

# Panasonic®



## Getting Started

### Hybrid IP-PBX

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Model No. **KX-HTS824**  
**KX-HTS32**

Thank you for purchasing this Panasonic product.

Please read this manual carefully before using this product and save this manual for future use.

In particular, be sure to read "1.1 For Your Safety" in Important Information Guide before using this product.

**KX-HTS Series:PJMPPR Software File Version 001.00000 or later**

Manuals and supporting information are provided on the Panasonic Web site at:

<http://www.panasonic.net/pcc/support/pbx/>

# System Components

## System Components for KX-HTS Series

Category	Model No.	Description
Main Unit	KX-HTS824 KX-HTS32	Hybrid IP-PBX: 4 to 8 Outside (CO) Lines, 8 to 24 Extensions, No activation Key for SIP trunk and SIP Extension, Wireless connection through built-in Wireless LAN.
Optional Service Cards	KX-HT82480	4 ports Analog Trunk interface with Caller ID (LCOT4)
	KX-HT82470	8 ports Standard Telephone Line Interface with Caller ID (SLC8)
	KX-HT82460	2 ports Panasonic Proprietary Door phone Interface with door opener (no sensor interface) (DPH2)
Proprietary Equipment	KX-A227	Backup battery cable

## Equipment Compatibility for Main Unit

The PBX supports the following equipment:

Doorphones: Doorphone (KX-T30865, KX-T7765)

SIP Phones: Compatible with the Video communication with the KX-NTV series. Refer to the Panasonic Web site for information on Compatible Terminal List as below, Click Compatible Terminal List at <http://panasonic.net/pcc/support/pbx/index.html> KX-HDV series terminals work as general SIP phone (except KX-HDV230).

Other: Single line telephones

### Note

- For the equipment that can be connected to the main unit, refer to corresponding device's manual.
- When using a video call on a remote site, you will need to set the network bandwidth on the KX-NTV series (512 kbps MAX). Refer to the corresponding manual for setup.

## Notice

- This PBX supports general SIP phones. However, some PBX features may not be available depending on the type of telephone.
- 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 hardware, software, and features are not available in some countries/areas. Please consult your certified Panasonic dealer for more information.
- In this manual, the suffix of each model number (e.g., KX-HTS824**SX**) is omitted unless necessary.

## List of Abbreviations

- SIP Extension -> Extensions of the PBX which use Session Initiation Protocol for communication.
- SLT -> Single Line Telephone
- Web-MC -> Web Maintenance Console

# Introduction

This Manual is designed to serve as an overall technical reference for the Panasonic Hybrid IP-PBX. It provides instructions for installing the hardware, and programming the PBX using Web Based programming.

## The Structure of this Manual

This manual contains the following sections:

### Section 1 Safety Precautions

Provides important information intended to prevent personal injury and property damage.

### Section 2 System Outline

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

### Section 3 Installation

Describes the procedures to install the PBX. Detailed instructions for planning the installation site, optional service cards, and cabling of peripheral equipment are provided.

### Section 4 Confirming Connections

Making and receiving calls with extensions and trunks.

### Section 5 Maintenance

Maintenance procedures.

### Section 6 Troubleshooting

Provides information on the PBX and telephone troubleshooting.

### Section 7 Appendix

Provides information about System Prompt Languages and the revision history.

## About the Other Manuals

In addition to this Manual, the following manuals are available:

### Programming Item List (PIL)

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

### Feature Manual (FM)

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

## 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 "4. Maintenance-Version Information" in the Programming Item List.

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# **Section 1**

## **Safety Precautions**

*This section provides important information intended to prevent personal injury and property damage.*

# 1.1 For Your Safety

To prevent personal injury and/or damage to property, be sure to observe the following safety precautions.

The following symbols classify and describe the level of hazard and injury caused when this unit is operated or handled improperly.



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



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

The following types of symbols are used to classify and describe the type of instructions to be observed.



This symbol is used to alert users to a specific operating procedure that must not be performed.



This symbol is used to alert users to a specific operating procedure that must be followed in order to operate the unit safely.

## Notice

Panasonic assumes no responsibility for injuries or property damage resulting from failures arising out of improper installation or operation inconsistent with this documentation.



## WARNING

### For All Telephone Equipment



- Do not install the product in any other way than described in relevant manuals.
- 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.
- Do not install the system in the following locations:
  - a. 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.
  - b. Areas with high amounts of dust. High amounts of dust can lead to fire or electric shock, and impair the performance of 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.
- 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.



- 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.
- Follow all warnings and instructions marked on the product.
- Small objects, such as the screws, pose a choking hazard. Keep small objects out of reach of children.
- 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 office/home, consult your dealer or local power company.
- For safety purposes some products are equipped with a grounded plug. If you do not have a grounded outlet, please have one installed. Do not bypass this safety feature by tampering with the plug.
- 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:
  - a. Never install telephone wiring during a lightning storm.
  - b. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
  - c. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
  - d. Use caution when installing or modifying telephone lines.
  - e. Anti-static precautions should be taken during installation.

## 1.1 For Your Safety

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- 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



- Do not insert foreign 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.
- Do not use the HTS without installing the option card with the dummy cover plate cut off, as it will lead to foreign objects of any kind touching dangerous voltage points or short out parts that could result in a fire or electric shock.
- Do not pull, bend, rest objects on, or chafe the power cord and plug. Damage to the power cord or plug can cause fire or electric shock.
- Do not attempt to repair the power cord or plug. If the power cord or plug is damaged or frayed, contact an authorized Panasonic Factory Service Center for a replacement.
- Do not use the product in health care facilities if any regulations posted in the area instruct you not to do so. Hospitals or health care facilities may be using devices sensitive to external RF (radio frequency) energy.



- If damage to the unit exposes any internal parts, disconnect the power supply cord immediately and return the unit to your dealer.
- To prevent fires, electric shock, injury, or damage to the product, be sure to follow these guidelines when performing any wiring or cabling:
  - a. Before performing any wiring or cabling, unplug the product's power cord from the outlet. After completing all wiring and cabling, plug the power cord back into the outlet.
  - b. When laying cables, do not bundle the product's power cord with the power cords of other devices.
  - c. Do not place any objects on top of the cables connected to the PBX.
  - d. When running cables along the floor, use protectors to prevent the cables from being stepped on.
  - e. Do not run any cables under carpeting.
- Unplug this unit from the AC outlet if it emits smoke, an abnormal smell or makes unusual noise. These conditions can cause fire or electric shock. Confirm that smoke has stopped and contact an authorized Panasonic Factory Service Center.
- Make sure that the wall that the unit will be attached to is made of concrete or thick wood, and is strong enough to support the unit (approx. 11 kg [24 lb]). Do not attach the unit to walls made from plasterboard or thin plywood. Attaching the unit to areas where there are strong winds, or where shocks or vibrations are frequent or strong, may lead to the product falling over.
- Only use the wall-mounting equipment (screws and washers) included with the PBX.
- The grounding wire of the AC cable has an effect against external noise and lightning strikes, but it may not be enough to protect the PBX and to ensure electromagnetic compatibility. A permanent connection between ground and the ground terminal of the PBX must be made.
- Proper grounding (connection to ground) is very important to reduce the risk to the user of electrocution or to protect the PBX from the bad effects of external noise in the case of a lightning strike.
- Plug the power cord firmly into an AC outlet. Otherwise, it can cause fire or electric shock.
- Be careful not to drop any components. Dropping components may damage them or cause an injury.
- Make sure that the AC outlet is properly grounded, then securely connect the 3-pin AC plug including the grounded pin.
- A lithium battery is used in the main unit. There is a risk of explosion if the battery is replaced with an incorrect type. Dispose of used batteries according to the manufacturer's instructions.
- Operating near 2.4 GHz electrical appliances may cause interference. Move away from the electrical appliances.
  - This equipment must be installed and operated in accordance with provided instructions and spacing as possible must be provided between antenna and all person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.
  - This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.
- Consult the manufacturer of any personal medical devices, such as pacemakers or hearing aids, to determine if they are adequately shielded from external RF (radio frequency) energy.
  - For North America / Latin America except Brazil / Taiwan:  
Wireless LAN features operate between 2.412 GHz and 2.462 GHz with a peak transmission power of 100 mW.
  - For all other countries / areas:

## 1.1 For Your Safety

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Wireless LAN features operate between 2.412 GHz and 2.472 GHz with a peak transmission power of 100 mW.



### CAUTION

#### For All Telephone Equipment



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

#### For the PBX



- Do not install the system in the following locations:
  - a. In direct sunlight and hot, cold, or humid places. (Temperature range: 0 °C to 40 °C [32 °F to 104 °F])
  - b. Areas where sulphuric gases may be present, such as near thermal springs.
  - c. Near devices that generate high frequencies, such as sewing machines or electric welders.
  - d. Locations where other objects will obstruct the area around the PBX. Be especially careful to leave at least 10 cm (4 in) to the openings of the PBX for ventilation.
  - e. Locations where condensation can occur.
- Do not block the openings of the PBX. Allow space of at least 20 cm (8 in) above, 10 cm (4 in) at the sides, and 10 cm (4 in) below the PBX.
- When installing or removing the optional service cards, do not put pressure on any parts of the mother board. Doing so may result in damage to the PBX.
- Once you have started the PBX, if you unplug the PBX, do not initialize it again as described in "System Initialization Procedure". Otherwise, your programmed data will be cleared. To restart the PBX.



- Before touching the product (PBX, cards, etc.), discharge static electricity by touching ground or wearing an grounding strap. Failure to do so may cause the PBX to malfunction due to static electricity.
- 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 plug of power supply cordset is used as the main disconnect device. Ensure that the AC outlet is located near the equipment and is easily accessible.
- 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.
- Make sure that the surface behind the PBX is flat and free of obstacles, so that the openings on the back of the PBX will not be blocked.
- When this product is no longer in use, make sure to detach it from the wall.
- Use only the AC power cord included with the PBX. A certified power supply cord has to be used with this equipment. The relevant national installation and/or equipment regulations shall be considered. A certified power supply cord not lighter than ordinary polyvinyl chloride flexible cord according to IEC 60227 (designation H05VV-F 3G 0.75 mm<sup>2</sup>) shall be used.
- Make sure to install all necessary optional service cards in the PBX before performing the wall mounting procedure. If it is necessary to install or remove a card, make sure to detach the PBX from the wall before installing or removing the card.
- When driving the screws into the wall, be careful to avoid touching any metal laths, wire laths or plates in the wall.
- Before opening the front cover, the AC power cord must be removed from the AC inlet.
- Disconnect the AC power source before servicing the equipment.
- Do not open the front cover soon after turning off the power. There is a risk of receiving burns.
- For safety reasons, fix the front cover and cable cover of the PBX with screws.
- If the PBX is not installed properly using the securing correct methods, the PBX may fall causing serious damage.
- When the PBX is placed on a desktop, make sure that the PBX is placed as indicated. Do not place it on its side or upside down.
- Performing surge protection is essential. Make sure to follow the instructions.
- It is strongly recommended to use TLS encrypted communication when the PC is accessing the PBX via the Internet. To use TLS encryption, routers must have a port set up for https communication.
- Avoid using the same AC outlet for computers 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.
- When installing or removing the optional service cards, the power switch must be turned off, and the AC power cord must be removed from the AC inlet.

## 1.2 Important Safety Instructions

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

### Notice

#### For All Telephone Equipment

- Read and understand all instructions.

#### For the PBX

- 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 authorized Panasonic Factory Service Center.

## 1.2 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**

## 1.3 Precautions

### Disposal of Old Equipment and Batteries

#### Only for European Union and countries with recycling systems



These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries must not be mixed with general household waste. For proper treatment, recovery and recycling of old products and batteries, please take them to applicable collection points in accordance with your national legislation.

By disposing of them correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment. For more information about collection and recycling, please contact your local municipality. Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.



#### Note for the battery symbol (bottom symbol)

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 Europe only

##### CE RF Exposure Compliance

This product meets the EU requirements on the limitation of exposure of the general public to electromagnetic fields by way of health protection.

This product has been tested and meets the European Standard EN 62311. Human Exposure is calculated with the separation of 0.1m to the body, while transmitting at the highest certified output level in all frequency band of this product. This product must be installed and operated in accordance with the provided instructions. The installed unit requires a minimum 10 cm of spacing between the PBX and a person's body. This product must not be co-located or operated in conjunction with any other antennas or transmitters.

#### 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 dialed 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.

### 1.3 Precautions

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- **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.
- The SLT ports are not specifically designed for 3-wire-connected equipment. 3-wire-connected equipment might not respond to incoming ringing when attached to these ports.

#### **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 battery can be found in the mother board of the PBX.

#### **Notice**

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

#### **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.



廢電池請回收

#### **Notice for users in California**

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

See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)

## **Password Security**

### **CAUTION**

**To the Administrator or Installer regarding the system password**

1. Please provide all system passwords to the customer.
2. To avoid unauthorized access and possible abuse of the PBX, keep the passwords secret, and inform the customer of the importance of the passwords, and the possible dangers if they become known to others.
3. The PBX has default passwords preset. For security, change these passwords the first time that you program the PBX.
4. Change the passwords periodically.
5. It is strongly recommended that passwords of 10 numbers or characters be used for maximum protection against unauthorized access. For a list of numbers and characters that can be used in system passwords, refer to "1.2 Entering Characters" in the Programming Item List.

# 1.4 Data Security

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:

Information sent from the PBX to a PC or a USB memory device, such as system data files.

### Requirements

1. Always make backups of data stored on the System memory and/or perform regular system data backups to a USB memory device. Refer to "4.3.3 Maintenance—[2-3] System Control—System Data Backup & Restore—System Data Backup" in the Programming Item List.
2. To prevent illegal access from the Internet, activate a Firewall.
3. To avoid unauthorized access and possible abuse of the PBX, we strongly recommend:
  - a. Keeping the password secret.
  - b. Selecting a complex, random password that cannot be easily guessed.
  - c. Changing your password regularly.
4. 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 System memory.
5. When user information is sent from the PBX to a PC or a USB memory device, the confidentiality of that information becomes the responsibility of the customer. Before disposing of the PC or the USB memory device, ensure that data cannot be retrieved from it by formatting the hard disk and/or rendering it physically unusable.

## 1.5 F.C.C. REQUIREMENTS AND RELEVANT INFORMATION

### 1. **Notification to the Telephone Company**

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the side of this equipment is a label that contains, among other information, a product identifier in the format US: ACJIS04BKX-HTS824. If requested, this number must be provided to the telephone company.

Installation must be performed by a qualified professional installer. If required, provide the telephone company with the following technical information:

- Telephone numbers to which the system will be connected
- Make: Panasonic
- Model: KX-HTS824
- Certification No.: found on the side of the unit
- Ringer Equivalence No.: 0.4B
- Facility Interface Code: 02LS2
- Service Order Code: 9.0F

- Required Network Interface Jack: RJ11C

## 2. Ringer Equivalence Number (REN)

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

The REN for this product is part of the product identifier that has the format US: ACJIS04BKX-HTS824. The digits represented by 04 are the REN without a decimal point (e.g., 04 is a REN of 0.4). For earlier products, the REN is separately shown on the label.

## 3. Incidence of Harm to the Telephone Lines

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

## 4. Changes in Telephone Company Communications Facilities, Equipment, Operations and Procedures

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

## 5. Trouble with this equipment

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

## 6. Connection to Party Line

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

## 7. Combined Use with Alarm Equipment

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

## Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

### CAUTION

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.
- When programming emergency numbers and/or making test calls to emergency numbers:
  1. Remain on the line and briefly explain to the dispatcher the reason for the call before hanging up.
  2. Perform such activities in the off-peak hours, such as early morning hours or late evenings.
- The software contained in the ARS and TRS features to allow user access to the network must be upgraded to recognize newly established network area codes and exchange codes as they are placed into service. Failure to upgrade the premises PBXs or peripheral equipment to recognize the new codes as they are established will restrict the customer and the customer's employees from gaining access to the network and to these codes.  
KEEP THE SOFTWARE UP-TO-DATE WITH THE LATEST DATA.

### **RF Exposure Warning:**

This product complies with FCC radiation exposure limits set forth for an uncontrolled environment. To comply with FCC RF exposure requirements, this product must be installed and operated in accordance with the provided instructions. The installed unit requires a minimum 20 cm (8 inches) of spacing between the PBX and a person's body. This product must not be co-located or operated in conjunction with any other antennas or transmitters.

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## **Section 2**

# **System Outline**

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

## 2.1 Basic System Construction

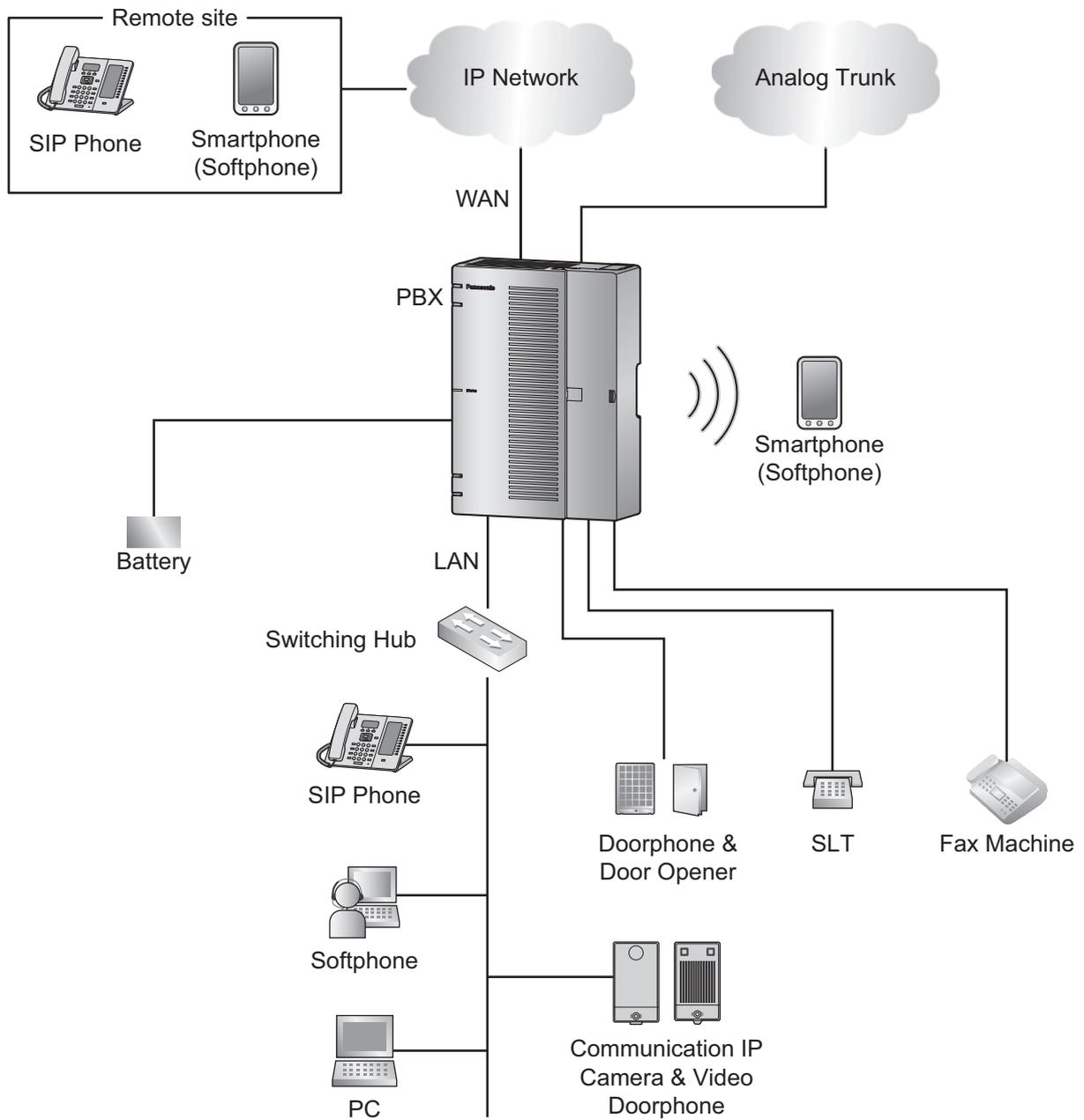
### 2.1.1 System Configurations

#### Main Unit

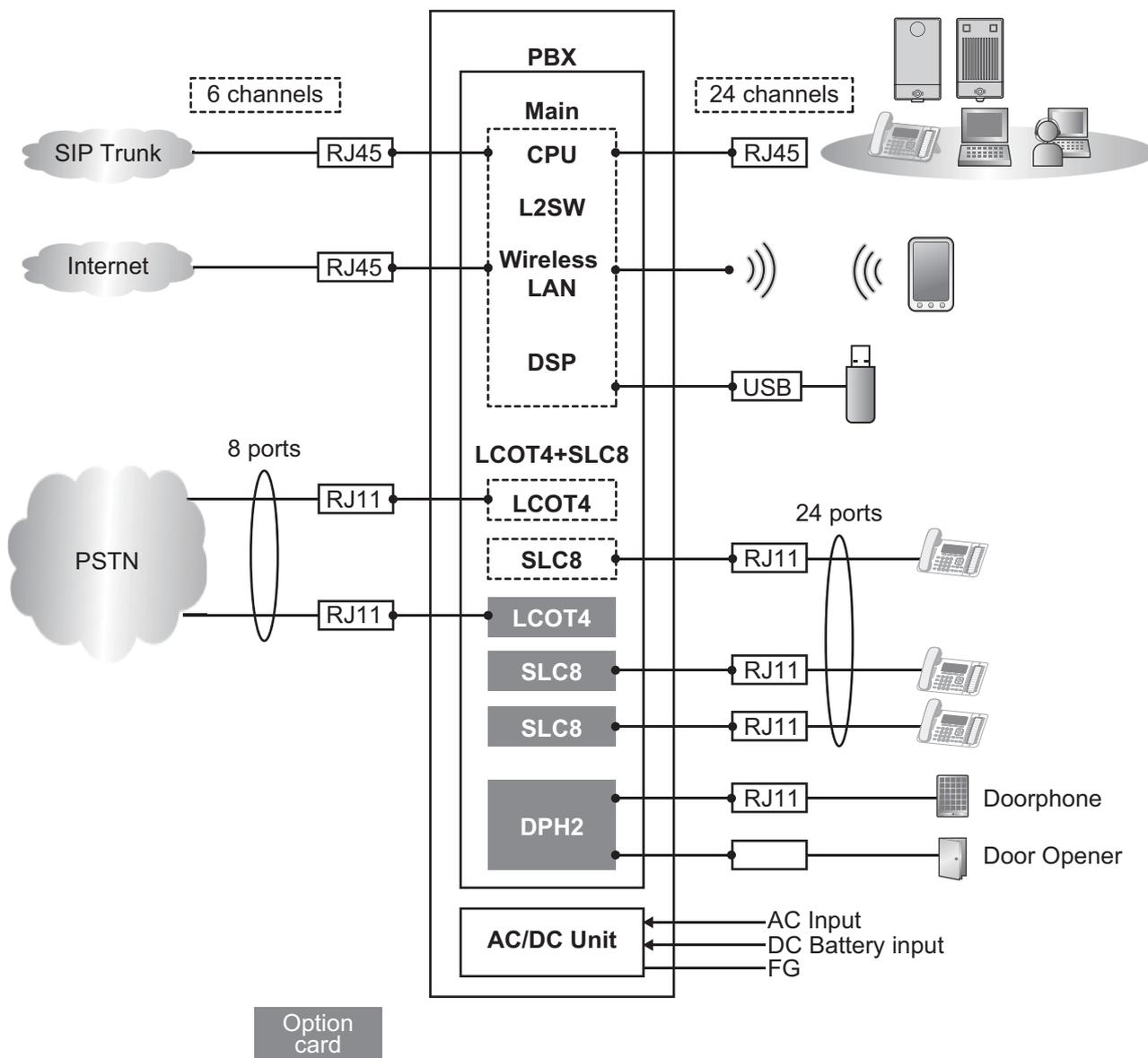
The main unit contains a mother board for controlling PBX functions.



## 2.1.2 System Connection Diagram



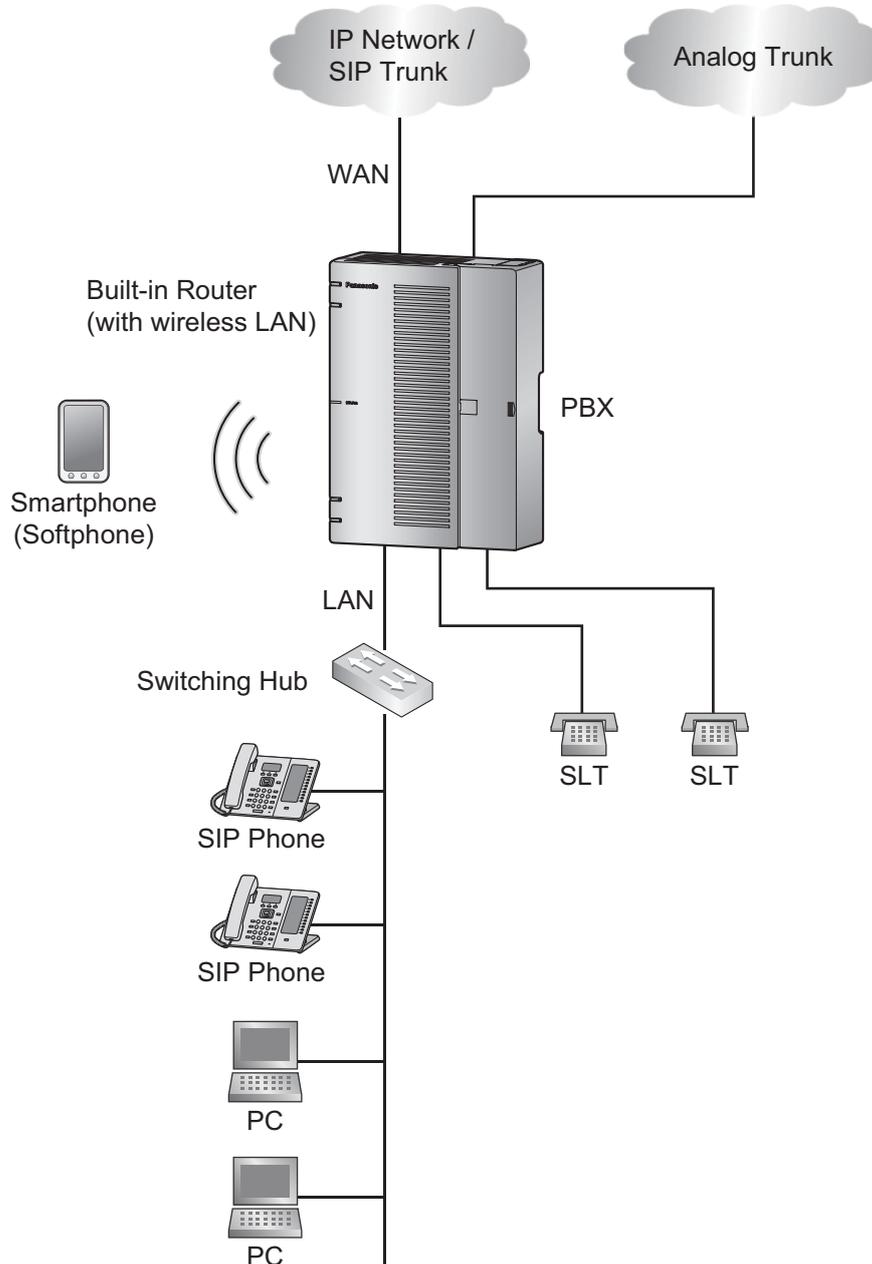
## 2.1.3 Block Diagram



## 2.1.4 Typical Network Setting Example

An example of typical network connection is shown below.

1. When installing in a new office or an office where there is no network infrastructure.



### Note

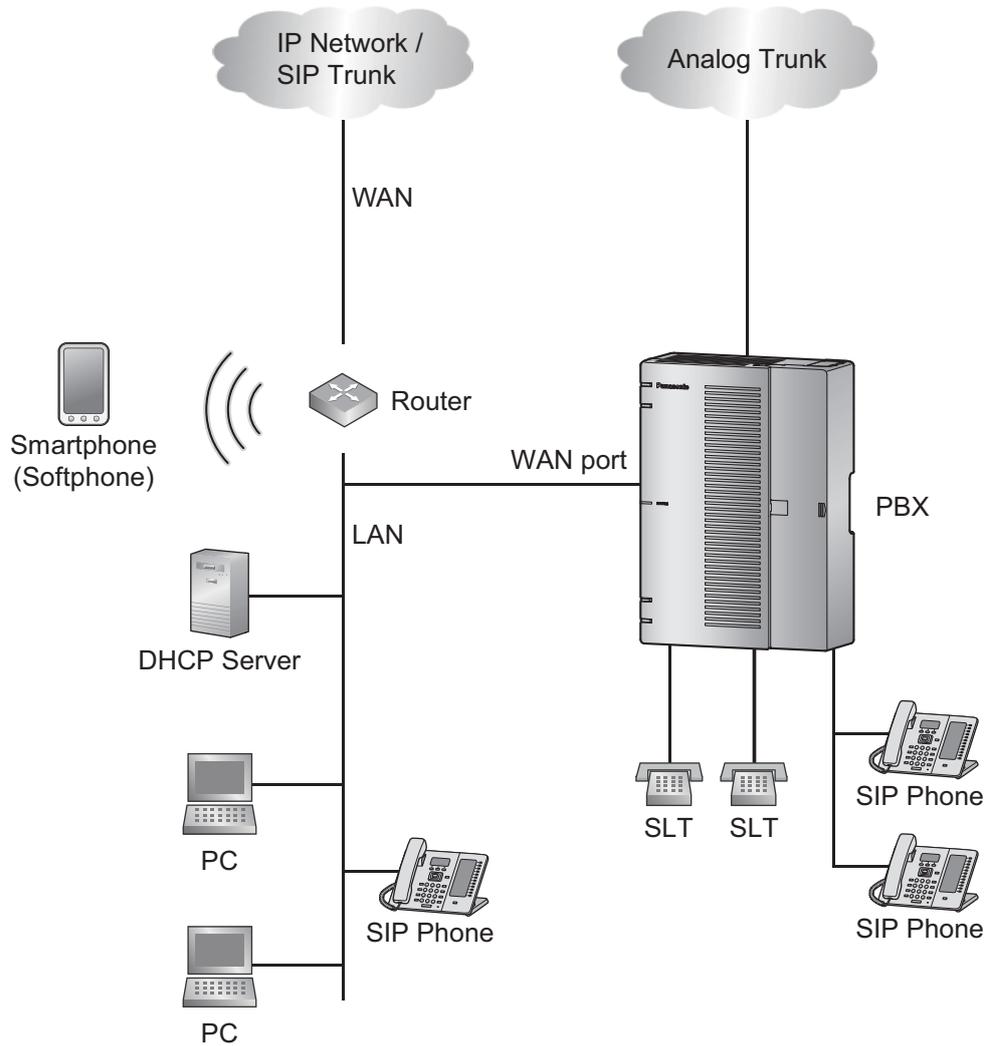
The PBX has a built-in DHCP server. When the DHCP server is enabled, the PBX will automatically assign IP addresses to other devices on the network.

Using a DHCP server simplifies network management by removing the need to assign IP addresses to devices manually.

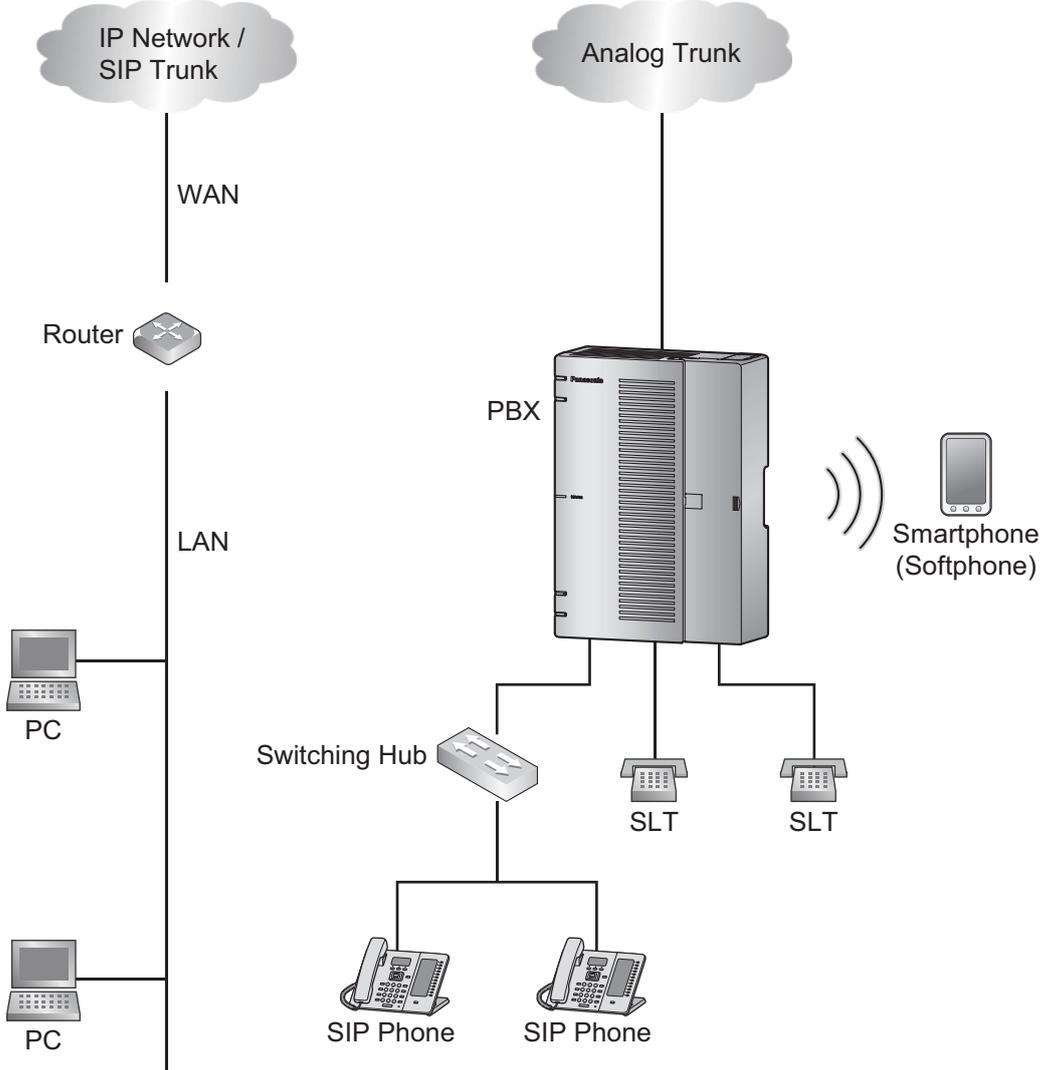
## 2.1.4 Typical Network Setting Example

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- When installing in an office that already has a network infrastructure.



3. When installing the PBX without connecting it to an existing network.



## 2.2 Optional Equipment

### 2.2.1 Optional Equipment

Model No.	Model Name	Description
KX-HT82480	4-Port Analog Trunk Card	4 ports Analog Trunk interface with Caller ID (LCOT4)
KX-HT82470	8-Port Single Line Telephone Extension Card	8 ports Standard Telephone Line Interface with Caller ID (SLC8)
KX-HT82460	2-Port Doorphone/Door Opener Card	2 ports Panasonic Proprietary Door phone Interface with door opener (no sensor interface) (DPH2)

## 2.3 Specifications

### 2.3.1 General Description

Power Input	AC 100-240 V, 50/60 Hz, 1.3-0.9A	
Power Supply Unit (PSU)	Power consumption: 60W	
External Backup Battery	External battery port is supported (DC 12 V). For more information, refer to 3.2.10 Backup Battery Connection.	
Real Time Clock	Lithium battery back up Data retention period 7 years	
Dialing	CO line	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialing with Caller ID (FSK/DTMF)
	Extension	Tone (DTMF) Dialing with Caller ID (FSK)
	Ring Frequency	20 Hz/25 Hz (selectable)
Operating Environment	Temperature	0 °C to 40 °C (32 °F to 104 °F) (forced cooling by using a FAN)
	Humidity	10 % to 90 % (non-condensing)
Ethernet Port	WAN port	10BASE-T / 100BASE-TX / 1000BASE-T RJ45 x 1 for SIP Trunks/Internet access
	WAN/LAN port	10BASE-T / 100BASE-TX / 1000BASE-T RJ45 x 1 WAN for SIP Trunks/Internet access LAN for SIP extensions/Maintenance/Mirroring
	LAN port	10BASE-T / 100BASE-TX / 1000BASE-T RJ45 x 1 for SIP extensions/Maintenance
Wireless LAN	Antenna	Built-in antenna
	Transmission method	2 x 2 MIMO
	Communication standard	IEEE802.11n/b/g
	Frequency range (center frequency)/ Channel	– For North America / Latin America except Brazil / Taiwan: 2.412 GHz - 2.462 GHz (1 - 11ch) – For all other countries / areas: 2.412 GHz - 2.472 GHz (1 - 13ch)
	Peak transmission power	100 mW
	Security	Open System (WEP64/WEP128) etc.
	Wireless LAN SETUP	PBC method (push button method)
USB port	USB 2.0 Type-A connector x1	
Dimension	297 mm (W) x 210 mm (H) x 90.4 mm (D) (11-3/4 in x 8-1/4 in x 3-1/2 in)	

### 2.3.2 Characteristics

Weight (when fully mounted)	Under 2.2 kg (4.9 lb)
Installation Environment	Wallmount Horizontal (Desktop) installation

### 2.3.2 Characteristics

Terminal Equipment Loop Limit	<ul style="list-style-type: none"> <li>• SLT: 600 <math>\Omega</math> including set</li> <li>• Doorphone: 20 <math>\Omega</math></li> </ul>
Minimum Leakage Resistance	15 000 $\Omega$ minimum
Maximum Number of Extension Instruments per Line	1 for SLT
Ring Voltage	65 Vrms at 20 Hz/25 Hz depending on the Ringing Load For Malaysia, 75 Vrms
Trunk Loop Limit	1600 $\Omega$ maximum
Hookswitch Flash/Recall Timing Range	24 ms to 2032 ms

### 2.3.3 System Capacity

#### System Capacity

Items	Default	Maximum Number	Remarks
Total Trunk (Channel/Port)	-	8 <sup>*1</sup>	
SIP Trunk (Channel) [Without G729 settings] <sup>*2</sup>	6	6	
SIP Trunk (Channel) [With G729 settings] <sup>*3</sup>	4	4	
Analog Trunk (Port) [Without G729 settings] <sup>*2</sup>	4	8	1 LCOT4 option card is required
Analog Trunk (Port) [With G729 settings] <sup>*3</sup>	4	6	1 LCOT4 option card is required
Total Extension (Channel/Port)	-	24	
SIP Extension (Channel) [G711/G722]		24	Includes softphone for smartphone or Personal Computer. Allows setting of Remote extension for each SIP extension. Remote extension can be set up to 8 lines.
Analog Extension (Port)	8	24	2 SLC8 option cards are required
Doorphone	0	2	1 DPH2 option card is required
Wireless LAN access point		1	
DISA/AA/VM channel		4	

<sup>\*1</sup> When Codec used by the SIP Trunk consists of G711 only, the maximum number of combinations of the Analog Trunk port number and SIP Trunk port number is as follows:

Maximum number (total number)	8	8	8	8	8	8	8
Maximum Analog Trunk port number	8	7	6	5	4	3	2
Maximum SIP Trunk port number	0	1	2	3	4	5	6

When G729 settings are contained in Codec used by the SIP Trunk, the maximum number of combinations of the Analog Trunk port number and SIP Trunk port number is as follows:

Maximum number (total number)	6	6	6	6
Maximum Analog Trunk port number	5	4	3	2
Maximum SIP Trunk port number	1	2	3	4

\*2 When used codec settings consist of G711 only

\*3 When G729 is contained in used codec settings

### Maximum number of concurrent calls

- The maximum number of calls that can be made simultaneously with HTS824 as below:

	Without Remote SIP <sup>*1</sup>	With Remote SIP <sup>*1</sup>
Without G729 settings	12 calls	10 calls
With G729 settings	10 calls	8 calls

<sup>\*1</sup> Remote SIP: Video Support is set Enable, and Phone Location is set Remote.

- When the number of simultaneous calls has reached the maximum number, subsequent calls are suppressed.
- With respect to the limit on the number of simultaneous calls, it is possible to prioritize calls that include an outside line. (Designating the number of outside lines to prioritize secures the number of calls made via outside lines (Initial value: 4). When the number of prioritized outside lines is set to 0, calls made from outside lines will not be prioritized.)
- The call configurations counted as the number of priority outside lines are as follows:

Call Configurations
Outside Line - Extension Call
Outside Line - Outside Line Call
Outside Line - VM/DISA/AA Connection
Meet Me Connection from Outside Line

- Calls other than priority outside lines are counted as number of unreserved calls. They cannot be included in the number of reserved calls.
- You can make calls until you reach the maximum number of concurrent calls, which amounts to the number of calls in reserve plus the number of calls actually in use. If the total exceeds the maximum number of concurrent calls, you will not be able to make any new calls.

## Maximum number of specific service

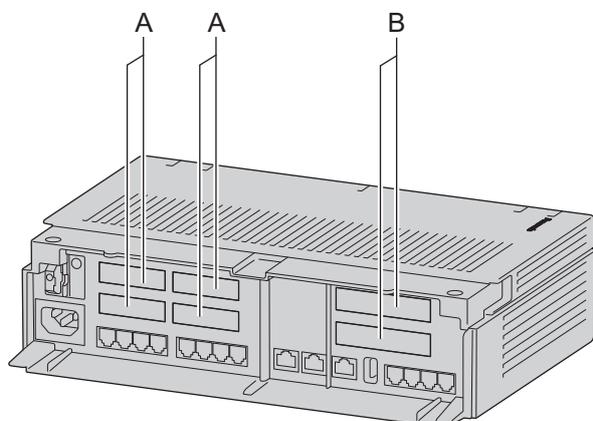
Maximum number of specific services will be managed for the items listed below.

Item	Max. No.	Description
Number of remote internal lines active at the same time	2	Management of the number of internal lines set as Remote(MRG) in Phone Location settings under SIP internal lines (Remote internal lines) (note 1)
Number of video calls active at the same time	2	The number of SIP internal lines when Video support is enabled
Number of SLT devices active at the same time	16	The number of SLT when line is off-the-hook (including when in active use)

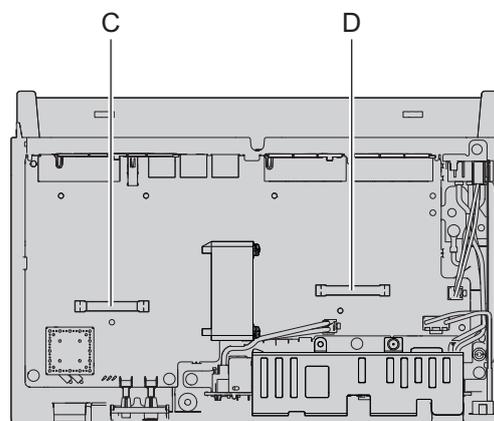
Note 1) When G729 is contained in used codec settings, the SIP trunk's maximum number of concurrent calls is 4. The maximum number of calls can be set by the SIP trunk number and Remote SIP Extension number from "Reserved concurrent G.729 call" in the System Options settings (refer to 2.2.6 PBX Configuration—[1-6] System—System Options in Programming Item List). Select any listed below.  
 SIP Trunk=3 / Remote SIP Extension=1  
 SIP Trunk=2 / Remote SIP Extension=2  
 No Reservation

### Main Unit

Right Side View (The cable cover is open.)



Inside View (The front cover is open.)



- A Dummy cover plates for Extension Card Slots
- B Dummy cover plates for Trunk/Doorphone Card Slots
- C Trunk/Doorphone Card Slot
- D Extension Card Slot

## Maximum Optional Service Cards

The following number of card can be installed in the Physical Slots of the PBX.

### Note

- Any card that exceeds the capacity of the PBX will be ignored.

### 2.3.3 System Capacity

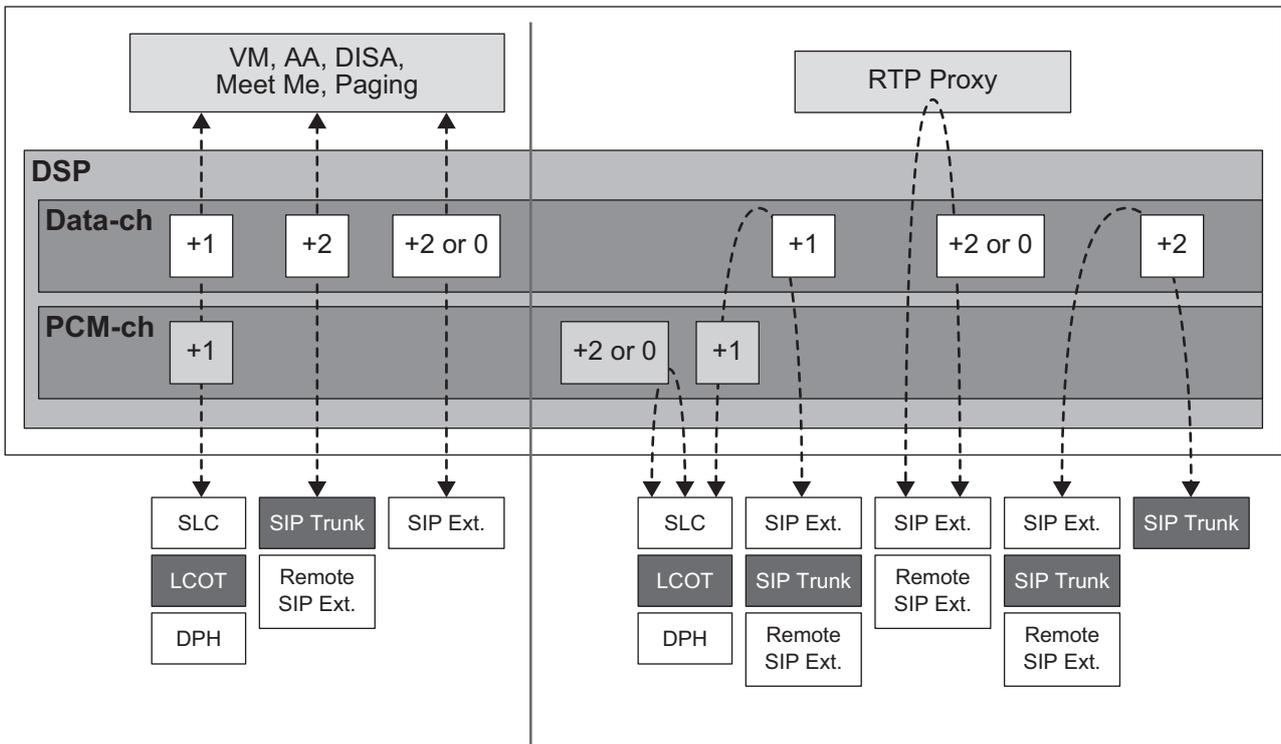
- When the PBX starts up with an invalid configuration, some cards will be ignored.

## Slot

Slot type	Card Name	Maximum Number
Trunk/Doorphone Slot	LCOT4	1
	DPH2	1
Extension Slot	SLC8	2

## DSP Resources

KX-HTS series has a built-in DSP. There are 2 types of DSP resources (Data-ch / PCM-ch), and there is a maximum of 14 resources each on the KX-HTS series system. DSP resources are consumed for calls, services (e.g. Paging and Meet Me) and holding calls. Depending on the types of extensions and lines that form calls and the services carried out, 2 types of DSP resources are consumed in combination as needed to provide calls and services. If either one or both types of DSP resources are exhausted, it is not possible to start a new call or service.



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## **Section 3**

# **Installation**

*This section describes the procedures to install the PBX. Detailed instructions for planning the installation site, installing the main unit and optional service cards, and cabling of peripheral equipment are provided. Further information on 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.

### Notice

Panasonic assumes no responsibility for injuries or property damage resulting from failures arising out of improper installation or operation inconsistent with this documentation.

## Safety Installation Instructions

### WARNING

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

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

## Installation Precautions

The PBX can be mounted on a wall or placed on a desktop, and should be installed in an accessible location where it can be easily inspected and maintained.

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

### WARNING

Do not install the system in the following locations:

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

### CAUTION

Do not install the system in the following locations:

- In direct sunlight and hot, cold, or humid places. (Temperature range: 0 °C to 40 °C [32 °F to 104 °F])
- Areas where sulphuric 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 5 cm (2 in) to the sides of the PBX for ventilation.
- Locations where condensation can occur.

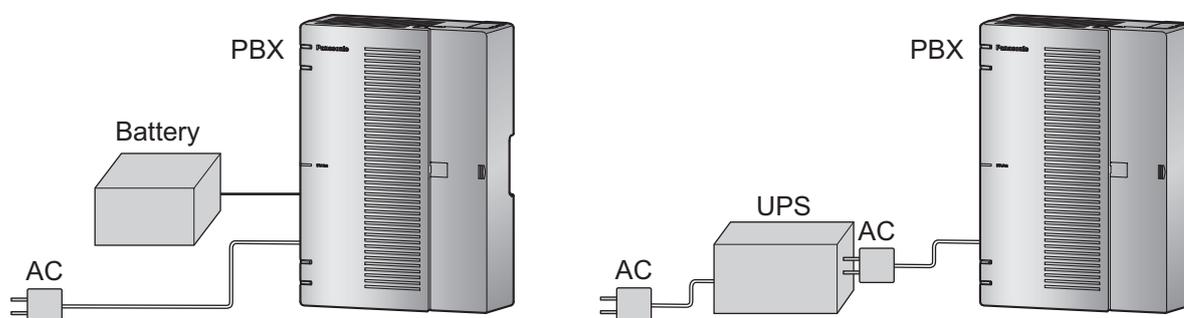
## Notice

Do not install the system in the following locations:

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

Do not perform the following:

- Do not block the openings of the PBX.
- Do not stack up the optional service cards.
- We recommend using batteries or UPS to back up power in order to cope with instantaneous power failure or power outages. For more information, refer to 3.2.10 Backup Battery Connection.



## Wiring Precautions

Be sure to follow these instructions when wiring the unit:

### CAUTION

- Avoid using the same AC outlet for computers 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 "3.2.9 Surge Protector Installation".

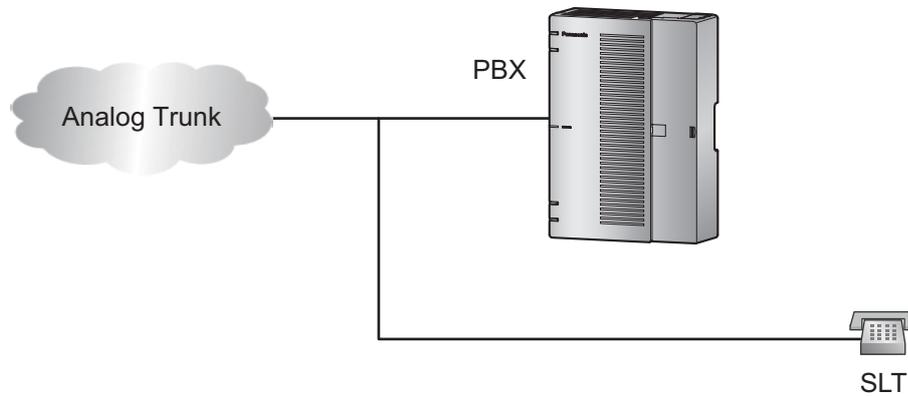
## Notice

- Use 1-pair telephone cables when connecting SLTs, data terminals, answering machines, computers, etc.
- Mis-wiring may cause the PBX to operate improperly. Refer to "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.

### 3.1.1 Before Installation

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- We recommend parallel-connecting the SLT to an Analog Trunk to serve as an emergency phone in times of power failure or equipment failure.



### Preparing the Network Environment

Be sure to prepare your network's environment for the installation of the PBX according to the intended PBX networking configuration.

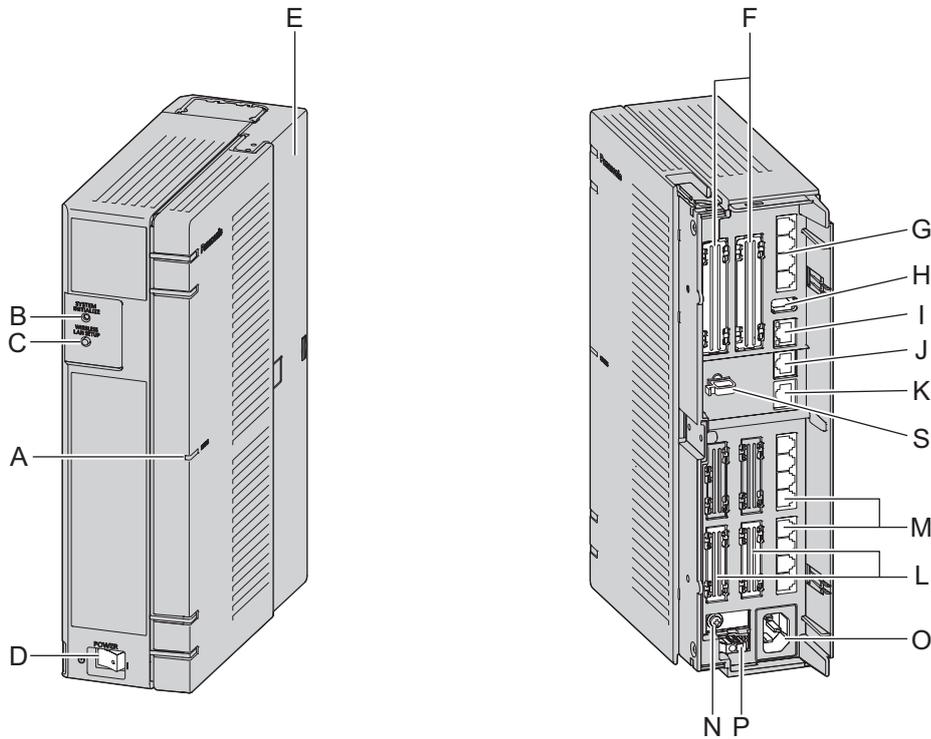
## 3.2 Installation of the PBX

### 3.2.1 Unpacking

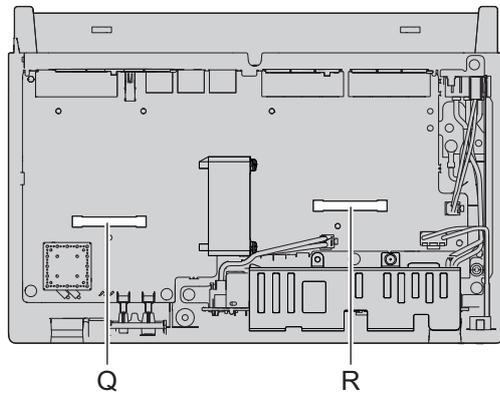
Unpack the box and check the items below:

- Main unit
- AC power cord
- Strap band
- Screw × 2 (For Wall Mounting)
- Washer × 2 (For Wall Mounting)

### 3.2.2 Names and Locations



Inside View (The front cover is open.)



- A STATUS Indicator
- B SYSTEM INITIALIZE Switch
- C Wireless LAN SETUP (WLAN SETUP) button
- D POWER Switch
- E Cable Cover
- F Trunk/Doorphone Free Slot
- G CO4 Interface
- H USB Port
- I WAN1 port
- J LAN2 / WAN2 port
- K LAN1 port
- L Extension Slot
- M SLT8 Interface
- N FG Terminal
- O AC Inlet
- P External Battery
- Q Trunk/Doorphone Card Slot
- R Extension Card Slot
- S Hook Clip

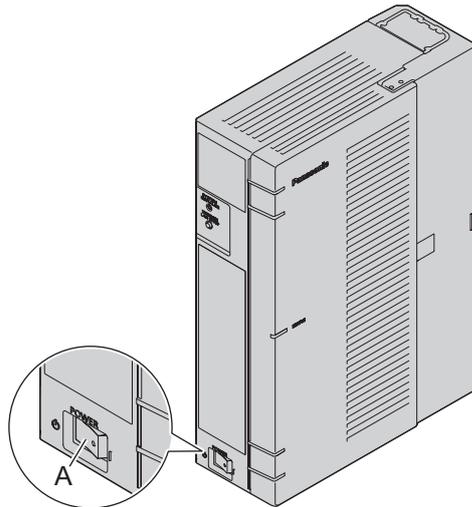
## 3.2.3 Opening/Closing the front cover

### Opening the front cover

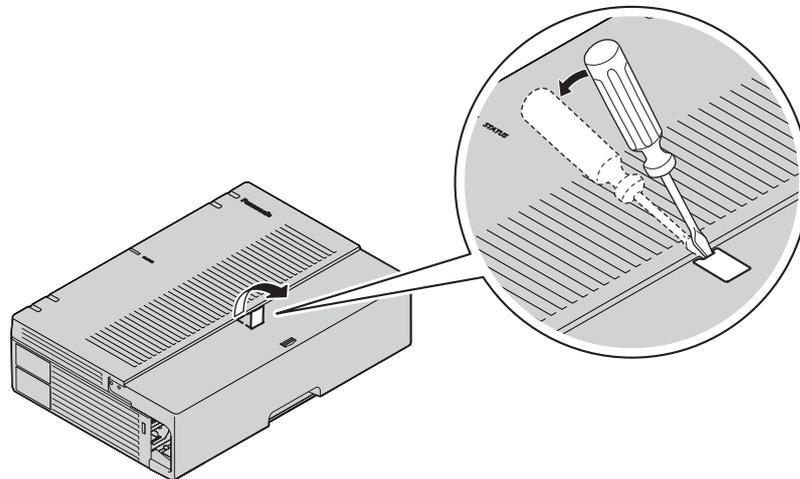
#### CAUTION

Do not open the front cover soon after turning off the power. There is a risk of receiving burns. Before opening the front cover, the AC power cord must be removed from the AC inlet.

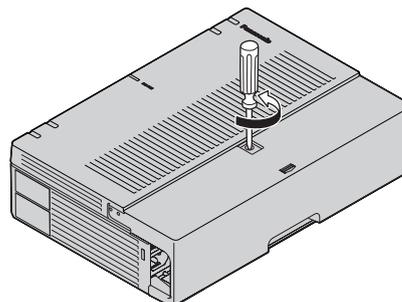
1. Confirm that the power switch is turned off. And open the screw cover.



A Power Switch



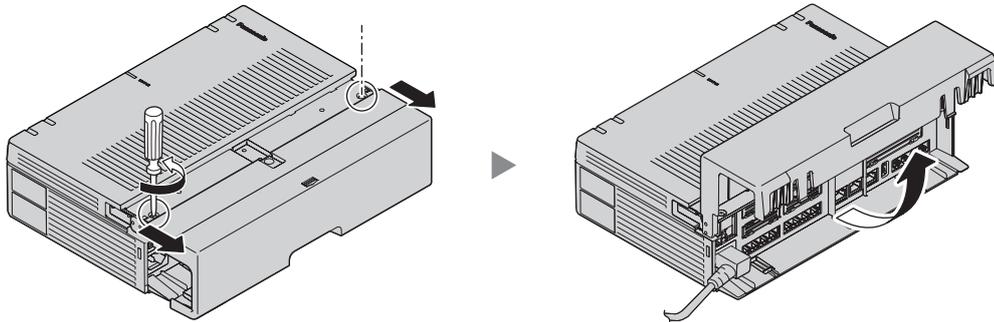
2. Turn the screws counterclockwise to loosen them.



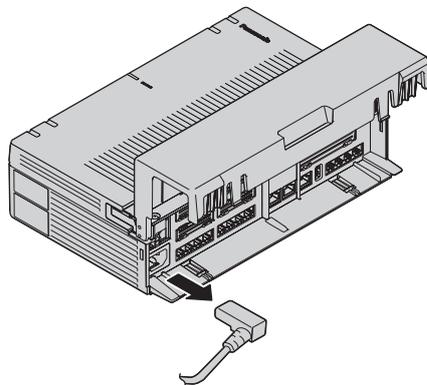
### 3.2.3 Opening/Closing the front cover

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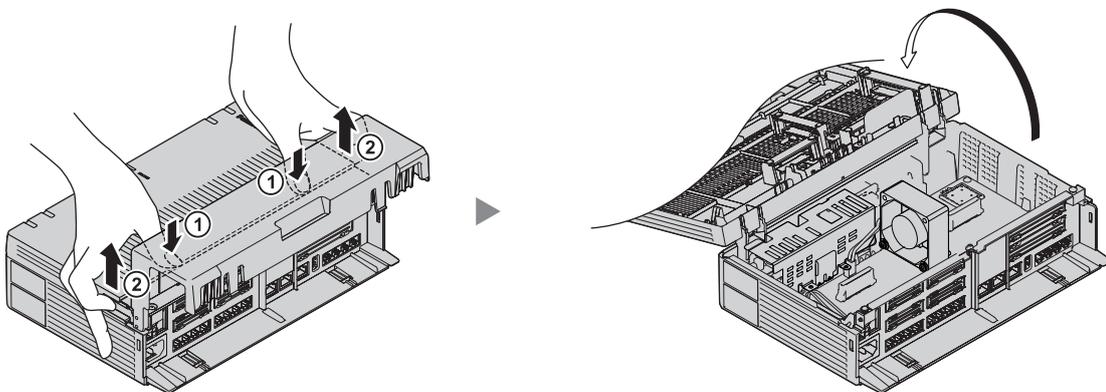
3. Slide out the cable cover until the end and turn the screws counterclockwise to loosen them. Then, open the cable cover turning 90 degrees as shown below.



4. Disconnect the power cable.

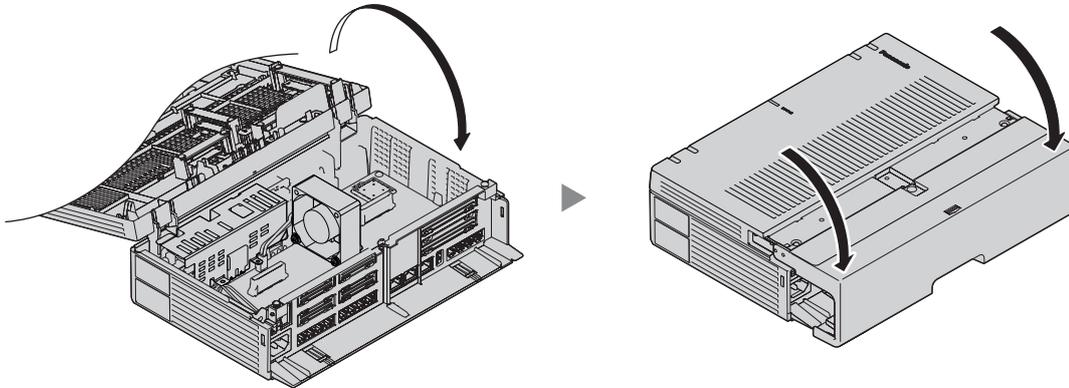


5. Open the front cover.

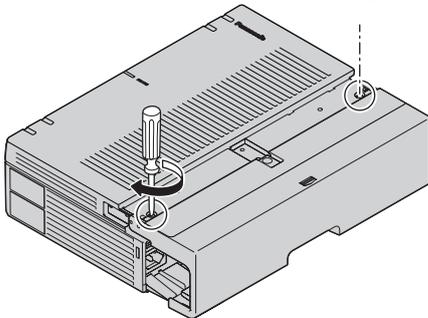


## Closing the front cover

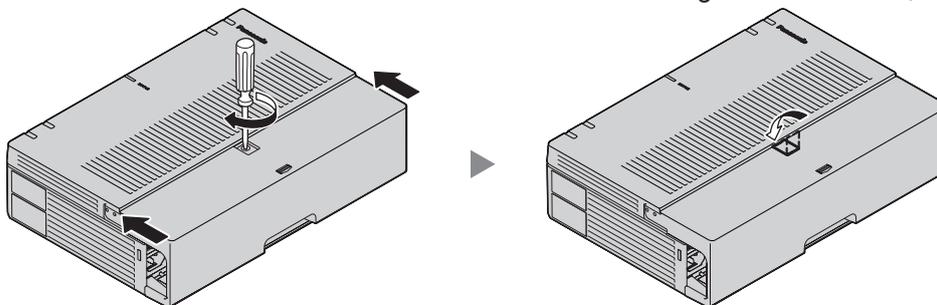
1. Close the front cover. Then, close the cable cover turning 90 degrees as shown below.



2. Turn the screws clockwise to tighten them.



3. Slide in the cable cover and turn the screws clockwise to tighten them. Then, close the screw cover.



### CAUTION

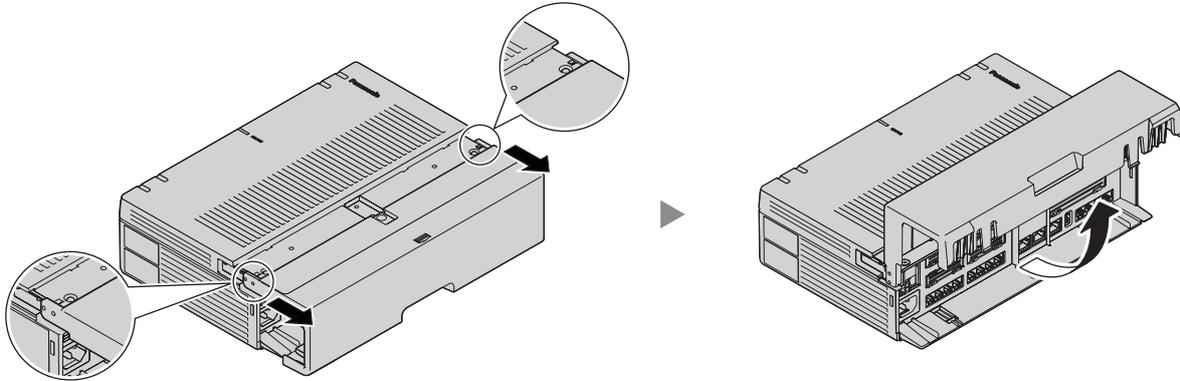
For safety reasons, fix the front cover and cable cover of the PBX with screws.

## Removing/Attaching the Cable Cover

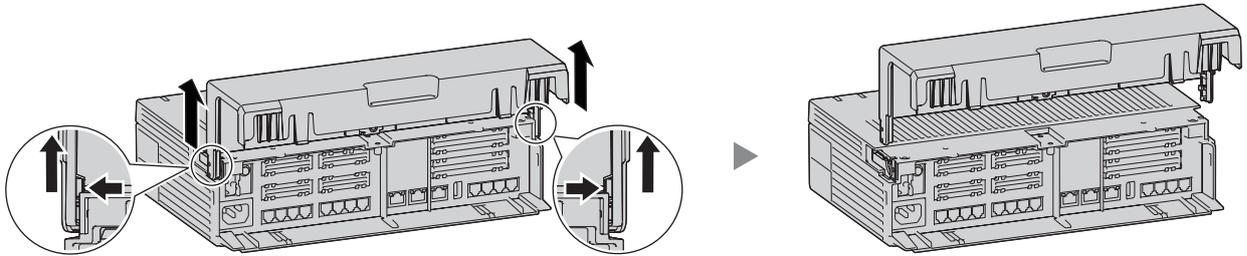
If you prefer, you can remove the cable cover.

### Removing the Cable Cover

1. Slide out the cable cover until the end and open it. Open the cable cover turning 90 degrees as shown below.

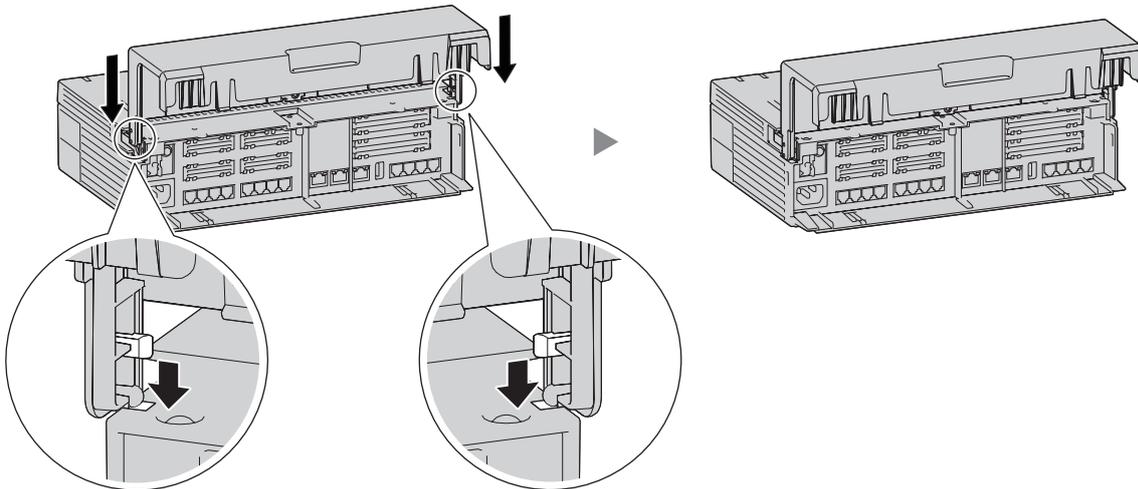


2. Holding the cable cover open at about a 90 angle, remove the cable cover by pushing it in the direction of the arrow as shown below.



### Attaching the Cable Cover

1. Fit the cable cover to the main unit as shown below, and then close the cable cover.



#### CAUTION

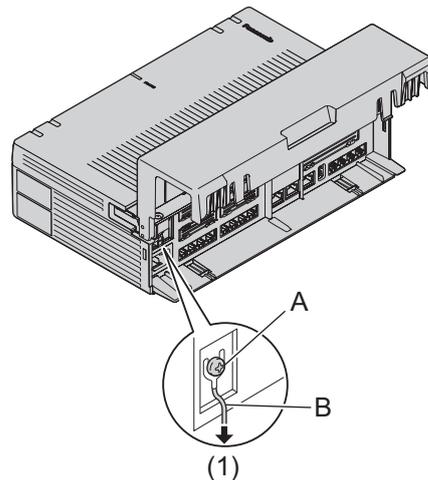
For safety reasons, fix the front cover and cable cover of the PBX with screws.

#### Note

Be careful not to pinch your fingers during operation.

## 3.2.4 Frame Ground Connection

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



- (1) To ground  
 A Screw  
 B Grounding wire

### WARNING

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

### CAUTION

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

### Notice

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

## 3.2.5 Installing/Removing the Optional Service Cards

### CAUTION

- Before touching the product (PBX, cards, etc.), discharge static electricity by touching ground or wearing an grounding strap. Failure to do so may cause the PBX to malfunction due to static electricity.
- When installing or removing the optional service cards, the power switch must be turned off, and the AC power cord must be removed from the AC inlet.

### 3.2.5 Installing/Removing the Optional Service Cards

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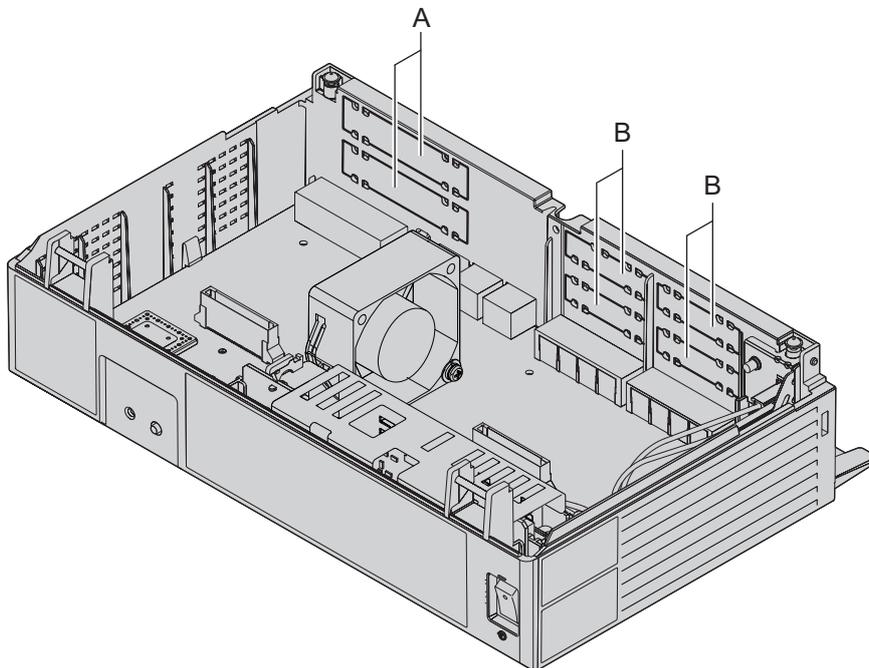
- When installing or removing the optional service cards, do not put pressure on any parts of the mother board. Doing so may result in damage to the PBX.
- Disconnect the AC power source before servicing the equipment.

#### Note

Make sure the AC power cord is not connected to the AC inlet of the PBX.

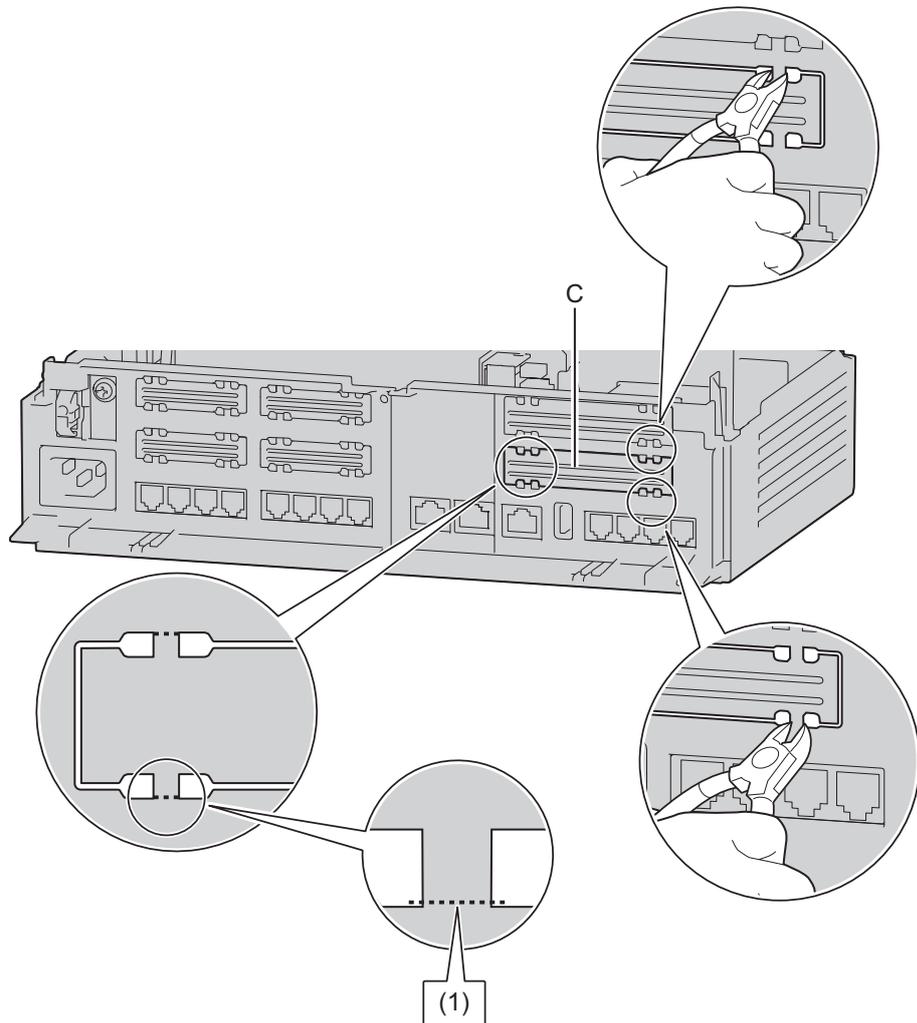
### Installing an Optional Service Card in the Free Slots

In the Main Unit, there are free slots for trunk/doorphone cards and free slots for extension cards.  
In the free slots for trunk/doorphone cards, you can install one each of the following cards: LCOT4, DPH2.  
In the free slots for extension cards, you can install one or more of the following card: SLC8.  
For details, refer to the description of each optional service card in "3.3.2 LCOT4 Card (KX-HT82480)", "3.3.3 SLC8 Card (KX-HT82470)" and "3.3.4 DPH2 Card (KX-HT82460)".



- A Trunk/Doorphone Card Slots
- B Extension Card Slots

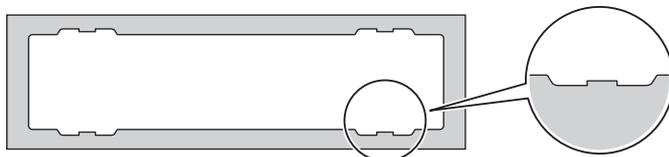
1. Remove the dummy cover plate for the Free slot.  
Cut off any excess plastic in order to make the surface smooth.



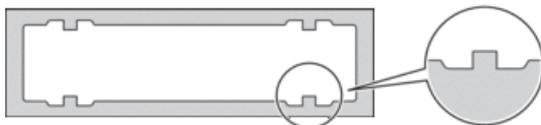
C Dummy Cover Plate

(1) Cut here.

Correct



Incorrect



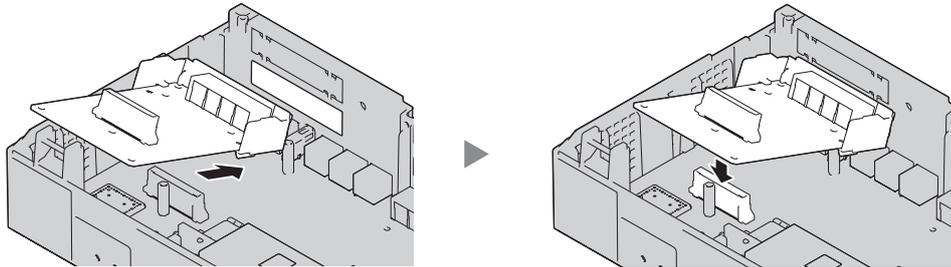
### Note

When removing the dummy cover plate, use plastic nippers. We do not recommend using a knife such as a retractable utility knife.

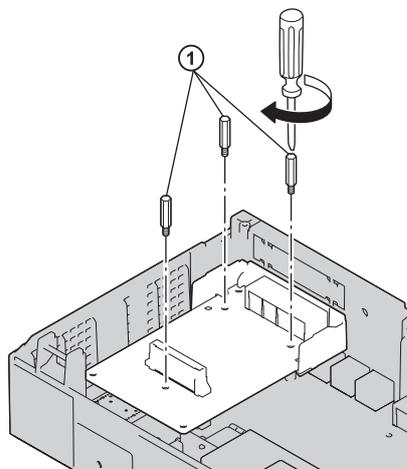
### 3.2.5 Installing/Removing the Optional Service Cards

---

2. Position the card in the open slot, making sure that the tabs on the both sides of the card fit into place. Then, holding the card firmly in place, lower the rear end so that the holes of the card are aligned with the screw holes.



3. Insert the spacers (①) into the holes on the card, and tighten the spacers to secure the card.



#### Note

- LCOT4 and DPH2 cards may be installed in either of the top and bottom of the Trunk/Doorphone Slot. When a card is installed, the another type of card can install to an empty slot. The type of card that can be installed is displayed on the screen of Web-MC.
- When a card is installed, the HTS will recognize it and also it will be available automatically.

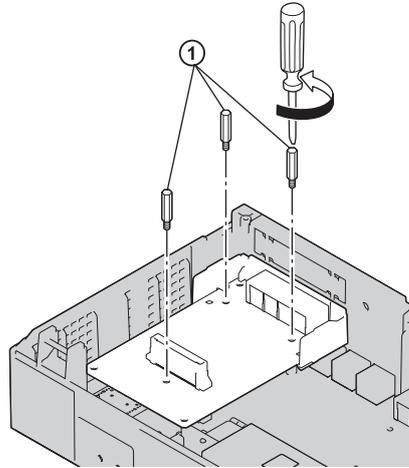
4. Connect cables to appropriate ports of the card. For details about pin assignments, refer to the appropriate section in "3.5 Connecting Extensions" and "3.6 Connecting Doorphones and Door Openers".

#### Note

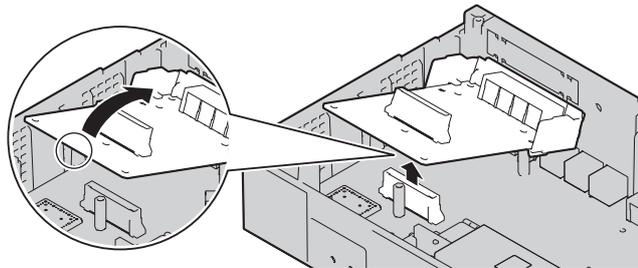
Make sure to connect cables after installing the card in the PBX, not before.

## Removing Optional Service Card from the Free Slot

1. Loosen and remove the spacers (①).

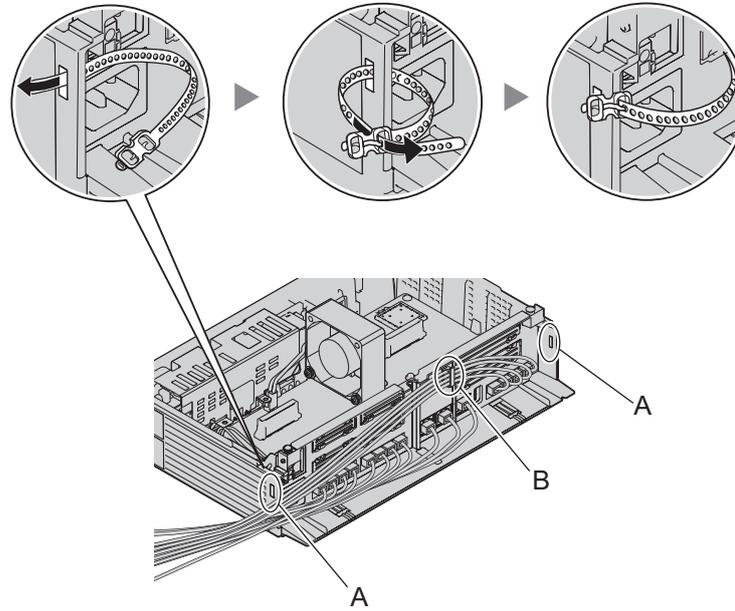


2. Holding the rear end of the card, pull the card in the direction of the arrows.



## 3.2.6 Securing the Cables

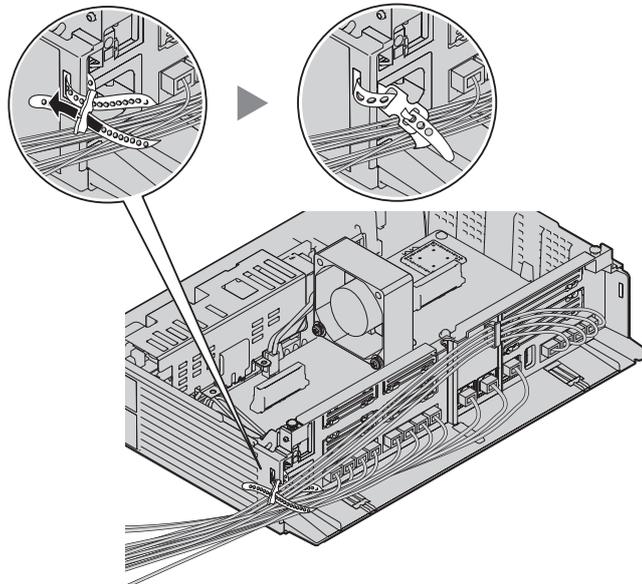
1. Attach the included strap to either of the 2 rails depending on your preference. Bind the cables inserted into the CO4 Interface using hook clips. (You can route the cables using hook clips so that the USB port will not be blocked by the cables.)



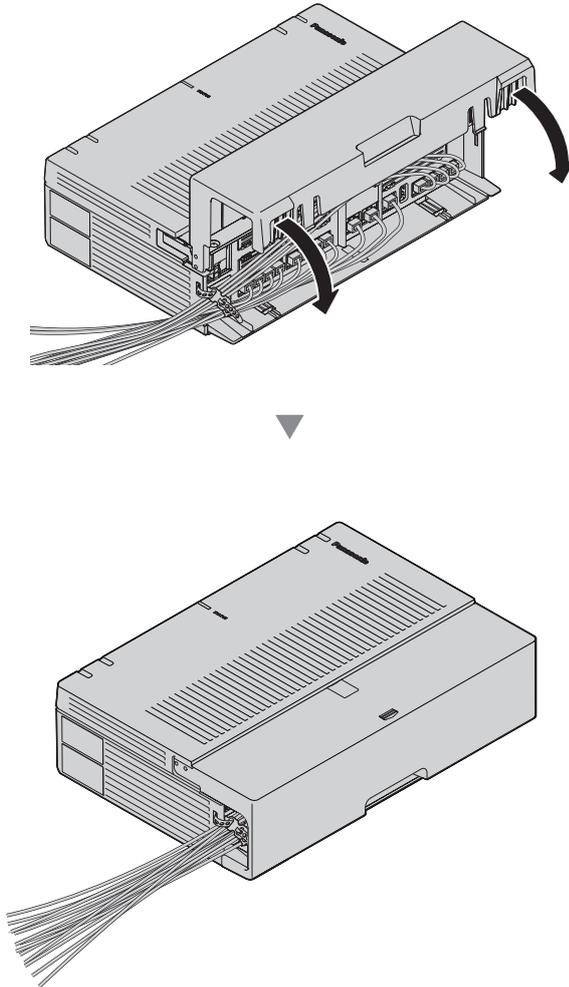
A Slit

B Hook Clip

2. Bind the cables as shown.



3. Close the cable cover. (For details, refer to "3.2.3 Opening/Closing the front cover".)

**Note**

- For safety reasons, do not stretch, bend, or pinch the cables.

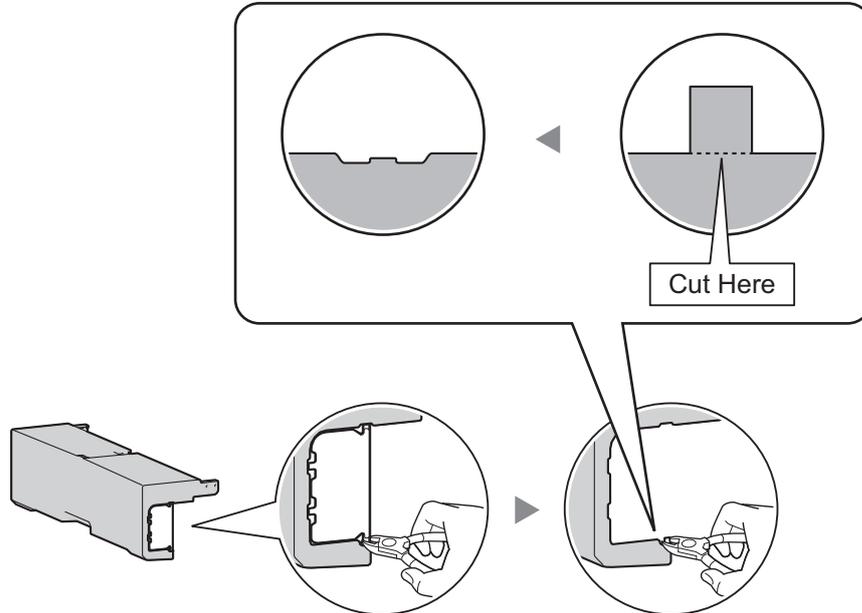
### 3.2.7 Placing the PBX on a Desktop

---

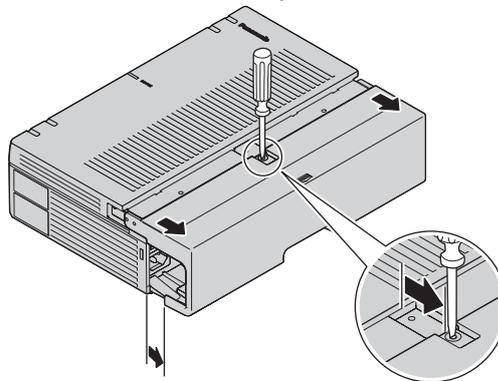
- If you prefer, you can cut the other side of the cable cover and run the cables through that opening. For safety reasons, smooth the cut edges.

#### Note

Use plastic nippers. We do not recommend using a knife such as a retractable utility knife.



- When there are too many cables to fully slide in the cable cover, leave the cable cover slid open, and tighten the screws with the cable cover in that position.



#### CAUTION

For safety reasons, fix the front cover and cable cover of the PBX with screws.

### 3.2.7 Placing the PBX on a Desktop

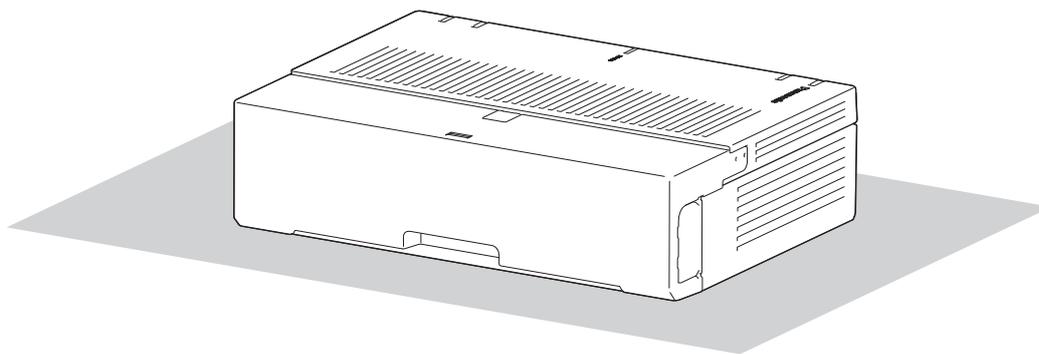
When placing the PBX on a desktop, make sure to follow these instructions.

#### WARNING

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

**CAUTION**

- When the PBX is placed on a desktop, make sure that the PBX is placed as indicated in the diagram below. Do not place it on its side or upside down.
- Do not block the openings of the PBX. Allow space of at least 20 cm (8 in) above and 10 cm (4 in) at the sides of the PBX.
- When installing the PBX horizontally, do not place it on a tablecloth or carpet. Doing so may cause discoloration due to heat.



Desk or Table

## 3.2.8 Wall Mounting

When wall mounting the main unit, use the included screws.

**WARNING**

- Make sure that the wall that the unit will be attached to is strong enough to support approximately 5 times the weight of the unit. If not, it is necessary for the wall to be reinforced.
- Only use the wall-mounting equipment (screws and washers) included with the PBX.
- Be careful not to drop any components. Dropping components may damage them or cause an injury.
- Proper grounding (connection to ground) is very important to reduce the risk to the user of electrocution or to protect the PBX from the bad effects of external noise in the case of a lightning strike. (See "3.2.4 Frame Ground Connection".)

**CAUTION**

- Make sure to install all necessary optional service cards in the PBX before performing the wall mounting procedure. If it is necessary to install or remove a card, make sure to detach the PBX from the wall before installing or removing the card.
- Do not block the openings of the PBX. Allow space of at least 20 cm (8 in) above, 10 cm (4 in) at the sides, and 10 cm (4 in) below the PBX.
- Make sure that the surface behind the PBX is flat and free of obstacles, so that the openings on the back of the PBX will not be blocked.
- If the PBX is not installed properly using the securing correct methods, the PBX may fall causing serious damage.
- When driving the screws into the wall, be careful to avoid touching any metal laths, wire laths or plates in the wall.
- When this product is no longer in use, make sure to detach it from the wall.

**Note**

For details about dimensions and weight of the PBX, see "2.3.1 General Description".

### Wall Mounting Procedures

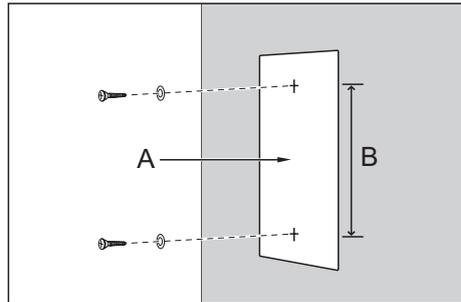
#### CAUTION

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

#### Mounting on a Wooden Wall

The included screws may be used when mounting the main unit on a wooden wall.

1. Place the template (found on the last page of this manual) on the wall to mark the 2 screw positions.



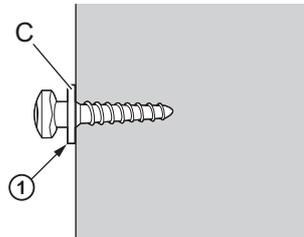
A Template

B 225 mm (8-7 / 8 in)

#### Note

When you print out the template, the distance on the paper output may deviate slightly from the indicated measurement. In this case, use the indicated measurement.

2. Install the screws and washers (included) to the wall.



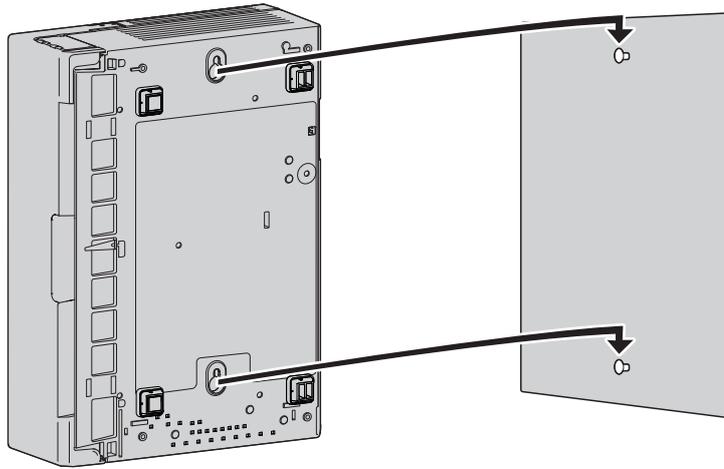
C Washer

① Drive the screw to this point.

#### Note

- As indicated above, do not tighten the screw fully.
- The pull-out strength of the installation area must be at least 294 N (30 kgf) per screw.
- Do not block the operations of the cabinet. Allow space of at least 20 cm (8 in) above and 10 cm (4 in) at the sides of the cabinet.
- Make sure that screw heads are the same distance from the wall.
- Install the screw perpendicular to the wall.
- Be careful not to drop the cabinet.

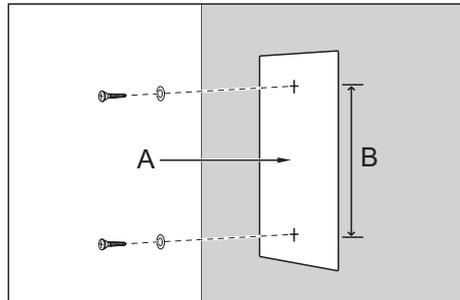
3. Hook the main unit on the screw heads.



## Mounting on a Concrete

The included screws may be used when mounting the main unit on a concrete. User supplied anchor plugs are also necessary.

1. Place the template (found on the last page of this manual) on the wall to mark the 2 screw positions.

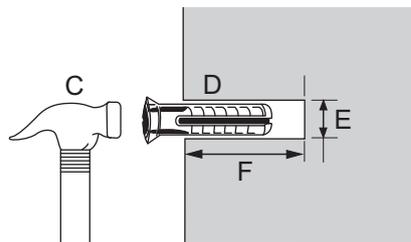


- A Template
- B 225 mm (8-7 / 8 in)

### Note

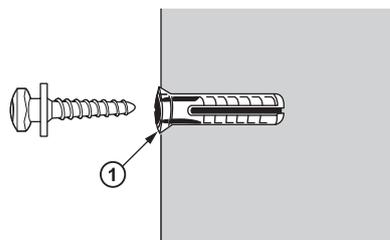
When you print out the template, the distance on the paper output may deviate slightly from the indicated measurement. In this case, use the indicated measurement.

2. Drill holes in the wall as marked and fit the anchor plugs (not included) into the holes.



- C Hammer
- D Anchor Plug
- E 6.4 mm (1/4 in)
- F 29 mm (1-9 / 64 in)

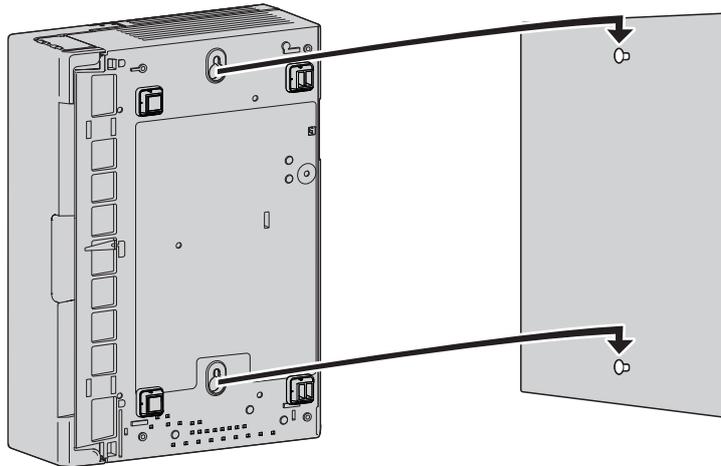
3. Fit the washers on the screws, and drive the screws into the anchor plugs.



- ① Drive the screw to this point.

**Note**

- As indicated above, do not tighten the screw fully.
- The pull-out strength of the installation area must be at least 294 N (30 kgf) per screw.
- Do not block the operations of the cabinet. Allow space of at least 20 cm (8 in) above, 10 cm (4 in) at the sides, and 10 cm (4 in) below the PBX.
- Make sure that screw heads are the same distance from the wall.
- Install the screw perpendicular to the wall.
- Be careful not to drop the cabinet.

**4.** Hook the main unit on the screw heads.

## 3.2.9 Surge Protector Installation

**CAUTION**

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

**Overview**

A massive electrical surge can be caused if lightning strikes a telephone cable 10 m (33 ft) above ground, or if a telephone line comes into contact with a power line. A surge protector is a device that is connected to a 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:

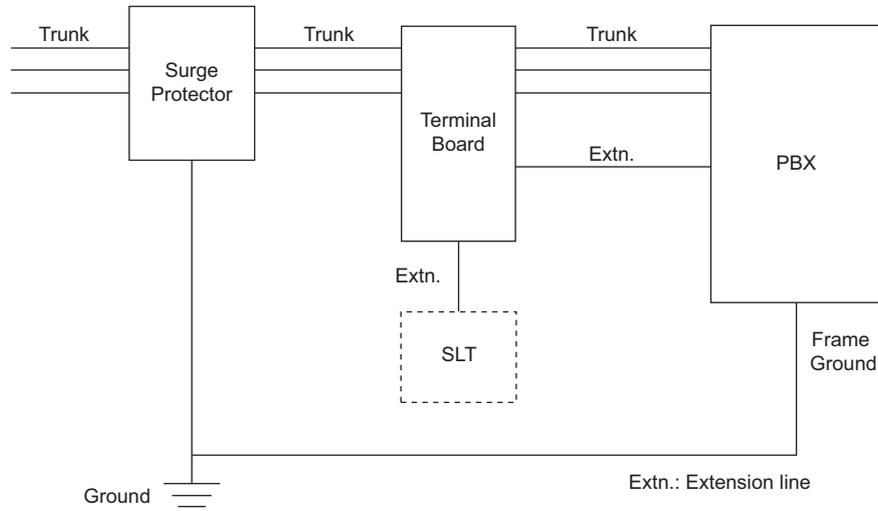
- Surge arrestor type: 3-electrode arrestor
- DC spark-over voltage: 230 V
- Maximum peak current: at least 10 kA

Additionally, proper grounding is very important for the protection of the system (refer to "3.2.4 Frame Ground Connection").

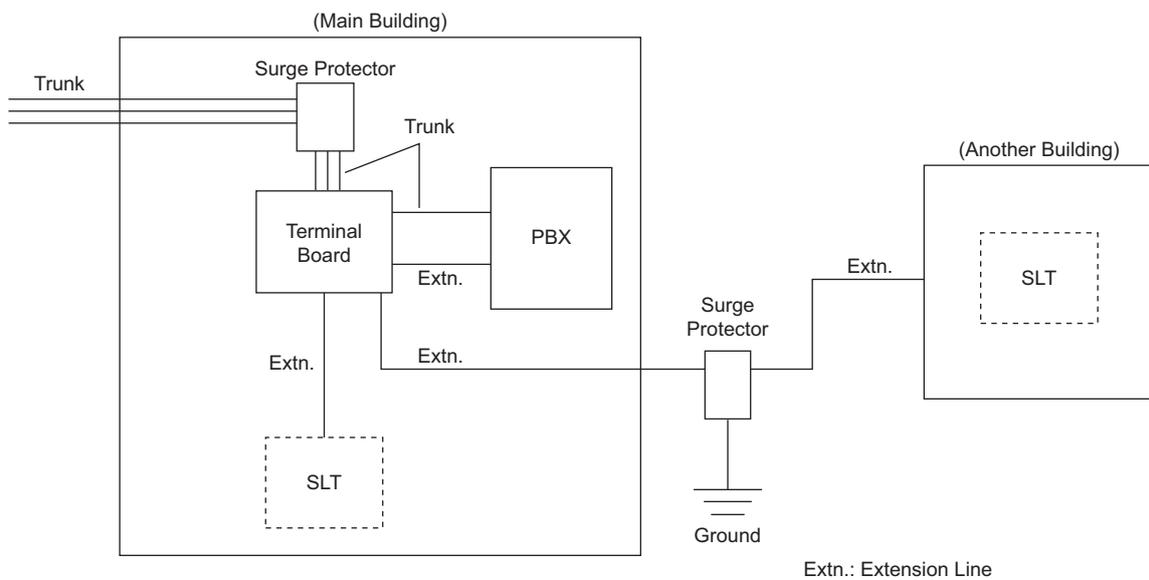
Many countries/areas have regulations requiring surge protection. Be sure to comply with all applicable laws, regulations, and guidelines.

### 3.2.9 Surge Protector Installation

## Installation



## Outside Installation



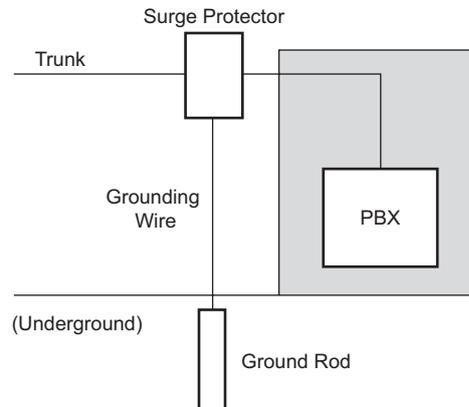
If you install an extension outside of the building, the following precautions are recommended:

- a. Install the extension wire underground.
- b. Use a conduit to protect the wire.

### Note

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

## Installation of an Ground Rod



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

### Note

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

## 3.2.10 Backup Battery Connection

The backup battery 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 battery automatically maintains the power to the PBX without interruption.

User-supplied Items

- Backup Battery: VRLA (Valve Regulated Lead Acid) 12 V DC × 1
- Back-up Battery Cable: KX-A227

### WARNING

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

### CAUTION

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

### Notice

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

### 3.2.10 Backup Battery Connection

#### Note

- The recommended maximum capacity is 28 Ah, to maintain effective battery charge.
- The Back-up Battery Cable should not be exposed to direct sunlight. Keep the Back-up Battery Cable and the backup battery away from heating appliances and fire. Place the backup battery in a ventilated place.
- For details about the backup battery, refer to the manual for the battery.

### Backup Power Supply Duration

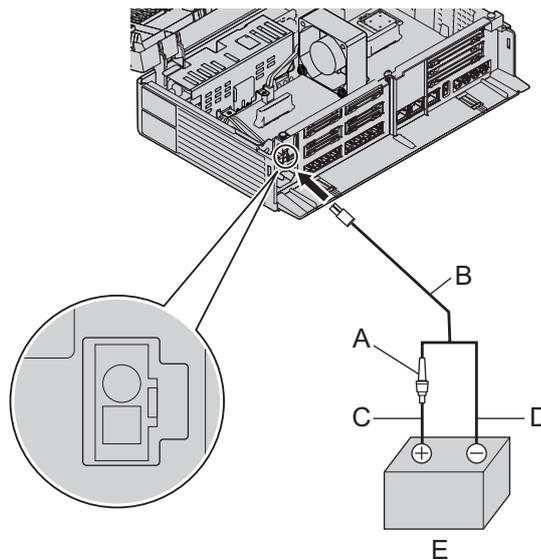
#### Examples

Battery Capacity	Backup Power Supply Duration <sup>*1</sup>
28Ah	9 h

\*1 The duration may vary depending on the conditions.

### Connecting a Backup Battery

1. Turn off the power switch.
2. Connect the Back-up Battery Cable to the backup battery.



- A Fuse
- B Backup Battery Cable
- C Red
- D Black
- E Backup Battery (VRLA 12 V DC)

## 3.3 The Mother Board and Option Cards

### 3.3.1 Mother Board

#### Function

The motherboard has the following functions preinstalled.

- Support for up to 8 trunks (SIP trunks and analog trunks combined)
- Support for up to 24 extensions (SIP extensions and analog extensions combined)

The following types of connections are supported for connecting to SIP extensions, SIP trunks, and PCs on private IP networks.

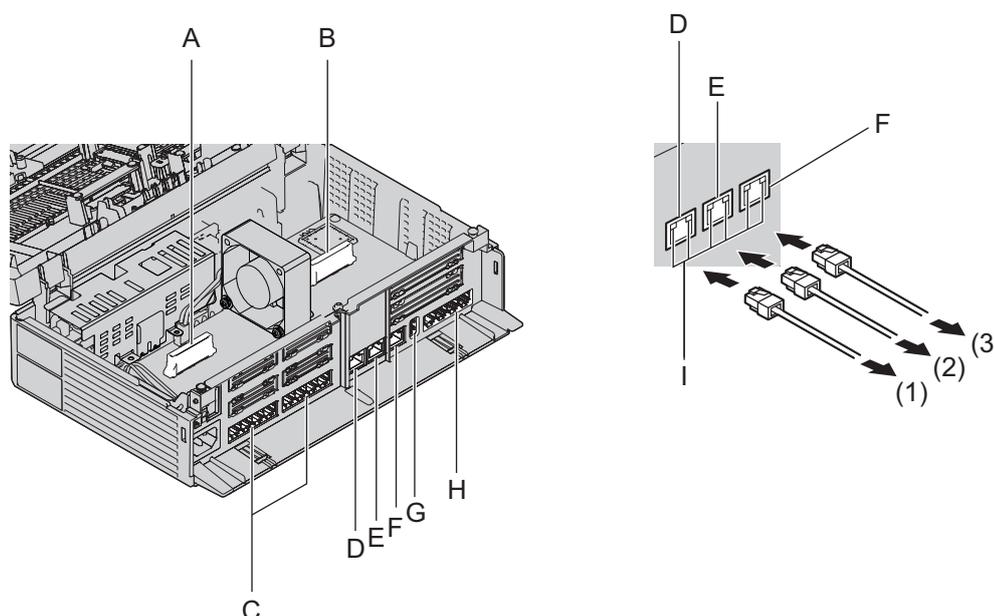
- LAN connection
- Wireless network connection

The following types of connections are supported for connecting to SIP trunks and external networks.

- WAN connection

#### Mountable Cards

- 4-Port Analog Trunk Card (refer to "3.3.2 LCOT4 Card (KX-HT82480)")
- 8-Port Single Line Telephone Extension Card (refer to "3.3.3 SLC8 Card (KX-HT82470)")
- 2-Port Doorphone/Door Opener Card (refer to "3.3.4 DPH2 Card (KX-HT82460)")



A	Extension slot	H	CO4 Interface
B	Trunk/Doorphone Free Slot	I	LEDs
C	SLT8 Interface	(1)	To LAN
D	LAN1 port	(2)	To LAN/WAN
E	LAN2 / WAN2 port	(3)	To WAN
F	WAN1 port		
G	USB Port		

### 3.3.1 Mother Board

#### Note

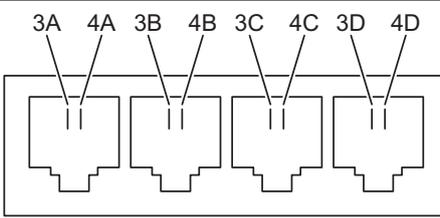
- The maximum length of the CAT 5/CAT 5e cables to be connected to the mother board is 100 m(328 ft).
- For details about connecting to a LAN, refer to "3.12 LAN Connection".

#### WARNING

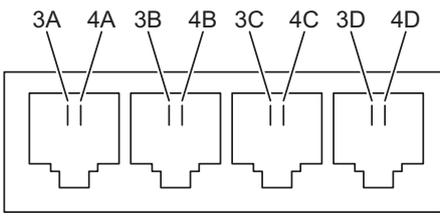
A lithium battery is used in the mother board. There is a risk of explosion if the battery is replaced with the incorrect type. Dispose of used batteries according to the manufacturer's instructions.

### PIN Assignments

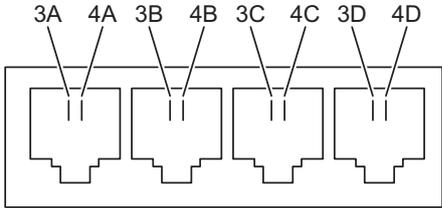
#### EXTN 1-4 RJ11×4 Connector

	No.	Signal Name	Input (I)/ Output (O)	Function
	3A	FXS-A-TIP	—	EXT Tip Port 1
	4A	FXS-A-RING	—	EXT Ring Port 1
	3B	FXS-B-TIP	—	EXT Tip Port 2
	4B	FXS-B-RING	—	EXT Ring Port 2
	3C	FXS-C-TIP	—	EXT Tip Port 3
	4C	FXS-C-RING	—	EXT Ring Port 3
	3D	FXS-D-TIP	—	EXT Tip Port 4
	4D	FXS-D-RING	—	EXT Ring Port 4

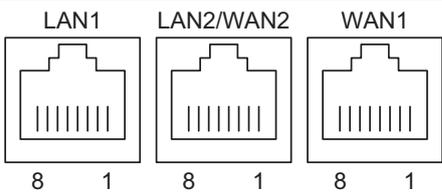
#### EXTN 5-8 RJ11×4 Connector

	No.	Signal Name	Input (I)/ Output (O)	Function
	3A	FXS-E-TIP	—	EXT Tip Port 5
	4A	FXS-E-RING	—	EXT Ring Port 5
	3B	FXS-F-TIP	—	EXT Tip Port 6
	4B	FXS-F-RING	—	EXT Ring Port 6
	3C	FXS-G-TIP	—	EXT Tip Port 7
	4C	FXS-G-RING	—	EXT Ring Port 7
	3D	FXS-H-TIP	—	EXT Tip Port 8
	4D	FXS-H-RING	—	EXT Ring Port 8

## Line 1-4 RJ11×4 Connector

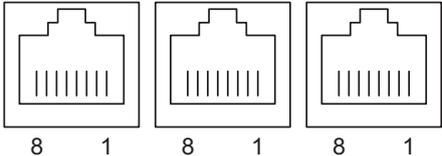
	No.	Signal Name	Input (I)/ Output (O)	Function
	3A	FXO-A-TIP	—	CO Tip Port1
	4A	FXO-A-RING	—	CO Ring Port1
	3B	FXO-B-TIP	—	CO Tip Port2
	4B	FXO-B-RING	—	CO Ring Port2
	3C	FXO-C-TIP	—	CO Tip Port3
	4C	FXO-C-RING	—	CO Ring Port3
	3D	FXO-D-TIP	—	CO Tip Port4
	4D	FXO-D-RING	—	CO Ring Port4

## LAN Port/WAN 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	Reserved	—	
	5	Reserved	—	
	6	TPI-	I	Receive data (-)
	7	Reserved	—	
	8	Reserved	—	

### 3.3.1 Mother Board

#### LAN Port/WAN Port (1000BASE-T)

	No.	Signal Name	Input (I)/ Output (O)	Function
	1	TRD0 (+)	—	Transmit and receive data 0 (+)
	2	TRD0 (-)	—	Transmit and receive data 0 (-)
	3	TRD1 (+)	—	Transmit and receive data 1 (+)
	4	TRD1 (-)	—	Transmit and receive data 1 (-)
	5	TRD2 (+)	—	Transmit and receive data 2 (+)
	6	TRD2 (-)	—	Transmit and receive data 2 (-)
	7	TRD3 (+)	—	Transmit and receive data 3 (+)
	8	TRD3 (-)	—	Transmit and receive data 3 (-)

#### LED Indications

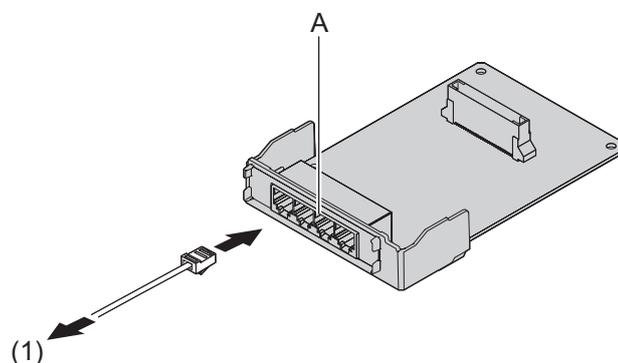
Indication	Color	Description
STATUS	Green	PBX status indication <ul style="list-style-type: none"> <li>• OFF: Power Off</li> <li>• ON: Power On and running</li> <li>• Flashing (60/minute): Starting up</li> <li>• Flashing (120/minute): Software is updating</li> <li>• Flashing (240/minute): During initialization</li> <li>• Flashing (240/minute): Wireless LAN SETUP in progress</li> </ul>
	Amber	PBX status indication <ul style="list-style-type: none"> <li>• Flashing (240/minute): Initialize switch pressed</li> </ul>
	Red	PBX status indication <ul style="list-style-type: none"> <li>• ON: Alarm The cause may be one of the following:               <ul style="list-style-type: none"> <li>– Alarm for an optional service card.</li> </ul> </li> <li>• Flashing (240/minute): System startup abnormality</li> </ul>

Indication		Color	Description
10BASE-T/ 100BASE-TX/ 1000BASE-T	WAN	LINK	Green Link status indication • OFF: Off-line • ON: Linked normally • Flashing: In communication
		1000	Yellow Data transmission speed indication • OFF: Off-line/10 Mbps/100 Mbps • ON: 1000 Mbps
	WAN/LAN	LINK	Green Link status indication • OFF: Off-line • ON: Linked normally • Flashing: In communication
		1000	Yellow Data transmission speed indication • OFF: Off-line/10 Mbps/100 Mbps • ON: 1000 Mbps
	LAN	LINK	Green Link status indication • OFF: Off-line • ON: Linked normally • Flashing: In communication
		1000	Yellow Data transmission speed indication • OFF: Off-line/10 Mbps/100 Mbps • ON: 1000 Mbps

### 3.3.2 LCOT4 Card (KX-HT82480)

#### Function

4 analog trunk ports with Caller ID (FSK/DTMF).



A RJ11

(1) To trunk

#### Accessories and User-supplied Items

**Accessories (included):** Spacer x 3

### 3.3.3 SLC8 Card (KX-HT82470)

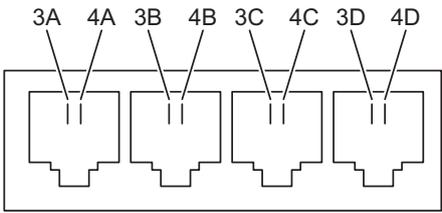
User-supplied (not included): RJ11 connector, Copper wire

#### Note

- Power failure Transfer feature between LCOT and SLC is not supported.
- To confirm the trunk connection, refer to "Confirming the Trunk Connection" in "3.8 Starting the PBX".

## PIN Assignments

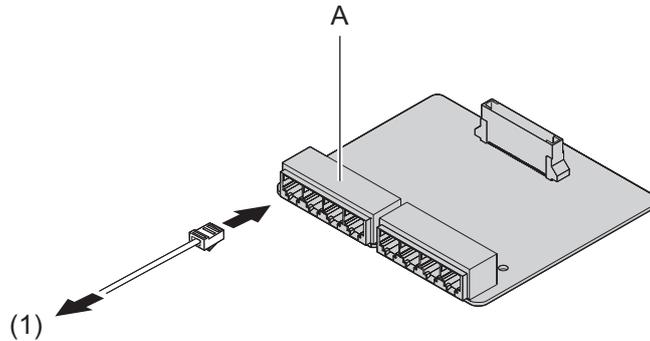
### LINE 5-8 RJ11×4 Connector

	No.	Signal Name	Input (I)/ Output (O)	Function
	3A	FXO-A-TIP	—	CO Tip Port5
	4A	FXO-A-RING	—	CO Ring Port5
	3B	FXO-B-TIP	—	CO Tip Port6
	4B	FXO-B-RING	—	CO Ring Port6
	3C	FXO-C-TIP	—	CO Tip Port7
	4C	FXO-C-RING	—	CO Ring Port7
	3D	FXO-D-TIP	—	CO Tip Port8
	4D	FXO-D-RING	—	CO Ring Port8

### 3.3.3 SLC8 Card (KX-HT82470)

#### Function

8-port extension card for SLTs with Caller ID (FSK) control.



A RJ11

(1) To Extension

#### Accessories and User-supplied Items

Accessories (included): Spacer x 3

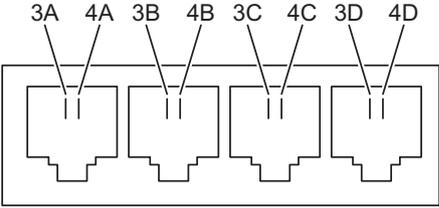
User-supplied (not included): RJ11 connector, Copper wire

#### Note

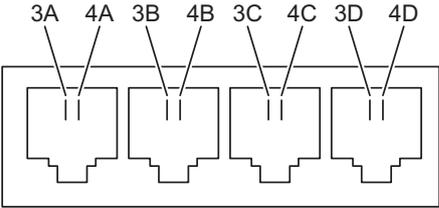
- Power failure Transfer feature between LCOT and SLC is not supported.

## PIN Assignments

### EXTN 9-12/17-20 RJ11×4 Connector

	No.	Signal Name	Input (I)/ Output (O)	Function
	3A	FXS-A-TIP	—	EXT Tip Port 9/17
	4A	FXS-A-RING	—	EXT Ring Port 9/17
	3B	FXS-B-TIP	—	EXT Tip Port 10/18
	4B	FXS-B-RING	—	EXT Ring Port 10/18
	3C	FXS-C-TIP	—	EXT Tip Port 11/19
	4C	FXS-C-RING	—	EXT Ring Port 11/19
	3D	FXS-D-TIP	—	EXT Tip Port 12/20
	4D	FXS-D-RING	—	EXT Ring Port 12/20

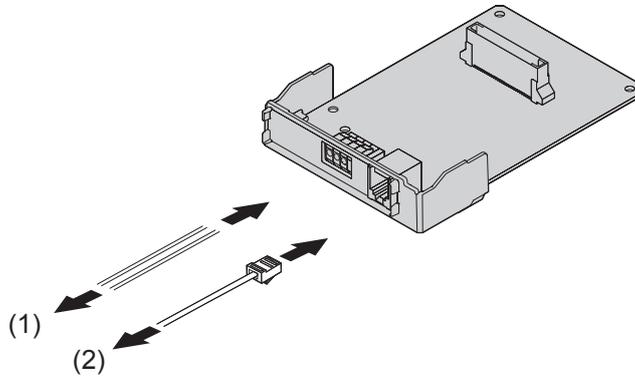
### EXTN 13-16/21-24 RJ11×4 Connector

	No.	Signal Name	Input (I)/ Output (O)	Function
	3A	FXS-E-TIP	—	EXT Tip Port 13/21
	4A	FXS-E-RING	—	EXT Ring Port 13/21
	3B	FXS-F-TIP	—	EXT Tip Port 14/22
	4B	FXS-F-RING	—	EXT Ring Port 14/22
	3C	FXS-G-TIP	—	EXT Tip Port 15/23
	4C	FXS-G-RING	—	EXT Ring Port 15/23
	3D	FXS-H-TIP	—	EXT Tip Port 16/24
	4D	FXS-H-RING	—	EXT Ring Port 16/24

### 3.3.4 DPH2 Card (KX-HT82460)

#### Function

A doorphone card for 2 doorphone and 2 door opener.



- (1) To Door opener
- (2) To Doorphone

#### Accessories and User-supplied Items

**Accessories (included):** Spacer x 3

**User-supplied (not included):** RJ11 connector, Copper wire

#### Note

For details about connecting to a doorphone and/or door opener, refer to "3.6 Connecting Doorphones and Door Openers".

### PIN Assignments

#### Doorphone 1-2 RJ11 Connector

	No.	Signal Name	Input (I)/ Output (O)	Function
<p>Doorphone</p>	2	DP2	—	Doorphone 2
	3	COM1	—	COM 1
	4	DP1	—	Doorphone 1
	5	COM2	—	COM 2

#### Door opener 1-2 Terminal Block

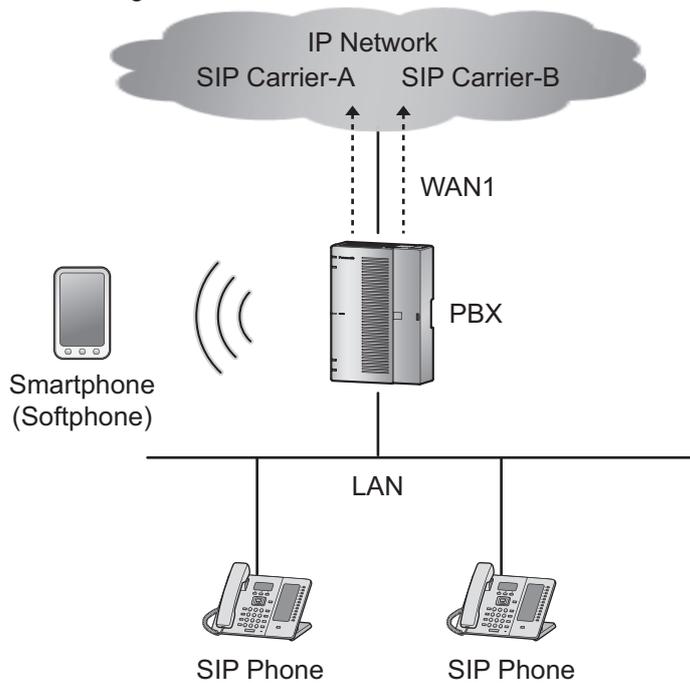
	No.	Signal Name	Input (I)/ Output (O)	Function
<p>Door opener</p>	1	OP1b	—	Door Opener 1 COM
	2	OP1a	—	Door Opener 1
	3	OP2b	—	Door Opener 2 COM
	4	OP2a	—	Door Opener 2

## 3.4 Connecting Outside Trunks

### 3.4.1 Connecting SIP Trunks

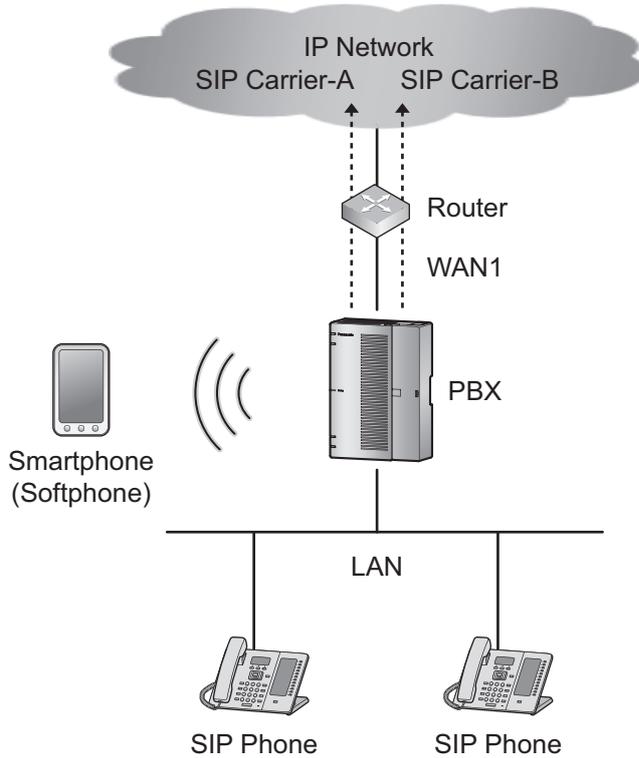
A typical connection example is shown below for connecting to 2 SIP carriers simultaneously. For details about connecting SIP trunks, refer to "Network Configuration" in the Programming Item List.

#### 1. Connecting via WAN1

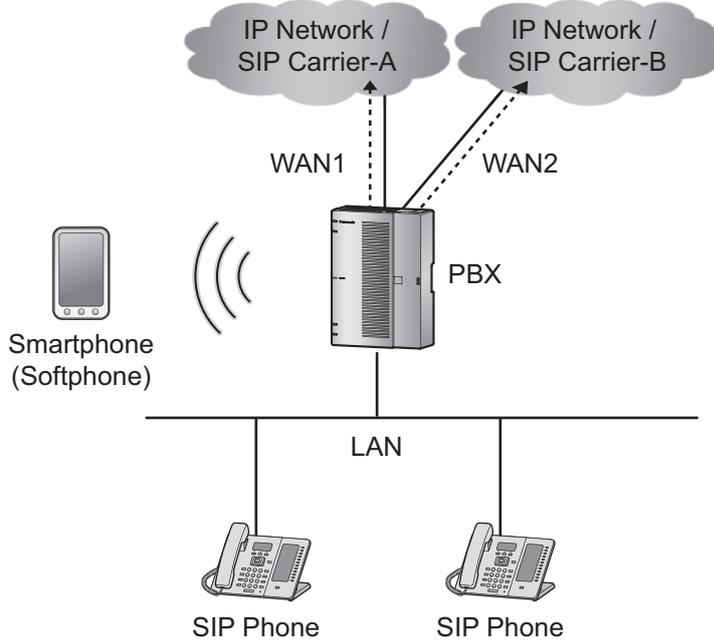


### 3.4.1 Connecting SIP Trunks

#### 2. Connecting via an external router



#### 3. In the case of using an SIP carrier's line separately from a regular IP network



#### Note

- Up to 2 SIP carriers can be connected to simultaneously.
- Trunks channels 1 through 6 can be allocated to SIP carriers.
- The number of usable SIP Trunk varies depending on the codec setting of the SIP Trunk. For more information, refer to 2.3.3 System Capacity.

- Each trunk port can be set to a SIP carrier or an analog line.
- Both of the WAN ports (WAN1 and WAN2) can be used for either SIP carrier connections (private network) or IP network connections (public network).
- To identify which LAN/WAN port is being used for each SIP carrier when both WAN1 and WAN2 are enabled, the routing information to each SIP Carrier must be retained.
- To use two WAN ports, one of the ports must be selected as the default route. For more information, refer to in 3.4 Network Configuration—[5] Route in Programming Item List.

## 3.4.2 Connecting Analog Trunks

Connection

1. Insert the modular plugs of the telephone line cords (2-conductor wiring) into the outside (CO) line jacks.
2. Connect the line cords to the terminal board or the modular jacks from the telephone company.

### Note

- Each trunk port can be set to a SIP carrier or an analog line.
- The end of calls is detected by tone. The detection target is as follows (In cases of Analog trunk ⇔ extension, the detection of call endings is not performed);

Analog Trunk ⇔ Analog Trunk

Analog Trunk ⇔ SIP Trunk

Analog Trunk ⇔ VM

Analog Trunk ⇔ DISA

## 3.4.3 Bandwidth Requirements

When using the SIP trunks and the remote extensions, you must ensure that the WAN has enough bandwidth to support VoIP communications. Refer to the table below and ensure that the sum of the required bandwidth for each channel is smaller than the amount the WAN (e.g., ADSL network) can provide.

Note that the amount in the table is only a guide. Subscribe to a network that has enough bandwidth. If the amount of bandwidth required for VoIP communications is larger than what the network can accommodate, speech quality will be compromised.

### Required Bandwidth for Each Channel

The required bandwidth depends on what combination of codecs is used. Keep in mind the following points about the type of codec, in terms of the speech quality:

Codec	Bandwidth
G.711	87.2 kbps
G.729	31.2 kbps
H.264 (Remote Video)	512 kbps

**Required Bandwidth** = [No. of SIP Trunk (G.711) × Required Bandwidth for the G.711 codec] +  
 [No. Remote SIP Extension (G.729) × Required Bandwidth for the G.729 codec] +  
 [No. Remote SIP Extension (Remote Video) × Required Bandwidth for the H.264 codec]

### 3.4.3 Bandwidth Requirements

---

**Example:**

No. of SIP Trunk (G.711): 2

No. of Remote SIP Extension (G.729): 2

No. of Remote SIP Extension (G711, and Remote Video): 1

In this case, the required bandwidth will be as follows:

Required Bandwidth =  $87.2 \times 2 + 31.2 \times 2 + (87.2 + 512) \times 1 = 836$  kbps

### Bandwidth Limitation

Packets used for voice and video calls have priority over other packets.

Packet	Priority
SIP	High
RTP/ RTCP (For audio and video)	High
Others (HTTP, SMTP, etc.)	Low

If the bandwidth for high priority packets (SIP/ RTP/ RTCP) cannot be sufficiently ensured, bandwidth for lower priority packets (Others) can be limited. You can limit the maximum bandwidth of low priority packets (Default: 500 kbps) via the Web Maintenance Console.

Refer to 3.2.1 Network Configuration—[3-1] WAN—WAN Setting—WAN—Option—Bandwidth Limitation for Others in the Programming Item List.

Maximum bandwidth can be calculated using required bandwidth as below:

Maximum bandwidth = Effective Bandwidth<sup>1</sup> – Required Bandwidth

<sup>1</sup> Effective bandwidth: the smaller of upload and download bandwidth

**Example:**

Effective Bandwidth (WAN1): 2,000 Kbps

Required Bandwidth: 836 kbps

⇒ Maximum bandwidth =  $2,000 - 836 = 1,164$  (kbps)

In order to increase speech quality, the packet (Others) bandwidth should be limited to 1,164 kbps or less.

## 3.5 Connecting Extensions

### 3.5.1 Connecting SIP Extensions

A typical connection example for SIP extensions is shown below. When connecting an analog FAX to the SIP extension port through the SIP-TA, set the Fax Connection to Yes for each extension port. For more information, refer to 2.3.1 PBX Configuration—[2-1] Extension—Port in Programming Item List.

**Important**

When connecting the following Panasonic IP terminals, please confirm the firmware version by the phone programming menu (KX-HDV series) or Installation Wizard (KX-NTV series). The following or later version is available. Please update their firmware if the version is lower than it.

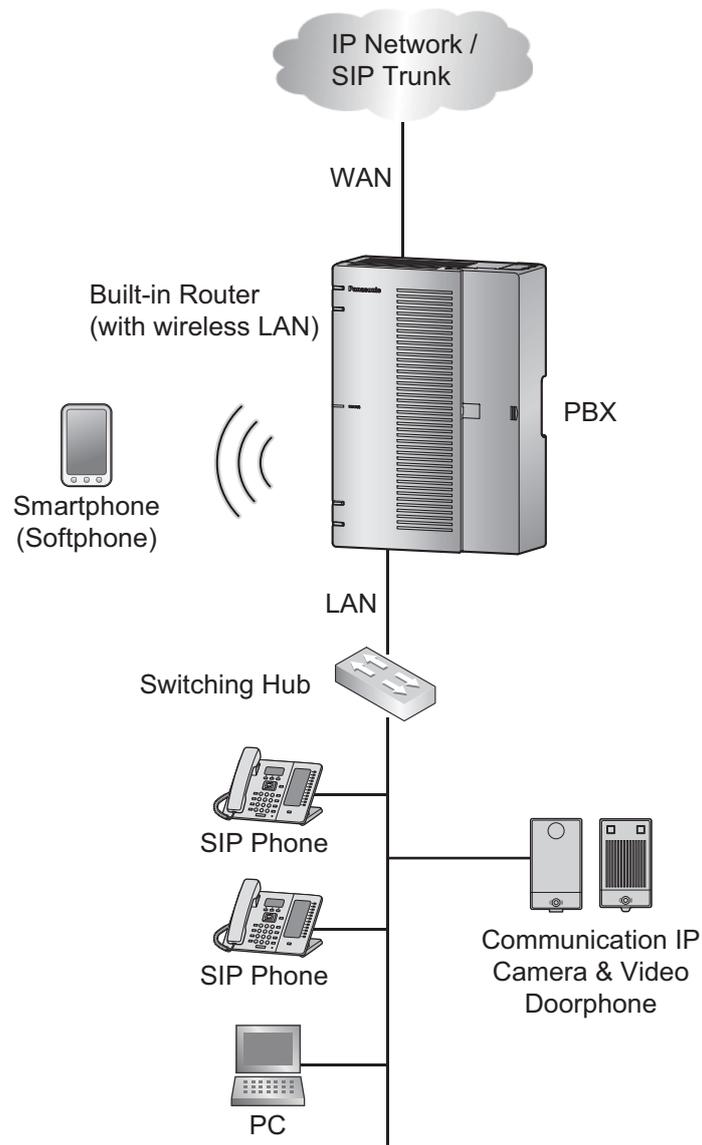
- KX-HDV230: Version 02.190
- KX-HDV100/KX-HDV130/KX-HDV330: Version 02.100
- KX-NTV series: Version 0101E

The following features can be used with the connection example shown below.

- Connect an existing LAN to the LAN port of HTS.
- Connect the IP extension, Communication IP Camera/Video doorphone, and 3rd party SIP to the LAN port of HTS.

### 3.5.1 Connecting SIP Extensions

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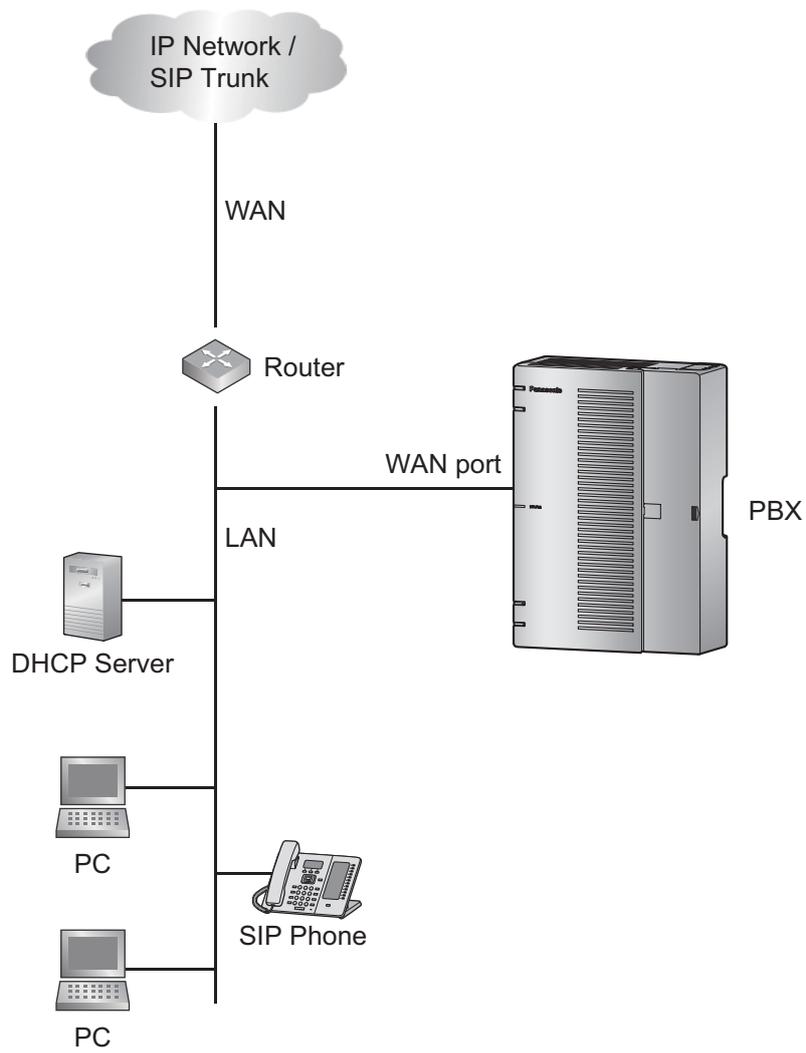


	Terminal		
	KX-HDV series	KX-NTV series	3rd party SIP
KX-HTS Setup/preparation	1. Set the DHCP Mode of KX-HTS series LAN side to Server. Refer to 3.3.1 Network Configuration—[4-2] LAN—LAN Settings—DHCP Mode in Programming Item List.	1. Enter your password to Registration Password of the SIP extension port. Refer to “2.3.1 PBX Configuration—[2-1] Extension—Port-SIP Extension—Registration Password” in Programming Item List.	
	2. Connect KX-HTS series LAN port to existing LAN network.		
Terminal Setup/preparation	3. Initialize the KX-HDV series terminal. For further information, refer to the KX-HDV series manual.  4. Connect KX-HDV series to existing LAN network.	3. In the web settings of KX-NTV series, set the KX-HTS LAN IP address and Registration Password.  4. Connect KX-NTV series to existing LAN network.	3. In the web settings of 3rd party SIP terminal, set KX-HTS LAN IP address and Registration Password.  4. Connect 3rd party SIP terminal to existing LAN network.
Remarks	KX-HDV series is automatically registered to the extension port with SIP extension port attribute. <sup>1</sup>	The terminal is registered to the SIP extension port to which the Registration Password is entered. <sup>1</sup>	

- Connect an existing LAN to the WAN port of HTS.
- Connect the IP extension, Communication IP Camera/Video doorphone, and 3rd party SIP to an existing LAN port, and connect it to KX-HTS.

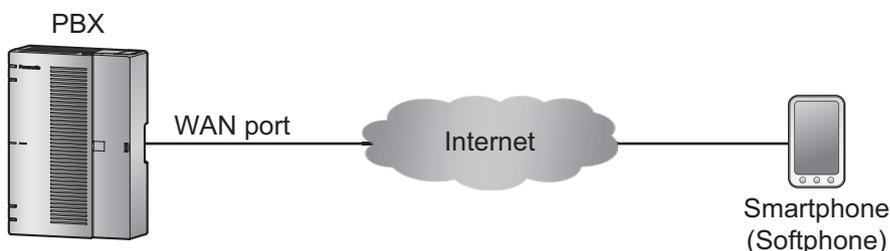
### 3.5.1 Connecting SIP Extensions

---



	Terminal
	KX-HDV series
KX-HTS Setup/ preparation	<ol style="list-style-type: none"> <li>1. Set the existing LAN network address on the WAN port. Refer to "2.3.7 PBX Configuration—[2-7] Extension—SIP Extension Property—IP Address of SIP Extension in existing router" in Programming Item List.</li> <li>2. Connect KX-HTS series WAN port to existing LAN.</li> </ol>
Terminal Setup/ preparation	<ol style="list-style-type: none"> <li>3. Initialize (refer to KX-HDV series manual).</li> <li>4. Set the following URL as the Master configuration file's URL: <b>http://xxx.xxx.xxx.xxx:80/panasip_data/HTS.cfg</b> <ul style="list-style-type: none"> <li>• "xxx.xxx.xxx.xxx" is the IP address for the WAN port of the PBX.</li> <li>• For more information about Master configuration file, refer to the manual for KX-HDV series.</li> </ul> </li> <li>5. Connect to existing LAN network.</li> </ol>
Remarks	<p>KX-HDV series is automatically registered to the extension port with SIP extension port attribute.<sup>1</sup></p> <p>If registration is completed, an extension number will be displayed on the LCD of the terminal.</p>

- Connect the internet to the WAN port of HTS.
- Connect the 3rd party SIP to KX-HTS via internet.



	Terminal
	3rd Party SIP
KX-HTS Setup/ preparation	<ol style="list-style-type: none"> <li>1. Enter Registration Password into SIP extension port. Refer to "2.3.1 PBX Configuration—[2-1] Extension—Port—SIP Extension—Registration Password" in Programming Item List.</li> <li>2. Set the SIP extension port Phone Location to Remote. Refer to "2.3.1 PBX Configuration—[2-1] Extension—Port—SIP Extension—Phone Location" in Programming Item List.</li> <li>3. Connect KX-HTS series WAN port to WAN network.</li> </ol>
Terminal Setup/ preparation	<ol style="list-style-type: none"> <li>4. In the web settings of 3rd party SIP terminal, set the KX-HTS series WAN port IP address as the SIP server. For the KX-HTS series WAN port IP address, refer to "3.2.2 Network Configuration—[3-2] WAN—WAN Status—IP".</li> <li>5. In the 3rd Party SIP terminal Web settings, set Registration Password.</li> </ol>

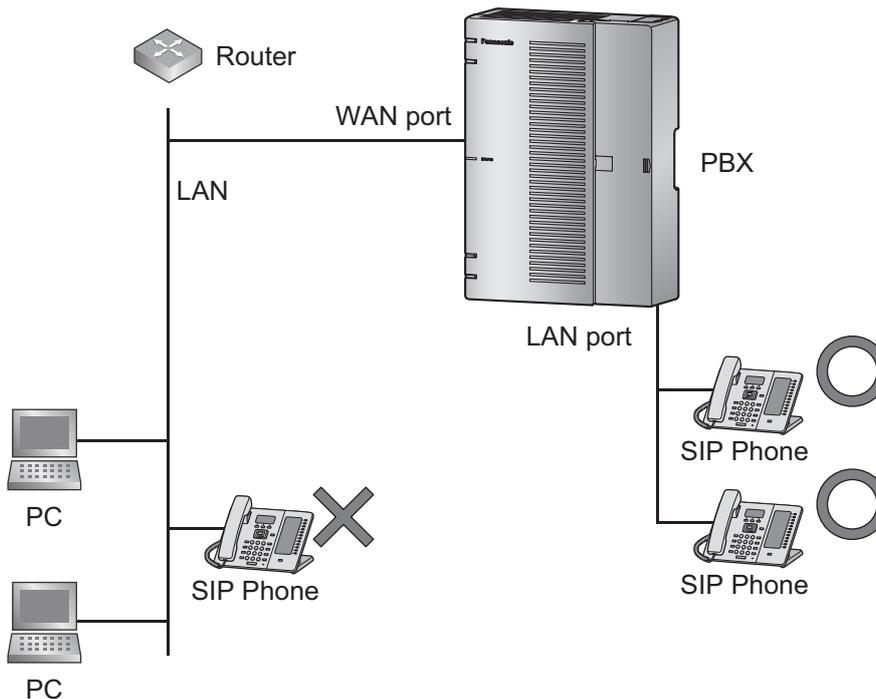
### 3.5.1 Connecting SIP Extensions

Remarks	The terminal is registered to the SIP extension port to which the Registration Password is entered. <sup>*1</sup>
---------	---

<sup>\*1</sup> To confirm that the terminal has been registered to the SIP extension port, refer to "2.3.1 PBX Configuration—[2-1] Extension—Port—SIP Extension—SIP Registration Status in Programming Item List.

#### Automatic update for terminal's firmware

The KX-HDV series terminals connected to the KX-HTS series can automatically carry out Firmware Updates. This is only applicable to KX-HDV series terminals accommodated in the same LAN as the KX-HTS series.



## 3.5.2 LAN Connections for SIP Extension

When an SIP Extension is connected to the LAN and power is supplied for the first time, you will be prompted to set network parameters. The network parameters must be set for the SIP Extension before it can be used.

### Connecting an SIP Extension to a Switching Hub

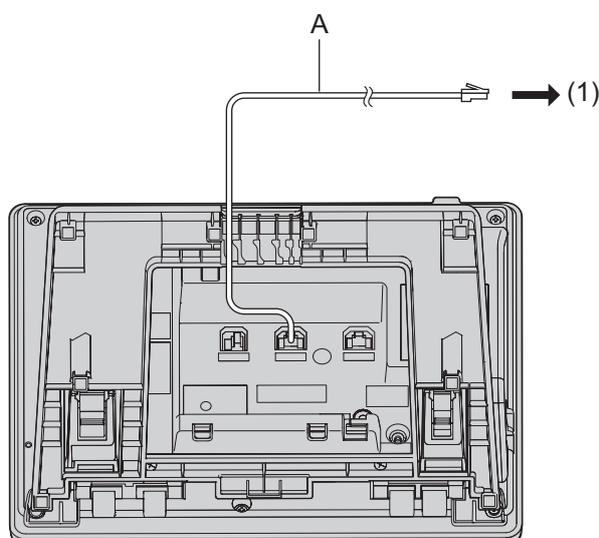
When connecting an SIP Extension to the LAN, connect it to a switching hub.

#### Note

- Use an Ethernet straight cable with an RJ45 connector to connect the SIP Extension to a switching hub. The cable should be a CAT 5 (Category 5) or higher for 10BASE-T/100BASE-TX, or CAT 5e (Enhanced Category 5) or higher for 1000BASE-T.
- When using the VLAN feature on the network, make sure that the switching hub to be connected is IEEE 802.1Q compliant and is configured for VLANs. In addition, the port of a switching hub that the SIP Extension is connected to must be set to "Trunk" port, to allow VLAN tagging. Consult your network administrator for details.
- Since a softphone is installed and operates on a PC, the PC must be connected to the LAN to use the softphone on the network.

The diagram below is for connecting a KX-HDV series to a switching hub. For SIP phones, refer to the documentation of your SIP phone.

Example: KX-HDV230



A Ethernet Straight Cable

(1) To a Switching Hub

### Connecting an AC Adaptor to an SIP Extension

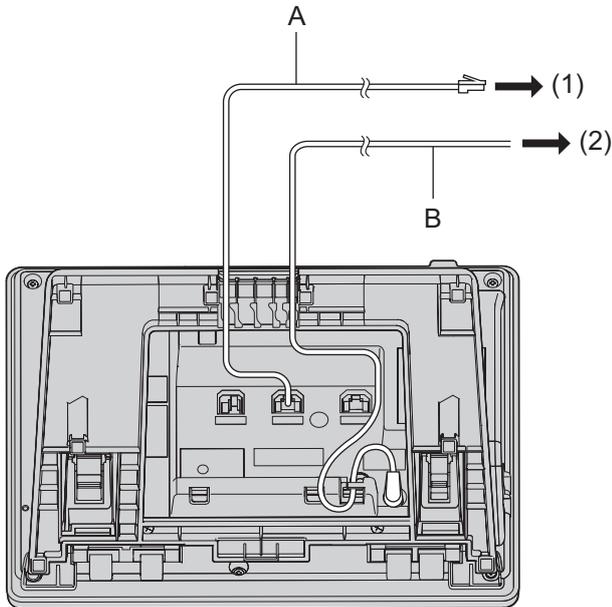
Some SIP phones comply with the IEEE 802.3af Power-over-Ethernet (PoE) standard. If PoE is available on your network, these SIP Extensions can receive the necessary power supply from the network through the network cable. In this case, an AC adaptor is not needed for the SIP Extension. However, if PoE is not available, you will need to connect an AC adaptor to the SIP Extension.

#### Note

Use only the specified type of AC adaptor for each SIP Extension. For details, refer to the documentation of your SIP Extension.

### 3.5.2 LAN Connections for SIP Extension

Example: KX-HDV230



- |     |                         |     |                 |
|-----|-------------------------|-----|-----------------|
| A   | Ethernet Straight Cable | B   | AC Cord Adaptor |
| (1) | To a Switching Hub      | (2) | To Wall Socket  |

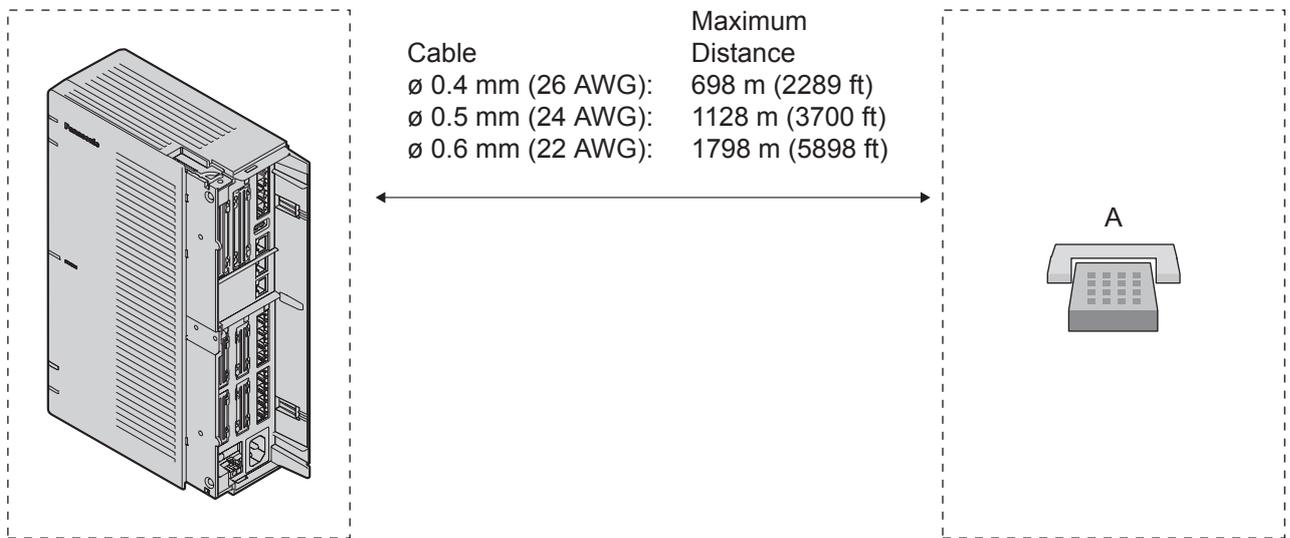
### Connecting a PC to an SIP Extension

You can connect a PC to some SIP Extensions using the SIP Extension's secondary port. In this case, only a single port from the LAN's network interface (switching hub) is required to connect both the SIP Extension and PC to the LAN.

#### Note

- Use an Ethernet straight cable with an RJ45 connector to connect a PC to the SIP Extension. The cable should be a CAT 5 (Category 5) or higher for 10BASE-T/100BASE-TX, or CAT 5e (Enhanced Category 5) or higher for 1000BASE-T.
- Only a PC can be connected to the secondary port of an SIP Extension. Other SIP Extensions or network devices such as routers or switching hubs, cannot be connected.
- In cases where a PC is connected to the secondary port, if the SIP Extension connection to the PBX is disconnected or reset, LAN communication to the PC will also be disrupted.

### 3.5.3 Connecting Analog Extensions (SLT)



A SLT

#### Notice

The maximum cabling distance may vary depending on the conditions.

When connecting a FAX to an extension port, set the Fax Connection to Yes for each extension port. For more information, refer to 2.3.1 PBX Configuration—[2-1] Extension—Port in Programming Item List.

### 3.5.4 Manager Extension

It is possible to grant various privileges by setting a Manager Extension to a specific extension. A Manager Extension must be designated for each extension. For information on performing settings, refer to 2.3.1 PBX Configuration—[2-1] Extension—Port in Programming Item List. Privileges granted by the Manager Extension are as follows:

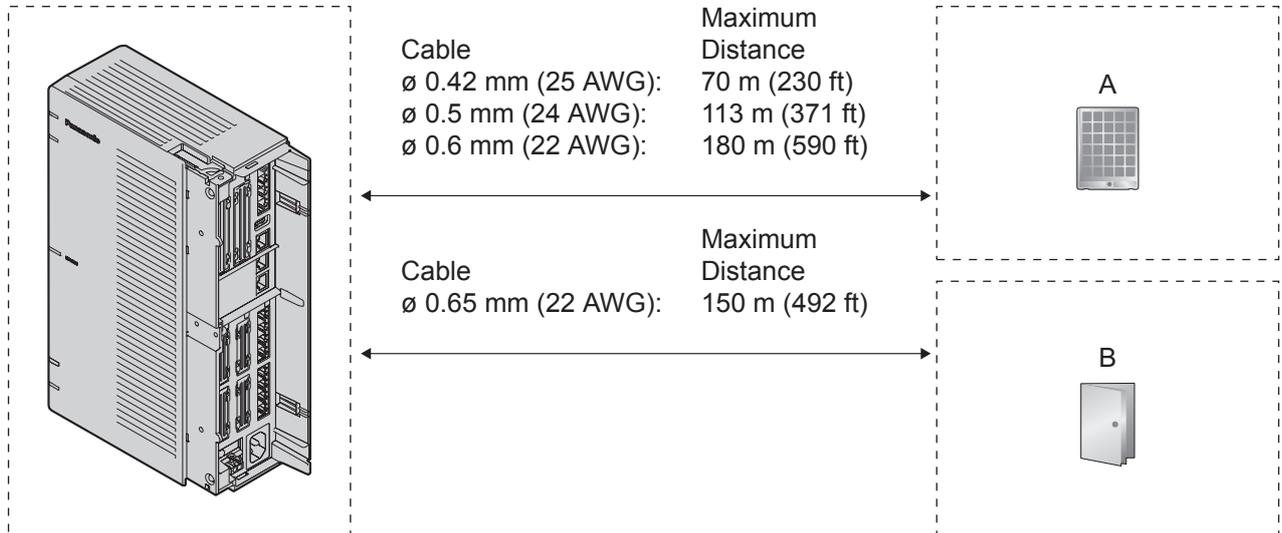
- OGM Record / Clear / Playback
- Door Open
- Time Service (Day / Lunch / Night) Switch
- System Setting

For more information, refer to 2.1.2 Programming by Dial for Manager in Feature Manual.

## 3.6 Connecting Doorphones and Door Openers

Up to 2 doorphones (KX-T30865/KX-T7765) and 2 door openers (user-supplied) can be installed.

### Maximum Cabling Distance



A Doorphone

B Door Opener

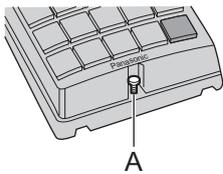
Door opener current limit: 30 V DC/30 V AC, 3 A maximum

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

#### Note

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

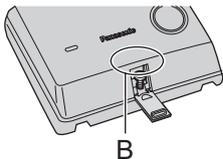
1. Loosen the screw to separate the doorphone into 2 halves.



A Screw

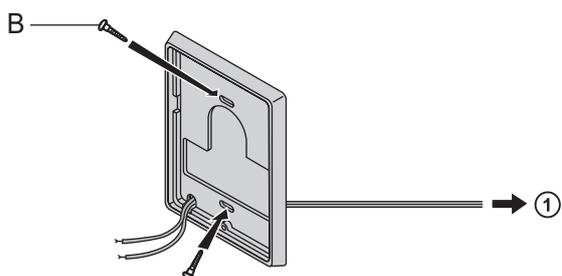
#### Note for KX-T7765 Users

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



B Cabinet Wall

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



B Screw

① To DPH2 Card

**Note**

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

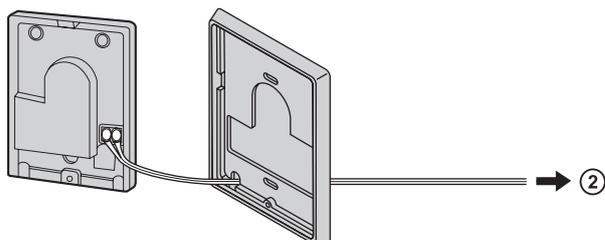


: when a doorphone plate has been fixed to the wall



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

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

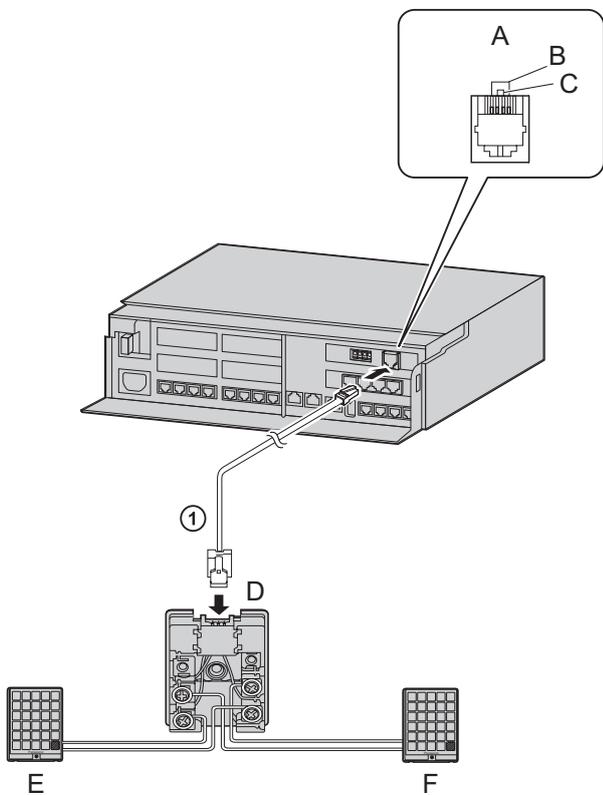


② To DPH2 Card

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

### Connecting Doorphones (KX-T30865/KX-T7765)

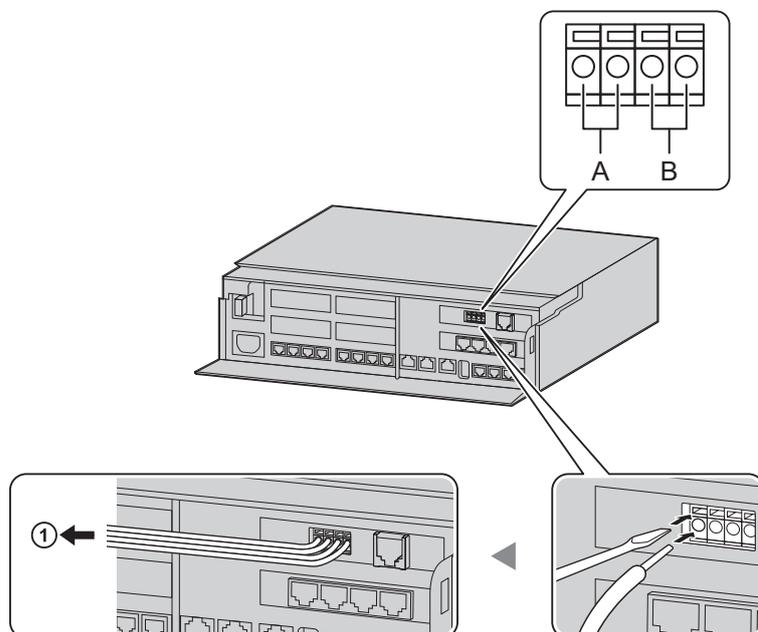
Connect the doorphone card to the terminal box using 4-conductor wiring and modular connectors.



- A View of Doorphone Connector Jack
- B Doorphone 2
- C Doorphone 1
- D Terminal Box
- E Doorphone 1
- F Doorphone 2
- ① 4-conductor wiring is required.

## Connecting Door Openers

1. Use a flathead screwdriver to press and hold open the button below the terminal, and insert the wire coming from the door opener into the terminal.



A Door Opener 1

B Door Opener 2

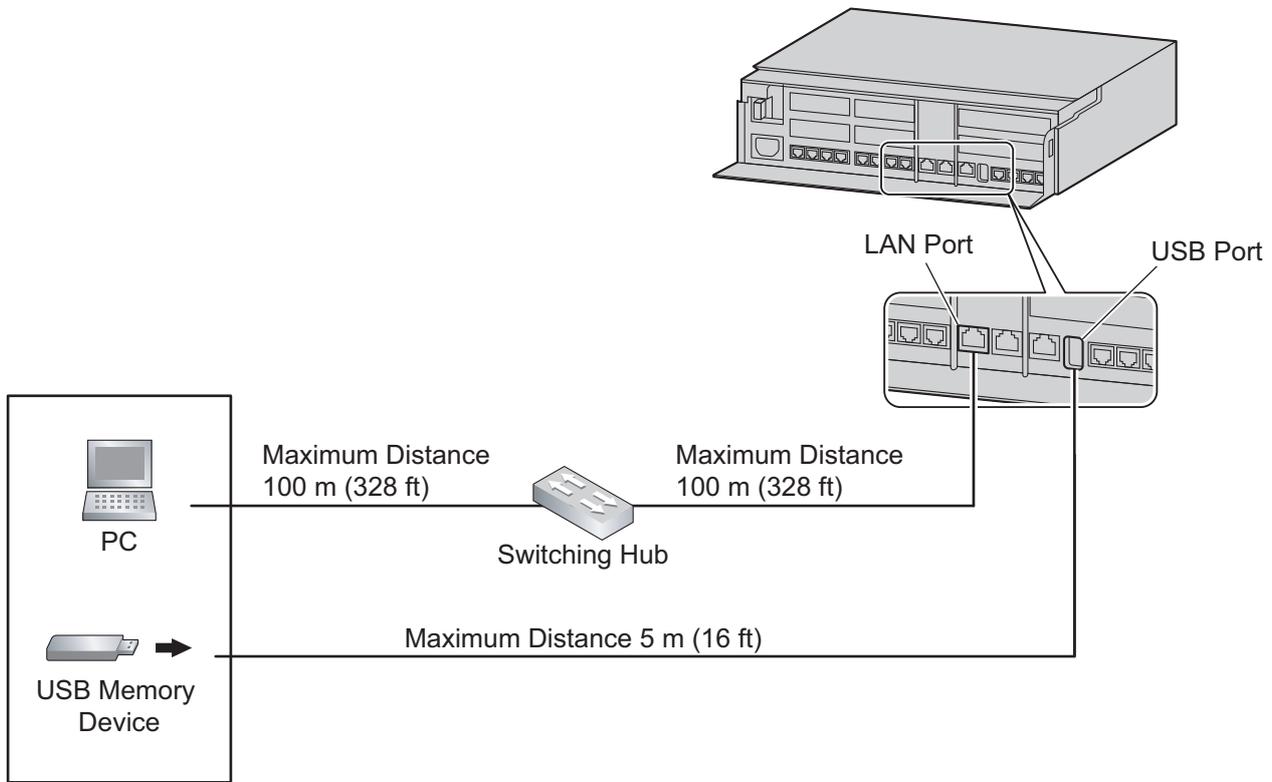
① To the door openers

2. Wrap the strap around all of the cords. (For details, refer to "3.2.6 Securing the Cables".)

### Note

- We recommend using UL1015 wire or an equivalent for wiring.
  - For users in except in U.S.A.**
    - The wire should be between 0.45 mm and 1.1 mm in diameter excluding the coating.
  - For users in U.S.A only**
    - We recommend using UL1015, 26 AWG to 22 AWG, or an equivalent wire for wiring.

## 3.7 Connection of Peripherals



### USB Interface for USB Memory Device

The PBX is equipped with a USB 2.0 interface. This interface provides communication between the PBX and user-supplied devices such as a USB memory device.

#### Using a USB memory device

A USB memory device can be used to backup and restore the system data of the PBX.

The PBX supports USB memory devices that meet the following specifications:

- File system: FAT
- Maximum capacity: 32 GB
- Maximum current: 500 mA

For details about backing up and restoring using a USB memory device, refer to "6.1 Tool—System Data Backup" in the Programming Item List.

#### Note

Do not use a USB hub when connecting a USB memory device to the PBX.

## 3.8 Starting the PBX

### WARNING

Make sure that the AC outlet is properly grounded, then securely connect the 3-pin AC plug including the grounded pin.

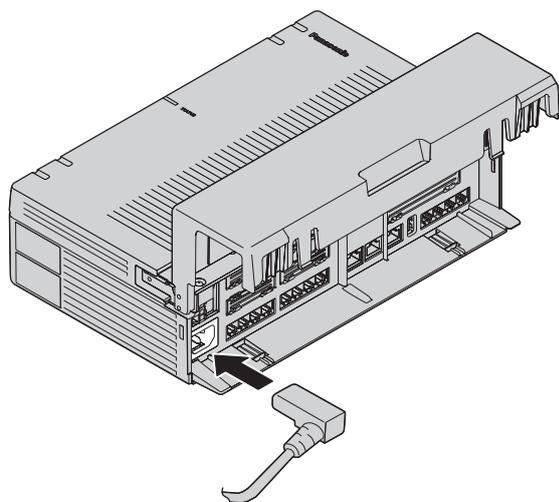
### CAUTION

- Use only the AC power cord included with the PBX.
- Before touching the product (PBX, cards, etc.), discharge static electricity by touching ground or wearing an grounding strap. Failure to do so may cause the PBX to malfunction due to static electricity.
- Once you have started the PBX, if you unplug the PBX, do not initialize it again as described in "System Initialization Procedure". Otherwise, your programmed data will be cleared. To restart the PBX, refer to "6.1.4 Restarting the PBX".
- The plug of power supply cordset is used as the main disconnect device. Ensure that the AC outlet is located near the equipment and is easily accessible.

### Connecting the AC Power Cord

#### Note

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



### System Initialization Procedure

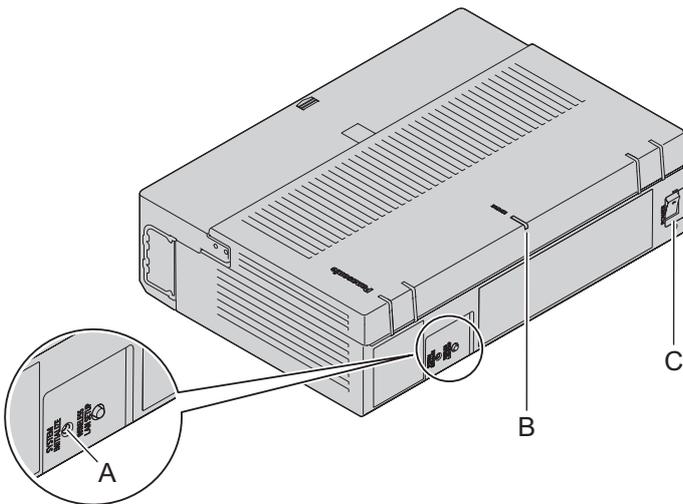
The system can be reset to its original default state by pressing the Initialize switch while turning the system power on.

The system initialization startup operation is as follows.

- Turn on the system power and press and hold the Initialize switch.  
For more information, refer to 5.3 System Initialization Procedure.
- When system initialization is complete, operation begins (green LED illuminated).  
Performing a system initialization returns the system data to its default settings.  
The memory state is also cleared.

### 3.8 Starting the PBX

---



- A SYSTEM INITIALIZE switch
- B STATUS Indicator
- C POWER switch

#### Note

- After the PBX is initialized, you can restore system data to the PBX that has been backed up earlier. For details about backing up and restoring system data, refer to "4.3.3 Maintenance—[2-3] System Control—System Data Backup & Restore" in the Programming Item List.
- After the PBX is initialized, you must set up the mandatory settings required for the PBX with Easy Setup Wizard. For details refer to "Connecting to Web Maintenance Console via LAN" and "3.9.4.1 Easy Setup Wizard".
- When Backup Batteries are connected, make sure it is started as instructed in the documentation for the Backup Batteries.

### Confirming the Trunk Connection

After the PBX starts up, program the PBX and connect trunks to the PBX.

To confirm that the trunks are successfully connected, make a call to an outside party. (Refer to 4.1.2 Calling an Outside Party)

## 3.9 Programming Information

### 3.9.1 Overview of Web Maintenance Console

Web Maintenance Console is designed to serve as an overall system programming reference for the PBX. You can program and control the PBX over an IP network using Web Maintenance Console. This section describes programming basic items using Web Maintenance Console.



#### Note

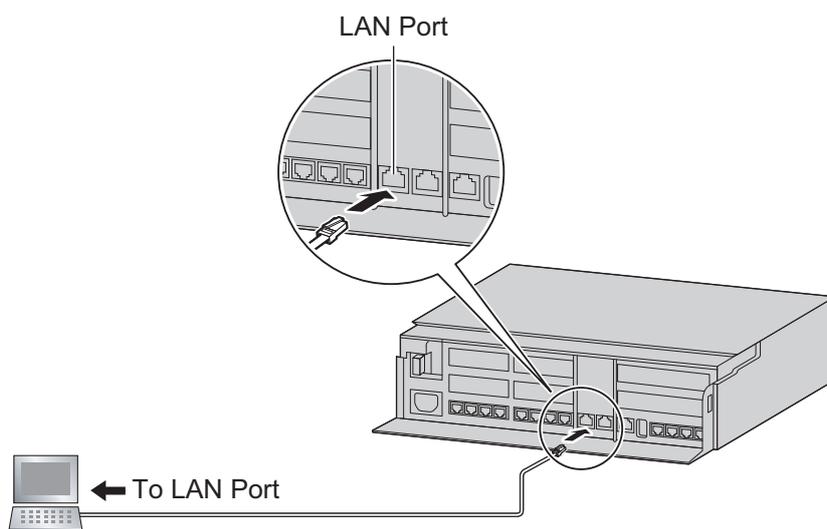
The contents and design of the software are subject to change without notice.

### 3.9.2 PC Connection

The Main Unit has a LAN port for PC to program PBX. A PC can be connected through LAN connection.

Port	Default IP Address	Default Subnet Mask
LAN Port	192.168.0.101	255.255.255.0

#### Direct Connection



#### Notice

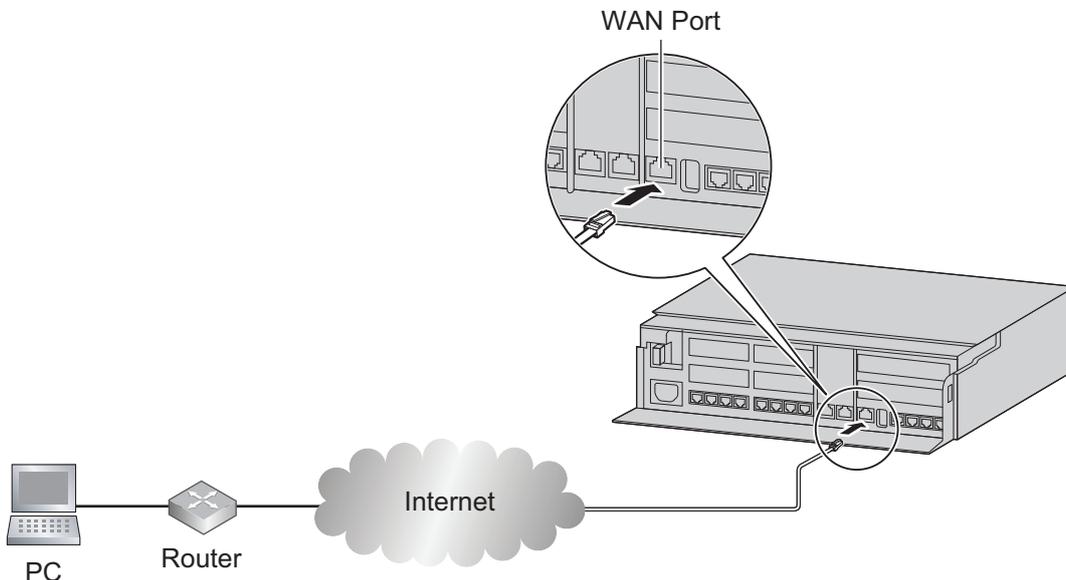
When connecting the PC to the LAN port, if the PC is set to obtain the IP address automatically, the IP address of the PC will be set to an appropriate IP address to establish a connection to the PBX.

### 3.9.3 Starting Web Maintenance Console

#### Note

- Use an Ethernet cable with an RJ45 connector to connect a PC to the PBX.

#### Connection via Internet



#### Note

For details about connecting WAN to the PBX, refer to "3.13 WAN Connection".

## 3.9.3 Starting Web Maintenance Console

### System Requirements

For the system requirements of the PC (operating system, hardware specifications, supported browsers etc.), refer to "1.3.1 Starting Web Maintenance Console" in the Programming Item List.

### Copyright for MD5

This software uses the Source Code of RSA Data Security, Inc. described in the RFC1321 (MD5 Message-Digest Algorithm).

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### Connecting to Web Maintenance Console via LAN

#### 1. Connect the PC to the PBX:

- Connect the PBX to a network with the LAN port and access the PBX from a PC in your LAN. For details, refer to "3.9.2 PC Connection".

2. Access Web Maintenance Console:

**LAN Connection:** Launch your Web browser and input the IP address into the address bar. The input method will differ according to the PC's connection to the PBX. The default IP address for the LAN port of the PBX is 192.168.0.101. Accordingly, the address to enter to connect to the PBX for the first time will be as follows (enter the address exactly as shown):

**http://192.168.0.101**

**WAN Connection:** When the WAN port of KX-HTS series is connected to an existing LAN and the PC is also connected to the same existing LAN, it is possible to access the Web Maintenance Console as shown below. The format of the address to enter to connect to the PBX will be as follows:

http://xxx.xxx.xxx.xxx

- "xxx.xxx.xxx.xxx" is the IP address for the WAN port of the PBX.
- The firewall of the PBX must be disabled in advance. Refer to 3.6.1 Network Configuration—[7-1] Firewall—Firewall Setting in the Programming Item List

### Note

- The default subnet mask for the LAN port is 255.255.255.0.

3. The Web Maintenance Console login screen is displayed. Log in with the Installer level account name and the default Installer level account password to launch the Easy Setup Wizard. For details about the Easy Setup Wizard, see "3.9.4.1 Easy Setup Wizard".

- The Installer level account password is preprogrammed in **Web Maintenance Password for Local Access**.

Refer to 4.2.1 Maintenance—[1-1] Management—Web Programming in the Programming Item List.

## Connecting to Web Maintenance Console over the internet

When accessing the Web Maintenance Console over the Internet, it is necessary to use "https", which has stronger security features than "http". (Remote access)

### To enable that accessing to Web Maintenance Console over the internet

1. Access the Web Maintenance Console via LAN.
2. Set a password for Remote access. Refer to 4.2.1 Maintenance—[1-1] Management—Web Programming—Web Maintenance Password for Remote Access in the Programming Item List.
3. Enable Remote access by following one of the procedures below (open the HTTPS Port).
  - In Web Maintenance Console, Set **Remote Web Maintenance to Enable**. (Refer to 4.2.1 Maintenance—[1-1] Management—Web Programming in the Programming Item List)
  - Dial the feature number for System Settings (HTTPS Port) and open the HTTPS Port. (Refer to 2.1.2 Programming by Dial for Manager in the Feature Manual)

### To connect to Web Maintenance Console over the internet

1. Connect the PC to an internet. Refer to Connection via Internet in 3.9.2 PC Connection.
2. Access Web Maintenance Console:
 

Launch your Web browser and input the IP address for the WAN port into the address bar. The input method will differ according to the PC's connection to the PBX. The address to enter to connect to the PBX will be as follows:

https://xxx.xxx.xxx.xxx

  - "xxx.xxx.xxx.xxx" is the IP address for the WAN port of the PBX. This IP address is displayed in web Maintenance Console. Refer to 3.1 Network Configuration—WAN1 Information—IP Address in the Programming Item List.
  - Note the usage of "https" instead of "http".

### 3.9.4 Programming the PBX

---

3. The Web Maintenance Console login screen is displayed. Log in with the Installer level account name and the password.
  - The Installer level account name is "INSTALLER".
  - The Installer level account password is preprogrammed in **Web Maintenance Password for Remote Access**. Refer to 4.2.1 Maintenance—[1-1] Management—Web Programming in the Programming Item List.

#### **When the PBX is connected to an existing network router:**

When the PBX is connected to an existing network router, the port forwarding settings of the network router must be configured. The format of the address to enter to connect to the PBX connection will be as follows:  
`https://XXX.XXX.XXX.XXX:yyy`

- "XXX.XXX.XXX.XXX" is the IP address of a device that can be accessed from the Internet, such as the IP address of a network router.
- "yyy" is a HTTPS port number of the PBX. If this port number is 443 (default), you do not have to enter "yyy". To change the port number of the PBX, Refer to 3.6.3 Network Configuration—[7-3] Firewall—Application Server Settings in the Programming Item List.

## 3.9.4 Programming the PBX

### 3.9.4.1 Easy Setup Wizard

In the Easy Setup Wizard, you will set up the mandatory settings required for the PBX.

When you log in to Web Maintenance Console for a PBX that is in its initialized, factory default state, the Easy Setup Wizard for that PBX will launch automatically. You must log in using the Installer level account name and password.

- The Installer level account name is "INSTALLER".
- The default Installer level account password is "1234". This password can be programmed in **Web Maintenance Password for Local Access**. Refer to 4.2.1 Maintenance—[1-1] Management—Web Programming in the Programming Item List.

Set the following items in the setting screens.

WebMC Language

Location Setting

Password Setting

1.Date & Time

2.Numbering

3.Incoming Call

4.Dialling Plan

5.IP

### 3.9.4.2 Login Management

Login management for the Web-MC is conducted in the below fashion.

- When connecting to the Web-MC from a LAN, upon failing to log in three consecutive times within ten minutes, you will not be able to log in again until one hour has passed or you have performed a reset by switching the power to OFF then ON.
- When conducting remote access from a WAN, upon failing to log in three consecutive times within ten minutes, you will no longer be able to log in. To enable yourself to log in, refer to 4.2 Maintenance—[1] Management-1.Web Programming-Web Programming-Remote Web Maintenance in Programming Item List.

- Using a Manager Extension, you can use special number operations to set whether or not to connect to the Web-MC remotely. For more information, refer to 2.1.2 Programming by Dial for Manager in Feature Manual.
- Ports for remote maintenance close automatically after 24 hours have passed.
- A login ID and password must be set in order to log in.
- The same user cannot log in multiple times simultaneously. Should the same user perform a login operation while they are already logged in, they will be forcibly logged out of their previous session and will have to log in again.
- When multiple users perform settings for the same settings items, the data set later on will be enabled.
- After logging into the Web-MC, should no operation be performed for a fixed amount of time (Default: 120 minutes), the user will be automatically logged out.
- This time limit for no operation can be changed from the Web-MC. For more information, refer to 4.2 Maintenance—[1] Management-1.Web Programming-Web Programming-Web Auto Logout Duration in Programming Item List.

## 3.10 Date and Time setting

The following items can be set for the date and time settings. For details about date and time settings, refer to "2.2.1 PBX Configuration—[1-1] System—Date & Time—Date & Time" in the Programming Item List.

- Time Setting
- Automatic Time Adjustment
- SNTP Server IP Address
- Time Zone
- Daylight Saving

The KX-HTS series can be used as an NTP server for KX-HDV series. When performing Easy Setup Wizard, the time on the PC you are operating is displayed as the initial value.

## 3.11 Network and Router Function

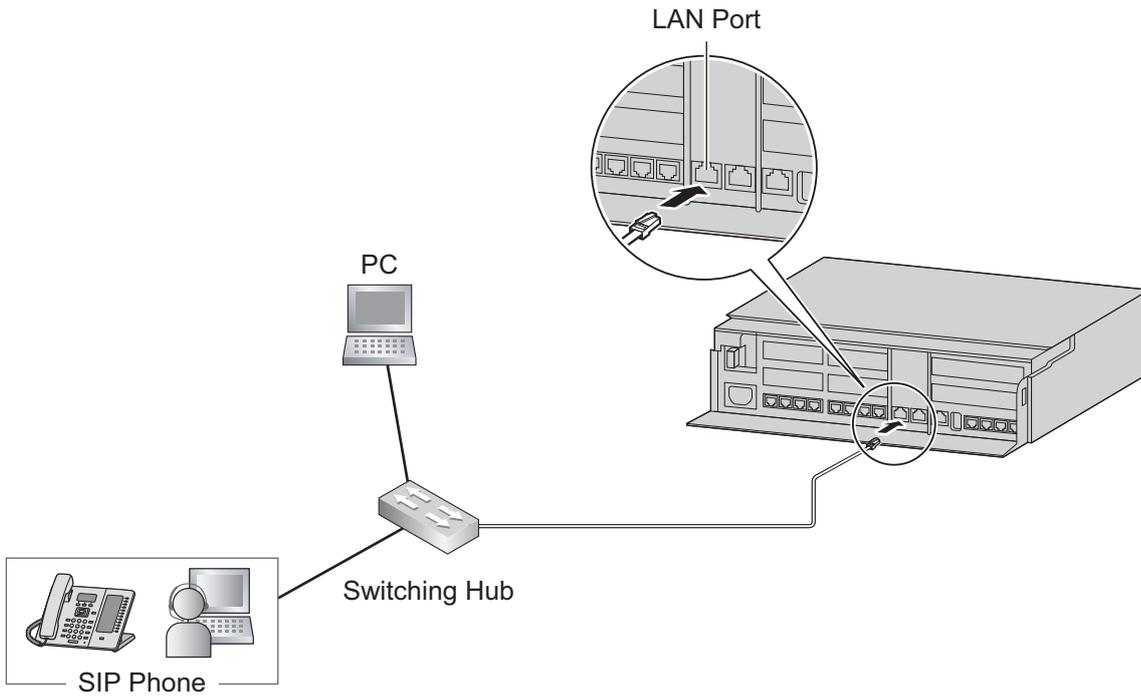
Following table describes networking functions and router functions. For details about settings, refer to "3.1 Network Configuration" in the Programming Item List.

# 3.12 LAN Connection

## 3.12.1 Wired LAN Connection

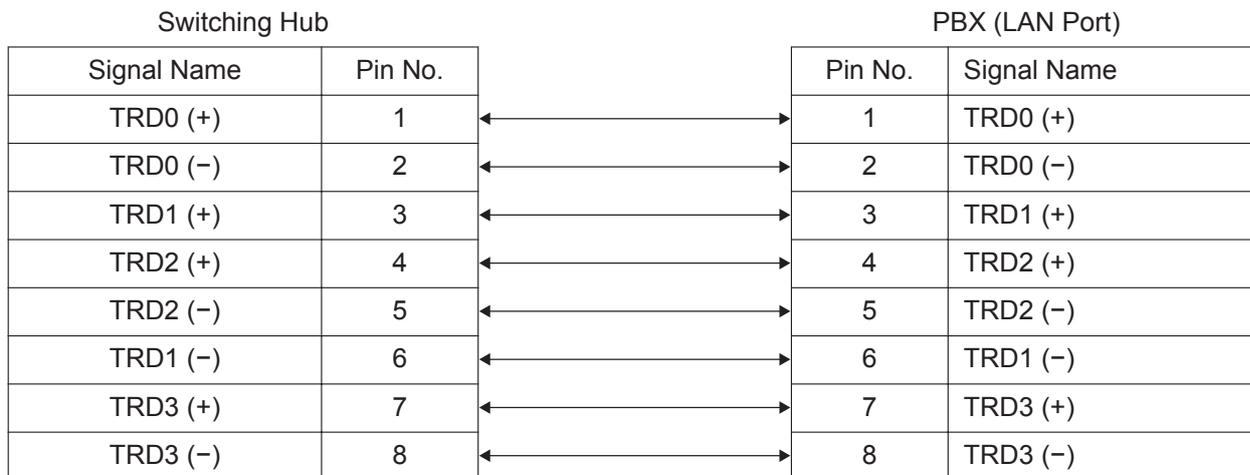
The PBX is equipped with a LAN port for connecting to a LAN so that SIP Extensions and PCs can be connected on a private IP network. When the PBX is connected to the LAN for the first time, you must assign IP addressing information to the PBX. See "1.4 Easy Setup Wizard" or "3 Network Configuration" in the Programming Item List.

### Connecting the Main Unit to the Wired LAN



#### Connection for 10BASE-T/100BASE-TX

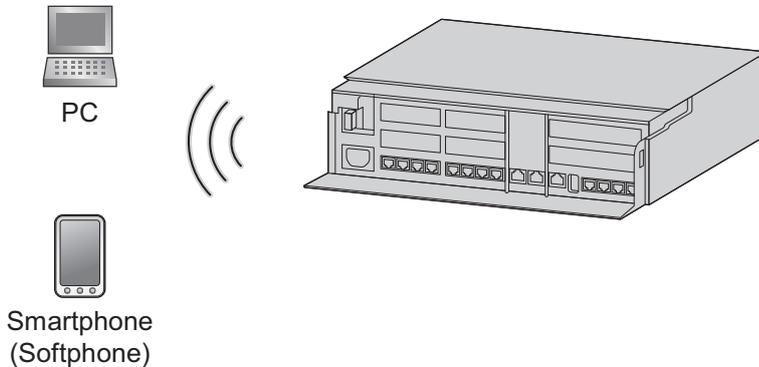
Switching Hub		PBX (LAN Port)	
Signal Name	Pin No.	Pin No.	Signal Name
RX+	1	1	TX+
RX-	2	2	TX-
TX+	3	3	RX+
TX-	6	6	RX-

**Connection for 1000BASE-T****Note**

- Use an Ethernet cable with an RJ45 connector for connection to a switching hub. The cable should be a CAT 5 (Category 5) or higher for 10BASE-T/100BASE-TX, or CAT 5e (Enhanced Category 5) or higher for 1000BASE-T.
- Make sure that all CAT 5/CAT 5e cables in use are not over 100 m (328 ft) in length.
- Make sure to set the port of the switching hub that connects to the LAN port to operate under "Auto Negotiation" mode.
- Activate the spanning tree for the L2 switch to be connected.
- If using the LAN/WAN port as a LAN, do not connect the LAN port and the LAN/WAN port to the same L2 switch as this causes a network loop.
- 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.
- When using the WAN/LAN port as a LAN port, the port operates as an L2 switch hub of the LAN1 port.
- The WAN/LAN port can be used as a Mirror port. For more information, refer to 3.1 Network Configuration-LAN2/WAN2 Setting & Information-Port Mirroring in Programming Item List.

## 3.12.2 Wireless LAN Connection

### Connecting wireless devices to Main Unit



1. Perform settings for the Wireless LAN connection of the HTS Series.  
Change the SSID and the Passphrase.  
Also change other settings as necessary.  
For details about the Wireless LAN Connection, refer to "3.5 Network Configuration—[6] Wireless" in the Programming Item List.
2. Wireless device connections  
You can connect the wireless device that supports the Wi-Fi Protected Setup™ (WPS).  
Select one of the following connection methods for using the Wi-Fi® function of the wireless device.
  - a. Connection using the Wireless LAN SETUP (WLAN SETUP) button
    - Press and hold the Wireless LAN SETUP (WLAN SETUP) button on the side of the HTS Series unit for 3 seconds. (STATUS Indicator : Green flashing (240/minute) - Wireless LAN SETUP (WLAN SETUP) in progress)
    - Press the Wi-Fi Protected Setup (WPS) setting button on the wireless device.  
Start the WPS, and confirm that it is connected. For details, check the manual of your wireless device.
    - Refer to the instruction manual of the wireless extension and configure it to enable Wi-Fi Protected Setup (WPS).
  - b. Connection using manual settings  
Manually set the necessary settings on the wireless extension. Use the settings of the HTS Series unit for setting the wireless extension's settings.  
SSID  
Security type  
Passphrase

### CAUTION

- If settings related to security are not performed, the following problems may occur.
  - Transmission contents may be intercepted by a third party.
  - There may be an illegal system intrusion by a third party.
- For security reasons, do not use the default passphrase without changing. Be sure to change it before the first use.
- You can strengthen the security using the following methods. Operate them with due consideration.
  - Activate "Enable Hidden SSID Mode" to prevent the Wireless LAN SSID from being discovered by third parties.

- Use Wireless LAN Setup Authorized MAC Configuration to fix the devices that can be connected (to prevent unintended Wireless LAN connections from third parties).
- Avoid using an easy-to-guess passphrase (or Pre-Shared Key).
- Regularly change your passphrase (or Pre-Shared Key).
- Use the WPA2 encryption system (to prevent data from being peeped).

**Note**

Because the call quality of Extensions connected to the KX-HTS using the Wireless LAN depends on the radio wave quality of the Wireless LAN, it may be difficult to maintain call quality on occasion.

## 3.13 WAN Connection

### Description

The following WAN connection types are supported.

WAN Type	Description
Dynamic IP Address	Retrieves an IP address dynamically from a DHCP server.
Static IP Address	Sets a static IP address.
PPPoE	Obtains an IP address dynamically from a PPPoE server.

You can confirm the current connection status of the WAN interface in Web Maintenance Console. For details about the WAN Status, refer to "3.2.2 Network Configuration—[3-2] WAN—WAN Status" in the Programming Item List.

### Conditions

- If the LAN2/WAN2 port attribute is changed, you must perform a System Reset and restart the PBX before the setting can be applied.
- For details about what values to use for configuring the protocol for specifying an IP address, consult the network administrator.

---

## **Section 4**

# **Confirming Connections**

*This section describes the basic checks and operation methods following PBX installation for making and receiving calls to and from extensions and outside lines.*

# 4.1 Making and Receiving Calls

The following is a description of the basic checks and operation methods following PBX installation for making and receiving calls to and from extensions and outside lines.

## 4.1.1 Calling Another Extension

To call an extension (Intercom Call)

– Follow the operation procedure described below.

1. Off-hook. (Dial tone is heard.)
2. Dial extension number.
3. Talk

## 4.1.2 Calling an Outside Party

You have to seize an outside line before dialing an outside phone number because external calls are made via your PBX.

– Follow the operation procedure described below.

1. Off-hook. (Dial tone is heard.)
2. Enter the Idle Line Access (Local Access) number (0/9). (Dial tone is not heard.)
3. Dial outside phone number.
4. Talk

## 4.1.3 Answering Calls

– Follow the operation procedure described below.

1. Off-hook.
2. Talk.

### Note

- If a call cannot be made or answered using the above procedures, refer to "6 Troubleshooting".

---

## **Section 5**

# ***Maintenance***

*This section describes maintenance procedures.*

# 5.1 System Data Backup and Restore

A PBX's system data can be backed up to a USB memory device inserted into the PBX's USB port or to a PC in the PBX's LAN network. At a later time, the backed up data can be restored to the PBX.

### Note

Operation data that is presently running is stored to the KX-HTS' internal storage with the following timing.

- When logging out of Web-MC
- Every 30-minutes

### To back up the system data to a USB memory device

- Insert a USB memory device into the USB port of the PBX.
- For details about backing up the system data to a USB memory device, refer to "4.3.3 Maintenance—[2-3] System Control—System Data Backup & Restore—System Data Backup" in the Programming Item List.

### Note

- The USB memory device must be compatible for use with the PBX. For details, refer to "3.7 Connection of Peripherals".

### To restore backed up data from a USB memory device to a PBX

- For details about restoring backed up data stored on a USB memory, refer to "4.3.3 Maintenance—[2-3] System Control—System Data Backup & Restore—System Data Restore" in the Programming Item List.

### Note

- System data must be stored in the directory below.  
`/private/meigroup/psn/hts/backup/dsys/`
- Data cannot be restored in the following cases.
  - The USB memory device hardware is faulty.
  - The data on the USB memory device has become corrupted.
  - The USB memory device is removed from the USB port of the PBX during the restoration process.
- After a system data restore, the main unit must be restarted using the Web Maintenance Console.

### To back up the system data to a PC

- For details about backing up the system data to a PC, refer to "4.3.3 Maintenance—[2-3] System Control—System Data Backup & Restore—System Data Backup" in the Programming Item List.

### Restoring backed up data from a PC to a PBX

- For details about restoring backed up data stored on a PC, refer to "4.3.3 Maintenance—[2-3] System Control—System Data Backup & Restore—System Data Restore" in the Programming Item List.

### Note

- After a system data restore, the main unit must be restarted using the Web Maintenance Console.

## 5.2 Software Upgrading

Obtaining software updates (downloading the update to the PBX) can be done manually via Web Maintenance Console. In this case, software updates can be obtained from a USB memory device connected to the PBX, or a PC that can access Web Maintenance Console.

The software of the following types of devices and components can be updated:

Data Type	Description
Main unit software	Main unit software on the PBX's motherboard.
Terminal software <sup>*1</sup>	Firmware of supported SIP extensions.

\*1 Only Panasonic telephones are supported. For details about a specific telephone, refer to the telephone's documentation.

### Note

- To transfer files from USB memory to HTS, store them in the directory below.  
/private/meigroup/psn/hts/update/
- The version of main unit and terminal software can be confirmed through Web-MC.
- To transfer files from Web-MC to HTS, refer to "4.3.1 Maintenance—[2-1] System Control—Firmware Transfer to PBX" in the Programming Item List.
- To update main unit software, refer to "4.3.2 Maintenance—[2-2] System Control—Firmware Update" in the Programming Item List.
- Either one Main Unit Software or one Terminal Software is stored in the HTS. If a new Software is stored when there is already stored Software, the latter will be overwritten.
- Upon a version up failure, the system automatically reverts back to the former main unit software.
- Version up failures and automatic reversions to the former main unit software are recorded in the error log.
- The version up log containing the error log can be accessed/retrieved from the Web-MC. For more information, refer to 4.4.2 Maintenance—[3-2] Utility—System Log in Programming Item List.
- For information on updating terminal software, refer to the corresponding manuals.

# 5.3 System Initialization Procedure

The system data can be returned to its initial state by following the procedure below.

1. While pressing and holding the Initialize Switch, turn the power ON. The LED will light amber.
2. Continue holding down the Initialize Switch (to confirm the holding). The LED will flash amber at a rate of 240 flashes/minute.
3. Initialization begins. The LED will flash green at a rate of 240 flashes/minute.
4. At this time the Initialize Switch may be released.
5. Operation begins in the initialized state. The LED will light green.  
All data will be erased. Data that is erased includes Voice Message data, call logs, etc. The settings for the PBX as well as all optional service cards will be initialized to their default values.

### Note

- After the PBX is initialized, you can restore system data to the PBX that has been backed up earlier. For details about backing up and restoring system data, refer to "5.1 System Data Backup and Restore".
- After the PBX is initialized, you must set up the mandatory settings required for PBXs. For details refer to "3.9.4.1 Easy Setup Wizard".

# 5.4 System Logging

This is a function that saves the system information to the HTS' internal storage and outputs it to administrators.

### System Log

The following types of Syslog information can be checked from the Web-MC. (The latest 100 logs are displayed.)

- syslog\_major Stores logs of major system errors
- syslog\_minor Stores logs of minor system errors
- syslog\_update Stores logs of version up operations

Syslog files and other than those described above can be exported to your PC by operating the Web-MC. For more information, refer to 4.4.2 Maintenance—[3-2] Utility—System Log in Programming Item List.

### Error Log

When system failure occurs, relevant information is logged into the Error Log.

Upon the occurrence of a major error log, the Status LED lights up red to notify the user that an anomaly has occurred. The status LED will light green when the Error Log (Major/Minor) is cleared.

Error Log information (Major/Minor) can be checked on the Web-MC.

Error Log information can be exported to your PC. For more information, refer to 4.4.2 Maintenance—[3-2] Utility—System Log in Programming Item List.

The Error Log displays up to the latest 100 Major and 100 Minor error records.

You may issue a failure notice via email when saving records in the Error Log.

KX-HTS series can send a mail for each time a major/minor error occurs. You can set for determining whether or not to send such email notice using the Web-MC. For more information, refer to 4.4.3 Maintenance—[3-3] Utility—Email Notification in Programming Item List.

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## **Section 6**

# **Troubleshooting**

*This section provides information on the PBX and telephone troubleshooting.*

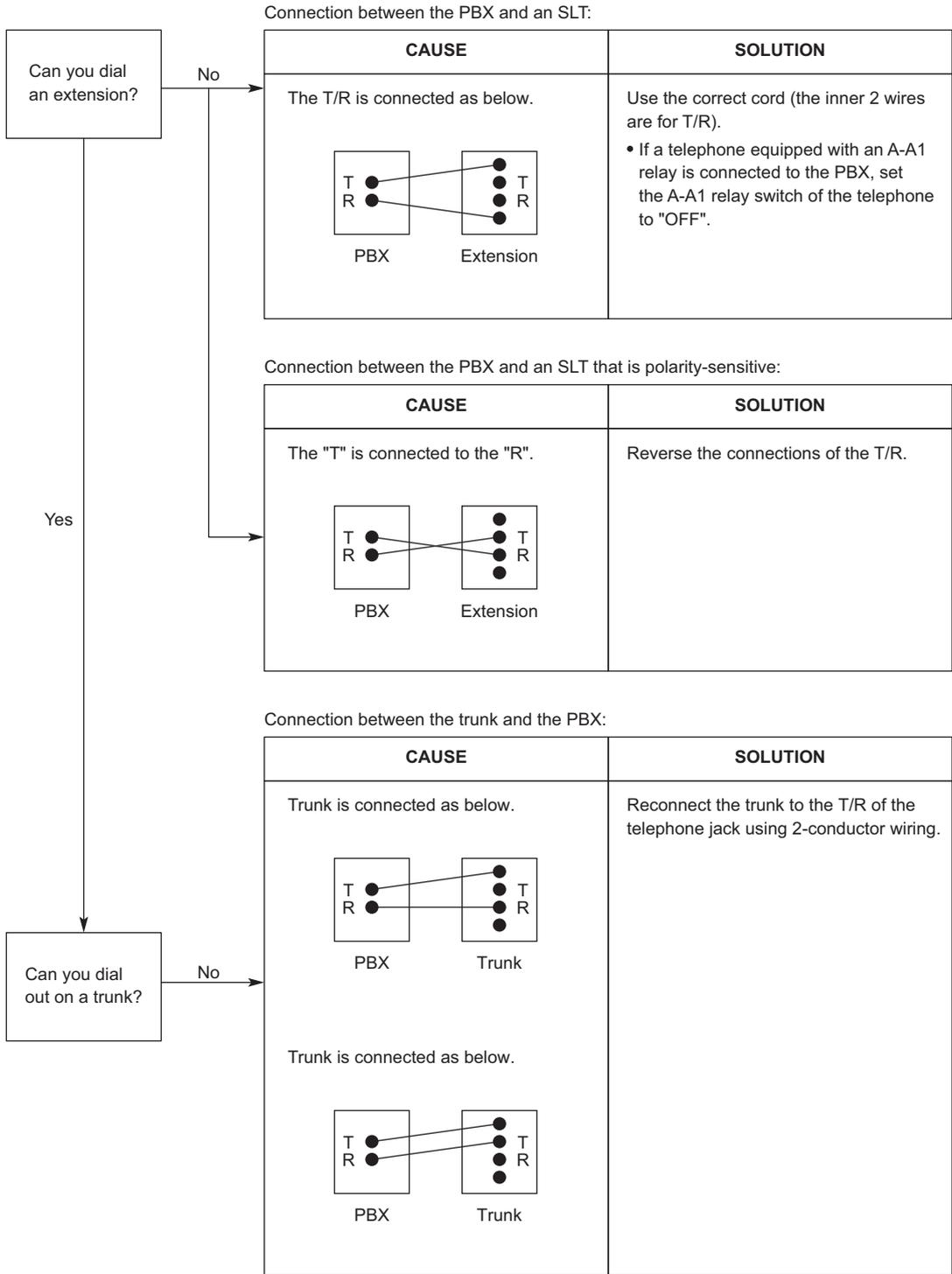
## 6.1 Troubleshooting

### 6.1.1 Installation

PROBLEM	PROBABLE CAUSE	SOLUTION
You cannot make/receive calls via an IP network.	<ul style="list-style-type: none"> <li>Mother board malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the mother board (be sure to turn off the PBX when replacing).</li> </ul>
	<ul style="list-style-type: none"> <li>Poor connection</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that an 8-pin twisted pair cable is used for connection.</li> <li>Make sure that none of the CAT 5/CAT 5e cables in use are over 100 m (328 ft) in length.</li> <li>Make sure that a straight cable is used for connection to a switching hub.</li> </ul>
	<ul style="list-style-type: none"> <li>Network malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that all network devices in use are switched on.</li> <li>Make sure that there is no unwanted firewall in the IP network.</li> </ul>
SIP phones do not operate.	<ul style="list-style-type: none"> <li>Mother board malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the mother board (be sure to turn off the PBX when replacing).</li> </ul>
	<ul style="list-style-type: none"> <li>SIP phone not registered</li> </ul>	<ul style="list-style-type: none"> <li>Register the corresponding SIP phone.</li> </ul>
	<ul style="list-style-type: none"> <li>SIP phone malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the SIP phone.</li> </ul>
	<ul style="list-style-type: none"> <li>Poor connection</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that an 8-pin twisted pair cable is used for connection.</li> <li>Make sure that none of the CAT 5/CAT 5e cables in use are over 100 m (328 ft) in length.</li> <li>Make sure that a straight cable is used for connection to a switching hub.</li> </ul>
	<ul style="list-style-type: none"> <li>Network malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that all network devices in use are switched on.</li> <li>Make sure that the SIP phone is not blocked by the firewall or other network devices.</li> </ul>

PROBLEM	PROBABLE CAUSE	SOLUTION
Extensions do not operate.	<ul style="list-style-type: none"> <li>Extension card malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the corresponding card.</li> </ul>
	<ul style="list-style-type: none"> <li>Poor connection between the PBX and the extension</li> </ul>	<ul style="list-style-type: none"> <li>Take the extension and plug it into the same extension port using a short telephone cord. If the extension works, then the connection between the PBX and the extension must be repaired.</li> </ul>
	<ul style="list-style-type: none"> <li>Extension malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Take the extension and plug it into another extension port that is working. If the extension does not work, replace the extension. If the extension works, replace the extension card.</li> </ul>
The PBX does not operate properly.		<ul style="list-style-type: none"> <li>Restart the PBX (refer to "6.1.4 Restarting the PBX").</li> <li>Turn off the power switch, and then turn it back on.</li> <li>Turn off the power switch, and then unplug the PBX. After 5 minutes, plug the PBX back in, and turn the power switch back on.</li> </ul>
The STATUS indicator on the front of the cabinet turns on red.	<ul style="list-style-type: none"> <li>A major/minor system error occurs in the PBX.</li> </ul>	<p>Error Log files can be accessed or exported on the Web-MC. For more information, refer to 4.4.2 Maintenance—[3-2] Utility—System Log in Programming Item List.</p> <ul style="list-style-type: none"> <li>Should a Main CPU failure be detected or a failure notice be received from any device, a description of the failure will be recorded in the log and appropriate measures, including but not limited to system reset, will be initiated.</li> </ul>
The LINK indicator of the mother board does not turn on.	<ul style="list-style-type: none"> <li>Mother board malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Replace the mother board (be sure to turn off the PBX when replacing).</li> </ul>
	<ul style="list-style-type: none"> <li>Poor connection.</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that an 8-pin twisted pair cable is used for connection.</li> <li>Make sure that none of the CAT 5/CAT 5e cables in use are over 100 m (328 ft) in length.</li> <li>Make sure that a straight cable is used for connection to a switching hub.</li> </ul>
	<ul style="list-style-type: none"> <li>Network malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that all network devices in use are switched on.</li> </ul>
Status LED is set to Power ON → Amber (5s) → continues to flash red (240 times/minute)	Fan failure	Contact Service Center

# 6.1.2 Connection



## 6.1.3 Operation

### Note

For devices connected to a PBX other than the Main Unit, refer to the Troubleshooting for that PBX.

PROBLEM	PROBABLE CAUSE	SOLUTION
Cannot set the IP address, subnet mask address, and PBX IP address to the SIP Phone.	<ul style="list-style-type: none"> <li>An unusable value is being set.</li> </ul>	<ul style="list-style-type: none"> <li>Set an IP address within the valid range. IP address of the SIP Phone/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")</li> </ul>
Cannot register the SIP Phone.	<ul style="list-style-type: none"> <li>The necessary network parameters are not set to the SIP Phone.</li> </ul>	<ul style="list-style-type: none"> <li>When not using the DHCP Server feature or an external DHCP server, set the IP address, subnet mask address, and enter the PBX IP address. If necessary, also enter the IP address of the default gateway.</li> <li>When using the DHCP Server feature or an external DHCP server, enter the PBX IP address.</li> <li>Automatic registration is only compatible with KX-HDV series connected to the same network as the KX-HTS series LAN port.</li> </ul>
The SIP Phone cannot connect to the PBX.	<ul style="list-style-type: none"> <li>The wrong IP address, subnet mask address, PBX IP address, or default gateway address was entered.</li> </ul>	<ul style="list-style-type: none"> <li>Check each parameter and enter the correct value.</li> </ul>
	<ul style="list-style-type: none"> <li>The Ethernet cable is not connected correctly.</li> </ul>	<ul style="list-style-type: none"> <li>Check the Ethernet cable connections.</li> </ul>
	<ul style="list-style-type: none"> <li>The DHCP server is not active.</li> </ul>	<ul style="list-style-type: none"> <li>Restart the external DHCP server.</li> <li>Confirm whether the DHCP Server feature is enabled.</li> <li>Disable DHCP and re-enter settings as appropriate.</li> </ul>
The SIP Phone does not ring.	<ul style="list-style-type: none"> <li>The ringer volume is off.</li> </ul>	<ul style="list-style-type: none"> <li>Turn on the ringer volume.</li> </ul>

### 6.1.4 Restarting the PBX

If the PBX does not operate properly, restart the PBX using Web Maintenance Console or switch the power to OFF then ON. Before restarting the PBX, try the system feature again to confirm whether there definitely is a problem or not.

#### Note

- Restarting the PBX causes the following:
  - Audio data being recorded
  - System data being saved
  - Data being transferred to PBX
  - 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.
- The data synchronicity cycle for "operation data" that is presently running and "system data" stored in the system's storage is 30 minutes. For that reason, when restarting the PBX within 30 minutes after operation data has been changed, on occasion, the changed operation data will not have been saved in the system data. Please verify the system data after restarting the PBX.

#### Operation

For details about the system reset, refer to "4.3.4 Maintenance—[2-4] System Control—System Reset" in the Programming Item List.

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# **Section 7**

## **Appendix**

*This section provides information about System Prompt Languages and the revision history.*

## 7.1 System Prompt Languages

### Note

- The following abbreviations are used in the language file names:
  - UK: United Kingdom
  - US: United States
  - LA: Latin America
  - BR: Brazil
- No. 1 is set by default. For details, see "2.8 PBX Configuration—[7] Voice Mail—Prompt Language" in the Programming Item List.

### System prompt languages stored in the System Memory

	AG	AL	BR	XE	US
No. 1 (Primary)	LA-Spanish	UK-English	BR-Portuguese	US-English	US-English
No. 2	US-English		US-English		LA-Spanish

	ML	NZ	RU	SA	LA
No. 1 (Primary)	US-English	UK-English	Russian	US-English	LA-Spanish
No. 2			US-English		US-English

	MX	NE	SU	UE	BX
No. 1 (Primary)	LA-Spanish	US-English	US-English	US-English	US-English
No. 2	US-English				

	SX	ND	TW
No. 1 (Primary)	US-English	US-English	US-English
No. 2			

\* For other languages, consult your dealer.

## TEMPLATE FOR WALL MOUNTING

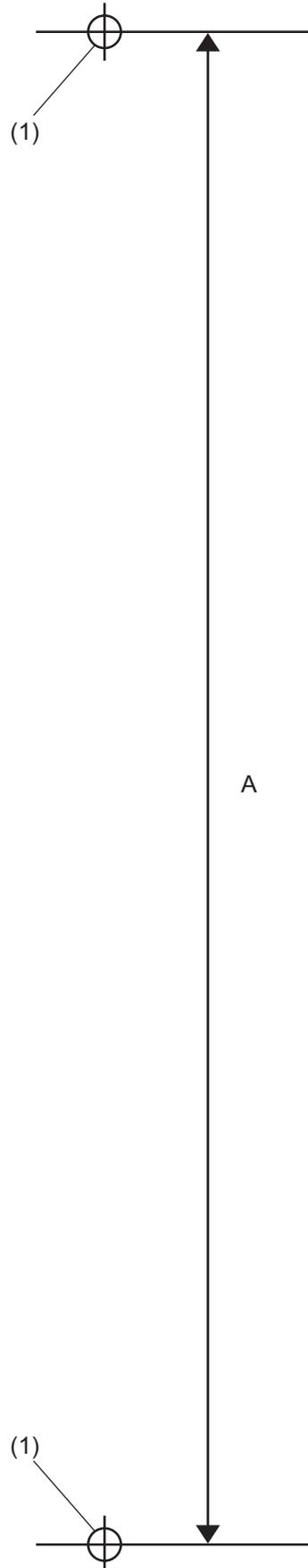
1. Copy or print this template and place it on the wall.
2. Install the screws as marked. If you mount the main unit on a concrete, fit anchor plugs (not included) into the wall beforehand.
3. Hook the unit onto the screw heads.

### Note

- Make sure to set the print size to correspond with the size of this page.
- If the dimensions of the paper output still deviate slightly from the measurements indicated here, use the measurements indicated here.

A 225mm (8-7 / 8 in)

(1) Install a screw here.



## Note

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## Note

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CE 0197

The KX-HTS32NE is designed to interwork with the:

- Analog Public Switched Telephone Network (PSTN) of European countries

This device is a Hybrid IP-PBX operating in the frequency band of 2412 MHz to 2472 MHz.

The usage of this device is generally allowed in all EU countries.

Panasonic System Networks Co., 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.ptc.panasonic.eu>

For information of Compliance with EU relevant Regulatory Directives,

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