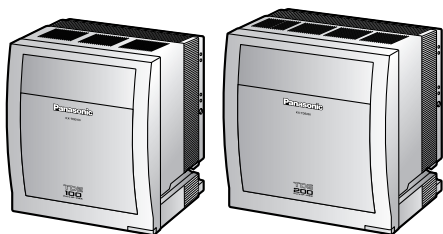


# Panasonic®

## Pure IP-PBX

# Installation Manual



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 1.0000 or later**



SD Logo is  
a trademark.

# System Components

System Components Table

Category	Model No.	Description
<b>Shelves</b>	KX-TDE100	Basic Shelf
	KX-TDE200	Basic Shelf
<b>Main Processing Card</b>		IP Convergence Main Processing Card (IPCMPR)
<b>IPCMPR Option Cards</b>	KX-TDE0110	16-Channel VoIP DSP Card (DSP16)
	KX-TDE0111	64-Channel VoIP DSP Card (DSP64)
	KX-TDA0196	Remote Card (RMT)
<b>Activation Key Codes</b>	KX-NCS4104	4-Channel IP Trunk Activation Key (4 IP Trunk)
	KX-NCS4208	8-Channel IP Softphone/IP Proprietary Telephone Activation Key (8 IP Softphone/IP PT)
	KX-NCS4508	8-Channel IP Proprietary Telephone Activation Key (8 IP PT)
	KX-NCS4716	16-Channel SIP Extension Activation Key (16 SIP Extension)
	KX-NCS4910	Activation Key for Software Upgrade to Enhanced Version (Software Upgrade 01)
<b>Virtual CO Line Card</b>	-	Virtual 16-Channel VoIP Gateway Card (V-IPGW16)
<b>Virtual Extension Cards</b>	-	Virtual 32-Channel VoIP Extension Card (V-IPEXT32)
	-	Virtual 32-Channel SIP Extension Card (V-SIPEXT32)
<b>Physical CO Line Cards</b>	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)

## System Components Table

Category	Model No.	Description
<b>Physical Extension Cards</b>	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-TDA0470	16-Channel VoIP Extension Card (IP-EXT16)	
<b>Other Physical Cards</b>	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)
<b>Power Supply Units (PSUs)</b>	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)
<b>Cell Stations (CSs)</b>	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
<b>Proprietary Equipment</b>	KX-A258	Blank Slot Cover
	KX-T30865	Doorphone

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## 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-T7600 series)
- Analog proprietary telephones (e.g., KX-T7700 series)
- Portable stations (e.g., 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

### Notes

- For the equipment (e.g., Add-on Key Module, USB Module, Headset\*<sup>1</sup>) 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 "1.2.2 System Connection Diagram".

## List of Abbreviations

- APT → Analog Proprietary Telephone
- 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

### Notice

This PBX supports SIP Extensions. However, some PBX features may not be available for SIP Extensions, depending on your telephone type.

## Important Notice

- 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

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\*<sup>1</sup> The KX-T7090 headset can be connected to the KX-T7000, KX-T7200, KX-T7300, and KX-T7400 series telephones.

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# Important Information

## **SAVE THESE INSTRUCTIONS**

### **SECURITY PRECAUTIONS**

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.

### **Security 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 unauthorised access to prevent data leakage.
2. Always make backups of data stored on the SD Memory Card. For details, refer to "2.5.2 Utility—File Transfer PC to PBX (SD Card)" and "2.5.3 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 unauthorised 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.

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## SAFETY REQUIREMENTS

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:

### For All Telephone Equipment

#### **WARNING**

- **DO NOT INSTALL THE PRODUCT IN ANY OTHER WAY THAN DESCRIBED IN RELEVANT MANUALS.**
  - **FOR SAFETY REASONS, DO NOT PHYSICALLY MODIFY THE PRODUCT OR ANY OPTIONAL EQUIPMENT.**
  - **THE PRODUCT MAY ONLY BE INSTALLED AND SERVICED BY QUALIFIED SERVICE PERSONNEL.**
  - **TO PREVENT POSSIBLE FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THE PRODUCT TO RAIN OR MOISTURE.**
1. Read and understand all instructions.
  2. Follow all warnings and instructions marked on the product.
  3. 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.
  4. 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.
  5. Do not place the product on an unstable surface, as a fall may cause serious internal damage.
  6. The product 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.
  7. 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.
  8. Do not allow anything to rest on the power cord. Do not locate the product where the power cord may be stepped on or tripped on.
  9. To reduce the risk of fire or electric shock, do not overload wall outlets and extension cords.
  10. To reduce the risk of electric shock, do not disassemble the product. Only qualified personnel should service the product. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock.
  11. 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.

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12. Avoid using wired telephones during an electrical storm. There is a remote risk of electric shock from lightning.
  13. Do not use a telephone in the vicinity of a gas leak to report the leak.
  14. 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.

**For the PBX**

**WARNING**

- **IF DAMAGE TO THE UNIT EXPOSES ANY INTERNAL PARTS, DISCONNECT THE POWER SUPPLY CORD IMMEDIATELY AND RETURN THE UNIT TO YOUR DEALER.**
  - **UNPLUG THIS UNIT 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.**
  - **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.**
  - **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.**
  - **THE SD MEMORY CARD POSES A CHOKING HAZARD. KEEP THE SD MEMORY CARD OUT OF REACH OF CHILDREN.**
  - **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.**
  - **WHEN DRIVING THE SCREWS INTO THE WALL, BE CAREFUL TO AVOID TOUCHING ANY METAL LATHS, WIRE LATHS OR METAL PLATES IN THE WALL.**
  - **WHEN PLACING THE METAL BRACKET, MAKE SURE THAT THE "TOP" ARROW IS POINTING UPWARD.**
  - **WHEN THIS PRODUCT IS NO LONGER IN USE, MAKE SURE TO DETACH IT FROM THE WALL.**
1. 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.

- 
- 2.** Do not insert objects of any kind into this product through its slots and openings, as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on or in the product.
  - 3.** 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.
  - 4.** If you are having problems making calls to outside destinations, follow this procedure to test the CO lines:
    - 1.** Disconnect the PBX from all CO lines.
    - 2.** Connect known working SLTs to those CO lines.
    - 3.** 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.



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## ***Precaution***

### **WARNING**

**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.

---

## Password Security

### ***Warning 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 KX-TDE 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 "2.4.1 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](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)**

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# 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 KX-TDE 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 KX-TDE Maintenance Console

Explains the installation procedure, structure, and basic information of the KX-TDE 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 the FAQ of the PC Programming Manual, or "[190] Main Processing (MPR) Software Version Reference" in the PT Programming Manual.

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# ***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.

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## 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.

### **Note**

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.**

---

## For Cell Station

### **CAUTION**

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

### **Note**

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.

Some wireless telephones operate at frequencies that may cause interference to nearby TVs and VCRs. To minimize or prevent such interference, the base of the wireless telephone should not be placed near or on top of a TV or VCR. If interference is experienced, move the wireless telephone further away from the TV or VCR. This will often reduce, or eliminate, interference.

Operating near 2.4 GHz electrical appliances may cause interference. Move away from the electrical appliances.

### **CAUTION**

To comply with FCC RF exposure requirements in uncontrolled environment:

- This equipment must be installed and operated in accordance with provided instructions and a minimum 20 cm (8 in) spacing must be provided between antenna and all person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.
- This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

**Medical**—consult the manufacturer of any personal medical devices, such as pacemakers, to determine if they are adequately shielded from external RF (radio frequency) energy. (The unit operates in the frequency range of 2401 MHz to 2480 MHz, and the power output level can range from 0.004 W to 0.4 W.) Do not use the unit in health care facilities if any regulations posted in the area instruct you not to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF (radio frequency) energy.

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# **Section 1**

## **System Outline**

*This section provides general information on the PBX, including the system capacity and specifications.*

# 1.1 System Highlights

## 1.1.1 System Highlights

### IPCMPR Card Features

The IPCMPR card (the preinstalled Main Processing card) includes the following features and resources:

#### VoIP CO lines/VoIP Extensions

The IPCMPR card allows the use of IP CO lines (H.323) and IP telephones (IP-PTs, IP softphones, and SIP Extensions). By connecting a DSP card to the IPCMPR card, these IP CO lines and extensions can be used. It is also possible to increase the number of IP CO lines (max. 32) and extensions (max. 128) through the purchase of activation key codes.

#### LAN Connection

The IPCMPR card is equipped with a LAN port allowing for the PBX to be connected to a LAN.

#### Computer Telephony Integration (CTI) Features

Connecting a PC to a DPT, or connecting a CTI Server to this PBX, allows functions of the PC, PBX and extensions to be integrated. For example, detailed caller information can be taken from a database and displayed on the PC as a call arrives, or the PC can dial numbers for the extension automatically.

#### Simplified Voice Message (SVM) Features

The IPCMPR card comes preinstalled with the SVM feature (2 channels), allowing for simple answering machine services to be supported.

### Internet Protocol (IP) Telephone Features

This PBX supports the following telephone features that use IP:

#### IP-PT Features

This PBX supports the connection of IP-PTs which function almost identically to normal PTs. However, they connect to the PBX over a LAN and make and receive calls using IP. In addition, KX-NT300 series IP-PTs support the following features:

- **Self Labeling (KX-NT366 only)**

The LCDs featured next to the 12 flexible buttons of the KX-NT366 can be programmed to display information regarding the setting of the corresponding flexible button. In addition, the flexible buttons can be organized into 4 “pages” allowing you to assign a total of 4 items to each physical button.

- **Optional Modules**

- KX-NT307(PSLP1528) Bluetooth® Module:  
Allows for a Bluetooth wireless headset to be connected to a KX-NT300 series IP-PT.
- KX-NT303 Add-on 12 Key Module:  
Allows for 12 additional flexible buttons to be connected to a KX-NT346 or KX-NT343.
- KX-NT305 Add-on 60 Key Module:  
Allows for 60 additional flexible buttons to be connected to a KX-NT346 or KX-NT343.

- **High Sound Quality**

Calls between KX-NT300 series IP-PTs support G.722 CODEC allowing for high sound quality conversations.

**SIP (Session Initiation Protocol) Extensions**

This PBX supports the connection of third party SIP supported IP telephones (hardphones and softphones). SIP Extensions make and receive calls using IP.

**IP Softphones**

This PBX supports the connection of Panasonic IP softphones, providing IP-PT operations and features using software on a PC.

## Internet Protocol (IP) Related Features

### Server Connection

This PBX supports the connection to the following servers, allowing for enhanced efficiency and record keeping:

- **SNMP Server:**

Allows for users assigned as SNMP managers to manage and receive PBX system status information, such as local alarm information and general system activity using Simple Network Management Protocol (SNMP).

- **SNTP Server:**

Allows for the PBX to automatically receive and update the time setting using Simple Network Time Protocol (SNTP).

- **DHCP Server:**

Allows for this PBX to receive IP addresses from a Dynamic Host Configuration Protocol (DHCP) server.

### Peer-to-peer Connection

Intercom calls can be made between peer-to-peer compatible IP extensions allowing for communication without using the PBX's VoIP resources.

## Networking Features

This PBX supports the following private networking features:

### Voice over Internet Protocol (VoIP) Network

This PBX can be used on a private network which implements VoIP. On this type of network, information is sent over the private network in IP packets, which allows voice as well as data to be sent to other devices in the private network. Automatic rerouting of VoIP calls to public CO lines is also available in case of network difficulties.

### TIE Line Service

PBXs can be connected via a privately leased telephone lines, forming a private network. These "TIE lines" provide a cost-effective way to route calls and communications, and are often used to connect corporate offices located in different cities.

### QSIG Support

TIE line service can be used on a private network that is established using Voice over Internet Protocol (VoIP) with the IP-GW card, or ISDN (PRI) lines programmed to implement the QSIG protocol (Q.931). QSIG offers TIE line service as well as advanced caller and called party identification features.

### External Device Support

The following are just a few of the many useful optional devices available to enhance your telephony system:

#### Portable Station (PS) Features

A Panasonic PS can be used in place of a PT to provide wireless access to PBX features and call handling. When in Wireless XDP Parallel Mode, a PS can share an extension number with a wired telephone, allowing extension users to use their PSs when they are away from their desks to answer or make calls as if they were using their wired telephones.

#### Cellular Phone Features (KX-NCS4910 required)

This PBX supports the use of cellular phones and other outside destinations with the PBX. Cellular phones can be treated as extensions within the PBX, and paired with wired telephones in Cellular Phone XDP Parallel Mode.

#### Phone Assistant (PA) Pro Series

This PBX supports KX-TDA Phone Assistant Pro Series applications, a collection of highly-intuitive CTI applications that allow you to use your PC to access a variety of PBX features conveniently and efficiently. PA Pro series applications combine the efficiency and user-friendliness of CTI applications with the convenience of server-based applications, allowing User IDs, passwords and PBX settings to be configured over a web browser.

#### Voice Mail Features

A Voice Processing System (VPS) can be connected to the PBX to provide Voice Mail (VM) and Automated Attendant (AA) services. A Panasonic VPS which supports DPT (Digital) Integration can be connected to the PBX effortlessly and with minimal setup required. It can also be connected to one PBX in a network to provide voice mail services for extensions at all PBXs. Conventional DTMF (analog) voice mail systems, including those from other manufacturers, are also supported.

#### ACD Report Server (KX-NCV200)

This PBX supports VPSs with an ACD Report Server. In addition to VPS features, the ACD Report Server provides you with a variety of features, such as monitoring, reporting, call logging features and creating performance graphs, to manage call information efficiently.

### Other Useful Features

#### Easy Installation and Setup

- **With Physical Cards**

By simply connecting telephones and outside lines to analog extension and CO line cards, you can make and receive calls. For digital CO lines (e.g., T1), it may be necessary to first make the required settings and restart the PBX.

- **With Virtual Cards**

By connecting the PBX to the LAN, installing each virtual card and registering the IP telephones through system programming, you can make and receive calls.

#### Enhanced Walking Extension Feature

It is possible to use the Walking Extension feature with extensions in Service-in (functions normally) and Service-out (cannot make CO line calls or receive calls) modes, allowing users to use their extensions at home and at work, or for multiple users who work in shifts to use their own extension settings on a single telephone.

### **Built-in Small Call Center Features**

Extensions can form an incoming call distribution (ICD) group and be used as a small call center which can take advantage of several features, some of which are highlighted below.

- **Queuing**  
When all available extensions in an ICD group are busy, additional calls can be placed in a queue as they arrive. While calls are waiting in the queue, callers can hear background music (BGM), an outgoing message (OGM), etc.
- **Log-in/Log-out**  
Members of an ICD group can log-in to or log-out of a group manually. Group members can log-in at the beginning of a work shift, and log-out at the end of the day. While logged-in, ICD group members can be allotted a specified amount of time after completing a call during which new calls will not be received by their extensions, allowing them to finish any necessary paperwork before being eligible to receive new calls (Wrap-up).
- **VIP Call**  
The VIP Call feature is one method of making sure that calls from preferred customers or callers are answered quickly. When using VIP Call mode, ICD groups are assigned a priority, allowing calls in higher-priority groups to be answered before calls in lower-priority groups.

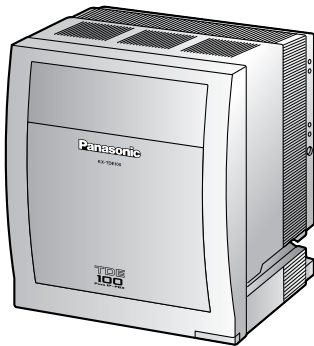
### **Hospitality Features**

This PBX has several features that support its use in a hotel-type environment. Extensions corresponding to guest rooms can be "checked in" or "checked out" by a designated hotel operator, who can also check or set wake-up calls.

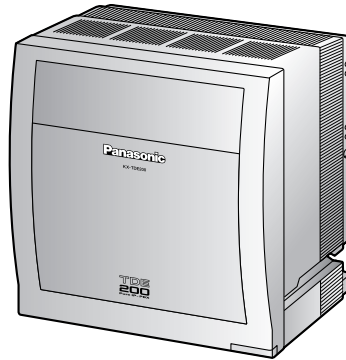
# 1.2 Basic System Construction

## 1.2.1 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.

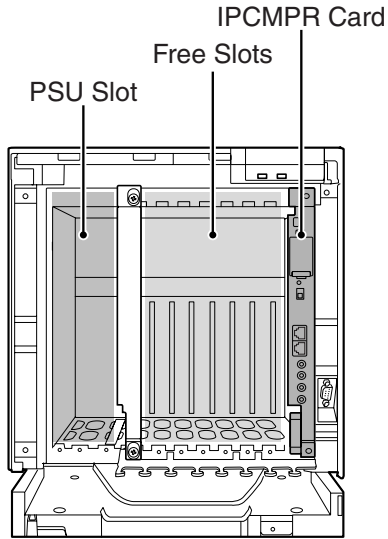


KX-TDE100

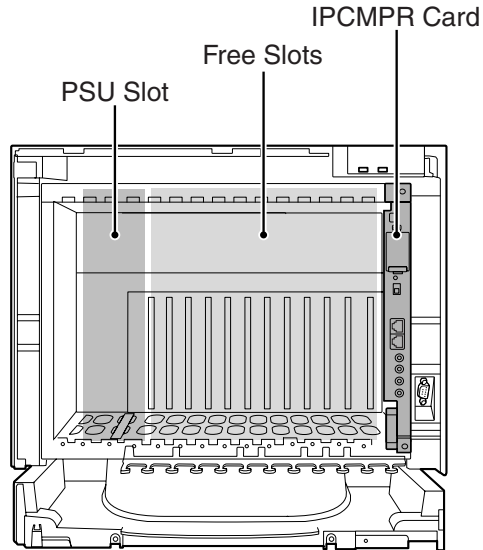


KX-TDE200

### Construction of the Basic Shelf



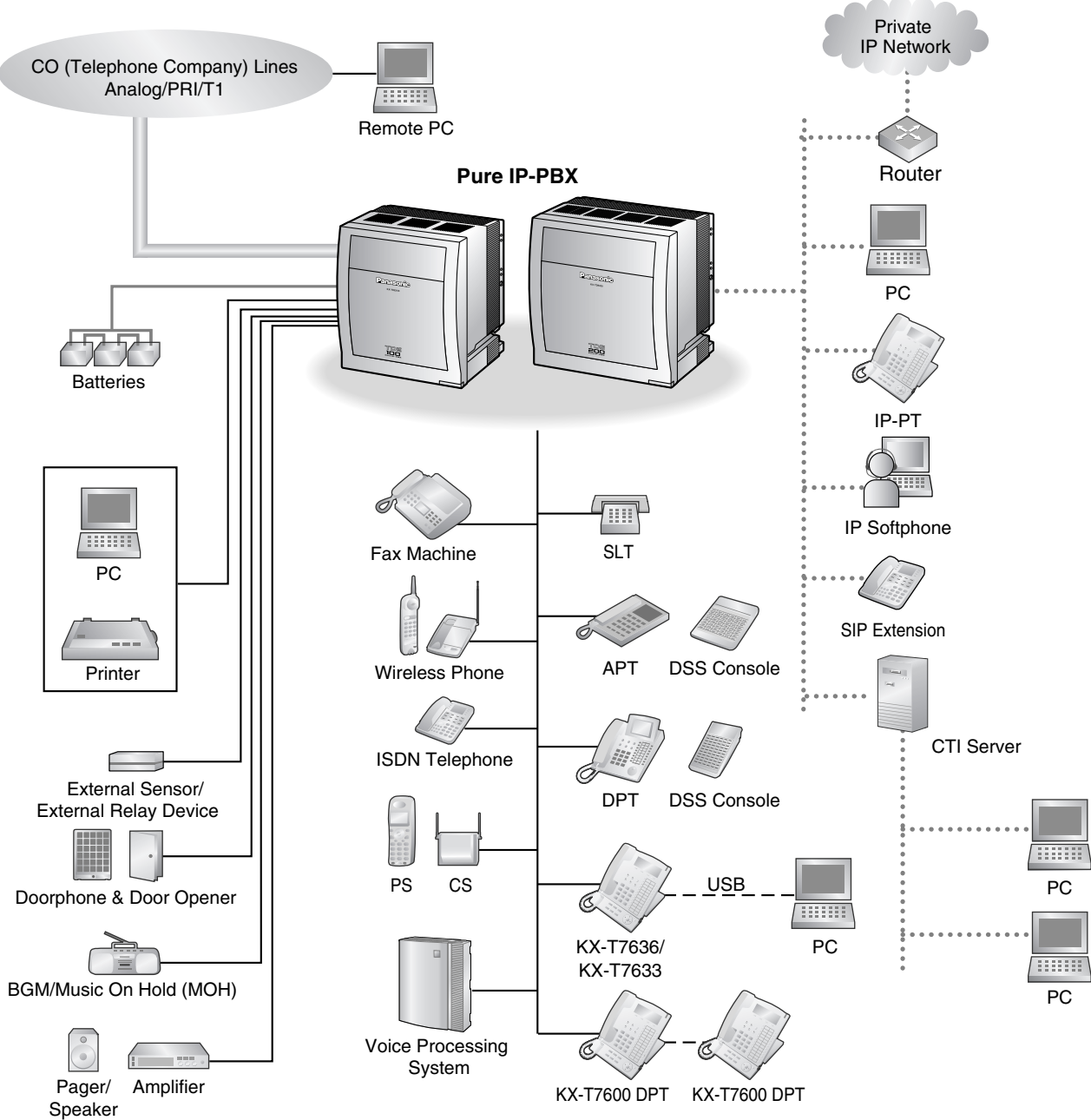
KX-TDE100



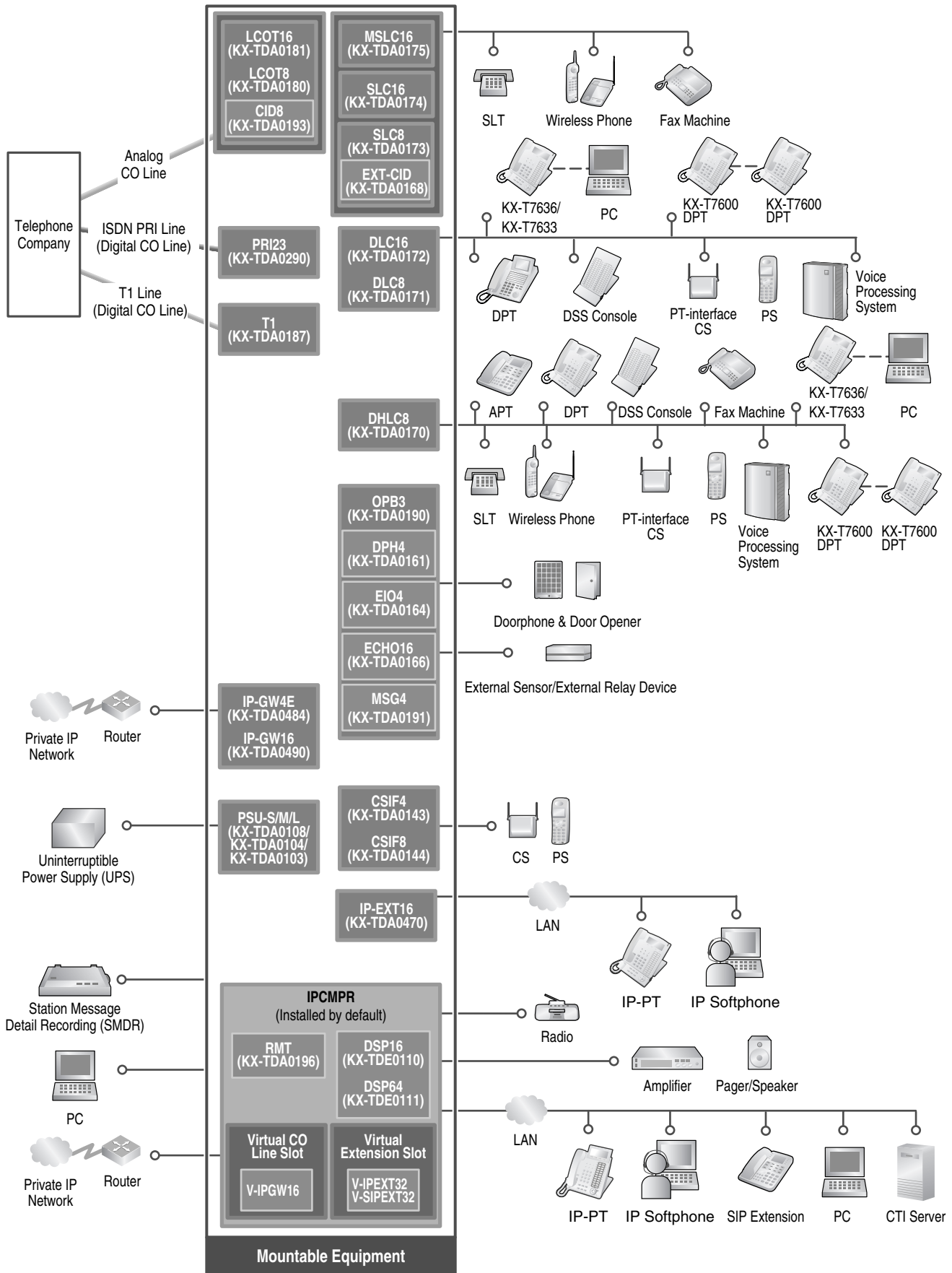
KX-TDE200



# 1.2.2 System Connection Diagram



## 1.2 Basic System Construction



## 1.3 Optional Equipment

### 1.3.1 Optional Equipment

Model No.	Model Name	Description
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 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.
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.

### 1.3 Optional Equipment

Model No.	Model Name	Description
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 for Message Waiting Lamp control.
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, DPH4, 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.
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 "1.4.3 System Capacity".

# 1.4 Specifications

## 1.4.1 General Description

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

## 1.4 Specifications

<b>Extension Connection Cable</b>		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	1-pair wire (D1, D2)
		DSS Console and Add-on Key Module	1-pair wire (D1, D2)
<b>Dimension</b>	<b>KX-TDE100</b>	334 mm (W) × 390 mm (H) × 272 mm (D) (13-1/3 in × 15-3/5 in × 10-3/4 in)	
	<b>KX-TDE200</b>	430 mm (W) × 415 mm (H) × 276 mm (D) (17-1/5 in × 16-3/5 in × 10-7/8 in)	
<b>Weight (when fully mounted)</b>	<b>KX-TDE100</b>	Under 12 kg (26.4 lb)	
	<b>KX-TDE200</b>	Under 16 kg (35.2 lb)	

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

## 1.4.2 Characteristics

<b>Terminal Equipment Loop Limit</b>	<ul style="list-style-type: none"> <li>• PT: KX-T7600 series DPT: 90 <math>\Omega</math>; all other DPTs/APTs: 40 <math>\Omega</math></li> <li>• SLT: 600 <math>\Omega</math> including set</li> <li>• Doorphone: 20 <math>\Omega</math></li> <li>• CS: 130 <math>\Omega</math>; PT-interface CS: 65 <math>\Omega</math></li> </ul>
<b>Minimum Leakage Resistance</b>	15 000 $\Omega$ minimum
<b>Maximum Number of Extension Instruments per Line</b>	<ol style="list-style-type: none"> <li>1 for PT or SLT</li> <li>2 by Parallel or eXtra Device Port connection of an APT/DPT and an SLT</li> <li>3 by Digital eXtra Device Port connection of 2 DPTs and an SLT</li> </ol>
<b>Ring Voltage</b>	75 Vrms at 20 Hz/25 Hz depending on the Ringing Load
<b>Central Office Loop Limit</b>	1600 $\Omega$ maximum
<b>Hookswitch Flash Timing Range</b>	24 ms to 2032 ms
<b>Door Opener Current Limit</b>	24 V DC/30 V AC, 1 A maximum
<b>External Relay Current Limit</b>	24 V DC/30 V AC, 1 A maximum
<b>External Sensor Current Limit</b>	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 $\Omega$ .
<b>Paging Terminal Impedance</b>	600 $\Omega$
<b>MOH (Music on Hold) Terminal Impedance</b>	10 000 $\Omega$

## 1.4.3 System Capacity

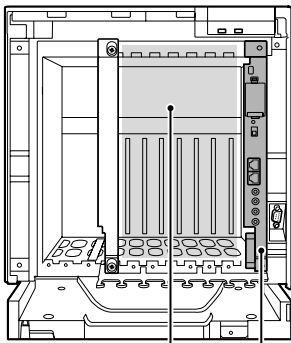
### Type and Maximum Number of Slots

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

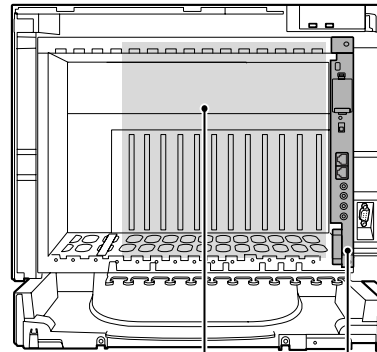
#### IPCMPR Card Slot and Free Slots

**KX-TDE100**



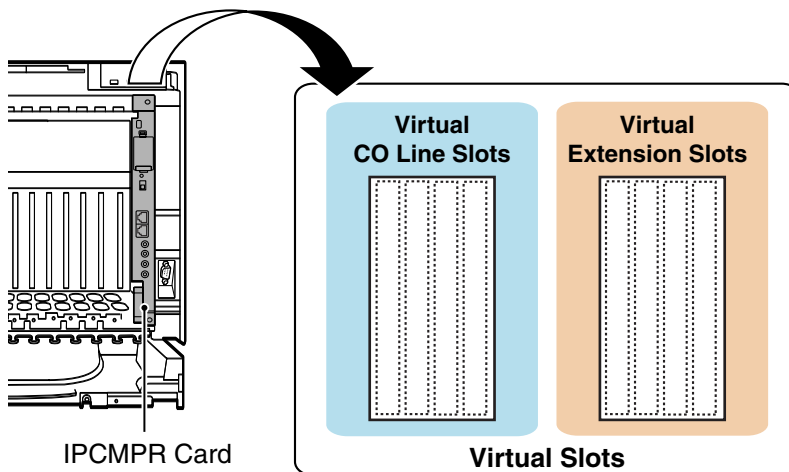
IPCMPR Card Slot  
Free Slots 1 to 6 (from the left)

**KX-TDE200**



IPCMPR Card Slot  
Free Slots 1 to 11 (from the left)

#### Virtual Slots of the IPCMPR Card





## Maximum Optional Service Cards

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

### Notes

- 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	2	2
V-IPGW16	2	2
Physical CO Line Card	Total 6 <sup>*1</sup>	Total 8 <sup>*2</sup>
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	2	2
V-SIPEXT32	4	4
Physical Extension Card	Total 6	Total 8
DHLC8		
DLC8		
DLC16		
SLC8	6	8
SLC16		
MSLC16		
IP-EXT16		
CSIF4	4	4
CSIF8		
OPB3	4	4
Total	14	16

<sup>\*1</sup> When installing T1 and PRI23 cards, make sure that the number of these cards  $\times 2$  + the number of the other cards does not exceed 8.

<sup>\*2</sup> One T1 or PRI23 card counts as 2 cards.

### Cards Mounted on Other Optional Service Cards

Card Type	Maximum Number		Mounted on
	KX-TDE100	KX-TDE200	
DSP16	1	1	IPCMPR Card
DSP64			
RMT			
EXT-CID	6	8	SLC8 Card
DPH4	4	4	OPB3 Card
ECHO16			
MSG4			
EIO4			
EIO4			

\*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)	120	128
CO Line (Virtual CO Line Card)	32	32
Total Number of Extensions	256	256
Extension (Physical Extension Card)	160	256
Extension (Virtual Extension Card)	128	128
IP-PT and IP Softphone	64	64
SIP Extension	128	128

#### 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.

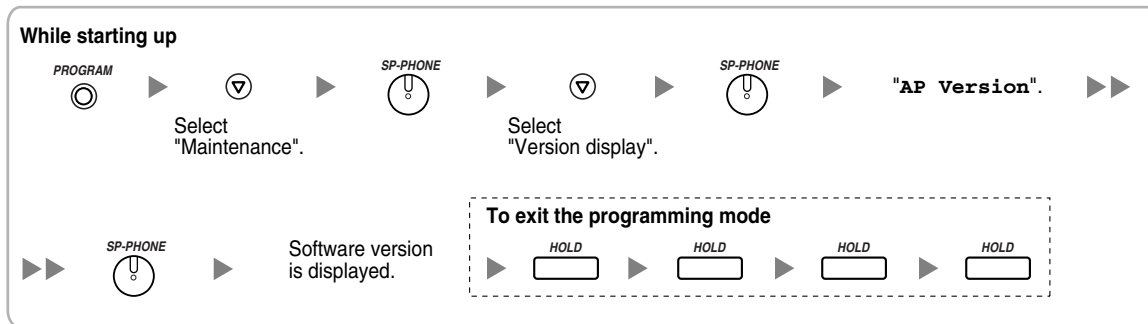
Terminal Equipment Type	KX-TDE100	KX-TDE200
Telephone	256	256
SLT	96	128
KX-T7600 series DPT	128	256
Other DPT	32	128
APT	24	64
IP-PT	160	160
IP-PT* <sup>1</sup> (supported by IP-EXT16 card)	96	128
IP-PT* <sup>2</sup> (supported by IPCMPR card)	64	64
SIP Extension	128	128
DSS console	8	8
CS	32	32
PS	128	128
Voice Processing System (VPS)	2	2
Doorphone	16	16
Door Opener	16	16
External Sensor	16	16
External Relay	16	16

\*<sup>1</sup> KX-NT136 and KX-NT265

\*<sup>2</sup> KX-NT300 series and KX-NT265 (software version 2.00 or later only)

**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:



## 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-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	16
	MSLC16	16
CS (1 unit)		4
PT-interface CS (1 unit)		4
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
<b>4 IP Trunk</b>	Allows the use of 4 IP CO lines.	8	32 IP CO lines
<b>8 IP Softphone/IP PT<sup>*1</sup></b>	Allows the use of 8 IP-PTs/IP softphones.	8	64 IP-PTs/IP softphones
<b>8 IP PT</b>	Allows the use of 8 IP-PTs.		
<b>16 SIP Extension</b>	Allows the use of 16 SIP Extensions.	8	128 SIP Extensions
<b>Software Upgrade 01</b>	Upgrades software to use enhanced features.	1	-

<sup>\*1</sup> You can set how many IP-PTs 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	<b>4-Channel IP Trunk</b>	1	4 IP CO lines
	<b>8-Channel IP Proprietary Telephone</b>	1	8 IP-PTs
DSP64	<b>4-Channel IP Trunk</b>	4	16 IP CO lines
	<b>8-Channel IP Proprietary Telephone</b>	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)

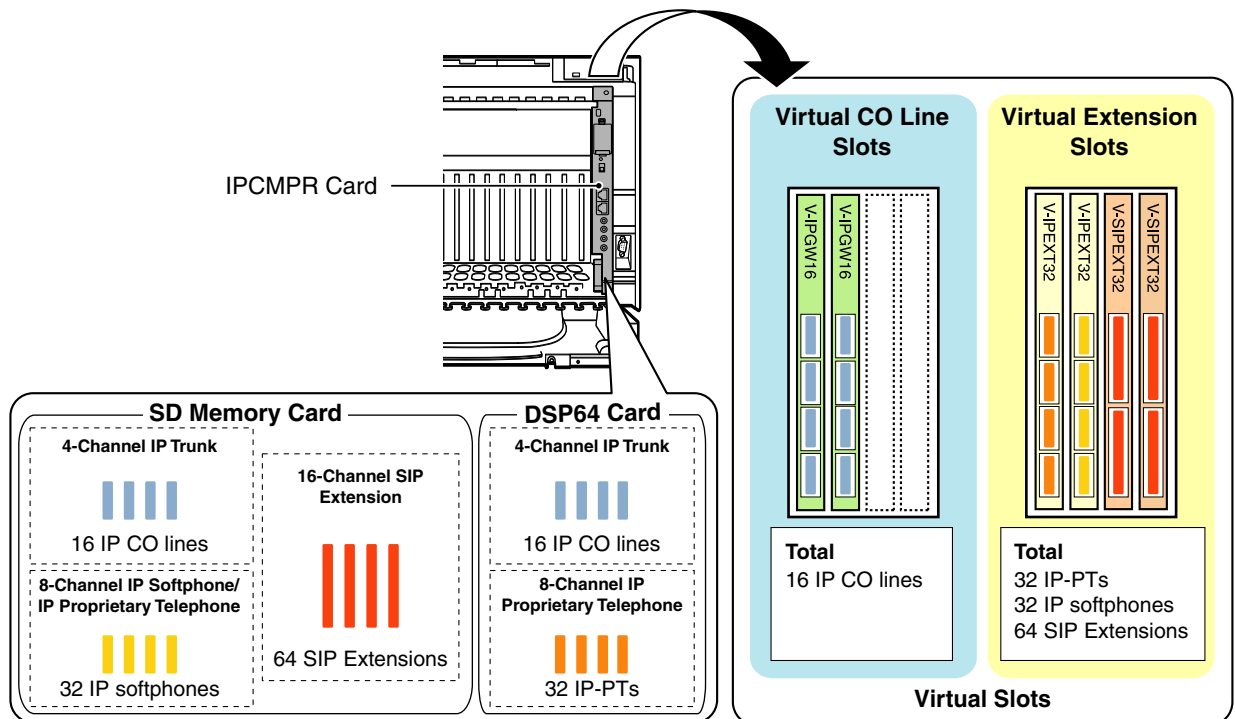
In addition to the preinstalled activation keys on the DSP16/DSP64 card, the following type and number of activation keys are installed in the SD Memory Card:

Activation Key Type	Maximum Number		Supported IP CO lines/IP Telephones	
	with DSP16	with DSP64	with DSP16	with DSP64
4 IP Trunk	7	4	28 IP CO lines	16 IP CO lines
8 IP Softphone/IP PT	7	4	56 IP-PTs/IP softphones	32 IP-PTs/IP softphones
8 IP PT				
16 SIP Extension	8		128 SIP Extensions	
Software Upgrade 01	1		-	

If the preinstalled activation keys in the DSP card are not enough for the desired configuration or if you wish to use enhanced features, it is necessary to obtain additional activation keys in the form of activation key files and install them in the SD Memory Card. 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 in the SD Memory Card, refer to "2.1.3 Activation Key File".

## Activation Key Installation Example

The following shows an example of when using 32 IP 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.

The following activation keys are available:

Model No.	Activation Key Type	Description
KX-NCS4104	<b>4 IP Trunk</b>	Provides the activation key number and registration ID to download the activation key that enables the use of 4 IP CO lines.
KX-NCS4208	<b>8 IP Softphone/IP PT</b>	Provides the activation key number and registration ID to download the activation key that enables the use of 8 IP-PTs/IP softphones.
KX-NCS4508	<b>8 IP PT</b>	Provides the activation key number and registration ID to download the activation key that enables the use of 8 IP-PTs.
KX-NCS4716	<b>16 SIP Extension</b>	Provides the activation key number and registration ID to download the activation key that enables the use of 16 SIP Extensions.
KX-NCS4910	<b>Software Upgrade 01</b>	Provides the activation key number and registration ID to download the activation key that enables the use of enhanced features.

### Notes

- 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.
- 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 KX-TDE Maintenance Console.

### Installing the Activation Key File in the SD Memory Card

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

1. Start the **KX-TDE Maintenance Console** from the Start menu on the PC.
2. From the **Utility** menu, select **File Transfer PC to PBX (SD Card)**.  
A dialogue 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. Change the card status of all virtual cards to OUS.
6. From the **Utility** menu, select **Refresh Activation Key**.  
A message will be displayed when refreshing is complete.
7. Click **OK**.
8. Change the card status of all virtual cards back to INS.

#### **Notes**

- It is necessary to restart the PBX to activate the UCAV2 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 KX-TDE Maintenance Console, refer to "2.7.3 [1-1] Slot—Activation Key" in the PC Programming Manual.

#### **CAUTION**

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.



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## **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

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:

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.
5. 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, avoid installing the system in the following locations:

1. In direct sunlight and hot, cold, or humid places. Temperature range: 0 °C to 40 °C (32 °F to 104 °F)
2. Areas where sulfuric gases may be present, such as near thermal springs.
3. Areas where shocks or vibrations are frequent or strong.
4. High-dust areas, or places the system may come into contact with water or oil.
5. Near devices that generate high frequencies, such as sewing machines or electric welders.
6. 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.)
7. 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).
8. 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.
9. Do not block the openings of the PBX.
10. Do not stack up the optional service cards.

#### Wiring Precautions

Be sure to follow these instructions when wiring the unit:

1. 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.
2. If cables are run on the floor, use protectors to prevent the cables from being stepped on. Avoid running cables under carpets.

- 3.** 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.
- 4.** 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.
- 5.** Unplug the system from its power source when wiring, and plug the system back in only after all wiring is completed.
- 6.** Mis-wiring may cause the PBX to operate improperly. Refer to Section 2 "Installation" when wiring the system.
- 7.** 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.
- 8.** For safety purposes this unit is 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.
- 9.** Use twisted pair cable for CO line connection.
- 10.** CO Lines should be installed with surge protectors. For details, refer to "3.2.13 Surge Protector Installation".
- 11.** 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:

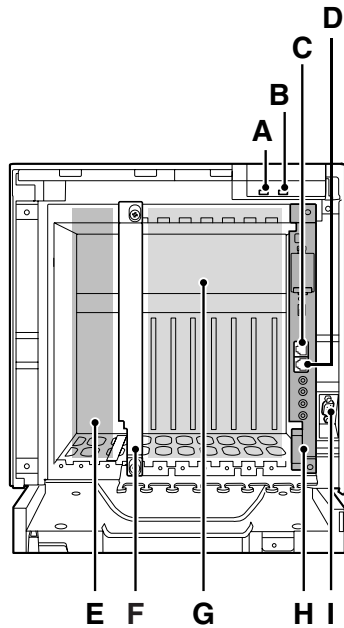
	<b>KX-TDE100</b>	<b>KX-TDE200</b>
Main Unit	1	1
Ferrite Core (for the IPCMPR card)	2	2
Metal Bracket	1	1
Screw A	3	4
Screw B (Black)	2	6
Anchor Plug	3	4
Mini Plug (for pager and music source)	4	4
SD Memory Card	1	1



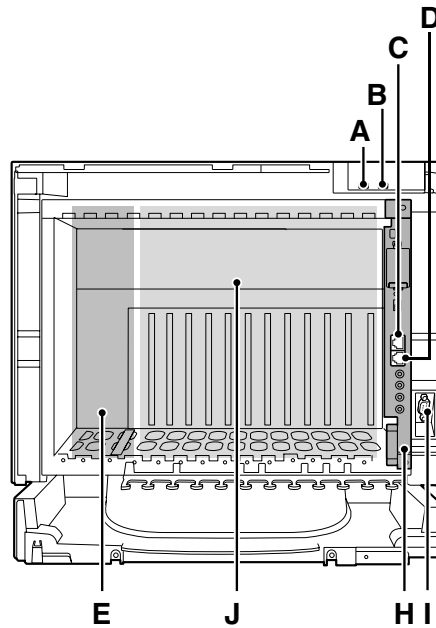
## 3.2.2 Names and Locations

### Inside View

KX-TDE100



KX-TDE200

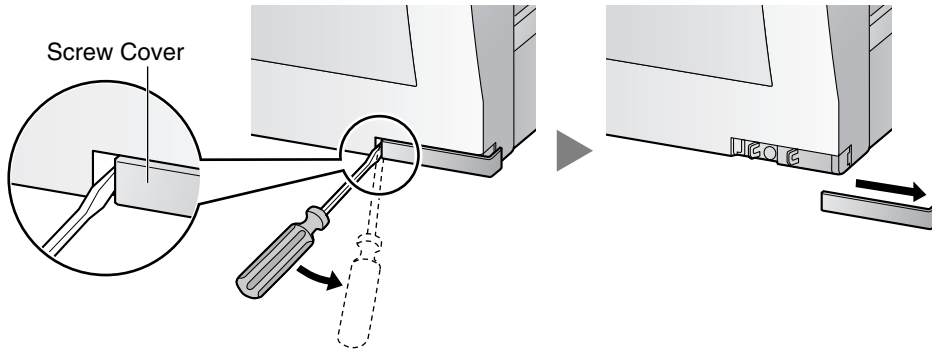


- A. RUN Indicator
- B. ALARM Indicator
- C. MNT Port
- D. LAN Port
- E. PSU Slot
- F. Null Slot (not available for any optional service card)
- G. Free Slots 1 to 6 (from the left)
- H. IPCMPR Card Slot
- I. RS-232C Port
- J. Free Slots 1 to 11 (from the left)

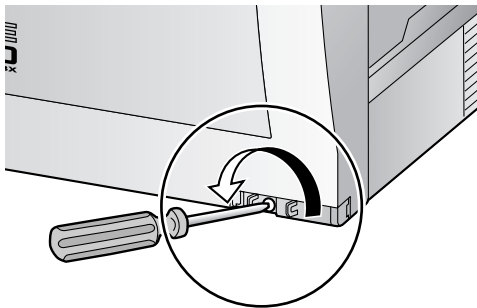
### 3.2.3 Opening/Closing the Front Cover

#### Opening the Front Cover

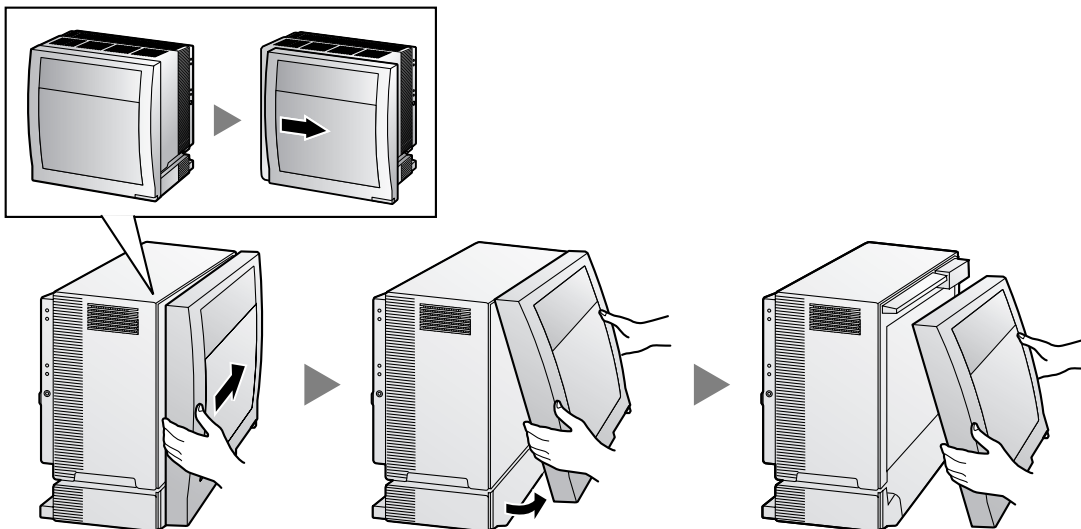
1. Insert a flathead screwdriver into the opening (on the left of the screw cover) and unlatch the screw cover.



2. Turn the screw anticlockwise to loosen.

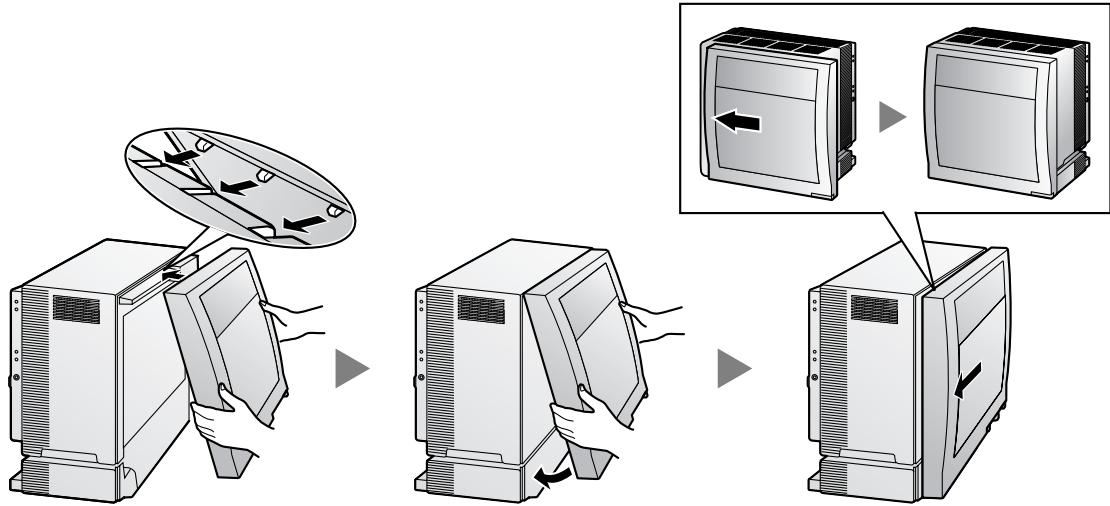


3. Slide the front cover to the right until it stops, then lift the front cover.

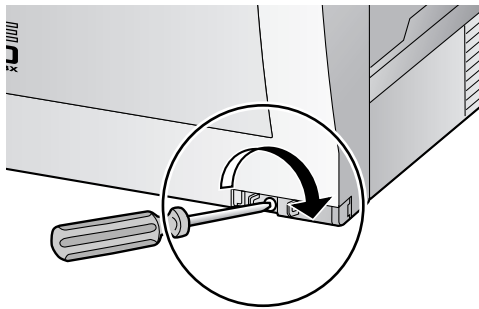


## Closing the Front Cover

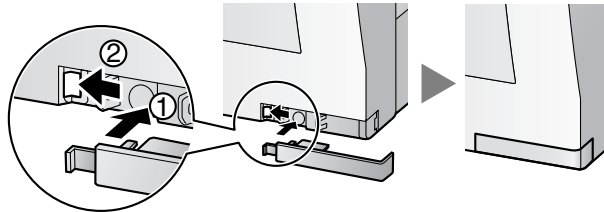
1. Hook the front cover onto the shelf (line up the protrusions on the cover with the receptacles on the shelf). Then slide the front cover to the left until it locks.



2. Turn the screw clockwise to tighten.



3. Secure the screw cover.



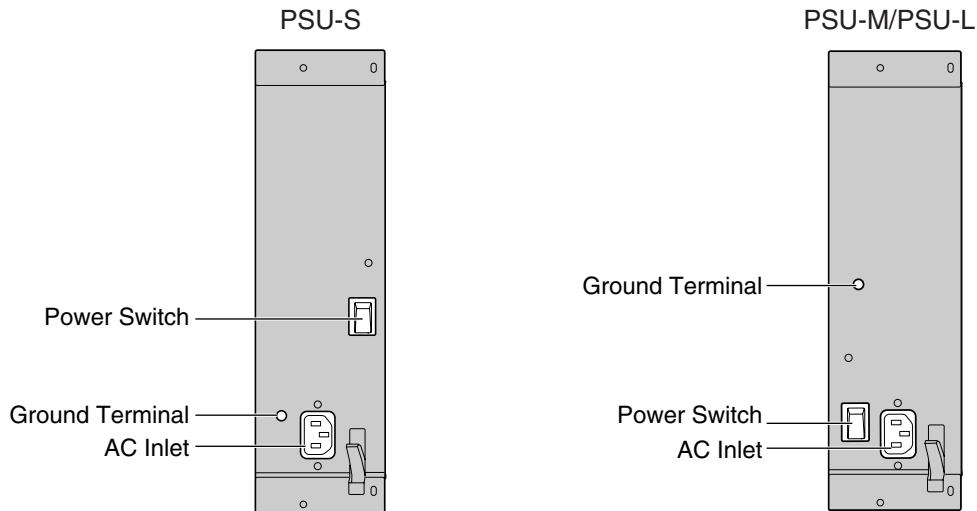
### CAUTION

- 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
<b>PSU-S</b> (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	
<b>PSU-M</b> (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	
<b>PSU-L</b> (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	



### Accessories and User-supplied Items

**Accessories (included):** Screws × 4, AC power cord × 1

**User-supplied (not included):** Grounding wire

### Notes

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

### Safety Instructions

Each PSU complies with Safety Class 1 of IEC60950, EN60950, UL60950, CAN/CSA-C22.2 No.60950, and AS/NZS60950; 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.

When installing or replacing a PSU, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

- 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.

4. 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.

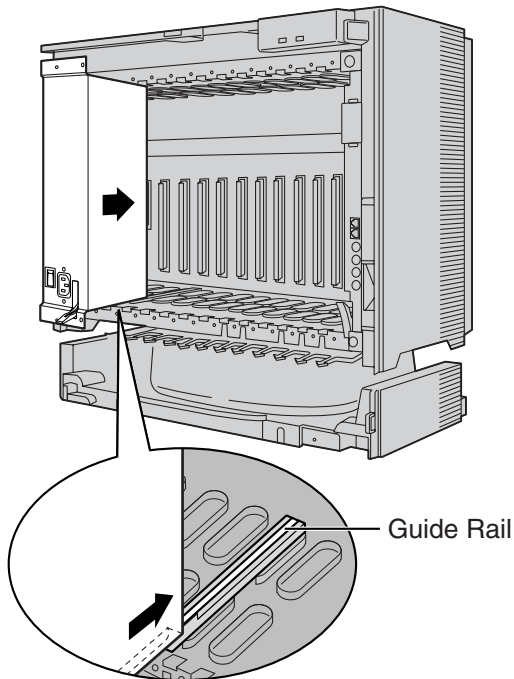
The following procedures are for installing or replacing a PSU only. Do not replace or remove the PSU for any other purpose.

## Installing the Power Supply Unit

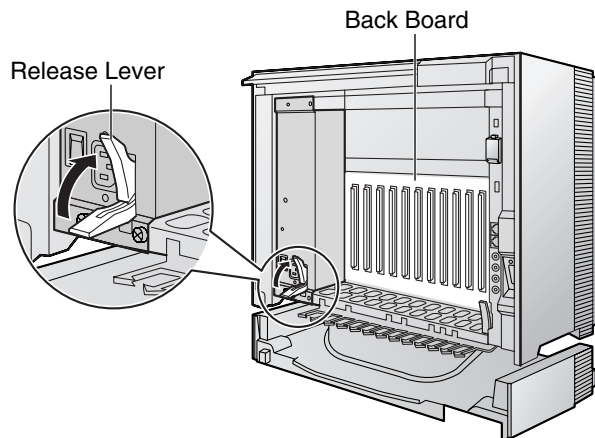
1. Insert the PSU along the guide rails.

### **CAUTION**

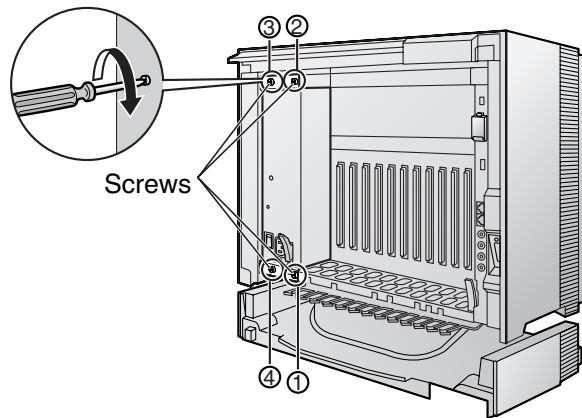
For safety reasons, do not touch parts in the PSU.



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

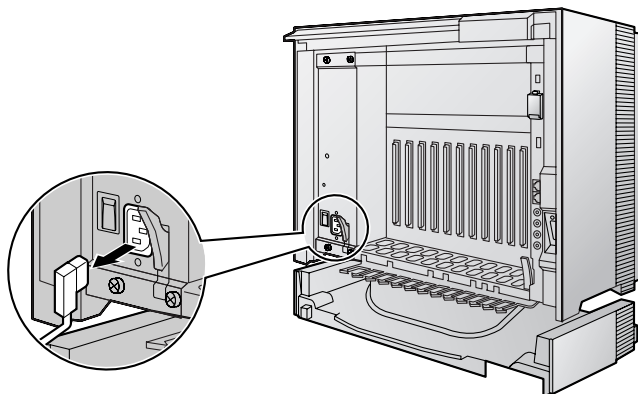


3. Turn the 4 screws clockwise, in the order indicated by the numbers 1 to 4, to fix the PSU.

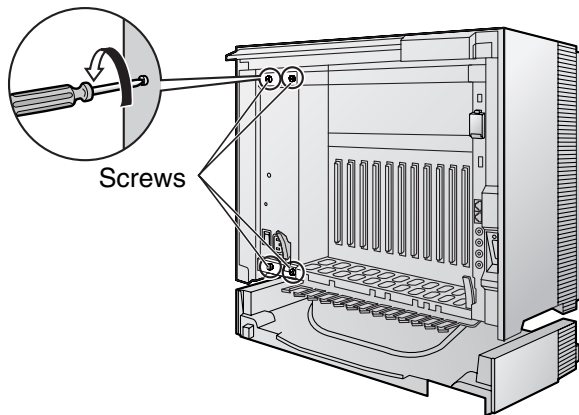


## Replacing the Power Supply Unit

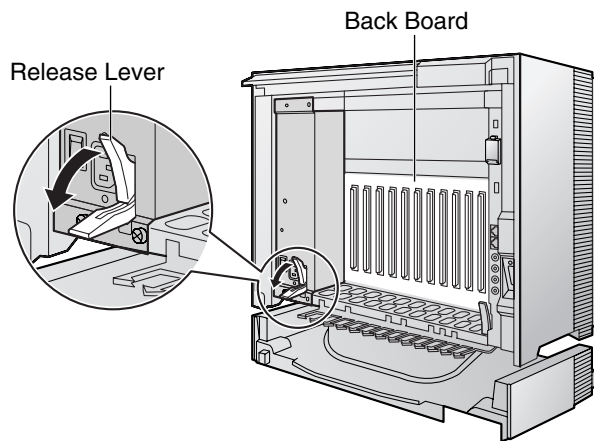
1. Unplug the AC power cord.



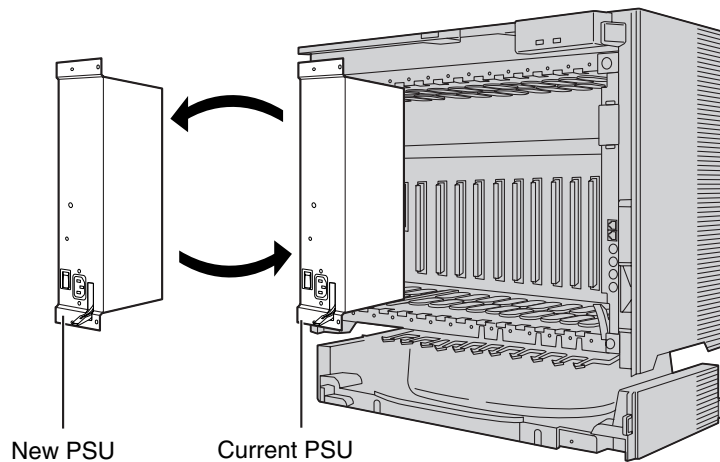
2. Turn the 4 screws anticlockwise to loosen them.



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



4. Replace the PSU.



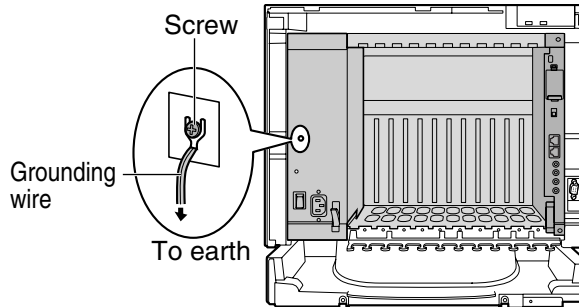
5. Follow the steps in "Installing the Power Supply Unit".

## 3.2.5 Frame ground Connection

### IMPORTANT

Connect the frame of the PBX to ground.

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



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

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

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

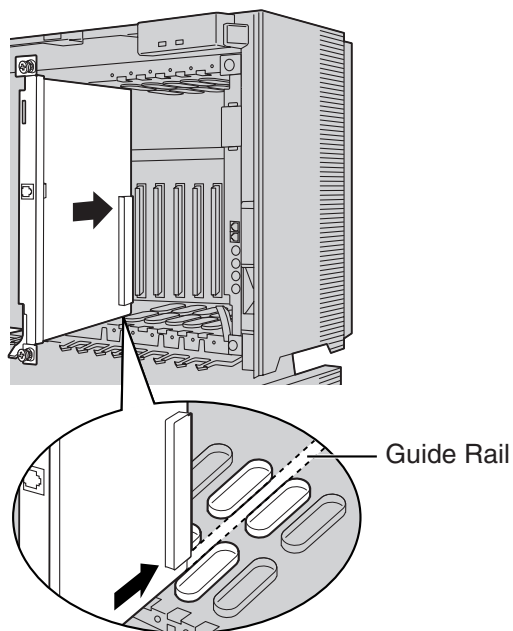
To protect the back board from static electricity, do not touch parts on the back board in the main unit and on the optional service cards. To discharge static electricity, touch ground or wear a grounding strap.

### Note

The optional service cards can be installed or removed while the DC power is supplied. However, when installing or removing the IPCMPR card, the DC power supply must be turned off.

### Installing Optional Service Cards

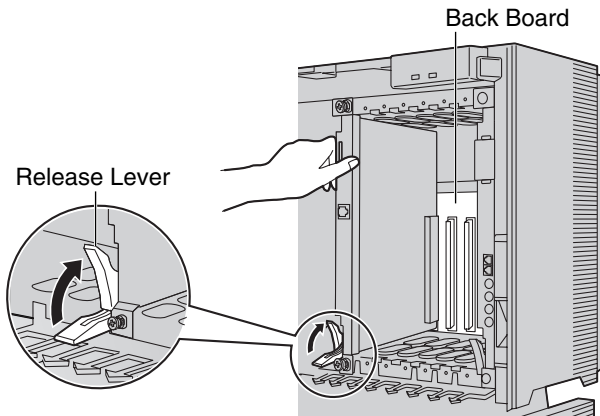
1. Insert the card along the guide rails.



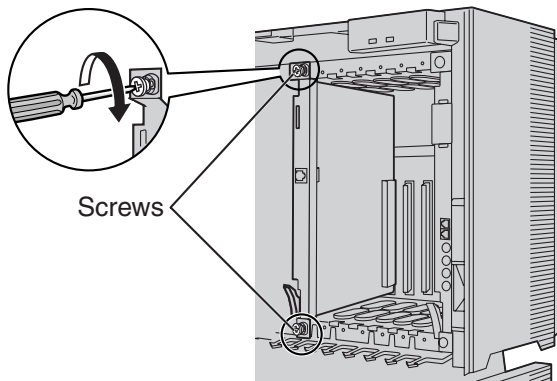
## 3.2 Installation of the PBX

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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.



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



### **Note**

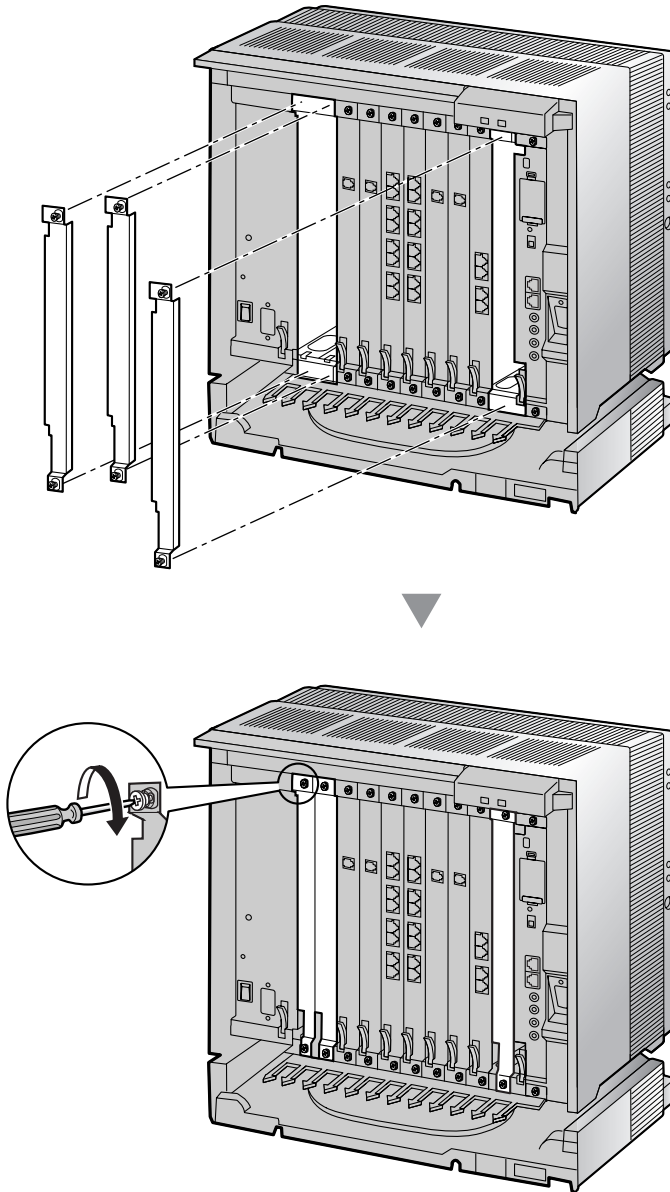
Make sure the screws are tightened to ground the card securely.

### Covering the Blank Slots

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

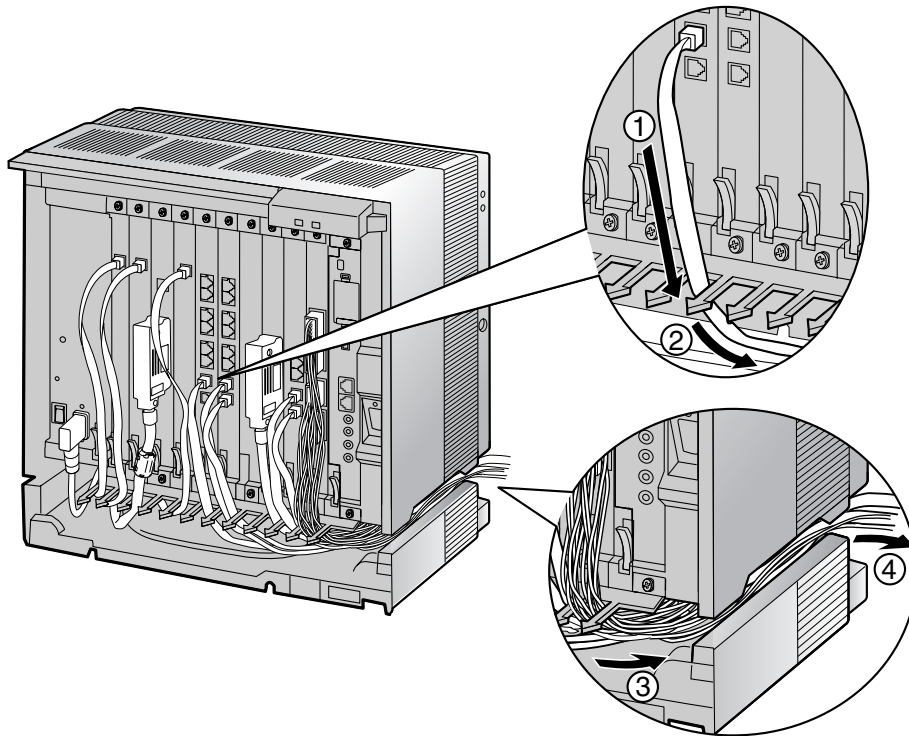
#### **CAUTION**

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.

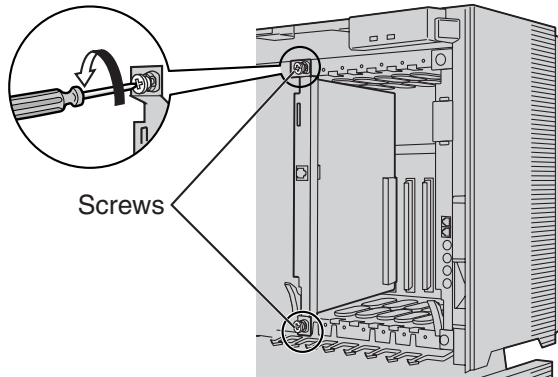


### **Note**

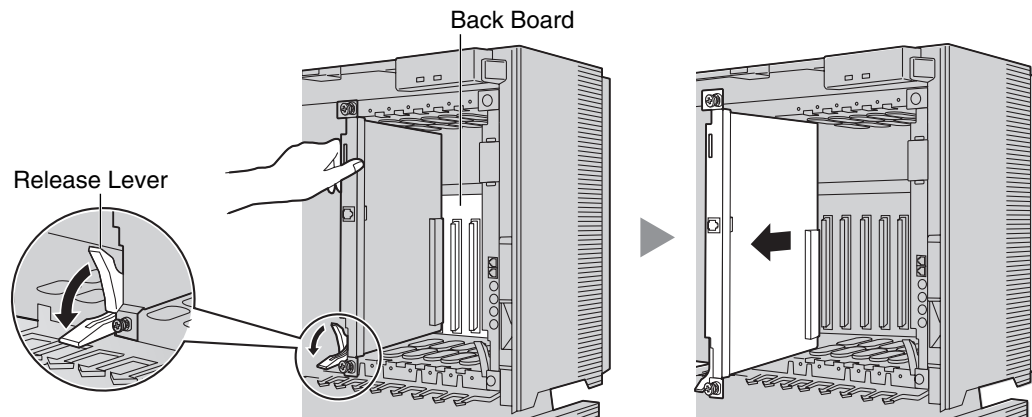
For safety reasons, do not stretch, bend, or pinch the AC power cord.

## Removing the Optional Service Cards

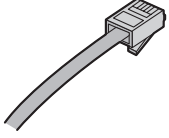
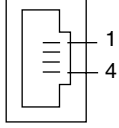
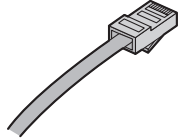
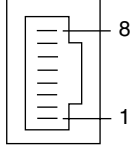
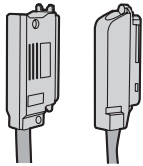
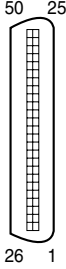
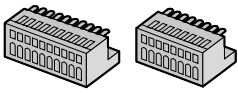
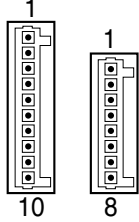
1. Turn the 2 screws anticlockwise to loosen them.

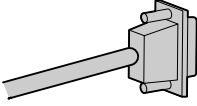
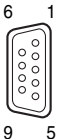
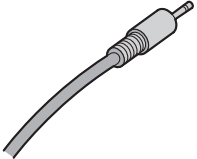



2. Pull the release lever in the direction of the arrow to disconnect the card from the back board. Pull the card from the shelf to remove it.



### 3.2.7 Types of Connectors

Connector Type	Pin Number	Used for
<p>RJ11</p>  <p>(Twisted pair cable)</p>		<ul style="list-style-type: none"> <li>• DHLC8 (KX-TDA0170)</li> <li>• SLC8 (KX-TDA0173)</li> <li>• SLC16 (KX-TDA0174)</li> <li>• MSLC16 (KX-TDA0175)</li> <li>• LCOT8 (KX-TDA0180)</li> <li>• LCOT16 (KX-TDA0181)</li> </ul>
<p>RJ45</p>  <p>(Twisted pair cable)</p>		<ul style="list-style-type: none"> <li>• IPCMPR</li> <li>• CSIF4 (KX-TDA0143)</li> <li>• CSIF8 (KX-TDA0144)</li> <li>• T1 (KX-TDA0187)</li> <li>• PRI23 (KX-TDA0290)</li> <li>• IP-EXT16 (KX-TDA0470)</li> <li>• IP-GW4E (KX-TDA0484)</li> <li>• IP-GW16 (KX-TDA0490)</li> </ul>
<p>Amphenol Type A Type B</p>  <p>(Shielded twisted pair cable)</p>		<ul style="list-style-type: none"> <li>• DHLC8 (KX-TDA0170)</li> <li>• DLC8 (KX-TDA0171)</li> <li>• DLC16 (KX-TDA0172)</li> <li>• SLC8 (KX-TDA0173)</li> <li>• SLC16 (KX-TDA0174)</li> <li>• MSLC16 (KX-TDA0175)</li> <li>• LCOT8 (KX-TDA0180)</li> <li>• LCOT16 (KX-TDA0181)</li> </ul>
<p>10-pin Terminal Block    8-pin Terminal Block</p> 		<ul style="list-style-type: none"> <li>• DPH4 (KX-TDA0161)</li> <li>• EIO4 (KX-TDA0164)</li> </ul>

Connector Type	Pin Number	Used for
<p data-bbox="354 268 467 296">RS-232C</p>  <p data-bbox="305 520 500 548">(Shielded cable)</p>		<ul data-bbox="841 243 1027 270" style="list-style-type: none"><li data-bbox="841 243 1027 270">• Basic Shelf</li></ul>
<p data-bbox="354 594 467 621">Mini Plug</p> 		<ul data-bbox="841 575 1000 602" style="list-style-type: none"><li data-bbox="841 575 1000 602">• IPCMPR</li></ul>

## 3.2.8 Attaching a Ferrite Core

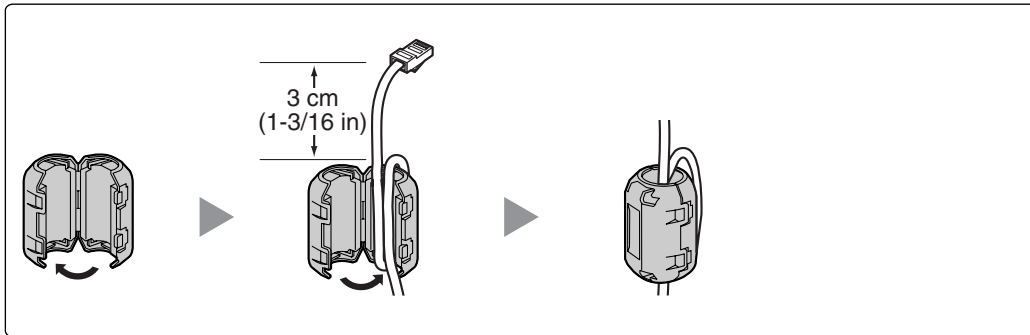
A ferrite core must be attached when:

- 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

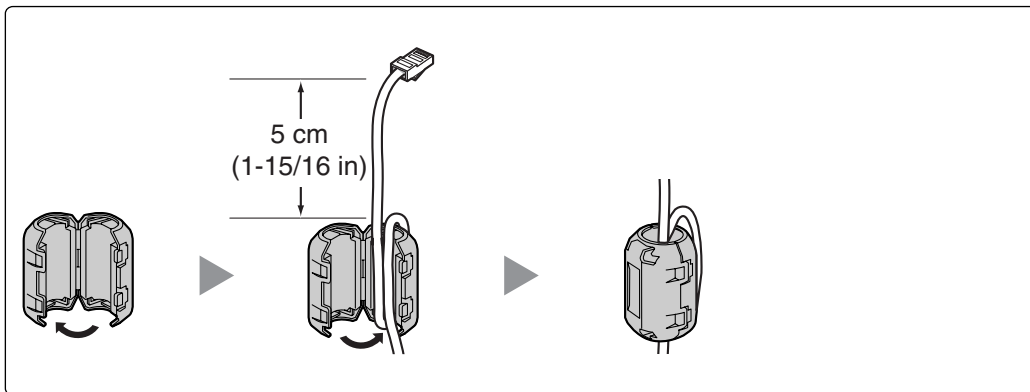
#### For the IPCMPR Card

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.

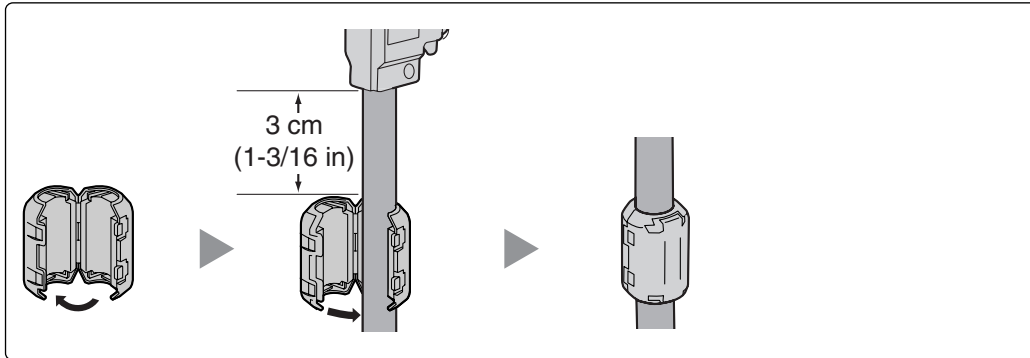




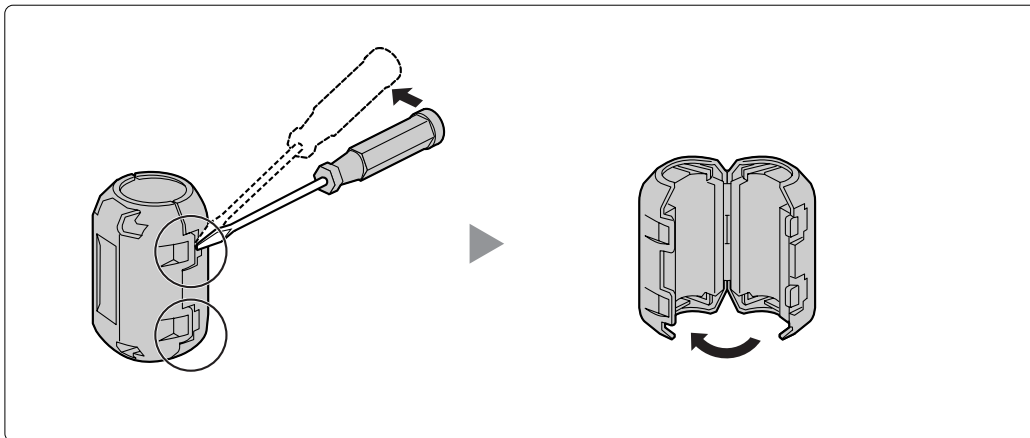
## Attaching to an Amphenol Connector

### 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.



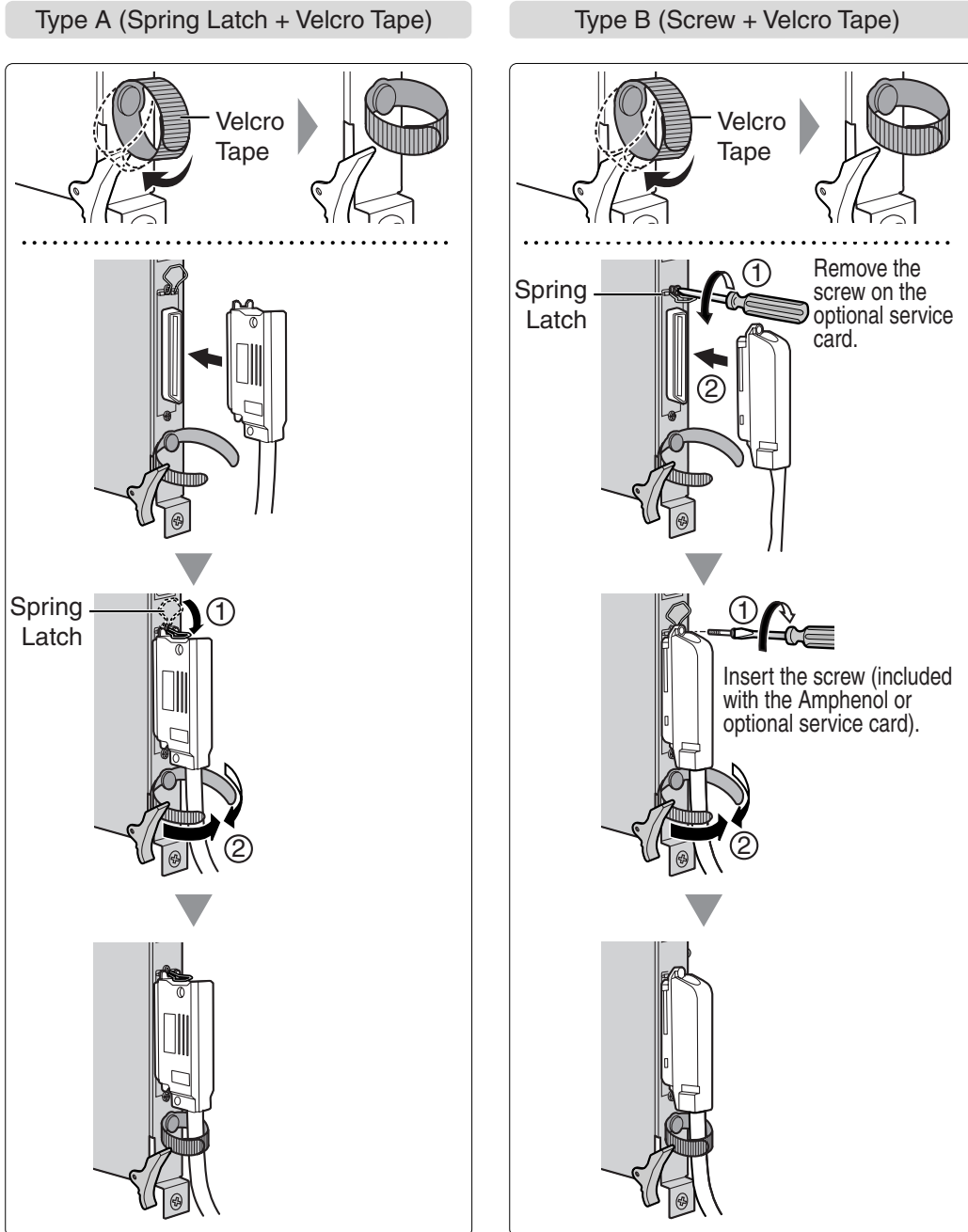
If you need to open the ferrite core, use a flathead screwdriver to unlatch the case of the ferrite core.



### 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.



## 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	MSLC16	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				
42			D1F	D1F				
18								
43								
19			RG					RG
44			TG					TG
20			D2G	D2G				
45			D1G	D1G				
21								
46								
22			RH					RH
47			TH					TH
23			D2H	D2H				
48			D1H	D1H				
24								
49								
25								
50								

### 3.2.10 Wall Mounting (KX-TDE200)

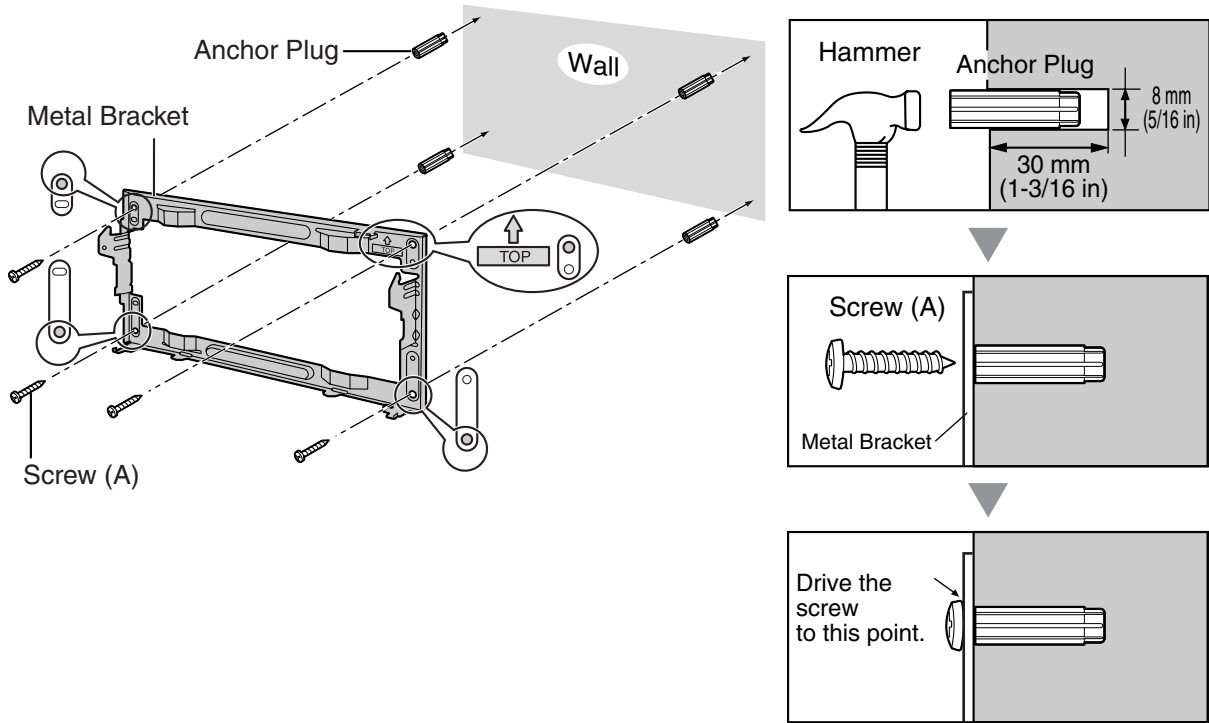
#### **WARNING**

- **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.**
- **WHEN DRIVING THE SCREWS INTO THE WALL, BE CAREFUL TO AVOID TOUCHING ANY METAL LATHS, WIRE LATHS OR METAL PLATES IN THE WALL.**
- **WHEN PLACING THE METAL BRACKET, MAKE SURE THAT THE "TOP" ARROW IS POINTING UPWARD.**
- **WHEN THIS PRODUCT IS NO LONGER IN USE, MAKE SURE TO DETACH IT FROM THE WALL.**

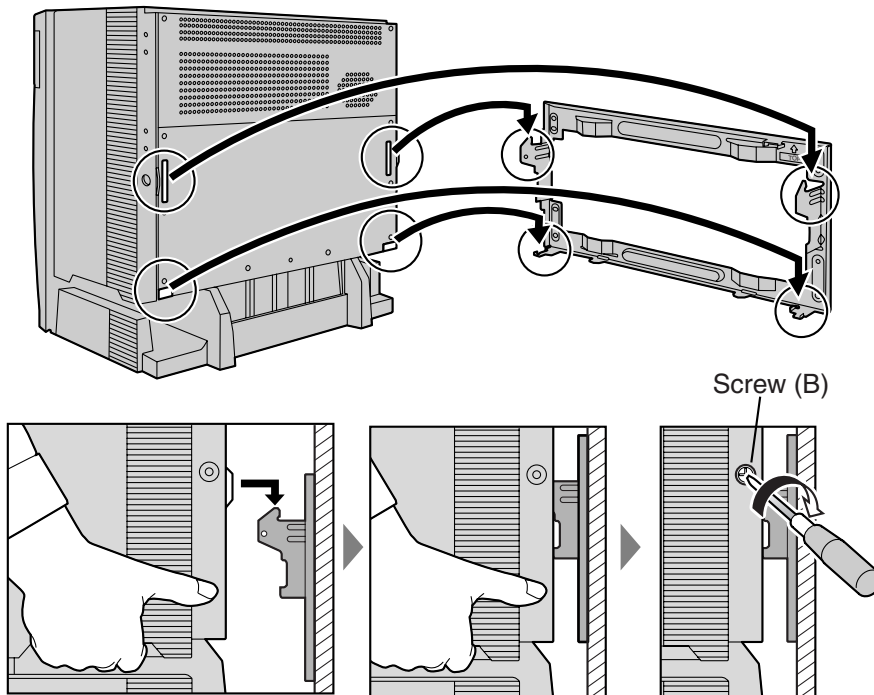
#### **Notes**

- 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.
- Be careful not to drop the shelf.
- For details about the dimensions and weight of the PBX, refer to "1.4.1 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).



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.



### 3.2.11 Wall Mounting (KX-TDE100)

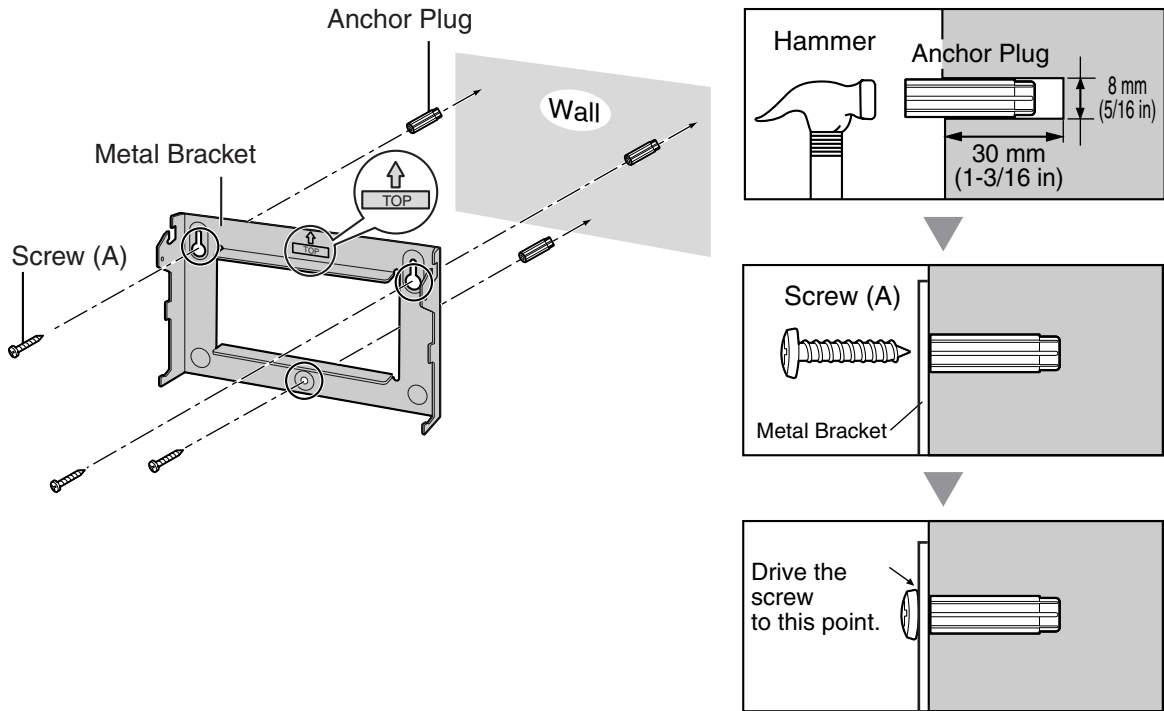
#### **WARNING**

- **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.**
- **WHEN DRIVING THE SCREWS INTO THE WALL, BE CAREFUL TO AVOID TOUCHING ANY METAL LATHS, WIRE LATHS OR METAL PLATES IN THE WALL.**
- **WHEN PLACING THE METAL BRACKET, MAKE SURE THAT THE "TOP" ARROW IS POINTING UPWARD.**
- **WHEN THIS PRODUCT IS NO LONGER IN USE, MAKE SURE TO DETACH IT FROM THE WALL.**

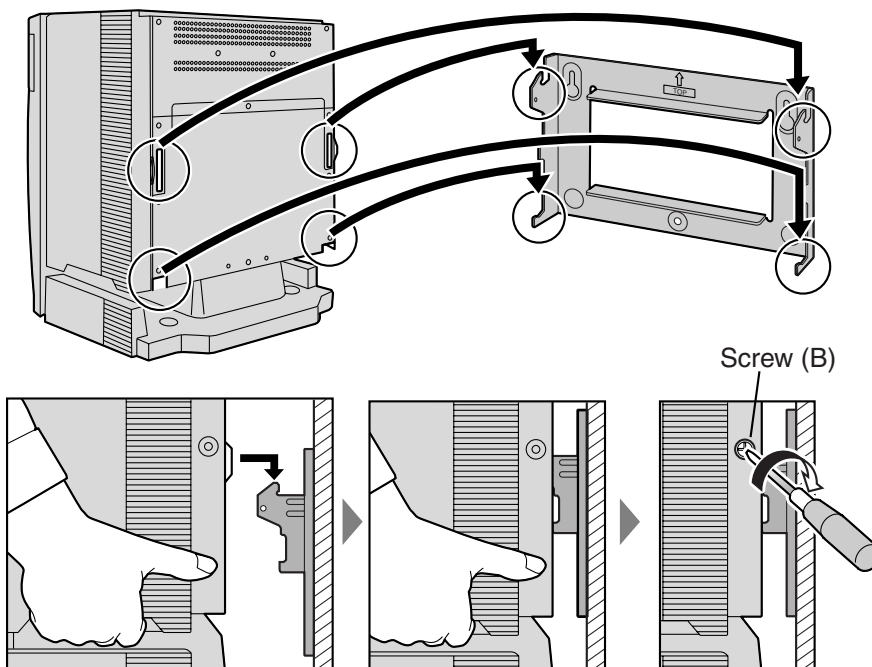
#### **Notes**

- 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.
- Be careful not to drop the shelf.
- For details about the dimensions and weight of the PBX, refer to "1.4.1 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.

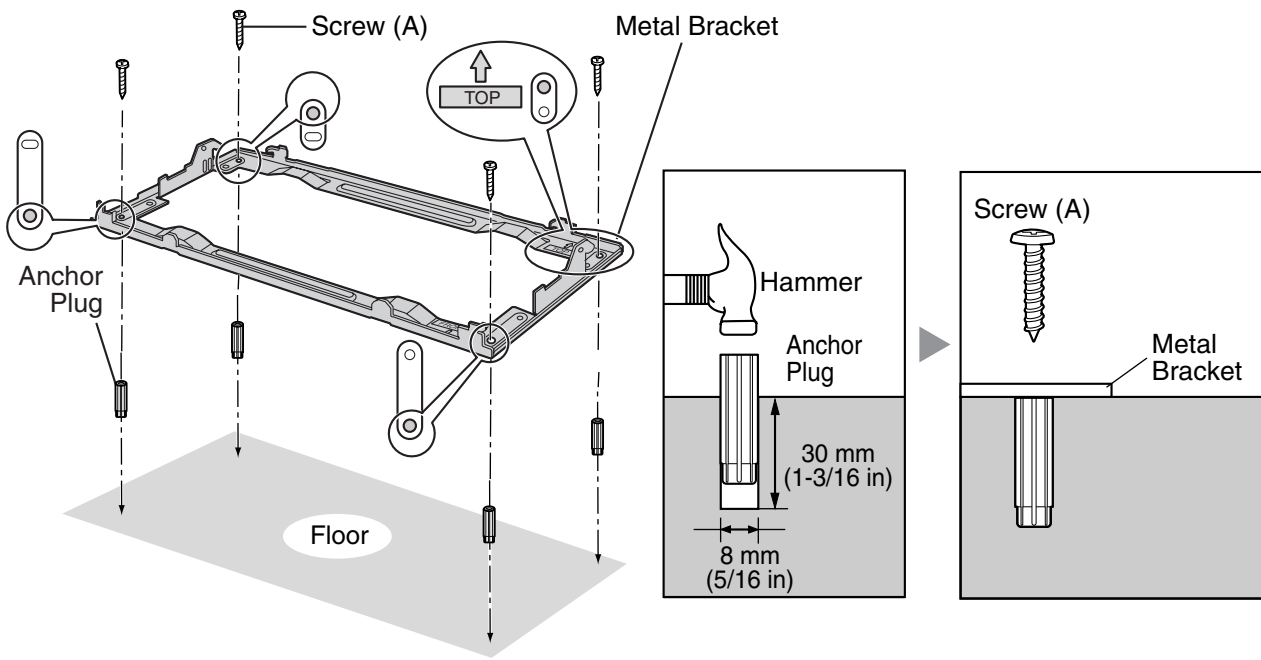


## 3.2.12 Floor Standing (KX-TDE200 Only)

### Notes

- 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.
- Be careful not to drop the shelf.

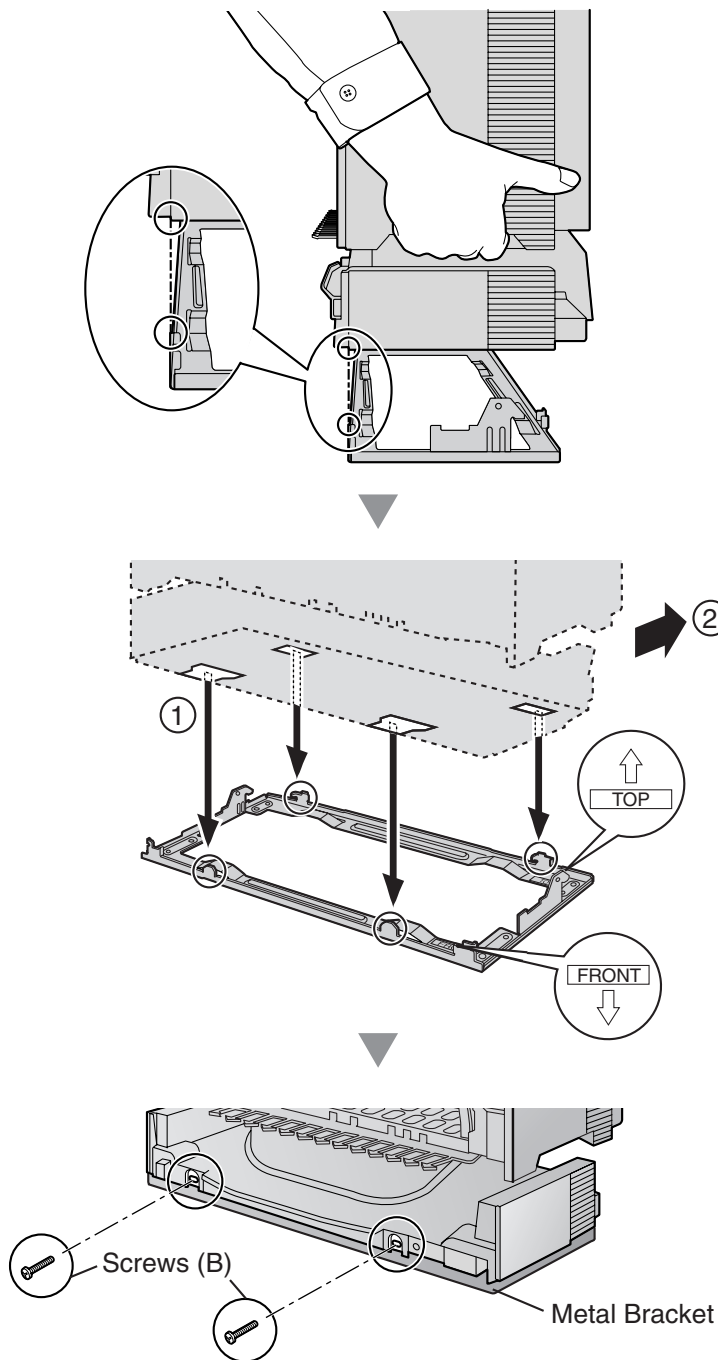
1. Install 4 anchor plugs in the floor, using the metal bracket as a template. Fix the metal bracket with 4 screws (A).



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).



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

## 3.2.13 Surge Protector Installation

### 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.

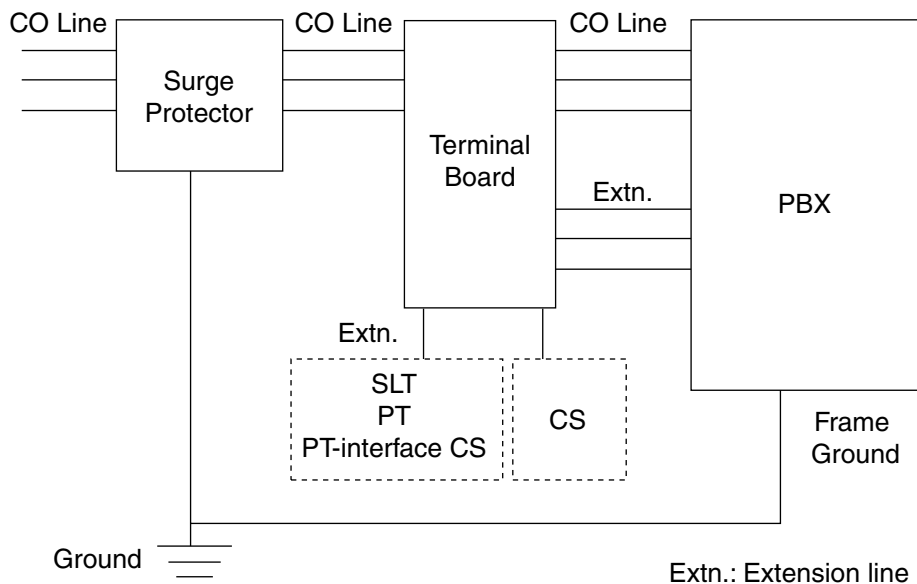
To protect the system from electrical surges, we strongly recommend connecting the system to a surge protector that meets the following specifications:

- Surge arrester type: 3-electrode arrester
- DC spark-over voltage: 230 V
- Maximum peak current: at least 10 kA

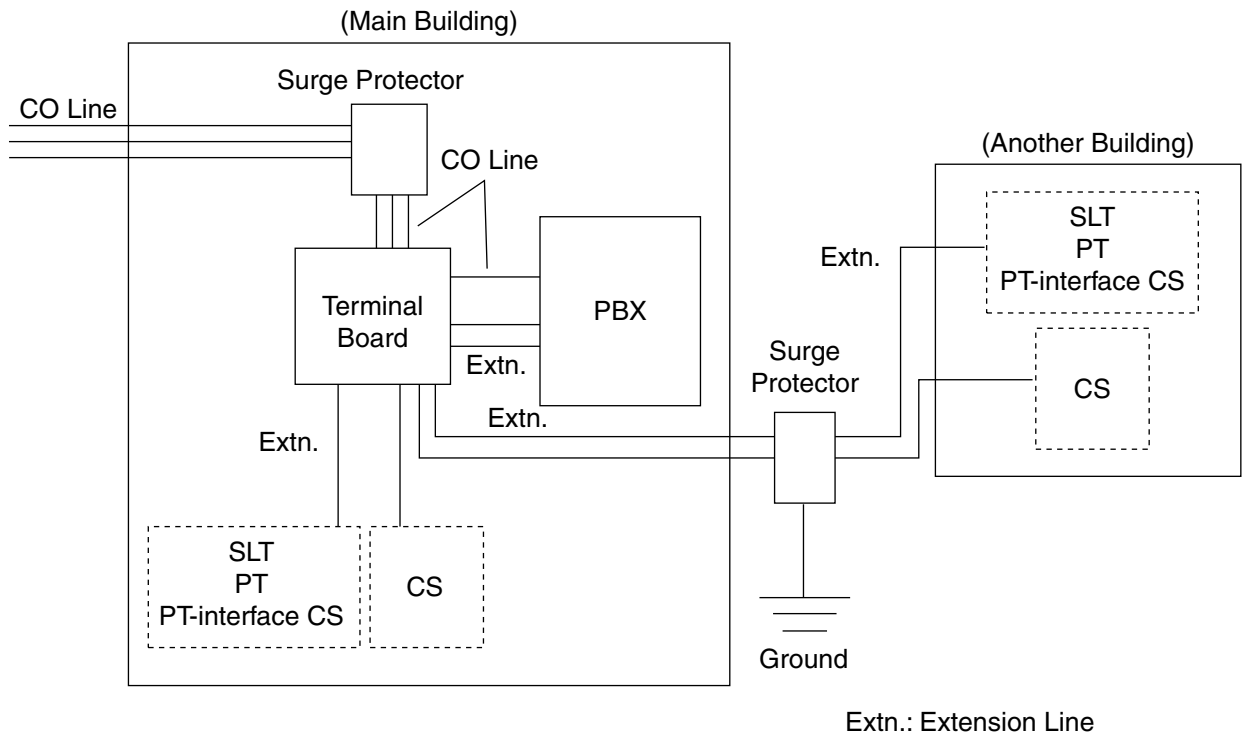
Additionally, proper grounding is very important for the protection of the system (refer to "3.2.5 Frame ground Connection").

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

### Installation



## Outside Installation



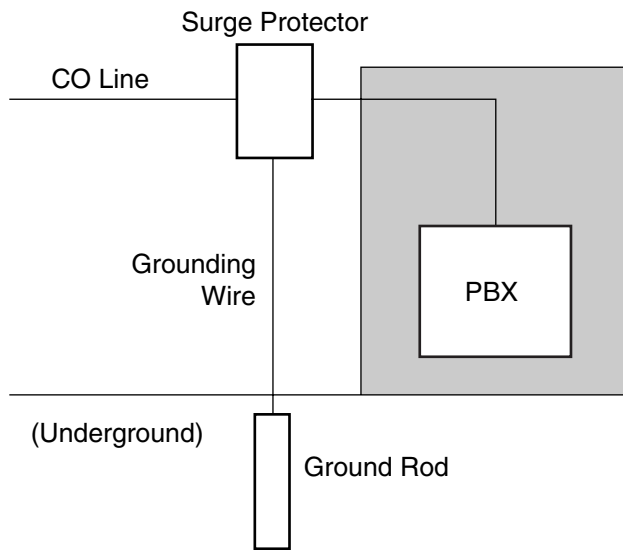
If you install an extension outside of the building, the following precautions are recommended:

- 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



### 3.2 Installation of the PBX

---

1. Connect the ground rod to the surge protector using a grounding wire with a cross-sectional area of at least 1.3 mm<sup>2</sup>.
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.

#### **Notes**

- 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

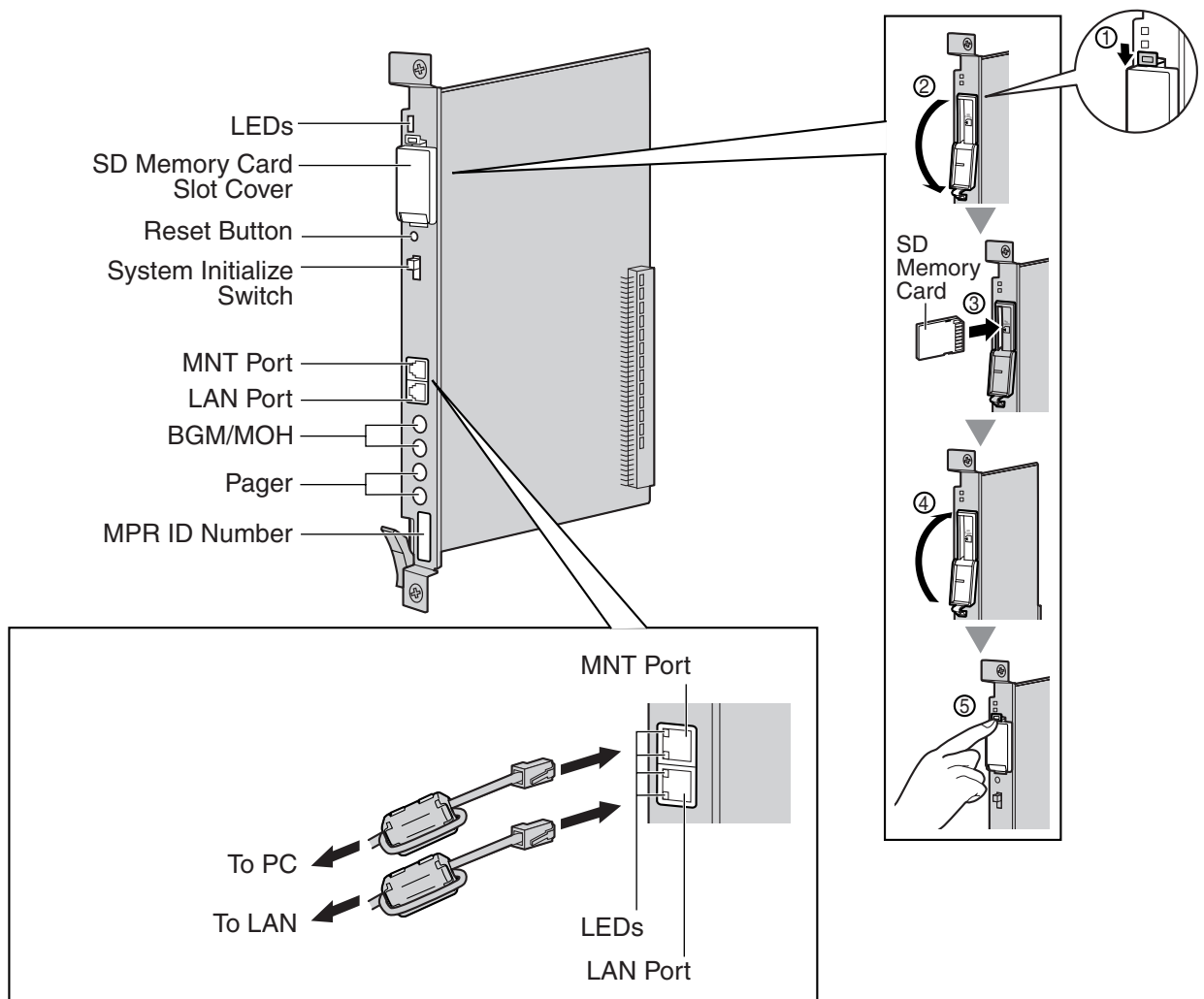
### 3.3.1 IPCMPR Card

#### Function

The IPCMPR card is the preinstalled main processing card with built-in SVM 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)" )
- RMT card (refer to "3.3.3 RMT Card (KX-TDA0196)" )



#### Notes

- 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 "1.4.3 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 "3.12 LAN Connection".
- For details about connecting peripherals, refer to "3.11.1 Connection of Peripherals".
- For details about System Initialize Switch, refer to "3.14.1 Starting the PBX".
- For details about Reset Button, refer to "5.1.4 Using the Reset Button".

#### WARNING

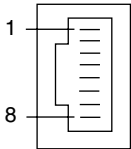
**A LITHIUM BATTERY IS USED IN THE IPCMPR CARD. THERE IS A RISK OF EXPLOSION IF THE BATTERY IS REPLACED WITH THE INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

#### CAUTION

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

## Pin Assignments

### MNT Port/LAN Port (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	–	–

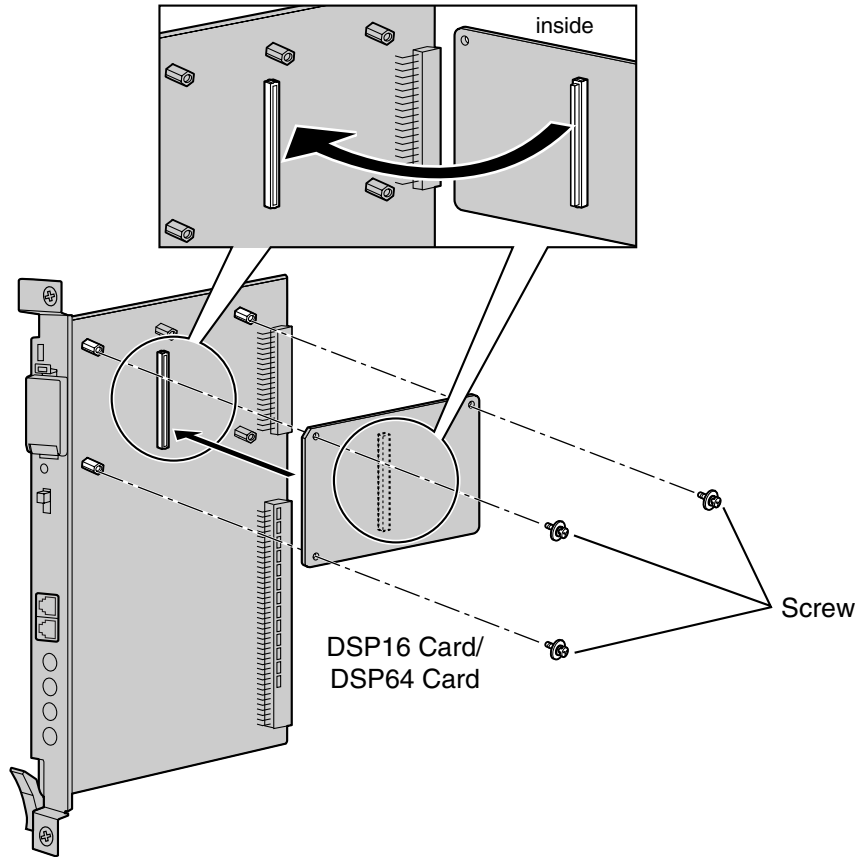
## LED Indications

Indication				Color	Description
BATT ALARM				Red	Battery alarm indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Alarm</li> </ul>
SD ACCESS				Green	SD memory card status <ul style="list-style-type: none"> <li>• ON: Accessing</li> </ul>
10BASE-T/100BASE-TX	MNT	2	LINK	Green	Link status indication <ul style="list-style-type: none"> <li>• OFF: Off-line</li> <li>• ON: Linked normally</li> <li>• Flashing: In communication</li> </ul>
			100	Yellow	Data transmission speed indication <ul style="list-style-type: none"> <li>• OFF: 10 Mbps</li> <li>• ON: 100 Mbps</li> </ul>
	LAN	1	LINK	Green	Link status indication <ul style="list-style-type: none"> <li>• OFF: Off-line</li> <li>• ON: Linked normally</li> <li>• Flashing: In communication</li> </ul>
			100	Yellow	Data transmission speed indication <ul style="list-style-type: none"> <li>• OFF: 10 Mbps</li> <li>• ON: 100 Mbps</li> </ul>

## 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

### Notes

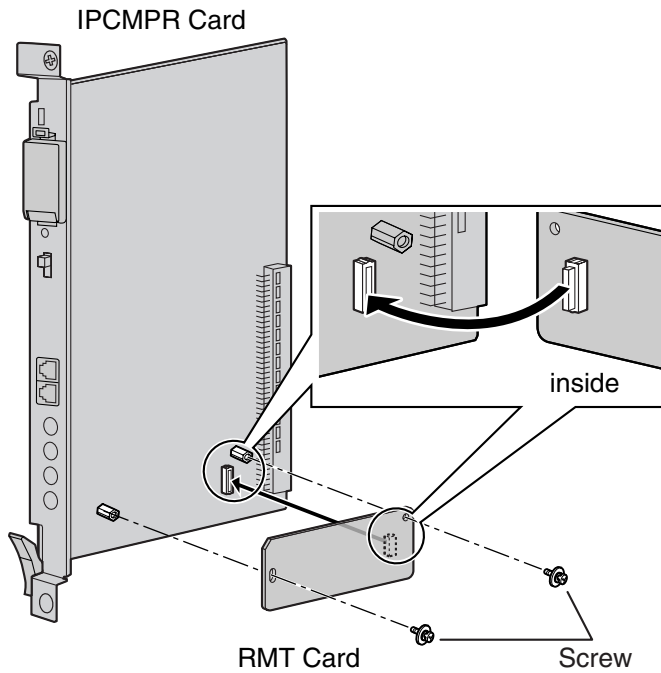
- Depending on the number and the type of IP CO lines and IP telephones you wish to use, required activation keys are determined, and either the DSP16 or DSP64 card is selected to be installed.
- If the preinstalled activation keys on the DSP16 or DSP64 cards are not enough for the desired configuration,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



### 3.3.3 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.



#### Accessories and User-supplied Items

**Accessories (included):** Screws × 2

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

## 3.4 Information about the Virtual Cards

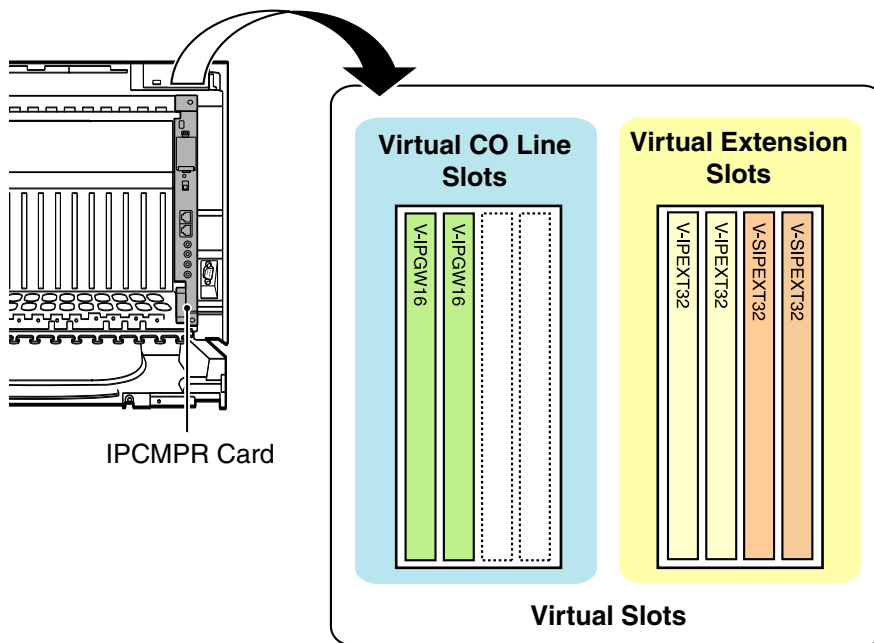
### 3.4.1 Virtual Cards

#### Function

Virtual Cards are included with the IPCMPR card and can be activated with the appropriate activation key. By installing Virtual Cards in the Virtual Slots of the IPCMPR card using the KX-TDE Maintenance Console, IP CO lines and IP extensions 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.
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.

#### Example: Virtual Cards in the Virtual Slots



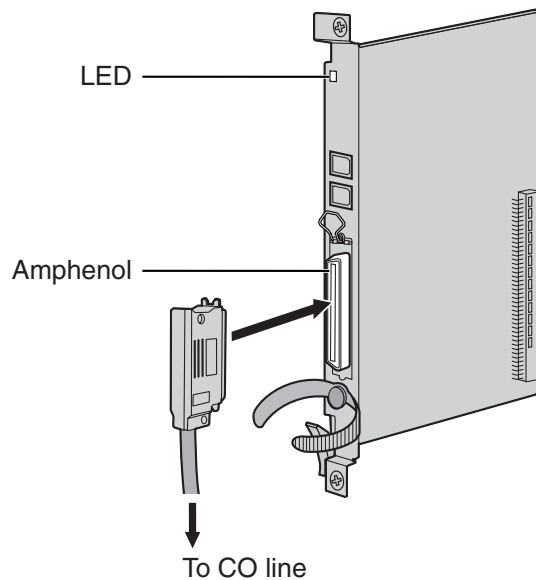
## 3.5 Information about the Physical CO Line Cards

### 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

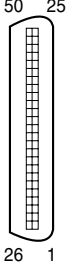
**User-supplied (not included):** Amphenol connector

#### Notes

- To connect the Amphenol connector, refer to "3.2.9 Fastening an Amphenol Connector".
- For details about power failure transfer, refer to "3.13.1 Power Failure Connections".
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.14.1 Starting the PBX".

## 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
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	–

#### Notes

- 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

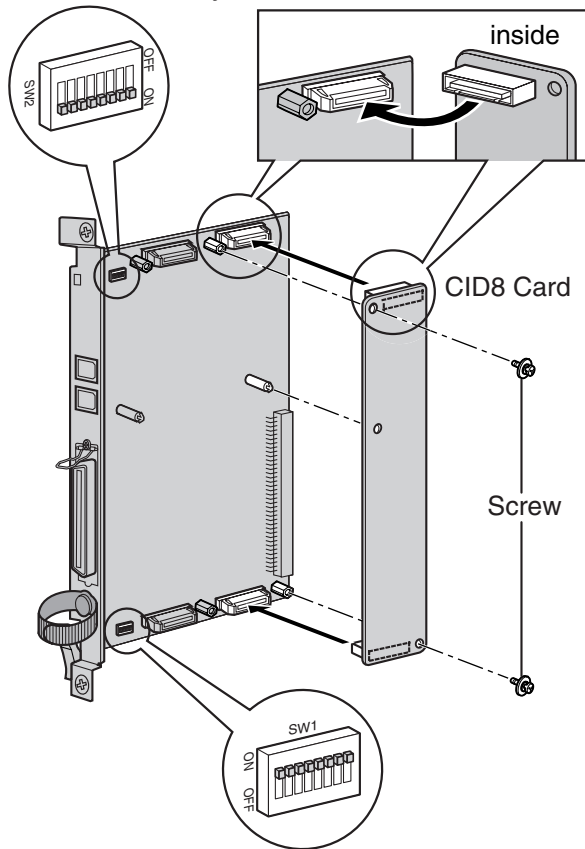
Indication	Color	Description
CARD STATUS	Green/Red	Card status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>

## 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



### 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.

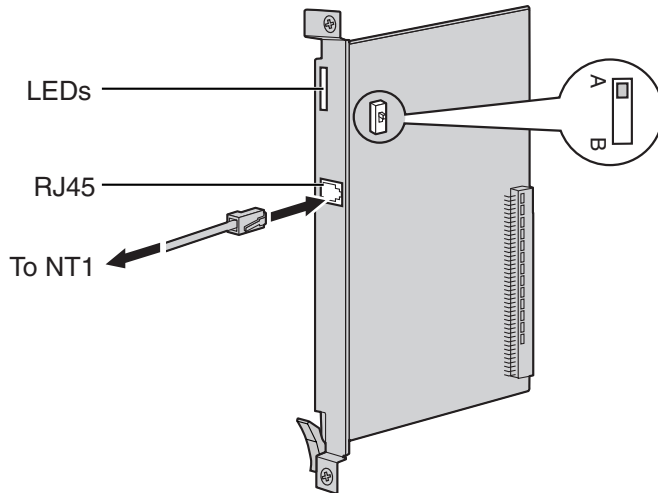
### Switch Settings (on LCOT8/LCOT16 cards)

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

### 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

#### Notes

- Connect this optional service card to the CO line through NT1; do not connect to the CO line directly.
- 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 "3.14.1 Starting the PBX".

#### CAUTION

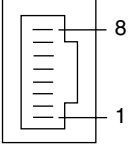
T1 ports are SELV ports and should only be connected to SELV services.

#### 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	–	–

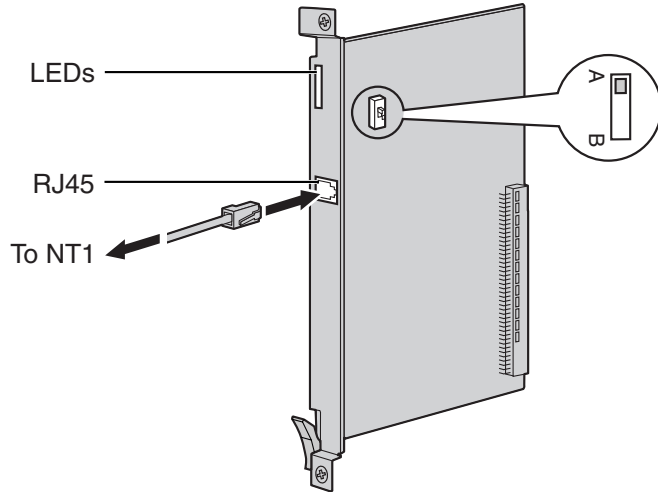
### LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>
SYNC-ERR	Red	Non-synchronization status indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Out of synchronization</li> </ul>
RAI	Red	RAI signal status indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Alarm (Clock Slave)</li> <li>• Flashing (60 times per minute): Alarm (Clock Master)</li> </ul>
AIS	Red	AIS status indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Alarm</li> </ul>
SYNC	Green	Synchronization status indication <ul style="list-style-type: none"> <li>• OFF: Not synchronized</li> <li>• ON: Synchronized</li> <li>• Flashing (60 times per minute): Synchronized (Clock Master)</li> </ul>

### 3.5.4 PRI23 Card (KX-TDA0290)

#### Function

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



#### Accessories and User-supplied Items

**Accessories (included):** none

**User-supplied (not included):** RJ45 connector

#### Notes

- Connect this optional service card to the CO line through an NT1; do not connect to the U interface of the CO line directly.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.14.1 Starting the PBX".

#### CAUTION

PRI ports are SELV ports and should only be connected to SELV services.

#### Switch Settings

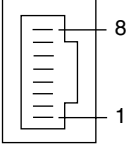
Switch	Type	Usage and Status Definition
A/B	Slide	Keep the switch at default A position. Do not change the position of this switch.



## 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	–	–



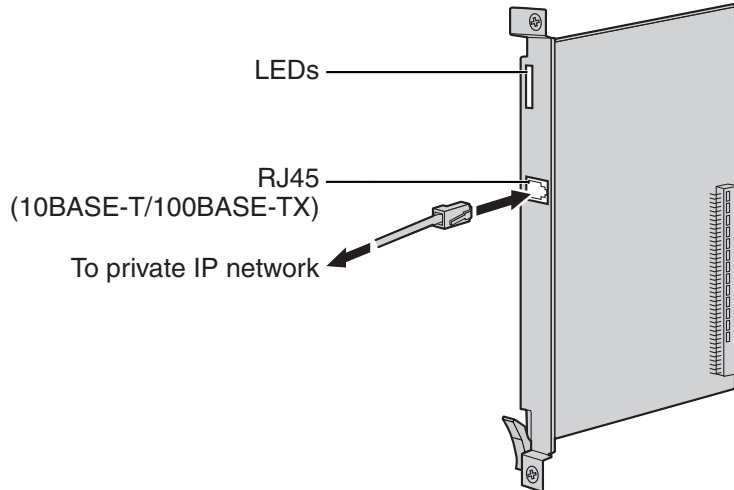
### LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>
SYNC-ERR	Red	Non-synchronization status indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Out of synchronization</li> </ul>
RAI	Red	RAI signal status indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Alarm (Clock Slave)</li> <li>• Flashing (60 times per minute): Alarm (Clock Master)</li> </ul>
AIS	Red	AIS status indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Alarm</li> </ul>
SYNC	Green	Synchronization status indication <ul style="list-style-type: none"> <li>• OFF: Not synchronized</li> <li>• ON: Synchronized</li> <li>• Flashing (60 times per minute): Synchronized (Clock Master)</li> </ul>
D-LINK	Green	Data link status indication <ul style="list-style-type: none"> <li>• OFF: Not established</li> <li>• ON: Established</li> </ul>

### 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

#### Notes

- 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 "3.14.1 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	—	—

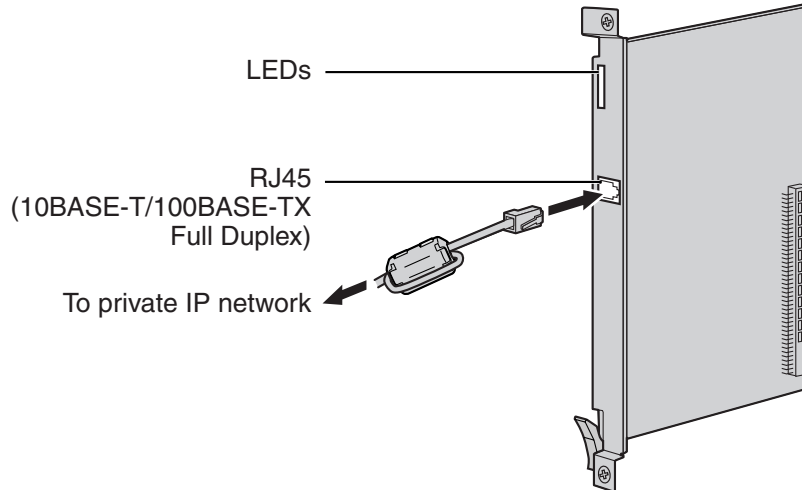
## LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>
ONLINE	Green	On-line status indication <ul style="list-style-type: none"> <li>• ON: On-line mode</li> <li>• OFF: Off-line mode</li> <li>• Flashing: Maintenance mode</li> </ul> <p><b>Note</b> If the LINK indicator is OFF, the ONLINE indicator will also be OFF.</p>
ALARM	Red	Alarm indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Alarm</li> </ul>
VoIP BUSY	Green	VoIP (H.323) process indication <ul style="list-style-type: none"> <li>• OFF: VoIP process inactive</li> <li>• ON: VoIP process active</li> </ul>
LINK	Green	Link status indication <ul style="list-style-type: none"> <li>• OFF: Connection error</li> <li>• ON: Normal connection</li> </ul>
DATA	Green	Data transmission indication <ul style="list-style-type: none"> <li>• OFF: No data transmitted</li> <li>• ON: Data transmitting</li> </ul>

## 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.



### Accessories and User-supplied Items

**Accessories (included):** Ferrite core × 1, CD-ROM (including documentation for web programming) × 1

**User-supplied (not included):** RJ45 connector

### Notes

- 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 "3.14.1 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 <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>
ONLINE	Green	On-line status indication <ul style="list-style-type: none"> <li>• ON: On-line mode</li> <li>• OFF: Off-line mode</li> <li>• Flashing: Maintenance mode</li> </ul> <p><b>Note</b> If the LINK indicator is OFF, the ONLINE indicator will also be OFF.</p>
ALARM	Red	Alarm indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Alarm</li> </ul>
VoIP BUSY	Green	VoIP (H.323) process indication <ul style="list-style-type: none"> <li>• OFF: VoIP process inactive</li> <li>• ON: VoIP process active</li> </ul>
LINK	Green	Link status indication <ul style="list-style-type: none"> <li>• OFF: Connection error</li> <li>• ON: Normal connection</li> </ul>
DATA	Green	Data transmission indication <ul style="list-style-type: none"> <li>• OFF: No data transmitted</li> <li>• ON: Data transmitting</li> </ul>

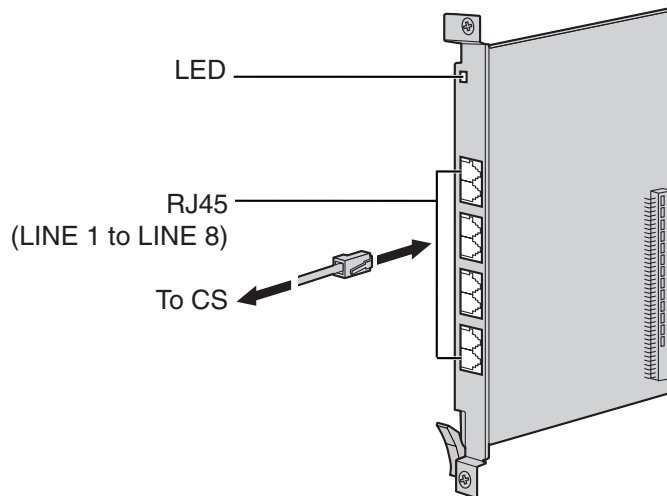
## 3.6 Information about the Physical Extension Cards

### 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 KX-TDE Maintenance Console, refer to "2.5.15 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.

#### **Notes**

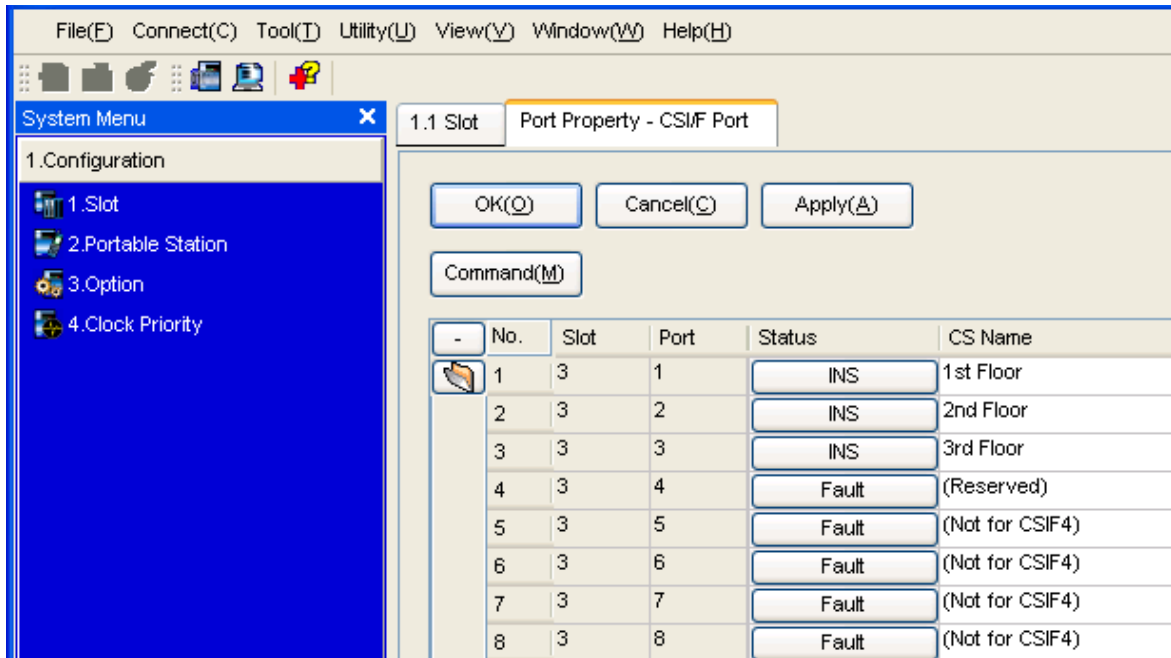
- LINE 5 to LINE 8 are for CSIF8 card only.
- When using the CSIF4 card, please note that the PBX software will recognize the CSIF4 card as the CSIF8 card. As a result, 8 cell stations may appear to be available; however, only 4 cell stations are supported by the CSIF4 card.
- For details about connecting the CS, refer to "3.9.7 Connecting a Cell Station to the PBX" in "3.9 Connection of 2.4 GHz Portable Stations".

## Editing the CS Name using the KX-TDE 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<sup>\*1</sup>



## Pin Assignments

### RJ45 Connector

No.	Signal Name	Function
1-2	Reserved	—
3	D1	Data port (High)
4	POWH	Power (High)
5	POWL	Power (Low)
6	D2	Data port (Low)
7-8	Reserved	—

<sup>\*1</sup> The contents and design of the software are subject to change without notice.

## LED Indications

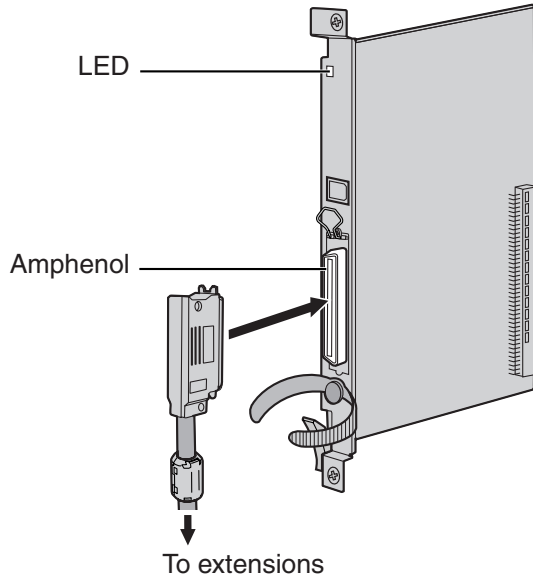
Indication	Color	Description
CARD STATUS	Green/Red	Card status indication <ul style="list-style-type: none"><li>• OFF: Power Off</li><li>• Green ON: Normal (all ports are idle)</li><li>• Green Flashing (60 times per minute): Normal (a port is in use)</li><li>• Red ON: Fault (includes reset)</li><li>• Red Flashing (60 times per minute): Out of Service</li></ul>



## 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.



### Accessories and User-supplied Items

**Accessories (included):** Screws × 2, Ferrite core × 1

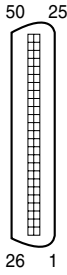
**User-supplied (not included):** Amphenol connector

### Notes

- 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 "3.13.1 Power Failure Connections".

## Pin Assignments

### Amphenol Connector



No.	Signal Name	Function	No.	Signal Name	Function
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)
6	Reserved	–	31	Reserved	–
7	RC	SLT Ring port 3	32	TC	SLT Tip port 3
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	–

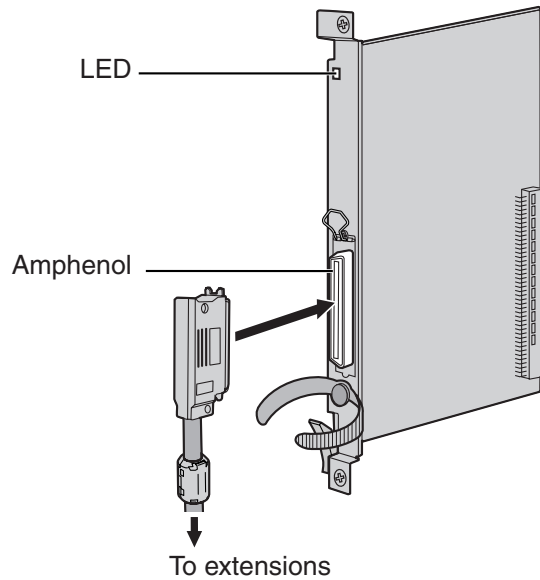
## LED Indications

Indication	Color	Description
CARD STATUS	Green/ Orange/Red	Card status indication <ul style="list-style-type: none"><li>• OFF: Power Off</li><li>• Green ON: Normal (all ports are idle)</li><li>• Green Flashing (60 times per minute): Normal (a port is in use)</li><li>• Orange Flashing: Detection of PT-interface CS connection (when starting up the PT-interface CS)</li><li>• Red ON: Fault (includes reset)</li><li>• Red Flashing (60 times per minute): Out of Service</li></ul>

### 3.6.3 DLC8 Card (KX-TDA0171)

#### Function

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



#### Accessories and User-supplied Items

**Accessories (included):** Screws × 2, Ferrite core × 1

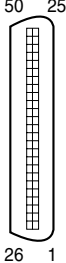
**User-supplied (not included):** Amphenol connector

#### Notes

- 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
	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)	
9-10	Reserved	–	34-35	Reserved	–	
11	D2D	Data port 4 (Low)	36	D1D	Data port 4 (High)	
12-13	Reserved	–	37-38	Reserved	–	
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	–	

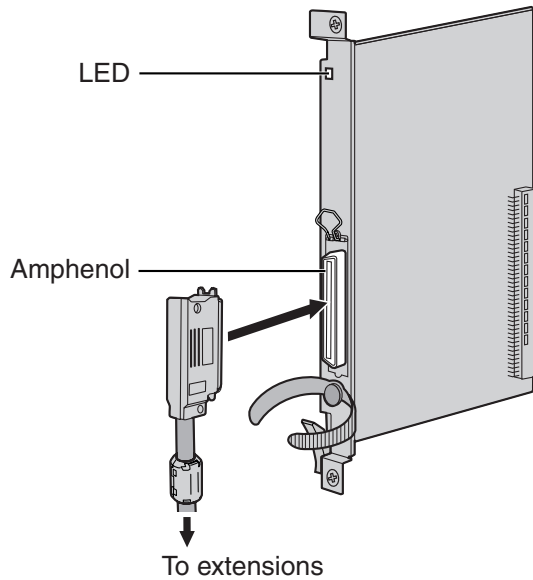
## LED Indications

Indication	Color	Description
CARD STATUS	Green/ Orange/Red	Card status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Orange Flashing: Detection of PT-interface CS connection (when starting up the PT-interface CS)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>

## 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

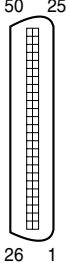
**User-supplied (not included):** Amphenol connector

### Notes

- 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
	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)
	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	–	

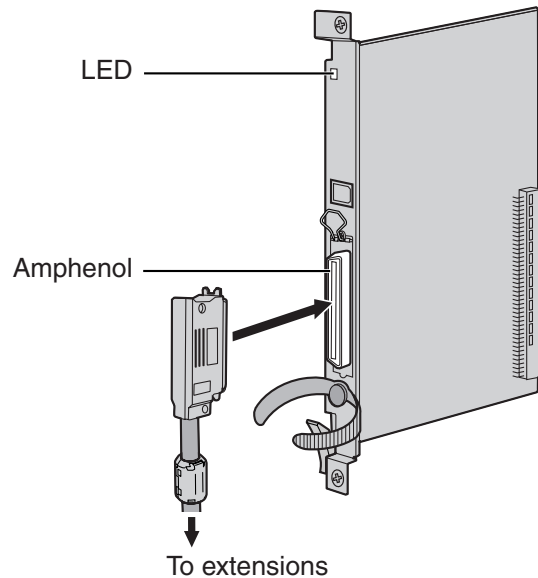
## LED Indications

Indication	Color	Description
CARD STATUS	Green/ Orange/Red	Card status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Orange Flashing: Detection of PT-interface CS connection (when starting up the PT-interface CS)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>

## 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

### Notes

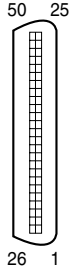
- Attach the included ferrite core to the cable. Refer to "3.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.9 Fastening an Amphenol Connector".
- For details about power failure transfer, refer to "3.13.1 Power Failure Connections".



## Pin Assignments

### Amphenol Connector

No.	Signal Name	Function	No.	Signal Name	Function
1	RA	Ring port 1	26	TA	Tip port 1
2-3	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	–	43-44	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	–



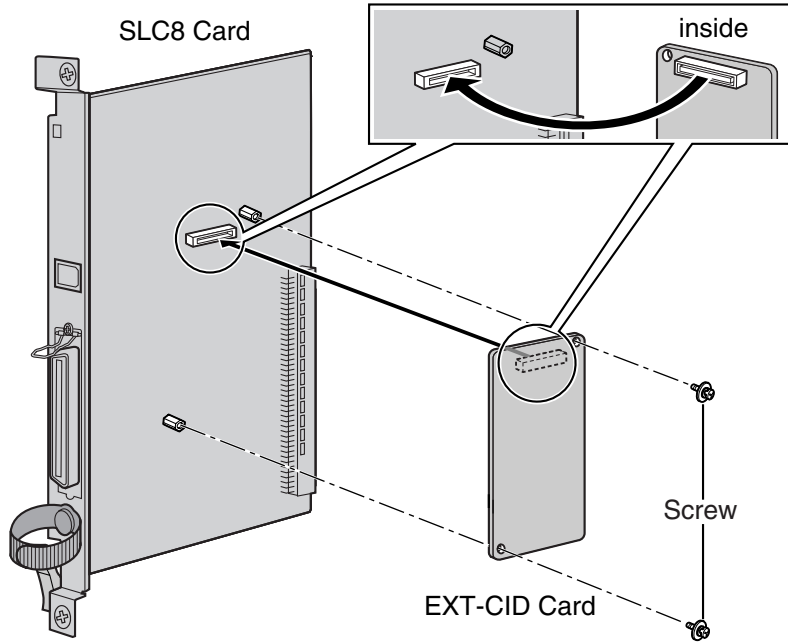
## LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>

## 3.6.6 EXT-CID Card (KX-TDA0168)

### Function

Sends Caller ID signals to extension ports. To be mounted on the SLC8 card only.



### Accessories and User-supplied Items

**Accessories (included):** Screws × 2

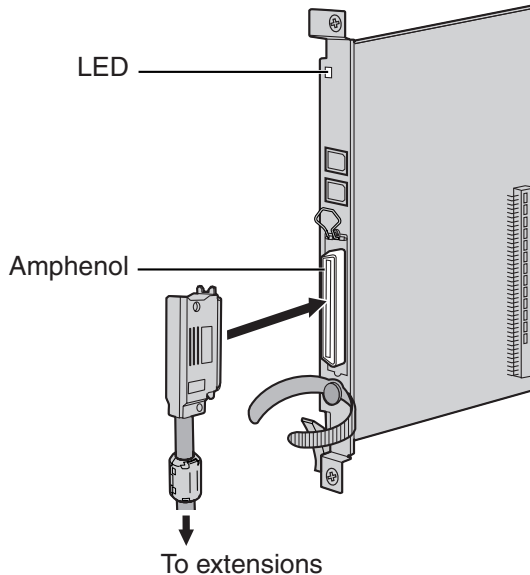
**User-supplied (not included):** none

## 3.6.7 SLC16 Card (KX-TDA0174) and MSLC16 Card (KX-TDA0175)

### 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 for Message Waiting Lamp control.



### Accessories and User-supplied Items

**Accessories (included):** Screws × 2, Ferrite core × 1

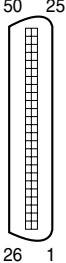
**User-supplied (not included):** Amphenol connector

### Notes

- Panasonic SLT with Message Waiting Lamp (e.g., KX-T7310) 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 "3.13.1 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
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	–

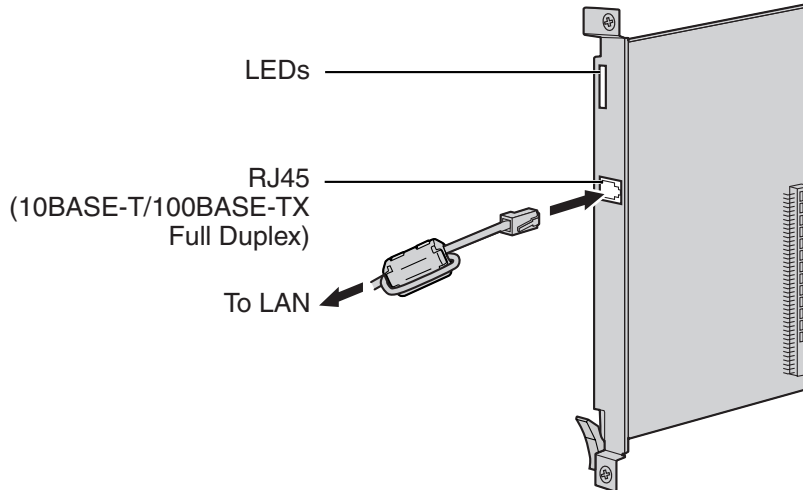
### LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>

## 3.6.8 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.



### Accessories and User-supplied Items

**Accessories (included):** Ferrite core × 1

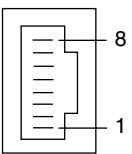
**User-supplied (not included):** RJ45 connector

#### Notes

- 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".

### 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 <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>
ONLINE	Green	On-line status indication <ul style="list-style-type: none"> <li>• ON: At least one port is in use (an IP-PT is connected)</li> <li>• OFF: No ports are in use (no IP-PTs are connected)</li> </ul> <p><b>Note</b> If the LINK indicator is OFF, the ONLINE indicator will also be OFF.</p>
ALARM	Red	Alarm indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Alarm</li> </ul>
VoIP BUSY	Green	Panasonic proprietary VoIP protocol process indication <ul style="list-style-type: none"> <li>• OFF: VoIP process inactive</li> <li>• ON: VoIP process active</li> </ul>
LINK	Green	Link status indication <ul style="list-style-type: none"> <li>• OFF: Connection error</li> <li>• ON: Normal connection</li> </ul>
DATA	Green	Data transmission indication <ul style="list-style-type: none"> <li>• OFF: No data transmitted</li> <li>• ON: Data transmitting</li> </ul>

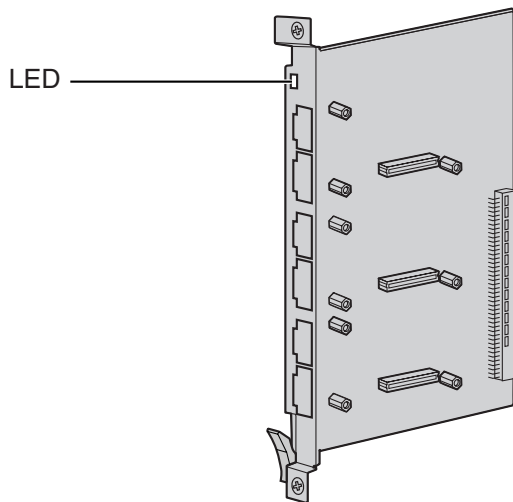
## 3.7 Information about the Other Physical Cards

### 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



#### 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.**

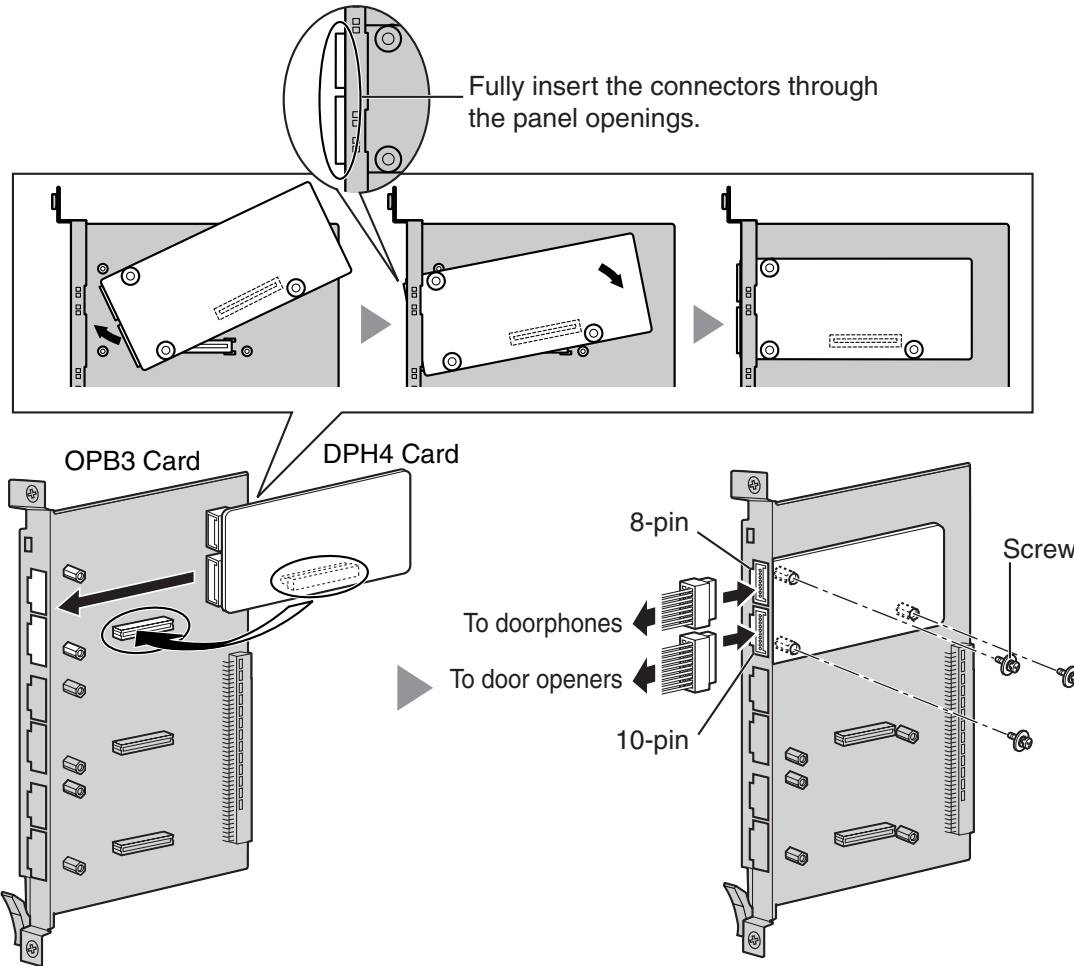
#### LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	Card status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• Green ON: Normal (all ports are idle)</li> <li>• Green Flashing (60 times per minute): Normal (a port is in use)</li> <li>• Red ON: Fault (includes reset)</li> <li>• Red Flashing (60 times per minute): Out of Service</li> </ul>

## 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.



### 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

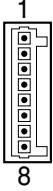
### Note

For details about connection to doorphones and door openers, refer to "3.10.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays".

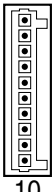


## Pin Assignments

### 8-pin Terminal Block

	No.	Signal Name	Function
	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

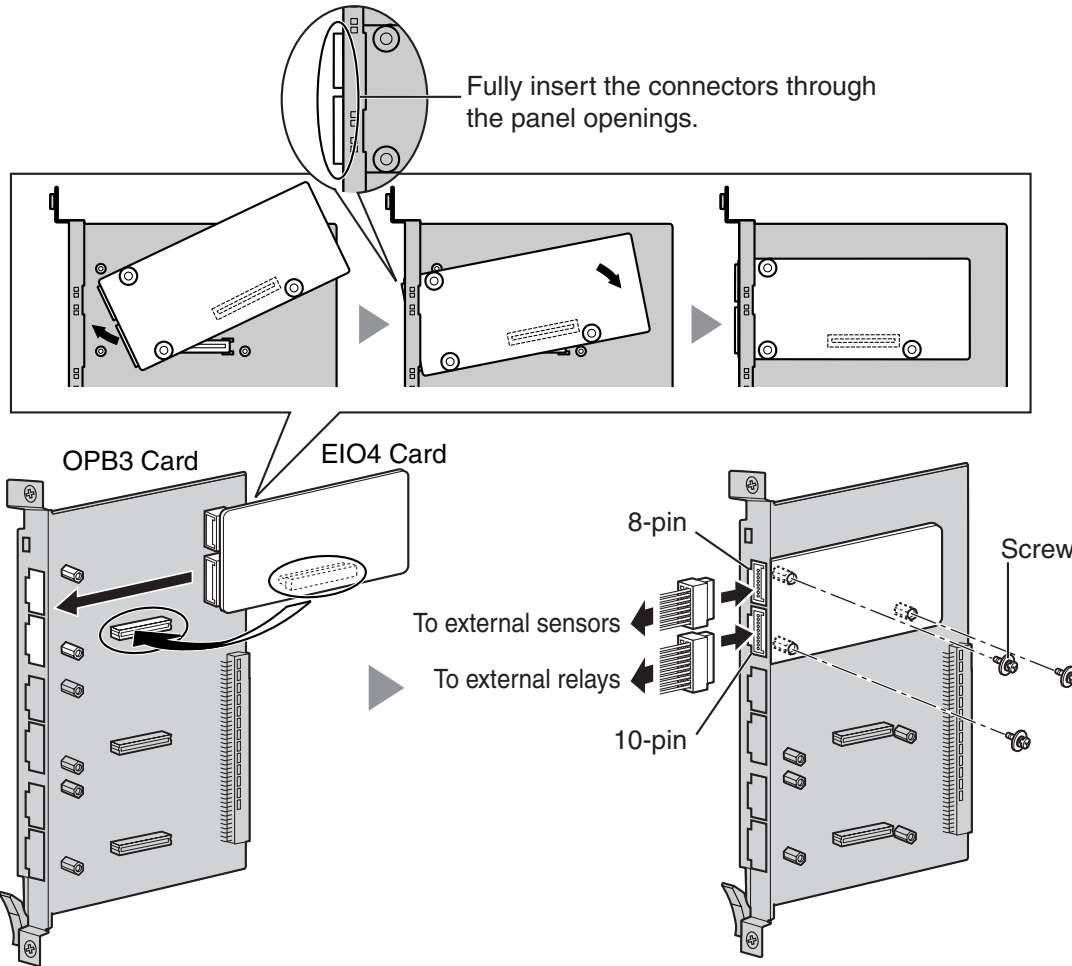
### 10-pin Terminal Block

	No.	Signal Name	Function
	1-2	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.



#### Accessories and User-supplied Items

**Accessories (included):** Screws × 3, 10-pin terminal block × 1, 8-pin terminal block × 1

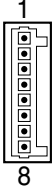
**User-supplied (not included):** Copper wire

#### Note

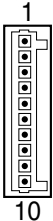
For details about connection to external sensors and external relays, refer to "3.10.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays".

## Pin Assignments

### 8-pin Terminal Block

	No.	Signal Name	Function
	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

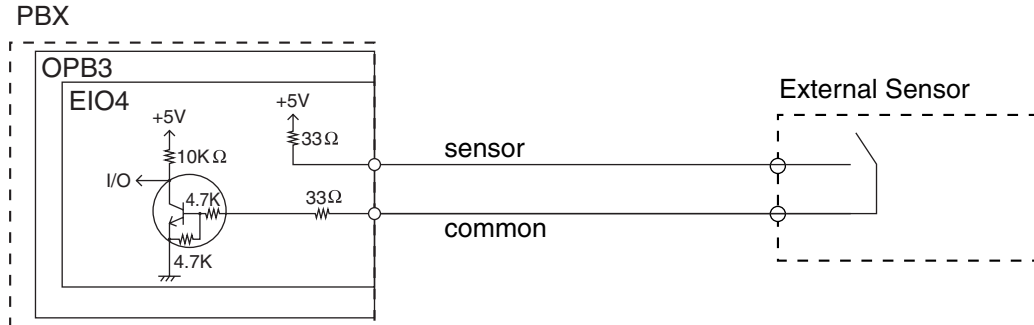
### 10-pin Terminal Block

	No.	Signal Name	Function
	1-2	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  $\Omega$ .

#### Connection Diagram



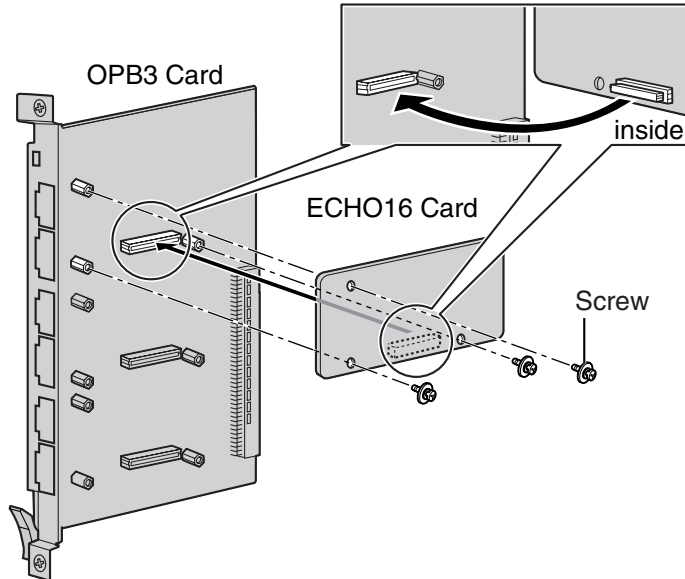
#### External Relay

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

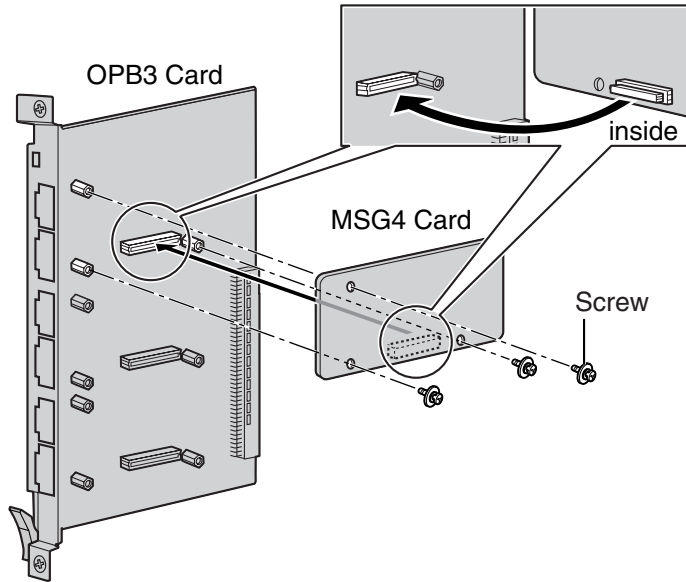
### Note

To establish a conference call involving 6 to 8 parties, install an ECHO16 card and enable echo cancellation for conferences using the KX-TDE Maintenance Console. For details, refer to "Echo Cancel—Conference" in "2.8.18 [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.



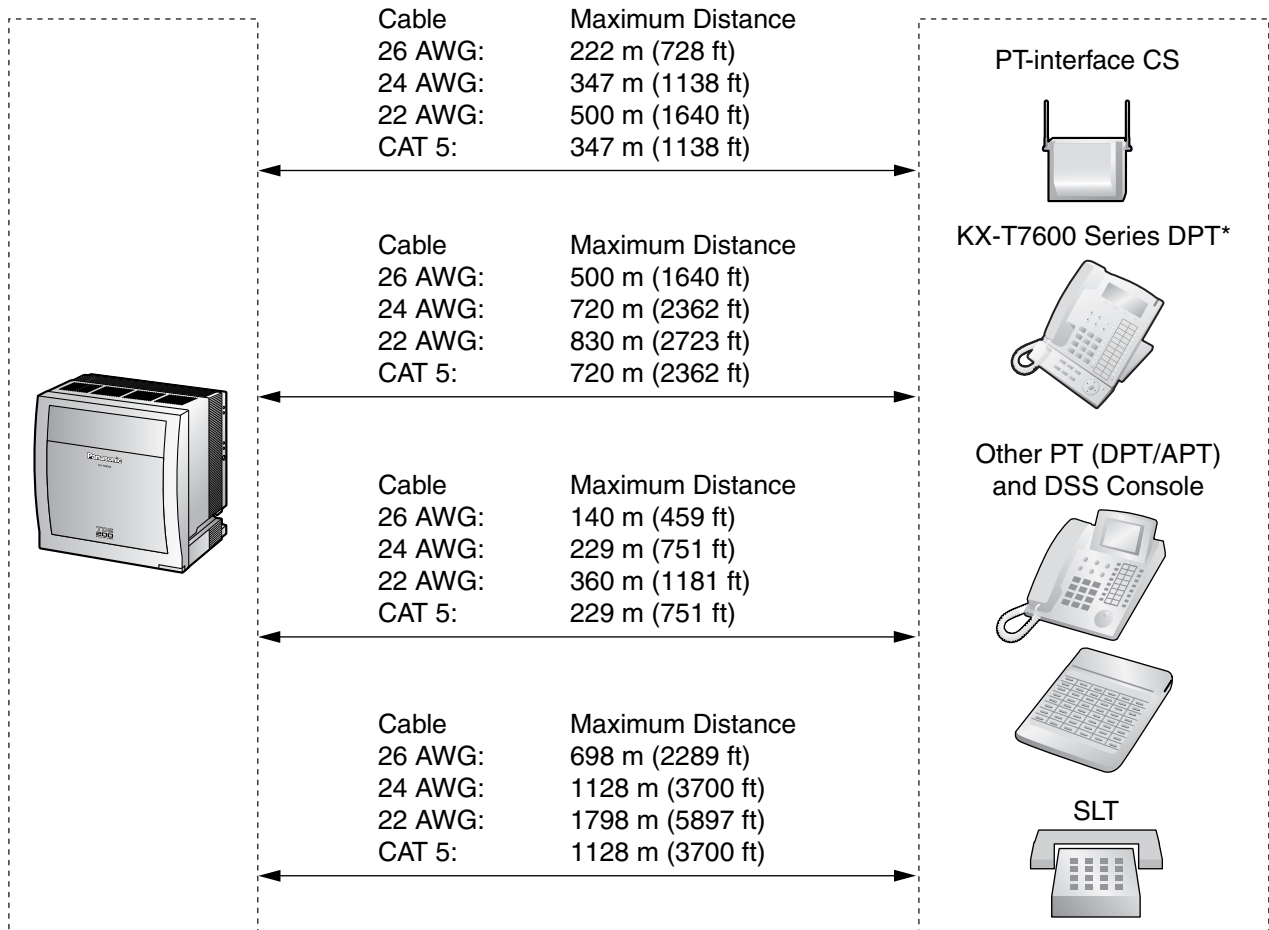
### Accessories and User-supplied Items

**Accessories (included):** Screws × 3

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

## 3.8 Connection of Extensions

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



\* 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	✓	✓	✓	✓	✓
MSLC16, SLC16, SLC8 Cards					✓
DLC16, DLC8 Cards	✓	✓		✓	

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

## 3.8.2 Parallel Connection of the Extensions

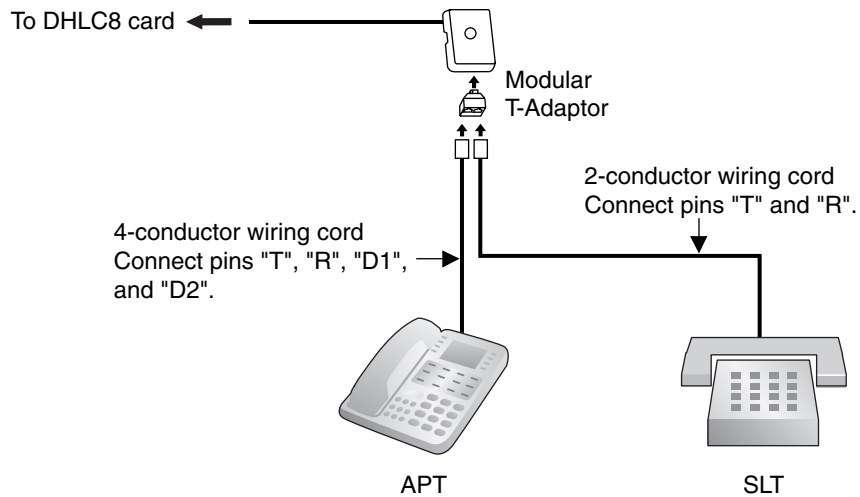
Any SLT can be connected in parallel with an APT or a DPT as follows.

### 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 "1.13.2 Paralleled Telephone" and "1.5.7 Extension Port Configuration" in the Feature Manual for further information.



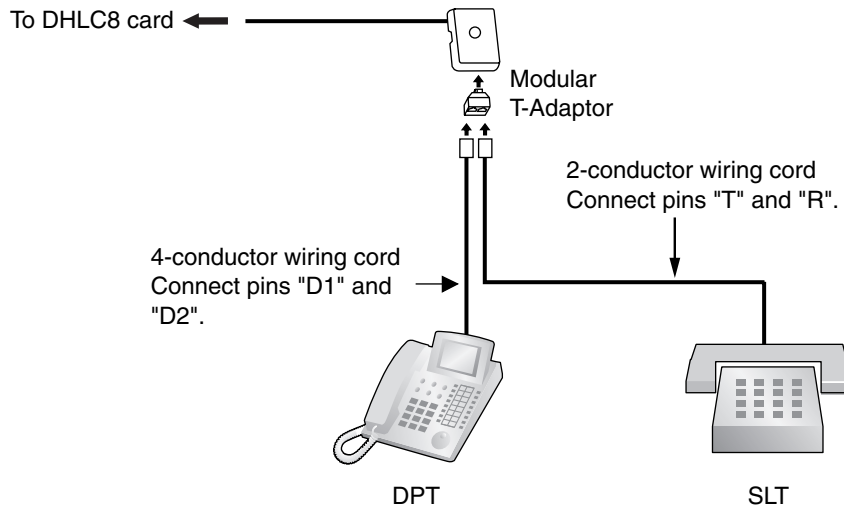


## With DPT

Parallel mode or eXtra Device Port (XDP) mode can be selected through system programming.

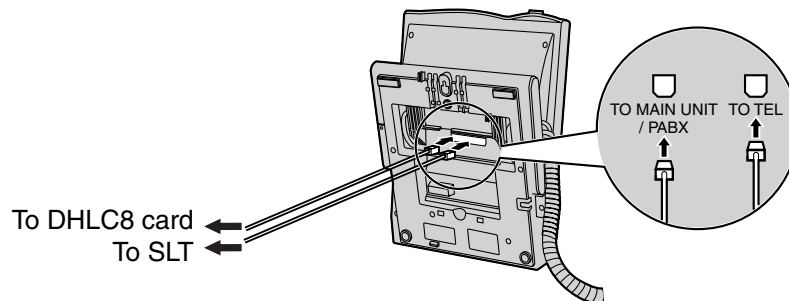
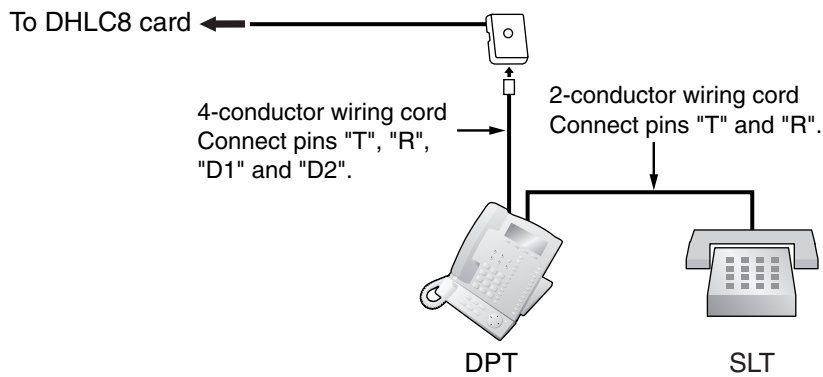
If XDP mode is enabled through system programming, parallel connection is not possible. Refer to "1.13.2 Paralleled Telephone" and "1.5.7 Extension Port Configuration" in the Feature Manual for further information.

### Using a Modular T-Adaptor

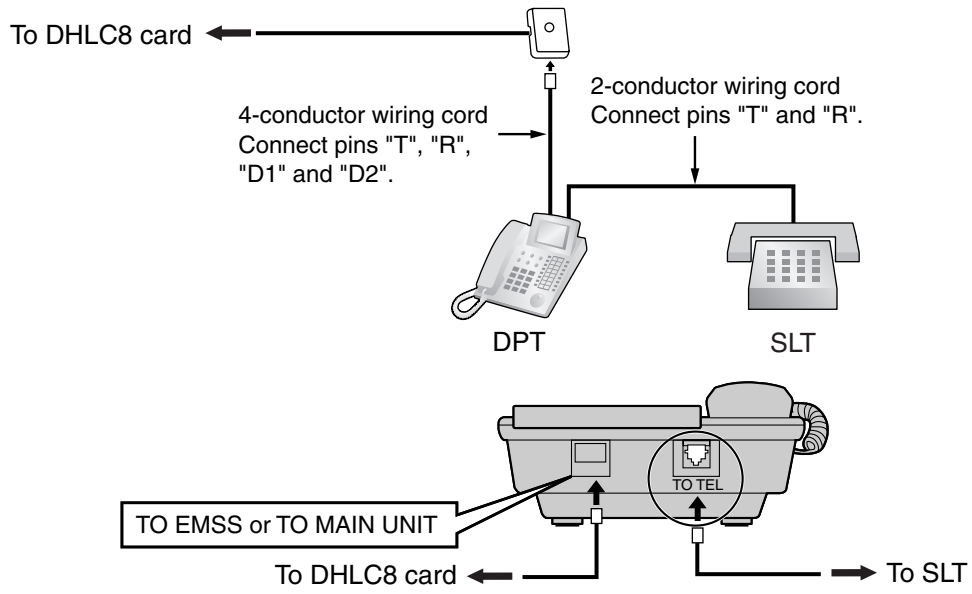


### Using an EXtra Device Port

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



With Other DPT



### 3.8.3 Digital EXtra Device Port (Digital XDP) Connection

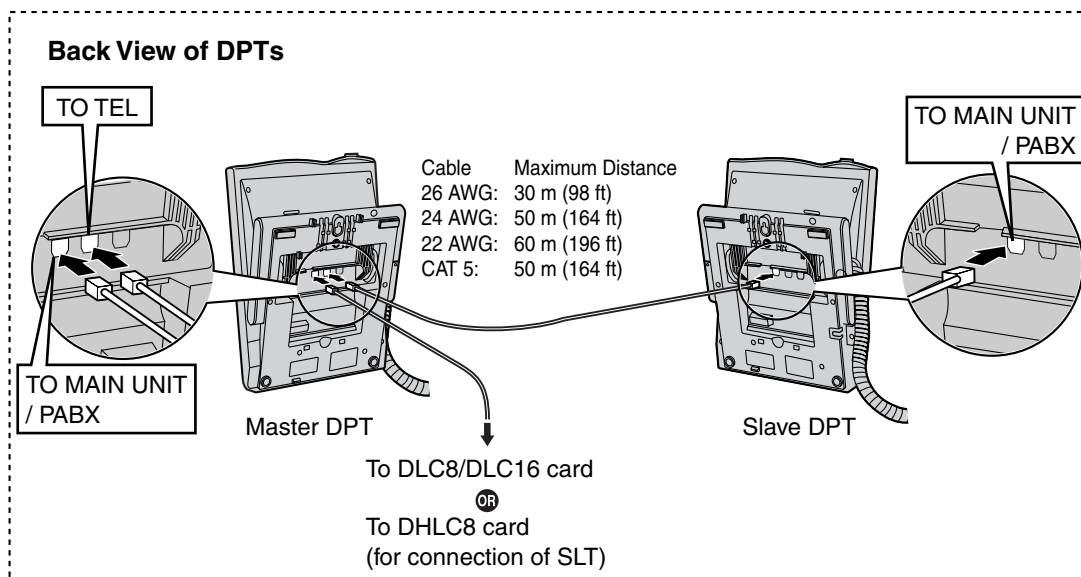
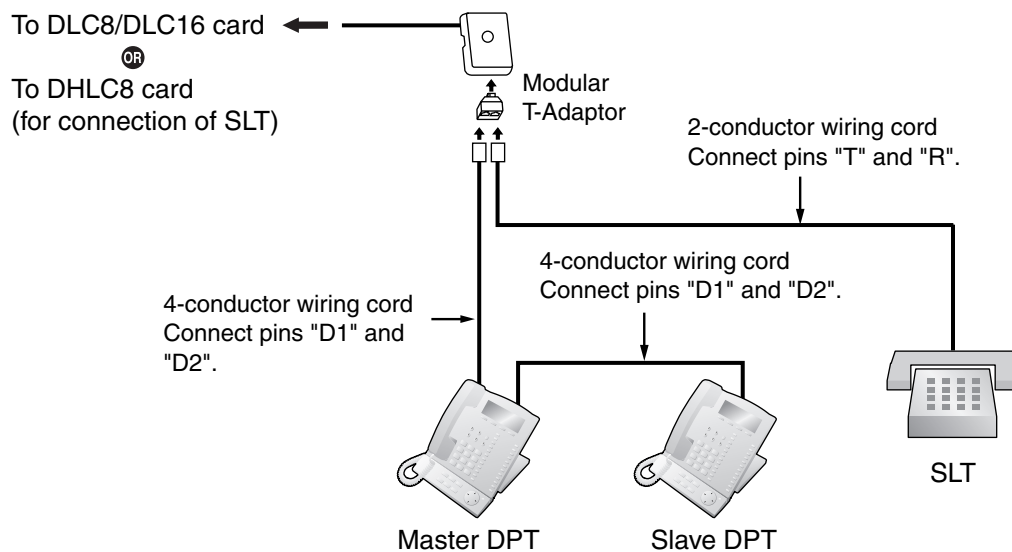
A DPT can be connected to another DPT on the Digital XDP connection. In addition, if the DPT is connected to a DHLC8 card, it can also have an SLT connected in Parallel mode or XDP mode.

#### Notes

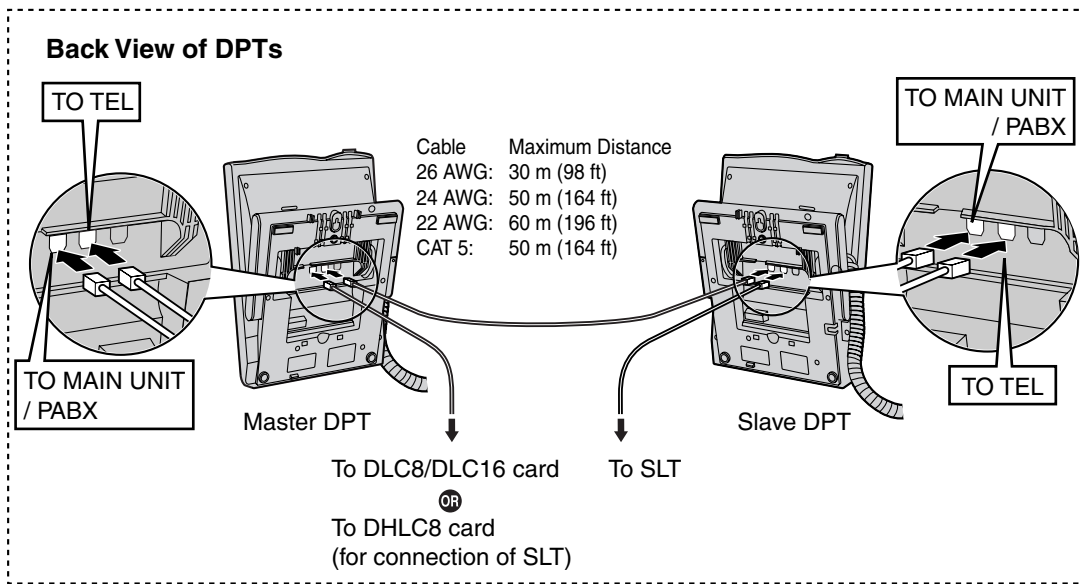
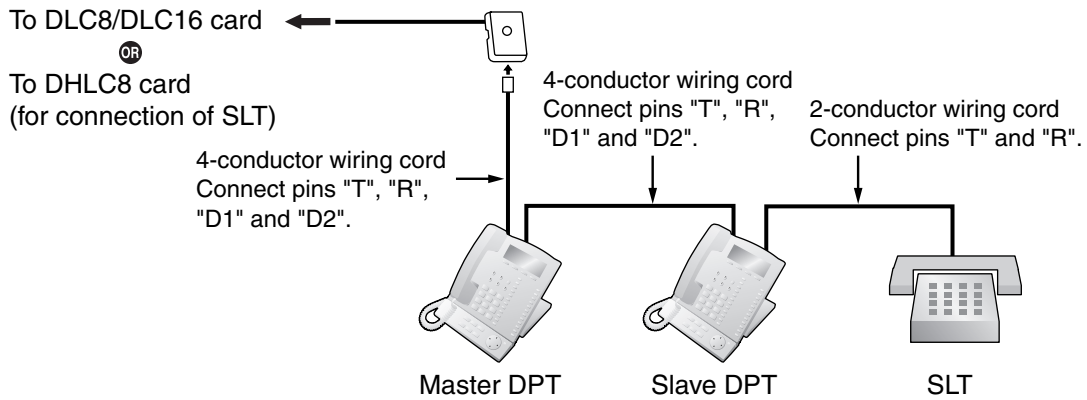
- Both DPTs must be KX-T7600 series DPTs (except KX-T7640). Note that the KX-T7667 can only be connected as a slave DPT.
- Parallel mode or XDP mode can be selected through system programming.
- If XDP mode is enabled through system programming, parallel connection is not possible. Refer to "1.13.2 Paralleled Telephone" and "1.5.7 Extension Port Configuration" in the Feature Manual for further information.

#### With KX-T7600 Series DPT

##### Using a Modular T-Adaptor



Using an EXtra Device Port

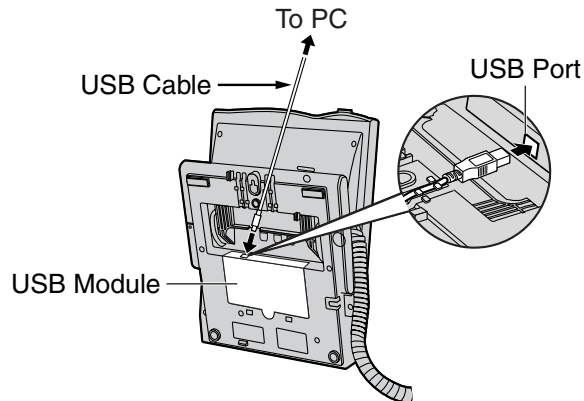


### 3.8.4 First Party Call Control CTI Connection

CTI connection between a PC and a 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 (KX-T7601) must be connected to the KX-T7633/KX-T7636 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.



#### **Notes**

- The maximum length of the USB cable is 3 m (9 ft 10 in).
- USB Modules must not be connected to DPTs in the Digital XDP connection. In a Digital XDP connection, the PC cannot be used. If a USB module is connected to a slave DPT, the DPT will not work properly.

## 3.9 Connection of 2.4 GHz Portable Stations

### 3.9.1 Overview

#### Required Equipment and Maximum Number of Calls

CSs determine the area covered by the wireless system. The number of calls that can be made simultaneously through each CS varies depending on the model, as follows:

CS	Connection Card	Maximum Calls	Compatible PSs
KX-T0151	DHLC/DLC	2	<ul style="list-style-type: none"> <li>• KX-TD7684</li> <li>• KX-TD7694</li> <li>• KX-TD7680</li> <li>• KX-TD7690</li> </ul>
KX-TDA0152	CSIF	3	
KX-T0141	DHLC/DLC	2	
KX-TDA0142	CSIF	3	

#### Note

For more details about the PS, refer to the Operating Instructions of the PS.

#### CAUTION

- The CS should be kept free of dust, moisture, high temperature (more than 40 °C [104 °F]), low temperature (less than 0 °C [32 °F]), and vibration, and should not be exposed to direct sunlight.
- The CS should not be placed outdoors (use indoors).
- The CS should not be placed near high-voltage equipment.
- The CS should not be placed on a metal object.
- Systems using 2.4 GHz ISM (Industrial, Scientific and Medical) band may interfere with the KX-TDA wireless system. Examples of such systems are cordless telephones, wireless LAN, Home RF, microwave ovens and other ISM devices. These systems may cause minor noise.
- Keeping some distance between the equipment listed below may prevent interference. (The distance may vary depending on the environment.)

Equipment	Distance
CS and office equipment such as a computer, telex, fax machine, etc.	More than 2 m (6 ft 7 in)
CS and PS	More than 1 m (3 ft 3 in)
Each PS	More than 0.5 m (1 ft 8 in)
PBX and CS	More than 2 m (6 ft 7 in)
CS and CS	More than 15 m (49 ft)

Please take into consideration the distance between the CSs when site planning. Please consult a certified dealer for details.

However, the required distance between CSs may vary depending on the environment of the installation site and conditions in which the wireless system is used. Conduct the site survey to determine the appropriate distance.

## 3.9.2 Procedure Overview

When connecting the wireless system, use extreme care in conducting the site survey. An incorrectly performed site survey can result in poor service area, frequent noise, and disconnection of calls.

### 1. Investigate the installation site

Refer to "3.9.3 Site Planning".

- Obtain a map of the CS installation site.
- Identify the service area required by the user on the map.
- Plan the location of each CS, taking account of distance, building materials, etc.

### 2. Prepare the CS for site survey

Refer to "3.9.4 Before Site Survey".

- Assign a CS number to each CS by setting the DIP switches on the back of the CS.
- Supply electricity to each CS using an AC adaptor/battery box or by connecting them to a CSIF/DLC/DHLC card.
- Install each CS temporarily as planned.

#### Notes

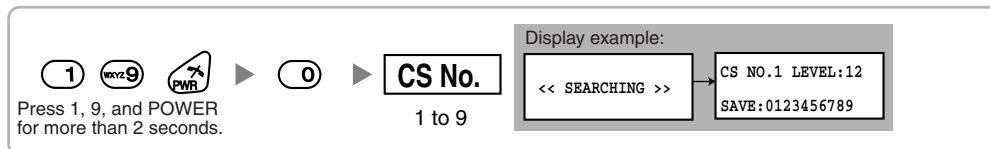
- Install at least 2 m (6 ft 7 in) above the floor.
- Keep the antennas in the upright position.

### 3. Conduct the site survey

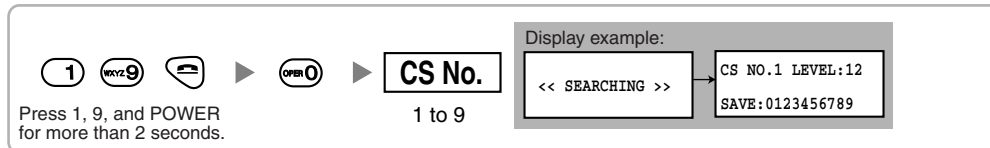
Refer to "3.9.5 Site Survey".

- Test the radio signal strength using the PS. Confirm that the radio signal strength level is "12" near the CS.

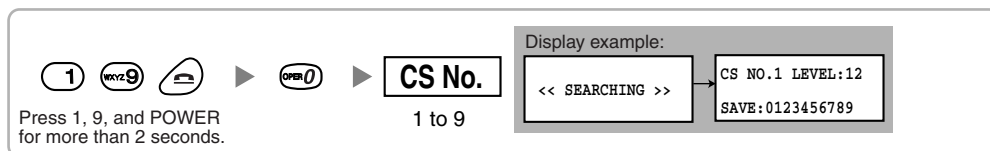
#### Using the KX-TD7684/KX-TD7694



#### Using the KX-TD7680



#### Using the KX-TD7690



- By walking away from the CS with the PS, check the radio signal strength. The radio signal strength weakens as you walk away from the CS.
- Map the CS coverage area at radio signal strength levels "3" and "8".

- d. Make sure that adjacent CS coverage areas overlap where the radio signal strength level is "8" by at least 5 m (16 ft).
- e. Make sure that the radio signal strength level is greater than "3" at any location within the service area required by the user.

#### 4. Finish the site survey

Refer to "3.9.6 After Site Survey".

- a. Turn off the PS.
- b. Stop supplying power, and return all DIP switches of each CS to the OFF position.

#### 5. Connect the CS and PS to the PBX and test the operation

Refer to "3.9.7 Connecting a Cell Station to the PBX".

- a. Connect the CSs to the PBX.
- b. Register the PSs to the PBX.
- c. Walk around the service area while having a conversation using a registered PS. If noise is frequent or conversations disconnect, relocate the CSs or install an additional CS.

#### 6. Mount the CS on the wall

Refer to "3.9.8 Wall Mounting".

- a. If there are no problems in testing, mount the CS on the wall.



### 3.9.3 Site Planning

Choosing the best site for the CS requires careful planning and testing of essential areas. The best location may not always be convenient for installation. Read the following information before installing the unit.

#### Understanding Radio Waves

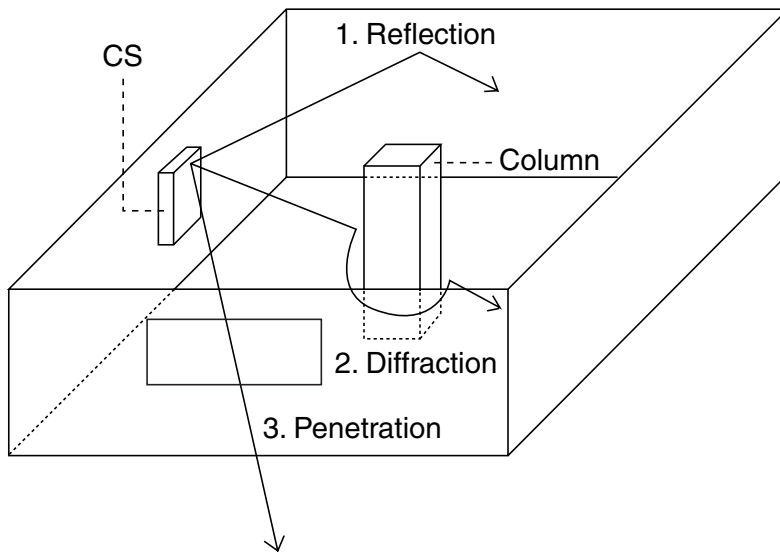
##### Characteristics of Radio Waves

The transmission of radio waves and the CS coverage area depend on the structure and materials of the building.

Office equipment, such as computers and fax machines, can interfere with radio waves. Such equipment may create noise or interfere with the performance of the PS.

The illustration below shows the special transmitting patterns of radio waves.

1. Radio waves are reflected by objects made of materials such as metal.
2. Radio waves are diffracted by objects such as metallic columns.
3. Radio waves penetrate objects made of materials such as glass.



##### Relationships Between Radio Waves and Building Structure and Materials

- The CS coverage area is affected more by the building materials and their thickness than the number of obstacles.
- Radio waves tend to be reflected or diffracted by conductive objects and rarely penetrate them.
- Radio waves tend to penetrate insulated objects and are rarely reflected by them.
- Radio waves penetrate thin objects more than thick objects.
- The table below shows the transmission tendency of radio waves when they reach objects made from various materials.

### 3.9 Connection of 2.4 GHz Portable Stations

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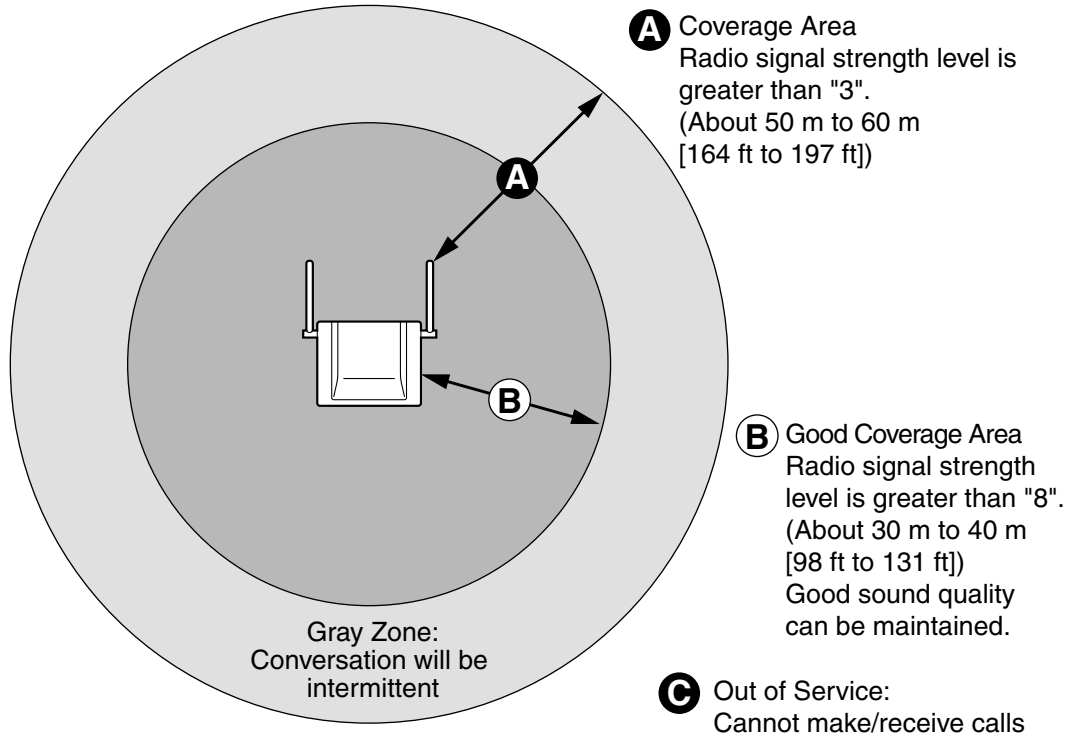
<b>Object</b>	<b>Material</b>	<b>Transmission Tendency</b>
Wall	Concrete	The thicker they are, the less radio waves penetrate them.
	Ferroconcrete	Radio waves can penetrate them, but the more iron there is, the more radio waves are reflected.
Window	Glass	Radio waves usually penetrate them.
	Glass with wire net	Radio waves can penetrate them, but tend to be reflected.
	Glass covered with heat-resistant film	Radio waves are weakened considerably when they penetrate windows.
Floor	Ferroconcrete	Radio waves can penetrate them, but the more iron there is, the more radio waves are reflected.
Partition	Steel	Radio waves are reflected and rarely penetrate them.
	Plywood, Glass	Radio waves usually penetrate them.
Column	Ferroconcrete	Radio waves can penetrate them, but the more iron there is, the more radio waves tend to be reflected or diffracted.
	Metal	Radio waves tend to be reflected or diffracted.
Cabinet	Steel	Radio waves are usually reflected or diffracted, and rarely penetrate them.
	Wood	Radio waves can penetrate them, but they are weakened.

## CS Coverage Area

The example below shows the size of the coverage area of 1 CS if it is installed in an area with no obstacles.

### Note

Radio signal strength levels are measured during the site survey (refer to "3.9.5 Site Survey").



### Radio Signal Strength Levels

Level: 00	 	Out of range
Level: 01 to 02		Receives noise easily or disconnects
Level: 03 to 07		May receive noise
Level: 08 to 10		Good
Level: 11 to 12		Better

## Site Survey Preparation

1. Obtain a map and investigate the installation site.
  - a. Check the obstacles (e.g., shelves, columns, and partitions).
  - b. Check the materials of the structures (e.g., metal, concrete, and plywood).
  - c. Check the layout and dimensions of the room, corridor, etc.
  - d. Write down the above information on the map.
2. Examine the service area required by the user on the map, referring to the following example.
  - a. Draw the coverage area around a CS. Extend the coverage area 30 to 60 meters (98 to 197 feet) in each direction, depending on the materials of the building structures and obstacles in the installation site. Note that a CS cannot be installed outside a building.
  - b. If one CS cannot cover the entire service area, install additional CSs as required. Overlap the coverage areas of adjacent CSs.  
Where CS coverage areas overlap, the PS will start call handover to the next CS if the signal from

one CS becomes weak. However, if a PS moves away from a CS and there are no CSs available for handover, the PS may go out of range and the call could be lost.

If the signal from the CS fades, due to the structure of the building, there may be some handover delay. The user will hear a range warning before handover in this case. This also applies in the case of interference from 2.4 GHz apparatus.

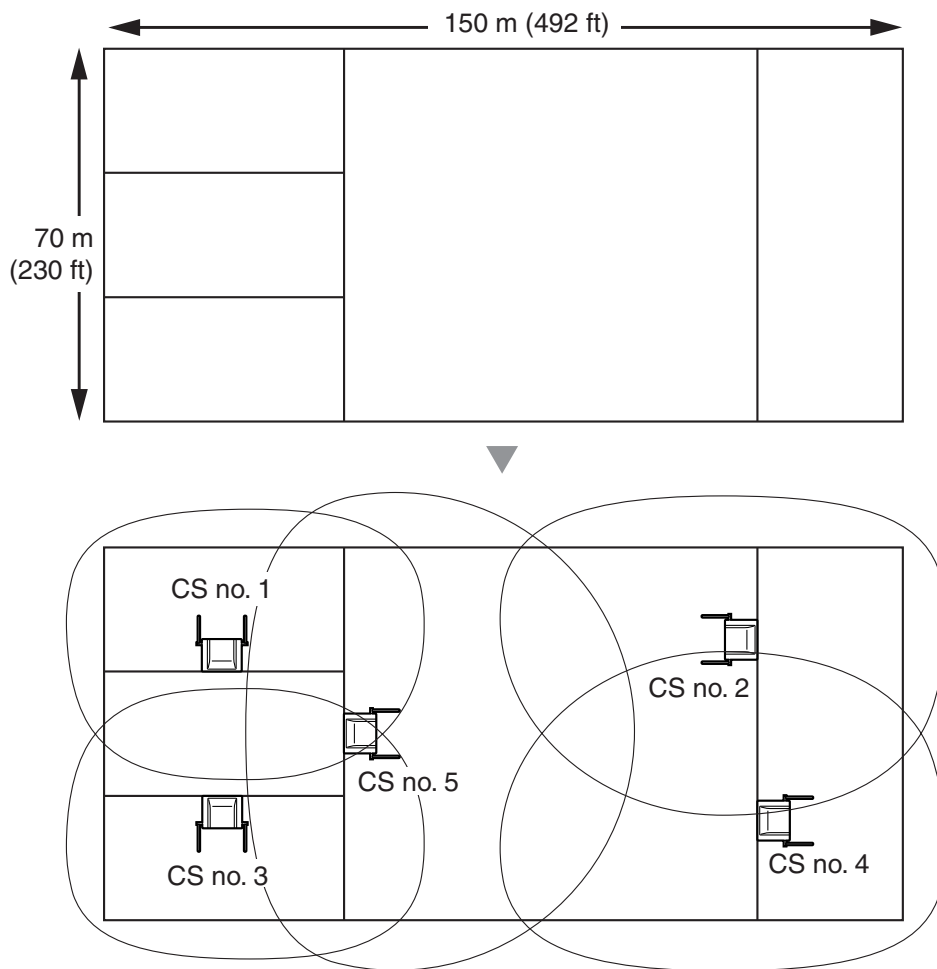
#### Example: Installing in a Room Separated by Interior Walls

##### Things to take note of:

- The room is separated by interior walls.
- The room is surrounded by concrete walls.

##### CS installation plan:

- The coverage area of each CS will not extend as far as when there are no obstacles, because the radio signals will be weakened by separating walls. Therefore, you will need 5 CSs to cover the entire room.

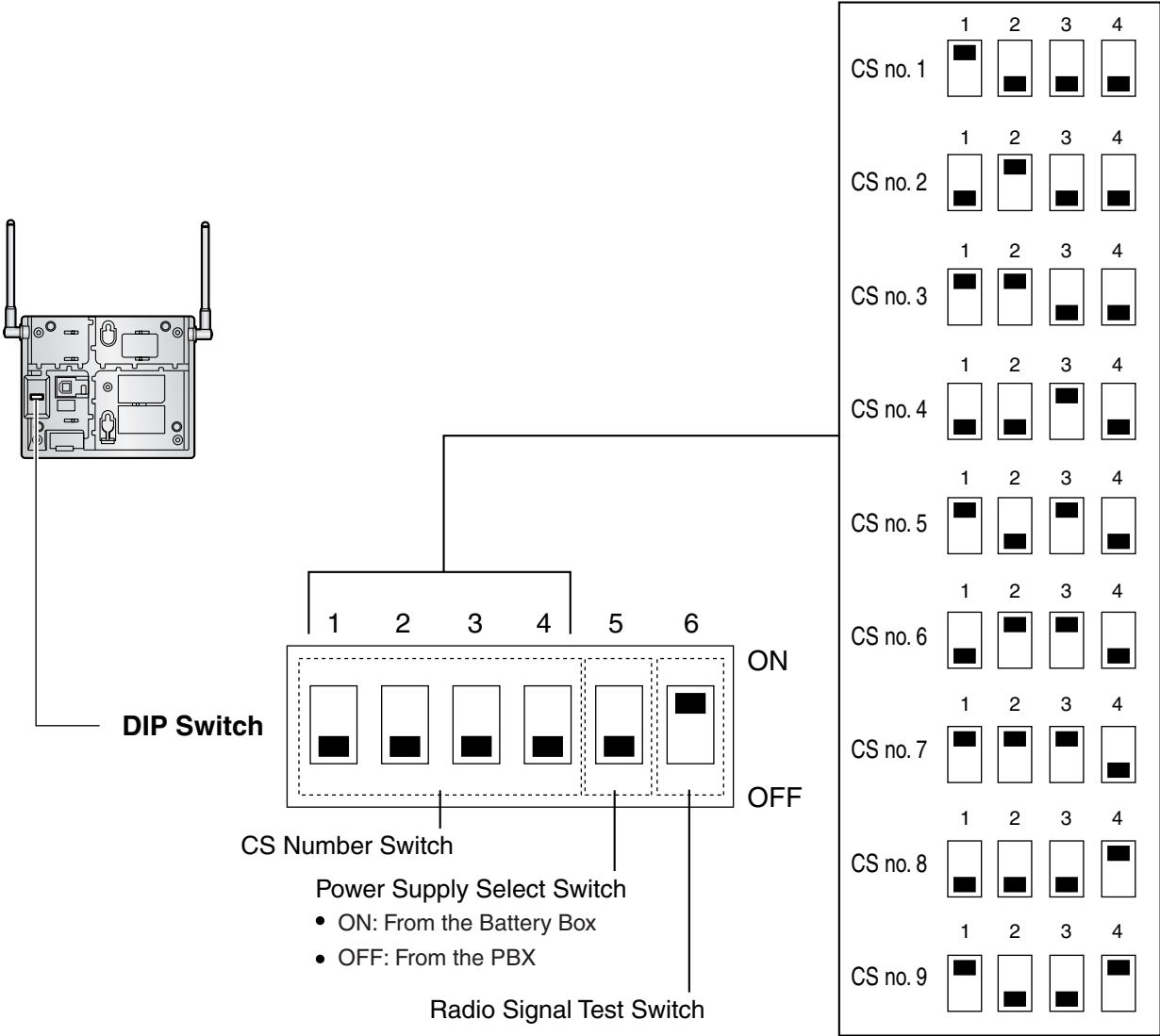


### 3.9.4 Before Site Survey

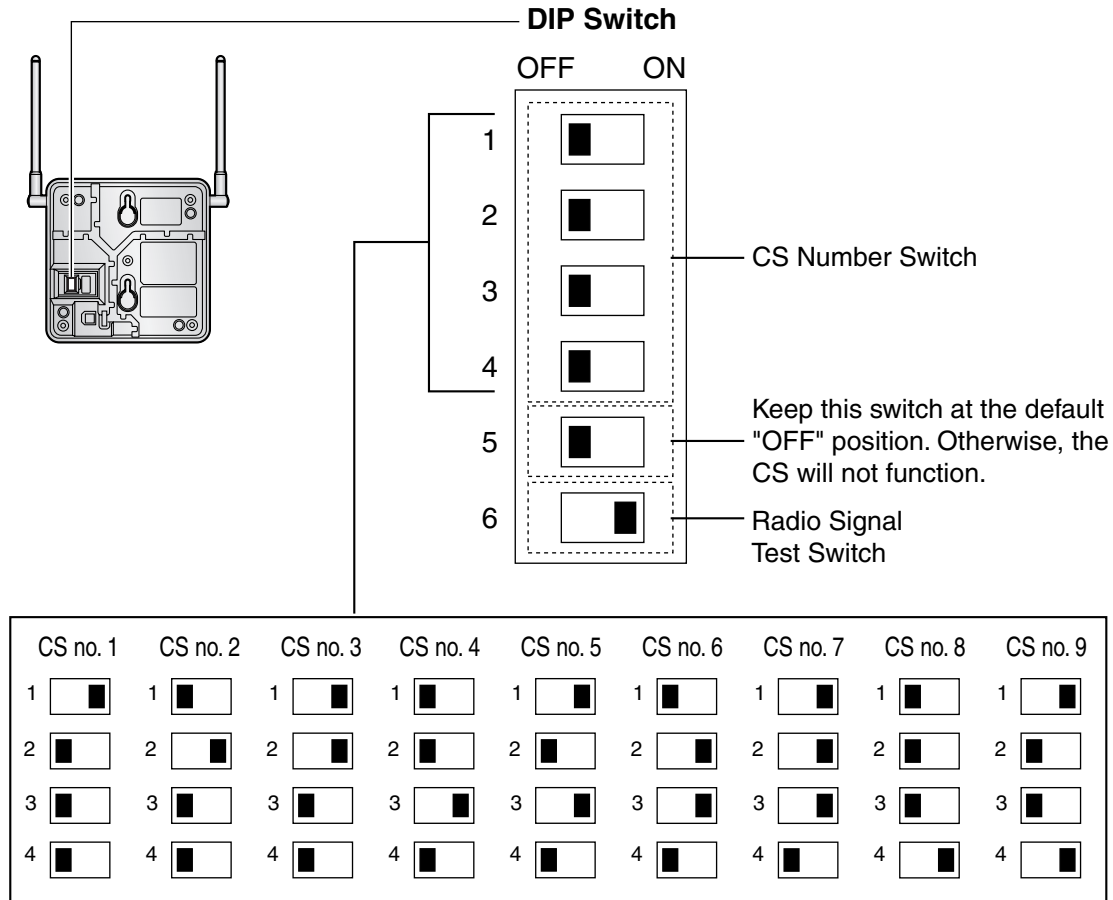
#### Setting and Installing the CS Temporarily for Site Survey

1. Switch the Radio Signal Test switch from OFF to ON.
2. Set the CS number switches as desired.
3. Set the Power Supply Select switch as desired (KX-T0151/KX-TDA0152 only).

KX-T0151/KX-TDA0152



KX-T0141/KX-TDA0142



**Note**

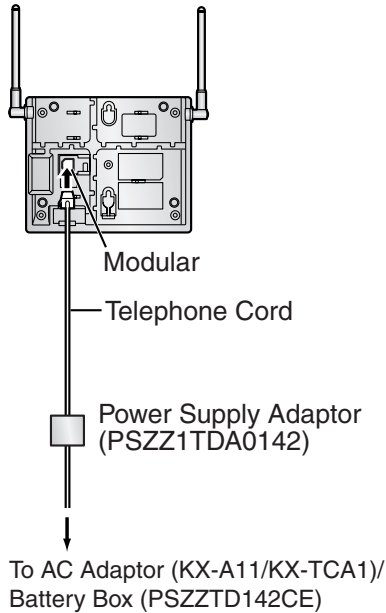
If more than 1 CS is in Radio Signal Test mode, each CS must have a unique CS number.

- After setting the DIP switches, connect the CS to an AC adaptor/battery box using a power supply adaptor.

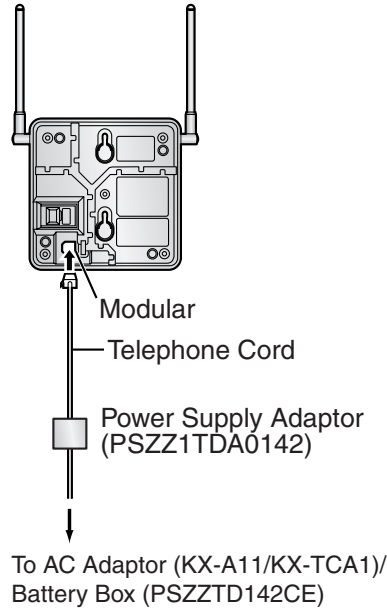
**Notes**

- The AC adaptor should be connected to a vertically oriented or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.
- If the Power Supply Select switch is set to ON in step 3, connect the CS to an AC adaptor/battery box. If it is set to OFF, connect the CS to a CSIF/DLC/DHLC card (KX-T0151/KX-TDA0152 only).

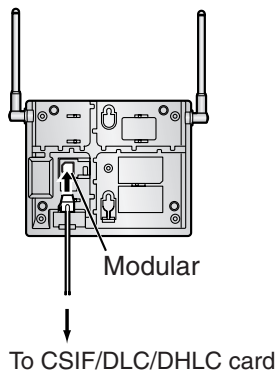
**KX-T0151/KX-TDA0152**



**KX-T0141/KX-TDA0142**



OR



- Install the CS temporarily for the site survey. Install the CS at least 2 m (6 ft 7 in) above the floor, keeping the antennas in the upright position.

## 3.9.5 Site Survey

The PS has a Radio Signal Test mode that monitors the state of the radio link to the CS. After installing the CSs temporarily, set the PS to Radio Signal Test mode and measure each CS coverage area. Then, record the results on the map of the installation site.

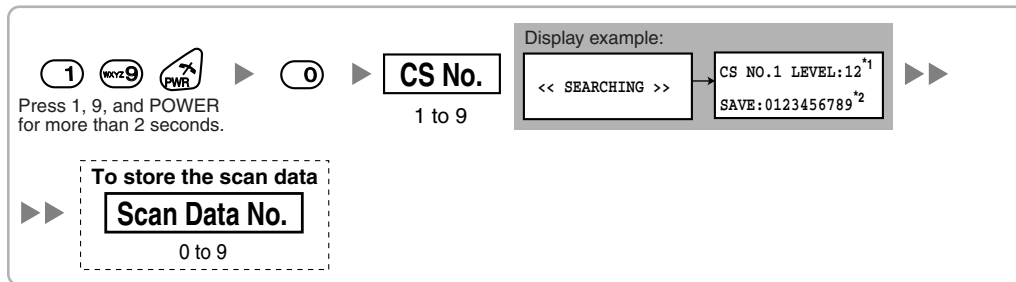
### Testing the Radio Signal Strength

#### Note

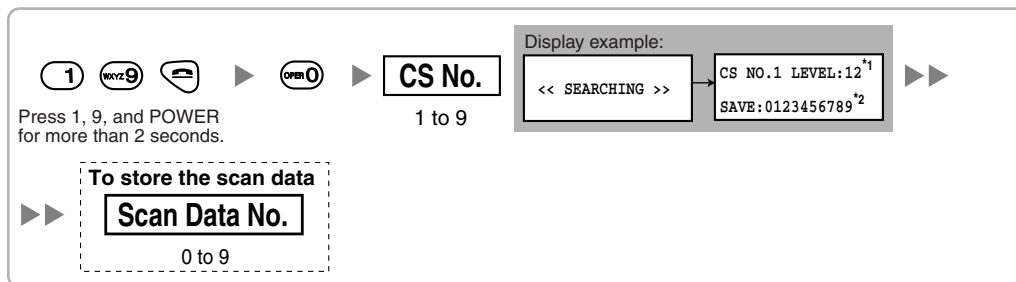
Display prompts for the site survey are only available in English.

#### 1. Enter Radio Signal Test mode.

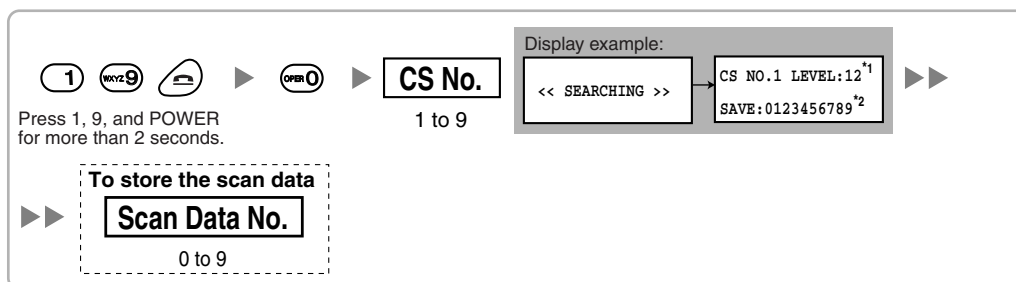
##### Using the KX-TD7684/KX-TD7694



##### Using the KX-TD7680



##### Using the KX-TD7690



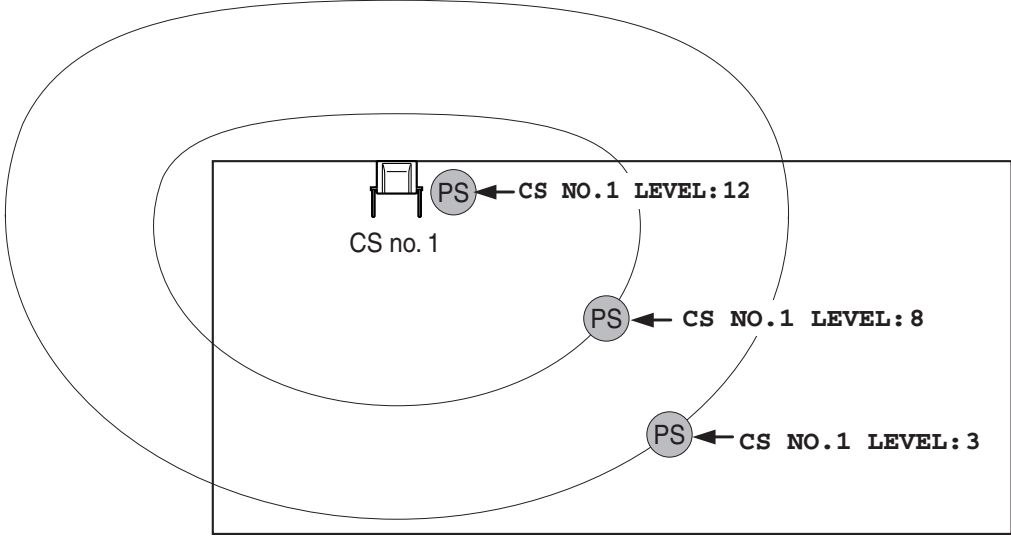
#### Notes

\*1: CS number and radio signal strength level.

\*2: Scan data (test result) number. Empty memory space will be indicated by a number; stored memory space will be indicated by a "-".



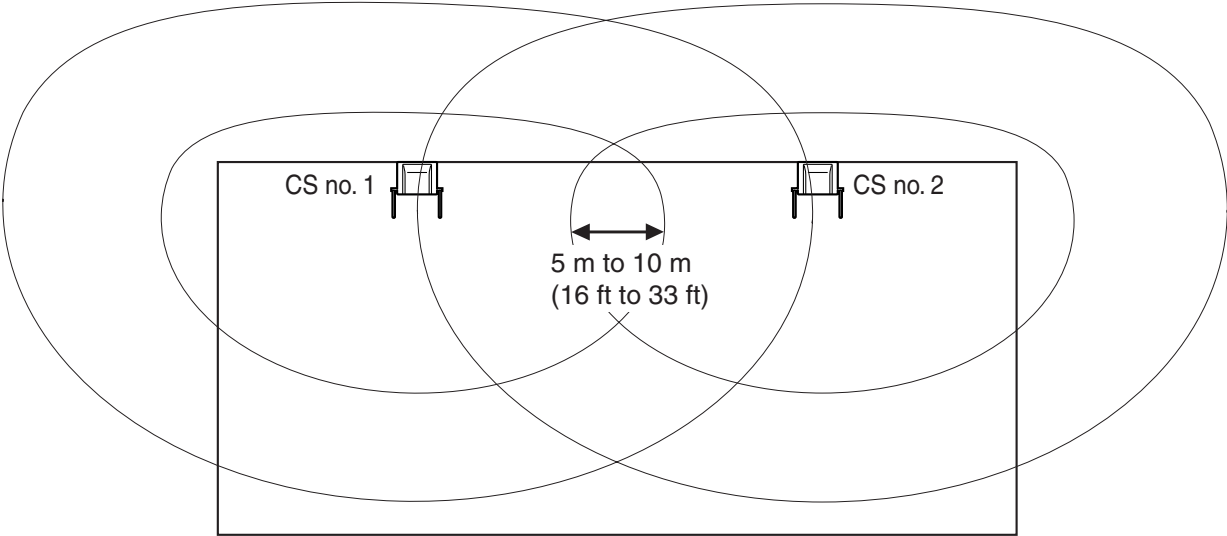
- 2. Measure the radio signal strength by moving towards and away from the CS.
  - a. Move to the CS until the radio signal strength level becomes "12".
  - b. Move away from the CS and identify the CS coverage area within which the radio signal strength level is greater than "8". Draw the area on the map.
  - c. Move away from the CS and identify the CS coverage area within which the radio signal strength level is greater than "3". Draw the area on the map.



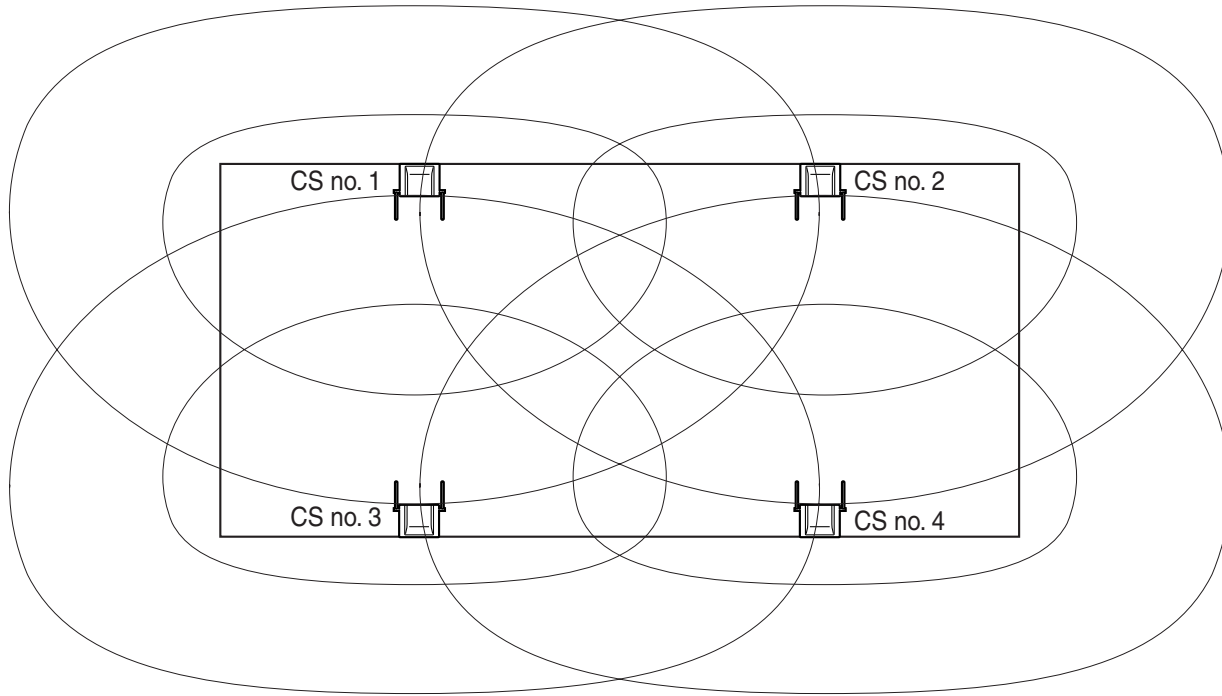
**Radio Signal Strength Levels**

Level: 00	Out of range
Level: 01 to 02	Receives noise easily or disconnects
Level: 03 to 07	May receive noise
Level: 08 to 10	Good
Level: 11 to 12	Better

- 3. Repeat steps 1 and 2 for other CSs, and relocate the CSs when necessary.
  - a. Overlap adjacent CS coverage areas where the radio signal strength level is "8" by 5 to 10 meters (16 to 33 feet).



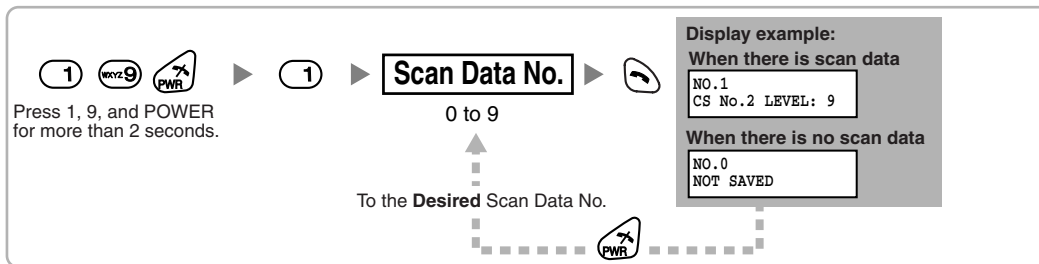
- b. Overlap the CS coverage areas of at least 2 CSs at any location in the installation site.



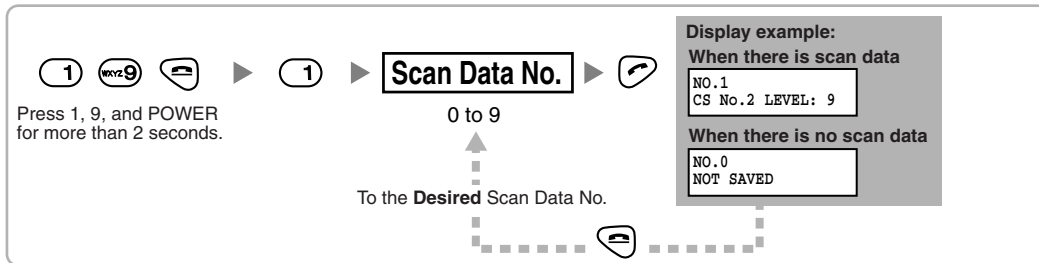
- c. Make sure that the radio signal strength level is greater than "3" at any location in the service area required by the user.

## Referring to the Stored Scan Data

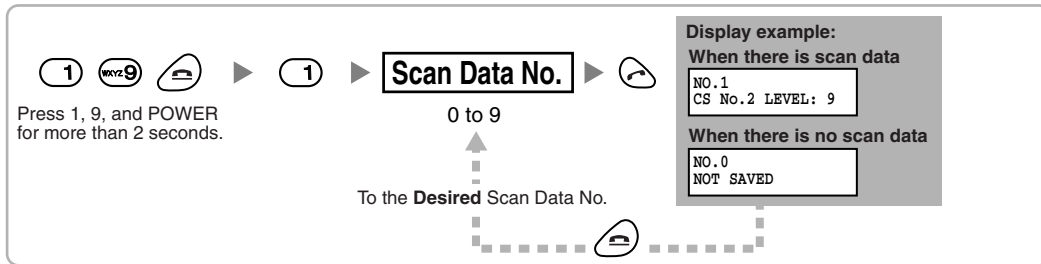
### Using the KX-TD7684/KX-TD7694



### Using the KX-TD7680

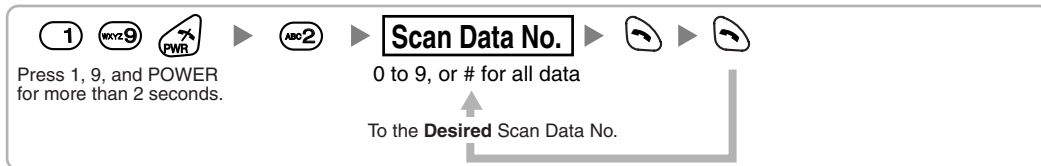


### Using the KX-TD7690

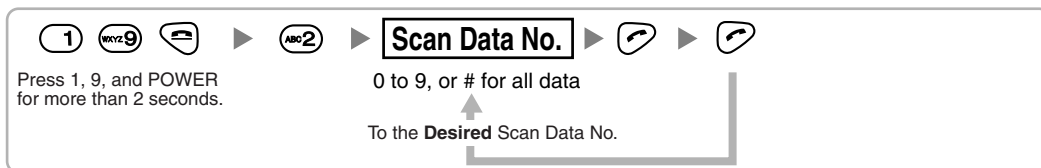


## Deleting the Stored Scan Data

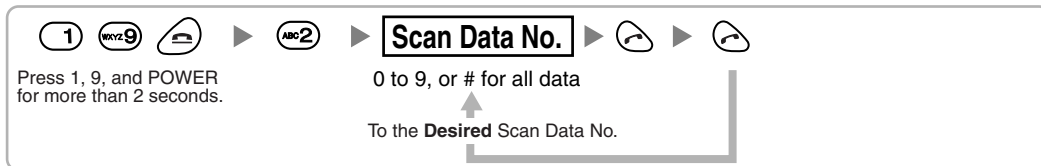
### Using the KX-TD7684/KX-TD7694



### Using the KX-TD7680



### Using the KX-TD7690

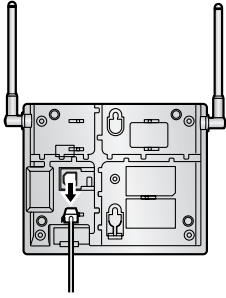


### 3.9.6 After Site Survey

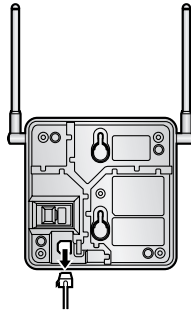
After obtaining the proper measurement results, exit Radio Signal Test mode before connecting the CS to the PBX.

1. Hold down the POWER button on the PS until the PS is turned OFF.
2. Disconnect the CS from the AC adaptor/battery box or the CSIF/DLC/DHLC card to stop supplying electricity.

**KX-T0151/KX-TDA0152**

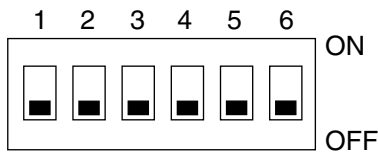


**KX-T0141/KX-TDA0142**

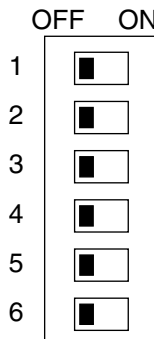


3. Switch all DIP switches on the CS from ON to OFF.

**KX-T0151/KX-TDA0152**



**KX-T0141/KX-TDA0142**

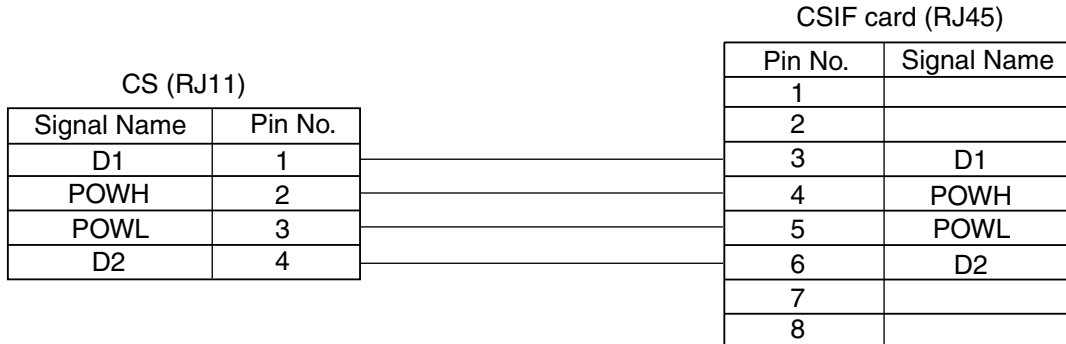
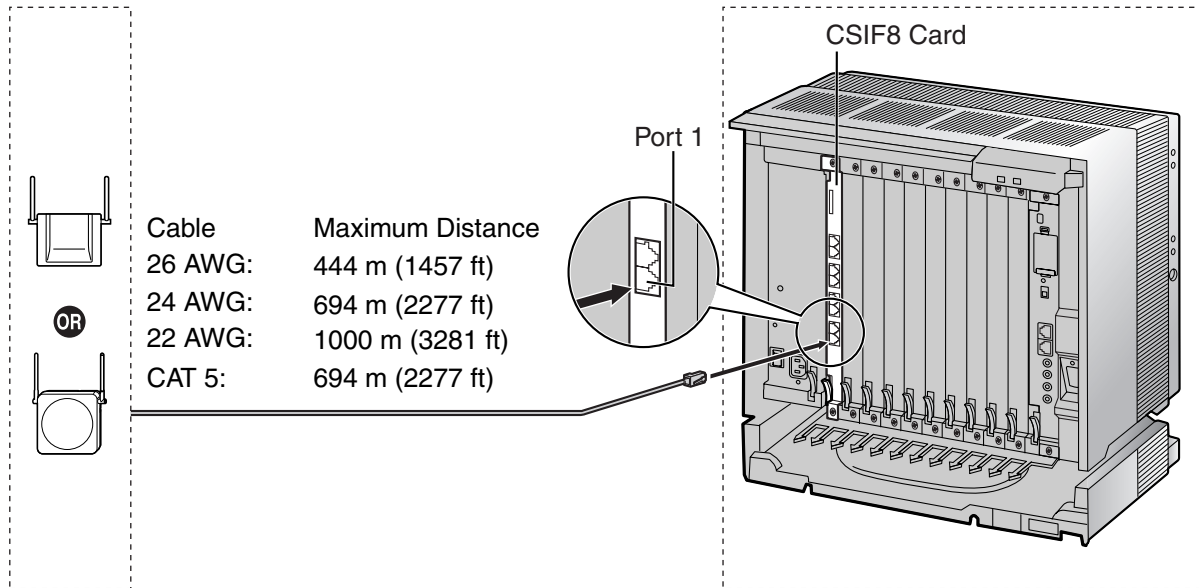


### 3.9.7 Connecting a Cell Station to the PBX

#### Using a CSIF Card

Refer to the following example to connect a CS to the PBX.

#### KX-TDA0152/KX-TDA0142



#### Accessories and User-supplied Items for the CS

**Accessories (included):** Screws × 2, Washers × 2

**User-supplied (not included):** RJ11 connector

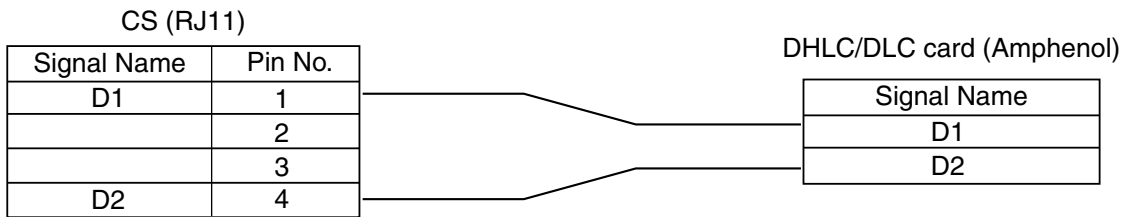
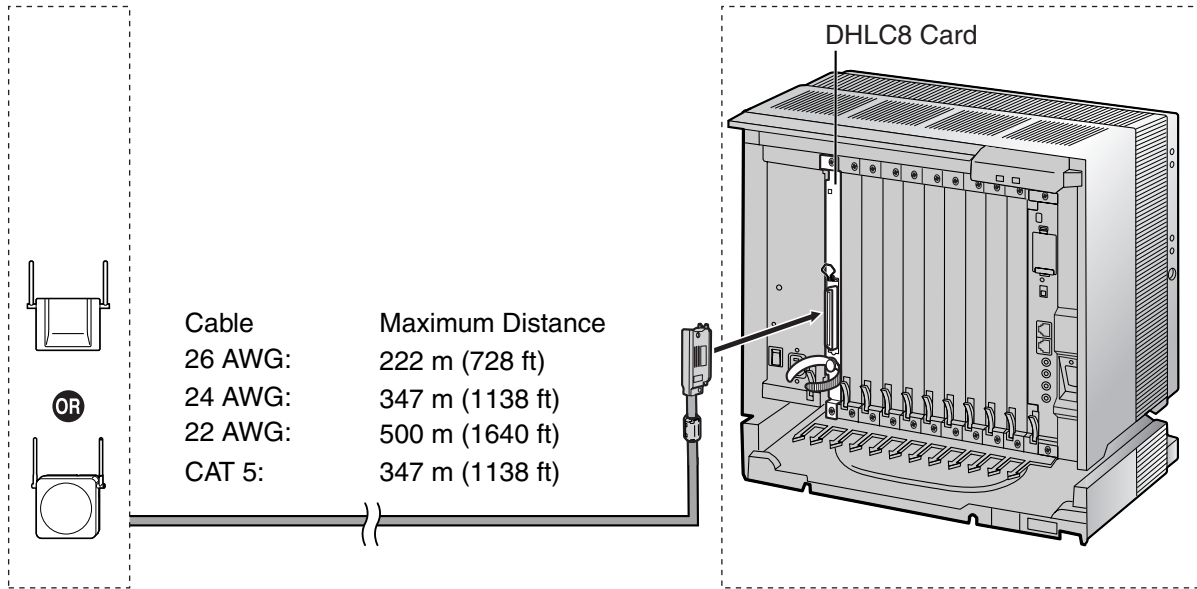
#### Note

For details about CSIF card, refer to "3.6.1 CSIF4 Card (KX-TDA0143) and CSIF8 Card (KX-TDA0144)".

### Using a DHLC/DLC Card

Refer to the following example to connect a CS to the PBX.

#### KX-T0151/KX-T0141



### Accessories and User-supplied Items for the CS

**Accessories (included):** Screws × 2, Washers × 2

**User-supplied (not included):** RJ11 connector

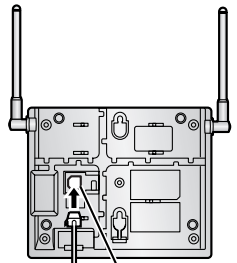
#### Note

For details about DHLC card or DLC card, refer to "3.6.2 DHLC8 Card (KX-TDA0170)", "3.6.3 DLC8 Card (KX-TDA0171)", or "3.6.4 DLC16 Card (KX-TDA0172)".

## Connecting the CS

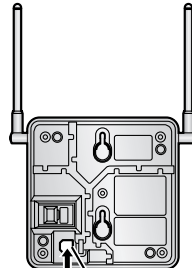
1. Connect the cable from the CSIF/DHLC/DLC card to the CS.

**KX-T0151/KX-TDA0152**



Modular  
To CSIF/DHLC/DLC card

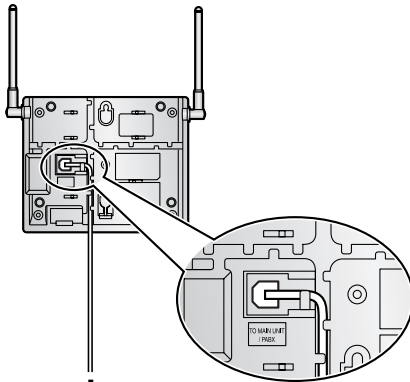
**KX-T0141/KX-TDA0142**



Modular  
To CSIF/DHLC/DLC card

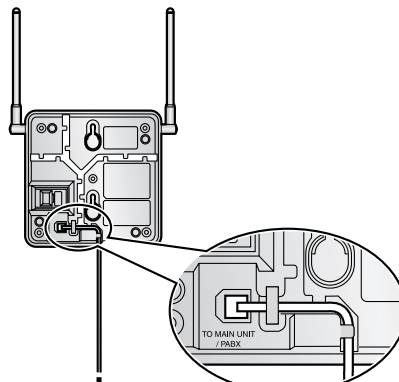
2. Pass the cable through the groove of the CS (in any direction depending on your preference).

**KX-T0151/KX-TDA0152**



To CSIF/DHLC/DLC card

**KX-T0141/KX-TDA0142**



To CSIF/DHLC/DLC card

## Registering the PS

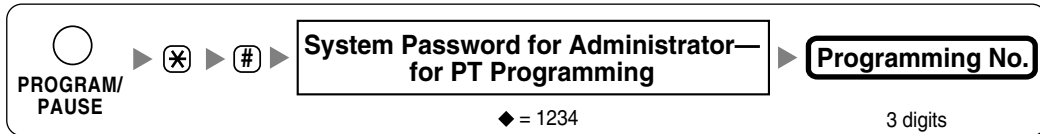
The PS must be registered to the PBX before it can be used. Programming of both the PS and PBX is required. A PT with multiline display (e.g., KX-T7636 6-line display) is required to perform the PBX system programming.

### Note

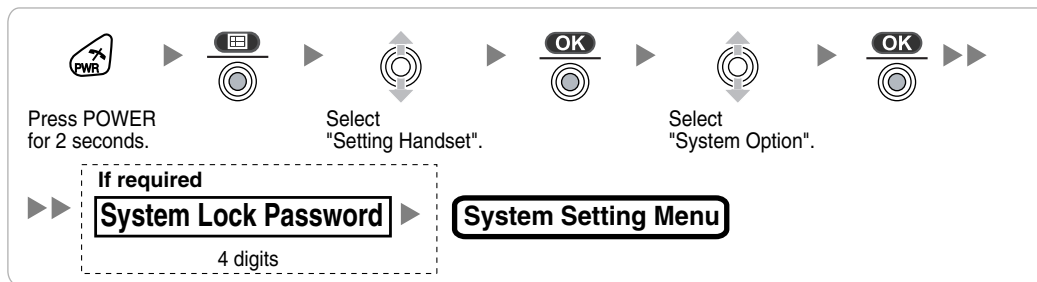
For details about system programming using a PT, refer to "1.13.30 PT Programming" in the Feature Manual, and "2.1 PT Programming" in the PT Programming Manual.

## Entering the System Programming Mode

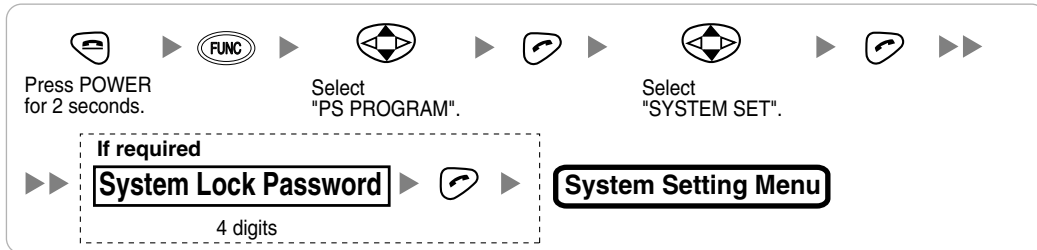
### PT (Administrator Level)



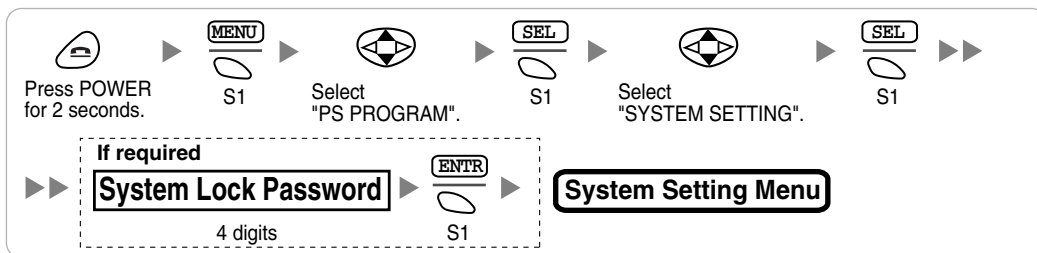
### PS (Using the KX-TD7684/KX-TD7694)



### PS (Using the KX-TD7680)



### PS (Using the KX-TD7690)

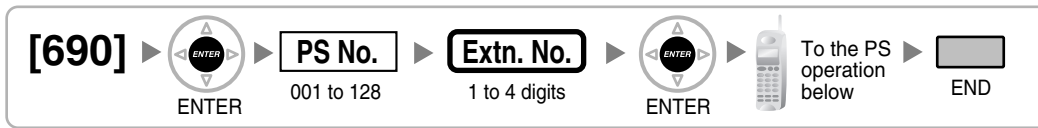


### Note

◆ means default value throughout this section.



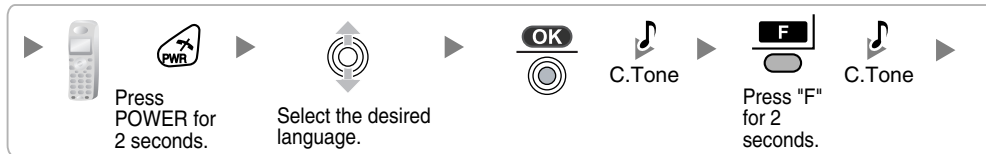
**PS Registration**



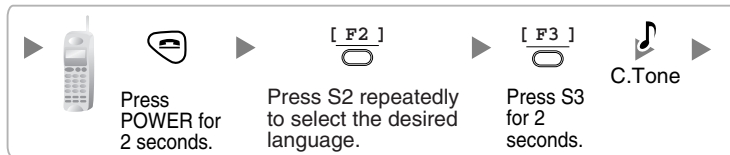
**When the PS has not been registered yet**

When registering the PS for the first time, it is possible to select the desired language for the display. (You do not need to enter the PS system programming mode when registering for the first time.)

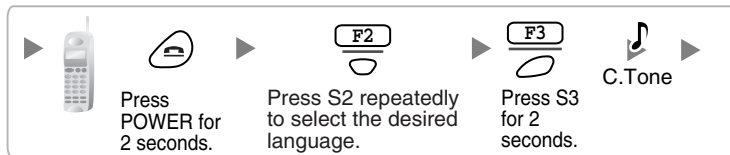
**Using the KX-TD7684/KX-TD7694**



**Using the KX-TD7680**



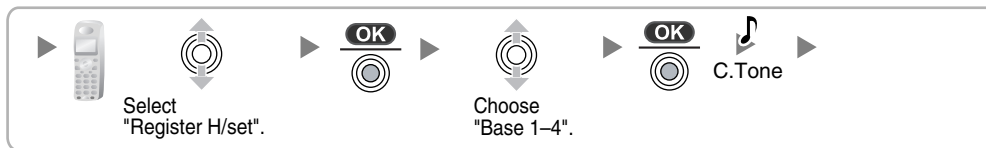
**Using the KX-TD7690**



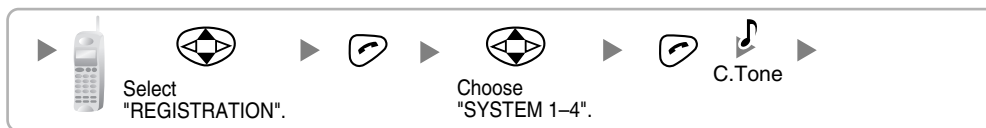
**When the PS has already been registered to another PBX**

One PS can be registered to a maximum of 4 different PBXs.

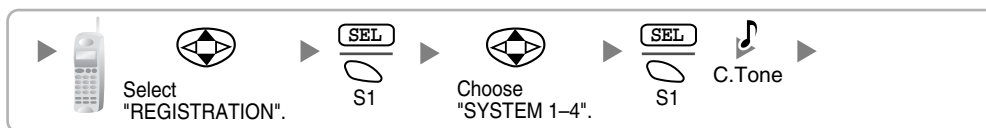
**Using the KX-TD7684/KX-TD7694**



**Using the KX-TD7680**



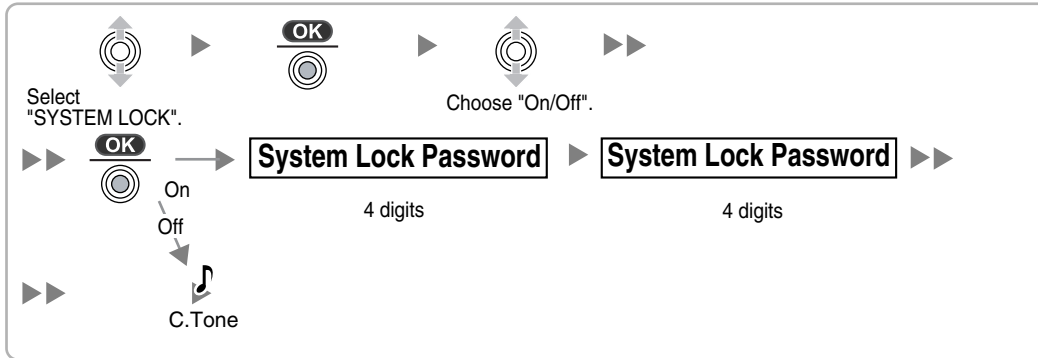
**Using the KX-TD7690**



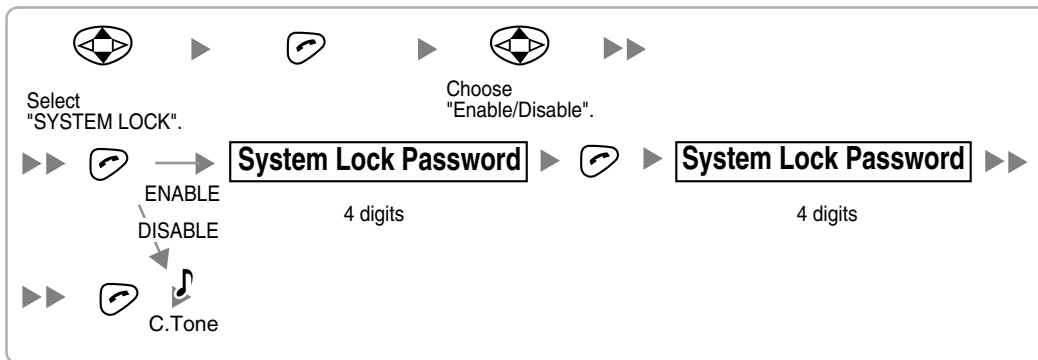
### Setting the System Lock

When a system lock has been set, the system lock password will be required for PS system setting.

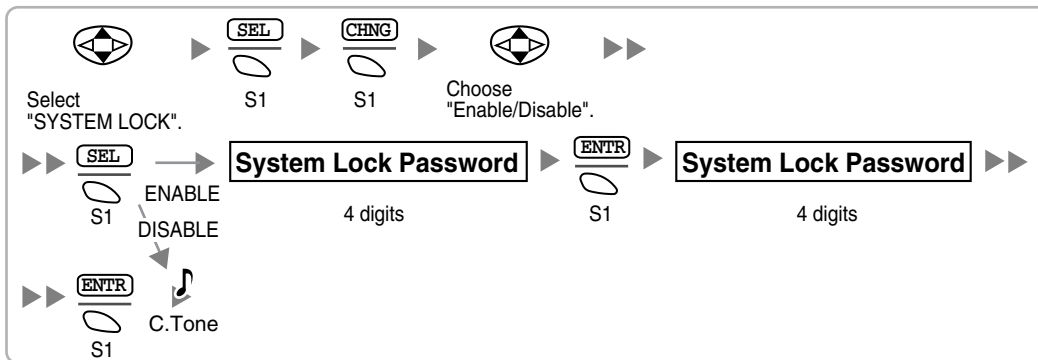
#### Using the KX-TD7684/KX-TD7694



#### Using the KX-TD7680



#### Using the KX-TD7690



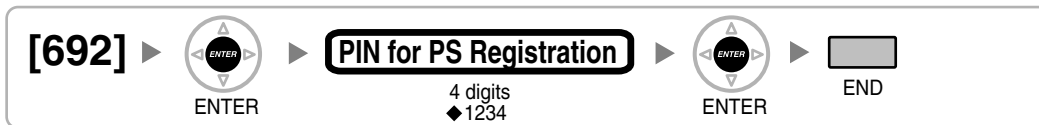
### Setting the Personal Identification Number (PIN) for PS Registration

To prevent registering the PS to a wrong PBX, a PIN for PS registration can be set to the PBX. Before registering the PS to the PBX, enter the PIN set to the PBX into the PS. By doing so, the PS will only be registered to the PBX with the matching PIN.

#### Notes

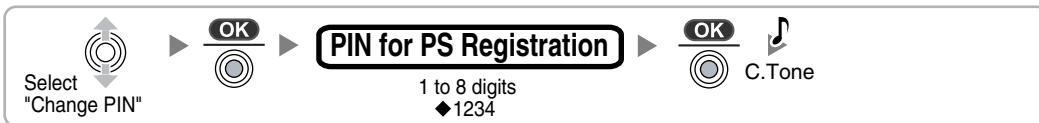
- By default, the PIN for PS registration is "1234" for both the PBX and PS. Therefore, the PS can be registered to the PBX without setting the PIN.
- The PIN for PS registration will only be used when registering the PS to the PBX. Therefore, during normal operation after registration, even if there is more than 1 PBX with the same PIN near the PS, the PS will not be inadvertently linked to a different PBX.

#### Setting the PIN for PBX

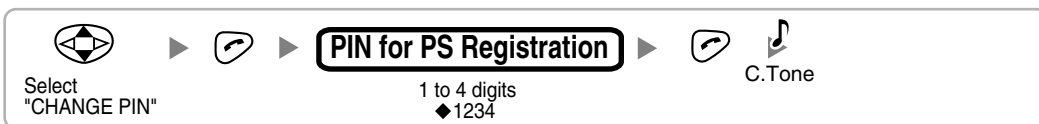


#### Setting the PIN for PS

##### Using the KX-TD7684/KX-TD7694



##### Using the KX-TD7680



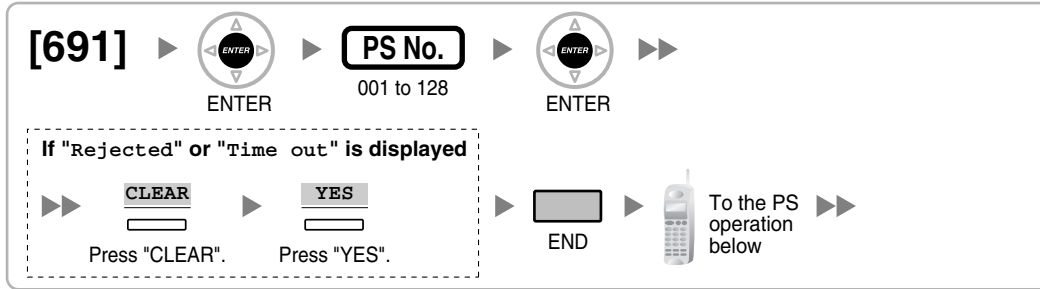
##### Using the KX-TD7690



### PS Termination

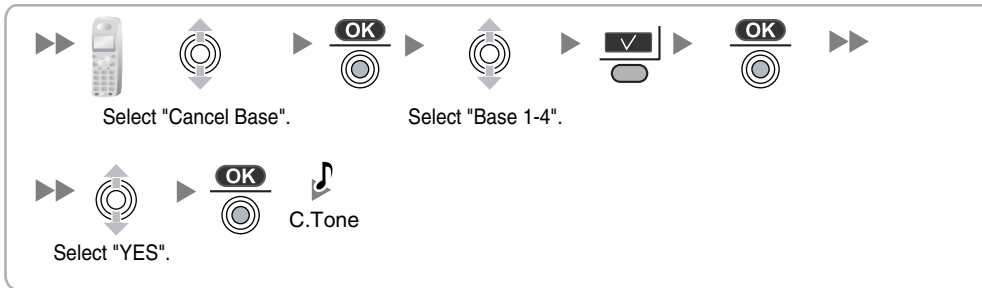
Confirm the following before canceling the PS registration:

- The PS is turned on.
- The PS is within range.

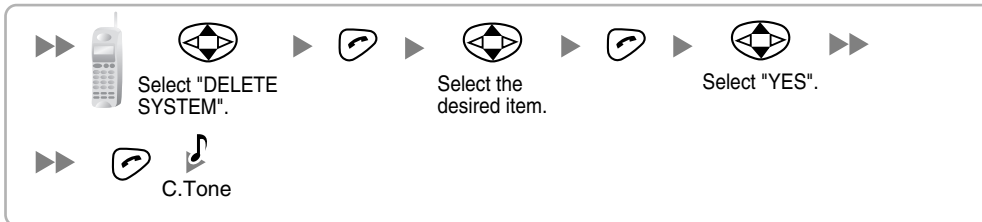


#### If the registration information is still stored in the PS

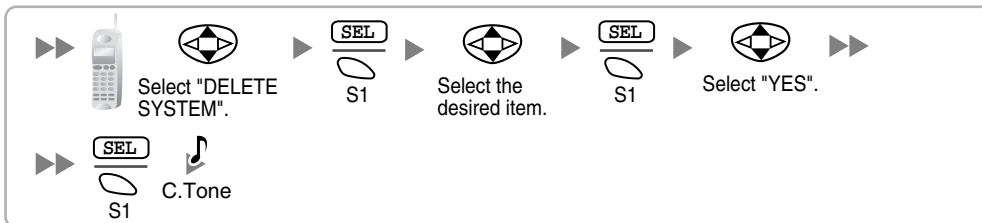
##### Using the KX-TD7684/KX-TD7694



##### Using the KX-TD7680



##### Using the KX-TD7690



### Testing the Operation

Walk around the service area while having a conversation using a registered PS. If noise is frequent or conversations disconnect, relocate the CSs or install an additional CS.

## 3.9.8 Wall Mounting

### Mounting the KX-T0151/KX-TDA0152

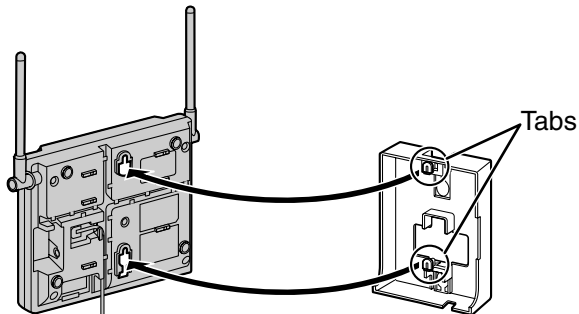
#### **WARNING**

- **MAKE SURE THAT THE WALL THAT THE UNIT WILL BE ATTACHED TO IS STRONG ENOUGH TO SUPPORT THE UNIT (APPROX. 310 g [11 oz]). IF NOT, IT IS NECESSARY FOR THE WALL TO BE REINFORCED.**
  - **ONLY USE THE WALL-MOUNTING EQUIPMENT (SCREWS, WASHERS, WALL MOUNTING PLATE) INCLUDED WITH THE UNIT.**
  - **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.**
1. Place the reference for wall mounting (KX-T0151/KX-TDA0152) on the wall to mark the 2 screw positions.
  2. Install the 2 screws and washers (included) into the wall.

#### **Notes**

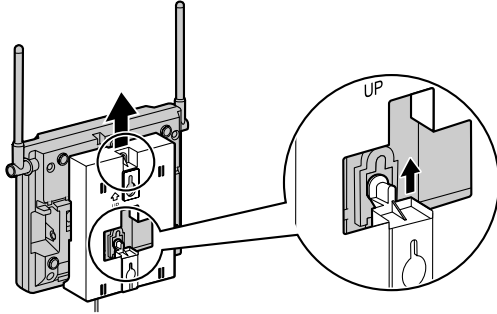
- Make sure that the screw heads are at the same distance from the wall.
  - Install the screws perpendicular to the wall.
3. Insert the upper and lower tabs of the wall mounting plate into the designated openings in the base unit.

#### **KX-T0151/KX-TDA0152**



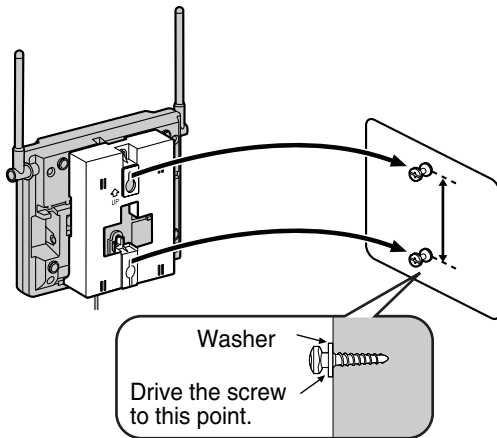
4. Slide the wall mounting plate in the direction of the arrow until it clicks.

**KX-T0151/KX-TDA0152**



5. Hook the CS on the screw heads.

**KX-T0151/KX-TDA0152**

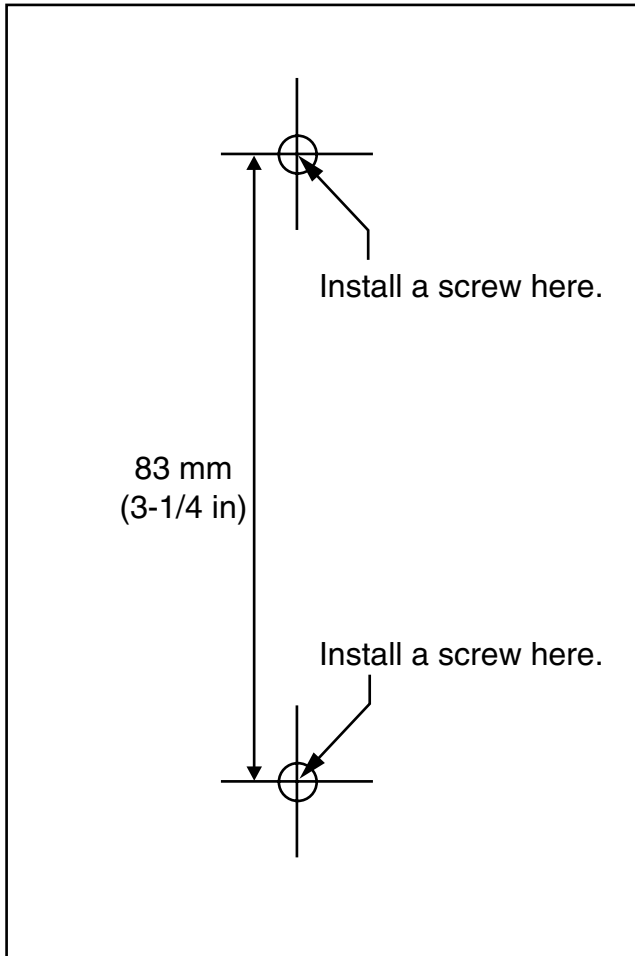


**CAUTION**

Make sure the cables are securely fastened to the wall.

## Reference for Wall Mounting (KX-T0151/KX-TDA0152)

Please copy this page and use as a reference for wall mounting.



### **Note**

Make sure to set the print size to correspond with the size of this page. If the dimension of the paper output still deviates slightly from the measurement indicated here, use the measurement indicated here.

## Mounting the KX-T0141/KX-TDA0142

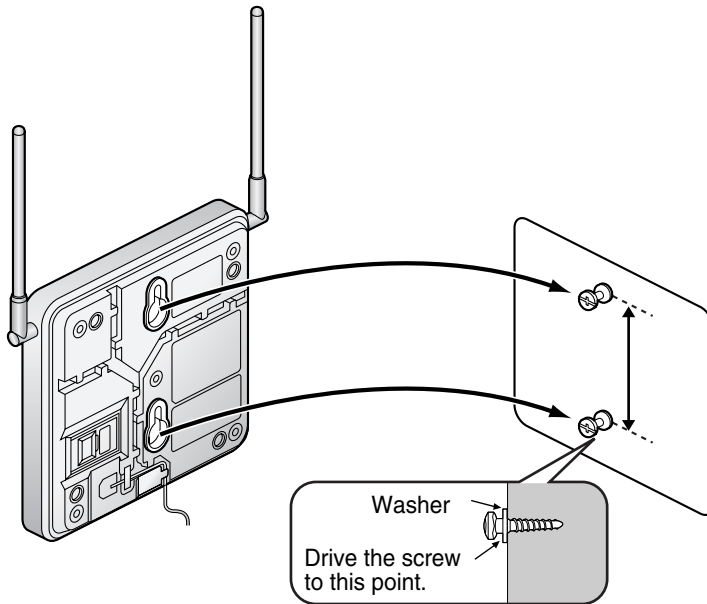
### **WARNING**

- **MAKE SURE THAT THE WALL THAT THE UNIT WILL BE ATTACHED TO IS STRONG ENOUGH TO SUPPORT THE UNIT (APPROX. 310 g [11 oz]). IF NOT, IT IS NECESSARY FOR THE WALL TO BE REINFORCED.**
- **ONLY USE THE WALL-MOUNTING EQUIPMENT (SCREWS, WASHERS) INCLUDED WITH THE UNIT.**
- **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.**

1. Place the reference for wall mounting (KX-T0141/KX-TDA0142) on the wall to mark the 2 screw positions.
2. Install the 2 screws and washers (included) into the wall.

### **Notes**

- Make sure that the screw heads are at the same distance from the wall.
  - Install the screws perpendicular to the wall.
3. Hook the CS on the screw heads.



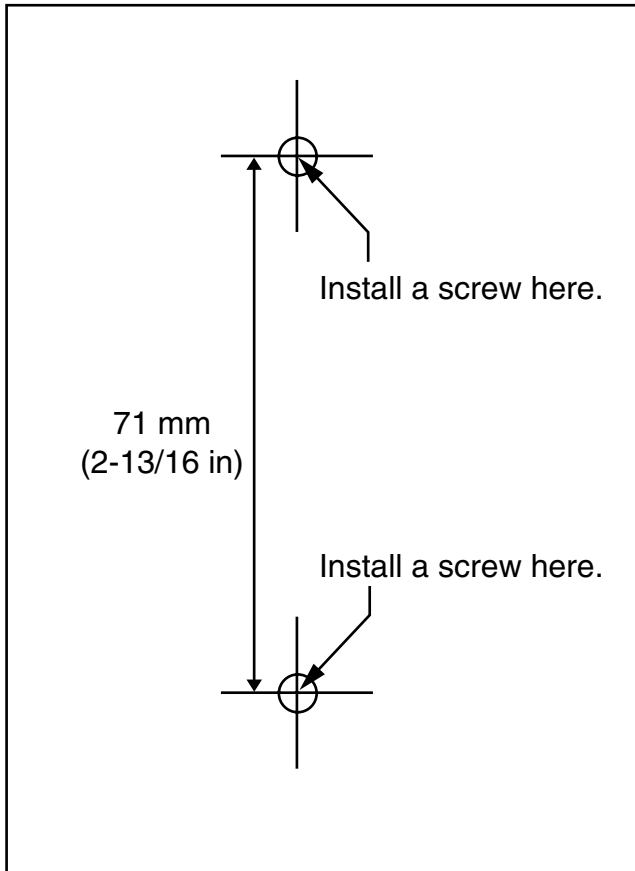
### **CAUTION**

Make sure the cables are securely fastened to the wall.



## Reference for Wall Mounting (KX-T0141/KX-TDA0142)

Please copy this page and use as a reference for wall mounting.



### **Note**

Make sure to set the print size to correspond with the size of this page. If the dimension of the paper output still deviates slightly from the measurement indicated here, use the measurement indicated here.

## 3.10 Connection of Doorphones, Door Openers, External Sensors, and External Relays

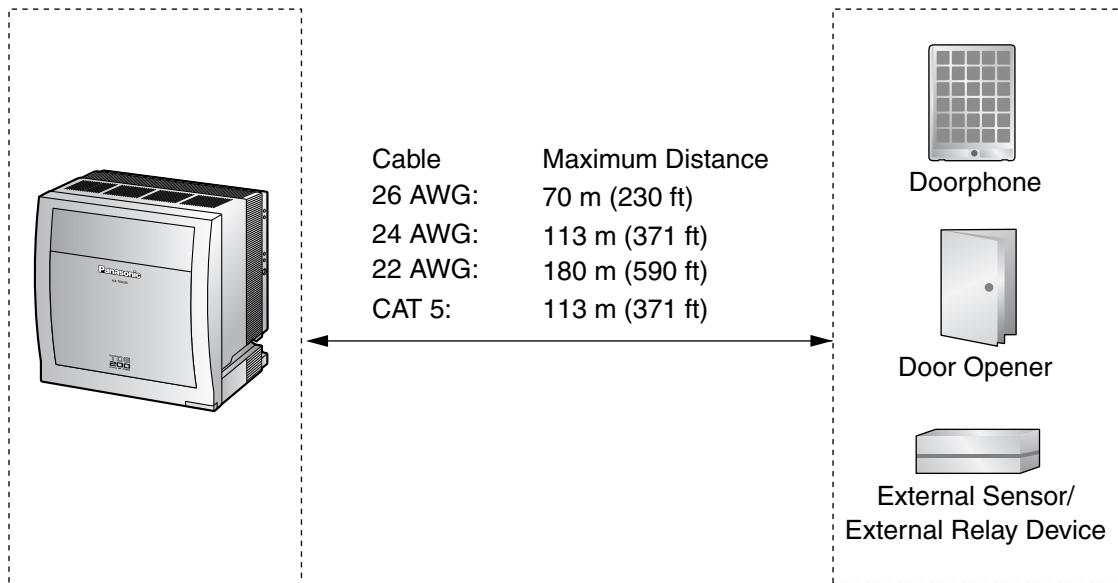
### 3.10.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays

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

**Note**

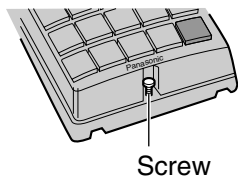
Doorphones, door openers, external sensors, and external relays are user-supplied.

#### Maximum Cabling Distance

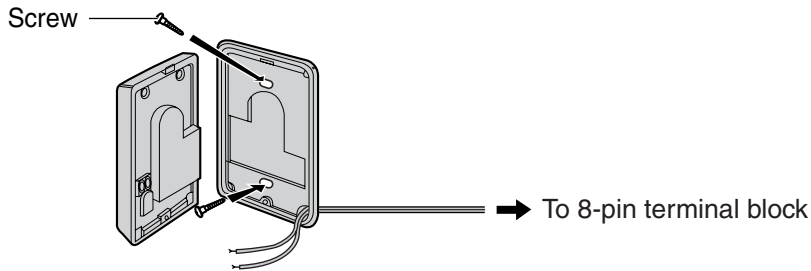


#### Installing the Doorphone (KX-T30865)

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





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

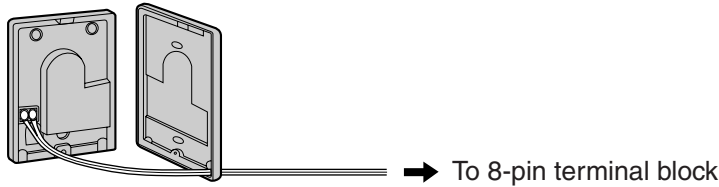


**Note**

Two kinds of screws are included with a KX-T30865. 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 front cover.

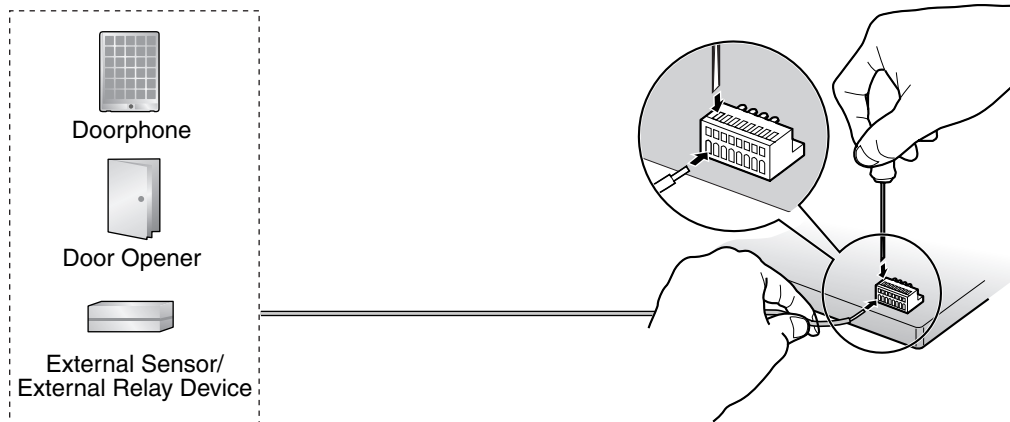


4. Re-attach the 2 halves and re-insert the screw.

**Connection**

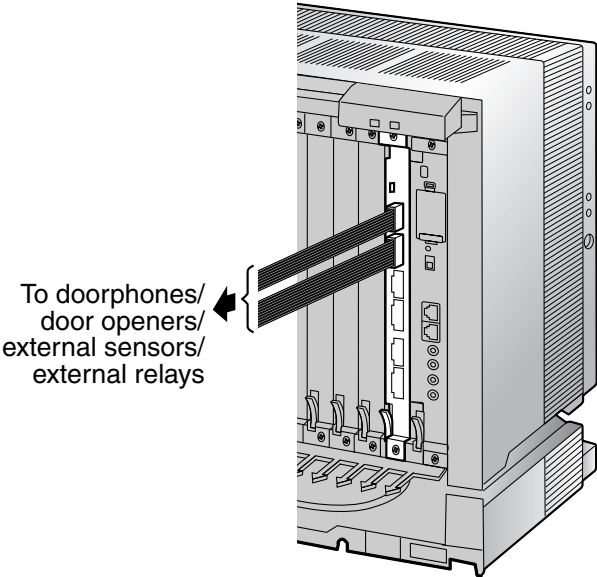
Use 8-pin and 10-pin terminal blocks (included with the card) for connection.

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.



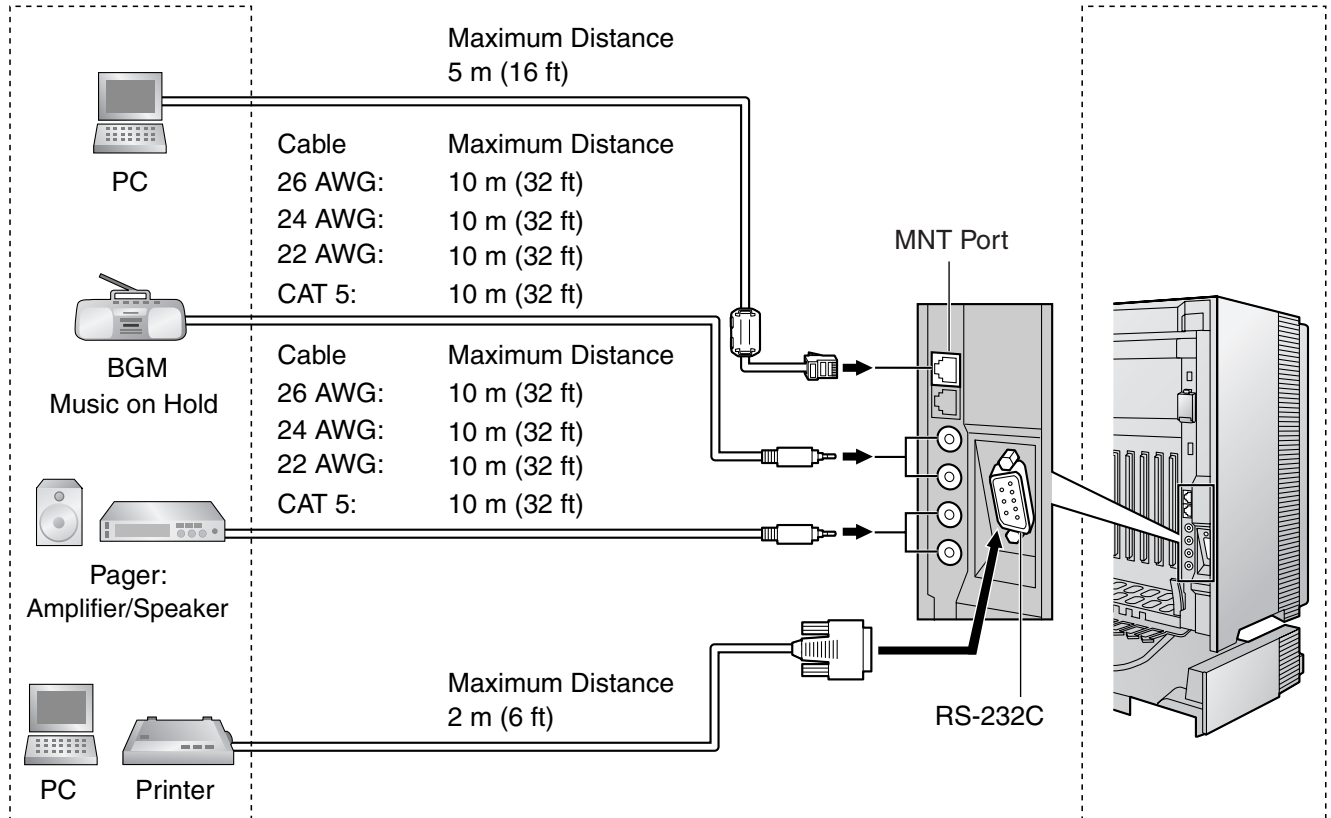
3.10 Connection of Doorphones, Door Openers, External Sensors, and External Relays

- 2. Attach the terminal blocks to the connectors of the DPH4/EIO4 card on the PBX.



## 3.11 Connection of Peripherals

### 3.11.1 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)

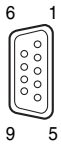
The PBX is equipped with an RS-232C interface. This interface provides communication between the PBX and the user-supplied devices such as PC or line printers. The RS-232C port is used for system programming, SMDR, diagnostics and external system database storage (save/load) functions. When using special 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.

### IMPORTANT

To protect the system, keep the following in mind:

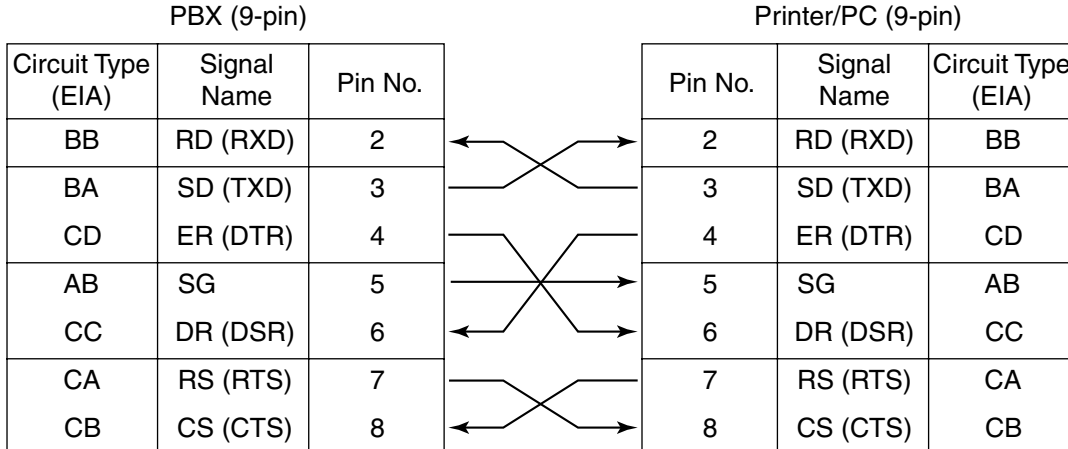
1. Make sure that both connector cases (frame ground) of the RS-232C cross cable (shielded cable) are conductive. If they are not conductive, make sure that both connector cases of the cable are firmly connected.
2. If this is not possible, connect the frame of the PBX to the frame of the PC/Printer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

## Pin Assignments

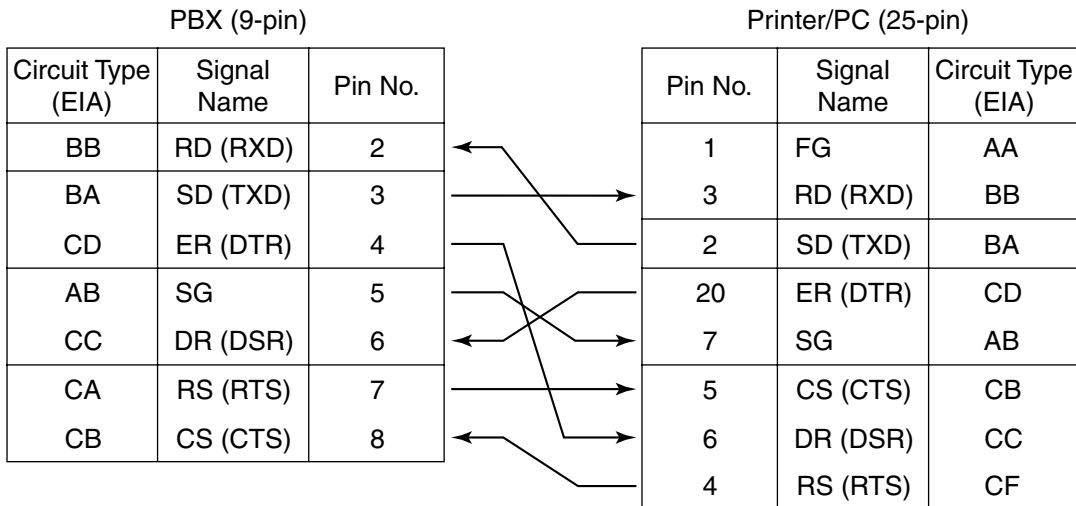
	No.	Signal Name	Function	Circuit Type	
				EIA	CCITT
	2	RD (RXD)	Receive Data	BB	104
	3	SD (TXD)	Transmit Data	BA	103
	4	ER (DTR)	Data Terminal Ready	CD	108.2
	5	SG	Signal Ground	AB	102
	6	DR (DSR)	Data Set Ready	CC	107
	7	RS (RTS)	Request To Send	CA	105
	8	CS (CTS)	Clear To Send	CB	106

## Connection Charts

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



### For connecting a printer/PC with a 25-pin RS-232C connector



### 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.

### 3.11 Connection of Peripherals

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- **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.

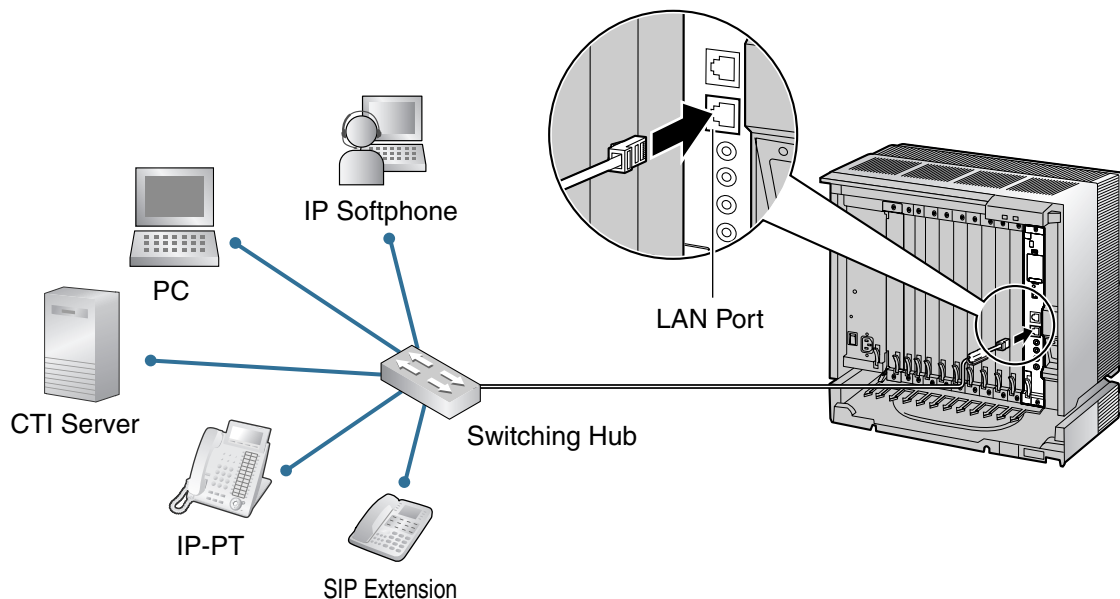


## 3.12 LAN Connection

### 3.12.1 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), 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-

#### Notes

- 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.

## 3.13 Power Failure Connections

### 3.13.1 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 "1.13.11 Power Failure Transfer" in the Feature Manual for further information.

#### Connection

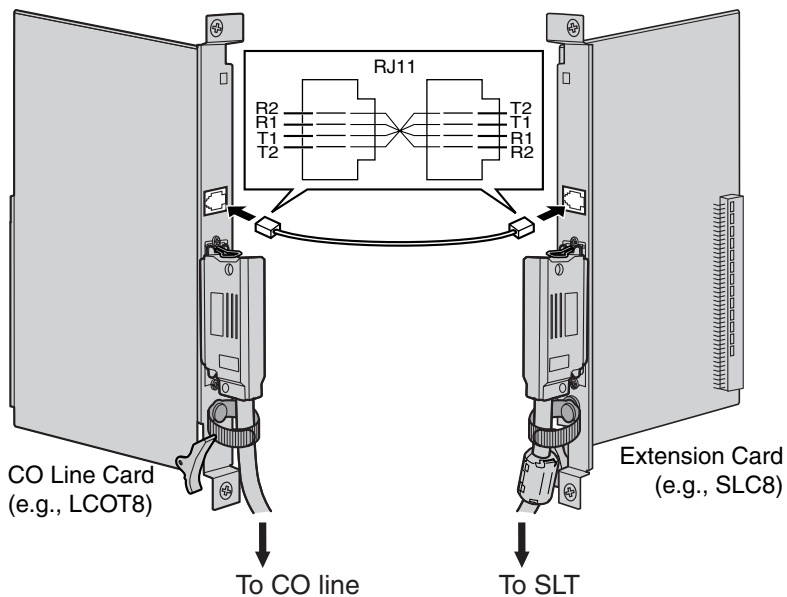
Power Failure Connection connects a specific SLT and a CO line in the event of power failure. The following analog CO line and extension cards can be used for Power Failure Connections:

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

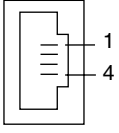


#### Accessories and User-supplied Items

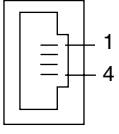
**Accessories (included):** none

**User-supplied (not included):** RJ11 connectors

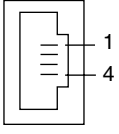
**RJ11 Connector Pin Assignments for Analog CO Line Card****PFT Ports 1 and 2**

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

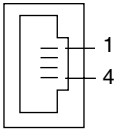
**PFT Ports 3 and 4 (for LCOT16 card only)**

	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/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

## 3.14 Starting the PBX

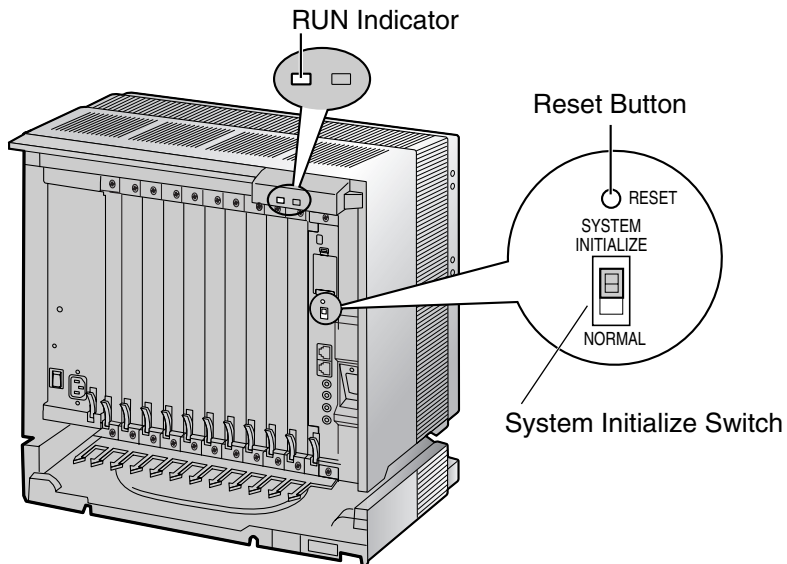
### 3.14.1 Starting the PBX

#### **CAUTION**

- The SD Memory Card must be inserted in the SD Memory Card slot of the IPCMPR card before startup.
- 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 PBX will continue to be powered even if the power switch is turned "OFF".
- 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.

#### System Initialization Procedure

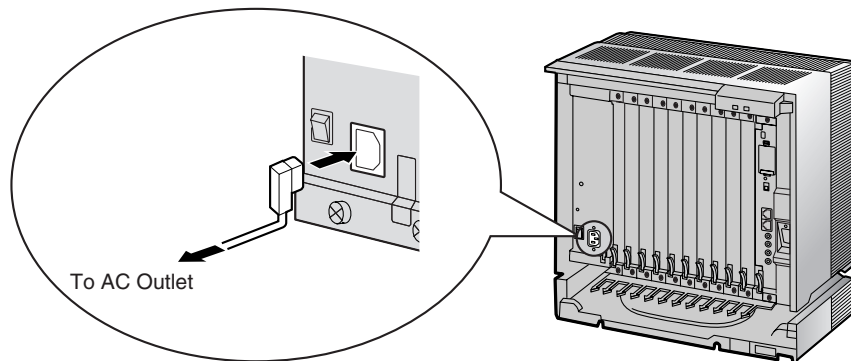
1. Slide the System Initialize Switch to the "SYSTEM INITIALIZE" position.



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.



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**

Use only the AC power cord included with the PSU.

## LED Indications

Indication	Color	Description
RUN	Green	PBX status indication <ul style="list-style-type: none"> <li>• OFF: Power Off (includes normal reset)</li> <li>• ON: Power On and running (on-line)</li> <li>• Flashing (60 times per minute): Starting up</li> <li>• Flashing (120 times per minute): Starting up or resetting with:               <ul style="list-style-type: none"> <li>• the System Initialize Switch in "SYSTEM INITIALIZE" position</li> <li>• the SD Memory Card not inserted</li> </ul> </li> </ul>
ALARM	Red	Alarm indication <ul style="list-style-type: none"> <li>• OFF: Normal</li> <li>• ON: Alarm (CPU stop, alarm for each optional service card)</li> <li>• Flashing: Alarm (IPCMPR file error in restarting)</li> </ul>

## 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.



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## **Section 4**

# ***Guide for the KX-TDE Maintenance Console***

*Explains the installation procedure, structure, and basic information of the KX-TDE Maintenance Console.*

# 4.1 Overview

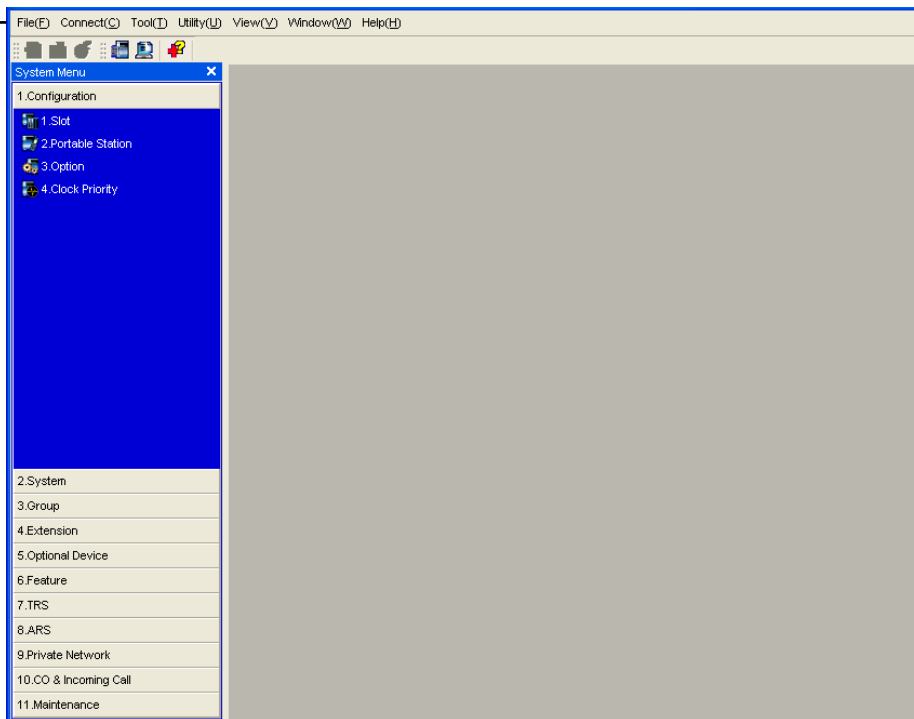
## 4.1.1 Overview

KX-TDE 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 KX-TDE Maintenance Console onto the PC.

This section describes overview and installation of the KX-TDE Maintenance Console only.

### KX-TDE Maintenance Console\*<sup>1</sup>

Menu Bar



System Menu

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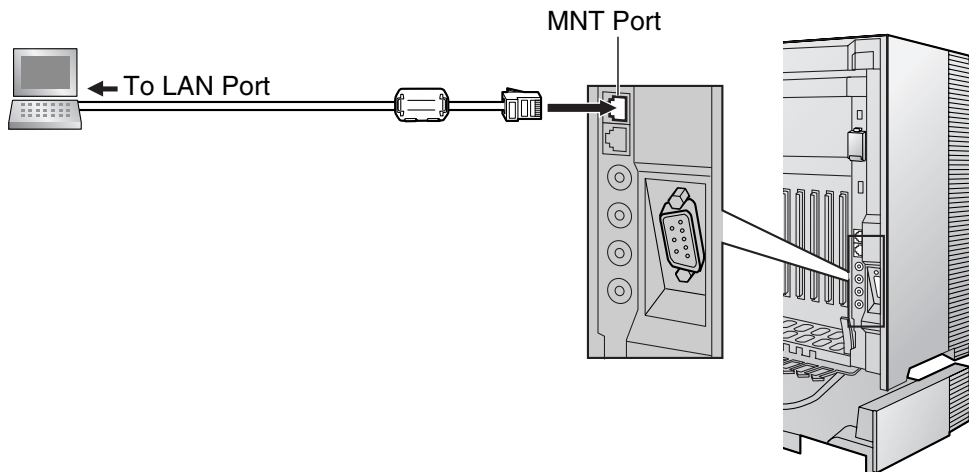
\*<sup>1</sup> The contents and design of the software are subject to change without notice.



## 4.2 PC Connection

### 4.2.1 PC Connection

#### Connection via MNT Port of IPCMPR Card



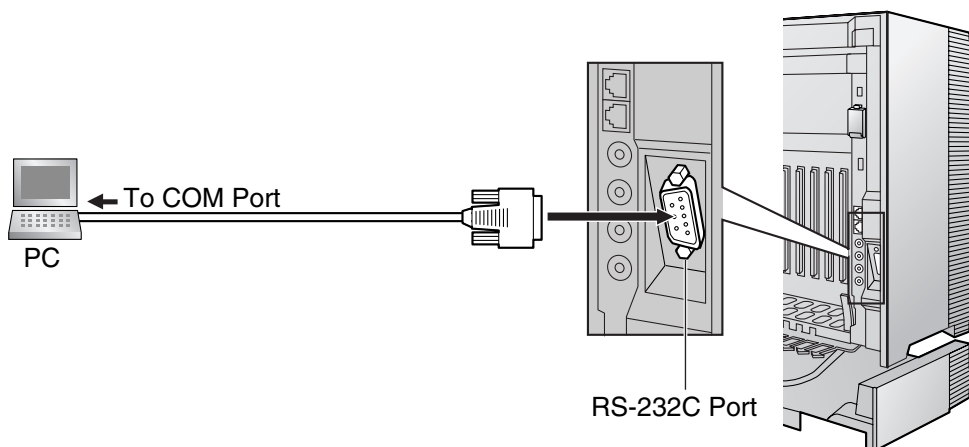
#### **IMPORTANT**

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 "3.11.1 Connection of Peripherals".

#### Serial Interface Connection



**IMPORTANT**

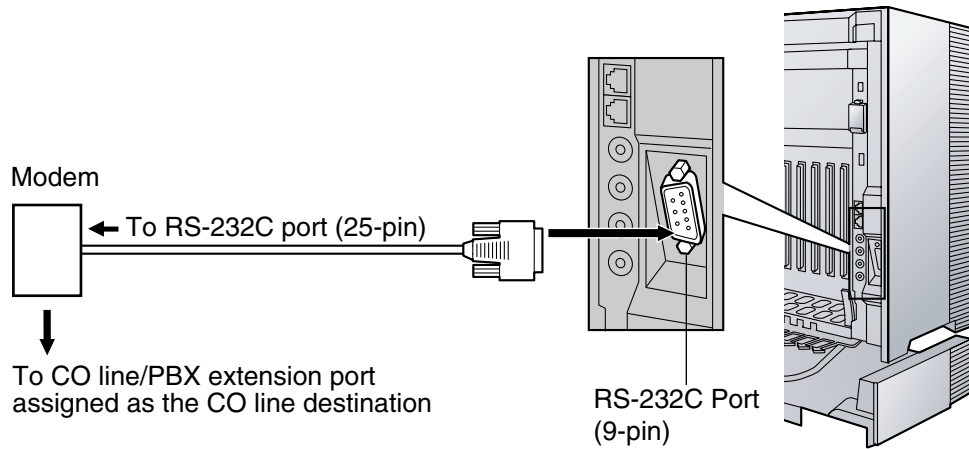
To protect the system, keep the following in mind:

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 an earthing wire in order to prevent difference in the electrical potentials.

**Note**

For pin assignments and maximum cabling distance, refer to "3.11.1 Connection of Peripherals".

**External Modem Connection**



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)

**IMPORTANT**

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 an earthing 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.

### **Notes**

- An AT command (for initialization, enabling automatic answer, etc.) can only be programmed by KX-TDE 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 KX-TDE Maintenance Console

### 4.3.1 Installing and Starting the KX-TDE Maintenance Console

#### System Requirements

##### Required Operating System

- Microsoft® Windows® 2000, Windows XP, or Windows Vista™ Business

##### Minimum Hardware Requirements

- CPU: 800 MHz Intel® Celeron® microprocessor
- HDD: 100 MB of available hard disk space
- RAM: 128 MB of available RAM

##### Recommended Display Settings

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

#### Installing the KX-TDE Maintenance Console

##### Notes

- Make sure to install and use the latest version of the KX-TDE Maintenance Console.
- To install or uninstall the software on a PC running Windows 2000 Professional or 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, you must be logged in as a user in the "Administrators" group.

1. Copy the setup file of the KX-TDE Maintenance Console to your PC. (Its icon is shown here, on the left.)
2. Double-click the setup file to run the installer.
3. Follow the on-screen instructions provided by the installation wizard.

#### Starting the KX-TDE Maintenance Console and Assigning the Basic Items (Quick Setup)

When you start the KX-TDE 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 "1.14.2 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 **KX-TDE 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**).  
The Programmer Code authorizes different programming levels, and the Quick Setup is only available when you start the KX-TDE Maintenance Console with the Installer Level Programmer Code.

**Note**

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

- b. Click **OK**.
5. a. Click **Connect** → **LAN** or **RS-232C** from the menu bar, depending on the type of PC connection with the PBX.  
b. The Login screen appears.
6. a. Enter the system password for installer (default: **1234**).  
b. Click **Setup**, then the Setup screen appears.  
c. Specify the settings as required.

**Note**

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. Click **OK** to return to the Login screen.
- e. Click **OK**.
7. Follow the instructions of the Quick Setup wizard and assign the basic items (Quick Setup).  
The system menu appears. You may now begin programming the PBX.

**Notes**

- 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 KX-TDE 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-T7600 series PT.  
Characters which can be displayed on a KX-T7600 series PT are shown below in the white cells.

### 4.3 Installation of the KX-TDE Maintenance Console

	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	€		,	f	„	...	†	‡	^	‰	Š	<	Œ		Ž	
90		'	'	“	”	•	—	—	~	™	š	>	œ		ž	ÿ
a0		ı	¢	£	¤	¥	¦	§	¨	©	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 KX-TDE 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.	<ul style="list-style-type: none"> <li>IP-EXT/IP-GW/DSP card malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the corresponding card.</li> </ul>
	<ul style="list-style-type: none"> <li>IPCMPR card malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the IPCMPR card (be sure to turn off the PBX when replacing).</li> </ul>
	<ul style="list-style-type: none"> <li>Not enough activation keys</li> </ul>	<ul style="list-style-type: none"> <li>Purchase additional activation key codes. Please consult a certified dealer for details.</li> </ul>
	<ul style="list-style-type: none"> <li>Poor connection</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that an 8-pin twisted pair cable is used for connection.</li> <li>Make sure that none of the CAT 5 cables in use are over 100 m (328 ft) in length.</li> <li>Make sure that a straight cable is used for connection to a switching hub.</li> </ul>
	<ul style="list-style-type: none"> <li>Network malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that all network devices in use are switched on.</li> <li>Make sure that there is no unwanted firewall in the IP network.</li> </ul>
IP-PTs/SIP Extensions do not operate.	<ul style="list-style-type: none"> <li>IP-EXT/DSP card malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the corresponding card.</li> </ul>
	<ul style="list-style-type: none"> <li>IPCMPR card malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the IPCMPR card (be sure to turn off the PBX when replacing).</li> </ul>
	<ul style="list-style-type: none"> <li>Not enough activation keys</li> </ul>	<ul style="list-style-type: none"> <li>Purchase additional activation key codes. Please consult a certified dealer for details.</li> </ul>
	<ul style="list-style-type: none"> <li>IP-PT/SIP Extension not registered</li> </ul>	<ul style="list-style-type: none"> <li>Register the corresponding IP-PT/SIP Extension.</li> </ul>
	<ul style="list-style-type: none"> <li>IP-PT/SIP Extension malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the IP-PT/SIP Extension.</li> </ul>
	<ul style="list-style-type: none"> <li>Poor connection</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that an 8-pin twisted pair cable is used for connection.</li> <li>Make sure that none of the CAT 5 cables in use are over 100 m (328 ft) in length.</li> <li>Make sure that a straight cable is used for connection to a switching hub.</li> </ul>



PROBLEM	PROBABLE CAUSE	SOLUTION
	<ul style="list-style-type: none"> <li>Network malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that all network devices in use are switched on.</li> <li>Make sure that the IP-PT/SIP Extension is not blocked by the firewall or other network devices.</li> </ul>
Extensions (except IP-PT/SIP Extension) do not operate.	<ul style="list-style-type: none"> <li>Extension card malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the corresponding card.</li> </ul>
	<ul style="list-style-type: none"> <li>Poor connection between the PBX and the extension</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> </ul>
	<ul style="list-style-type: none"> <li>A telephone with an A-A1 relay is connected.</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that a 2-wire cord is used.</li> <li>Make sure that the A-A1 relay switch of the telephone is in "OUT" or "OFF" position.</li> </ul>
	<ul style="list-style-type: none"> <li>Extension malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Take the extension and plug it into another extension port that is working. If the extension does not work, replace the extension.</li> </ul>
	<ul style="list-style-type: none"> <li>Wrong type of PSU</li> </ul>	<ul style="list-style-type: none"> <li>Replace the PSU with the appropriate type.</li> </ul>
The PBX does not operate properly.		<ul style="list-style-type: none"> <li>Press the Reset Button (refer to "5.1.4 Using the Reset Button").</li> <li>Turn off the power switch, and then turn it back on.</li> <li>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.</li> </ul>
Noise on external paging.	<ul style="list-style-type: none"> <li>Induced noise on the wire between the PBX and the amplifier.</li> </ul>	<ul style="list-style-type: none"> <li>Use a shielded cable as the connection wire between the PBX and amplifier. A short shielded cable is recommended.</li> </ul>
Distorted external music.	<ul style="list-style-type: none"> <li>Excessive input level from external music source.</li> </ul>	<ul style="list-style-type: none"> <li>Decrease the output level of the external music source by using the volume control on the music source.</li> </ul>
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).	<ul style="list-style-type: none"> <li>Voice-calling mode and Hands-free mode with LCS are not available with Wireless Phones.</li> </ul>	<ul style="list-style-type: none"> <li>Switch the calling mode to ring-calling.</li> <li>Set the LCS mode to "Private".</li> </ul>
The ALARM indicator on the front of the shelf turns on red.	<ul style="list-style-type: none"> <li>A major system error occurs in the PBX.</li> </ul>	<ul style="list-style-type: none"> <li>See the error log using the KX-TDE Maintenance Console (refer to "5.1.5 Troubleshooting by Error Log").</li> </ul>

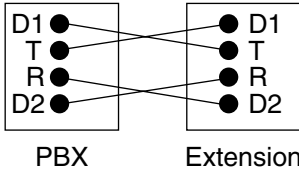
## 5.1 Troubleshooting

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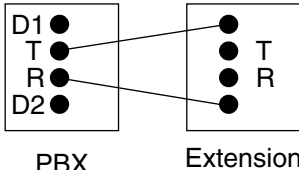
<b>PROBLEM</b>	<b>PROBABLE CAUSE</b>	<b>SOLUTION</b>
The LINK indicator of the IP-EXT/IP-GW/IPCMPR does not turn on.	<ul style="list-style-type: none"><li>• IP-EXT/IP-GW card malfunction</li></ul>	<ul style="list-style-type: none"><li>• Replace the corresponding card.</li></ul>
	<ul style="list-style-type: none"><li>• IPCMPR card malfunction</li></ul>	<ul style="list-style-type: none"><li>• Replace the IPCMPR card (be sure to turn off the PBX when replacing).</li></ul>
	<ul style="list-style-type: none"><li>• Poor connection</li></ul>	<ul style="list-style-type: none"><li>• Make sure that an 8-pin twisted pair cable is used for connection.</li><li>• Make sure that none of the CAT 5 cables in use are over 100 m (328 ft) in length.</li><li>• Make sure that a straight cable is used for connection to a switching hub.</li></ul>
	<ul style="list-style-type: none"><li>• Network malfunction</li></ul>	<ul style="list-style-type: none"><li>• Make sure that all network devices in use are switched on.</li></ul>

## 5.1.2 Connection

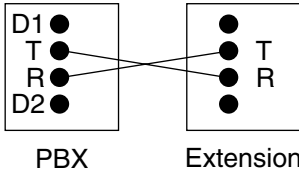
Connection between the PBX and a PT:

Can you dial an extension?	No	<b>CAUSE</b>	<b>SOLUTION</b>
		<p>The T/R is connected to the D1/D2.</p>  <p style="text-align: center;">PBX                  Extension</p>	<p>Use the correct cord (the inner 2 wires are for T/R and the outer 2 wires are for D1/D2)</p>

Connection between the PBX and an SLT:

Can you dial an extension?	No	<b>CAUSE</b>	<b>SOLUTION</b>
		<p>The T/R is connected to the D1/D2.</p>  <p style="text-align: center;">PBX                  Extension</p>	<p>Use the correct cord (the inner 2 wires are for T/R).</p> <ul style="list-style-type: none"> <li>• 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".</li> </ul>

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

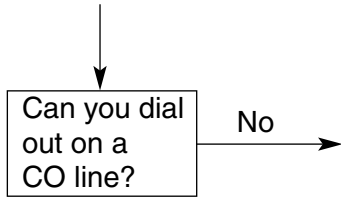
Can you dial an extension?	No	<b>CAUSE</b>	<b>SOLUTION</b>
		<p>The "T" is connected to the "R".</p>  <p style="text-align: center;">PBX                  Extension</p>	<p>Reverse the connections of the T/R.</p>

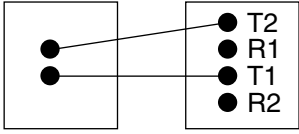
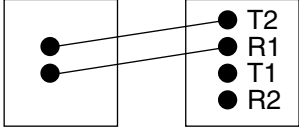
Yes

(Continued on the next page.)

Connection between the central office and the PBX:

(Continued from the previous page.)



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

## 5.1.3 Operation

PROBLEM	PROBABLE CAUSE	SOLUTION
<ul style="list-style-type: none"> <li>Cannot set the IP address, subnet mask address, and PBX IP address to the IP-PT.</li> </ul>	<ul style="list-style-type: none"> <li>An unusable value is being set.</li> </ul>	<ul style="list-style-type: none"> <li>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: "0.0.0.0" to "255.255.255.255"</li> </ul>
<ul style="list-style-type: none"> <li>Cannot register the IP-PT.</li> </ul>	<ul style="list-style-type: none"> <li>The necessary network parameters are not set to the IP-PT.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>When using a DHCP server, enter the PBX IP address.</li> </ul>
<ul style="list-style-type: none"> <li>The IP-PT cannot connect to the PBX.</li> </ul>	<ul style="list-style-type: none"> <li>The wrong IP address, subnet mask address, PBX IP address, or default gateway address was entered.</li> </ul>	<ul style="list-style-type: none"> <li>Check each parameter and enter the correct value.</li> </ul>
	<ul style="list-style-type: none"> <li>The Ethernet cable is not connected correctly.</li> </ul>	<ul style="list-style-type: none"> <li>Check the Ethernet cable connections.</li> </ul>
	<ul style="list-style-type: none"> <li>The DHCP server is not active.</li> </ul>	<ul style="list-style-type: none"> <li>Restart the DHCP server.</li> <li>Disable DHCP and re-enter settings as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>When using the speakerphone on an APT, nothing is audible.</li> </ul>	<ul style="list-style-type: none"> <li>The HANDSET/HEADSET selector is set to the "HEADSET" position.</li> </ul>	<ul style="list-style-type: none"> <li>When the headset is not used, set the HANDSET/HEADSET selector to the "HANDSET" position.</li> </ul>
<ul style="list-style-type: none"> <li>When using the speakerphone/monitor mode with a DPT, nothing is audible.</li> </ul>	<ul style="list-style-type: none"> <li>The "HEADSET" mode is selected by Personal Programming, "Handset/Headset Selection".</li> </ul>	<ul style="list-style-type: none"> <li>When the headset is not used, select the "HANDSET" mode by Personal Programming.</li> </ul>
<ul style="list-style-type: none"> <li>The PT does not ring.</li> </ul>	<ul style="list-style-type: none"> <li>The ringer volume is off.</li> </ul>	<ul style="list-style-type: none"> <li>Turn on the ringer volume.</li> </ul>
<ul style="list-style-type: none"> <li>During a power failure, extensions connected to ports 1 to 4 of MSLC16/SLC16 and ports 1 to 2 of DHLC8/SLC8 cards do not operate.</li> </ul>	<ul style="list-style-type: none"> <li>A DPT or APT is connected to the extension port.</li> <li>The dialing mode (tone or pulse) is incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>Disconnect the DPT or APT and connect an SLT.</li> <li>Set the Tone/Pulse switch to the other position.</li> </ul>
<ul style="list-style-type: none"> <li>Originating an outside call, call transfer, or conference cannot be performed.</li> </ul>	<ul style="list-style-type: none"> <li>The corresponding flexible button does not exist on the PT.</li> </ul>	<ul style="list-style-type: none"> <li>Program the flexible button. Refer to "1.6.3 Flexible Buttons" in the Feature Manual.</li> </ul>

## 5.1 Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
<ul style="list-style-type: none"> <li>Cannot register the PS.</li> </ul>	<ul style="list-style-type: none"> <li>Wrong Personal Identification Number (PIN) is registered to the PS.</li> <li>CS is not connected properly.</li> </ul>	<ul style="list-style-type: none"> <li>Enter the PIN set to the PBX into the PS.</li> <li>Make sure that the cable is connected properly with correct pin assignments. Also, make sure that the cable does not make short circuits.</li> <li>Switch all DIP switches off.</li> </ul>
<ul style="list-style-type: none"> <li>PS becomes out of range.</li> <li>Cannot make calls using the PS.</li> </ul>	<ul style="list-style-type: none"> <li>CSIF card is not working.</li> <li>CS is not working.</li> <li>Location of CS is not good.</li> <li>Access system of the PS is not properly set.</li> </ul>	<ul style="list-style-type: none"> <li>Install the CSIF card properly.</li> <li>Make sure that the cable is connected properly with correct pin assignments. Also, make sure that the cable does not make short circuits.</li> <li>Switch all DIP switches off.</li> <li>Locate the CS properly (refer to "3.9.5 Site Survey" ).</li> <li>Change the access system setting of the PS to the appropriate system or automatic.</li> </ul>
<ul style="list-style-type: none"> <li>Noise is frequent while using the PS.</li> <li>Conversations disconnect while using the PS.</li> </ul>	<ul style="list-style-type: none"> <li>Call handover is not working.</li> <li>PS is out of CS coverage area.</li> </ul>	<ul style="list-style-type: none"> <li>Locate the CS properly (refer to "3.9.5 Site Survey" ).</li> </ul>
<ul style="list-style-type: none"> <li>PS stays out of service when the CS status is changed from Out of Service to In Service.</li> </ul>	<ul style="list-style-type: none"> <li>It may take about 20 s for CS to start up after the status has been changed to In Service.</li> </ul>	<ul style="list-style-type: none"> <li>Wait until the CS starts up.</li> </ul>

## 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.

### Notes

- 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.

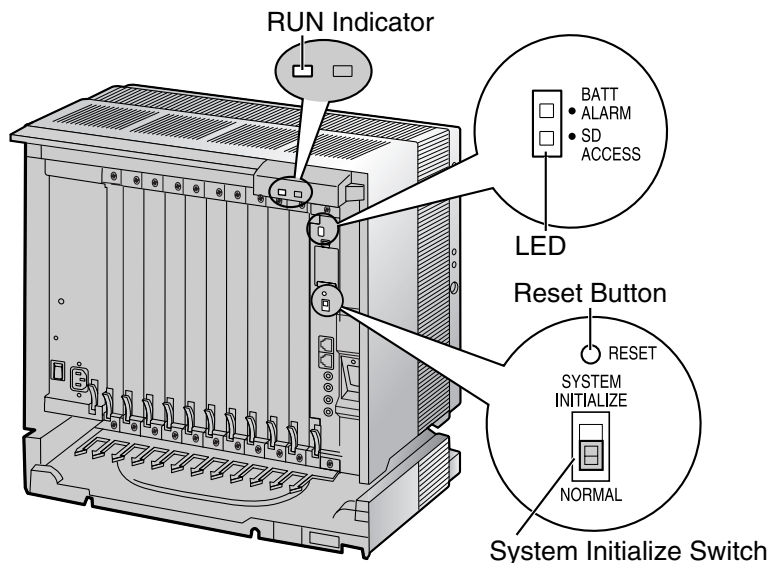
Other data stored in memory, except the above, are not cleared.

- 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.



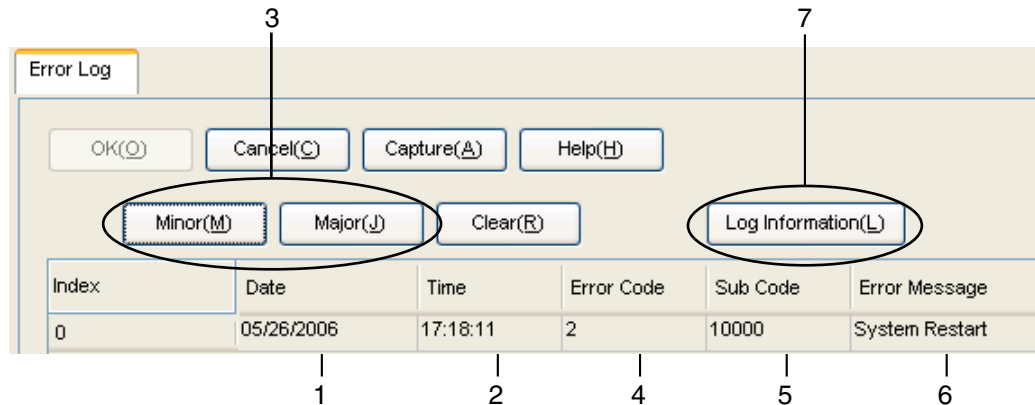
## 5.1.5 Troubleshooting by Error Log

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 "2.5.8 Utility—Error Log" in the PC Programming Manual.

**Example: KX-TDE 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
    
```

Numbered callouts 1 through 6 are placed below the SMDR lines to indicate field positions: 1 under the date, 2 under the time, 3 under the level (MN ALM), 4 under the error code (#301), 5 under the sub code (10501), and 6 under the error message (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	<p>The 6-digit sub code of the relevant hardware (X1YYZZ).</p> <ul style="list-style-type: none"> <li>• X: Shelf type <ul style="list-style-type: none"> <li>– Physical shelf: " " (blank)</li> <li>– Virtual shelf: "*" (asterisk)</li> </ul> </li> <li>• 1: Shelf number</li> <li>• YY: Slot number <ul style="list-style-type: none"> <li>– KX-TDE100 (Physical slot): 00 to 06 (00: IPCMPR Card Slot; 01 to 06: Free Slots)</li> <li>– KX-TDE200 (Physical slot): 00 to 11 (00: IPCMPR Card Slot; 01 to 11: Free Slots)</li> <li>– KX-TDE100/KX-TDE200 (Virtual slot): 01 to 08 (01 to 04: Virtual CO Line Slots; 05 to 08: Virtual Extension Slots)</li> </ul> </li> <li>• ZZ: Port number <ul style="list-style-type: none"> <li>– For optional service cards except OPB3 card: Port number (01 to 16) will be displayed.</li> <li>– For OPB3 card: Sub slot number (1 to 3) + port number (1 to 4) will be displayed as follows: <ul style="list-style-type: none"> <li>• Sub slot 1 of OPB3: 11 to 14</li> <li>• Sub slot 2 of OPB3: 21 to 24</li> <li>• Sub slot 3 of OPB3: 31 to 34</li> </ul> </li> </ul> </li> </ul> <p><b>Note</b></p> <p>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"</p>
6	Error Message	A description of the error.
7	Log Information	Displays probable causes of the errors and their solutions.



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## When you ship the product

Carefully pack and send it prepaid, adequately insured and preferably in the original carton. Attach a postage-paid 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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