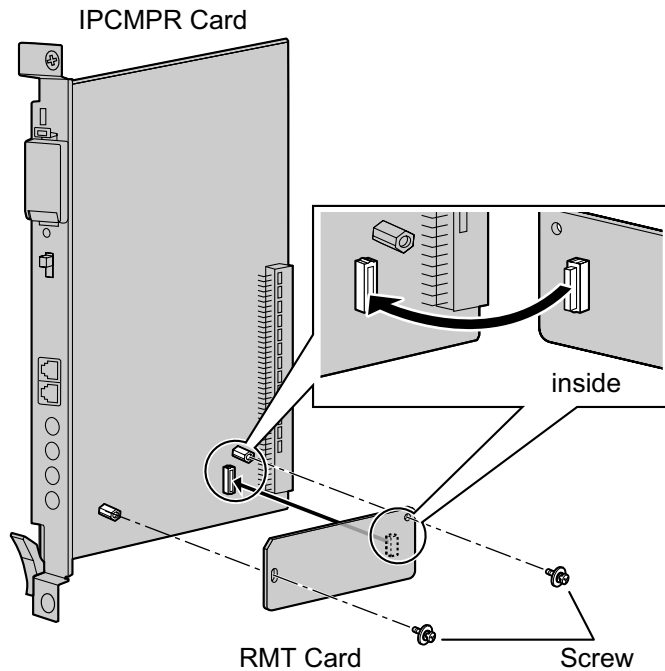
Accessories and User-supplied Items

Accessories (included): Screws × 2
User-supplied (not included): none

3.4 Information about the Virtual Cards

3.4.1 Virtual Cards

Function

Virtual Cards are included with the IPCMPR card and can be activated with the appropriate activation key (Only V-IPCS4 cards can be activated without activation keys). By installing Virtual Cards in the Virtual Slots of the IPCMPR card using the Maintenance Console, IP CO lines, IP extensions, and IP-CSs can be used via the IPCMPR card.

Virtual Card	Description
Virtual 16-Channel VoIP Gateway Card (V-IPGW16)	Virtual Card for 16-channel VoIP CO line. Compliant with VoIP H.323 V.5 protocol. Also supports T.38 protocol.
Virtual 16-Channel SIP CO Line Card (V-SIPGW16)	Virtual Card for 16-channel SIP CO line. Compliant with RFC 3261, 3262, 3264, 3311, 3581, 3960 and 4028 protocols, and ITU-T G.729A and G.711 codec methods. Also supports T.38 protocol.
Virtual 32-Channel VoIP Extension Card (V-IPEXT32)	Virtual Card for 32 VoIP extensions. Compliant with Panasonic proprietary protocol.
Virtual 32-Channel SIP Extension Card (V-SIPEXT32)	Virtual Card for 32 SIP Extensions. Compliant with RFC 3261, 3264, 3310, 2327, and 4028 protocols.
Virtual 4 IP Cell Station Interface Card (V-IPCS4)	Virtual Card for 4 IP-CSs. Compliant with ITU-T G.729A and G. 711 codec methods.

Example: Virtual Cards in the Virtual Slots

IPCMPR Card

Virtual CO Line Slots

V-IPGW16 V-IPGW16 V-SIPGW16 V-SIPGW16

Virtual Extension Slots

V-IPEXT32 V-IPEXT32 V-SIPEXT32 V-IPCS4

Virtual Slots
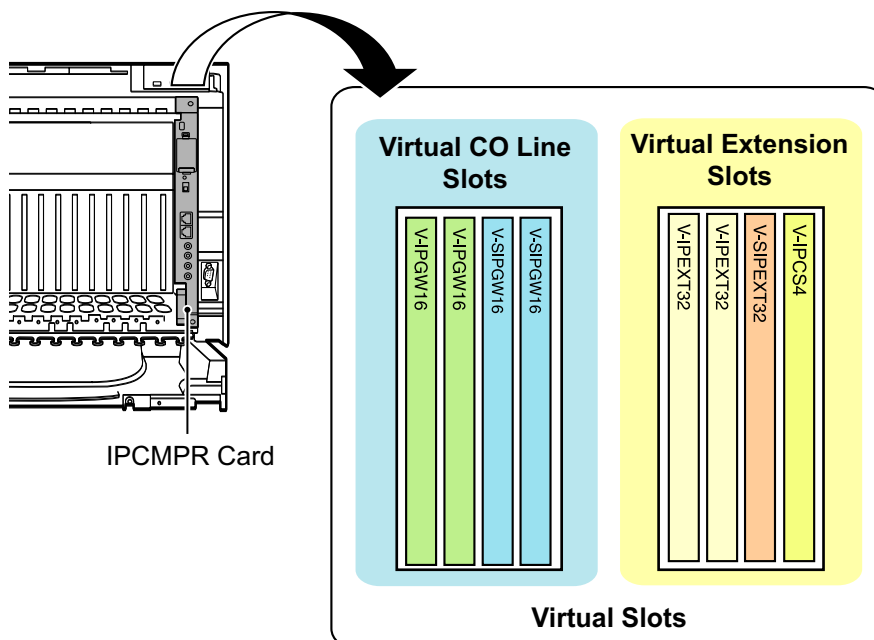
3.5 Information about the Physical CO Line Cards

3.5.1 LCOT8 Card (KX-TDA0180) and LCOT16 Card (KX-TDA0181)

Function

LCOT8:   8-port analog CO line card with 2 power failure transfer (PFT) ports. One CID8 card can be mounted on the LCOT8 card (refer to "3.5.2 CID8 Card (KX-TDA0193)").

LCOT16:   16-port analog CO line card with 4 power failure transfer (PFT) ports. A maximum of 2 CID8 cards can be mounted on the LCOT16 card (refer to "3.5.2 CID8 Card (KX-TDA0193)").
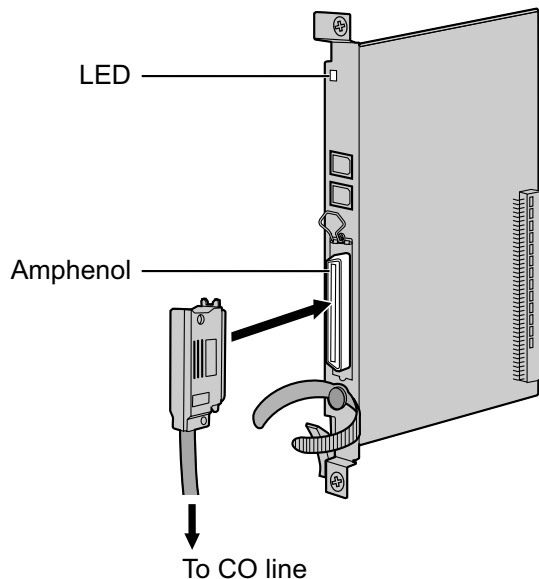
Accessories and User-supplied Items
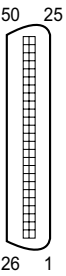
Accessories (included): Screws × 2
User-supplied (not included): Amphenol connector

Note

- To connect the Amphenol connector, refer to "3.2.9 Fastening an Amphenol Connector".
- For details about power failure transfer, refer to "3.12.1 Power Failure Connections".
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.13.1 Starting the PBX".

Pin Assignments

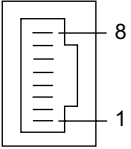### Amphenol Connector

	No.	Signal Name	Function	No.	Signal Name	Function
50 25 26 1	1	RA	Ring port 1	26	TA	Tip port 1
	2	RB	Ring port 2	27	TB	Tip port 2
	3	RC	Ring port 3	28	TC	Tip port 3
	4	RD	Ring port 4	29	TD	Tip port 4
	5	RE	Ring port 5	30	TE	Tip port 5
	6	RF	Ring port 6	31	TF	Tip port 6
	7	RG	Ring port 7	32	TG	Tip port 7
	8	RH	Ring port 8	33	TH	Tip port 8
	9	RI	Ring port 9	34	TI	Tip port 9
	10	RJ	Ring port 10	35	TJ	Tip port 10
	11	RK	Ring port 11	36	TK	Tip port 11
	12	RL	Ring port 12	37	TL	Tip port 12
	13	RM	Ring port 13	38	TM	Tip port 13
	14	RN	Ring port 14	39	TN	Tip port 14
	15	RO	Ring port 15	40	TO	Tip port 15
	16	RP	Ring port 16	41	TP	Tip port 16
	17-25	Reserved	–	42-50	Reserved	–

Note

- Pin assignments for the pins 5 to 8 and 30 to 33 are for the LCOT8 and LCOT16 card only.
- Pin assignments for the pins 9 to 16 and 34 to 41 are for the LCOT16 card only.

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.5.2 CID8 Card (KX-TDA0193)

Function

8-port Caller ID signal type FSK/FSK (with Call Waiting Caller ID [Visual Caller ID])/DTMF. To be mounted on the LCOT8/LCOT16 cards.

LCOT16 card only
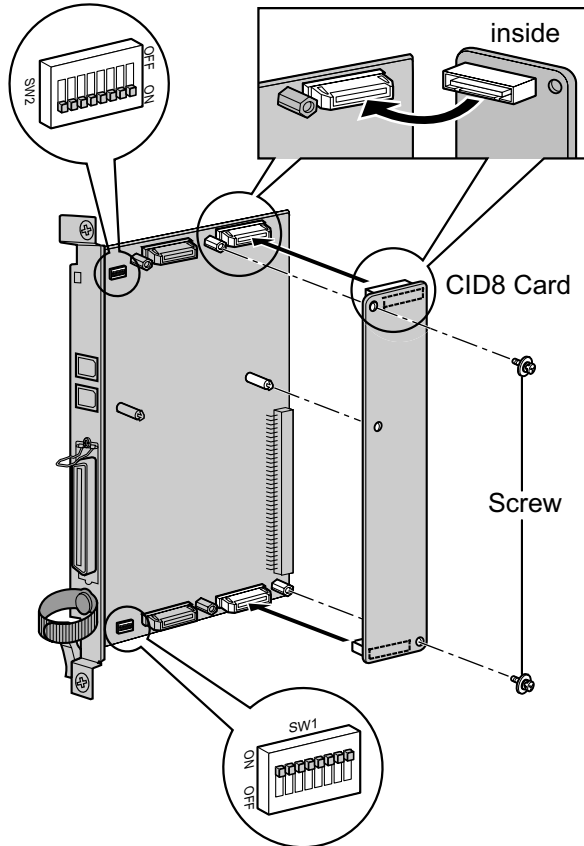
inside

CID8 Card

Screw

SW2

SW1

ON

OFF

Accessories and User-supplied Items

Accessories (included): Screws × 2
User-supplied (not included): none

Note

Only 1 CID8 card can be mounted on the LCOT8 card.

Switch Settings (on LCOT8/LCOT16 cards)

Switch	Type	Usage and Status Definition
Port Setting	DIP	Keep all DIP switches at default "ON" positions. Do not change the positions of these switches. **Note** SW2 is for the LCOT16 card only.

3.5.3 T1 Card (KX-TDA0187)

Function

1-port T1 CO line card. EIA/TIA standard compliant.
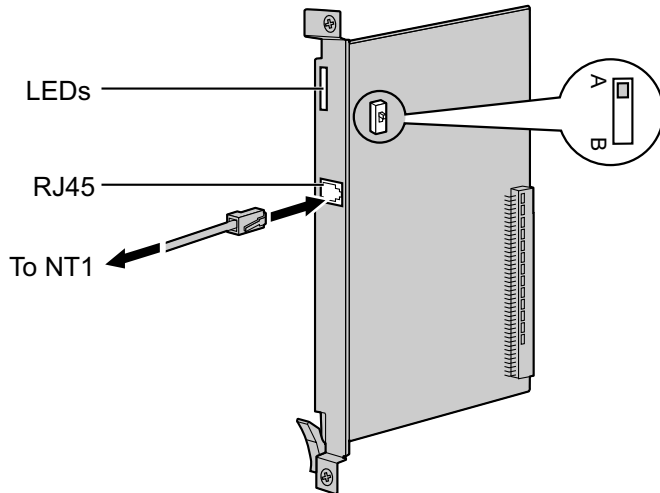
Accessories and User-supplied Items

Accessories (included): none
User-supplied (not included): RJ45 connector

CAUTION

- T1 ports are SELV ports and should only be connected to SELV services.
- Connect this optional service card to the CO line through NT1; do not connect to the CO line directly.

Note
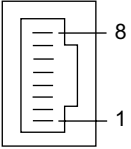
- T1 Card must be installed behind an FCC registered and UL or CSA-NRTL listed CSU.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.13.1 Starting the PBX".

Switch Settings

Switch	Type	Usage and Status Definition
A/B	Slide	Keep the switch at default A position. Do not change the position of this switch.

Pin Assignments

RJ45 Connector

	No.	Signal Name	Level [V]	Function
	1	RX+	(+)	Receive data (+)
	2	RX-	(-)	Receive data (-)
	3	Reserved	–	–
	4	TX-	(-)	Transmit data (-)
	5	TX+	(+)	Transmit data (+)
	6-8	Reserved	–	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
SYNC-ERR	Red	Non-synchronization status indication • OFF: Normal • ON: Out of synchronization
RAI	Red	RAI signal status indication • OFF: Normal • ON: Alarm (Clock Slave) • Flashing (60 times per minute): Alarm (Clock Master)
AIS	Red	AIS status indication • OFF: Normal • ON: Alarm
SYNC	Green	Synchronization status indication • OFF: Not synchronized • ON: Synchronized • Flashing (60 times per minute): Synchronized (Clock Master)

3.5.4 PRI23 Card (KX-TDA0290)

Function

1-port ISDN Primary Rate Interface card (23B channels). NI (North American standard ISDN protocol) compliant.

LEDs

RJ45

To NT1
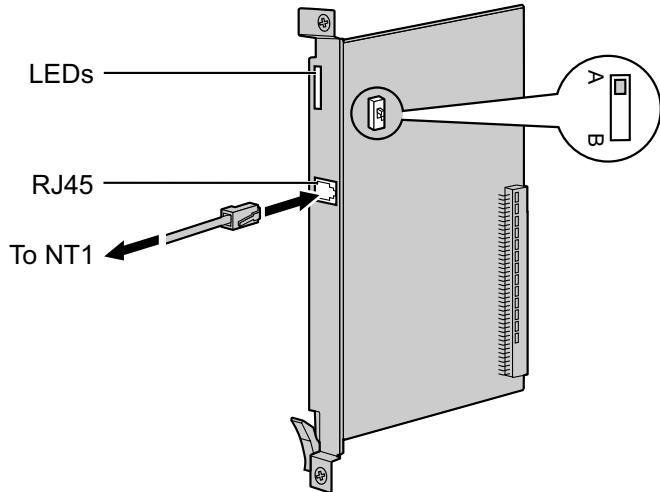
Accessories and User-supplied Items

Accessories (included): none
User-supplied (not included): RJ45 connector

CAUTION

- PRI ports are SELV ports and should only be connected to SELV services.
- Connect this optional service card to the CO line through an NT1; do not connect to the U interface of the CO line directly.

Note

To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.13.1 Starting the PBX".

Switch Settings

Switch	Type	Usage and Status Definition
A/B	Slide	Keep the switch at default A position. Do not change the position of this switch.

Pin Assignments

RJ45 Connector

	No.	Signal Name	Level [V]	Function
8 1	1	RX+	(+)	Receive data (+)
	2	RX-	(-)	Receive data (-)
	3	Reserved	–	–
	4	TX-	(-)	Transmit data (-)
	5	TX+	(+)	Transmit data (+)
	6-8	Reserved	–	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
SYNC-ERR	Red	Non-synchronization status indication • OFF: Normal • ON: Out of synchronization
RAI	Red	RAI signal status indication • OFF: Normal • ON: Alarm (Clock Slave) • Flashing (60 times per minute): Alarm (Clock Master)
AIS	Red	AIS status indication • OFF: Normal • ON: Alarm
SYNC	Green	Synchronization status indication • OFF: Not synchronized • ON: Synchronized • Flashing (60 times per minute): Synchronized (Clock Master)
D-LINK	Green	Data link status indication • OFF: Not established • ON: Established

3.5.5 IP-GW4E Card (KX-TDA0484)

Function

4-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729A, G.723.1 and G. 711 codec methods.
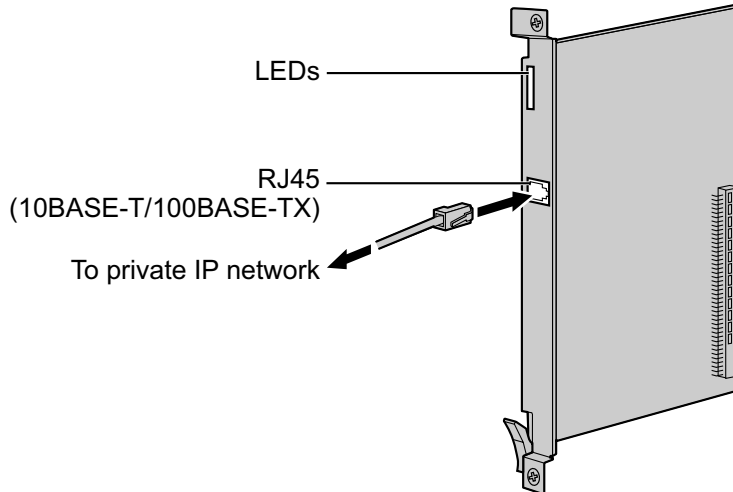
Accessories and User-supplied Items

Accessories (included): CD-ROM (including documentation for web programming) × 1
User-supplied (not included): RJ45 connector

Note

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- The IP-GW4E card occupies the space of only 1 free slot when it is installed in the PBX.
- For programming instructions and other information about the IP-GW4E card, refer to the documentation for the IP-GW4E card. To program the IP-GW4E card, use the web programming designed for the IP-GW4E card.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.13.1 Starting the PBX".

Pin Assignments

RJ45 Connector (10BASE-T/100BASE-TX)

	No.	Signal Name	Input (I)/Output (O)	Function
	1	TPO+	O	Transmit data+
	2	TPO-	O	Transmit data-
	3	TPI+	I	Receive data+
	4-5	Reserved	–	–
	6	TPI-	I	Receive data-
	7-8	Reserved	–	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
ONLINE	Green	On-line status indication • ON: On-line mode • OFF: Off-line mode • Flashing: Maintenance mode **Note** If the LINK indicator is OFF, the ONLINE indicator will also be OFF.
ALARM	Red	Alarm indication • OFF: Normal • ON: Alarm
VoIP BUSY	Green	VoIP (H.323) process indication • OFF: VoIP process inactive • ON: VoIP process active
LINK	Green	Link status indication • OFF: Connection error • ON: Normal connection
DATA	Green	Data transmission indication • OFF: No data transmitted • ON: Data transmitting

3.5.6 IP-GW16 Card (KX-TDA0490)

Function

16-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729A, G.723.1 and G.711 codec methods.

LEDs

RJ45
(10BASE-T/100BASE-TX
Full Duplex)

To private IP network
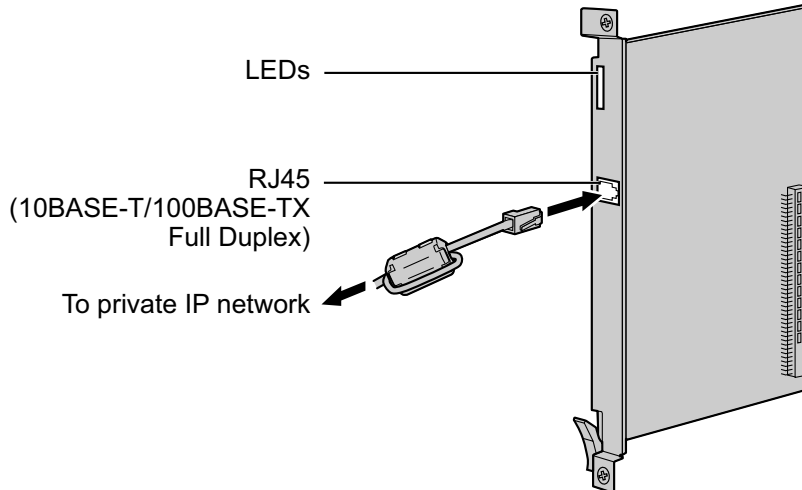
Accessories and User-supplied Items

Accessories (included): Ferrite core × 1, CD-ROM (including documentation for web programming) × 1
User-supplied (not included): RJ45 connector

Note

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- When connecting the RJ45 connector, attach the included ferrite core. Refer to "3.2.8 Attaching a Ferrite Core".
- For programming instructions and other information about the IP-GW16 card, refer to the documentation for the IP-GW16 card. To program the IP-GW16 card, use the web programming designed for the IP-GW16 card.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.13.1 Starting the PBX".

Pin Assignments

RJ45 Connector (10BASE-T/100BASE-TX)

	No.	Signal Name	Input (I)/Output (O)	Function
	1	TPO+	O	Transmit data+
	2	TPO-	O	Transmit data-
	3	TPI+	I	Receive data+
	4-5	Reserved	–	–
	6	TPI-	I	Receive data-
	7-8	Reserved	–	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
ONLINE	Green	On-line status indication • ON: On-line mode • OFF: Off-line mode • Flashing: Maintenance mode **Note** If the LINK indicator is OFF, the ONLINE indicator will also be OFF.
ALARM	Red	Alarm indication • OFF: Normal • ON: Alarm
VoIP BUSY	Green	VoIP (H.323) process indication • OFF: VoIP process inactive • ON: VoIP process active
LINK	Green	Link status indication • OFF: Connection error • ON: Normal connection
DATA	Green	Data transmission indication • OFF: No data transmitted • ON: Data transmitting

3.6 Information about the Physical Extension Cards

3.6.1 CSIF4 Card (KX-TDA0143) and CSIF8 Card (KX-TDA0144)

Function

CSIF4: 4-port CS interface card for 4 CSs.
CSIF8: 8-port CS interface card for 8 CSs.
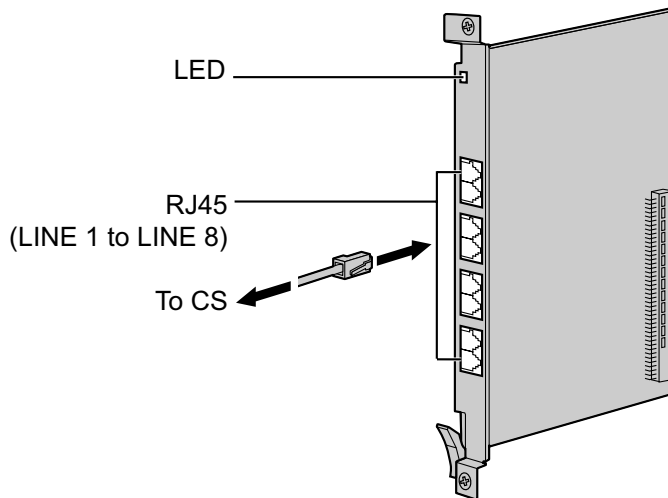
Accessories and User-supplied Items

Accessories (included): none
User-supplied (not included): RJ45 connector

CAUTION

Make sure that the status of all the CSs connected to the CSIF cards are set to in-service (INS). For information about how to view CS information using the Maintenance Console, refer to "2.6.15 Utility— CS Information" in the PC Programming Manual. If there is a CS in out-of-service (OUS) status, make sure that it is securely connected to the CSIF card. If the CS remains in OUS status, there may be a fault with the connection. Do not leave the connected CS in OUS status since it may cause severe damage to the CSIF card.

Note

- LINE 5 to LINE 8 are for CSIF8 card only.
- When using the CSIF4 card, please note that the PBX software will recognize the CSIF4 card as the CSIF8 card. As a result, 8 cell stations may appear to be available; however, only 4 cell stations are supported by the CSIF4 card.
- For details about connecting CSs, refer to the Quick Installation Guide for the relevant CS.

Editing the CS Name using the Maintenance Console

While programming the PBX, we strongly recommend that you input a unique recognizable CS name (maximum 20 characters) for each CS port in use, and "(Reserved)" or "(Not for CSIF4)" for unused ports or unavailable ports respectively for the following reasons:
a. you will be able to easily distinguish installed CSs.
b. you will be able to know which CSIF card has been installed; CSIF4 or CSIF8.

Example: When the CSIF4 card has been installed[*1]
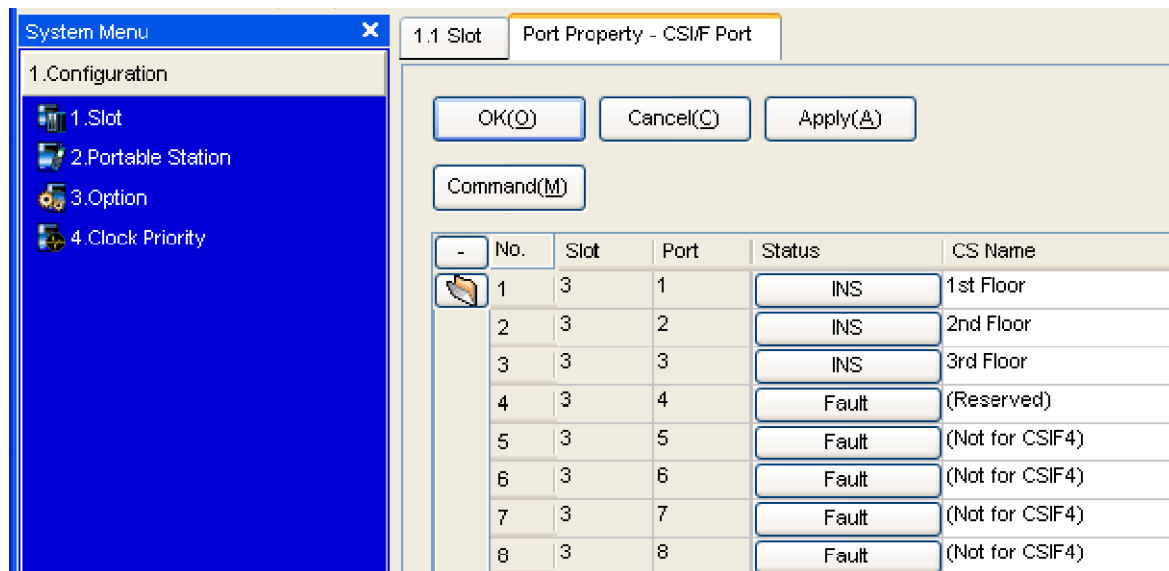
[*1]   The contents and design of the software are subject to change without notice.

Pin Assignments

RJ45 Connector

	No.	Signal Name	Function
(connector diagram, pins 8 and 1 labeled)	1-2	Reserved	–
	3	D1	Data port (High)
	4	POWH	Power (High)
	5	POWL	Power (Low)
	6	D2	Data port (Low)
	7-8	Reserved	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.6.2 DHLC8 Card (KX-TDA0170)

Function

8-port digital hybrid extension card for DPTs, APTs, SLTs, DSS consoles, and PT-interface CSs, with 2 power failure transfer (PFT) ports.

LED

Amphenol

To extensions

Accessories and User-supplied Items

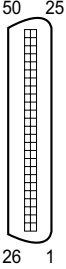**Accessories (included):** Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.9 Fastening an Amphenol Connector".
- For details about power failure transfer, refer to "3.12.1 Power Failure Connections".

Pin Assignments

Amphenol Connector

	No.	Signal Name	Function	No.	Signal Name	Function
50 25	1	RA	SLT Ring port 1	26	TA	SLT Tip port 1
	2	D2A	PT Data port 1 (Low)	27	D1A	PT Data port 1 (High)
	3	Reserved	–	28	Reserved	–
	4	RB	SLT Ring port 2	29	TB	SLT Tip port 2
	5	D2B	PT Data port 2 (Low)	30	D1B	PT Data port 2 (High)
26 1	6	Reserved	–	31	Reserved	–
	7	RC	SLT Ring port 3	32	TC	SLT Tip port 3

	No.	Signal Name	Function	No.	Signal Name	Function
	8	D2C	PT Data port 3 (Low)	33	D1C	PT Data port 3 (High)
	9	Reserved	–	34	Reserved	–
	10	RD	SLT Ring port 4	35	TD	SLT Tip port 4
	11	D2D	PT Data port 4 (Low)	36	D1D	PT Data port 4 (High)
	12	Reserved	–	37	Reserved	–
	13	RE	SLT Ring port 5	38	TE	SLT Tip port 5
	14	D2E	PT Data port 5 (Low)	39	D1E	PT Data port 5 (High)
	15	Reserved	–	40	Reserved	–
	16	RF	SLT Ring port 6	41	TF	SLT Tip port 6
	17	D2F	PT Data port 6 (Low)	42	D1F	PT Data port 6 (High)
	18	Reserved	–	43	Reserved	–
	19	RG	SLT Ring port 7	44	TG	SLT Tip port 7
	20	D2G	PT Data port 7 (Low)	45	D1G	PT Data port 7 (High)
	21	Reserved	–	46	Reserved	–
	22	RH	SLT Ring port 8	47	TH	SLT Tip port 8
	23	D2H	PT Data port 8 (Low)	48	D1H	PT Data port 8 (High)
	24-25	Reserved	–	49-50	Reserved	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/ Orange/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Orange Flashing: Detection of PT-interface CS connection (when starting up the PT-interface CS) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.6.3 DLC8 Card (KX-TDA0171)

Function

8-port digital extension card for DPTs, DSS consoles, and PT-interface CSs.
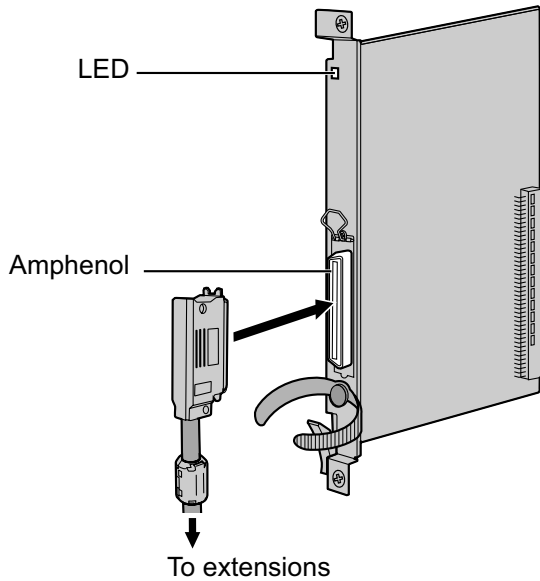
LED

Amphenol

To extensions

Accessories and User-supplied Items

Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.9 Fastening an Amphenol Connector".

Pin Assignments

Amphenol Connector

	No.	Signal Name	Function	No.	Signal Name	Function
50 25	1	Reserved	–	26	Reserved	–
	2	D2A	Data port 1 (Low)	27	D1A	Data port 1 (High)
	3-4	Reserved	–	28-29	Reserved	–
	5	D2B	Data port 2 (Low)	30	D1B	Data port 2 (High)
	6-7	Reserved	–	31-32	Reserved	–
	8	D2C	Data port 3 (Low)	33	D1C	Data port 3 (High)
26 1	9-10	Reserved	–	34-35	Reserved	–
	11	D2D	Data port 4 (Low)	36	D1D	Data port 4 (High)
	12-13	Reserved	–	37-38	Reserved	–

	No.	Signal Name	Function	No.	Signal Name	Function
	14	D2E	Data port 5 (Low)	39	D1E	Data port 5 (High)
	15-16	Reserved	–	40-41	Reserved	–
	17	D2F	Data port 6 (Low)	42	D1F	Data port 6 (High)
	18-19	Reserved	–	43-44	Reserved	–
	20	D2G	Data port 7 (Low)	45	D1G	Data port 7 (High)
	21-22	Reserved	–	46-47	Reserved	–
	23	D2H	Data port 8 (Low)	48	D1H	Data port 8 (High)
	24-25	Reserved	–	49-50	Reserved	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/ Orange/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Orange Flashing: Detection of PT-interface CS connection (when starting up the PT-interface CS) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.6.4 DLC16 Card (KX-TDA0172)

Function

16-port digital extension card for DPTs, DSS consoles, and PT-interface CSs.
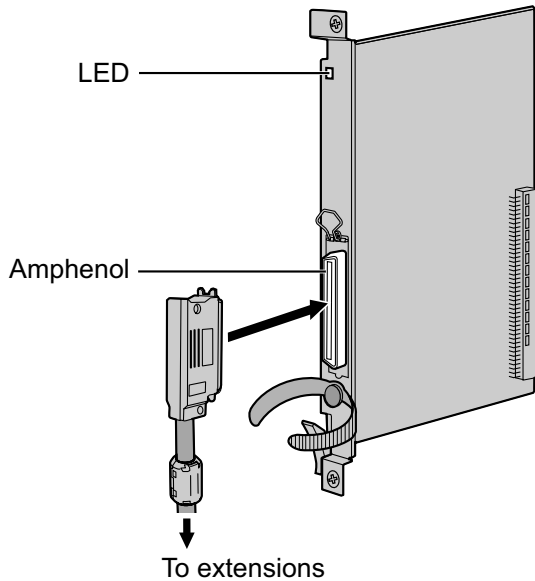
Accessories and User-supplied Items

Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.9 Fastening an Amphenol Connector".

Pin Assignments

Amphenol Connector

	No.	Signal Name	Function	No.	Signal Name	Function
50 25 26 1	1	D2A	Data port 1 (Low)	26	D1A	Data port 1 (High)
	2	D2B	Data port 2 (Low)	27	D1B	Data port 2 (High)
	3	D2C	Data port 3 (Low)	28	D1C	Data port 3 (High)
	4	D2D	Data port 4 (Low)	29	D1D	Data port 4 (High)
	5	D2E	Data port 5 (Low)	30	D1E	Data port 5 (High)
	6	D2F	Data port 6 (Low)	31	D1F	Data port 6 (High)
	7	D2G	Data port 7 (Low)	32	D1G	Data port 7 (High)
	8	D2H	Data port 8 (Low)	33	D1H	Data port 8 (High)
	9	D2I	Data port 9 (Low)	34	D1I	Data port 9 (High)

	No.	Signal Name	Function	No.	Signal Name	Function
	10	D2J	Data port 10 (Low)	35	D1J	Data port 10 (High)
	11	D2K	Data port 11 (Low)	36	D1K	Data port 11 (High)
	12	D2L	Data port 12 (Low)	37	D1L	Data port 12 (High)
	13	D2M	Data port 13 (Low)	38	D1M	Data port 13 (High)
	14	D2N	Data port 14 (Low)	39	D1N	Data port 14 (High)
	15	D2O	Data port 15 (Low)	40	D1O	Data port 15 (High)
	16	D2P	Data port 16 (Low)	41	D1P	Data port 16 (High)
	17-25	Reserved	–	42-50	Reserved	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/ Orange/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Orange Flashing: Detection of PT-interface CS connection (when starting up the PT-interface CS) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.6.5 SLC8 Card (KX-TDA0173)

Function

8-port extension card for SLTs with 2 power failure transfer (PFT) ports.

Accessories and User-supplied Items

Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.9 Fastening an Amphenol Connector".
- For details about power failure transfer, refer to "3.12.1 Power Failure Connections".

Pin Assignments

Amphenol Connector

	No.	Signal Name	Function	No.	Signal Name	Function
50 25 26 1	1	RA	Ring port 1	26	TA	Tip port 1
	2-3	Reserved	–	27-28	Reserved	–
	4	RB	Ring port 2	29	TB	Tip port 2
	5-6	Reserved	–	30-31	Reserved	–
	7	RC	Ring port 3	32	TC	Tip port 3
	8-9	Reserved	–	33-34	Reserved	–
	10	RD	Ring port 4	35	TD	Tip port 4
	11-12	Reserved	–	36-37	Reserved	–
	13	RE	Ring port 5	38	TE	Tip port 5
	14-15	Reserved	–	39-40	Reserved	–
	16	RF	Ring port 6	41	TF	Tip port 6
	17-18	Reserved	–	42-43	Reserved	–
	19	RG	Ring port 7	44	TG	Tip port 7
	20-21	Reserved	–	45-46	Reserved	–
	22	RH	Ring port 8	47	TH	Tip port 8
	23-25	Reserved	–	48-50	Reserved	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.6.6 EXT-CID Card (KX-TDA0168)

Function

Sends Caller ID signals (FSK) to extension ports. To be mounted on the SLC8 card only.
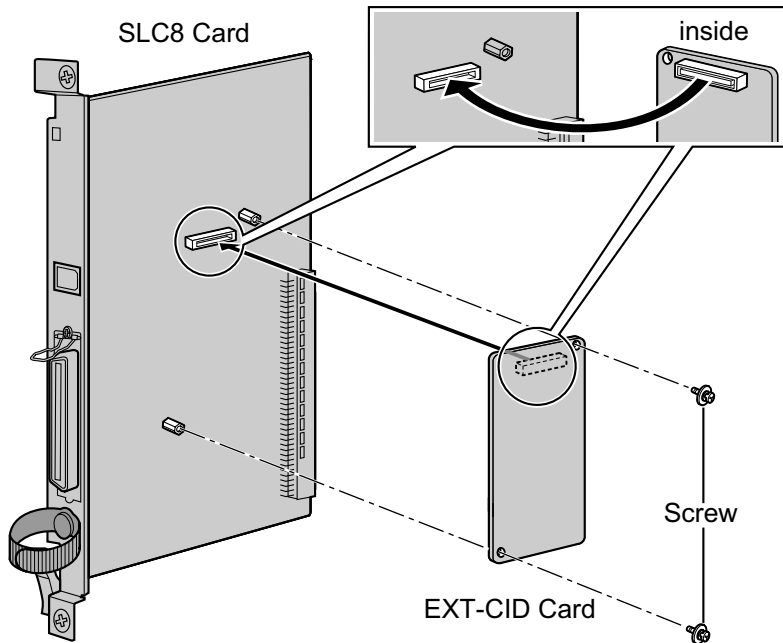
Accessories and User-supplied Items

Accessories (included): Screws × 2
User-supplied (not included): none

3.6.7 SLC16 Card (KX-TDA0174), MSLC16 Card (KX-TDA0175), and CSLC16 Card (KX-TDA0177)

Function

SLC16:   16-port extension card for SLTs with 4 power failure transfer (PFT) ports.

MSLC16:   16-port extension card for SLTs with Message Waiting Lamp control and 4 power failure transfer (PFT) ports. Maximum power output of 160 V/90 V (open voltage with no external load) for Message Waiting Lamp control.

CSLC16:   16-port extension card for SLTs with Caller ID (FSK) and 4 power failure transfer (PFT) ports.

LED

Amphenol

To extensions
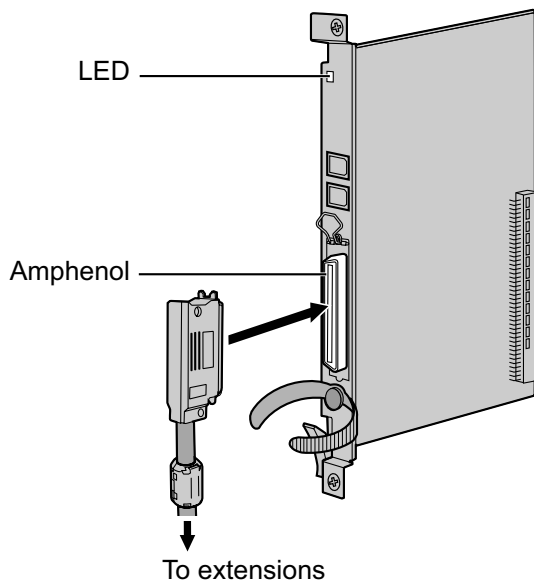
Accessories and User-supplied Items
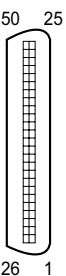
Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

<u>Note</u>

- Panasonic SLT with Message Waiting Lamp is recommended for connection to the MSLC16 card.
- Attach the included ferrite core to the cable. Refer to "3.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.9 Fastening an Amphenol Connector".
- For details about power failure transfer, refer to "3.12.1 Power Failure Connections".

Pin Assignments

Amphenol Connector

	No.	Signal Name	Function	No.	Signal Name	Function
	1	RA	Ring port 1	26	TA	Tip port 1
	2	RB	Ring port 2	27	TB	Tip port 2
	3	RC	Ring port 3	28	TC	Tip port 3
50 25	4	RD	Ring port 4	29	TD	Tip port 4
	5	RE	Ring port 5	30	TE	Tip port 5
26 1	6	RF	Ring port 6	31	TF	Tip port 6
	7	RG	Ring port 7	32	TG	Tip port 7
	8	RH	Ring port 8	33	TH	Tip port 8
	9	RI	Ring port 9	34	TI	Tip port 9
	10	RJ	Ring port 10	35	TJ	Tip port 10
	11	RK	Ring port 11	36	TK	Tip port 11
	12	RL	Ring port 12	37	TL	Tip port 12
	13	RM	Ring port 13	38	TM	Tip port 13
	14	RN	Ring port 14	39	TN	Tip port 14
	15	RO	Ring port 15	40	TO	Tip port 15
	16	RP	Ring port 16	41	TP	Tip port 16
	17-25	Reserved	–	42-50	Reserved	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.6.8 MCSLC16 Card (KX-TDA1176) and MCSLC24 Card (KX-TDA1178)

Function

MCSLC16: 16-port extension card for SLTs with Caller ID (FSK), Message Waiting Lamp control, and 2 power failure transfer (PFT) ports. Maximum power output of 90 V (open voltage with no external load) for Message Waiting Lamp control.

MCSLC24: 24-port extension card for SLTs with Caller ID (FSK), Message Waiting Lamp control, and 2 power failure transfer (PFT) ports. Maximum power output of 90 V (open voltage with no external load) for Message Waiting Lamp control.

LED

Amphenol

To extensions
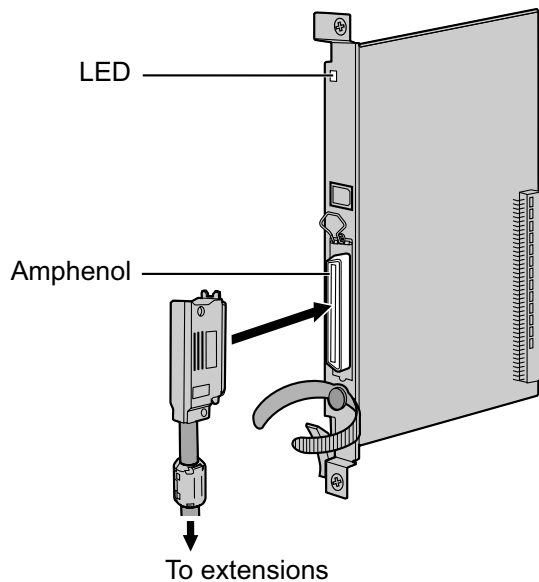
Accessories and User-supplied Items
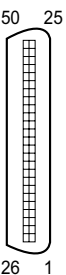
Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- The IPCMEC card must be installed in order to install a MCSLC16/MCSLC24 card.
- Attach the included ferrite core to the cable. Refer to "3.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.9 Fastening an Amphenol Connector".
- For details about power failure transfer, refer to "3.12.1 Power Failure Connections".

Pin Assignments

Amphenol Connector

	No.	Signal Name	Function	No.	Signal Name	Function
50 25 26 1	1	RA	Ring port 1	26	TA	Tip port 1
	2	RB	Ring port 2	27	TB	Tip port 2
	3	RC	Ring port 3	28	TC	Tip port 3
	4	RD	Ring port 4	29	TD	Tip port 4
	5	RE	Ring port 5	30	TE	Tip port 5
	6	RF	Ring port 6	31	TF	Tip port 6
	7	RG	Ring port 7	32	TG	Tip port 7
	8	RH	Ring port 8	33	TH	Tip port 8
	9	RI	Ring port 9	34	TI	Tip port 9
	10	RJ	Ring port 10	35	TJ	Tip port 10
	11	RK	Ring port 11	36	TK	Tip port 11
	12	RL	Ring port 12	37	TL	Tip port 12
	13	RM	Ring port 13	38	TM	Tip port 13
	14	RN	Ring port 14	39	TN	Tip port 14
	15	RO	Ring port 15	40	TO	Tip port 15
	16	RP	Ring port 16	41	TP	Tip port 16
	17	RQ	Ring port 17	42	TQ	Tip port 17
	18	RR	Ring port 18	43	TR	Tip port 18
	19	RS	Ring port 19	44	TS	Tip port 19
	20	RT	Ring port 20	45	TT	Tip port 20
	21	RU	Ring port 21	46	TU	Tip port 21
	22	RV	Ring port 22	47	TV	Tip port 22
	23	RW	Ring port 23	48	TW	Tip port 23
	24	RX	Ring port 24	49	TX	Tip port 24
	25	Reserved	–	50	Reserved	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.6.9 IP-EXT16 Card (KX-TDA0470)

Function

16-channel VoIP extension card. Compliant with Panasonic proprietary protocol, and ITU-T G.729A and G. 711 codec methods.

LEDs

RJ45
(10BASE-T/100BASE-TX
Full Duplex)

To LAN
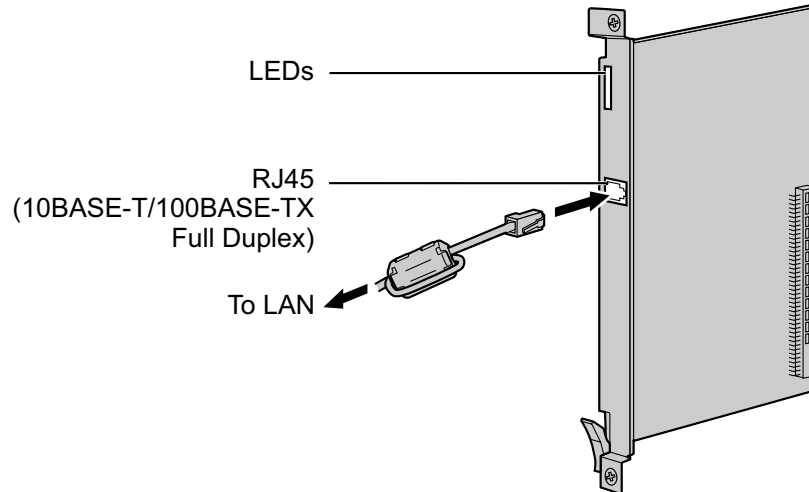
Accessories and User-supplied Items

Accessories (included): Ferrite core × 1
User-supplied (not included): RJ45 connector

Note

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- When connecting the RJ45 connector, attach the included ferrite core. Refer to "3.2.8 Attaching a Ferrite Core".
- Portions of this product contains software of Datalight, Inc. Copyright 1993–2000 Datalight,Inc., All Rights Reserved.

Pin Assignments

RJ45 Connector (10BASE-T/100BASE-TX)

	No.	Signal Name	Input (I)/Output (O)	Function
	1	TPO+	O	Transmit data+
	2	TPO-	O	Transmit data-
	3	TPI+	I	Receive data+
	4-5	Reserved	–	–
	6	TPI-	I	Receive data-
	7-8	Reserved	–	–

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
ONLINE	Green	On-line status indication • ON: At least one port is in use (an IP-PT is connected) • OFF: No ports are in use (no IP-PTs are connected) **Note** If the LINK indicator is OFF, the ONLINE indicator will also be OFF.
ALARM	Red	Alarm indication • OFF: Normal • ON: Alarm
VoIP BUSY	Green	Panasonic proprietary VoIP protocol process indication • OFF: VoIP process inactive • ON: VoIP process active
LINK	Green	Link status indication • OFF: Connection error • ON: Normal connection
DATA	Green	Data transmission indication • OFF: No data transmitted • ON: Data transmitting

3.7 Information about the Other Physical Cards

3.7.1 OPB3 Card (KX-TDA0190)

Function

Optional 3-slot base card for mounting a maximum of 3 option cards from the following:
- DPH4 card
- EIO4 card
- ECHO16 card
- MSG4 card
- ESVM4 card
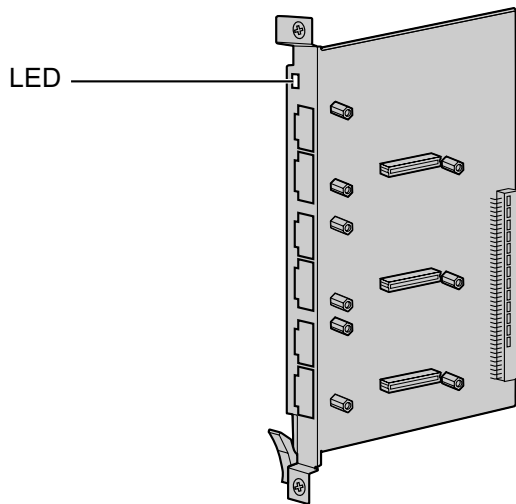
LED

Accessories and User-supplied Items

Accessories (included): none
User-supplied (not included): none

WARNING

A lithium battery is used in OPB3 card. There is a risk of explosion if the battery is replaced with the incorrect type. Dispose of used batteries according to the manufacturer's instructions.

LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.7.2 DPH4 Card (KX-TDA0161)

Function

4-port doorphone card for 4 doorphones and 4 door openers. To be mounted on the OPB3 card.
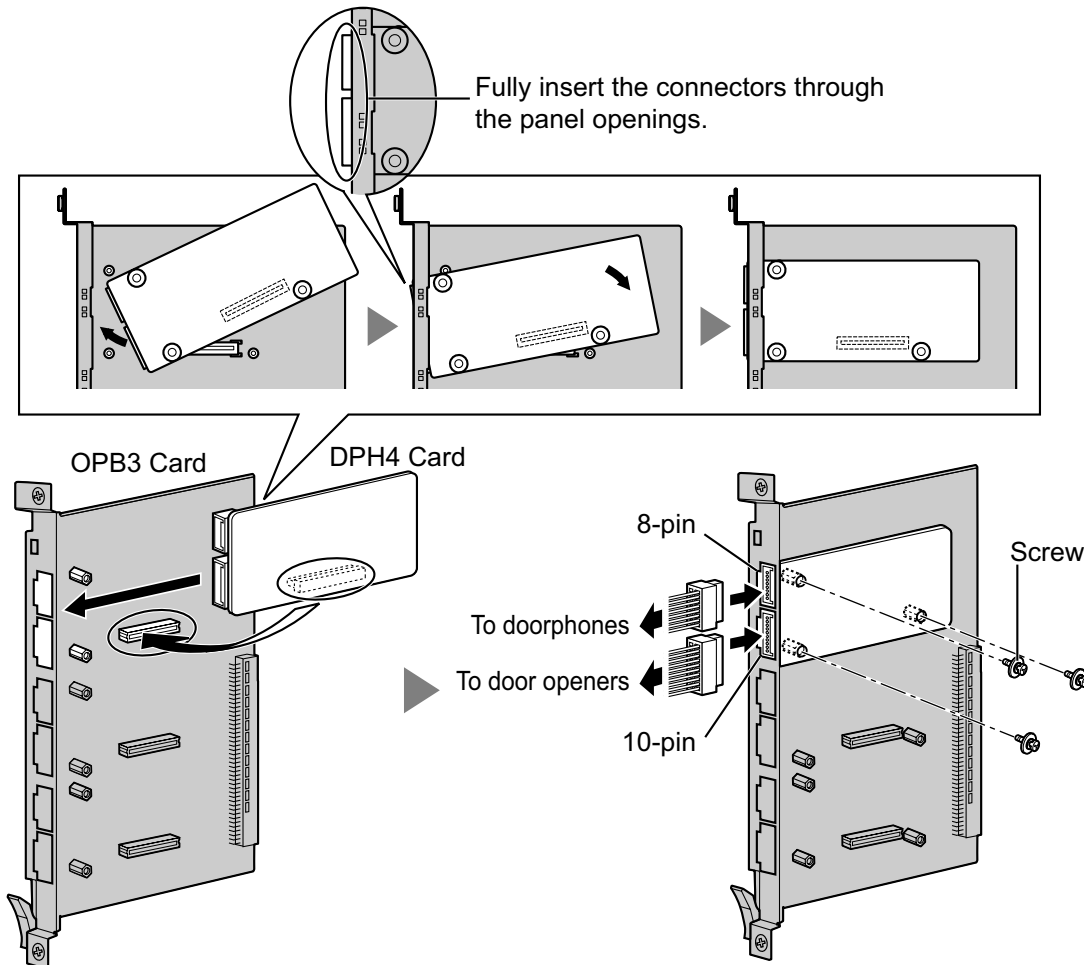
Fully insert the connectors through the panel openings.

OPB3 Card   DPH4 Card

8-pin
Screw
To doorphones
To door openers
10-pin

Accessories and User-supplied Items

Accessories (included): Screws × 3, 10-pin terminal block × 1, 8-pin terminal block × 1
User-supplied (not included): Copper wire
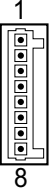
Note
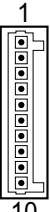
For details about connection to doorphones and door openers, refer to "3.9.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays".

Pin Assignments

8-pin Terminal Block

	No.	Signal Name	Function
1 8	1	DP4	Doorphone 4 transmit
	2	com4	Doorphone 4 receive
	3	DP3	Doorphone 3 transmit
	4	com3	Doorphone 3 receive
	5	DP2	Doorphone 2 transmit
	6	com2	Doorphone 2 receive
	7	DP1	Doorphone 1 transmit
	8	com1	Doorphone 1 receive

10-pin Terminal Block

	No.	Signal Name	Function
1 10	1-2	Reserved	–
	3	OP4b	Door opener 4
	4	OP4a	Door opener 4 com
	5	OP3b	Door opener 3
	6	OP3a	Door opener 3 com
	7	OP2b	Door opener 2
	8	OP2a	Door opener 2 com
	9	OP1b	Door opener 1
	10	OP1a	Door opener 1 com

3.7.3 EIO4 Card (KX-TDA0164)

Function

4-port external input/output card. To be mounted on the OPB3 card.
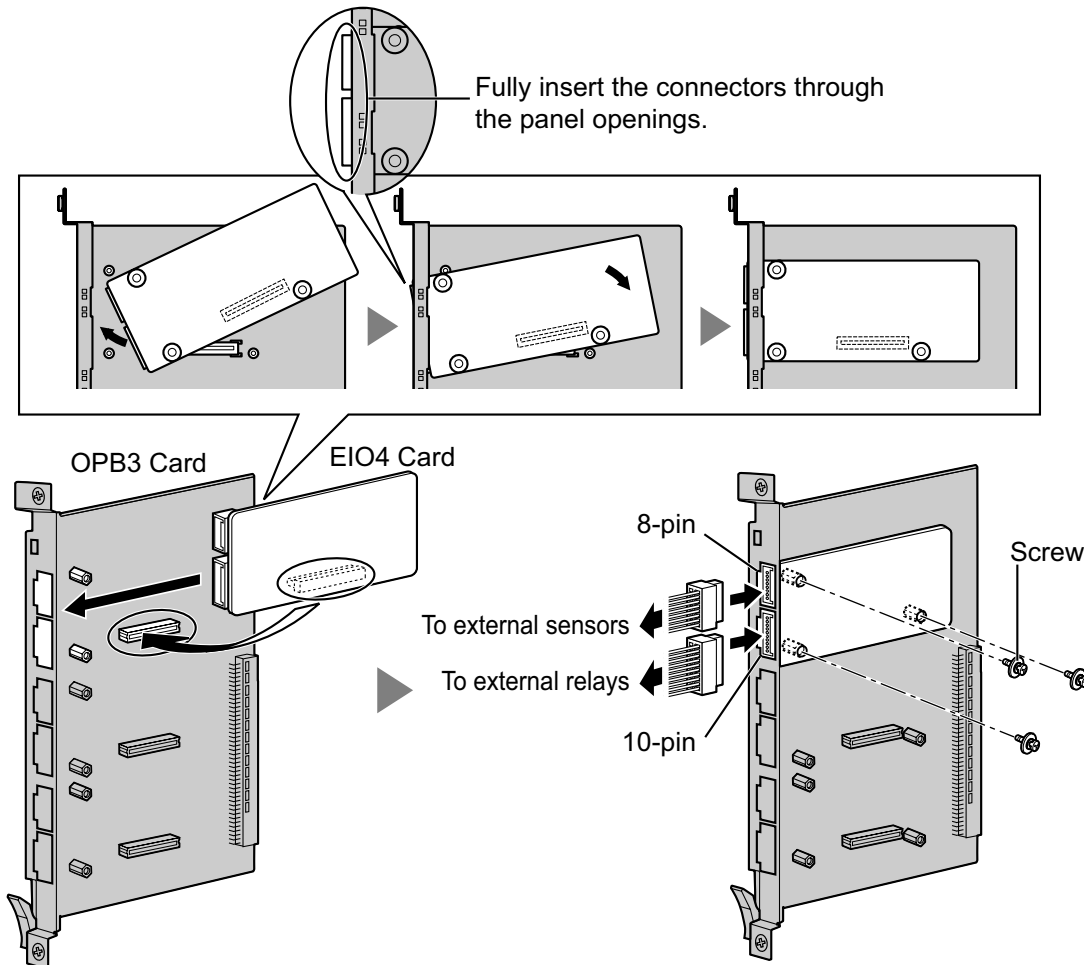
Fully insert the connectors through the panel openings.

OPB3 Card   EIO4 Card

8-pin
To external sensors
To external relays
10-pin
Screw

Accessories and User-supplied Items

Accessories (included): Screws × 3, 10-pin terminal block × 1, 8-pin terminal block × 1
User-supplied (not included): Copper wire
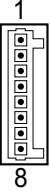
Note
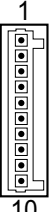
For details about connection to external sensors and external relays, refer to "3.9.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays".

Pin Assignments

8-pin Terminal Block

	No.	Signal Name	Function
1 8	1	C4b	Control 4
	2	C4a	Control 4 com
	3	C3b	Control 3
	4	C3a	Control 3 com
	5	C2b	Control 2
	6	C2a	Control 2 com
	7	C1b	Control 1
	8	C1a	Control 1 com

10-pin Terminal Block

	No.	Signal Name	Function
1 10	1-2	Reserved	–
	3	OP4b	Opener 4
	4	OP4a	Opener 4 com
	5	OP3b	Opener 3
	6	OP3a	Opener 3 com
	7	OP2b	Opener 2
	8	OP2a	Opener 2 com
	9	OP1b	Opener 1
	10	OP1a	Opener 1 com

External Sensor

Power to the external sensor is provided from the EIO4 card and must be grounded through the EIO4 card as indicated in the diagram below. A pair of "sensor" and "common" lines are connected to the EIO4 card for each external sensor. The PBX detects input from the sensor when the signal is under 100 Ω.

Connection Diagram
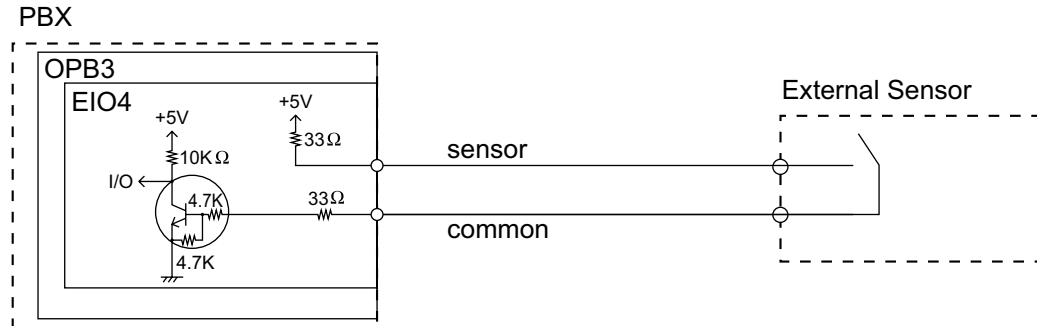
External Relay

Current Limit: 24 V DC/30 V AC, 1 A maximum

3.7.4 ECHO16 Card (KX-TDA0166)

Function

16-channel card for echo cancellation during conferences. To be mounted on the OPB3 card.
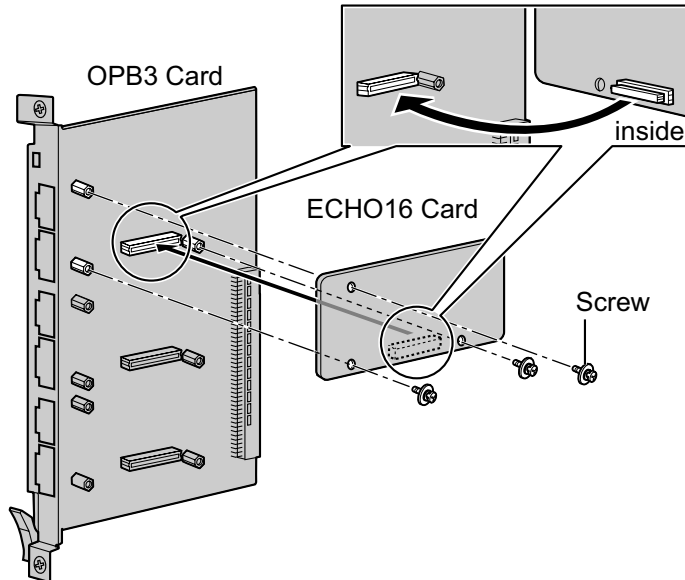
Accessories and User-supplied Items

Accessories (included): Screws × 3
User-supplied (not included): none

Note

To establish a conference call involving 6 to 8 parties, install an ECHO16 card and enable echo cancellation for conferences using the Maintenance Console. For details, refer to "Echo Cancel—Conference" in "4.18 [2-9] System Options" of the PC Programming Manual.

3.7.5 MSG4 Card (KX-TDA0191)

Function

4-channel message card. To be mounted on the OPB3 card.
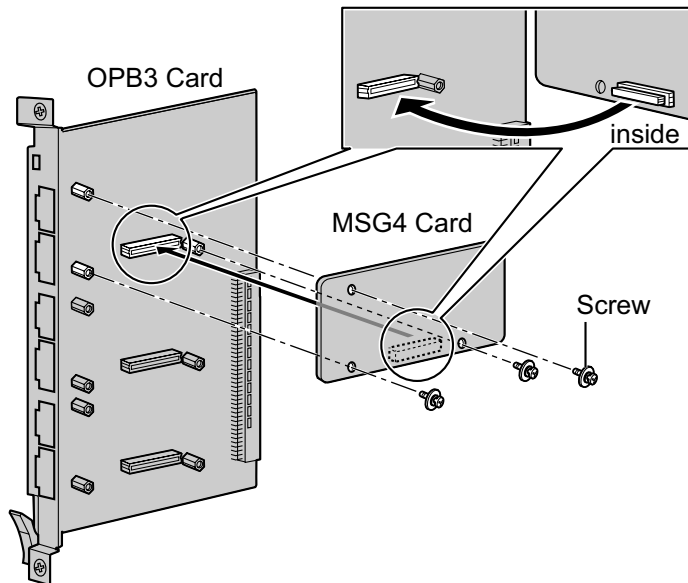
OPB3 Card

inside

MSG4 Card

Screw

Accessories and User-supplied Items

Accessories (included): Screws × 3
User-supplied (not included): none

3.7.6 ESVM4 Card (KX-TDA0194)

Function

4-channel simplified voice message card for Simplified Voice Message feature. Also supports MSG card features. To be mounted on the OPB3 card.
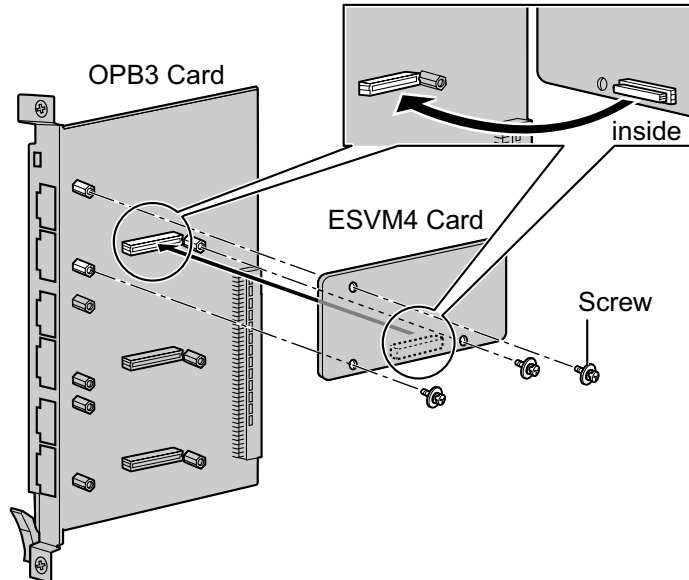
Accessories and User-supplied Items

Accessories (included): Screws × 3
User-supplied (not included): none

CAUTION

When installing/uninstalling an ESVM card, be careful not to damage the chips around the connection parts. Doing so may cause severe damage to the ESVM card.

Notice

- When replacing an ESVM card, ensure that the status of the OPB3 card is In Service (INS), and then initialize the ESVM card. For details about the initialization procedure, refer to "2.5.4 Tool—Simplified Voice Message—Delete All Recording" in the PC Programming Manual.
- When installing an ESVM card for the first time on an OPB3 card that is already installed in the PBX, do not remove the OPB3 card from the PBX until the card status becomes INS.
- After installing the OPB3 card, with an ESVM card mounted, for the first time, do not remove the OPB3 card from the PBX until the card status becomes INS.

Note

When using an ESVM card for the SVM feature, it must be mounted on sub-slot 3 (highest slot) of the OPB3 card.

3.8 Connection of Extensions

3.8.1 Maximum Cabling Distances of the Extension Wiring (Twisted Cable)

Cable	Maximum Distance
26 AWG:	222 m (728 ft)
24 AWG:	347 m (1138 ft)
22 AWG:	500 m (1640 ft)
CAT 5:	347 m (1138 ft)

PT-interface CS

Cable	Maximum Distance
26 AWG:	500 m (1640 ft)
24 AWG:	720 m (2362 ft)
22 AWG:	830 m (2723 ft)
CAT 5:	720 m (2362 ft)

KX-DT300 Series DPT

Cable	Maximum Distance
26 AWG:	500 m (1640 ft)
24 AWG:	720 m (2362 ft)
22 AWG:	830 m (2723 ft)
CAT 5:	720 m (2362 ft)

KX-T7600 Series DPT[1]

Cable	Maximum Distance
26 AWG:	140 m (459 ft)
24 AWG:	229 m (751 ft)
22 AWG:	360 m (1181 ft)
CAT 5:	229 m (751 ft)

Other PT (DPT/APT) and DSS Console

Cable	Maximum Distance
26 AWG:	698 m (2289 ft)
24 AWG:	1128 m (3700 ft)
22 AWG:	1798 m (5897 ft)
CAT 5:	1128 m (3700 ft)

SLT

[1]   The maximum cabling distance from the PBX is the same even when the KX-T7600 series DPT is the master DPT on the Digital XDP connection.

Notice

The maximum cabling distance may vary depending on the conditions.

	PT-interface CS	**DPT**	**APT**	**DSS Console**	**SLT**
DHLC8 Card	✓	✓	✓	✓	✓
MCSLC24, MCSLC16, MSLC16, CSLC16, SLC16, SLC8 Cards					✓
DLC16, DLC8 Cards	✓	✓		✓	

"✓" indicates that the extension card supports the terminal.

3.8.2 Parallel Connection of the Extensions

Any SLT can be connected in parallel with an APT or a DPT as follows.

Note

> In addition to an SLT, an answering machine, a fax machine or a modem (PC) can be connected in parallel with an APT or a DPT.

With APT

For parallel connection, eXtra Device Port (XDP) mode must be disabled for that port through system programming. Refer to "13.1.2 Paralleled Telephone" and "5.1.7 Extension Port Configuration" in the Feature Manual for further information.

To DHLC8 card ◀━━━━━━━━

Modular
T-Adaptor

2-conductor wiring cord
Connect pins "T" and "R".

4-conductor wiring cord
Connect pins "T", "R", "D1", ━▶
and "D2".

APT   SLT
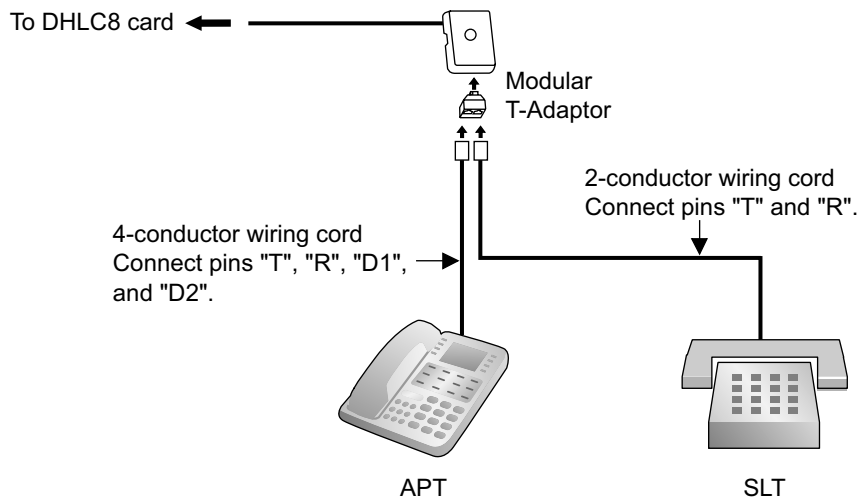
With DPT

Parallel mode or eXtra Device Port (XDP) mode can be selected through system programming.
If XDP mode is enabled through system programming, parallel connection is not possible. Refer to
"13.1.2 Paralleled Telephone" and "5.1.7 Extension Port Configuration" in the Feature Manual for further
information.

Using a Modular T-Adaptor

To DHLC8 card ◄───

Modular
T-Adaptor

2-conductor wiring cord
Connect pins "T" and "R".

4-conductor wiring cord
Connect pins "D1" and
"D2".

DPT   SLT
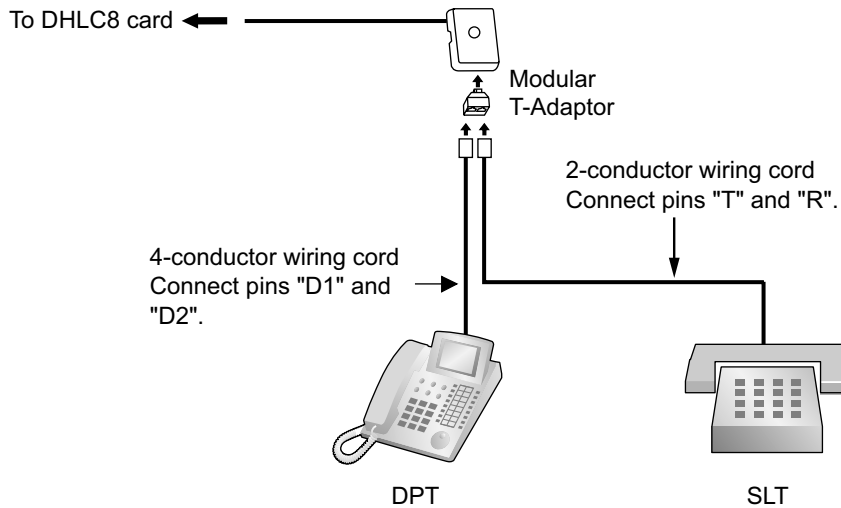
Using an EXtra Device Port
With KX-DT300 Series DPT (except KX-DT321)

To DHLC8 card ◄───

4-conductor wiring cord
Connect pins "T", "R",
"D1" and "D2".

2-conductor wiring cord
Connect pins "T" and "R".

DPT   SLT

TO MAIN UNIT   TO TEL
/ PABX
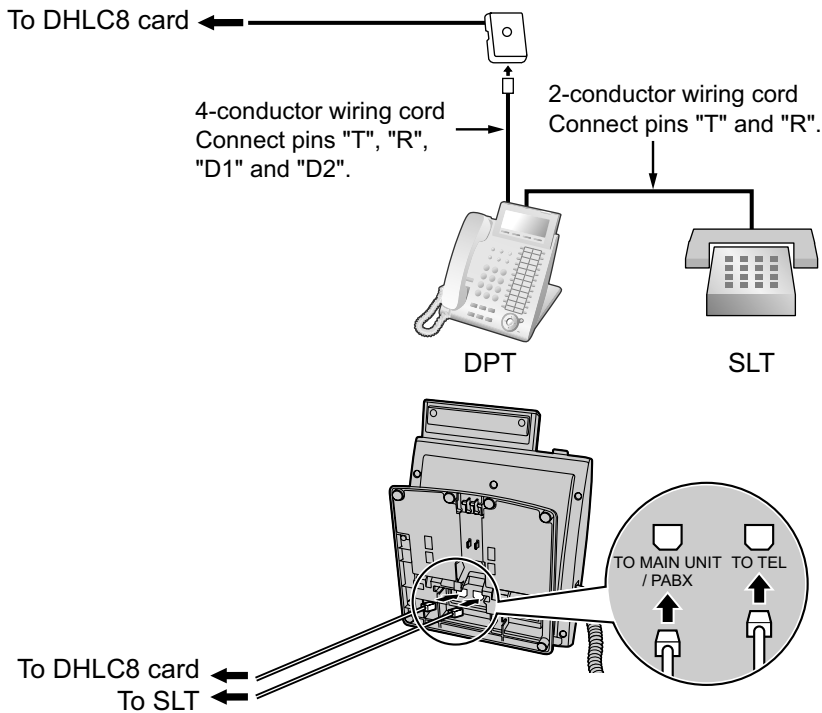
To DHLC8 card ◄───
To SLT ◄───

With KX-T7600 Series DPT (except KX-T7665)

To DHLC8 card ←

2-conductor wiring cord
Connect pins "T" and "R".

4-conductor wiring cord
Connect pins "T", "R",
"D1" and "D2". →

DPT   SLT

TO MAIN UNIT   TO TEL
/ PABX

To DHLC8 card ←
To SLT ←

With Other DPT

To DHLC8 card ←

2-conductor wiring cord
Connect pins "T" and "R".

4-conductor wiring cord
Connect pins "T", "R",
"D1" and "D2". →

DPT   SLT

TO TEL

TO EMSS or TO MAIN UNIT
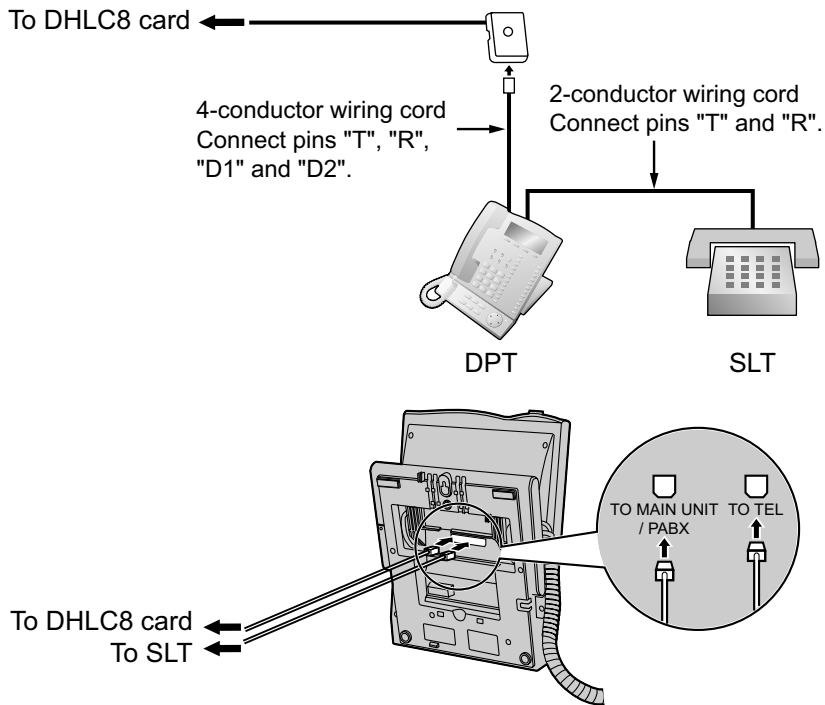
To DHLC8 card ←   → To SLT
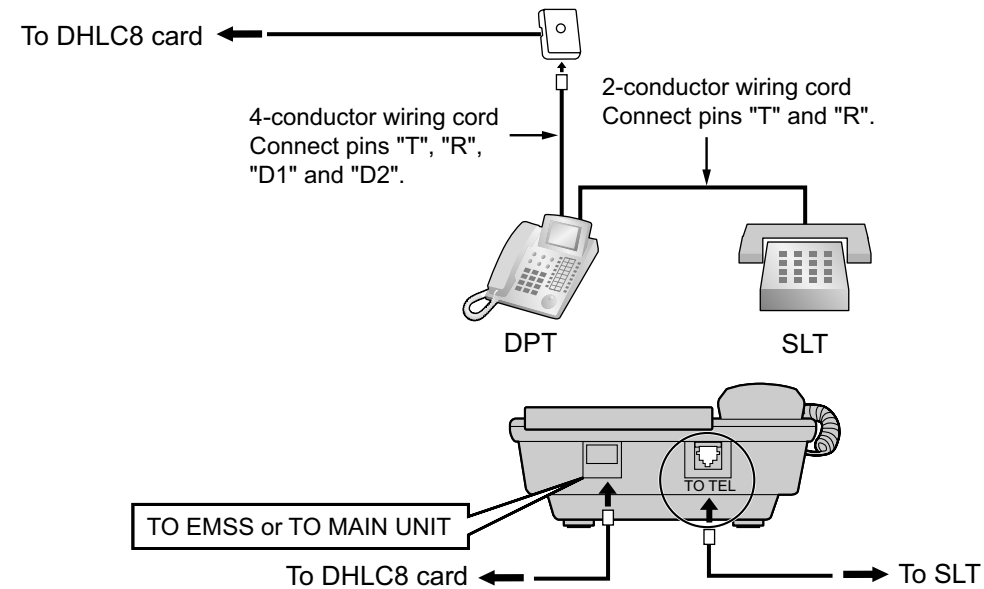
3.8.3 Digital EXtra Device Port (Digital XDP) Connection

A DPT can be connected to another DPT on the Digital XDP connection. In addition, if the DPT is connected to a DHLC8 card, it can also have an SLT connected in Parallel mode or XDP mode.

Note

- Both DPTs must be KX-DT300/KX-T7600 series DPTs (except KX-T7640). Note that the KX-T7667 can only be connected as a slave DPT.
- Bluetooth® Modules or USB Modules must not be connected to DPTs in the Digital XDP connection.
- Parallel mode or XDP mode can be selected through system programming.
- If XDP mode is enabled through system programming, parallel connection is not possible. Refer to "13.1.2 Paralleled Telephone" and "5.1.7 Extension Port Configuration" in the Feature Manual for further information.

With KX-DT300 Series DPT

Using a Modular T-Adaptor

To DLC8/DLC16 card
OR
To DHLC8 card
(for connection of SLT)

Modular
T-Adaptor

2-conductor wiring cord
Connect pins "T" and "R".

4-conductor wiring cord
Connect pins "D1" and "D2".

4-conductor wiring cord
Connect pins "D1" and "D2".

Master DPT   Slave DPT   SLT

Back View of DPTs

TO TEL

TO MAIN UNIT / PABX

Cable   Maximum Distance
26 AWG: 30 m (98 ft)
24 AWG: 50 m (164 ft)
22 AWG: 60 m (196 ft)
CAT 5:   50 m (164 ft)

TO MAIN UNIT / PABX

Master DPT   Slave DPT

To DLC8/DLC16 card
OR
To DHLC8 card
(for connection of SLT)

Using an EXtra Device Port

To DLC8/DLC16 card
OR
To DHLC8 card
(for connection of SLT)

4-conductor wiring cord
Connect pins "T", "R",
"D1" and "D2".

4-conductor wiring cord
Connect pins "T", "R",
"D1" and "D2".

2-conductor wiring cord
Connect pins "T" and "R".

Master DPT   Slave DPT   SLT

Back View of DPTs

TO TEL

Cable	Maximum Distance
26 AWG:	30 m (98 ft)
24 AWG:	50 m (164 ft)
22 AWG:	60 m (196 ft)
CAT 5:	50 m (164 ft)

TO MAIN UNIT
/ PABX

Master DPT   Slave DPT

TO MAIN UNIT
/ PABX

TO TEL

To DLC8/DLC16 card   To SLT
OR
To DHLC8 card
(for connection of SLT)

With KX-T7600 Series DPT

Using a Modular T-Adaptor

To DLC8/DLC16 card

OR

To DHLC8 card
(for connection of SLT)

Modular
T-Adaptor

2-conductor wiring cord
Connect pins "T" and "R".

4-conductor wiring cord
Connect pins "D1" and "D2".

4-conductor wiring cord
Connect pins "D1" and
"D2".

SLT

Master DPT   Slave DPT

Back View of DPTs

TO TEL

TO MAIN UNIT
/ PABX

Cable	Maximum Distance
26 AWG:	30 m (98 ft)
24 AWG:	50 m (164 ft)
22 AWG:	60 m (196 ft)
CAT 5:	50 m (164 ft)

TO MAIN UNIT
/ PABX

Master DPT

Slave DPT

To DLC8/DLC16 card

OR

To DHLC8 card
(for connection of SLT)

Using an EXtra Device Port

To DLC8/DLC16 card
OR
To DHLC8 card
(for connection of SLT)

4-conductor wiring cord
Connect pins "T", "R",
"D1" and "D2".

2-conductor wiring cord
Connect pins "T" and "R".

4-conductor wiring cord
Connect pins "T", "R",
"D1" and "D2".

Master DPT   Slave DPT   SLT

Back View of DPTs

TO TEL

TO MAIN UNIT
/ PABX

Cable	Maximum Distance
26 AWG:	30 m (98 ft)
24 AWG:	50 m (164 ft)
22 AWG:	60 m (196 ft)
CAT 5:	50 m (164 ft)

TO MAIN UNIT
/ PABX

TO TEL

Master DPT   Slave DPT

To DLC8/DLC16 card   To SLT
OR
To DHLC8 card
(for connection of SLT)

3.8.4 First Party Call Control CTI Connection

CTI connection between a PC and a KX-DT343/KX-DT346/KX-T7633/KX-T7636 DPT provides first party call control. The CTI connection is made via a USB interface (version 2.0), and uses the TAPI 2.1 protocol.
A USB Module must be connected to the DPT.

Note

> The operating system of the PC required for first party call control depends on your CTI application software. For details, refer to the manual for your CTI application software.

KX-DT343/KX-DT346
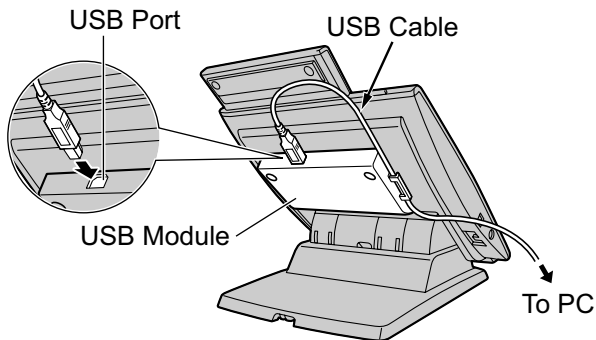
KX-T7633/KX-T7636
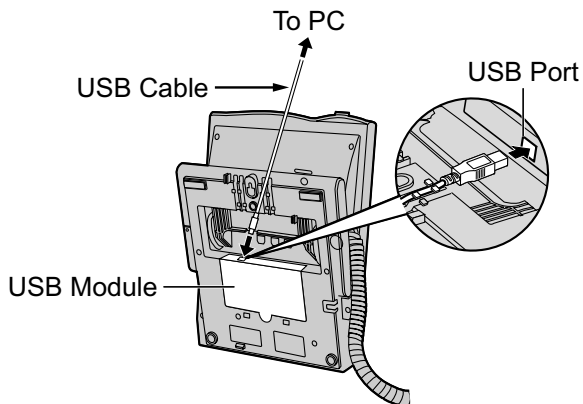
Note

> The maximum length of the USB cable is 3 m (9 ft 10 in).

3.9 Connection of Doorphones, Door Openers, External Sensors, and External Relays

3.9.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays

The PBX supports a maximum of 16 doorphones, 16 door openers, 16 external sensors, and 16 external relays.

Note

Doorphones, door openers, external sensors, and external relays are user-supplied.

Maximum Cabling Distance

Cable	Maximum Distance
26 AWG:	70 m (230 ft)
24 AWG:	113 m (371 ft)
22 AWG:	180 m (590 ft)
CAT 5:	113 m (371 ft)

Doorphone

Door Opener

External Sensor/
External Relay Device
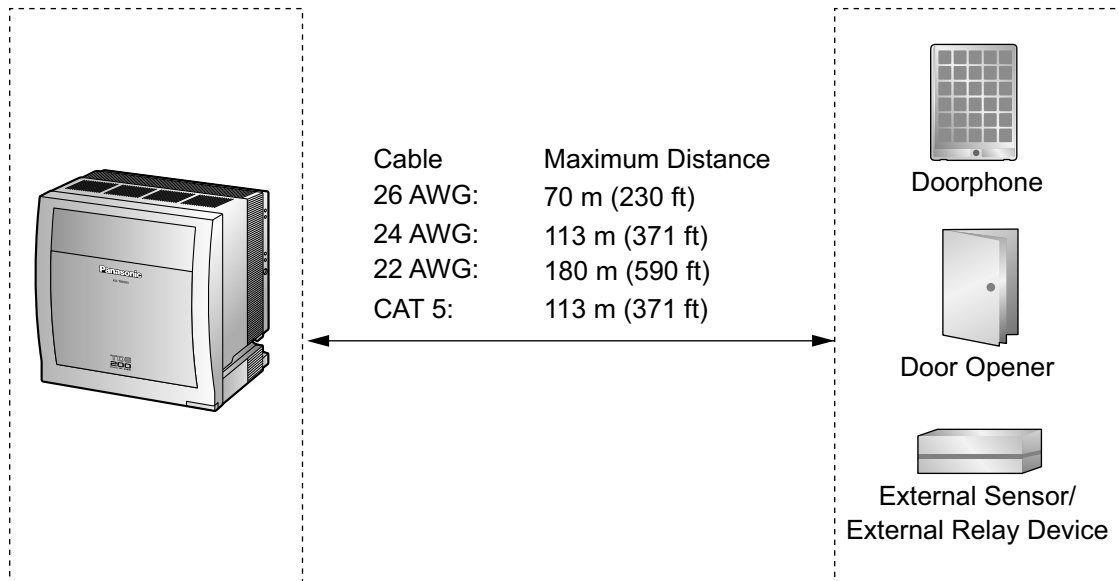
Installing the Doorphone (KX-T30865/KX-T7765/KX-T7775)

Note

- The illustrations shown in the installation procedure are based on the KX-T30865.
- For details about the installation of the KX-T7775, refer to the Operating Instructions of the KX-T7775.

1. Loosen the screw to separate the doorphone into 2 halves.
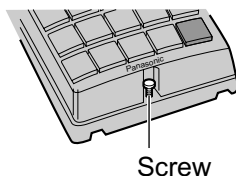
Screw

Note for KX-T7765 Users

When loosening/tightening the screw, do not scratch the cabinet wall with the driver shaft.

Cabinet Wall
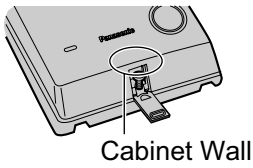
2. Pass the wires through the hole in the base cover, and attach the base cover to a wall using 2 screws.

Screw

To 8-pin terminal block
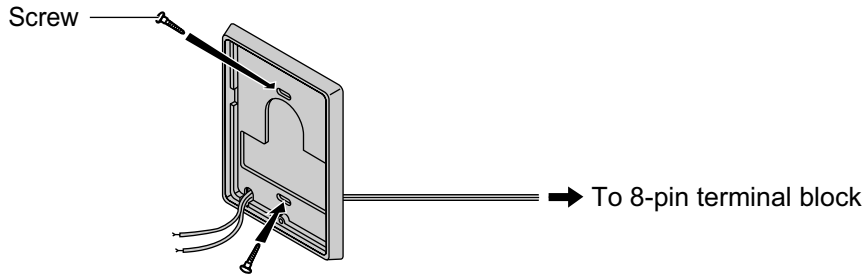
Note

Two kinds of screws are included with the doorphone. Please choose the appropriate kind for your wall type.

: when a doorphone plate has been fixed to the wall

: when you wish to install the doorphone directly onto the wall

3. Connect the wires to the screws located in the back cover.

To 8-pin terminal block
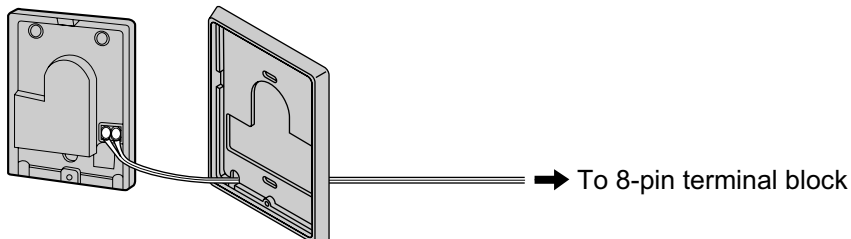
4. Re-attach the 2 halves and re-insert the screw.

Connection

Use 8-pin and 10-pin terminal blocks (included with the card) for connection.

1. While pressing down on the hole at the top of the terminal block using a screwdriver, insert the wire into the side hole as shown below. Repeat this procedure for other doorphones, door openers, external sensors, and external relays.
Refer to "3.7.2 DPH4 Card (KX-TDA0161)" and "3.7.3 EIO4 Card (KX-TDA0164)" for pin assignments.
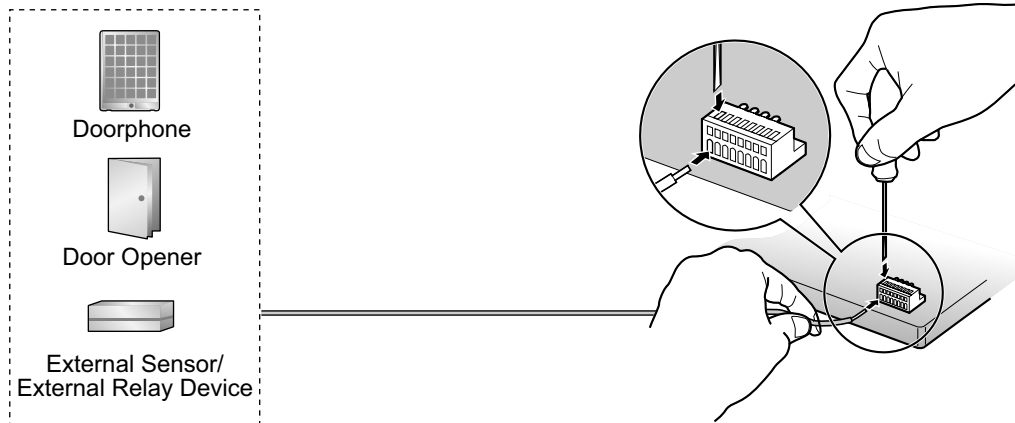
2. Attach the terminal blocks to the connectors of the DPH4/EIO4 card on the PBX.
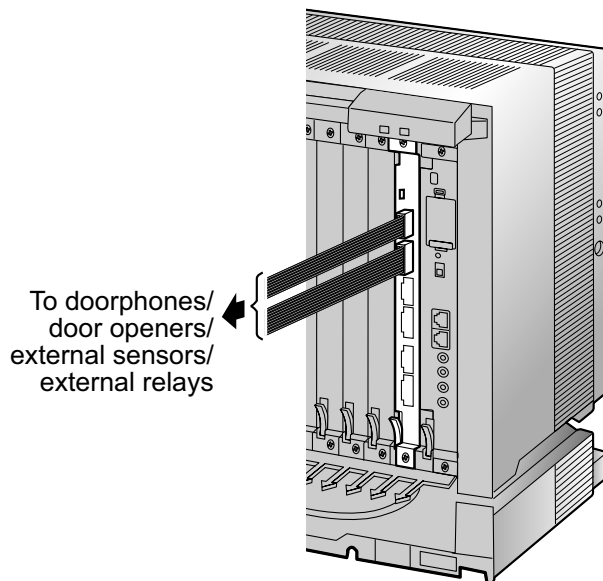
3.10 Connection of Peripherals

3.10.1 Connection of Peripherals
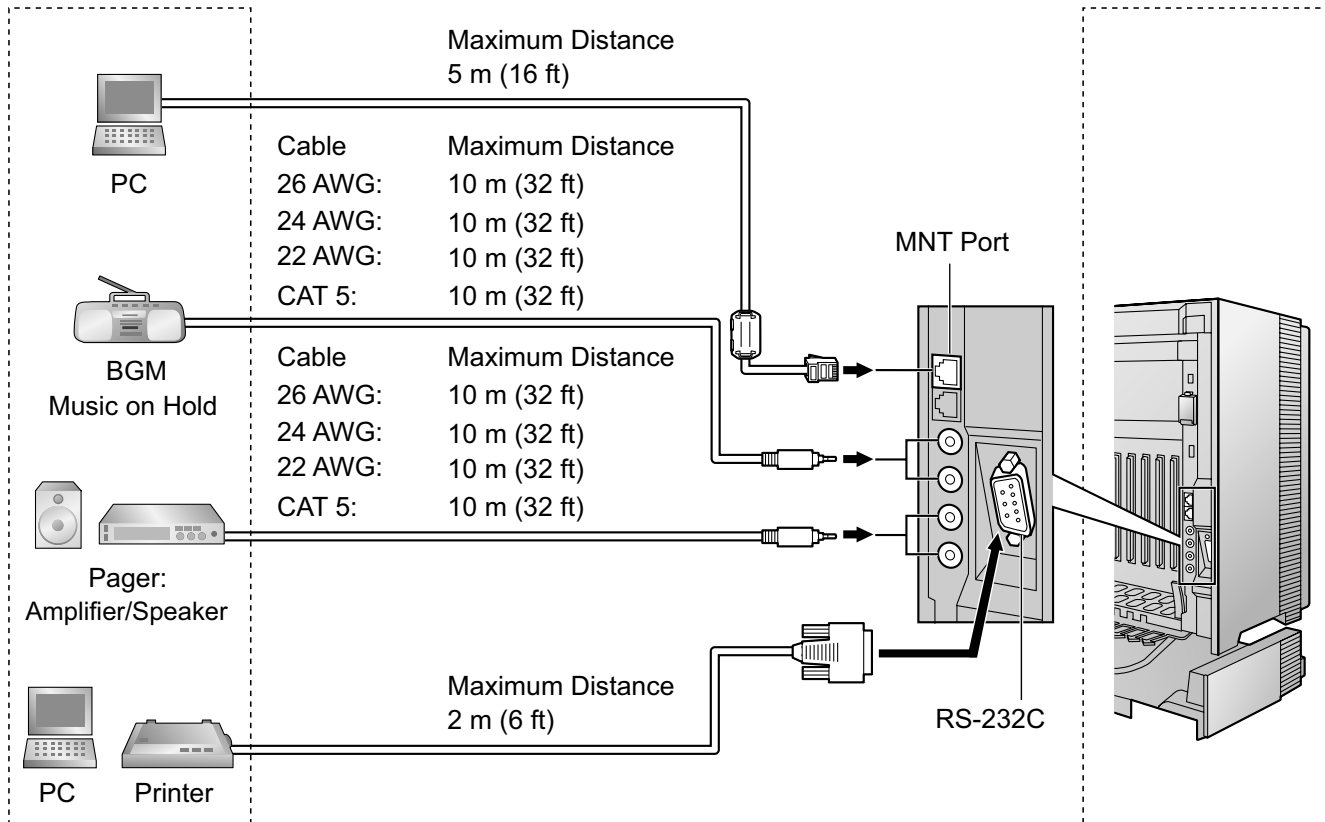
PC (via MNT Port)

A PC can be connected to the PBX via the MNT port of the IPCMPR card. It is used for system programming, diagnostics and external system database storage (save/load) functions.

Pin Assignments

	No.	Signal Name	Input (I)/Output (O)	Function
	1	TPO+	O	Transmit data+
	2	TPO-	O	Transmit data-
	3	TPI+	I	Receive data+
	4-5	Reserved	–	–
	6	TPI-	I	Receive data-
	7-8	Reserved	–	–

BGM/MOH

The PBX provides Background Music and Music on Hold. Up to 2 external music sources (e.g., user-supplied radios) can be connected to the PBX.

CAUTION

- Wiring should be done carefully to prevent undue force being exerted on the plug. Otherwise, sound may only be heard intermittently.
- External Music Jacks are SELV ports and should only be connected to approved SELV devices.

Note

When the PBX and external music sources are not connected to the same ground, hum noise may be induced into Background Music and Music on Hold.

Pager

Up to 2 paging devices (user-supplied) can be connected to the PBX.

CAUTION

External Paging Jacks are SELV ports and should only be connected to approved SELV devices.

PC/Printer (via RS-232C)

The PBX is equipped with an RS-232C interface. This interface provides communication between the PBX and the user-supplied devices such as PC or line printers. The RS-232C port is used for system programming, SMDR, diagnostics and external system database storage (save/load) functions.
When using special accessories such as cable, the user should use those specified in this installation manual to comply with the limits for a Class B digital device pursuant to the FCC Rules.
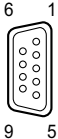
CAUTION

To protect the system, keep the following in mind:
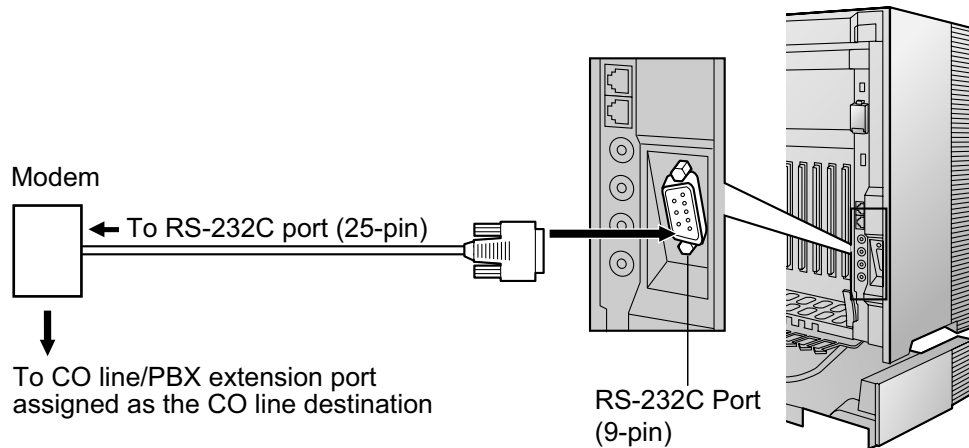1. Make sure that both connector cases (frame ground) of the RS-232C cross cable (shielded cable) are conductive. If they are not conductive, make sure that both connector cases of the cable are firmly connected.
2. If this is not possible, connect the frame of the PBX to the frame of the PC/Printer using a grounding wire in order to prevent difference in the electrical potentials.

Pin Assignments

	No.	Signal Name	Function	Circuit Type	
				EIA	CCITT
6 1 ... 9 5	2	RD (RXD)	Receive Data	BB	104
	3	SD (TXD)	Transmit Data	BA	103
	4	ER (DTR)	Data Terminal Ready	CD	108.2
	5	SG	Signal Ground	AB	102
	6	DR (DSR)	Data Set Ready	CC	107
	7	RS (RTS)	Request To Send	CA	105
	8	CS (CTS)	Clear To Send	CB	106

Connection Charts

For connecting a printer/PC with a 9-pin RS-232C connector

PBX (9-pin)   Printer/PC (9-pin)

Circuit Type (EIA)	Signal Name	Pin No.
BB	RD (RXD)	2
BA	SD (TXD)	3
CD	ER (DTR)	4
AB	SG	5
CC	DR (DSR)	6
CA	RS (RTS)	7
CB	CS (CTS)	8

Pin No.	Signal Name	Circuit Type (EIA)
2	RD (RXD)	BB
3	SD (TXD)	BA
4	ER (DTR)	CD
5	SG	AB
6	DR (DSR)	CC
7	RS (RTS)	CA
8	CS (CTS)	CB
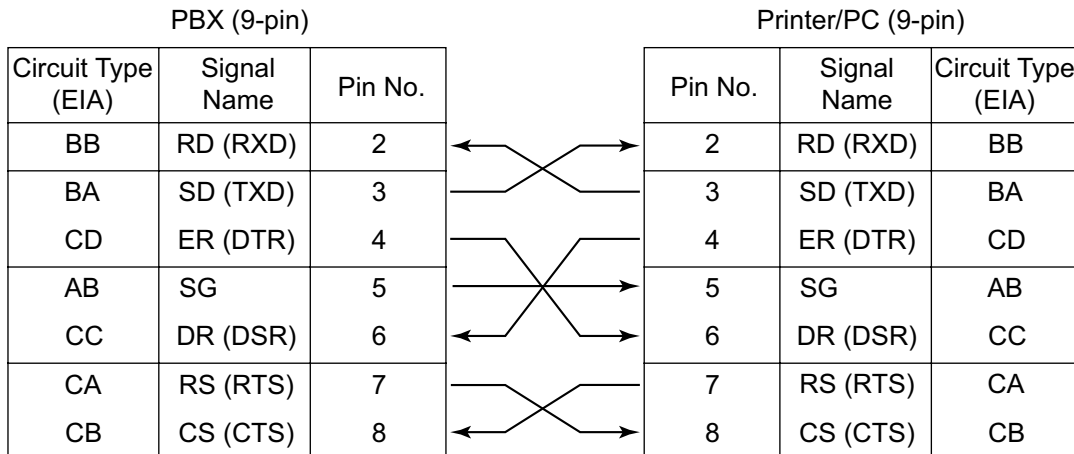
For connecting a printer/PC with a 25-pin RS-232C connector

PBX (9-pin)   Printer/PC (25-pin)

Circuit Type (EIA)	Signal Name	Pin No.
BB	RD (RXD)	2
BA	SD (TXD)	3
CD	ER (DTR)	4
AB	SG	5
CC	DR (DSR)	6
CA	RS (RTS)	7
CB	CS (CTS)	8

Pin No.	Signal Name	Circuit Type (EIA)
1	FG	AA
3	RD (RXD)	BB
2	SD (TXD)	BA
20	ER (DTR)	CD
7	SG	AB
5	CS (CTS)	CB
6	DR (DSR)	CC
4	RS (RTS)	CF
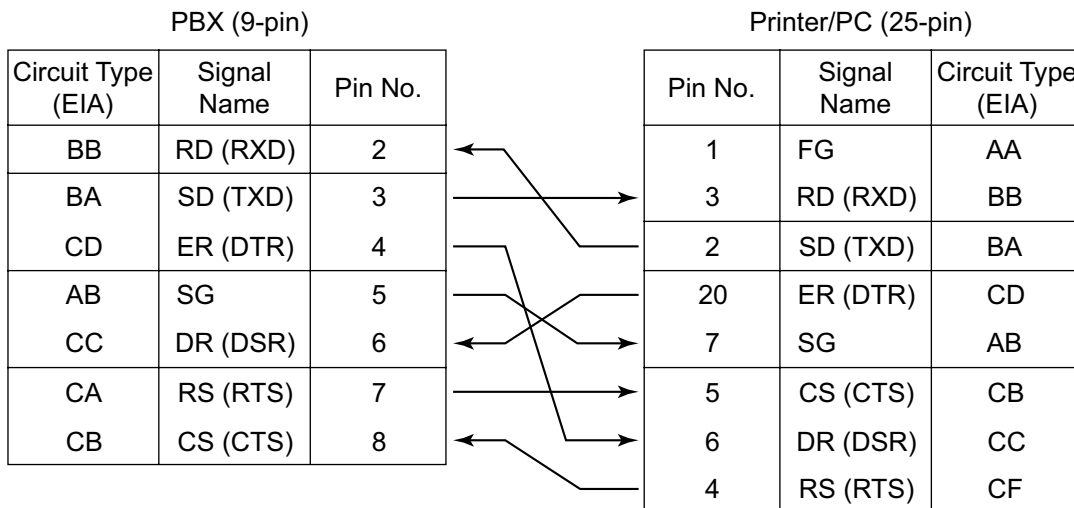
RS-232C Signals

- **Receive Data (RXD):**…(input)
  Conveys signals from the printer or the PC.
- **Transmit Data (TXD):**…(output)
  Conveys signals from the unit to the printer or the PC. A "Mark" condition is held unless data or BREAK signals are being transmitted.
- **Data Terminal Ready (DTR):**…(output)
  This signal line is turned ON by the unit to indicate that it is ON LINE. Circuit ER (DTR) ON does not indicate that communication has been established with the printer or the PC. It is switched OFF when the unit is OFF LINE.
- **Signal Ground (SG)**
  Connects to the DC ground of the unit for all interface signals.
- **Data Set Ready (DSR):**…(input)
  An ON condition of circuit DR (DSR) indicates the printer or the PC is ready. Circuit DR (DSR) ON does not indicate that communication has been established with the printer or the PC.
- **Request To Send (RTS):**…(output)
  This lead is held ON whenever DR (DSR) is ON.

- **Clear To Send (CTS):**…(input)
  An ON condition of circuit CS (CTS) indicates that the printer or the PC is ready to receive data from the unit. The unit does not attempt to transfer data or receive data when circuit CS (CTS) is OFF.
- **Frame Ground (FG)**
  Connects to the unit frame and the ground conductor of the AC power cord.

3.11 LAN Connection

3.11.1 LAN Connection

Connection Chart for LAN Connection

The PBX is equipped with a LAN port for connecting to a LAN so that IP telephones (IP-PTs, IP softphones, SIP Extensions), IP-CSs, PCs and a CTI Server can be connected on a private IP network.

Switching Hub			PBX (LAN Port)
Signal Name	Pin No.	Pin No.	Signal Name
TX+	1	1	RX+
TX-	2	2	RX-
RX+	3	3	TX+
RX-	6	6	TX-
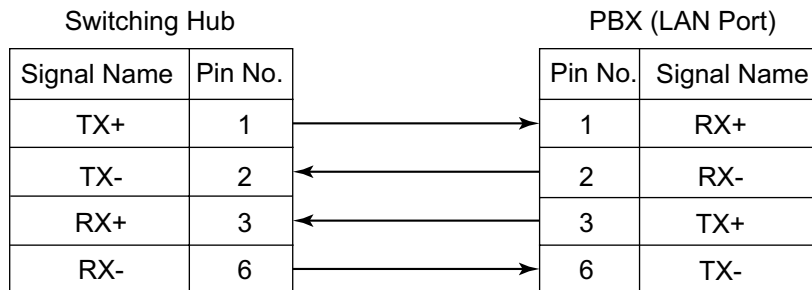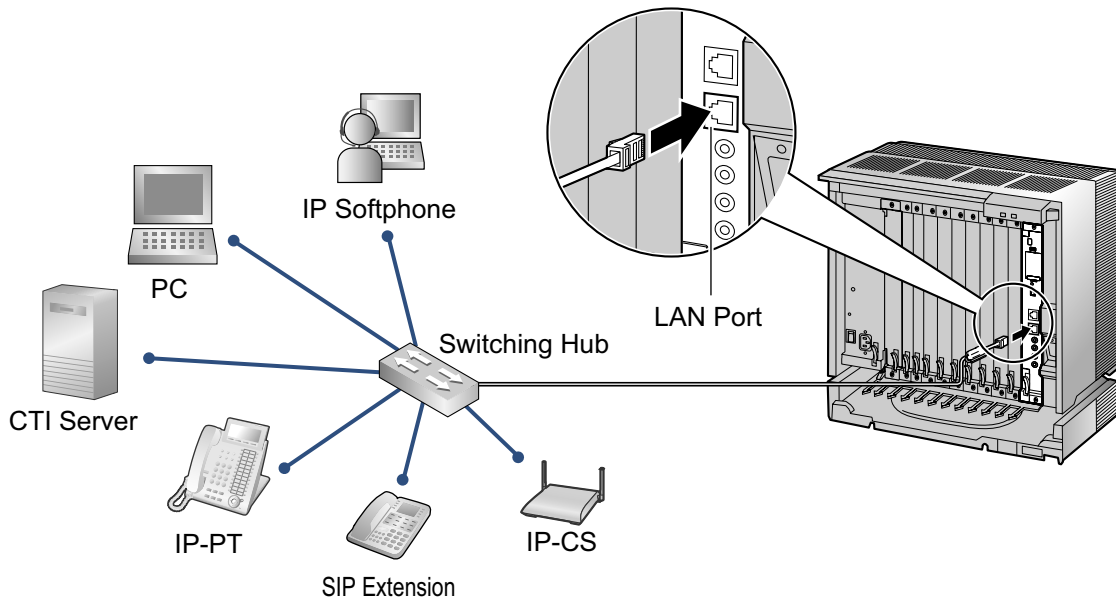
Note
- Use an Ethernet straight cable with an RJ45 connector for connection to a switching hub. The cable should be a 10BASE-T/100BASE-TX CAT 5 or higher cable.
- Make sure that all the CAT 5 cables in use are not over 100 m (328 ft) in length.
- Make sure to create a spanning tree for LAN connection in order to prevent loops from occurring in a multi-bridged environment. Otherwise, some packets may circulate for long periods of time and eventually PBX performance system may degrade.
- The CTI server can be used for connecting PCs on a LAN to provide third party call control CTI. CTI connection uses the CSTA Phase 3 or TAPI 2.1 protocol. The operating system of the PC or CTI server required for third party call control depends on your CTI application software. For details, refer to the manual for your CTI application software.

3.12 Power Failure Connections

3.12.1 Power Failure Connections

When the power supply to the PBX fails, power failure transfer (PFT) will switch from the current connection to the Power Failure Connection. Refer to "13.1.11 Power Failure Transfer" in the Feature Manual for further information.

Connection

Power Failure Connection connects a specific SLT and a CO line in the event of power failure. The following analog CO line and extension cards can be used for Power Failure Connections:

- **Analog CO line cards:** LCOT16 (4 PFT ports), LCOT8 (2 PFT ports)
- **Extension cards:** MSLC16 (4 PFT ports), CSLC16 (4 PFT ports), SLC16 (4 PFT ports), DHLC8 (2 PFT ports), SLC8 (2 PFT ports), MCSLC16 (2 PFT ports), and MCSLC24 (2 PFT ports)

To 1 analog CO line card, connect only 1 extension card.

Note

By programming the PBX, a CO line conversation established during power failure can be maintained even when the power returns and the connection is switched back to the normal configuration from the Power Failure Connection. However, if no special programming is performed, the connection will be dropped when power returns.
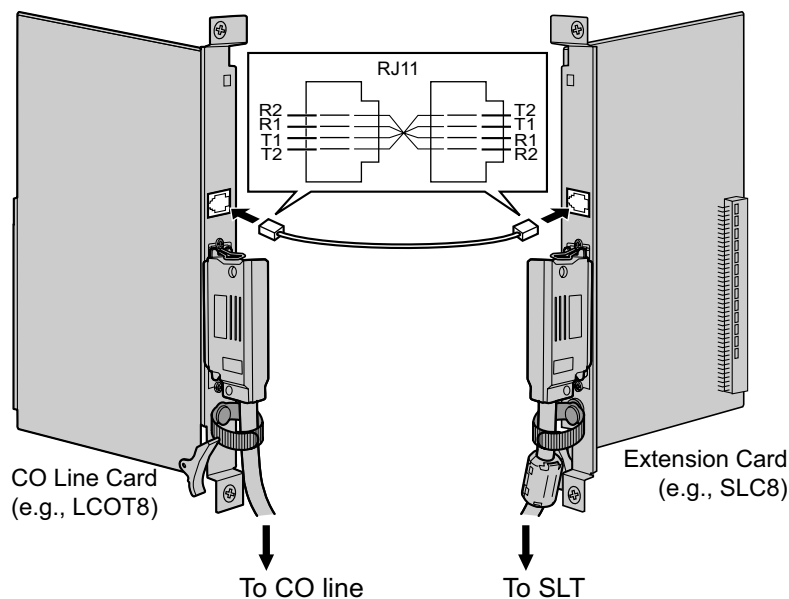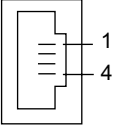
Accessories and User-supplied Items
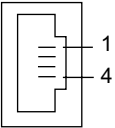
Accessories (included): none
User-supplied (not included): RJ11 connectors
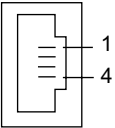
RJ11 Connector Pin Assignments for Analog CO Line Card
PFT Ports 1 and 2

	No.	Signal Name	Function
	1	R2	Ring port 2
	2	R1	Ring port 1
	3	T1	Tip port 1
	4	T2	Tip port 2
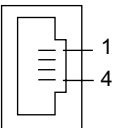
PFT Ports 3 and 4 (for LCOT16 card only)

	No.	Signal Name	Function
	1	R4	Ring port 4
	2	R3	Ring port 3
	3	T3	Tip port 3
	4	T4	Tip port 4

RJ11 Connector Pin Assignments for Extension Card
PFT Ports 1 and 2

	No.	Signal Name	Function
	1	T2	Tip port 2
	2	T1	Tip port 1
	3	R1	Ring port 1
	4	R2	Ring port 2

PFT Ports 3 and 4 (for MSLC16/CSLC16/SLC16 card only)

	No.	Signal Name	Function
	1	T4	Tip port 4
	2	T3	Tip port 3
	3	R3	Ring port 3
	4	R4	Ring port 4

3.13 Starting the PBX

3.13.1 Starting the PBX

Before Starting the PBX

Before starting the PBX, please pay attention to the following:

Notice

The SD Memory Card must be inserted in the SD Memory Card slot of the IPCMPR card before startup.

Starting the PBX

CAUTION

- Use only the AC power cord included with the PBX for the PSU.
- Before touching the System Initialize Switch, discharge static electricity by touching ground or wearing a grounding strap.
- Once you have started the PBX and if you unplug the PBX, do not perform the following procedures to start the PBX again. Otherwise, your programmed data is cleared. To restart the PBX, refer to "5.1.4 Using the Reset Button".
- The power supply cord is used as the main disconnect device. Ensure that the AC outlet is located near the equipment and is easily accessible.

Note

The PBX will continue to be powered even if the power switch is turned "OFF".

System Initialization Procedure

1. Slide the System Initialize Switch to the "SYSTEM INITIALIZE" position.
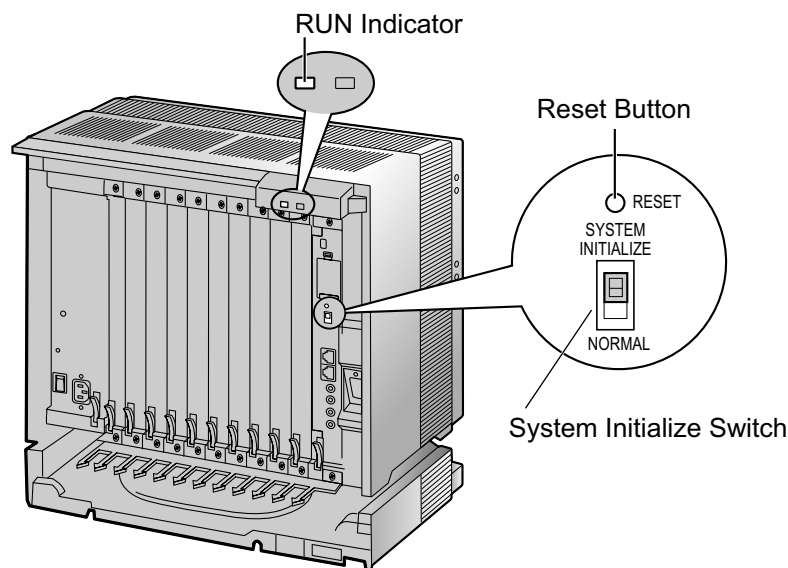
2. Plug the AC power cord into the PBX and an AC outlet, and turn on the PBX. The RUN indicator will flash.

> **Note**
>
> For safety reasons, do not stretch, bend, or pinch the AC power cord.

To AC Outlet
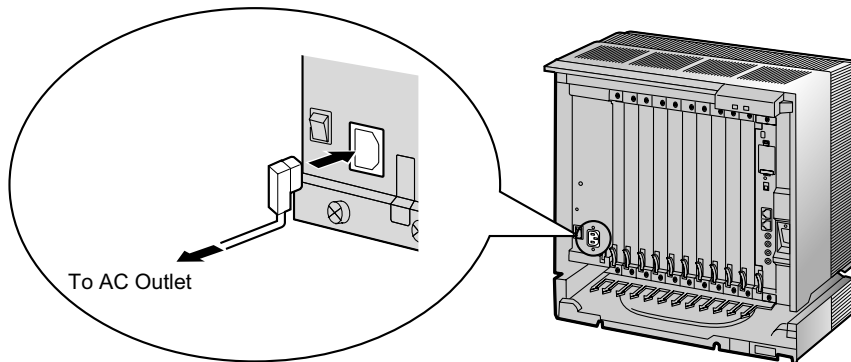
3. While the RUN indicator is flashing, slide the System Initialize Switch back to the "NORMAL" position. Depending on the configuration, initialization takes about 1 min to 3 min. If successfully executed, the RUN indicator will stop flashing and stay lit.

All data will be cleared, and the PBX as well as all optional service cards (except for the IP-GW card) will be initialized to the default values. The DPTs should show the time as 01:00.
The data of the IP-GW card will not be initialized.

> **Note**
>
> When initializing the PBX, the built-in ESVM card will also be initialized. Therefore, the built-in ESVM card feature may not be used for up to 2 minutes after the PBX starts.

LED Indications

Indication	Color	Description
RUN	Green	PBX status indication • OFF: Power Off (includes normal reset) • ON: Power On and running (on-line) • Flashing (60 times per minute): Starting up • Flashing (120 times per minute): Starting up or resetting with: • the System Initialize Switch in "SYSTEM INITIALIZE" position • the SD Memory Card not inserted
ALARM	Red	Alarm indication • OFF: Normal • ON: Alarm (CPU stop, alarm for each optional service card) • Flashing: Alarm (IPCMPR file error in restarting)

Confirming the CO Line Connection

After initialization, program the PBX and connect CO lines to the PBX.

To confirm that the CO lines are successfully connected, dial [✱] [3] [7] + CO line number (3 digits) on a PT, or press the PT's S-CO button. You will hear a dial tone if the CO line is available and connected.

Section 4

Guide for the Maintenance Console

Explains the installation procedure, structure, and basic information of the Maintenance Console.

4.1 Overview

4.1.1 Overview

The Maintenance Console is designed to serve as an overall system programming reference for the PBX. To program and administer the PBX by PC, you need to install the Maintenance Console onto the PC.
This section describes overview and installation of the Maintenance Console only.

Menu Bar ——

System Menu
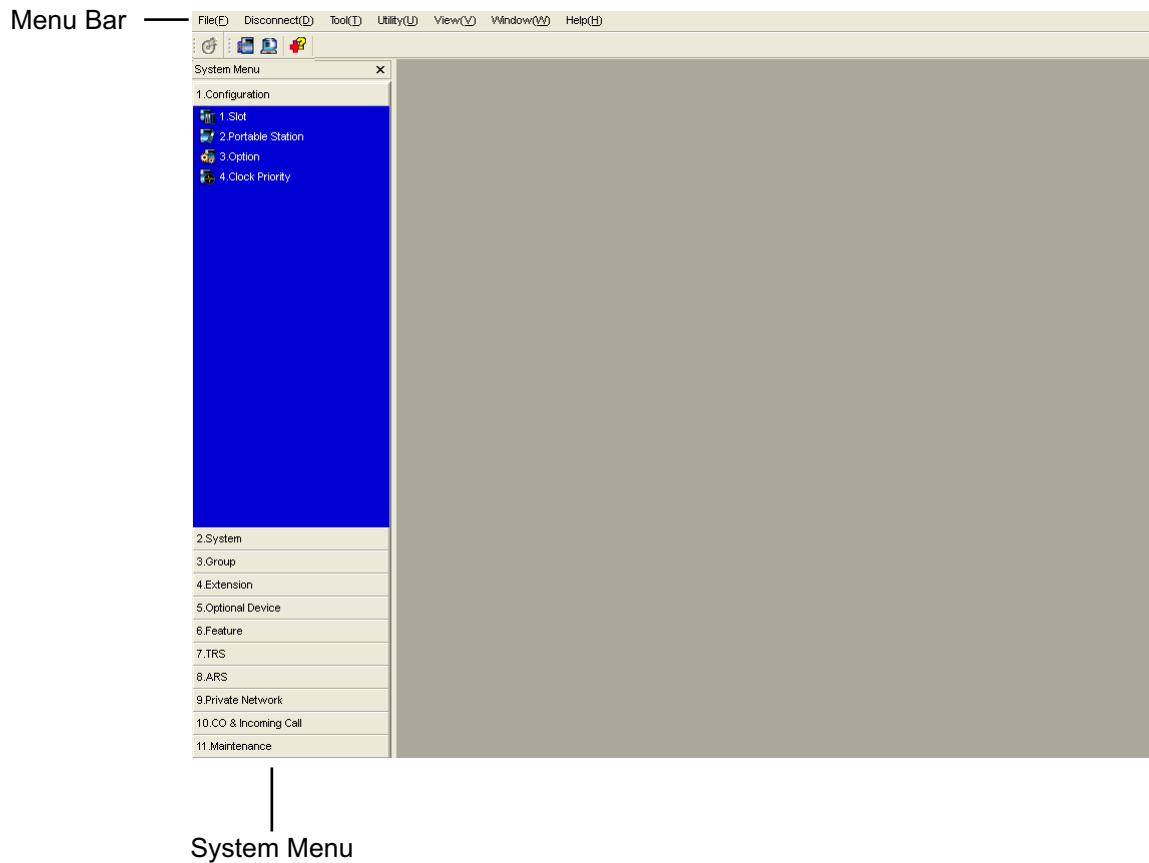
Note

The contents and design of the software are subject to change without notice.

4.2 PC Connection

4.2.1 PC Connection

Connection via MNT Port of IPCMPR Card

MNT Port

← To LAN Port
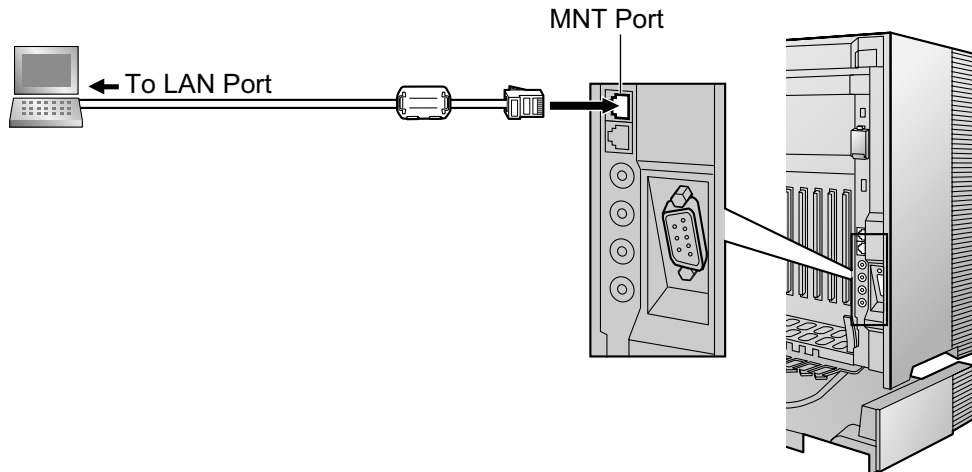
Notice

When connecting a PC to the PBX, a fixed IP address must be assigned to the PC. For information about fixed IP addresses, ask your network administrator.

Note

For pin assignments and maximum cabling distance, refer to "3.10.1 Connection of Peripherals".

Serial Interface Connection
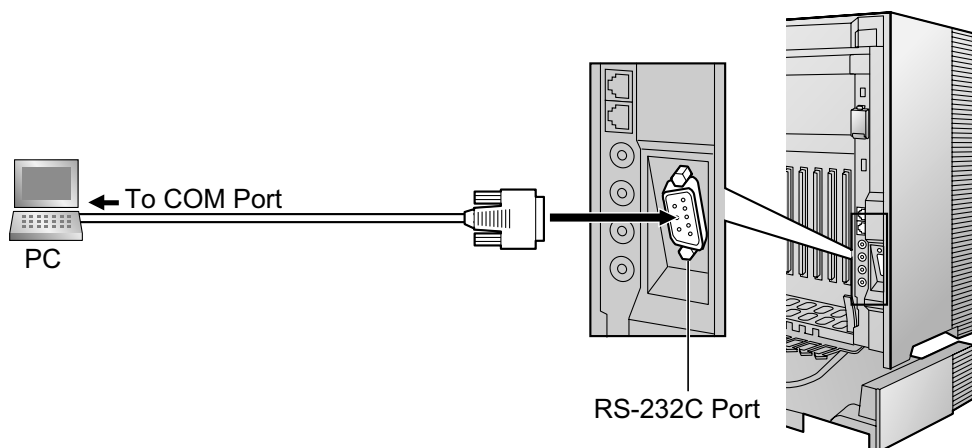
← To COM Port

PC

RS-232C Port

CAUTION

To protect the system, keep the following in mind:

1. Make sure that both connector cases (frame ground) of the RS-232C cross cable (shielded cable) are conductive. If they are not conductive, make sure that both connector cases of the cable are firmly connected.
2. If this is not possible, connect the frame of the PBX to the frame of the PC using a grounding wire in order to prevent difference in the electrical potentials.

Note

For pin assignments and maximum cabling distance, refer to "3.10.1 Connection of Peripherals".

External Modem Connection

Modem

To RS-232C port (25-pin)

To CO line/PBX extension port
assigned as the CO line destination

RS-232C Port
(9-pin)

External Modem (25-pin)   PBX (9-pin)

Signal Name	Pin No.		Pin No.	Signal Name
RD (RXD)	3	→	2	RD (RXD)
SD (TXD)	2	←	3	SD (TXD)
ER (DTR)	20	←	4	ER (DTR)
DR (DSR)	6	→	6	DR (DSR)

CAUTION

To protect the system, keep the following in mind:
1. Make sure that both connector cases (frame ground) of the RS-232C straight cable (shielded cable) are conductive. If they are not conductive, make sure that both connector cases of the cable are firmly connected.
2. If this is not possible, connect the frame of the PBX to the frame of the external modem using a grounding wire in order to prevent difference in the electrical potentials.

After connecting the PBX and the external modem, set the power switch of the external modem to "ON", then the external modem will be initialized with the default values.
The following AT command settings may be required for the modem:
• The Data Terminal Ready (DTR) signal should be ignored.
• The Data Terminal Equipment (DTE)/Modem flow control should be turned off.
• Data compression should be disabled.
• Error Correction is not necessary.

Note

- An AT command (for initialization, enabling automatic answer, etc.) can only be programmed by Maintenance Console. "AT&F" is stored as the default value.
- For more information about the AT command, refer to the external modem's instructions.

4.3 Installation of the Maintenance Console

4.3.1 Installing and Starting the Maintenance Console

System Requirements

Required Operating System

- Microsoft® Windows® XP, Windows Vista® Business, or Windows 7 Professional operating system

Minimum Hardware Requirements

- HDD: 100 MB of available hard disk space
- The PC must fulfill the hardware requirements of the installed Microsoft Windows operating system.

Recommended Display Settings

- Screen resolution: XGA (1024 × 768)
- DPI setting: Normal size (96 DPI)

Installing the Maintenance Console

Note

- Make sure to install and use the latest version of the Maintenance Console.
- To install or uninstall the software on a PC running Windows XP Professional, you must be logged in as a user in either the "Administrators" or "Power Users" group.
- To install or uninstall the software on a PC running Windows Vista Business or Windows 7 Professional, you must be logged in as a user in the "Administrators" group.

1. Copy the setup file of the Maintenance Console to your PC.
2. Double-click the setup file to run the installer.
3. Follow the on-screen instructions provided by the installation wizard.

Starting the Maintenance Console and Assigning the Basic Items (Quick Setup)

When you start the Maintenance Console with the Installer Level Programmer Code and connect to the PBX for the first time after initialization (with the factory default setting), Quick Setup will launch automatically. During Quick Setup, you will set up the basic items. For details about the basic items, refer to "14.1.2 Quick Setup" in the Feature Manual.

1. Connect the PC to the PBX with an Ethernet straight cable or RS-232C cross cable.

2. Start the Maintenance Console from the Start menu.

3. "Information before programming" appears.
   a. Carefully read this important additional information, which includes updates to this and other manuals.
   b. Click **OK** to close this window.

4. a. Enter the Installer Level Programmer Code (default: **INSTALLER**).

   Note

   There are 2 other Programmer Codes with limited authorization: Administrator Level (default: **ADMIN**), and User Level (default: **USER**).
   b. Click **OK**.

5. Click **Connect**.

6. **a.** Select **KX-TDE100/200** from **PBX Model**.

   b. Select the **LAN** or **RS-232C** tab, depending on the type of PC connection with the PBX.

   c. Specify the settings as required.

   <u>Note</u>

   When connecting to the PBX for the first time selecting **LAN**, the **IP Address** and **Port Number** must be set to **192.168.0.101** and **35300** respectively.

   d. Enter the system password for installer (default: **1234**).

   e. Click **Connect**.

7. Follow the instructions of the Quick Setup wizard and assign the basic items (Quick Setup). After Quick Setup is completed, if the IP addressing information was not changed and a V-IPEXT card was installed during setup, the IP-PT registration screen is displayed. For information on registering IP-PTs to the PBX, refer to "3.15 [1-1] Slot—Port Property - Virtual IP Extension" in the PC Programming Manual. You may now begin programming the PBX.

<u>Notice</u>

- During a long programming session, it is highly recommended that you periodically save the system data to the SD Memory Card. If the PBX undergoes a sudden power failure or if the system is reset for some reason, all the system data in RAM will be lost. However, if system data has been saved to the SD Memory Card, it can be easily restored.
  To save the system data to the SD Memory Card, (1) click the "**SD Memory Backup**" icon before resetting the PBX or turning off the power, or (2) exit the Maintenance Console so that the PBX automatically saves the system data.
- When programming PBX data which can be displayed on a proprietary telephone (PT) (extension names, group names, System Speed Dialing names, etc.), it is possible to enter characters which cannot be displayed on a KX-DT300/KX-T7600 series PT. Characters which can be displayed on a KX-DT300/KX-T7600 series PT are shown below in the white cells.

	00	01	02	03	04	05	06	07	08	09	0a	0b	0c	0d	0e	0f
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{			}	~	
80	€		,	ƒ	„	…	†	‡	ˆ	‰	Š	‹	Œ		Ž	
90		'	'	"	"	•	–	—	~	™	š	›	œ		ž	Ÿ
a0		¡	¢	£	¤	¥	¦	§	¨	©	ª	«	¬		®	¯
b0	°	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
c0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
d0	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
e0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
f0	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

• The PC will not perform any shutdown operation, or enter the power-saving system standby mode while the Maintenance Console is connected to the PBX. To perform either of the operations above, first close the connection to the PBX.

CAUTION

Do not remove the SD Memory Card while power is supplied to the PBX. Doing so may cause the PBX to fail to start when you try to restart the system.

Section 5

Troubleshooting

This section provides information on the PBX and telephone troubleshooting.

5.1 Troubleshooting

5.1.1 Installation

PROBLEM	PROBABLE CAUSE	SOLUTION
You cannot make/receive calls via an IP network.	• IP-EXT/IP-GW/DSP card malfunction	• Replace the corresponding card.
	• IPCMPR card malfunction	• Replace the IPCMPR card (be sure to turn off the PBX when replacing).
	• Not enough activation keys	• Purchase additional activation key codes. Please consult a certified dealer for details.
	• Poor connection	• Make sure that an 8-pin twisted pair cable is used for connection. • Make sure that none of the CAT 5 cables in use are over 100 m (328 ft) in length. • Make sure that a straight cable is used for connection to a switching hub.
	• Network malfunction	• Make sure that all network devices in use are switched on. • Make sure that there is no unwanted firewall in the IP network.
IP-PTs/SIP Extensions do not operate.	• IP-EXT/DSP card malfunction	• Replace the corresponding card.
	• IPCMPR card malfunction	• Replace the IPCMPR card (be sure to turn off the PBX when replacing).
	• Not enough activation keys	• Purchase additional activation key codes. Please consult a certified dealer for details.
	• IP-PT/SIP Extension not registered	• Register the corresponding IP-PT/SIP Extension.
	• IP-PT/SIP Extension malfunction	• Replace the IP-PT/SIP Extension.
	• Poor connection	• Make sure that an 8-pin twisted pair cable is used for connection. • Make sure that none of the CAT 5 cables in use are over 100 m (328 ft) in length. • Make sure that a straight cable is used for connection to a switching hub.
	• Network malfunction	• Make sure that all network devices in use are switched on. • Make sure that the IP-PT/SIP Extension is not blocked by the firewall or other network devices.
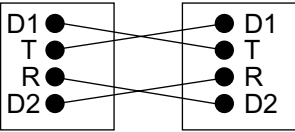
PROBLEM	PROBABLE CAUSE	SOLUTION
Extensions (except IP-PT/SIP Extension) do not operate.	• Extension card malfunction	• Replace the corresponding card.
	• Poor connection between the PBX and the extension	• Take the extension and plug it into the same extension port using a short telephone cord. If the extension works, then the connection between the PBX and the extension must be repaired.
	• A telephone with an A-A1 relay is connected.	• Make sure that a 2-wire cord is used. • Make sure that the A-A1 relay switch of the telephone is in "OUT" or "OFF" position.
	• Extension malfunction	• Take the extension and plug it into another extension port that is working. If the extension does not work, replace the extension.
	• Wrong type of PSU	• Replace the PSU with the appropriate type.
The PBX does not operate properly.		• Press the Reset Button (refer to "5.1.4 Using the Reset Button"). • Turn off the power switch, and then turn it back on. • Turn off the power switch, and then unplug the PBX. After 5 minutes, plug the PBX back in, and turn the power switch back on.
	• IPCMEC card malfunction	• See the error log using the Maintenance Console (refer to "5.1.5 Troubleshooting by Error Log"). If the error no. 41 is displayed, replace the IPCMEC card.
Noise on external paging.	• Induced noise on the wire between the PBX and the amplifier.	• Use a shielded cable as the connection wire between the PBX and amplifier. A short shielded cable is recommended.
Distorted external music.	• Excessive input level from external music source.	• Decrease the output level of the external music source by using the volume control on the music source.
Alternate Calling—Ring/Voice and Live Call Screening (LCS) do not function as set when using a Wireless Phone (KX-T7880/KX-T7885/KX-TD7894/KX-TD7895).	• Voice-calling mode and Hands-free mode with LCS are not available with Wireless Phones.	• Switch the calling mode to ring-calling. • Set the LCS mode to "Private".
The ALARM indicator on the front of the shelf turns on red.	• A major system error occurs in the PBX.	• See the error log using the Maintenance Console (refer to "5.1.5 Troubleshooting by Error Log").
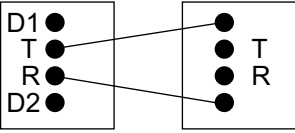
PROBLEM	PROBABLE CAUSE	SOLUTION
The LINK indicator of the IP-EXT/IP-GW/IPCMPR does not turn on.	• IP-EXT/IP-GW card malfunction	• Replace the corresponding card.
	• IPCMPR card malfunction	• Replace the IPCMPR card (be sure to turn off the PBX when replacing).
	• Poor connection	• Make sure that an 8-pin twisted pair cable is used for connection. • Make sure that none of the CAT 5 cables in use are over 100 m (328 ft) in length. • Make sure that a straight cable is used for connection to a switching hub.
	• Network malfunction	• Make sure that all network devices in use are switched on.

5.1.2 Connection
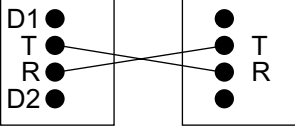
Connection between the PBX and a PT:

Can you dial an extension?

CAUSE	SOLUTION
The T/R is connected to the D1/D2.	Use the correct cord (the inner 2 wires are for T/R and the outer 2 wires are for D1/D2)

Connection between the PBX and an SLT:

CAUSE	SOLUTION
The T/R is connected to the D1/D2.	Use the correct cord (the inner 2 wires are for T/R). • If a telephone equipped with an A-A1 relay is connected to the PBX, set the A-A1 relay switch of the telephone to "OFF".

Connection between the PBX and an SLT that is polarity-sensitive:

CAUSE	SOLUTION
The "T" is connected to the "R".	Reverse the connections of the T/R.

Yes

No
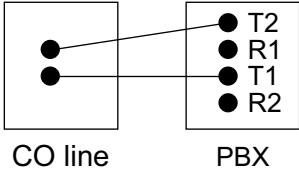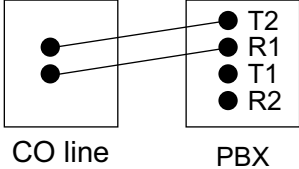
(Continued on the next page.)

Connection between the central office and the PBX:

(Continued from the previous page.)

Can you dial out on a CO line?

No

CAUSE	SOLUTION

CO line is connected to the T2/T1.
 	
CO line   PBX
          T2
          R1
          T1
          R2
 	
CO line is connected to the T2/R1.
 	
CO line   PBX
          T2
          R1
          T1
          R2
	Reconnect the CO line to the T1/R1 or T2/R2 of the telephone jack using 2-conductor wiring.

5.1.3 Operation

PROBLEM	PROBABLE CAUSE	SOLUTION
• Cannot set the IP address, subnet mask address, and PBX IP address to the IP-PT.	• An unusable value is being set.	• Set an IP address within the valid range. IP address of the IP-PT/PBX: "1.0.0.0" to "223.255.255.255" Subnet mask address: "0–255.0–255.0–255.0–255" (except 0.0.0.0 and 255.255.255.255)
• Cannot register the IP-PT.	• The necessary network parameters are not set to the IP-PT.	• When not using a DHCP server, set the IP address, subnet mask address, and enter the PBX IP address. If necessary, also enter the IP address of the default gateway. • When using a DHCP server, enter the PBX IP address.
• The IP-PT cannot connect to the PBX.	• The wrong IP address, subnet mask address, PBX IP address, or default gateway address was entered.	• Check each parameter and enter the correct value.
	• The Ethernet cable is not connected correctly.	• Check the Ethernet cable connections.
	• The DHCP server is not active.	• Restart the DHCP server. • Disable DHCP and re-enter settings as appropriate.
• Whenever you try to make calls using a SIP Extension, a busy tone is heard.	• The status of the port that the SIP Extension is connected to is Out of Service.	• Change the port status from Out of Service to In Service using the Maintenance Console.
• When using the speakerphone on an APT, nothing is audible.	• The HANDSET/ HEADSET selector is set to the "HEADSET" position.	• When the headset is not used, set the HANDSET/HEADSET selector to the "HANDSET" position.
• When using the speakerphone/monitor mode with a DPT, nothing is audible.	• The "HEADSET" mode is selected by Personal Programming, "Handset/Headset Selection".	• When the headset is not used, select the "HANDSET" mode by Personal Programming.
• The PT does not ring.	• The ringer volume is off.	• Turn on the ringer volume.

PROBLEM	PROBABLE CAUSE	SOLUTION
• During a power failure, extensions connected to ports 1 to 4 of MSLC16/CSLC16/ SLC16 and ports 1 to 2 of DHLC8/SLC8/ MCSLC16/MCSLC24 cards do not operate.	• A DPT or APT is connected to the extension port. • The dialing mode (tone or pulse) is incorrect.	• Disconnect the DPT or APT and connect an SLT. • Set the Tone/Pulse switch to the other position.
• Originating an outside call, call transfer, or conference cannot be performed.	• The corresponding flexible button does not exist on the PT.	• Program the flexible button. Refer to "6.1.3 Flexible Buttons" in the Feature Manual.
• The KX-HGT100 does not work properly, or some features cannot be performed using the KX-HGT100.	• The firmware of the KX-HGT100 and the MPR software file version of the PBX are not upgraded to their latest versions.	• Upgrade the firmware of the KX-HGT100 and the MPR software file version of the PBX to their latest versions.

5.1.4 Using the Reset Button

If the PBX does not operate properly, use the Reset Button. Before using the Reset Button, try the system feature again to confirm whether there definitely is a problem or not.

CAUTION

In order to avoid possible corruption of data on the SD Memory Card, please ensure that the "SD ACCESS" LED is off before pressing the Reset Button.

Note

- When the System Initialize Switch is set to "NORMAL", pressing the Reset Button causes the following:
  - Camp-on is cleared.
  - Calls on hold are terminated.
  - Calls on exclusive hold are terminated.
  - Calls in progress are terminated.
  - Call park is cleared.

  Other data stored in memory, except the above, are not cleared.
- Be aware that pressing the Reset Button with the System Initialize Switch in the "SYSTEM INITIALIZE" position clears all data stored in the PBX. Do not perform this operation unless you intend to delete all data from the PBX.

Operation

If the PBX does not operate properly:
1. Slide the System Initialize Switch to the "NORMAL" position.
2. Press the Reset Button for about 1 second.
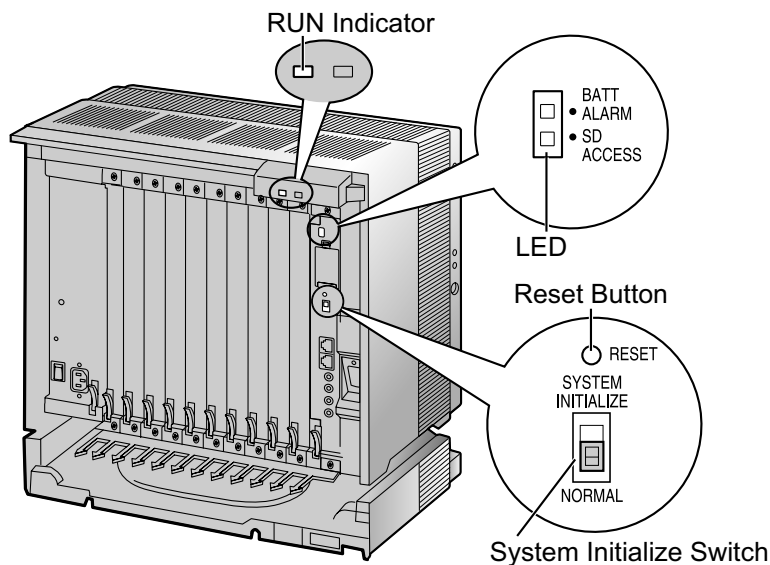
5.1.5 Troubleshooting by Error Log

When a major system error occurs in the PBX, the ALARM indicator on the front of the shelf turns on red, and the system logs the error information.

Error Log Display Format

Below is the display format of the error log. For information about how to view the error log using the KX-TDE Maintenance Console, refer to "2.6.8 Utility—Error Log" in the PC Programming Manual.

Example: Maintenance Console
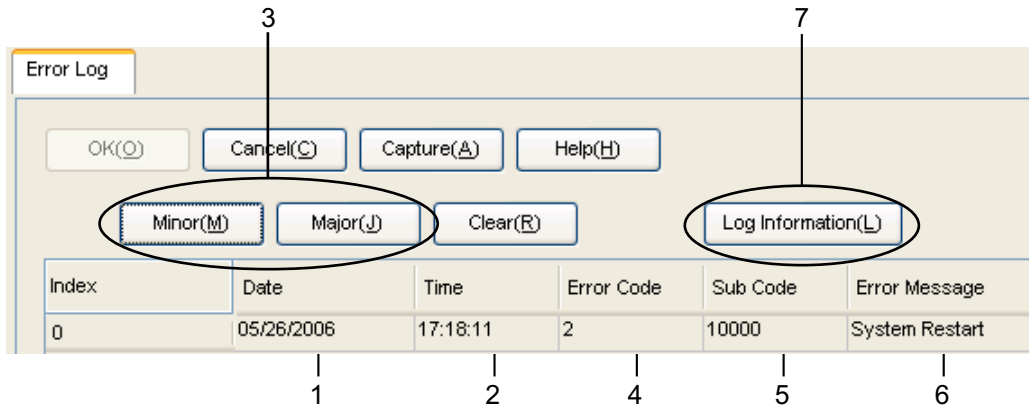
Example: Station Message Detail Recording (SMDR)

```
07/01/01 10:37AM  MJ ALM #000 10000  MPR WDT overflow
07/01/01 11:07AM  MN ALM #010 10000  AC power down
07/01/01 03:55PM  MN ALM #301 10501  Digital trunk RAI reception
```

Description

	Item		Description
1	Date		The date of the error detection.
2	Time		The time of the error detection.
3	Level	Minor (MN ALM)	Displays minor errors, which affect only a certain part of system operation.
		Major (MJ ALM)	Displays major errors, which affect operation of the whole system, or result in system failure.
4	Error Code		The 3-digit error code assigned by the PBX.

	Item	Description

5	Sub Code	The 6-digit sub code of the relevant hardware (X1YYZZ).
		• X: Shelf type
		  – Physical shelf: " " (blank)
		  – Virtual shelf: "*" (asterisk)
		• 1: Shelf number
		• YY: Slot number
		  – KX-TDE100 (Physical slot): 00 to 06
		    (00: IPCMPR Card Slot/Built-in ESVM card; 01 to 06: Free Slots)
		  – KX-TDE200 (Physical slot): 00 to 11
		    (00: IPCMPR Card Slot/Built-in ESVM card; 01 to 11: Free Slots)
		  – KX-TDE100/KX-TDE200 (Virtual slot): 01 to 08
		    (01 to 04: Virtual CO Line Slots, 05 to 08: Virtual Extension Slots)
		• ZZ: Port number
		  – For optional service cards except OPB3 card:
		    Port number (01 to 16) will be displayed.
		  – For OPB3 card:
		    Sub slot number (1 to 3) + port number (1 to 4) will be displayed as follows:
		      • Sub slot 1 of OPB3: 11 to 14
		      • Sub slot 2 of OPB3: 21 to 24
		      • Sub slot 3 of OPB3: 31 to 34
		
		Note
		When there is no parameter for slot and port number, YY and ZZ will be displayed as "00".
		Example: Sub code for IPCMPR card = " 10000"

6	Error Message	A description of the error.
7	Log Information	Displays probable causes of the errors and their solutions.

5.1.5 Troubleshooting by Error Log

Section 6

Appendix

6.1 Revision History

6.1.1 PMMPR Software File Version 2.0xxx

New Options

- System Components Table

  - KX-TDA0177   16-Port Single Line Telephone Extension Card with Caller ID (CSLC16)

  - KX-TDA0194   4-Channel Simplified Voice Message Card (ESVM4)

  - KX-T0155   DECT 6.0 2-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for DECT 6.0 Portable Station

  - KX-T0158   DECT 6.0 8-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for DECT 6.0 Portable Station

  - KX-T7765   Doorphone

  - KX-T7775   Doorphone

Changed Contents

- 1.3.3 System Capacity

- 3.9.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays

- 4.3.1 Installing and Starting the Maintenance Console

6.1.2 PMMPR Software File Version 2.01xx

New Options

- System Components Table

  - KX-NCS4501   1-Channel IP Proprietary Telephone Activation Key (1 IP PT)

  - KX-NCS4701   1-Channel SIP Extension Activation Key (1 SIP Extension)

  - KX-NCS4201   1-Channel IP Softphone/IP Proprietary Telephone Activation Key (1 IP Softphone/IP PT)

  - KX-NCS4204   4-Channel IP Softphone/IP Proprietary Telephone Activation Key (4 IP Softphone/IP PT)

  - KX-NCS4216   16-Channel IP Softphone/IP Proprietary Telephone Activation Key (16 IP Softphone/IP PT)

  - KX-NCS4102   2-Channel IP Trunk Activation Key (2 IP Trunk)

  - KX-NCS4504   4-Channel IP Proprietary Telephone Activation Key (4 IP PT)

  - KX-NCS4704   4-Channel SIP Extension Activation Key (4 SIP Extension)

  - KX-NCS4708   8-Channel SIP Extension Activation Key (8 SIP Extension)

  - KX-NCS4516   16-Channel IP Proprietary Telephone Activation Key (16 IP PT)

Changed Contents

- 2.1.1 Activation Keys

- 2.1.2 Activation Key Code and Key Management System

- 3.4.1 Virtual Cards

6.1.3 PMMPR Software File Version 3.0xxx

New Options

- System Components Table
  - KX-NCS2201   Activation Key for CA Pro for 1 User (CA Pro 1user)
  - KX-NCS2205   Activation Key for CA Pro for 5 Users (CA Pro 5users)
  - KX-NCS2210   Activation Key for CA Pro for 10 Users (CA Pro 10users)
  - KX-NCS2240   Activation Key for CA Pro for 40 Users (CA Pro 40users)
  - KX-NCS2249   Activation Key for CA Pro for 128 Users (CA Pro 128users)
  - KX-NCS2301   Activation Key for CA ACD Monitor for 1 ICD Supervisor (CA Supervisor 1user)
  - KX-TDE0105   IPCMEC memory expansion card to increase system data storage space.
  - KX-NCP0158   DECT 6.0 8-Channel IP Cell Station Unit Using a V-IPCS4 Card for DECT 6.0 Portable Station
  - KX-TDA0156   DECT 6.0 4-Channel Cell Station Unit Using a CSIF Card for DECT 6.0 Portable Station
  - -   Virtual 4 IP Cell Station Interface Card (V-IPCS4)

New Contents

- 3.3.3 IPCMEC Card (KX-TDE0105)

Changed Contents

- 1.1.2 System Connection Diagram
- 1.3.3 System Capacity
- 2.1.1 Activation Keys
- 2.1.2 Activation Key Code and Key Management System
- 3.4.1 Virtual Cards
- 3.11.1 LAN Connection
- 4.3.1 Installing and Starting the Maintenance Console
- 5.1.3 Operation

6.1.4 PMMPR Software File Version 4.1xxx

Changed Contents

- 1.3.3 System Capacity

6.1.5 PMMPR Software File Version 5.0xxx

New Options

- System Components Table

    – KX-TDA1176   16-Port Single Line Telephone Extension with Caller ID and Message Lamp Card (MCSLC16)

    – KX-TDA1178   24-Port Single Line Telephone Extension with Caller ID and Message Lamp Card (MCSLC24)

Changed Contents

- 1.1.2 System Connection Diagram
- 1.3.3 System Capacity
- 2.1.1 Activation Keys
- 3.2.7 Types of Connectors
- 3.2.9 Fastening an Amphenol Connector
- 3.3.1 IPCMPR Card
- 3.8.1 Maximum Cabling Distances of the Extension Wiring (Twisted Cable)
- 3.12.1 Power Failure Connections

Index

Index

W

When you ship the product

Carefully pack and send it prepaid, adequately insured and preferably in the original carton. Attach a postagepaid letter, detailing the symptom, to the outside of the carton. DO NOT send the product to the Executive or Regional Sales offices. They are NOT equipped to make repairs.

Product Service

Panasonic Factory Service Centers for this product are listed in the service center directory. Consult your certified Panasonic dealer for detailed instructions.

For Future Reference

Please print, record, and retain the following information for future reference.

Note

The serial number of this product can be found on the label affixed to the unit. You should record the model number and the serial number of this unit as a permanent record of your purchase to aid in identification in the event of theft.

MODEL NO.	_____
SERIAL NO.	_____
DATE OF PURCHASE	_____
NAME OF DEALER	_____
DEALER'S ADDRESS	_____
	_____
	_____
DEALER'S TEL. NO.	_____

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http://www.panasonic.com/bts