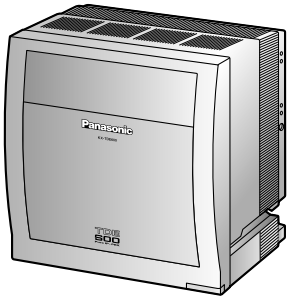


Panasonic

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		IP Convergence 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 Codes[*1]	KX-NCS4102	2-Channel IP Trunk Activation Key (2 IP Trunk)
	KX-NCS4104	4-Channel IP Trunk Activation Key (4 IP Trunk)
	KX-NCS4201	1-Channel IP Softphone/IP Proprietary Telephone Activation Key (1 IP Softphone/IP PT)
	KX-NCS4204	4-Channel IP Softphone/IP Proprietary Telephone Activation Key (4 IP Softphone/IP PT)
	KX-NCS4208	8-Channel IP Softphone/IP Proprietary Telephone Activation Key (8 IP Softphone/IP PT)
	KX-NCS4216	16-Channel IP Softphone/IP Proprietary Telephone Activation Key (16 IP Softphone/IP PT)
	KX-NCS4501	1-Channel IP Proprietary Telephone Activation Key (1 IP PT)
	KX-NCS4504	4-Channel IP Proprietary Telephone Activation Key (4 IP PT)
	KX-NCS4508	8-Channel IP Proprietary Telephone Activation Key (8 IP PT)
	KX-NCS4516	16-Channel IP Proprietary Telephone Activation Key (16 IP PT)
	KX-NCS4701	1-Channel SIP Extension Activation Key (1 SIP Extension)

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 Trunk Cards	-	Virtual 16-Channel VoIP Gateway Card (V-IPGW16)
	-	Virtual 16-Channel SIP Trunk 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 Trunk Cards	KX-TDA0182	8-Port DID Card (DID8)
	KX-TDA0184	8-Port E & M Trunk Card (E&M8)
	KX-TDA0187	T-1 Trunk Card (T1)
	KX-TDA0188	E-1 Trunk Card (E1)
	KX-TDA0189	8-Port Caller ID/Pay Tone Card (CID/PAY8)

Category	Model No.	Description
	KX-TDA0193	8-Port Caller ID Card (CID8)
	KX-TDA0284	4-Port BRI Card (BRI4)
	KX-TDA0288	8-Port BRI Card (BRI8)
	KX-TDA0290CE	PRI Card (PRI30)
	KX-TDA0290CJ	PRI Card (PRI30)
	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 Analogue Trunk Card (ELCOT16)
Physical Extension Cards	KX-TDA0143	4 Cell Station Interface Card (CSIF4)
	KX-TDA0144	8 Cell Station Interface Card (CSIF8)
	KX-TDA0170	8-Port Digital Hybrid Extension Card (DHLC8)
	KX-TDA0171	8-Port Digital Extension Card (DLC8)
	KX-TDA0172	16-Port Digital Extension Card (DLC16)
	KX-TDA0173	8-Port Single Line Telephone Extension Card (SLC8)
	KX-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-TDA0162	2-Port Doorphone Card (German Type) (DPH2)
	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-TDA0192	2-Channel Simplified Voice Message Card (ESVM2)
	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)

Category		Model No.	Description
Cell Stations (CSs)	**2.4 GHz**	KX-TDA0141	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-TDA0151	2-Channel Cell Station Unit Using a DHLC/DLC Card (PTinterface 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	KX-TDA0141CE	2-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for DECT Portable Station
		KX-TDA0142CE	4-Channel Cell Station Unit Using a CSIF Card for DECT Portable Station
		KX-TDA0158CE	8-Channel High-density Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for DECT Portable Station
		KX-NCP0158CE	8-Channel IP Cell Station Unit Using a V-IPCS4 Card for DECT Portable Station
	DECT 6.0	KX-TDA0155	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-TDA0158	DECT 6.0 8-Channel Cell Station Unit Using a DHLC/DLC Card (PT-interface CS) for DECT 6.0 Portable Station
Proprietary Equipment		KX-A228	S/M-type Back-up Battery Cable
		KX-A229	L-type Back-up Battery Cable
		KX-A258	Blank Slot Cover
		KX-T30865	Doorphone
		KX-T7765	

[*1] The types of activation keys are subject to change without notice.

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)

Category	Model No.	Description
Trunk Cards	KX-TDA0180	8-Port Analogue Trunk Card (LCOT8)
	KX-TDA0181	16-Port Analogue Trunk Card (LCOT16)
	KX-TDA0183	4-Port Analogue 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-TDA0820	SD Memory Card for Software Upgrade
	KX-TDA0920	SD Memory Card for Software Upgrade to Enhanced Version
	KX-TDA6920	SD Memory Card for Software Upgrade to Enhanced Version
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-NCS8100)
- Digital proprietary telephones (e.g., KX-DT300 series)
- Analogue proprietary telephones (e.g., KX-T7700 series)
- Portable stations (e.g., KX-TCA355, KX-TCA256, KX-TD7690)
- DSS consoles (e.g., KX-DT390)
- Single line telephones (e.g., KX-T7710)

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
- KX-TD7500 DECT portable station

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, KX-T7400, and KX-T7500 (except for KX-T7560/KX-T7565) 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

Note

- Some optional service cards and features are not available for certain countries/areas. Consult your certified Panasonic dealer for detailed instructions.
- In this manual, the suffix of each model number (e.g., KX-TDE600**NE**) is omitted unless necessary.

Safety Notices

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

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

List of Abbreviations

- APT → Analogue 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 an earthed plug. If you do not have an earthed 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 authorised Panasonic Factory Service Centre.
- 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 plug, 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) 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 an earthing 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 unauthorised 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 unauthorised access and possible abuse of the PBX, we strongly recommend:
   a. Keeping the password secret.
   b. Selecting a complex, random password that cannot be easily guessed.
   c. Changing your password regularly.
5. Perform the following when sending the PBX for repair or handing it over to a third party.
   a. Make a backup of data stored on the SD Memory Card.
   b. Using an SD formatter, format the SD Memory Card so that information cannot be retrieved from it.
6. To prevent data leakage, render the SD Memory Card physically unusable before disposal.
7. When user information is sent from the PBX to a PC or other external device, the confidentiality of that information becomes the responsibility of the customer. Before disposing of the PC or other external device, ensure that data cannot be retrieved from it by formatting the hard disk and/or rendering it physically unusable.

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 trunks:
  a. Disconnect the PBX from all trunks.
  b. Connect known working SLTs to those trunks.
  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 trunk 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 trunks until it has been serviced by an authorised Panasonic Factory Service Centre.

Precaution

For users in the United Kingdom

FOR YOUR SAFETY, PLEASE READ THE FOLLOWING TEXT CAREFULLY.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience. A 5 amp fuse is fitted in this plug. Should the fuse need to be replaced, please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark or the BSI mark on the body of the fuse.

If the plug contains a removable fuse cover, you must ensure that it is refitted when the fuse is replaced. If you lose the fuse cover, the plug must not be used until a replacement cover is obtained. A replacement fuse cover can be purchased from your local Panasonic dealer.

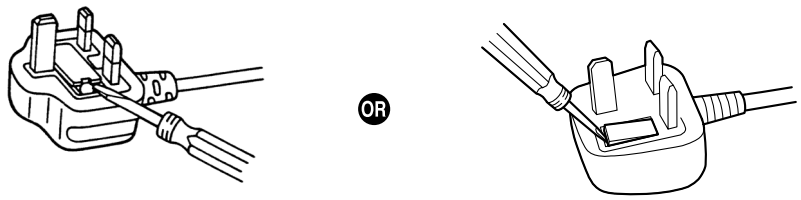
IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE AC OUTLET IN YOUR PREMISES, THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT-OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.

If a new plug is to be fitted, please observe the wiring code as shown below. If in any doubt, please consult a qualified electrician.

WARNING

This appliance must be earthed.

IMPORTANT: The wires in the mains lead are coloured as follows:
Green-and-yellow: Earth
Blue: Neutral
Brown: Live
As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows.
The wire that is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug that is marked with the letter E or by the safety earth symbol ⏚ or coloured GREEN or GREEN-AND-YELLOW.
The wire that is coloured BLUE must be connected to the terminal that is marked with the letter N or coloured BLACK.
The wire that is coloured BROWN must be connected to the terminal that is marked with the letter L or coloured RED.
How to replace the fuse: Open the fuse compartment with a screwdriver and replace the fuse and fuse cover.



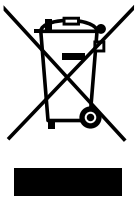
The equipment must be connected to direct extension lines, and a payphone should not be connected as an extension.

999 and 112 can be dialled on the apparatus after accessing the Exchange line for the purpose of making outgoing calls to the BT emergency services.

During dialling, this apparatus may tinkle the bells of other telephones using the same line. This is not a fault and we advise you not to call the Fault Repair Service.

For users in the European Union only

Information for Users on Collection and Disposal of Old Equipment and used Batteries



These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries should not be mixed with general household waste.
For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC and 2006/66/EC.
By disposing of these products and batteries correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.
For more information about collection and recycling of old products and batteries, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.
Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

For business users in the European Union
If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union
These symbols are only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

Note for the battery symbol (bottom two symbol examples):
This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

For users in Germany only

- Machine Noise Information Ordinance, 3rd GPSGV: The highest sound pressure level is 70 dB (A) or less according to EN ISO 7779.
- This equipment is not for use at video display work stations according to BildscharbV.

For users in Finland, Norway and Sweden only

- This unit may only be installed in a room or space with restricted access, and equipotential bonding must be applied. For information on earthing, refer to "3.2.10 Frame Earth Connection".

For users in New Zealand only

- This equipment shall not be set to make automatic calls to the Telecom ‘111' Emergency Service.
- The grant of a Telepermit for any item of terminal equipment indicates only that Telecom has accepted that the item complies with minimum conditions for connection to its network. It indicates no endorsement of the product by Telecom, nor does it provide any sort of warranty. Above all, it provides no assurance

that any item will work correctly in all respects with another item of Telepermitted equipment of a different make or model, nor does it imply that any product is compatible with all of Telecom's network services.

- This equipment is not capable, under all operating conditions, of correct operation at the higher speeds for which it is designed. Telecom will accept no responsibility should difficulties arise in such circumstances.
- Some parameters required for compliance with Telecom's Telepermit requirements are dependent on the equipment (PBX) associated with this modem. In order to operate within the limits for compliance with Telecom's Specifications, the associated PBX equipment shall be set to ensure that modem calls are answered between 3 and 30 seconds of receipt of ringing.
- Using the toll services of a company other than Telecom:
  If the PBX is set up to use the toll services of a company other than Telecom, the telephone numbers dialled from the Caller Display listings within the PBX will be directed through the toll services of the other company because the telephone numbers include the toll access digit and area code digit. A toll charge may be incurred. Please check with the toll carrier concerned.
- APPLICABLE ONLY TO TELECOM CUSTOMERS WHO HAVE AUTOMATIC ACCESS TO OTHER CARRIERS FOR TOLL CALLS
  When calling back a number from the Caller ID list, all numbers prefixed with "0 + AREA CODE" will be automatically forwarded to your toll carrier. This includes numbers in your local calling area. The zero + area code should either be removed when calling back local numbers, or check with your toll carrier that a charge will not be levied.
- All persons using this device for recording telephone conversations shall comply with New Zealand law. This requires that at least one party to the conversation is to be aware that it is being recorded. In addition, the principles enumerated in the Privacy Act 1993 shall be complied with in respect to the nature of the personal information collected, the purpose for its collection, how it is used, and what is disclosed to any other party.

For users in Australia only

- No External TRC Terminal is provided due to an Internal Link between PE and TRC.

For users in Taiwan only

- Lithium batteries can be found in the circuit boards of the main board and optional cards of the PBX.

Note

- When disposing of any of the above products, all batteries must be removed. Follow the applicable laws, regulations, and guidelines in your country/area regarding disposal of batteries.
- When replacing a battery, use only the same battery type, or an equivalent recommended by the battery manufacturer.

Notice

Regarding removing or replacing a battery in the circuit board, consult your dealer.

廢電池請回收

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 Guide
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.

User 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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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 49
2.1.3 Activation Key File 50
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) 91
3.2.8 Wall Mounting (KX-TDE600/KX-TDE620) 107
3.2.9 Installing/Replacing the Power Supply Unit 110
3.2.10 Frame Earth Connection 114
3.2.11 Backup Battery Connection 115
3.2.12 Installing/Removing the Optional Service Cards 118
3.2.13 Cable Handling 122
3.2.14 Types of Connectors 124
3.2.15 Attaching a Ferrite Core 126
3.2.16 Fastening an Amphenol Connector 129
3.2.17 Surge Protector Installation 131
3.3 Information about the Main Processing Card 134
3.3.1 IPCEMPR Card 134
3.3.2 DSP16 Card (KX-TDE0110) and DSP64 Card (KX-TDE0111) 137
3.3.3 IPCMEC Card (KX-TDE0105) 139
3.3.4 RMT Card (KX-TDA0196) 140
3.4 Information about the Virtual Cards 141
3.4.1 Virtual Cards 141
3.5 Information about the Optional Shelf Expansion Cards 142
3.5.1 BUS-M Card (KX-TDA6110) 142
3.5.2 BUS-ME Card (KX-TDA6111) 143
3.6 Information about the Built-in Shelf Expansion Card 144
3.6.1 BUS-S Card 144
3.7 Information about the Physical Trunk Cards 145

3.7.1 ELCOT16 Card (KX-TDA6181) 145
3.7.2 DID8 Card (KX-TDA0182) 147
3.7.3 CID/PAY8 Card (KX-TDA0189) 149
3.7.4 CID8 Card (KX-TDA0193) 150
3.7.5 E&M8 Card (KX-TDA0184) 151
3.7.6 T1 Card (KX-TDA0187) 153
3.7.7 E1 Card (KX-TDA0188) 156
3.7.8 BRI4 Card (KX-TDA0284) and BRI8 Card (KX-TDA0288) 159
3.7.9 PRI30 Card (KX-TDA0290CE/KX-TDA0290CJ) 163
3.7.10 PRI23 Card (KX-TDA0290) 166
3.7.11 IP-GW4E Card (KX-TDA0484) 169
3.7.12 IP-GW16 Card (KX-TDA0490) 171
3.8 Information about the Physical Extension Cards 173
3.8.1 CSIF4 Card (KX-TDA0143) and CSIF8 Card (KX-TDA0144) 173
3.8.2 DHLC8 Card (KX-TDA0170) 175
3.8.3 DLC8 Card (KX-TDA0171) 177
3.8.4 DLC16 Card (KX-TDA0172) 179
3.8.5 SLC8 Card (KX-TDA0173) 181
3.8.6 EXT-CID Card (KX-TDA0168) 183
3.8.7 CSLC16 Card (KX-TDA0177), ESLC16 Card (KX-TDA6174), EMSLC16 Card (KX-TDA6175), and ECSLC24 Card (KX-TDA6178) 184
3.8.8 IP-EXT16 Card (KX-TDA0470) 187
3.9 Information about the Other Physical Cards 189
3.9.1 OPB3 Card (KX-TDA0190) 189
3.9.2 DPH4 Card (KX-TDA0161) 190
3.9.3 DPH2 Card (KX-TDA0162) 192
3.9.4 EIO4 Card (KX-TDA0164) 195
3.9.5 MSG4 Card (KX-TDA0191) 198
3.9.6 ESVM2 Card (KX-TDA0192) and ESVM4 Card (KX-TDA0194) 199
3.9.7 EECHO16 Card (KX-TDA6166) 200
3.10 Connection of Extensions 201
3.10.1 Maximum Cabling Distances of the Extension Wiring (Twisted Cable) 201
3.10.2 Parallel Connection of the Extensions 203
3.10.3 Digital EXtra Device Port (Digital XDP) Connection 206
3.10.4 First Party Call Control CTI Connection 213
3.11 Connection of Doorphones, Door Openers, External Sensors, and External Relays 214
3.11.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays 214
3.12 Connection of Peripherals 217
3.12.1 Connection of Peripherals 217
3.13 LAN Connection 221
3.13.1 LAN Connection 221
3.14 Power Failure Connections 222
3.14.1 Power Failure Connections 222
3.15 Starting the PBX 226
3.15.1 Starting the PBX 226
4 Guide for the Maintenance Console 229
4.1 Overview 230
4.1.1 Overview 230
4.2 PC Connection 231
4.2.1 PC Connection 231
4.3 Installation of the Maintenance Console 234
4.3.1 Installing and Starting the Maintenance Console 234

5 Troubleshooting 237
5.1 Troubleshooting 238
5.1.1 Installation 238
5.1.2 Connection 242
5.1.3 Operation 244
5.1.4 Using the Reset Button 246
5.1.5 Troubleshooting by Error Log 247
6 Appendix 249
6.1 Revision History 250
6.1.1 PGMPR Software File Version 3.0xxx 250
Index.....251

Section 1

System Outline

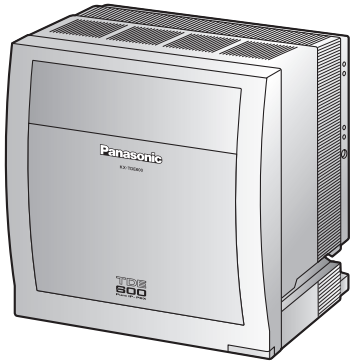
This section provides general information on the PBX, including the system capacity and specifications.

1.1 System Construction

1.1.1 Basic System

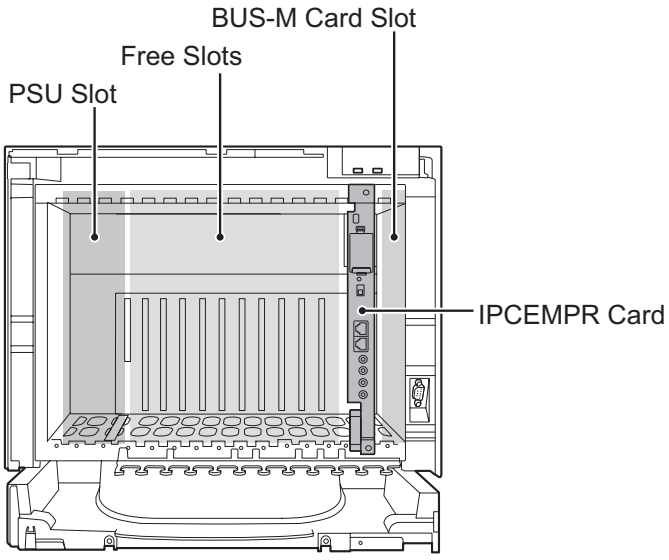
Basic Shelf

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

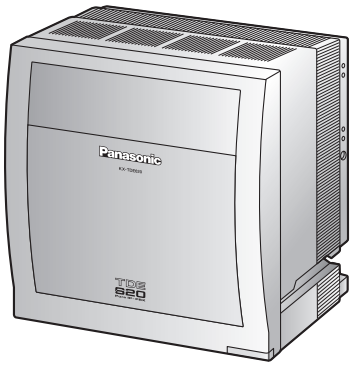


Basic Shelf (KX-TDE600)

1.1.2 Expanded System

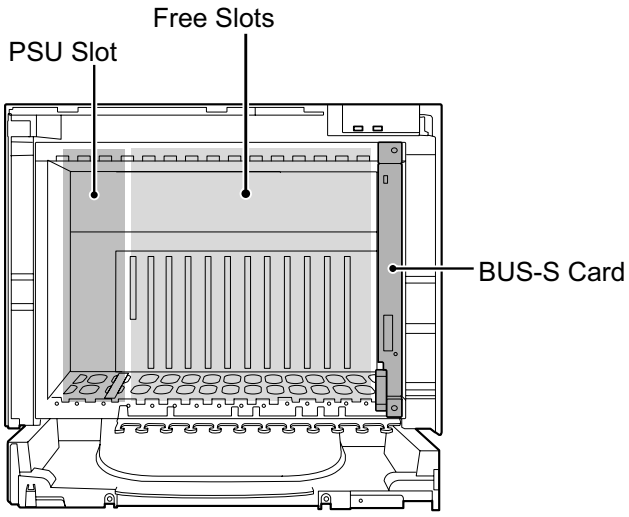
Expansion Shelf

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

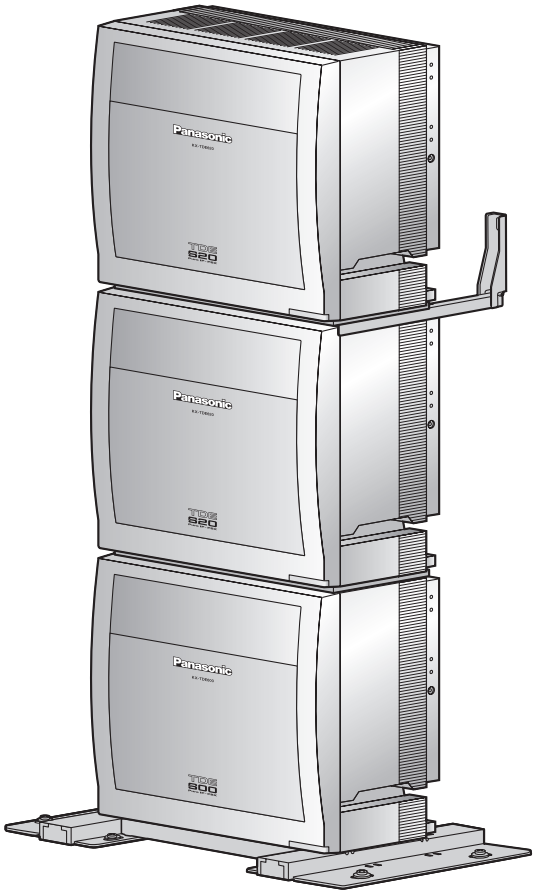
Expanded system (Basic Shelf + 1 Expansion Shelf). Expansion Shelf 1 is mounted on the Basic Shelf.

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).

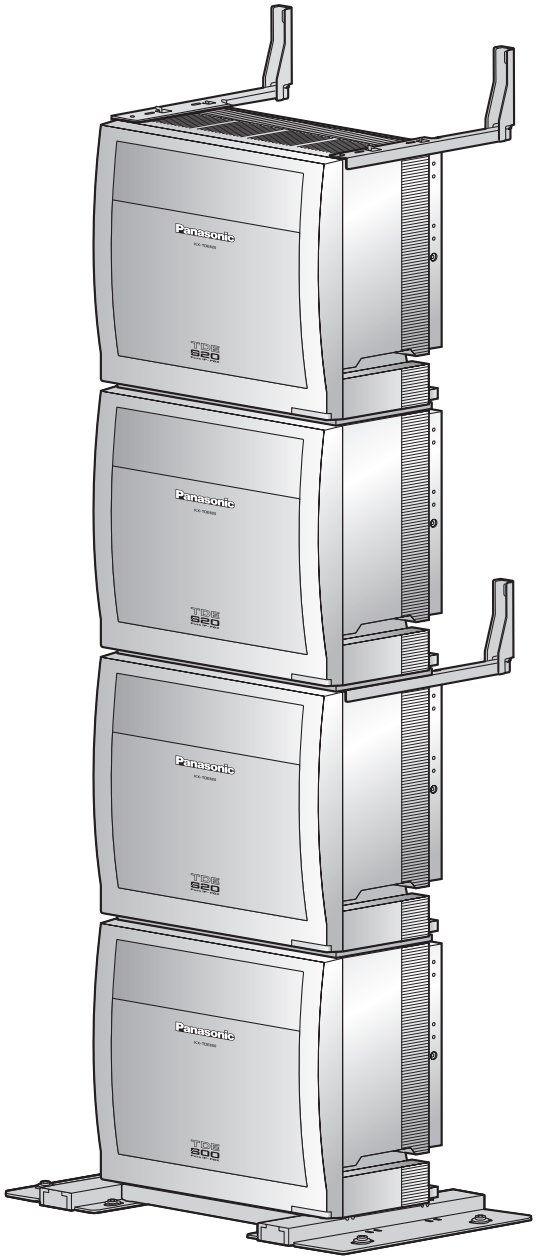
3-shelf System (Tower Type)

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.



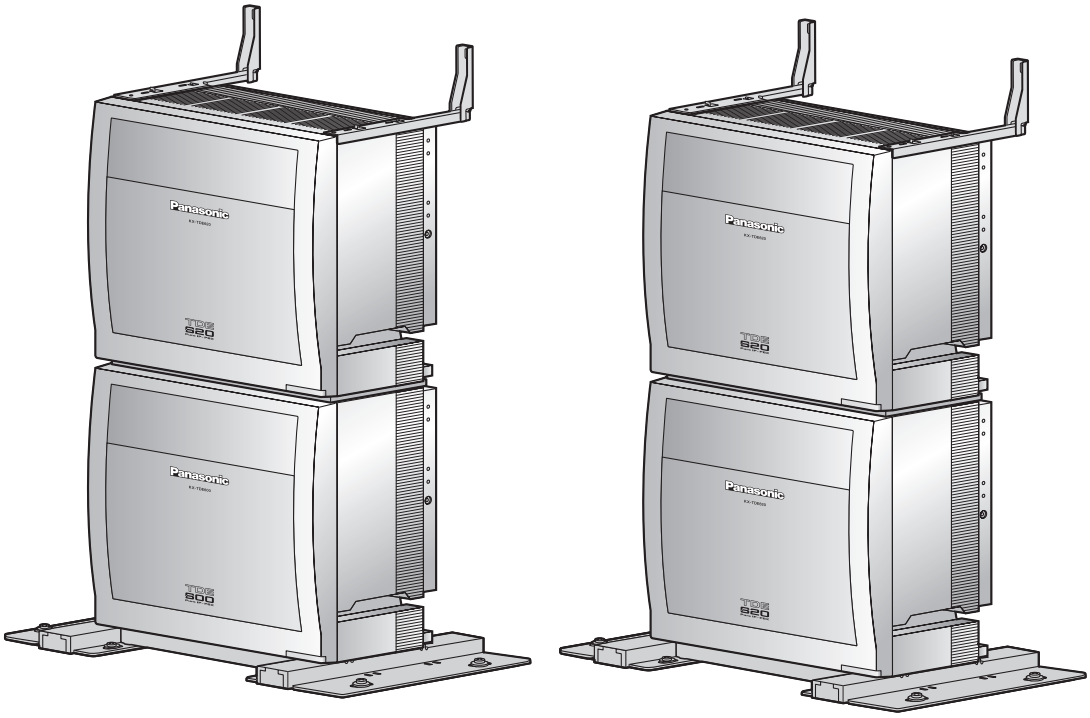
4-shelf System (Tower Type)

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.

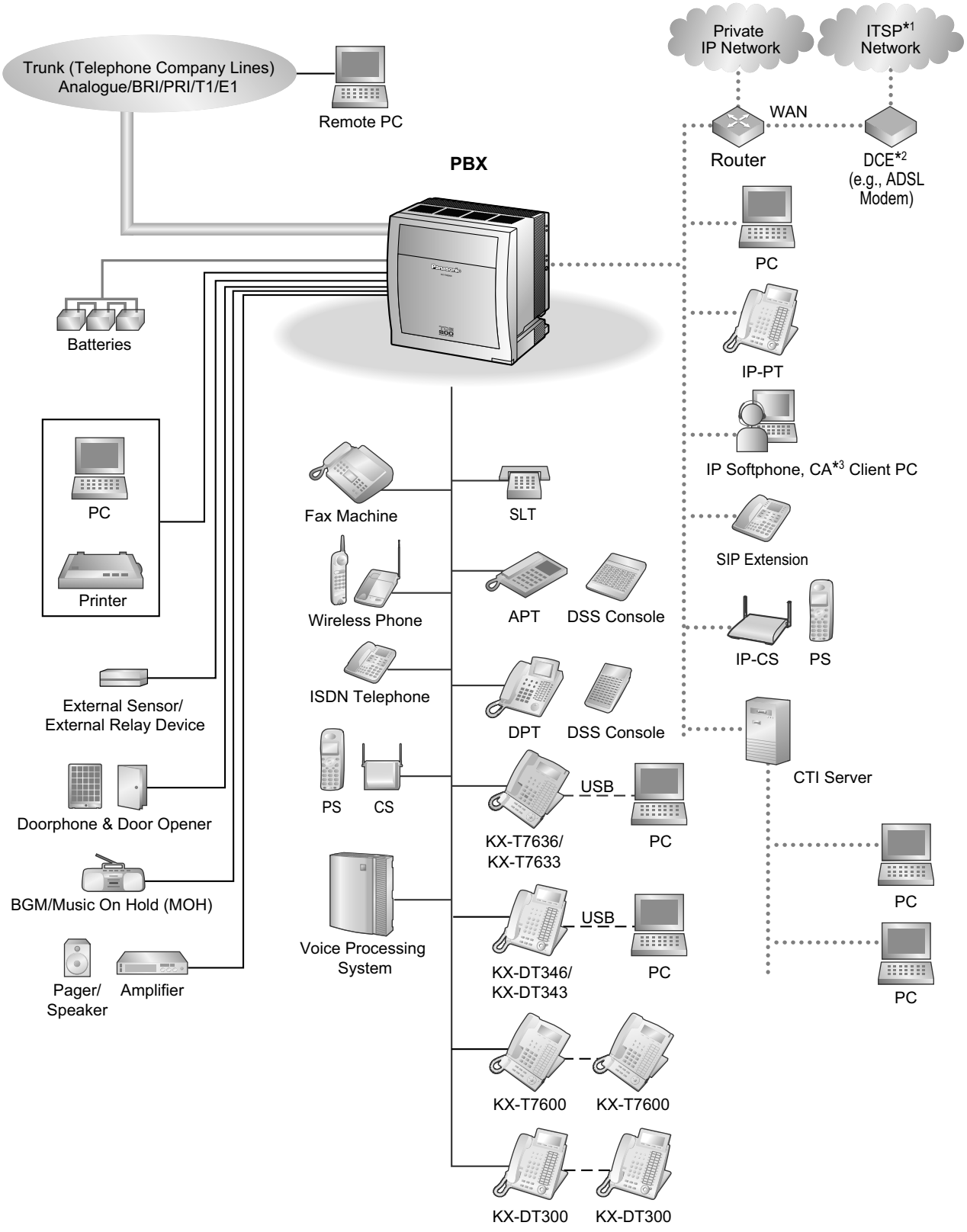


4-shelf System (Side-by-side Type)

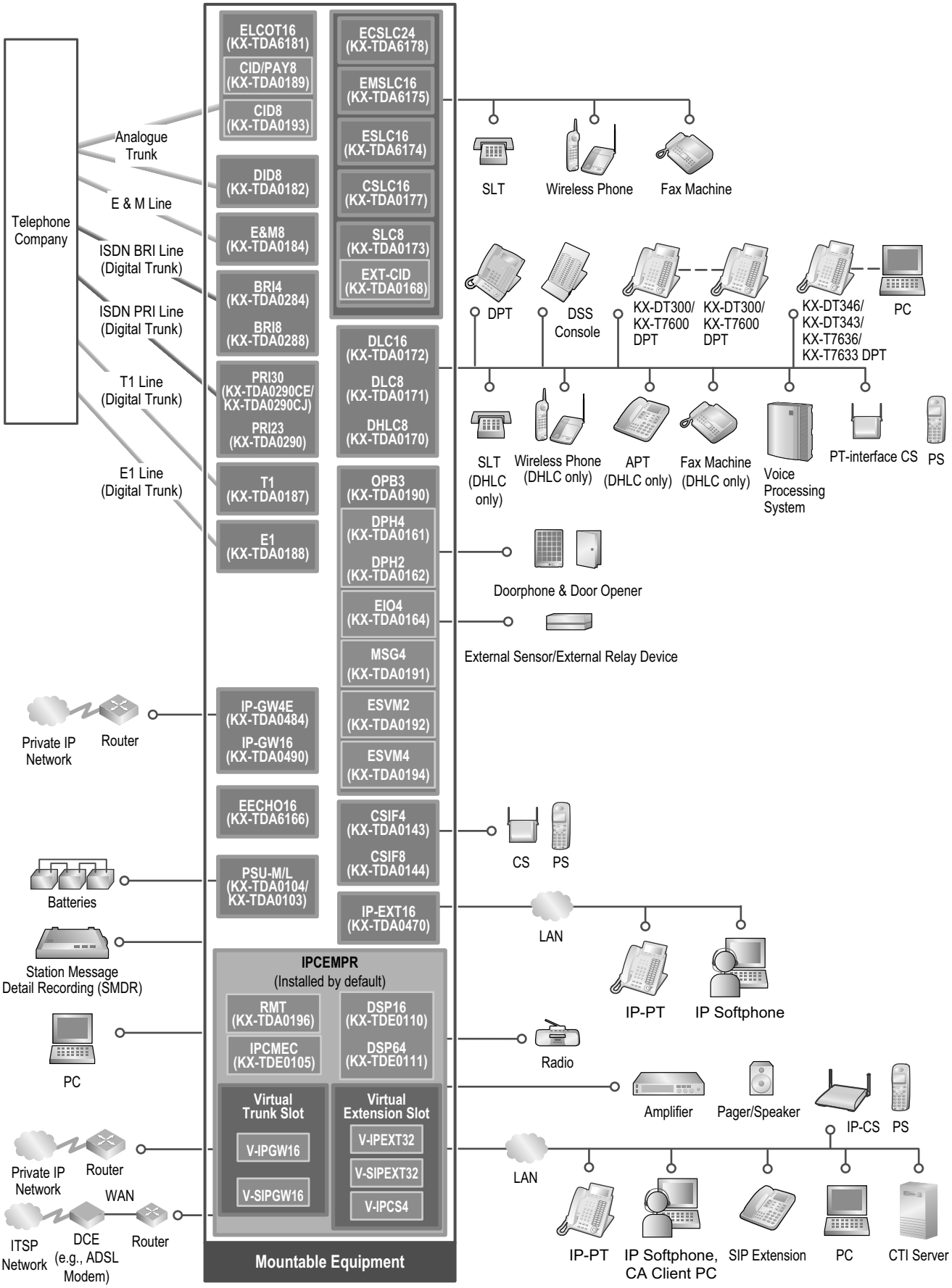
When vertical space is limited, it is possible to install a fully expanded system (Basic Shelf + Expansion Shelf 1, and Expansion Shelf 2 + Expansion Shelf 3) in a side-by-side configuration. Expansion Shelf 1 is mounted on the Basic Shelf, and Expansion Shelf 3 is mounted on Expansion Shelf 2. Installing 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


Telephone Company
Analogue Trunk
E & M Line
ISDN BRI Line (Digital Trunk)
ISDN PRI Line (Digital Trunk)
T1 Line (Digital Trunk)
E1 Line (Digital Trunk)
ELCOT16 (KX-TDA6181)
CID/PAY8 (KX-TDA0189)
CID8 (KX-TDA0193)
DID8 (KX-TDA0182)
E&M8 (KX-TDA0184)
BRI4 (KX-TDA0284)
BRI8 (KX-TDA0288)
PRI30 (KX-TDA0290CE/ KX-TDA0290CJ)
PRI23 (KX-TDA0290)
T1 (KX-TDA0187)
E1 (KX-TDA0188)
ECSLC24 (KX-TDA6178)
EMSLC16 (KX-TDA6175)
ESLC16 (KX-TDA6174)
CSLC16 (KX-TDA0177)
SLC8 (KX-TDA0173)
EXT-CID (KX-TDA0168)
DLC16 (KX-TDA0172)
DLC8 (KX-TDA0171)
DHLC8 (KX-TDA0170)
OPB3 (KX-TDA0190)
DPH4 (KX-TDA0161)
DPH2 (KX-TDA0162)
EIO4 (KX-TDA0164)
MSG4 (KX-TDA0191)
ESVM2 (KX-TDA0192)
ESVM4 (KX-TDA0194)
CSIF4 (KX-TDA0143)
CSIF8 (KX-TDA0144)
IP-EXT16 (KX-TDA0470)
IP-GW4E (KX-TDA0484)
IP-GW16 (KX-TDA0490)
EECHO16 (KX-TDA6166)
PSU-M/L (KX-TDA0104/ KX-TDA0103)
IPCEMPR
(Installed by default)
RMT (KX-TDA0196)
IPCMEC (KX-TDE0105)
DSP16 (KX-TDE0110)
DSP64 (KX-TDE0111)
Virtual Trunk Slot
V-IPGW16
V-SIPGW16
Virtual Extension Slot
V-IPEXT32
V-SIPEXT32
V-IPCS4
Mountable Equipment
SLT
Wireless Phone
Fax Machine
DPT
DSS Console
KX-DT300/ KX-T7600 DPT
KX-DT300/ KX-T7600 DPT
KX-DT346/ KX-DT343/ KX-T7636/ KX-T7633 DPT
PC
SLT (DHLC only)
Wireless Phone (DHLC only)
APT (DHLC only)
Fax Machine (DHLC only)
Voice Processing System
PT-interface CS
PS
Doorphone & Door Opener
External Sensor/External Relay Device
Private IP Network
Router
CS
PS
Batteries
LAN
Station Message Detail Recording (SMDR)
IP-PT
IP Softphone
PC
Radio
Amplifier
Pager/Speaker
IP-CS
PS
Private IP Network
Router
LAN
WAN
ITSP Network
DCE (e.g., ADSL Modem)
Router
IP-PT
IP Softphone, CA Client PC
SIP Extension
PC
CTI Server

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-TDA0162	2-Port Doorphone Card (German Type) (DPH2)	2-port doorphone card for 2 German-type doorphones and 2 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-TDA0182	8-Port DID Card (DID8)	8-port DID trunk card.
KX-TDA0184	8-Port E & M Trunk Card (E&M8)	8-port E & M (TIE) trunk card. Type 5 support.
KX-TDA0187	T-1 Trunk Card (T1)	1-port T1 trunk card. EIA/TIA standard compliant.
KX-TDA0188	E-1 Trunk Card (E1)	1-port E1 trunk card. ITU-T standard compliant.
KX-TDA0189	8-Port Caller ID/Pay Tone Card (CID/PAY8)	8-port Caller ID signal type FSK/FSK (with Call Waiting Caller ID [Visual Caller ID])/DTMF, and 8-port Pay Tone Service (12 kHz/16 kHz). To be mounted on the ELCOT16 card.
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, ESVM2, ESVM4, DPH4, DPH2 or EIO4 card.
KX-TDA0191	4-Channel Message Card (MSG4)	4-channel message card. To be mounted on the OPB3 card.
KX-TDA0192	2-Channel Simplified Voice Message Card (ESVM2)	2-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-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)	Analogue modem card for remote communication with the PBX. ITU-T V.90 support. To be mounted on the IPCEMPR card.
KX-TDA0284	4-Port BRI Card (BRI4)	4-port ISDN Basic Rate Interface card with 1 power failure transfer port. EURO-ISDN/ETSI compliant.
KX-TDA0288	8-Port BRI Card (BRI8)	8-port ISDN Basic Rate Interface card with 1 power failure transfer port. EURO-ISDN/ETSI compliant.
KX-TDA0290CE	PRI Card (PRI30)	1-port ISDN Primary Rate Interface card (30B channels). EURO-ISDN/ETSI compliant.
KX-TDA0290CJ	PRI Card (PRI30)	1-port ISDN Primary Rate Interface card (30B channels). EURO-ISDN/ETSI compliant.

1.2.1 Optional Equipment

Model No.	Model Name	Description
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.
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 160 V/90 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 Analogue Trunk Card (ELCOT16)	16-port analogue trunk 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	
External Battery		+36 V DC (+12 V DC × 3, recommended maximum capacity per shelf is 28 Ah)	
Maximum Power Failure Tolerance		300 ms (without using backup batteries)	
Memory Backup Duration		7 years	
Dialling	**Trunk**	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialling	
	Extension	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialling	
Mode Conversion		DP-DTMF, DTMF-DP	
Ring Frequency		20 Hz/25 Hz (selectable)	
Trunk Loop Limit		1600 Ω maximum	
Operating Environment	**Temperature**	0 °C to 40 °C	
	Humidity	10 % to 90 % (non-condensing)	
Conference Call Trunk (per shelf)		From 10 × 3-party conference call to 4 × 8-party conference call	
Music on Hold (MOH)		2 ports (Level Control: -11 dB to +11 dB in 1 dB steps) MOH1: External Music Source port MOH2: Selectable Internal/External Music Source port	
Paging	**Internal**	Level Control: -15 dB to +6 dB in 3 dB steps	
	External	2 ports (Volume Control: -15 dB to +15 dB in 1 dB steps)	
Serial Interface Port	**RS-232C**	1 (maximum 115.2 kbps)	
RJ45 Port	**MNT Port**	1 (for PC connection)	
	LAN Port	1 (for LAN connection)	
Extension Connection Cable		SLT	1-pair wire (T, R)
		DPT	1-pair wire (D1, D2) or 2-pair wire (T, R, D1, D2)
		APT	2-pair wire (T, R, D1, D2)

		PT-interface CS	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)	
	Expansion Shelf	430 mm (W) × 415 mm (H) × 270 mm (D)	
Weight (when fully mounted)	**Basic Shelf**	Under 16 kg	
	Expansion Shelf	Under 16 kg	

1.3.2 Characteristics

Terminal Equipment Loop Limit	• PT: KX-DT300/KX-T7600 series DPT: 90 Ω; all other DPTs/APTs: 40 Ω • SLT: 600 Ω including set • Doorphone: 20 Ω • CS: 130 Ω; PT-interface CS: 65 Ω
Minimum Leakage Resistance	15 000 Ω minimum
Maximum Number of Extension Instruments per Line	**1.** for PT or SLT **2.** by Parallel or eXtra Device Port connection of an APT/DPT and an SLT **3.** by Digital eXtra Device Port connection of 2 DPTs and an SLT
Ring Voltage	75 Vrms at 20 Hz/25 Hz depending on the Ringing Load
Trunk Loop Limit	1600 Ω maximum
Hookswitch Flash/Recall Timing Range	24 ms to 2032 ms
BRI Cards Internal ISDN Mode	Supply Voltage: 40 V Power Supply (BRI4): 4.5 W per 1 line, 10 W per 4 lines Power Supply (BRI8): 4.5 W per 1 line, 20 W per 8 lines Power Supply Method: Phantom Power Supply
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 "3.9.4 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

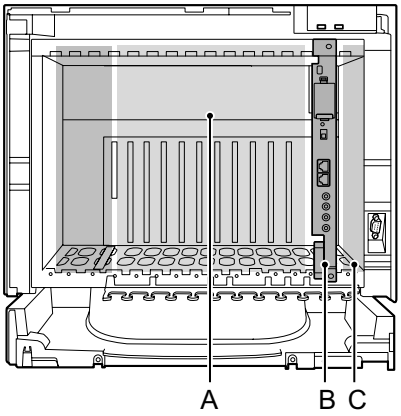
Type and Maximum Number of Slots

The PBX supports the following type and number of slots.

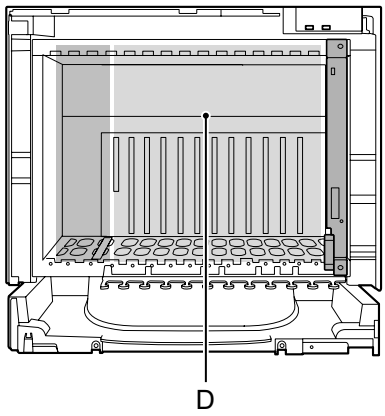
Slot Type		Maximum Number			
		Basic System	2-shelf System	3-shelf System	4-shelf System
IPCEMPR Card Slot		1	1	1	1
BUS-M Card Slot		1	1	1	1
Free Slot		10	21	32	43
Virtual Slot	Virtual Trunk Slot	4	4	4	4
	Virtual Extension Slot	4	4	4	4

Card Slots

Basic Shelf

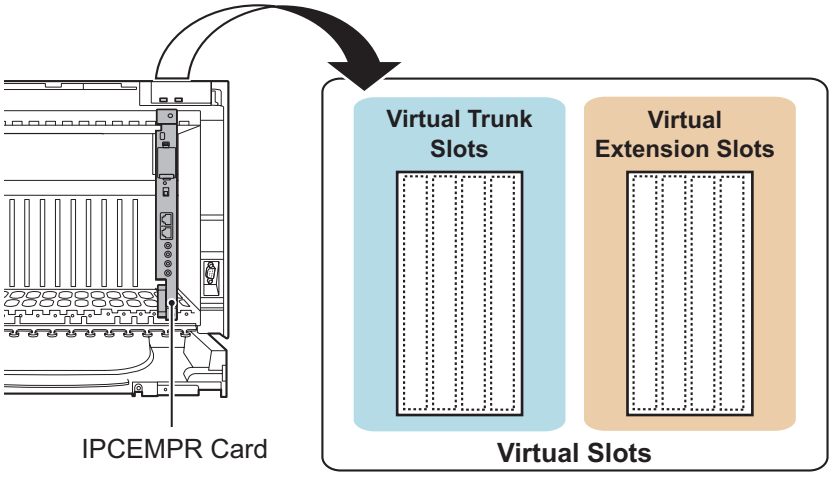


Expansion Shelf



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
Trunk Card	14*1	24*1	34*1	40*1
Virtual Trunk Card	4	4	4	4
V-IPGW16	2	2	2	2
V-SIPGW16	2	2	2	2
Physical Trunk Card	10*1	20*1	30*1	40*1
ELCOT16	10	20	30	40
DID8				
E&M8				
BRI4				
BRI8				
T1	5	10	15	20
E1				
PRI23				
PRI30				
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	4	8	12	16
CSIF8				
OPB3	4	8	12	16
EECHO16	2	4	6	8
Total	18	29	40	51 (43) *3

*1 One T1, E1, PRI30, 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 trunk cards and extension cards is limited to 43.
Also, in this case, one T1, E1, PRI30, 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	1				
RMT	1				
CID/PAY8	20	40	60	80	ELCOT16 Card
CID8					
EXT-CID	10	20	30	40	SLC8 Card
DPH4	4	8	12	16	OPB3 Card
DPH2	8	16	24	32	
MSG4	4	8	12	16	
ESVM2					
ESVM4					
EIO4	4	8	12	16	
BUS-ME	–		1	2	BUS-M Card

Maximum Trunks and Extensions

The PBX supports the following number of trunks and extensions.

Type	Basic System	2-shelf System	3-shelf System	4-shelf System
Total Number of Trunks	192	352	512	640
Trunk (Physical Trunk Card)	160	320	480	640
Trunk (Virtual Trunk Card)	64[*1]			
H.323 Trunks	32			
SIP Trunks	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 trunk/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

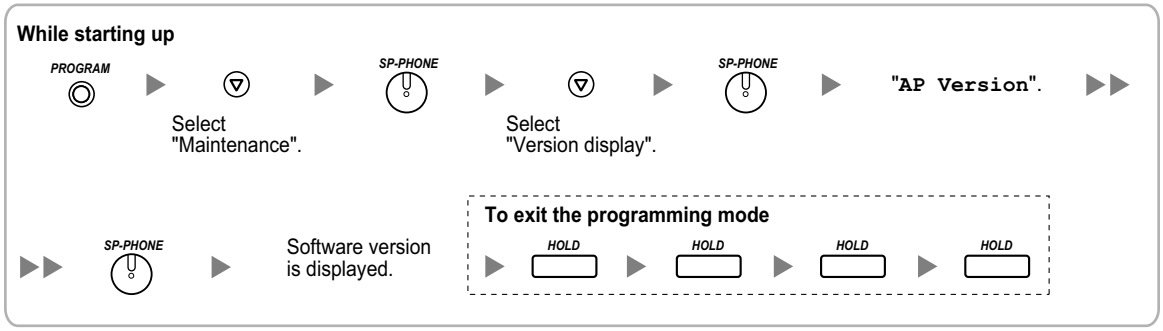
The following number of items of terminal equipment can be supported by the PBX.

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	224	384	544	672
IP-PT[*2] (supported by IP-EXT16 card)	160	320	480	640
IP-PT[*3] (supported by IPCEMPR card)	128			
SIP Extension	128			
DSS console	64			
CS	32	64	96	128
High-density CS	16	32	48	64
IP-CS	16	16	16	16
PS	512			
Voice Processing System (VPS)[*4]	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] 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
ISDN Extension		2

Equipment Type	Load Figure
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.

1.3.3 System Capacity

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 trunks 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.
Activation keys are provided via the DSP16/DSP64 card and optional activation key files.

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 Trunks/ IP Telephones/CA Users
2 IP Trunk[*1]	Allows the use of 2 IP trunks (H.323/ SIP).	32	64 IP trunks (H.323/SIP)
4 IP Trunk[*1]	Allows the use of 4 IP trunks (H.323/ SIP).	16	
1 IP Softphone/IP PT[*2]	Allows the use of 1 IP-PT/IP softphone.	128	128 IP-PTs/IP softphones
4 IP Softphone/IP PT[*2]	Allows the use of 4 IP-PTs/IP softphones.	32	
8 IP Softphone/IP PT[*2]	Allows the use of 8 IP-PTs/IP softphones.	16	
16 IP Softphone/IP PT[*2]	Allows the use of 16 IP-PTs/IP softphones.	8	
1 IP PT	Allows the use of 1 IP-PT.	128	128 IP-PTs
4 IP PT	Allows the use of 4 IP-PTs.	32	
8 IP PT	Allows the use of 8 IP-PTs.	16	
16 IP PT	Allows the use of 16 IP-PTs.	8	
1 SIP Extension	Allows the use of 1 SIP Extension.	128	128 SIP Extensions
4 SIP Extension	Allows the use of 4 SIP Extensions.	32	
8 SIP Extension	Allows the use of 8 SIP Extensions.	16	
16 SIP Extension	Allows the use of 16 SIP Extensions.	8	
CA 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 Trunks/ 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 trunks through system programming. By default, all the installed activation keys will be used for SIP trunks.

*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.

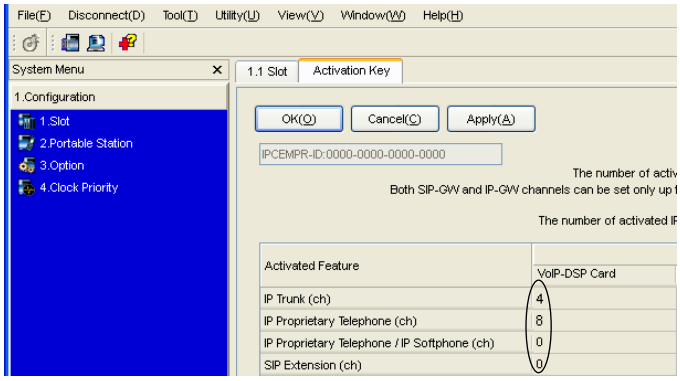
Preinstalled Activation Keys in the DSP16/DSP64

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

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

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

Example: Preinstalled Activation Keys in the DSP16 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 Trunks

Model No.	Activation Key Type	Maximum Number/Supported IP Trunks			
		with DSP16		with DSP64	
KX-NCS4102	**2 IP Trunk**	30	60 IP trunks (H.323/SIP)	24	48 IP trunks (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

Model No.	Activation Key Type	Maximum Number/Supported IP Telephones			
		with DSP16		with DSP64	
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
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

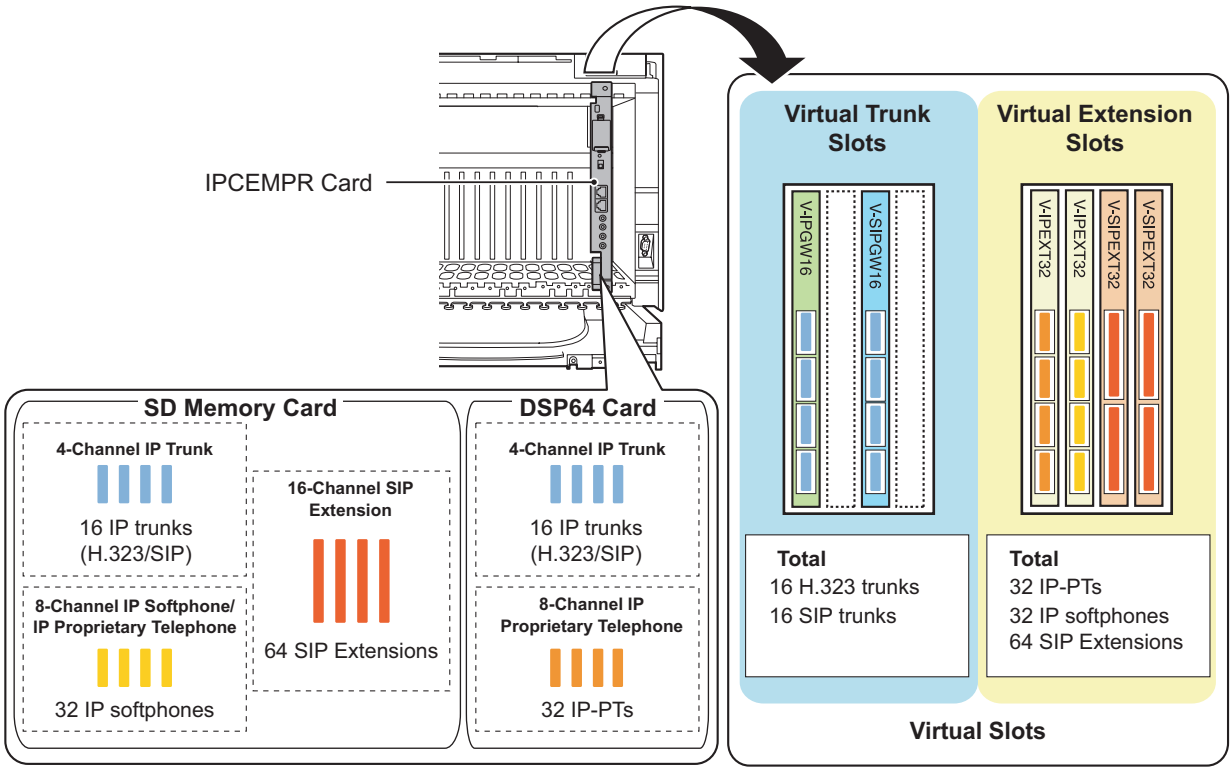
Model No.	Activation Key Type	Maximum Number
KX-NCS4950	**Software Upgrade 01**	1

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 trunks, 16 SIP trunks, 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 30 activation key files can be installed on the SD Memory Card.
- It is possible to send the activation key file to a specified e-mail address at the same time as downloading it to a PC.
- Make sure to backup the downloaded activation key files on your PC.
- In the event of a system malfunction, you need a temporary activation key for maintenance purposes. The temporary activation key can only be used for a limited time period, and can be downloaded from the Key Management System in the same way as downloading activation key files.

2.1.3 Activation Key File

The corresponding number of IP trunks 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 dialogue box will be displayed.
3. Select the file to upload.
   A window showing the upload progress will be displayed.
   While transferring files to the SD memory card, the PBX automatically renames them according to the header information.
   A message will be displayed when the transfer is complete.
4. Click **OK**.
5. 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.**

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.

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

To prevent malfunction, noise, or discolouration, follow the instructions below:
Do not install the system in the following locations:

- In direct sunlight and hot, cold, or humid places. (Temperature range: 0 °C to 40 °C)
- 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 of space above and 10 cm 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 of radios and televisions. (Both the PBX and PTs should be at least 1.8 m away from such devices.)

Do not perform the following:

- Do not block the openings of the PBX.

- Do not stack up the optional service cards.

Wiring Precautions

Be sure to follow these instructions when wiring the unit:

CAUTION

- Avoid using the same AC outlet for computers, telexes, and other office equipment, as noise generated by such equipment may hamper system performance or interrupt the system.
- Unplug the system from its power source when wiring, and plug the system back in only after all wiring is completed.
- Trunks should be installed with surge protectors. For details, refer to "3.2.17 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 trunk 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.

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
AC Cord with a Ferrite Core*1		1*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

*1 In Canada, there is no ferrite core attached to the AC cord.
*2 KX-TDE600BX is supplied with 2 types of AC cord. Please use whichever is appropriate for the country/area.

Supplied Items for an Expansion Shelf (KX-TDE620)

Unpack the box and check the items below:

Main Unit		1
AC Cord with a Ferrite Core[*1]		1[*2]
Metal Bracket		1
Anchor Plug		4
Fan Guard		2
Screw A		4
Screw B		6
Screw C		2

[*1] In Canada, there is no ferrite core attached to the AC cord.
[*2] KX-TDE620BX is supplied with 2 types of AC cord. Please use whichever is appropriate for the country/area.

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.

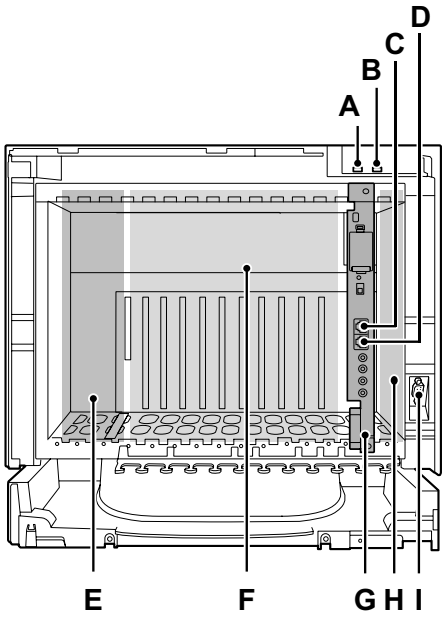
Note

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

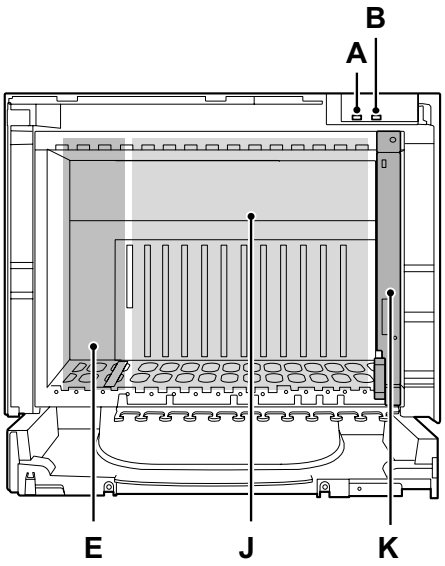
3.2.2 Names and Locations

Inside View

Basic Shelf (KX-TDE600)



Expansion Shelf (KX-TDE620)

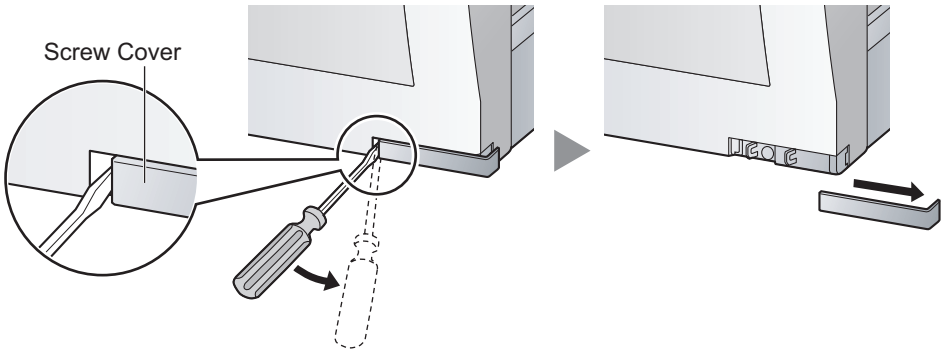


A. RUN Indicator
B. ALARM Indicator
C. MNT Port
D. LAN Port
E. PSU Slot
F. Free Slots 1 to 10 (from the left)
G. IPCEMPR Card
H. BUS-M Card Slot
I. RS-232C Port
J. Free Slots 1 to 11 (from the left)
K. BUS-S Card

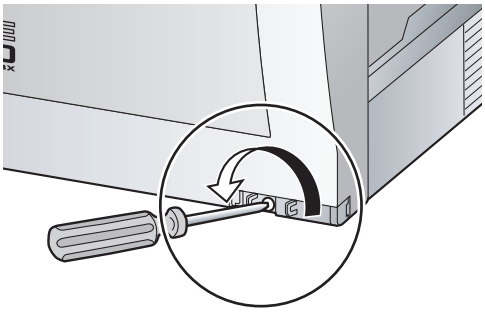
3.2.3 Opening/Closing the Front Cover

Opening the Front Cover

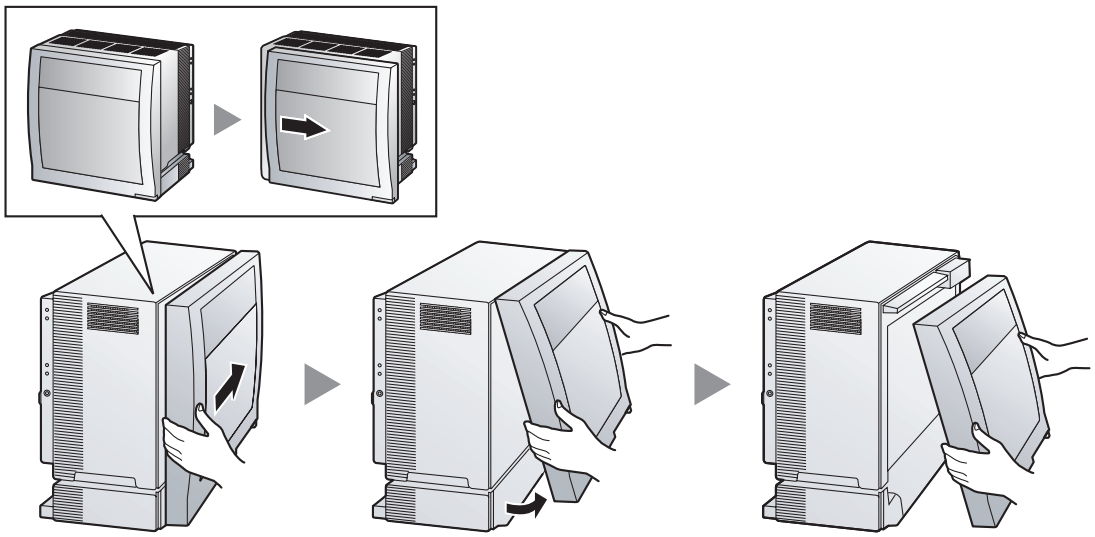
1. Insert a flathead screwdriver into the opening (on the left of the screw cover) and unlatch the screw cover.



2. Turn the screw anticlockwise to loosen.

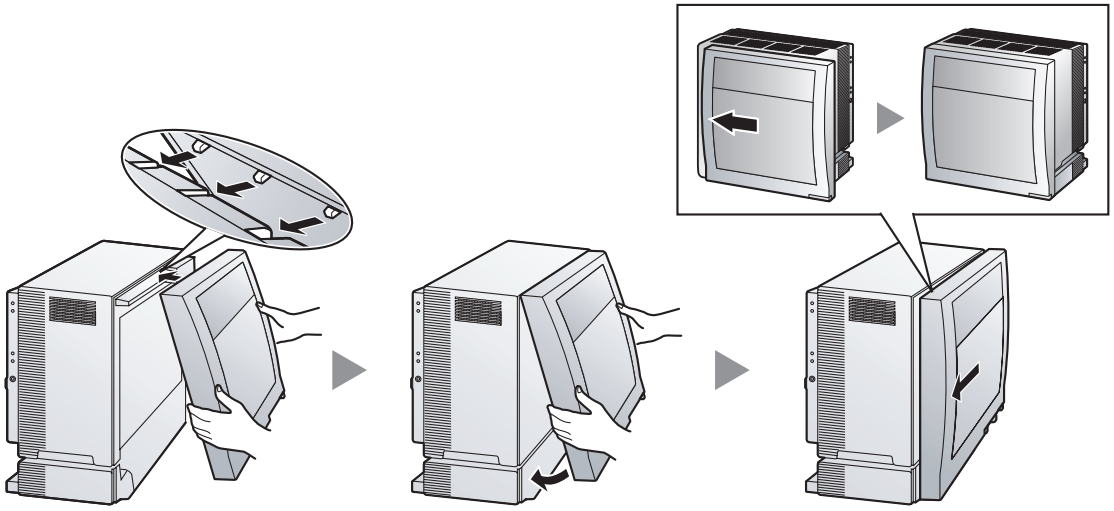


3. Slide the front cover to the right until it stops, then lift the front cover.

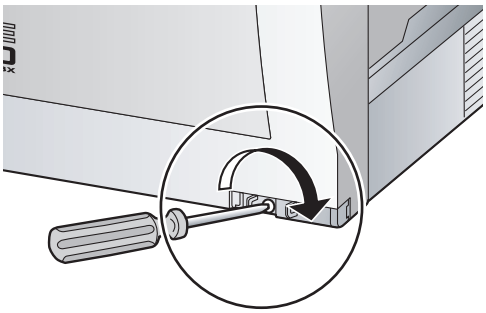


Closing the Front Cover

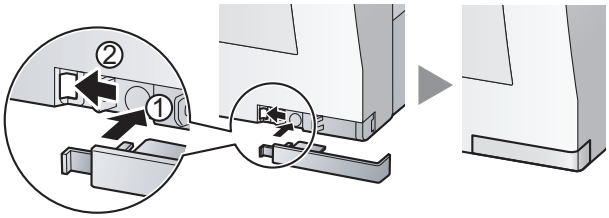
1. Hook the front cover onto the shelf (line up the protrusions on the cover with the receptacles on the shelf). Then slide the front cover to the left until it locks.



2. Turn the screw clockwise to tighten.



3. Secure the screw cover.



CAUTION

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

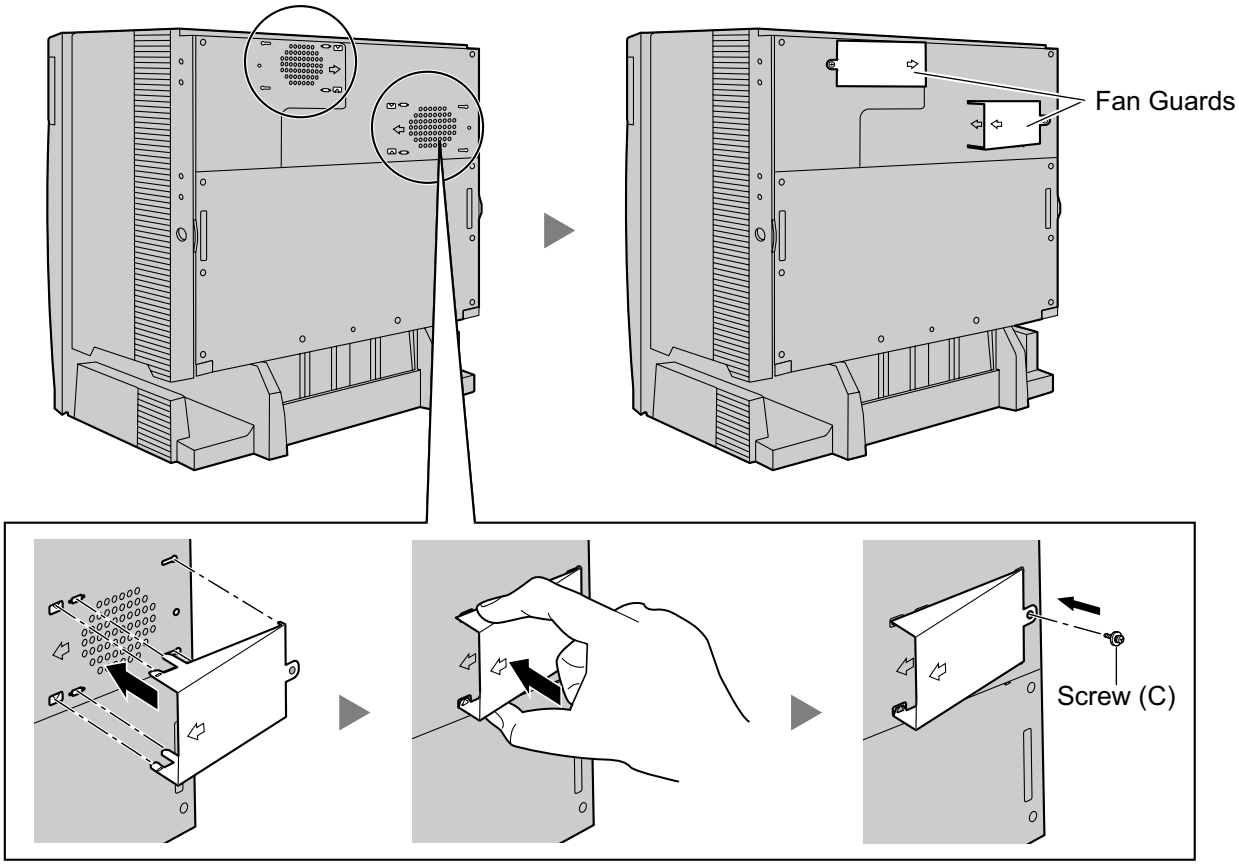
3.2.4 Attaching Fan Guards

Attaching Fan Guards

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

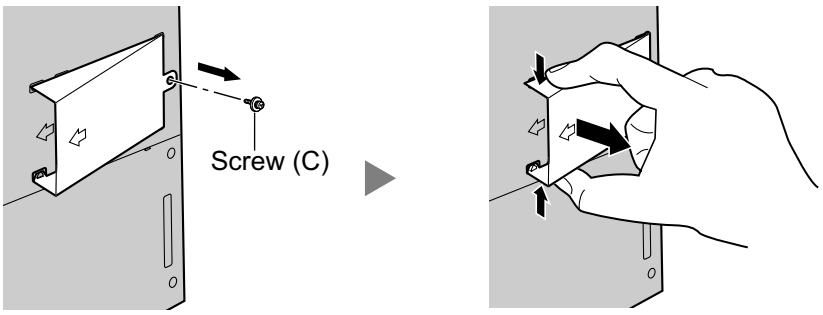
- installing a multiple-shelf system,
- mounting the shelf on the wall, or
- installing the shelf near the wall

to protect the air vents on the back of the shelf.



Note

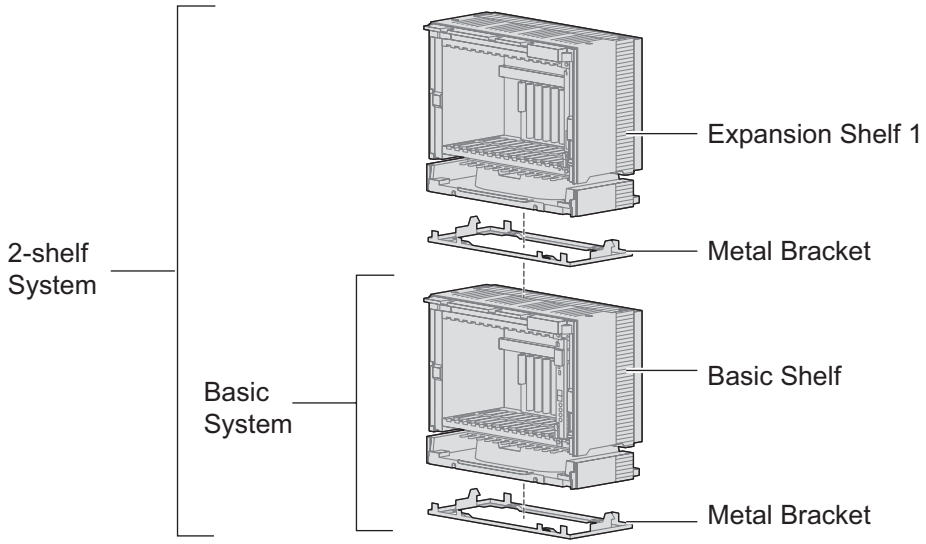
If you need to remove the Fan Guard:



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 at the sides of the shelf, and 20 cm 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.

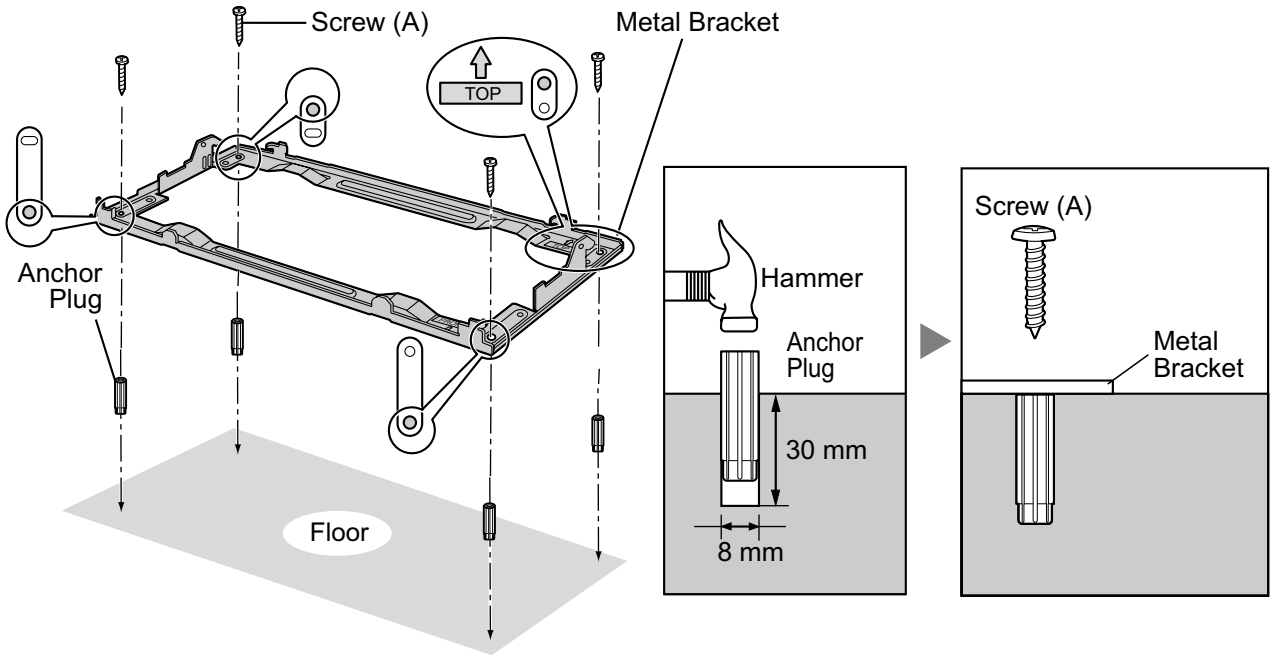
Note

- 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.

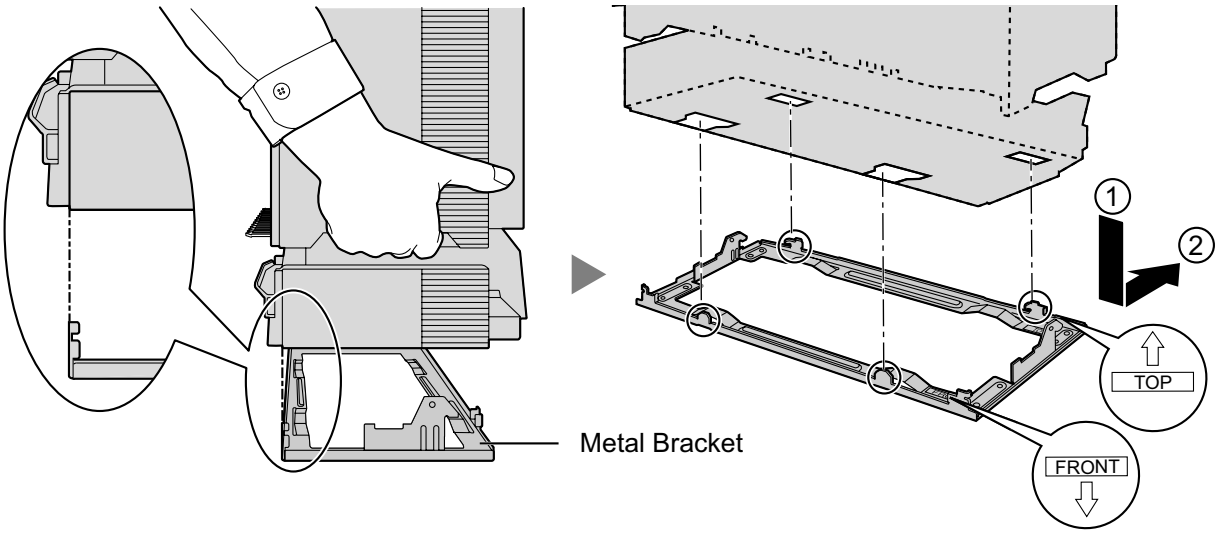
Installing the Basic Shelf

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.

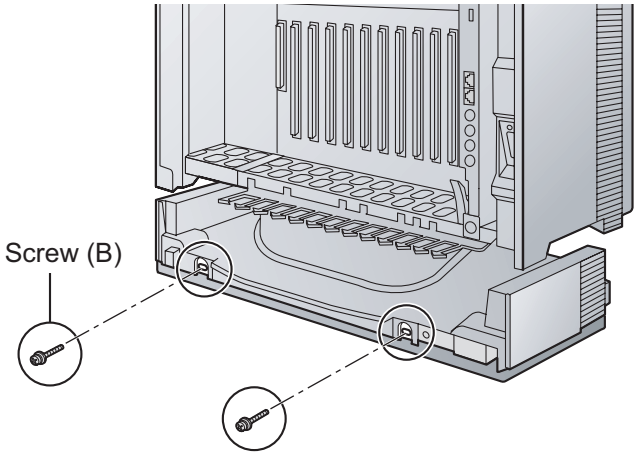
1. Install 4 anchor plugs on the floor, using the metal bracket as a template. Fix the metal bracket in place with 4 screws (A).



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).

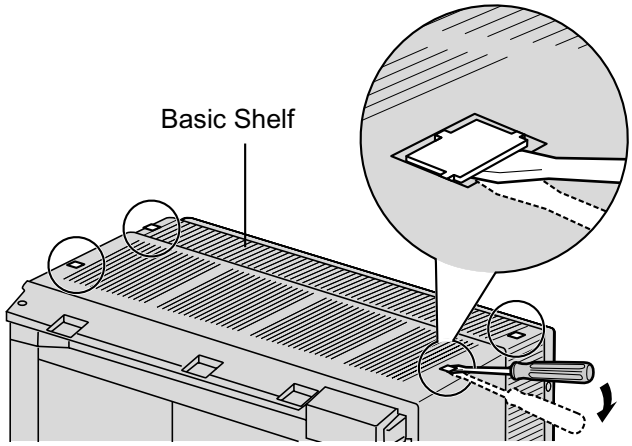


Installation of the basic system is complete. If you are installing a 2-shelf system, follow the procedure below.

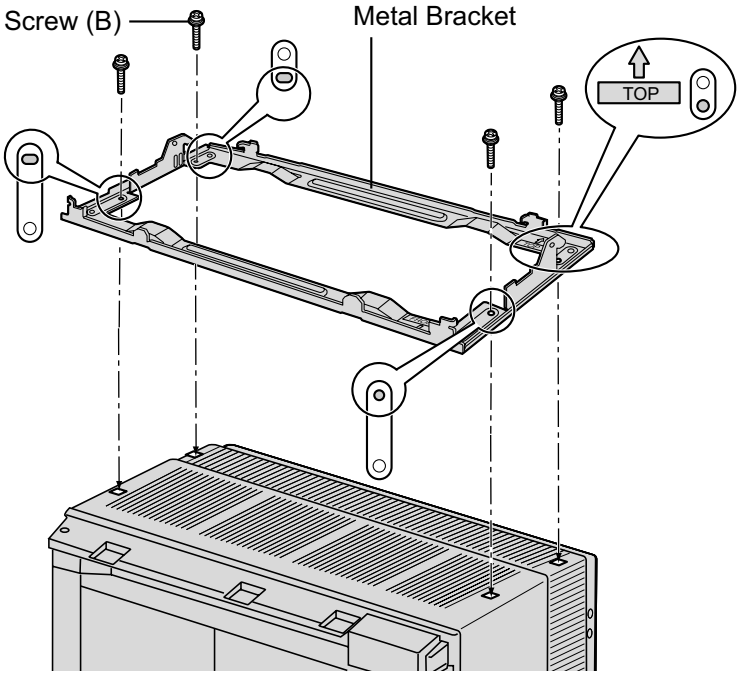
Mounting Expansion Shelf 1

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.

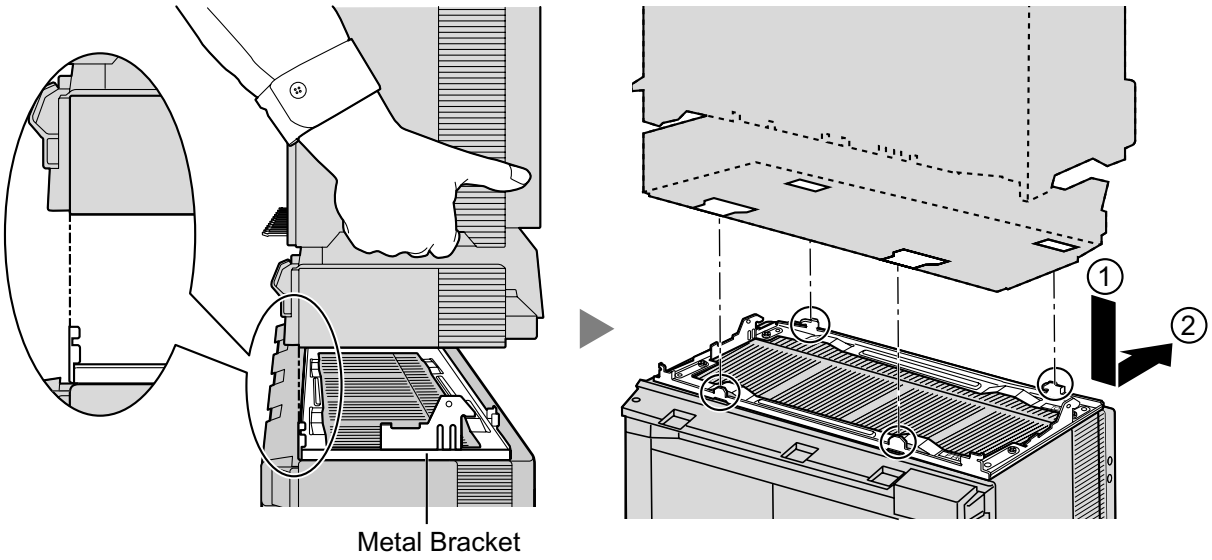
1. Remove the 4 tabs on the top cover of the Basic Shelf, by using a flathead screwdriver, as shown below.



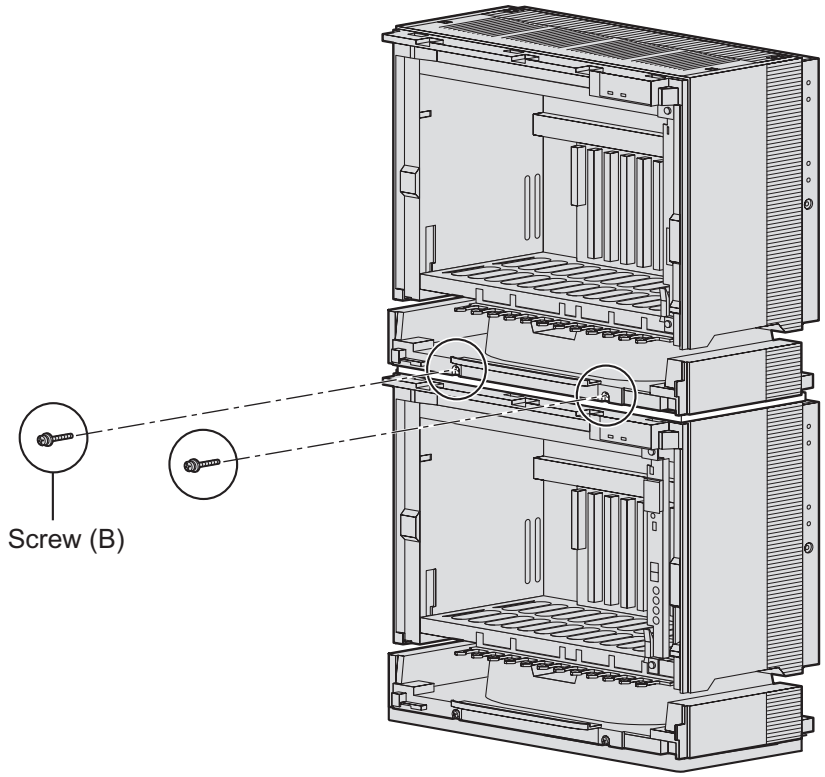
2. Fix the metal bracket to the Basic Shelf with 4 screws (B).



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



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.

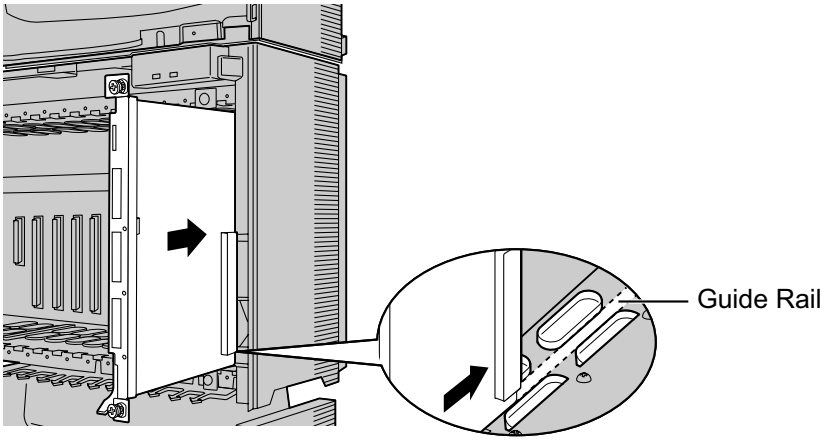
Connecting Shelves

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".

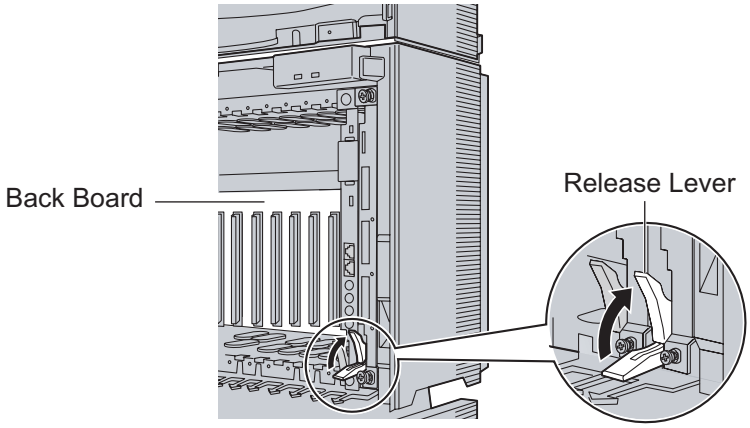
Note

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

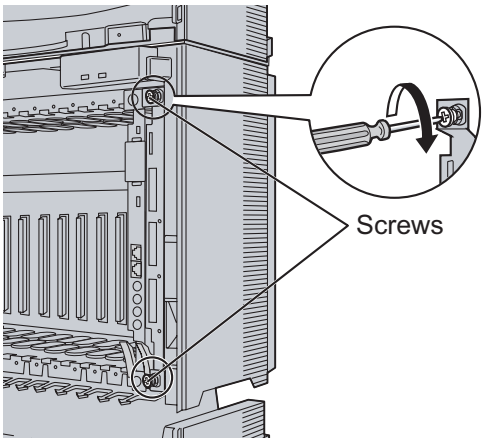
1. Insert the BUS-M card along the guide rails in the BUS-M Card Slot (the right-most slot) of the Basic Shelf.



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.



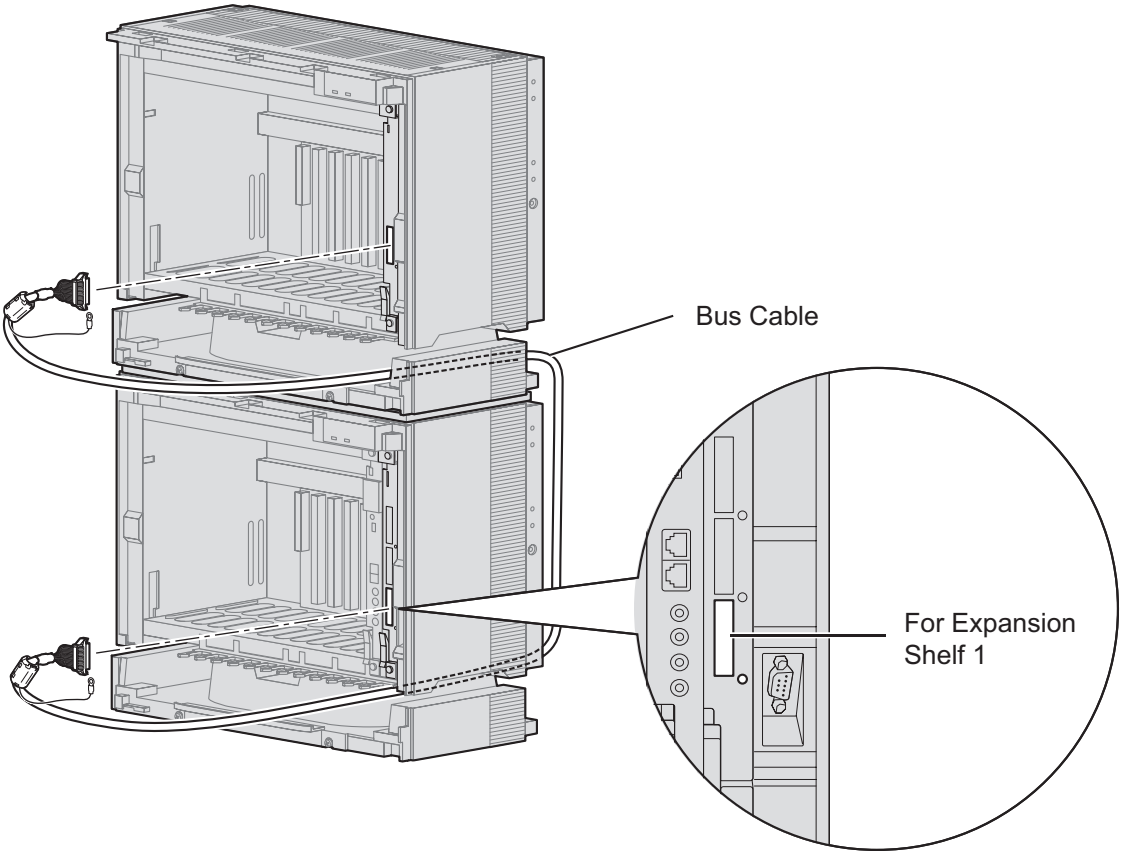
3. Turn the 2 screws clockwise to fix the BUS-M card in place.



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

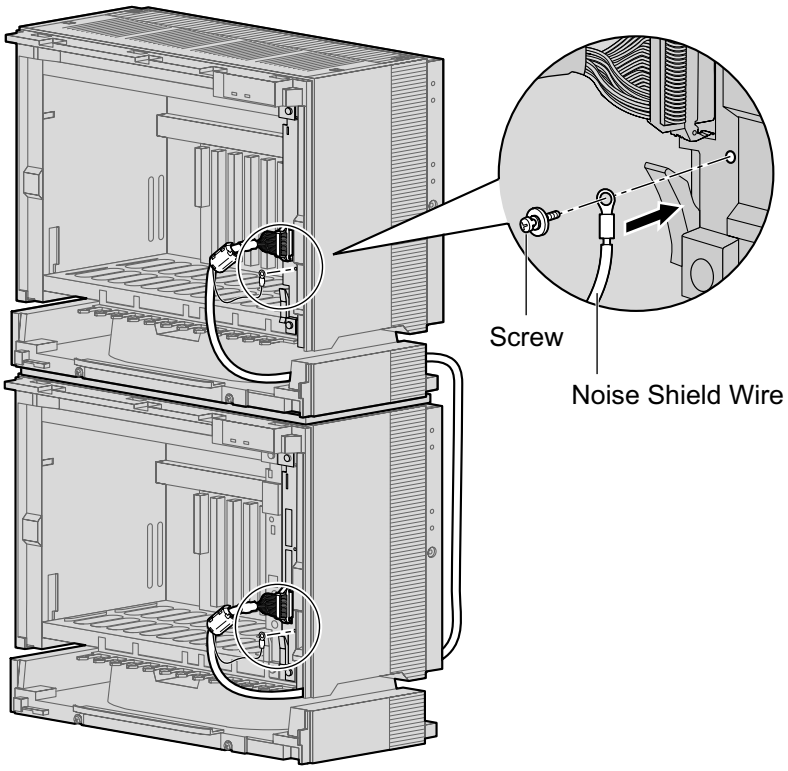
When plugging or unplugging the Bus Cable, make sure that the DC power supply is turned off.



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

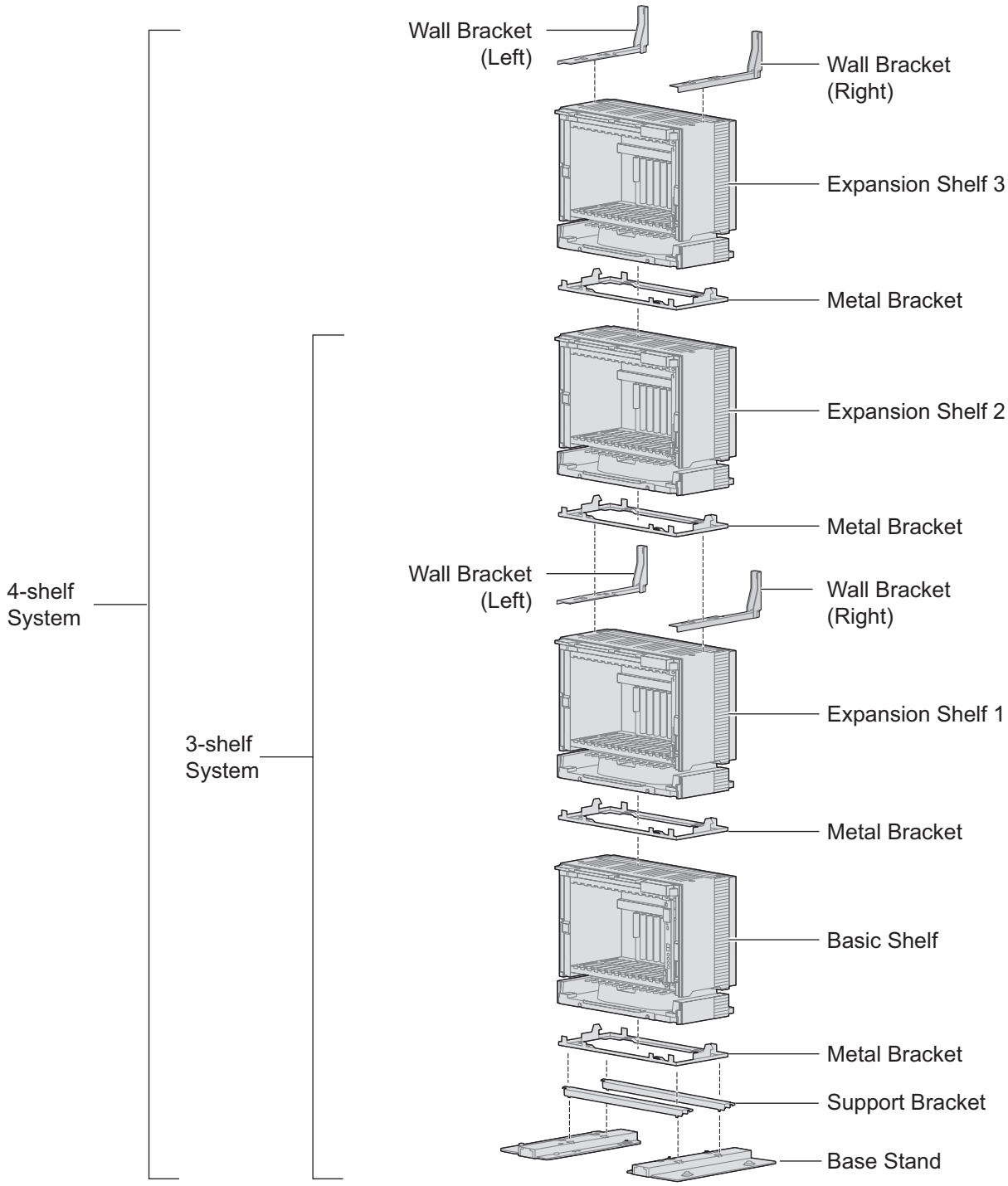
When attaching or removing the noise shield wires, make sure that the DC power supply is turned off.



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 at the sides of the shelf, and 20 cm 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.

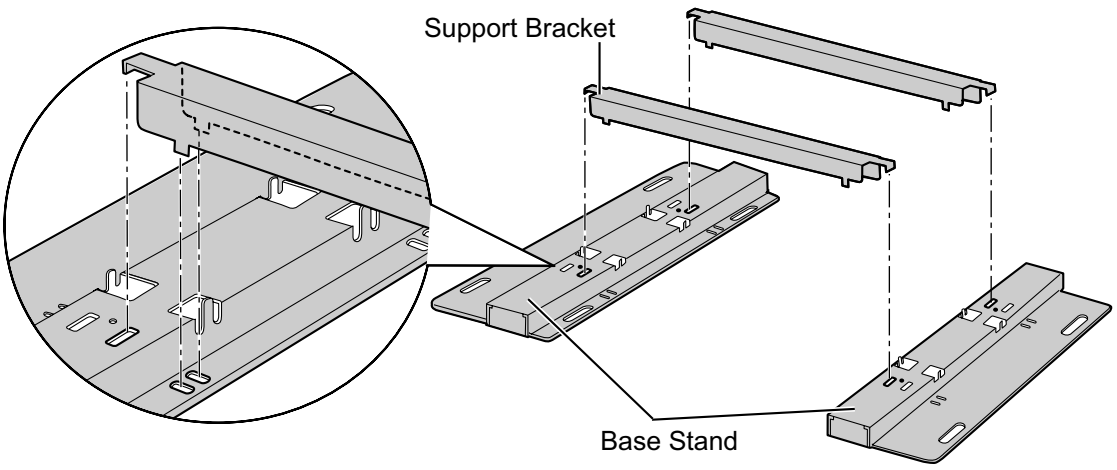
Note

- 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

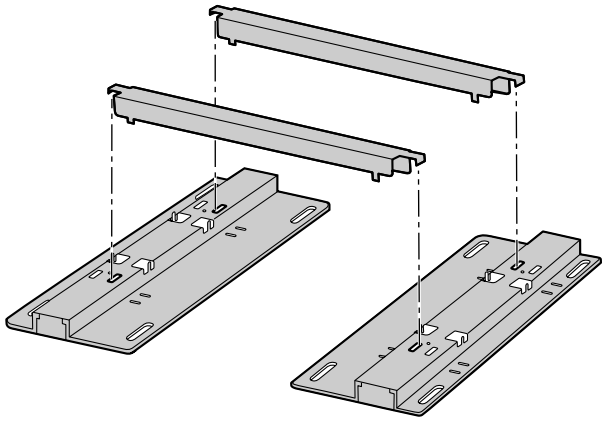
To install the Basic Shelf, attach the metal bracket (supplied with the Basic Shelf) to the base stands (supplied with the Mounting Kit) first. Then, install the base stands on the floor and fix the Basic Shelf to them.

1. Attach the support brackets to the base stands.

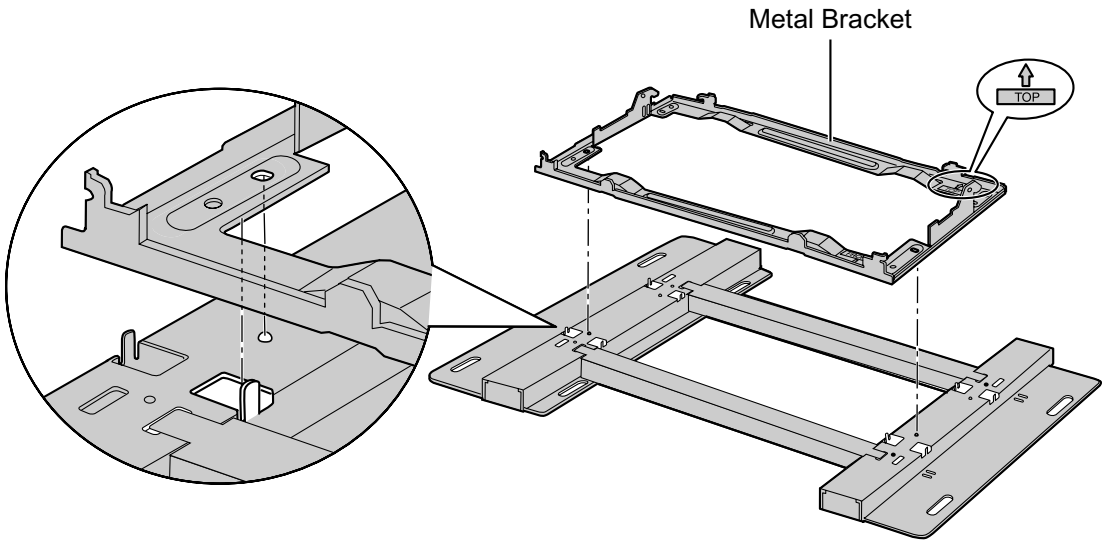


Note

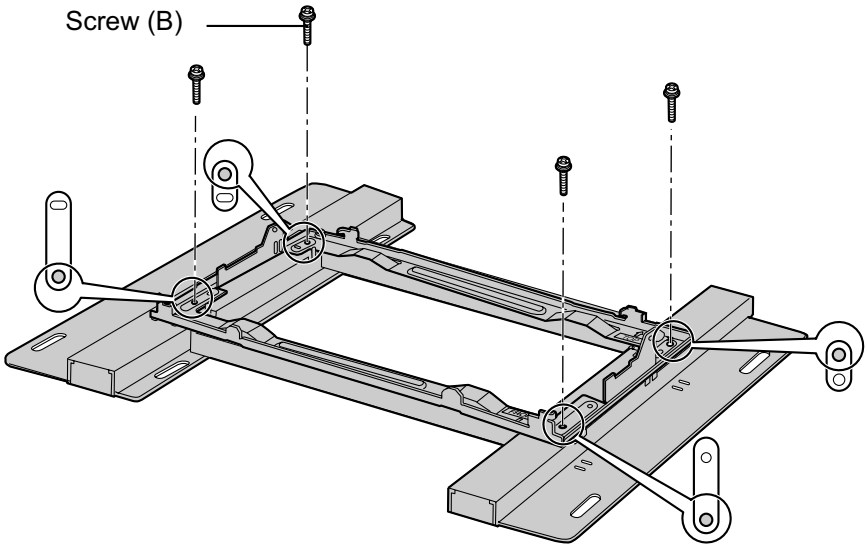
If necessary, it is possible to reverse the direction of the base stands as shown below:



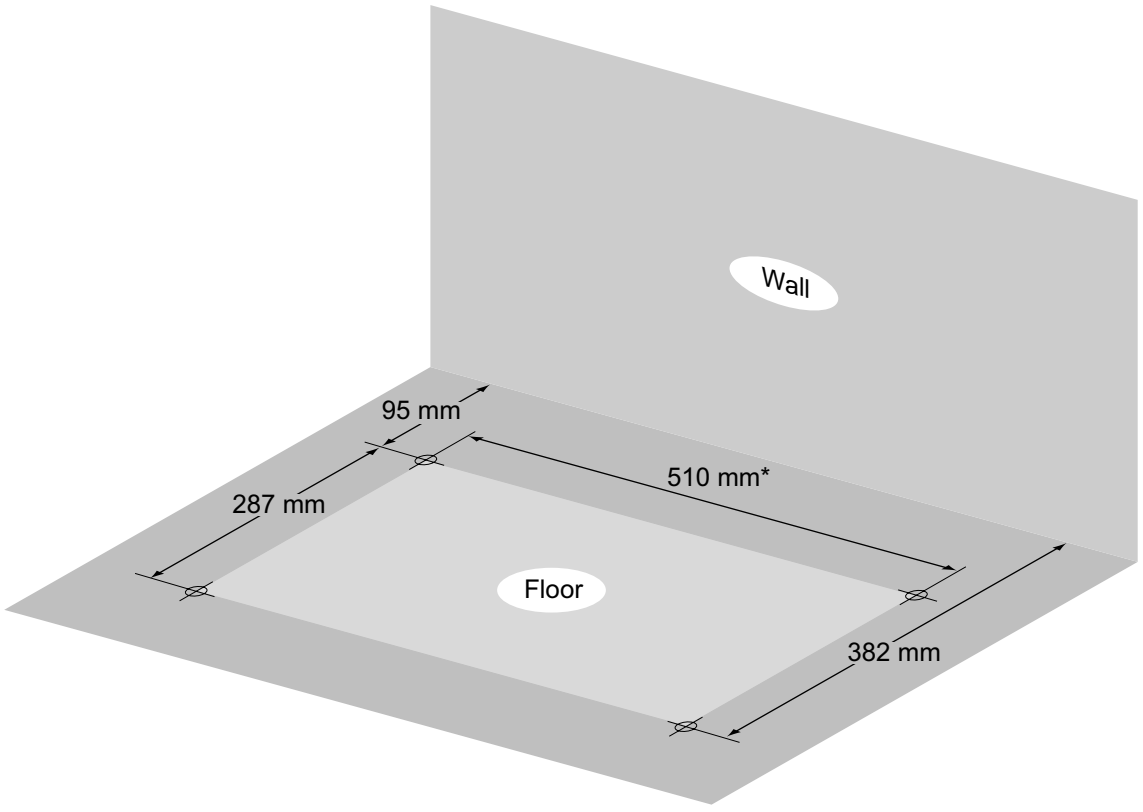
2. Place the metal bracket on the base stands.



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

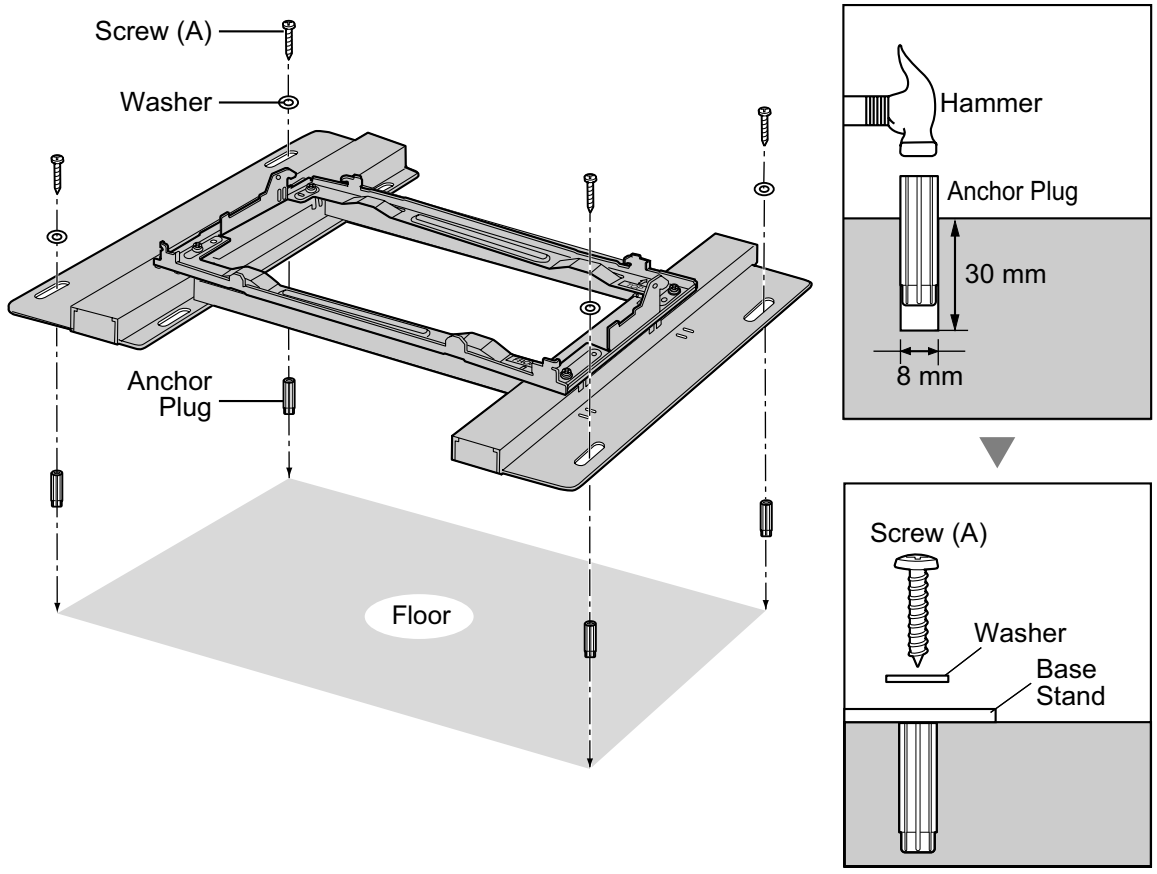


4. Make 4 holes for anchor plugs on the floor, using the measurements indicated here.

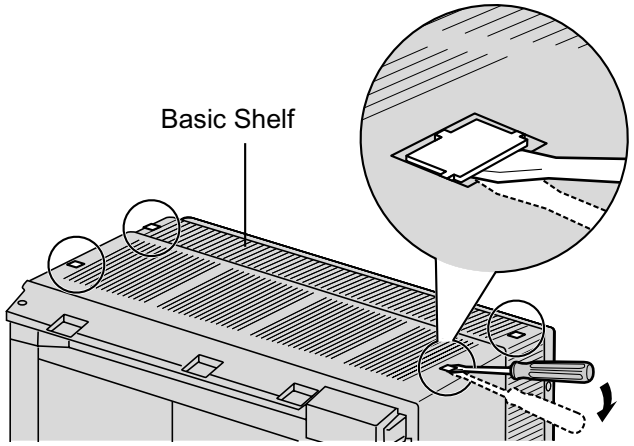


* If the direction of the base stands is reversed, the measurement must be 443.4 mm

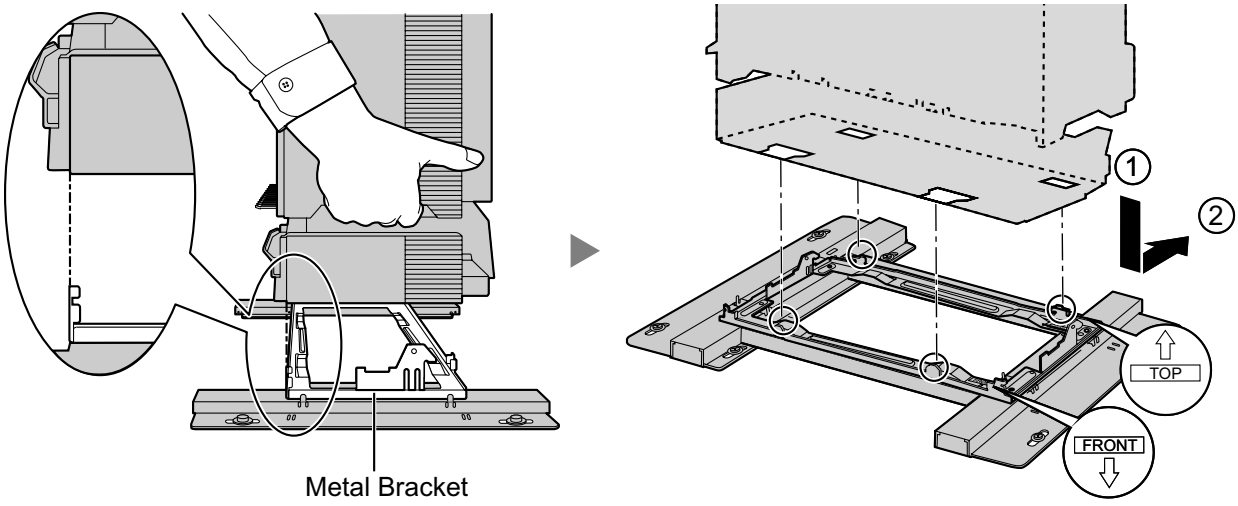
5. Install 4 anchor plugs in the holes on the floor.
Then, fasten the base stands to the floor loosely with 4 screws (A). (This makes it easy to adjust the position of the shelves later.)



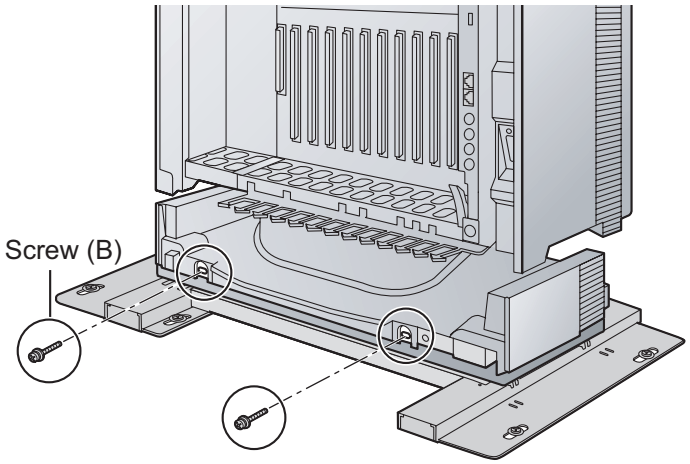
6. Remove the 4 tabs on the top cover of the Basic Shelf, by using a flathead screwdriver, as shown below.



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).

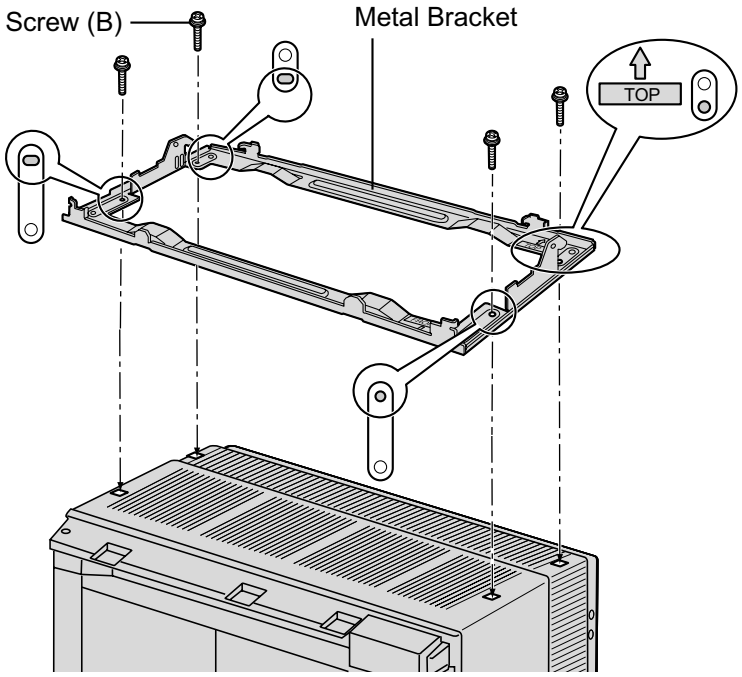


Mounting Expansion Shelves 1 and 2

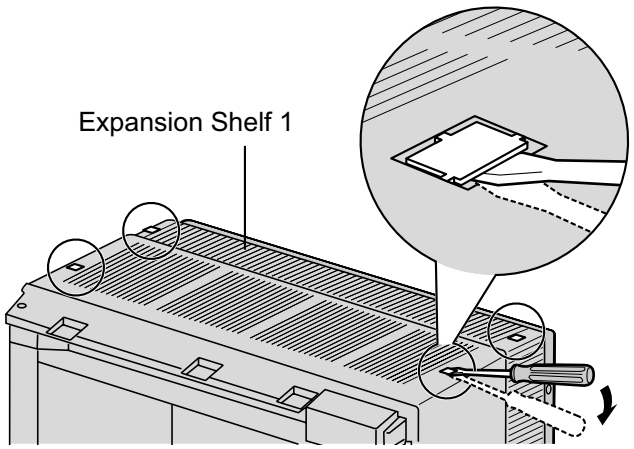
For the 3- or 4-shelf system, attach the metal bracket (supplied with the Expansion Shelf) to the Basic Shelf first. After mounting Expansion Shelf 1 on the Basic Shelf, fix Expansion Shelf 1 to the wall. Then, mount Expansion Shelf 2 on Expansion Shelf 1.

Expansion Shelf 1

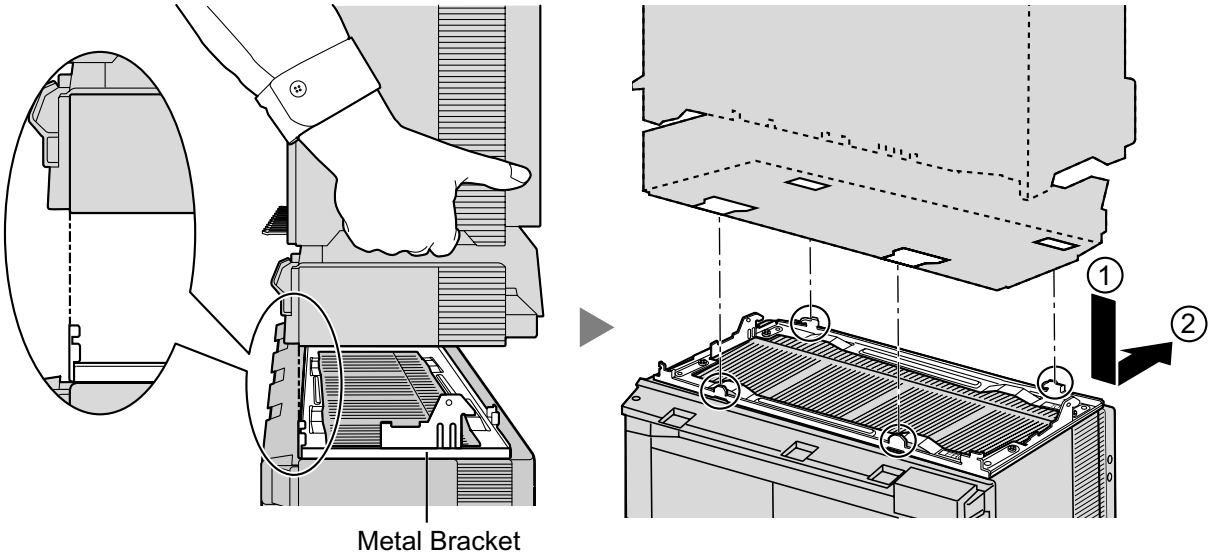
1. Fix the metal bracket to the Basic Shelf with 4 screws (B).



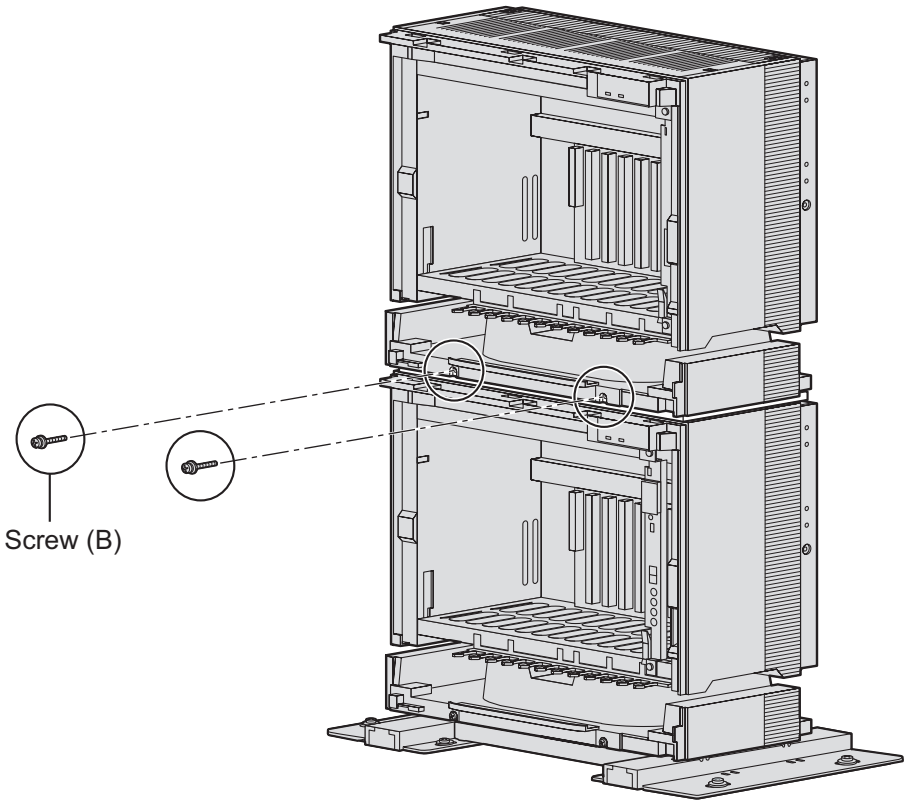
2. Remove the 4 tabs on the top cover of Expansion Shelf 1, by using a flathead screwdriver, as shown below.



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

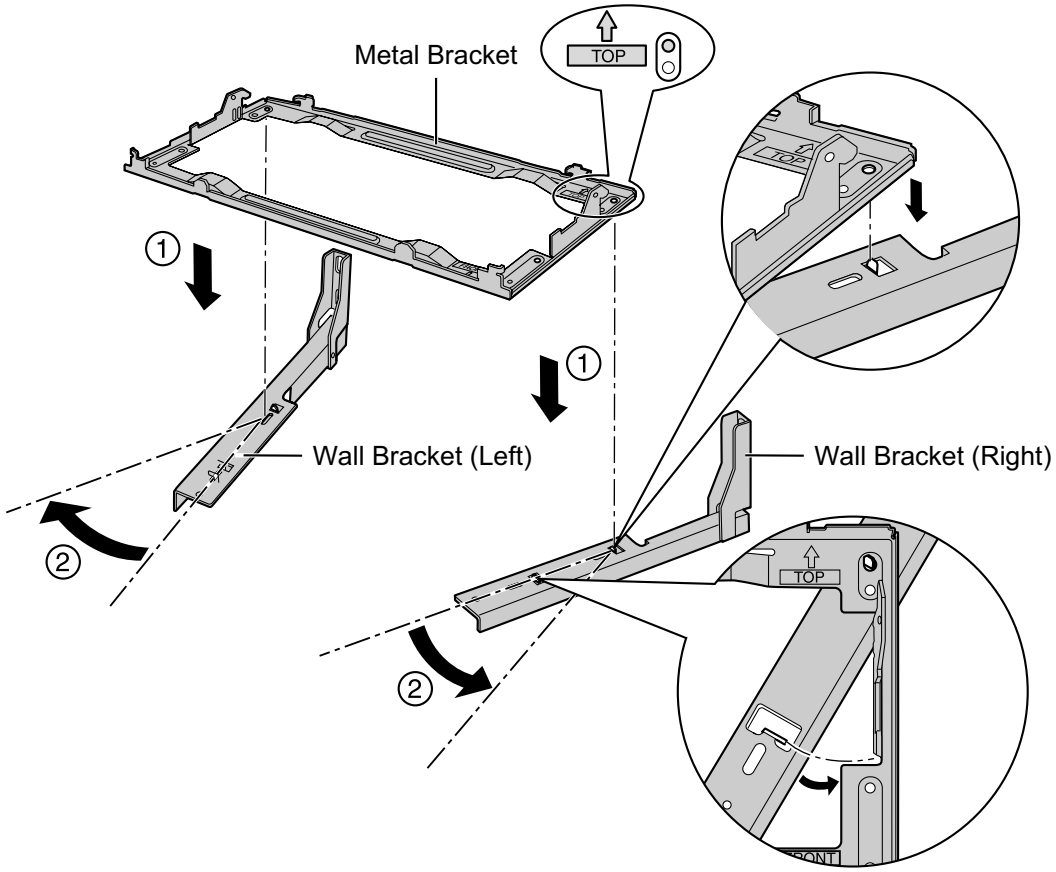


4. Secure Expansion Shelf 1 to the metal bracket with 2 screws (B).

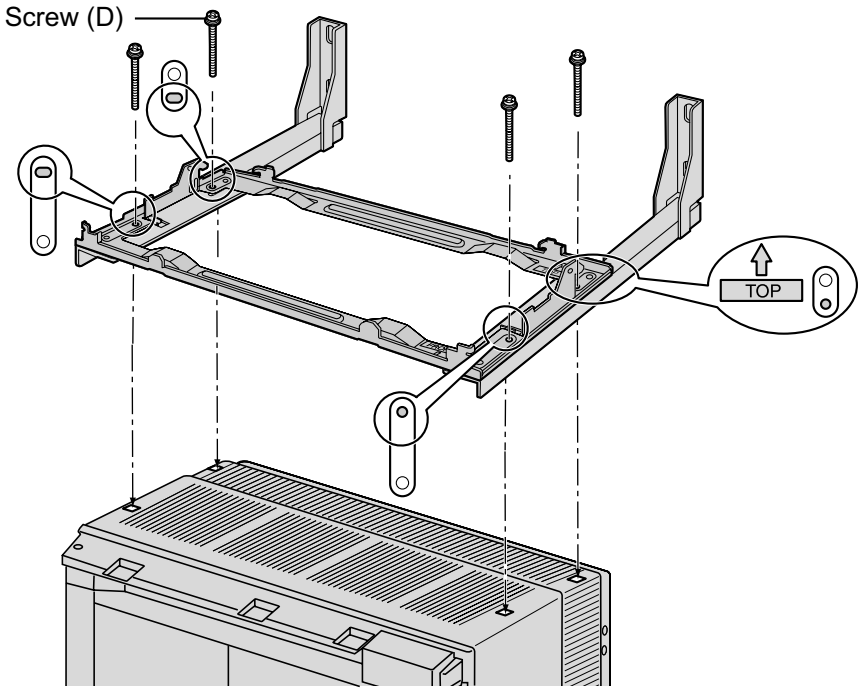


Fixing to the Wall

1. Attach the metal bracket to the wall brackets.



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

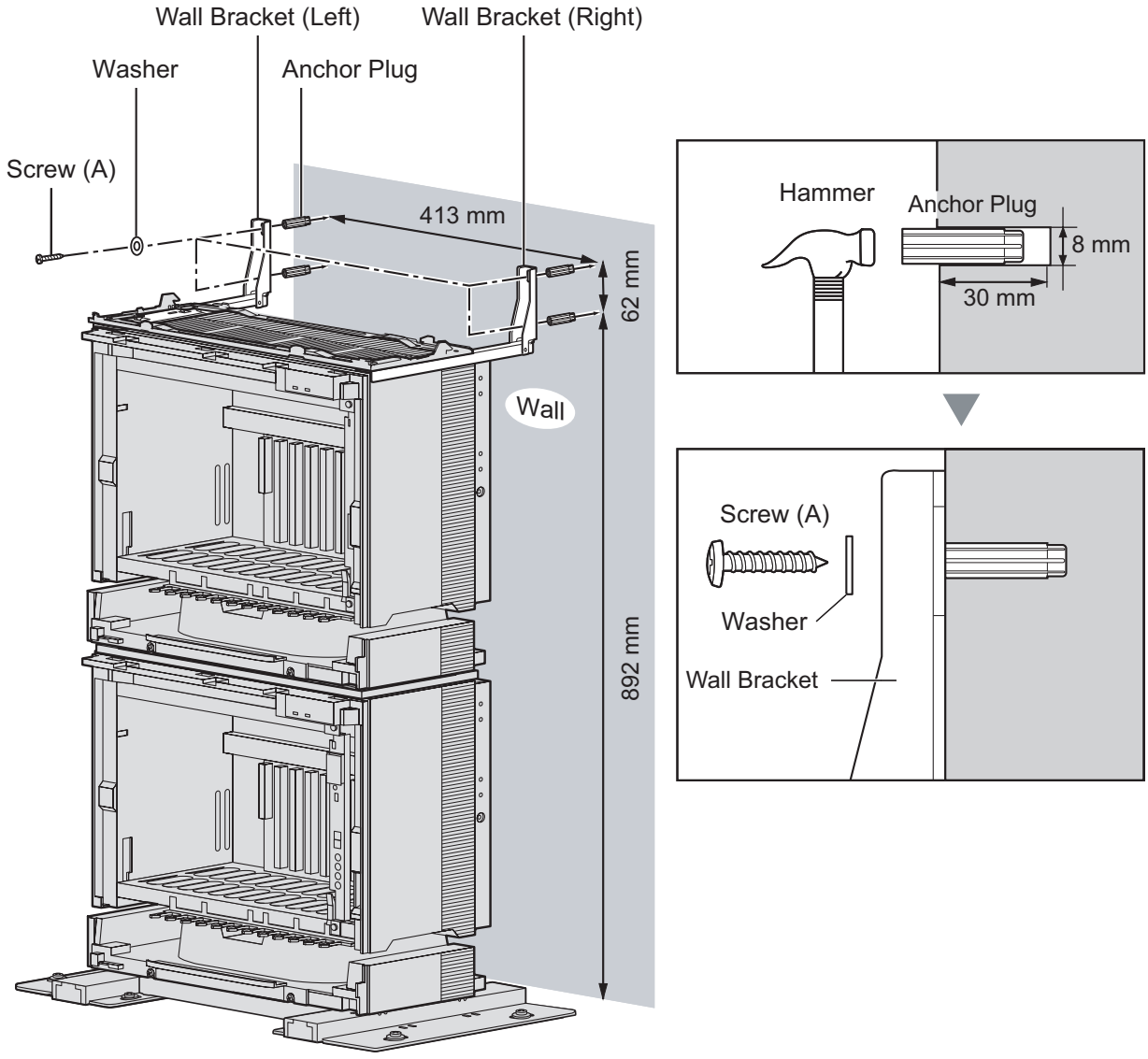


3. Install 4 anchor plugs in the wall, using the wall brackets as a template. Fix the wall brackets to the wall with 4 screws (A).

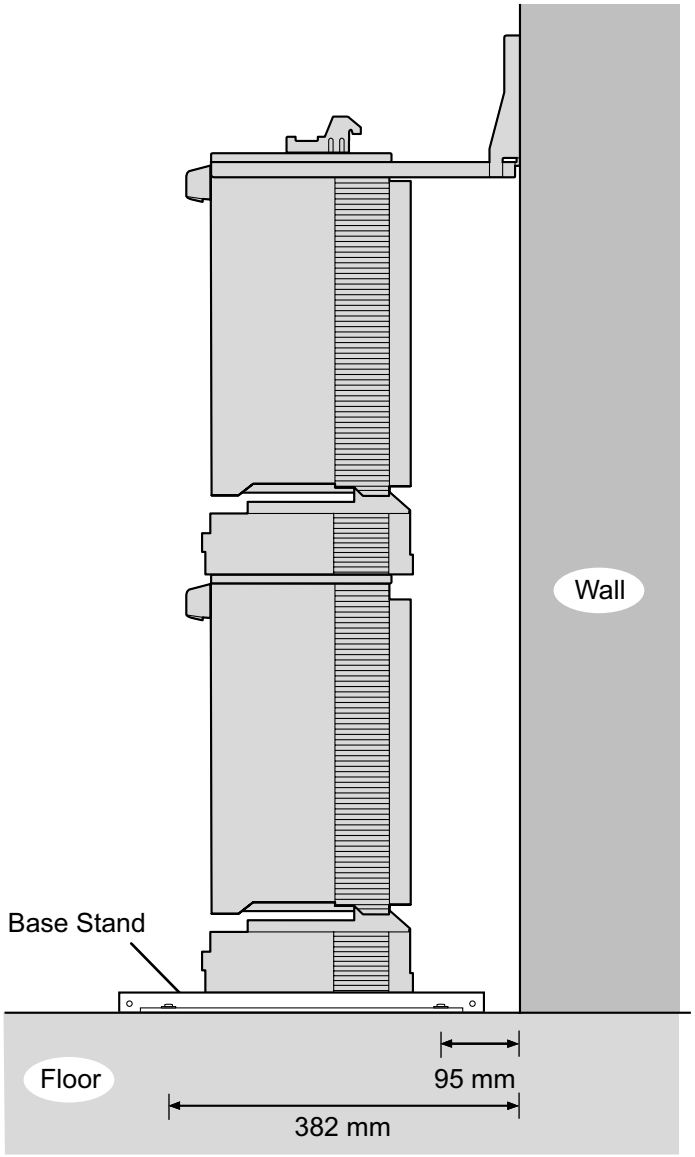
Notice

- 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.

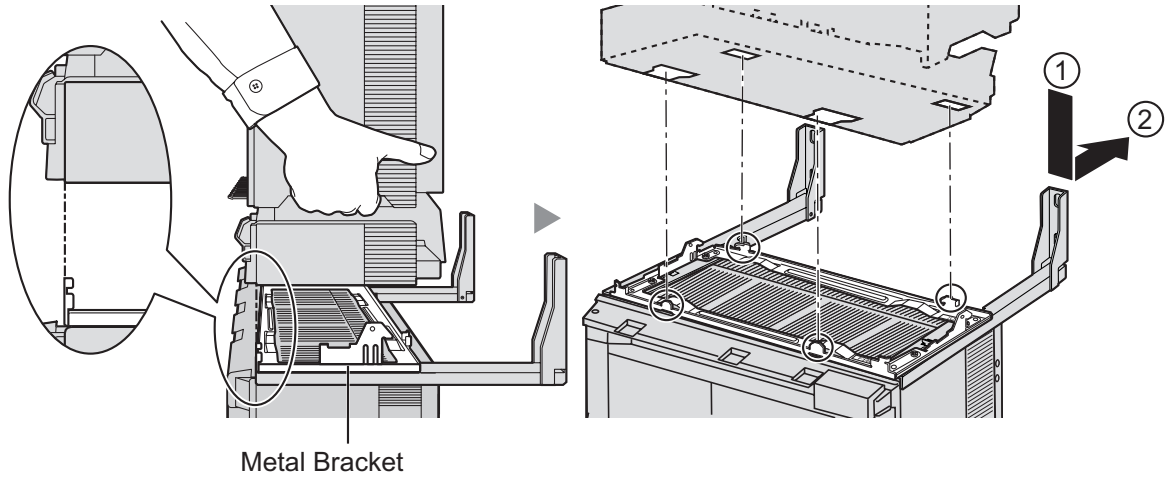


4. Check that the shelves are standing exactly vertically. If the shelves are leaning slightly to one side, move the base stands to adjust the position. (Since the base stands are attached loosely to the floor, it should be possible to adjust the position of the shelves.)
Then, tighten the screws connecting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

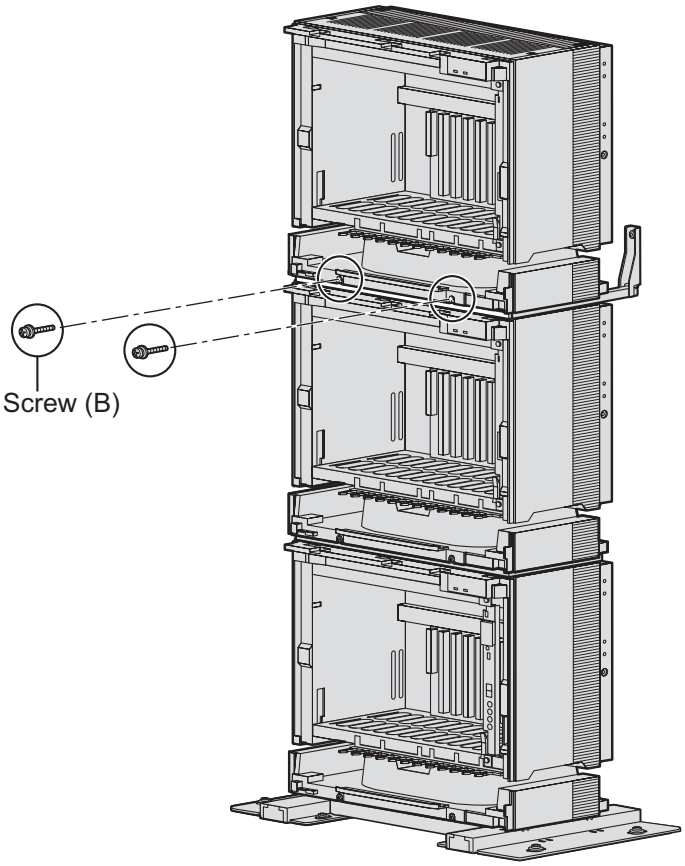


Expansion Shelf 2

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).



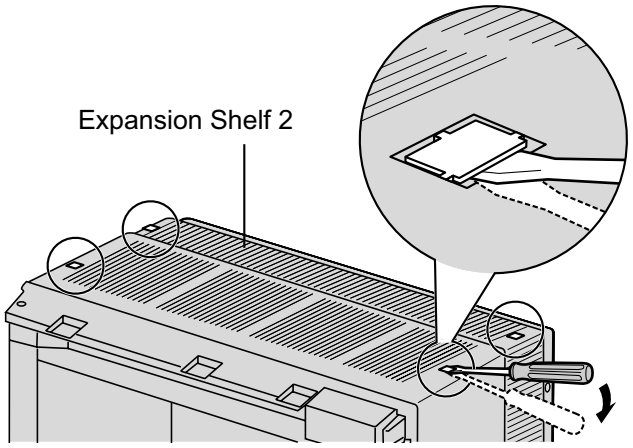
Installation of a 3-shelf system is complete. Next, it is necessary to connect the shelves.
If you are installing a 4-shelf system, follow the procedure below before connecting the shelves.

Mounting Expansion Shelf 3

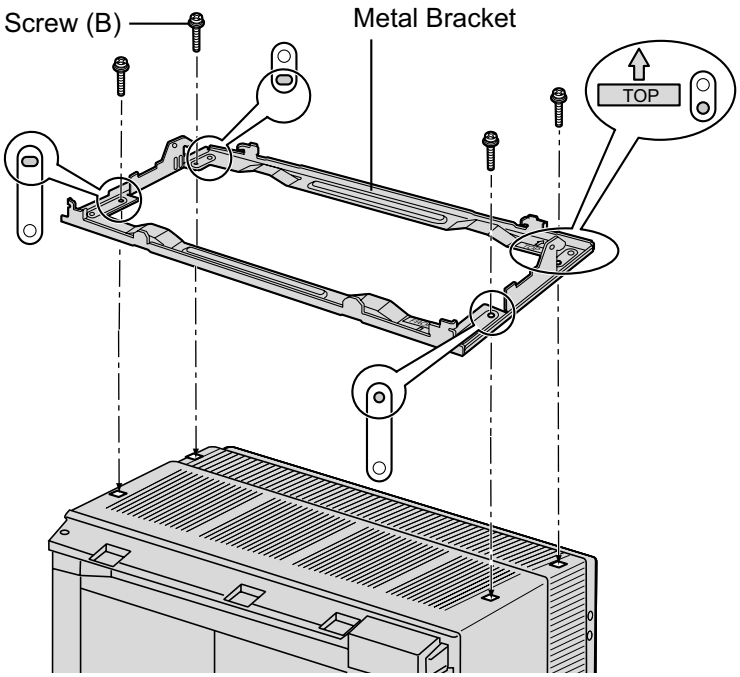
For the 4-shelf system, attach the metal bracket (supplied with Expansion Shelf 3) to Expansion Shelf 2 first. Then, attach the wall brackets (supplied with the Mounting Kit) to Expansion Shelf 3. After mounting Expansion Shelf 3 on Expansion Shelf 2, fix Expansion Shelf 3 to the wall.

Expansion Shelf 3

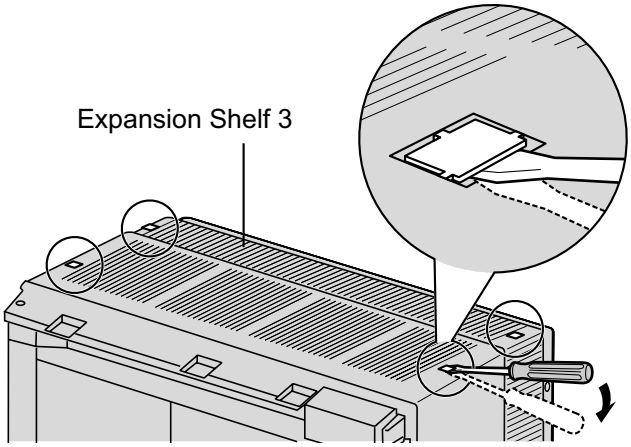
1. Remove the 4 tabs on the top cover of Expansion Shelf 2, by using a flathead screwdriver, as shown below.



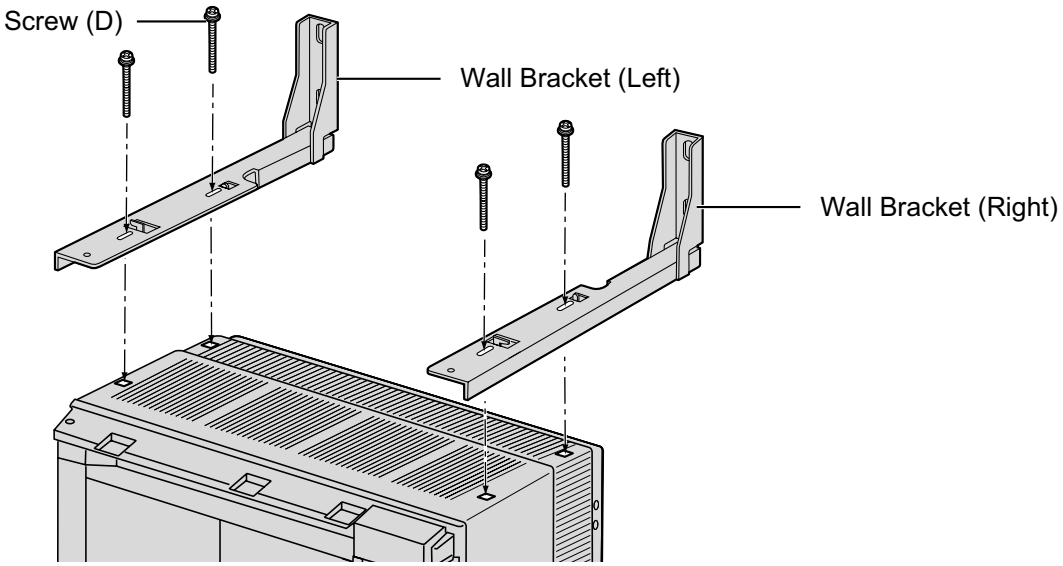
2. Fix the metal bracket to Expansion Shelf 2 with 4 screws (B).



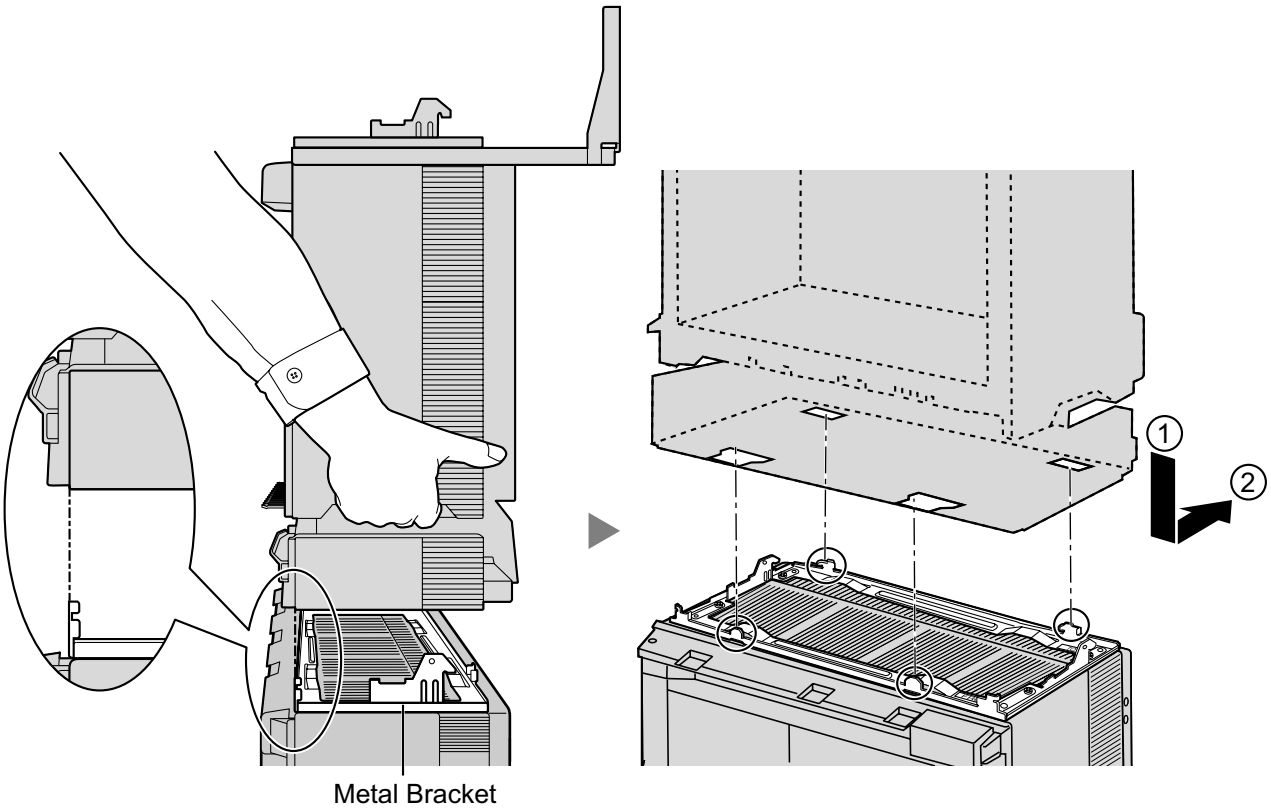
3. Remove the 4 tabs on the top cover of Expansion Shelf 3, by using a flathead screwdriver, as shown below.



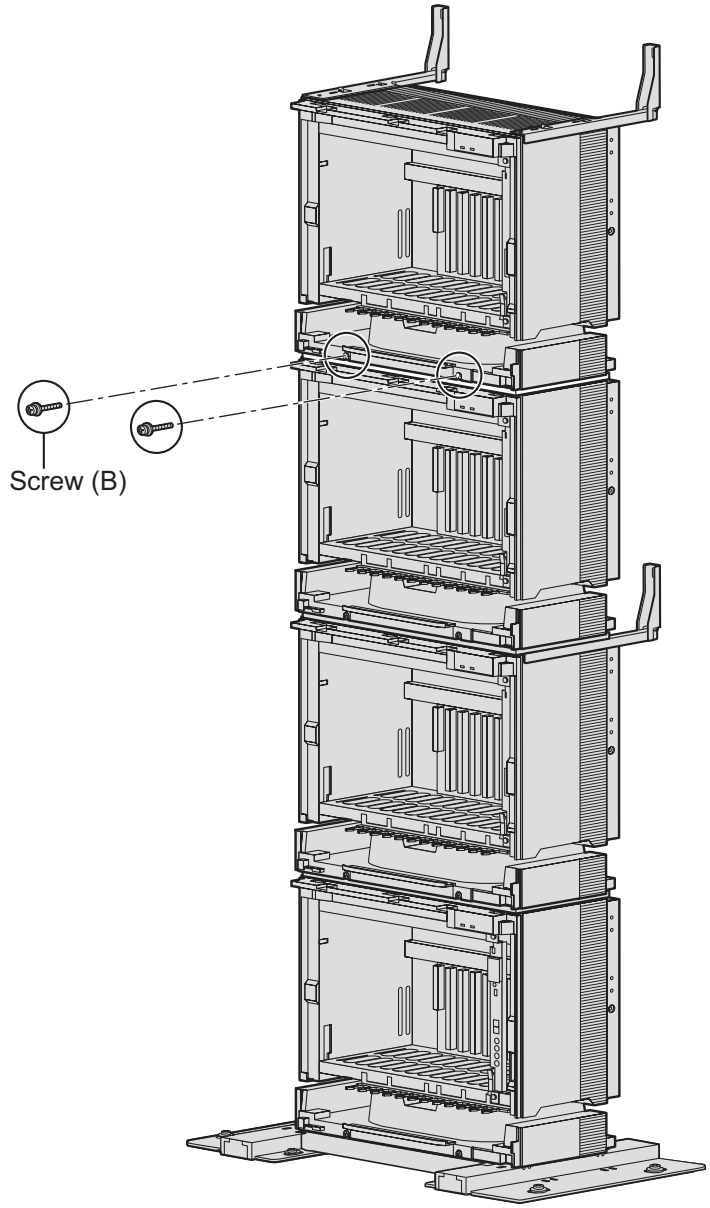
4. Fasten the wall brackets loosely to Expansion Shelf 3 with 4 screws (D). (This makes it easy to adjust the position of the shelves later.)



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



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

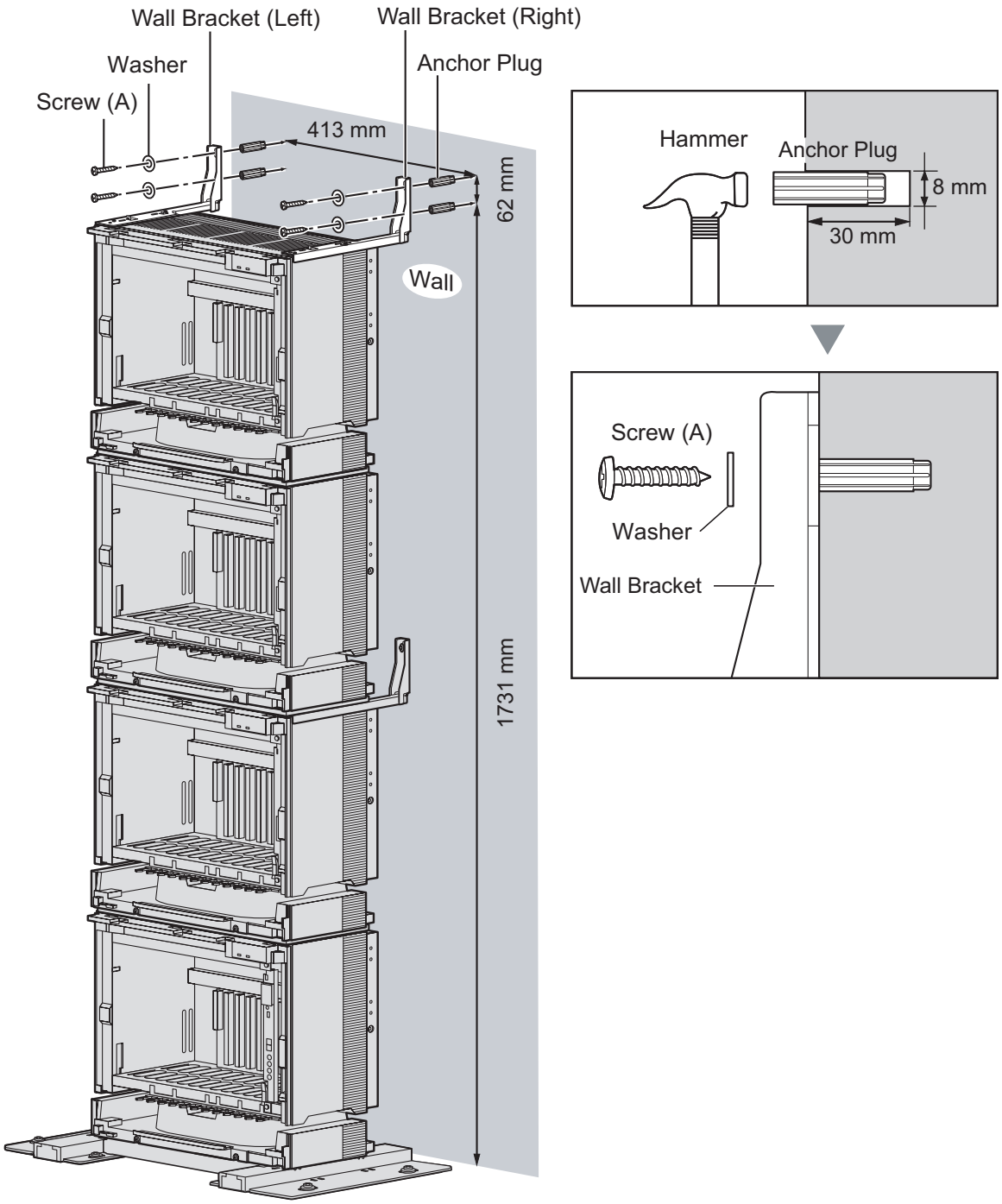


Fixing to the Wall

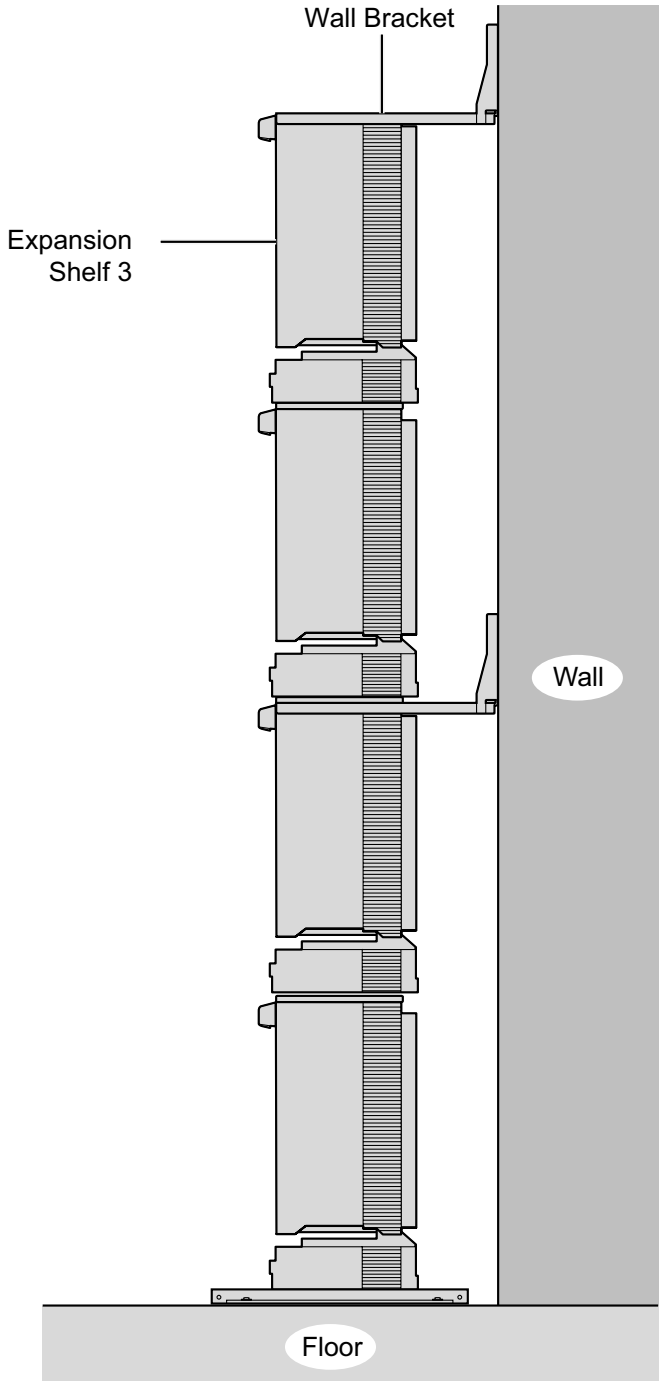
1. Install 4 anchor plugs in the wall, using the wall brackets as a template. Fix the wall brackets to the wall with 4 screws (A).

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.

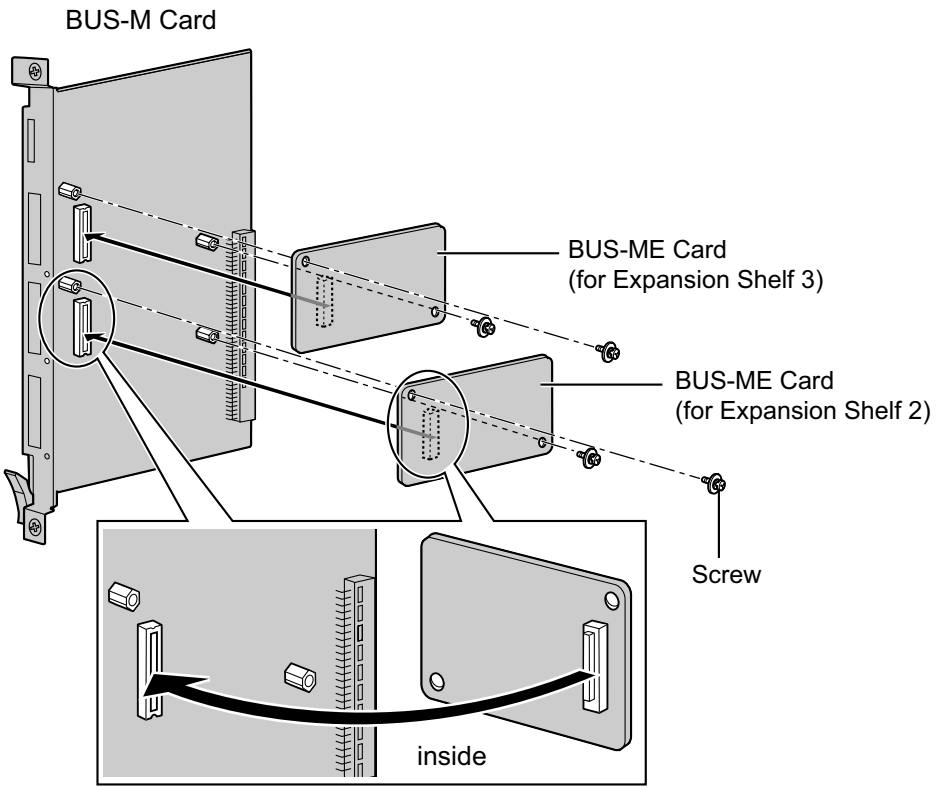
Connecting Shelves

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".

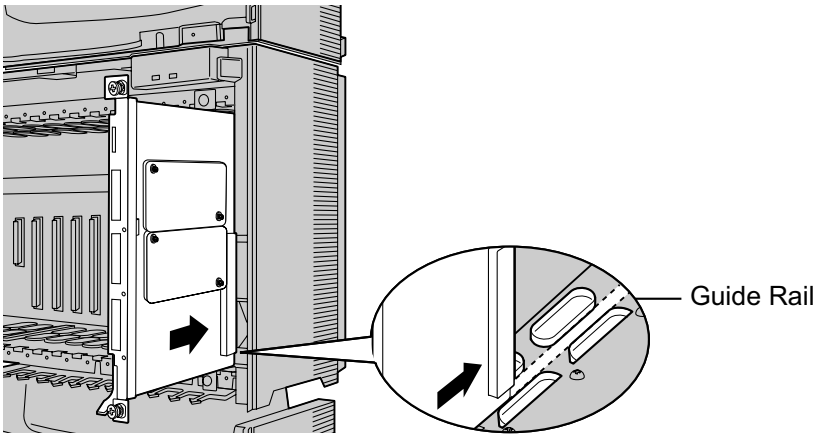
Note

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

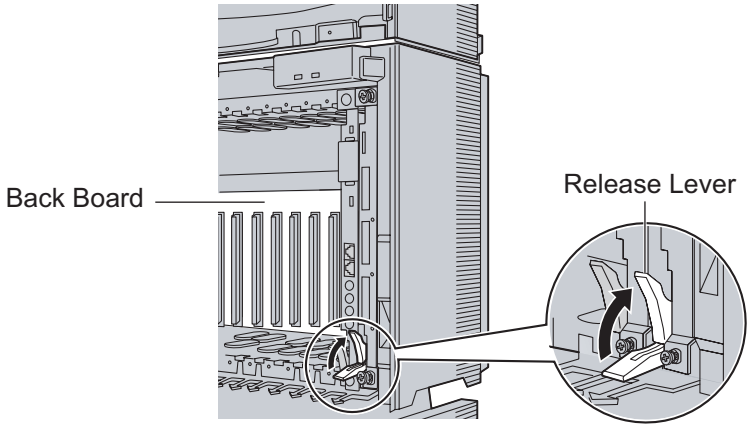
1. Mount 1 BUS-ME card (for a 3-shelf system), or 2 BUS-ME cards (for a 4-shelf system) on the BUS-M card as shown below.



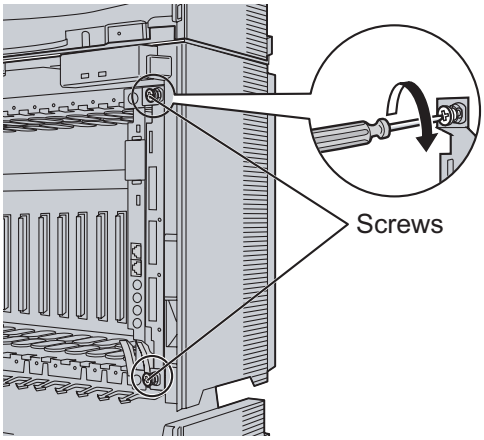
2. Insert the BUS-M card along the guide rails in the BUS-M Card Slot (the right-most slot) of the Basic Shelf.



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.



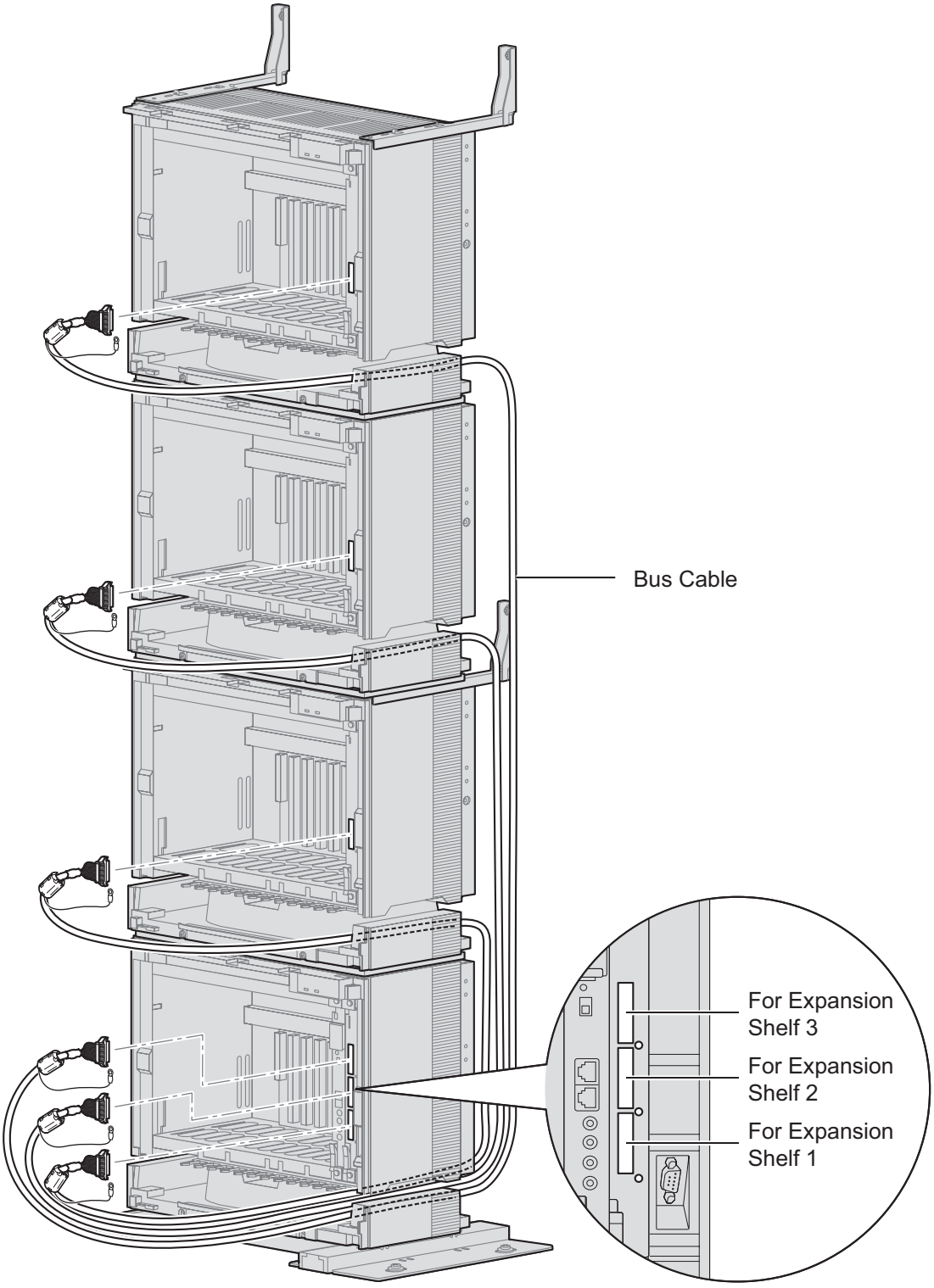
4. Turn the 2 screws clockwise to fix the BUS-M card in place.



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

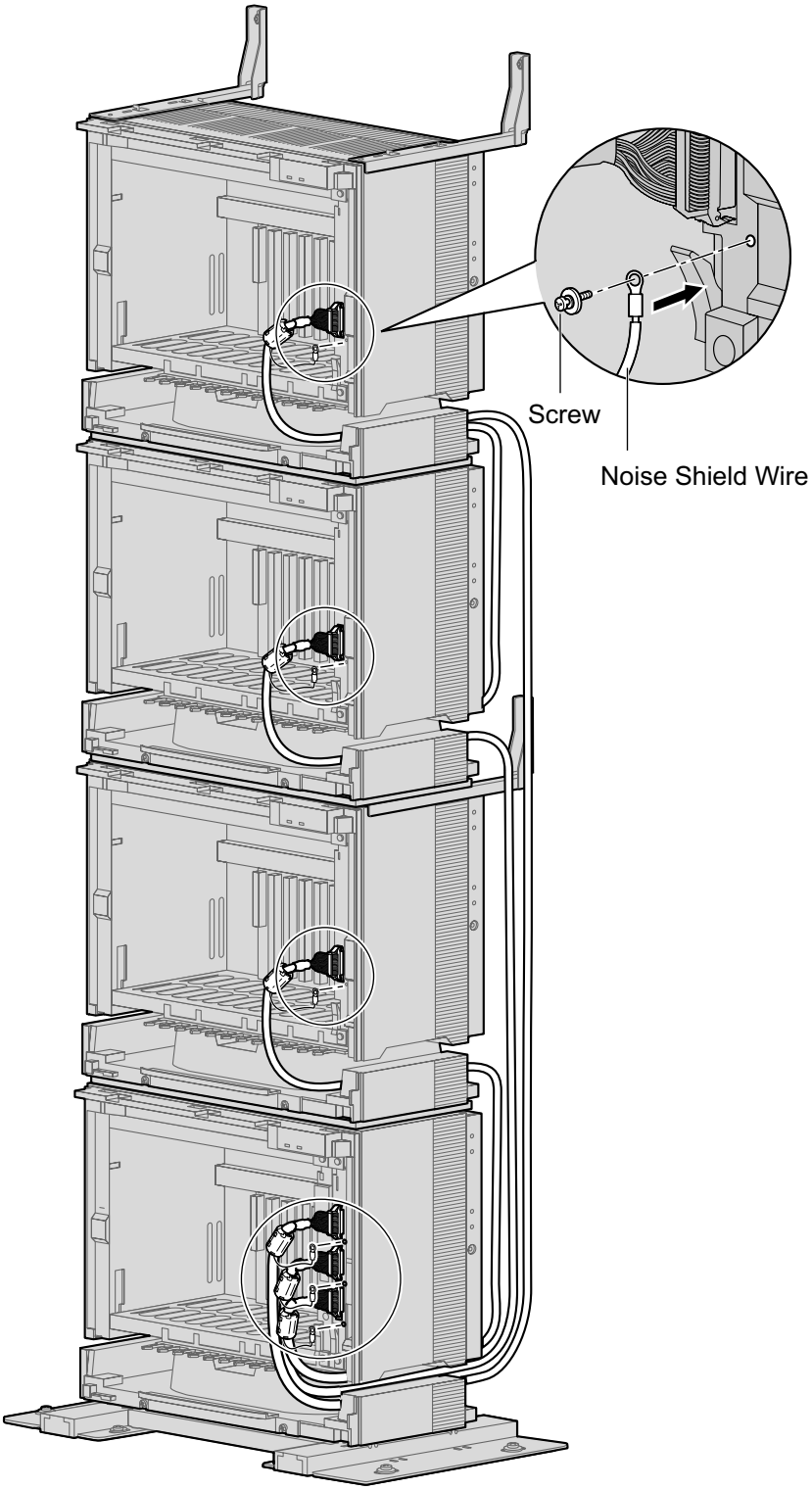
When plugging or unplugging the Bus Cables, make sure that the DC power supply is turned off.



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

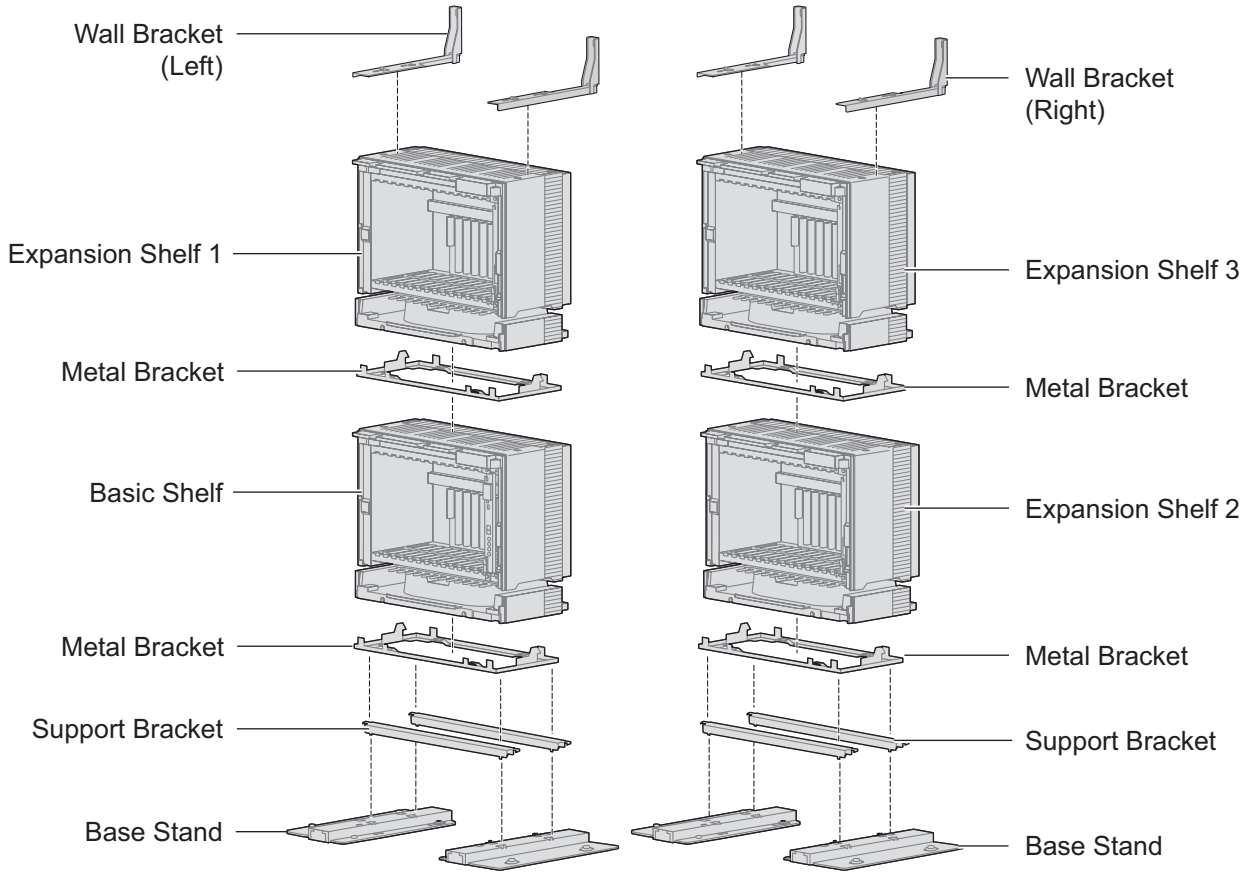
When attaching or removing the noise shield wires, make sure that the DC power supply is turned off.



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 at the sides of the shelf, and 20 cm 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

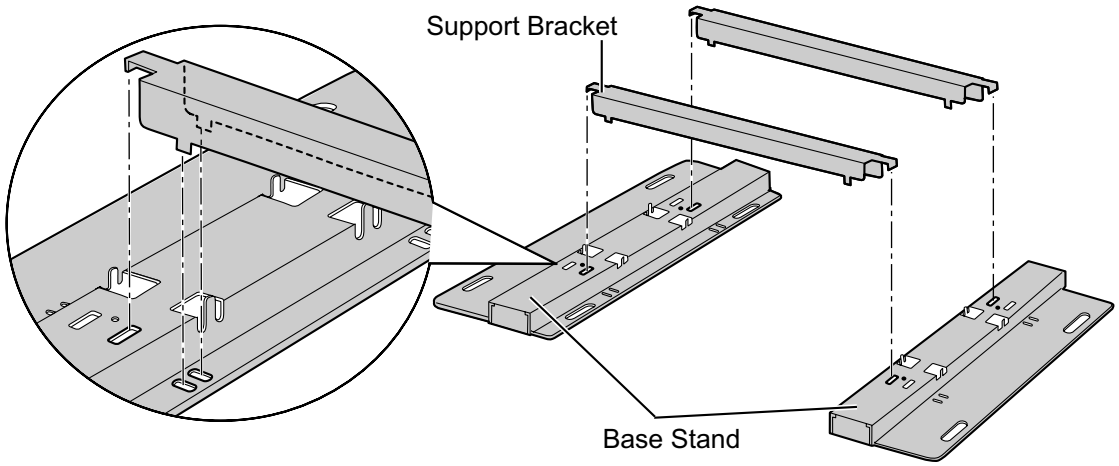
- Make sure to remove the front cover from each shelf before installing the shelves (refer to "3.2.3 Opening/Closing the Front Cover").
- Do not install any optional service cards or a PSU in the shelves before installation.
- Make sure to install the shelves where the Bus Cable (supplied with a BUS-M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

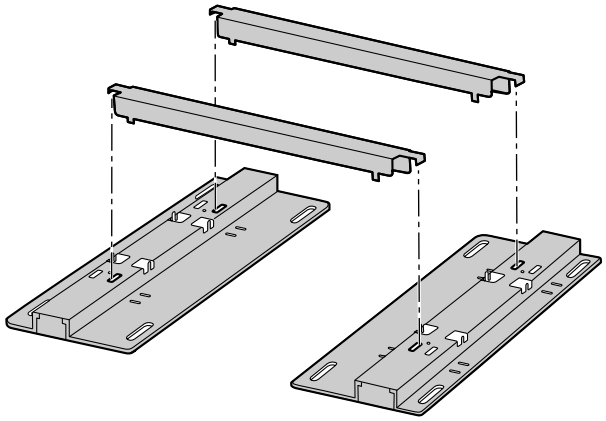
Basic Shelf

1. Attach the support brackets to the base stands.

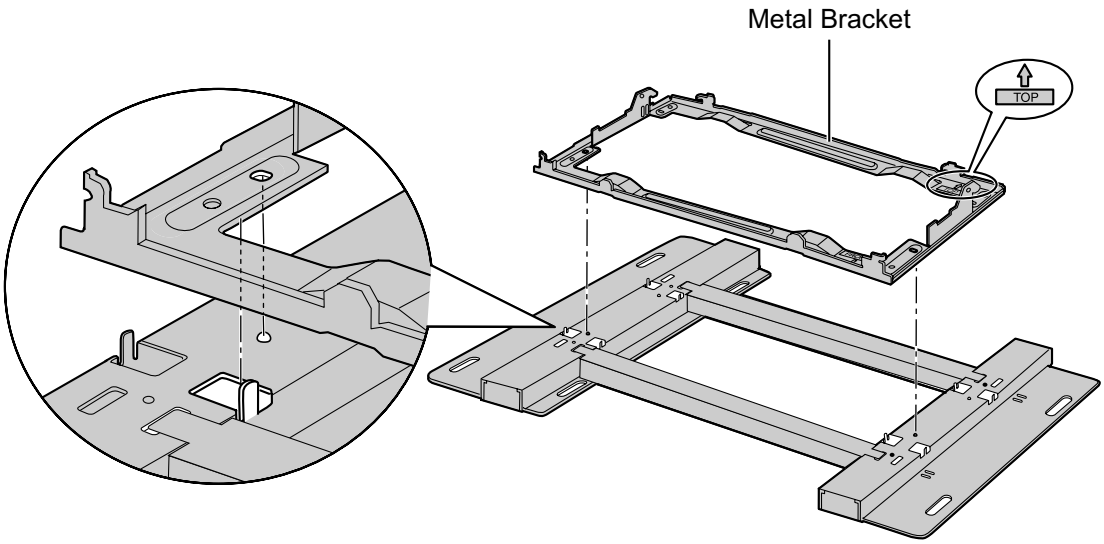


Note

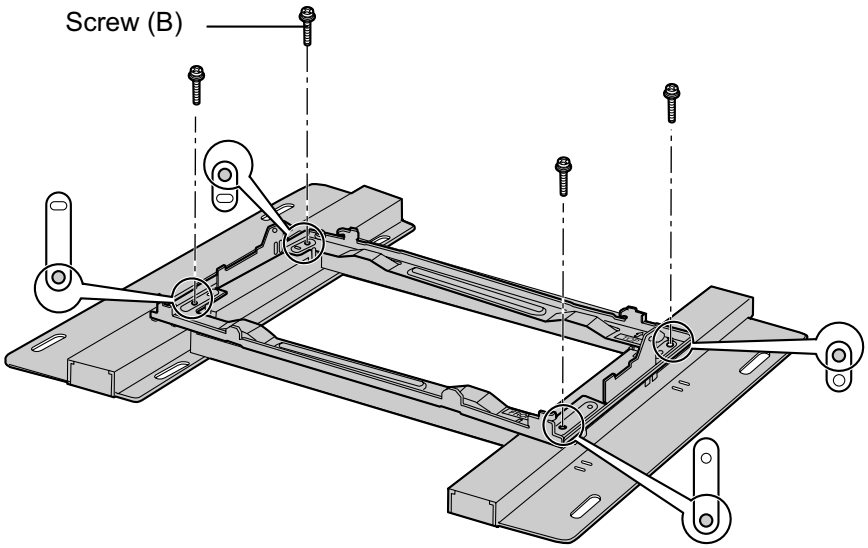
If necessary, it is possible to reverse the direction of the base stands as shown below:



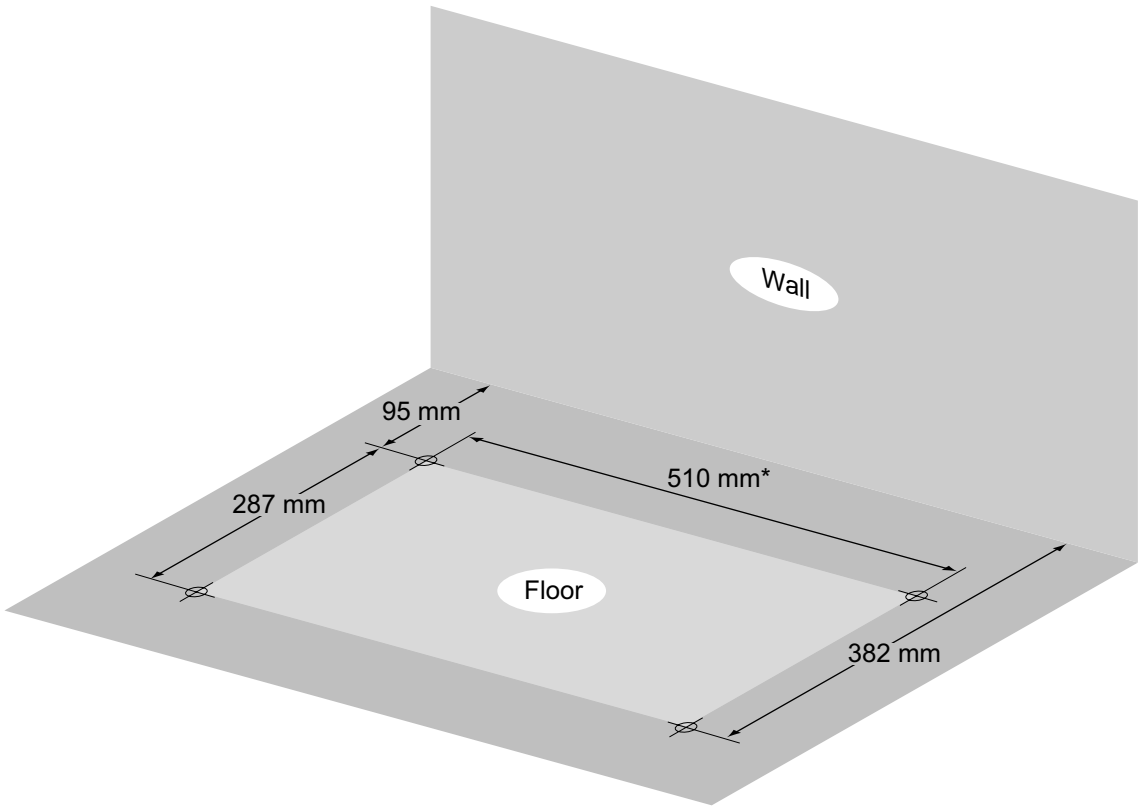
2. Place the metal bracket on the base stands.



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

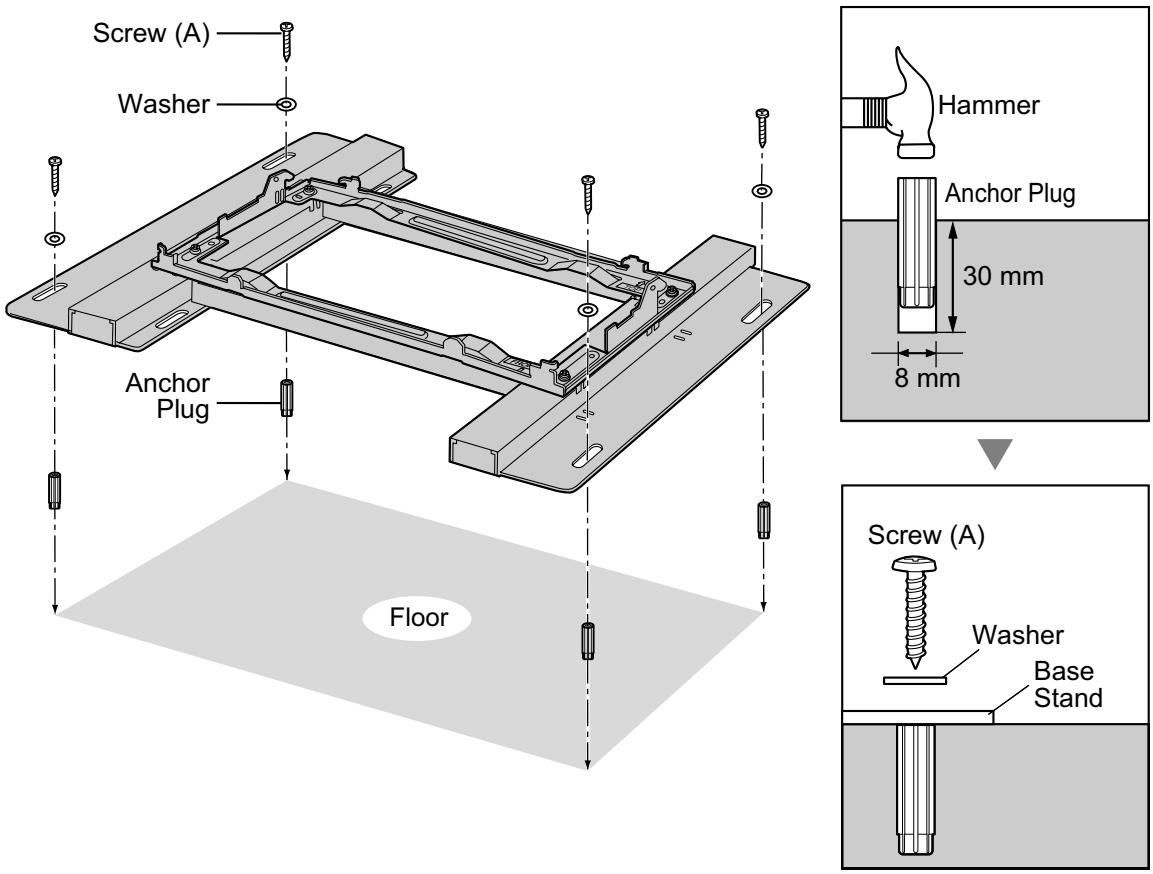


4. Make 4 holes for anchor plugs on the floor, using the measurements indicated here.

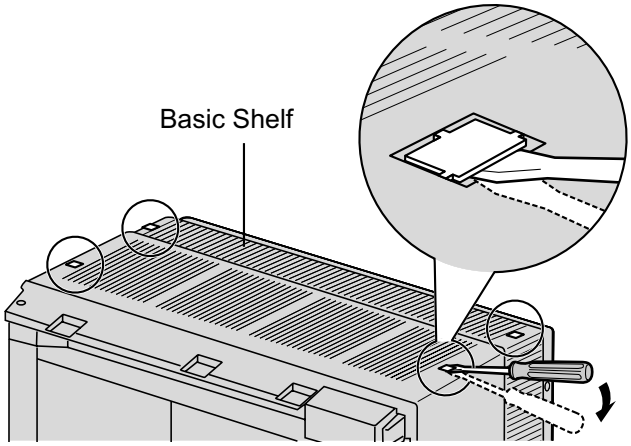


* If the direction of the base stands is reversed, the measurement must be 443.4 mm.

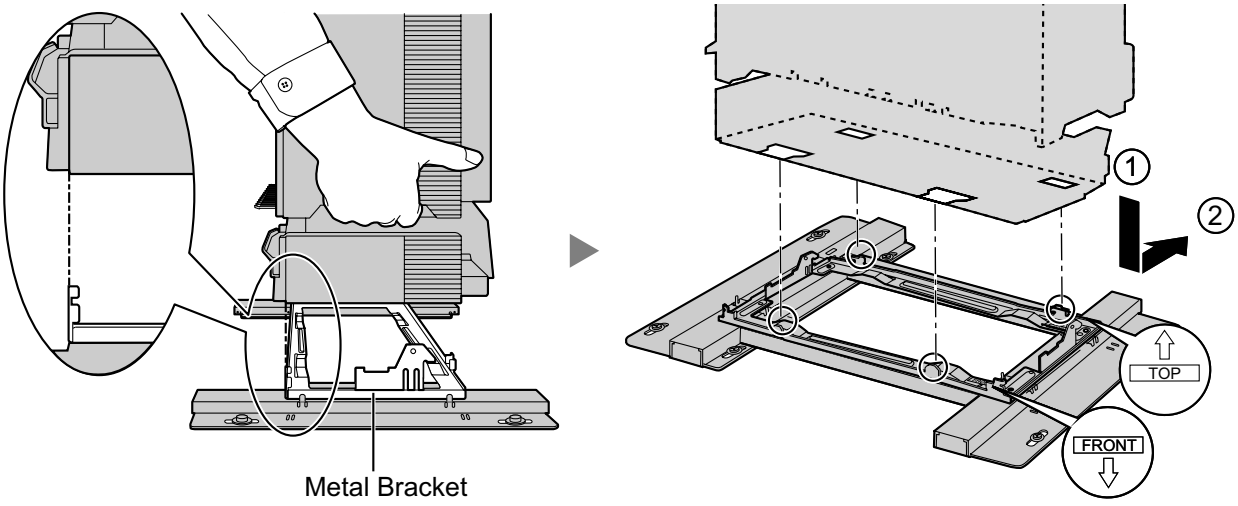
5. Install 4 anchor plugs in the holes on the floor.
Then, fasten the base stands to the floor with 4 screws (A).



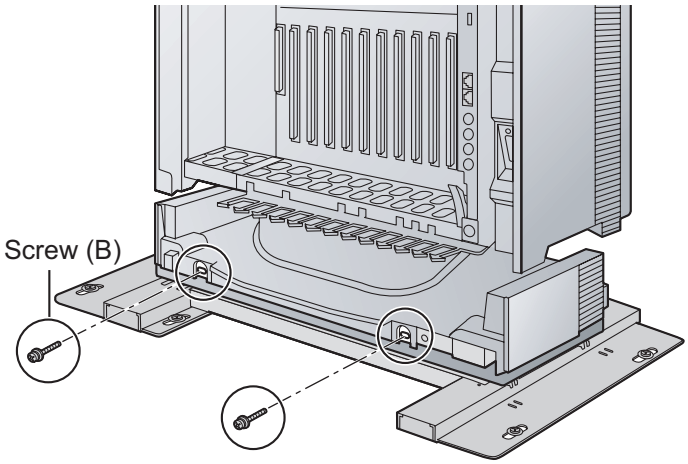
6. Remove the 4 tabs on the top cover of the Basic Shelf, by using a flathead screwdriver, as shown below.



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

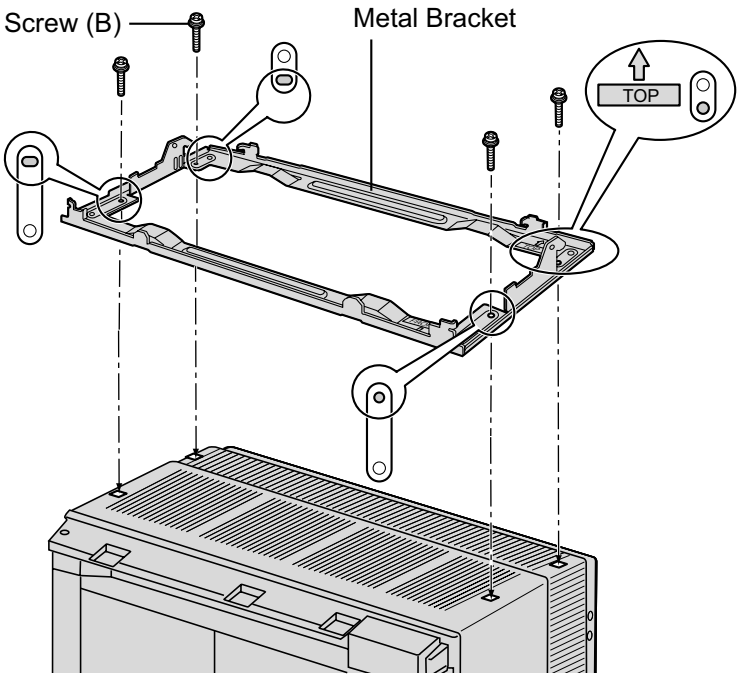


8. Secure the Basic Shelf to the metal bracket with 2 screws (B).

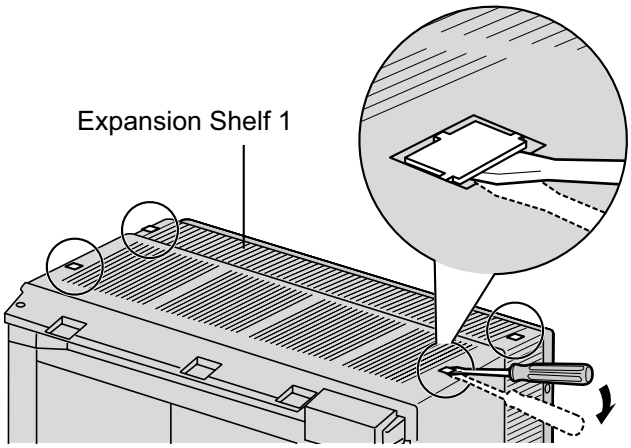


Expansion Shelf 1

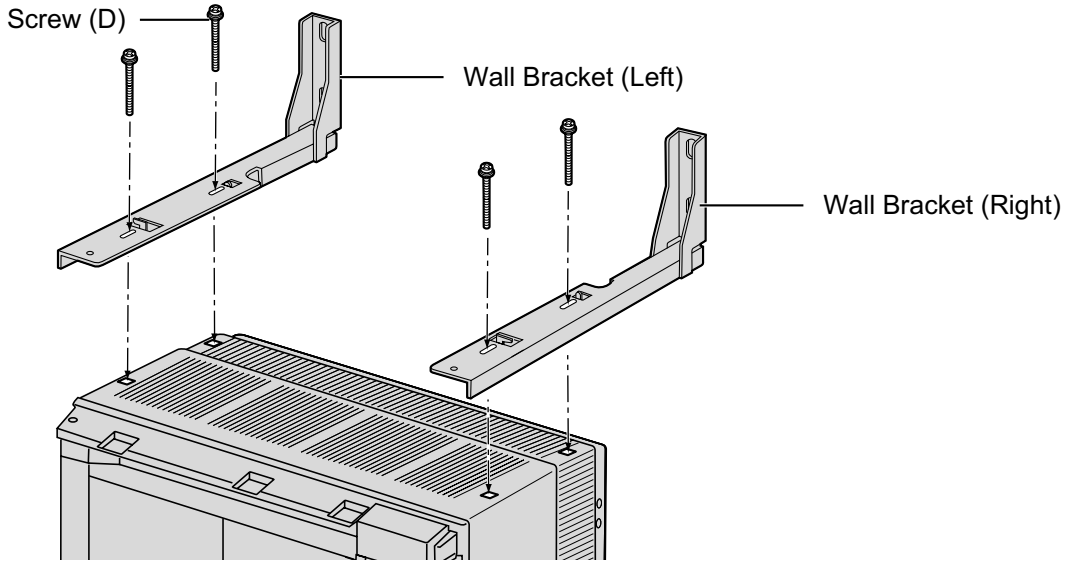
1. Fix the metal bracket to the Basic Shelf with 4 screws (B).



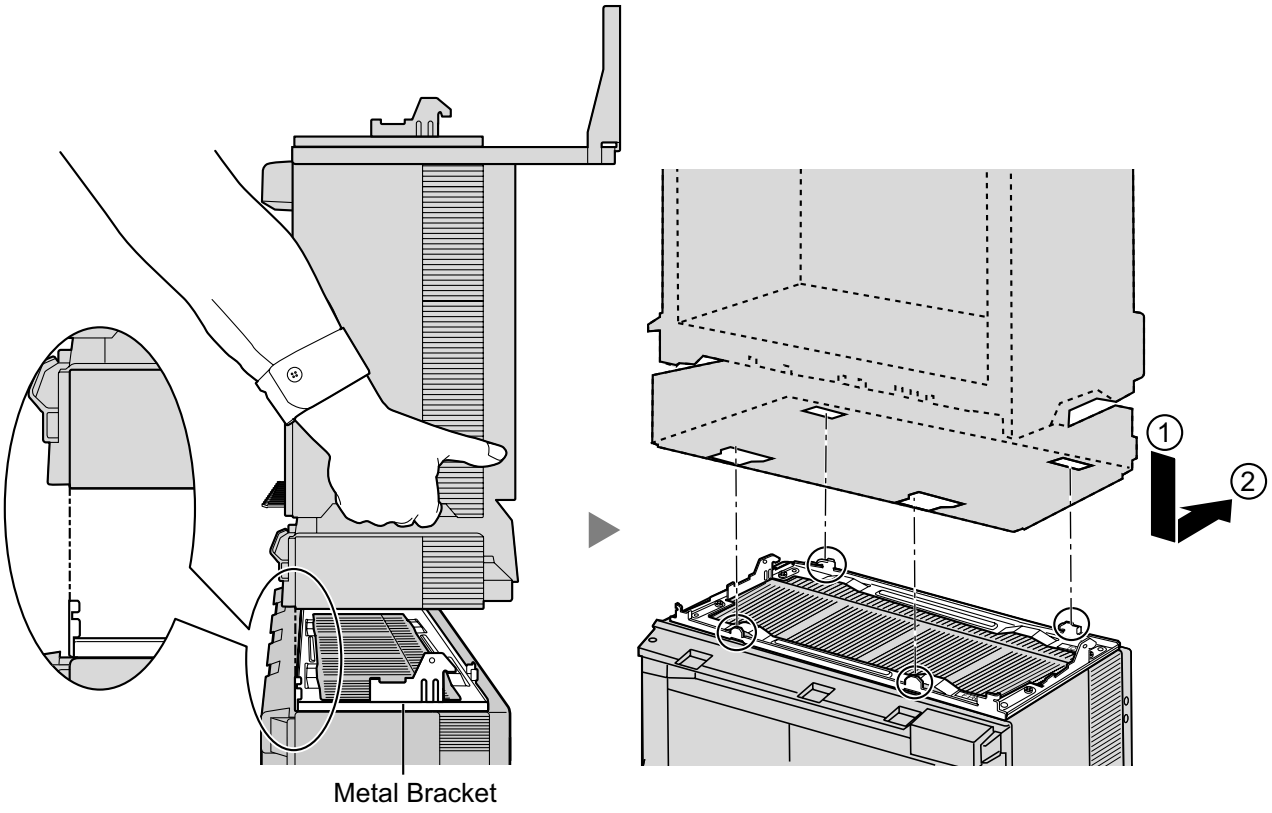
2. Remove the 4 tabs on the top cover of Expansion Shelf 1, by using a flathead screwdriver, as shown below.



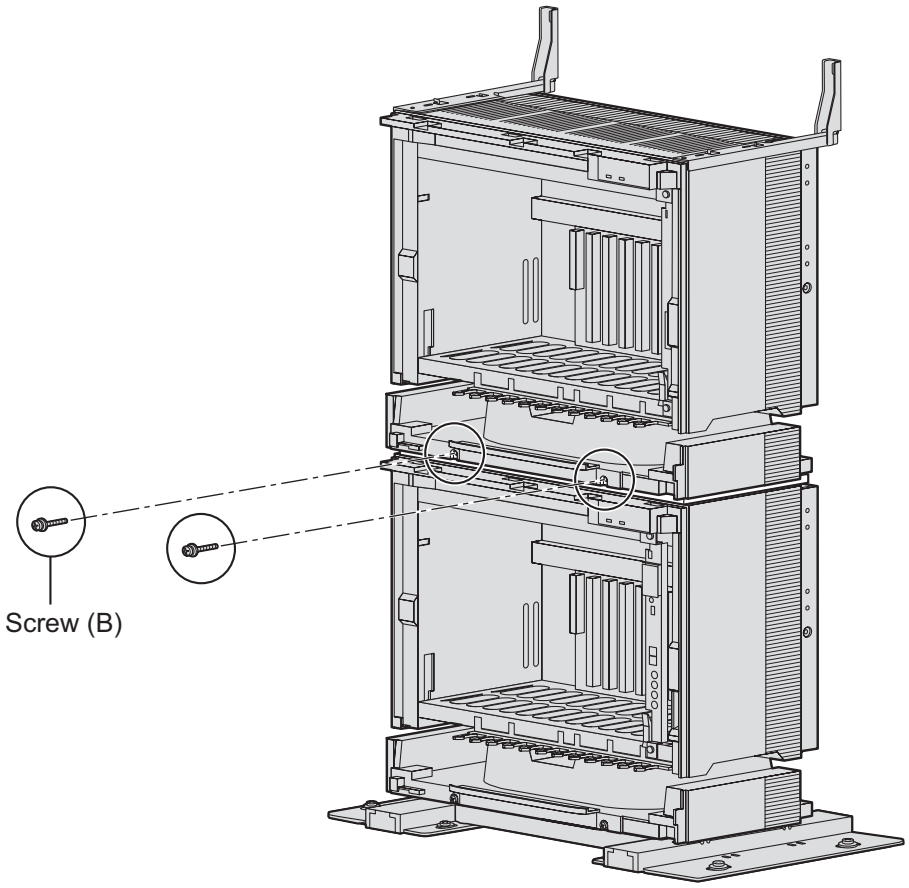
3. Fasten the wall brackets loosely to Expansion Shelf 1 with 4 screws (D). (This makes it easy to adjust the position of the shelves later.)



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).



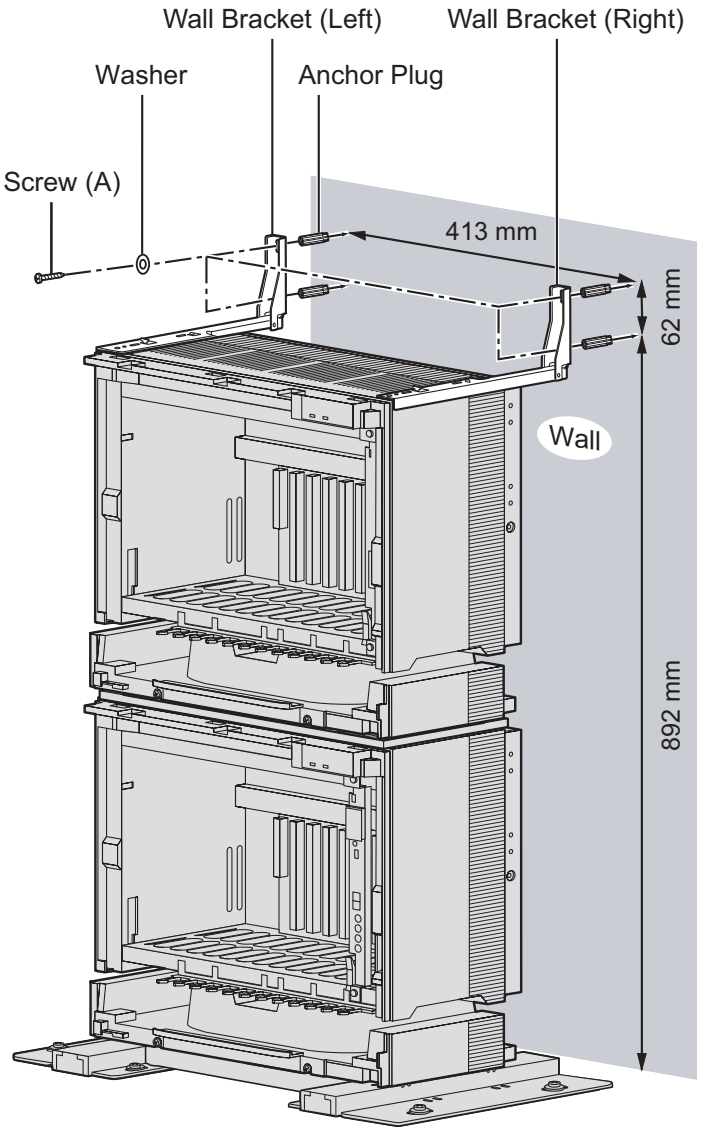
Fixing to the Wall

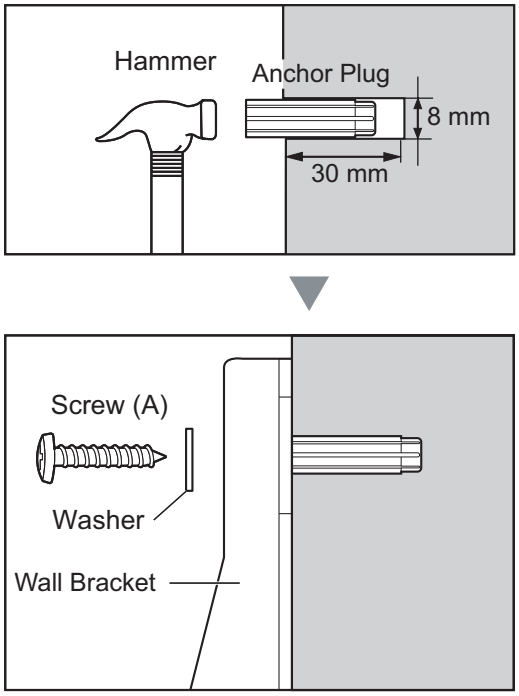
1. Install 4 anchor plugs in the wall, using the wall brackets as a template. Fix the wall brackets to the wall with 4 screws (A).

Notice

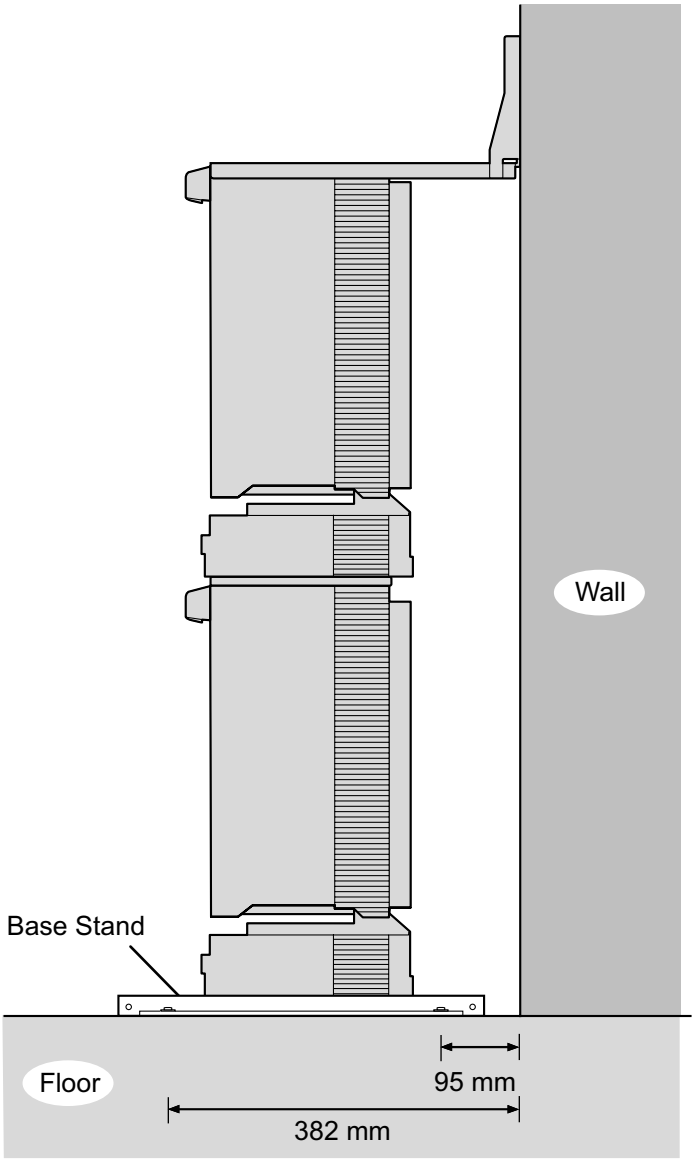
- Drive mounting screws into the wall. Be careful to avoid touching any metal laths, wire laths or metal plates in the wall.

- 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 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.

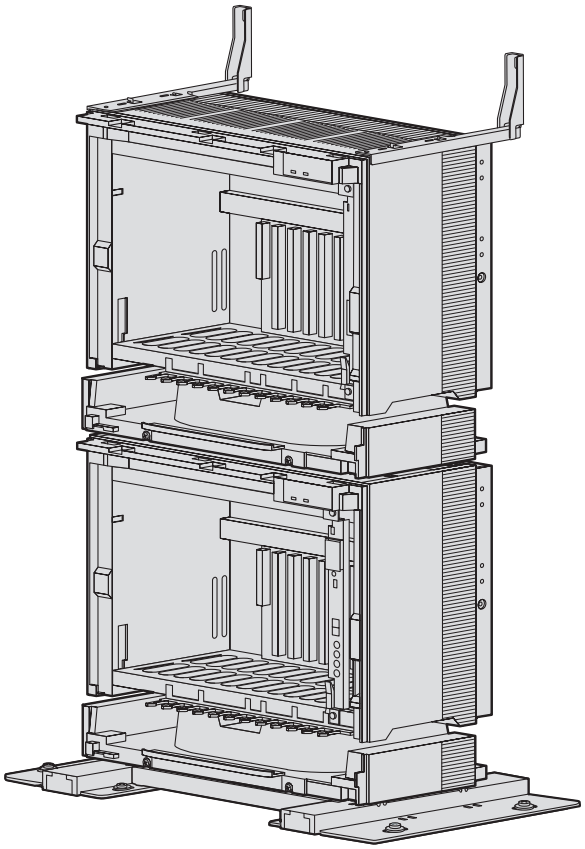


Installation of the first 2 shelves is complete. Next, install Expansion Shelves 2 and 3 next to the Basic Shelf and Expansion Shelf 1.

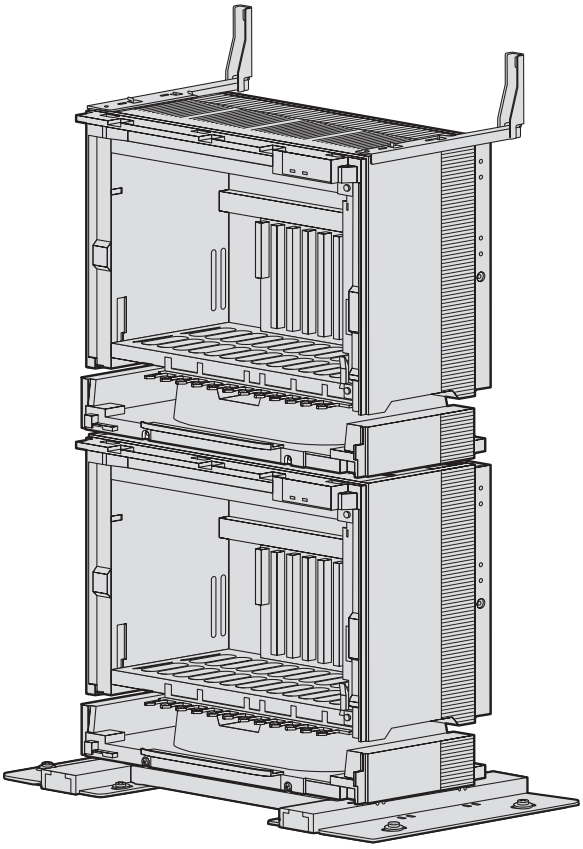
Installing Expansion Shelves 2 and 3

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.

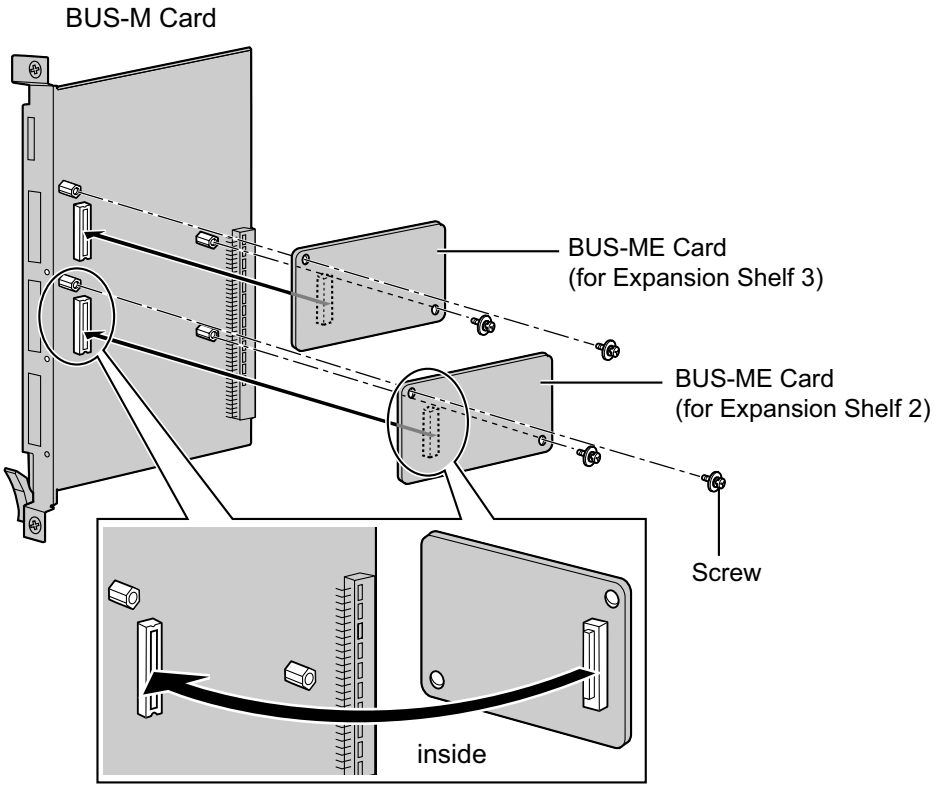
Connecting Shelves

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".

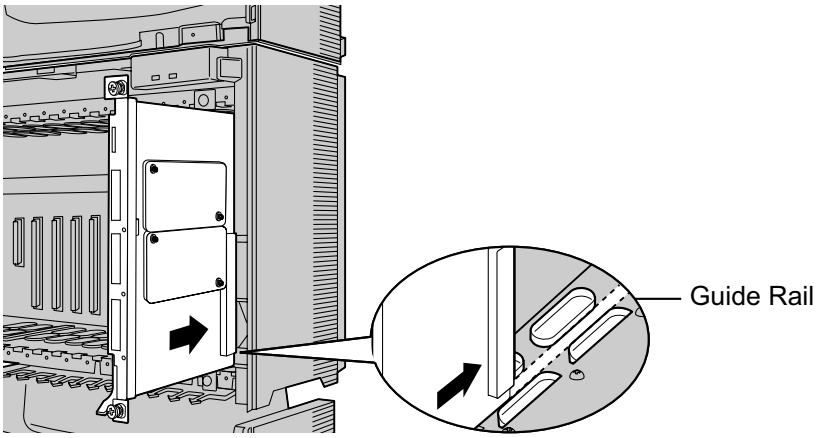
Note

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

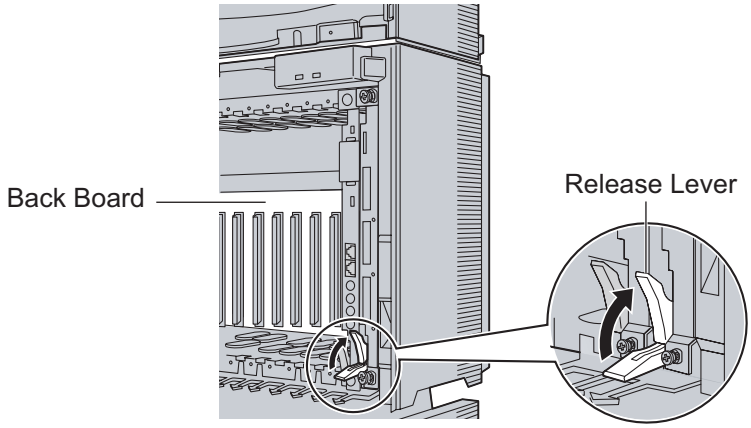
1. Mount 2 BUS-ME cards on the BUS-M card as shown below.



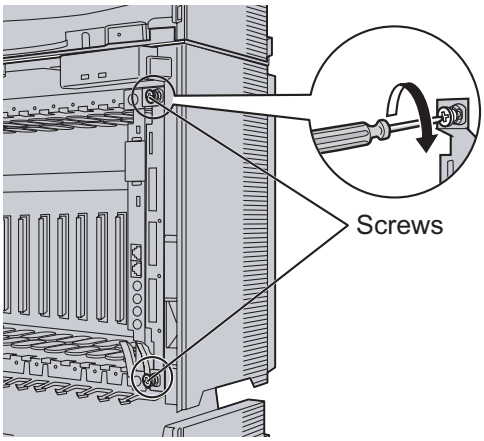
2. Insert the BUS-M card along the guide rails in the BUS-M Card Slot (the right-most slot) of the Basic Shelf.



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.



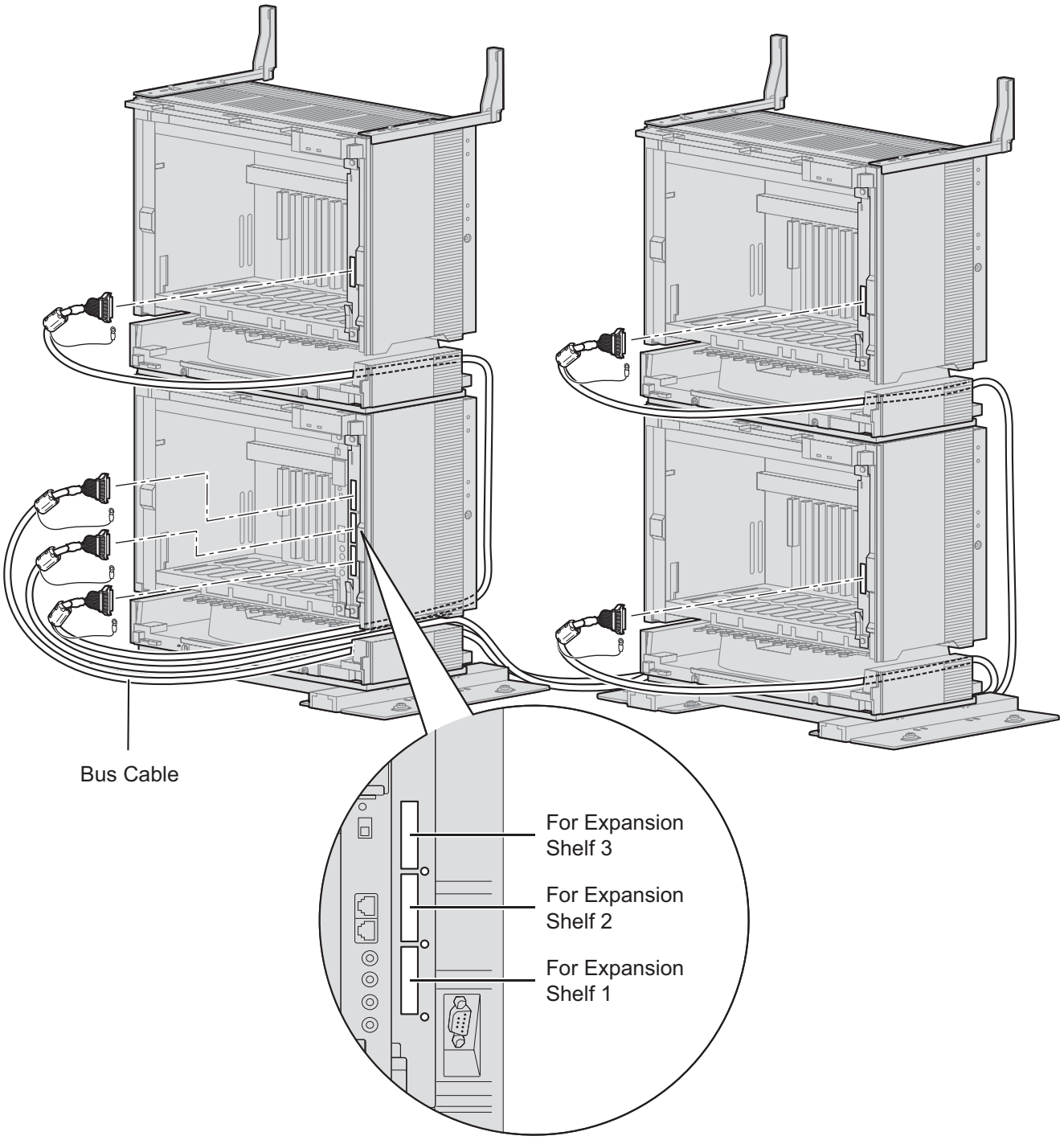
4. Turn the 2 screws clockwise to fix the BUS-M card in place.



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

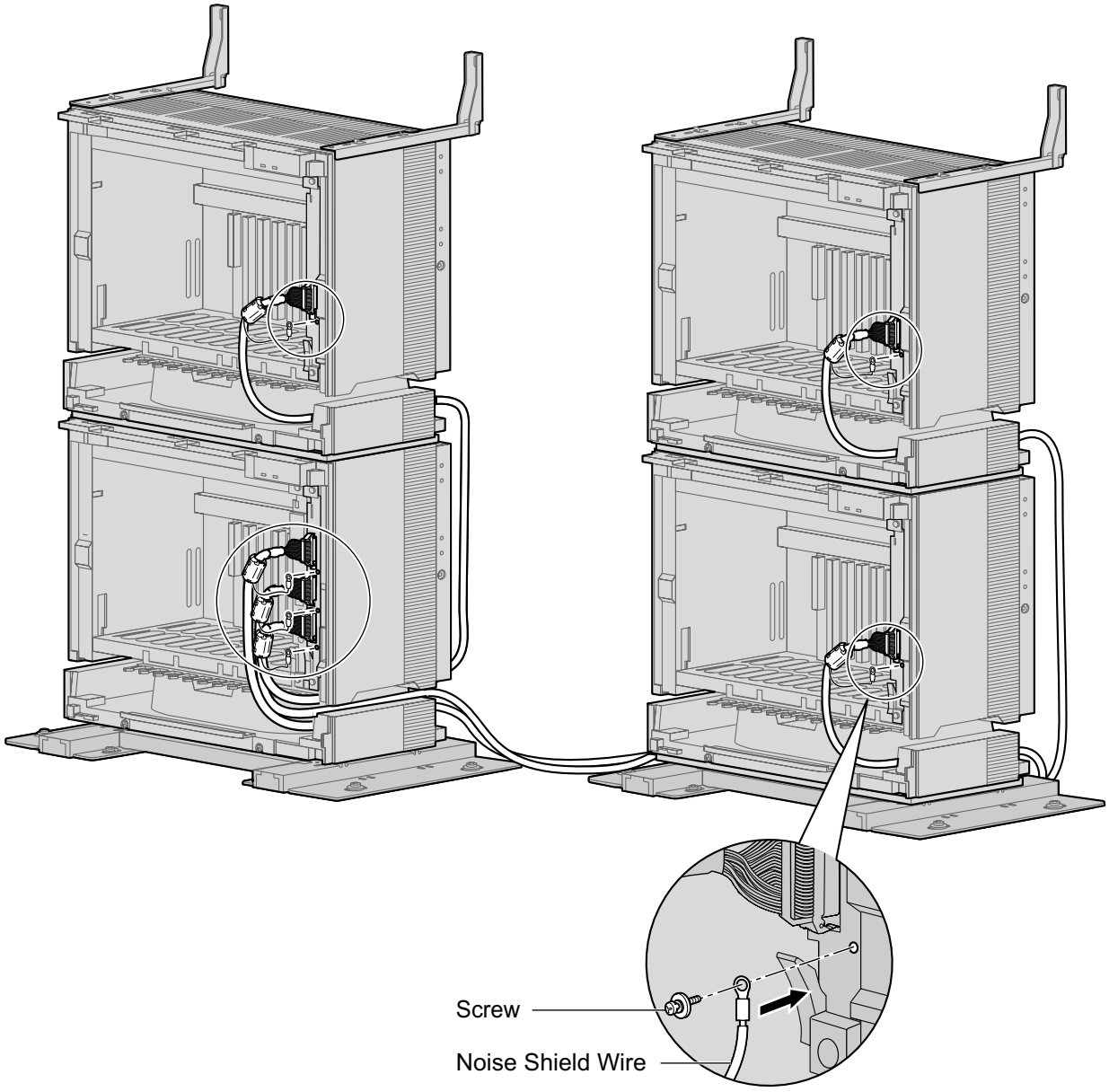
When plugging or unplugging the Bus Cables, make sure that the DC power supply is turned off.



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 above and 10 cm 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.

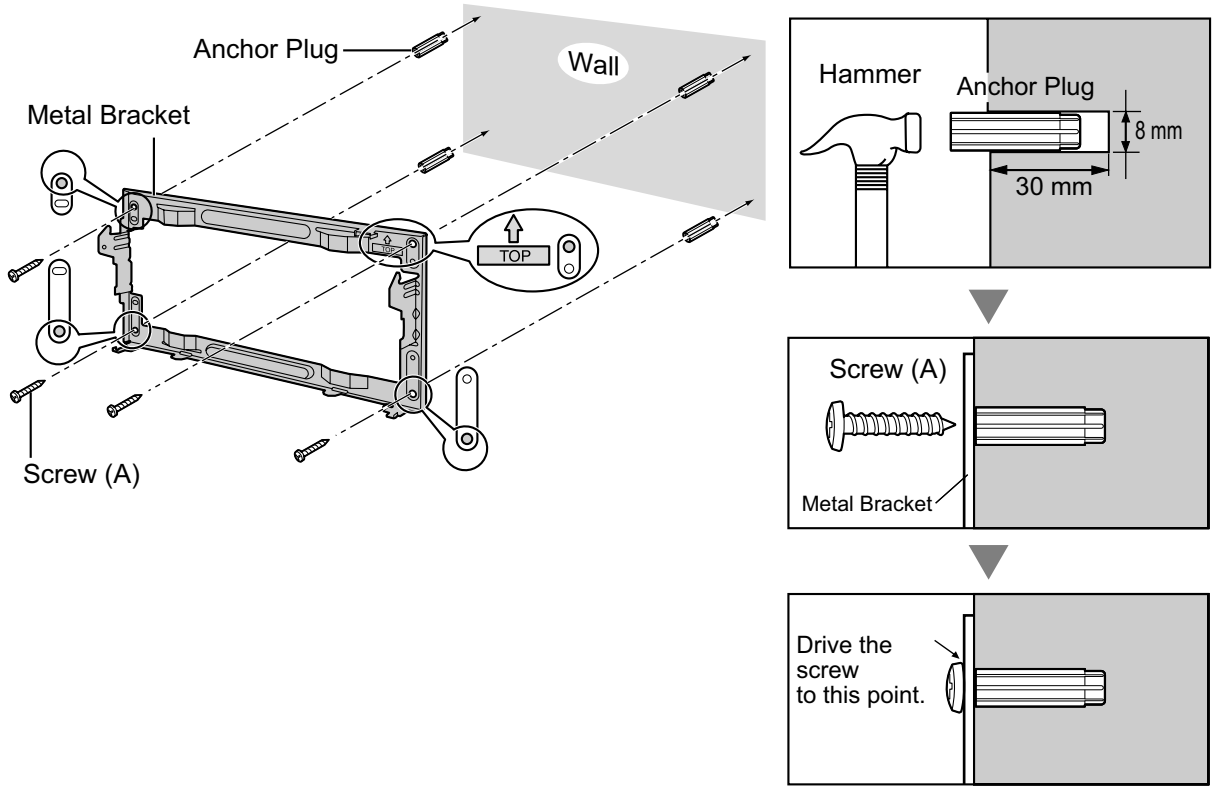
Notice

- 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.

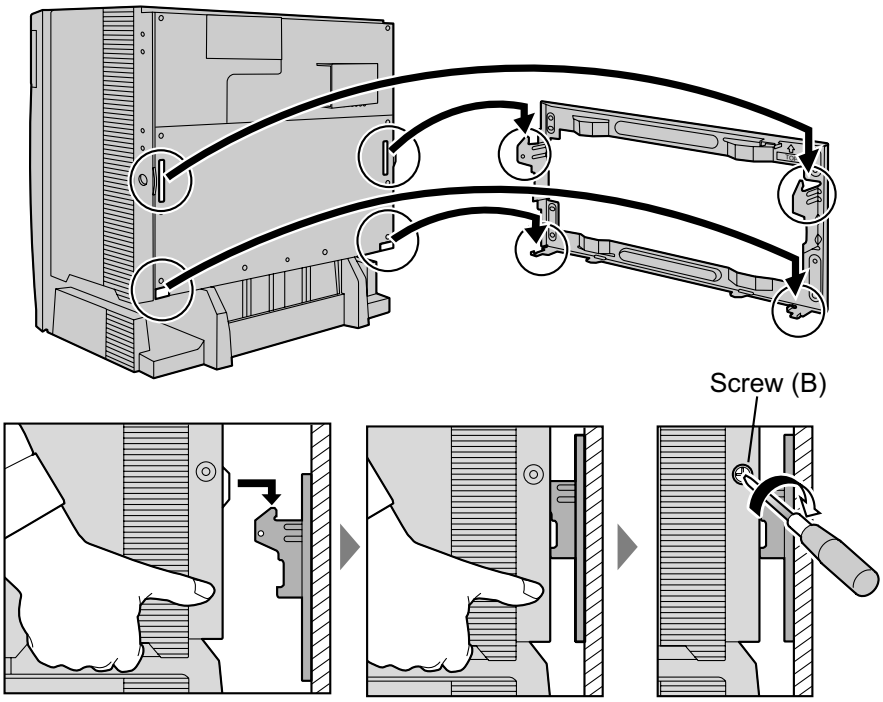
Note

- 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).



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



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)".

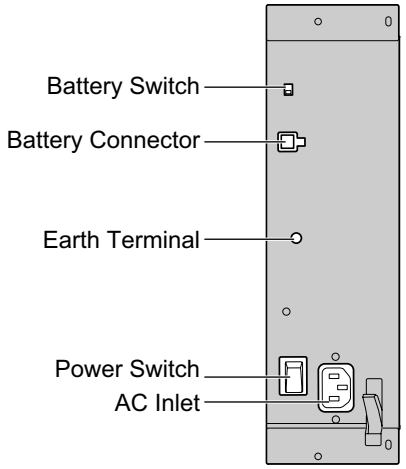
3.2.9 Installing/Replacing the Power Supply Unit

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.

PSU-M/PSU-L



Accessories and User-supplied Items

Accessories (included): Screws × 4
User-supplied (not included): Earthing wire, Back-up Battery Cable (KX-A228 for PSU-M, or KX-A229 for PSU-L)

WARNING

- **Each PSU complies with Safety Class 1 of IEC60950, EN60950, UL60950, CAN/CSA-C22.2 No. 60950, and AS/NZS60950; therefore a protective earth 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 and backup battery supply are 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 earth connection, refer to "3.2.10 Frame Earth Connection".
- For details about backup batteries connection, refer to "3.2.11 Backup Battery Connection".

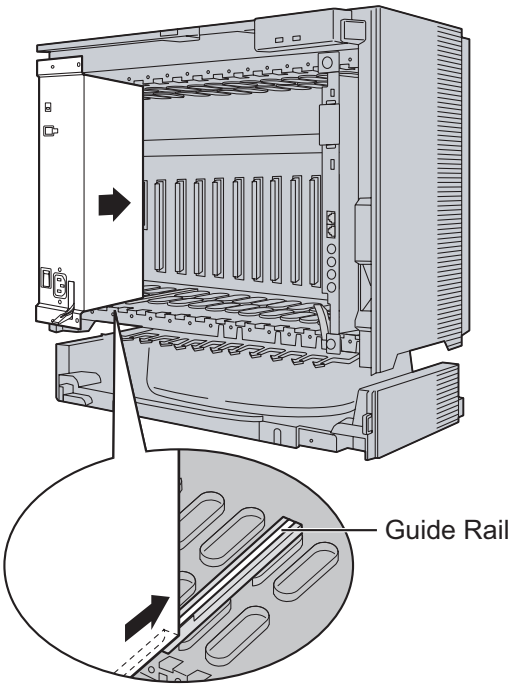
The following procedures are for installing or replacing a PSU only. Do not replace or remove the PSU for any other purpose.

Installing the Power Supply Unit

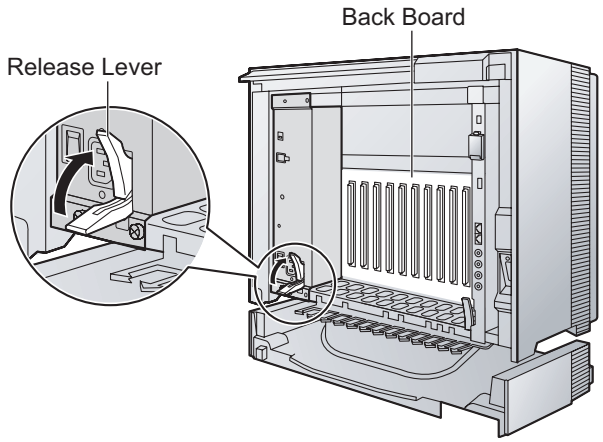
1. Insert the PSU along the guide rails.

   CAUTION

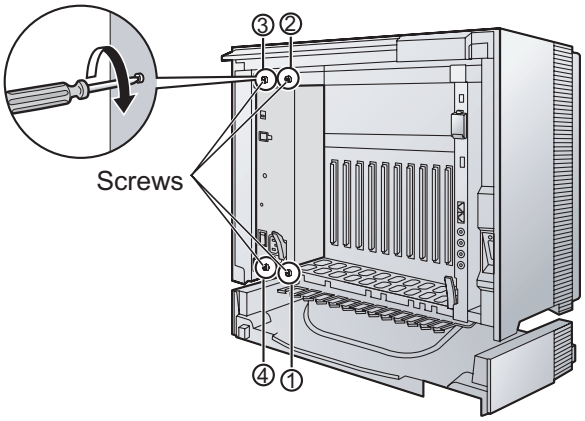
   For safety reasons, do not touch parts in the PSU.



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

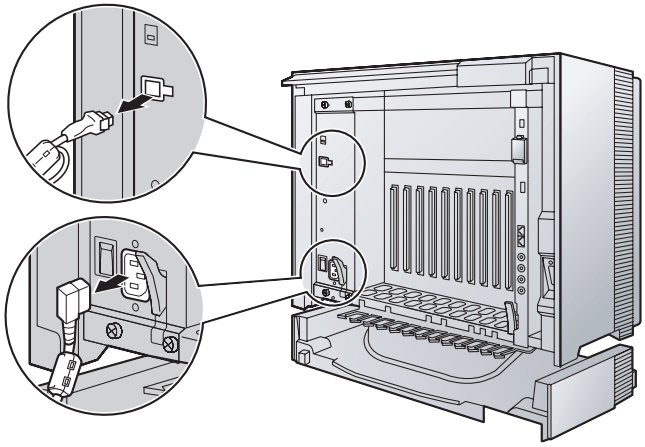


3. Turn the 4 screws clockwise, in the order indicated by the numbers 1 to 4, to fix the PSU.

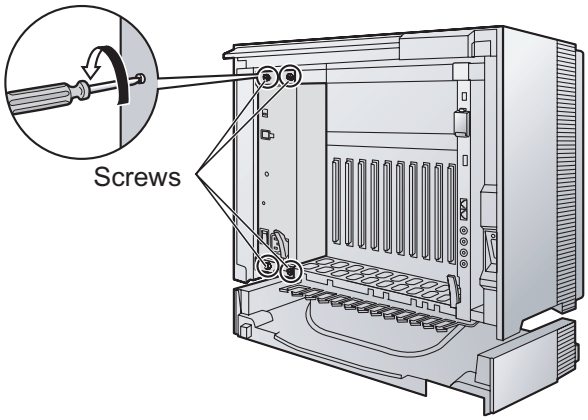


Replacing the Power Supply Unit

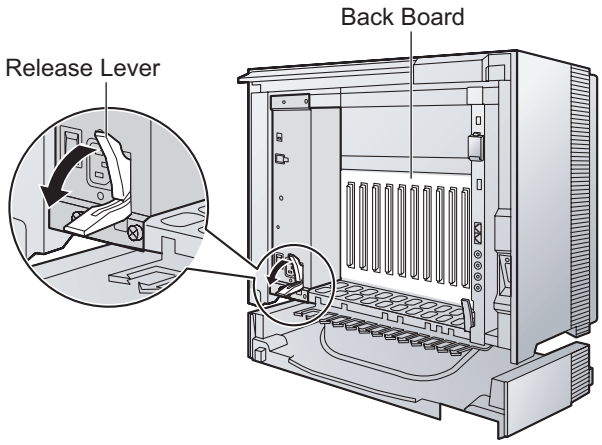
1. Unplug the AC power cord and Back-up Battery Cable.



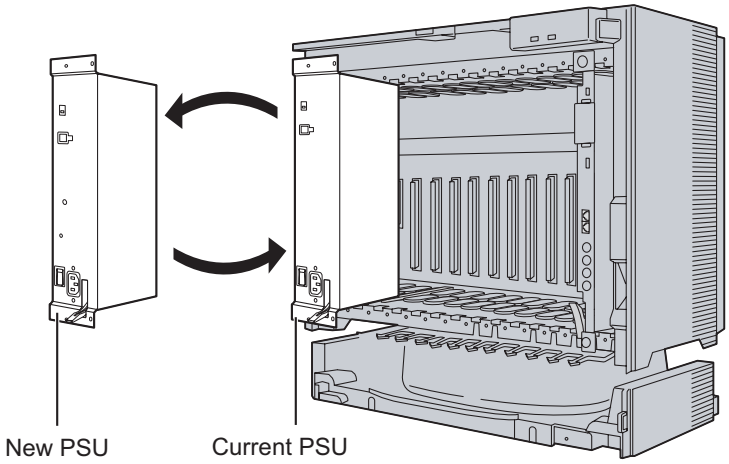
2. Turn the 4 screws anticlockwise to loosen them.



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



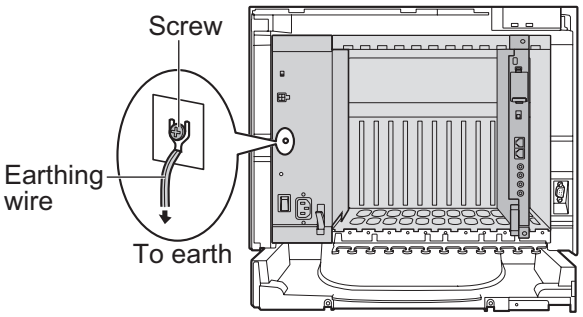
4. Replace the PSU.



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

3.2.10 Frame Earth Connection

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



WARNING

- **Proper earthing (connection to earth) 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 earthing 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 earth and the earth terminal of each PBX must be made.**

CAUTION

- Make sure to separately connect the frame of each shelf to a different earth terminal. Do not connect it to other shelves.
- For earthing wire, green-and-yellow insulation is required, and the cross-sectional area of the conductor must be more than 0.75 mm^2 or 18 AWG.

Notice

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

3.2.11 Backup Battery Connection

The backup batteries and Back-up Battery Cable provide a backup power supply to allow full use of the PBX in the event of a power failure. In case of power failure, the backup batteries automatically maintain the power to the PBX without interruption.

User-supplied Items

- Backup Batteries: VRLA (Valve Regulated Lead Acid) 12 V DC × 3
- Back-up Battery Cable: KX-A228 (for PSU-M) or KX-A229 (for PSU-L)

WARNING

- **There is a danger of explosion if backup batteries are 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 you do not short the backup batteries or cables.**

CAUTION

- Make sure that each Back-up Battery Cable is securely fastened to both the backup batteries and the shelf.
- Make sure that the polarities of the backup batteries and wiring are correct.
- Use the correct type of Back-up Battery Cable for the PSU.

Notice

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

Note

- Turn on the battery switch on the PSU only after the installation of the shelves is finished and AC power is available.
- It is recommended to connect all installed shelves of the system to backup batteries. Note that backup batteries can not provide a backup power supply to any shelves which are not directly connected to the backup batteries.
- The recommended maximum capacity per shelf is 28 Ah, to maintain effective battery charge.
- Make sure that the type and capacity of the 3 backup batteries are identical.
- The Back-up Battery Cable should not be exposed to direct sunlight. Keep the Back-up Battery Cable and the backup batteries away from heating appliances and fire. Place the backup batteries in a ventilated place.
- For details about the backup batteries, refer to the manual for the batteries.

Backup Power Supply Duration

The length of time that backup batteries can power the shelves varies depending on the total load figure of the shelves to which the backup batteries are connected. For how to calculate the load figure from the connected items, refer to "Load Figure Calculation".

Examples

Battery Capacity	Total Load Figure of the Connected Shelves	Backup Power Supply Duration*1
28 Ah	128	5.5 h
	512	3 h

*1 The duration may vary depending on the conditions.

Connecting Backup Batteries

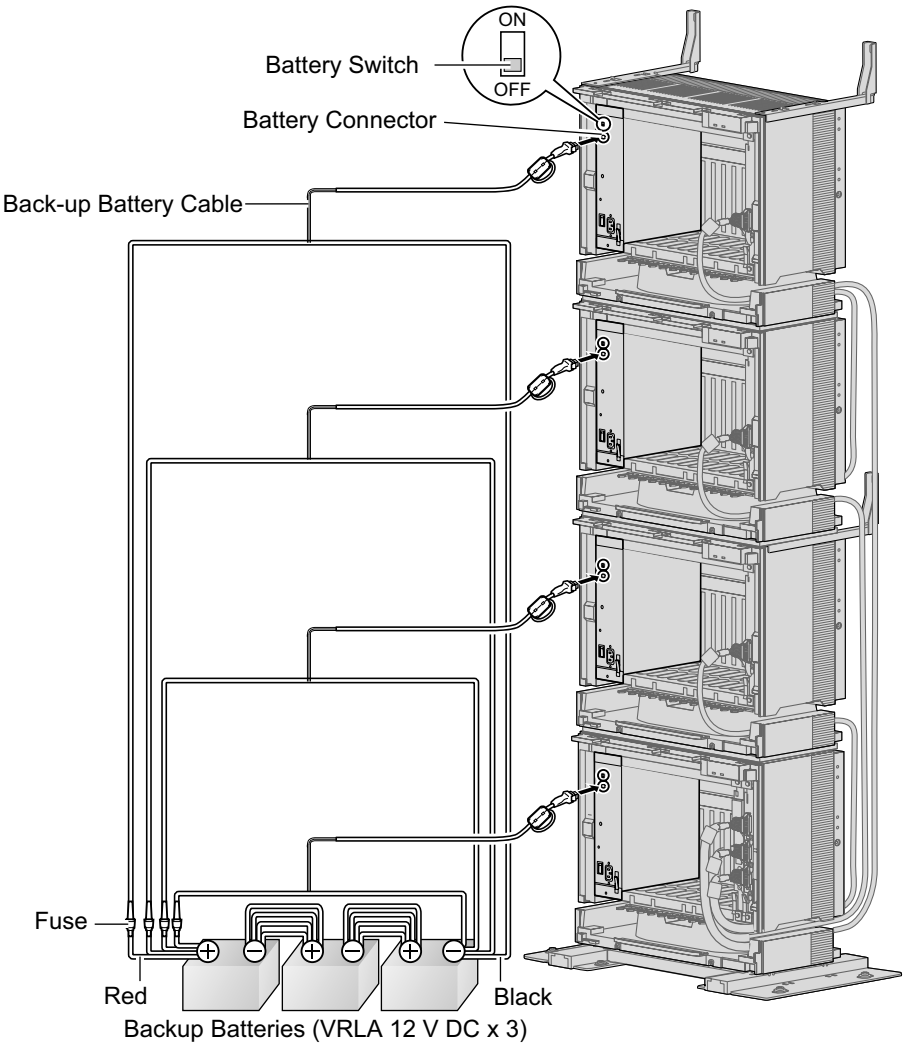
There are 2 types of backup batteries connection:

a. Connecting multiple shelves to one set of backup batteries

b. Connecting each shelf to its own set of backup batteries

Connecting Multiple Shelves to One Set of Backup Batteries

1. Turn off the battery switch on the PSU.
2. Connect the Back-up Battery Cables to a set of 3 identical backup batteries.

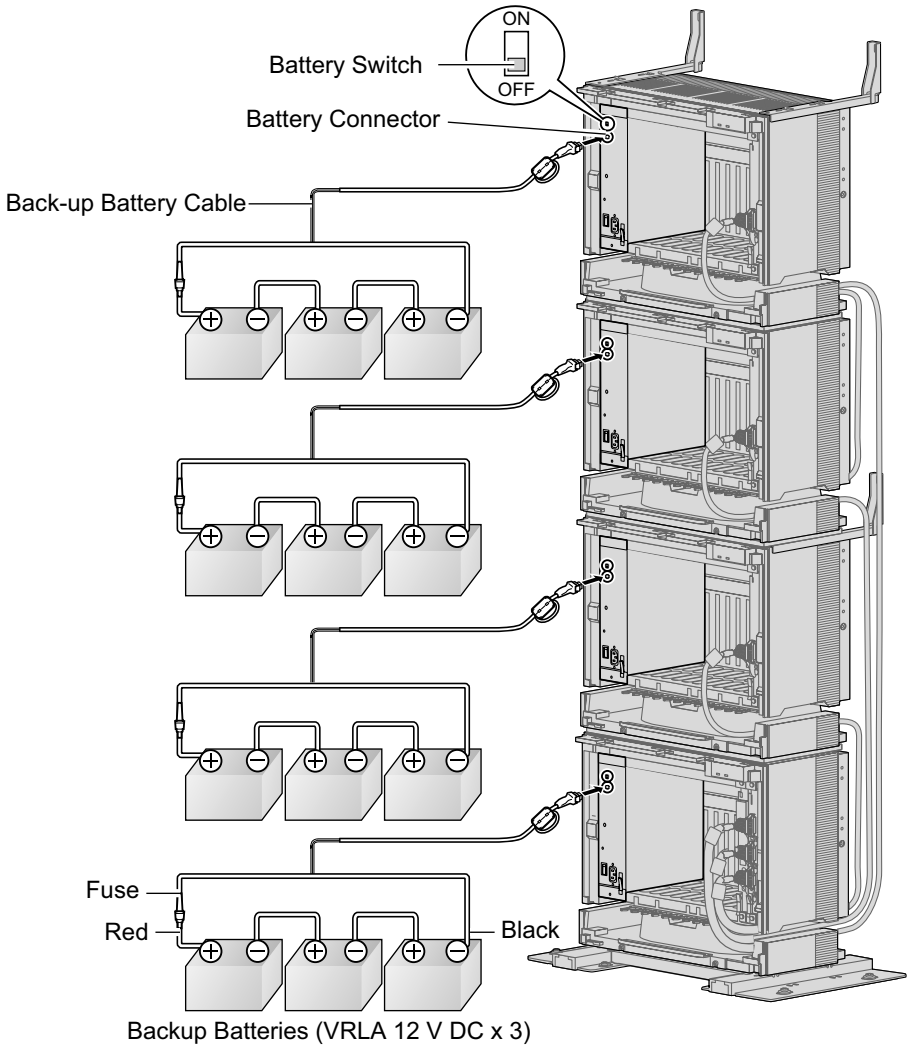


Note

- When connecting backup batteries, make sure to use the same number of Back-up Battery Cables as the number of installed shelves, even between connected batteries. For example, if 4 shelves are installed, 4 cables must be attached to each terminal of each battery, as shown above.
- If the length of time that power must be maintained after a power failure exceeds the capacity of the backup batteries, connect additional sets of 3 backup batteries as required.

Connecting Each Shelf to Its Own Set of Backup Batteries

1. Turn off the battery switch on the PSU.
2. Connect each Back-up Battery Cable to its own set of 3 identical backup batteries.



3.2.12 Installing/Removing the Optional Service Cards

CAUTION

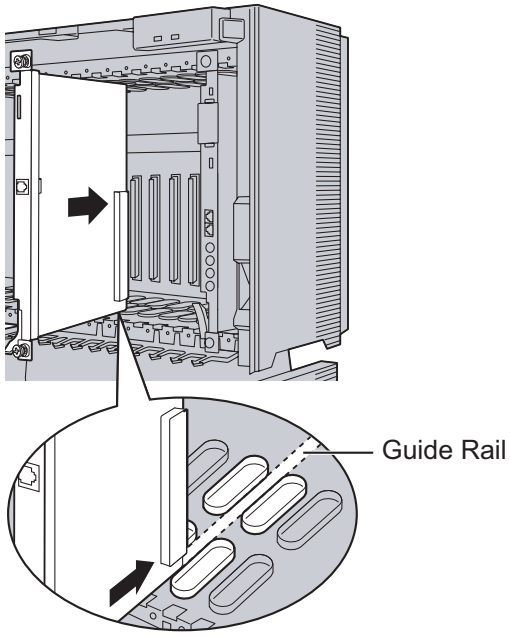
- To protect the back board from static electricity, do not touch parts on the back board in the main unit and on the optional service cards. To discharge static electricity, touch ground or wear an earthing strap.
- When installing or removing the IPCEMPR card, BUS-M card or BUS-S card, the DC power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

Note

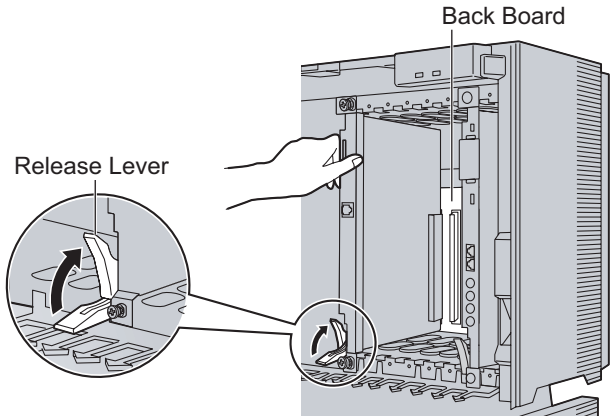
The optional service cards can be installed or removed while the DC power is supplied.

Installing Optional Service Cards

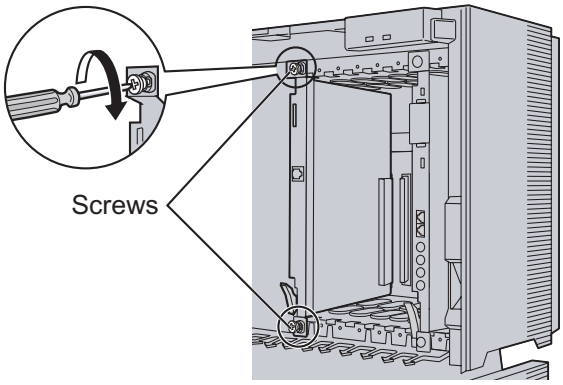
1. Insert the card along the guide rails.



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.



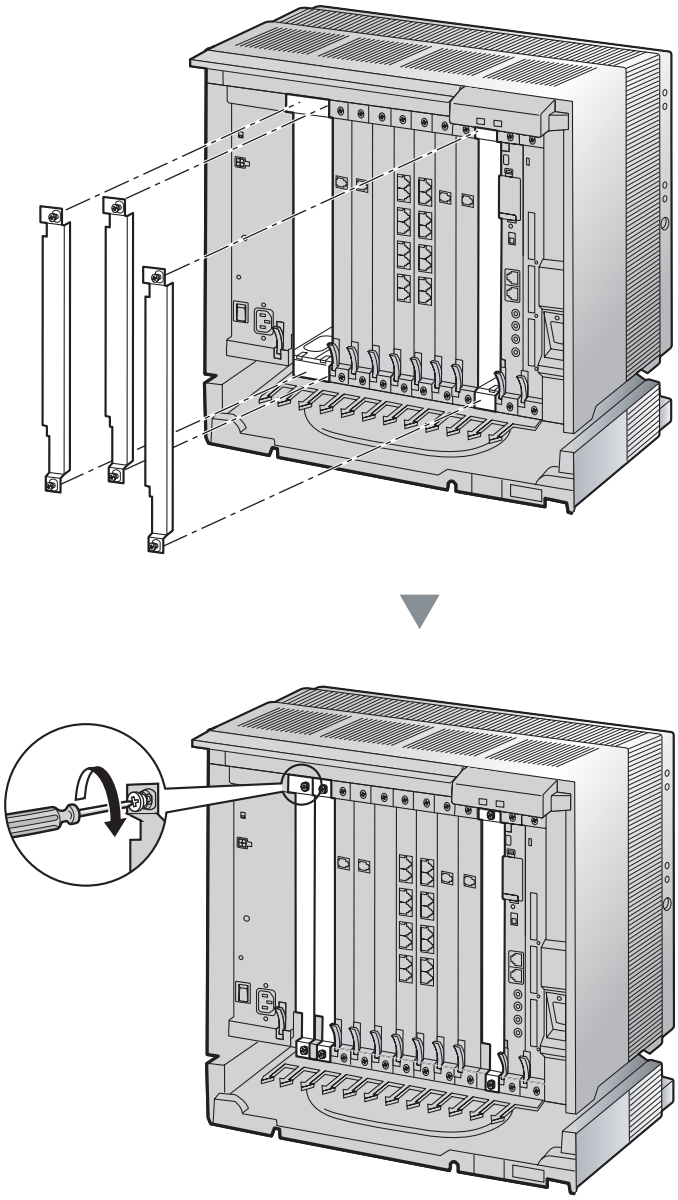
Note

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

Covering the Blank Slots

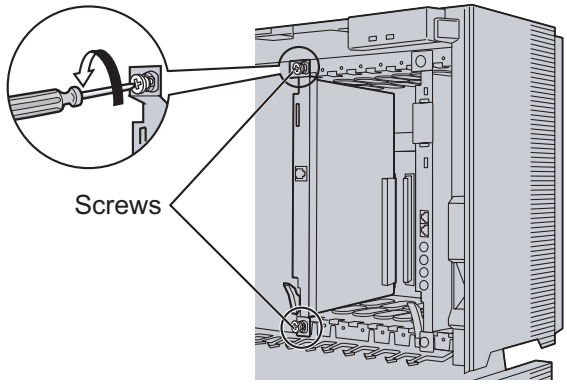
CAUTION

- Be sure to cover each slot in which no optional service card is installed by using a Blank Slot Cover.
- Failure to install the Blank Slot Cover may cause electromagnetic interference.

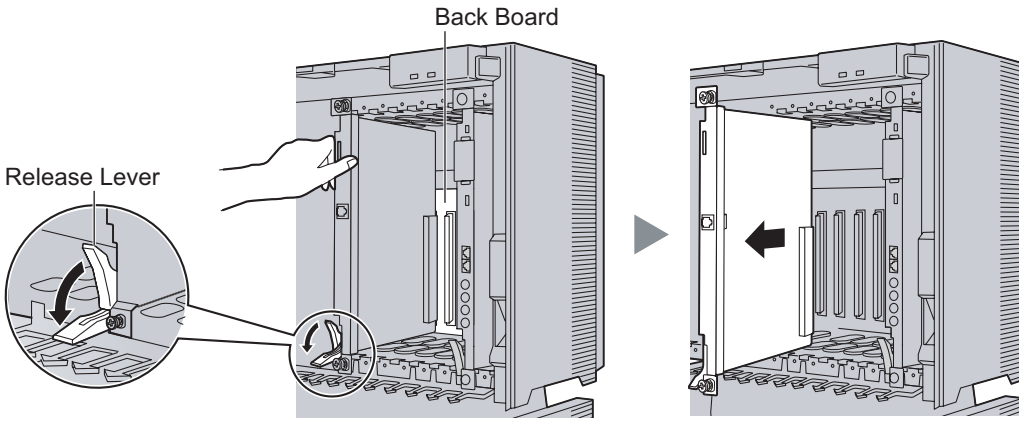


Removing the Optional Service Cards

1. Turn the 2 screws anticlockwise to loosen them.



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



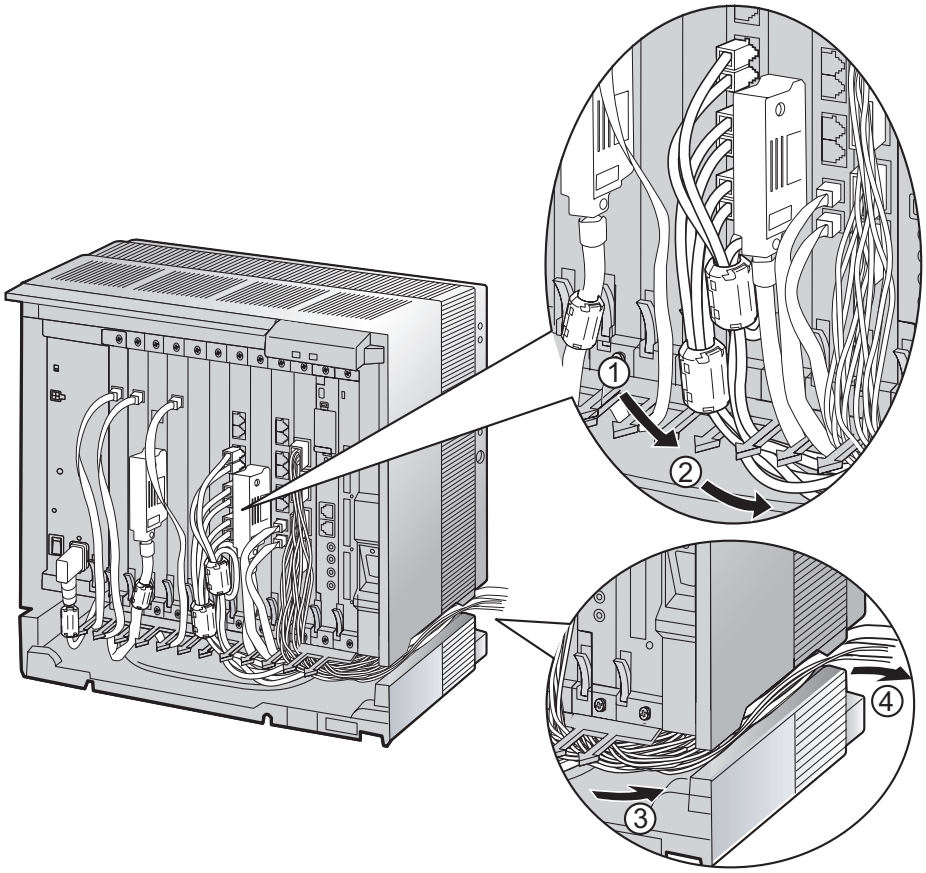
3.2.13 Cable Handling

Note

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

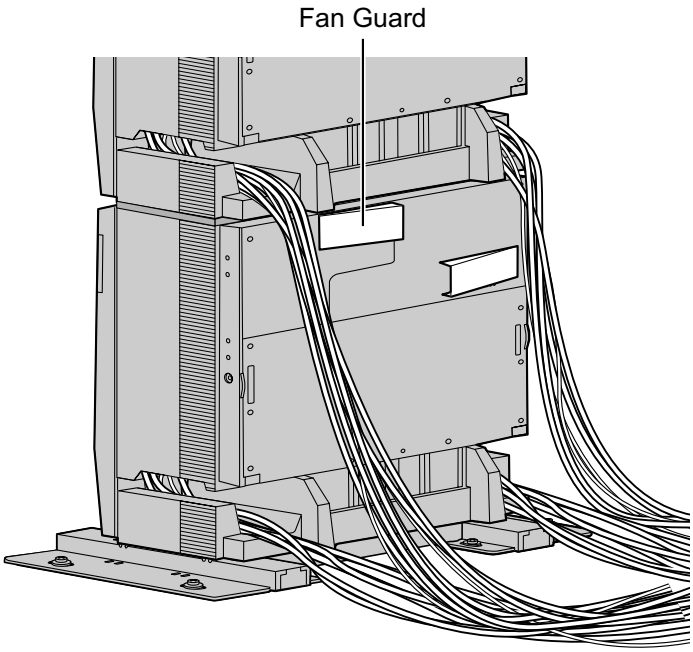
Cable Handling for Each Shelf

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.

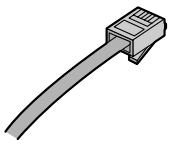
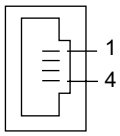
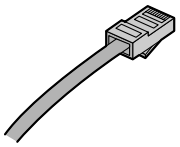
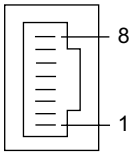
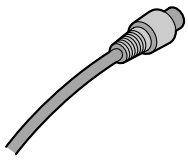
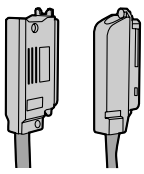
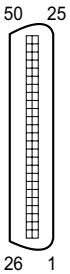


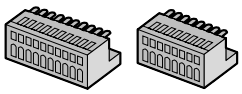
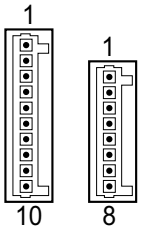
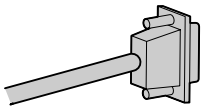
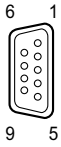
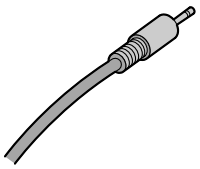
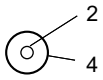
Cable Handling for Connected Shelves

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



3.2.14 Types of Connectors

Connector Type	Pin Number	Used for
RJ11  (Twisted pair cable)		• DHLC8 (KX-TDA0170) • SLC8 (KX-TDA0173) • CSLC16 (KX-TDA0177) • ESLC16 (KX-TDA6174) • EMSLC16 (KX-TDA6175) • ECSLC24 (KX-TDA6178) • ELCOT16 (KX-TDA6181)
RJ45  (Twisted pair cable)		• IPCEMPR • CSIF4 (KX-TDA0143) • CSIF8 (KX-TDA0144) • T1 (KX-TDA0187) • E1 (KX-TDA0188) • BRI4 (KX-TDA0284) • BRI8 (KX-TDA0288) • PRI30 (KX-TDA0290CE/KX-TDA0290CJ) • PRI23 (KX-TDA0290) • IP-EXT16 (KX-TDA0470) • IP-GW4E (KX-TDA0484) • IP-GW16 (KX-TDA0490)
BNC 		• E1 (KX-TDA0188) • PRI30 (KX-TDA0290CE/KX-TDA0290CJ)
Amphenol Type A Type B  (Shielded twisted pair cable)		• DHLC8 (KX-TDA0170) • DLC8 (KX-TDA0171) • DLC16 (KX-TDA0172) • SLC8 (KX-TDA0173) • CSLC16 (KX-TDA0177) • ESLC16 (KX-TDA6174) • EMSLC16 (KX-TDA6175) • ECSLC24 (KX-TDA6178) • ELCOT16 (KX-TDA6181) • DID8 (KX-TDA0182) • E&M8 (KX-TDA0184)

Connector Type	Pin Number	Used for
10-pin Terminal Block 8-pin Terminal Block 		• DPH4 (KX-TDA0161) • DPH2 (KX-TDA0162) • EIO4 (KX-TDA0164)
RS-232C  (Shielded cable)		• Basic Shelf (KX-TDE600)
Mini Plug 		• IPCEMPR

3.2.15 Attaching a Ferrite Core

A ferrite core must be attached when:

- an RJ45 connector is connected to IPCEMPR, T1, E1, PRI, BRI, IP-GW16 or IP-EXT16 cards, or
- an Amphenol connector is connected to an extension card.

The ferrite core is included with the card.

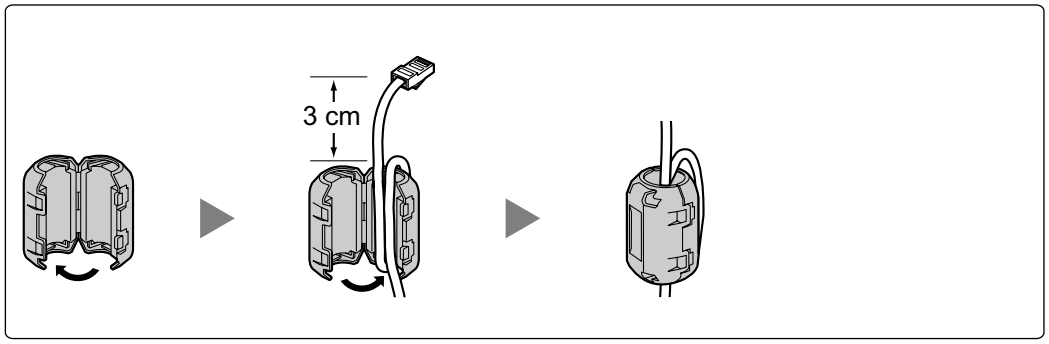
Note

In Canada, the ferrite core is not necessarily required for the T1 and PRI23 cards.

Attaching to an RJ45 Connector

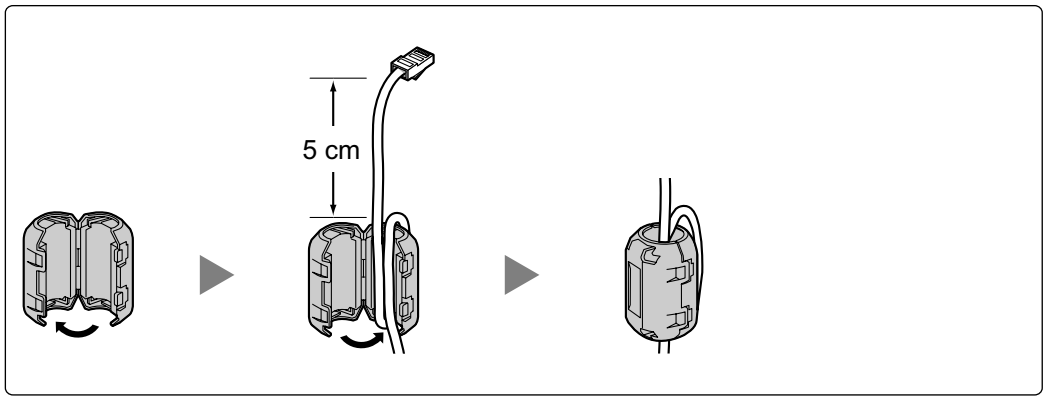
For the IPCEMPR Card

Wrap the cable once around the ferrite core, then close the case of the ferrite core. Attach the ferrite core 3 cm away from the connector. The ferrite core is included with the PBX.



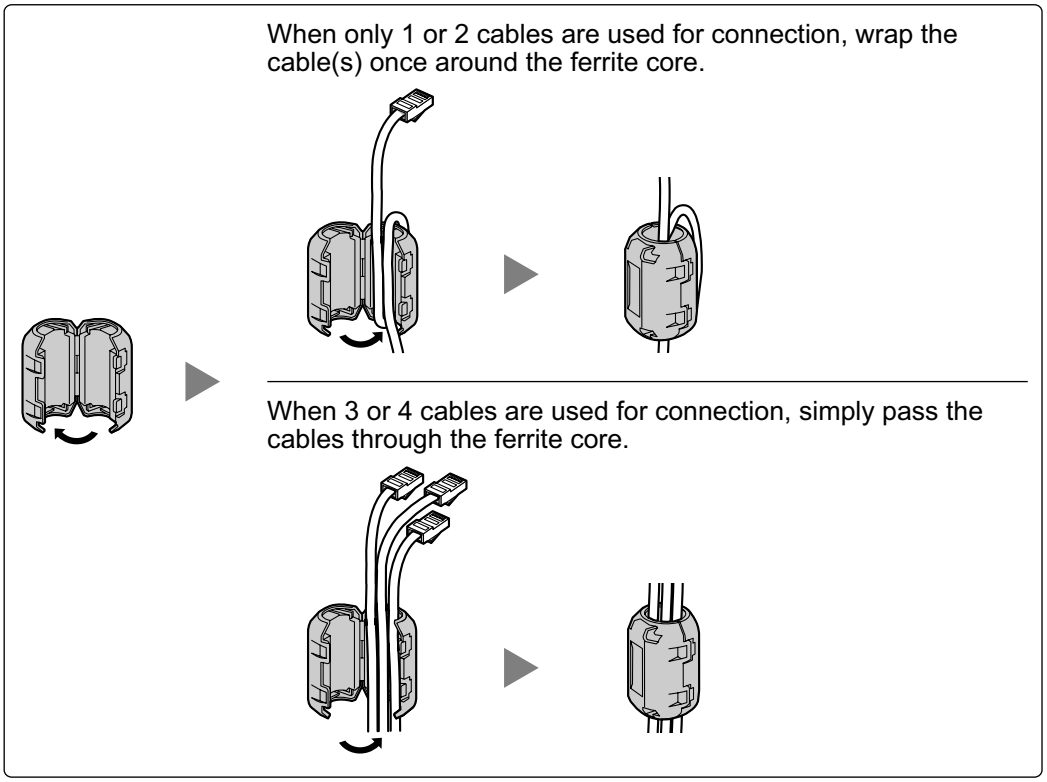
For T1/E1/PRI/IP-GW16/IP-EXT16 Cards

Wrap the cable once around the ferrite core, then close the case of the ferrite core. Attach the ferrite core 5 cm away from the connector. The ferrite core is included with the card.



For a BRI card

Attach the ferrite core, then close the case of the ferrite core. Attach the ferrite core as close to the card's connector as possible. The ferrite core is included with the card.



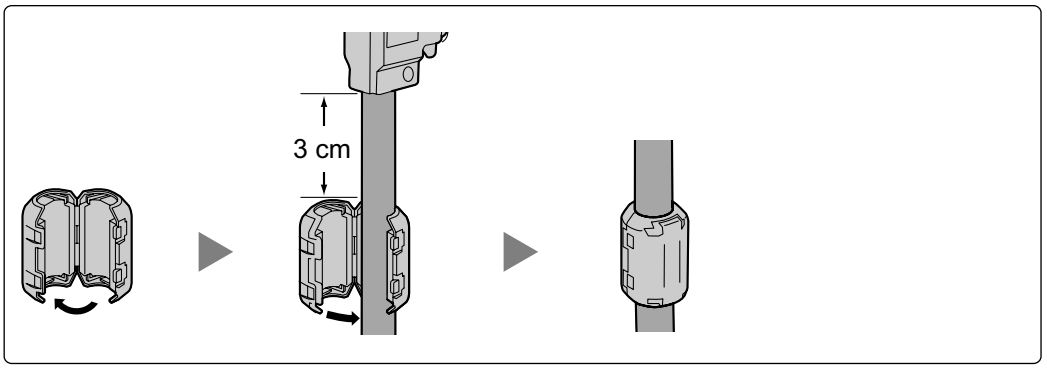
Note

For every 4 cables, use 1 ferrite core; a ferrite core holds a maximum of 4 cables.

Attaching to an Amphenol Connector

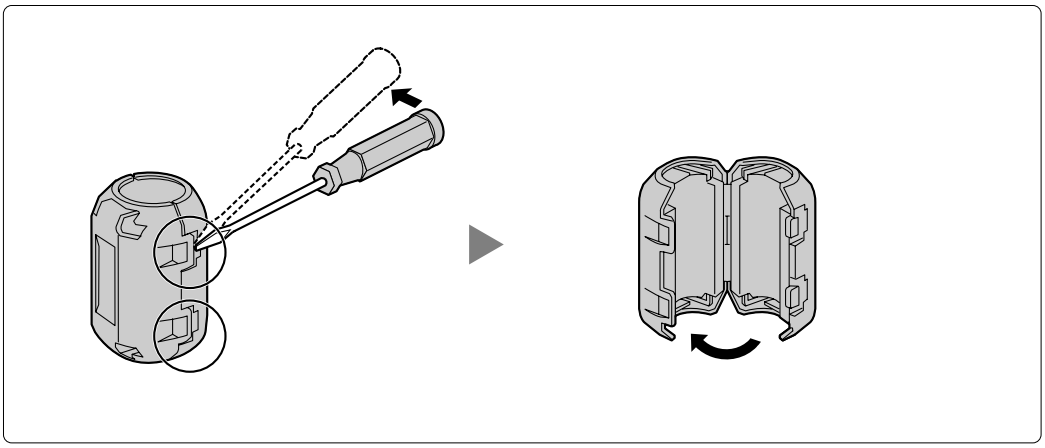
For Extension Cards

Pass the cable through the ferrite core, then close the case of the ferrite core. Attach the ferrite core 3 cm away from the connector. The ferrite core is included with the card.



3.2.15 Attaching a Ferrite Core

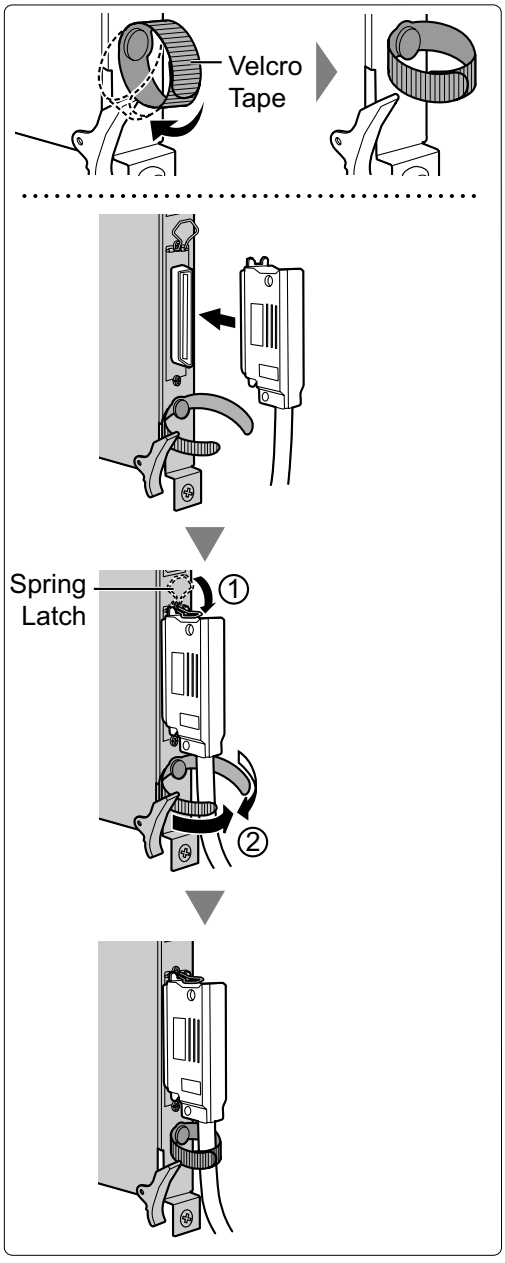
If you need to open the ferrite core, use a flathead screwdriver to unlatch the case of the ferrite core.



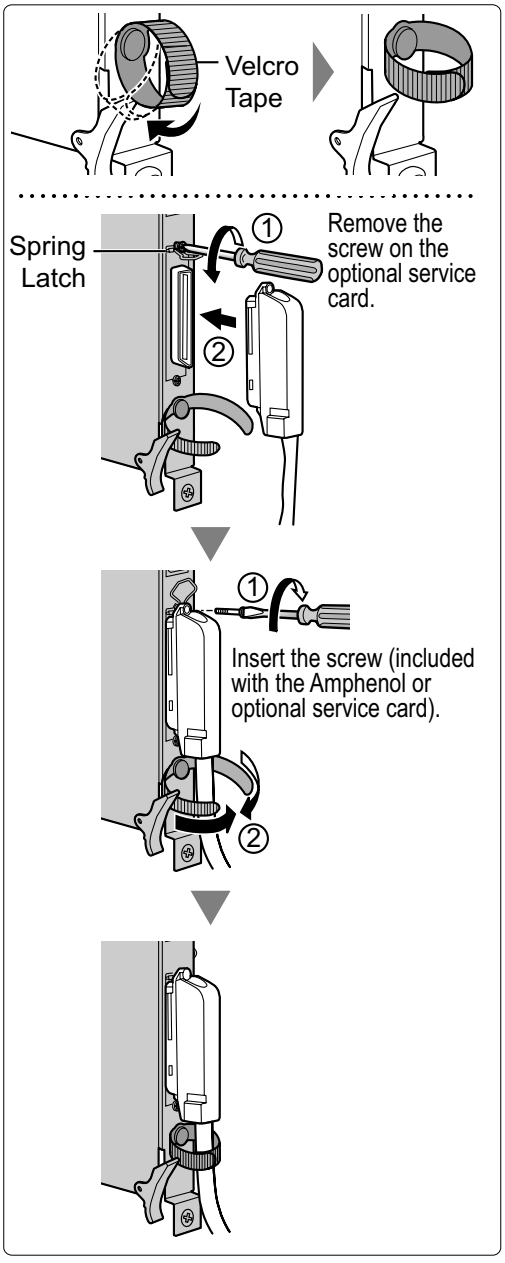
3.2.16 Fastening an Amphenol Connector

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

Type A (Spring Latch + Velcro Tape)



Type B (Screw + Velcro Tape)



Amphenol Connector Pin Assignment Chart

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

Pin No.	ELCOT16	DID8	E&M8	DHLC8	DLC8	DLC16	EMSLC16	ECSLC24	CSLC16	ESLC16	SLC8
1	RA	RA	TA	RA		D2A	RA	RA	RA	RA	RA
26	TA	TA	RA	TA		D1A	TA	TA	TA	TA	TA
2	RB	RB	T1A	D2A	D2A	D2B	RB	RB	RB	RB	
27	TB	TB	R1A	D1A	D1A	D1B	TB	TB	TB	TB	
3	RC	RC	EA			D2C	RC	RC	RC	RC	
28	TC	TC	MA			D1C	TC	TC	TC	TC	
4	RD	RD	SGA	RB		D2D	RD	RD	RD	RD	RB
29	TD	TD	SGB	TB		D1D	TD	TD	TD	TD	TB
5	RE	RE	TB	D2B	D2B	D2E	RE	RE	RE	RE	
30	TE	TE	RB	D1B	D1B	D1E	TE	TE	TE	TE	
6	RF	RF	T1B			D2F	RF	RF	RF	RF	
31	TF	TF	R1B			D1F	TF	TF	TF	TF	
7	RG	RG	EB	RC		D2G	RG	RG	RG	RG	RC
32	TG	TG	MB	TC		D1G	TG	TG	TG	TG	TC
8	RH	RH	TC	D2C	D2C	D2H	RH	RH	RH	RH	
33	TH	TH	RC	D1C	D1C	D1H	TH	TH	TH	TH	
9	RI		T1C			D2I	RI	RI	RI	RI	
34	TI		R1C			D1I	TI	TI	TI	TI	
10	RJ		EC	RD		D2J	RJ	RJ	RJ	RJ	RD
35	TJ		MC	TD		D1J	TJ	TJ	TJ	TJ	TD
11	RK		TD	D2D	D2D	D2K	RK	RK	RK	RK	
36	TK		RD	D1D	D1D	D1K	TK	TK	TK	TK	
12	RL		T1D			D2L	RL	RL	RL	RL	
37	TL		R1D			D1L	TL	TL	TL	TL	
13	RM		ED	RE		D2M	RM	RM	RM	RM	RE
38	TM		MD	TE		D1M	TM	TM	TM	TM	TE
14	RN		TE	D2E	D2E	D2N	RN	RN	RN	RN	
39	TN		RE	D1E	D1E	D1N	TN	TN	TN	TN	
15	RO		T1E			D2O	RO	RO	RO	RO	
40	TO		R1E			D1O	TO	TO	TO	TO	
16	RP		EE	RF		D2P	RP	RP	RP	RP	RF
41	TP		ME	TF		D1P	TP	TP	TP	TP	TF
17			TF	D2F	D2F			RQ			
42			RF	D1F	D1F			TQ			
18			T1F					RR			
43			R1F					TR			
19			EF	RG				RS			RG
44			MF	TG				TS			TG
20			TG	D2G	D2G			RT			
45			RG	D1G	D1G			TT			
21			T1G					RU			
46			R1G					TU			
22			EG	RH				RV			RH
47			MG	TH				TV			TH
23			TH	D2H	D2H			RW			
48			RH	D1H	D1H			TW			
24			T1H					RX			
49			R1H					TX			
25			EH								
50			MH								

3.2.17 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 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 trunk to prevent potentially dangerous electrical surges from entering the building via the trunk and damaging the PBX and connected equipment.

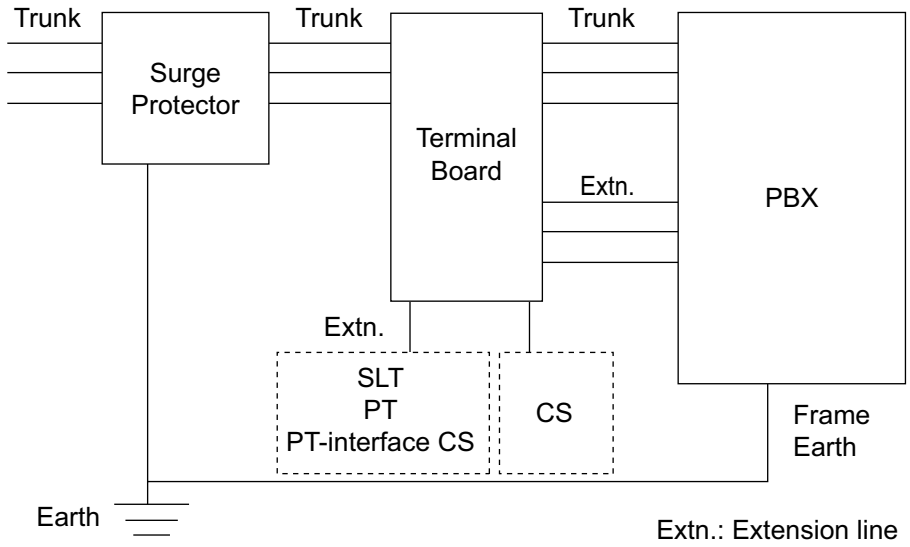
To protect the system from electrical surges, we strongly recommend connecting the system to a surge protector that meets the following specifications:

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

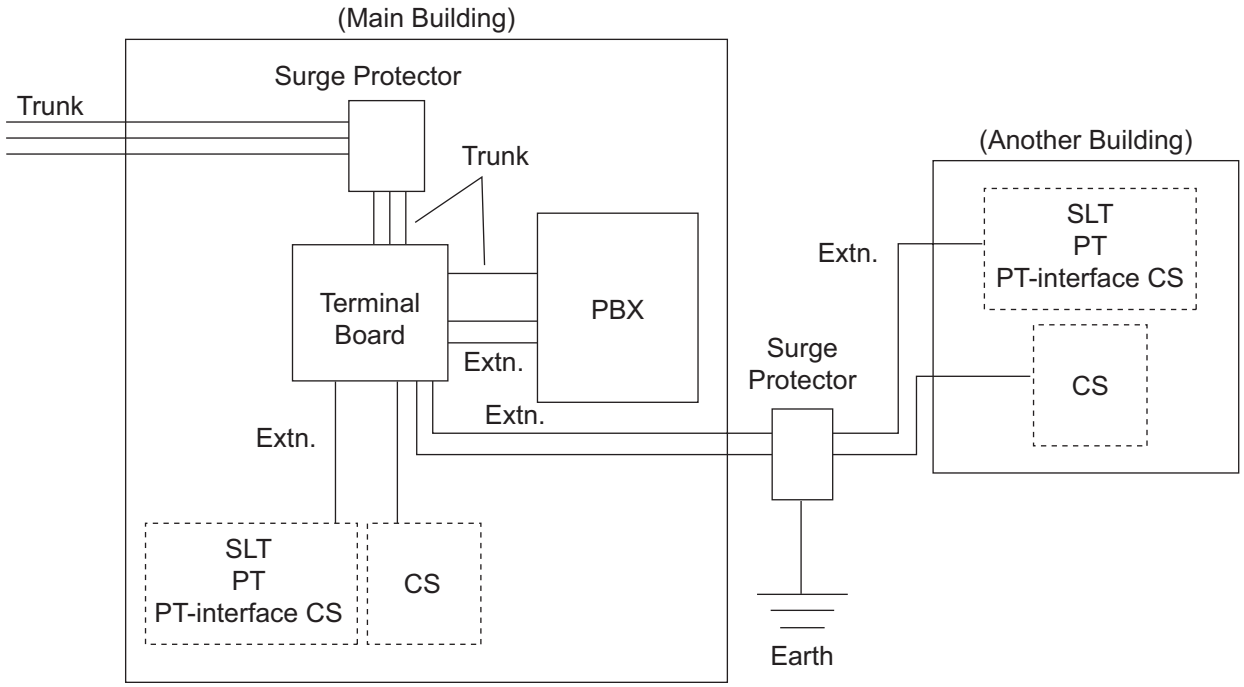
Additionally, proper earthing is very important for the protection of the system (refer to "3.2.10 Frame Earth Connection").

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

Installation



Outside Installation



Extn.: Extension Line

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

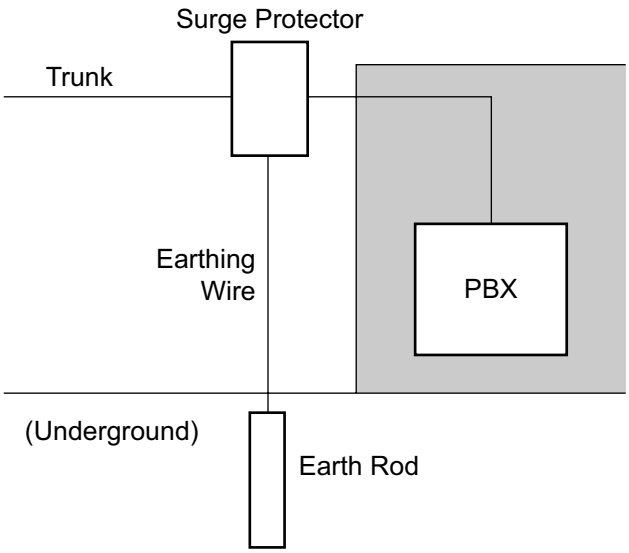
a. Install the extension wire underground.

b. Use a conduit to protect the wire.

Note

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

Installation of an Earth Rod



1. Connect the earth rod to the surge protector using an earthing wire with a cross-sectional area of at least 1.3 mm^2.
2. Bury the earth rod near the protector. The earthing wire should be as short as possible.
3. The earthing wire should run straight to the earth rod. Do not run the wire around other objects.
4. Bury the earth rod at least 50 cm underground.

Note

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

3.3 Information about the Main Processing Card

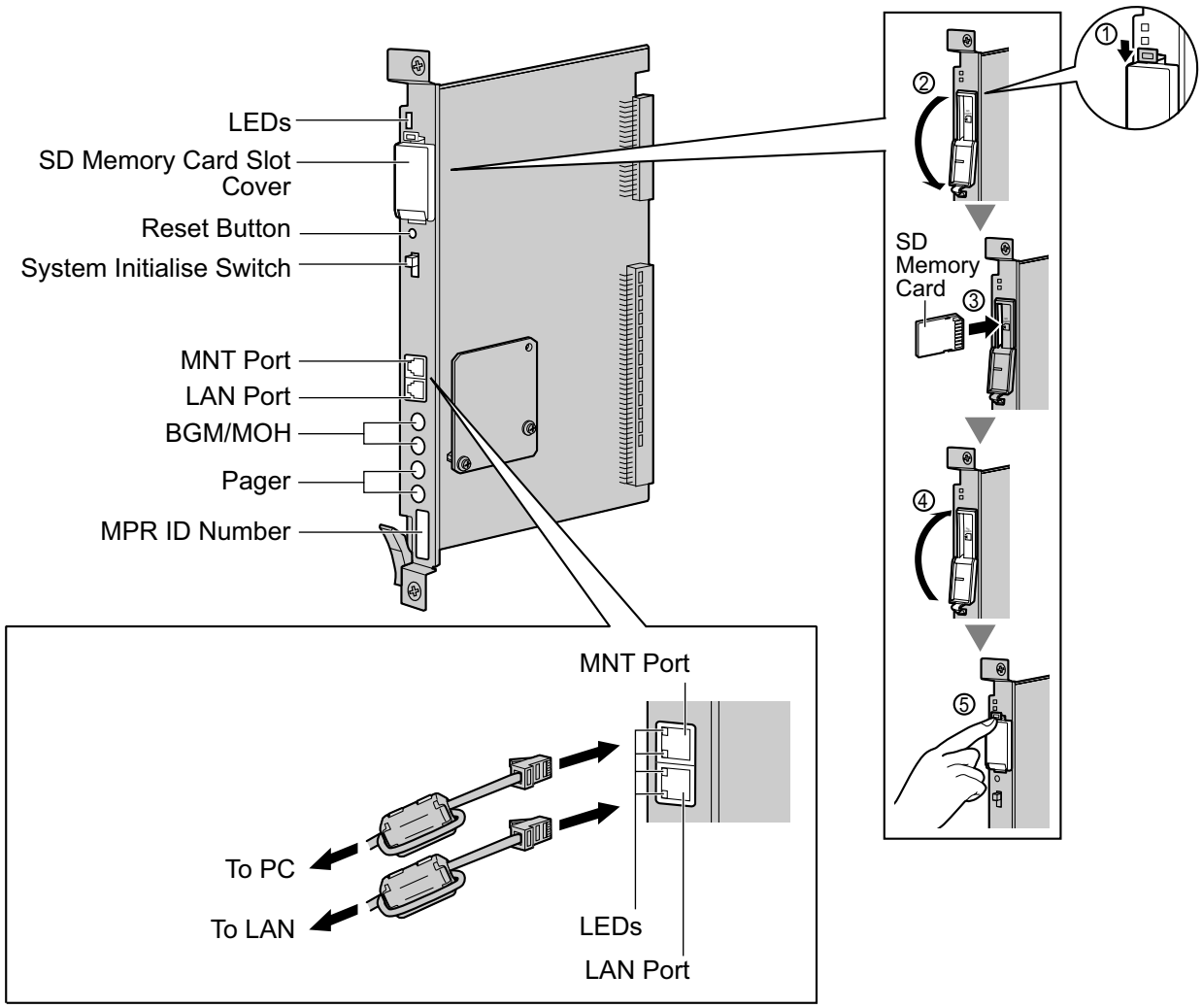
3.3.1 IPCEMPR Card

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 (trunk/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 unauthorised 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

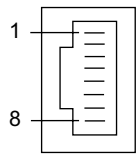
- Use only the SD Memory Card included with the PBX.
- The SD Memory Card must be inserted in the SD Memory Card slot of the IPCEMPR card before startup.

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.
- When connecting the RJ45 connector, attach the ferrite core included with the PBX. Refer to "3.2.15 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 Initialise Switch, refer to "3.15.1 Starting the PBX".
- For details about Reset Button, refer to "5.1.4 Using the Reset Button".

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	Colour	Description
BATT ALARM	Red	Battery alarm indication • OFF: Normal ON: Alarm

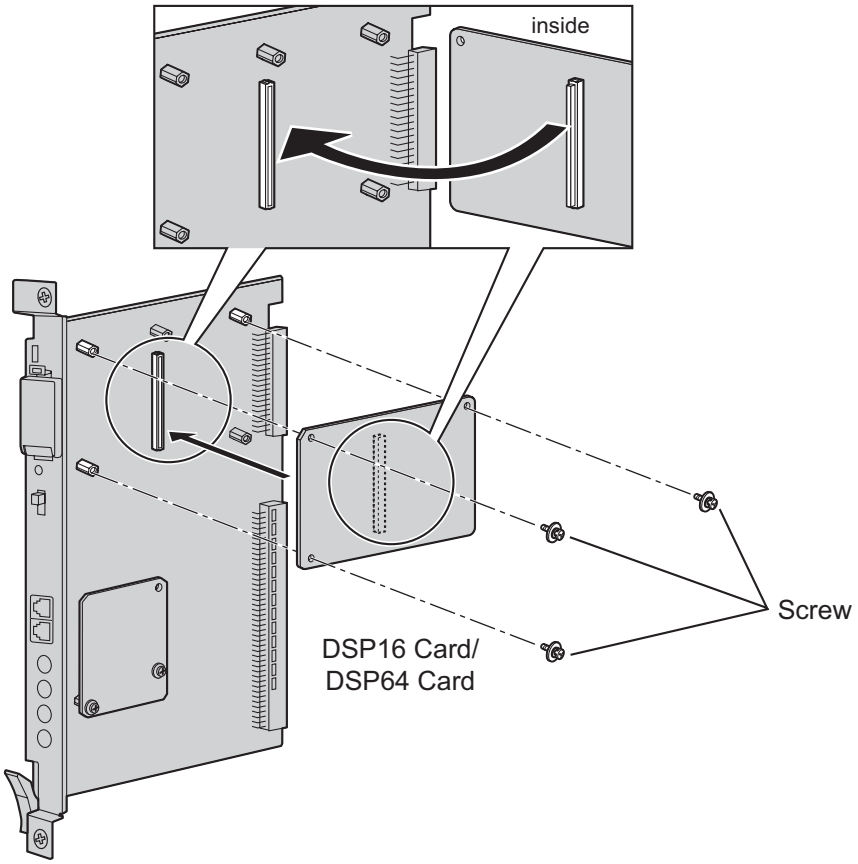
Indication				Colour	Description
SD ACCESS				Green	SD memory card status • ON: Accessing
10BASE-T/ 100BASE-TX	MNT	2	LINK	Green	Link status indication • OFF: Off-line • ON: Linked normally • Flashing: In communication
			100	Yellow	Data transmission speed indication • OFF: 10 Mbps • ON: 100 Mbps
	LAN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

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

Function

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



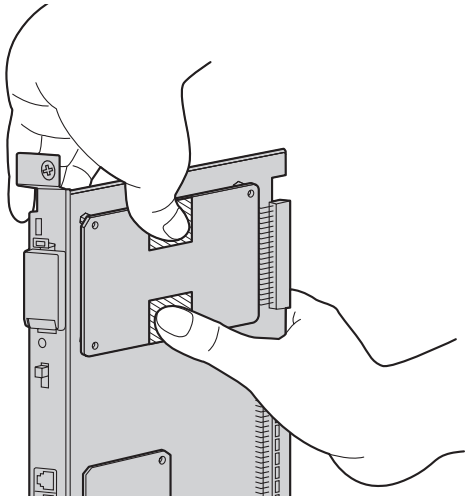
Accessories and User-supplied Items

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

Note

- Depending on the number and the type of IP trunks 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".

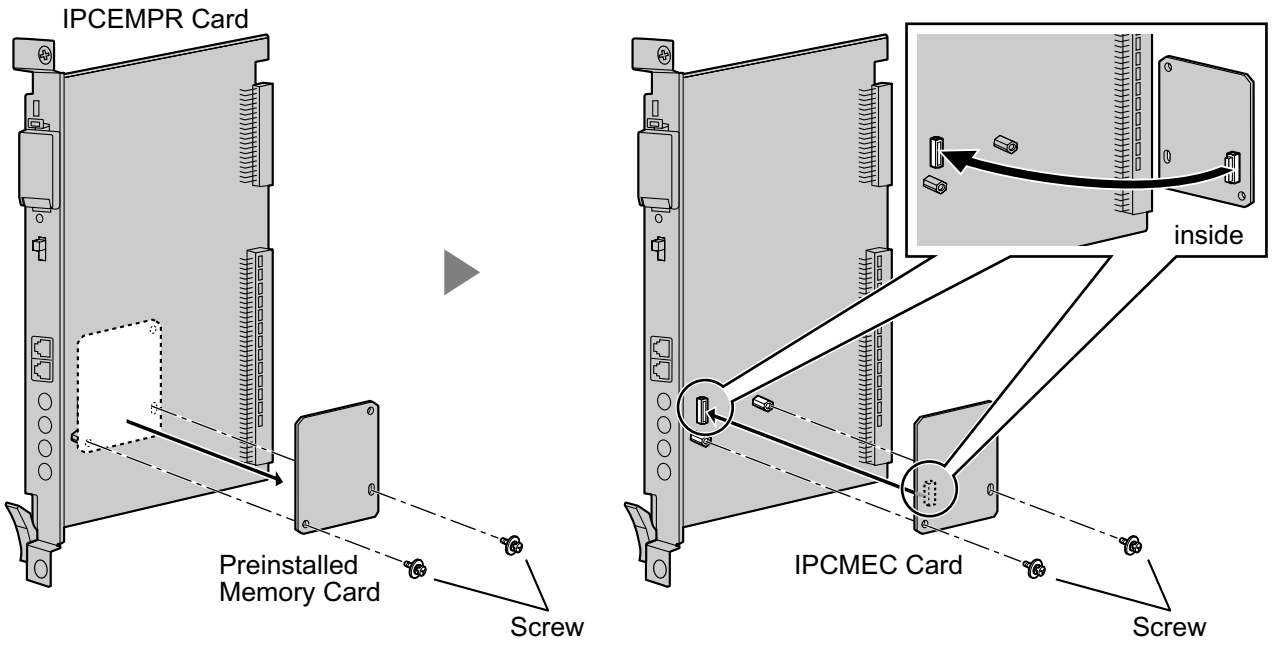
- When installing the DSP16 or DSP64 card, hold down the shaded areas of the card to connect it firmly.



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

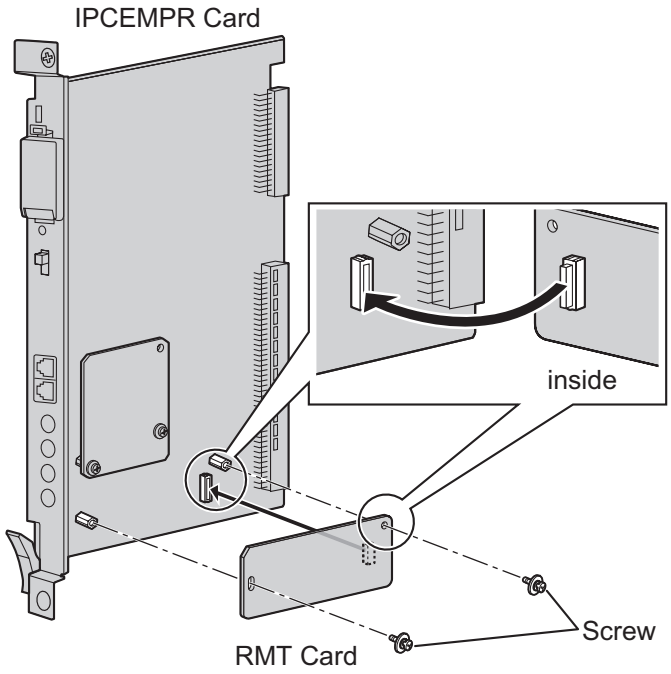
CAUTION

- 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 initialised. For details about the initialisation procedure, refer to "3.15.1 Starting the PBX".
- After initialisation, 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

Analogue modem card for remote communication with the PBX. ITU-T V.90 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

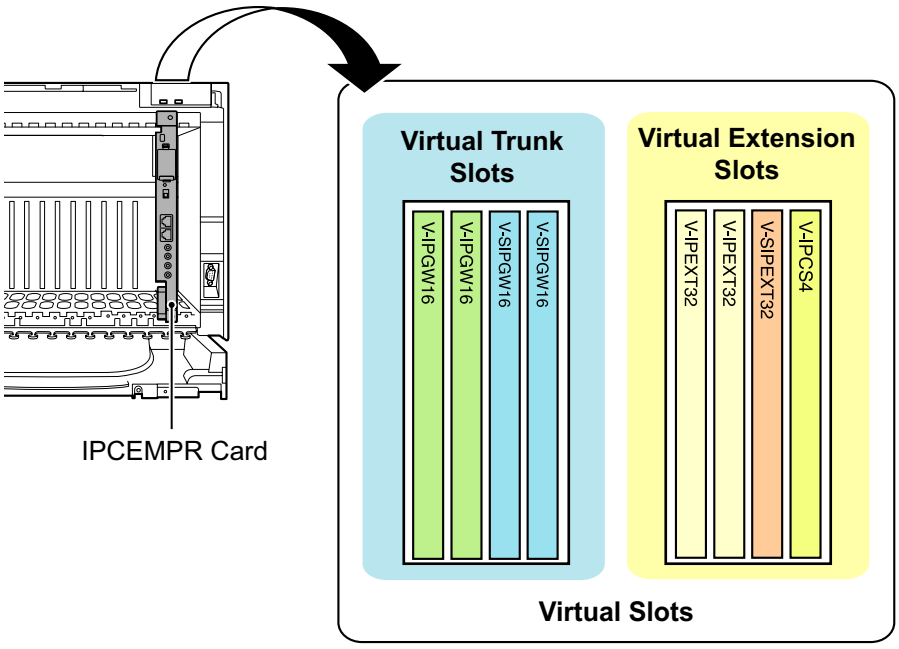
3.4.1 Virtual Cards

Function

Virtual Cards are included with the IPCEMPR card and can be activated with the appropriate activation key (Only V-IPCS4 card can be activated without activation keys). By installing Virtual Cards in the Virtual Slots of the IPCEMPR card using the Maintenance Console, IP trunks, 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 H.323 trunk. Compliant with VoIP H.323 V.5 protocol, and ITU-T G.729A and G.711 codec methods. Also supports T.38 protocol.
Virtual 16-Channel SIP Trunk Card (V-SIPGW16)	Virtual Card for 16-channel SIP trunk. 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, and ITU-T G.729A, G.711 and G.722 codec methods.
Virtual 32-Channel SIP Extension Card (V-SIPEXT32)	Virtual Card for 32 SIP Extensions. Compliant with RFC 3261, 3264, 3310, 2327, and 4028 protocols, and ITU-T G.729A, G.711 and G.722 codec methods.
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

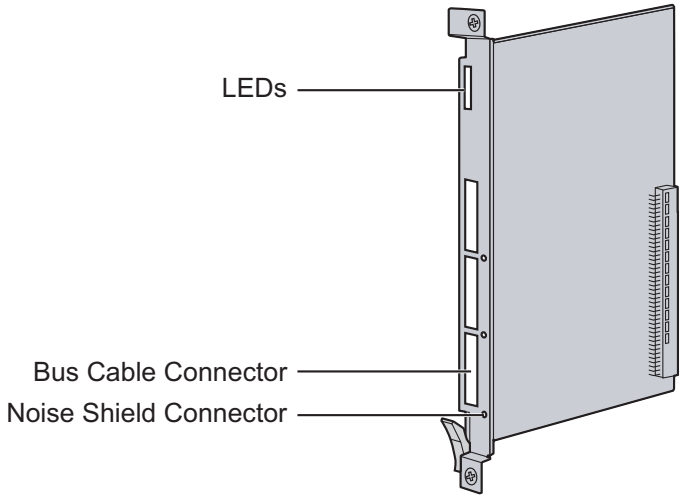


3.5 Information about the Optional Shelf Expansion Cards

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

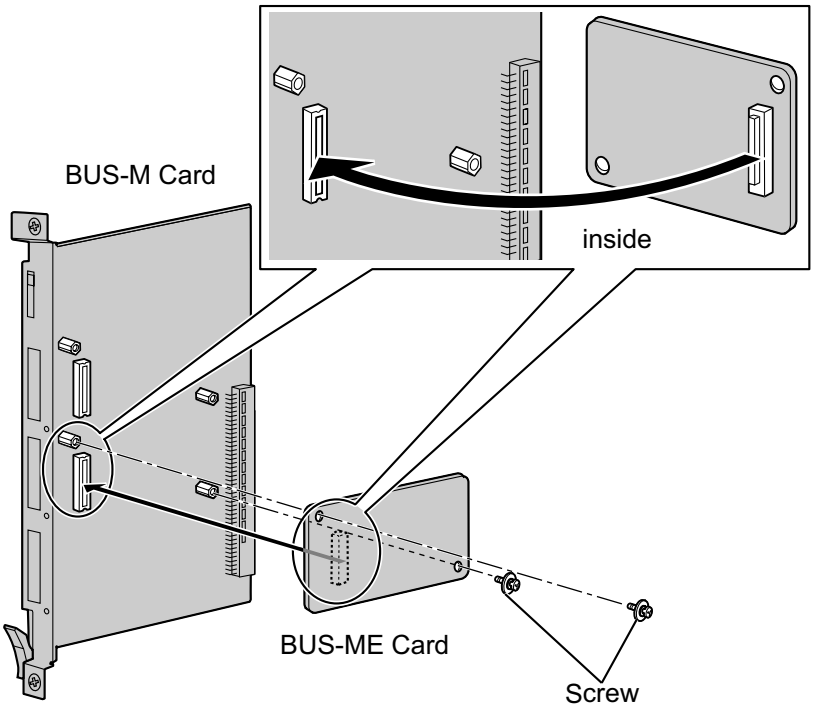
LED Indications

Indication	Colour	Description
CARD STATUS	Green	Card status indication • OFF: Starting up • Green ON: Normal
LINK3	Green	Link status indication for Expansion Shelf 3 • OFF: Connection error • ON: Normal connection
LINK2	Green	Link status indication for Expansion Shelf 2 • OFF: Connection error • ON: Normal connection
LINK1	Green	Link status indication for Expansion Shelf 1 • 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

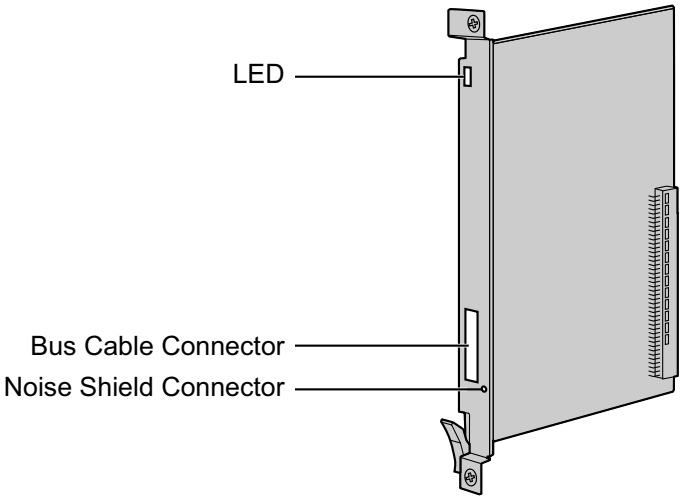
Accessories (included): Bus Cable × 1, Screws × 2
User-supplied (not included): none

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.

LED Indications

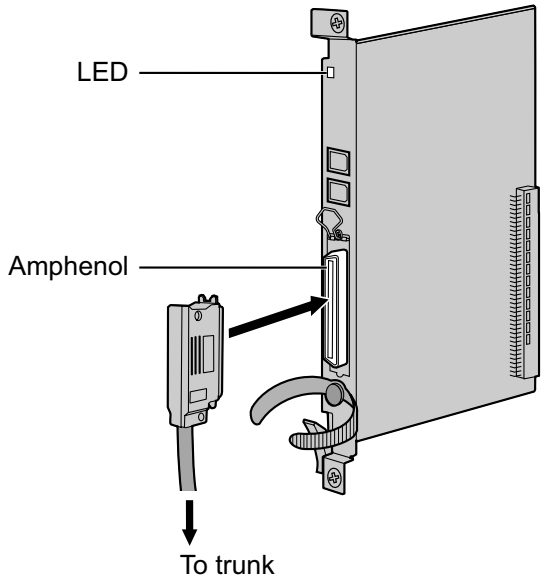
Indication	Colour	Description
CARD STATUS	Green/Red	Card status indication • Green ON: Normal • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.7 Information about the Physical Trunk Cards

3.7.1 ELCOT16 Card (KX-TDA6181)

Function

16-port analogue trunk card with 4 power failure transfer (PFT) ports. A maximum of 2 CID8 cards, 2 CID/PAY8 cards, or one of each can be mounted on the ELCOT16 card (refer to "3.7.3 CID/PAY8 Card (KX-TDA0189)" and "3.7.4 CID8 Card (KX-TDA0193)").



Accessories and User-supplied Items

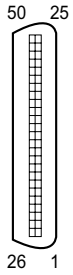
Accessories (included): Screws × 2
User-supplied (not included): Amphenol connector

Note

- To connect the Amphenol connector, refer to "3.2.16 Fastening an Amphenol Connector".
- For details about power failure transfer, refer to "3.14.1 Power Failure Connections".
- To confirm the trunk connection, refer to "Confirming the Trunk 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	–

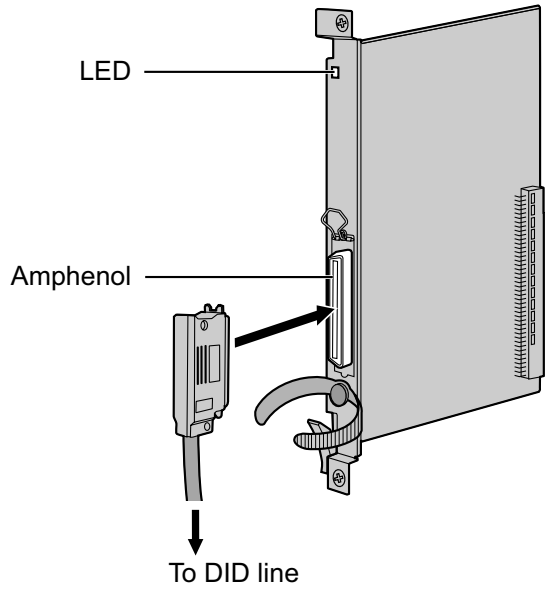
LED Indications

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

3.7.2 DID8 Card (KX-TDA0182)

Function

8-port DID trunk card.



Accessories and User-supplied Items

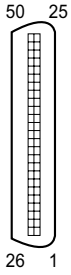
Accessories (included): Screws × 2
User-supplied (not included): Amphenol connector

Note

- To connect the Amphenol connector, refer to "3.2.16 Fastening an Amphenol Connector".
- To confirm the trunk connection, refer to "Confirming the Trunk 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
	9-25	Reserved	–	34-50	Reserved	–

LED Indications

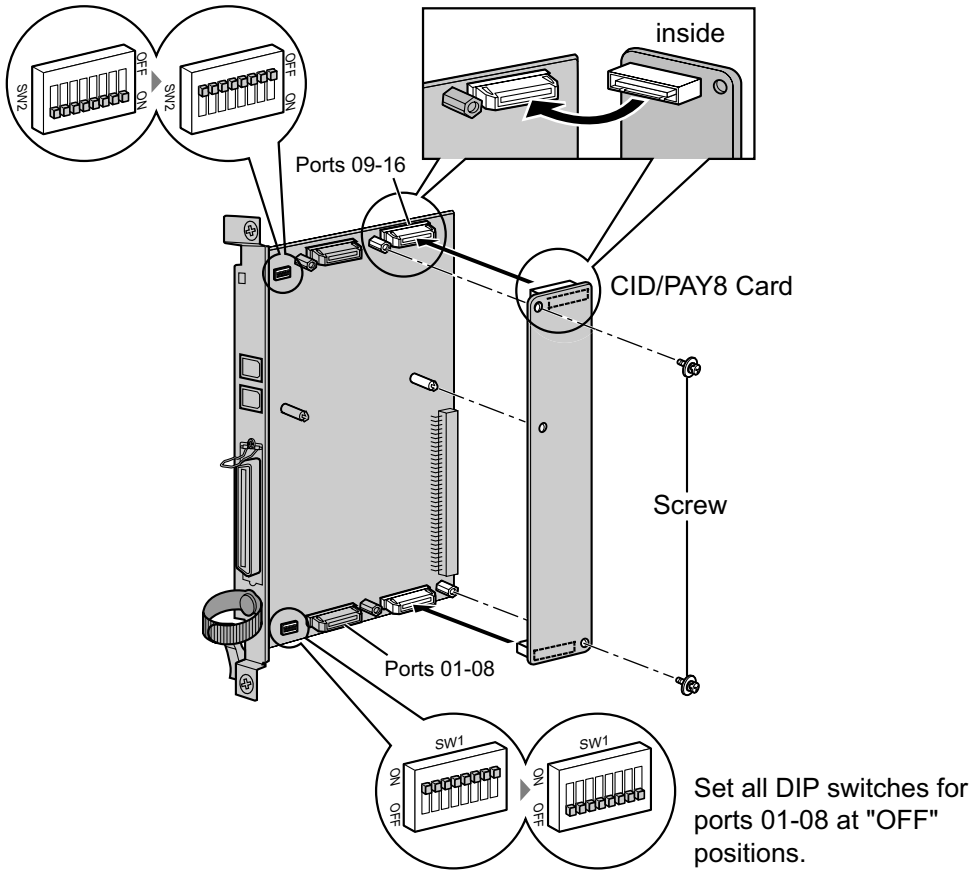
Indication	Colour	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service

3.7.3 CID/PAY8 Card (KX-TDA0189)

Function

8-port Caller ID signal type FSK/FSK (with Call Waiting Caller ID [Visual Caller ID])/DTMF, and 8-port Pay Tone Service (12 kHz/16 kHz). To be mounted on the ELCOT16 card.

Set all DIP switches for ports 09-16 at "OFF" positions.



Accessories and User-supplied Items

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

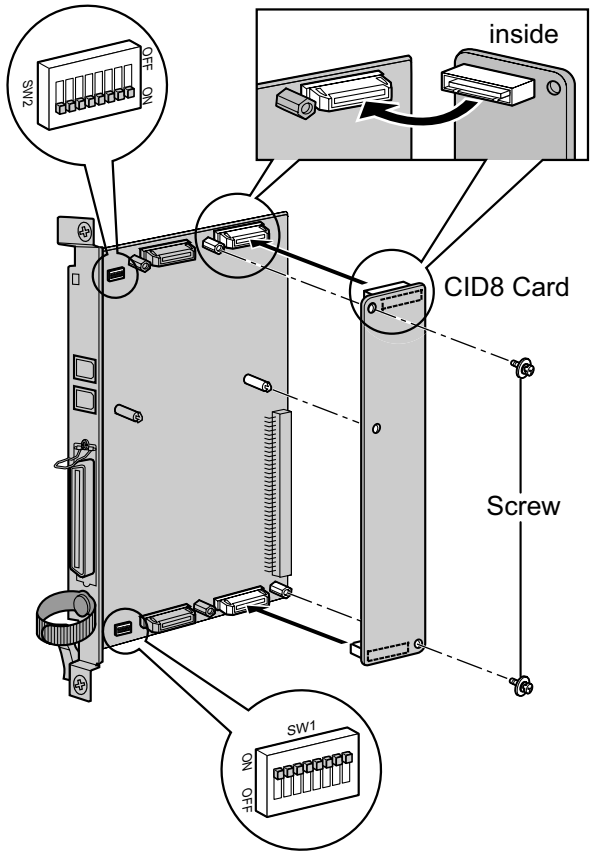
Switch Settings (on ELCOT16 card)

Switch	Type	Usage and Status Definition
Port Setting	DIP	Set all DIP switches at "OFF" positions.

3.7.4 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

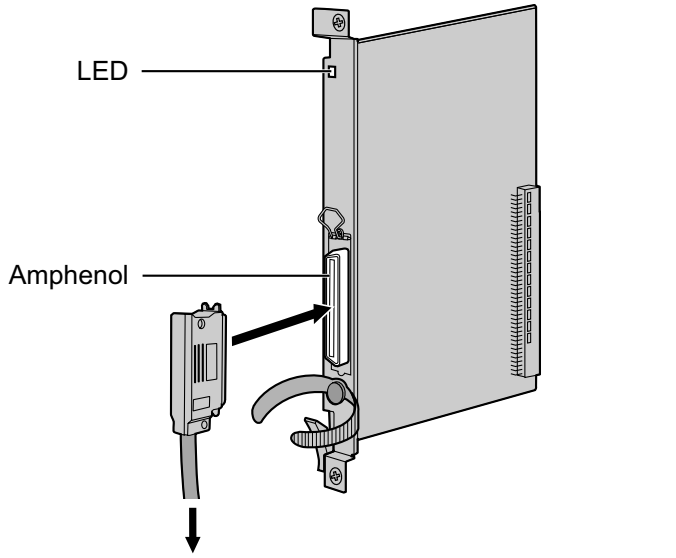
Switch Settings (on ELCOT16 card)

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.

3.7.5 E&M8 Card (KX-TDA0184)

Function

8-port E & M (TIE) trunk card. Type 5 support.



Accessories and User-supplied Items

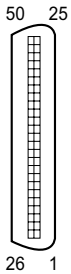
Accessories (included): Screws × 2
User-supplied (not included): Amphenol connector

Note

- Connect this optional service card to the trunk through terminal board from the E & M (TIE) line; do not connect to the trunk directly.
- To connect the Amphenol connector, refer to "3.2.16 Fastening an Amphenol Connector".
- To confirm the trunk connection, refer to "Confirming the Trunk Connection" in "3.15.1 Starting the PBX".

Pin Assignments

Amphenol Connector

	No.	Signal Name	Function	No.	Signal Name	Function
	1	TA	Tip port 1	26	RA	Ring port 1
	2	T1A	Tip 1 port 1	27	R1A	Ring 1 port 1
	3	EA	E line port 1	28	MA	M line port 1
	4	SGA	SG line port 1	29	SGB	SG line port 2
	5	TB	Tip port 2	30	RB	Ring port 2
	6	T1B	Tip 1 port 2	31	R1B	Ring 1 port 2
	7	EB	E line port 2	32	MB	M line port 2
	8	TC	Tip port 3	33	RC	Ring port 3

	No.	Signal Name	Function	No.	Signal Name	Function
	9	T1C	Tip 1 port 3	34	R1C	Ring 1 port 3
	10	EC	E line port 3	35	MC	M line port 3
	11	TD	Tip port 4	36	RD	Ring port 4
	12	T1D	Tip 1 port 4	37	R1D	Ring 1 port 4
	13	ED	E line port 4	38	MD	M line port 4
	14	TE	Tip port 5	39	RE	Ring port 5
	15	T1E	Tip 1 port 5	40	R1E	Ring 1 port 5
	16	EE	E line port 5	41	ME	M line port 5
	17	TF	Tip port 6	42	RF	Ring port 6
	18	T1F	Tip 1 port 6	43	R1F	Ring 1 port 6
	19	EF	E line port 6	44	MF	M line port 6
	20	TG	Tip port 7	45	RG	Ring port 7
	21	T1G	Tip 1 port 7	46	R1G	Ring 1 port 7
	22	EG	E line port 7	47	MG	M line port 7
	23	TH	Tip port 8	48	RH	Ring port 8
	24	T1H	Tip 1 port 8	49	R1H	Ring 1 port 8
	25	EH	E line port 8	50	MH	M line port 8

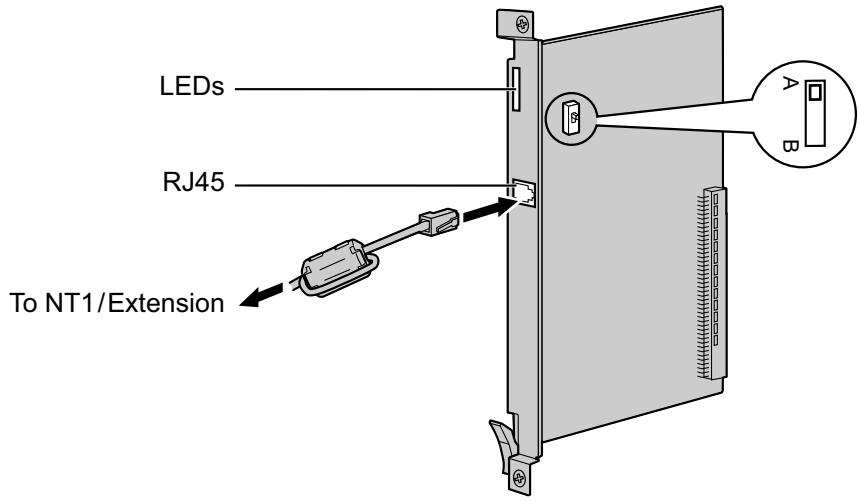
LED Indications

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

3.7.6 T1 Card (KX-TDA0187)

Function

1-port T1 trunk card. EIA/TIA standard compliant.



Accessories and User-supplied Items

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

CAUTION

- When connecting this optional service card to the trunk, connect through NT1; do not connect to the trunk directly.
- T1 ports are SELV ports and should only be connected to SELV services.

Notice

When connecting the RJ45 connector, attach the included ferrite core (except in Canada, where the ferrite core is not necessarily required). Refer to "3.2.15 Attaching a Ferrite Core".

Note

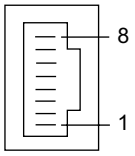
- This optional service card can be used for either trunk or extension connection, by setting the A/B switch or using the connector with appropriate pin assignments.
- To confirm the trunk connection, refer to "Confirming the Trunk Connection" in "3.15.1 Starting the PBX".

Switch Settings

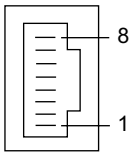
Switch	Type	Usage and Status Definition
A/B	Slide	Select A (default) for trunk or B for extension use.

Pin Assignments

RJ45 Connector for Trunk Use

	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	–	–

RJ45 Connector for Extension Use

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

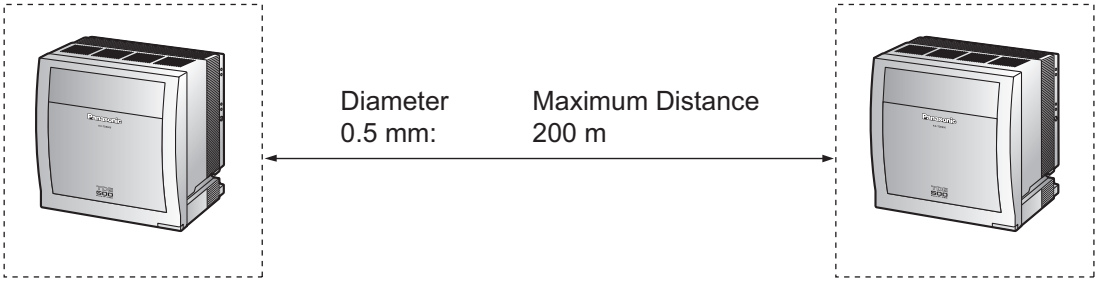
LED Indications

Indication	Colour	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
SYNC-ERR	Red	Non-synchronisation status indication • OFF: Normal • ON: Out of synchronisation
RAI	Red	RAI signal status indication • OFF: Normal • ON: Alarm (Clock Slave) • Flashing (60 times per minute): Alarm (Clock Master)
AIS	Red	AIS status indication • OFF: Normal • ON: Alarm

Indication	Colour	Description
SYNC	Green	Synchronisation status indication • OFF: Not synchronised • ON: Synchronised • Flashing (60 times per minute): Synchronised (Clock Master)

Maximum Cabling Distance of Extension Connection

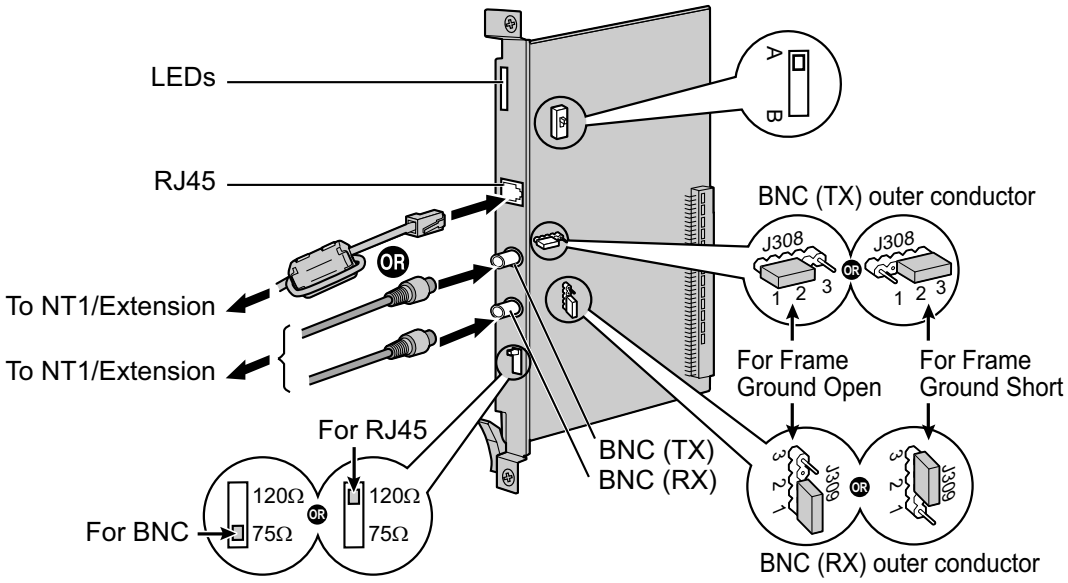
The maximum length of the extension cable that connects the T1 cards is shown below:



3.7.7 E1 Card (KX-TDA0188)

Function

1-port E1 trunk card. ITU-T standard compliant.



Accessories and User-supplied Items

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

CAUTION

- When connecting this optional service card to the trunk, connect through NT1; do not connect to the trunk directly.
- E1 ports are SELV ports and should only be connected to SELV services.

Notice

When connecting the RJ45 connector, attach the included ferrite core. Refer to "3.2.15 Attaching a Ferrite Core".

Note

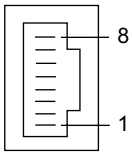
- In some countries/areas, this optional service card must not be connected to the Public Switched Telephone Network.
- Use only 1 type of connector (RJ45 or BNC) for connection; RJ45 and BNC cannot be used simultaneously.
- This optional service card can be used for either trunk or extension connection, by setting the A/B switch or using the connector with appropriate pin assignments.
- To confirm the trunk connection, refer to "Confirming the Trunk Connection" in "3.15.1 Starting the PBX".

Switch Settings

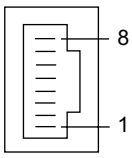
Switch	Type	Usage and Status Definition
Termination	Slide	Select 120 Ω (default) or 75 Ω to match the connector type to be used.
A/B	Slide	When using an RJ45 connector, select A (default) for trunk or B for extension use. When using BNC connectors, make sure that A is selected.
Frame Ground Short	Short pin	J308 is for BNC (TX) outer conductor, and J309 is for BNC (RX) outer conductor. Connection of 1 and 2: Open (default) Connection of 2 and 3: Short

Pin Assignments

RJ45 Connector for Trunk Use

	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	–	–

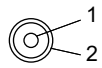
RJ45 Connector for Extension use

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

BNC (coaxial) Connector (TX)

	No.	Signal Name	Level [V]	Function
	1	TX+	(+)	Transmit data (+)
	2	TX-	(-)	Transmit data (-)

BNC (coaxial) Connector (RX)

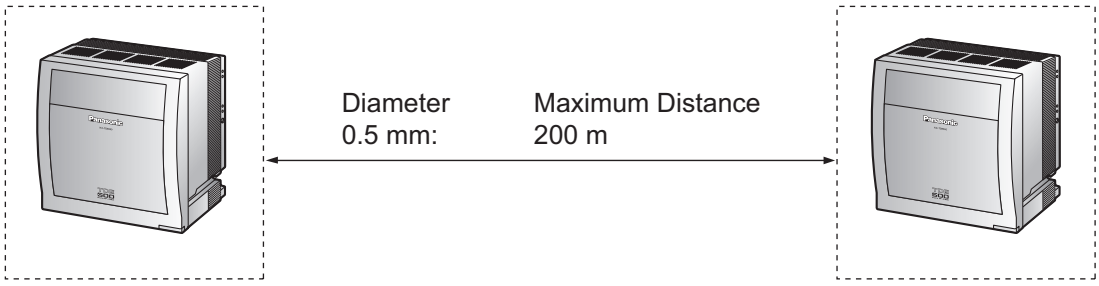
	No.	Signal Name	Level [V]	Function
	1	RX-	(-)	Receive data (-)
	2	RX+	(+)	Receive data (+)

LED Indications

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

Maximum Cabling Distance of Extension Connection

The maximum length of the extension cable that connects the E1 cards is shown below:

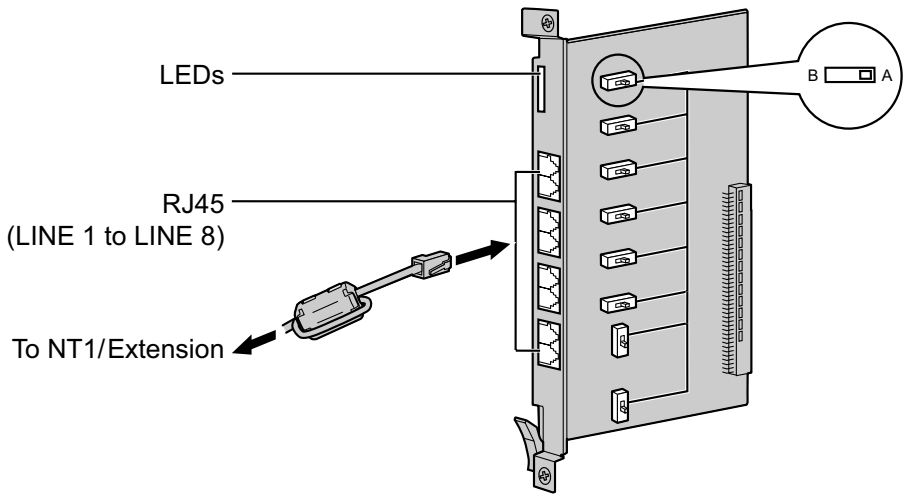


3.7.8 BRI4 Card (KX-TDA0284) and BRI8 Card (KX-TDA0288)

Function

BRI4: 4-port ISDN Basic Rate Interface card with 1 power failure transfer port. EURO-ISDN/ETSI compliant.

BRI8: 8-port ISDN Basic Rate Interface card with 1 power failure transfer port. EURO-ISDN/ETSI compliant.



Accessories and User-supplied Items

Accessories (included): Ferrite core(s) × 1 (BRI4 card) or 2 (BRI8 card)
User-supplied (not included): RJ45 connector

CAUTION

- If the connected ISDN terminal has no external power source, make sure that the power is supplied from the BRI4/BRI8 card by programming the PBX accordingly.
  However, if there is an external power source to the terminal, make sure that there is no power supplied to the terminal from the BRI4/BRI8 card. Failure to do so may cause damage to the power supply circuit of the BRI4/BRI8 card or the terminal.
- When connecting these optional service cards to the trunk, connect through an NT1; do not connect to the U interface of the trunk directly.

Notice

When connecting the RJ45 connector, attach the included ferrite core. Refer to "3.2.15 Attaching a Ferrite Core".

Note

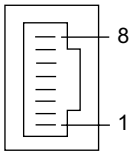
- LINE 5 to LINE 8 are for BRI8 card only.
- These optional service cards have 100 Ω of terminal resistance. For use in point to multi-point connection, the cards must be placed at the end of the bus.
- These optional service cards can be used for either trunk or extension connection, by setting the A/B switch or using the connector with appropriate pin assignments.
- For details about power failure transfer, refer to "3.14.1 Power Failure Connections".
- To confirm the trunk connection, refer to "Confirming the Trunk Connection" in "3.15.1 Starting the PBX".

Switch Settings

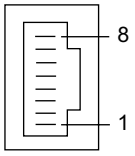
Switch	Type	Usage and Status Definition
A/B	Slide	Select A (default) for trunk or B for extension use.

Pin Assignments

RJ45 Connector for Trunk Use

	No.	Signal Name	Level [V]	Function
	1-2	Reserved	–	–
	3	TX1	(+)	Transmit data 1
	4	RX2	(+)	Receive data 2
	5	RX1	(-)	Receive data 1
	6	TX2	(-)	Transmit data 2
	7-8	Reserved	–	–

RJ45 Connector for Extension Use

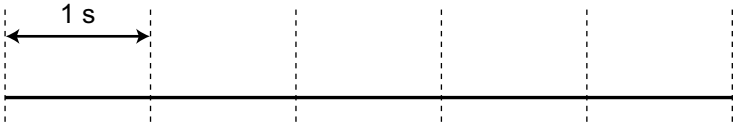
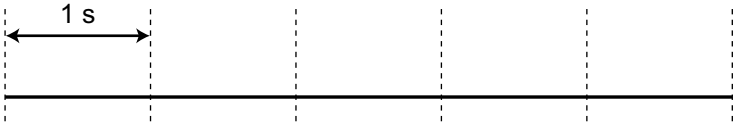
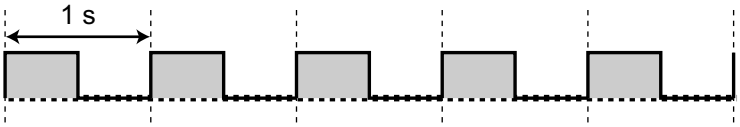
	No.	Signal Name	Level [V]	Function
	1-2	Reserved	–	–
	3	RX2	(+)	Receive data 2
	4	TX1	(+)	Transmit data 1
	5	TX2	(-)	Transmit data 2
	6	RX1	(-)	Receive data 1
	7-8	Reserved	–	–

LED Indications

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

Indication	Colour	Description
LINE 8 LINE 7 LINE 6 LINE 5 LINE 4 LINE 3 LINE 2 LINE 1	Green	Line status indication (LINE 1 to LINE 8): Refer to "LINE LED Pattern" below for details. **Note** LINE 5 to LINE 8 are for BRI8 card only.

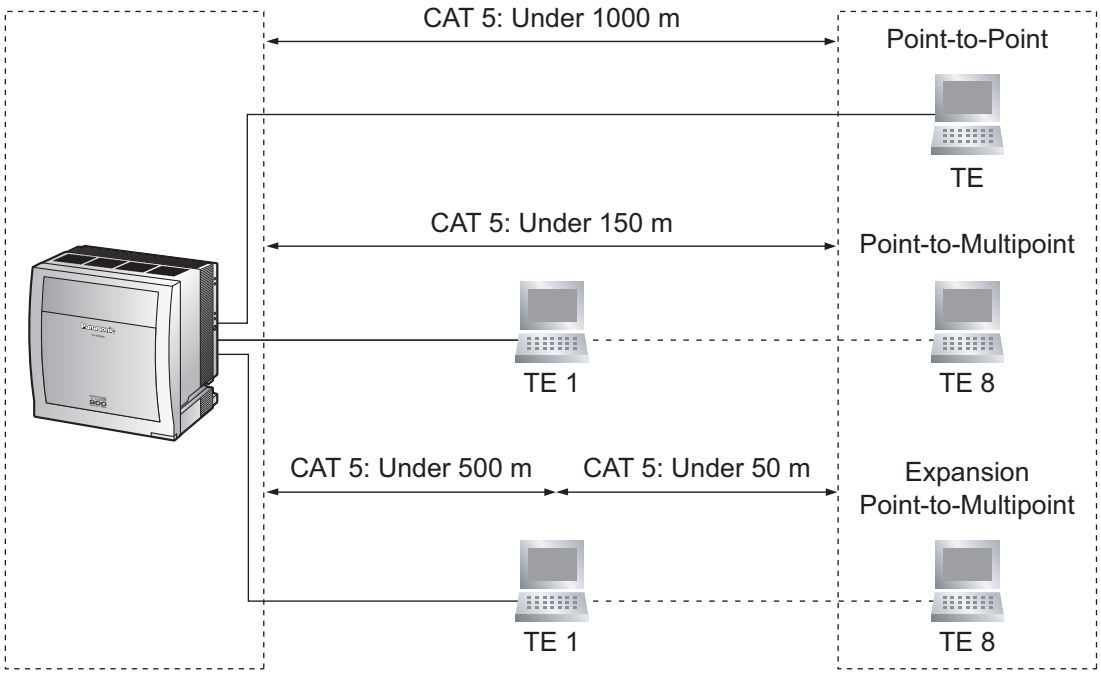
LINE LED Pattern

Layer 1	Layer 2	Master Clock	LED Pattern
OFF	OFF	OFF	
ON	OFF	OFF	
ON	ON	OFF	
ON	OFF	ON	
ON	ON	ON	

Layer 1: ON (Synchronous)
Layer 2: ON (Link established)/OFF (Link not established)
Master Clock: ON (Master)/OFF (Slave)

Maximum Cabling Distance of S0 Bus Connection

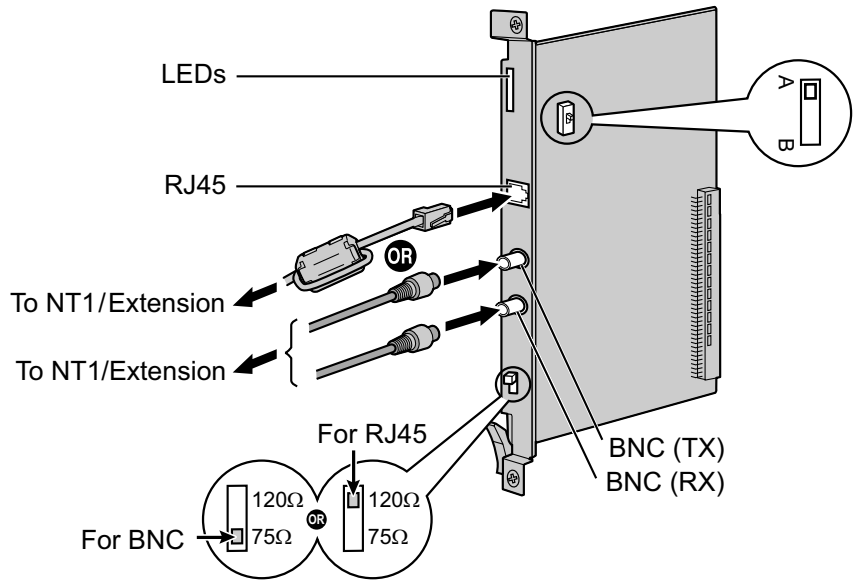
The maximum length of the extension cable that connects the PBX and the ISDN terminal equipment (TE) is shown below:



3.7.9 PRI30 Card (KX-TDA0290CE/KX-TDA0290CJ)

Function

1-port ISDN Primary Rate Interface card (30B channels). EURO-ISDN/ETSI compliant.



Accessories and User-supplied Items

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

CAUTION

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

Notice

When connecting the RJ45 connector, attach the included ferrite core. Refer to "3.2.15 Attaching a Ferrite Core".

Note

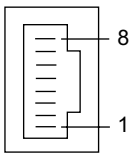
- In some countries/areas, this optional service card must not be connected to the Public Switched Telephone Network.
- Use only 1 type of connector (RJ45 or BNC) for connection; RJ45 and BNC cannot be used simultaneously.
- This optional service card can be used for either trunk or extension connection, by setting the A/B switch or using the connector with appropriate pin assignments.
- To confirm the trunk connection, refer to "Confirming the Trunk Connection" in "3.15.1 Starting the PBX".

Switch Settings

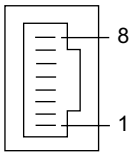
Switch	Type	Usage and Status Definition
Termination	Slide	Select 120 Ω (default) or 75 Ω to match the connector type to be used.
A/B	Slide	When using an RJ45 connector, select A (default) for trunk or B for extension use. When using BNC connectors, make sure that A is selected.

Pin Assignments

RJ45 Connector for Trunk Use

	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	–	–

RJ45 Connector for Extension Use

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

BNC (coaxial) Connector (TX)

	No.	Signal Name	Level [V]	Function
	1	TX+	(+)	Transmit data (+)
	2	TX-	(-)	Transmit data (-)

BNC (coaxial) Connector (RX)

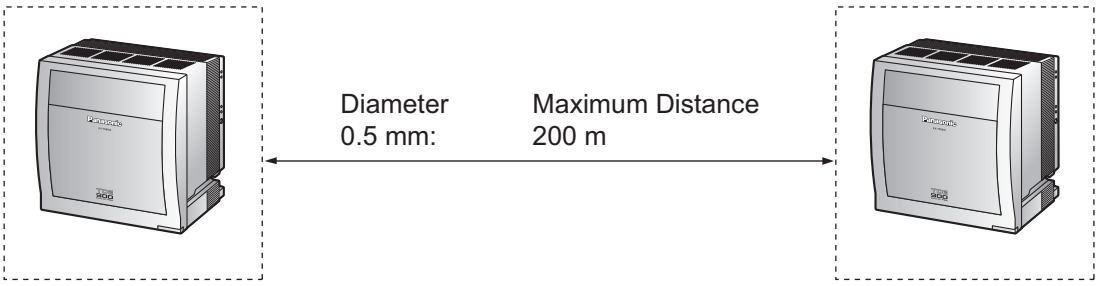
	No.	Signal Name	Level [V]	Function
	1	RX-	(-)	Receive data (-)
	2	RX+	(+)	Receive data (+)

LED Indications

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

Maximum Cabling Distance of Extension Connection

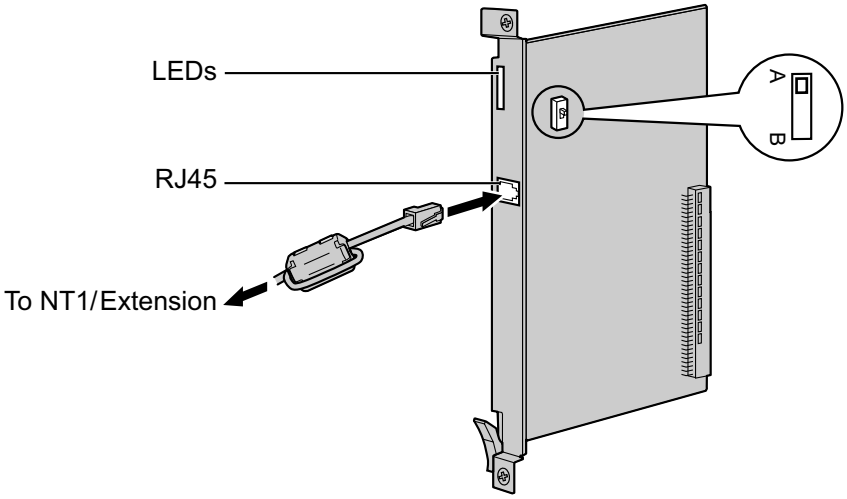
The maximum length of the extension cable that connects the PRI30 cards is shown below:



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

CAUTION

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

Notice

When connecting the RJ45 connector, attach the included ferrite core (except in Canada, where the ferrite core is not necessarily required). Refer to "3.2.15 Attaching a Ferrite Core".

Note

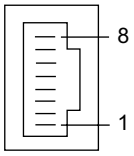
- This optional service card can be used for either trunk or extension connection, by setting the A/B switch or using the connector with appropriate pin assignments.
- To confirm the trunk connection, refer to "Confirming the Trunk Connection" in "3.15.1 Starting the PBX".

Switch Settings

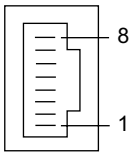
Switch	Type	Usage and Status Definition
A/B	Slide	Select A (default) for trunk or B for extension use.

Pin Assignments

RJ45 Connector for Trunk Use

	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	–	–

RJ45 Connector for Extension Use

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

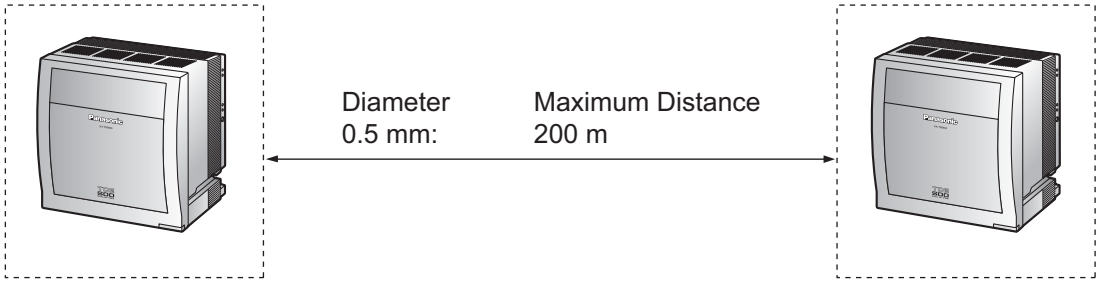
LED Indications

Indication	Colour	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
SYNC-ERR	Red	Non-synchronisation status indication • OFF: Normal • ON: Out of synchronisation
RAI	Red	RAI signal status indication • OFF: Normal • ON: Alarm (Clock Slave) • Flashing (60 times per minute): Alarm (Clock Master)
AIS	Red	AIS status indication • OFF: Normal • ON: Alarm

Indication	Colour	Description
SYNC	Green	Synchronisation status indication • OFF: Not synchronised • ON: Synchronised • Flashing (60 times per minute): Synchronised (Clock Master)
D-LINK	Green	Data link status indication • OFF: Not established • ON: Established

Maximum Cabling Distance of Extension Connection

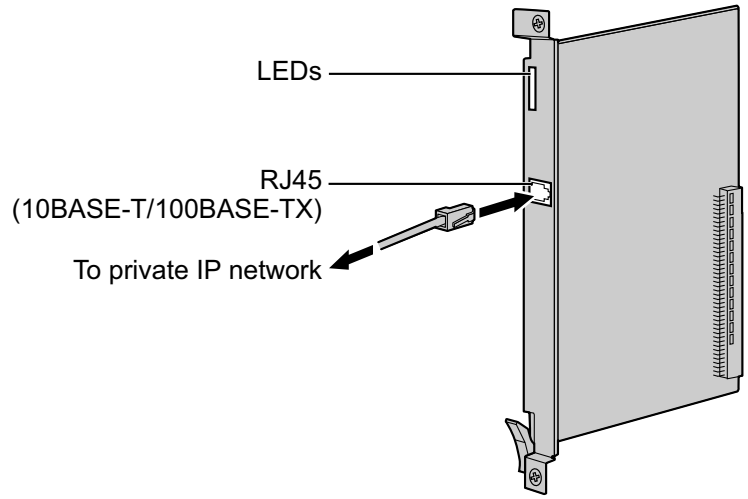
The maximum length of the extension cable that connects the PRI23 cards is shown below:



3.7.11 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

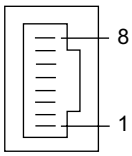
Accessories (included): CD-ROM (including documentation for web programming) × 1
User-supplied (not included): RJ45 connector

Note

- The maximum length of the cable to be connected to this optional service card is 100 m.
- 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 programme the IP-GW4E card, use the web programming designed for the IP-GW4E card.
- To confirm the trunk connection, refer to "Confirming the Trunk 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	–	–

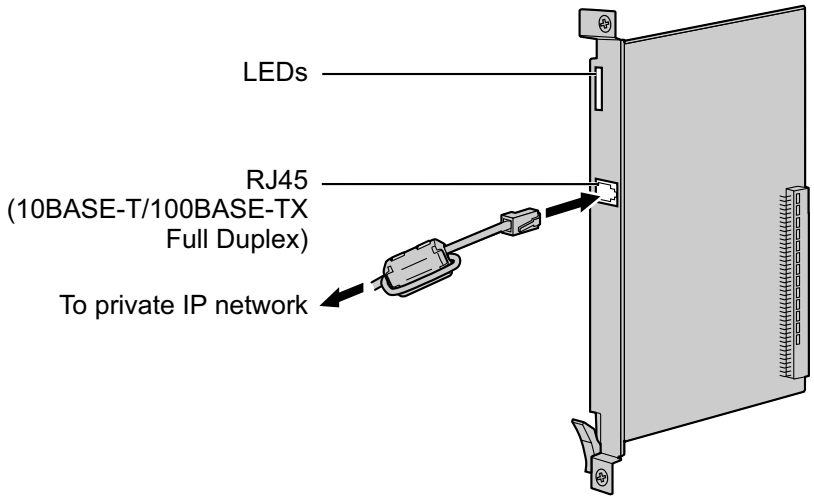
LED Indications

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

3.7.12 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

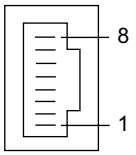
Accessories (included): Ferrite core × 1, CD-ROM (including documentation for web programming) × 1
User-supplied (not included): RJ45 connector

Note

- The maximum length of the cable to be connected to this optional service card is 100 m.
- When connecting the RJ45 connector, attach the included ferrite core. Refer to "3.2.15 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 programme the IP-GW16 card, use the web programming designed for the IP-GW16 card.
- To confirm the trunk connection, refer to "Confirming the Trunk 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

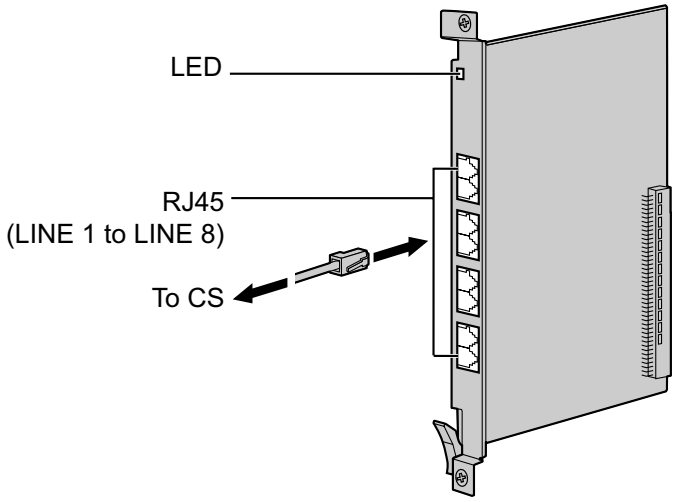
Indication	Colour	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • Green ON: Normal (all ports are idle) • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
ONLINE	Green	On-line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

3.8 Information about the Physical 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

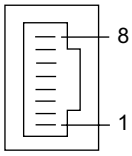
Make sure that the status of all the CSs connected to the CSIF cards are set to in-service (INS). For information about how to view CS information using the Maintenance Console, refer to "2.6.15 Utility—CS Information" in the PC Programming Manual. If there is a CS in out-of-service (OUS) status, make 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 recognise 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.

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	–

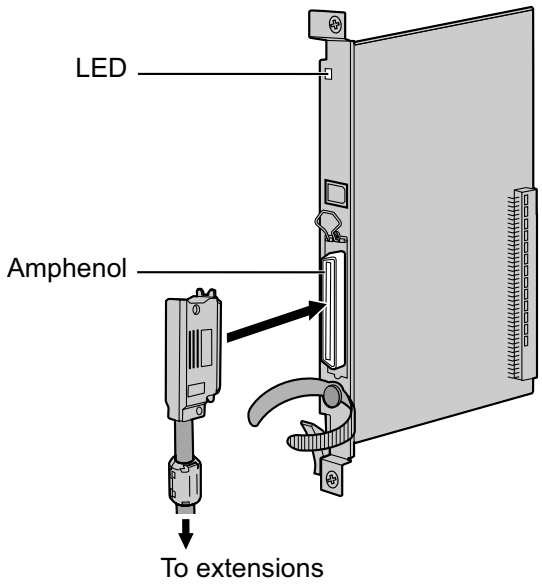
LED Indications

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

3.8.2 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

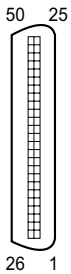
Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.15 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.16 Fastening an 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

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

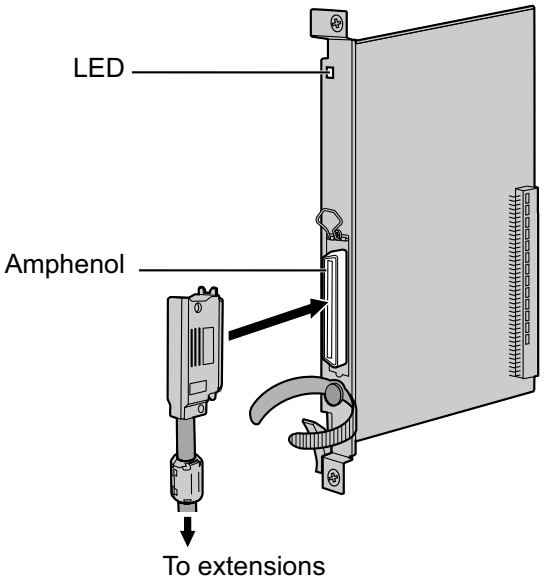
LED Indications

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

3.8.3 DLC8 Card (KX-TDA0171)

Function

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



Accessories and User-supplied Items

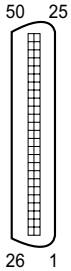
Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.15 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.16 Fastening an Amphenol Connector".

Pin Assignments

Amphenol Connector

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

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

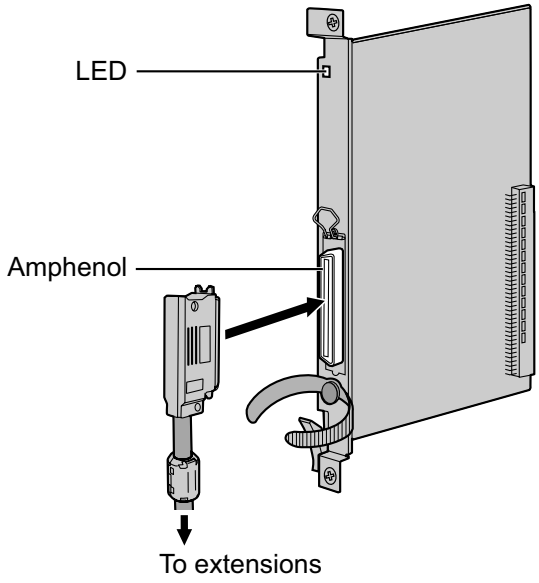
LED Indications

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

3.8.4 DLC16 Card (KX-TDA0172)

Function

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



Accessories and User-supplied Items

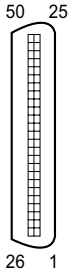
Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.15 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.16 Fastening an Amphenol Connector".

Pin Assignments

Amphenol Connector

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

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

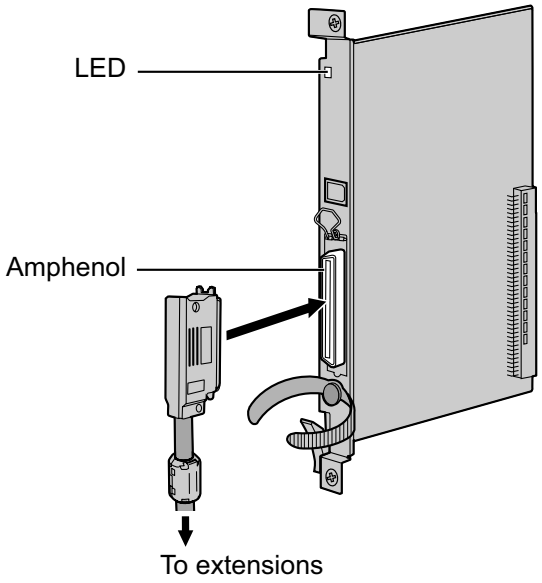
LED Indications

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

3.8.5 SLC8 Card (KX-TDA0173)

Function

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



Accessories and User-supplied Items

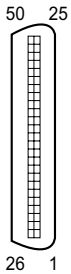
Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- Attach the included ferrite core to the cable. Refer to "3.2.15 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.16 Fastening an 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

	No.	Signal Name	Function	No.	Signal Name	Function
	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	–

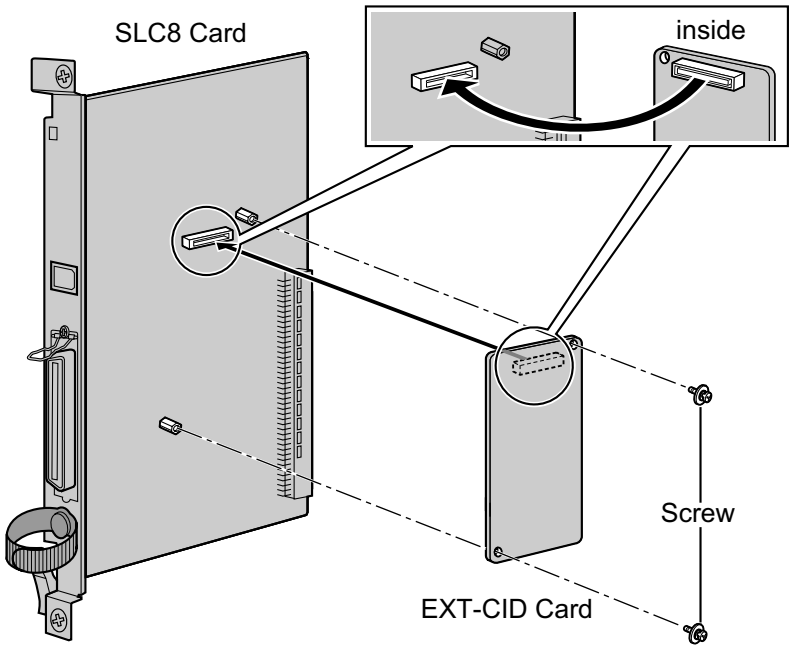
LED Indications

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

3.8.6 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)

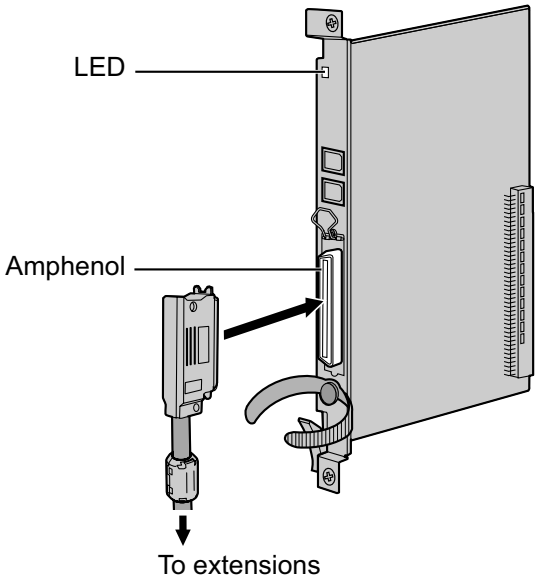
Function

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 power output of 160 V/90 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

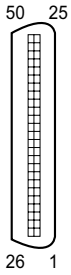
Accessories (included): Screws × 2, Ferrite core × 1
User-supplied (not included): Amphenol connector

Note

- Panasonic SLT with Message Waiting Lamp (e.g., KX-T7710) is recommended for connection to the EMSLC16 card.
- Attach the included ferrite core to the cable. Refer to "3.2.15 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "3.2.16 Fastening an 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	–

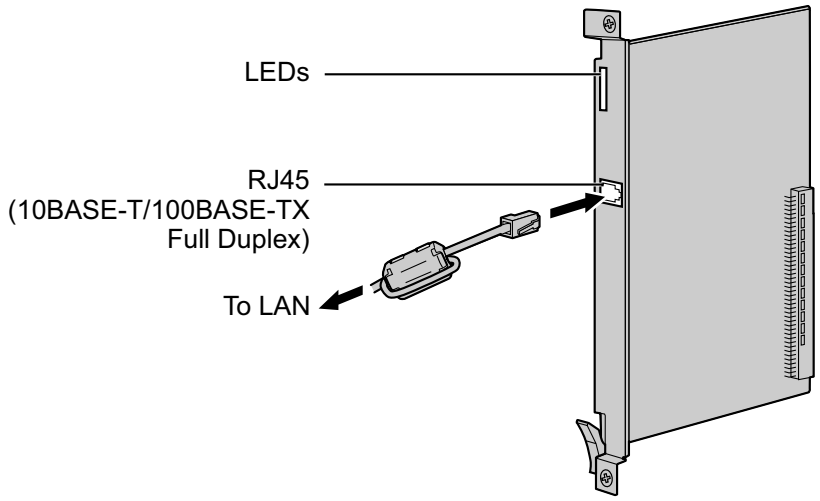
LED Indications

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

3.8.8 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

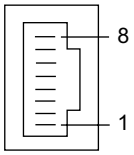
Accessories (included): Ferrite core × 1
User-supplied (not included): RJ45 connector

Note

- The maximum length of the cable to be connected to this optional service card is 100 m.
- When connecting the RJ45 connector, attach the included ferrite core. Refer to "3.2.15 Attaching a Ferrite Core".

Pin Assignments

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

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

LED Indications

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

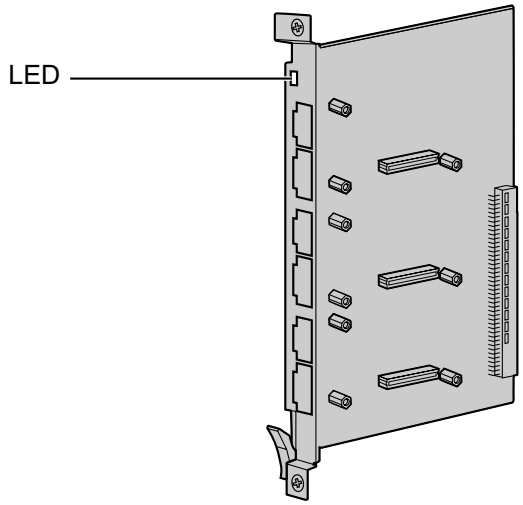
3.9 Information about the Other Physical Cards

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
- DPH2 card
- EIO4 card
- MSG4 card
- ESVM2 card
- ESVM4 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.

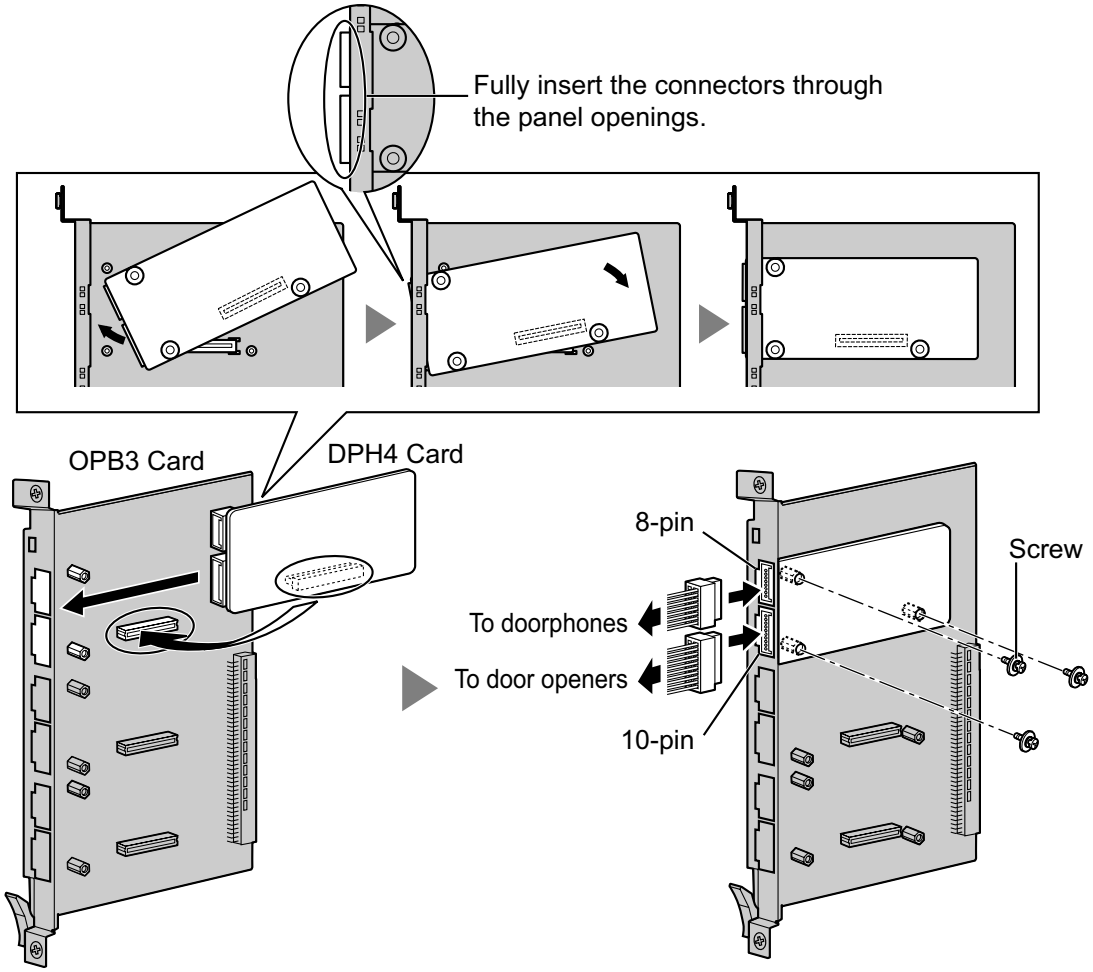
LED Indications

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

3.9.2 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

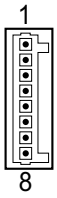
Accessories (included): Screws × 3, 10-pin terminal block × 1, 8-pin terminal block × 1
User-supplied (not included): Copper wire

Note

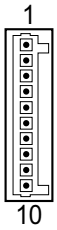
For details about connection to doorphones and door openers, refer to "3.11.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays".

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

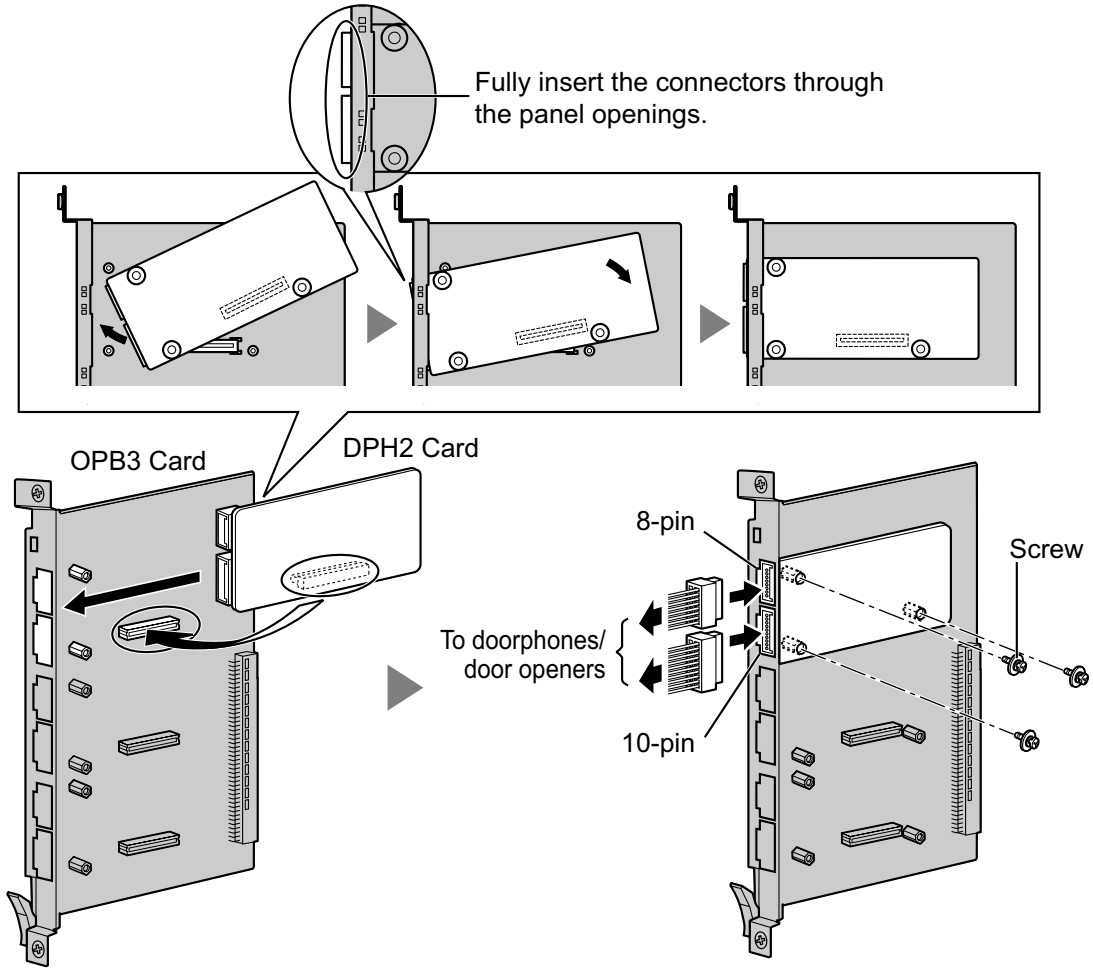
10-pin Terminal Block

	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 DPH2 Card (KX-TDA0162)

Function

2-port doorphone card for 2 German-type doorphones and 2 door openers. To be mounted on the OPB3 card.



Accessories and User-supplied Items

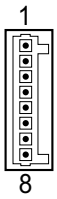
Accessories (included): Screws × 3, 10-pin terminal block × 1, 8-pin terminal block × 1
User-supplied (not included): Copper wire

Note

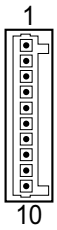
For details about connection to doorphones and door openers, refer to "3.11.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays".

Pin Assignments

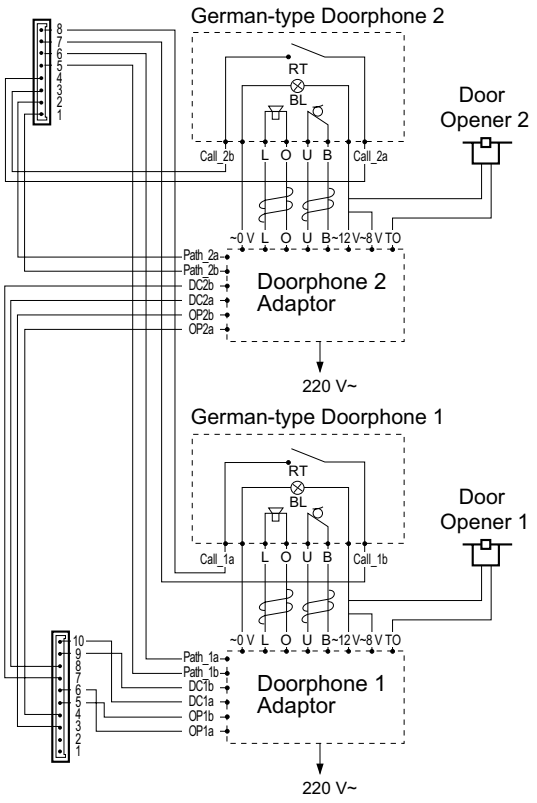
8-pin Terminal Block

	No.	Proprietary Signal Name	Standard Signal Name	Function
	1	Path_2b	b (2)	Doorphone 2 transmit
	2	Path_2a	a (2)	Doorphone 2 receive
	3	Call_2b	RT b (2)	Doorphone 2 call button
	4	Call_2a	RT a (2)	Doorphone 2 call button com
	5	Path_1b	b (1)	Doorphone 1 transmit
	6	Path_1a	a (1)	Doorphone 1 receive
	7	Call_1b	RT b (1)	Doorphone 1 call button
	8	Call_1a	RT a (1)	Doorphone 1 call button com

10-pin Terminal Block

	No.	Proprietary Signal Name	Standard Signal Name	Function
	1-2	Reserved	Reserved	–
	3	OP2b	TO b (2)	Door opener 2
	4	OP2a	TO a (2)	Door opener 2 com
	5	OP1b	TO b (1)	Door opener 1
	6	OP1a	TO a (1)	Door opener 1 com
	7	DC2b	TS b (2)	Doorphone control 2
	8	DC2a	TS a (2)	Doorphone control 2 com
	9	DC1b	TS b (1)	Doorphone control 1
	10	DC1a	TS a (1)	Doorphone control 1 com

Connection Diagram for German-type Doorphones and Door Openers

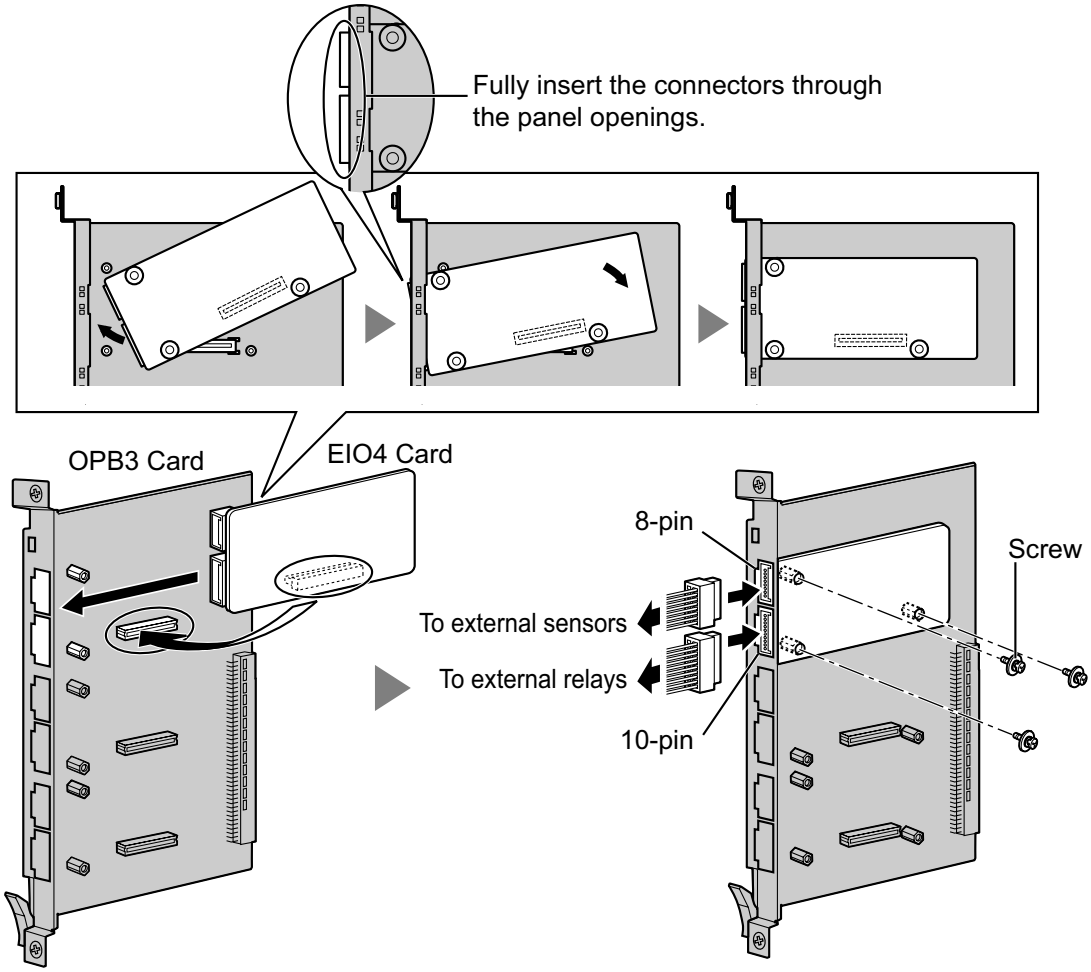


BL: Light
RT: Call Button
OP: Door Opener Connection Terminal
DC: Doorphone Current Supply Control Terminal
Path: Doorphone Call Path
: Speaker
: Microphone
: Shield

3.9.4 EIO4 Card (KX-TDA0164)

Function

4-port external input/output card. To be mounted on the OPB3 card.



Accessories and User-supplied Items

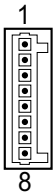
Accessories (included): Screws × 3, 10-pin terminal block × 1, 8-pin terminal block × 1
User-supplied (not included): Copper wire

Note

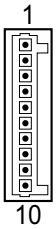
For details about connection to external sensors and external relays, refer to "3.11.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays".

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

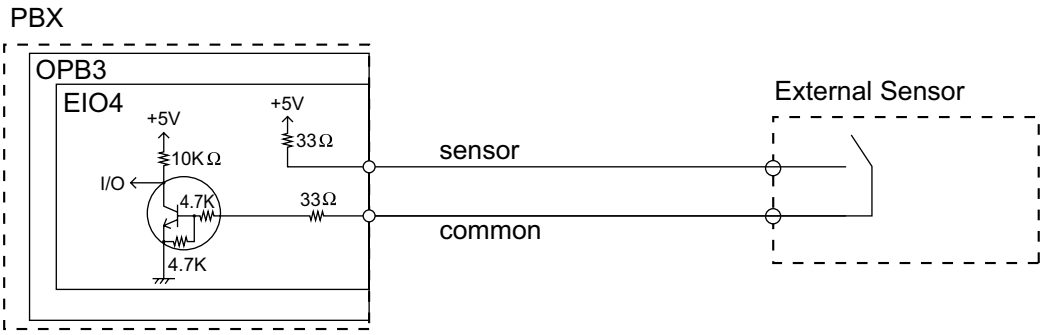
10-pin Terminal Block

	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



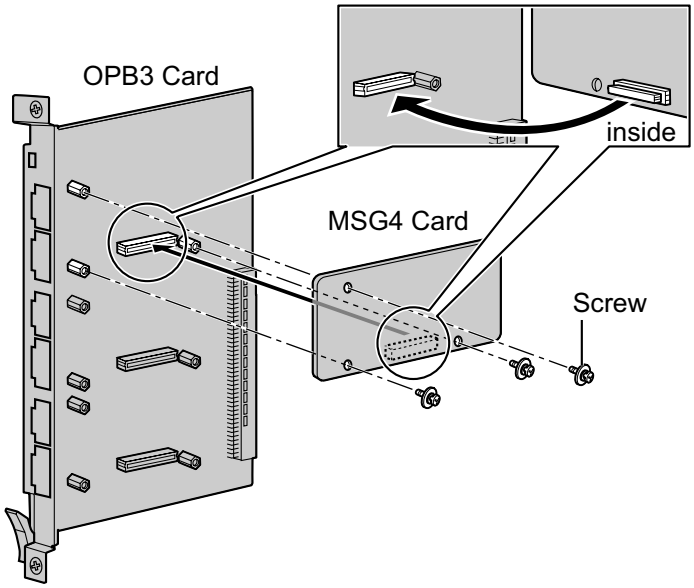
External Relay

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

3.9.5 MSG4 Card (KX-TDA0191)

Function

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



Accessories and User-supplied Items

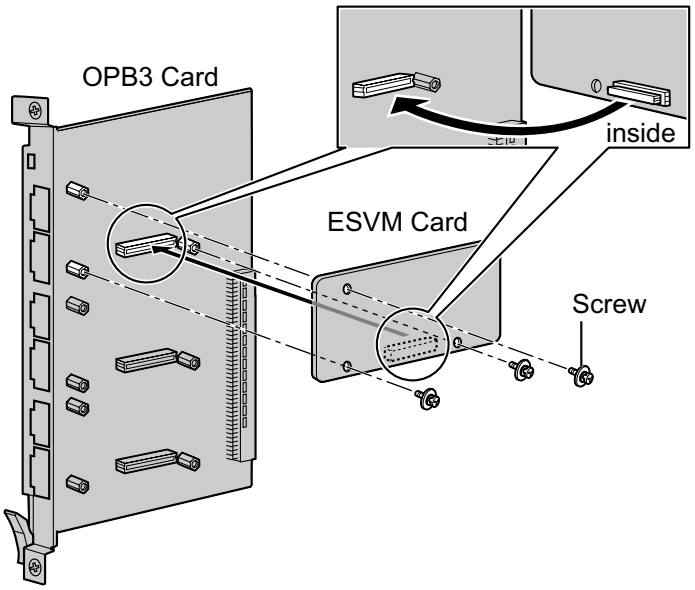
Accessories (included): Screws × 3
User-supplied (not included): none

3.9.6 ESVM2 Card (KX-TDA0192) and ESVM4 Card (KX-TDA0194)

Function

ESVM2: 2-channel simplified voice message card for Built-in Simplified Voice Message feature. Also supports MSG card features. To be mounted on the OPB3 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.



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 initialise the ESVM card. For details about the initialisation procedure, refer to "2.5.5 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.

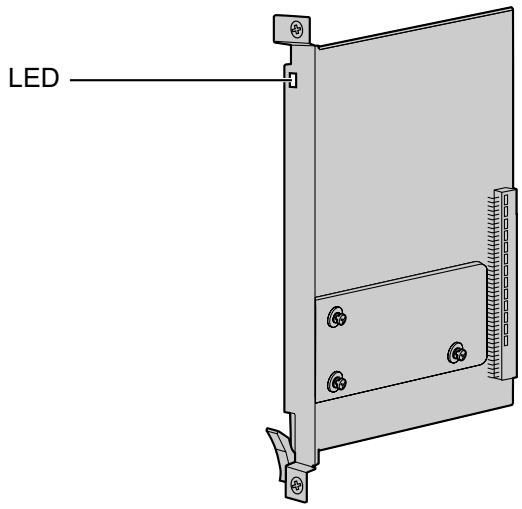
Note

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

3.9.7 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

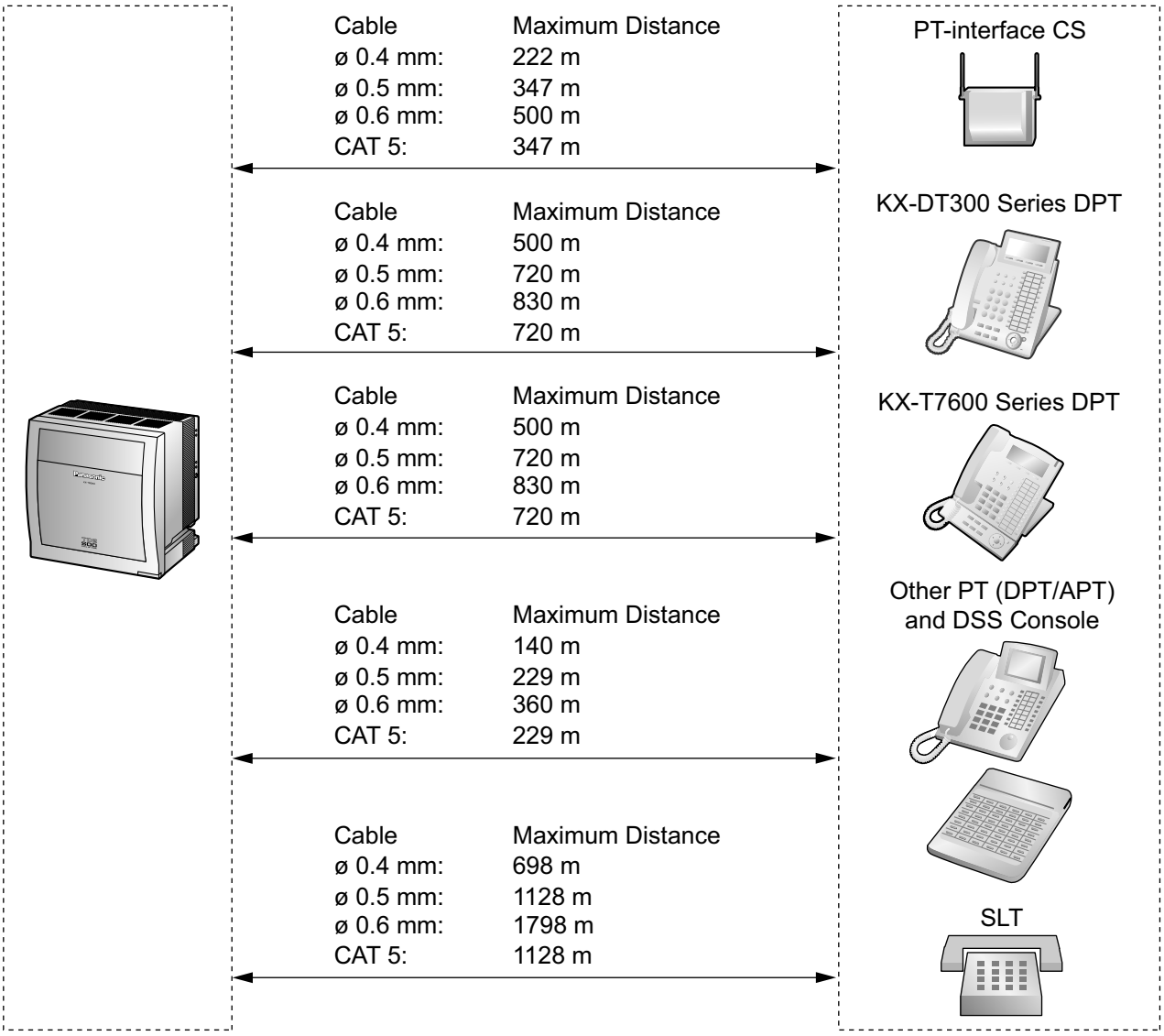
To establish a conference call involving 6 to 8 parties, install an EECHO16 card and enable echo cancellation for conferences using the Maintenance Console. For details, refer to "Echo Cancel—Conference" in "4.18 [2-9] System Options" of the PC Programming Manual.

LED Indications

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

3.10 Connection of Extensions

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



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

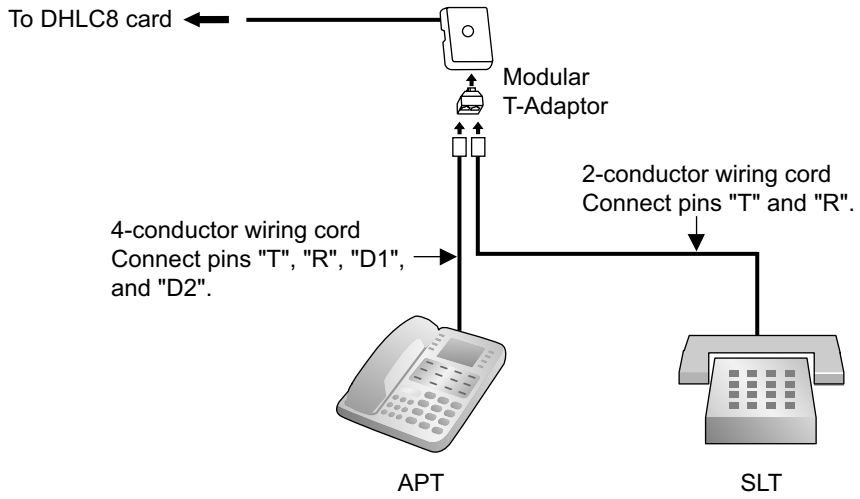
Any SLT can be connected in parallel with an APT or a DPT as follows.

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

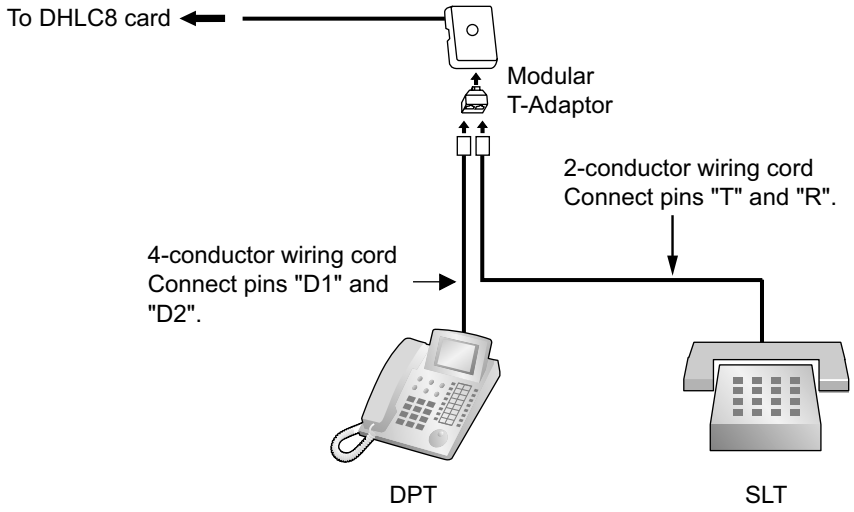
For parallel connection, eXtra Device Port (XDP) mode must be disabled for that port through system programming. Refer to "1.11.9 Parallelled Telephone" and "2.1.1 Extension Port Configuration" in the Feature Guide for further information.



With DPT

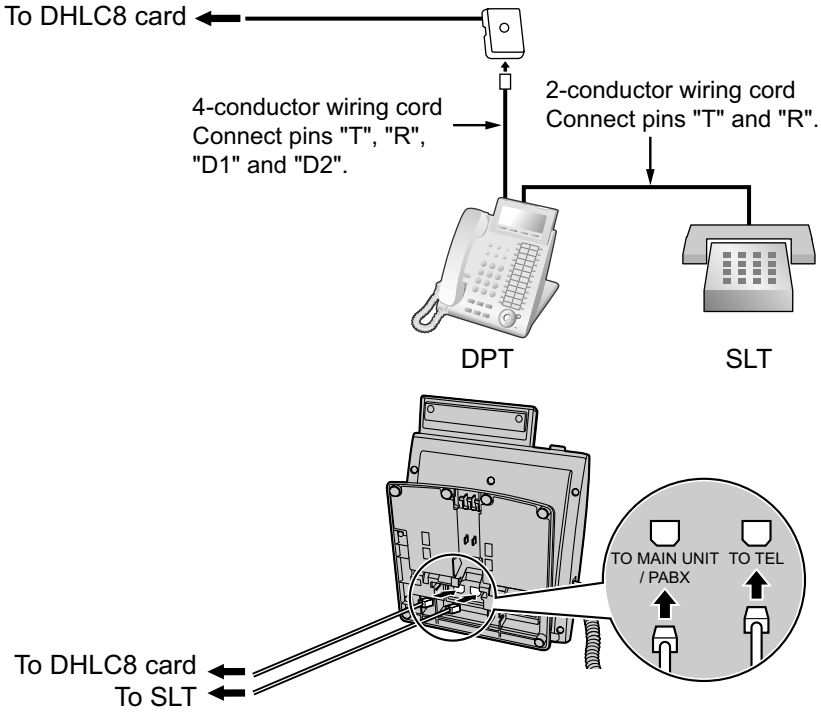
Parallel mode or eXtra Device Port (XDP) mode can be selected through system programming.
If XDP mode is enabled through system programming, parallel connection is not possible. Refer to "1.11.9 Parallelled Telephone" and "2.1.1 Extension Port Configuration" in the Feature Guide for further information.

Using a Modular T-Adaptor

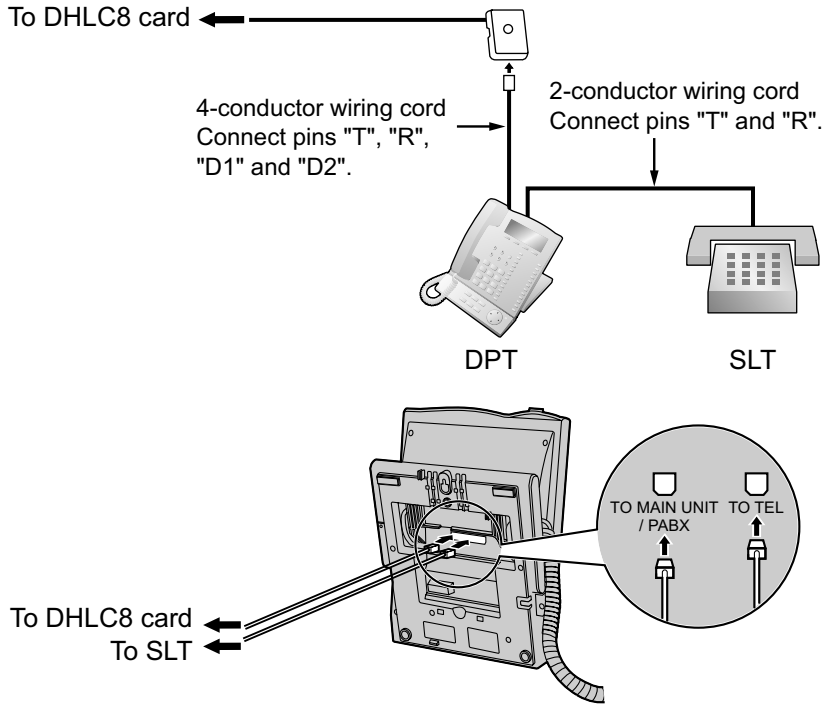


Using an EXtra Device Port

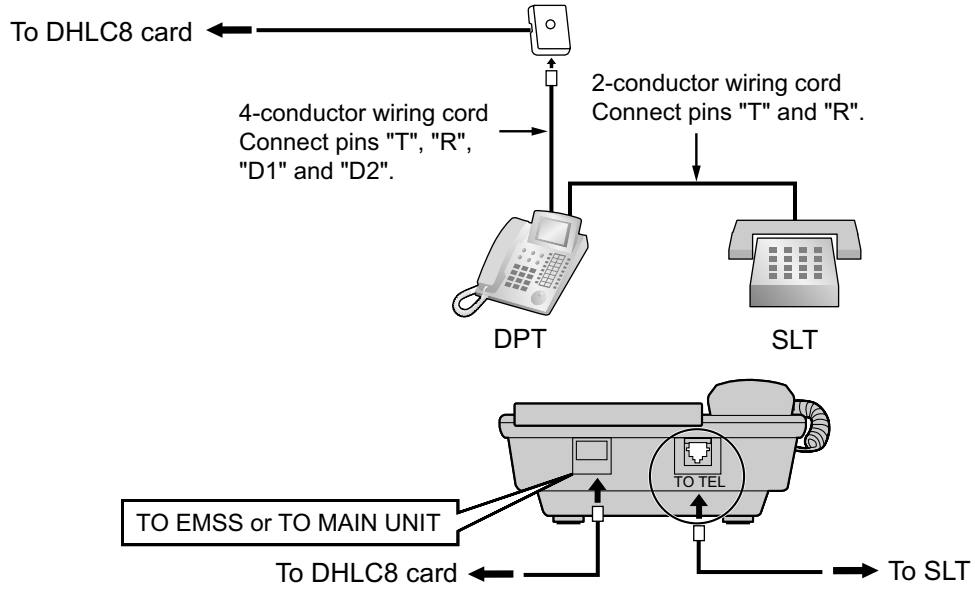
With KX-DT300 Series DPT (except KX-DT321)



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



With Other DPT (except KX-T7560 and KX-T7565)



3.10.3 Digital EXtra Device Port (Digital XDP) Connection

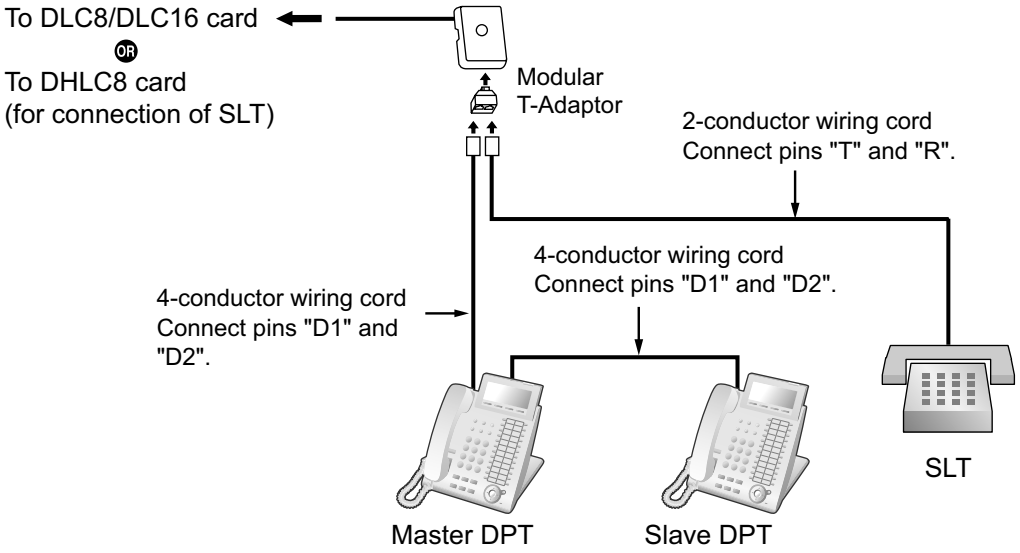
A DPT can be connected to another DPT on the Digital XDP connection. In addition, if the DPT is connected to a DHLC8 card, it can also have an SLT connected in Parallel mode or XDP mode.

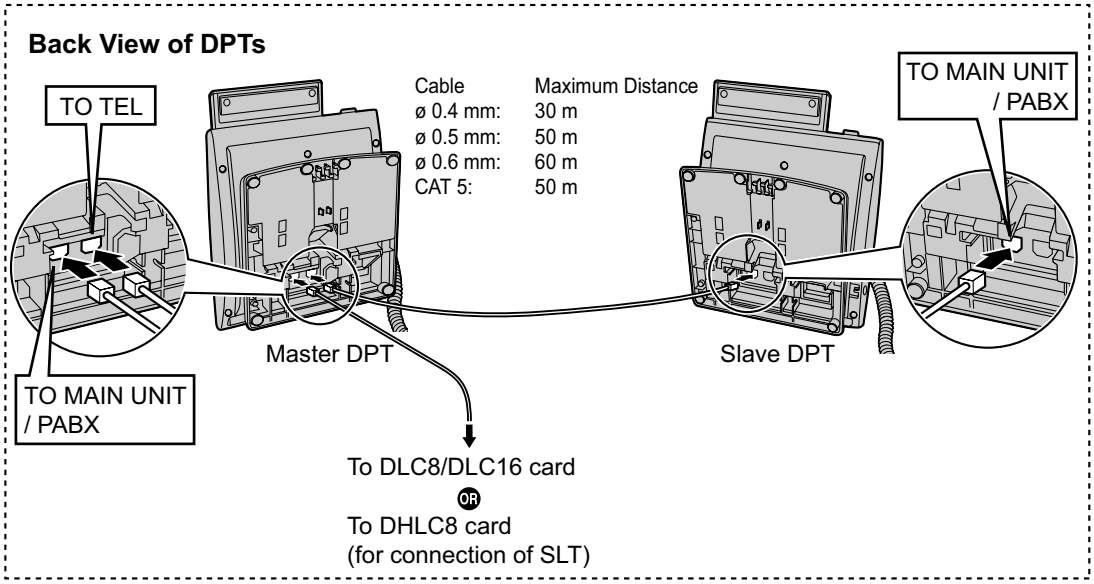
Note

- 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 "1.11.9 Parallelled Telephone" and "2.1.1 Extension Port Configuration" in the Feature Guide for further information.

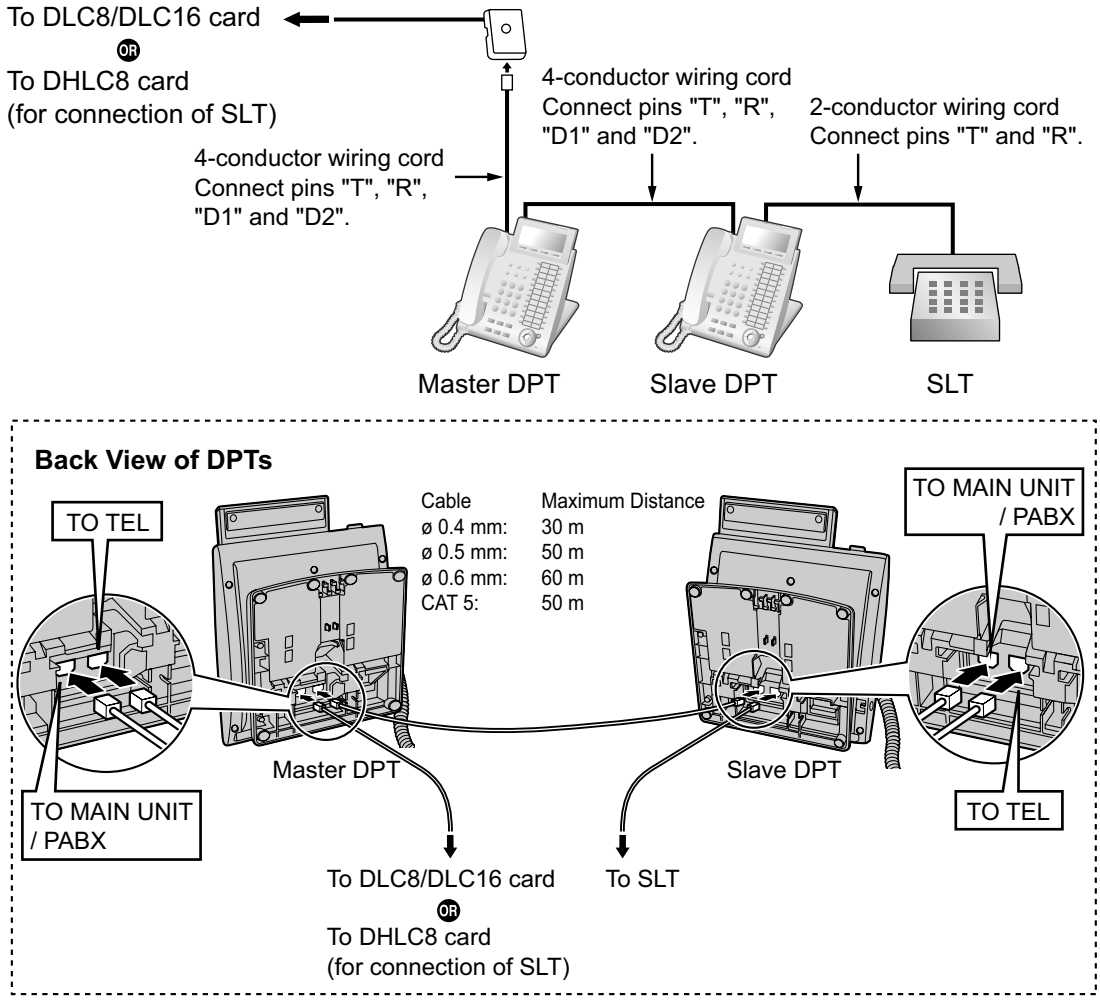
With KX-DT300 Series DPT

Using a Modular T-Adaptor



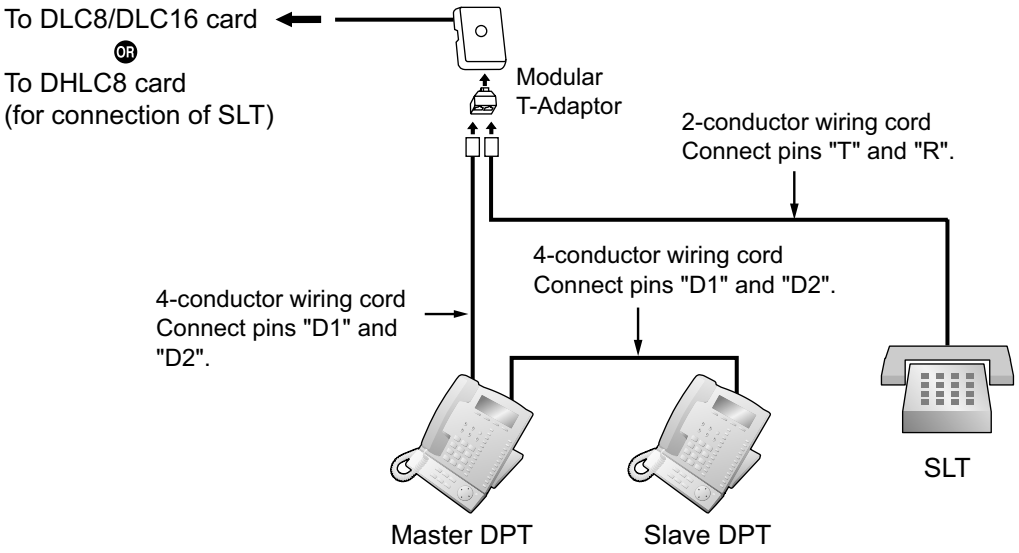


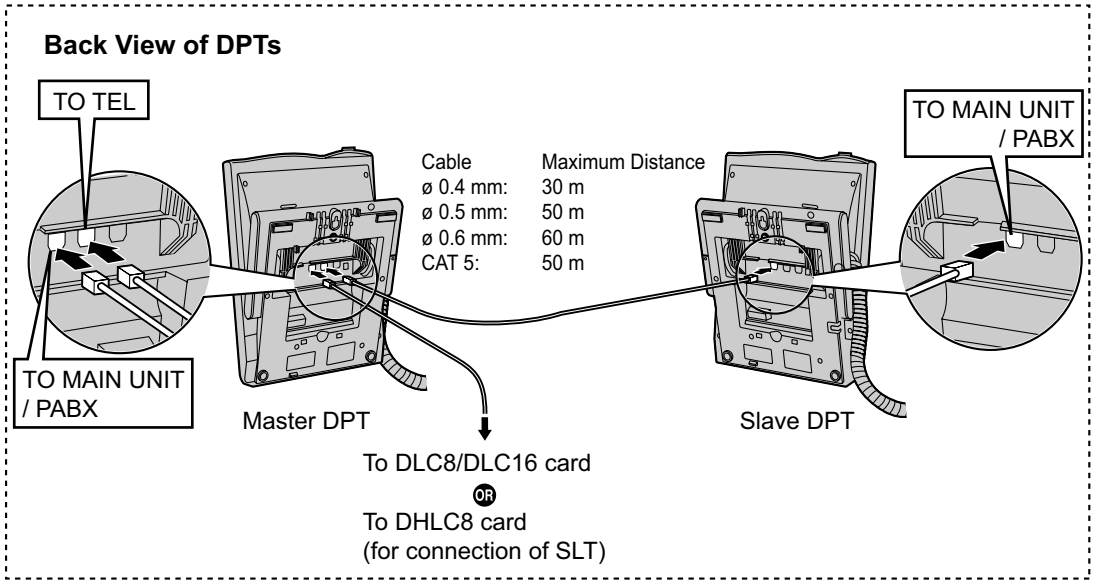
Using an EXtra Device Port



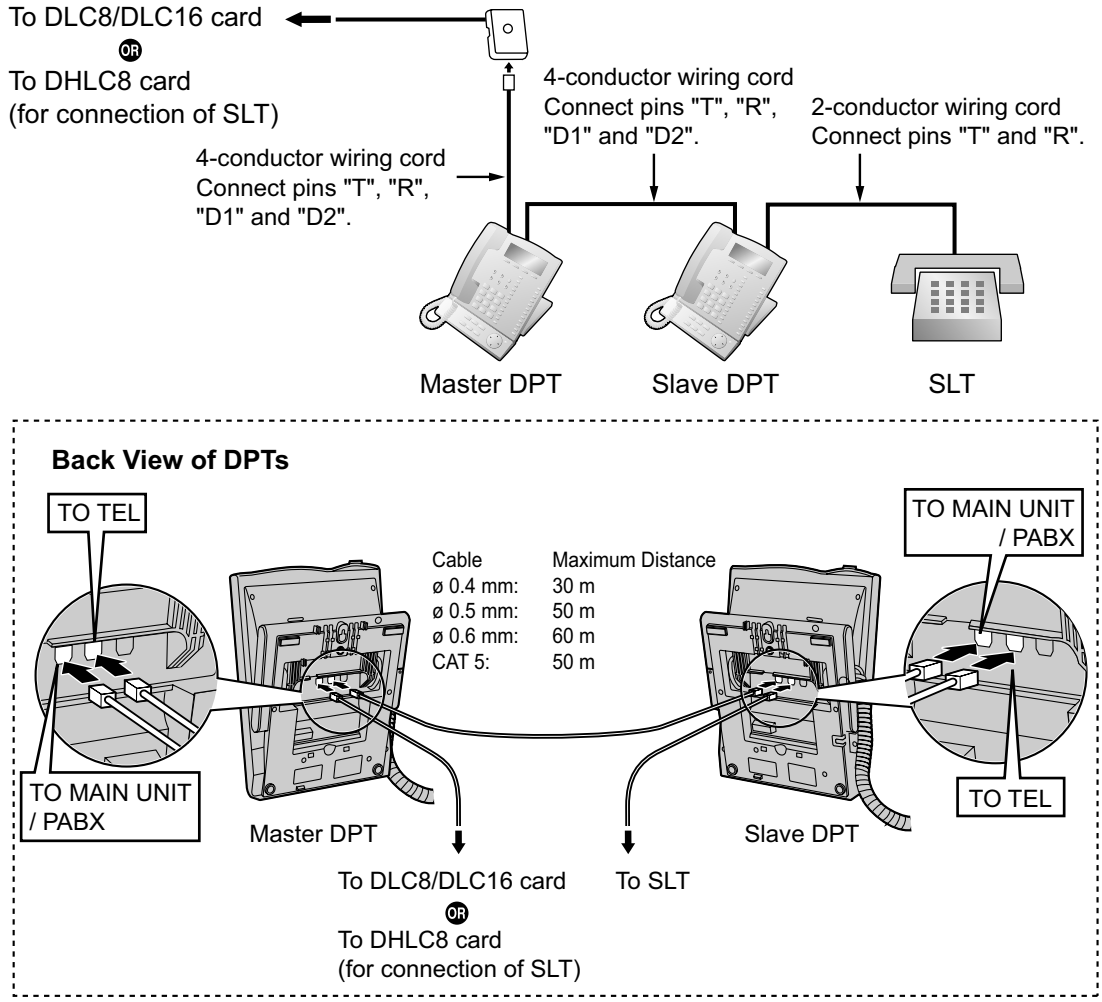
With KX-T7600 Series DPT (except KX-T7600E Series)

Using a Modular T-Adaptor



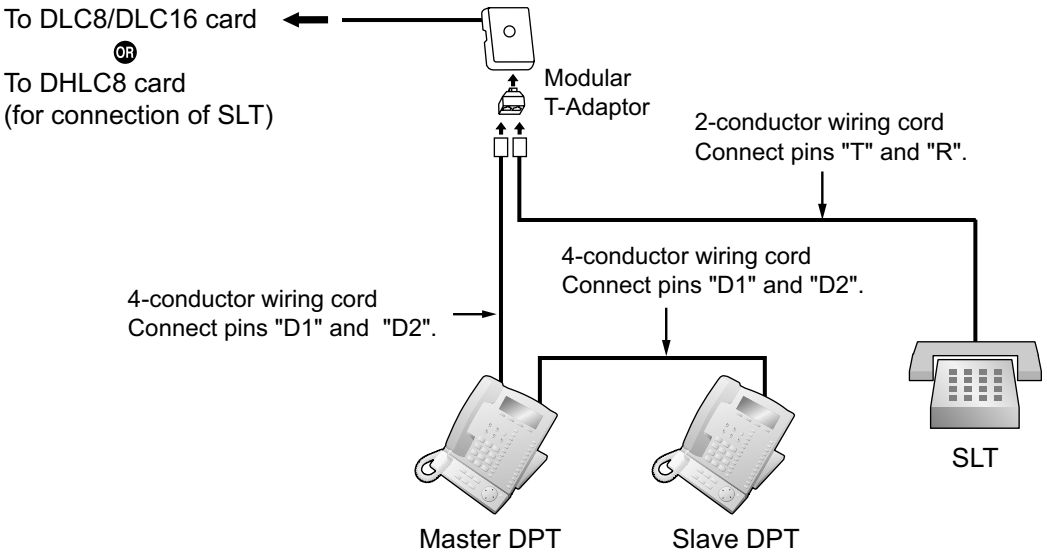


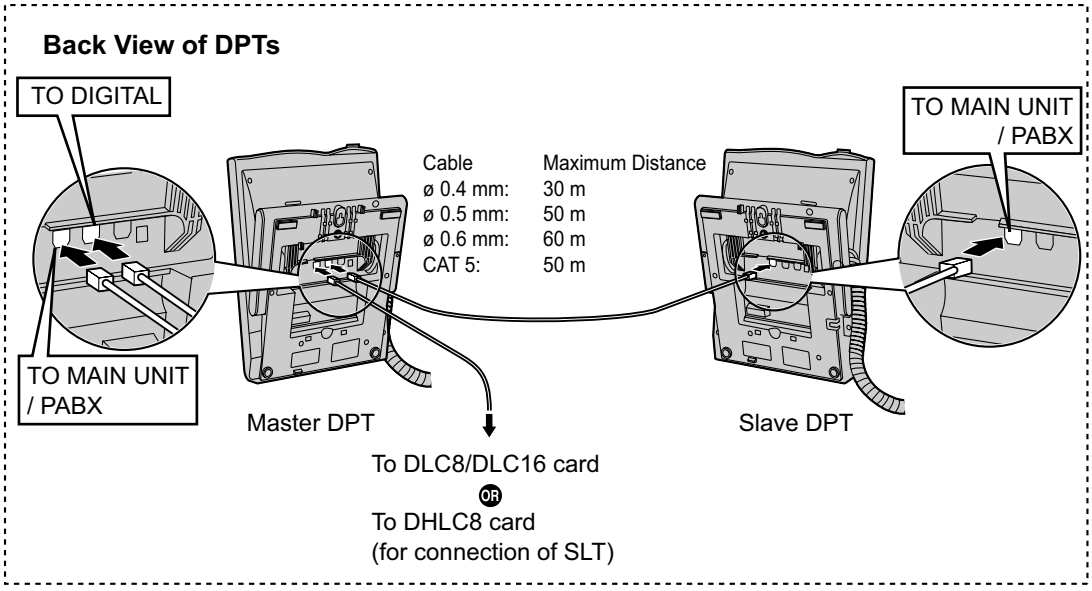
Using an EXtra Device Port



With KX-T7600E Series DPT

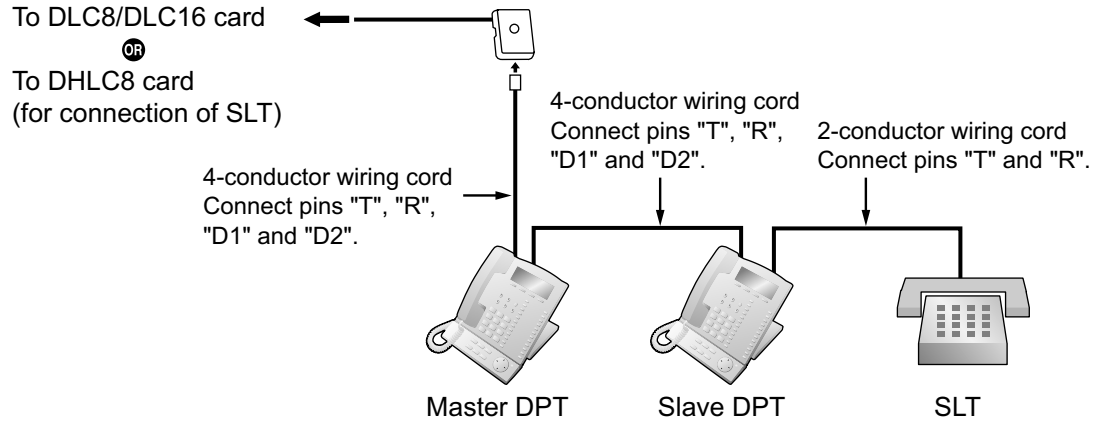
Using a Modular T-Adaptor

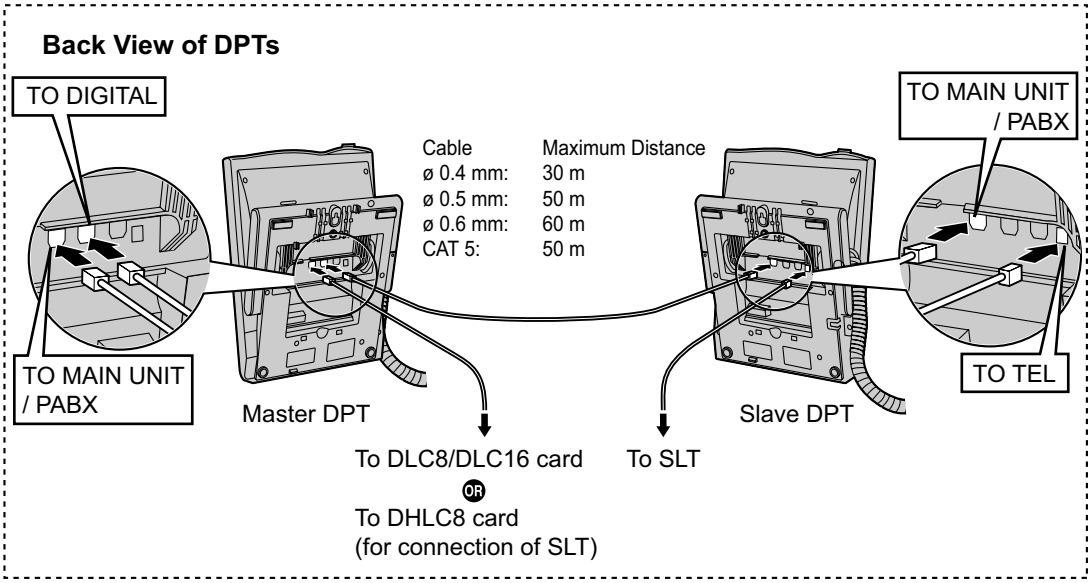




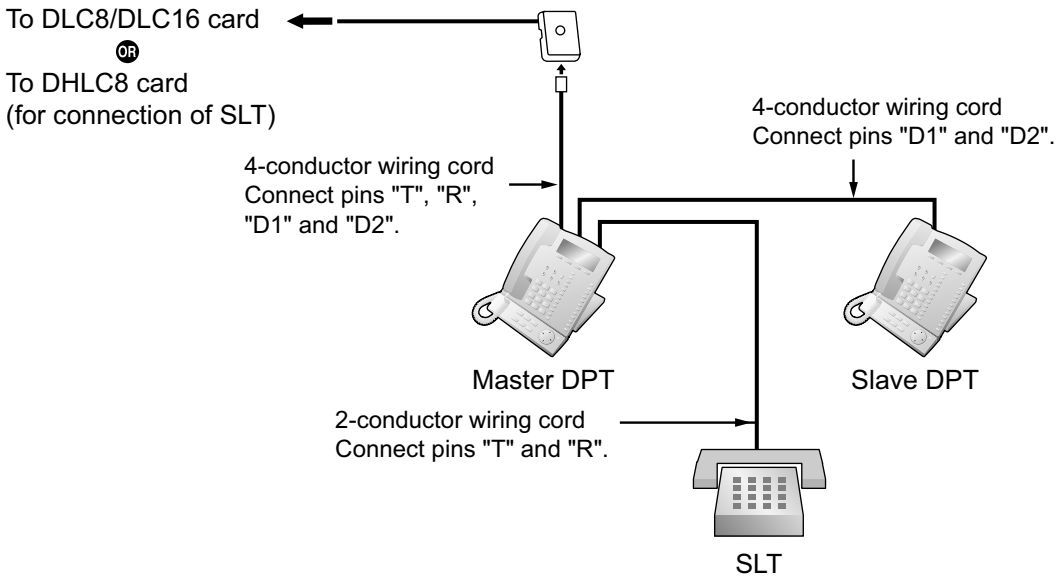
Using an EXtra Device Port

Connecting to a Slave DPT

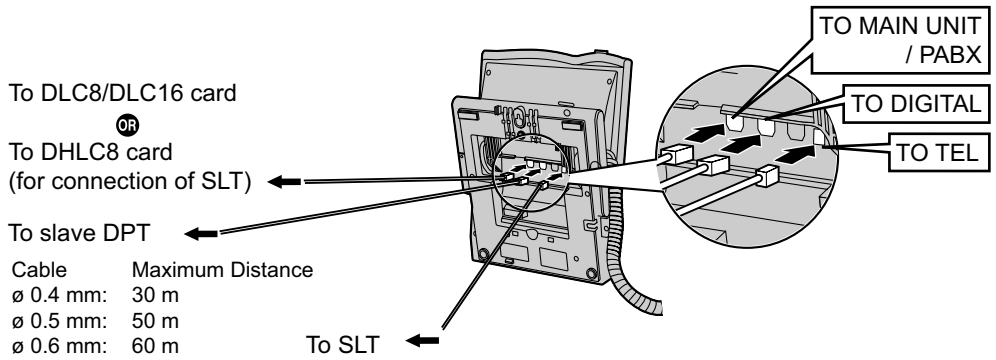




Connecting to a Master DPT



Back View of DPTs



Cable	Maximum Distance
ø 0.4 mm:	30 m
ø 0.5 mm:	50 m
ø 0.6 mm:	60 m
CAT 5:	50 m

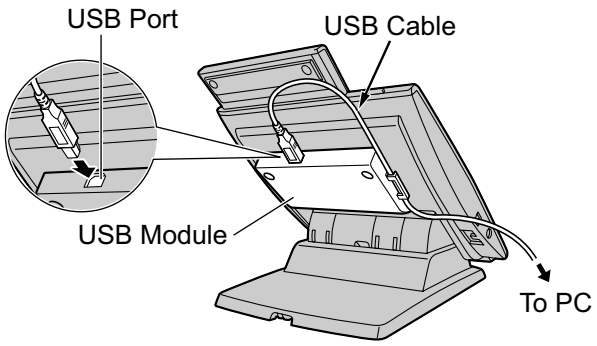
3.10.4 First Party Call Control CTI Connection

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 DPTs.

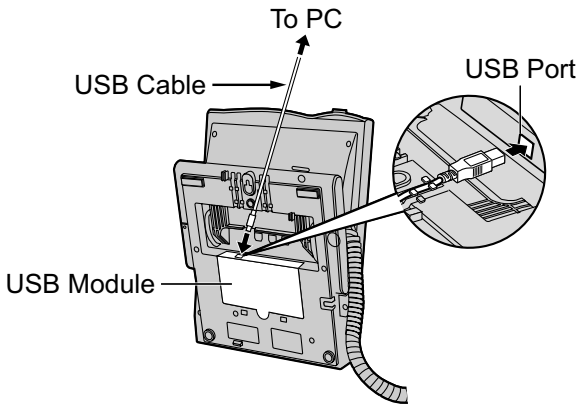
Note

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.

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

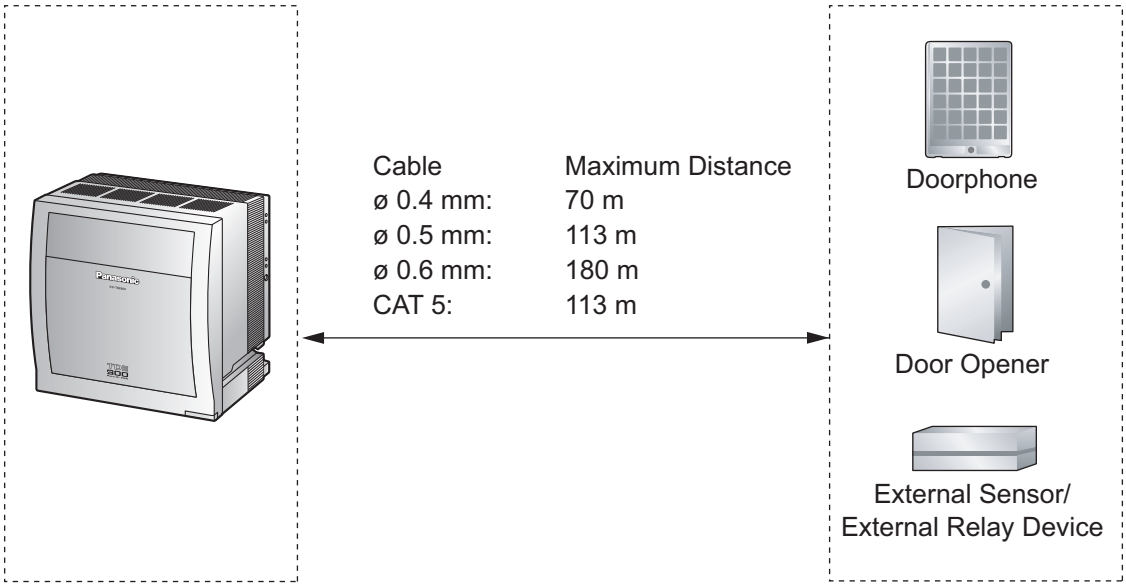
3.11.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays

The PBX supports a maximum of 64 doorphones (KX-T30865/KX-T7765 with a DPH4 card, or German-type doorphone with a DPH2 card), 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

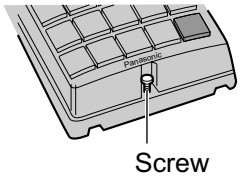


Installing the Doorphone (KX-T30865/KX-T7765)

Note

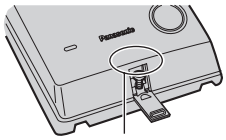
The illustrations shown in the installation procedure are based on the KX-T30865.

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



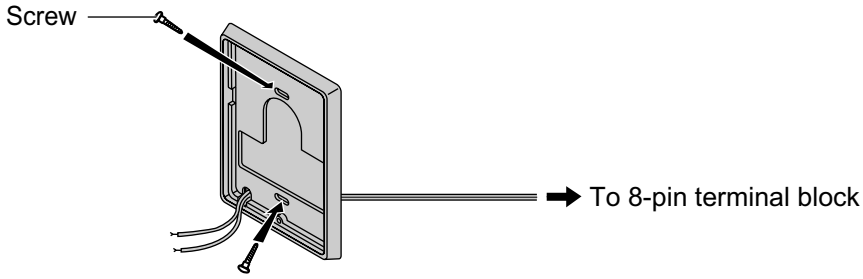
Note for KX-T7765 Users

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



Cabinet Wall

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



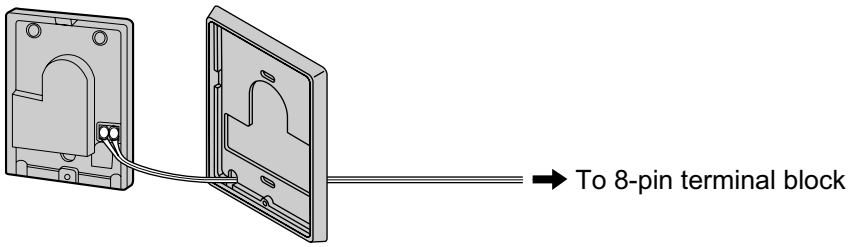
Note

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.

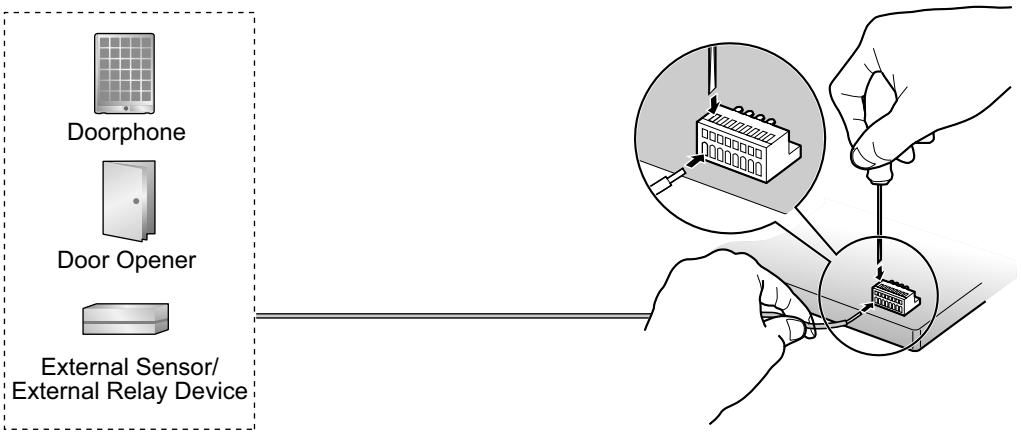


4. Re-attach the 2 halves and re-insert the screw.

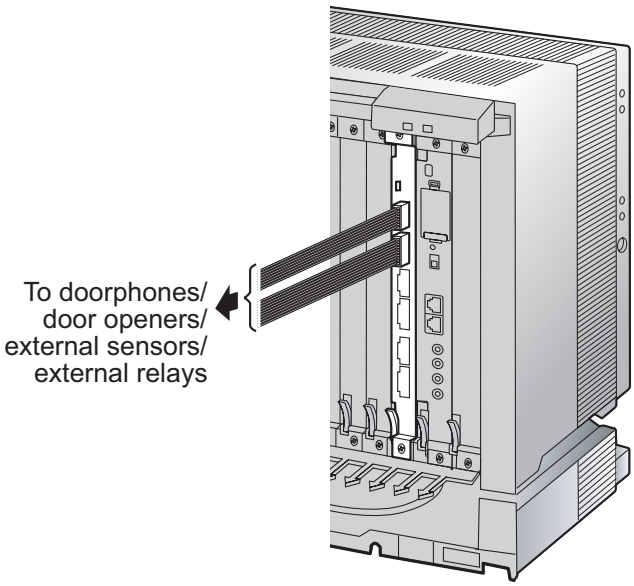
Connection

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)", "3.9.3 DPH2 Card (KX-TDA0162)", and "3.9.4 EIO4 Card (KX-TDA0164)" for pin assignments.

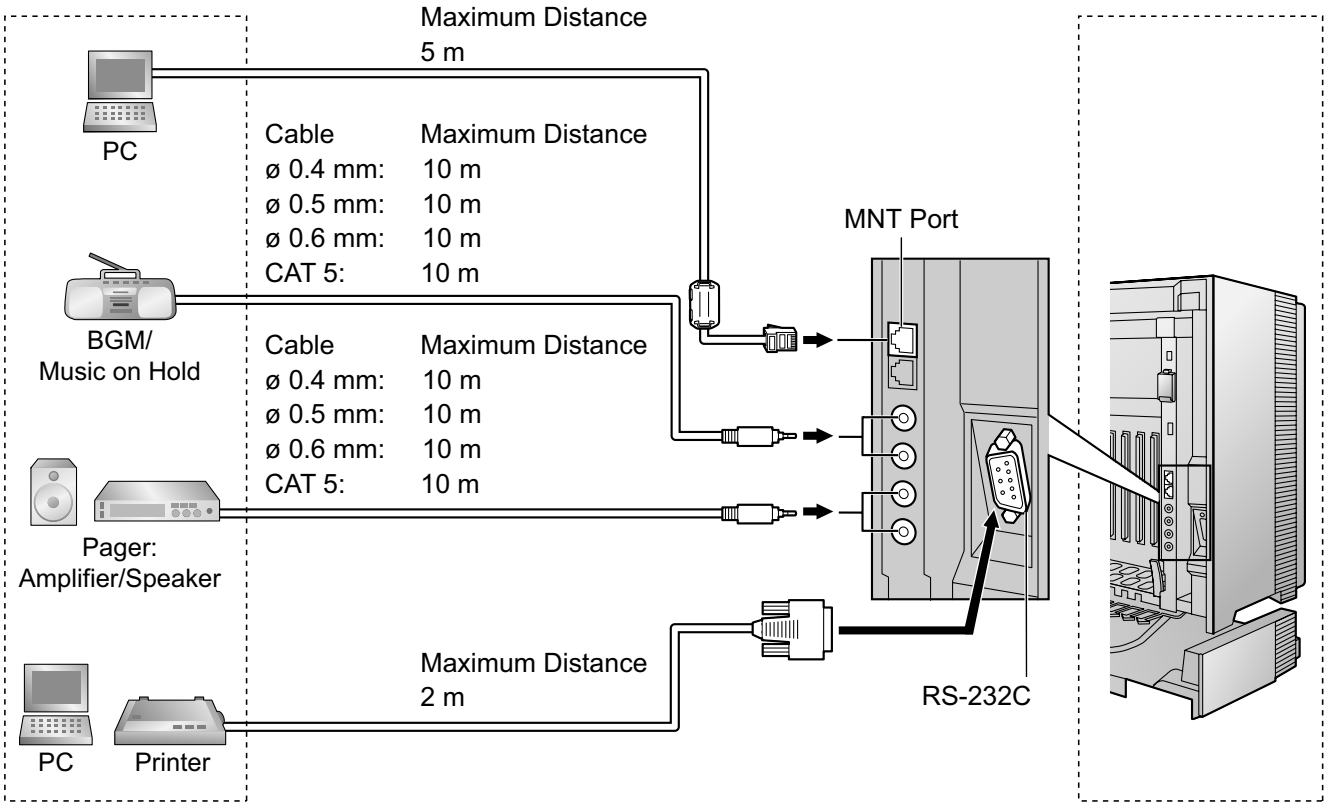


2. Attach the terminal blocks to the connectors of the DPH4/DPH2/EIO4 card on the PBX.



3.12 Connection of Peripherals

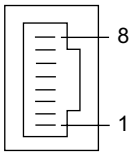
3.12.1 Connection of Peripherals



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, or in Australia, via the Line Isolation Unit with the Telecommunications Compliance Label.

Note

When the PBX and external music sources are not connected to the same earth, 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, or in Australia, via the Line Isolation Unit with the Telecommunications Compliance Label.

PC/Printer (via RS-232C)

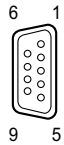
The PBX is equipped with an RS-232C interface. This interface provides communication between the PBX and the user-supplied devices such as PC or line printers. The RS-232C port is used for system programming, SMDR, diagnostics and external system database storage (save/load) functions.

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

Pin Assignments

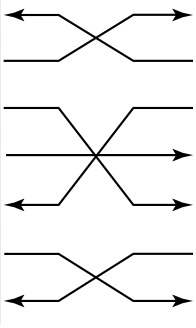
	No.	Signal Name	Function	Circuit Type	
				EIA	CCITT
	2	RD (RXD)	Receive Data	BB	104
	3 4	SD (TXD) ER (DTR)	Transmit Data Data Terminal Ready	BA CD	103 108.2
	5 6	SG DR (DSR)	Signal Ground Data Set Ready	AB CC	102 107
	7 8	RS (RTS) CS (CTS)	Request To Send Clear To Send	CA CB	105 106

Connection Charts

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

PBX (9-pin)

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



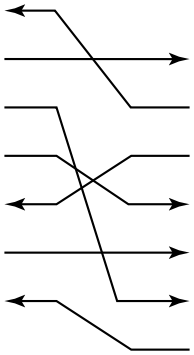
Printer/PC (9-pin)

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

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

PBX (9-pin)

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



Printer/PC (25-pin)

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

RS-232C Signals

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

An ON condition of circuit DR (DSR) indicates the printer or the PC is ready. Circuit DR (DSR) ON does not indicate that communication has been established with the printer or the PC.

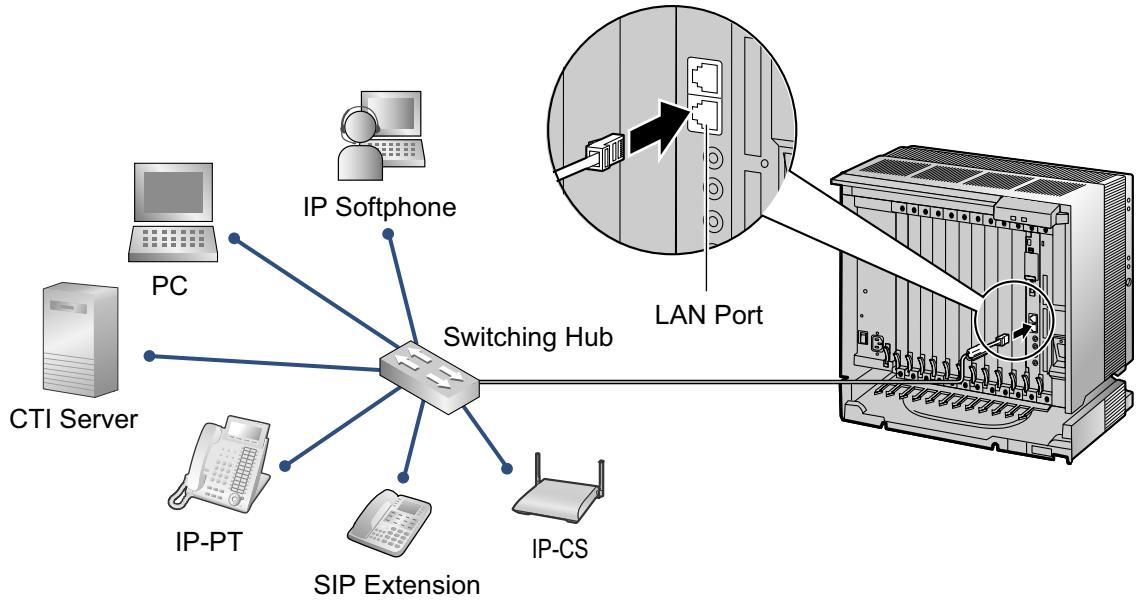
- **Request To Send (RTS):**…(output)
  This lead is held ON whenever DR (DSR) is ON.
- **Clear To Send (CTS):**…(input)
  An ON condition of circuit CS (CTS) indicates that the printer or the PC is ready to receive data from the unit. The unit does not attempt to transfer data or receive data when circuit CS (CTS) is OFF.
- **Frame Ground (FG)**
  Connects to the unit frame and the earth 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.



Switching Hub		PBX (LAN Port)	
Signal Name	Pin No.	Pin No.	Signal Name
TX+	1	1	RX+
TX-	2	2	RX-
RX+	3	3	TX+
RX-	6	6	TX-

Note

- Use an Ethernet straight cable with an RJ45 connector for connection to a switching hub. The cable should be a 10BASE-T/100BASE-TX CAT 5 or higher cable.
- Make sure that all the CAT 5 cables in use are not over 100 m 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 "2.4.1 Power Failure Transfer" in the Feature Guide for further information.

Note

While DC power is provided by the backup batteries, the PBX will remain fully operational and the connection will not switch to the Power Failure Connection.

Using Analogue Trunk Card and Extension Card

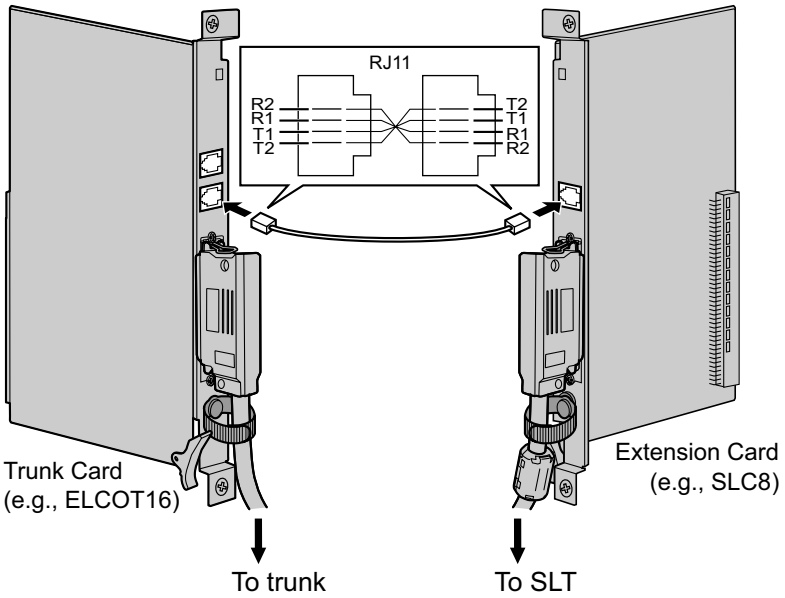
Power Failure Connection connects a specific SLT and a trunk in the event of power failure. The following analogue trunk and extension cards can be used for Power Failure Connections:

- **Analogue trunk 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 ports) and SLC8 (2 PFT ports)

To 1 analogue trunk card, connect only 1 extension card.

Note

- Power Failure Connections must be made within the same shelf.
- By programming the PBX, a trunk 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.

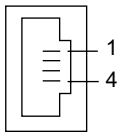


Accessories and User-supplied Items

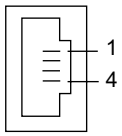
Accessories (included): none
User-supplied (not included): RJ11 connectors

RJ11 Connector Pin Assignments for Analogue Trunk Card

PFT Ports 1 and 2

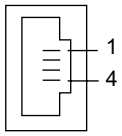
	No.	Signal Name	Function
	1	R2	Ring port 2
	2	R1	Ring port 1
	3	T1	Tip port 1
	4	T2	Tip port 2

PFT Ports 3 and 4

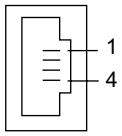
	No.	Signal Name	Function
	1	R4	Ring port 4
	2	R3	Ring port 3
	3	T3	Tip port 3
	4	T4	Tip port 4

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)

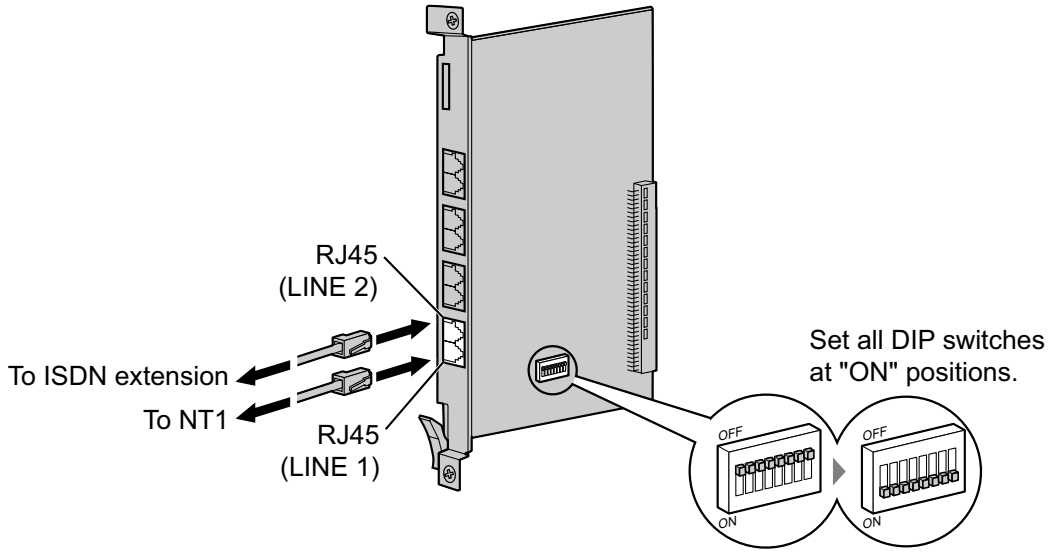
	No.	Signal Name	Function
	1	T4	Tip port 4
	2	T3	Tip port 3
	3	R3	Ring port 3
	4	R4	Ring port 4

Using BRI Card

LINE 1 and LINE 2 of the BRI4 and BRI8 cards can be used for Power Failure Connections.

Note

When the power returns, the connection will switch back to normal configuration from the Power Failure Connection, and a trunk conversation established during power failure will be dropped.



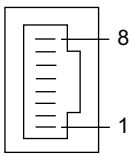
Accessories and User-supplied Items

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

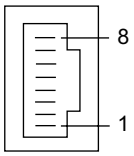
Switch Settings

Switch	Type	Usage and Status Definition
PFT Setting	DIP	Set all DIP switches to "ON" positions to use LINE 1 and LINE 2 as a PFT port. LINE 1: Power Failure LINE (NT1) LINE 2: Power Failure EXTN (extension)

RJ45 Connector LINE 1 Pin Assignments

	No.	Signal Name	Level [V]	Function
	1-2	Reserved	–	–
	3	TX1	(+)	Transmit data 1
	4	RX2	(+)	Receive data 2
	5	RX1	(-)	Receive data 1
	6	TX2	(-)	Transmit data 2
	7-8	Reserved	–	–

RJ45 Connector LINE 2 Pin Assignments

	No.	Signal Name	Level [V]	Function
	1-2	Reserved	–	–
	3	RX2	(+)	Receive data 2
	4	TX1	(+)	Transmit data 1
	5	TX2	(-)	Transmit data 2
	6	RX1	(-)	Receive data 1
	7-8	Reserved	–	–

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 PBX for the PSU.

CAUTION

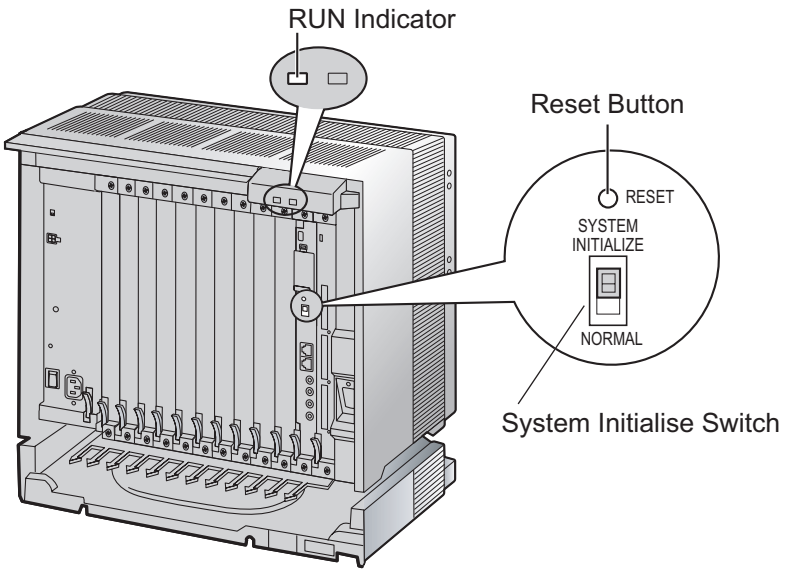
- Before touching the System Initialise Switch, discharge static electricity by touching ground or wearing an earthing strap.
- Once you have started the PBX and if you unplug the PBX, do not perform the following procedures to start the PBX again. Otherwise, your programmed data is cleared. To restart 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 Initialisation Procedure

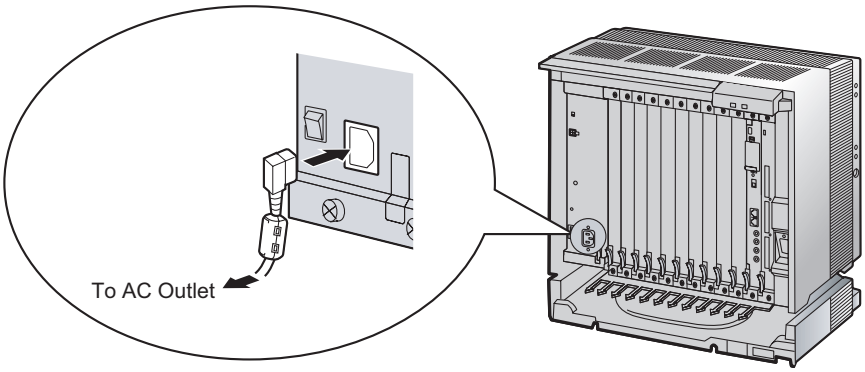
1. Slide the System Initialise Switch to the "SYSTEM INITIALIZE" position.



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 Initialise Switch back to the "NORMAL" position. Depending on the configuration, initialisation 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 initialised to the default values. The DPTs should show the time as 01:00.
The data of the IP-GW card will not be initialised.

Note

When initialising the PBX, the built-in ESVM card will also be initialised. 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	Colour	Description

RUN	Green	PBX status indication
		• OFF: Power Off (includes normal reset)
		• ON: Power On and running (on-line)
		• Flashing (60 times per minute): Starting up
		• Flashing (120 times per minute): Starting up or resetting with:
		  • the System Initialise Switch in "SYSTEM INITIALIZE" position
		  • the SD Memory Card not inserted

ALARM	Red	Alarm indication • OFF: Normal • ON: Alarm (CPU stop, alarm for each optional service card installed in the Basic Shelf) • Flashing: Alarm (MPR file error in restarting)

For an Expansion Shelf

Indication	Colour	Description
RUN	Green	Expansion shelf status indication • OFF: Power Off (includes normal reset) • ON: Power On and running (on-line) • Flashing (60 times per minute): Starting up • Flashing (120 times per minute): Program error in the BUS-S card
ALARM	Red	Alarm indication • OFF: Normal • ON: Alarm (CPU stop, alarm for each optional service card installed in Expansion Shelves)

Confirming the Trunk Connection

After initialisation, programme the PBX and connect trunks to the PBX.

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

Section 4

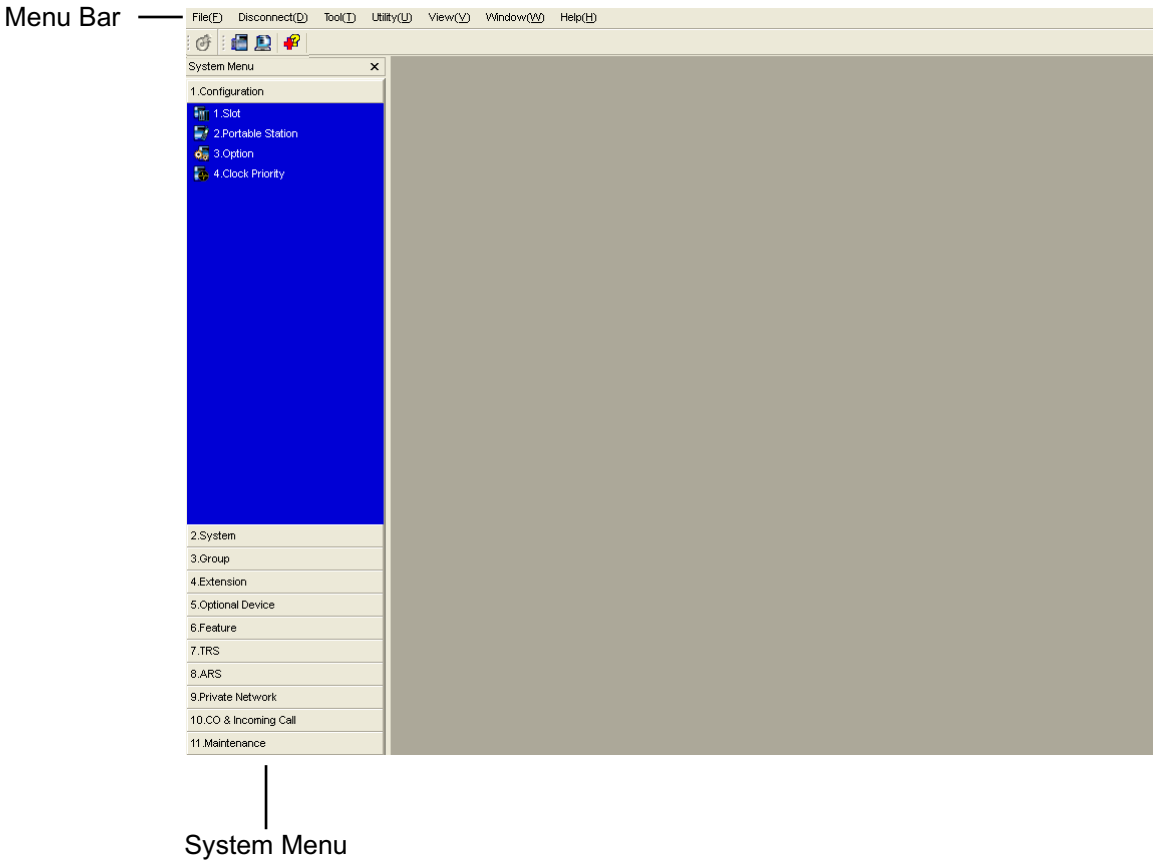
Guide for the Maintenance Console

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

4.1 Overview

4.1.1 Overview

The Maintenance Console is designed to serve as an overall system programming reference for the PBX. To programme 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.



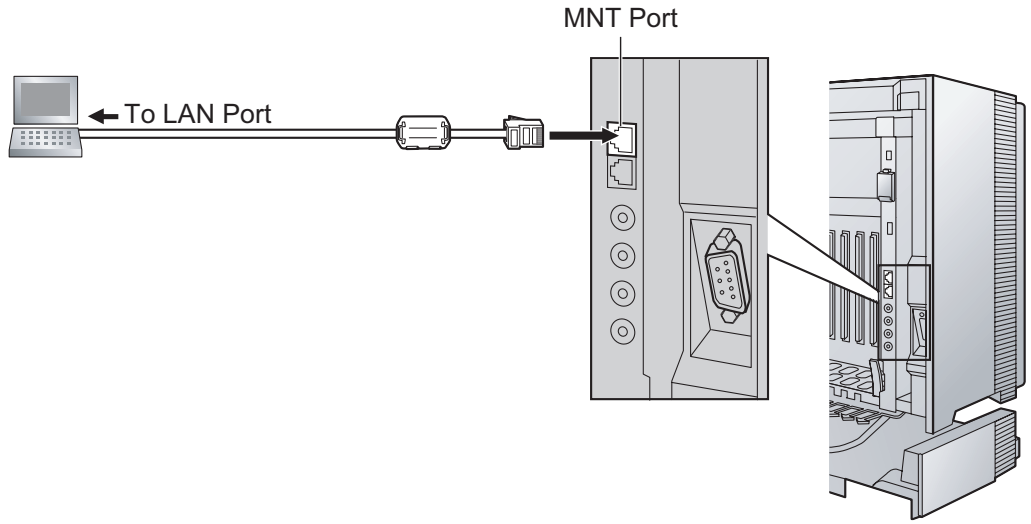
Note

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



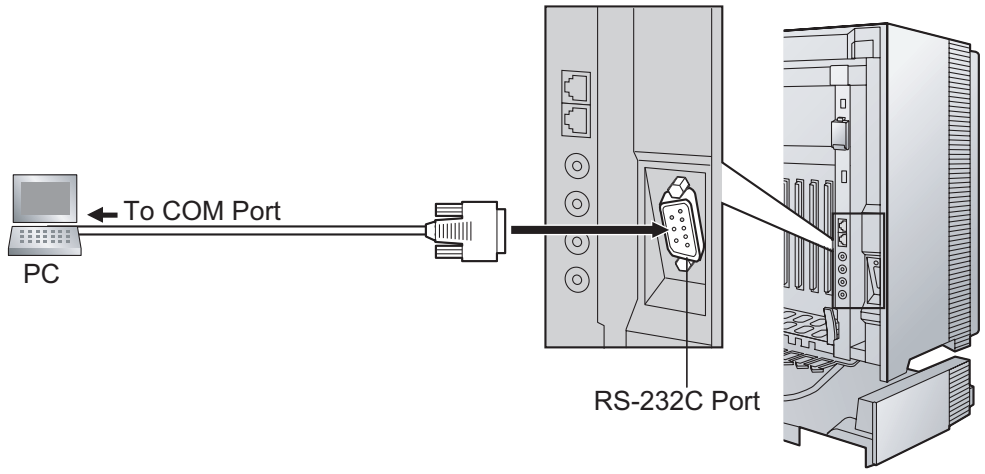
Notice

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

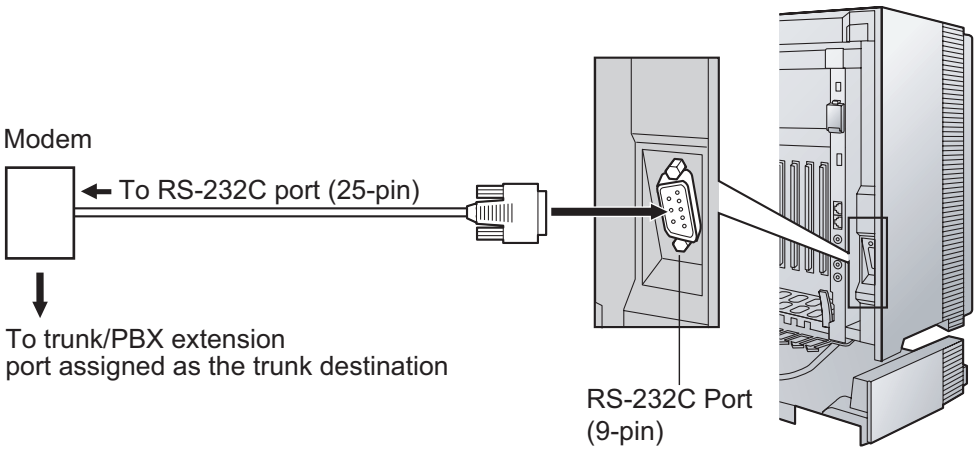
To protect the system, keep the following in mind:

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

After connecting the PBX and the external modem, set the power switch of the external modem to "ON", then the external modem will be initialised 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 initialisation, enabling automatic answer, etc.) can only be programmed by the 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)

Password Security

CAUTION

To the Administrator or Installer regarding the system password

1. Please provide all system passwords to the customer.
2. To avoid unauthorised 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 programme 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 unauthorised 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.

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 initialisation (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 "2.3.4 Quick Setup" in the Feature Guide.

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 authorisation: 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. **When country/area data do not match:**
   a. Click **OK** to replace the country/area data of the PBX. Replacement may take several minutes to complete.
   b. Follow the procedure described in "3.15.1 Starting the PBX" and restart the PBX.
   c. Repeat step **5** to reconnect the Maintenance Console to the PBX.
8. 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, 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

1. 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.
2. The PC will not perform any shutdown operation, or enter the power-saving system standby mode while the Maintenance Console is connected to the PBX. To perform either of the operations above, first close the connection to the PBX.

CAUTION

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

Section 5
Troubleshooting

This section provides information on the PBX and telephone troubleshooting.

5.1 Troubleshooting

5.1.1 Installation

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

PROBLEM	PROBABLE CAUSE	SOLUTION
Extensions (except IP-PT/ SIP Extension) do not operate.	• Extension card malfunction	• Replace the corresponding card.
	• Poor connection between the PBX and the extension	• Take the extension and plug it into the same extension port using a short telephone cord. If the extension works, then the connection between the PBX and the extension must be repaired.
	• A telephone with an A-A1 relay is connected.	• Make sure that a 2-wire cord is used. • Make sure that the A-A1 relay switch of the telephone is in "OUT" or "OFF" position.
	• Extension malfunction	• Take the extension and plug it into another extension port that is working. If the extension does not work, replace the extension.
	• Wrong type of PSU	• Replace the PSU with the appropriate type.
	• An unsupported extension card (SLC16 or MSLC16 card) is installed.	• Replace the optional service card with an appropriate one (ESLC16 or EMSLC16 card).
You cannot make/receive outside calls.	• An unsupported trunk card (LCOT4, LCOT8, or LCOT16 card) is installed.	• Replace the optional service card with an appropriate one (ELCOT16 card).
The PBX does not operate properly.		• Press the Reset Button (refer to "5.1.4 Using the Reset Button"). • Turn off the power switch, and then turn it back on. • Turn off the power switch, and then unplug the PBX. After 5 minutes, plug the PBX back in, and turn the power switch back on.
	• IPCMEC/preinstalled memory card malfunction	• See the error log using the Maintenance Console (refer to "5.1.5 Troubleshooting by Error Log"). If the error no. 41 is displayed, replace the IPCMEC/ preinstalled memory card.
Noise on external paging.	• Induced noise on the wire between the PBX and the amplifier.	• Use a shielded cable as the connection wire between the PBX and amplifier. A short shielded cable is recommended.
Distorted external music.	• Excessive input level from external music source.	• Decrease the output level of the external music source by using the volume control on the music source.

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

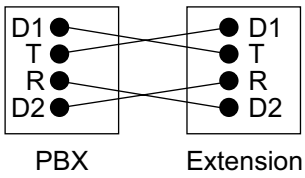
PROBLEM	PROBABLE CAUSE	SOLUTION
Extensions connected to an Expansion Shelf do not send a dial tone.	• Bus Cable is not connected properly.	• Connect the Bus Cables properly.
	• Optional service card malfunction: BUS-S	• Replace the corresponding shelf expansion card.
	• Defective Bus Cable (included with BUS-M card or BUS-ME card).	• Replace the corresponding Bus Cable.

5.1.2 Connection

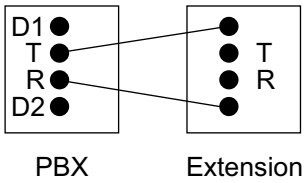
Can you dial an extension?

No

Connection between the PBX and a PT:

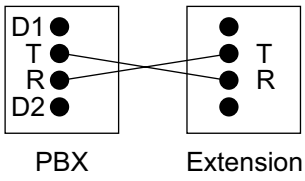
CAUSE	SOLUTION
The T/R is connected to the D1/D2.  	Use the correct cord (the inner 2 wires are for T/R and the outer 2 wires are for D1/D2).

Connection between the PBX and an SLT:

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

Yes

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

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

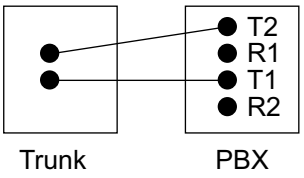
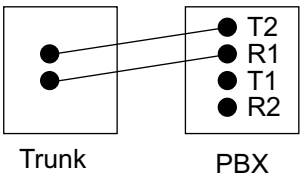
(Continued on the next page.)

Connection between the trunk and the PBX:

(Continued from the previous page.)

Can you dial out on a trunk?

No

CAUSE	SOLUTION
Trunk is connected to the T2/T1.  Trunk is connected to the T2/R1.  	Reconnect the trunk to the T1/R1 or T2/R2 of the telephone jack using 2-conductor wiring.

5.1.3 Operation

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

PROBLEM	PROBABLE CAUSE	SOLUTION
• During a power failure, extensions connected to ports 1 to 4 of EMSLC16/ESLC16/ ECSLC24/CSLC16 and ports 1 to 2 of DHLC8/ SLC8 cards do not operate.	• A DPT or APT is connected to the extension port. • The dialling mode (tone or pulse) is incorrect.	• Disconnect the DPT or APT and connect an SLT. • Set the Tone/Pulse switch to the other position.
• Originating an outside call, call transfer, or conference cannot be performed.	• The corresponding flexible button does not exist on the PT.	• Programme the flexible button. Refer to "1.20.2 Flexible Buttons" in the Feature Guide.
• The KX-HGT100 does not work properly, or some features cannot be performed using the KX-HGT100.	• The firmware of the KX-HGT100 and the MPR software file version of the PBX are not upgraded to their latest versions.	• Upgrade the firmware of the KX-HGT100 and the MPR software file version of the PBX to their latest versions.

5.1.4 Using the Reset Button

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

CAUTION

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

Note

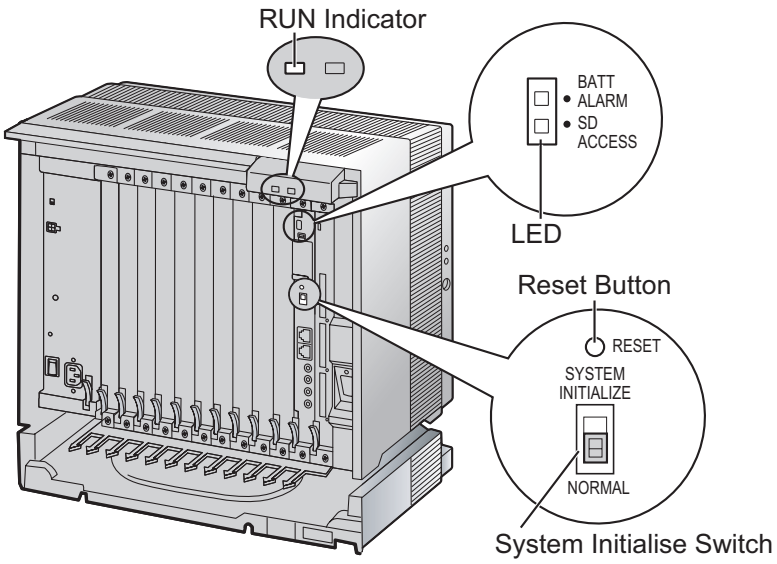
- When the System Initialise Switch is set to "NORMAL", pressing the Reset Button causes the following:
  - Camp-on is cleared.
  - Calls on hold are terminated.
  - Calls on exclusive hold are terminated.
  - Calls in progress are terminated.
  - Call park is cleared.

  Other data stored in memory, except the above, are not cleared.
- Be aware that pressing the Reset Button with the System Initialise 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 Initialise Switch to the "NORMAL" position.
2. Press the Reset Button for about 1 second.



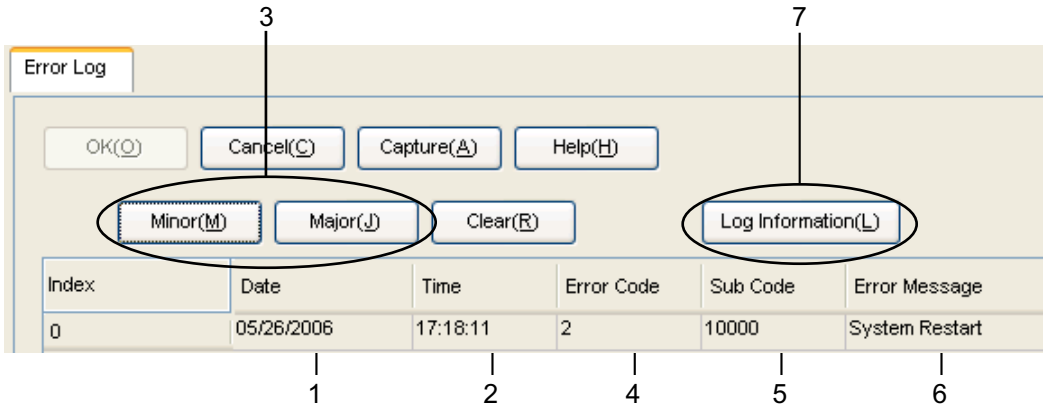
5.1.5 Troubleshooting by Error Log

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.

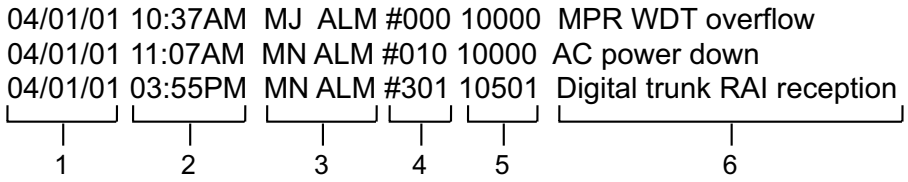
Error Log Display Format

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)



Description

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

	Item	Description
5	Sub Code	The 6-digit sub code of the relevant hardware (WXYYZZ). • W: Shelf type – Physical shelf: " " (blank) – Virtual shelf: "*" (asterisk) • X: Shelf number – 1: Basic Shelf – 2: Expansion Shelf 1 – 3: Expansion Shelf 2 – 4: Expansion Shelf 3 • YY: Slot number – Basic Shelf: 00 to 10 (00: IPCEMPR Card Slot; 01 to 10: Free Slots) – Expansion Shelf: 01 to 12 (01 to 11: Free Slots; 12: BUS-S Card Slot) – Virtual Shelf: 00 to 08 (00: Built-in ESVM card, 01 to 04: Virtual Trunk Slots, 05 to 08: Virtual Extension Slots) • ZZ: Port number – For optional service cards except OPB3 card: Port number (01 to 16) will be displayed. – For OPB3 card: Sub slot number (1 to 3) + port number (1 to 4) will be displayed as follows. • Sub slot 1 of OPB3: 11 to 14 • Sub slot 2 of OPB3: 21 to 24 • Sub slot 3 of OPB3: 31 to 34 **Note** When there is no parameter for slot and 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"
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-NCP0158CE 8-Channel IP Cell Station Unit Using a V-IPCS4 Card for DECT Portable Station
  - KX-TDA0156 DECT 6.0 4-Channel Cell Station Unit Using a CSIF Card for DECT 6.0 Portable Station
  - - Virtual 4 IP Cell Station Interface Card (V-IPCS4)

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
- 3.10.4 First Party Call Control CTI Connection
- 3.13.1 LAN Connection
- 4.3.1 Installing and Starting the Maintenance Console
- 5.1.3 Operation

Index

Numerics

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) 47
16-Channel Echo Canceller Card (KX-TDA6166) 30, 200
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) 47
16-Channel VoIP DSP Card (KX-TDE0110) 28, 137
16-Channel VoIP Extension Card (KX-TDA0470) 30, 187
16-Channel VoIP Gateway Card (KX-TDA0490) 30, 171
16-Port Analogue Trunk Card (KX-TDA6181) 30, 145
16-Port Digital Extension Card (KX-TDA0172) 28, 179
16-Port Single Line Telephone Extension Card (KX-TDA6174) 30, 184
16-Port Single Line Telephone Extension Card with Caller ID (KX-TDA0177) 29, 184
16-Port Single Line Telephone Extension with Message Lamp Card (KX-TDA6175) 30, 184
2-Channel IP Trunk Activation Key (KX-NCS4102) 46
2-Channel Simplified Voice Message Card (KX-TDA0192) 29, 199
2-Port Doorphone Card (German Type) (KX-TDA0162) 28, 192
2-shelf System 22
2-shelf System, Construction (Floor Standing) 60
2-shelf System, Installation (Floor Standing) 60
2-shelf System, System Capacity 34
24-Port Single Line Telephone Extension Card with Caller ID (KX-TDA6178) 30, 184
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, 173
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, 198
4-Channel Simplified Voice Message Card (KX-TDA0194) 29, 199
4-Channel SIP Extension Activation Key (KX-NCS4704) 47
4-Channel VoIP Gateway Card (KX-TDA0484) 30, 169
4-Port BRI Card (KX-TDA0284) 29, 159
4-Port Doorphone Card (KX-TDA0161) 28, 190
4-Port External Input/Output Card (KX-TDA0164) 28, 195
4-shelf System (Side-by-side Type) 25
4-shelf System (Side-by-side Type), Construction 91
4-shelf System (Side-by-side Type), Installation 91
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, 137
8 Cell Station Interface Card (KX-TDA0144) 28, 173
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) 47
8-Port BRI Card (KX-TDA0288) 29, 159
8-Port Caller ID Card (KX-TDA0193) 29, 150
8-Port Caller ID/Pay Tone Card (KX-TDA0189) 29, 149
8-Port DID Card (KX-TDA0182) 29, 147
8-Port Digital Extension Card (KX-TDA0171) 28, 177
8-Port Digital Hybrid Extension Card (KX-TDA0170) 28, 175
8-Port E & M Trunk Card (KX-TDA0184) 29, 151
8-Port Single Line Telephone Extension Card (KX-TDA0173) 28, 181

A

About the software version of your PBX 15
Activation Key 44
Activation Key Code 49
Activation Key File 46, 50
Activation Key for CA ACD Monitor for 1 ICD Supervisor (KX-NCS2301) 47
Activation Key for CA Basic for 1 User (KX-NCS2101) 47
Activation Key for CA Basic for 10 Users (KX-NCS2110) 47
Activation Key for CA Basic for 128 Users (KX-NCS2149) 47
Activation Key for CA Basic for 40 Users (KX-NCS2140) 47
Activation Key for CA Basic for 5 Users (KX-NCS2105) 47
Activation Key for CA PRO for 1 User (KX-NCS2201) 47
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 46
Activation Key, Maximum Number 44
Amphenol Connector 129, 130

B

Backup Battery Connection 115
Backup Power Supply Duration 115
Basic Shelf 20
Basic Shelf, Construction 20
Basic Shelf, Installation (Wall Mounting) 107
Basic Shelf, LED Indications 228
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 218

Blank Slot Cover 120
BRI4 Card (KX-TDA0284) 159
BRI8 Card (KX-TDA0288) 159
Bus Cable 66, 89, 105, 142, 143
Bus Cable Connector 142, 144
Bus Master Card (KX-TDA6110) 30, 142
Bus Master Expansion Card (KX-TDA6111) 30, 143
Bus Slave Card (BUS-S Card) 144
BUS-M Card (KX-TDA6110) 65, 87, 103, 142
BUS-ME Card (KX-TDA6111) 87, 103, 143
BUS-S Card 65, 87, 103, 144

C

Cable Distance 201
Cable Handling for Connected Shelves 123
Cable Handling for Each Shelf 122
Characteristics 33
CID/PAY8 Card (KX-TDA0189) 149
CID8 Card (KX-TDA0193) 150
Components, System 2
Connecting Backup Batteries 116
Connecting Each Shelf to Its Own Set of Backup Batteries 117
Connecting Multiple Shelves to One Set of Backup Batteries 116
Connecting Shelves, 2-shelf System 65
Connecting Shelves, 3-shelf System 87
Connecting Shelves, 4-shelf System 87, 103
Connection Chart for LAN Connection 221
Connection Diagram, System 26
Connector Types 124
Cover for Blank Slot 120
CSIF4 Card (KX-TDA0143) 173
CSIF8 Card (KX-TDA0144) 173
CSLC16 Card (KX-TDA0177) 184
CTI Server Connection (via LAN Port) 221
CTI—First Party Call Control 213
CTI—Third Party Call Control 221

D

DHLC8 Card (KX-TDA0170) 175
DID8 Card (KX-TDA0182) 147
Digital EXtra Device Port (Digital XDP) Connection 206
Digital XDP 206
Digital XDP Connection, Using a Modular T-Adaptor 206, 208, 210
Digital XDP Connection, Using an EXtra Device Port 207, 209, 211
DLC16 Card (KX-TDA0172) 179
DLC8 Card (KX-TDA0171) 177
Door Opener 190, 192, 214
Doorphone 190, 192, 214
DPH2 Card (KX-TDA0162) 192
DPH4 Card (KX-TDA0161) 190
DSP16 Card (KX-TDE0110) 137
DSP64 Card (KX-TDE0111) 137

E

E&M8 Card (KX-TDA0184) 151
E-1 Trunk Card (KX-TDA0188) 29, 156
E1 Card (KX-TDA0188) 156
ECSLC24 Card (KX-TDA6178) 184
EECHO16 Card (KX-TDA6166) 200
EIO4 Card (KX-TDA0164) 195
ELCOT16 Card (KX-TDA6181) 145
EMSLC16 Card (KX-TDA6175) 184
Error Log 247
ESLC16 Card (KX-TDA6174) 184
ESVM2 Card (KX-TDA0192) 199
ESVM4 Card (KX-TDA0194) 199
Examples 115
Expanded System 21
Expansion Shelf 21
Expansion Shelf, Construction 21
Expansion Shelf, Installation (Wall Mounting) 107
Expansion Shelf, LED Indications 228
Expansion Shelf, Names and Locations 56
Expansion Shelf, Supplied Items 55
EXT-CID Card (KX-TDA0168) 183
Extension Caller ID Card (KX-TDA0168) 28, 183
External Relay 195, 197, 214
External Sensor 195, 197, 214
EXtra Device Port (XDP) Mode 203, 206

F

Fan Guard 59
Ferrite Core 126
First Party Call Control CTI Connection 213
Frame Earth Connection 114
Front Cover, Closing 58
Front Cover, Opening 57

I

Information about the Virtual Cards 141
Installation Precautions 52
IP Convergence Main Processing Card (IPCEMPR Card) 134
IP-EXT16 Card (KX-TDA0470) 187
IP-GW16 Card (KX-TDA0490) 171
IP-GW4E Card (KX-TDA0484) 169
IPCEMPR Card 134
IPCEMPR Card Slot 34
IPCMEC Card (KX-TDE0105) 139

K

Key Management System 49
KX-NCS2101 (Activation Key for CA Basic for 1 User) 47
KX-NCS2105 (Activation Key for CA Basic for 5 Users) 47
KX-NCS2110 (Activation Key for CA Basic for 10 Users) 47
KX-NCS2140 (Activation Key for CA Basic for 40 Users) 47
KX-NCS2149 (Activation Key for CA Basic for 128 Users) 47
KX-NCS2201 (Activation Key for CA PRO for 1 User) 47
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) 47
KX-NCS4704 (4-Channel SIP Extension Activation Key) 47
KX-NCS4708 (8-Channel SIP Extension Activation Key) 47
KX-NCS4716 (16-Channel SIP Extension Activation Key) 47
KX-NCS4950 (Activation Key for Software Upgrade to Enhanced Version) 47
KX-TDA0103 (L-Type Power Supply Unit) 28, 110
KX-TDA0104 (M-Type Power Supply Unit) 28, 110
KX-TDA0143 (4 Cell Station Interface Card) 28, 173
KX-TDA0144 (8 Cell Station Interface Card) 28, 173
KX-TDA0161 (4-Port Doorphone Card) 28, 190
KX-TDA0162 (2-Port Doorphone Card [German Type]) 28, 192
KX-TDA0164 (4-Port External Input/Output Card) 28, 195
KX-TDA0168 (Extension Caller ID Card) 28, 183
KX-TDA0170 (8-Port Digital Hybrid Extension Card) 28, 175
KX-TDA0171 (8-Port Digital Extension Card) 28, 177
KX-TDA0172 (16-Port Digital Extension Card) 28, 179
KX-TDA0173 (8-Port Single Line Telephone Extension Card) 28, 181
KX-TDA0177 (16-Port Single Line Telephone Extension Card with Caller ID) 29, 184
KX-TDA0182 (8-Port DID Card) 29, 147
KX-TDA0184 (8-Port E & M Trunk Card) 29, 151
KX-TDA0187 (T-1 Trunk Card) 29, 153
KX-TDA0188 (E-1 Trunk Card) 29, 156
KX-TDA0189 (8-Port Caller ID/Pay Tone Card) 29, 149
KX-TDA0190 (Optional 3-Slot Base Card) 29, 189
KX-TDA0191 (4-Channel Message Card) 29, 198
KX-TDA0192 (2-Channel Simplified Voice Message Card) 29, 199
KX-TDA0193 (8-Port Caller ID Card) 29, 150
KX-TDA0194 (4-Channel Simplified Voice Message Card) 29, 199
KX-TDA0196 (Remote Card) 29, 140
KX-TDA0284 (4-Port BRI Card) 29, 159
KX-TDA0288 (8-Port BRI Card) 29, 159
KX-TDA0290 (PRI Card [PRI23]) 30, 166
KX-TDA0290CE (PRI Card [PRI30]) 29, 163
KX-TDA0290CJ (PRI Card [PRI30]) 29, 163
KX-TDA0470 (16-Channel VoIP Extension Card) 30, 187
KX-TDA0484 (4-Channel VoIP Gateway Card) 30, 169
KX-TDA0490 (16-Channel VoIP Gateway Card) 30, 171
KX-TDA6110 (Bus Master Card) 30, 142
KX-TDA6111 (Bus Master Expansion Card) 30, 143
KX-TDA6166 (16-Channel Echo Canceller Card) 30, 200
KX-TDA6174 (16-Port Single Line Telephone Extension Card) 30, 184
KX-TDA6175 (16-Port Single Line Telephone Extension with Message Lamp Card) 30, 184
KX-TDA6178 (24-Port Single Line Telephone Extension Card with Caller ID) 30, 184
KX-TDA6181 (16-Port Analogue Trunk Card) 30, 145
KX-TDA6201 (Mounting Kit) 23, 24, 25, 30
KX-TDE0105 (Memory Expansion Card) 28, 139
KX-TDE0110 (16-Channel VoIP DSP Card) 28, 137
KX-TDE0111 (64-Channel VoIP DSP Card) 28, 137

L

L-Type Power Supply Unit (KX-TDA0103) 28, 110
LED Indications, Basic Shelf 228
LED Indications, Expansion Shelf 228
Load Figure Calculation 40

M

M-Type Power Supply Unit (KX-TDA0104) 28, 110
Maintenance Console 230
Maintenance Console, Installation 234
Maintenance Console, Overview 230
Maintenance Console, Password Security 234
Maintenance Console, PC Connection 231
Maintenance Console, Quick Setup 234
Maintenance Console, System Requirements 234
Master DPT, Digital XDP 206
Maximum Terminal Equipment 39
Memory Expansion Card (KX-TDE0105) 28, 139
MOH 218
Mounting Kit (KX-TDA6201) 23, 24, 25, 30
Mounting Kit, Supplied Items 55
MSG4 Card (KX-TDA0191) 198

N

Names and Locations 56
Noise Shield Connector 142, 144
Noise Shield Wire 67, 90, 106

O

OPB3 Card (KX-TDA0190) 189
Optional 3-Slot Base Card (KX-TDA0190) 29, 189
Optional Equipment 28
Optional Equipment, Unsupported 5
Optional Service Card, Installation 118
Optional Service Card, Maximum Number 34
Optional Service Card, Removal 121

P

Pager 218
Parallel Connection of the Extensions 203
Parallel Connection, Using a Modular T-Adaptor 204

Parallel Connection, Using an EXtra Device Port 204
Parallel Mode 203, 206
Password Security 234
PC Connection (via MNT Port) 217
PC Connection (via RS-232C) 218
PGMPR Software File Version 3.0xxx 250
Power Failure Connections 222
Power Supply Unit 110
Power Supply Unit Selection for Each Shelf 40
Power Supply Unit, Installation 111
Power Supply Unit, Replacement 112
PRI Card (PRI23) (KX-TDA0290) 30, 166
PRI Card (PRI30) (KX-TDA0290CE) 29, 163
PRI Card (PRI30) (KX-TDA0290CJ) 29, 163
PRI23 Card (KX-TDA0290) 166
PRI30 Card (KX-TDA0290CE) 163
PRI30 Card (KX-TDA0290CJ) 163
Printer Connection (via RS-232C) 218
PSU 110
PSU Capacity 41
PSU-L 40, 110
PSU-M 40, 110

Q

Quick Setup 234

R

Remote Card (KX-TDA0196) 29, 140
Reset Button 246
RMT Card (KX-TDA0196) 140
RUN Indicator 226

S

Safety Installation Instructions 52
SD Memory Card 134
Slave DPT, Digital XDP 206
SLC8 Card (KX-TDA0173) 181
Slot for the IPCEMPR Card 34
Slots for Physical Cards (Free Slots) 34
Slots for Virtual Extension Cards 34
Slots for Virtual Trunk Cards 34
Specifications 31
Specifications, Characteristics 33
Specifications, General Description 31
Specifications, System Capacity 34
Starting the PBX 226
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 131
System Capacity 34
System Components Table 2
System Connection Diagram 26
System Initialise Switch 226, 246
System Requirements 234

T

T-1 Trunk Card (KX-TDA0187) 29, 153
T1 Card (KX-TDA0187) 153
Terminal Equipment, Maximum Number 39
Troubleshooting, by Error Log 247
Troubleshooting, Connection 242
Troubleshooting, Installation 238
Troubleshooting, Operation 244
Troubleshooting, Using the Reset Button 246
Trunk Connection 228

U

Unpacking 54

V

V-IPCS4 (Virtual 4 IP Cell Station Interface Card) 141
V-IPEXT32 (Virtual 32-Channel VoIP Extension Card) 141
V-IPGW16 (Virtual 16-Channel VoIP Gateway Card) 141
V-SIPEXT32 (Virtual 32-Channel SIP Extension Card) 141
Virtual 16-Channel VoIP Gateway Card (V-IPGW16) 141
Virtual 32-Channel SIP Extension Card (V-SIPEXT32) 141
Virtual 32-Channel VoIP Extension Card (V-IPEXT32) 141
Virtual 4 IP Cell Station Interface Card (V-IPCS4) 141
Virtual Cards 141
Virtual Extension Slot 34
Virtual Trunk Slot 34

W

Wall Mounting (KX-TDE600/KX-TDE620) 107
Wiring Precautions 53

CE

The KX-TDE600UK, the KX-TDE600NE, and the KX-TDE600GR are designed to interwork with the:

- Analogue Public Switched Telephone Network (PSTN) of European countries
- Pan-European Integrated Services Digital Network (ISDN) using ISDN basic rate access
- Pan-European Integrated Services Digital Network (ISDN) using ISDN primary rate access
- ONP 2048 kbit/s digital structured leased lines (D2048S)

Panasonic Communications Co., Ltd./Panasonic Communications Company (U.K.) Ltd. declares that this equipment is in compliance with the essential requirements and other relevant provisions of Radio & Telecommunications Terminal Equipment (R&TTE) Directive 1999/5/EC.
Declarations of Conformity for the relevant Panasonic products described in this manual are available for download by visiting:

http://www.doc.panasonic.de

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Panasonic Testing Centre
Panasonic Marketing Europe GmbH
Winsbergring 15, 22525 Hamburg, Germany

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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