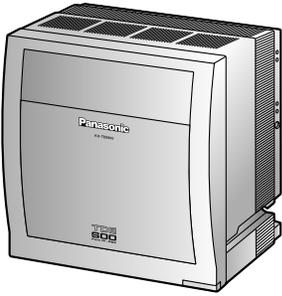


Panasonic®



Installation Manual Pure IP-PBX

Model No. **KX-TDE600**



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-TDE600: PGMPR Software File Version 3.0000 or later



SD Logo is
a trademark.

System Components

System Components Table

Category	Model No.	Description
Basic Shelf	KX-TDE600	Basic Shelf
Main Processing Card		Main Processing Card (IPCEMPR)
IPCEMPR Optional Cards	KX-TDE0105	Memory Expansion Card (IPCMEC)
	KX-TDE0110	16-Channel VoIP DSP Card (DSP16)
	KX-TDE0111	64-Channel VoIP DSP Card (DSP64)
	KX-TDA0196	Remote Card (RMT)
Optional Shelf Expansion Cards	KX-TDA6110	Bus Master Card (BUS-M)
	KX-TDA6111	Bus Master Expansion Card (BUS-ME)
Expansion Shelf	KX-TDE620	Expansion Shelf
Built-in Shelf Expansion Card		Bus Slave Card (BUS-S)
Mounting Kit	KX-TDA6201	Mounting Kit for expanding to a 3- or 4- shelf System
Activation Key Codes¹	KX-NCS4102	2-Channel IP Trunk Activation Key (2 IP Trunk)
	KX-NCS4104	4-Channel IP Trunk Activation Key (4 IP Trunk)
	KX-NCS4201	1-Channel IP Softphone/IP Proprietary Telephone Activation Key (1 IP Softphone/IP PT)
	KX-NCS4204	4-Channel IP Softphone/IP Proprietary Telephone Activation Key (4 IP Softphone/IP PT)
	KX-NCS4208	8-Channel IP Softphone/IP Proprietary Telephone Activation Key (8 IP Softphone/IP PT)
	KX-NCS4216	16-Channel IP Softphone/IP Proprietary Telephone Activation Key (16 IP Softphone/IP PT)
	KX-NCS4501	1-Channel IP Proprietary Telephone Activation Key (1 IP PT)
	KX-NCS4504	4-Channel IP Proprietary Telephone Activation Key (4 IP PT)
	KX-NCS4508	8-Channel IP Proprietary Telephone Activation Key (8 IP PT)
	KX-NCS4516	16-Channel IP Proprietary Telephone Activation Key (16 IP PT)
	KX-NCS4701	1-Channel SIP Extension Activation Key (1 SIP Extension)

Category	Model No.	Description
	KX-NCS4704	4-Channel SIP Extension Activation Key (4 SIP Extension)
	KX-NCS4708	8-Channel SIP Extension Activation Key (8 SIP Extension)
	KX-NCS4716	16-Channel SIP Extension Activation Key (16 SIP Extension)
	KX-NCS4950	Activation Key for Software Upgrade to Enhanced Version (Software Upgrade 01)
	KX-NCS2101	Activation Key for CA Basic for 1 User (CA Basic 1user)
	KX-NCS2105	Activation Key for CA Basic for 5 Users (CA Basic 5users)
	KX-NCS2110	Activation Key for CA Basic for 10 Users (CA Basic 10users)
	KX-NCS2140	Activation Key for CA Basic for 40 Users (CA Basic 40users)
	KX-NCS2149	Activation Key for CA Basic for 128 Users (CA Basic 128users)
	KX-NCS2201	Activation Key for CA PRO for 1 User (CA Pro 1user)
	KX-NCS2205	Activation Key for CA PRO for 5 Users (CA Pro 5users)
	KX-NCS2210	Activation Key for CA PRO for 10 Users (CA Pro 10users)
	KX-NCS2240	Activation Key for CA PRO for 40 Users (CA Pro 40users)
	KX-NCS2249	Activation Key for CA PRO for 128 Users (CA Pro 128users)
	KX-NCS2301	Activation Key for CA ACD Monitor for 1 ICD Supervisor (CA Supervisor 1user)
Virtual CO line Card	-	Virtual 16-Channel VoIP Gateway Card (V-IPGW16)
	-	Virtual 16-Channel SIP CO Line Card (V-SIPGW16)
Virtual Extension Cards	-	Virtual 32-Channel VoIP Extension Card (V-IPEXT32)
	-	Virtual 32-Channel SIP Extension Card (V-SIPEXT32)
	-	Virtual 4 IP Cell Station Interface Card (V-IPCS4)
Physical CO Line Cards	KX-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)
	KX-TDA6181	16-Port Analog Trunk Card (ELCOT16)
Physical Extension Cards	KX-TDA0143	4 Cell Station Interface Card (CSIF4)
	KX-TDA0144	8 Cell Station Interface Card (CSIF8)

Category		Model No.	Description
		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-TDA0177	16-Port Single Line Telephone Extension Card with Caller ID (CSLC16)
		KX-TDA0470	16-Channel VoIP Extension Card (IP-EXT16)
		KX-TDA6174	16-Port Single Line Telephone Extension Card (ESLC16)
		KX-TDA6175	16-Port Single Line Telephone Extension with Message Lamp Card (EMSLC16)
		KX-TDA6178	24-Port Single Line Telephone Extension Card with Caller ID (ECSLC24)
Other Physical Cards		KX-TDA0161	4-Port Doorphone Card (DPH4)
		KX-TDA0164	4-Port External Input/Output Card (EIO4)
		KX-TDA0168	Extension Caller ID Card (EXT-CID)
		KX-TDA0190	Optional 3-Slot Base Card (OPB3)
		KX-TDA0191	4-Channel Message Card (MSG4)
		KX-TDA0194	4-Channel Simplified Voice Message Card (ESVM4)
		KX-TDA6166	16-Channel Echo Canceller Card (EECHO16)
Power Supply Units (PSUs)		KX-TDA0103	L-Type Power Supply Unit (PSU-L)
		KX-TDA0104	M-Type Power Supply Unit (PSU-M)
Cell Stations (CSs)	2.4 GHz	KX-T0141	2-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for 2.4 GHz Portable Station
		KX-TDA0142	3-Channel Cell Station Unit Using a CSIF Card for 2.4 GHz Portable Station
		KX-T0151	2-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for 2.4 GHz Portable Station
		KX-TDA0152	3-Channel Cell Station Unit Using a CSIF Card for 2.4 GHz Portable Station
	DECT 6.0	KX-T0155	DECT 6.0 2-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for DECT 6.0 Portable Station
		KX-TDA0156	DECT 6.0 4-Channel Cell Station Unit Using a CSIF Card for DECT 6.0 Portable Station
		KX-T0158	DECT 6.0 8-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for DECT 6.0 Portable Station
		KX-NCP0158	DECT 6.0 8-Channel IP Cell Station Unit Using a V-IPCS4 Card for DECT 6.0 Portable Station

Category	Model No.	Description
Proprietary Equipment	KX-A258	Blank Slot Cover
	KX-T30865	Doorphone
	KX-T7765	
	KX-T7775	

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

Unsupported Optional Equipment

Most optional equipment supported by the KX-TDA100/KX-TDA200/KX-TDA600/KX-TDE100/KX-TDE200 can also be used with the KX-TDE600. However, the items listed below are not supported by the KX-TDE600.

Category	Model No.	Description
MPR Optional Cards	KX-TDA0105	Memory Expansion Card (MEC)
	KX-TDA6105	Memory Expansion Card (EMEC)
CO Line Cards	KX-TDA0180	8-Port Analog Trunk Card (LCOT8)
	KX-TDA0181	16-Port Analog Trunk Card (LCOT16)
	KX-TDA0183	4-Port Analog Trunk Card (LCOT4)
	KX-TDA0480	4-Channel VoIP Gateway Card (IP-GW4)
Extension Cards	KX-TDA0174	16-Port Single Line Telephone Extension Card (SLC16)
	KX-TDA0175	16-Port Single Line Telephone Extension with Message Lamp Card (MSLC16)
Other Cards	KX-TDA0166	16-Channel Echo Canceller Card (ECHO16)
	KX-TDA0410	CTI Link Card (CTI-LINK)
Optional SD Memory Cards	KX-TDA0920	SD Memory Card for Software Upgrade to Enhanced Version
	KX-TDA6920	
Activation Key Code	KX-NCS4910	Activation Key for Software Upgrade to Enhanced Version (Software Upgrade 01)
PSU	KX-TDA0108	S-Type Power Supply Unit (PSU-S)

Equipment Compatibility

Compatible Panasonic Proprietary Telephones

The PBX supports the following telephones:

- IP proprietary telephones (e.g., KX-NT300 series)
- IP softphones (e.g., KX-TDA0350)
- Digital proprietary telephones (e.g., KX-DT300 series)
- Analog proprietary telephones (e.g., KX-T7700 series)
- Portable stations (e.g., KX-TD7690)
- DSS consoles (e.g., KX-DT390)

- Single line telephones

Incompatible Panasonic Proprietary Telephones

The PBX does not support the following telephones:

- KX-T30800 series proprietary telephones and DSS consoles
- KX-T61600 series proprietary telephones and DSS consoles
- KX-T123200 series proprietary telephones and DSS consoles

Note

- For the equipment (e.g., Add-on Key Module, USB Module, Headset^{*1}) that can be connected to a particular telephone, refer to the telephone's manual.
- For other equipment that can be connected to the PBX, refer to "1.1.3 System Connection Diagram".

^{*1} The KX-T7090 headset can be connected to the KX-T7000, KX-T7200, KX-T7300, and KX-T7400 series telephones.

Notice

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

Safety Notices

Please observe the safety notices in this manual in order to avoid danger to users or other people, and prevent damage to property.

The notices are classified as follows, according to the severity of injury or damage:

<u>WARNING</u>	This notice means that misuse could result in death or serious injury.
<u>CAUTION</u>	This notice means that misuse could result in injury or damage to property.

List of Abbreviations

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

Important Safety Instructions

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

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

SAVE THESE INSTRUCTIONS

Important Information

SAVE THESE INSTRUCTIONS

WARNING

SAFETY REQUIREMENTS

For All Telephone Equipment

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

For the PBX

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

- Unplug all installed shelves of the system from the AC outlet if it emits smoke, an abnormal smell or makes unusual noise. These conditions can cause fire or electric shock. Confirm that smoke has stopped and contact an authorized Panasonic Factory Service Center.
- Danger of explosion exists if a battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the battery manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- Make sure that the wall that the shelf will be attached to is strong enough to support the shelf. If not, it is necessary for the wall to be reinforced.
- Only use the wall-mounting equipment (anchor plugs, screws, metal bracket) included with the PBX.
- When this product is no longer in use, make sure to detach it from the wall.
- Do not insert objects of any kind into this product, as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock.

CAUTION

SAFETY REQUIREMENTS

For All Telephone Equipment

- 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.
- 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

- Before touching the product (PBX, cards, etc.), discharge static electricity by touching ground or wearing a grounding strap. Failure to do so may cause the PBX to malfunction due to static electricity.
- When driving the screws into the wall, be careful to avoid touching any metal laths, wire laths or metal plates in the wall.
- When relocating the equipment, first disconnect the telecom connection before disconnecting the power connection. When the unit is installed in the new location, reconnect the power first, and then reconnect the telecom connection.
- The power supply cord is used as the main disconnect device. Ensure that the AC outlet is located near the equipment and is easily accessible.
- The SD Memory Card poses a choking hazard. Keep the SD Memory Card out of reach of children.
- Slots and openings in the front, back and bottom of the cabinet are provided for ventilation; to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface while in use. The product should never be placed near or over a radiator or other heat source. This product should not be placed in a sealed environment unless proper ventilation is provided.

SECURITY REQUIREMENTS

In order to use the PBX safely and correctly, the Security Requirements below must be observed. Failure to do so may result in:

- Loss, leakage, falsification or theft of user information.
- Illegal use of the PBX by a third party.
- Interference or suspension of service caused by a third party.

What is User Information?

User Information is defined as:

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

Requirements

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

Notice

SAFETY REQUIREMENTS For All Telephone Equipment

- Read and understand all instructions.

For the PBX

- When placing the metal bracket, make sure that the "TOP" arrow is pointing upward.
- Keep the unit away from heating appliances and devices that generate electrical noise such as fluorescent lamps, motors and televisions. These noise sources can interfere with the performance of the PBX.
- If you are having problems making calls to outside destinations, follow this procedure to test the CO lines:
 - a. Disconnect the PBX from all CO lines.
 - b. Connect known working SLTs to those CO lines.
 - c. Make a call to an external destination using those SLTs.

If a call cannot be carried out correctly, there may be a problem with the CO line that the SLT is connected to. Contact your telephone company.

If all SLTs operate properly, there may be a problem with your PBX. Do not reconnect the PBX to the CO lines until it has been serviced by an authorized Panasonic Factory Service Center.

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

CAUTION

To the Administrator or Installer regarding the system password

1. Please provide all system passwords to the customer.
2. To avoid unauthorized access and possible abuse of the PBX, keep the passwords secret, and inform the customer of the importance of the passwords, and the possible dangers if they become known to others.
3. The PBX has default passwords preset. For security, change these passwords the first time that you program the PBX.
4. Change the passwords periodically.
5. It is strongly recommended that passwords of 10 numbers or characters be used for maximum protection against unauthorized access. For a list of numbers and characters that can be used in system passwords, refer to "1.1.2 Entering Characters" in the PC Programming Manual.
6. If a system password is forgotten, it can be found by loading a backup of the system data into a PC, and checking the password using the Maintenance Console software. If you do not have a backup of the system data, you must reset the PBX to its factory defaults and reprogram it. Therefore, we strongly recommend maintaining a backup of the system data. For more information on how to back up the system data, refer to "2.5.1 Tool—SD memory backup" in the PC Programming Manual. However, as system passwords can be extracted from backup copies of the system data file, do not allow unauthorized access to these files.

Notice for users in California

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

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

Introduction

This Installation Manual is designed to serve as an overall technical reference for the Panasonic Pure IP-PBX, KX-TDE600. It provides instructions for installing the hardware, and programming the PBX using the Maintenance Console.

The Structure of this Manual

This manual contains the following sections:

Section 1 System Outline

Provides general information on the PBX, including the system capacity and specifications.

Section 2 Activation Key Installation

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

Section 3 Installation

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

Section 4 Guide for the Maintenance Console

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

Section 5 Troubleshooting

Provides information on the PBX and telephone troubleshooting.

About the Other Manuals

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

Feature Manual

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

PC Programming Manual

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

PT Programming Manual

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

Operating Manual

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

About the software version of your PBX

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

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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: ACJMF04BKX-TDA600. 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-TDE600
- Certification No.: found on the side of the unit
- Ringer Equivalence No.: 0.4B
- Facility Interface Code: 02LS2, 04DU9.BN/DN/1KN/1SN
- Service Order Code: 9.0F, 6.0P
- Required Network Interface Jack: RJ21X, RJ48C

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: ACJMF04BKX-TDA600. The digits represented by 04 are the REN without a decimal point (e.g., 04 is a REN of 0.4). 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 Servicenter Directory. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

6. Connection to Party Line

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

7. Combined Use with Alarm Equipment

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

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

KEEP THE SOFTWARE UP-TO-DATE WITH THE LATEST DATA.

Table of Contents

1	System Outline	19
1.1	System Construction	20
1.1.1	Basic System	20
1.1.2	Expanded System	21
1.1.3	System Connection Diagram	26
1.2	Optional Equipment	28
1.2.1	Optional Equipment	28
1.3	Specifications	31
1.3.1	General Description	31
1.3.2	Characteristics	33
1.3.3	System Capacity	34
2	Activation Key Installation	43
2.1	Information about the Activation Keys	44
2.1.1	Activation Keys	44
2.1.2	Activation Key Code and Key Management System	48
2.1.3	Activation Key File	49
3	Installation	51
3.1	Before Installation	52
3.1.1	Before Installation	52
3.2	Installation of the PBX	54
3.2.1	Unpacking	54
3.2.2	Names and Locations	56
3.2.3	Opening/Closing the Front Cover	57
3.2.4	Attaching Fan Guards	59
3.2.5	Installation of Basic System or 2-shelf System (Floor Standing)	60
3.2.6	Installation of 3- or 4-shelf System (Tower Type)	68
3.2.7	Installation of 4-shelf System (Side-by-side Type)	90
3.2.8	Wall Mounting (KX-TDE600/KX-TDE620)	106
3.2.9	Installing/Replacing the Power Supply Unit	109
3.2.10	Frame Ground Connection	113
3.2.11	Installing/Removing the Optional Service Cards	114
3.2.12	Cable Handling	118
3.2.13	Types of Connectors	120
3.2.14	Attaching a Ferrite Core	122
3.2.15	Fastening Amphenol Connector	124
3.2.16	Surge Protector Installation	126
3.3	Information about the Main Processing Card	129
3.3.1	IPCEMPR Card	129
3.3.2	DSP16 Card (KX-TDE0110) and DSP64 Card (KX-TDE0111)	132
3.3.3	IPCMEC Card (KX-TDE0105)	134
3.3.4	RMT Card (KX-TDA0196)	135
3.4	Information about the Virtual Cards	136
3.4.1	Virtual Cards	136
3.5	Information about the Optional Shelf Expansion Cards	137
3.5.1	BUS-M Card (KX-TDA6110)	137
3.5.2	BUS-ME Card (KX-TDA6111)	138
3.6	Information about the Built-in Shelf Expansion Card	139
3.6.1	BUS-S Card	139
3.7	Information about the CO Line Cards	140
3.7.1	ELCOT16 Card (KX-TDA6181)	140

3.7.2	CID8 Card (KX-TDA0193)	142
3.7.3	T1 Card (KX-TDA0187)	143
3.7.4	PRI23 Card (KX-TDA0290)	145
3.7.5	IP-GW4E Card (KX-TDA0484)	147
3.7.6	IP-GW16 Card (KX-TDA0490)	149
3.8	Information about the Extension Cards	151
3.8.1	CSIF4 Card (KX-TDA0143) and CSIF8 Card (KX-TDA0144)	151
3.8.2	DHLC8 Card (KX-TDA0170)	153
3.8.3	DLC8 Card (KX-TDA0171)	156
3.8.4	DLC16 Card (KX-TDA0172)	158
3.8.5	SLC8 Card (KX-TDA0173)	160
3.8.6	EXT-CID Card (KX-TDA0168)	162
3.8.7	CSLC16 Card (KX-TDA0177), ESLC16 Card (KX-TDA6174), EMSLC16 Card (KX-TDA6175), and ECSLC24 Card (KX-TDA6178)	163
3.8.8	IP-EXT16 Card (KX-TDA0470)	166
3.9	Information about the Other Cards	168
3.9.1	OPB3 Card (KX-TDA0190)	168
3.9.2	DPH4 Card (KX-TDA0161)	169
3.9.3	EIO4 Card (KX-TDA0164)	171
3.9.4	MSG4 Card (KX-TDA0191)	174
3.9.5	ESVM4 Card (KX-TDA0194)	175
3.9.6	EECHO16 Card (KX-TDA6166)	176
3.10	Connection of Extensions	177
3.10.1	Maximum Cabling Distances of the Extension Wiring (Twisted Cable)	177
3.10.2	Parallel Connection of the Extensions	179
3.10.3	Digital EXtra Device Port (Digital XDP) Connection	182
3.10.4	First Party Call Control CTI Connection	186
3.11	Connection of Doorphones, Door Openers, External Sensors, and External Relays	187
3.11.1	Connection of Doorphones, Door Openers, External Sensors, and External Relays	187
3.12	Connection of Peripherals	190
3.12.1	Connection of Peripherals	190
3.13	LAN Connection	194
3.13.1	LAN Connection	194
3.14	Power Failure Connections	195
3.14.1	Power Failure Connections	195
3.15	Starting the PBX	197
3.15.1	Starting the PBX	197
4	Guide for the Maintenance Console	201
4.1	Overview	202
4.1.1	Overview	202
4.2	PC Connection	203
4.2.1	PC Connection	203
4.3	Installation of the Maintenance Console	206
4.3.1	Installing and Starting the Maintenance Console	206
5	Troubleshooting	209
5.1	Troubleshooting	210
5.1.1	Installation	210
5.1.2	Connection	214
5.1.3	Operation	216
5.1.4	Using the Reset Button	218
5.1.5	Troubleshooting by Error Log	219

- 6 Appendix221**
- 6.1 Revision History222**
- 6.1.1 PGMPR Software File Version 3.0xxx222
- Index.....223**

Section 1

System Outline

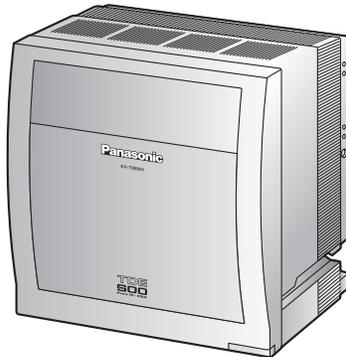
This section provides general information on the PBX, including the system capacity and specifications.

1.1 System Construction

1.1.1 Basic System

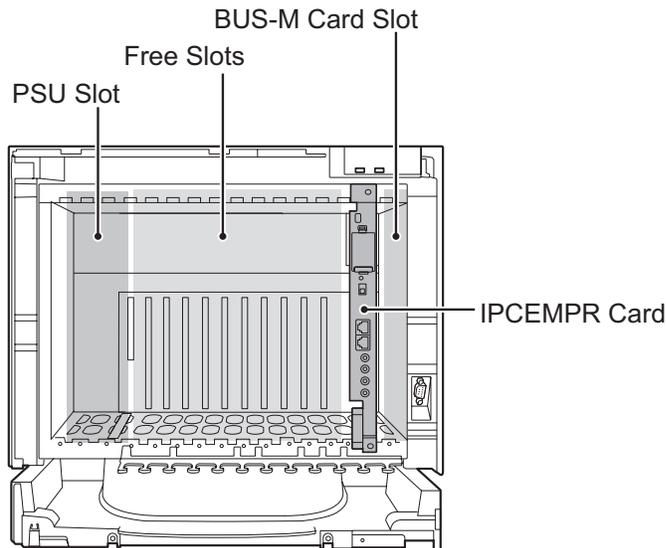
Basic Shelf

The Basic Shelf contains an IPCEMPR card for controlling the PBX. To use the basic system, install a power supply unit (PSU) in the PSU Slot and optional service cards in Free Slots. To expand to a multiple-shelf system, you also need to install a BUS-M card in the BUS-M Card Slot.



Basic Shelf (KX-TDE600)

Construction of the Basic Shelf

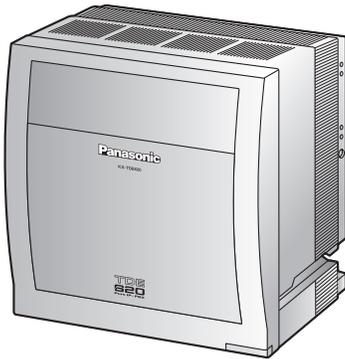


Basic Shelf (KX-TDE600)

1.1.2 Expanded System

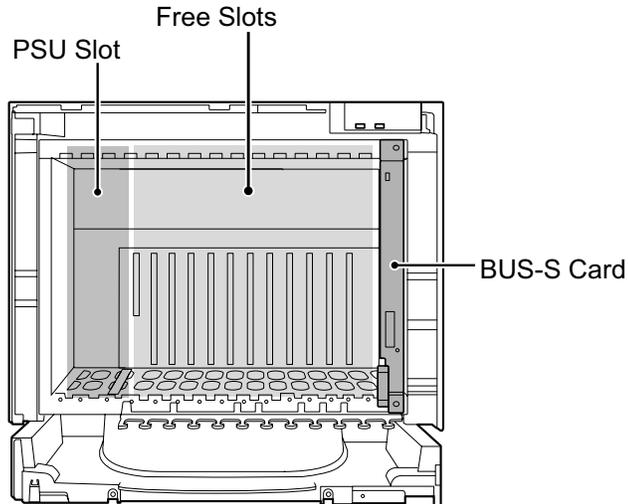
Expansion Shelf

Each Expansion Shelf contains a BUS-S card for connecting to the Basic Shelf. To use Expansion Shelf, connect it to the Basic Shelf, and install a power supply unit (PSU) in the PSU Slot and optional service cards in Free Slots. Up to 3 Expansion Shelves can be connected to the Basic Shelf.



Expansion Shelf (KX-TDE620)

Construction of an Expansion Shelf



Expansion Shelf (KX-TDE620)

2-shelf System

Expanded system (Basic Shelf + 1 Expansion Shelf). Expansion Shelf 1 is mounted on the Basic Shelf.



CAUTION

If you are installing a 2-shelf system in an area prone to earthquakes, make sure to fix the system to the wall using the wall brackets (supplied with an optional Mounting Kit).

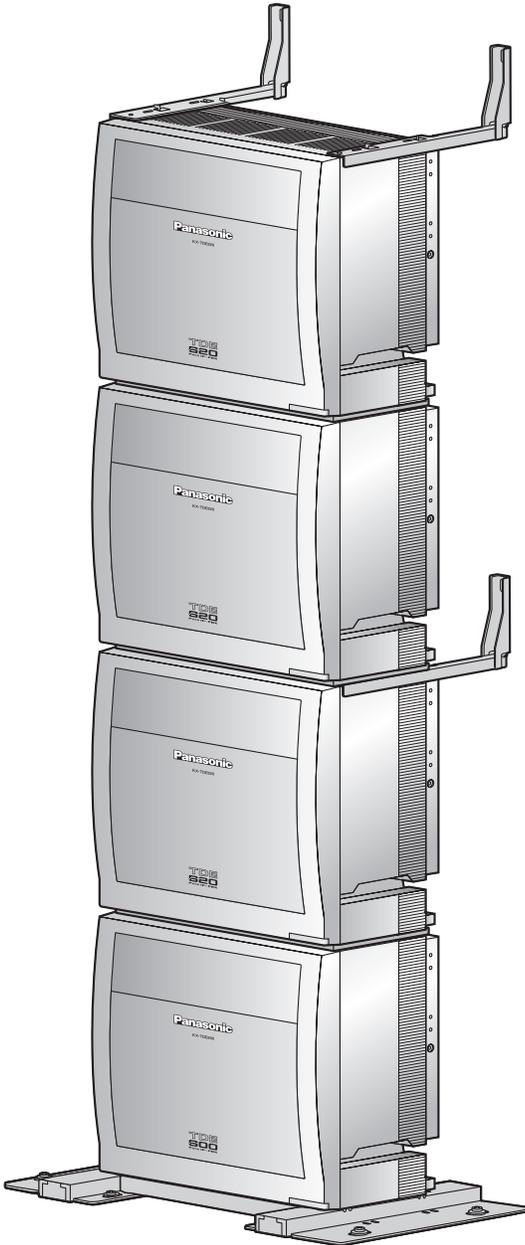
3-shelf System (Tower Type)

Expanded system (Basic Shelf + 2 Expansion Shelves). Expansion Shelves 1 and 2 are mounted on the Basic Shelf. A Mounting Kit is required for the 3-shelf system.



4-shelf System (Tower Type)

Fully expanded system (Basic Shelf + 3 Expansion Shelves). Expansion Shelves 1 to 3 are mounted on the Basic Shelf. A Mounting Kit is required for the 4-shelf system.

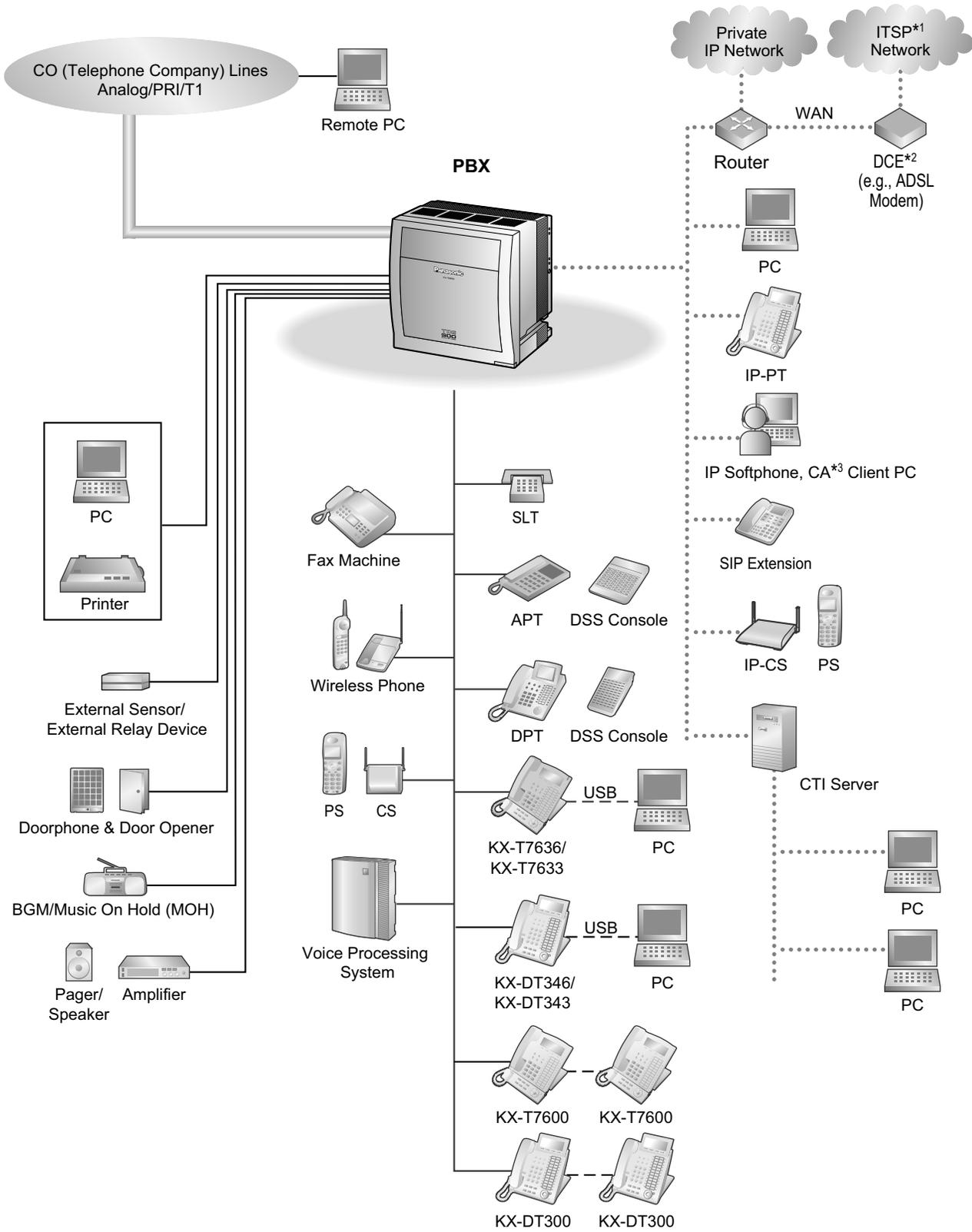


4-shelf System (Side-by-side Type)

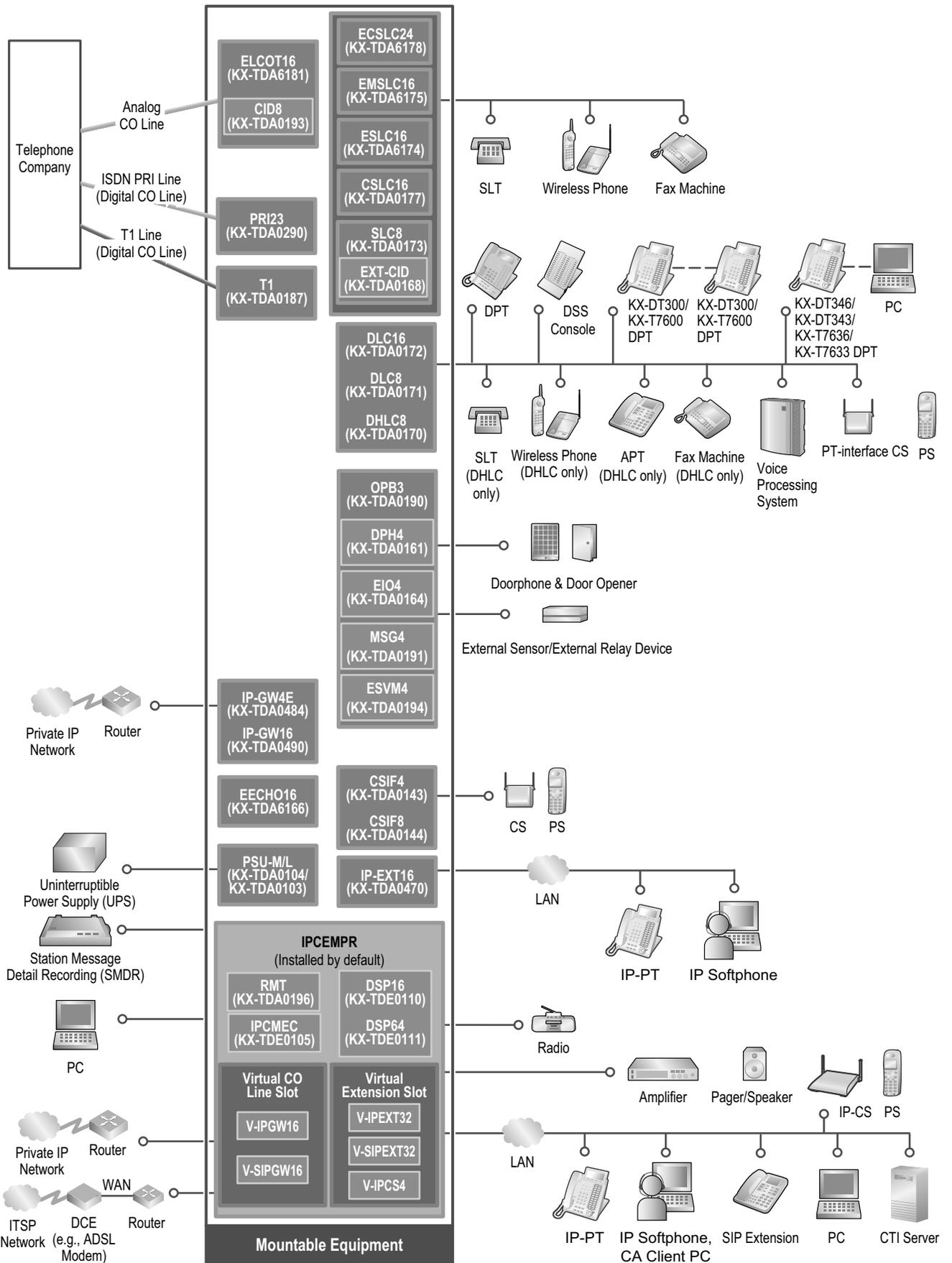
When vertical space is limited, it is possible to install a fully expanded system (Basic Shelf + Expansion Shelf 1, and Expansion Shelf 2 + Expansion Shelf 3) in a side-by-side configuration. Expansion Shelf 1 is mounted on the Basic Shelf, and Expansion Shelf 3 is mounted on Expansion Shelf 2. Installing the system using base stands (supplied with an optional Mounting Kit) makes it easy to reinstall shelves in a different place.



1.1.3 System Connection Diagram



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



1.2 Optional Equipment

1.2.1 Optional Equipment

Model No.	Model Name	Description
KX-TDE0105	Memory Expansion Card (IPCMEC)	Memory expansion card to increase system data storage space. To be mounted on the IPCEMPR card.
KX-TDE0110	16-Channel VoIP DSP Card (DSP16)	16-channel digital signal processor card with a 4-Channel IP Trunk activation key and a 8-Channel IP Proprietary Telephone activation key preinstalled. Compliant with ITU-T G.729A and G.711 codec methods. To be mounted on the IPCEMPR 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 IPCEMPR card.
KX-TDA0103	L-Type Power Supply Unit (PSU-L)	Power Supply Unit. Total power output of 279 W. Safety Class 1 compliant.
KX-TDA0104	M-Type Power Supply Unit (PSU-M)	Power Supply Unit. Total power output of 140.4 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-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.

Model No.	Model Name	Description
KX-TDA0177	16-Port Single Line Telephone Extension Card with Caller ID (CSLC16)	16-port extension card for SLTs with Caller ID (FSK) and 4 power failure transfer (PFT) ports.
KX-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 optional service cards from the following: MSG4, DPH4 or EIO4 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 ELCOT16 card.
KX-TDA0194	4-Channel Simplified Voice Message Card (ESVM4)	4-channel simplified voice message card for Built-in Simplified Voice Message feature. Also supports MSG card features. To be mounted on the OPB3 card.
KX-TDA0196	Remote Card (RMT)	Analog modem card for remote communication with the PBX. V90 support. To be mounted on the IPCEMPR 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.
KX-TDA6110	Bus Master Card (BUS-M)	Optional shelf expansion card required when mounting Expansion Shelves. To be installed in the Basic Shelf only.
KX-TDA6111	Bus Master Expansion Card (BUS-ME)	Optional shelf expansion card required when mounting Expansion Shelf 2 or 3. To be mounted on the BUS-M card installed in the Basic Shelf.
KX-TDA6166	16-Channel Echo Canceller Card (EECHO16)	16-channel card for echo cancellation during conferences.
KX-TDA6174	16-Port Single Line Telephone Extension Card (ESLC16)	16-port extension card for SLTs with 4 power failure transfer (PFT) ports.

1.2.1 Optional Equipment

Model No.	Model Name	Description
KX-TDA6175	16-Port Single Line Telephone Extension with Message Lamp Card (EMSLC16)	16-port extension card for SLTs with Message Waiting Lamp control and 4 power failure transfer (PFT) ports. Maximum power output of 145 V/ 85 V for Message Waiting Lamp control.
KX-TDA6178	24-Port Single Line Telephone Extension Card with Caller ID (ECSLC24)	24-port extension card for SLTs with Caller ID (FSK) and 4 power failure transfer (PFT) ports. Can only be installed in shelves in which a PSU-L is installed.
KX-TDA6181	16-Port Analog Trunk Card (ELCOT16)	16-port analog CO line card with 4 power failure transfer (PFT) ports.
KX-TDA6201	Mounting Kit	Mounting Kit for expanding to a 3- or 4-shelf system.

1.3 Specifications

1.3.1 General Description

Control Bus		Original bus (16-bit, 8 MHz, 10 megabytes per second)	
Communication Bus		H.100 bus conformity (1024 time slots)	
Switching		Distributed Switching	
Power Input	PSU-M	100 V AC to 130 V AC; 2.5 A/200 V AC to 240 V AC; 1.4 A; 50 Hz/60 Hz	
	PSU-L	100 V AC to 130 V AC; 5.1 A/200 V AC to 240 V AC; 2.55 A; 50 Hz/60 Hz	
Maximum Power Failure Tolerance**		300 ms	
Power Consumption (per shelf)	With PSU-M	190 W; 2.5 A (at 120 V AC; 60 Hz)	
	With PSU-L	410 W; 5.1 A (at 120 V AC; 60 Hz)	
Memory Backup Duration		7 years	
Dialing	CO Line	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialing	
	Extension	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialing	
Mode Conversion		DP-DTMF, DTMF-DP	
Ring Frequency		20 Hz/25 Hz (selectable)	
Central Office Loop Limit		1600 Ω maximum	
Operating Environment	Temperature	0 °C to 40 °C (32 °F to 104 °F)	
	Humidity	10 % to 90 % (non-condensing)	
Conference Call CO Line (per shelf)		From 10 \times 3-party conference call to 4 \times 8-party conference call	
Music on Hold (MOH)		2 ports (Level Control: -11 dB to +11 dB in 1 dB steps) MOH1: External Music Source port MOH2: Selectable Internal/External Music Source port	
Paging	Internal	Level Control: -15 dB to +6 dB in 3 dB steps	
	External	2 ports (Volume Control: -15 dB to +15 dB in 1 dB steps)	
Serial Interface Port	RS-232C	1 (maximum 115.2 kbps)	
RJ45 Port	MNT Port	1 (for PC connection)	
	LAN Port	1 (for LAN connection)	
Extension Connection Cable		SLT	1-pair wire (T, R)
		DPT	1-pair wire (D1, D2) or 2-pair wire (T, R, D1, D2)
		APT	2-pair wire (T, R, D1, D2)

1.3.1 General Description

		PT-interface CS	1-pair wire (D1, D2)
		PT-interface CS (High-density)	4-pair wire (D1, D2)
		DSS Console and Add-on Key Module	1-pair wire (D1, D2)
Dimension	Basic Shelf	430 mm (W) × 415 mm (H) × 270 mm (D) (17-1/5 in × 16-3/5 in × 10-4/5 in)	
	Expansion Shelf	430 mm (W) × 415 mm (H) × 270 mm (D) (17-1/5 in × 16-3/5 in × 10-4/5 in)	
Weight (when fully mounted)	Basic Shelf	Under 16 kg (35.2 lb)	
	Expansion Shelf	Under 16 kg (35.2 lb)	

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

1.3.2 Characteristics

Terminal Equipment Loop Limit	<ul style="list-style-type: none"> • PT: KX-DT300/KX-T7600 series DPT: 90 Ω; all other DPTs/APTs: 40 Ω • SLT: 600 Ω including set • Doorphone: 20 Ω • CS: 130 Ω; PT-interface CS: 65 Ω
Minimum Leakage Resistance	15 000 Ω minimum
Maximum Number of Extension Instruments per Line	<ol style="list-style-type: none"> 1. for PT or SLT 2. by Parallel or eXtra Device Port connection of an APT/DPT and an SLT 3. by Digital eXtra Device Port connection of 2 DPTs and an SLT
Ring Voltage	75 Vrms at 20 Hz/25 Hz depending on the Ringing Load
Central Office Loop Limit	1600 Ω maximum
Hookswitch Flash Timing Range	24 ms to 2032 ms
Door Opener Current Limit	24 V DC/30 V AC, 1 A maximum
External Relay Current Limit	24 V DC/30 V AC, 1 A maximum
External Sensor Current Limit	Power to the external sensor is provided from the EIO4 card and must be grounded through the EIO4 card. For the connection diagram, refer to "3.9.3 EIO4 Card (KX-TDA0164)". The PBX detects input from the sensor when the signal is under 100 Ω .
Paging Terminal Impedance	600 Ω
MOH (Music on Hold) Terminal Impedance	10 000 Ω

1.3.3 System Capacity

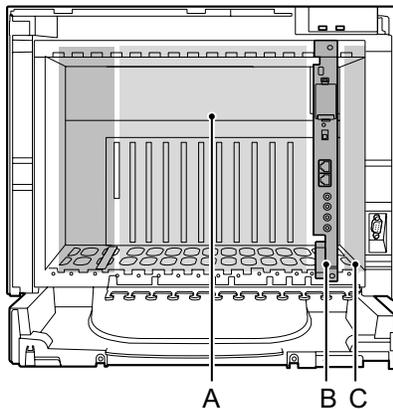
Type and Maximum Number of Slots

The PBX supports the following type and number of slots.

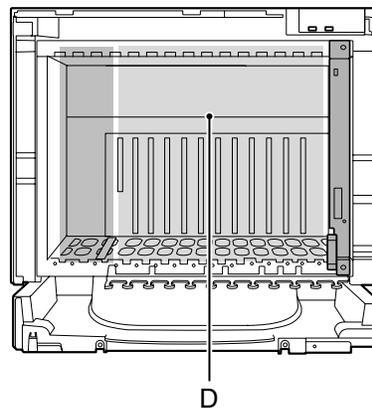
Slot Type		Maximum Number			
		Basic System	2-shelf System	3-shelf System	4-shelf System
IPCEMPR Card Slot		1	1	1	1
BUS-M Card Slot		1	1	1	1
Free Slot		10	21	32	43
Virtual Slot	Virtual CO Line Slot	4	4	4	4
	Virtual Extension Slot	4	4	4	4

Card Slots

Basic Shelf

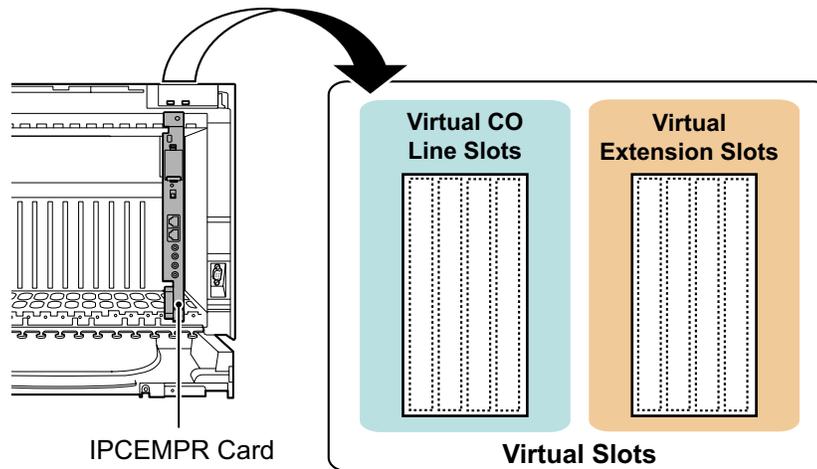


Expansion Shelf



- A. Free Slots 1 to 10 (from the left)
- B. IPCEMPR Card Slot
- C. BUS-M Card Slot
- D. Free Slots 1 to 11 (from the left)

Virtual Slots of the IPCEMPR Card



Maximum Optional Service Cards

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

Note

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

Cards Installed in Free Slots or Virtual Slots

Card Type	Maximum Number			
	Basic System	2-shelf System	3-shelf System	4-shelf System
IPCEMPR	1	1	1	1
CO Line Card	14 ^{*1}	24 ^{*1}	34 ^{*1}	40 ^{*1}
Virtual CO Line Card	4	4	4	4
V-IPGW16	2	2	2	2
V-SIPGW16	2	2	2	2
Physical CO Line Card	10 ^{*1}	20 ^{*1}	30 ^{*1}	40 ^{*1}
ELCOT16	10	20	30	40
T1	5	10	15	20
PRI23				
IP-GW4E	10	20	30	40
IP-GW16				
Extension Card	14	24	34	40
Virtual Extension Card	4	4	4	4
V-IPEXT32	4	4	4	4
V-SIPEXT32				
V-IPCS4				
Physical Extension Card	10	20	30	40
DHLC8	10	20	30	40
DLC8				
DLC16				
SLC8				
CSLC16				
ESLC16				
ECSLC24 ^{*2}				
EMSLC16				
IP-EXT16				
CSIF4				
CSIF8				
OPB3	4	8	12	16
EECHO16	2	4	6	8
Total	18	29	40	51 (43)^{*3}

*1 One T1 or PRI23 card counts as 2 cards.

*2 Can only be installed in shelves in which a PSU-L is installed.

*3 The maximum number of CO line cards and extension cards is limited to 43. Also, in this case, one T1 or PRI23 card counts as 1 card.

Cards Mounted on Other Optional Service Cards

Card Type	Maximum Number				Mounted on
	Basic System	2-shelf System	3-shelf System	4-shelf System	
DSP16	1				IPCEMPR Card
DSP64					
IPCMEC					
RMT	1				
CID8	20	40	60	80	ELCOT16 Card
EXT-CID	10	20	30	40	SLC8 Card
DPH4	4	8	12	16	OPB3 Card
MSG4	4	8	12	16	
ESVM4					
EIO4	4	8	12	16	
BUS-ME	–		1	2	BUS-M Card

Maximum CO Lines and Extensions

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

Type	Basic System	2-shelf System	3-shelf System	4-shelf System
Total Number of CO Lines	224	384	544	640
CO Line (Physical CO Line Card)	160	320	480	640
CO Line (Virtual CO Line Card)	64 ^{*1}			
H.323 CO Lines	32			
SIP CO Lines	32			
Total Number of Extensions	432	736	1008	1152
Extension (Physical Extension Card)	304	608	880	1120
PT	256	512	640 ^{*2}	640 ^{*2}
SLT	240	480	720	960
PT and SLT	304	608	880	1120
Extension (Virtual Extension Card)	128 ^{*1}			
IP-PT and IP Softphone	128			
SIP Extension				

^{*1} Only 49 virtual CO line/extension card channels can be in use at any one time (except for peer-to-peer calls for IP extensions).

^{*2} The maximum number of PTs in the whole system is limited to 640.

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 number of items of terminal equipment can be supported by the PBX.

Terminal Equipment Type	Basic System	2-shelf System	3-shelf System	4-shelf System
Telephone (using Digital XDP)	368 (432) ^{*1}	608 (736) ^{*1}	848 (1008) ^{*1}	992 (1152) ^{*1}
SLT	240	480	720	960
KX-DT300/KX-T7600 series DPT	256	512	640	640
Other DPT	128	256	384	512
APT	80	160	240	320
IP-PT	288	448	608	704
IP-PT ^{*2} (supported by IP-EXT16 card)	160	320	480	640
IP-PT ^{*3} (supported by IPCEMPR card)	128 ^{*4}			
SIP Extension	128			
DSS console	64			
CS	32 ^{*5}	64 ^{*5}	96 ^{*5}	128 ^{*5}
2- to 4- channel CS	32	64	96	128
High-density CS	16	32	48	64
IP-CS	16	16	16	16
PS	512			
Voice Processing System (VPS) ^{*6}	8			
Doorphone	16	32	48	64
Door Opener	16	32	48	64
External Sensor	16	32	48	64
External Relay	16	32	48	64

^{*1} Even when Digital XDP is used, each shelf supports a maximum of 256 KX-DT300/KX-T7600 series DPTs.

^{*2} KX-NT300 series (except KX-NT366/KX-NT305), KX-NT265, and KX-NT136

^{*3} KX-NT400, KX-NT300 series, and KX-NT265 (software version 2.00 or later only)

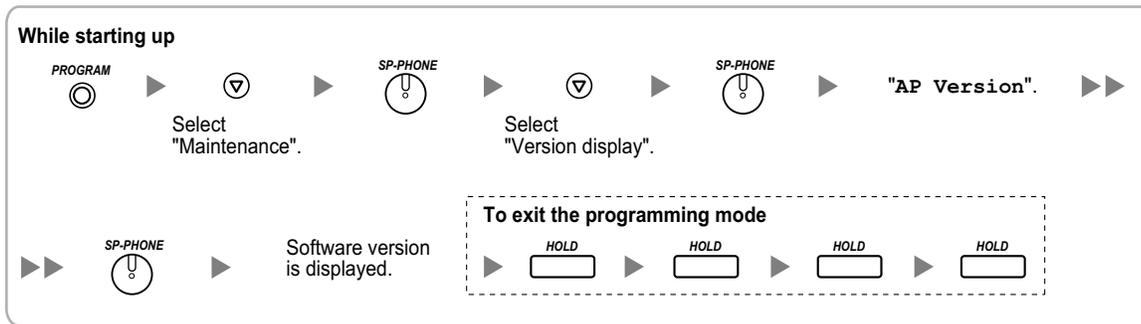
^{*4} For the KX-NT400, the maximum number of extensions that can be connected to the PBX is 64.

^{*5} One high-density CS or IP-CS counts as 2 CSs for the total number of CSs.

^{*6} Only a single VPS can be connected to one optional service card.

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 for Each Shelf

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

Note

Regardless of the total load figure, if a shelf contains an ECSLC24 card, the PSU-L must be installed.

Load Figure Calculation

Equipment Type		Load Figure
PT	KX-DT300 series DPT/KX-DT300 series DSS console/KX-T7600 series DPT/KX-T7600 series DSS console	1
	KX-T7560/KX-T7565 DPT	1
	Other DPT/Other DSS console	4
	APT	4
	IP-PT	0
	SIP Extension	0
Extension Card ^{*1}	DHLC8	8
	SLC8	8
	ESLC16/CSLC16/EMSLC16	16
	ECSLC24	24
CS (1 unit)		4
High-density CS (1 unit)		8
IP-CS (1 unit)		0
VPS (1 port)		1

^{*1} Only the extension cards that can support SLTs count for the load figures.

PSU Capacity

Each PSU supports a different load figure.

PSU Type	Maximum Load Figure
PSU-M	128
PSU-L	512

If the total load figure is greater than 128, you must install the PSU-L. If the total load figure is less than 128, but you expect expansion in the future, it may be better to install the PSU-L instead of the PSU-M. There is no harm in installing a PSU that is larger than is required for the current configuration.

Calculation Example

Equipment Type		Load Figure
KX-T7600 series DPT	48 units	48
Other DPT	4 units	16
ESLC16	1 card	16
EMSLC16	3 cards	48
VPS	8 ports	8
Total		136

The total load figure is 136. As this is between 128 and 512, you must install the PSU-L.

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 IPCEMPR card or to upgrade the software for enhanced features, you need the appropriate activation keys.

Type and Maximum Number of Activation Keys

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

Activation Key Type	Description	Maximum Number	Supported IP CO lines/ IP Telephones/CA Users
2 IP Trunk¹	Allows the use of 2 IP CO lines (H.323/SIP).	32	64 IP CO lines (H.323/SIP)
4 IP Trunk¹	Allows the use of 4 IP CO lines (H.323/SIP).	16	
1 IP Softphone/IP PT²	Allows the use of 1 IP-PT/IP softphone.	128	128 IP-PTs/IP softphones
4 IP Softphone/IP PT²	Allows the use of 4 IP-PTs/IP softphones.	32	
8 IP Softphone/IP PT²	Allows the use of 8 IP-PTs/IP softphones.	16	
16 IP Softphone/IP PT²	Allows the use of 16 IP-PTs/IP softphones.	8	
1 IP PT	Allows the use of 1 IP-PT.	128	128 IP-PTs
4 IP PT	Allows the use of 4 IP-PTs.	32	
8 IP PT	Allows the use of 8 IP-PTs.	16	
16 IP PT	Allows the use of 16 IP-PTs.	8	
1 SIP Extension	Allows the use of 1 SIP Extension.	128	128 SIP Extensions
4 SIP Extension	Allows the use of 4 SIP Extensions.	32	
8 SIP Extension	Allows the use of 8 SIP Extensions.	16	
16 SIP Extension	Allows the use of 16 SIP Extensions.	8	
CA Basic 1user	Allows the use of CA Basic for 1 user.	128	128 users
CA Basic 5users	Allows the use of CA Basic for 5 users.	25	125 users
CA Basic 10users	Allows the use of CA Basic for 10 users.	12	120 users
CA Basic 40users	Allows the use of CA Basic for 40 users.	3	120 users

Activation Key Type	Description	Maximum Number	Supported IP CO lines/ IP Telephones/CA Users
CA Basic 128users	Allows the use of CA Basic for 128 users.	1	128 users
CA Pro 1user	Allows the use of CA PRO for 1 user.	128	128 users
CA Pro 5users	Allows the use of CA PRO for 5 users.	25	125 users
CA Pro 10users	Allows the use of CA PRO for 10 users.	12	120 users
CA Pro 40users	Allows the use of CA PRO for 40 users.	3	120 users
CA Pro 128users	Allows the use of CA PRO for 128 users.	1	128 users
CA Supervisor 1user	Allows the use of CA ACD Monitor for 1 ICD Supervisor.	4	4 users
Software Upgrade 01	Upgrades software to use enhanced features.	1	-

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

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

Preinstalled Activation Keys in the DSP16/DSP64

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

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

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

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

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

The following type and number of additional activation keys can be installed on the SD Memory Card:

Activation Keys for IP CO Lines

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

Activation Keys for IP Telephones

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

Activation Keys for CA Users

Model No.	Activation Key Type	Maximum Number	Supported CA Users
KX-NCS2101	CA Basic 1user	128	128 users
KX-NCS2105	CA Basic 5users	25	125 users
KX-NCS2110	CA Basic 10users	12	120 users
KX-NCS2140	CA Basic 40users	3	120 users
KX-NCS2149	CA Basic 128users	1	128 users
KX-NCS2201	CA Pro 1user	128	128 users

Model No.	Activation Key Type	Maximum Number	Supported CA Users
KX-NCS2205	CA Pro 5users	25	125 users
KX-NCS2210	CA Pro 10users	12	120 users
KX-NCS2240	CA Pro 40users	3	120 users
KX-NCS2249	CA Pro 128users	1	128 users
KX-NCS2301	CA Supervisor 1user	4	4 users

Activation Keys for Software Upgrading

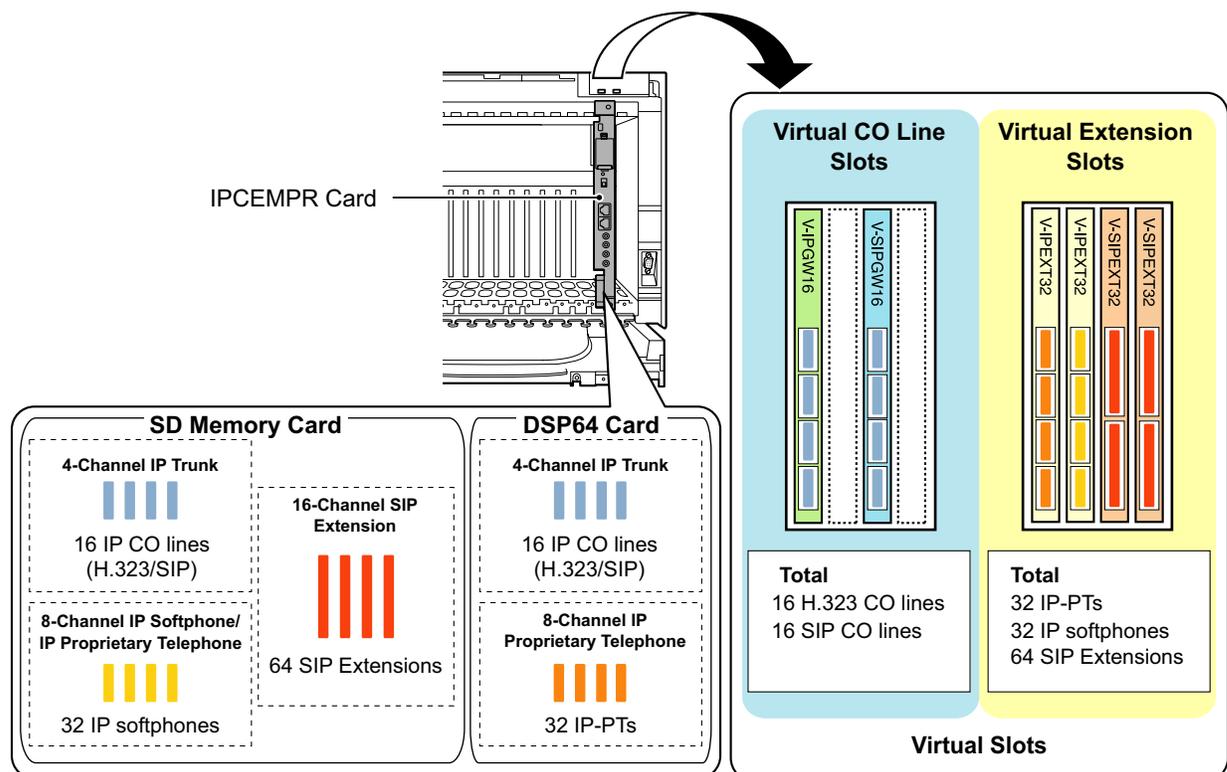
Model No.	Activation Key Type	Maximum Number
KX-NCS4950	Software Upgrade 01	1

Note

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

Activation Key Installation Example

The following shows an example of when using 16 H.323 CO lines, 16 SIP CO lines, 32 IP-PTs, 32 IP softphones, and 64 SIP Extensions on a private IP network using the IPCEMPR 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 IPCEMPR card in the PBX, and activation key number and registration ID provided on each activation key code.

For information about the type of activation key codes available, refer to "Additional Activation Keys in the SD Memory Card (Activation Key Files)".

Note

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

2.1.3 Activation Key File

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

Installing the Activation Key File in the SD Memory Card

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

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

Note

- It is necessary to restart the PBX to activate the Software Upgrade 01 activation key after performing the procedure above. To restart the PBX, refer to "5.1.4 Using the Reset Button".
- For information about programming activation keys using the Maintenance Console, refer to "3.3 [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 IPCEMPR card crashes.

Section 3

Installation

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

3.1 Before Installation

3.1.1 Before Installation

Please read the following notes concerning installation and connection before installing the PBX and terminal equipment.

Be sure to comply with all applicable laws, regulations, and guidelines.

Safety Installation Instructions

WARNING

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

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Anti-static precautions should be taken during installation.

Installation Precautions

The PBX is made for both floor standing and wall mounting, and should be installed in a location where it is accessible for inspections and maintenance.

To prevent malfunction, noise, or discoloration, follow the instructions below:

Do not install the system in the following locations:

WARNING

- Areas where shocks or vibrations are frequent or strong. Such activity may lead to the product falling over and causing injury, or may impair the product's performance.
- Areas with high amounts of dust. High amounts of dust can lead to fire or electric shock, and impair the performance of the product.

CAUTION

- In direct sunlight and hot, cold, or humid places. (Temperature range: 0 °C to 40 °C [32 °F to 104 °F])
- Areas where sulfuric gases may be present, such as near thermal springs.
- Near devices that generate high frequencies, such as sewing machines or electric welders.
- Locations where other objects will obstruct the area around the PBX. Be especially careful to leave at least 20 cm (8 in) of space above and 10 cm (4 in) to the sides of the PBX for ventilation.

Notice

Do not install the system in the following locations:

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

Do not perform the following:

- Do not block the openings of the PBX.

- Do not stack up the optional service cards.

Wiring Precautions

Be sure to follow these instructions when wiring the unit:

WARNING

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

CAUTION

- Avoid using the same AC outlet for computers, telexes, and other office equipment, as noise generated by such equipment may hamper system performance or interrupt the system.
- Unplug the system from its power source when wiring, and plug the system back in only after all wiring is completed.
- CO lines should be installed with surge protectors. For details, refer to "3.2.16 Surge Protector Installation".

Notice

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

3.2 Installation of the PBX

3.2.1 Unpacking

Supplied Items for the Basic Shelf (KX-TDE600)

Unpack the box and check the items below:

Main Unit		1
Ferrite Core (for the IPCEMPR card)		2
Metal Bracket		1
Anchor Plug		4
Fan Guard		2
Mini Plug (for pager and music source)		4
SD Memory Card		1
Screw A		4
Screw B		6
Screw C		2

Supplied Items for an Expansion Shelf (KX-TDE620)

Unpack the box and check the items below:

Main Unit		1
Metal Bracket		1
Anchor Plug		4
Fan Guard		2
Screw A		4
Screw B		6
Screw C		2

Supplied Items for the Mounting Kit (KX-TDA6201)

Unpack the box and check the items below:

Wall Bracket (Right)		2
Wall Bracket (Left)		2
Base Stand		4
Support Bracket		4
Washer		16
Screw D		8

CAUTION

If you are installing a multiple-shelf system in an area prone to earthquakes, make sure to fix the system to the wall using the wall brackets.

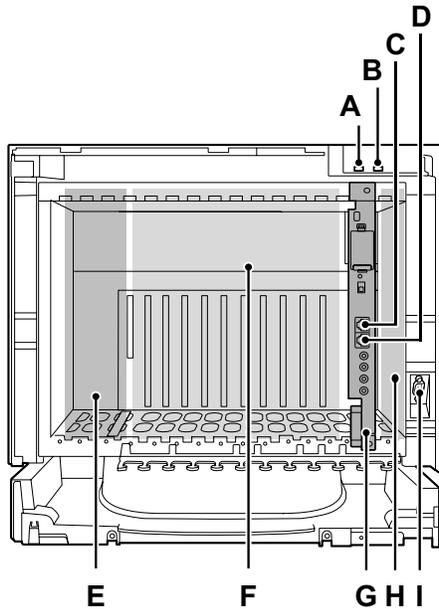
Note

When installing the Mounting Kit, it is necessary to use the screws (A) and anchor plugs supplied with the Basic Shelf or Expansion Shelf.

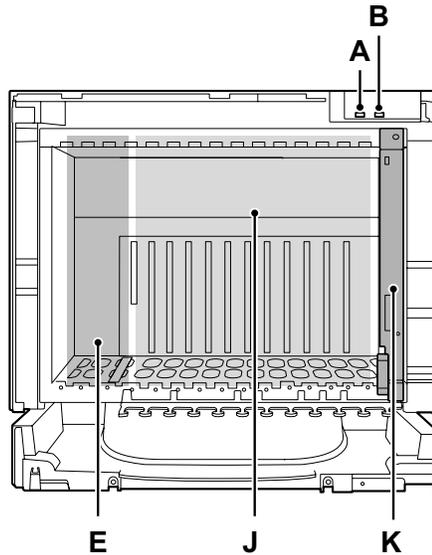
3.2.2 Names and Locations

Inside View

Basic Shelf (KX-TDE600)



Expansion Shelf (KX-TDE620)

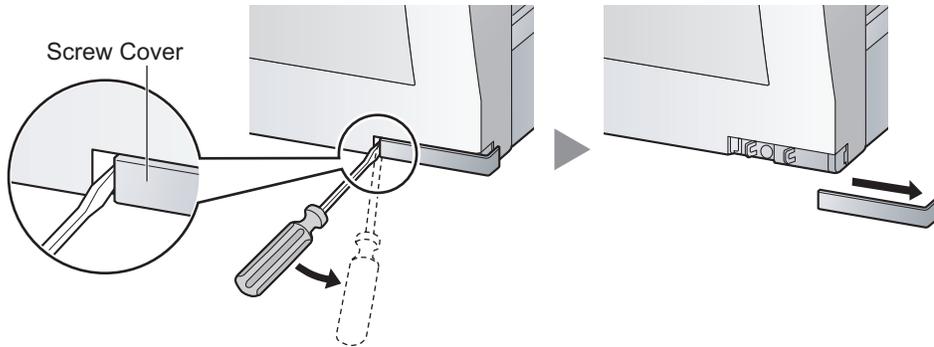


- A. RUN Indicator
- B. ALARM Indicator
- C. MNT Port
- D. LAN Port
- E. PSU Slot
- F. Free Slots 1 to 10 (from the left)
- G. IPCEMPR Card
- H. BUS-M Card Slot
- I. RS-232C Port
- J. Free Slots 1 to 11 (from the left)
- K. BUS-S Card

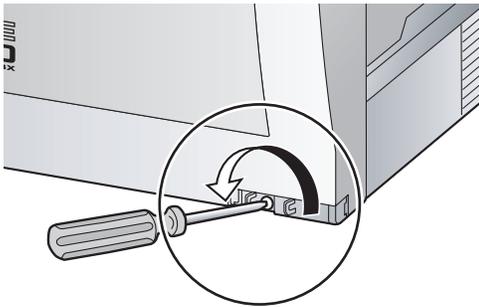
3.2.3 Opening/Closing the Front Cover

Opening the Front Cover

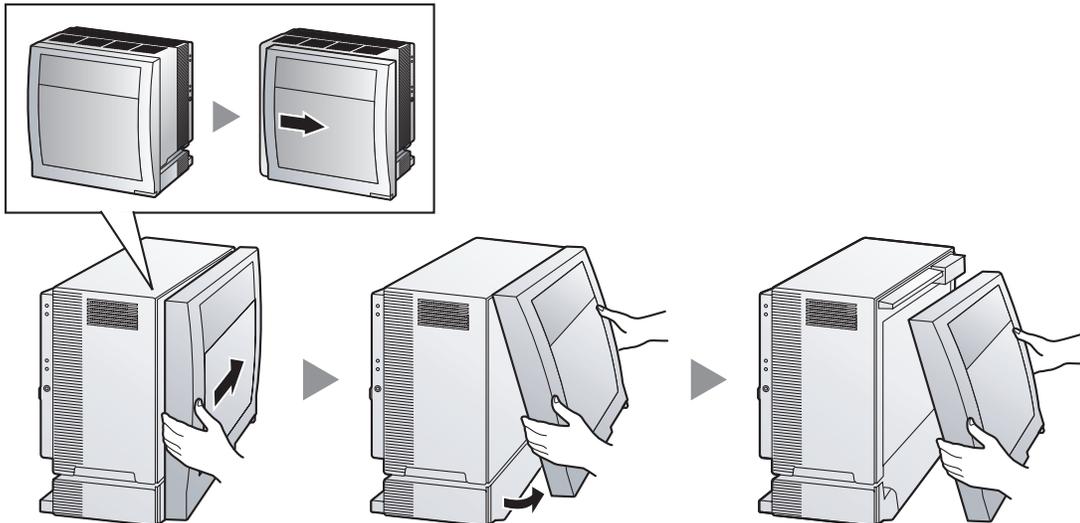
1. Insert a flathead screwdriver into the opening (on the left of the screw cover) and unlatch the screw cover.



2. Turn the screw counterclockwise to loosen.

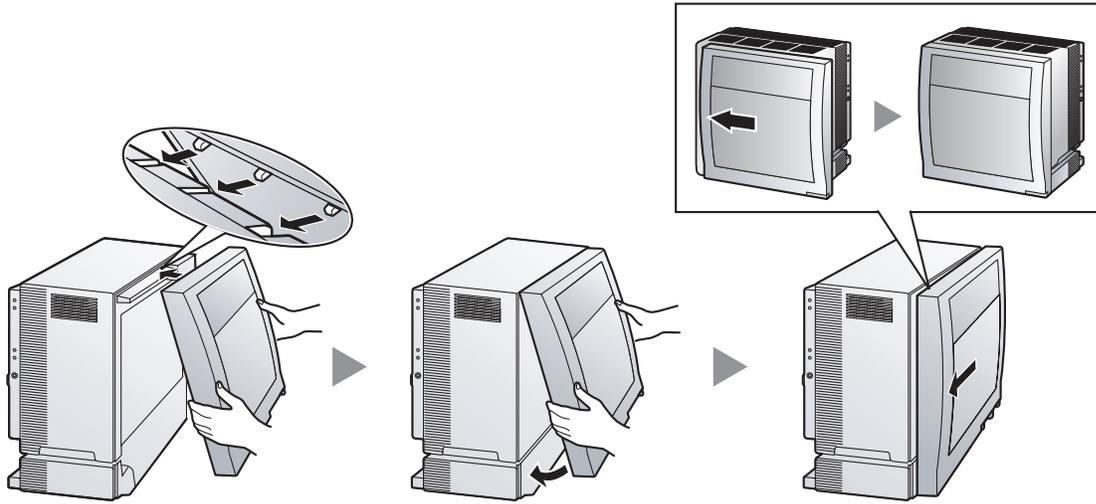


3. Slide the front cover to the right until it stops, then lift the front cover.

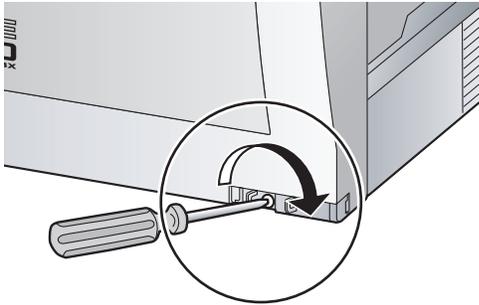


Closing the Front Cover

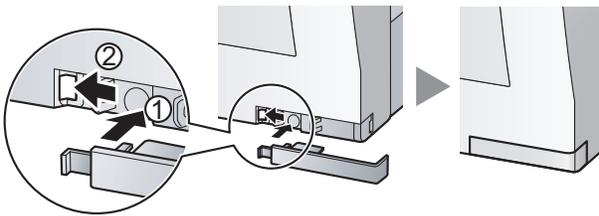
1. Hook the front cover onto the shelf (line up the protrusions on the cover with the receptacles on the shelf). Then slide the front cover to the left until it locks.



2. Turn the screw clockwise to tighten.



3. Secure the screw cover.



CAUTION

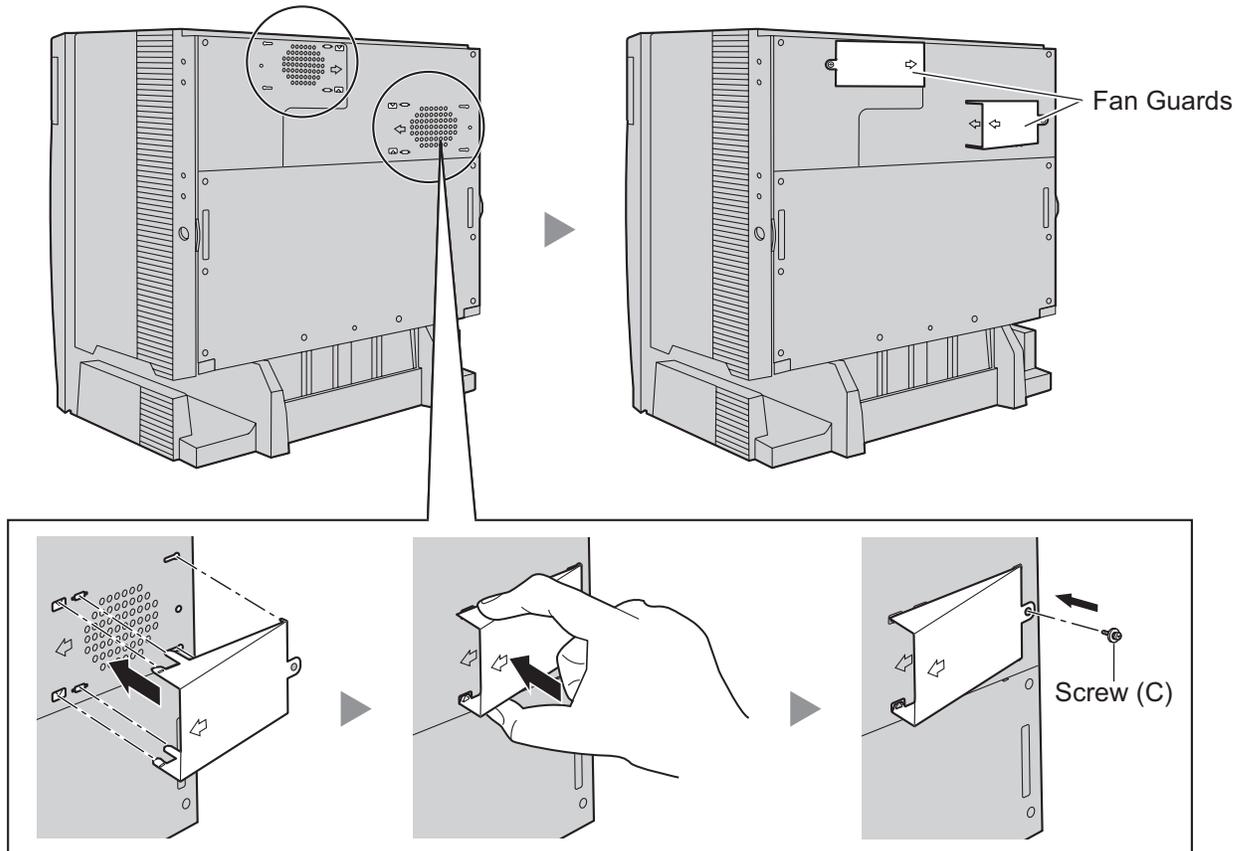
- For safety reasons, close the front cover and tighten the screw before operating the PBX.
- Do not forget to tighten the screw before securing the screw cover.

3.2.4 Attaching Fan Guards

Attaching Fan Guards

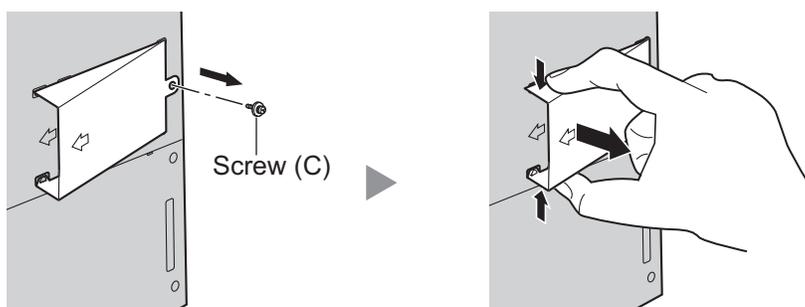
Fan Guards (supplied with the shelf) must be attached using the screws (C) when:

- installing a multiple-shelf system,
- mounting the shelf on the wall, or
- installing the shelf near the wall to protect the air vents on the back of the shelf.



Note

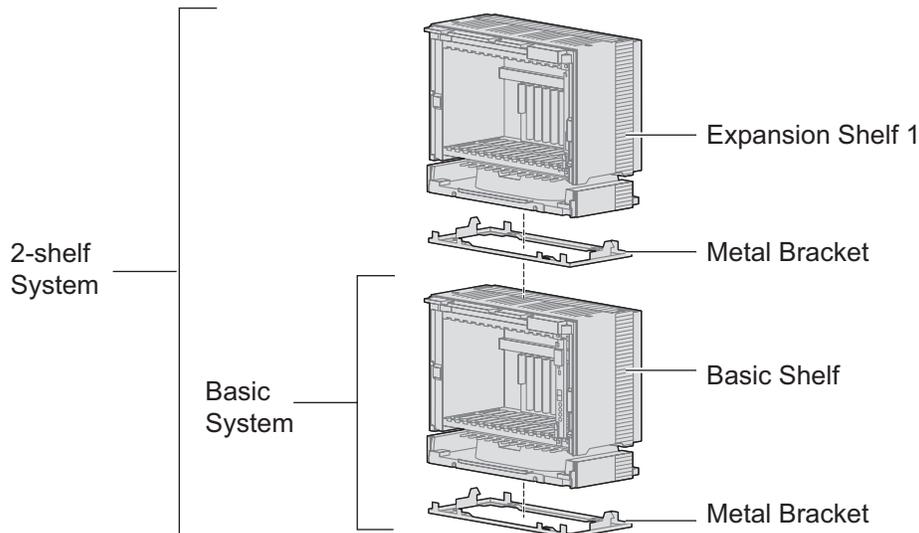
If you need to remove the Fan Guard:



3.2.5 Installation of Basic System or 2-shelf System (Floor Standing)

The PBX can be expanded to a 2-shelf system by mounting an Expansion Shelf on the Basic Shelf.

Construction of Basic System or 2-shelf System



WARNING

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

CAUTION

- Do not block the openings of the shelf. Allow space of at least 10 cm (4 in) at the sides of the shelf, and 20 cm (8 in) above the top-mounted 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.

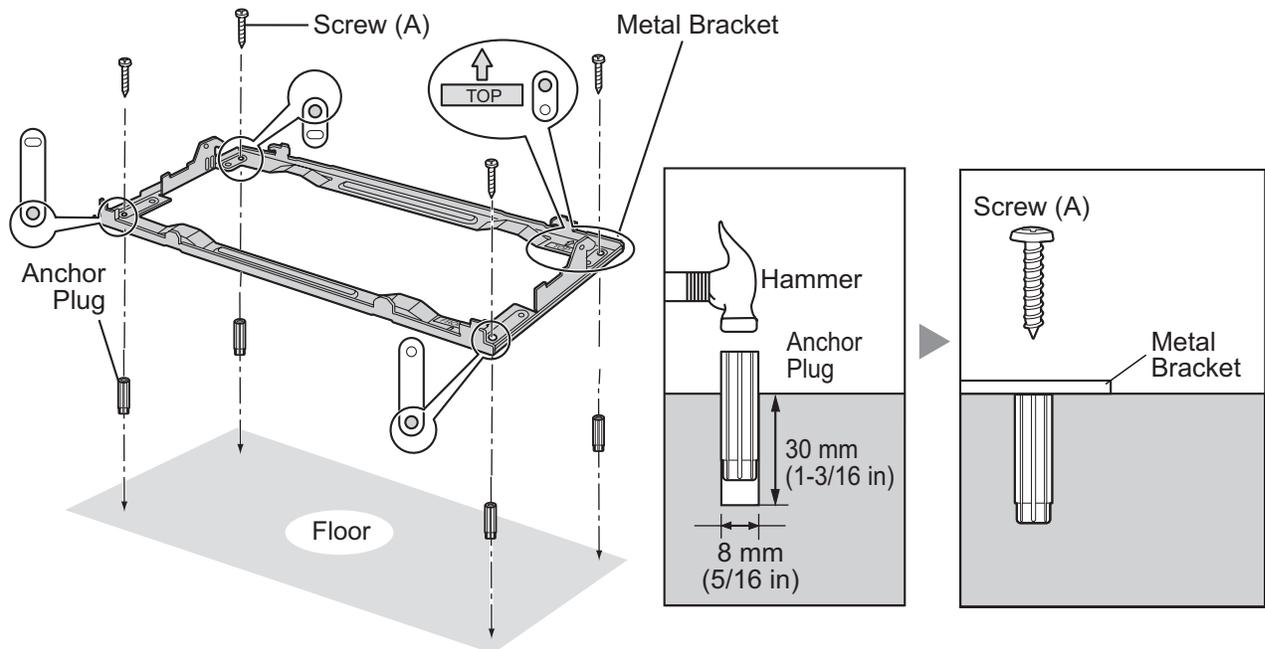
Note

- Make sure to remove the front cover from each shelf before installing the shelves (refer to "3.2.3 Opening/Closing the Front Cover").
- Do not install any optional service cards or a PSU in the shelves before installation.

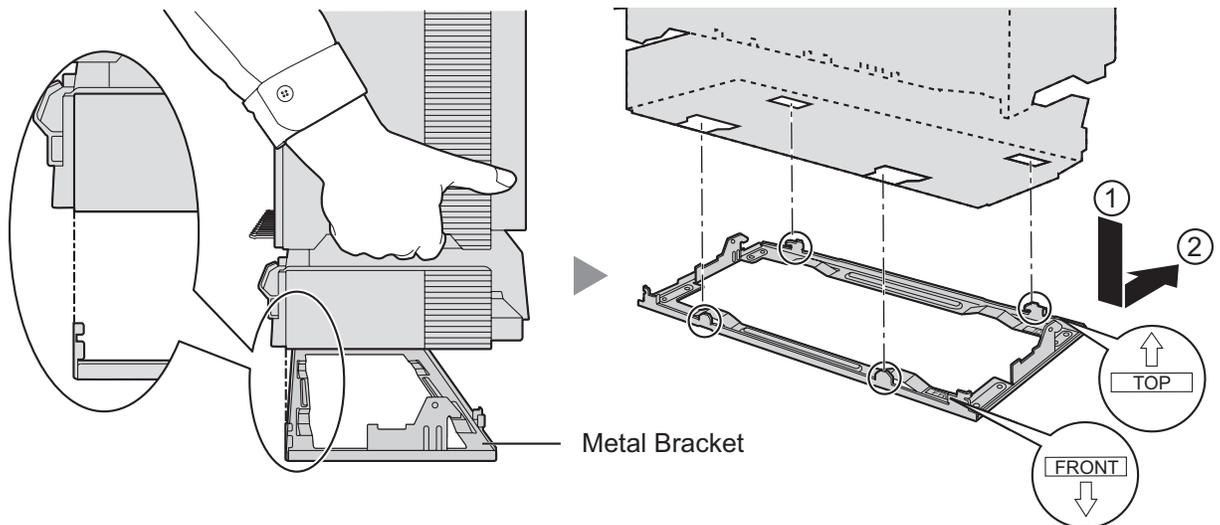
Installing the Basic Shelf

For the basic system, install the metal bracket (supplied with the Basic Shelf) on the floor first. Then, attach the Basic Shelf to the metal bracket.

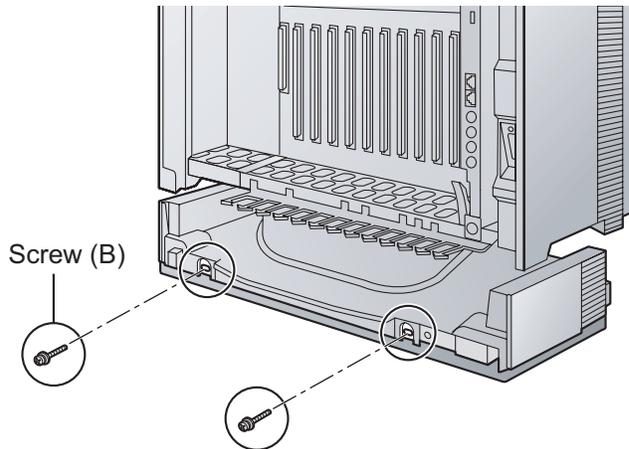
1. Install 4 anchor plugs on the floor, using the metal bracket as a template. Fix the metal bracket in place with 4 screws (A).



2. Lift the Basic Shelf, attach it to the metal bracket, and slide it backwards until it locks.



3. Secure the Basic Shelf to the metal bracket with 2 screws (B).

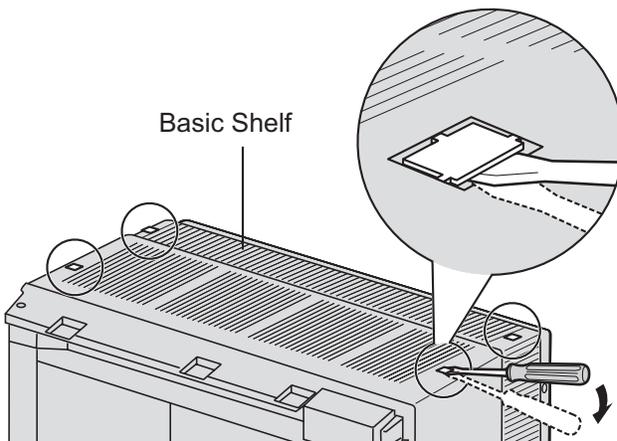


Installation of the basic system is complete. If you are installing a 2-shelf system, follow the procedure below.

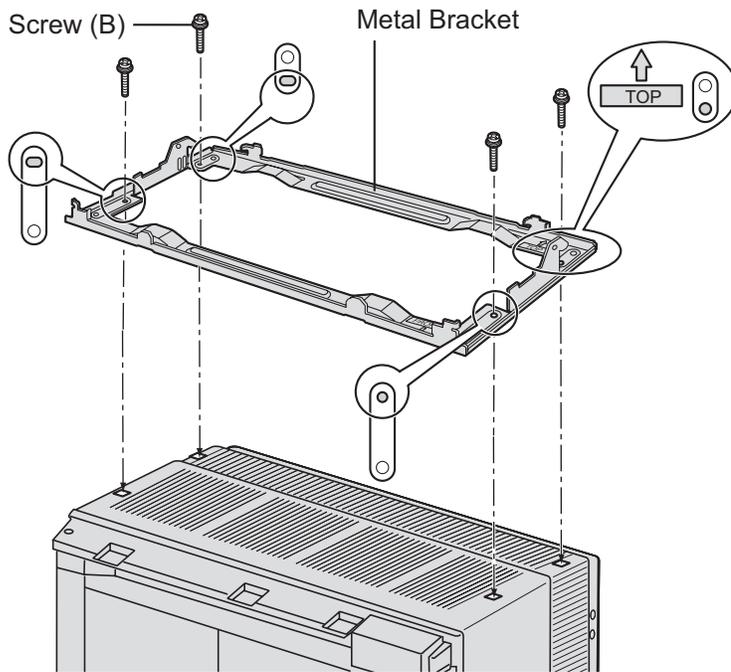
Mounting Expansion Shelf 1

For the 2-shelf system, attach the metal bracket (supplied with the Expansion Shelf 1) to the Basic Shelf first. Then, mount Expansion Shelf 1 on the Basic Shelf.

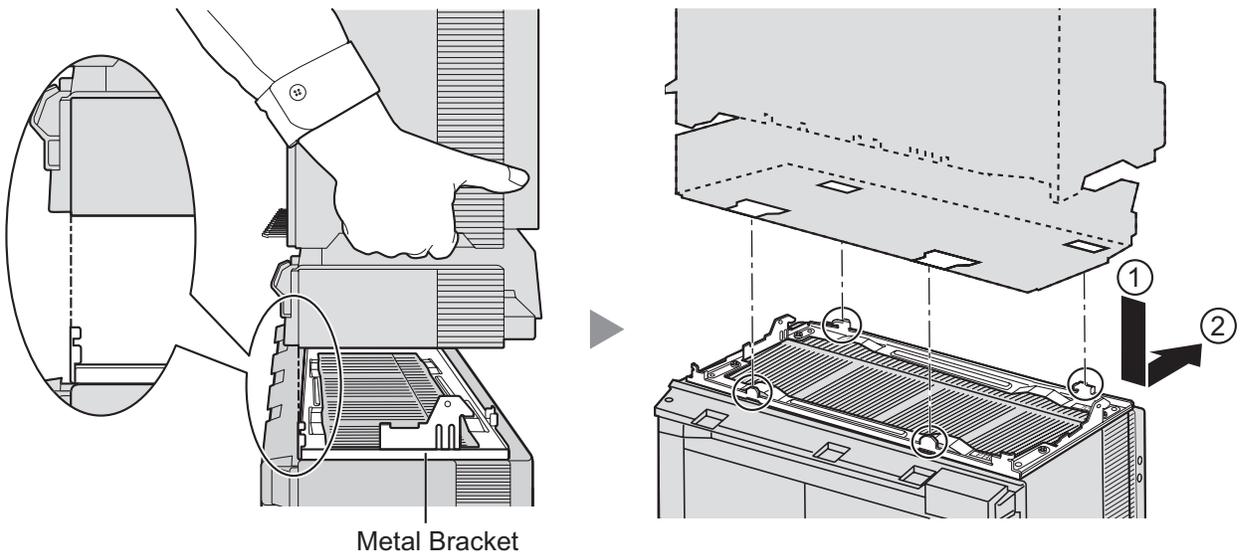
1. Remove the 4 tabs on the top cover of the Basic Shelf, by using a flathead screwdriver, as shown below.



2. Fix the metal bracket to the Basic Shelf with 4 screws (B).

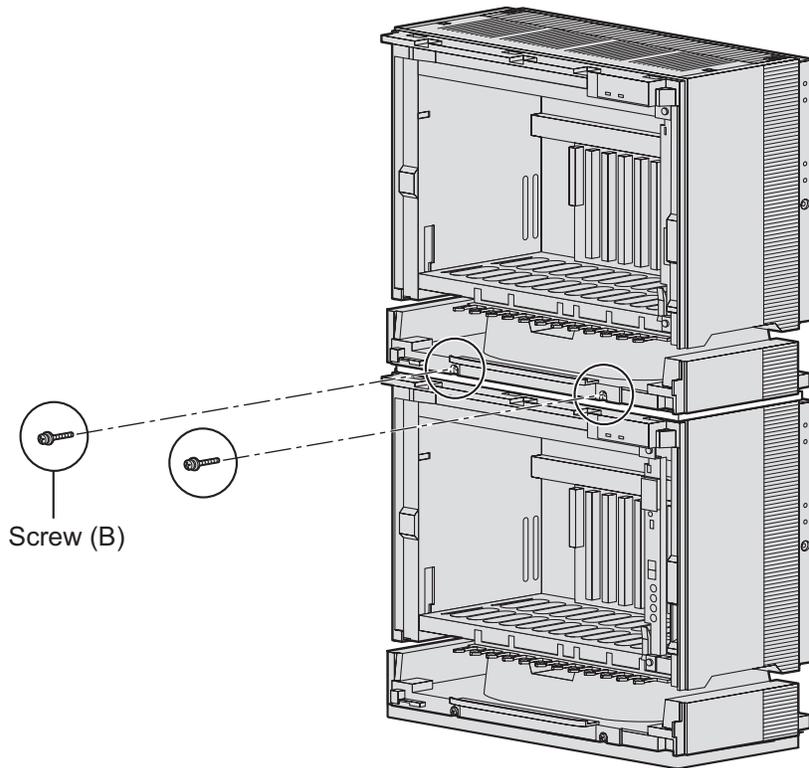


3. Lift Expansion Shelf 1, attach it to the metal bracket on the Basic Shelf, and slide it backwards until it locks.



3.2.5 Installation of Basic System or 2-shelf System (Floor Standing)

4. Secure Expansion Shelf 1 to the metal bracket with 2 screws (B).



Shelf installation is complete. Next, it is necessary to connect the shelves.

Connecting Shelves

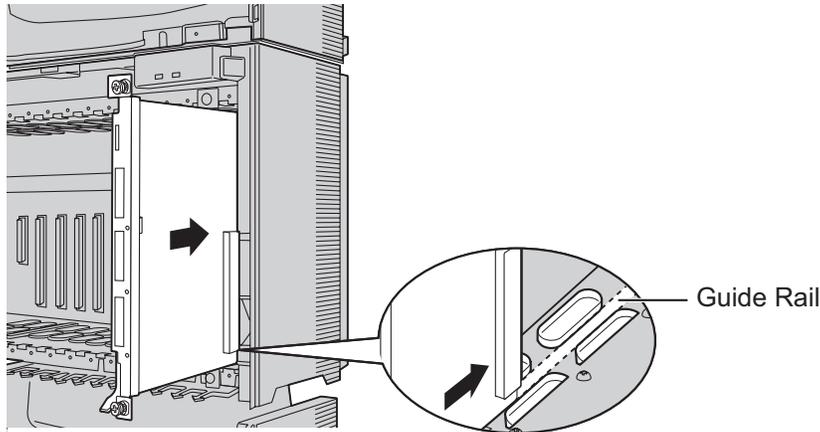
For the 2-shelf system, you need to install an optional BUS-M card in the Basic Shelf. To connect the shelves, plug the Bus Cable (supplied with the BUS-M card) into the bottom slot of the BUS-M card. Then, plug the other end into the BUS-S card built in to Expansion Shelf 1.

For details about the cards, refer to "3.5.1 BUS-M Card (KX-TDA6110)" and "3.6.1 BUS-S Card".

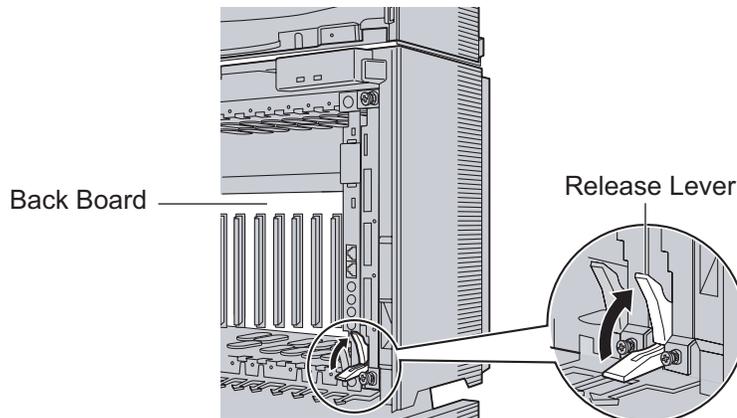
Note

When installing or removing the BUS-M card, make sure that the DC power supply is turned off.

1. Insert the BUS-M card along the guide rails in the BUS-M Card Slot (the right-most slot) of the Basic Shelf.

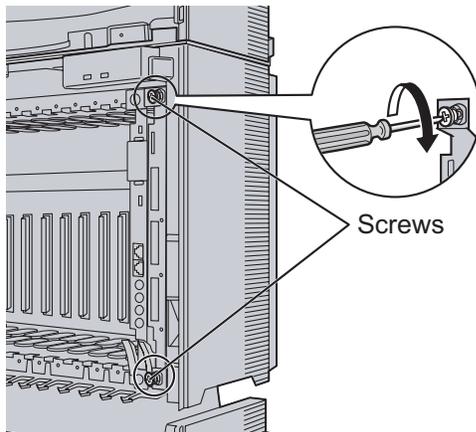


2. Push the release lever in the direction of the arrow so that the BUS-M card engages securely with the connector on the back board.



3.2.5 Installation of Basic System or 2-shelf System (Floor Standing)

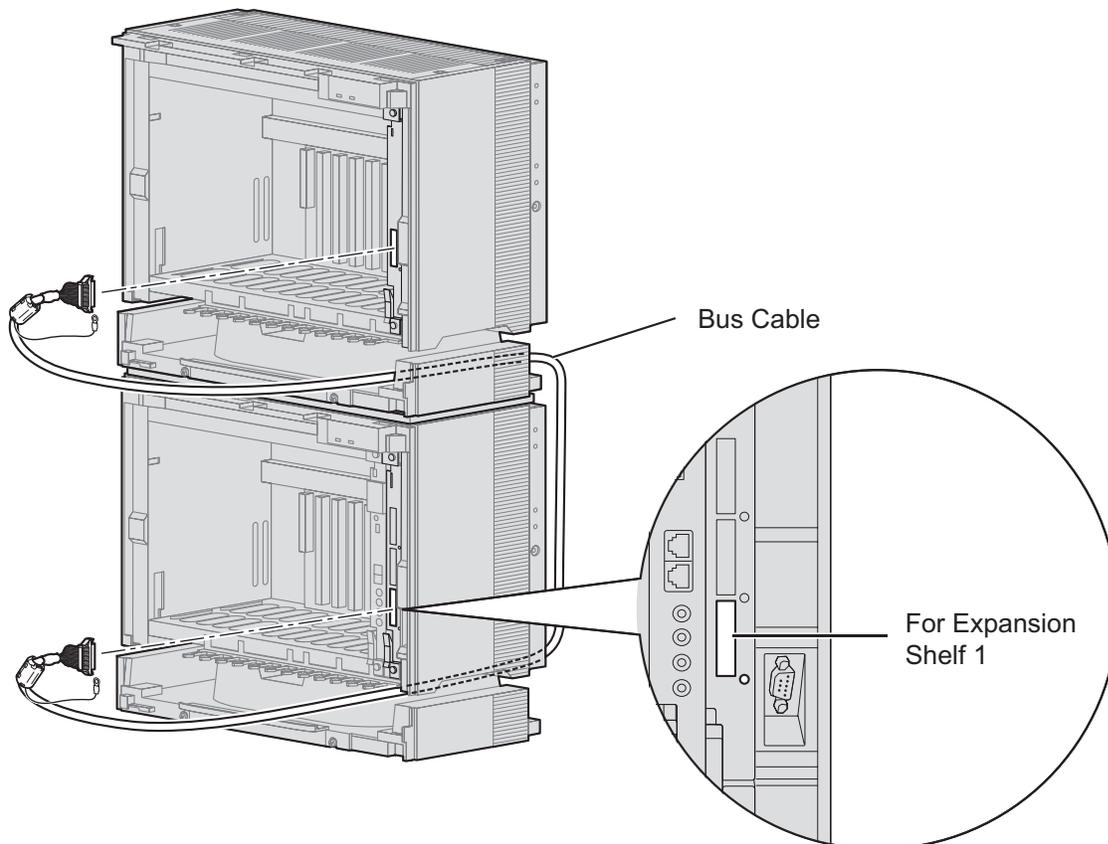
3. Turn the 2 screws clockwise to fix the BUS-M card in place.



4. Plug the Bus Cable into the bottom port of the BUS-M card in the Basic Shelf. Then, plug the other end into the BUS-S card in Expansion Shelf 1.

Note

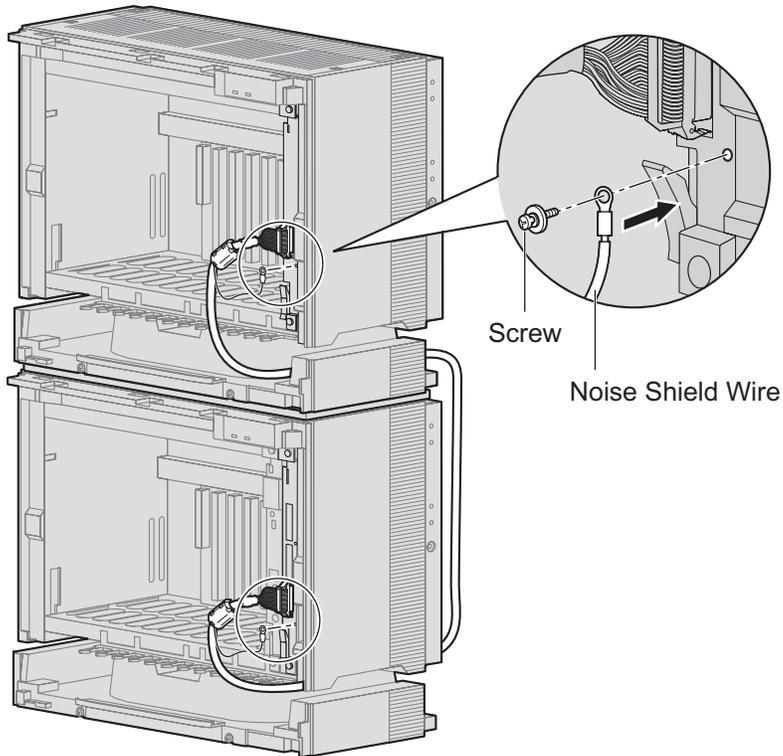
When plugging or unplugging the Bus Cable, make sure that the DC power supply is turned off.



5. Attach the noise shield wires of the Bus Cable to the Basic Shelf and Expansion Shelf 1 with the screws of the BUS-M card.

Note

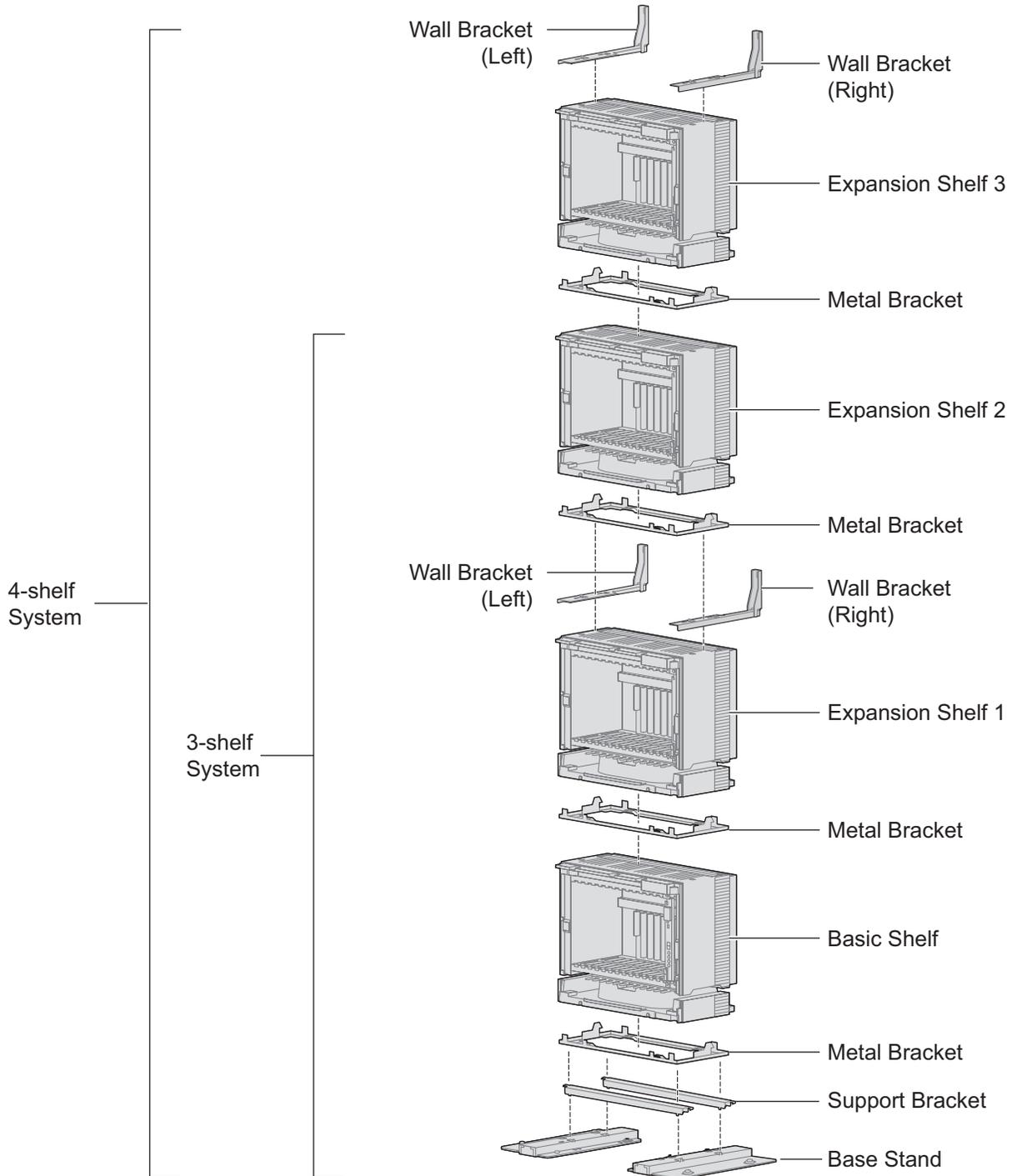
When attaching or removing the noise shield wires, make sure that the DC power supply is turned off.



3.2.6 Installation of 3- or 4-shelf System (Tower Type)

The PBX can be expanded to a 3- or 4-shelf system by mounting Expansion Shelves on the Basic Shelf. For a 3- or 4-shelf system, you need a Mounting Kit, which supplies you with the base stands and wall brackets.

Construction of 3- or 4-shelf System (Tower Type)



WARNING

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

CAUTION

- Do not block the openings of the shelf. Allow space of at least 10 cm (4 in) at the sides of the shelf, and 20 cm (8 in) above the top-mounted 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.

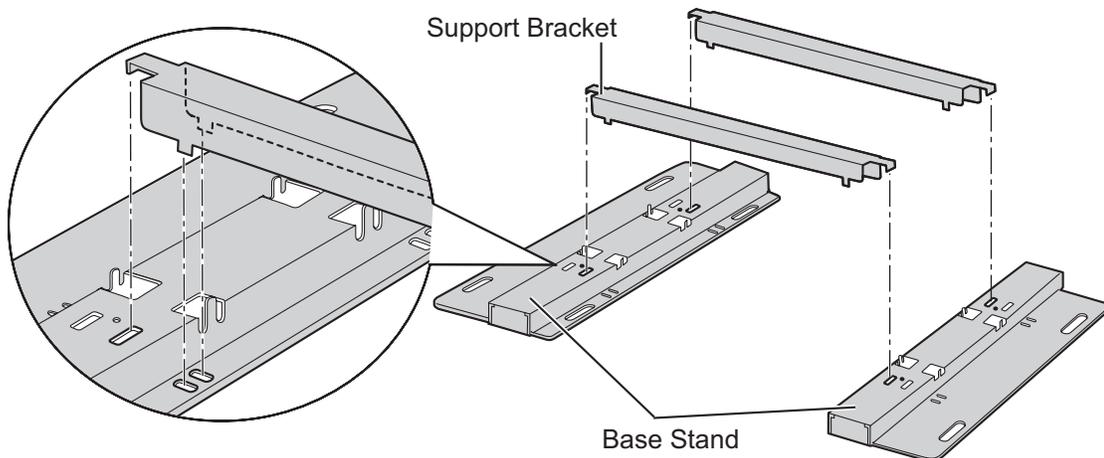
Note

- Make sure to remove the front cover from each shelf before installing the shelves (refer to "3.2.3 Opening/Closing the Front Cover").
- Do not install any optional service cards or a PSU in the shelves before installation.

Installing the Basic Shelf

To install the Basic Shelf, attach the metal bracket (supplied with the Basic Shelf) to the base stands (supplied with the Mounting Kit) first. Then, install the base stands on the floor and fix the Basic Shelf to them.

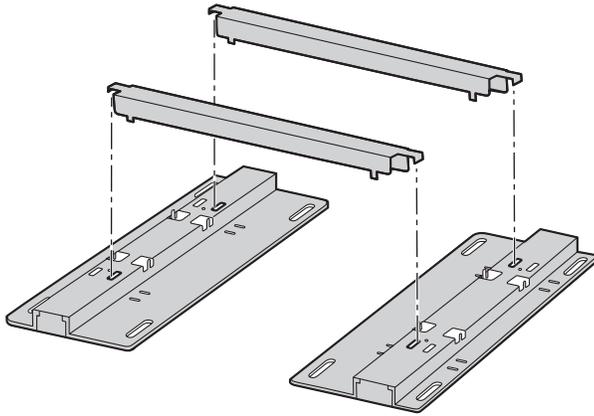
1. Attach the support brackets to the base stands.



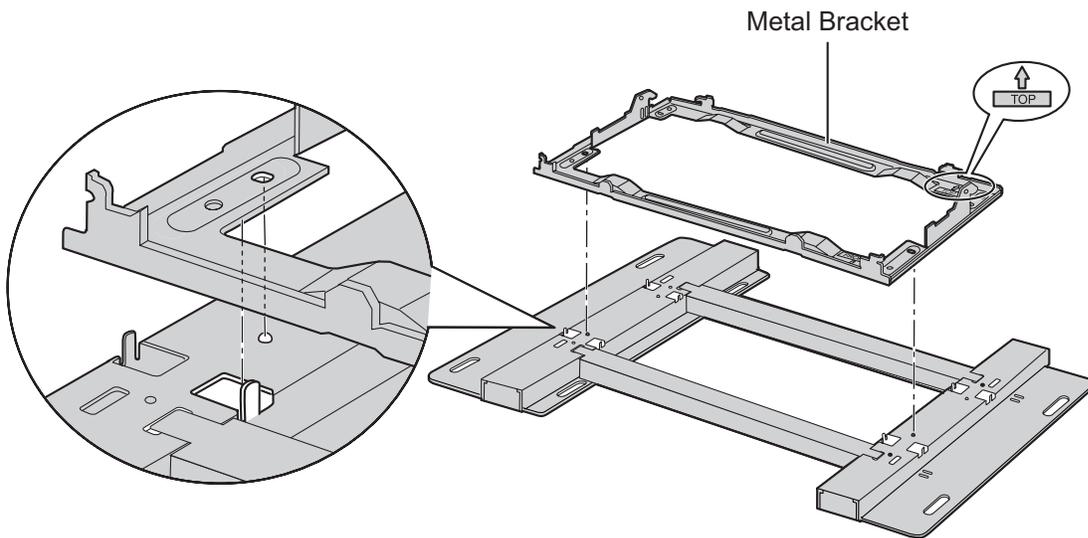
3.2.6 Installation of 3- or 4-shelf System (Tower Type)

Note

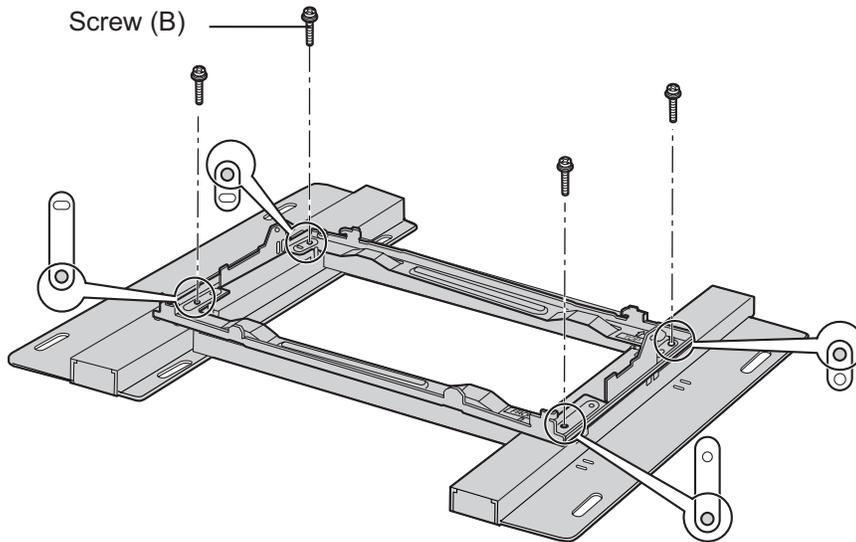
If necessary, it is possible to reverse the direction of the base stands as shown below:



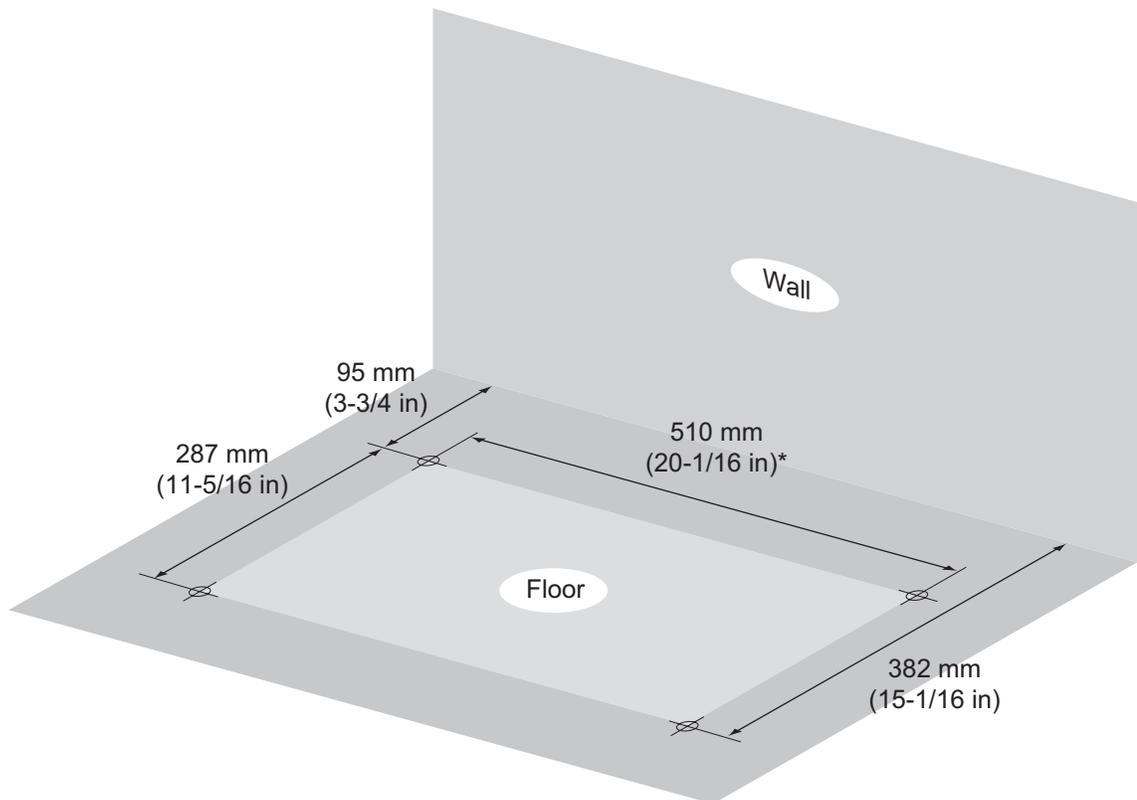
2. Place the metal bracket on the base stands.



3. Attach the metal bracket to the base stands with 4 screws (B).



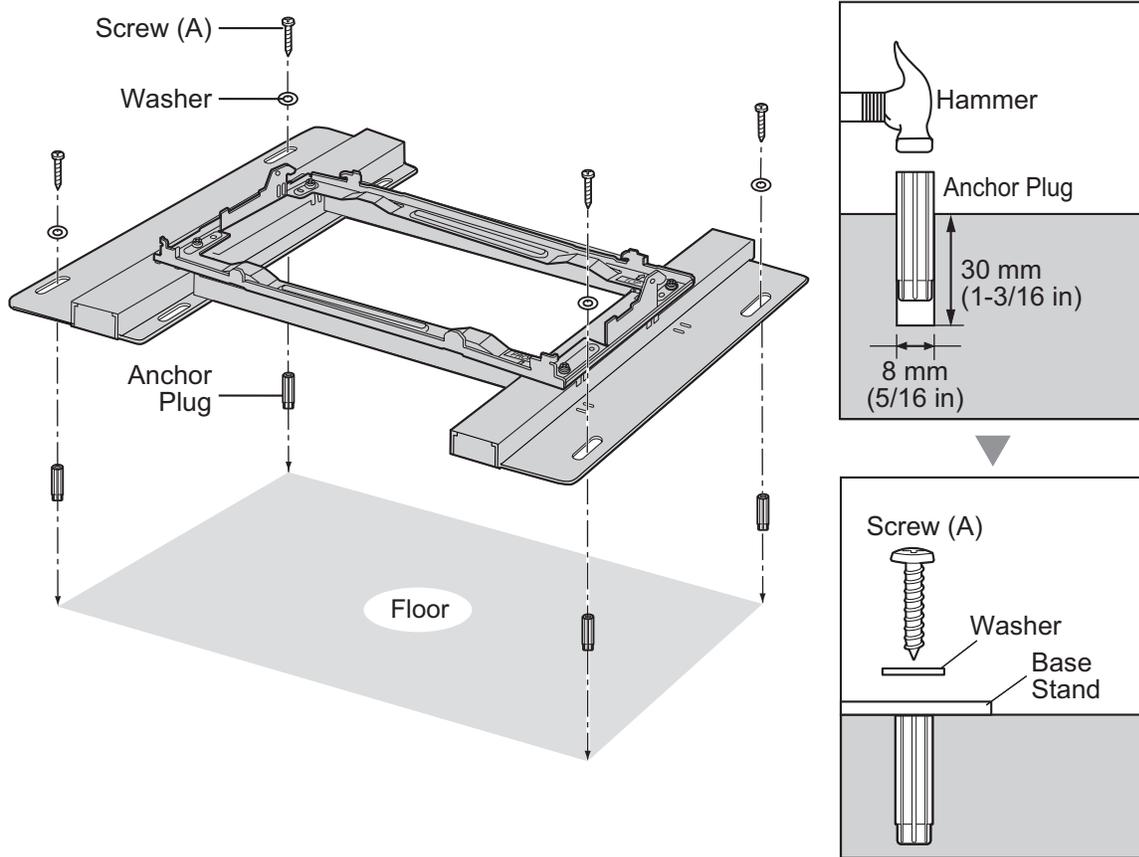
4. Make 4 holes for anchor plugs on the floor, using the measurements indicated here.



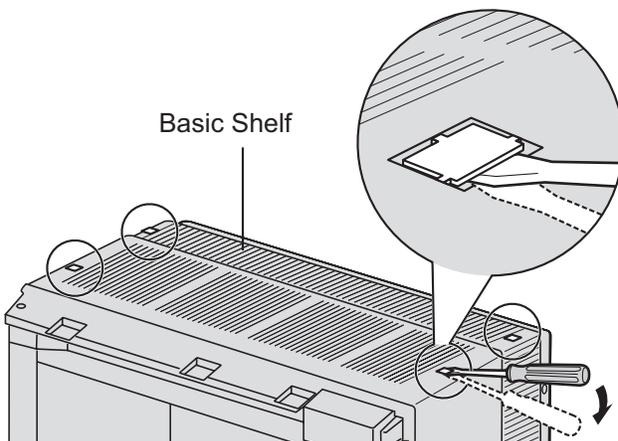
* If the direction of the base stands is reversed, the measurement must be 443.4 mm (17-7/16 in).

3.2.6 Installation of 3- or 4-shelf System (Tower Type)

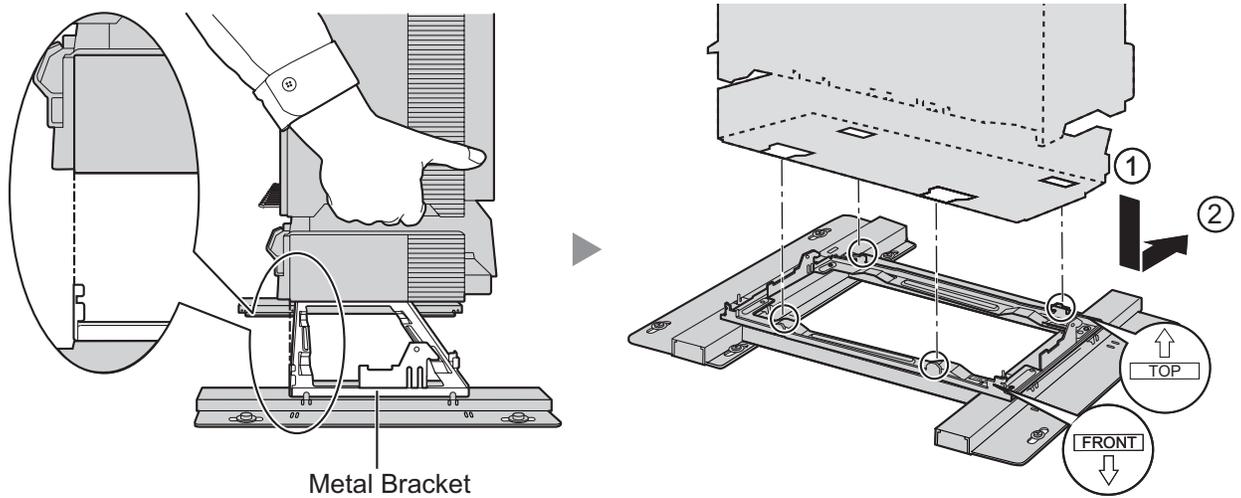
5. Install 4 anchor plugs in the holes on the floor.
Then, fasten the base stands to the floor loosely with 4 screws (A). (This makes it easy to adjust the position of the shelves later.)



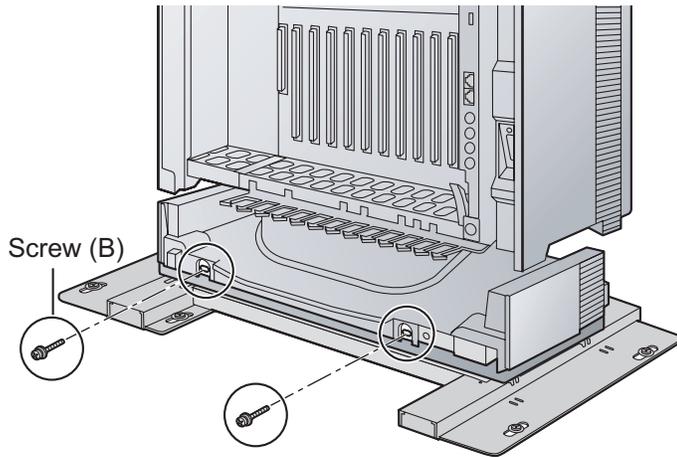
6. Remove the 4 tabs on the top cover of the Basic Shelf, by using a flathead screwdriver, as shown below.



7. Lift the Basic Shelf, attach it to the metal bracket, and slide it backwards until it locks.



8. Secure the Basic Shelf to the metal bracket with 2 screws (B).

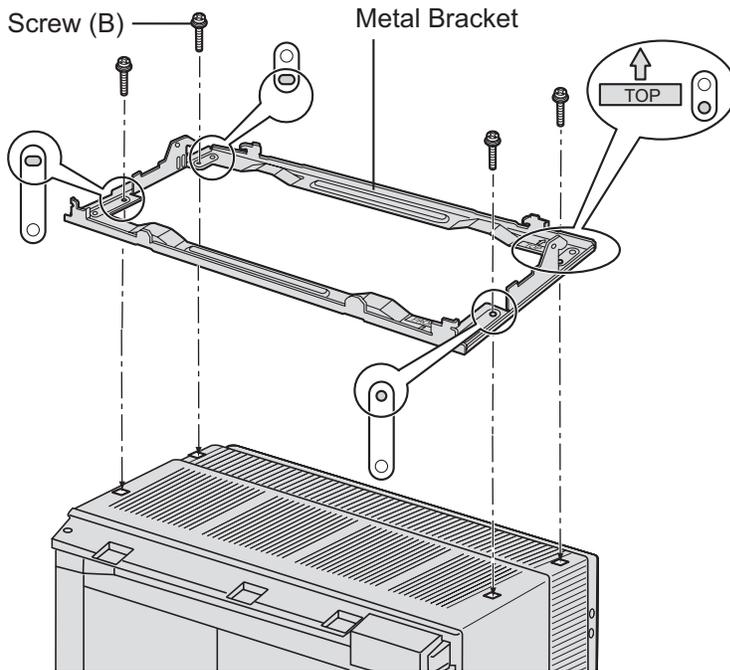


Mounting Expansion Shelves 1 and 2

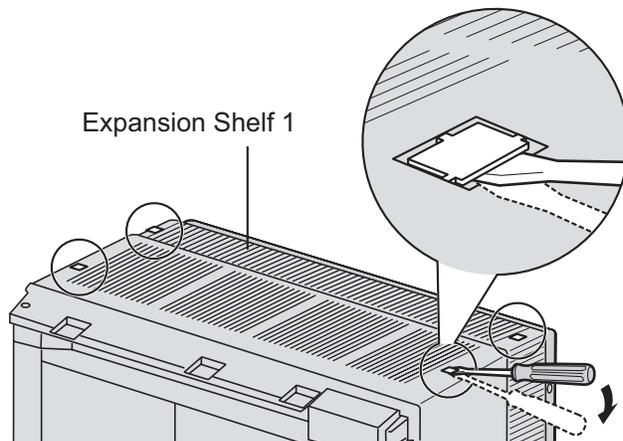
For the 3- or 4-shelf system, attach the metal bracket (supplied with the Expansion Shelf) to the Basic Shelf first. After mounting Expansion Shelf 1 on the Basic Shelf, fix Expansion Shelf 1 to the wall. Then, mount Expansion Shelf 2 on Expansion Shelf 1.

Expansion Shelf 1

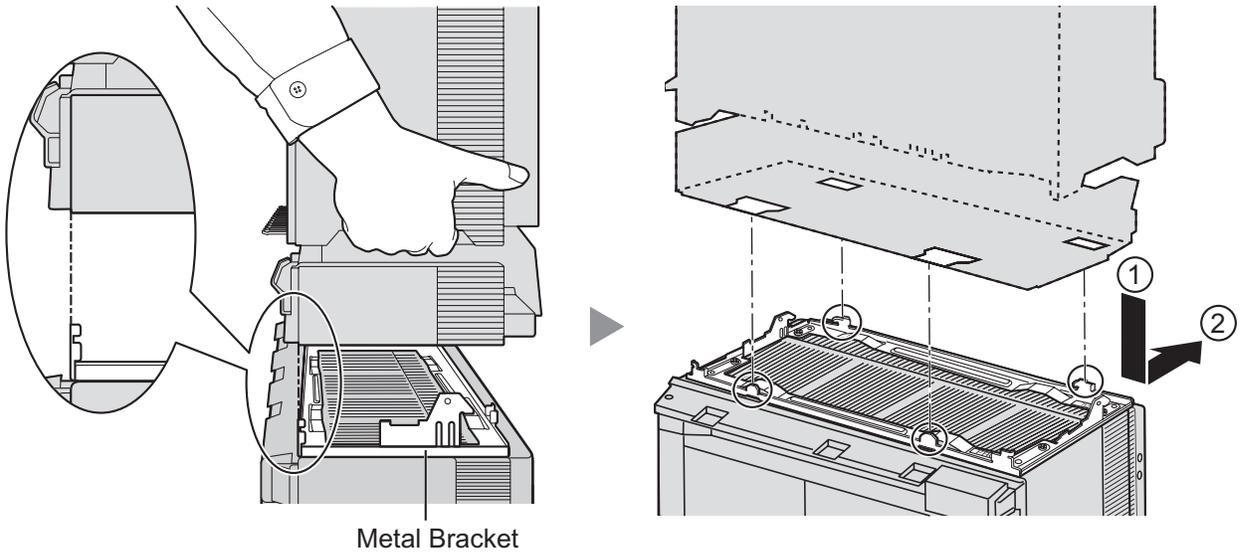
1. Fix the metal bracket to the Basic Shelf with 4 screws (B).



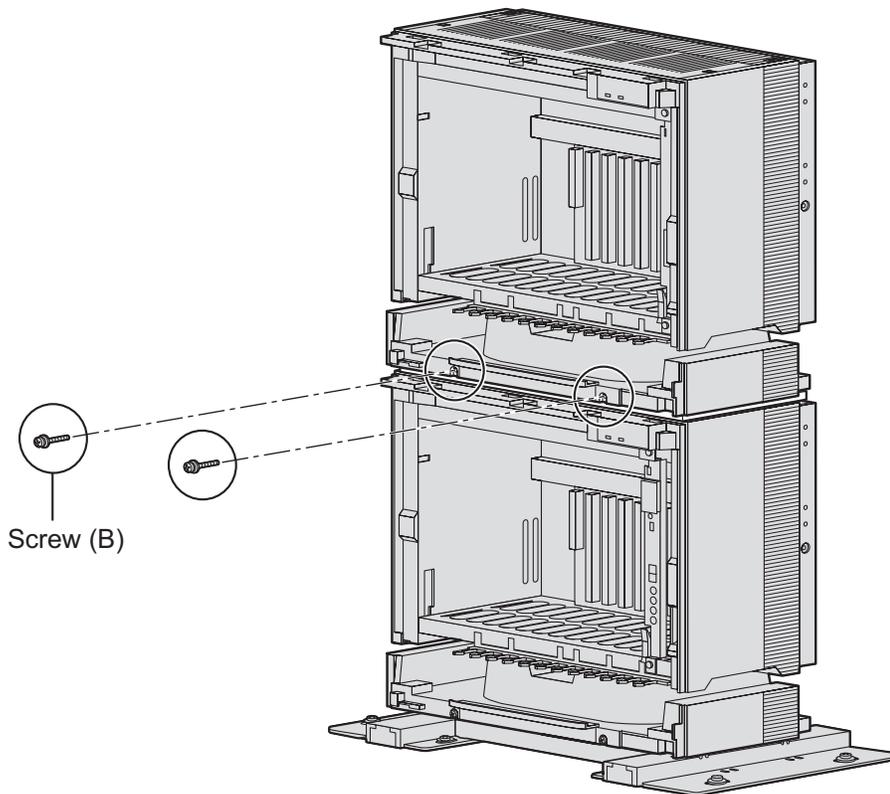
2. Remove the 4 tabs on the top cover of Expansion Shelf 1, by using a flathead screwdriver, as shown below.



3. Lift Expansion Shelf 1, attach it to the metal bracket on the Basic Shelf, and slide it backwards until it locks.

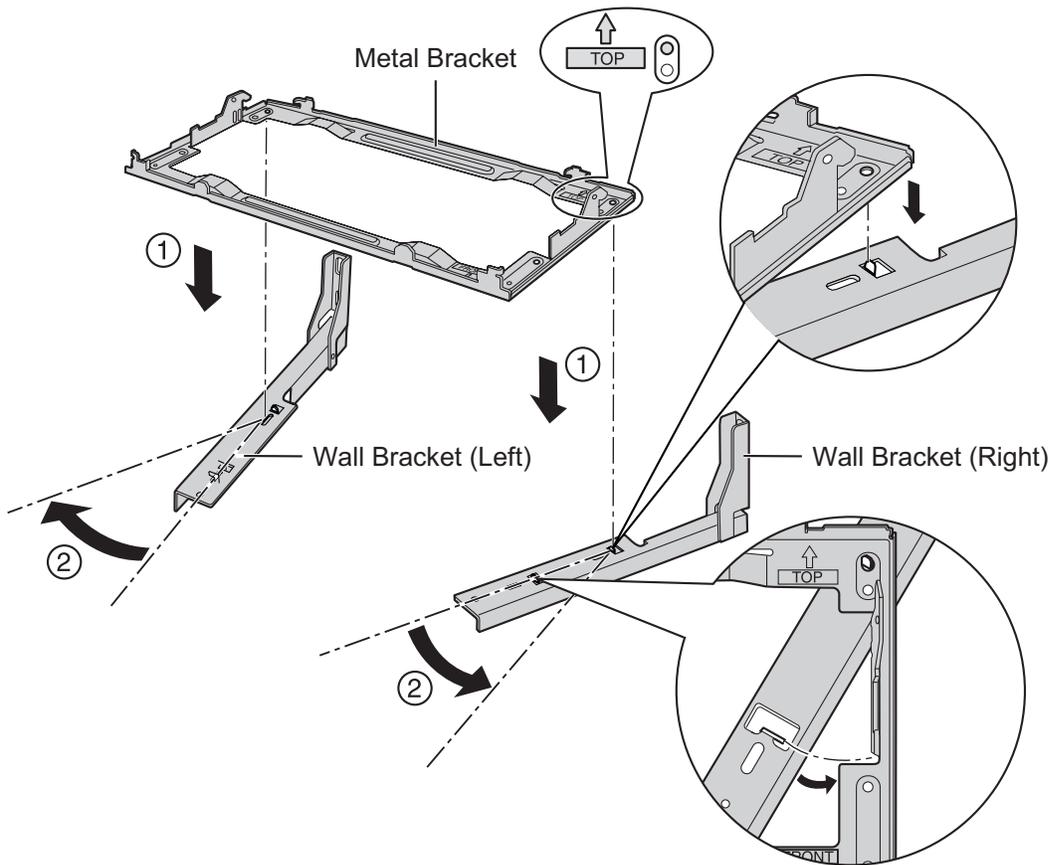


4. Secure Expansion Shelf 1 to the metal bracket with 2 screws (B).

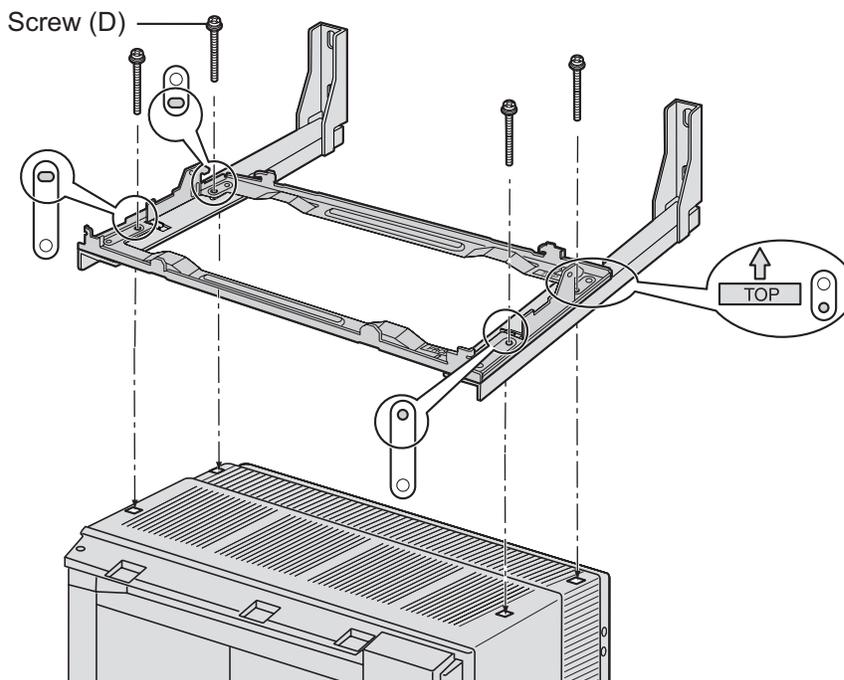


Fixing to the Wall

1. Attach the metal bracket to the wall brackets.



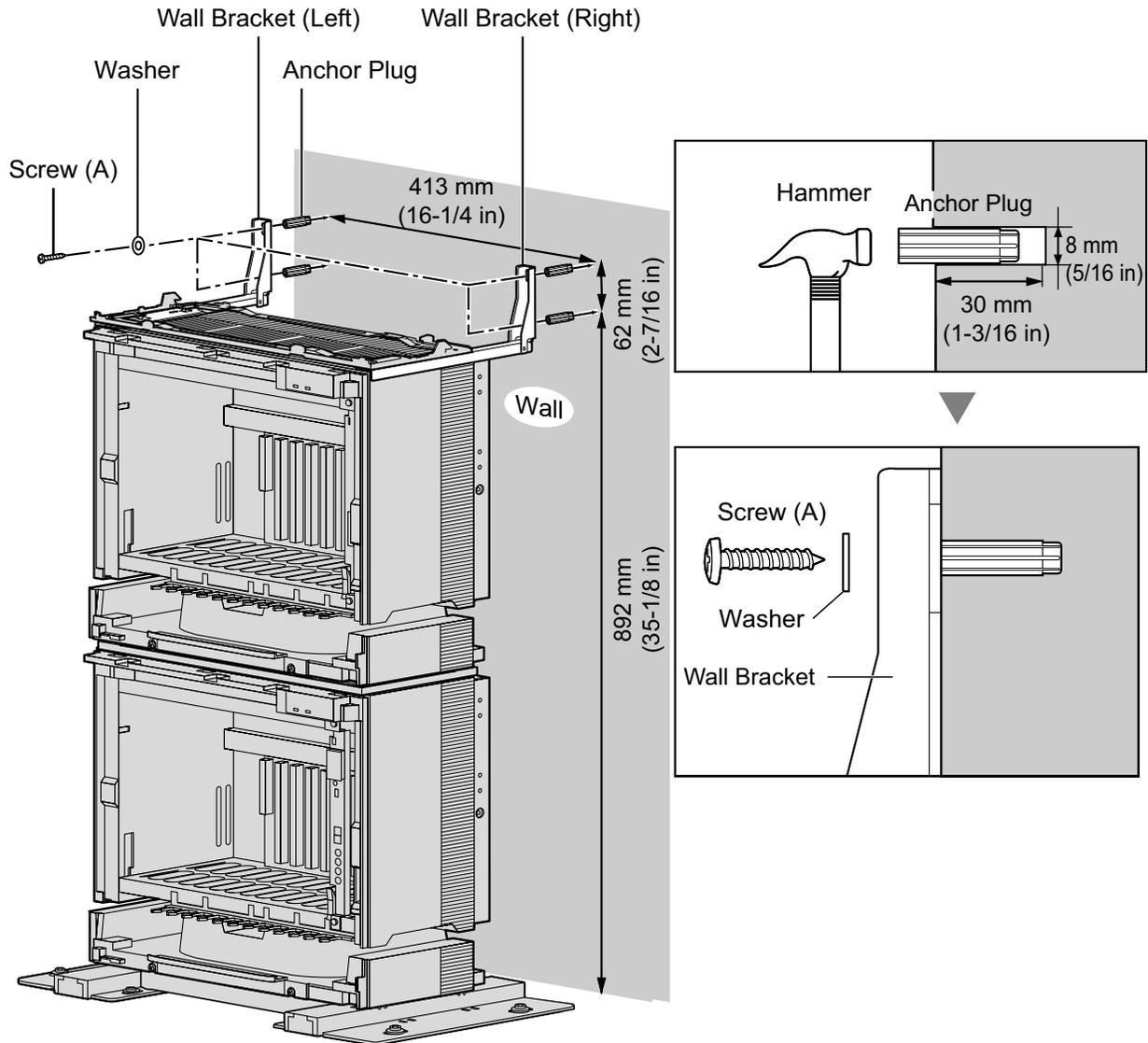
2. Fix the metal bracket to Expansion Shelf 1 with 4 screws (D).



3. Install 4 anchor plugs in the wall, using the wall brackets as a template. Fix the wall brackets to the wall with 4 screws (A).

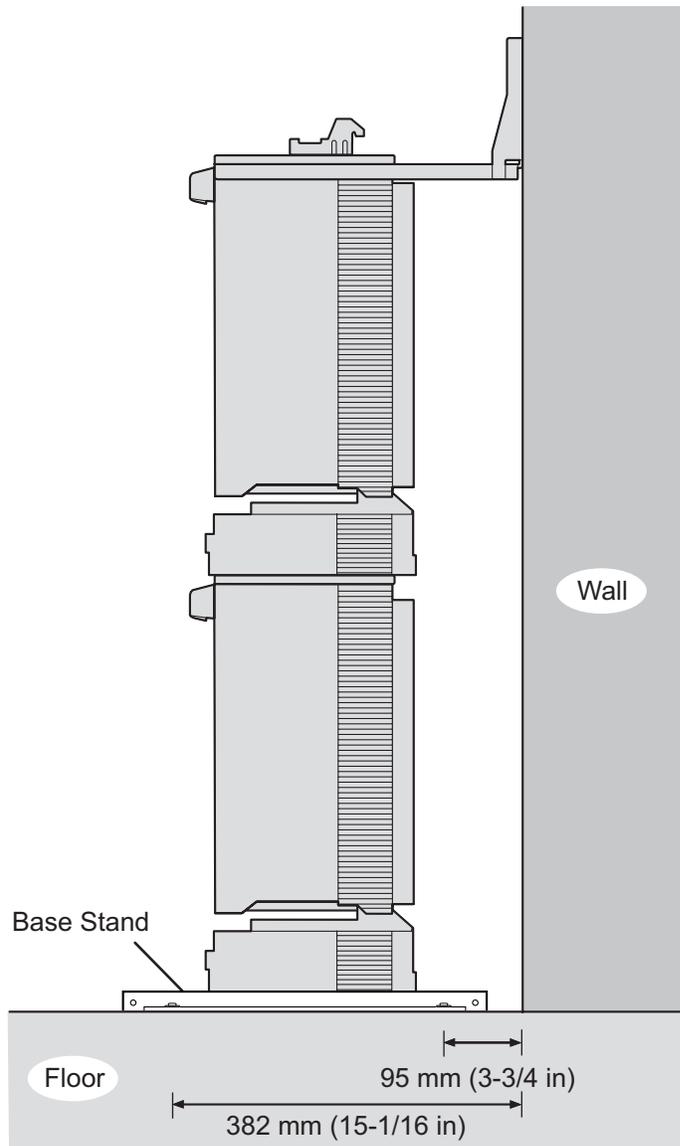
Notice

- Drive mounting screws into the wall. Be careful to avoid touching any metal laths, wire laths or metal plates in the wall.
- When installing anchor plugs in the wall, be careful not to damage or dirty the shelves.



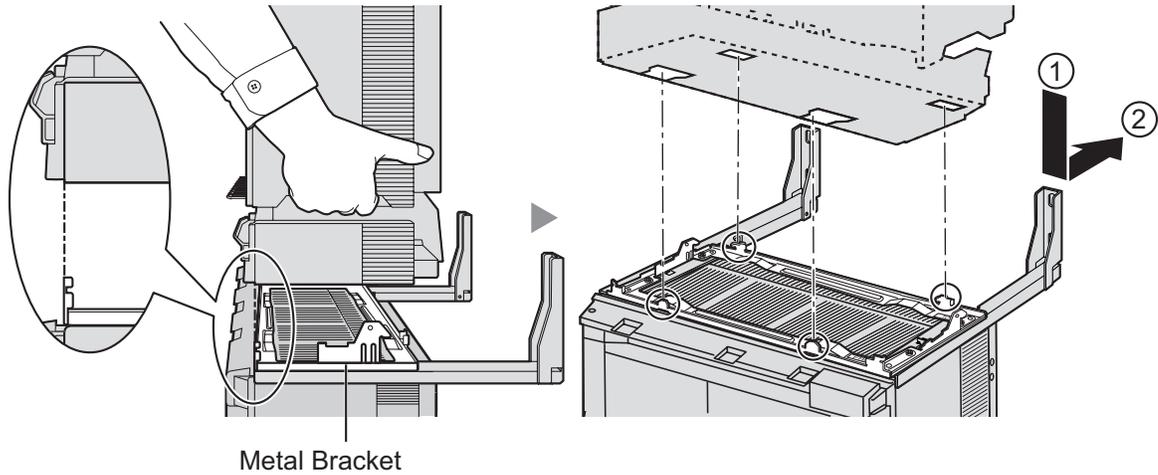
3.2.6 Installation of 3- or 4-shelf System (Tower Type)

4. Check that the shelves are standing exactly vertically. If the shelves are leaning slightly to one side, move the base stands to adjust the position. (Since the base stands are attached loosely to the floor, it should be possible to adjust the position of the shelves.) Then, tighten the screws connecting the base stands to the floor.

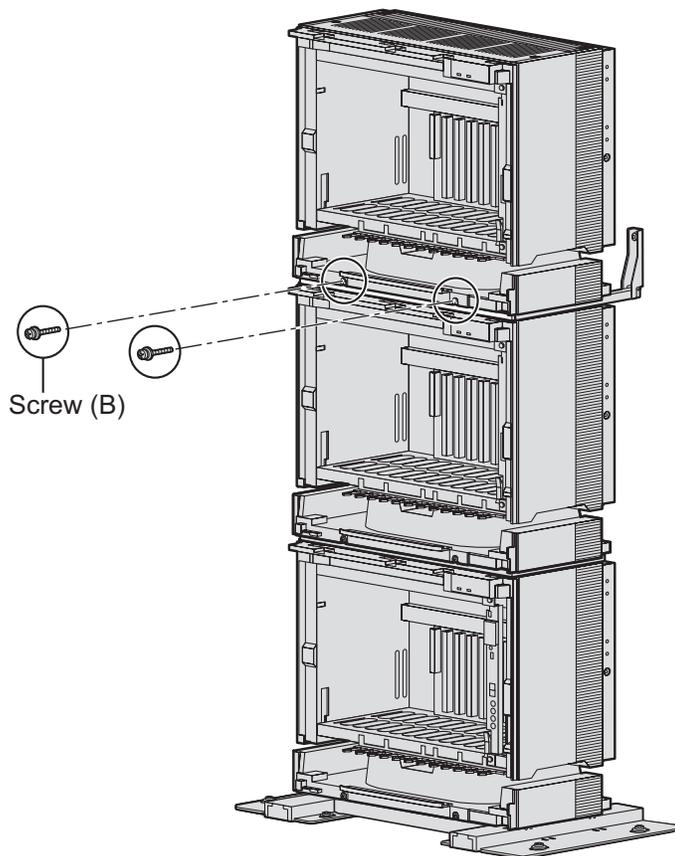


Expansion Shelf 2

1. Lift Expansion Shelf 2, attach it to the metal bracket fixed on Expansion Shelf 1, and slide it backwards until it locks.



2. Secure Expansion Shelf to the metal bracket 2 with 2 screws (B).



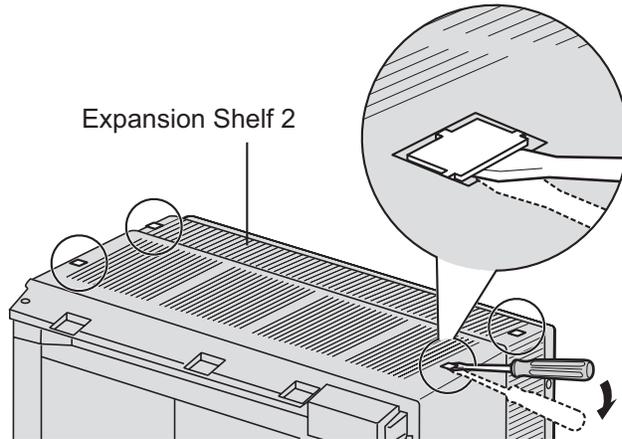
Installation of a 3-shelf system is complete. Next, it is necessary to connect the shelves.
If you are installing a 4-shelf system, follow the procedure below before connecting the shelves.

Mounting Expansion Shelf 3

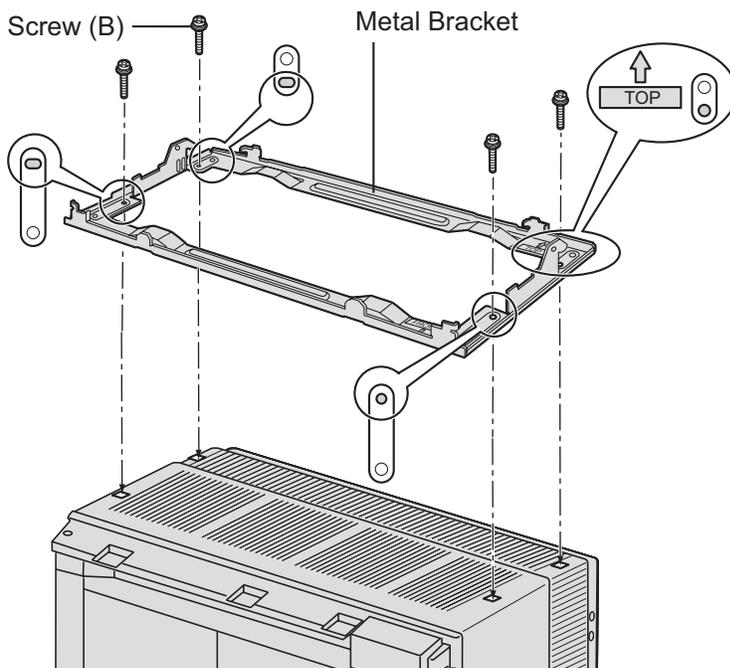
For the 4-shelf system, attach the metal bracket (supplied with Expansion Shelf 3) to Expansion Shelf 2 first. Then, attach the wall brackets (supplied with the Mounting Kit) to Expansion Shelf 3. After mounting Expansion Shelf 3 on Expansion Shelf 2, fix Expansion Shelf 3 to the wall.

Expansion Shelf 3

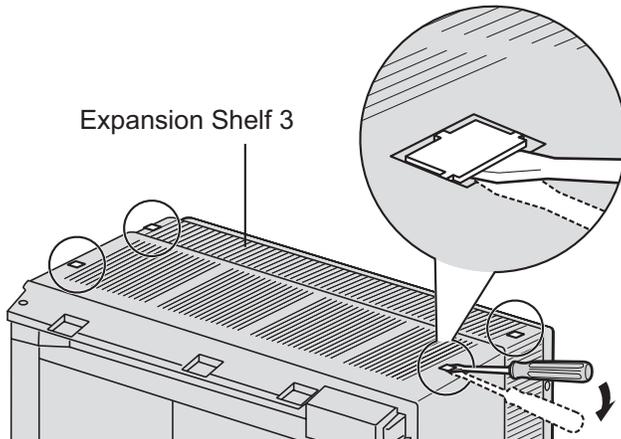
1. Remove the 4 tabs on the top cover of Expansion Shelf 2, by using a flathead screwdriver, as shown below.



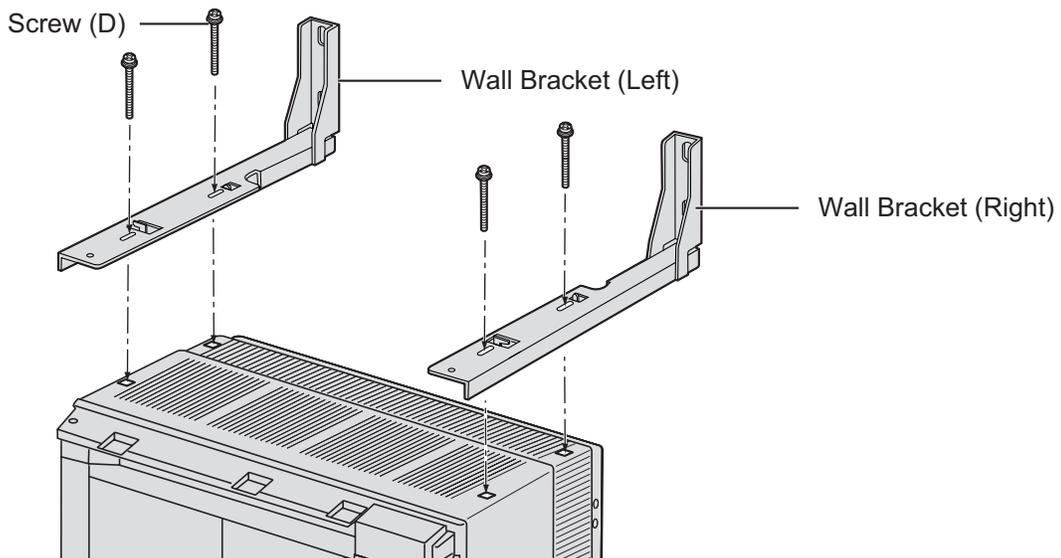
2. Fix the metal bracket to Expansion Shelf 2 with 4 screws (B).



3. Remove the 4 tabs on the top cover of Expansion Shelf 3, by using a flathead screwdriver, as shown below.

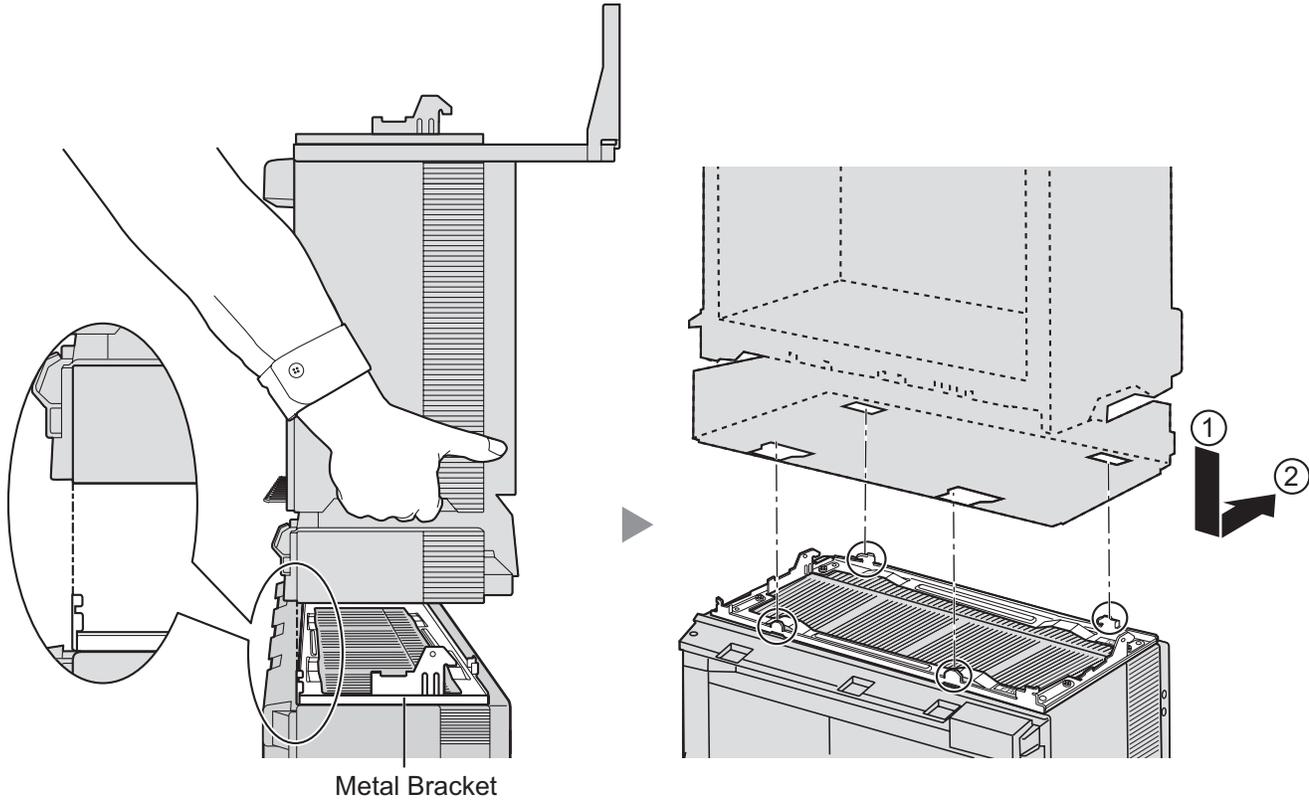


4. Fasten the wall brackets loosely to Expansion Shelf 3 with 4 screws (D). (This makes it easy to adjust the position of the shelves later.)

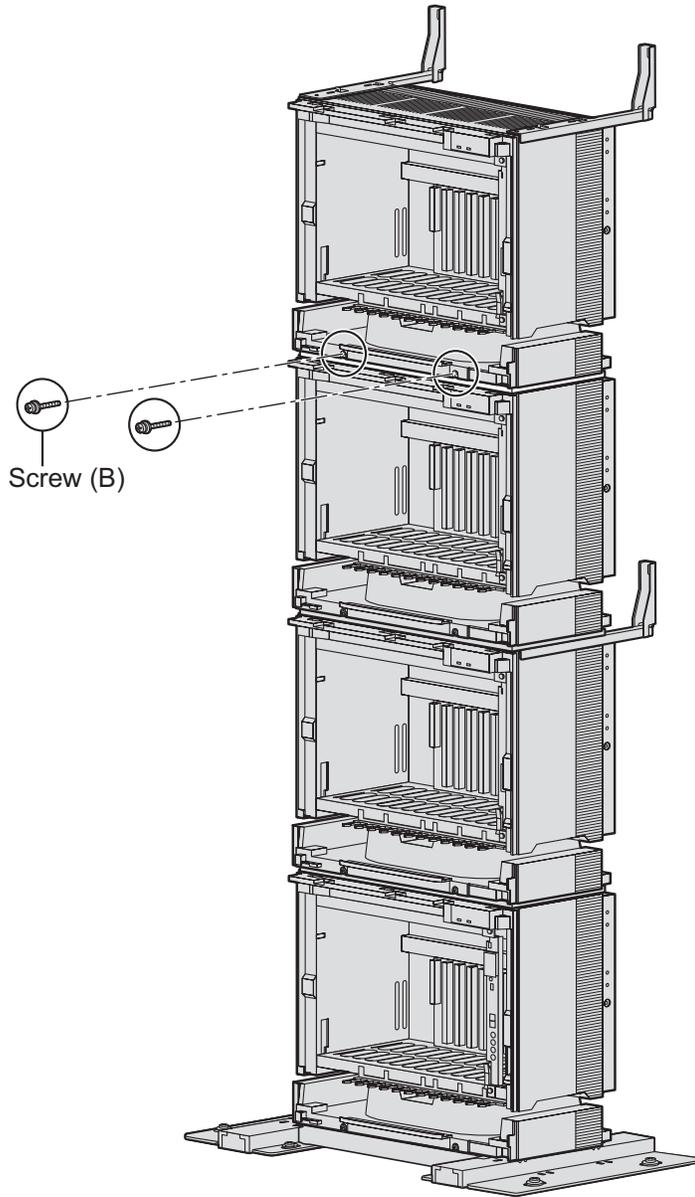


3.2.6 Installation of 3- or 4-shelf System (Tower Type)

5. Lift Expansion Shelf 3, attach it to the metal bracket fixed on Expansion Shelf 2, and slide it backwards until it locks.



- Secure Expansion Shelf 3 to the metal bracket with 2 screws (B).

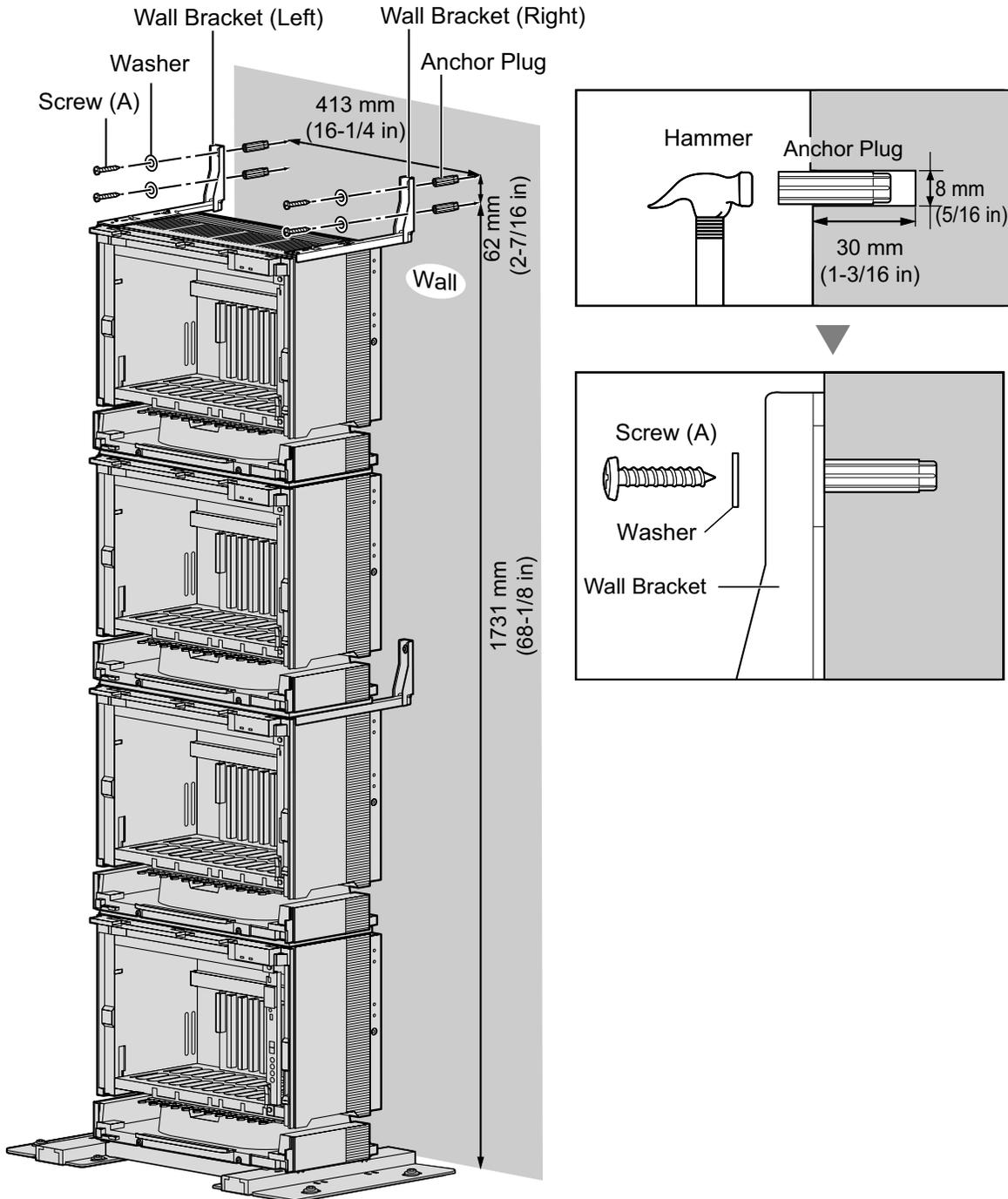


Fixing to the Wall

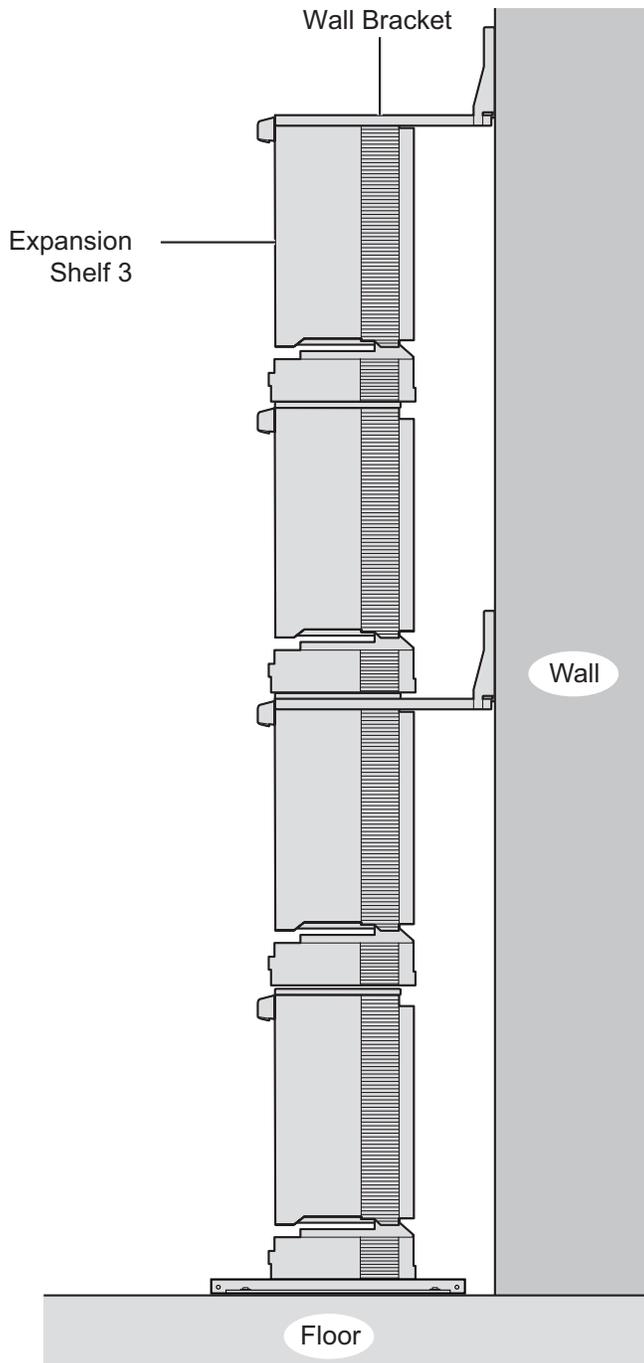
1. Install 4 anchor plugs in the wall, using the wall brackets as a template. Fix the wall brackets to the wall with 4 screws (A).

Notice

- Drive mounting screws into the wall. Be careful to avoid touching any metal laths, wire laths or metal plates in the wall.
- When installing anchor plugs in the wall, be careful not to damage or dirty the shelves.



2. Check that the shelves are standing exactly vertically. If the upper shelves are leaning slightly to one side, move Expansion Shelf 3 to adjust the position. (Since the wall brackets are attached loosely to Expansion Shelf 3, it should be possible to adjust the position of the shelves.) Then, tighten the screws connecting the wall brackets to Expansion Shelf 3.



Shelf installation is complete. Next, it is necessary to connect the shelves.

Connecting Shelves

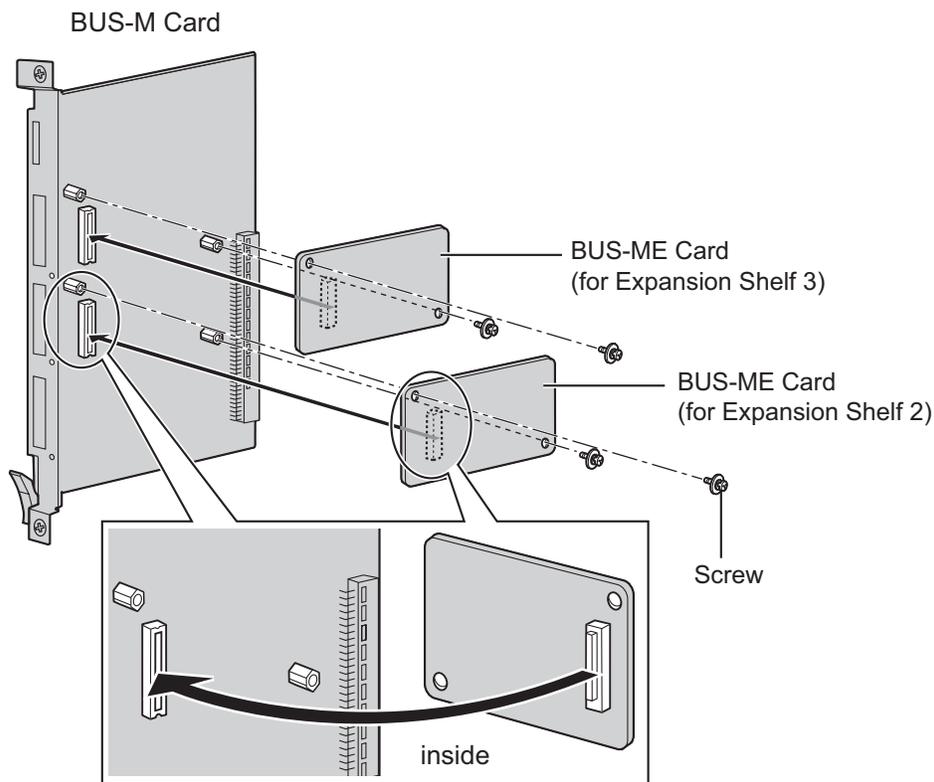
For a 3- or 4-shelf system, you need to install an optional BUS-M card and BUS-ME card(s) in the Basic Shelf. To connect the shelves, plug the Bus Cables (supplied with the BUS-M card or BUS-ME card) into the slots of the BUS-M card. Then, plug the other end of each Bus Cable into the BUS-S card built in to each Expansion Shelf.

For details about the cards, refer to "3.5.1 BUS-M Card (KX-TDA6110)", "3.5.2 BUS-ME Card (KX-TDA6111)", and "3.6.1 BUS-S Card".

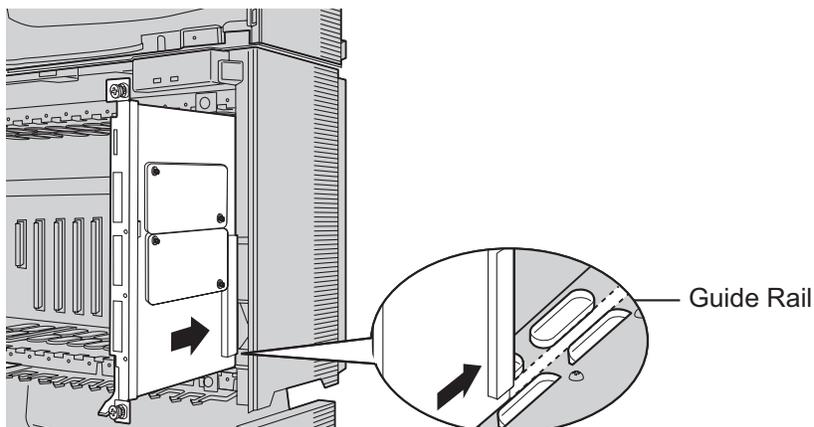
Note

When installing or removing the BUS-M card, make sure that the DC power supply is turned off.

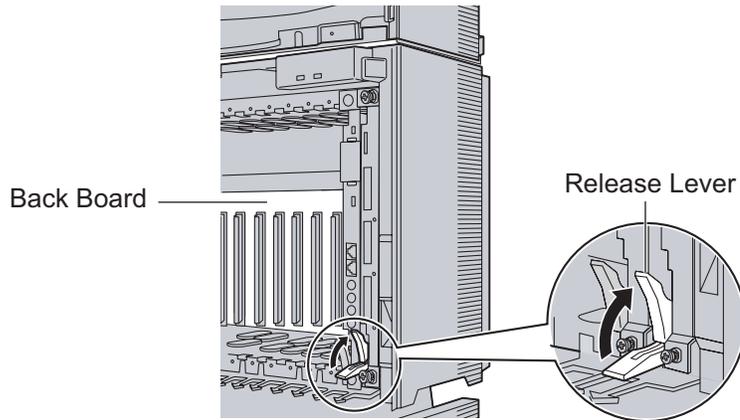
1. Mount 1 BUS-ME card (for a 3-shelf system), or 2 BUS-ME cards (for a 4-shelf system) on the BUS-M card as shown below.



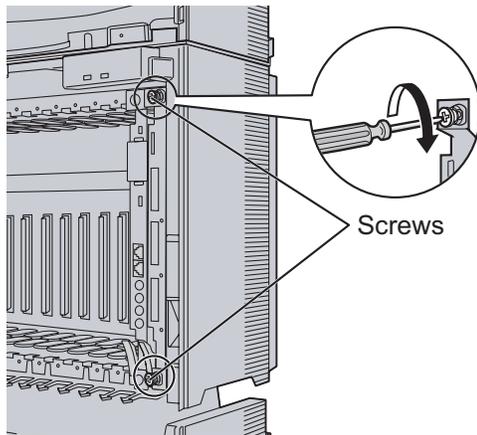
2. Insert the BUS-M card along the guide rails in the BUS-M Card Slot (the right-most slot) of the Basic Shelf.



3. Push the release lever in the direction of the arrow so that the BUS-M card engages securely with the connector on the back board.



4. Turn the 2 screws clockwise to fix the BUS-M card in place.

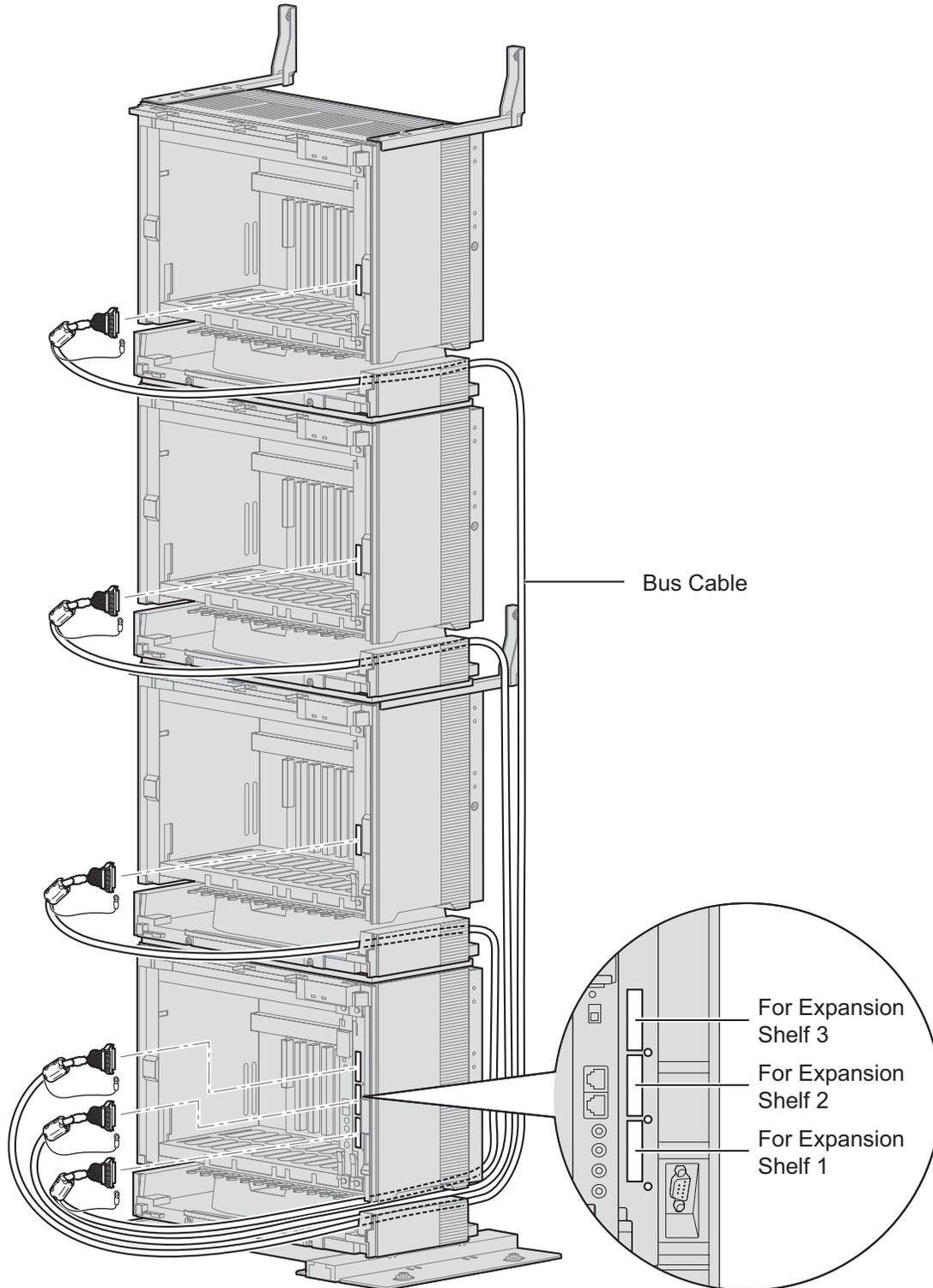


3.2.6 Installation of 3- or 4-shelf System (Tower Type)

5. Plug each Bus Cable into the corresponding port of the BUS-M card in the Basic Shelf. Then, plug the other end into the BUS-S card in each Expansion Shelf.

Note

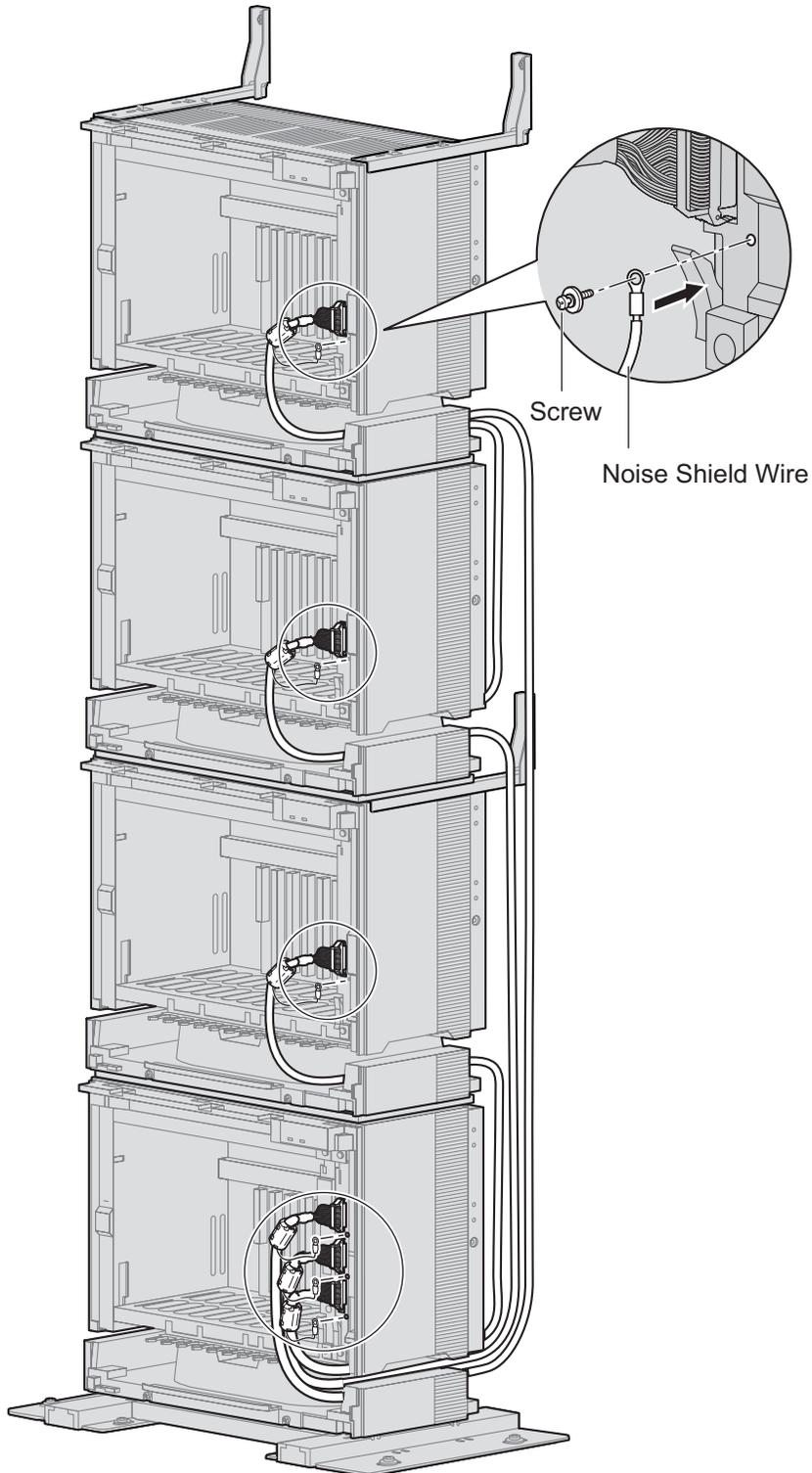
When plugging or unplugging the Bus Cables, make sure that the DC power supply is turned off.



6. Attach the noise shield wires of each Bus Cable to the Basic Shelf and each Expansion Shelf with the screws of the BUS-M card.

Note

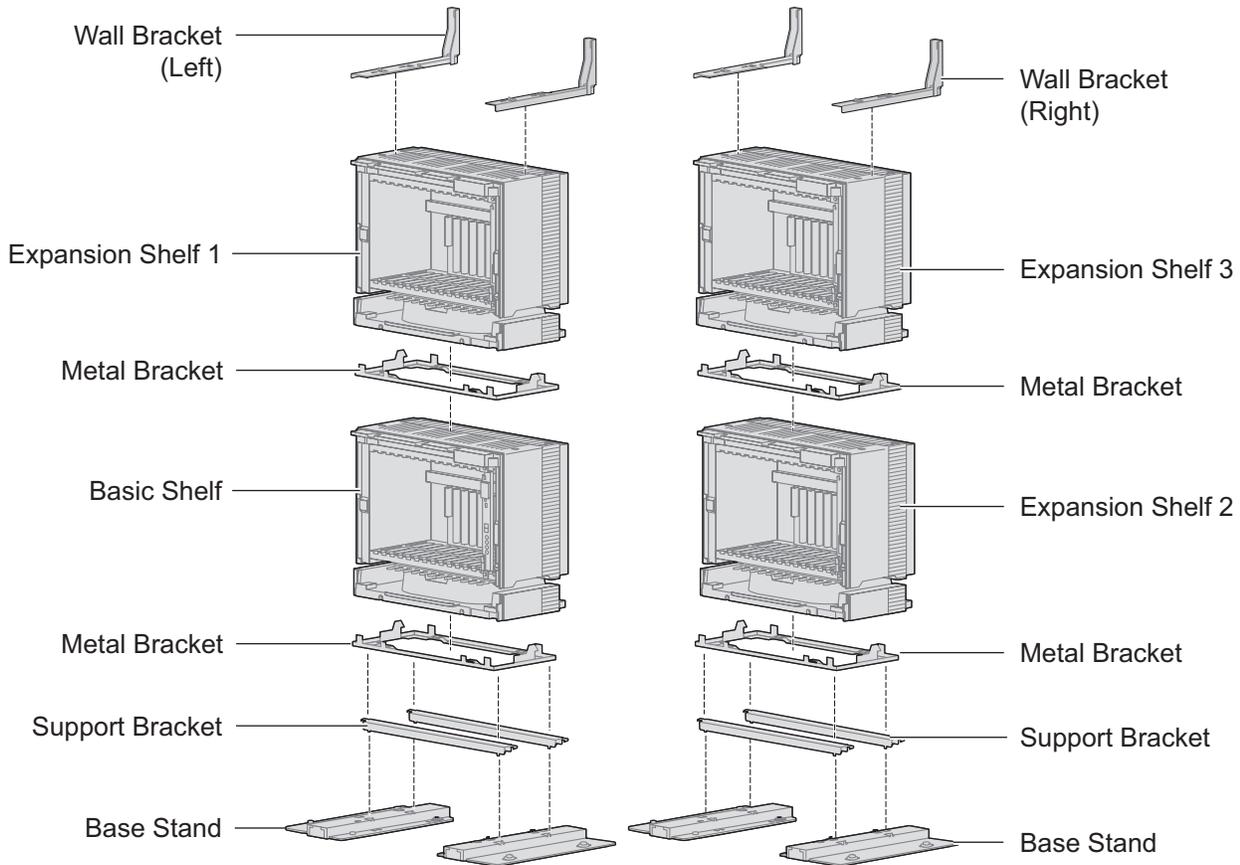
When attaching or removing the noise shield wires, make sure that the DC power supply is turned off.



3.2.7 Installation of 4-shelf System (Side-by-side Type)

When vertical space is limited, it is possible to install shelves side-by-side. Installing the system using base stands (supplied with an optional Mounting Kit) makes it easy to reinstall shelves in a different place.

Construction of 4-shelf System (Side-by-side Type)



WARNING

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

CAUTION

- Do not block the openings of the shelf. Allow space of at least 10 cm (4 in) at the sides of the shelf, and 20 cm (8 in) above the top-mounted 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.

Note

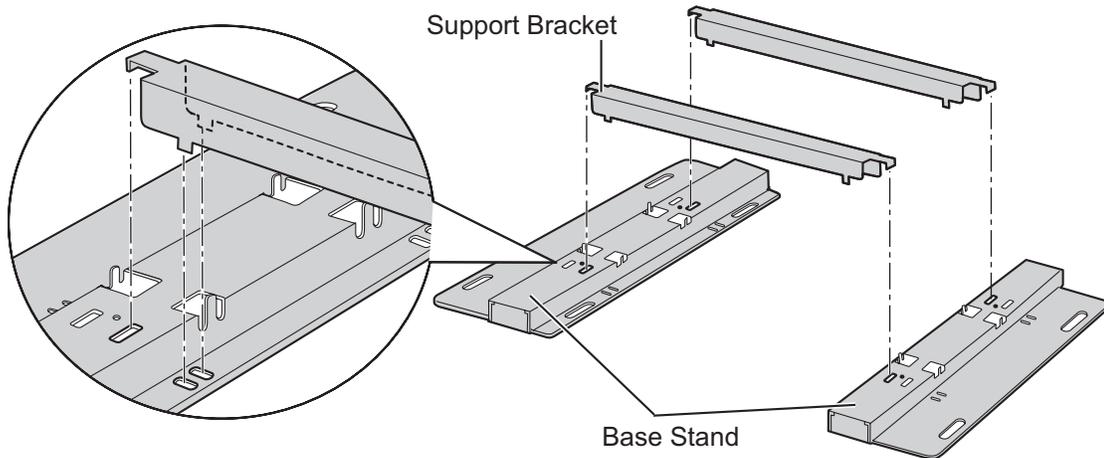
- Make sure to remove the front cover from each shelf before installing the shelves (refer to "3.2.3 Opening/Closing the Front Cover").
- Do not install any optional service cards or a PSU in the shelves before installation.
- Make sure to install the shelves where the Bus Cable (supplied with a BUS-M card or BUS-ME card) can reach the shelves.

Installing the Basic Shelf and Expansion Shelf 1

To install the Basic Shelf, attach the metal bracket (supplied with the Basic Shelf) to the base stands (supplied with the optional Mounting Kit) first. Then, install the base stands on the floor and fix the Basic Shelf to it. To install Expansion Shelf 1, attach the metal bracket (supplied with Expansion Shelf 1) to the Basic Shelf. Then, mount Expansion Shelf 1 on the Basic Shelf.

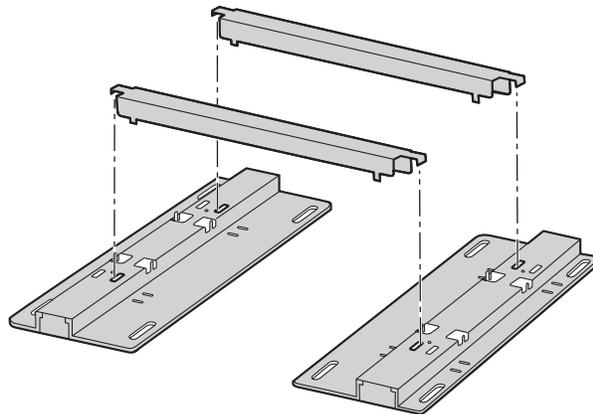
Basic Shelf

1. Attach the support brackets to the base stands.



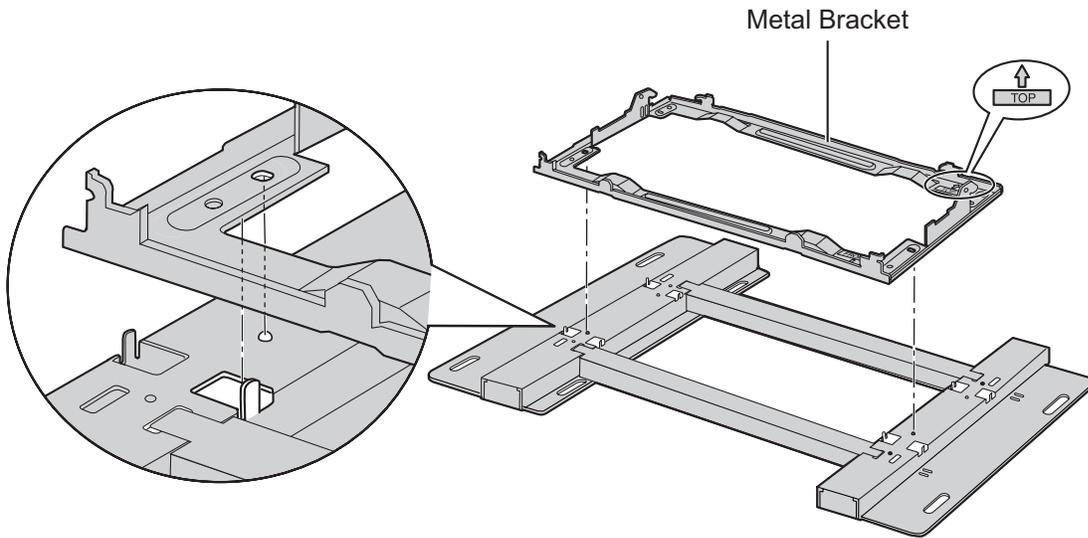
Note

If necessary, it is possible to reverse the direction of the base stands as shown below:

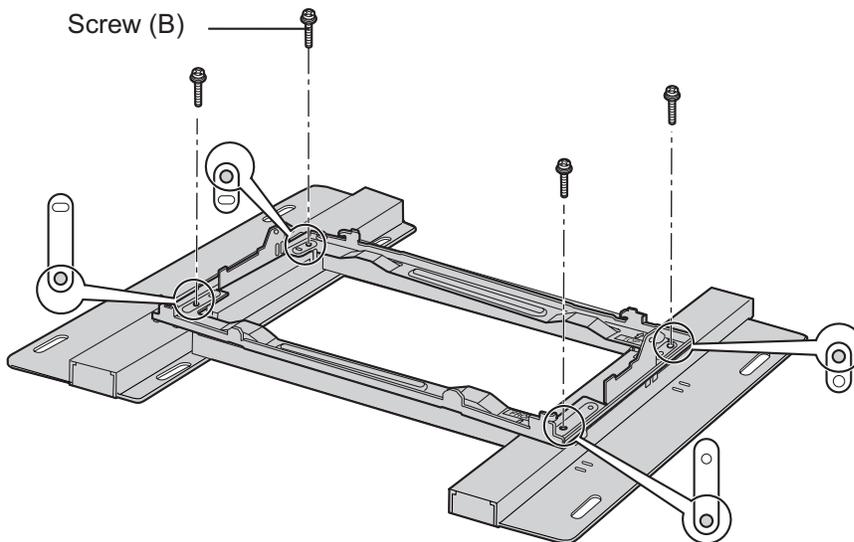


3.2.7 Installation of 4-shelf System (Side-by-side Type)

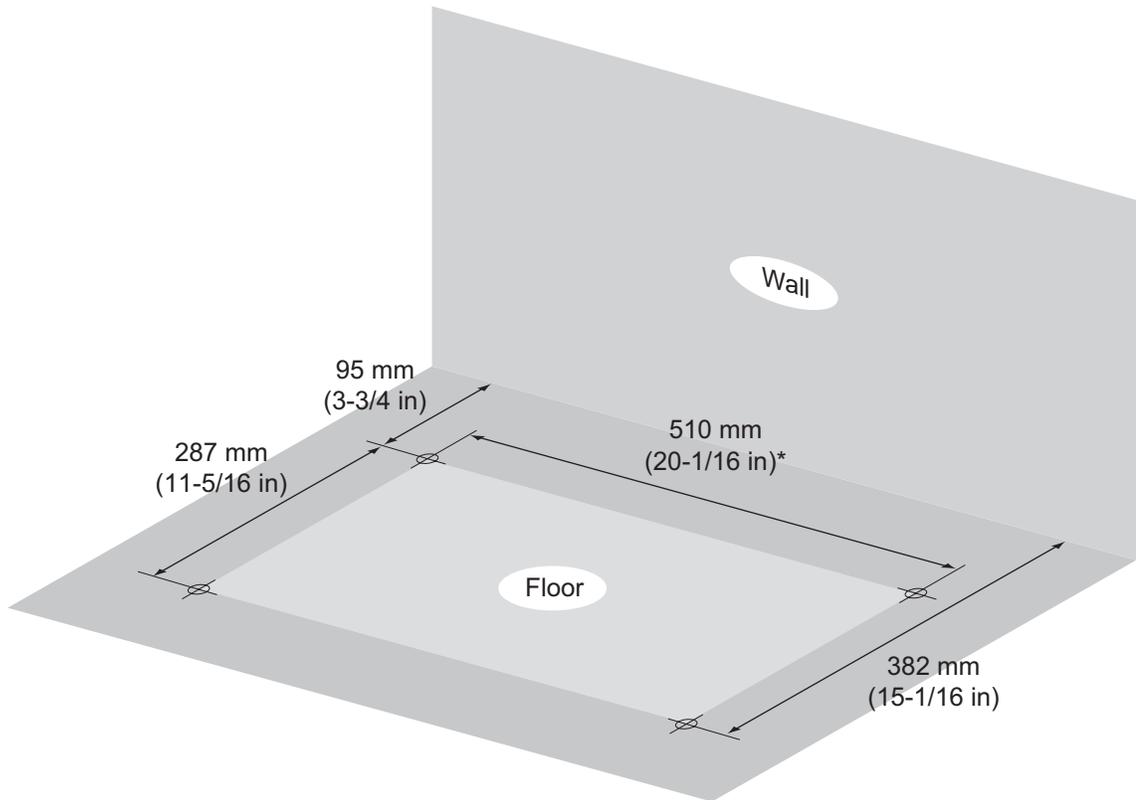
2. Place the metal bracket on the base stands.



3. Attach the metal bracket to the base stands with 4 screws (B).



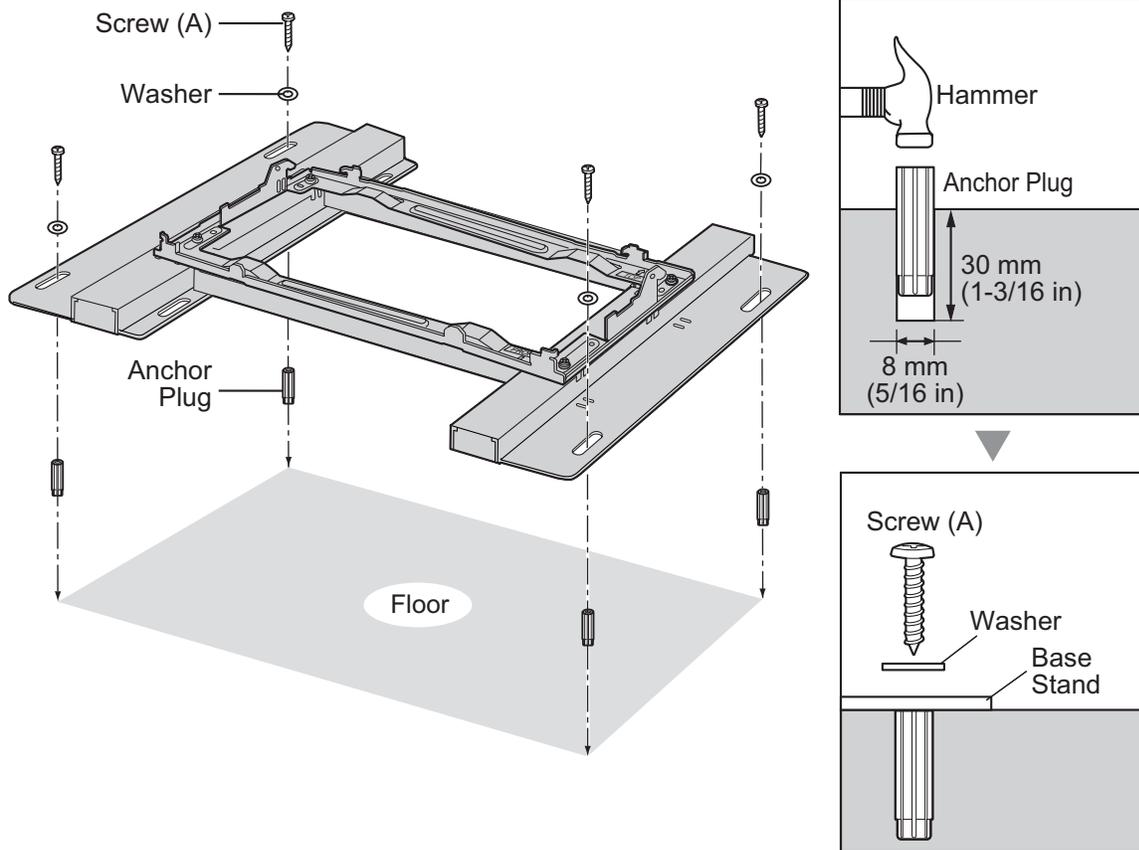
4. Make 4 holes for anchor plugs on the floor, using the measurements indicated here.



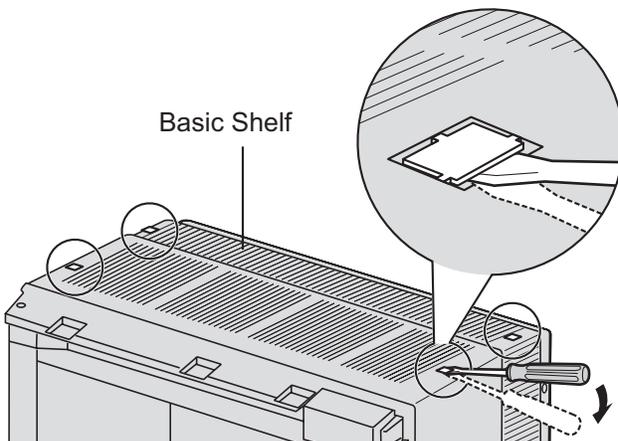
* If the direction of the base stands is reversed, the measurement must be 443.4 mm (17-7/16 in).

3.2.7 Installation of 4-shelf System (Side-by-side Type)

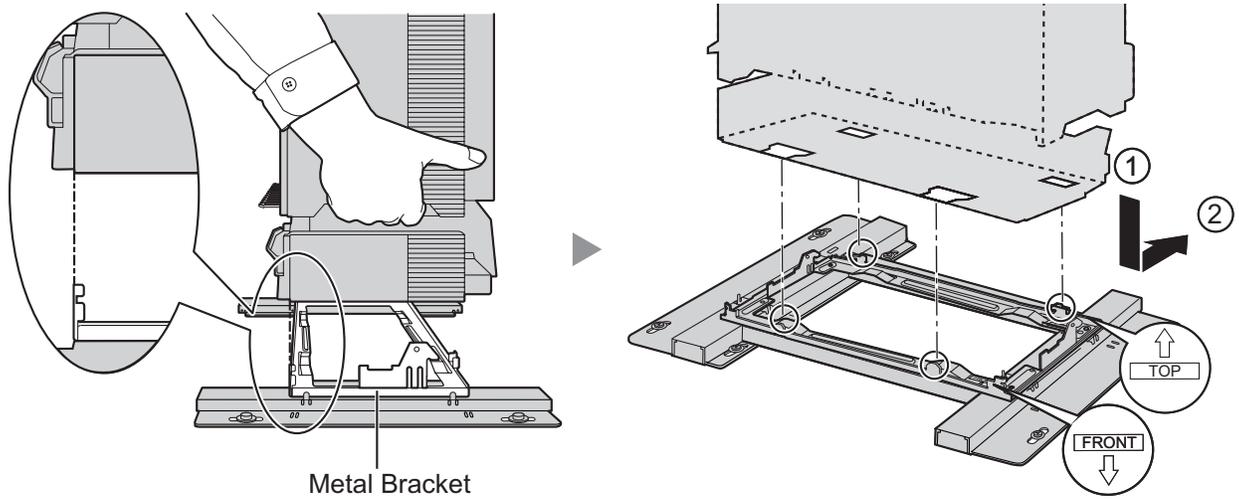
5. Install 4 anchor plugs in the holes on the floor.
Then, fasten the base stands to the floor with 4 screws (A).



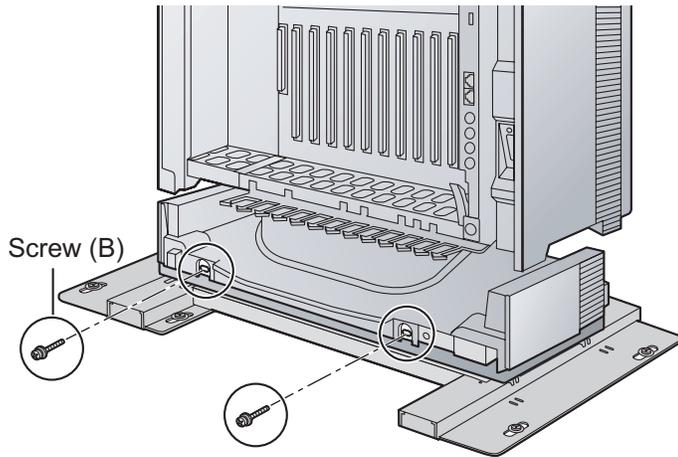
6. Remove the 4 tabs on the top cover of the Basic Shelf, by using a flathead screwdriver, as shown below.



7. Lift the Basic Shelf, attach it to the metal bracket, and slide it backwards until it locks.

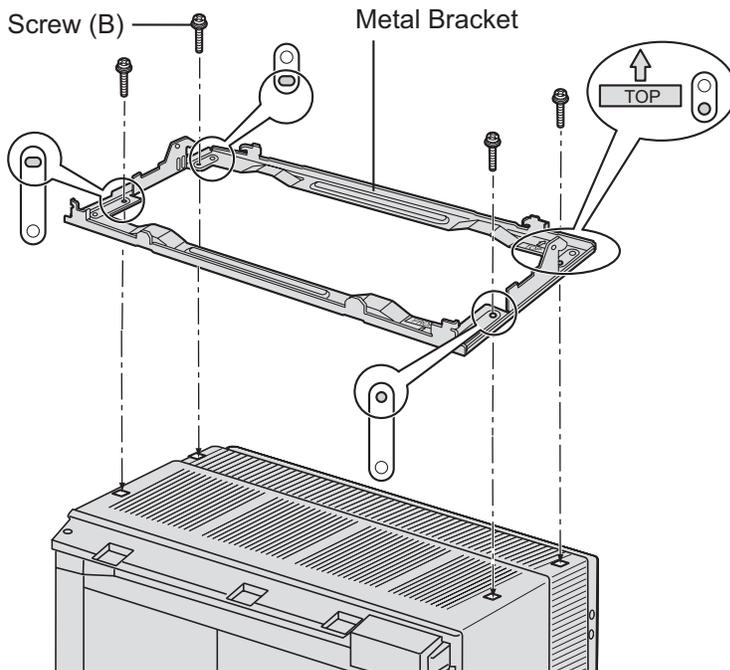


8. Secure the Basic Shelf to the metal bracket with 2 screws (B).

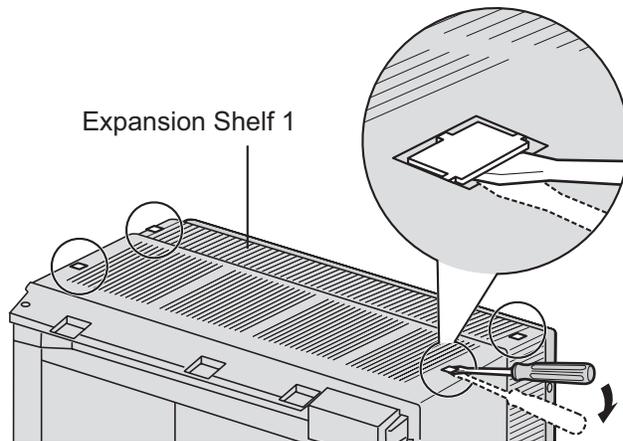


Expansion Shelf 1

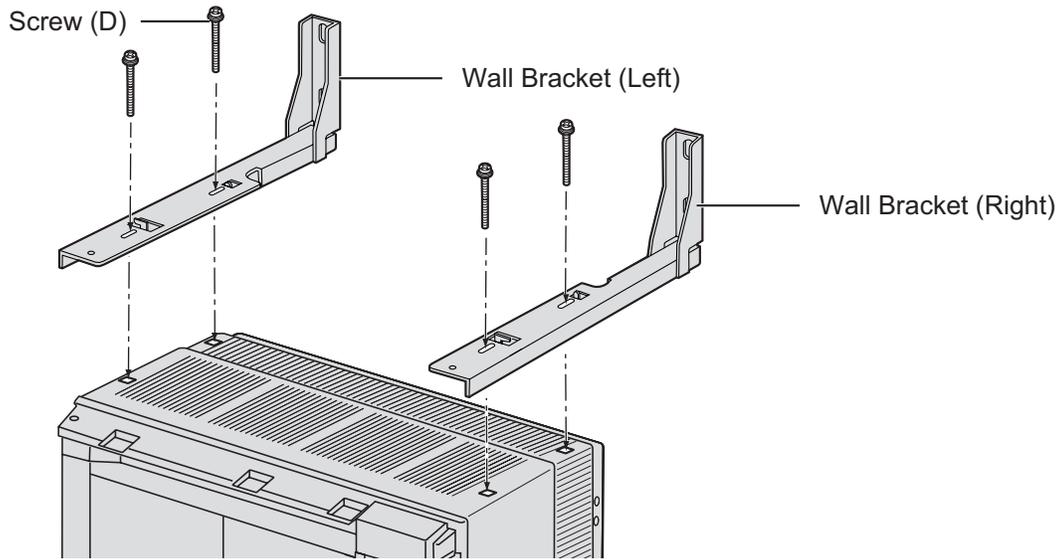
1. Fix the metal bracket to the Basic Shelf with 4 screws (B).



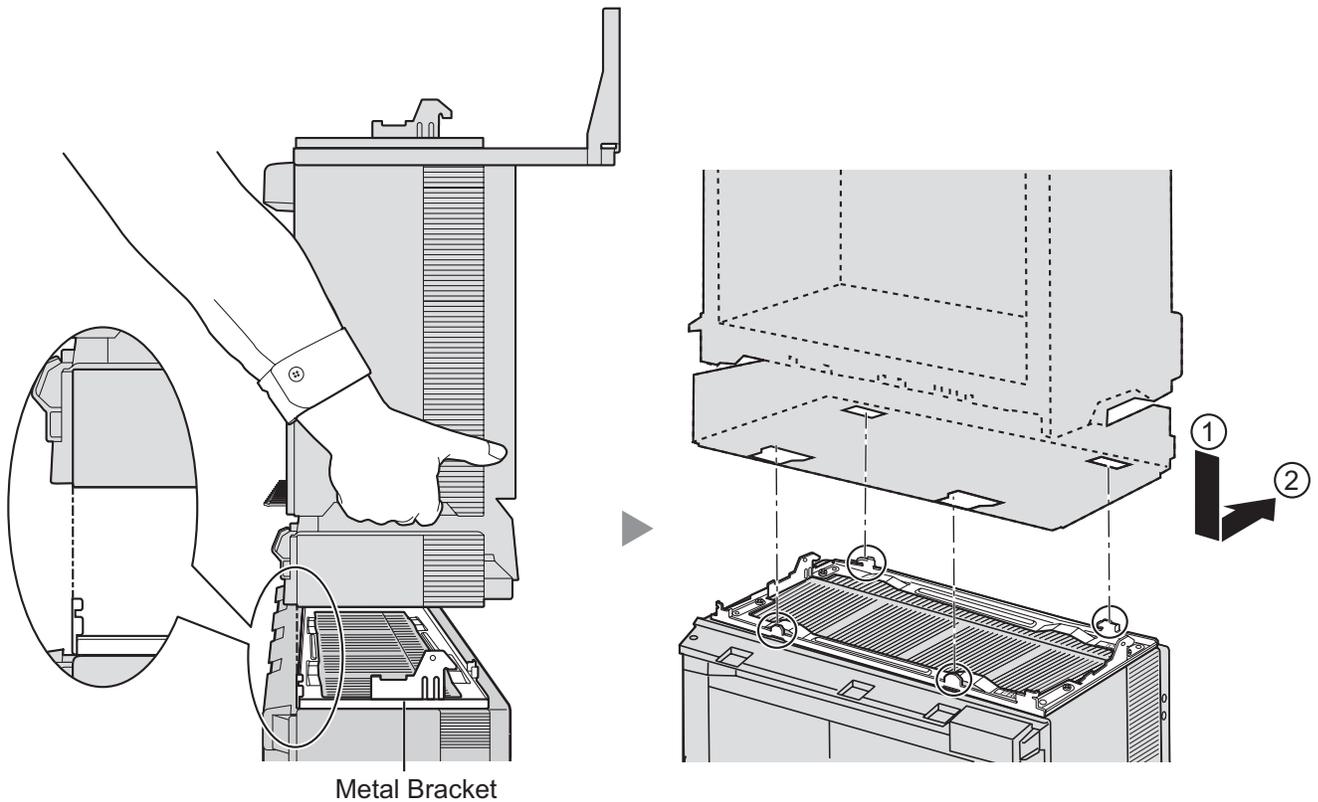
2. Remove the 4 tabs on the top cover of Expansion Shelf 1, by using a flathead screwdriver, as shown below.



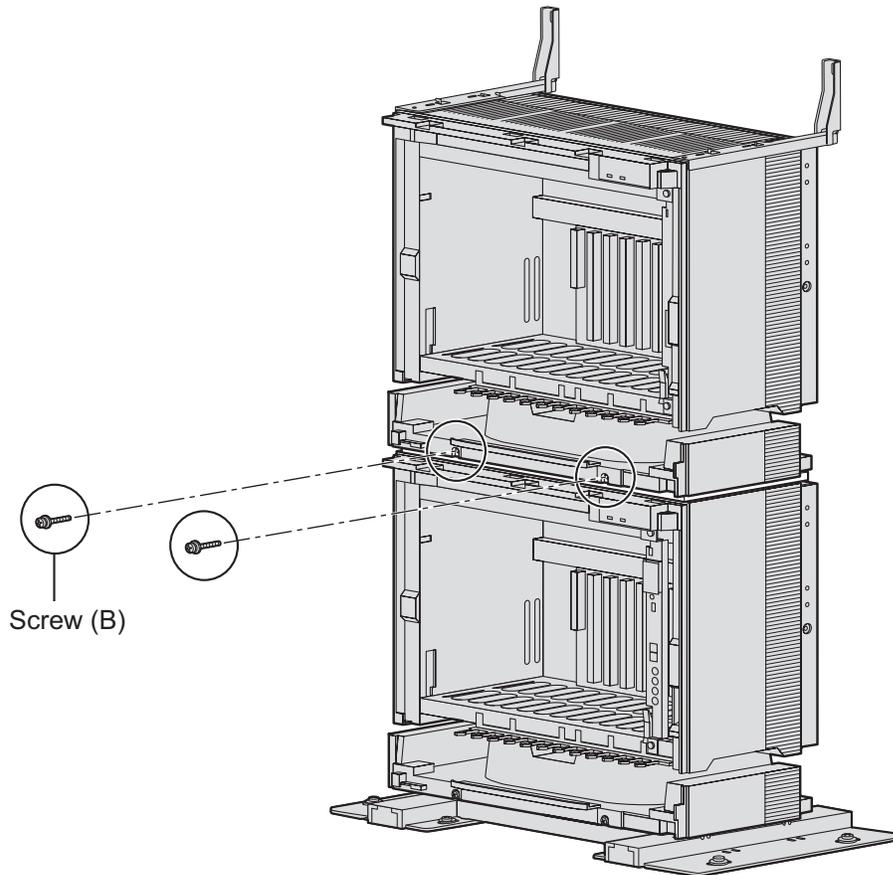
3. Fasten the wall brackets loosely to Expansion Shelf 1 with 4 screws (D). (This makes it easy to adjust the position of the shelves later.)



4. Lift Expansion Shelf 1, attach it to the metal bracket fixed on the Basic Shelf, and slide it backwards until it locks.



5. Secure Expansion Shelf 1 to the metal bracket with 2 screws (B).



Fixing to the Wall

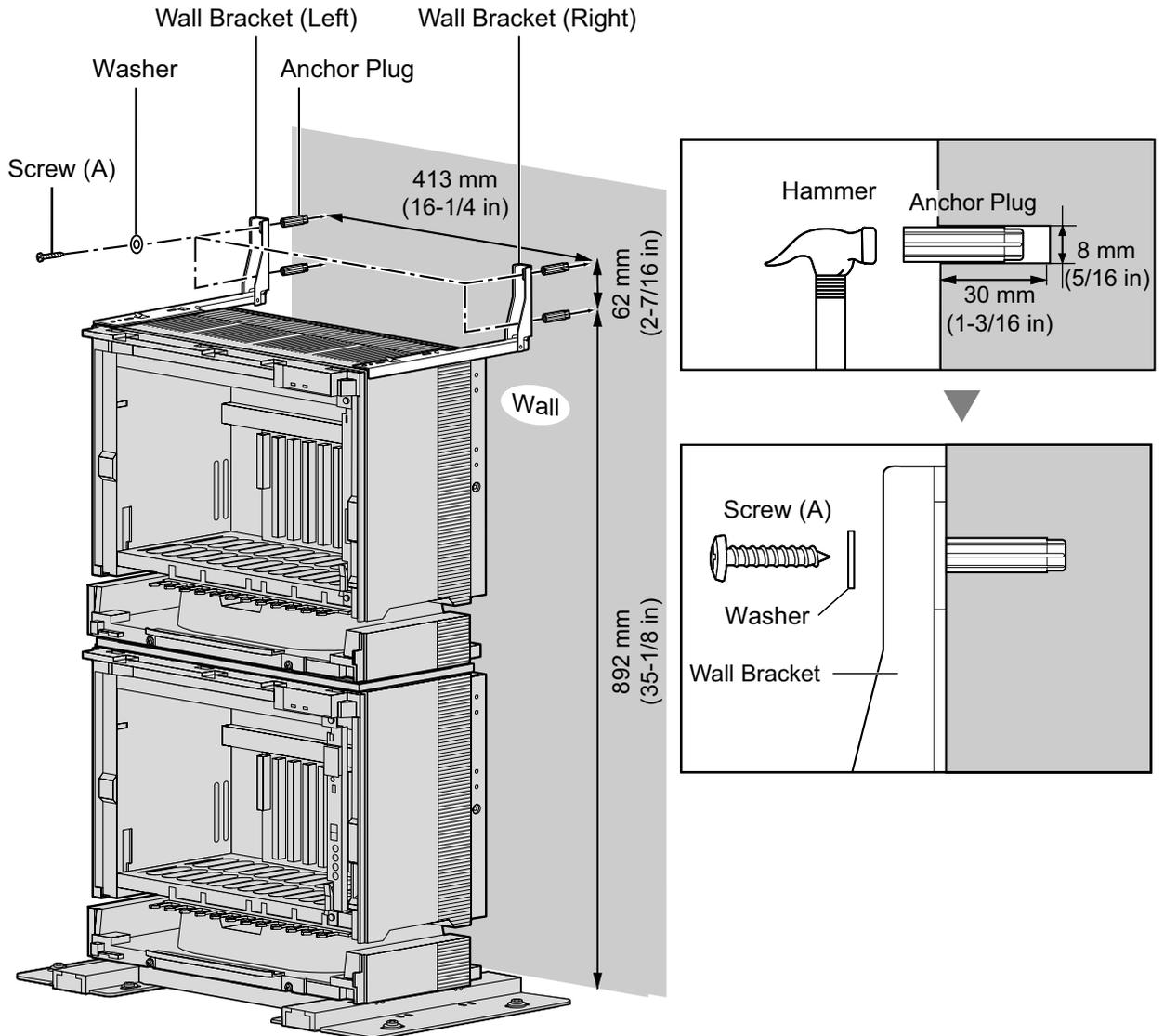
1. Install 4 anchor plugs in the wall, using the wall brackets as a template. Fix the wall brackets to the wall with 4 screws (A).

Notice

- Drive mounting screws into the wall. Be careful to avoid touching any metal laths, wire laths or metal plates in the wall.

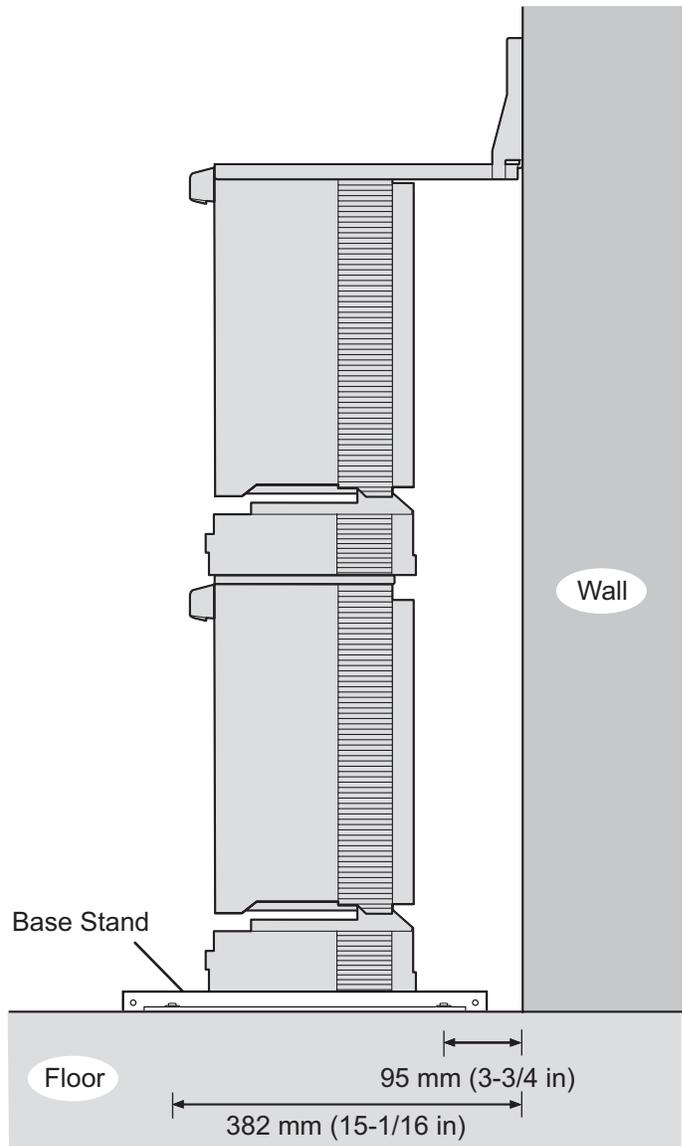
3.2.7 Installation of 4-shelf System (Side-by-side Type)

- When installing anchor plugs in the wall, be careful not to damage or dirty the shelves.



3.2.7 Installation of 4-shelf System (Side-by-side Type)

2. Check that the shelves are standing exactly vertically. If the shelves are leaning slightly to one side, move the base stands to adjust the position. (Since the base stands are attached loosely to the floor, it should be possible to adjust the position of the shelves.) Then, tighten the screws connecting the base stands to the floor.

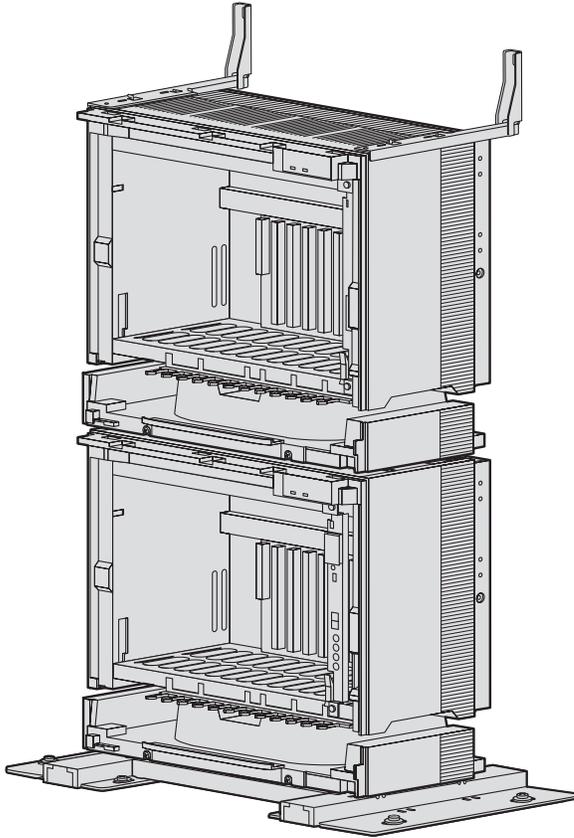


Installation of the first 2 shelves is complete. Next, install Expansion Shelves 2 and 3 next to the Basic Shelf and Expansion Shelf 1.

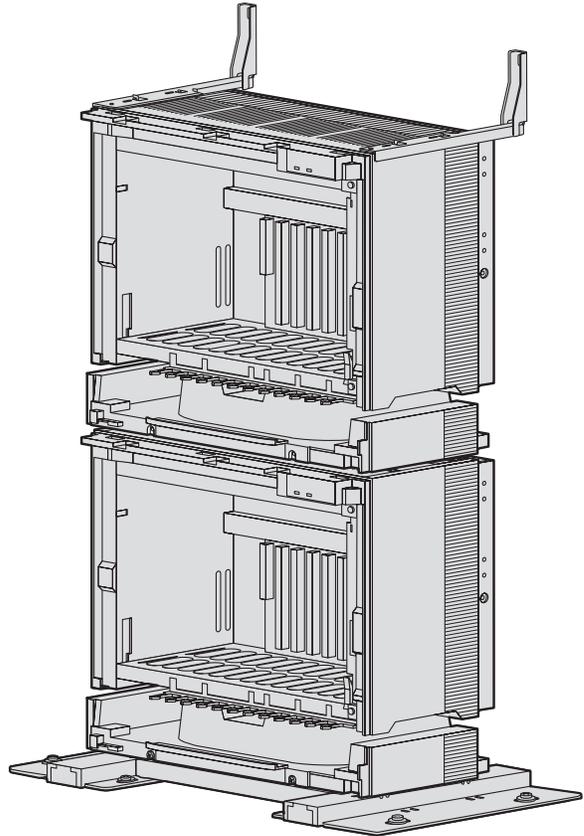
Installing Expansion Shelves 2 and 3

Repeat the procedure in "Installing the Basic Shelf and Expansion Shelf 1" for Expansion Shelves 2 and 3. Expansion Shelves 2 and 3 must be connected to the Basic Shelf using Bus Cables. Therefore, make sure that Expansion Shelves 2 and 3 are installed so that the Bus Cables can reach the Basic Shelf.

Basic Shelf and Expansion Shelf 1



Expansion Shelves 2 and 3



Shelf installation is complete. Next, it is necessary to connect the shelves.

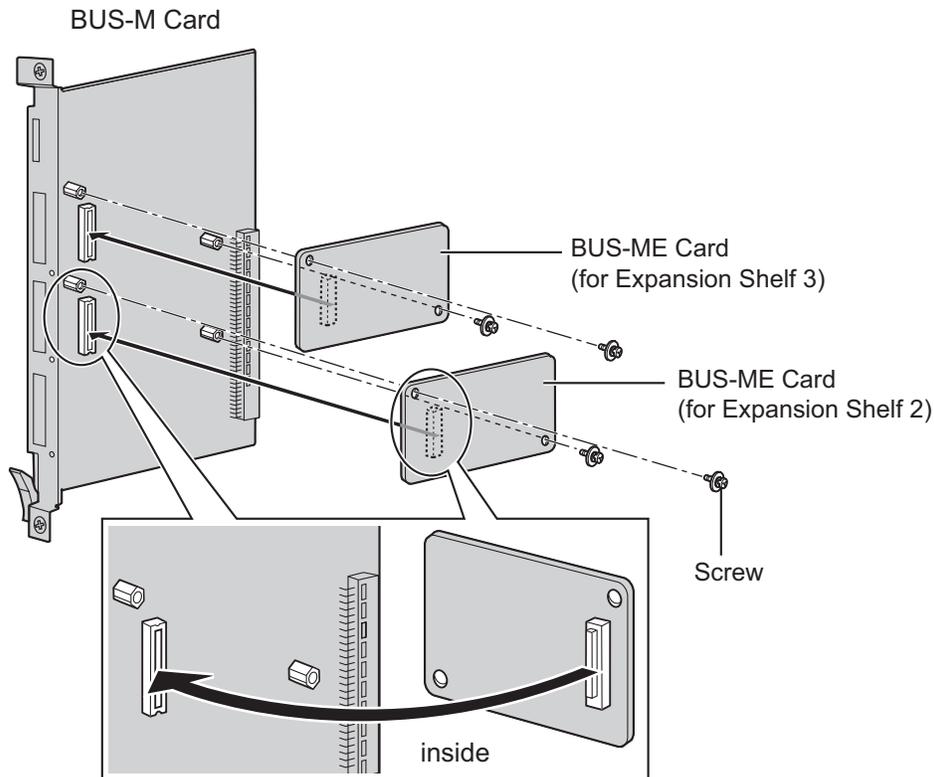
Connecting Shelves

For the 4-shelf system, you need to install an optional BUS-M card and BUS-ME cards in the Basic Shelf. To connect the shelves, plug the Bus Cables (supplied with the BUS-M card or BUS-ME card) into the slot of the BUS-M card. Then, plug the other end of each Bus Cable into the BUS-S card built in to each Expansion Shelf. For details about the cards, refer to "3.5.1 BUS-M Card (KX-TDA6110)", "3.5.2 BUS-ME Card (KX-TDA6111)", and "3.6.1 BUS-S Card".

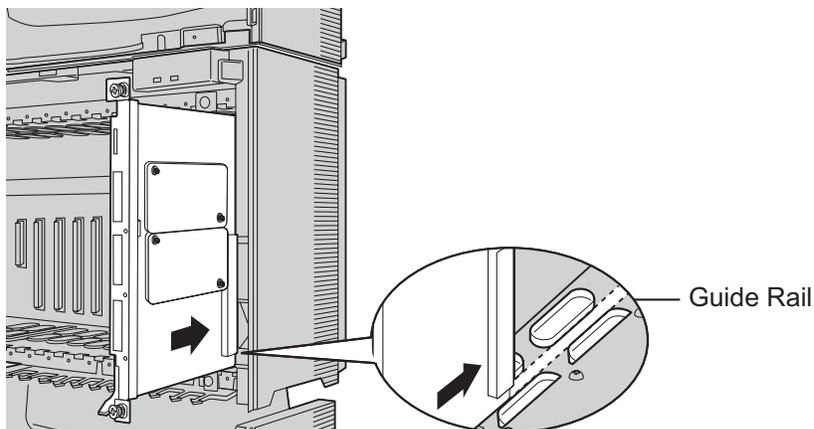
Note

When installing or removing the BUS-M card, make sure that the DC power supply is turned off.

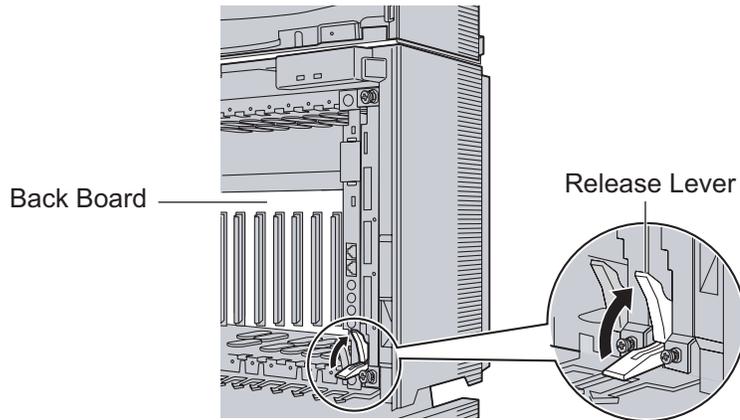
1. Mount 2 BUS-ME cards on the BUS-M card as shown below.



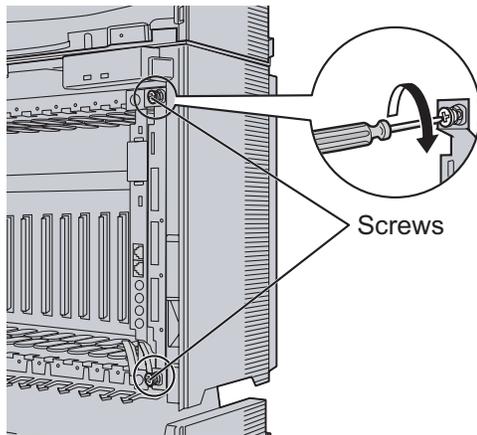
2. Insert the BUS-M card along the guide rails in the BUS-M Card Slot (the right-most slot) of the Basic Shelf.



3. Push the release lever in the direction of the arrow so that the BUS-M card engages securely with the connector on the back board.



4. Turn the 2 screws clockwise to fix the BUS-M card in place.

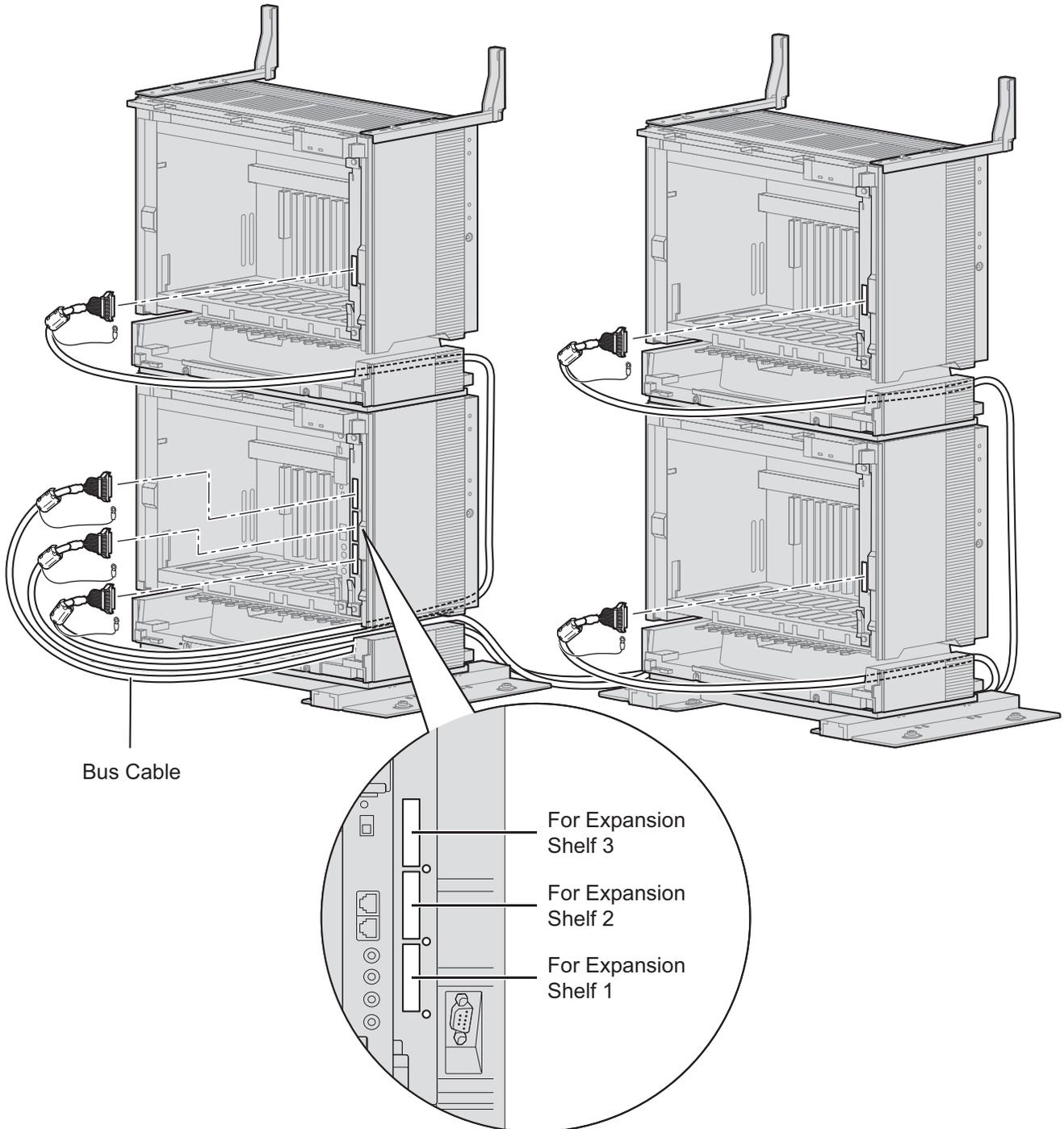


3.2.7 Installation of 4-shelf System (Side-by-side Type)

5. Plug each Bus Cable into the corresponding port of the BUS-M card in the Basic Shelf. Then, plug the other end into the BUS-S card in each Expansion Shelf.

Note

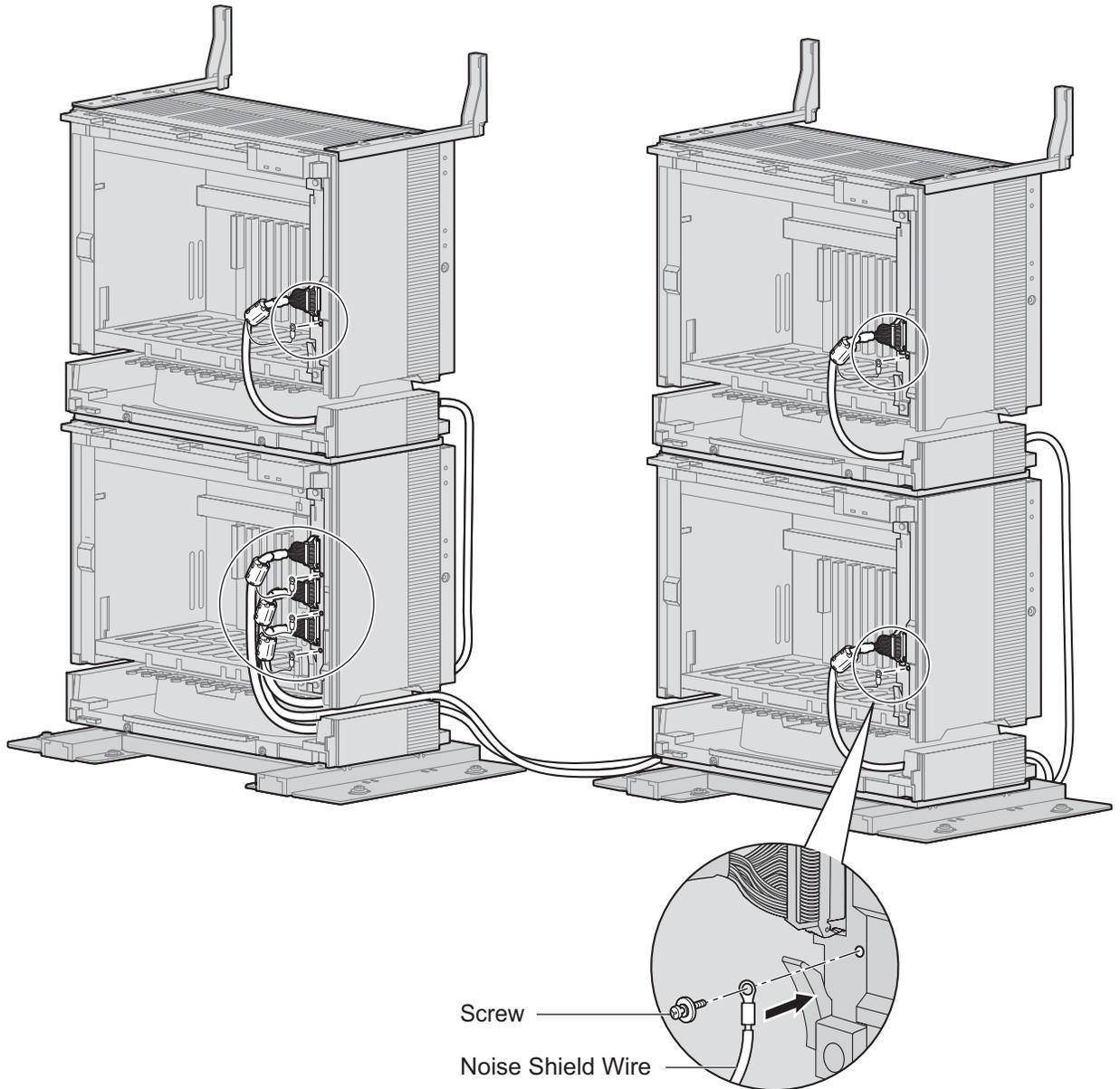
When plugging or unplugging the Bus Cables, make sure that the DC power supply is turned off.



6. Attach the noise shield wires of each Bus Cable to the Basic Shelf and each Expansion Shelf with the screws of the BUS-M card.

Note

When attaching or removing the noise shield wires, make sure that the DC power supply is turned off.



3.2.8 Wall Mounting (KX-TDE600/KX-TDE620)

Mounting Shelves

WARNING

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

CAUTION

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

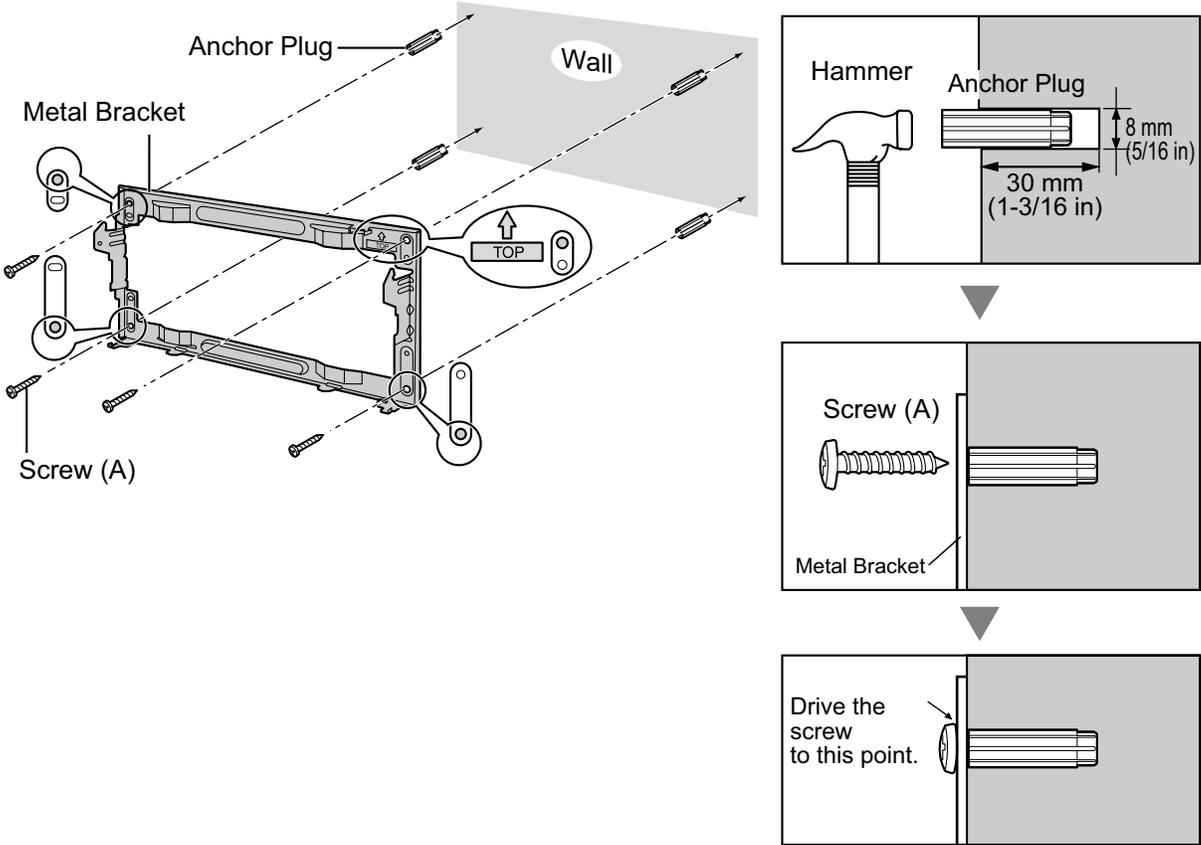
Notice

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

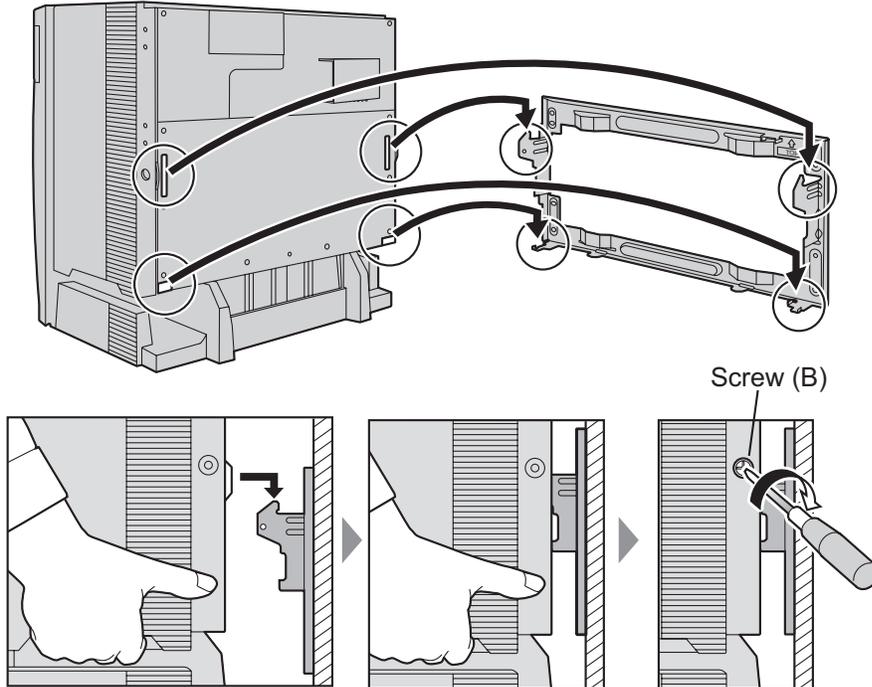
Note

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

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



- 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.



Connecting Shelves

For a multiple shelf system, you need to install an optional BUS-M card and BUS-ME card(s) in the Basic Shelf. To connect the shelves, plug the Bus Cables (supplied with the BUS-M card or BUS-ME card) into the slots of the BUS-M card. Then, plug the other end of each Bus Cable into the BUS-S card built in to each Expansion Shelf.

For a 2-shelf System (Basic Shelf + 1 Expansion Shelf)

It is necessary to install an optional BUS-M card in the Basic Shelf.

For how to connect the shelves, refer to "Connecting Shelves" in "3.2.5 Installation of Basic System or 2-shelf System (Floor Standing)".

For a 3- or 4- shelf System (Basic Shelf + 2 or 3 Expansion Shelves)

It is necessary to install an optional BUS-M card in the Basic Shelf, and mount 1 BUS-ME card (for a 3-shelf system), or 2 BUS-ME cards (for a 4-shelf system) on the BUS-M card.

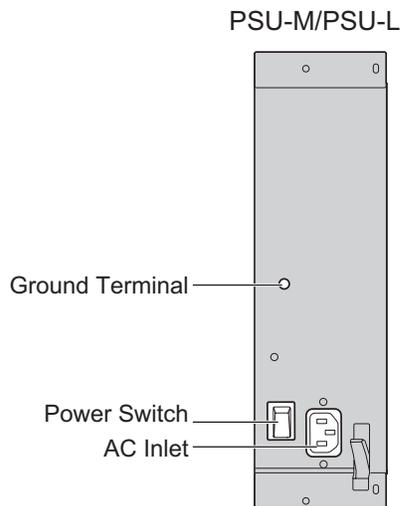
For how to connect the shelves, refer to "Connecting Shelves" in "3.2.6 Installation of 3- or 4-shelf System (Tower Type)".

3.2.9 Installing/Replacing the Power Supply Unit

Function

PSU Type	Lower/Upper Input Voltage Range	Current	Input Frequency
PSU-M	Lower: 100 V AC to 130 V AC	2.5 A ^{*1}	50 Hz or 60 Hz
	Upper: 200 V AC to 240 V AC	1.4 A	
PSU-L	Lower: 100 V AC to 130 V AC	5.1 A ^{*1}	
	Upper: 200 V AC to 240 V AC	2.55 A	

^{*1} When you are installing multiple shelves, make sure that the total ampere rating of all the devices plugged into the AC outlet does not exceed the ampere rating of either the AC outlet or the breaker.



Accessories and User-supplied Items

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

User-supplied (not included): Grounding wire

WARNING

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

Notice

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

Note

For details about frame ground connection, refer to "3.2.10 Frame Ground Connection".

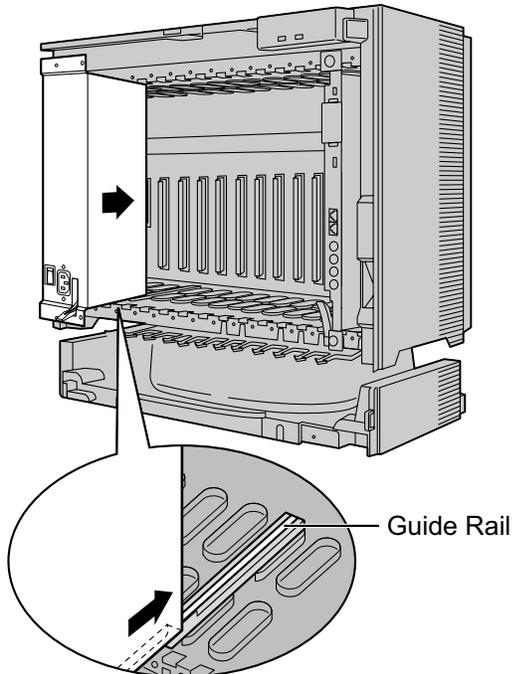
The following procedures are for installing or replacing a PSU only. Do not replace or remove the PSU for any other purpose.

Installing the Power Supply Unit

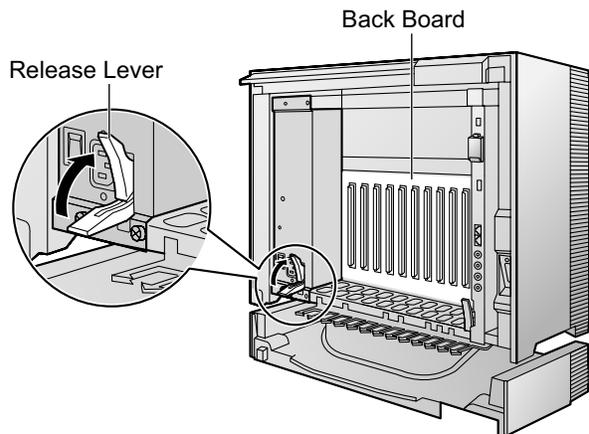
1. Insert the PSU along the guide rails.

CAUTION

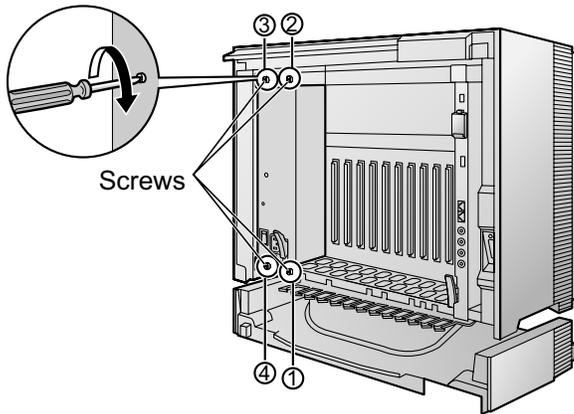
For safety reasons, do not touch parts in the PSU.



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

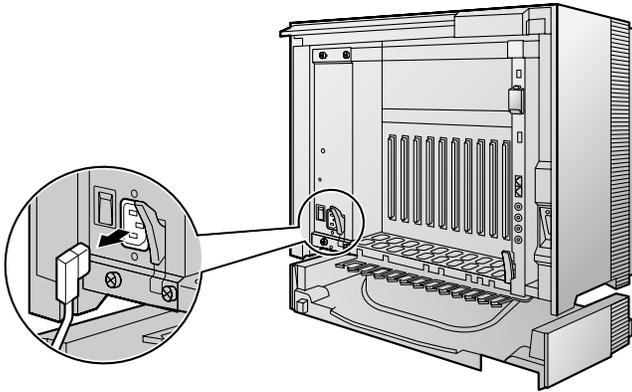


3. Turn the 4 screws clockwise, in the order indicated by the numbers 1 to 4, to fix the PSU.

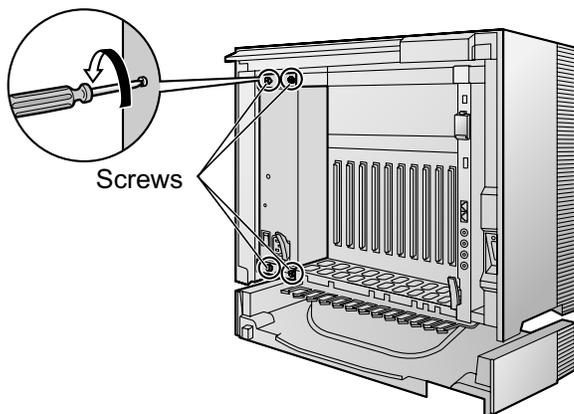


Replacing the Power Supply Unit

1. Unplug the AC power cord.

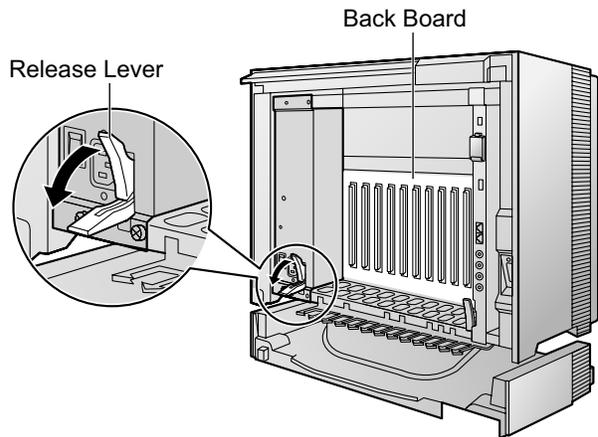


2. Turn the 4 screws counterclockwise to loosen them.

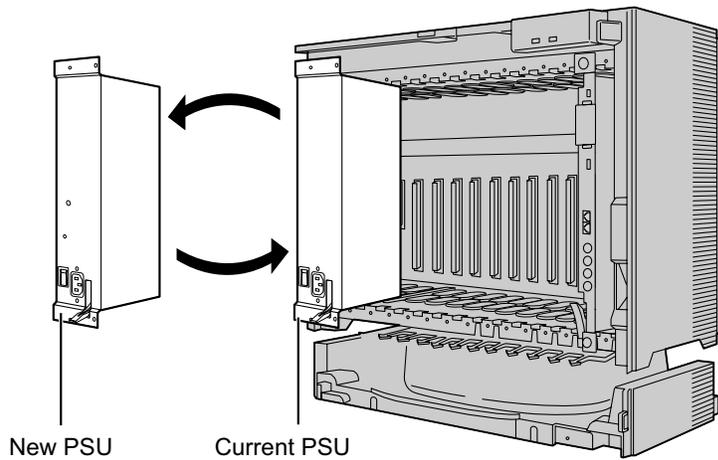


3.2.9 Installing/Replacing the Power Supply Unit

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



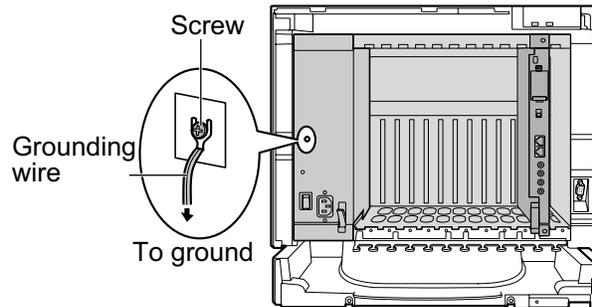
4. Replace the PSU.



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

3.2.10 Frame Ground Connection

1. Loosen the screw.
2. Insert a grounding wire (user-supplied).
3. Tighten the screw.
4. Connect the grounding wire to ground.
5. Repeat steps 1 to 4 for each shelf.



WARNING

- **Proper grounding (connection to ground) is very important to reduce the risk to the user of electrocution or to protect the PBX from the bad effects of external noise 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 each PBX must be made.**

CAUTION

- Make sure to separately connect the frame of each shelf to a different ground terminal. Do not connect it to other shelves.
- For grounding wire, green-and-yellow insulation is required, and the cross-sectional area of the conductor must be more than 0.75 mm² or 18 AWG.

Notice

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

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

Test Procedure

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

3.2.11 Installing/Removing the Optional Service Cards

CAUTION

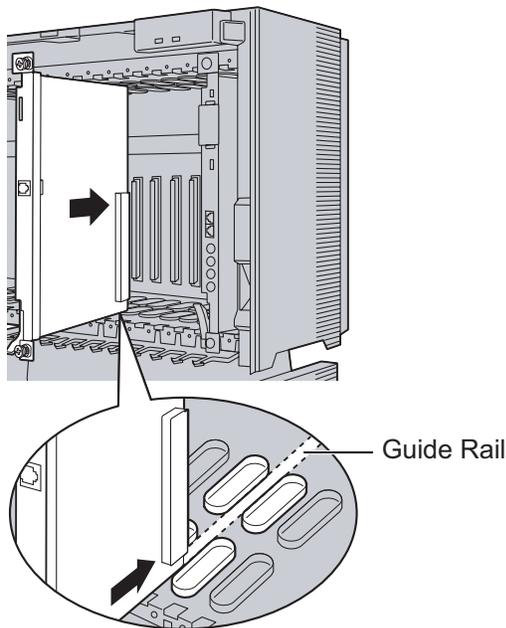
- To protect the back board from static electricity, do not touch parts on the back board in the main unit and on the optional service cards. To discharge static electricity, touch ground or wear a grounding strap.
- When installing or removing the IPCEMPR card, BUS-M card or BUS-S card, the DC power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

Note

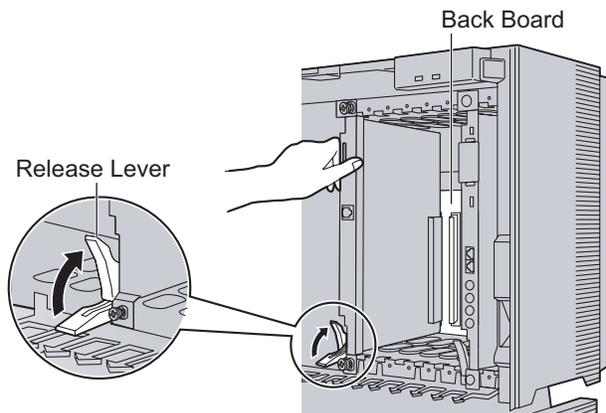
The optional service cards can be installed or removed while the DC power is supplied.

Installing Optional Service Cards

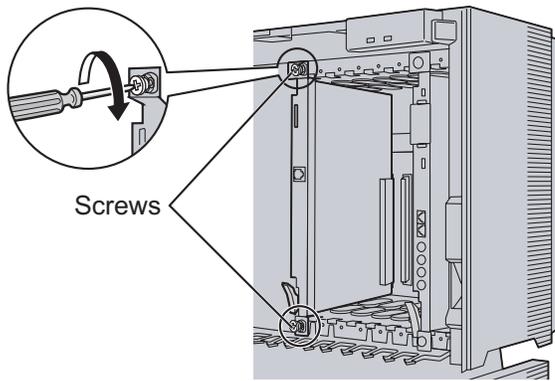
1. Insert the card along the guide rails.



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

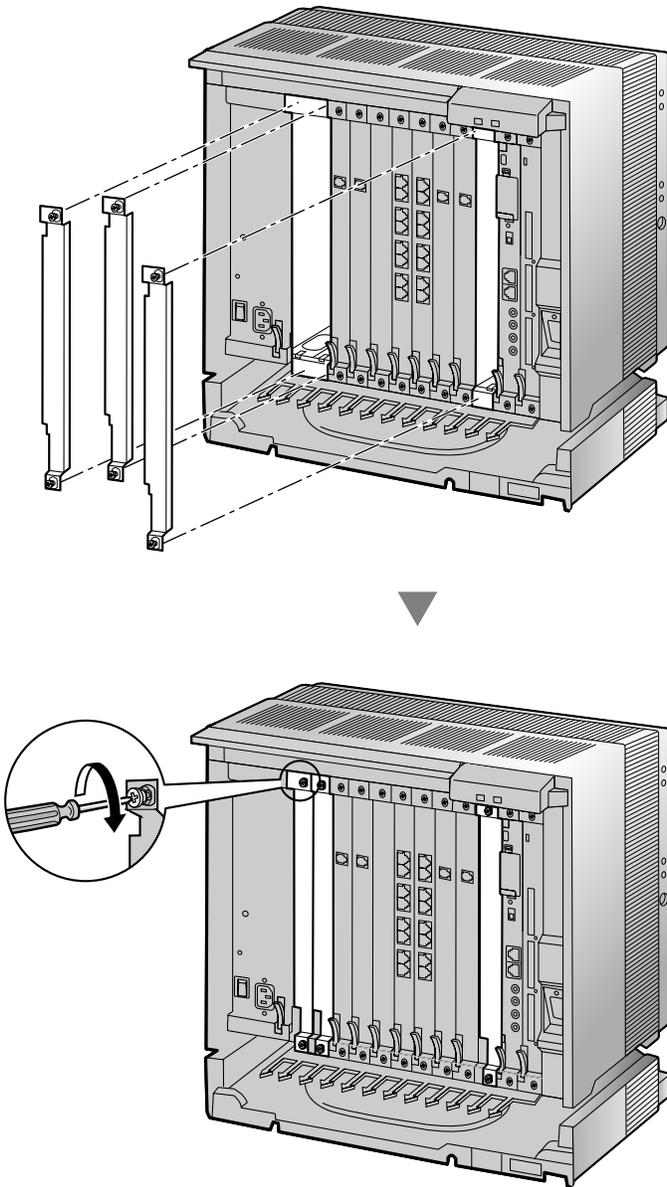
Make sure the screws are tightened to ground the card securely.

Covering the Blank Slots

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

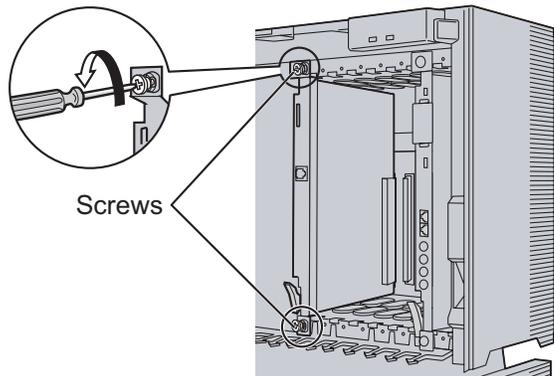
CAUTION

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

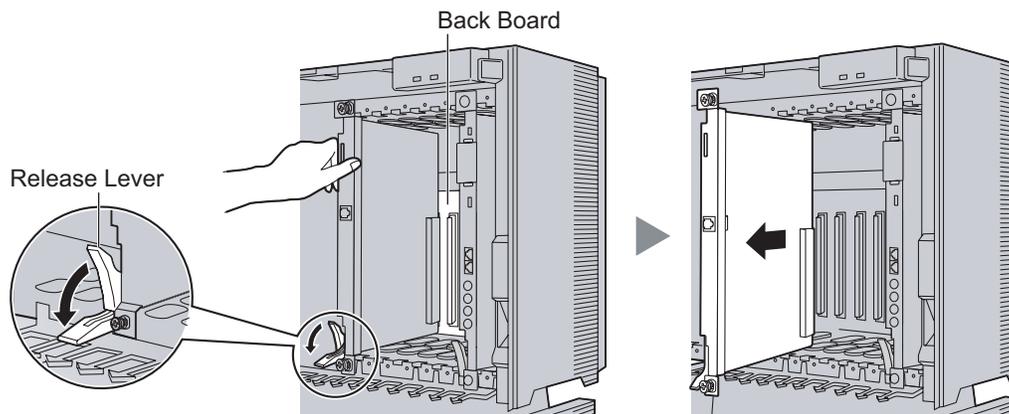


Removing the Optional Service Cards

1. Turn the 2 screws counterclockwise 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.



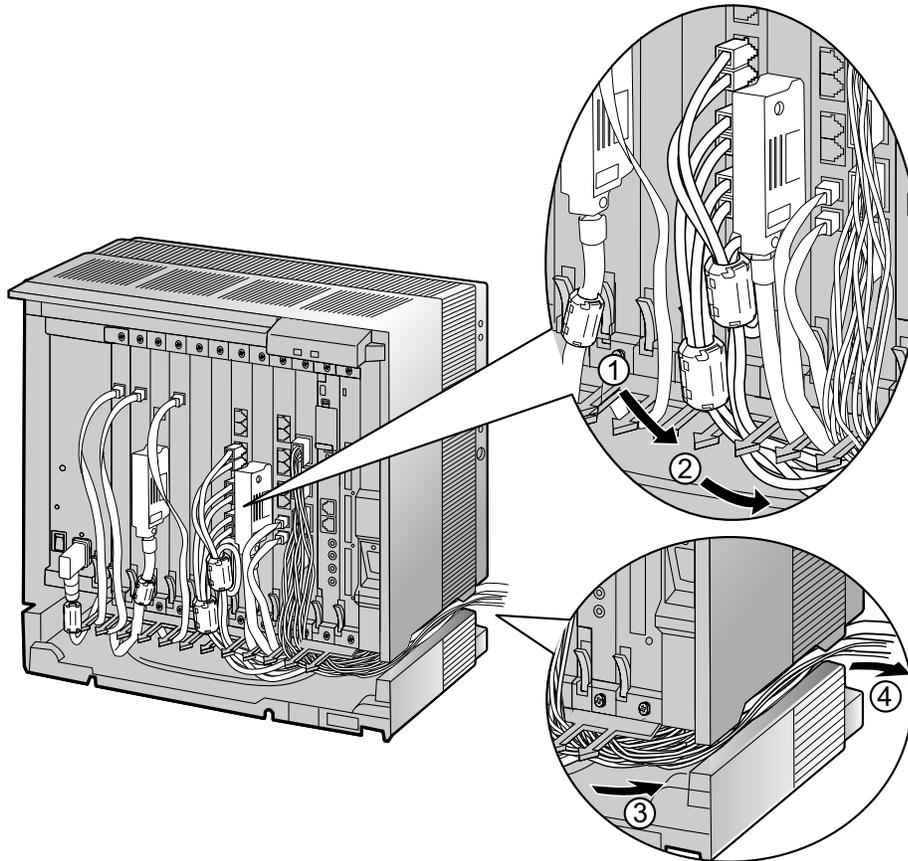
3.2.12 Cable Handling

Note

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

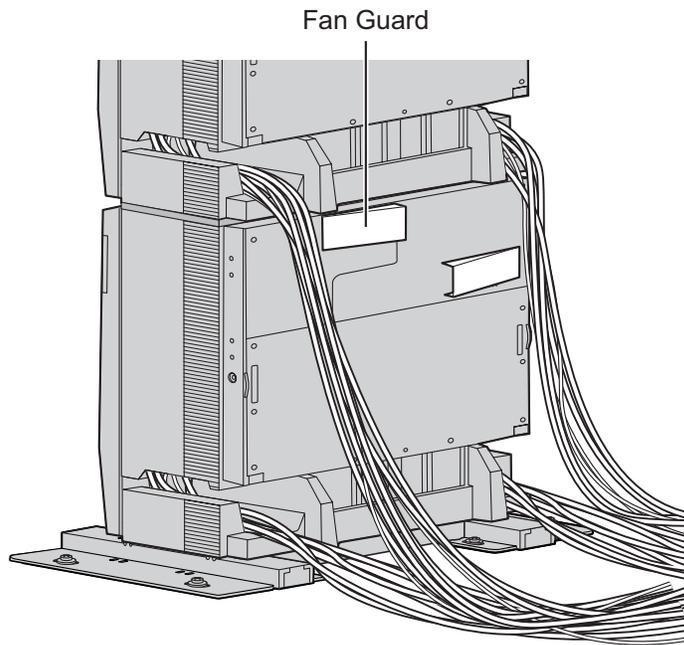
Cable Handling for Each Shelf

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

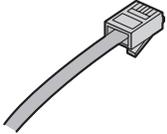
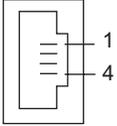
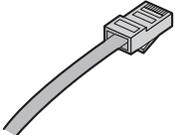
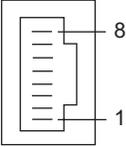
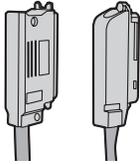
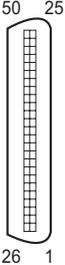
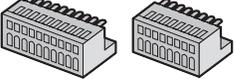
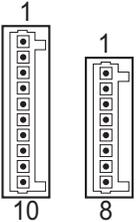


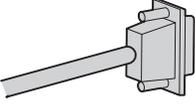
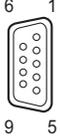
Cable Handling for Connected Shelves

When running connected cables towards the back of the shelves, make sure not to block the opening of each Fan Guard as shown below.



3.2.13 Types of Connectors

Connector Type	Pin Number	Used for
<p>RJ11</p>  <p>(Twisted pair cable)</p>		<ul style="list-style-type: none"> • DHLC8 (KX-TDA0170) • SLC8 (KX-TDA0173) • CSLC16 (KX-TDA0177) • ESLC16 (KX-TDA6174) • EMSLC16 (KX-TDA6175) • ECSLC24 (KX-TDA6178) • ELCOT16 (KX-TDA6181)
<p>RJ45</p>  <p>(Twisted pair cable)</p>		<ul style="list-style-type: none"> • IPCEMPR • CSIF4 (KX-TDA0143) • CSIF8 (KX-TDA0144) • T1 (KX-TDA0187) • PRI23 (KX-TDA0290) • IP-EXT16 (KX-TDA0470) • IP-GW4E (KX-TDA0484) • IP-GW16 (KX-TDA0490)
<p>Amphenol Type A Type B</p>  <p>(Shielded twisted pair cable)</p>		<ul style="list-style-type: none"> • DHLC8 (KX-TDA0170) • DLC8 (KX-TDA0171) • DLC16 (KX-TDA0172) • CSLC16 (KX-TDA0177) • SLC8 (KX-TDA0173) • ESLC16 (KX-TDA6174) • EMSLC16 (KX-TDA6175) • ECSLC24 (KX-TDA6178) • ELCOT16 (KX-TDA6181)
<p>10-pin Terminal Block 8-pin Terminal Block</p> 		<ul style="list-style-type: none"> • DPH4 (KX-TDA0161) • EIO4 (KX-TDA0164)

Connector Type	Pin Number	Used for
<p data-bbox="354 281 467 310">RS-232C</p>  <p data-bbox="310 548 505 577">(Shielded cable)</p>		<ul data-bbox="850 268 1198 298" style="list-style-type: none">• Basic Shelf (KX-TDE600)
<p data-bbox="363 617 477 646">Mini Plug</p> 		<ul data-bbox="850 604 1019 634" style="list-style-type: none">• IPCEMPR

3.2.14 Attaching a Ferrite Core

A ferrite core must be attached when:

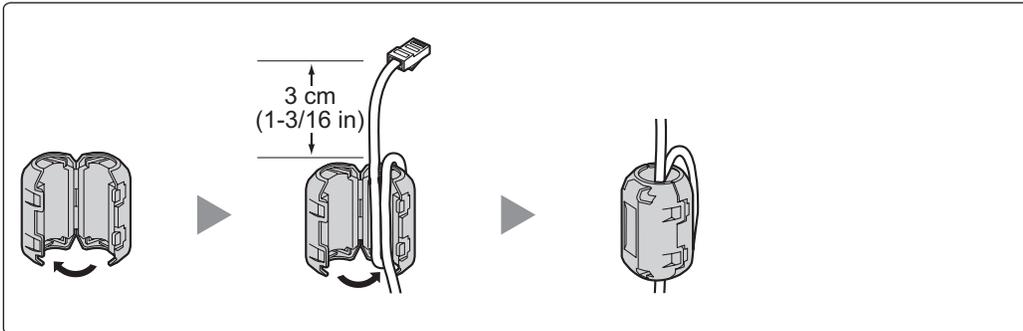
- an RJ45 connector is connected to IPCEMPR, IP-GW16 or IP-EXT16 cards, or
- an Amphenol connector is connected to an extension card.

The ferrite core is included with the card.

Attaching to an RJ45 Connector

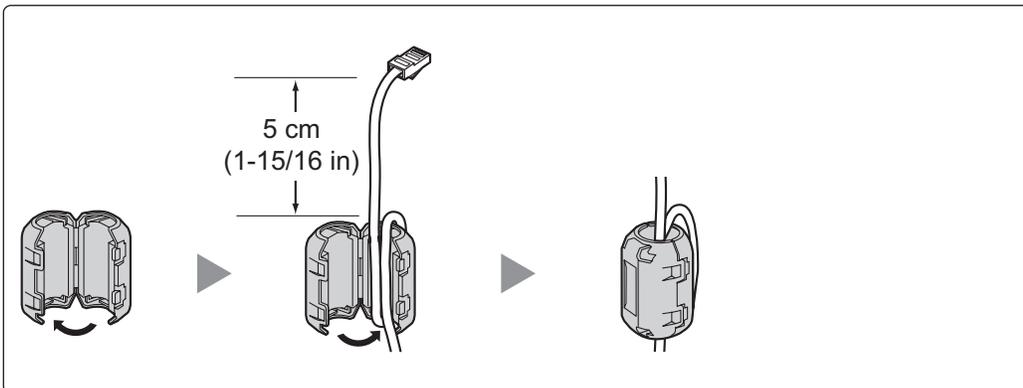
For the IPCEMPR Card

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

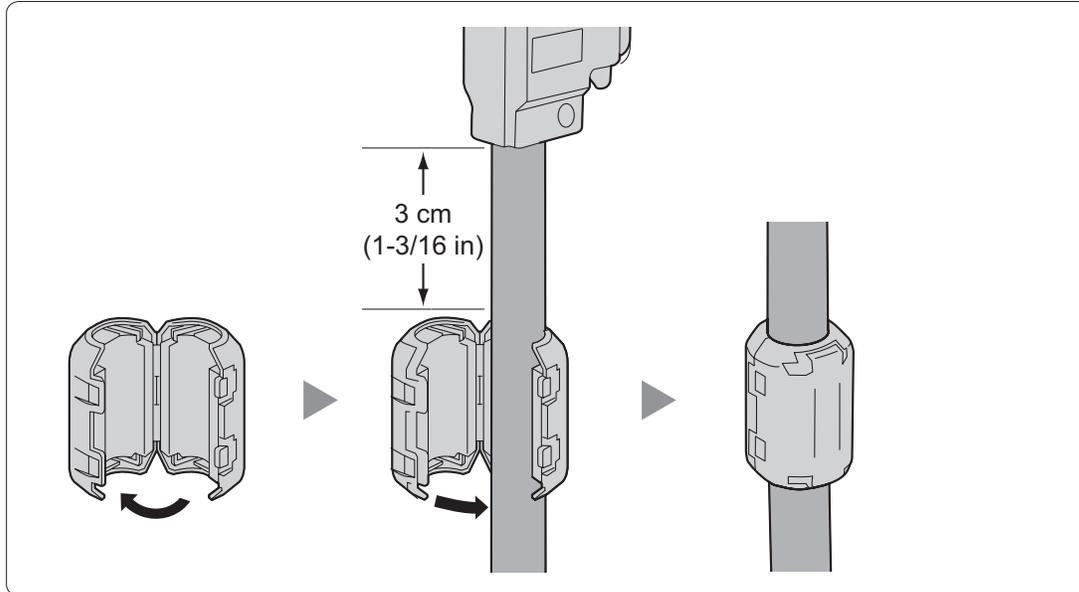
Wrap the cable once around the ferrite core, then close the case of the ferrite core. Attach the ferrite core 5 cm (1-15/16 in) away from the connector. The ferrite core is included with the card.



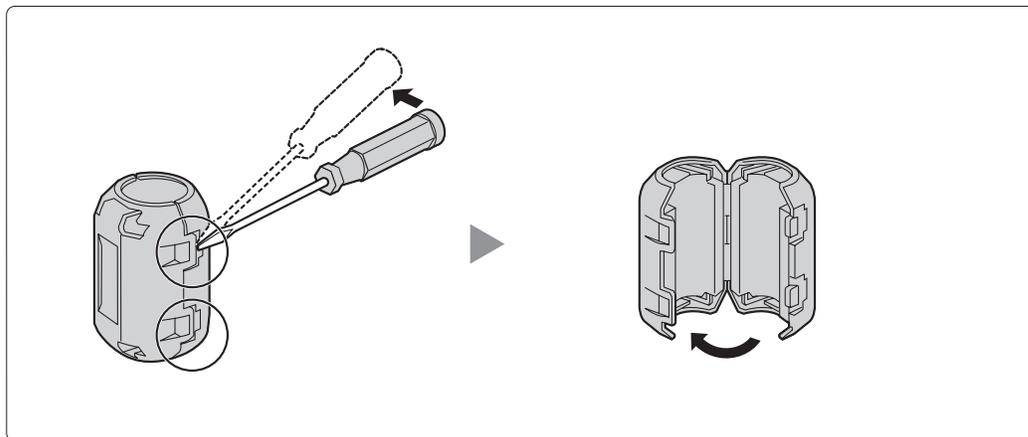
Attaching to an Amphenol Connector

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.

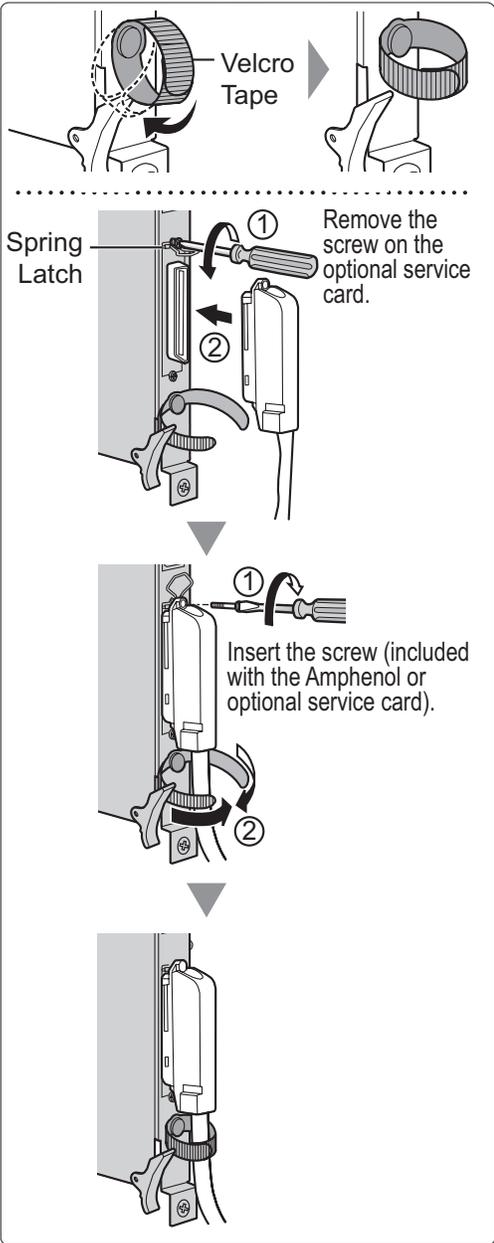
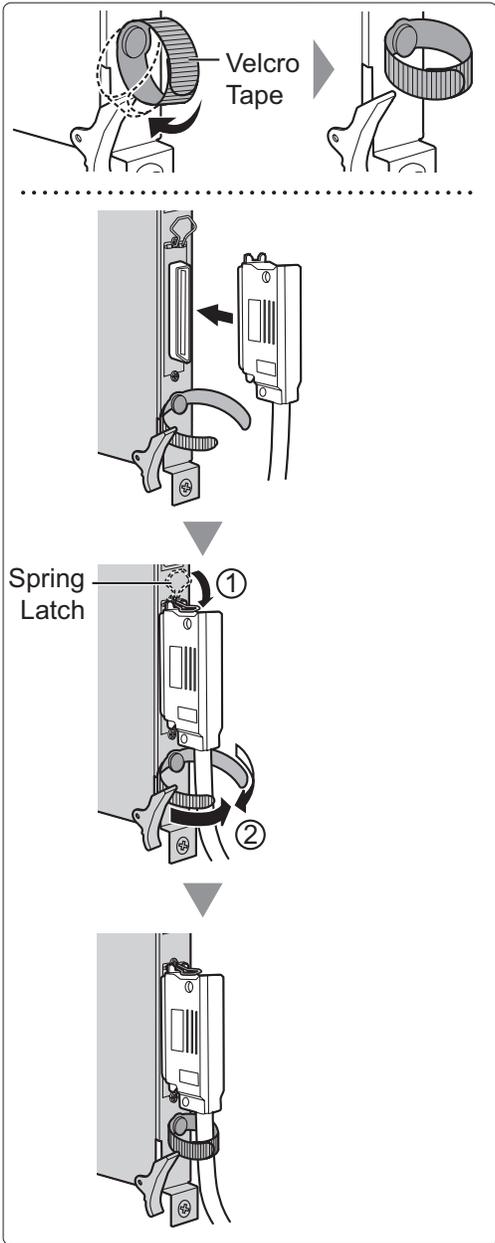


3.2.15 Fastening Amphenol Connector

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

Type A (Spring Latch + Velcro Tape)

Type B (Screw + Velcro Tape)



Amphenol Connector Pin Assignment Chart

Below is an Amphenol connector pin assignment chart for all optional service cards that use the Amphenol connector. For more details, refer to the appropriate section in "3.7 Information about the CO Line Cards" and "3.8 Information about the Extension Cards".

Pin No.	ELCOT16	DHLC8	DLC8	DLC16	EMSLC16	ECSLC24	CSLC16	ESLC16	SLC8
1	RA	RA		D2A	RA	RA	RA	RA	RA
26	TA	TA		D1A	TA	TA	TA	TA	TA
2	RB	D2A	D2A	D2B	RB	RB	RB	RB	
27	TB	D1A	D1A	D1B	TB	TB	TB	TB	
3	RC			D2C	RC	RC	RC	RC	
28	TC			D1C	TC	TC	TC	TC	
4	RD	RB		D2D	RD	RD	RD	RD	RB
29	TD	TB		D1D	TD	TD	TD	TD	TB
5	RE	D2B	D2B	D2E	RE	RE	RE	RE	
30	TE	D1B	D1B	D1E	TE	TE	TE	TE	
6	RF			D2F	RF	RF	RF	RF	
31	TF			D1F	TF	TF	TF	TF	
7	RG	RC		D2G	RG	RG	RG	RG	RC
32	TG	TC		D1G	TG	TG	TG	TG	TC
8	RH	D2C	D2C	D2H	RH	RH	RH	RH	
33	TH	D1C	D1C	D1H	TH	TH	TH	TH	
9	RI			D2I	RI	RI	RI	RI	
34	TI			D1I	TI	TI	TI	TI	
10	RJ	RD		D2J	RJ	RJ	RJ	RJ	RD
35	TJ	TD		D1J	TJ	TJ	TJ	TJ	TD
11	RK	D2D	D2D	D2K	RK	RK	RK	RK	
36	TK	D1D	D1D	D1K	TK	TK	TK	TK	
12	RL			D2L	RL	RL	RL	RL	
37	TL			D1L	TL	TL	TL	TL	
13	RM	RE		D2M	RM	RM	RM	RM	RE
38	TM	TE		D1M	TM	TM	TM	TM	TE
14	RN	D2E	D2E	D2N	RN	RN	RN	RN	
39	TN	D1E	D1E	D1N	TN	TN	TN	TN	
15	RO			D2O	RO	RO	RO	RO	
40	TO			D1O	TO	TO	TO	TO	
16	RP	RF		D2P	RP	RP	RP	RP	RF
41	TP	TF		D1P	TP	TP	TP	TP	TF
17		D2F	D2F			RQ			
42		D1F	D1F			TQ			
18						RR			
43						TR			
19		RG				RS			RG
44		TG				TS			TG
20		D2G	D2G			RT			
45		D1G	D1G			TT			
21						RU			
46						TU			
22		RH				RV			RH
47		TH				TV			TH
23		D2H	D2H			RW			
48		D1H	D1H			TW			
24						RX			
49						TX			
25									
50									

3.2.16 Surge Protector Installation

CAUTION

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

Overview

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

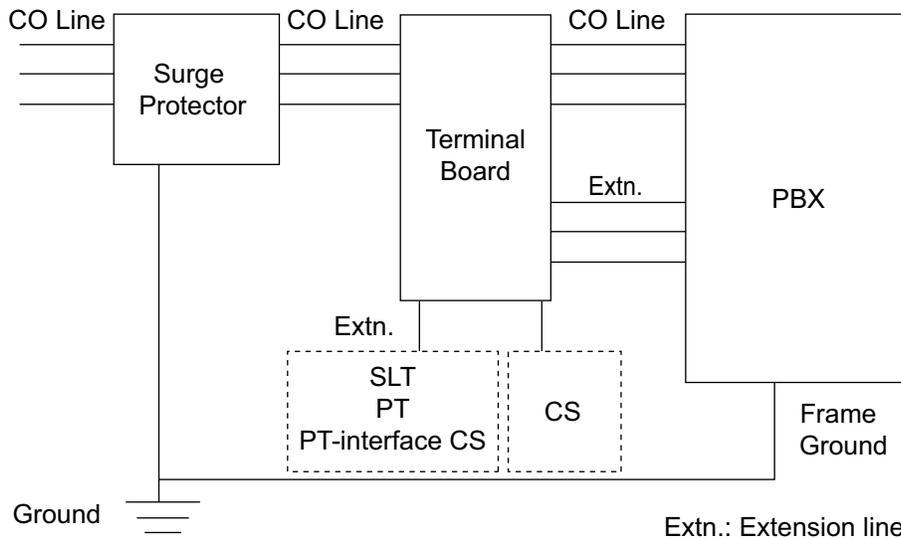
To protect the system from electrical surges, we strongly recommend connecting the system to a surge protector that meets the following specifications:

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

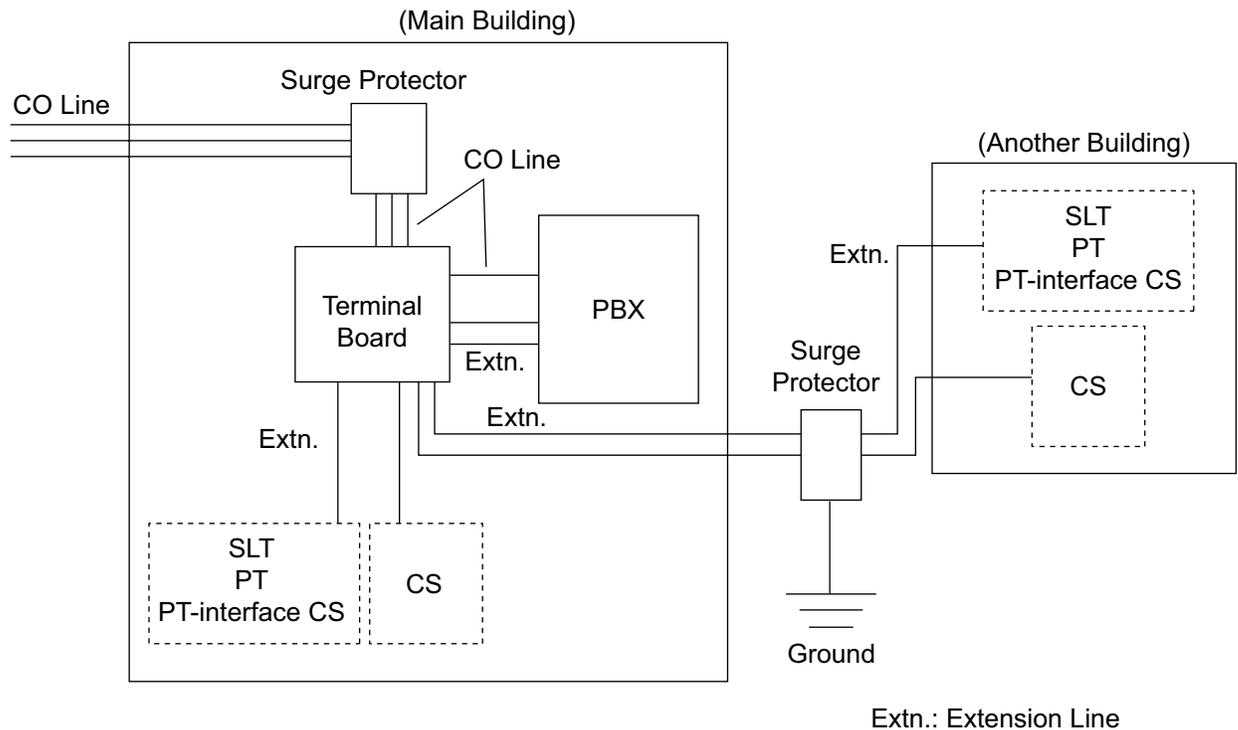
Additionally, proper grounding is very important for the protection of the system (refer to "3.2.10 Frame Ground Connection").

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

Installation



Outside Installation



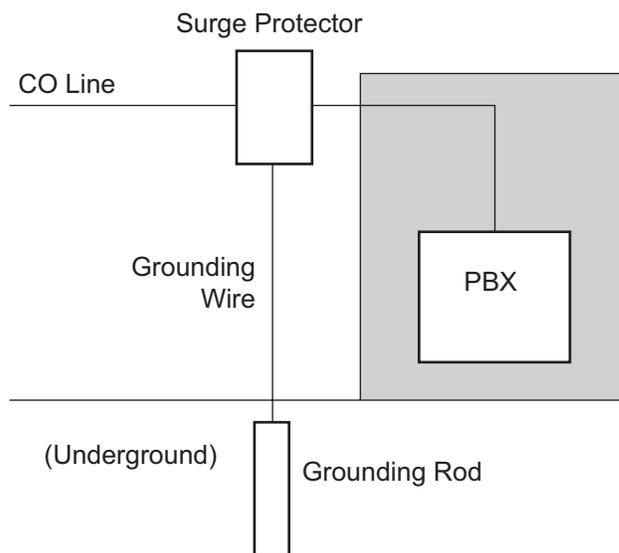
If you install an extension outside of the building, the following precautions are recommended:

- 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 Grounding Rod



3.2.16 Surge Protector Installation

1. Connect the grounding rod to the surge protector using a grounding wire with a cross-sectional area of at least 1.3 mm².
2. Bury the grounding rod near the protector. The grounding wire should be as short as possible.
3. The grounding wire should run straight to the grounding rod. Do not run the wire around other objects.
4. Bury the grounding rod at least 50 cm (20 in) underground.

Note

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

3.3 Information about the Main Processing Card

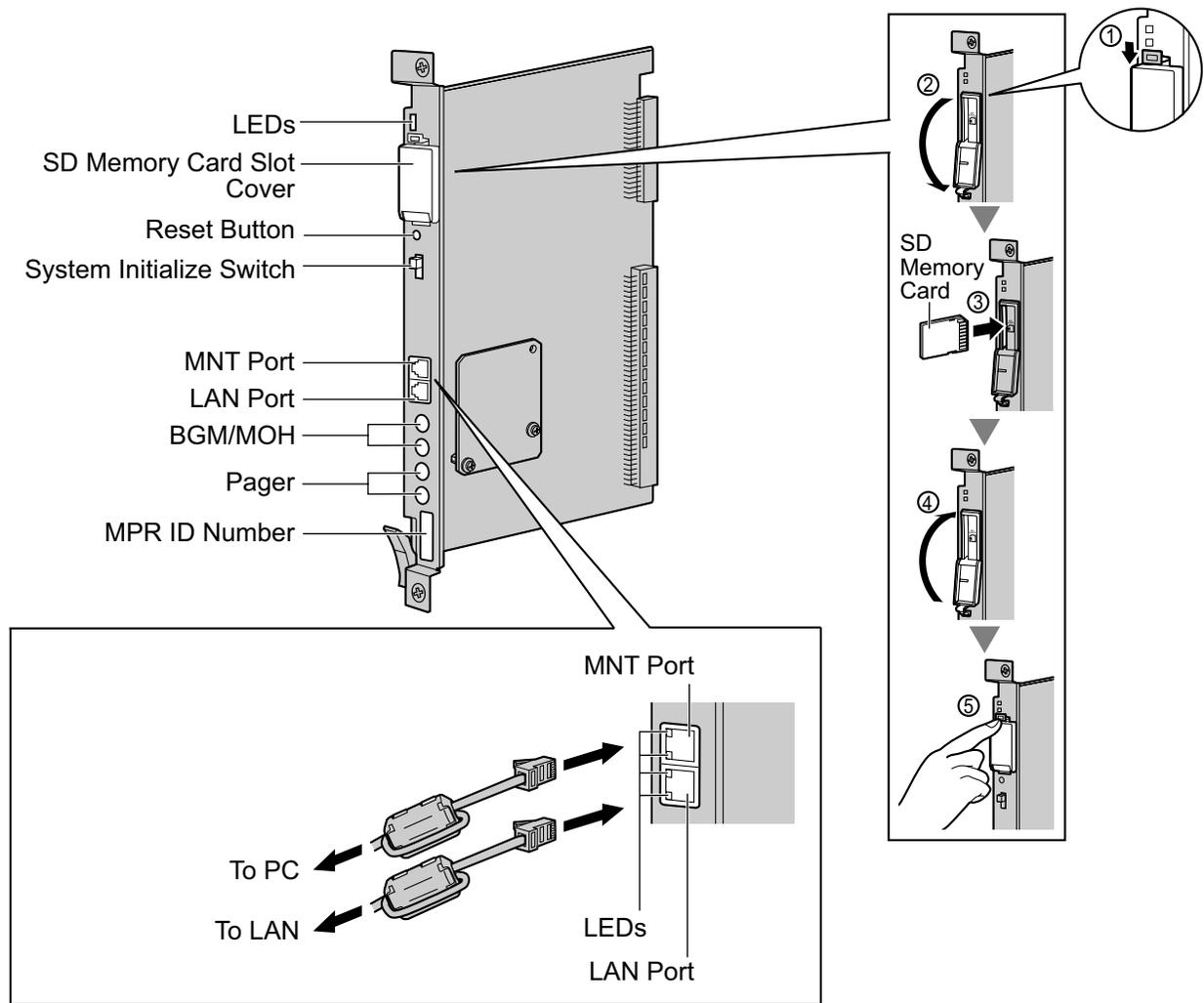
3.3.1 IPCEMPR Card

Function

The IPCEMPR card is the preinstalled main processing card with built-in ESVM card feature (2-channel) and an Activation Key for CA Basic for 20 Users. The Virtual Cards (CO line/extension) can be installed in Virtual Slots of the IPCEMPR card and can be activated with the activation keys. Also, the IPCEMPR supports LAN connection so that IP telephones (IP-PTs, IP softphones, SIP Extensions) and PCs can be connected on a private IP network.

Mountable Cards

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



WARNING

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

CAUTION

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

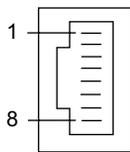
Notice

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

Note

- Make sure to use the MNT port for PC connection, and the LAN port for LAN connection.
- The maximum length of the cable to be connected to the IPCEMPR card is 100 m (328 ft).
- When connecting the RJ45 connector, attach the ferrite core included with the PBX. Refer to "3.2.14 Attaching a Ferrite Core".
- For details about Virtual Slots, refer to "1.3.3 System Capacity".
- For details about the activation keys, refer to "2.1 Information about the Activation Keys".
- For details about connecting to a LAN, refer to "3.13.1 LAN Connection".
- For details about connecting peripherals, refer to "3.12.1 Connection of Peripherals".
- For details about System Initialize Switch, refer to "3.15.1 Starting the PBX".
- For details about Reset Button, refer to "5.1.4 Using the Reset Button".
- Portions of this product contains software of Datalight, Inc. Copyright 1993–2000 Datalight, Inc., All Rights Reserved.

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

	No.	Signal Name	Input (I)/Output (O)	Function
	1	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	–	–

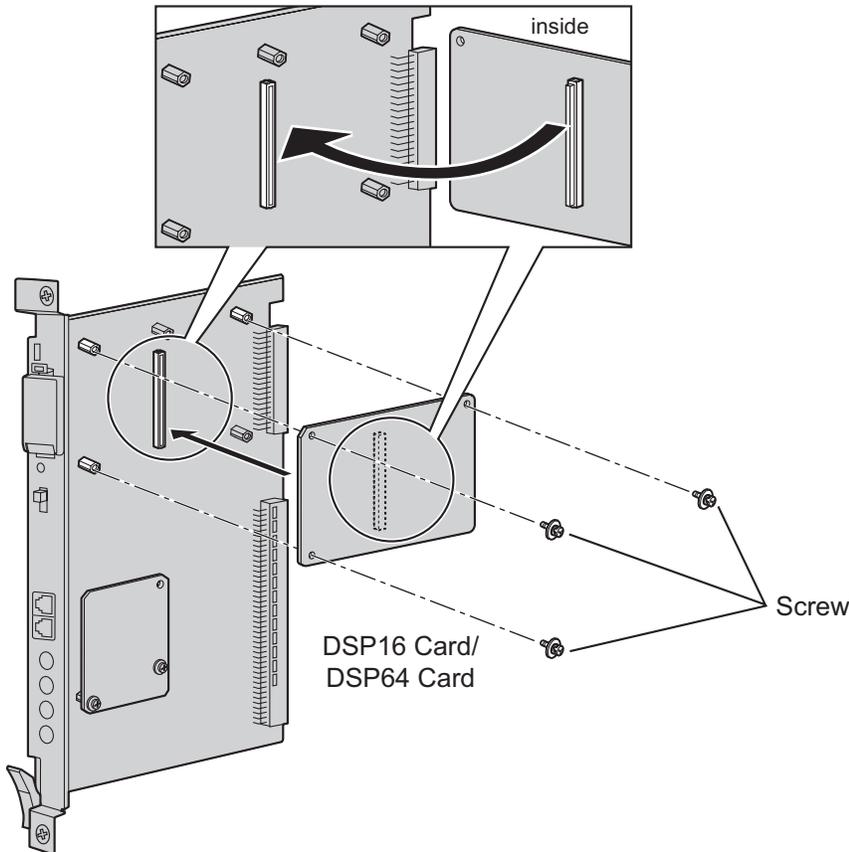
LED Indications

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

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

Function

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



Accessories and User-supplied Items

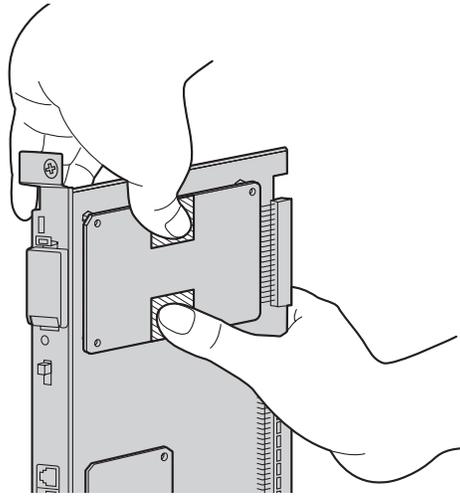
Accessories (included): Screws × 3

User-supplied (not included): none

Note

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

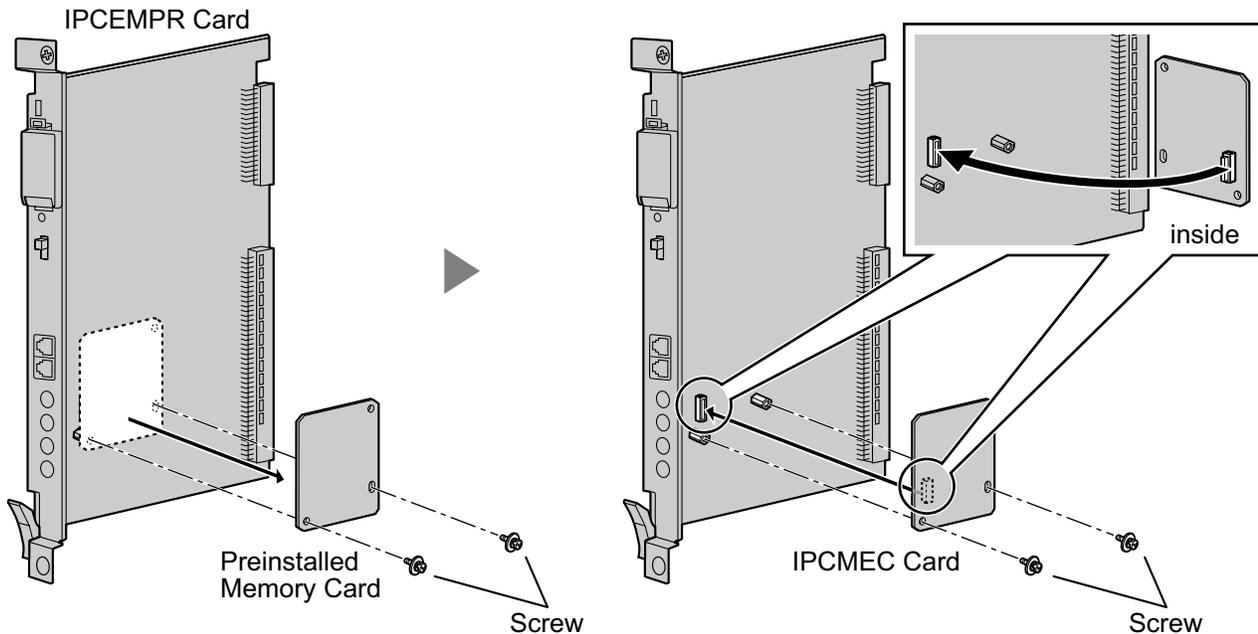
- When installing the DSP16 or DSP64 card, hold down the shaded areas of the card to connect it firmly.



3.3.3 IPCMEC Card (KX-TDE0105)

Function

Memory expansion card to increase system data storage space. To be mounted on the IPCEMPR card. To install the IPCMEC card, first remove the preinstalled memory card from the IPCEMPR card.



Accessories and User-supplied Items

Accessories (included): Screws × 2

User-supplied (not included): none

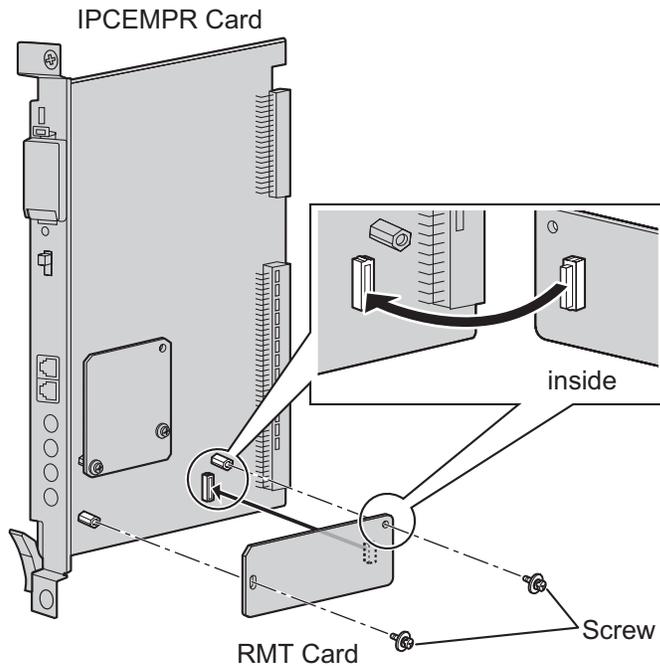
CAUTION

- Before removing the preinstalled memory card, be sure to back up the system data. For details, refer to "2.5.1 Tool—SD memory backup" and "2.6.3 Utility—File Transfer PBX (SD Card) to PC" in the PC Programming Manual.
- After installing the IPCMEC card, the PBX must be initialized. For details about the initialization procedure, refer to "3.15.1 Starting the PBX".
- After initialization, even after restoring system data, some data (e.g., SMDR data) will not be restored. For further information about which data will not be restored, refer to Saving Modified Data in "2.7.1 Frequently Asked Questions (FAQ)" in the PC Programming Manual.
- It is recommended to output the SMDR data before removing the preinstalled memory card.

3.3.4 RMT Card (KX-TDA0196)

Function

Analog modem card for remote communication with the PBX. V90 support. To be mounted on the IPCEMPR card.



Accessories and User-supplied Items

Accessories (included): Screws × 2

User-supplied (not included): none

3.4 Information about the Virtual Cards

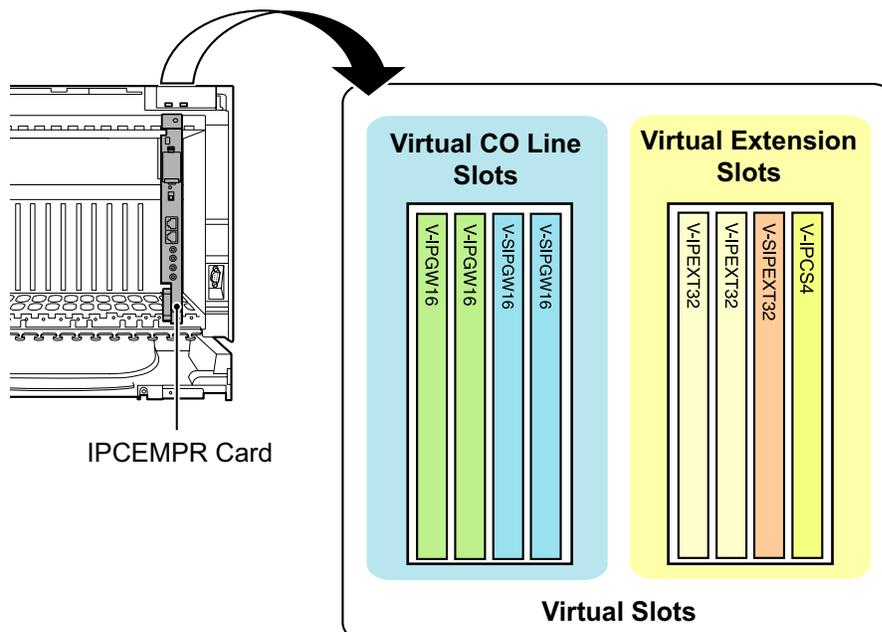
3.4.1 Virtual Cards

Function

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

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

Example: Virtual Cards in the Virtual Slots

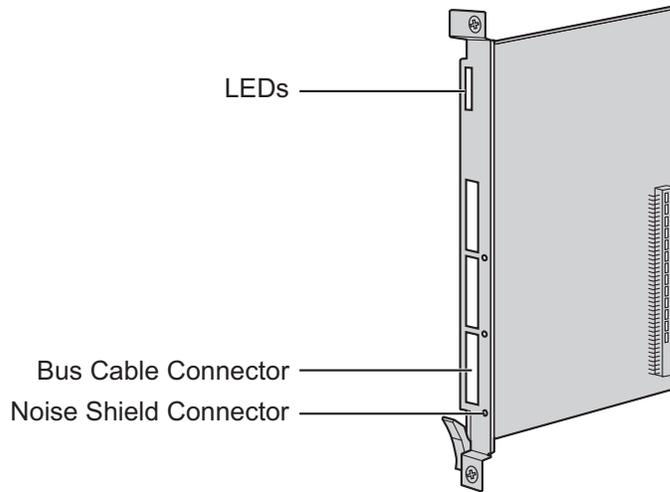


3.5 Information about the Optional Shelf Expansion Cards

3.5.1 BUS-M Card (KX-TDA6110)

Function

Optional shelf expansion card required when mounting Expansion Shelves. To be installed in the Basic Shelf only.



Accessories and User-supplied Items

Accessories (included): Bus Cable × 1

User-supplied (not included): none

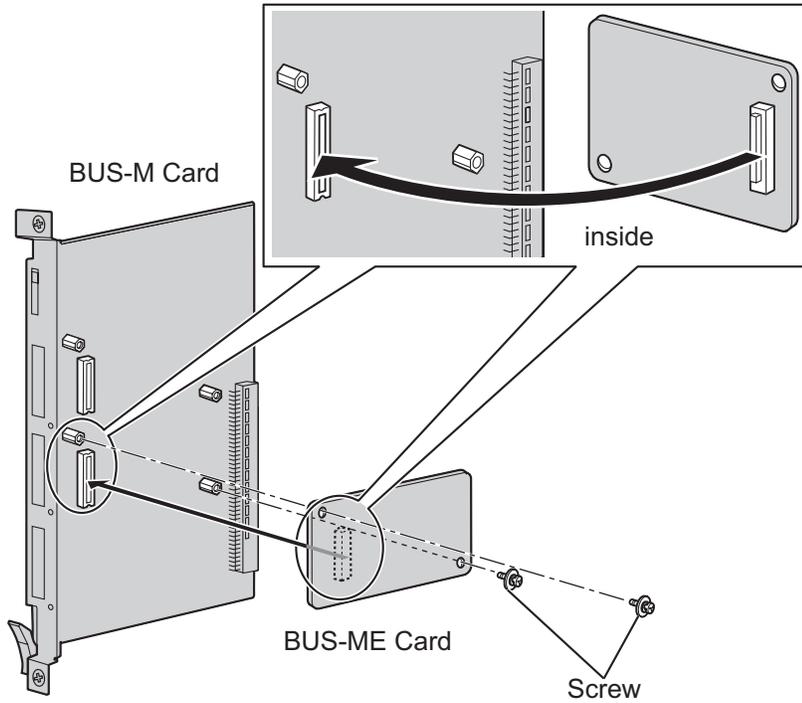
LED Indications

Indication	Color	Description
CARD STATUS	Green	Card status indication <ul style="list-style-type: none"> • OFF: Starting up • Green ON: Normal
LINK3	Green	Link status indication for Expansion Shelf 3 <ul style="list-style-type: none"> • OFF: Connection error • ON: Normal connection
LINK2	Green	Link status indication for Expansion Shelf 2 <ul style="list-style-type: none"> • OFF: Connection error • ON: Normal connection
LINK1	Green	Link status indication for Expansion Shelf 1 <ul style="list-style-type: none"> • OFF: Connection error • ON: Normal connection

3.5.2 BUS-ME Card (KX-TDA6111)

Function

Optional shelf expansion card required when mounting Expansion Shelf 2 or 3. To be mounted on the BUS-M card installed in the Basic Shelf.



Accessories and User-supplied Items

Accessories (included): Bus Cable × 1, Screws × 2

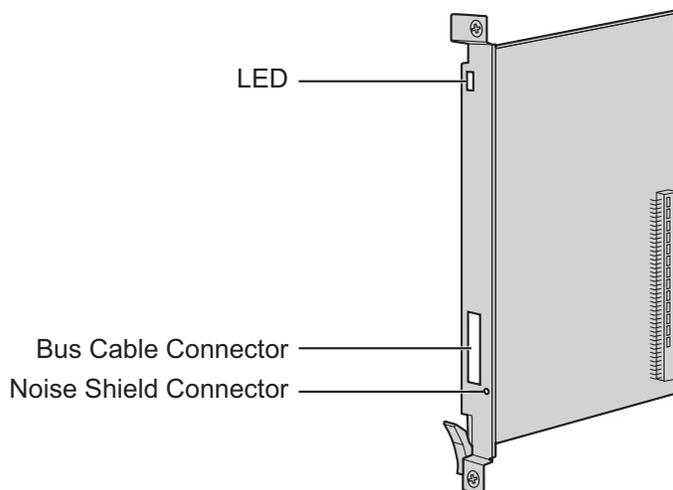
User-supplied (not included): none

3.6 Information about the Built-in Shelf Expansion Card

3.6.1 BUS-S Card

Function

Shelf expansion card, built in to an Expansion Shelf, for connecting to the Basic Shelf.



WARNING

A lithium battery is used in the BUS-S 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.

Note

- The BUS-S card must be version 2.000 or later.
- Portions of this product contains software of Datalight, Inc. Copyright 1993–2000 Datalight, Inc., All Rights Reserved.

LED Indications

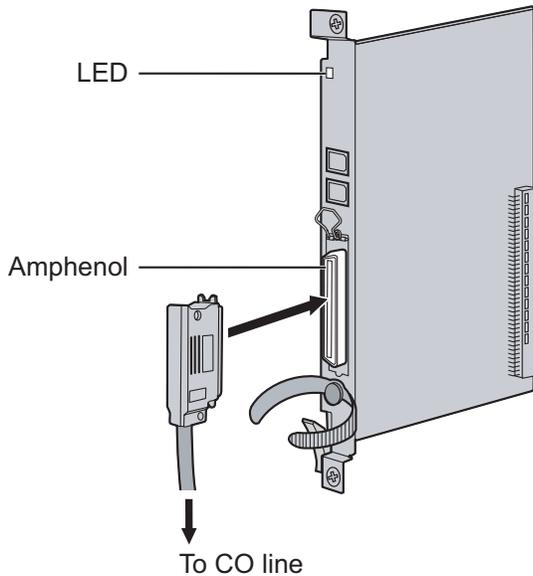
Indication	Color	Description
CARD STATUS	Green/Red	Card status indication <ul style="list-style-type: none"> • Green ON: Normal • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.7 Information about the CO Line Cards

3.7.1 ELCOT16 Card (KX-TDA6181)

Function

16-port analog CO line card with 4 power failure transfer (PFT) ports. A maximum of 2 CID8 cards can be mounted on the ELCOT16 card (refer to "3.7.2 CID8 Card (KX-TDA0193)").



Accessories and User-supplied Items

Accessories (included): Screws × 2

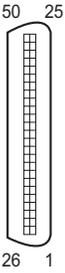
User-supplied (not included): Amphenol connector

Note

- To connect the Amphenol connector, refer to "3.2.15 Fastening Amphenol Connector".
- For details about power failure transfer, refer to "3.14.1 Power Failure Connections".
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.15.1 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	–

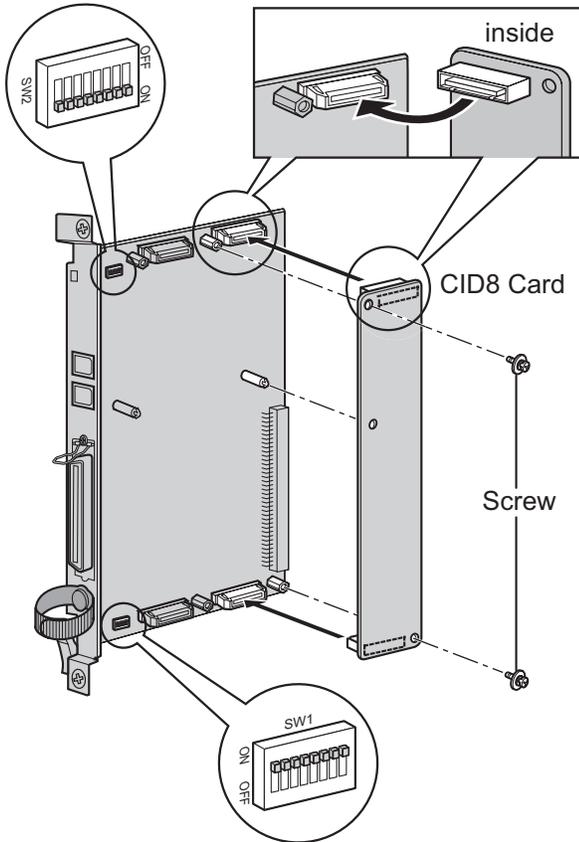
LED Indications

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

3.7.2 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 ELCOT16 card.



Accessories and User-supplied Items

Accessories (included): Screws × 2

User-supplied (not included): none

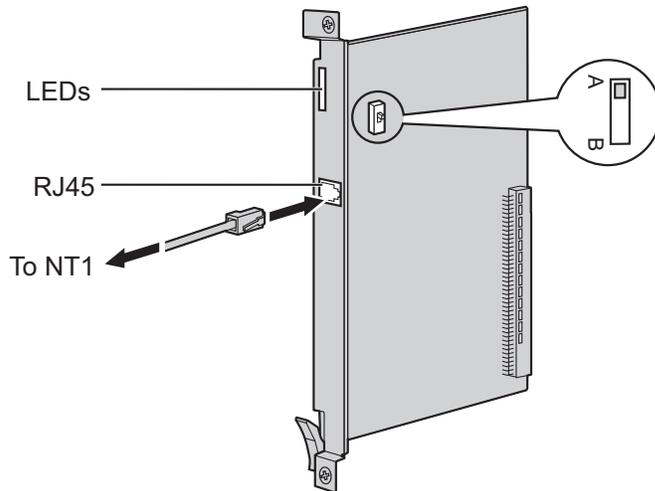
Switch Settings (on ELCOT16 card)

Switch	Type	Usage and Status Definition
Port Setting	DIP	Keep all DIP switches at default "ON" positions. Do not change the positions of these switches.

3.7.3 T1 Card (KX-TDA0187)

Function

1-port T1 CO line card. EIA/TIA standard compliant.



Accessories and User-supplied Items

Accessories (included): none

User-supplied (not included): RJ45 connector

CAUTION

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

Note

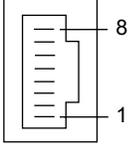
- T1 Card must be installed behind an FCC registered and UL or CSA-NRTL listed CSU.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.15.1 Starting the PBX".

Switch Settings

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

Pin Assignments

RJ45 Connector

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

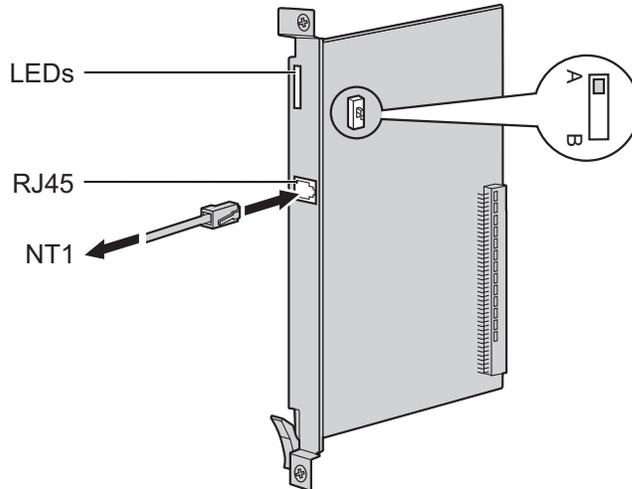
LED Indications

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

3.7.4 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

CAUTION

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

Note

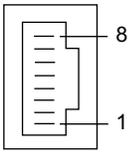
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.15.1 Starting the PBX".

Switch Settings

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

Pin Assignments

RJ45 Connector

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

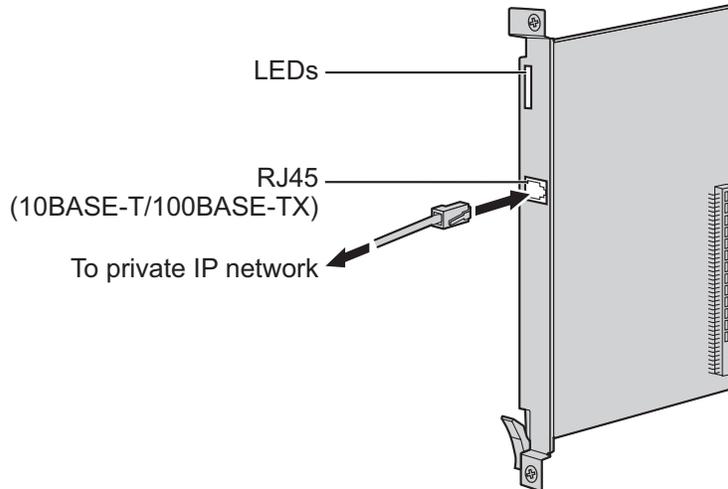
LED Indications

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

3.7.5 IP-GW4E Card (KX-TDA0484)

Function

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



Accessories and User-supplied Items

Accessories (included): CD-ROM (including documentation for web programming) × 1

User-supplied (not included): RJ45 connector

Note

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- The IP-GW4E card occupies the space of only 1 free slot when it is installed in the PBX.
- For programming instructions and other information about the IP-GW4E card, refer to the documentation for the IP-GW4E card. To program the IP-GW4E card, use the web programming designed for the IP-GW4E card.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "3.15.1 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	–	–

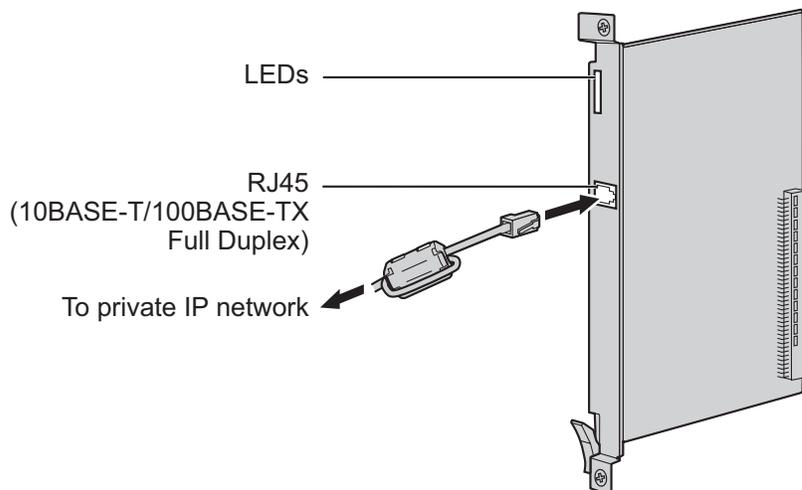
LED Indications

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

3.7.6 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

Note

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- When connecting the RJ45 connector, attach the included ferrite core. Refer to "3.2.14 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 "3.15.1 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"> • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
ONLINE	Green	On-line status indication <ul style="list-style-type: none"> • ON: On-line mode • OFF: Off-line mode • Flashing: Maintenance mode <p>Note If the LINK indicator is OFF, the ONLINE indicator will also be OFF.</p>
ALARM	Red	Alarm indication <ul style="list-style-type: none"> • OFF: Normal • ON: Alarm
VoIP BUSY	Green	VoIP (H.323) process indication <ul style="list-style-type: none"> • OFF: VoIP process inactive • ON: VoIP process active
LINK	Green	Link status indication <ul style="list-style-type: none"> • OFF: Connection error • ON: Normal connection
DATA	Green	Data transmission indication <ul style="list-style-type: none"> • OFF: No data transmitted • ON: Data transmitting

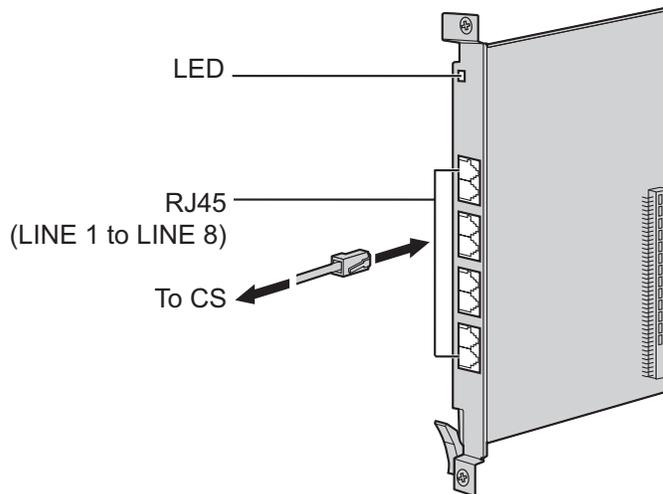
3.8 Information about the Extension Cards

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

Function

CSIF4: 4-port CS interface card for 4 CSs.

CSIF8: 8-port CS interface card for 8 CSs.



Accessories and User-supplied Items

Accessories (included): none

User-supplied (not included): RJ45 connector

CAUTION

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

Note

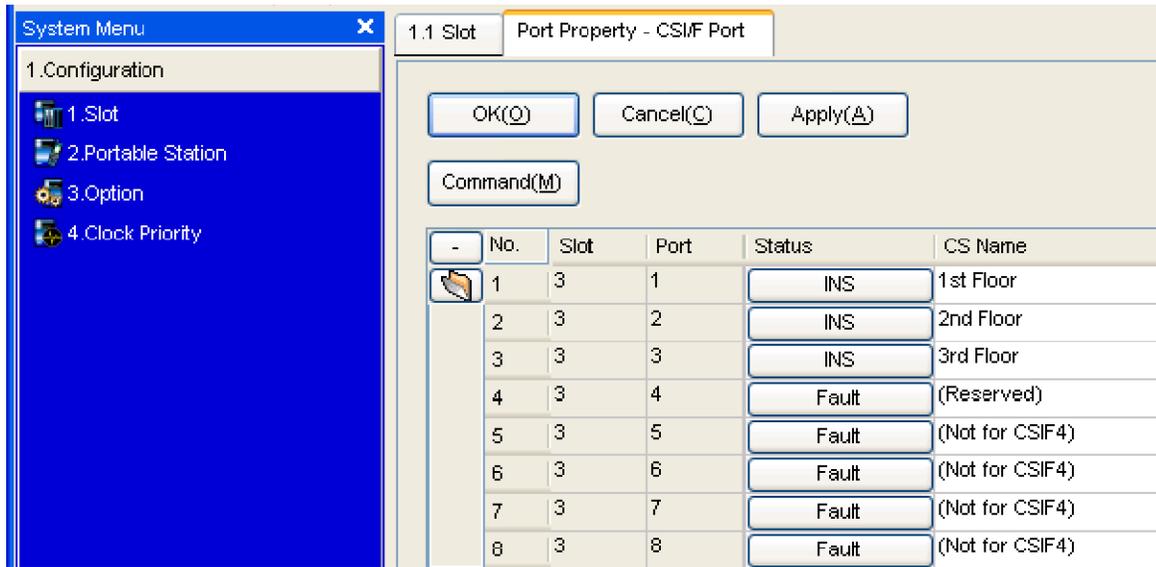
- LINE 5 to LINE 8 are for CSIF8 card only.
- When using the CSIF4 card, please note that the PBX software will recognize the CSIF4 card as the CSIF8 card. As a result, 8 cell stations may appear to be available; however, only 4 cell stations are supported by the CSIF4 card.
- For details about connecting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

Editing the CS Name using the Maintenance Console

While programming the PBX, we strongly recommend that you input a unique recognizable CS name (maximum 20 characters) for each CS port in use, and "(Reserved)" or "(Not for CSIF4)" for unused ports or unavailable ports respectively for the following reasons:

- a. you will be able to easily distinguish installed CSs.
- b. you will be able to know which CSIF card has been installed; CSIF4 or CSIF8.

Example: When the CSIF4 card has been installed¹



¹ The contents and design of the software are subject to change without notice.

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	–

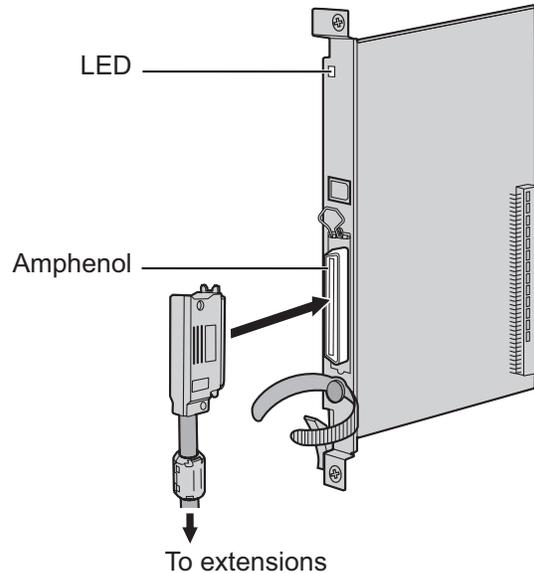
LED Indications

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

3.8.2 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

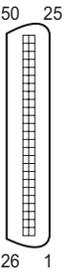
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.14 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.15 Fastening Amphenol Connector".
- For details about power failure transfer, refer to "3.14.1 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	–

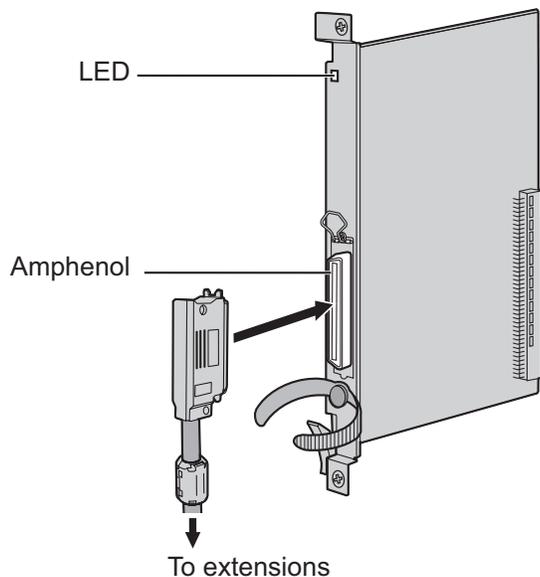
LED Indications

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

3.8.3 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

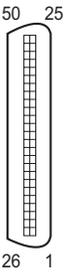
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.14 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.15 Fastening 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	–	

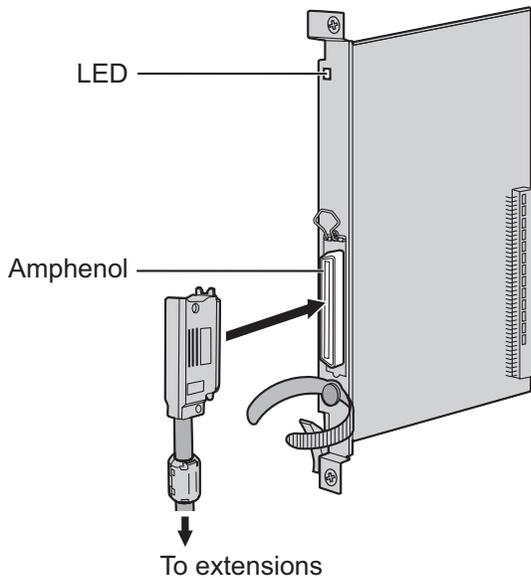
LED Indications

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

3.8.4 DLC16 Card (KX-TDA0172)

Function

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



Accessories and User-supplied Items

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

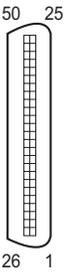
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.14 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.15 Fastening 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	–

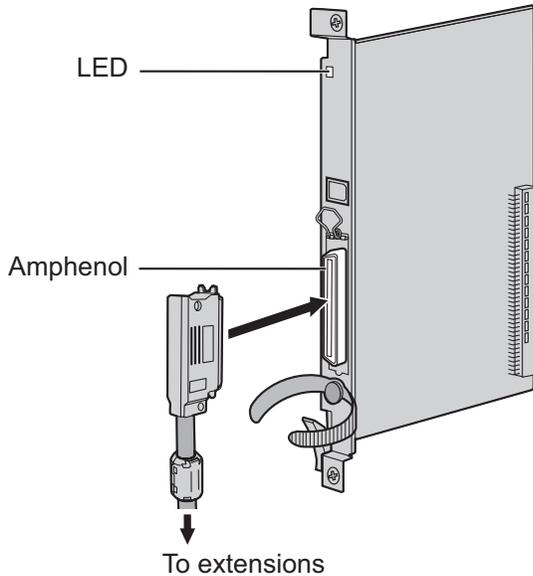
LED Indications

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

3.8.5 SLC8 Card (KX-TDA0173)

Function

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



Accessories and User-supplied Items

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

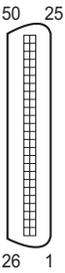
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.14 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.15 Fastening Amphenol Connector".
- For details about power failure transfer, refer to "3.14.1 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	–	42-43	Reserved	–
	19	RG	Ring port 7	44	TG	Tip port 7
	20-21	Reserved	–	45-46	Reserved	–
	22	RH	Ring port 8	47	TH	Tip port 8
	23-25	Reserved	–	48-50	Reserved	–

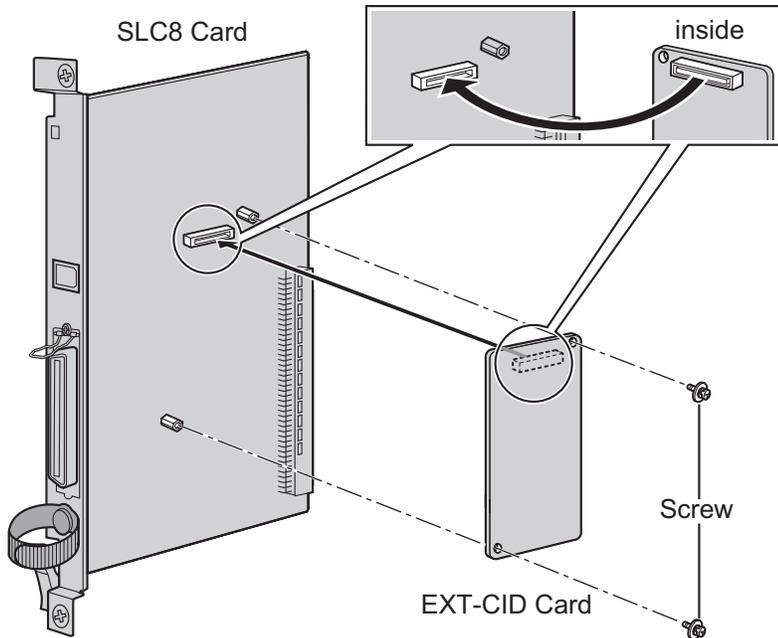
LED Indications

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

3.8.6 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

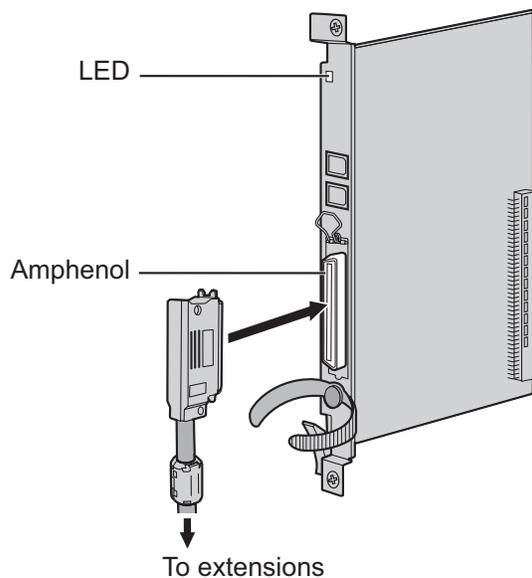
Accessories (included): Screws × 2

User-supplied (not included): none

3.8.7 CSLC16 Card (KX-TDA0177), ESLC16 Card (KX-TDA6174), EMSLC16 Card (KX-TDA6175), and ECSLC24 Card (KX-TDA6178)

Function

- CSLC16:** 16-port extension card for SLTs with Caller ID (FSK) and 4 power failure transfer (PFT) ports.
- ESLC16:** 16-port extension card for SLTs with 4 power failure transfer (PFT) ports.
- EMSLC16:** 16-port extension card for SLTs with Message Waiting Lamp control and 4 power failure transfer (PFT) ports. Maximum output of 145 V/85 V for Message Waiting Lamp control.
- ECSLC24:** 24-port extension card for SLTs with Caller ID (FSK) and 4 power failure transfer (PFT) ports. Can only be installed in shelves in which a PSU-L is installed.



Accessories and User-supplied Items

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

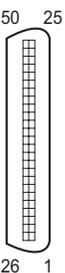
User-supplied (not included): Amphenol connector

Note

- Panasonic SLT with Message Waiting Lamp is recommended for connection to the EMSLC16 card.
- Attach the included ferrite core to the cable. Refer to "3.2.14 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.15 Fastening Amphenol Connector".
- For details about power failure transfer, refer to "3.14.1 Power Failure Connections".
- To use a CSLC16 card, the Local Processor (LPR) software of the card must be version 2.000 or later.

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	RQ	Ring port 17	42	TQ	Tip port 17
	18	RR	Ring port 18	43	TR	Tip port 18
	19	RS	Ring port 19	44	TS	Tip port 19
	20	RT	Ring port 20	45	TT	Tip port 20
	21	RU	Ring port 21	46	TU	Tip port 21
	22	RV	Ring port 22	47	TV	Tip port 22
	23	RW	Ring port 23	48	TW	Tip port 23
	24	RX	Ring port 24	49	TX	Tip port 24
	25	Reserved	–	50	Reserved	–

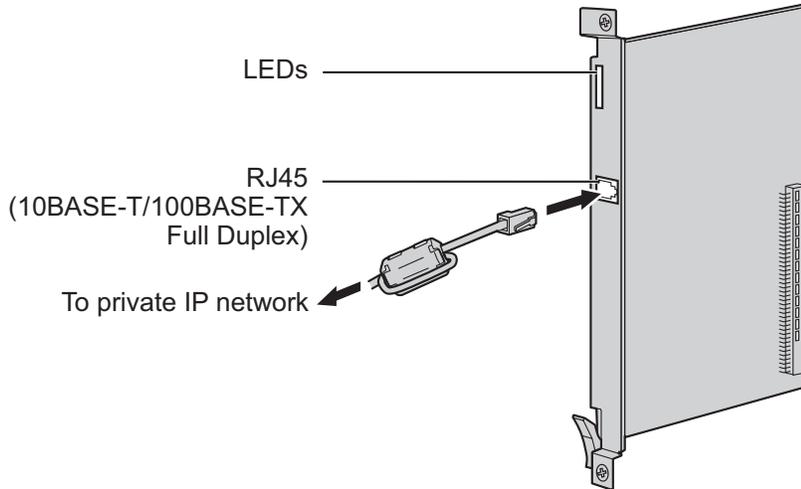
LED Indications

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

3.8.8 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

Note

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- When connecting the RJ45 connector, attach the included ferrite core. Refer to "3.2.14 Attaching a Ferrite Core".
- Portions of this product contains software of Datalight, Inc. Copyright 1993–2000 Datalight, Inc., All Rights Reserved.

Pin Assignments

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

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

LED Indications

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

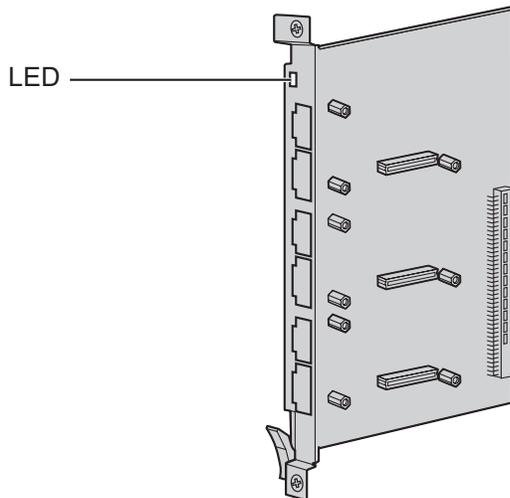
3.9 Information about the Other Cards

3.9.1 OPB3 Card (KX-TDA0190)

Function

Optional 3-slot base card for mounting a maximum of 3 optional service cards from the following:

- DPH4 card
- EIO4 card
- MSG4 card
- ESV4 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.

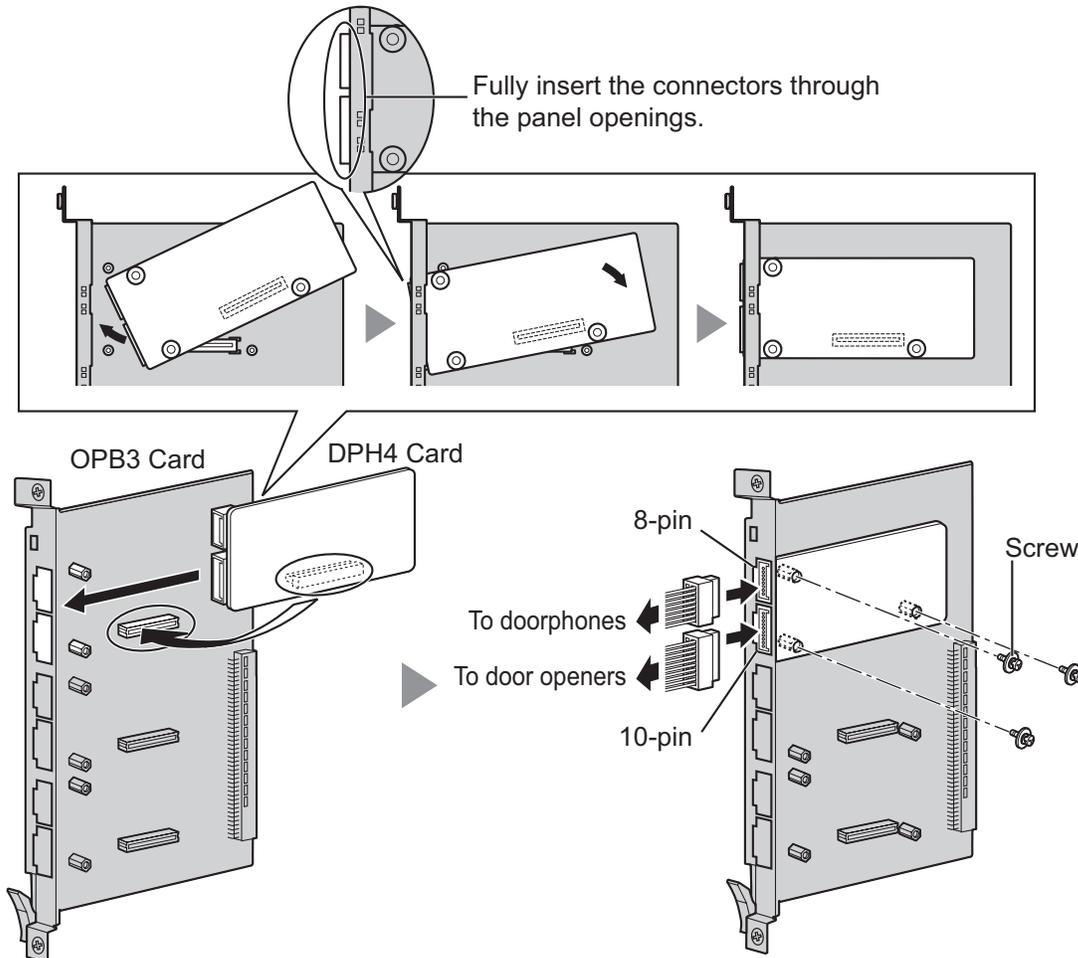
LED Indications

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

3.9.2 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 "3.11.1 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

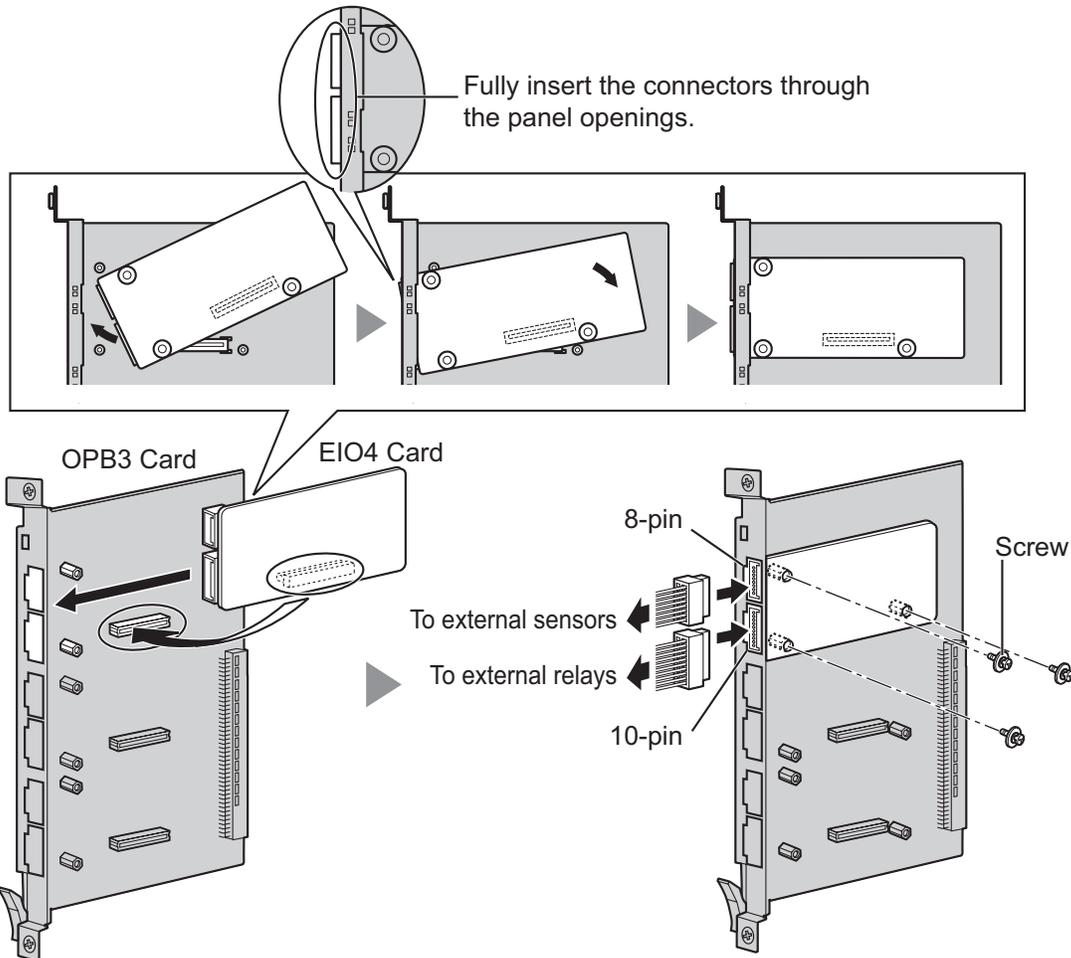
10-pin Terminal Block

	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

3.9.3 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 "3.11.1 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

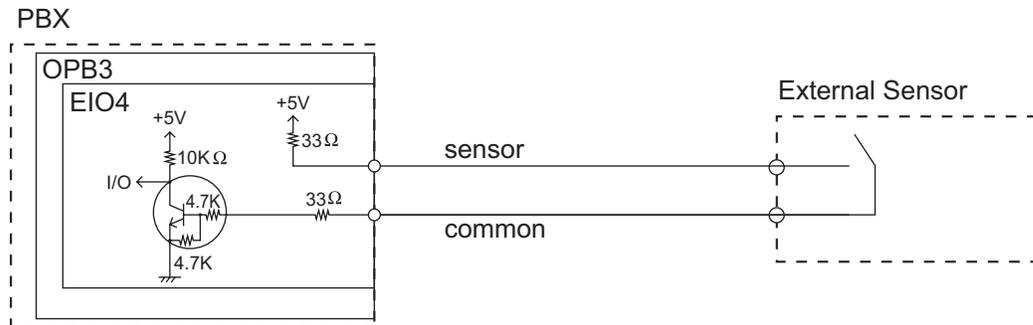
10-pin Terminal Block

	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 Ω .

Connection Diagram



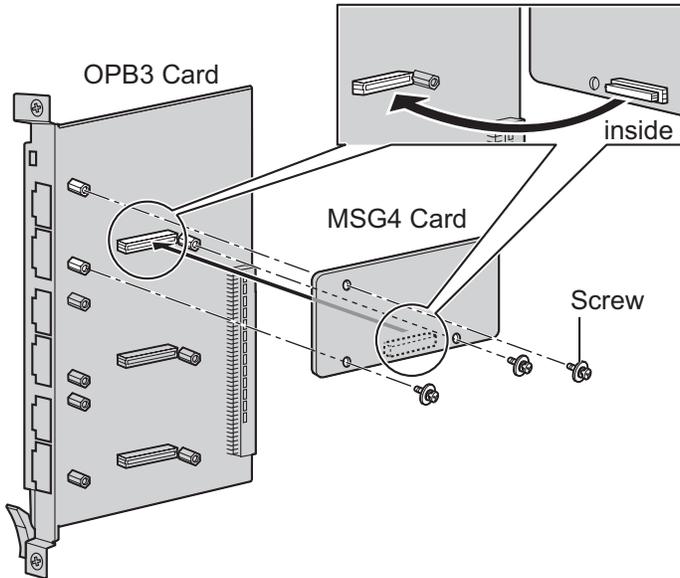
External Relay

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

3.9.4 MSG4 Card (KX-TDA0191)

Function

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



Accessories and User-supplied Items

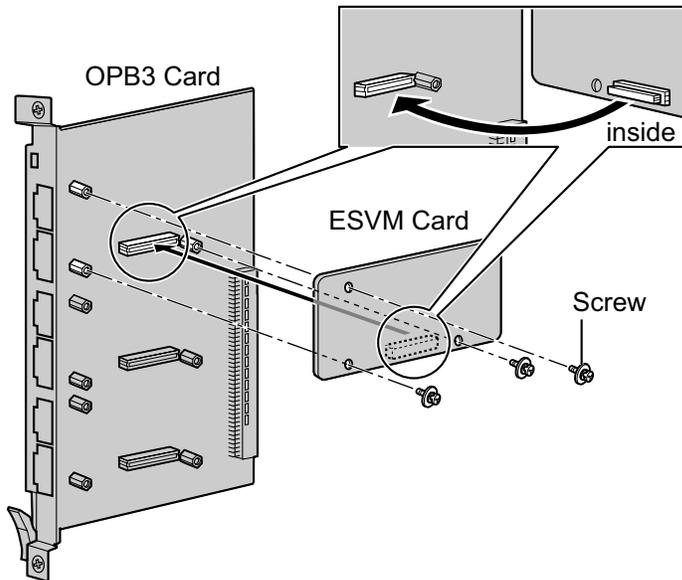
Accessories (included): Screws × 3

User-supplied (not included): none

3.9.5 ESVM4 Card (KX-TDA0194)

Function

4-channel simplified voice message card for Built-in Simplified Voice Message feature. Also supports MSG card features. To be mounted on the OPB3 card.



Accessories and User-supplied Items

Accessories (included): Screws × 3

User-supplied (not included): none

CAUTION

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

Notice

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

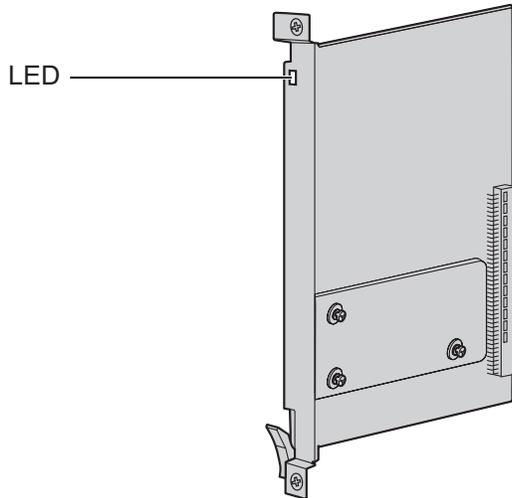
Note

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

3.9.6 EECHO16 Card (KX-TDA6166)

Function

16-channel card for echo cancellation during conferences.



Accessories and User-supplied Items

Accessories (included): none

User-supplied (not included): none

Note

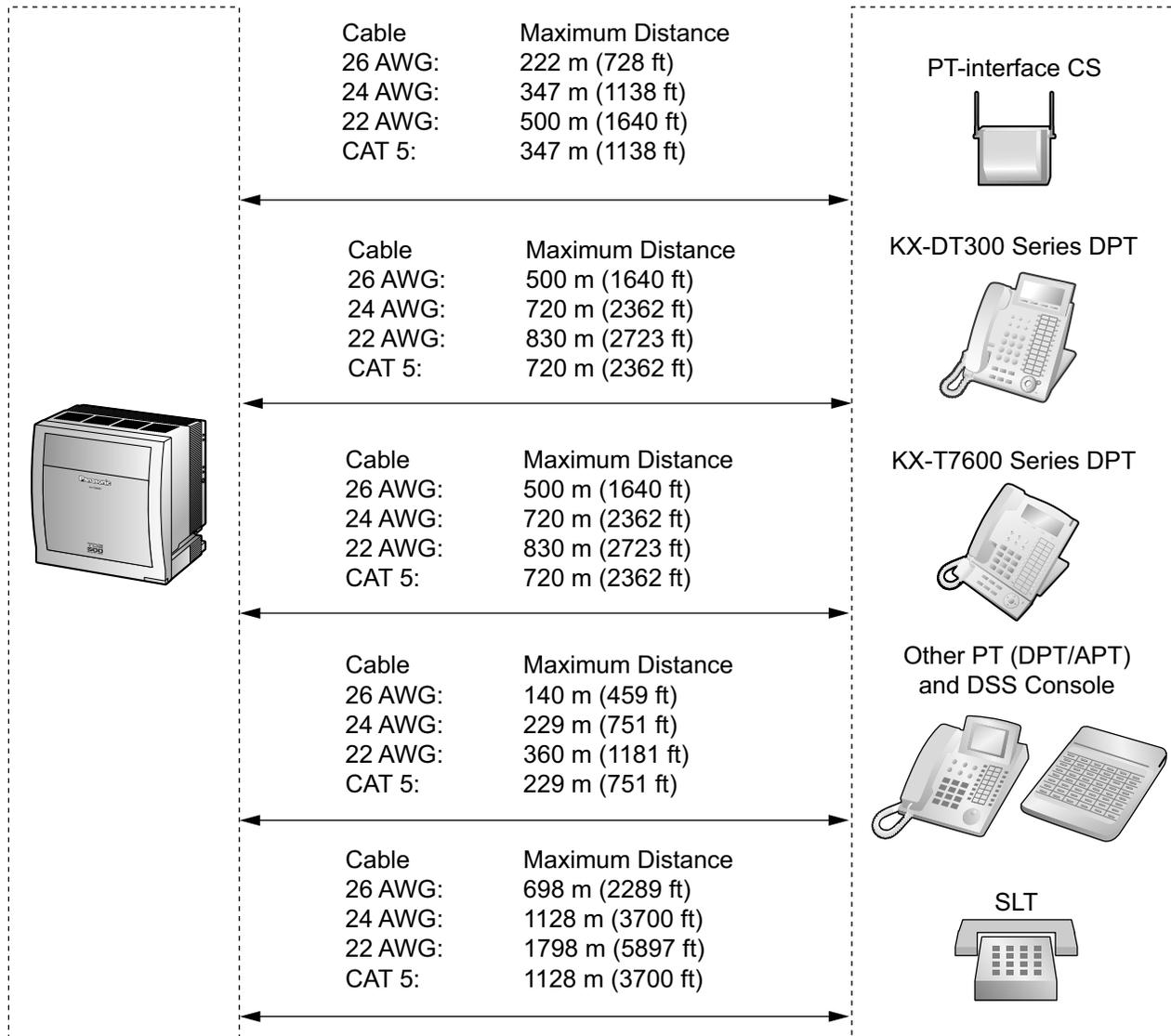
To establish a conference call involving 6 to 8 parties, install an EECHO16 card and enable echo cancellation for conferences using the Maintenance Console. For details, refer to "Echo Cancel—Conference" in "4.18 [2-9] System Options" of the PC Programming Manual.

LED Indications

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

3.10 Connection of Extensions

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



* The maximum cabling distance from the PBX is the same even when the KX-DT300/KX-T7600 series DPT is the master DPT on the Digital XDP connection.

Notice

- If the cabling distance exceeds the maximum cabling distance above, satisfactory performance of each terminal cannot be guaranteed.
- The connected terminals will operate over the maximum cabling distance under optimum conditions. However, the maximum cabling distance of SLTs connected to ports No. 9–24 of the ECSLC24 card may be shorter than that of SLTs connected to the ESLC16 card.

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

	PT-interface CS	DPT	APT	DSS Console	SLT
DHLC8 Card	✓	✓	✓	✓	✓
EMSLC16, ESLC16,ECSLC24, CSLC16, SLC8 Cards					✓
DLC16, DLC8 Cards	✓	✓		✓	

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

3.10.2 Parallel Connection of the Extensions

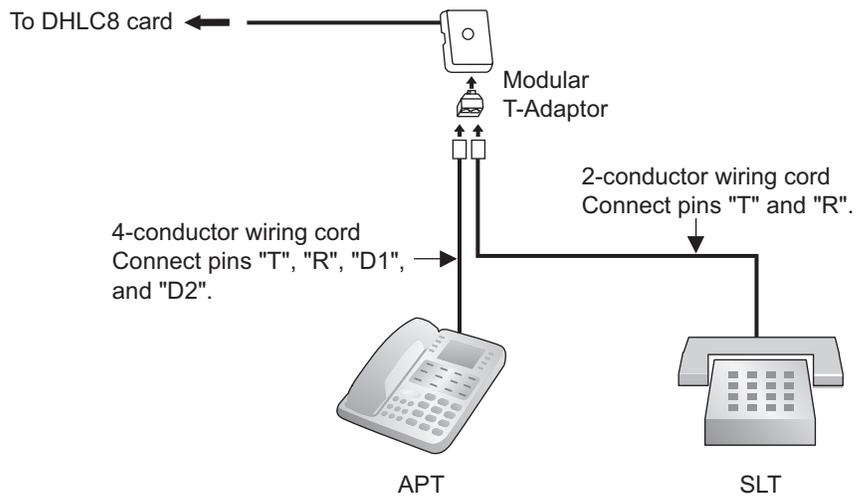
Any SLT can be connected in parallel with an APT or a DPT as follows.

Note

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

With APT

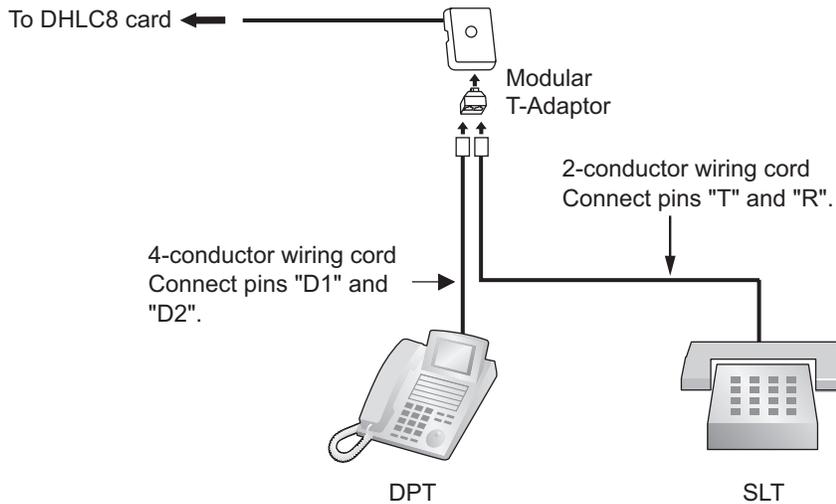
For parallel connection, eXtra Device Port (XDP) mode must be disabled for that port through system programming. Refer to "13.1.2 Paralleled Telephone" and "5.1.7 Extension Port Configuration" in the Feature Manual for further information.



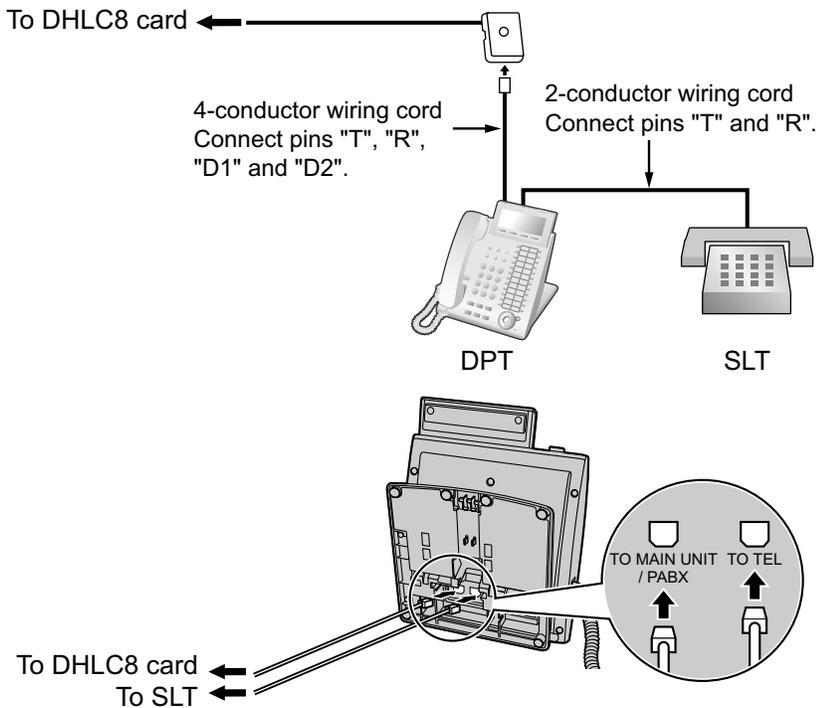
With DPT

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

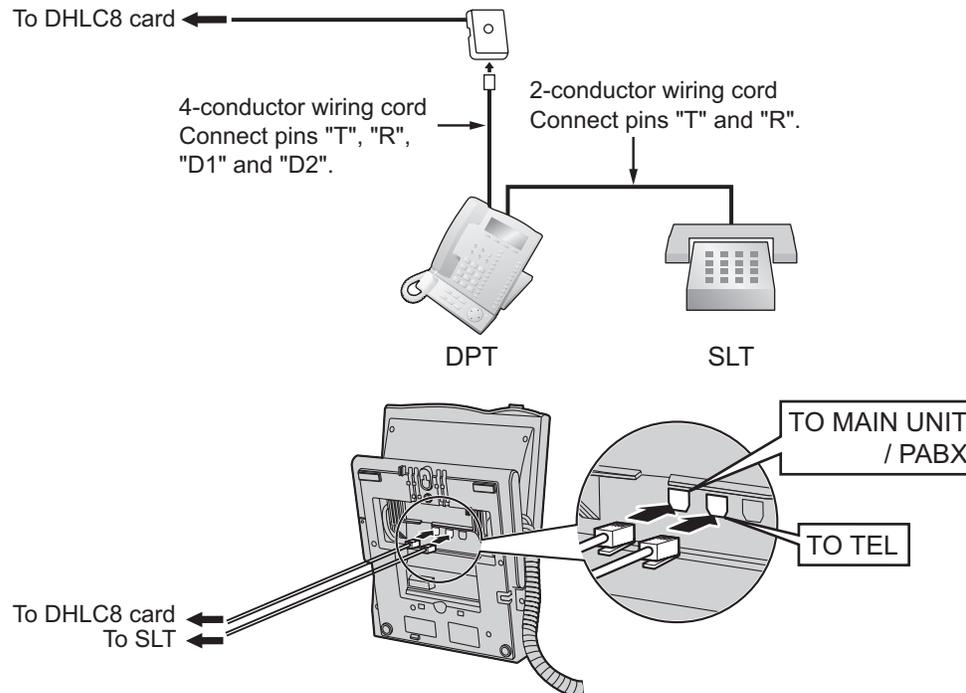
Using a Modular T-Adaptor



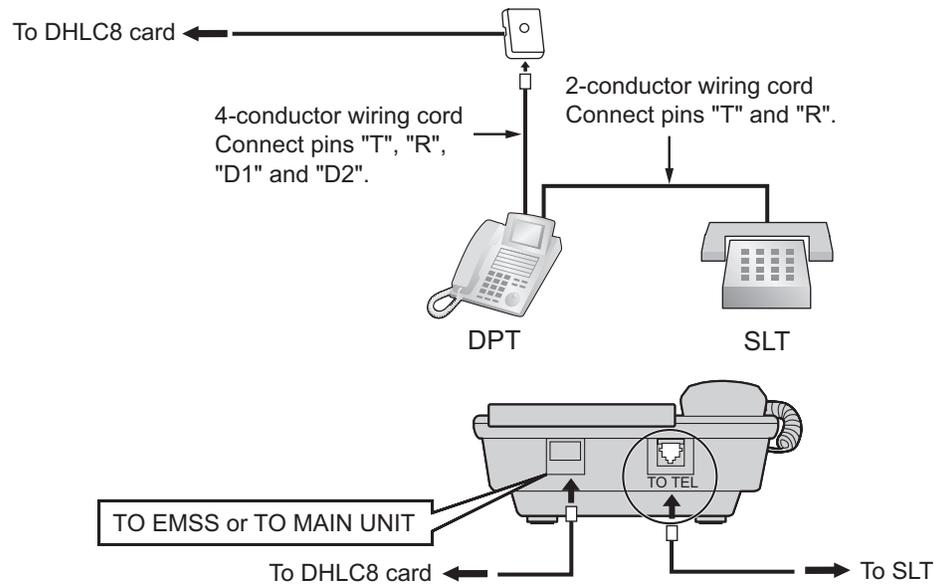
Using an EXtra Device Port With KX-DT300 Series DPT (except KX-DT321)



With KX-T7600 Series DPT



With Other DPT



3.10.3 Digital EXtra Device Port (Digital XDP) Connection

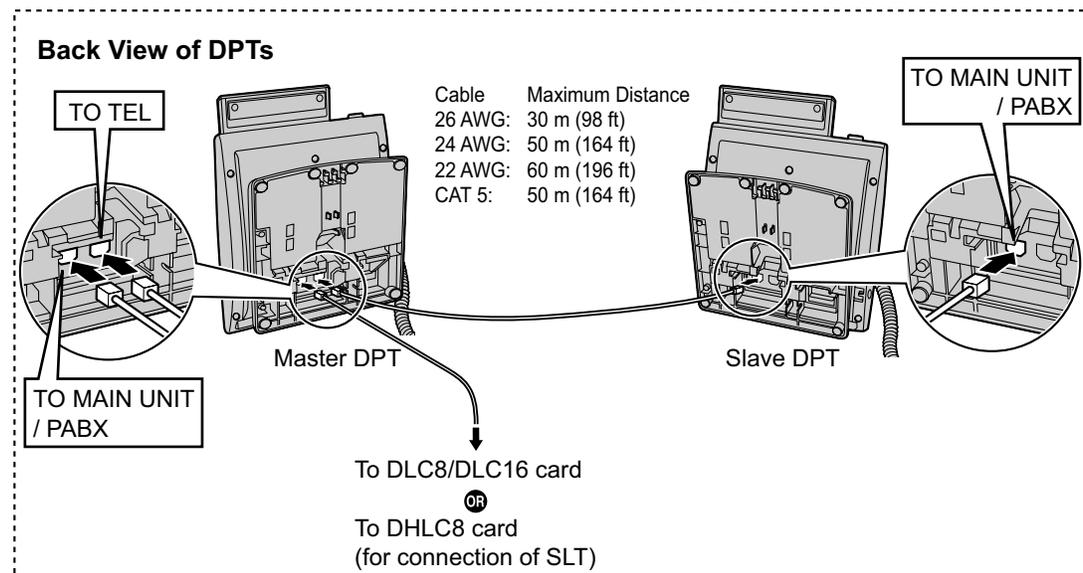
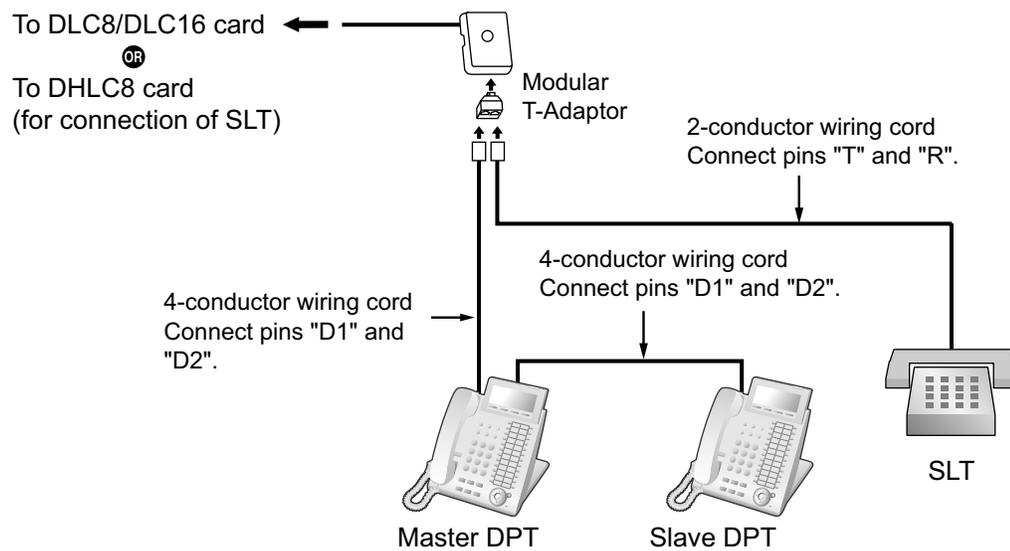
A DPT can be connected to another DPT on the Digital XDP connection. In addition, if the DPT is connected to a DHLC8 card, it can also have an SLT connected in Parallel mode or XDP mode.

Note

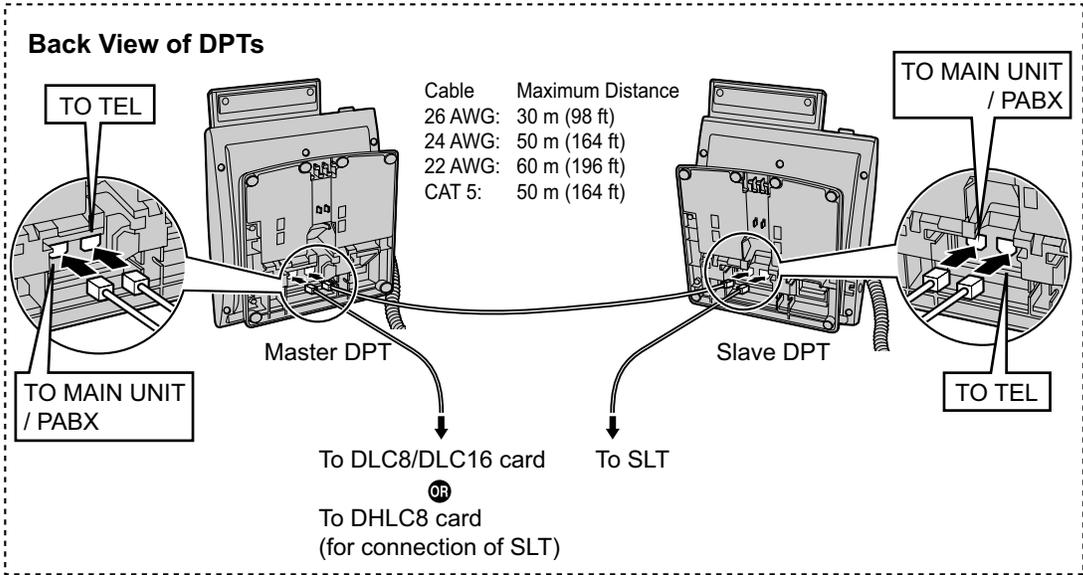
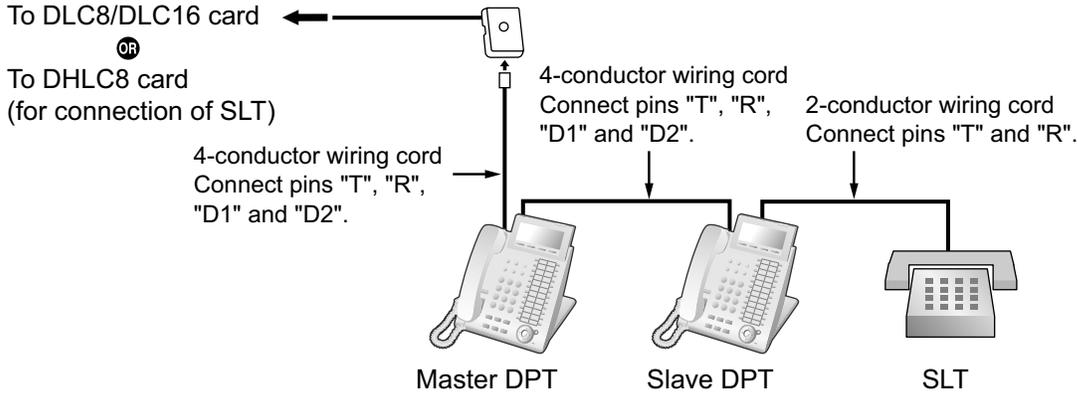
- Both DPTs must be KX-DT300/KX-T7600 series DPTs (except KX-T7640). Note that the KX-T7667 can only be connected as a slave DPT.
- Bluetooth® Modules or USB Modules must not be connected to DPTs in the Digital XDP connection.
- Parallel mode or XDP mode can be selected through system programming.
-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

With KX-DT300 Series DPT

Using a Modular T-Adaptor

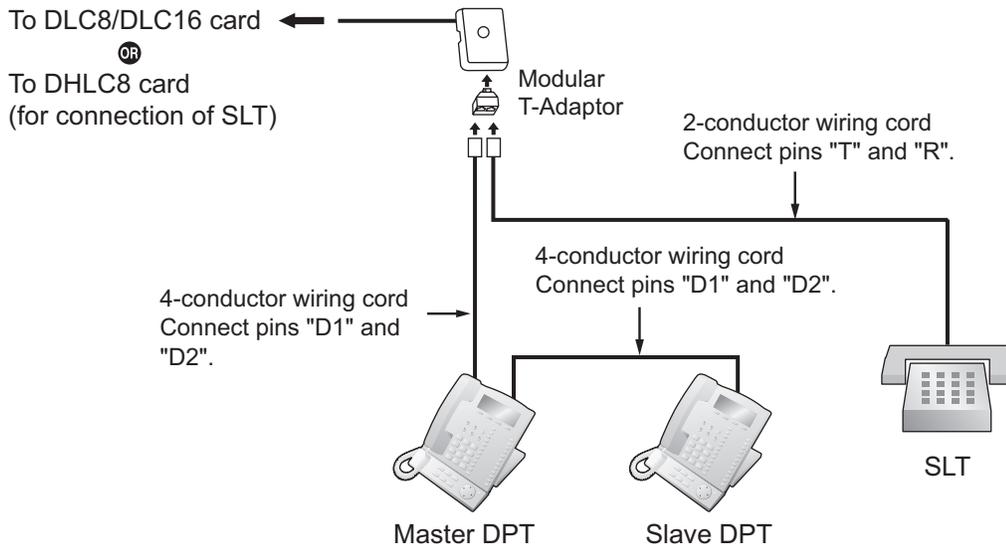


Using an EXtra Device Port

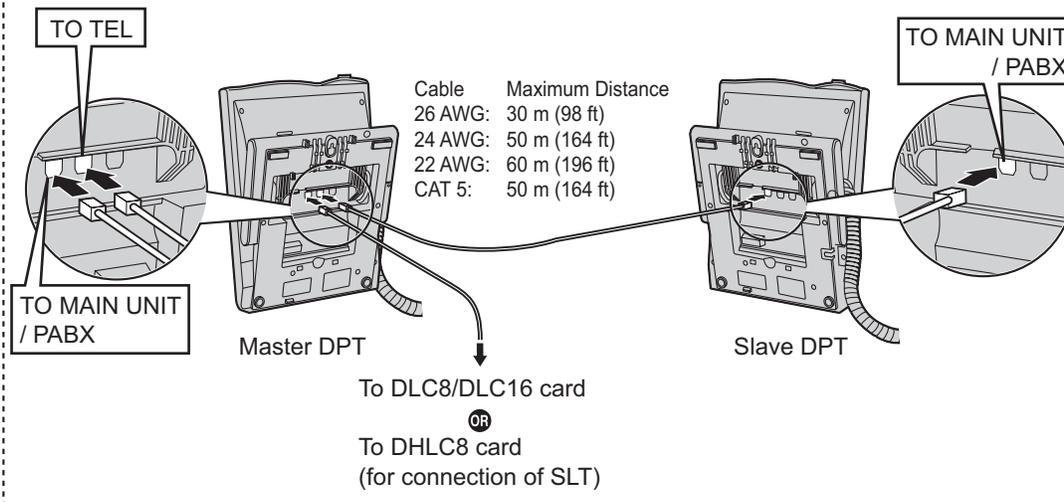


With KX-T7600 Series DPT

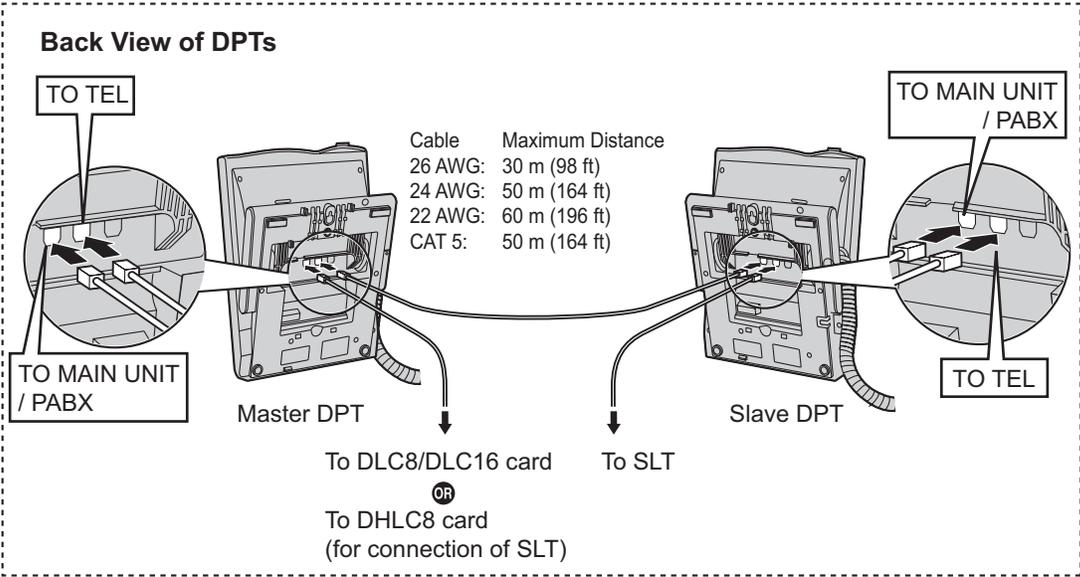
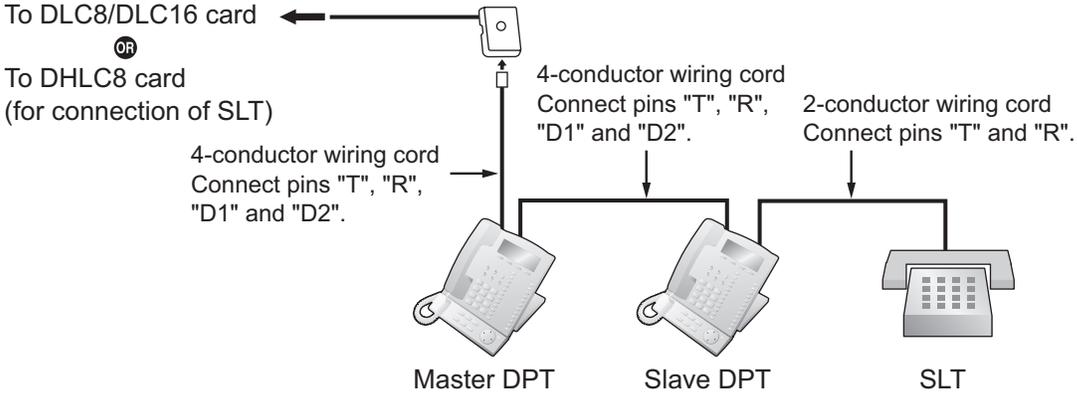
Using a Modular T-Adaptor



Back View of DPTs



Using an EXtra Device Port



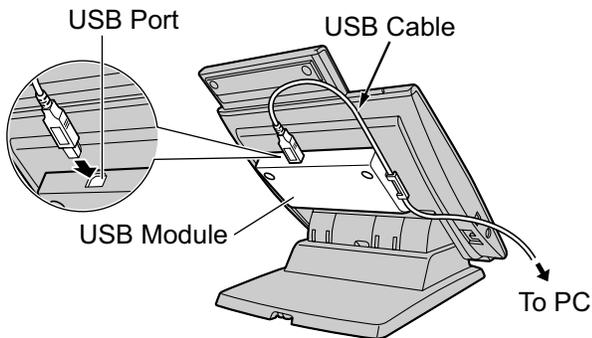
3.10.4 First Party Call Control CTI Connection

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

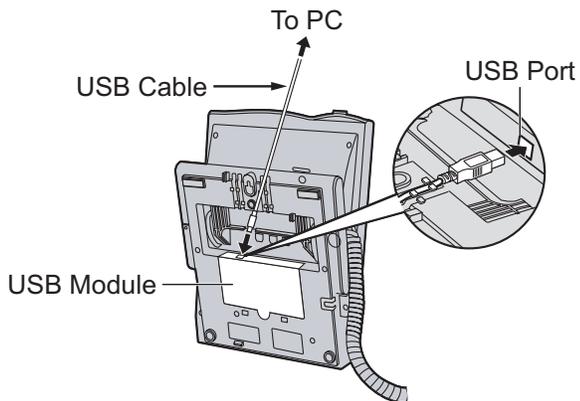
Note

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

KX-DT343/KX-DT346



KX-T7633/KX-T7636



Note

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

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

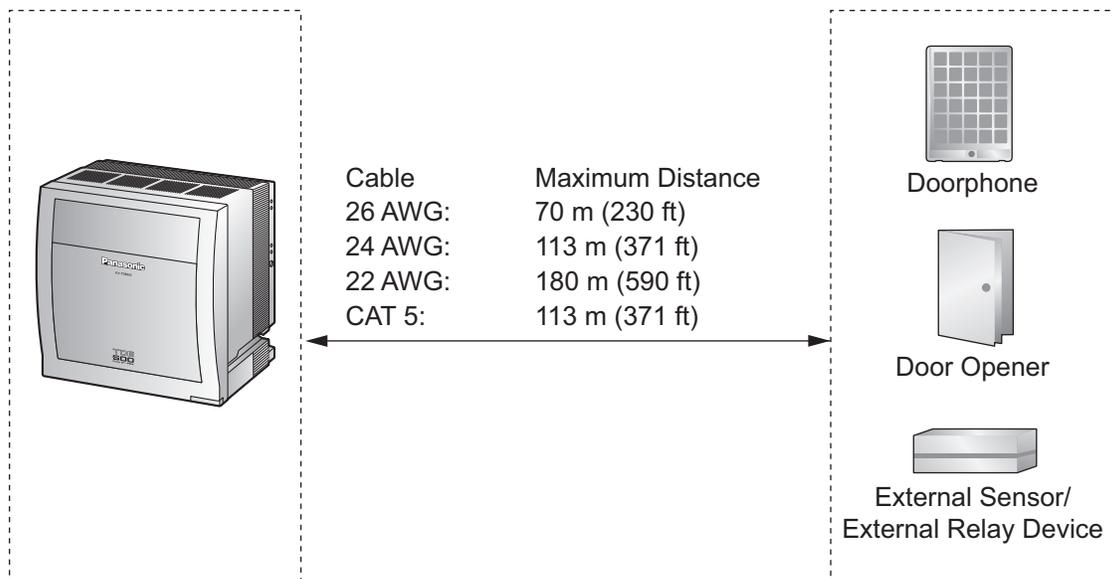
3.11.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays

The PBX supports a maximum of 64 doorphones, 64 door openers, 64 external sensors, and 64 external relays.

Note

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

Maximum Cabling Distance

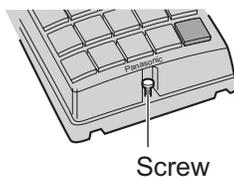


Installing the Doorphone (KX-T30865/KX-T7765/KX-T7775)

Note

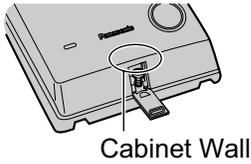
- The illustrations shown in the installation procedure are based on the KX-T30865.
- For details about the installation of the KX-T7775, refer to the Operating Instructions of the KX-T7775.

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

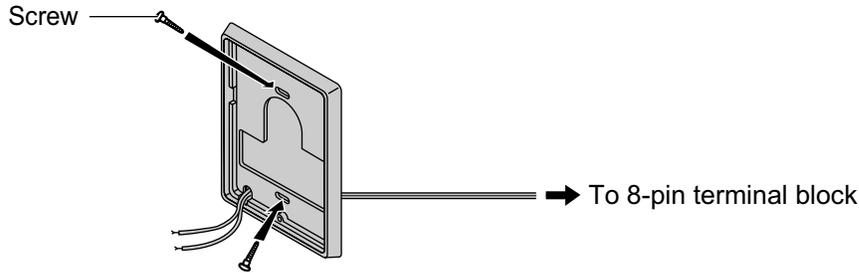


Note for KX-T7765 Users

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



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



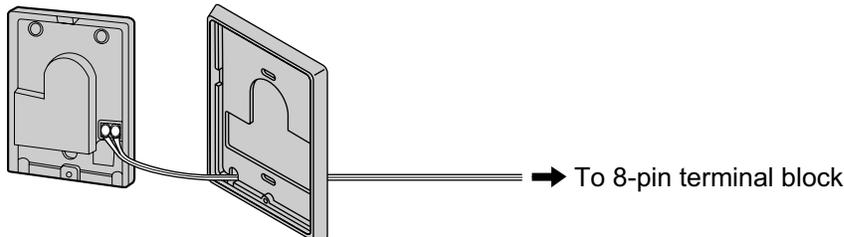
Note

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

 : when a doorphone plate has been fixed to the wall

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

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



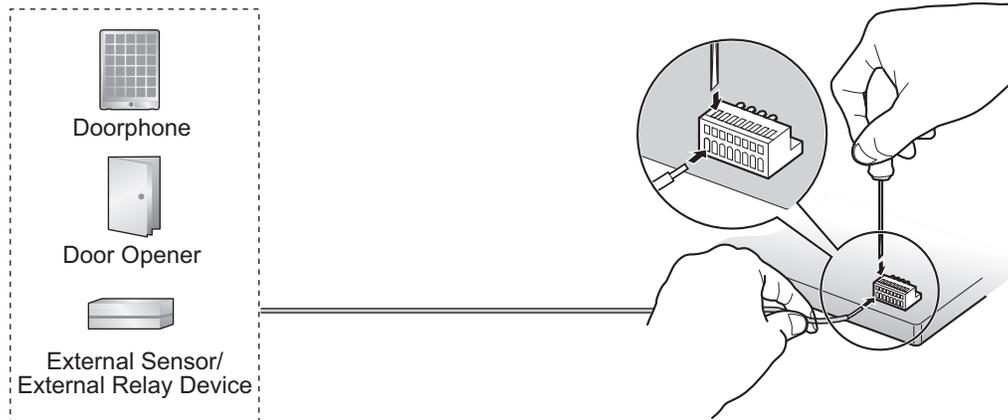
4. Re-attach the 2 halves and re-insert the screw.

Connection

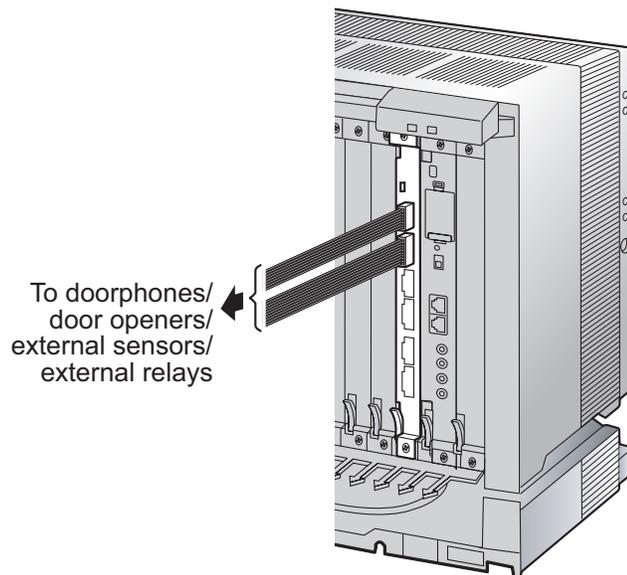
Use 8-pin and 10-pin terminal blocks (included with the card) for connection.

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 "3.9.2 DPH4 Card (KX-TDA0161)" and "3.9.3 EIO4 Card (KX-TDA0164)" for pin assignments.

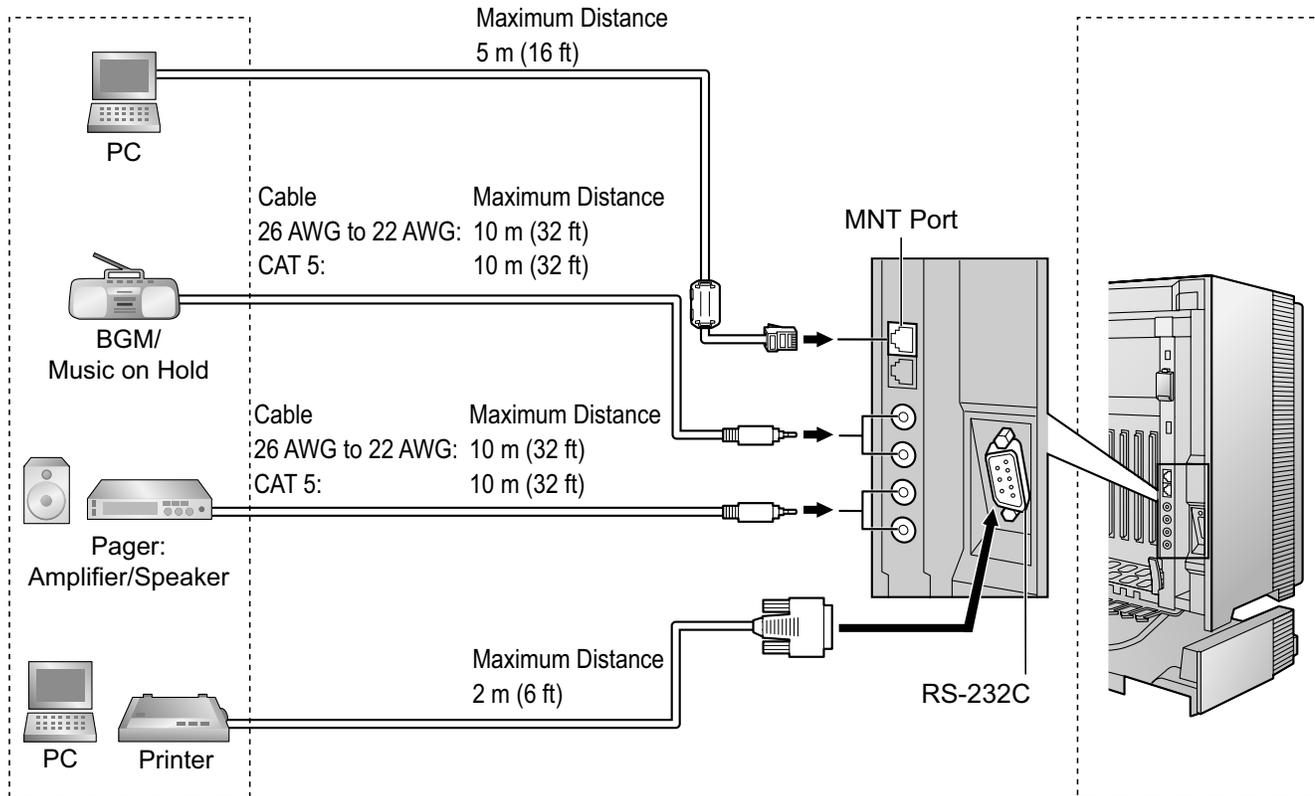


2. Attach the terminal blocks to the connectors of the DPH4/EIO4 card on the PBX.



3.12 Connection of Peripherals

3.12.1 Connection of Peripherals



PC (via MNT Port)

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

Pin Assignments

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

BGM/MOH

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

CAUTION

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

Note

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

Pager

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

CAUTION

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

PC/Printer (via RS-232C)

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

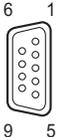
When using special accessories such as cable, the user should use those specified in this installation manual to comply with the limits for a Class B digital device pursuant to the FCC Rules.

CAUTION

To protect the system, keep the following in mind:

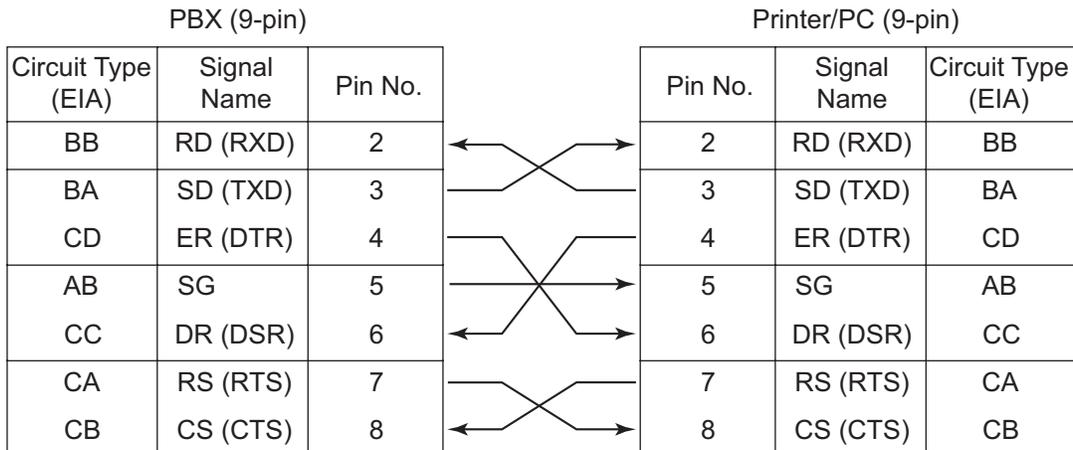
1. Make sure that both connector cases (frame ground) of the RS-232C cross cable (shielded cable) are conductive. If they are not conductive, make sure that both connector cases of the cable are firmly connected.
2. If this is not possible, connect the frame of the PBX to the frame of the PC/Printer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

Pin Assignments

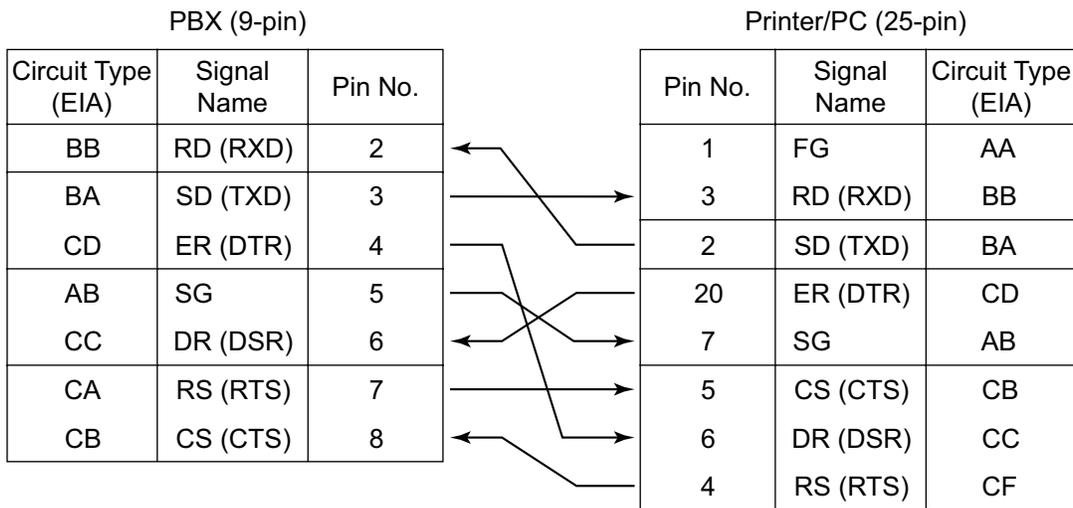
	No.	Signal Name	Function	Circuit Type	
				EIA	CCITT
	2	RD (RXD)	Receive Data	BB	104
	3	SD (TXD)	Transmit Data	BA	103
	4	ER (DTR)	Data Terminal Ready	CD	108.2
	5	SG	Signal Ground	AB	102
	6	DR (DSR)	Data Set Ready	CC	107
	7	RS (RTS)	Request To Send	CA	105
	8	CS (CTS)	Clear To Send	CB	106

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.

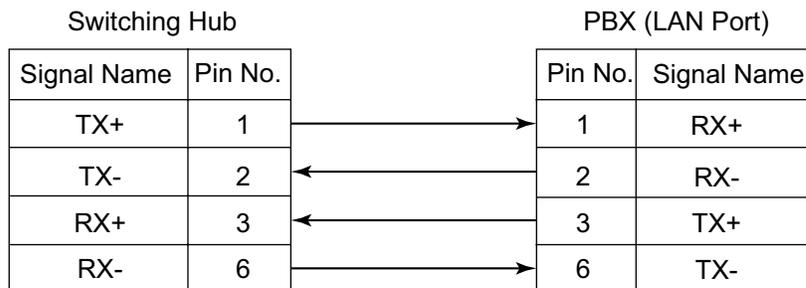
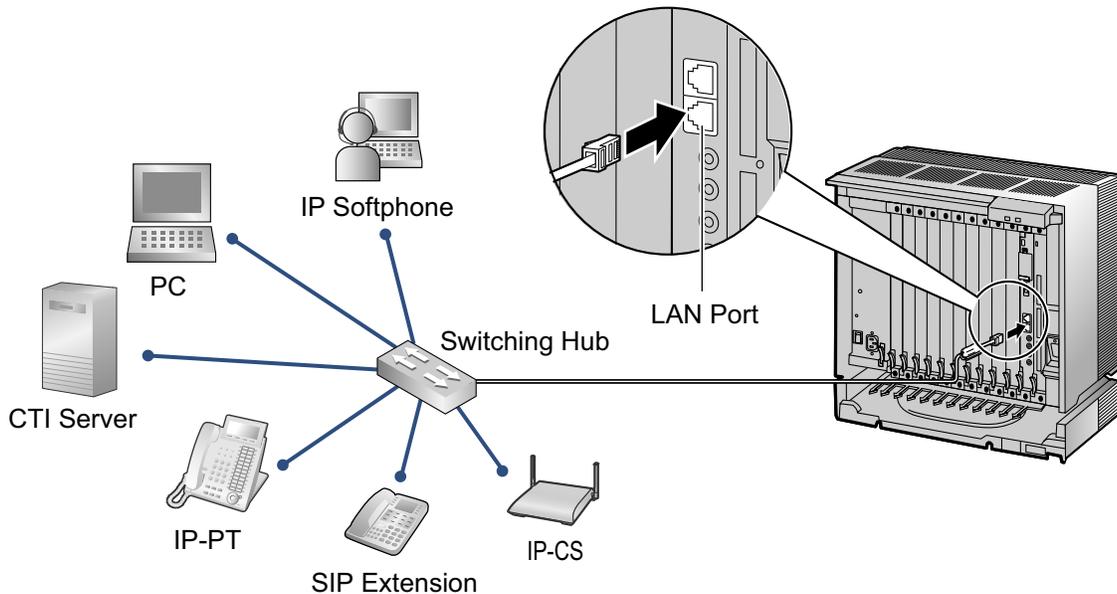
- **Clear To Send (CTS):...**(input)
An ON condition of circuit CS (CTS) indicates that the printer or the PC is ready to receive data from the unit. The unit does not attempt to transfer data or receive data when circuit CS (CTS) is OFF.
- **Frame Ground (FG)**
Connects to the unit frame and the ground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

3.13 LAN Connection

3.13.1 LAN Connection

Connection Chart for LAN Connection

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



Note

- Use an Ethernet straight cable with an RJ45 connector for connection to a switching hub. The cable should be a 10BASE-T/100BASE-TX CAT 5 or higher cable.
- Make sure that all the CAT 5 cables in use are not over 100 m (328 ft) in length.
- Make sure to create a spanning tree for LAN connection in order to prevent loops from occurring in a multi-bridged environment. Otherwise, some packets may circulate for long periods of time and eventually PBX performance system may degrade.
- The CTI server can be used for connecting PCs on a LAN to provide third party call control CTI. CTI connection uses the CSTA Phase 3 or TAPI 2.1 protocol. The operating system of the PC or CTI server required for third party call control depends on your CTI application software. For details, refer to the manual for your CTI application software.

3.14 Power Failure Connections

3.14.1 Power Failure Connections

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

Connection

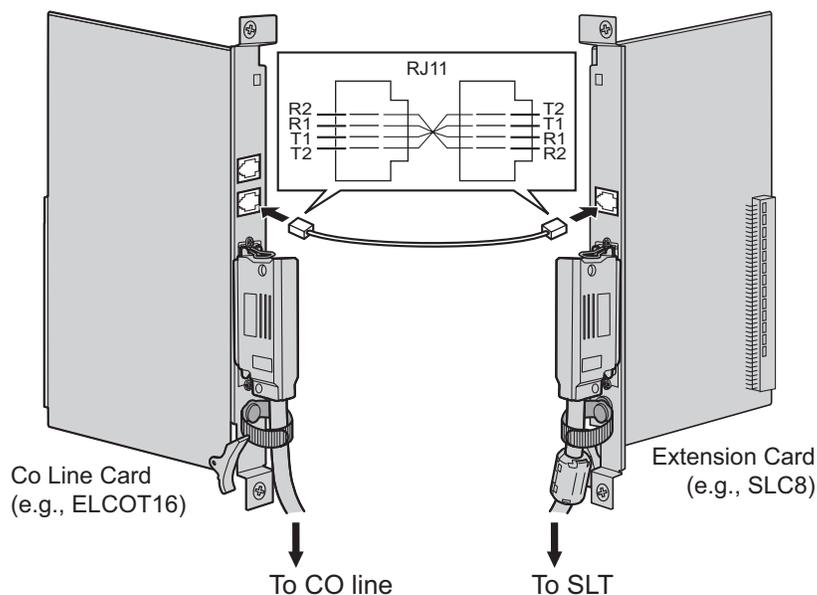
Power Failure Connection connects a specific SLT and a CO line in the event of power failure. The following CO line and extension cards can be used for Power Failure Connections:

- **Analog CO line card:** ELCOT16 (4 PFT ports)
- **Extension card:** EMSLC16 (4 PFT ports), ESLC16 (4 PFT ports), ECSLC24 (4 PFT ports), CSLC16 (4 PFT ports), DHLC8 (2 PFT port) and SLC8 (2 PFT port)

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

Note

- Power Failure Connections must be made within the same shelf.
- 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.

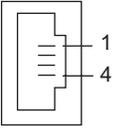


Accessories and User-supplied Items

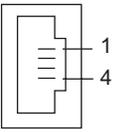
Accessories (included): none

User-supplied (not included): RJ11 connectors

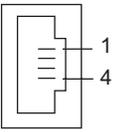
RJ11 Connector Pin Assignments for CO line Card**PFT Ports 1 and 2**

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

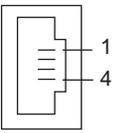
PFT Ports 3 and 4

	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 EMSLC16/ESLC16/ECSLC24/CSLC16 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

3.15 Starting the PBX

3.15.1 Starting the PBX

Before Starting the PBX

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

- **SD Memory Card**

Notice

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

- **Bus Cable**

Pull the Bus Cables in order to make sure that they are connected securely to the shelves. If the Bus Cables detach or are loose, plug them in to the shelves again, confirming that the clasps on the Bus Cable attach securely to the connector of the BUS-S or BUS-M card.

Starting the PBX

WARNING

Use only the AC power cord included with the PSU.

CAUTION

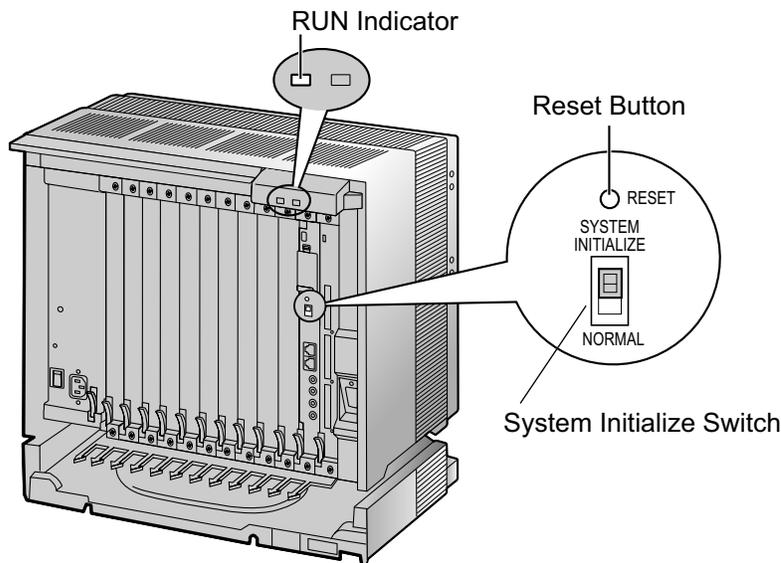
- Before touching the System Initialize Switch, discharge static electricity by touching ground or wearing a grounding strap.
- Once you have started the PBX and if you unplug the PBX, do not perform the following procedures to start the PBX again. Otherwise, your programmed data is cleared. To restart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

Note

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

System Initialization Procedure

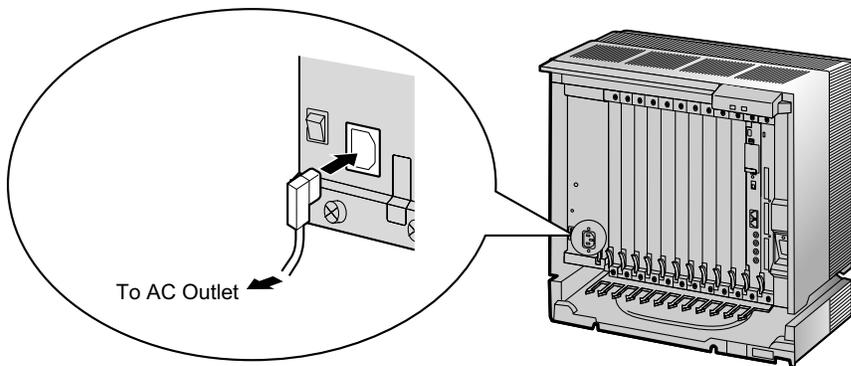
1. Slide the System Initialize Switch to the "SYSTEM INITIALIZE" position.



2. Plug the AC power cord into the PBX and an AC outlet, and turn on the PBX. The RUN indicator will flash.

Note

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



3. While the RUN indicator is flashing, slide the System Initialize Switch back to the "NORMAL" position. Depending on the configuration, initialization takes about 1 min to 3 min. If successfully executed, the RUN indicator will stop flashing and stay lit. All data will be cleared, and the PBX as well as all optional service cards (except for the IP-GW card) will be initialized to the default values. The DPTs should show the time as 01:00. The data of the IP-GW card will not be initialized.

Note

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

LED Indications

For the Basic Shelf

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

For an Expansion Shelf

Indication	Color	Description
RUN	Green	Expansion shelf status indication <ul style="list-style-type: none">• OFF: Power Off (includes normal reset)• ON: Power On and running (on-line)• Flashing (60 times per minute): Starting up• Flashing (120 times per minute): Program error in the BUS-S card
ALARM	Red	Alarm indication <ul style="list-style-type: none">• OFF: Normal• ON: Alarm (CPU stop, alarm for each optional service card installed in Expansion Shelves)

Confirming the CO Line Connection

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

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

Section 4

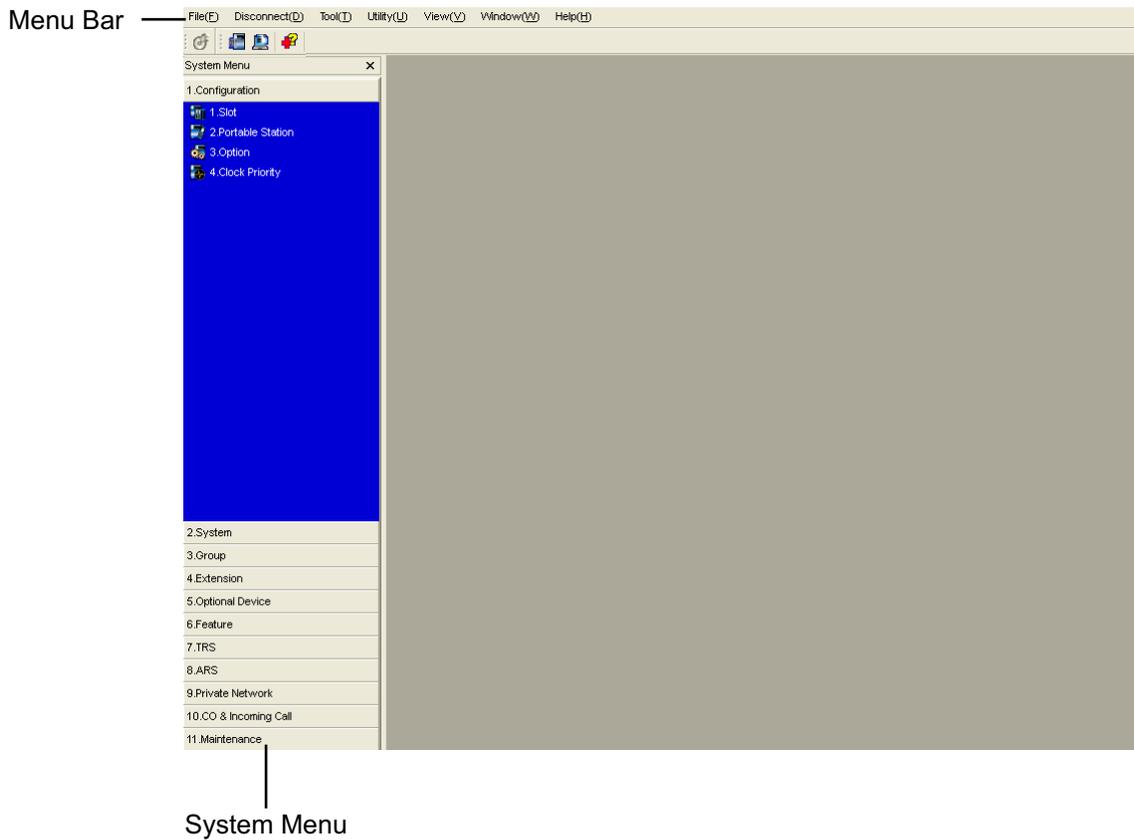
Guide for the Maintenance Console

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

4.1 Overview

4.1.1 Overview

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



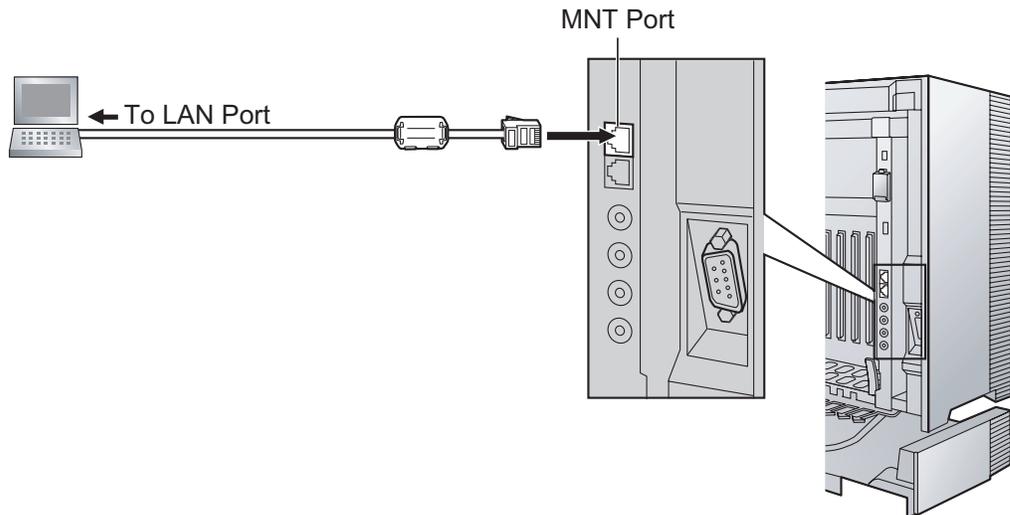
Note

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

4.2 PC Connection

4.2.1 PC Connection

Connection via MNT Port of IPCEMPR Card



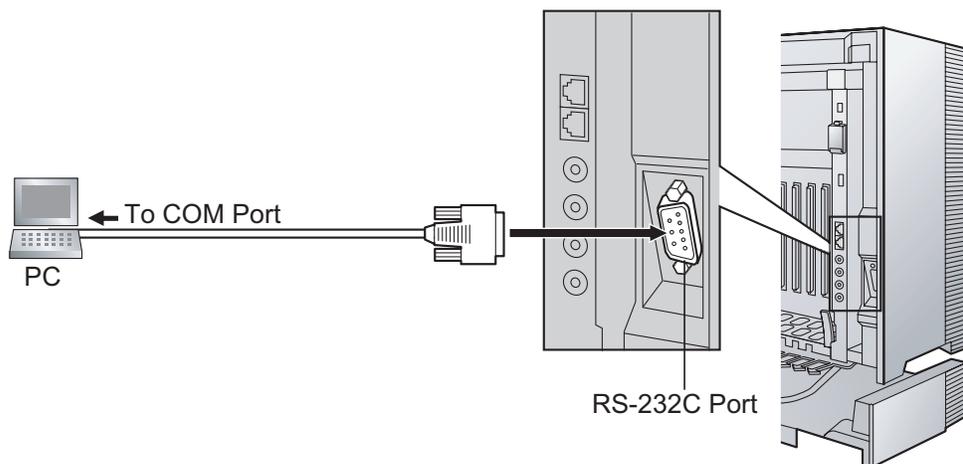
Notice

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

Note

For pin assignments and maximum cabling distance, refer to "3.12.1 Connection of Peripherals".

Serial Interface Connection



CAUTION

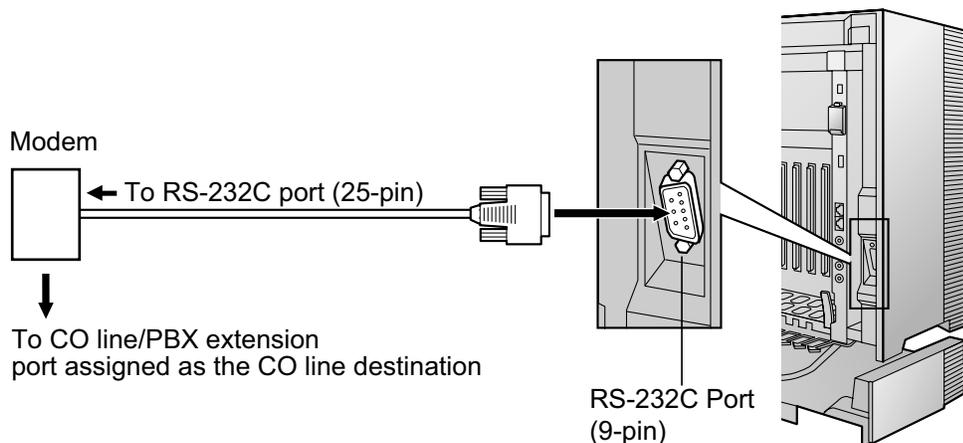
To protect the system, keep the following in mind:

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

Note

For pin assignments and maximum cabling distance, refer to "3.12.1 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)

CAUTION

To protect the system, keep the following in mind:

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

After connecting the PBX and the external modem, set the power switch of the external modem to "ON", then the external modem will be initialized with the default values.

The following AT command settings may be required for the modem:

- The Data Terminal Ready (DTR) signal should be ignored.
- The Data Terminal Equipment (DTE)/Modem flow control should be turned off.

- Data compression should be disabled.
- Error Correction is not necessary.

Note

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

4.3 Installation of the Maintenance Console

4.3.1 Installing and Starting the Maintenance Console

System Requirements

Required Operating System

- Microsoft® Windows® XP or Windows Vista® Business operating system

Minimum Hardware Requirements

- HDD: 100 MB of available hard disk space

Recommended Display Settings

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

Installing the Maintenance Console

Note

- Make sure to install and use the latest version of the Maintenance Console.
 - To install or uninstall the software on a PC running Windows XP Professional, you must be logged in as a user in either the "Administrators" or "Power Users" group.
 - To install or uninstall the software on a PC running Windows Vista Business, you must be logged in as a user in the "Administrators" group.
1. Copy the setup file of the Maintenance Console to your PC.
 2. Double-click the setup file to run the installer.
 3. Follow the on-screen instructions provided by the installation wizard.

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

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

1. Connect the PC to the PBX with an Ethernet straight cable or RS-232C cross cable.
2. Start the Maintenance Console from the Start menu.
3. "Information before programming" appears.
 - a. Carefully read this important additional information, which includes updates to this and other manuals.
 - b. Click **OK** to close this window.
4.
 - a. Enter the Installer Level Programmer Code (default: **INSTALLER**).

Note

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

- b. Click **OK**.

5. Click **Connect**.
6.
 - a. Select **KX-TDE600** from **PBX Model**.
 - b. Select the **LAN** or **RS-232C** tab, depending on the type of PC connection with the PBX.
 - c. Specify the settings as required.

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. Enter the system password for installer (default: **1234**).
 - e. Click **Connect**.
7. Follow the instructions of the Quick Setup wizard and assign the basic items (Quick Setup). After Quick Setup is completed, if the IP addressing information was not changed and a V-IPEXT card was installed during setup, the IP-PT registration screen is displayed. For information on registering IP-PTs to the PBX, refer to "3.15 [1-1] Slot—Port Property - Virtual IP Extension" in the PC Programming Manual. You may now begin programming the PBX.

Notice

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

	00	01	02	03	04	05	06	07	08	09	0a	0b	0c	0d	0e	0f
00																
10																
20		!	"	#	\$	%	&	'	()	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
80	€		,	f	„	...	†	‡	^	‰	Š	<	Œ		Ž	
90		‘	’	“	”	•	—	—	~	™	š	>	œ		ž	ÿ
a0		ı	ç	£	¤	¥	¦	§	¨	©	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

4.3.1 Installing and Starting the Maintenance Console

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

CAUTION

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

Section 5

Troubleshooting

This section provides information on the PBX and telephone troubleshooting.

5.1 Troubleshooting

5.1.1 Installation

PROBLEM	PROBABLE CAUSE	SOLUTION
You cannot make/receive calls via an IP network.	<ul style="list-style-type: none"> IP-EXT/IP-GW/DSP card malfunction 	<ul style="list-style-type: none"> Replace the corresponding card.
	<ul style="list-style-type: none"> IPCEMPR card malfunction 	<ul style="list-style-type: none"> Replace the IPCEMPR card (be sure to turn off the PBX when replacing).
	<ul style="list-style-type: none"> Not enough activation keys 	<ul style="list-style-type: none"> Purchase additional activation key codes. Please consult a certified dealer for details.
	<ul style="list-style-type: none"> Poor connection 	<ul style="list-style-type: none"> Make sure that an 8-pin twisted pair cable is used for connection. Make sure that none of the CAT 5 cables in use are over 100 m (328 ft) in length. Make sure that a straight cable is used for connection to a switching hub.
	<ul style="list-style-type: none"> Network malfunction 	<ul style="list-style-type: none"> Make sure that all network devices in use are switched on. Make sure that there is no unwanted firewall in the IP network.
IP-PTs/SIP Extensions do not operate.	<ul style="list-style-type: none"> IP-EXT/DSP card malfunction 	<ul style="list-style-type: none"> Replace the corresponding card.
	<ul style="list-style-type: none"> IPCEMPR card malfunction 	<ul style="list-style-type: none"> Replace the IPCEMPR card (be sure to turn off the PBX when replacing).
	<ul style="list-style-type: none"> Not enough activation keys 	<ul style="list-style-type: none"> Purchase additional activation key codes. Please consult a certified dealer for details.
	<ul style="list-style-type: none"> IP-PT/SIP Extension not registered 	<ul style="list-style-type: none"> Register the corresponding IP-PT/SIP Extension.
	<ul style="list-style-type: none"> IP-PT/SIP Extension malfunction 	<ul style="list-style-type: none"> Replace the IP-PT/SIP Extension.
	<ul style="list-style-type: none"> Poor connection 	<ul style="list-style-type: none"> Make sure that an 8-pin twisted pair cable is used for connection. Make sure that none of the CAT 5 cables in use are over 100 m (328 ft) in length. Make sure that a straight cable is used for connection to a switching hub.
	<ul style="list-style-type: none"> Network malfunction 	<ul style="list-style-type: none"> Make sure that all network devices in use are switched on. Make sure that the IP-PT/SIP Extension is not blocked by the firewall or other network devices.

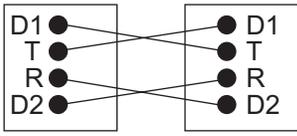
PROBLEM	PROBABLE CAUSE	SOLUTION
Extensions (except IP-PT/SIP Extension) do not operate.	<ul style="list-style-type: none"> Extension card malfunction 	<ul style="list-style-type: none"> Replace the corresponding card.
	<ul style="list-style-type: none"> Poor connection between the PBX and the extension 	<ul style="list-style-type: none"> 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.
	<ul style="list-style-type: none"> A telephone with an A-A1 relay is connected. 	<ul style="list-style-type: none"> Make sure that a 2-wire cord is used. Make sure that the A-A1 relay switch of the telephone is in "OUT" or "OFF" position.
	<ul style="list-style-type: none"> Extension malfunction 	<ul style="list-style-type: none"> Take the extension and plug it into another extension port that is working. If the extension does not work, replace the extension.
	<ul style="list-style-type: none"> Wrong type of PSU 	<ul style="list-style-type: none"> Replace the PSU with the appropriate type.
	<ul style="list-style-type: none"> An unsupported extension card (SLC16 or MSLC16 card) is installed. 	<ul style="list-style-type: none"> Replace the optional service card with an appropriate one (ESLC16 or EMSLC16 card).
You cannot make/receive outside calls.	<ul style="list-style-type: none"> An unsupported CO line card (LCOT4, LCOT8, or LCOT16 card) is installed. 	<ul style="list-style-type: none"> Replace the optional service card with an appropriate one (ELCOT16 card).
The PBX does not operate properly.		<ul style="list-style-type: none"> Press the Reset Button (refer to "5.1.4 Using the Reset Button"). Turn off the power switch, and then turn it back on. Turn off the power switch, and then unplug the PBX. After 5 minutes, plug the PBX back in, and turn the power switch back on.
	<ul style="list-style-type: none"> IPCMEC/preinstalled memory card malfunction 	<ul style="list-style-type: none"> See the error log using the Maintenance Console (refer to "5.1.5 Troubleshooting by Error Log"). If the error no. 41 is displayed, replace the IPCMEC/preinstalled memory card.
Noise on external paging.	<ul style="list-style-type: none"> Induced noise on the wire between the PBX and the amplifier. 	<ul style="list-style-type: none"> Use a shielded cable as the connection wire between the PBX and amplifier. A short shielded cable is recommended.
Distorted external music.	<ul style="list-style-type: none"> Excessive input level from external music source. 	<ul style="list-style-type: none"> Decrease the output level of the external music source by using the volume control on the music source.

PROBLEM	PROBABLE CAUSE	SOLUTION
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"> Voice-calling mode and Hands-free mode with LCS are not available with Wireless Phones. 	<ul style="list-style-type: none"> Switch the calling mode to ring-calling. Set the LCS mode to "Private".
The ALARM indicator on the front of the Basic Shelf turns on red.	<ul style="list-style-type: none"> A major system error occurs in the PBX. 	<ul style="list-style-type: none"> See the error log using the Maintenance Console (refer to "5.1.5 Troubleshooting by Error Log").
The LINK indicator of the IP-EXT/IP-GW/IPCEMPR does not turn on.	<ul style="list-style-type: none"> IP-EXT/IP-GW card malfunction 	<ul style="list-style-type: none"> Replace the corresponding card.
	<ul style="list-style-type: none"> IPCEMPR card malfunction 	<ul style="list-style-type: none"> Replace the IPCEMPR card (be sure to turn off the PBX when replacing).
	<ul style="list-style-type: none"> Poor connection. 	<ul style="list-style-type: none"> Make sure that an 8-pin twisted pair cable is used for connection. Make sure that none of the CAT 5 cables in use are over 100 m in length. Make sure that a straight cable is used for connection to a switching hub.
	<ul style="list-style-type: none"> Network malfunction 	<ul style="list-style-type: none"> Make sure that all network devices in use are switched on.
The RUN indicator of an Expansion Shelf does not turn on.	<ul style="list-style-type: none"> Bus Cable is not connected properly. 	<ul style="list-style-type: none"> Connect the Bus Cables properly.
	<ul style="list-style-type: none"> Defective Bus Cable (included with BUS-M card or BUS-ME card). 	<ul style="list-style-type: none"> Replace the corresponding Bus Cable.
	<ul style="list-style-type: none"> Optional service card malfunction: BUS-M, BUS-ME, BUS-S 	<ul style="list-style-type: none"> Replace the corresponding shelf expansion card (be sure to turn off the PBX when replacing a BUS-M card).
	<ul style="list-style-type: none"> Defective Expansion Shelf. 	<ul style="list-style-type: none"> Replace the corresponding Expansion Shelf.
The LINK indicator of the BUS-M card of the Basic Shelf does not turn on.	<ul style="list-style-type: none"> Bus Cable is not connected properly. 	<ul style="list-style-type: none"> Connect the Bus Cables properly.
	<ul style="list-style-type: none"> Defective Bus Cable (included with BUS-M card or BUS-ME card). 	<ul style="list-style-type: none"> Replace the corresponding Bus Cable.
	<ul style="list-style-type: none"> Optional service card malfunction: BUS-M, BUS-ME, BUS-S 	<ul style="list-style-type: none"> Replace the corresponding shelf expansion card (be sure to turn off the PBX when replacing a BUS-M card).

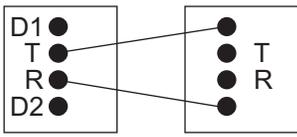
PROBLEM	PROBABLE CAUSE	SOLUTION
Extensions connected to an Expansion Shelf do not send a dial tone.	<ul style="list-style-type: none">• Bus Cable is not connected properly.	<ul style="list-style-type: none">• Connect the Bus Cables properly.
	<ul style="list-style-type: none">• Optional service card malfunction: BUS-S	<ul style="list-style-type: none">• Replace the corresponding shelf expansion card.
	<ul style="list-style-type: none">• Defective Bus Cable (included with BUS-M card or BUS-ME card).	<ul style="list-style-type: none">• Replace the corresponding Bus Cable.

5.1.2 Connection

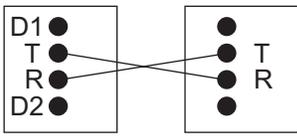
Connection between the PBX and a PT:

Can you dial an extension?	No	CAUSE	SOLUTION
		<p>The T/R is connected to the D1/D2.</p>  <p>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:

	CAUSE	SOLUTION
	<p>The T/R is connected to the D1/D2.</p>  <p>PBX Extension</p>	<p>Use the correct cord (the inner 2 wires are for T/R).</p> <ul style="list-style-type: none"> • If a telephone equipped with an A-A1 relay is connected to the PBX, set the A-A1 relay switch of the telephone to "OFF".

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

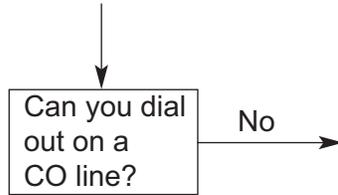
	CAUSE	SOLUTION
	<p>The "T" is connected to the "R".</p>  <p>PBX Extension</p>	<p>Reverse the connections of the T/R.</p>

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"> Cannot set the IP address, subnet mask address, and PBX IP address to the IP-PT. 	<ul style="list-style-type: none"> An unusable value is being set. 	<ul style="list-style-type: none"> Set an IP address within the valid range. IP address of the IP-PT/PBX: "1.0.0.0" to "223.255.255.255" Subnet mask address: "0–255.0–255.0–255.0–255" (except 0.0.0.0 and 255.255.255.255)
<ul style="list-style-type: none"> Cannot register the IP-PT. 	<ul style="list-style-type: none"> The necessary network parameters are not set to the IP-PT. 	<ul style="list-style-type: none"> When not using a DHCP server, set the IP address, subnet mask address, and enter the PBX IP address. If necessary, also enter the IP address of the default gateway. When using a DHCP server, enter the PBX IP address.
<ul style="list-style-type: none"> The IP-PT cannot connect to the PBX. 	<ul style="list-style-type: none"> The wrong IP address, subnet mask address, PBX IP address, or default gateway address was entered. 	<ul style="list-style-type: none"> Check each parameter and enter the correct value.
	<ul style="list-style-type: none"> The Ethernet cable is not connected correctly. 	<ul style="list-style-type: none"> Check the Ethernet cable connections.
	<ul style="list-style-type: none"> The DHCP server is not active. 	<ul style="list-style-type: none"> Restart the DHCP server. Disable DHCP and re-enter settings as appropriate.
<ul style="list-style-type: none"> Whenever you try to make calls using a SIP Extension, a busy tone is heard. 	<ul style="list-style-type: none"> The status of the port that the SIP Extension is connected to is Out of Service. 	<ul style="list-style-type: none"> Change the port status from Out of Service to In Service using the Maintenance Console.
<ul style="list-style-type: none"> When using the speakerphone on an APT, nothing is audible. 	<ul style="list-style-type: none"> The HANDSET/ HEADSET selector is set to the "HEADSET" position. 	<ul style="list-style-type: none"> When the headset is not used, set the HANDSET/HEADSET selector to the "HANDSET" position.
<ul style="list-style-type: none"> When using the speakerphone/monitor mode with a DPT, nothing is audible. 	<ul style="list-style-type: none"> The "HEADSET" mode is selected by Personal Programming, "Handset/Headset Selection". 	<ul style="list-style-type: none"> When the headset is not used, select the "HANDSET" mode by Personal Programming.
<ul style="list-style-type: none"> The PT does not ring. 	<ul style="list-style-type: none"> The ringer volume is off. 	<ul style="list-style-type: none"> Turn on the ringer volume.

PROBLEM	PROBABLE CAUSE	SOLUTION
<ul style="list-style-type: none"> During a power failure, extensions connected to ports 1 to 4 of EMSLC16/ESLC16/ECSLC24/CSLC16 and ports 1 to 2 of DHLC8/SLC8 cards do not operate. 	<ul style="list-style-type: none"> A DPT or APT is connected to the extension port. The dialing mode (tone or pulse) is incorrect. 	<ul style="list-style-type: none"> Disconnect the DPT or APT and connect an SLT. Set the Tone/Pulse switch to the other position.
<ul style="list-style-type: none"> Originating an outside call, call transfer, or conference cannot be performed. 	<ul style="list-style-type: none"> The corresponding flexible button does not exist on the PT. 	<ul style="list-style-type: none"> Program the flexible button. Refer to "6.1.3 Flexible Buttons" in the Feature Manual.
<ul style="list-style-type: none"> The KX-HGT100 does not work properly, or some features cannot be performed using the KX-HGT100. 	<ul style="list-style-type: none"> The firmware of the KX-HGT100 and the MPR software file version of the PBX are not upgraded to their latest versions. 	<ul style="list-style-type: none"> Upgrade the firmware of the KX-HGT100 and the MPR software file version of the PBX to their latest versions.

5.1.4 Using the Reset Button

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

CAUTION

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

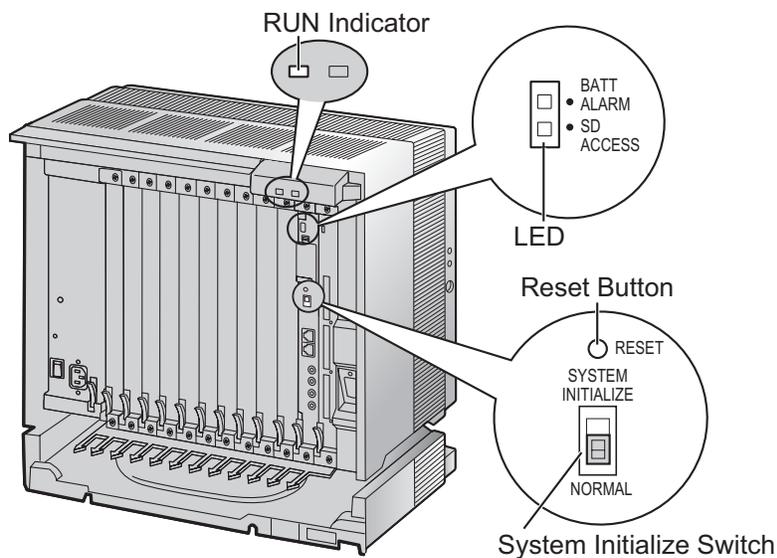
Note

- When the System Initialize Switch is set to "NORMAL", pressing the Reset Button causes the following:
 - Camp-on is cleared.
 - Calls on hold are terminated.
 - Calls on exclusive hold are terminated.
 - Calls in progress are terminated.
 - Call park is cleared.
 Other data stored in memory, except the above, are not cleared.
- Be aware that pressing the Reset Button with the System Initialize Switch in the "SYSTEM INITIALIZE" position clears all data stored in the PBX. Do not perform this operation unless you intend to delete all data from the PBX.

Operation

If the PBX does not operate properly:

1. Slide the System Initialize Switch to the "NORMAL" position.
2. Press the Reset Button for about 1 second.



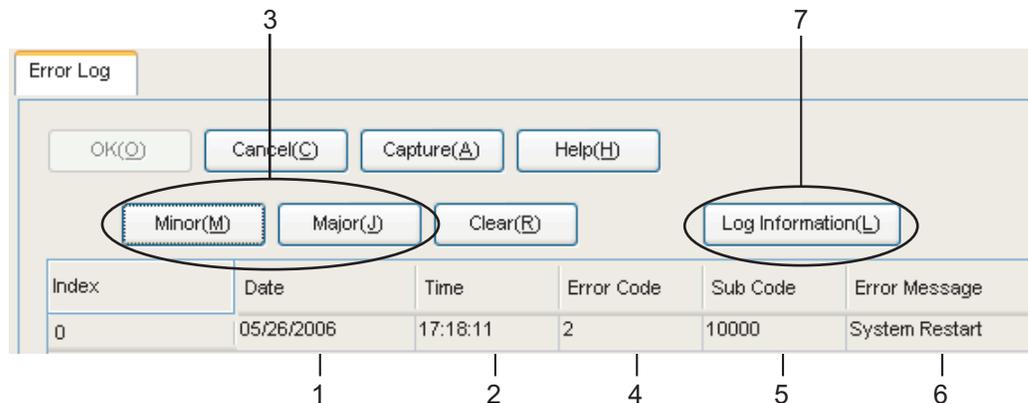
5.1.5 Troubleshooting by Error Log

When a major system error occurs in the PBX, the ALARM indicator on the front of the Basic 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 Maintenance Console, refer to "2.6.8 Utility—Error Log" in the PC Programming Manual.

Example: Maintenance Console



Example: Station Message Detail Recording (SMDR)

```

04/01/01 10:37AM MJ ALM #000 10000 MPR WDT overflow
04/01/01 11:07AM MN ALM #010 10000 AC power down
04/01/01 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/MJ), 4 under the alarm number, 5 under the error code, and 6 under the error message.

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 (WXYYZZ).</p> <ul style="list-style-type: none"> • W: Shelf type <ul style="list-style-type: none"> – Physical shelf: " " (blank) – Virtual shelf: "*" (asterisk) • X: Shelf number <ul style="list-style-type: none"> – 1: Basic Shelf – 2: Expansion Shelf 1 – 3: Expansion Shelf 2 – 4: Expansion Shelf 3 • YY: Slot number <ul style="list-style-type: none"> – Basic Shelf: 00 to 10 (00: IPCEMPR Card Slot/Built-in ESVM card; 01 to 10: Free Slots) – Expansion Shelf: 01 to 12 (01 to 11: Free Slots; 12: BUS-S Card Slot) – Virtual Shelf: 01 to 08 (01 to 04: Virtual CO Line Slots, 05 to 08: Virtual Extension Slots) • ZZ: Port number <ul style="list-style-type: none"> – For optional service cards except OPB3 card: Port number (01 to 16) will be displayed. – For OPB3 card: Sub slot number (1 to 3) + port number (1 to 4) will be displayed as follows. <ul style="list-style-type: none"> • Sub slot 1 of OPB3: 11 to 14 • Sub slot 2 of OPB3: 21 to 24 • Sub slot 3 of OPB3: 31 to 34 <p>Note</p> <p>When there is no parameter for slot and physical port number (neither for Basic Shelf nor Expansion Shelf), YY and ZZ will be displayed as "00". Example: Sub code for IPCEMPR card =" 10000"</p>
6	Error Message	A description of the error.
7	Log Information	Displays probable causes of the errors and their solutions.

Section 6

Appendix

6.1 Revision History

6.1.1 PGMPR Software File Version 3.0xxx

New Options

- System Components Table
 - KX-NCS2101 Activation Key for CA Basic for 1 User (CA Basic 1user)
 - KX-NCS2105 Activation Key for CA Basic for 5 Users (CA Basic 5users)
 - KX-NCS2110 Activation Key for CA Basic for 10 Users (CA Basic 10users)
 - KX-NCS2140 Activation Key for CA Basic for 40 Users (CA Basic 40users)
 - KX-NCS2149 Activation Key for CA Basic for 128 Users (CA Basic 128users)
 - KX-NCS2201 Activation Key for CA PRO for 1 User (CA Pro 1user)
 - KX-NCS2205 Activation Key for CA PRO for 5 Users (CA Pro 5users)
 - KX-NCS2210 Activation Key for CA PRO for 10 Users (CA Pro 10users)
 - KX-NCS2240 Activation Key for CA PRO for 40 Users (CA Pro 40users)
 - KX-NCS2249 Activation Key for CA PRO for 128 Users (CA Pro 128users)
 - KX-NCS2301 Activation Key for CA ACD Monitor for 1 ICD Supervisor (CA Supervisor 1user)
 - KX-TDA0156 DECT 6.0 4-Channel Cell Station Unit Using a CSIF Card for DECT 6.0 Portable Station
 - KX-NCP0158 DECT 6.0 8-Channel IP Cell Station Unit Using a V-IPCS4 Card for DECT 6.0 Portable Station
 - - Virtual 4 IP Cell Station Interface Card (V-IPCS4)

Changed Contents

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

Index

Numerics

16-Channel Echo Canceller Card (KX-TDA6166) 29, 176
 16-Channel IP Proprietary Telephone Activation Key (KX-NCS4516) 46
 16-Channel IP Softphone/IP Proprietary Telephone Activation Key (KX-NCS4216) 46
 16-Channel SIP Extension Activation Key (KX-NCS4716) 46
 16-Channel VoIP DSP Card (KX-TDE0110) 28, 132
 16-Channel VoIP Extension Card (KX-TDA0470) 29, 166
 16-Channel VoIP Gateway Card (KX-TDA0490) 29, 149
 16-Port Analog Trunk Card (KX-TDA6181) 30, 140
 16-Port Digital Extension Card (KX-TDA0172) 28, 158
 16-Port Single Line Telephone Extension Card (KX-TDA6174) 29, 163
 16-Port Single Line Telephone Extension Card with Caller ID (KX-TDA0177) 29, 163
 16-Port Single Line Telephone Extension with Message Lamp Card (KX-TDA6175) 30, 163
 1-Channel IP Proprietary Telephone Activation Key (KX-NCS4501) 46
 1-Channel IP Softphone/IP Proprietary Telephone Activation Key (KX-NCS4201) 46
 1-Channel SIP Extension Activation Key (KX-NCS4701) 46
 24-Port Single Line Telephone Extension Card with Caller ID (KX-TDA6178) 30, 163
 2-Channel IP Trunk Activation Key (KX-NCS4102) 46
 2-shelf System 22
 2-shelf System, Construction (Floor Standing) 60
 2-shelf System, Installation (Floor Standing) 60
 2-shelf System, System Capacity 34
 3-shelf System (Tower Type) 23
 3-shelf System (Tower Type), Construction 68
 3-shelf System (Tower Type), Installation 68
 3-shelf System, System Capacity 34
 4 Cell Station Interface Card (KX-TDA0143) 28, 151
 4-Channel IP Proprietary Telephone Activation Key (KX-NCS4504) 46
 4-Channel IP Softphone/IP Proprietary Telephone Activation Key (KX-NCS4204) 46
 4-Channel IP Trunk Activation Key (KX-NCS4104) 46
 4-Channel Message Card (KX-TDA0191) 29, 174
 4-Channel Simplified Voice Message Card (KX-TDA0194) 29, 175
 4-Channel SIP Extension Activation Key (KX-NCS4704) 46
 4-Channel VoIP Gateway Card (KX-TDA0484) 29, 147
 4-Port Doorphone Card (KX-TDA0161) 28, 169
 4-Port External Input/Output Card (KX-TDA0164) 28, 171
 4-shelf System (Side-by-side Type) 25
 4-shelf System (Side-by-side Type), Construction 90
 4-shelf System (Side-by-side Type), Installation 90
 4-shelf System (Tower Type) 24
 4-shelf System (Tower Type), Construction 68
 4-shelf System (Tower Type), Installation 68
 4-shelf System, System Capacity 34
 64-Channel VoIP DSP Card (KX-TDE0111) 28, 132
 8 Cell Station Interface Card (KX-TDA0144) 28, 151
 8-Channel IP Proprietary Telephone Activation Key (KX-NCS4508) 46

8-Channel IP Softphone/IP Proprietary Telephone Activation Key (KX-NCS4208) 46
 8-Channel SIP Extension Activation Key (KX-NCS4708) 46
 8-Port Caller ID Card (KX-TDA0193) 29, 142
 8-Port Digital Extension Card (KX-TDA0171) 28, 156
 8-Port Digital Hybrid Extension Card (KX-TDA0170) 28, 153
 8-Port Single Line Telephone Extension Card (KX-TDA0173) 28, 160

A

About the software version of your PBX 13
 Activation Key 44
 Activation Key Code 48
 Activation Key File 45, 49
 Activation Key for CA ACD Monitor for 1 ICD Supervisor (KX-NCS2301) 47
 Activation Key for CA Basic for 1 User (KX-NCS2101) 46
 Activation Key for CA Basic for 10 Users (KX-NCS2110) 46
 Activation Key for CA Basic for 128 Users (KX-NCS2149) 46
 Activation Key for CA Basic for 40 Users (KX-NCS2140) 46
 Activation Key for CA Basic for 5 Users (KX-NCS2105) 46
 Activation Key for CA PRO for 1 User (KX-NCS2201) 46
 Activation Key for CA PRO for 10 Users (KX-NCS2210) 47
 Activation Key for CA PRO for 128 Users (KX-NCS2249) 47
 Activation Key for CA PRO for 40 Users (KX-NCS2240) 47
 Activation Key for CA PRO for 5 Users (KX-NCS2205) 47
 Activation Key for Software Upgrade to Enhanced Version (KX-NCS4950) 47
 Activation Key, in the DSP16/DSP64 Card 45
 Activation Key, in the SD Memory Card 45
 Activation Key, Maximum Number 44
 Amphenol Connector 124, 125
 Attaching to an Amphenol Connector 123

B

Basic Shelf 20
 Basic Shelf, Construction 20
 Basic Shelf, Installation (Wall Mounting) 106
 Basic Shelf, LED Indications 199
 Basic Shelf, Names and Locations 56
 Basic Shelf, Supplied Items 54
 Basic System 20
 Basic System, Construction (Floor Standing) 60
 Basic System, Installation (Floor Standing) 60
 Basic System, System Capacity 34
 BGM 191
 Blank Slot Cover 116
 Bus Cable 66, 88, 104, 137, 138
 Bus Cable Connector 137, 139
 Bus Master Card (KX-TDA6110) 29, 137
 Bus Master Expansion Card (KX-TDA6111) 29, 138
 Bus Slave Card (BUS-S Card) 139
 BUS-M Card (KX-TDA6110) 65, 86, 102, 137
 BUS-ME Card (KX-TDA6111) 86, 102, 138
 BUS-S Card 65, 86, 102, 139

C

Cable Distance 177
 Cable Handling for Connected Shelves 119
 Cable Handling for Each Shelf 118
 Characteristics 33
 CID8 Card (KX-TDA0193) 142
 CO Line Connection 200
 Components, System 2
 Connecting Shelves, 2-shelf System 65
 Connecting Shelves, 3-shelf System 86
 Connecting Shelves, 4-shelf System 86, 102
 Connection Chart for LAN Connection 194
 Connection Diagram, System 26
 Connector Types 120
 Cover for Blank Slot 116
 CS, Basic 4
 CSIF4 Card (KX-TDA0143) 151
 CSIF8 Card (KX-TDA0144) 151
 CSLC16 Card (KX-TDA0177) 163
 CTI Server Connection (via LAN Port) 194
 CTI—First Party Call Control 186
 CTI—Third Party Call Control 194

D

DHLC8 Card (KX-TDA0170) 153
 Digital EXtra Device Port (Digital XDP) Connection 182
 Digital XDP 182
 Digital XDP Connection, Using a Modular T-Adaptor 182, 184
 Digital XDP Connection, Using an EXtra Device Port 183, 185
 DLC16 Card (KX-TDA0172) 158
 DLC8 Card (KX-TDA0171) 156
 Door Opener 169, 187
 Doorphone 169, 187
 DPH4 Card (KX-TDA0161) 169
 DSP16 Card (KX-TDE0110) 132
 DSP64 Card (KX-TDE0111) 132

E

ECSLC24 Card (KX-TDA6178) 163
 Editing the CS Name using the Maintenance Console 151
 EECHO16 Card (KX-TDA6166) 176
 EIO4 Card (KX-TDA0164) 171
 ELCOT16 Card (KX-TDA6181) 140
 EMSLC16 Card (KX-TDA6175) 163
 Error Log 219
 ESLC16 Card (KX-TDA6174) 163
 ESVM4 Card (KX-TDA0194) 175
 Expanded System 21
 Expansion Shelf 21
 Expansion Shelf, Construction 21
 Expansion Shelf, Installation (Wall Mounting) 106
 Expansion Shelf, LED Indications 200
 Expansion Shelf, Names and Locations 56
 Expansion Shelf, Supplied Items 55
 EXT-CID Card (KX-TDA0168) 162
 Extension Caller ID Card (KX-TDA0168) 28, 162
 External Relay 171, 173, 187
 External Sensor 171, 173, 187
 EXtra Device Port (XDP) Mode 180, 182

F

Fan Guard 59
 Ferrite Core 122
 First Party Call Control CTI Connection 186
 Frame Ground Connection 113
 Front Cover, Closing 58
 Front Cover, Opening 57

I

Information about the Virtual Cards 136
 Installation Precautions 52
 IP Convergence Main Processing Card (IPCEMPR Card) 129
 IPCEMPR Card 129
 IPCEMPR Card Slot 34
 IPCMEC Card (KX-TDE0105) 134
 IP-EXT16 Card (KX-TDA0470) 166
 IP-GW16 Card (KX-TDA0490) 149
 IP-GW4E Card (KX-TDA0484) 147

K

Key Management System 48
 KX-NCS2101 (Activation Key for CA Basic for 1 User) 46
 KX-NCS2105 (Activation Key for CA Basic for 5 Users) 46
 KX-NCS2110 (Activation Key for CA Basic for 10 Users) 46
 KX-NCS2140 (Activation Key for CA Basic for 40 Users) 46
 KX-NCS2149 (Activation Key for CA Basic for 128 Users) 46
 KX-NCS2201 (Activation Key for CA PRO for 1 User) 46
 KX-NCS2205 (Activation Key for CA PRO for 5 Users) 47
 KX-NCS2210 (Activation Key for CA PRO for 10 Users) 47
 KX-NCS2240 (Activation Key for CA PRO for 40 Users) 47
 KX-NCS2249 (Activation Key for CA PRO for 128 Users) 47
 KX-NCS2301 (Activation Key for CA ACD Monitor for 1 ICD Supervisor) 47
 KX-NCS4102 (2-Channel IP Trunk Activation Key) 46
 KX-NCS4104 (4-Channel IP Trunk Activation Key) 46
 KX-NCS4201 (1-Channel IP Softphone/IP Proprietary Telephone Activation Key) 46
 KX-NCS4204 (4-Channel IP Softphone/IP Proprietary Telephone Activation Key) 46
 KX-NCS4208 (8-Channel IP Softphone/IP Proprietary Telephone Activation Key) 46
 KX-NCS4216 (16-Channel IP Softphone/IP Proprietary Telephone Activation Key) 46
 KX-NCS4501 (1-Channel IP Proprietary Telephone Activation Key) 46
 KX-NCS4504 (4-Channel IP Proprietary Telephone Activation Key) 46
 KX-NCS4508 (8-Channel IP Proprietary Telephone Activation Key) 46
 KX-NCS4516 (16-Channel IP Proprietary Telephone Activation Key) 46
 KX-NCS4701 (1-Channel SIP Extension Activation Key) 46
 KX-NCS4704 (4-Channel SIP Extension Activation Key) 46

KX-NCS4708 (8-Channel SIP Extension Activation Key) 46
 KX-NCS4716 (16-Channel SIP Extension Activation Key) 46
 KX-NCS4950 (Activation Key for Software Upgrade to Enhanced Version) 47
 KX-TDA0103 (L-Type Power Supply Unit) 28, 109
 KX-TDA0104 (M-Type Power Supply Unit) 28, 109
 KX-TDA0143 (4 Cell Station Interface Card) 28, 151
 KX-TDA0144 (8 Cell Station Interface Card) 28, 151
 KX-TDA0161 (4-Port Doorphone Card) 28, 169
 KX-TDA0164 (4-Port External Input/Output Card) 28, 171
 KX-TDA0168 (Extension Caller ID Card) 28, 162
 KX-TDA0170 (8-Port Digital Hybrid Extension Card) 28, 153
 KX-TDA0171 (8-Port Digital Extension Card) 28, 156
 KX-TDA0172 (16-Port Digital Extension Card) 28, 158
 KX-TDA0173 (8-Port Single Line Telephone Extension Card) 28, 160
 KX-TDA0177 (16-Port Single Line Telephone Extension Card with Caller ID) 29, 163
 KX-TDA0187 (T-1 Trunk Card) 29, 143
 KX-TDA0190 (Optional 3-Slot Base Card) 29, 168
 KX-TDA0191 (4-Channel Message Card) 29, 174
 KX-TDA0193 (8-Port Caller ID Card) 29, 142
 KX-TDA0194 (4-Channel Simplified Voice Message Card) 29, 175
 KX-TDA0196 (Remote Card) 29, 135
 KX-TDA0290 (PRI Card [PRI23]) 29, 145
 KX-TDA0470 (16-Channel VoIP Extension Card) 29, 166
 KX-TDA0484 (4-Channel VoIP Gateway Card) 29, 147
 KX-TDA0490 (16-Channel VoIP Gateway Card) 29, 149
 KX-TDA6110 (Bus Master Card) 29, 137
 KX-TDA6111 (Bus Master Expansion Card) 29, 138
 KX-TDA6166 (16-Channel Echo Canceller Card) 29, 176
 KX-TDA6174 (16-Port Single Line Telephone Extension Card) 29, 163
 KX-TDA6175 (16-Port Single Line Telephone Extension with Message Lamp Card) 30, 163
 KX-TDA6178 (24-Port Single Line Telephone Extension Card with Caller ID) 30, 163
 KX-TDA6181 (16-Port Analog Trunk Card) 30, 140
 KX-TDA6201 (Mounting Kit) 23, 24, 25, 30
 KX-TDE0105 (Memory Expansion Card) 28, 134
 KX-TDE0110 (16-Channel VoIP DSP Card) 28, 132
 KX-TDE0111 (64-Channel VoIP DSP Card) 28, 132

L

LED Indications, Basic Shelf 199
 LED Indications, Expansion Shelf 200
 Load Figure Calculation 40
 L-Type Power Supply Unit (KX-TDA0103) 28, 109

M

Maintenance Console 202
 Maintenance Console, Connection 203
 Maintenance Console, Installation 206
 Maintenance Console, Overview 202
 Maintenance Console, Quick Setup 206
 Maintenance Console, System Requirements 206
 Master DPT, Digital XDP 182

Maximum Terminal Equipment 39
 Memory Expansion Card (KX-TDE0105) 28, 134
 MOH 191
 Mounting Kit (KX-TDA6201) 23, 24, 25, 30
 Mounting Kit, Supplied Items 55
 MSG4 Card (KX-TDA0191) 174
 M-Type Power Supply Unit (KX-TDA0104) 28, 109

N

Names and Locations 56
 Noise Shield Connector 137, 139
 Noise Shield Wire 67, 89, 105

O

OPB3 Card (KX-TDA0190) 168
 Optional 3-Slot Base Card (KX-TDA0190) 29, 168
 Optional Equipment 28
 Optional Equipment, Unsupported 5
 Optional Service Card, Installation 114
 Optional Service Card, Maximum Number 34
 Optional Service Card, Removal 117

P

Pager 191
 Panasonic Proprietary Telephones, Compatible 5
 Panasonic Proprietary Telephones, Incompatible 6
 Parallel Connection of the Extensions 179
 Parallel Connection, Using a Modular T-Adaptor 180
 Parallel Connection, Using an EXtra Device Port 180
 Parallel Mode 180, 182
 Password Security 12
 PC Connection (via MNT Port) 190
 PC Connection (via RS-232C) 191
 PGMPR Software File Version 3.0xxx 222
 Power Failure Connections 195
 Power Supply Unit 109
 Power Supply Unit Selection for Each Shelf 40
 Power Supply Unit, Installation 110
 Power Supply Unit, Replacement 111
 PRI Card (PRI23) (KX-TDA0290) 29, 145
 PRI23 Card (KX-TDA0290) 145
 Printer Connection (via RS-232C) 191
 PSU 109
 PSU Capacity 41
 PSU-L 40, 109
 PSU-M 40, 109

Q

Quick Setup 206

R

Remote Card (KX-TDA0196) 29, 135
 Reset Button 218
 RMT Card (KX-TDA0196) 135
 RUN Indicator 197

S

Safety Installation Instructions 52

SD Memory Card 129
 Slave DPT, Digital XDP 182
 SLC8 Card (KX-TDA0173) 160
 Slot for the IPCEMPR Card 34
 Slots for Physical Cards (Free Slots) 34
 Slots for Virtual CO Line Cards 34
 Slots for Virtual Extension Cards 34
 Specifications 31
 Specifications, Characteristics 33
 Specifications, General Description 31
 Specifications, System Capacity 34
 Starting the PBX 197
 Supplied Items for an Expansion Shelf (KX-TDE620) 55
 Supplied Items for the Basic Shelf (KX-TDE600) 54
 Supplied Items for the Mounting Kit (KX-TDA6201) 55
 Surge Protector Installation 126
 System Capacity 34
 System Components Table 2
 System Connection Diagram 26
 System Initialization Procedure 198
 System Initialize Switch 197, 218
 System Requirements 206

T

T1 Card (KX-TDA0187) 143
 T-1 Trunk Card (KX-TDA0187) 29, 143
 Terminal Equipment, Maximum Number 39
 Troubleshooting, by Error Log 219
 Troubleshooting, Connection 214
 Troubleshooting, Installation 210
 Troubleshooting, Operation 216
 Troubleshooting, Using the Reset Button 218

U

Unpacking 54

V

V-IPCS4 (Virtual 4 IP Cell Station Interface Card) 136
 V-IPEXT32 (Virtual 32-Channel VoIP Extension Card) 136
 V-IPGW16 (Virtual 16-Channel VoIP Gateway Card) 136
 Virtual 16-Channel VoIP Gateway Card (V-IPGW16) 136
 Virtual 32-Channel SIP Extension Card (V-SIPEXT32) 136
 Virtual 32-Channel VoIP Extension Card (V-IPEXT32) 136
 Virtual 4 IP Cell Station Interface Card (V-IPCS4) 136
 Virtual Cards 136
 Virtual CO Line Slot 34
 Virtual Extension Slot 34
 V-SIPEXT32 (Virtual 32-Channel SIP Extension Card) 136

W

Wall Mounting (KX-TDE600/KX-TDE620) 106
 Wiring Precautions 53

When you ship the product

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

Product Service

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

For Future Reference

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

Note

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

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

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<http://www.panasonic.com/csd>

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