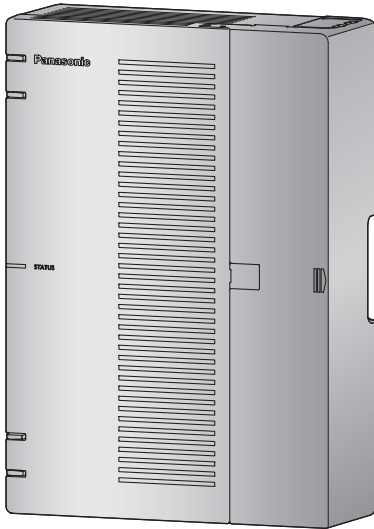




Getting Started

Hybrid IP-PBX

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, page 8" before using this product.

KX-HTS: Series (KX-HTS824 KX-HTS32) : PJMPR 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	Main Unit
Physical Cards	KX-HT82480	4 ports Analogue 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

- Refer to the Panasonic Web site for information on compatible terminals.

Other

- Single line telephones

Note

- For the equipment that can be connected to a particular telephone, refer to the telephone's manual.

Notice

- This PBX supports SIP extensions. 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**BX**) is omitted unless necessary.

List of Abbreviations

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

- P-SIP -> Panasonic SIP Phones (KX-HDV series)

Introduction

This Manual is designed to serve as an overall technical reference for the Panasonic KX-HTS824 and KX-HTS32 IP-PBXs. 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 (PI)

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

Trademarks

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- All other trademarks identified herein are the property of their respective owners.
- Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation.

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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 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 an earthed plug. If you do not have an earthed outlet, please have one installed. Do not bypass this safety feature by tampering with the plug.
- 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.
- 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.

1.1 For Your Safety

- 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 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 authorised Panasonic Factory Service Centre 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.
- Do not leave the slot open if an option service card is not installed after removing a dummy cover plate. Make sure to insert the slot cover included with the option service card into the slot.



- 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 authorised Panasonic Factory Service Centre.
- 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 earthing wire of the AC cable has an effect against external noise and lightning strikes, but it may not be enough to protect the PBX and to ensure electromagnetic compatibility. A permanent connection between earth and the earth terminal of the PBX must be made.

- Proper earthing (connection to earth) is very important to reduce the risk to the user of electrocution or to protect the PBX from the bad effects of external noise in the case of a lightning strike. (See "3.2.4 Frame Earth Connection".)
- 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 earthed, then securely connect the 3-pin AC plug including the earthed 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.
- 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 / Taiwan:
Wi-Fi features operate between 2.412 GHz and 2.462 GHz with a peak transmission power of 100 mW.
 - For all other countries / areas:
Wi-Fi 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 benzene 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 5 cm (2 in) to the sides 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 initialise it again as described in "System Initialisation Procedure". Otherwise, your programmed data will be cleared. To restart the PBX, refer to "6.1.4 Restarting the PBX".



- Before touching the product (PBX, cards, etc.), discharge static electricity by touching ground or wearing an earthing strap. Failure to do so may cause the PBX to malfunction due to static electricity.
- When 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 mm²) 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 in "3.2.7 Placing the PBX on a Desktop". Do not place it on its side or upside down.
- Performing surge protection is essential. Make sure to follow the instructions in "3.2.9 Surge Protector Installation".
- 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. For details, refer to "3.2.9 Surge Protector Installation".
- 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.
- For earthing wire, green-and-yellow insulation is required, and the cross-sectional area of the conductor must be more than 0.75 mm² or 18 AWG.

Notice**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.

1.1 For Your Safety

c. Make a call to an external destination using those SLTs.

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

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

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:

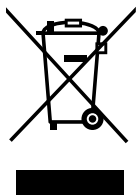
- Do not use the product near water, for example, near a bathtub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
- Avoid using wired telephones during an electrical storm. There is a remote risk of electric shock from lightning.
- Do not use a telephone in the vicinity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

SAVE THESE INSTRUCTIONS

1.3 Precautions

For users in the European Union only

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



These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries should not be mixed with general household waste.

For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC and 2006/66/EC.

By disposing of these products and batteries correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

For more information about collection and recycling of old products and batteries, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

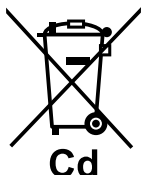
For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.



Information on Disposal in other Countries outside the European Union

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



Note for the battery symbol (bottom two symbol examples):

This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

For users in New Zealand only

- This equipment shall not be set to make automatic calls to the Telecom '111' Emergency Service.
- The grant of a Telepermit for any item of terminal equipment indicates only that Telecom has accepted that the item complies with minimum conditions for connection to its network. It indicates no endorsement of the product by Telecom, nor does it provide any sort of warranty. Above all, it provides no assurance that any item will work correctly in all respects with another item of Telepermitted equipment of a different make or model, nor does it imply that any product is compatible with all of Telecom's network services.
- This equipment is not capable, under all operating conditions, of correct operation at the higher speeds for which it is designed. Telecom will accept no responsibility should difficulties arise in such circumstances.
- Some parameters required for compliance with Telecom's Telepermit requirements are dependent on the equipment (PBX) associated with this modem. In order to operate within the limits for compliance with Telecom's Specifications, the associated PBX equipment shall be set to ensure that modem calls are answered between 3 and 30 seconds of receipt of ringing.
- Using the toll services of a company other than Telecom:

If the PBX is set up to use the toll services of a company other than Telecom, the telephone numbers dialled from the Caller Display listings within the PBX will be directed through the toll services of the other company because the telephone numbers include the toll access digit and area code digit. A toll charge may be incurred. Please check with the toll carrier concerned.

- **APPLICABLE ONLY TO TELECOM CUSTOMERS WHO HAVE AUTOMATIC ACCESS TO OTHER CARRIERS FOR TOLL CALLS**
When calling back a number from the Caller ID list, all numbers prefixed with "0 + AREA CODE" will be automatically forwarded to your toll carrier. This includes numbers in your local calling area. The zero + area code should either be removed when calling back local numbers, or check with your toll carrier that a charge will not be levied.
- All persons using this device for recording telephone conversations shall comply with New Zealand law. This requires that at least one party to the conversation is to be aware that it is being recorded. In addition, the principles enumerated in the Privacy Act 1993 shall be complied with in respect to the nature of the personal information collected, the purpose for its collection, how it is used, and what is disclosed to any other party.
- 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 batteries can be found in the circuit boards of the mother board and optional service cards 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

Password Security

CAUTION

To the Administrator or Installer regarding the system password

1. Please provide all system passwords to the customer.
2. To avoid unauthorised access and possible abuse of the PBX, keep the passwords secret, and inform the customer of the importance of the passwords, and the possible dangers if they become known to others.
3. The PBX has default passwords preset. For security, change these passwords the first time that you programme the PBX.
4. Change the passwords periodically.
5. It is strongly recommended that passwords of 10 numbers or characters be used for maximum protection against unauthorised access. For a list of numbers and characters that can be used in system passwords, refer to "1.2 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 "Maintenance-[2-3]System Control-System Data Backup- ♦System Data Backup" in the Programming Item List.
2. To prevent illegal access from the Internet, activate a Firewall.
3. To avoid unauthorised access and possible abuse of the PBX, we strongly recommend:
 - a. Keeping the password secret.
 - b. Selecting a complex, random password that cannot be easily guessed.
 - c. Changing your password regularly.
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.

Section 2

System Outline

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

2.1 Basic System Construction

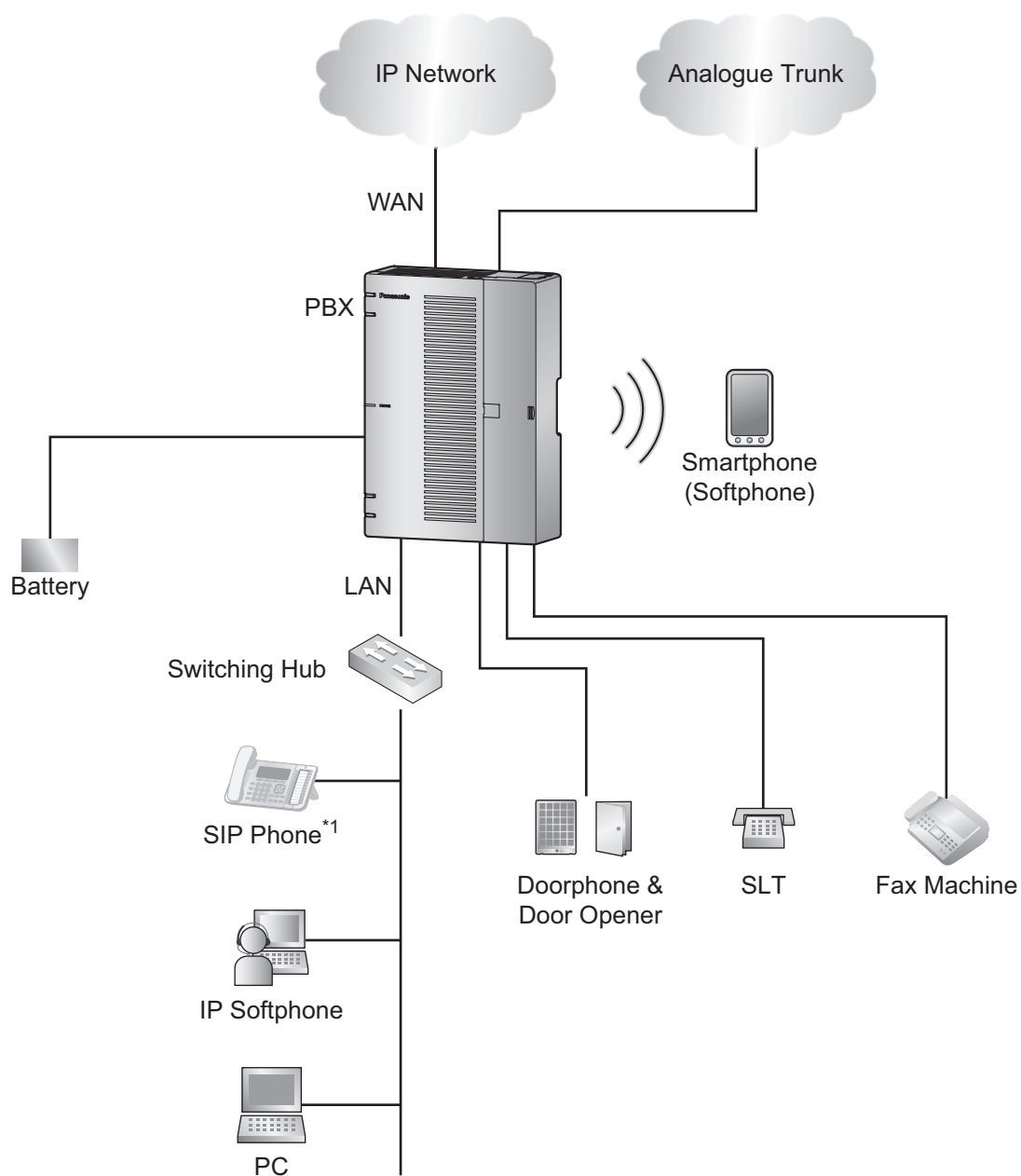
2.1.1 System Configurations

Main Unit

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

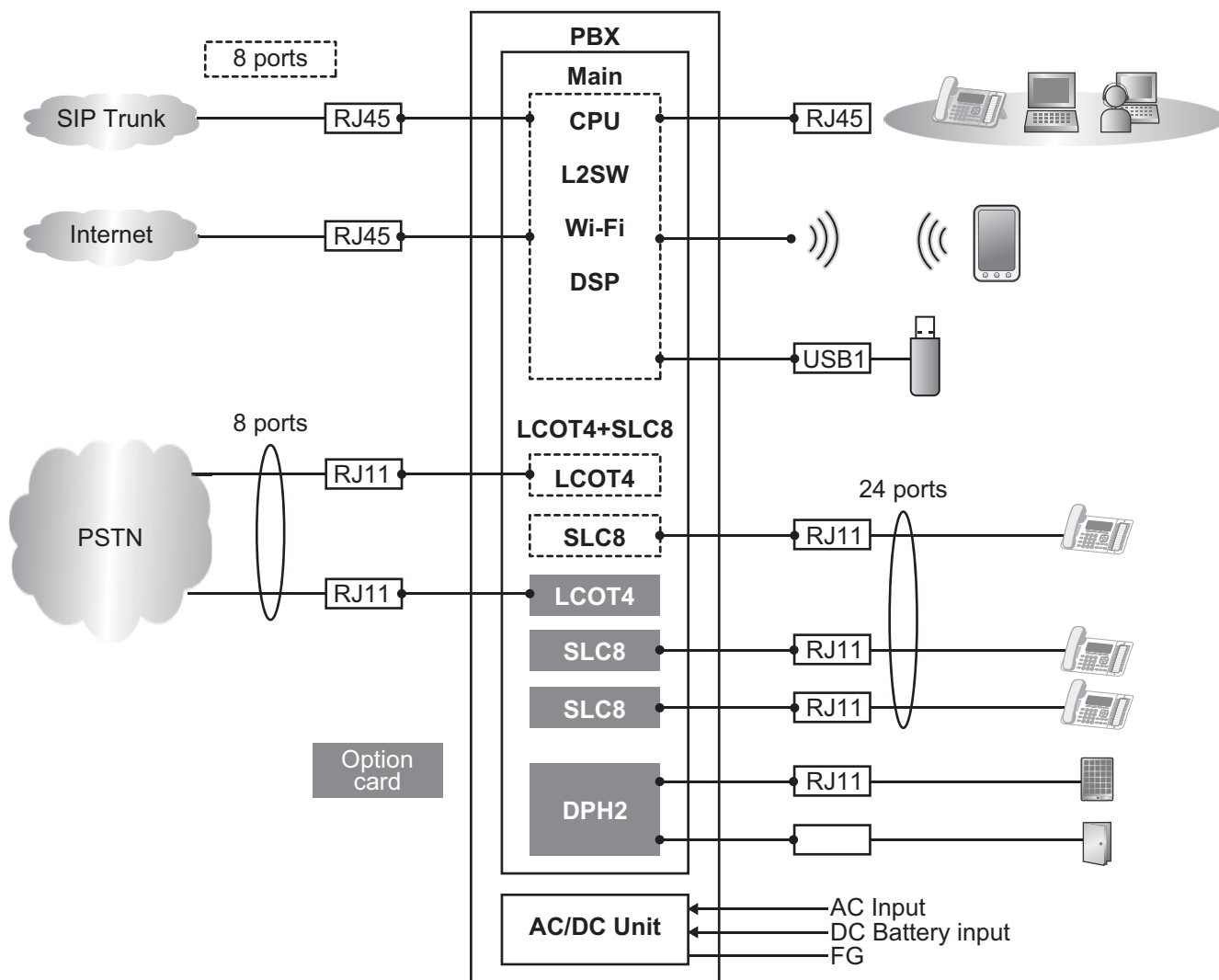


2.1.2 System Connection Diagram



*1 SIP Phone: Panasonic SIP Phone is included

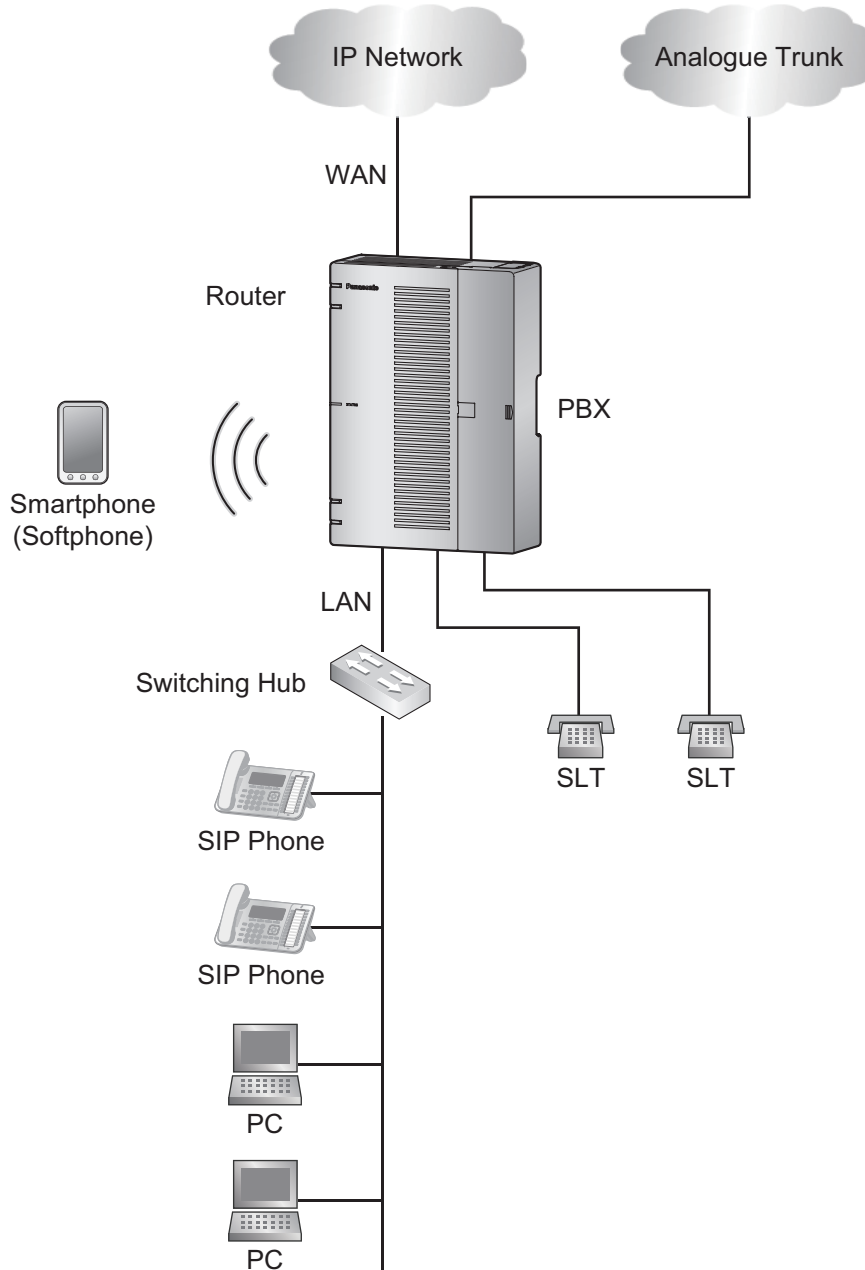
2.1.3 Block Diagram



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.

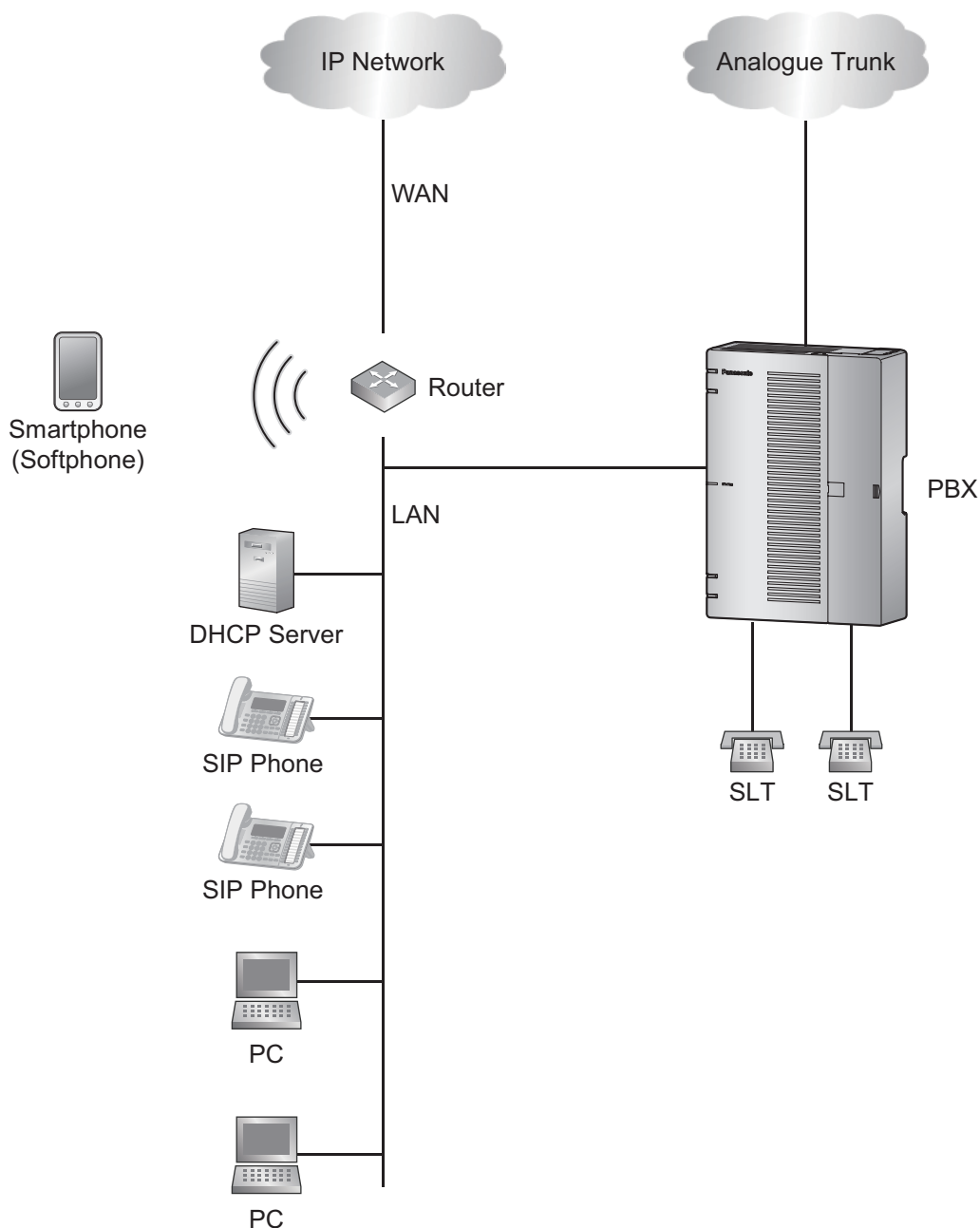


Notice

- Refer to the following when the internal DHCP server will be used.
For details about DHCP server settings, refer to "Network Configuration-[4-2]LAN Settings-
◆DHCP Mode" in the Programming Item List.

2.1.4 Typical Network Setting Example

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



Note

- Dynamic Host Configuration Protocol (DHCP) Server

Description

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.

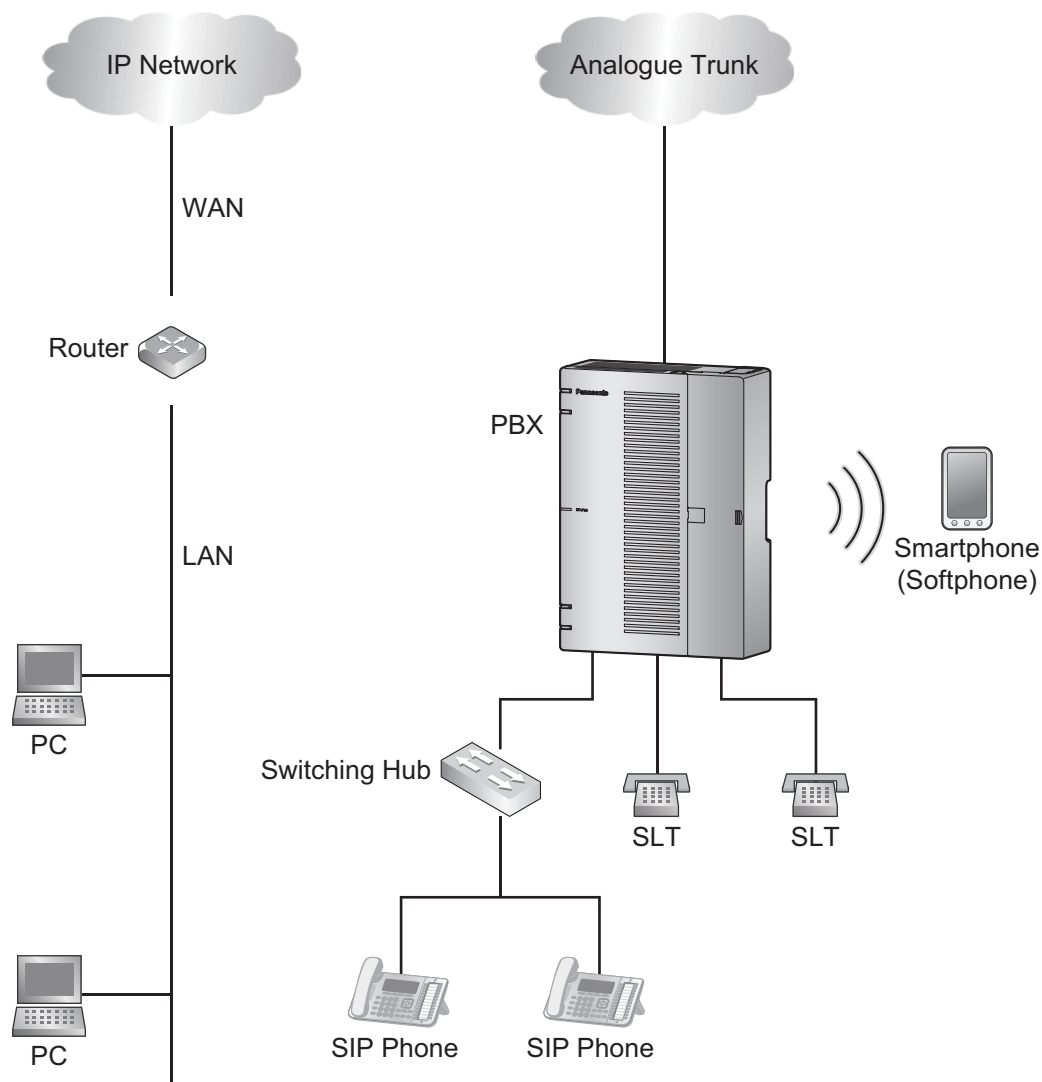
Notice

- If an external DHCP server is in use, the DHCP Server feature of the PBX must be disabled.

For details about DHCP server settings, refer to "Network Configuration-[4-2]LAN Settings-◆DHCP Mode" in the Programming Item List.

2.1.4 Typical Network Setting Example

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



Notice

- Refer to the following when the internal DHCP server will be used.
For details about DHCP server settings, refer to "Network Configuration-[4-2]LAN Settings-◆DHCP Mode" in the Programming Item List.

2.2 Optional Equipment

2.2.1 Optional Equipment

Model No.	Model Name	Description
KX-HT82480	4-Port Analogue Trunk Card	4 ports Analogue CO interface with Caller ID (LCOT4)
KX-HT82470	8-Port Single Line Telephone Extension Card	8 ports Standard Telephone Line Interface with Caller ID & Message waiting Lamp (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

CPU	MIPS 34Kc 720MHz	
Power Input	AC 100-240 V,50/60 Hz/60 Hz,1.3-0.9A	
Power Consumption (when fully mounted)	60 W	
External Backup Battery	External battery port is supported.	
Memory Backup Duration	Data retention period 7 years	
Dialling	Trunk	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialling with Caller ID (FSK/DTMF)
	Extension	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialling with Caller ID (FSK)
Mode Conversion	DP-DTMF, DTMF-DP	
Ring Frequency	20 Hz/25 Hz (selectable)	
Operating Environment	Temperature	0 °C to 40 °C(32 °F to 104 °F)
	Humidity	10 % to 90 % (non-condensing)
LAN Port	WAN port	10BASE-T/100BASE-TX/1000BASE-T
	WAN/LAN port	
	LAN port	
Wireless LAN	Antenna	Built-in antenna
	Transmission method	2 x 2 MIMO
	Communication standard	IEEE802.11n/b/g
	Frequency range (centre frequency)/ Channel	- For North America / Latin America / 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	WPA/WPA2-PSK (TKIP/AES) Open System (WEP64/WEP128)
	WPS	PBC method (push button method), PIN method (PIN code method)
USB port	USB 2.0 Type-A connector	
Dimension	297 mm (W) x 210 mm (H) x 80 mm (D)	

	(11-3/4 in x 8-1/4 in x 3-1/8 in)
Weight (when fully mounted)	Under 2.1 kg(4.7 lb)
Installation Environment	Wallmount Horizontal (Desktop) installation

2.3.2 Characteristics

Terminal Equipment Loop Limit	- SLT: 600 Ω including set - Doorphone: 20 Ω
Minimum Leakage Resistance	15 000 Ω minimum
Maximum Number of Extension Instruments per Line	1 for SLT
Ring Voltage	75 Vrms at 20 Hz/25 Hz depending on the Ringing Load
Trunk Loop Limit	1600 Ω maximum
Hookswitch Flash/Recall Timing Range	24 ms to 2032 ms

2.3.3 System Capacity

Type and Maximum Number of Slots

The PBX supports the following type and number of slots.

Items		Maximum Number	Remarks
Total Trunk (Channel/Port)		8	
	SIP Trunk (Channel)	8	
	Analogue Trunk (Port)	8	1 LCOT4 option card is required
Total Extension (Channel/Port)		24	
	SIP Extension (Channel)	24	Include softphone for smartphone or Personal Computer
	Analogue Extension (Port)	24	2 MCSLT8 option cards are required
Wireless LAN access point		1	Target throughput ^{*1} ^{*2}
DISA/AA/VM channel		8	
System Concurrent call		8	

^{*1} Target throughput under ideal condition

IEEE802.11b: 5-6 Mbps

IEEE802.11g: 20 Mbps

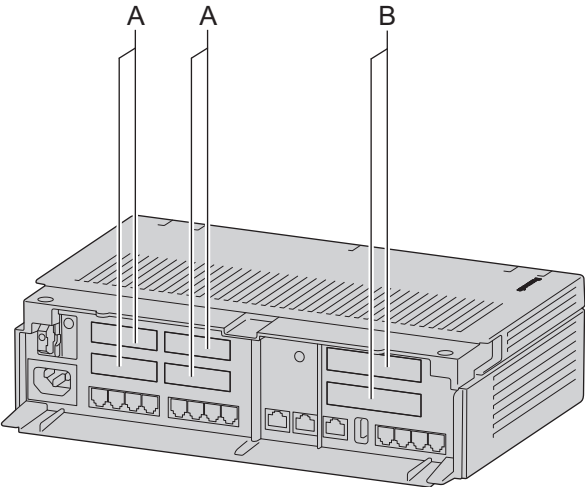
IEEE802.11n: 70-80 Mbps

QoS feature (IEEE802.11eEDCA) is supported.

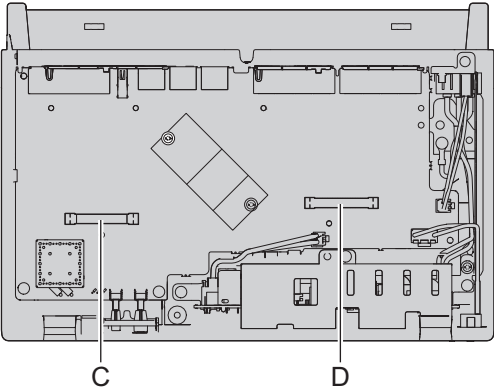
^{*2} The actual line speed may be different depending on the network environment and the wireless devices connected.

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 Extension Card Slot
- D Trunk/Doorphone Card Slot

Maximum Optional Service Cards

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

Note

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

Slot

Slot type	Card Name	Maximum Number
Pre-installed	LCOT4	1
	SLC8	1

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

DSP Resources

The KX-HTS series has a built-in DSP with a maximum of 14 DSP resources. This DSP is used for switching the TDM and IP terminals.

1. The definition of TDM and IP

	Subject	Remarks
TDM Trunk	Analogue Trunk	
TDM Extension	Analogue Telephone (SLT, Fax, etc.) Doorphone	
SIP Trunk	SIP Trunk	
IP Extension	SIP phone Softphone on a smartphone or personal computer	
Others	DISA / Automated Attendant / Voicemail / Conference	

2. Resource count

DSP resources are counted as follows.

The codec typically used for SIP Trunks is G.711. Some countries such as South Africa use G.729. In this chart, IP extensions are using G.711.

Case	Connection	DSP Resource count (SIP trunk : G711)	DSP Resource Count (SIP trunk : G729)
1	TDM Trunk <-> TDM Trunk	0 (TSW)	0 (TSW)
2	TDM Trunk <-> TDM Extension	0 (TSW)	0 (TSW)
3	TDM Trunk <-> IP Extension	1 (DSP)	1 (DSP)
4	TDM Trunk <-> Others	1 (DSP)	1 (DSP)
5	SIP Trunk <-> SIP Trunk	*1) 0 (P2P) / 2(DSP)	*1) 0 (P2P) / 2(DSP)
6	SIP Trunk <-> TDM Extension	1 (DSP)	1 (DSP)
7	SIP Trunk <-> IP Extension	0 (P2P)	2 (DSP)
8	SIP Trunk <-> Others	1 (DSP)	1 (DSP)
9	TDM Extension <-> TDM Extension	0 (TSW)	0 (TSW)
10	TDM Extension <-> Others	1 (DSP)	1 (DSP)
11	IP Extension <-> IP Extension	*1) 0 (P2P) / 2(DSP)	*1) 0 (P2P) / 2(DSP)
12	IP Extension <-> Others	1 (DSP)	1 (DSP)

*1 P2P or DSP is selectable for the connection's base setting.

Note

The recommended codec for SIP trunk service is G.711.

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 discolouration, 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 PTs should be at least 1.8 m [6 ft] away from such devices.)

Do not perform the following:

- Do not block the openings of the PBX.
- Do not stack up the optional service cards.

Wiring Precautions

Be sure to follow these instructions when wiring the unit:

CAUTION

- Avoid using the same AC outlet for computers 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.

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.

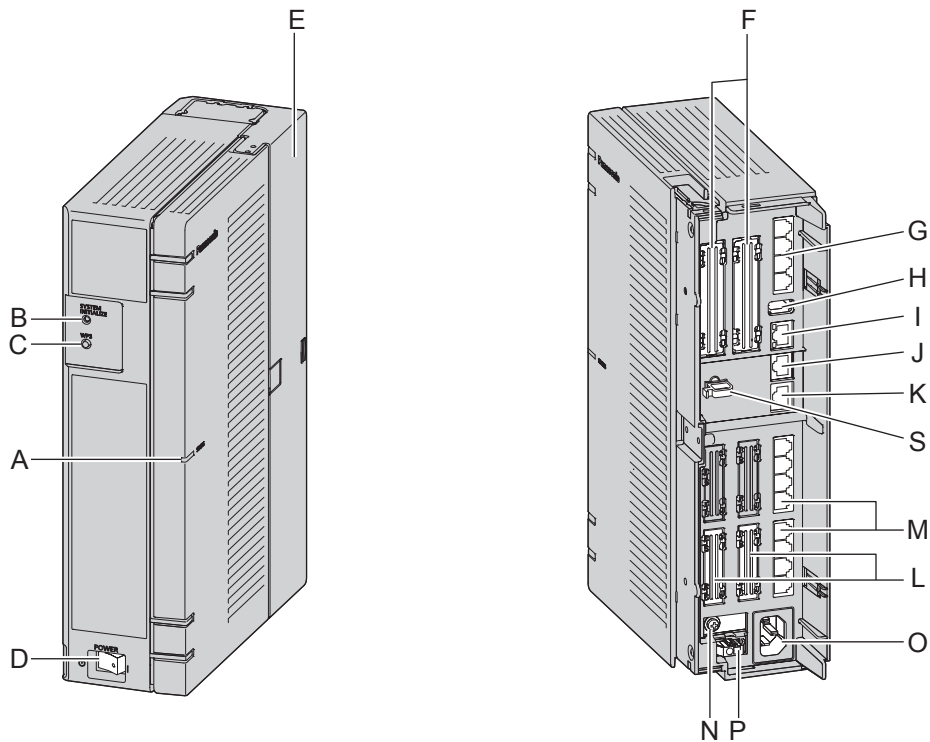
3.2 Installation of the PBX

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)

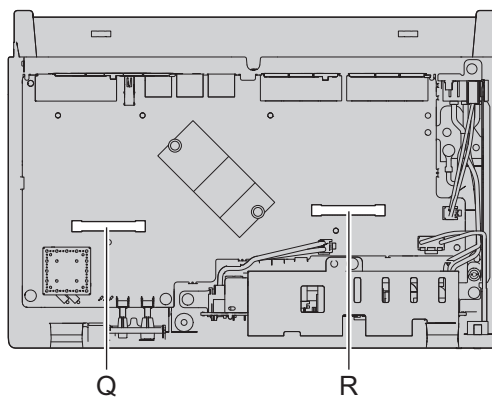
3.2.2 Names and Locations



- A STATUS Indicator
- B Initialize Switch
- C WPS Switch
- 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 Extension Card Slot
- R Trunk/Doorphone Card Slot
- S Hook Clip

Inside View (The front cover is open.)



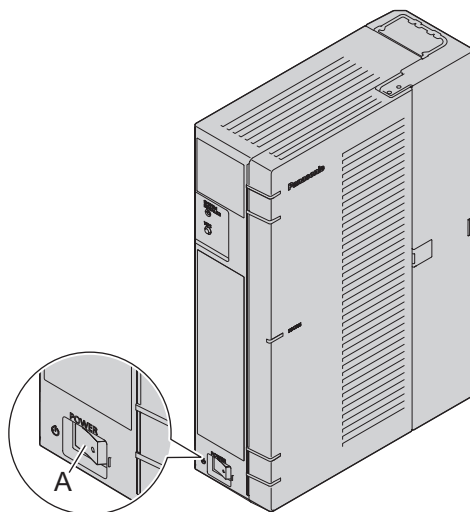
3.2.3 Opening/Closing the front cover

Opening the front cover

CAUTION

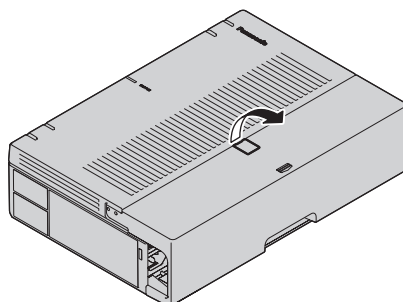
Before opening the front cover, the AC power cord must be removed from the AC inlet. Do not open the front cover soon after turning off the power. There is a risk of receiving burns.

1. Confirm that the power switch is turned off.

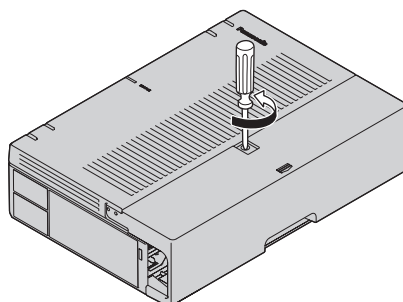


3.2.3 Opening/Closing the front cover

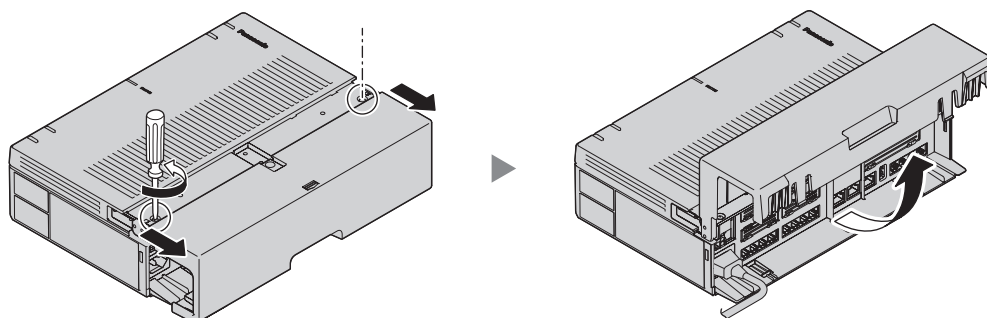
A Power Switch



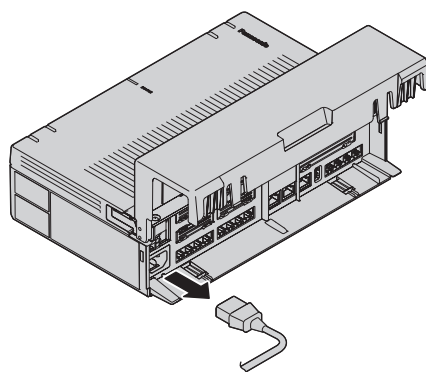
2. Turn the screws anticlockwise to loosen them.



3. Slide out the cable cover and turn the screws anticlockwise to loosen them.



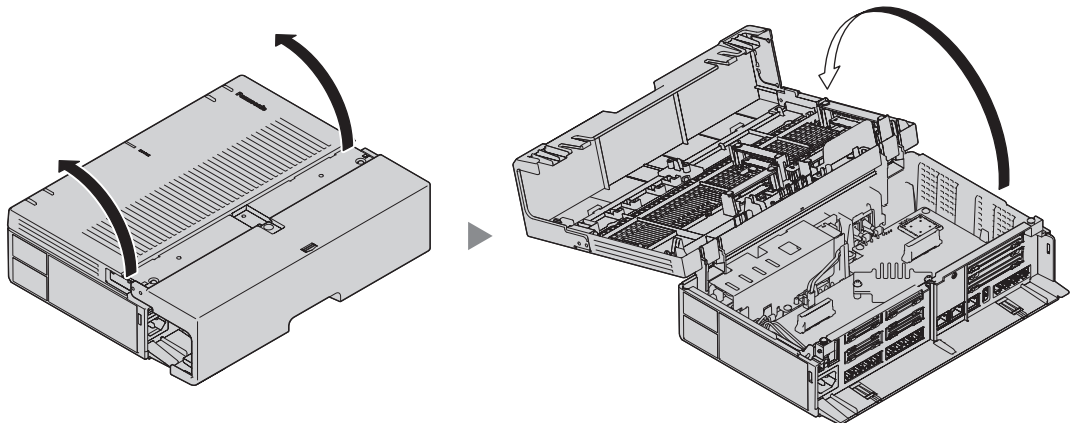
4. Disconnect the power cable.



Note

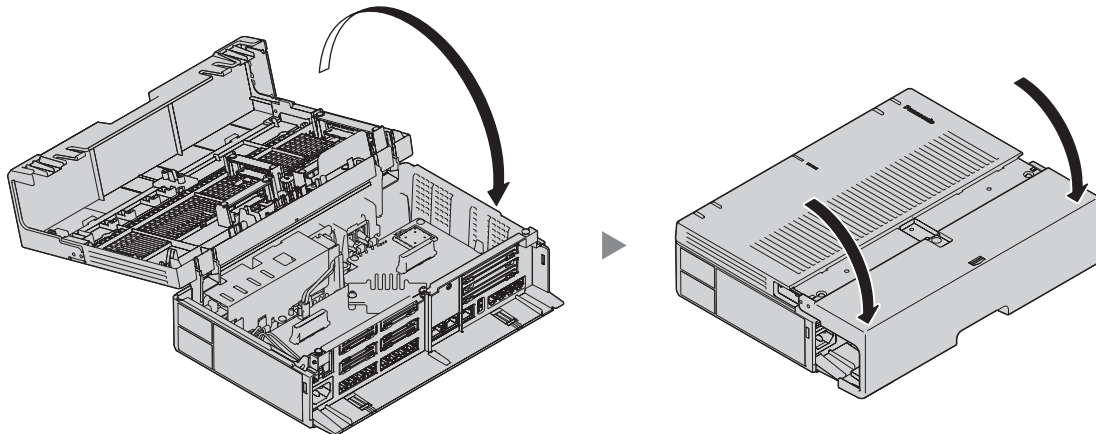
In order to turn off the PBX's power, a system shutdown using Web Maintenance Console must first be performed. For details, refer to "5.4 System Control—System Shutdown" in the Programming Item List.

5. Open the front cover.

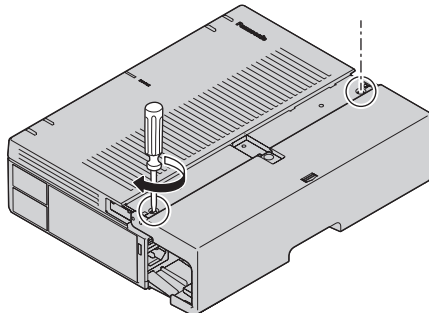


Closing the front cover

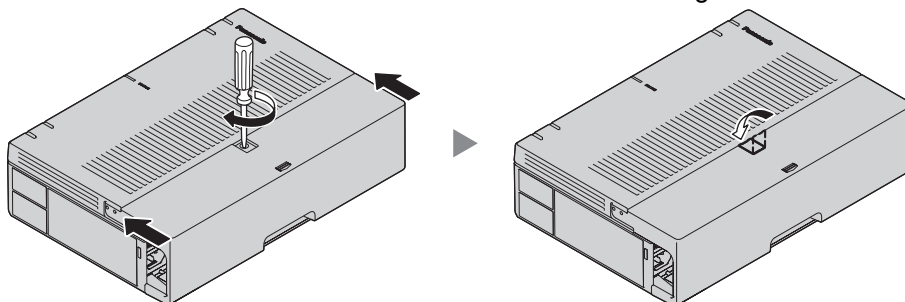
1. Close the front cover.



2. Turn the screws clockwise to tighten them.



3. Slide in the cable cover and turn the screws clockwise to tighten them.



CAUTION

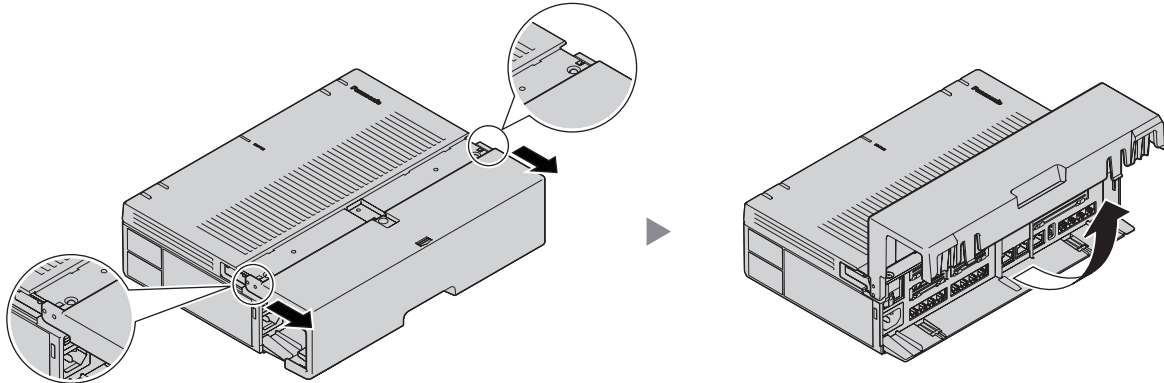
For safety reasons, fix the front cover and cable cover of the PBX with screws.

3.2.3.1 Removing/Attaching the Cable Cover

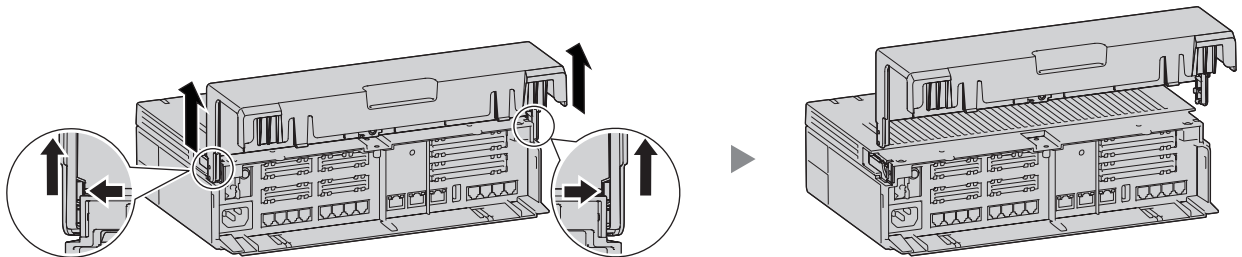
If you prefer, you can remove the cable cover.

Removing the Cable Cover

1. Slide out the cable cover and open it.

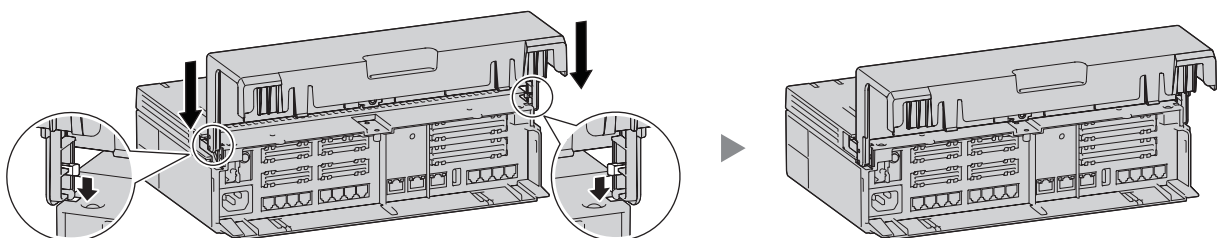


2. Holding the cable cover open at about a 90 angle, remove the front cover by pushing it in the direction of the arrow as shown below.



Attaching the Cable Cover

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



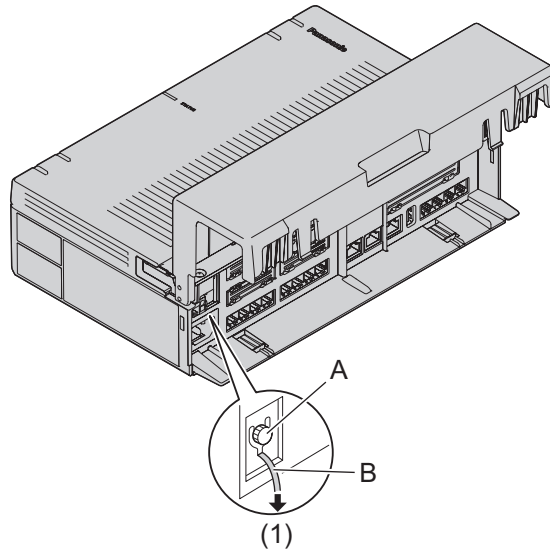
CAUTION

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

3.2.4 Frame Earth Connection

1. Loosen the screw.
2. Insert an earthing wire (user-supplied).
3. Tighten the screw.

4. Connect the earthing wire to earth.



(1) To earth

A Screw

B Earthing wire

WARNING

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

CAUTION

For earthing wire, green-and-yellow insulation is required, and the cross-sectional area of the conductor must be more than 0.75 mm² or 18 AWG.

Note

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 earthing 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.
- 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.

Notice

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

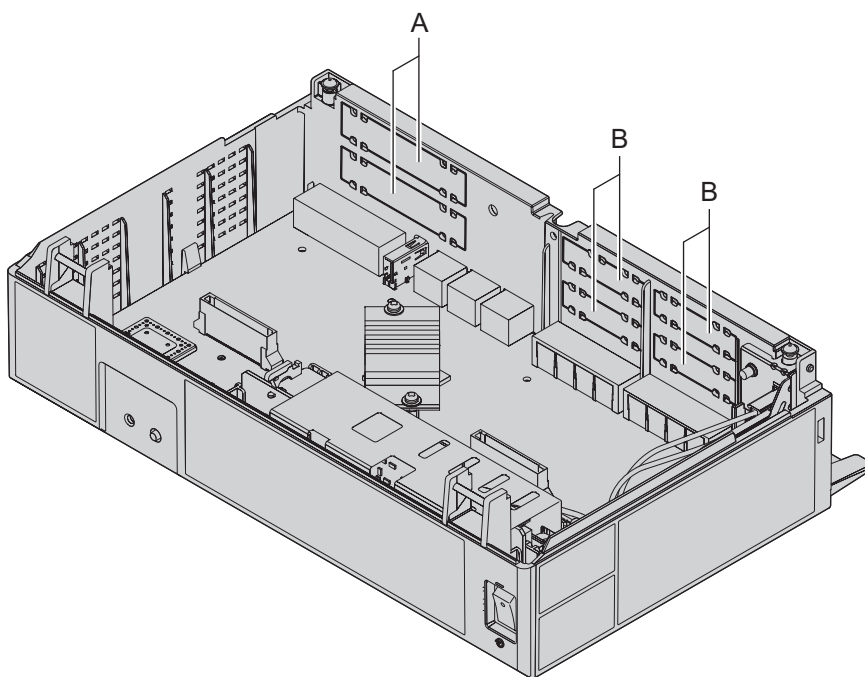
Installing an Optional Service Card in the Free Slots

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.

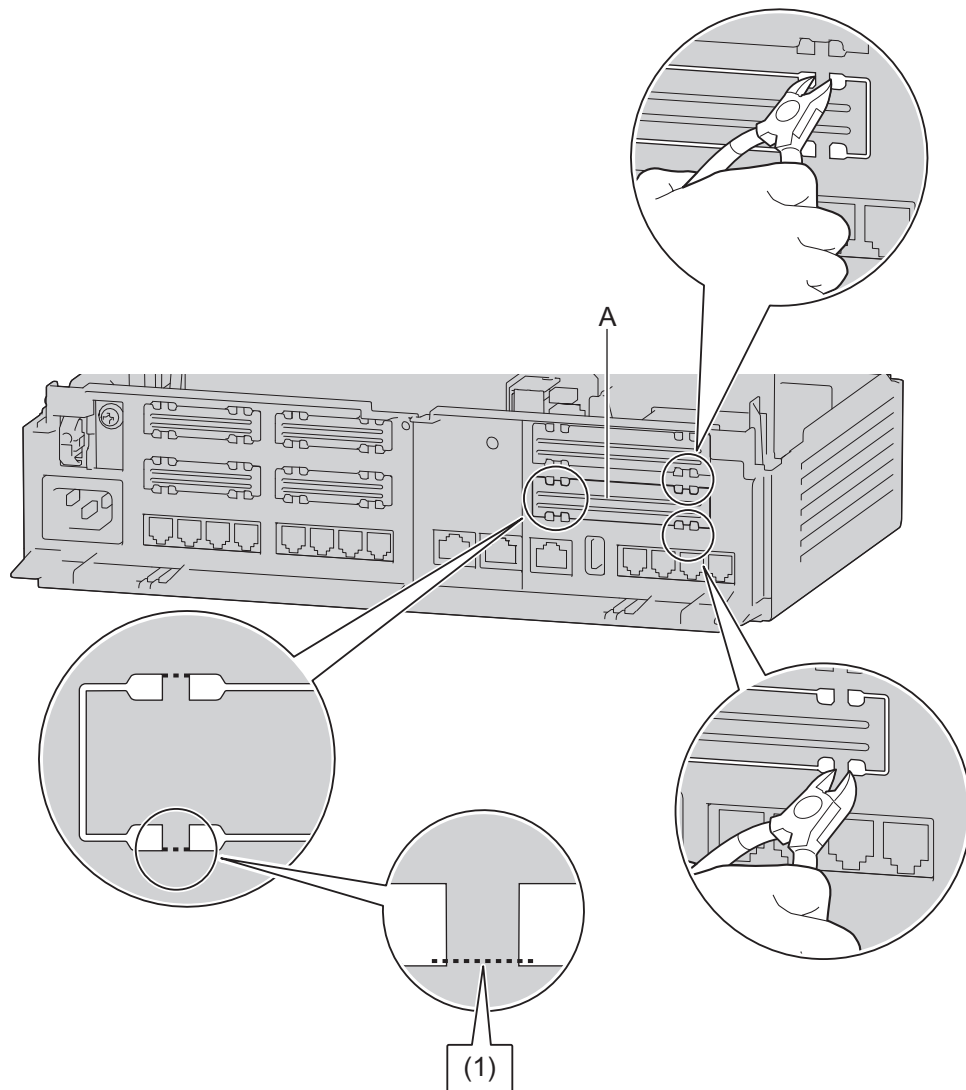
For details, refer to the description of each optional service card in "3.3.2 LCOT4 Card (KX-HT82480)", "3.3.3 SLC8 Card (KX-HT82470)" and "3.3.4 DPH2 Card (KX-HT82460)".



A Trunk/Doorphone Card Slots

B Extension Card Slots

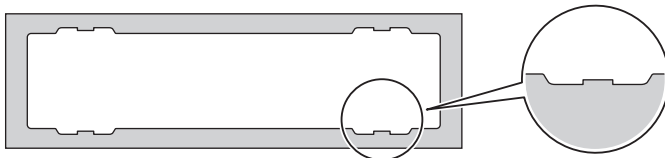
1. Remove the dummy cover plate for the Free slot.
Cut off any excess plastic in order to make the surface smooth.



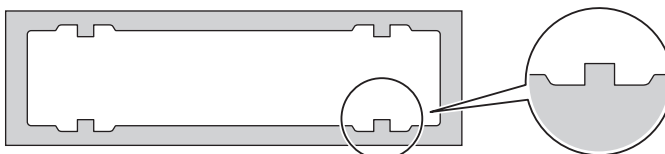
A Dummy Cover Plate

(1) Cut here.

Correct



Incorrect

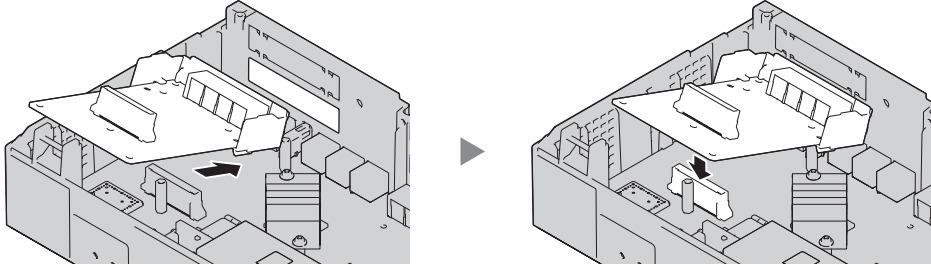


Note

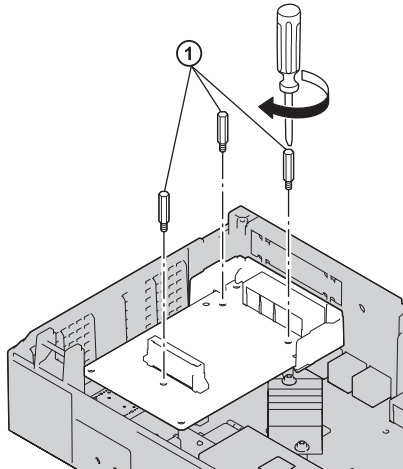
When removing the dummy cover plate, use plastic nippers. We do not recommend using a knife such as a retractable utility knife.

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

When using an LCOT4 card with a DPH2 card, install the LCOT4 card in the bottom.

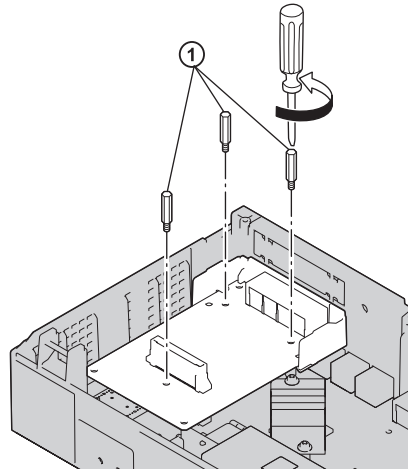
4. Connect cables to appropriate ports of the card. For details about pin assignments, refer to the appropriate section in "3.5 Connecting Extensions" and "3.6 Connecting Doorphones and Door Openers".

Note

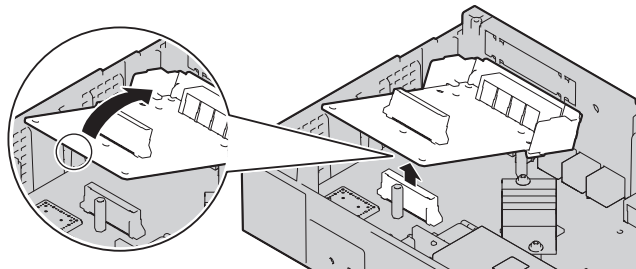
Make sure to connect cables after installing the card in the PBX, not before.

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.

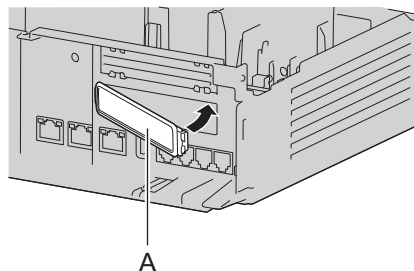


3.2.5.1 Slot covers

Only remove the dummy cover plates when you are planning to install an optional service card. If you do not install an optional service card, insert a slot cover included with the option service card, as shown in the following procedure.

To insert a slot cover

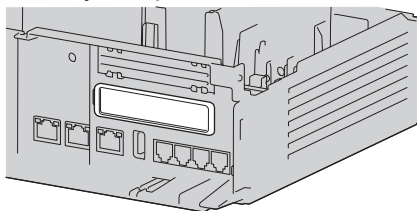
1. With the clip-side of the slot cover on the left, insert the right edge of the cover in the slot.



A Slot cover

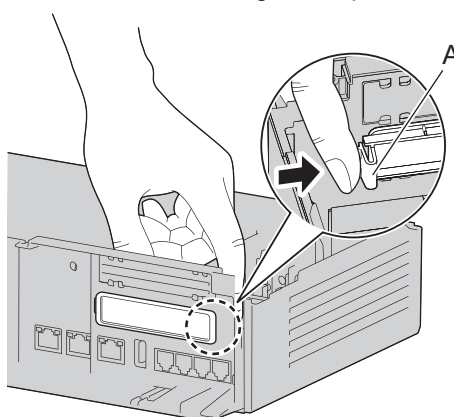
3.2.6 Securing the Cables

2. Push the left edge in until it clicks securely into place.



To remove a slot cover

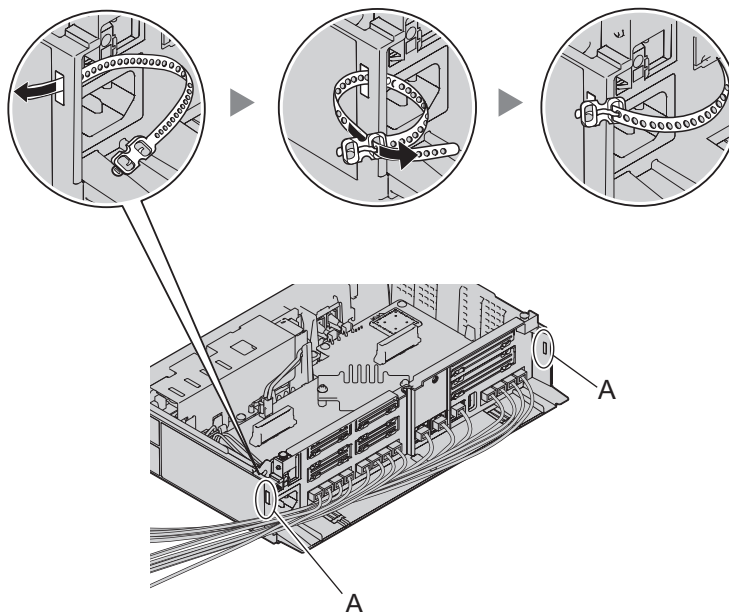
1. Remove the front cover.
Refer to "Opening the front cover" in "3.2.3 Opening/Closing the front cover".
2. From the inside, push the tab of the slot cover to the right and push out the left edge of the slot cover.



A Tab

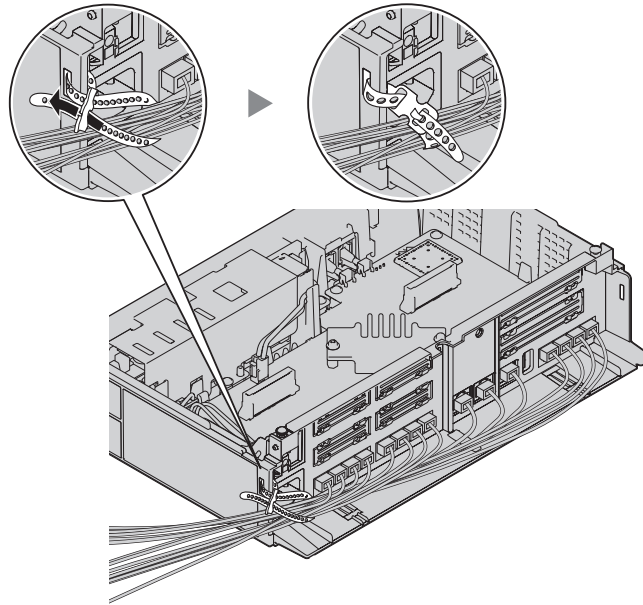
3.2.6 Securing the Cables

1. Pass the included strap through either of the 2 slits for securing cables according to your needs.

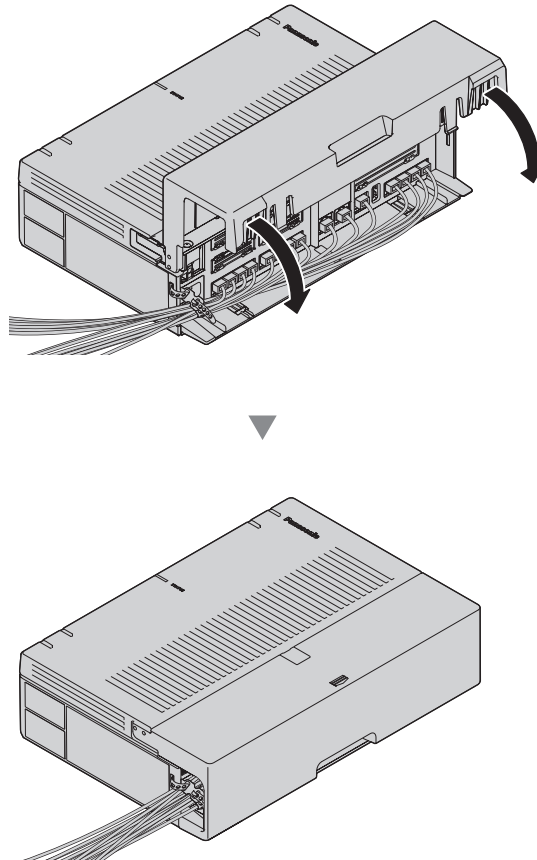


A Slit

2. Bind the cables as shown.



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

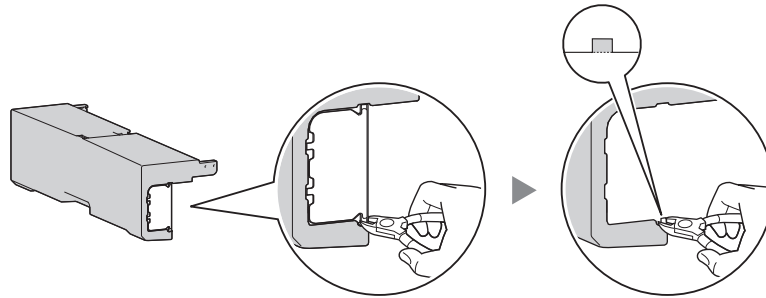


Note

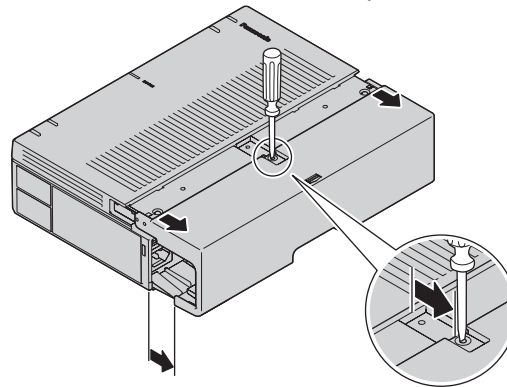
- For safety reasons, do not stretch, bend, or pinch the cables.

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.



- 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

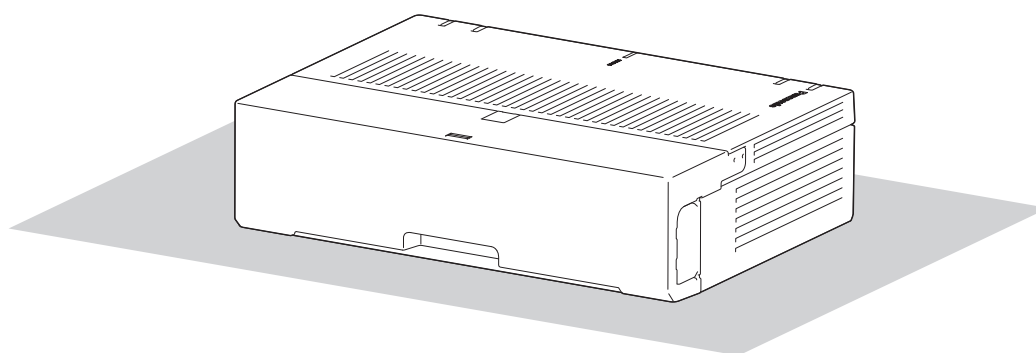
When placing the PBX on a desktop, make sure to follow these instructions.

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.



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 earthing (connection to earth) is very important to reduce the risk to the user of electrocution or to protect the PBX from the bad effects of external noise in the case of a lightning strike. (See "3.2.4 Frame Earth 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

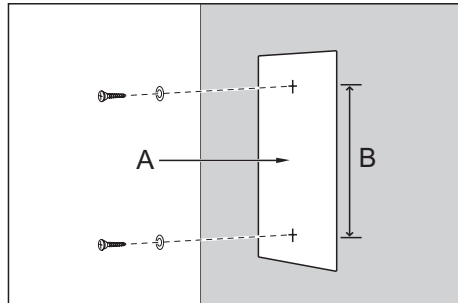
Drive mounting screws into the wall. Be careful to avoid touching any metals laths, wire laths or metal plates in the wall.

Mounting on a Wooden Wall

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

3.2.8 Wall Mounting

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

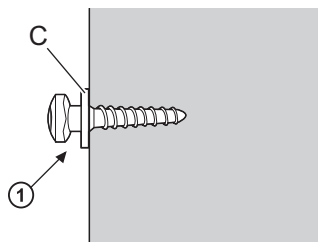


- A Template
B 225 mm (8-7 / 8 in)

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.

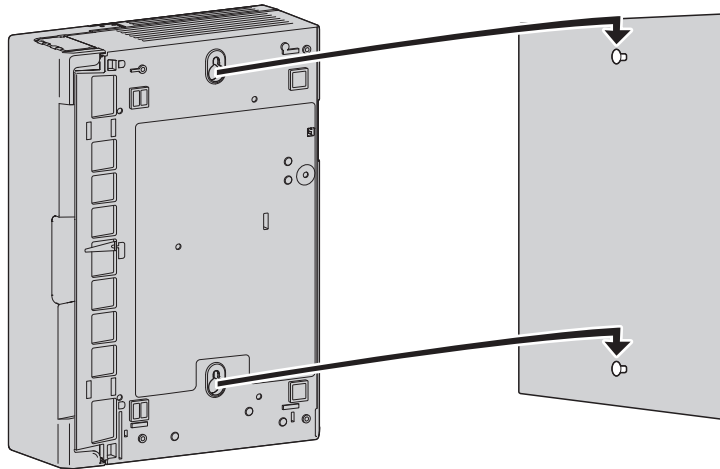


- C Washer
■ Drive the screw to this point.

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.

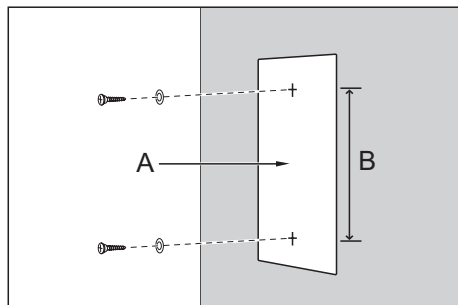
- Hook the main unit on the screw heads.



Mounting on a Concrete

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

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

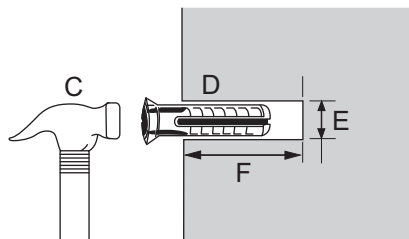


- A Template
- B 225 mm (8-7 / 8 in)

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.

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

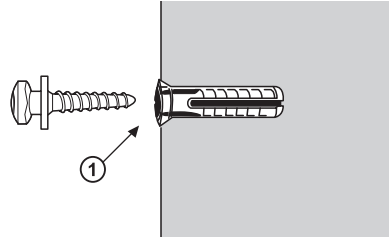


- C Hammer
- D Anchor Plug
- E 6.4 mm (1/4 in)

3.2.9 Surge Protector Installation

F 29 mm (1-9 / 64 in)

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

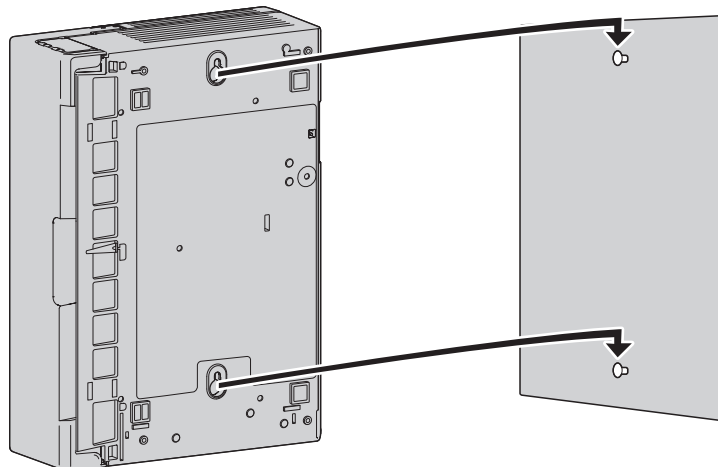


■ Drive the screw to this point.

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.

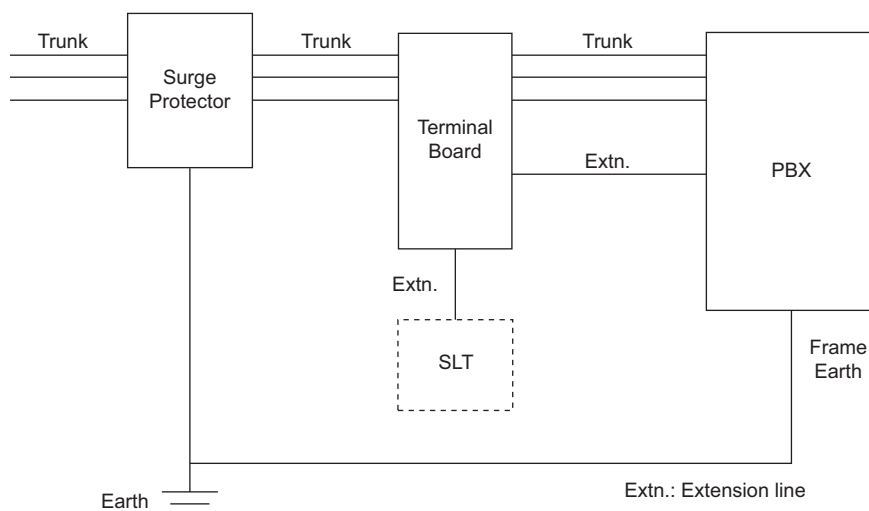
To protect the system from electrical surges, we strongly recommend connecting the system to a surge protector that meets the following specifications:

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

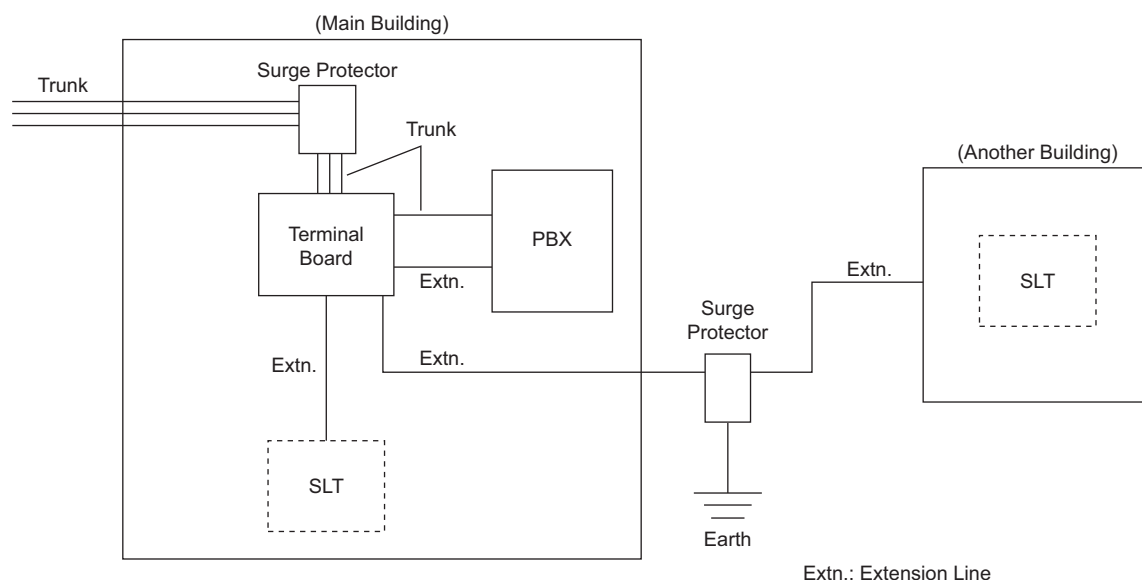
Additionally, proper earthing is very important for the protection of the system (refer to "3.2.4 Frame Earth Connection").

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

Installation



Outside Installation



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

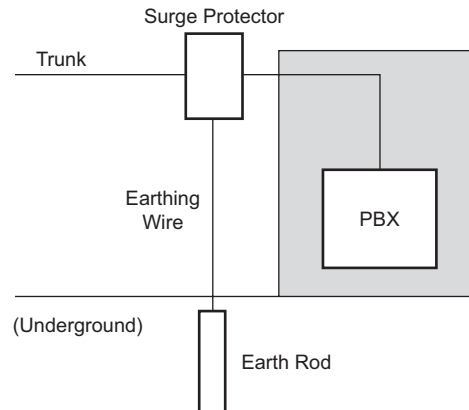
- a. Install the extension wire underground.
- b. Use a conduit to protect the wire.

3.2.10 Backup Battery Connection

Note

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

Installation of an Earth Rod



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

Note

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

3.2.10 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 PSU.

Notice

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

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

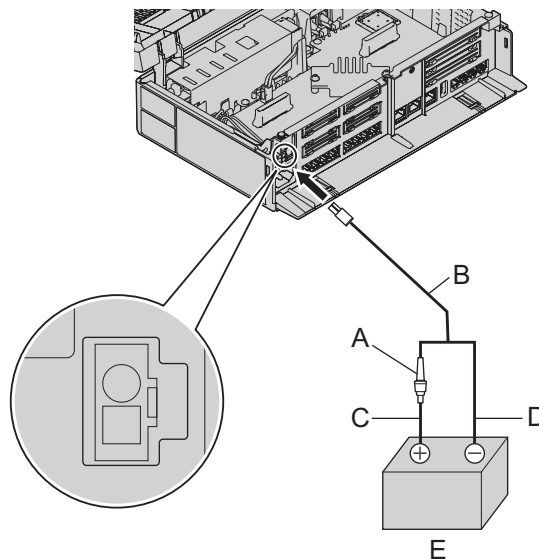
Examples

Battery Capacity	Backup Power Supply Duration ^{*1}
28Ah	16 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 analogue trunks combined)
- Support for up to 24 extensions (SIP extensions and analogue extensions combined)

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

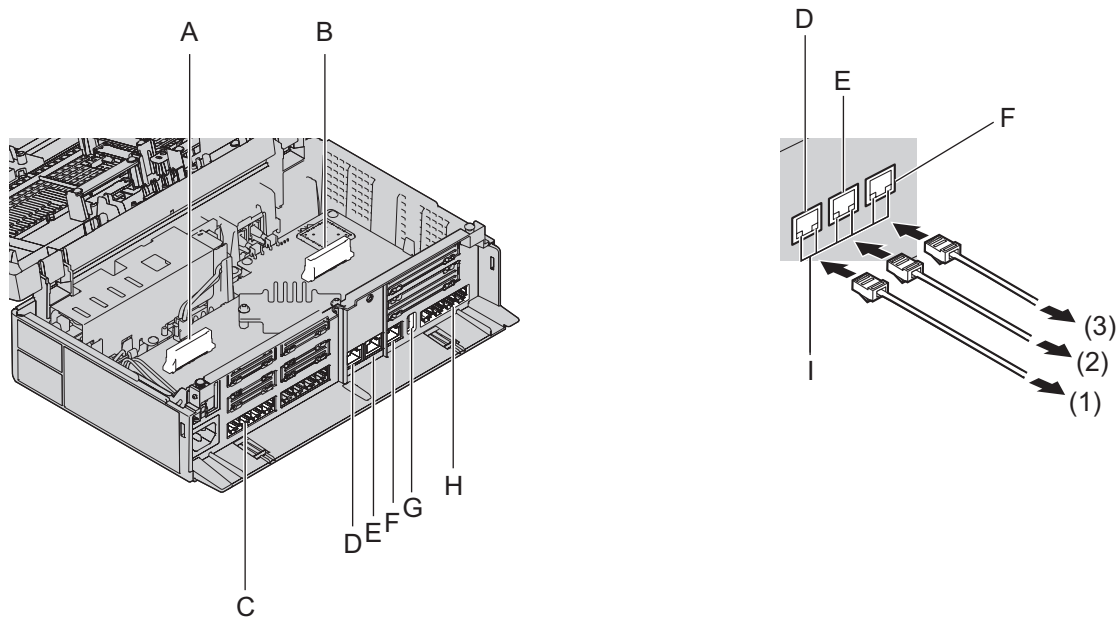
- LAN connection
- Wireless network connection

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

- WAN connection

Mountable Cards

- 4-Port Analogue 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
- B Trunk/Doorphone Free Slot
- C SLT8 Interface
- D LAN1 port
- E LAN2 / WAN2 port
- F WAN1 port
- G USB Port

H CO4 Interface

I LEDs

(1) To LAN

(2) To LAN/WAN

(3) To WAN

Note

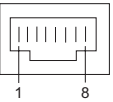
- The maximum length of the CAT 5/CAT 5e cables to be connected to the mother board is 100 m(328 ft).
- For details about connecting to a LAN, refer to "3.12 LAN Connection".

WARNING

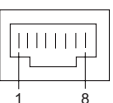
A lithium battery is used in the mother board. There is a risk of explosion if the battery is replaced with the incorrect type. Dispose of used batteries according to the manufacturer's instructions.

Pin Assignments

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+
	4-5	Reserved	-	-
	6	TPI-	I	Receive data-
	7-8	Reserved	-	-

LAN Port/WAN Port (1000BASE-T)

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

LED Indications

Indication	Colour	Description
STATUS	Green	PBX status indication

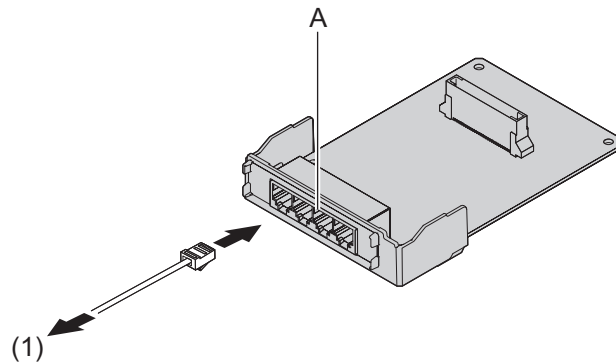
3.3.1 Mother Board

Indication	Colour		Description	
			• OFF: Power Off • ON: Power On and running • Flashing (60/minute): Starting up/Logging in • Flashing (120/minute): Software is updating • Flashing (240/minute): During initialisation • Flashing (240/minute): Wi-Fi Protected Setup (WPS) in progress	
	Amber		PBX status indication • Flashing (60/minute): Shutting down • Flashing (240/minute): Initialize switch pressed	
	Red		PBX status indication • ON: Alarm The cause may be one of the following: – Alarm for an optional service card. • Flashing (240/minute): Initialise failed	
Indication			Colour	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 analogue trunk ports with Caller ID (FSK/FSK with Call Waiting Caller ID [Visual Caller ID]/DTMF).



A RJ11

(1) To trunk

Accessories and User-supplied Items

Accessories (included): Spacer x 3, slot cover x 1

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

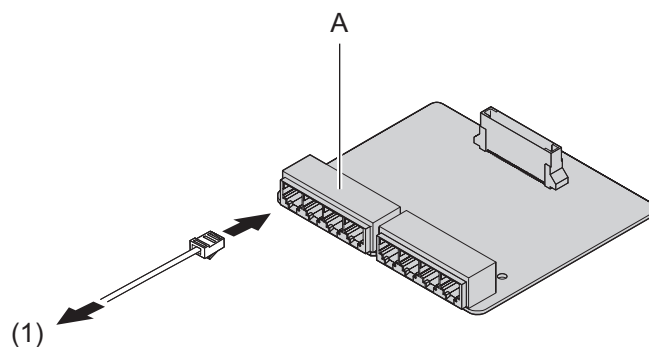
Note

- 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".

3.3.3 SLC8 Card (KX-HT82470)

Function

8-port extension card for SLTs with Caller ID (FSK), Message Waiting Lamp control.



A RJ11

(1) To Extension

Accessories and User-supplied Items

Accessories (included): Spacer x 3, slot cover x 1

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

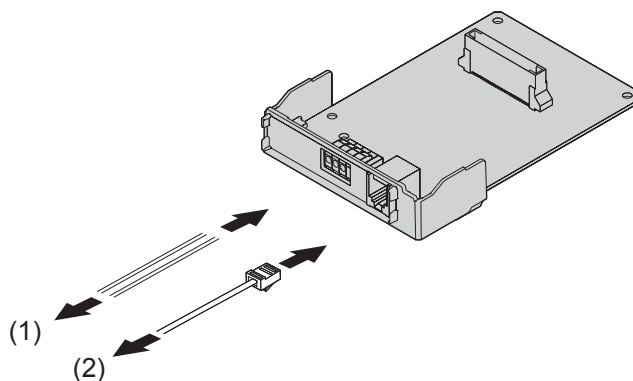
Note

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

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, slot cover x 1

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

Note

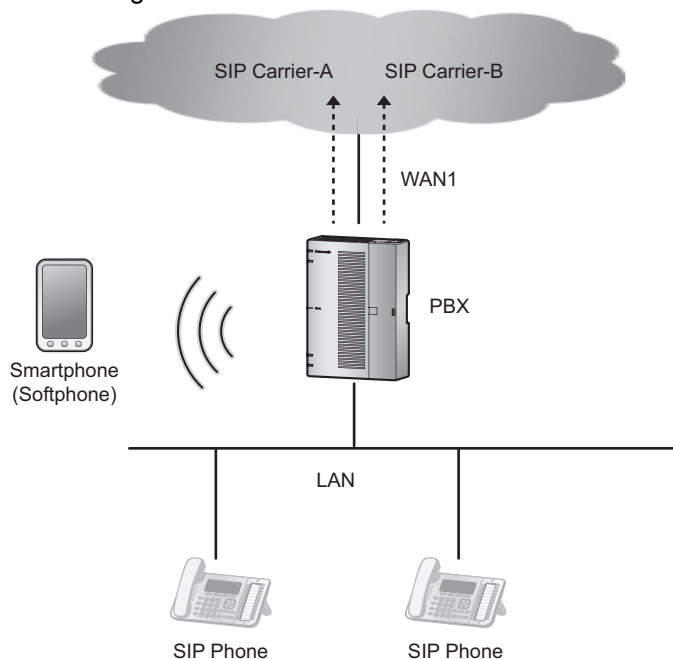
For details about connecting to a doorphone and/or door opener, refer to "3.6 Connecting Doorphones and Door Openers".

3.4 Connecting Outside Trunks

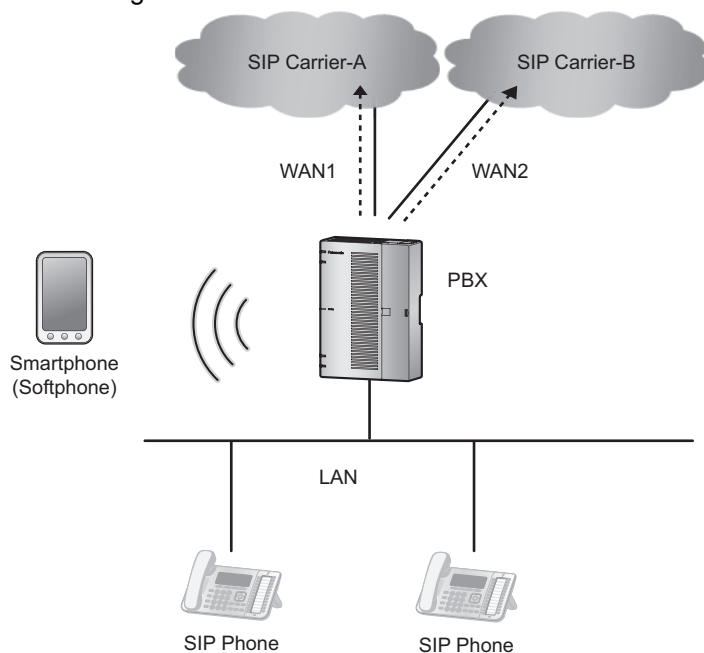
3.4.1 Connecting SIP Trunks

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

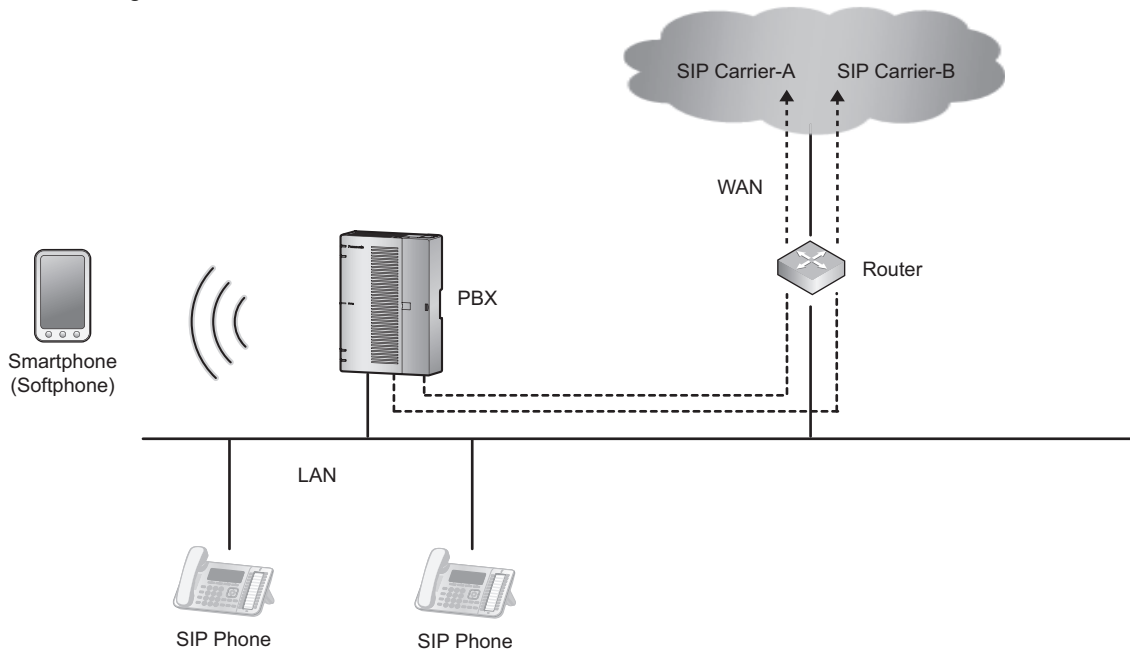


2. Connecting via both WAN1 and WAN2

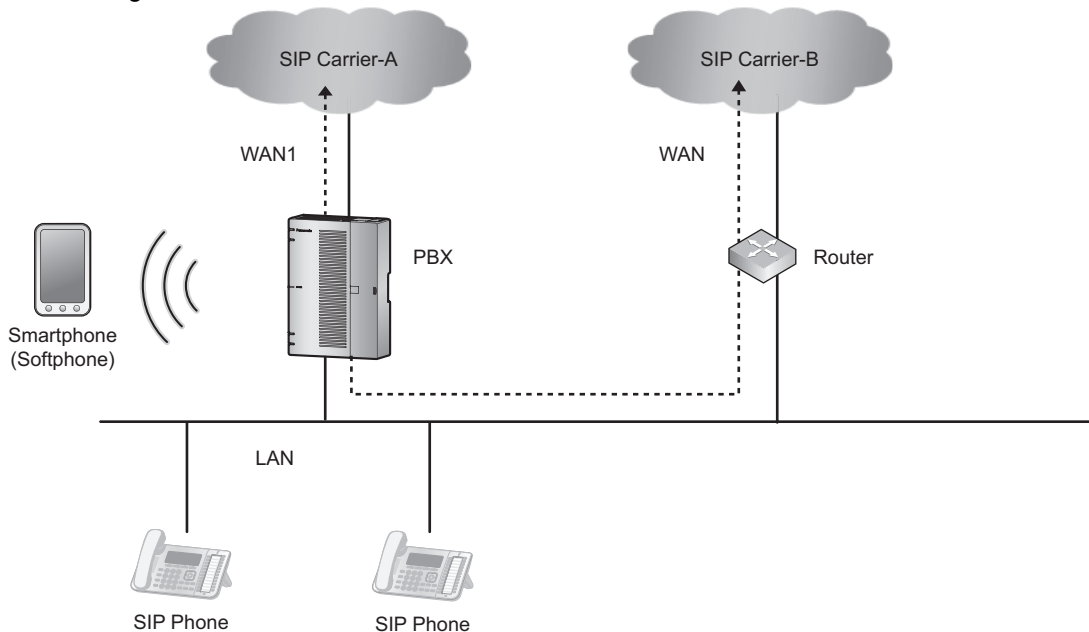


3.4.1 Connecting SIP Trunks

3. Connecting via an external router



4. Connecting via both WAN1 and an external router



Note

- Up to 2 SIP carriers can be connected to simultaneously.
- Trunks ports 1 through 8 can be allocated to SIP carriers.
- Each trunk port can be set to a SIP carrier or an analogue 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.

3.4.2 Connecting Analogue 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 analogue line.

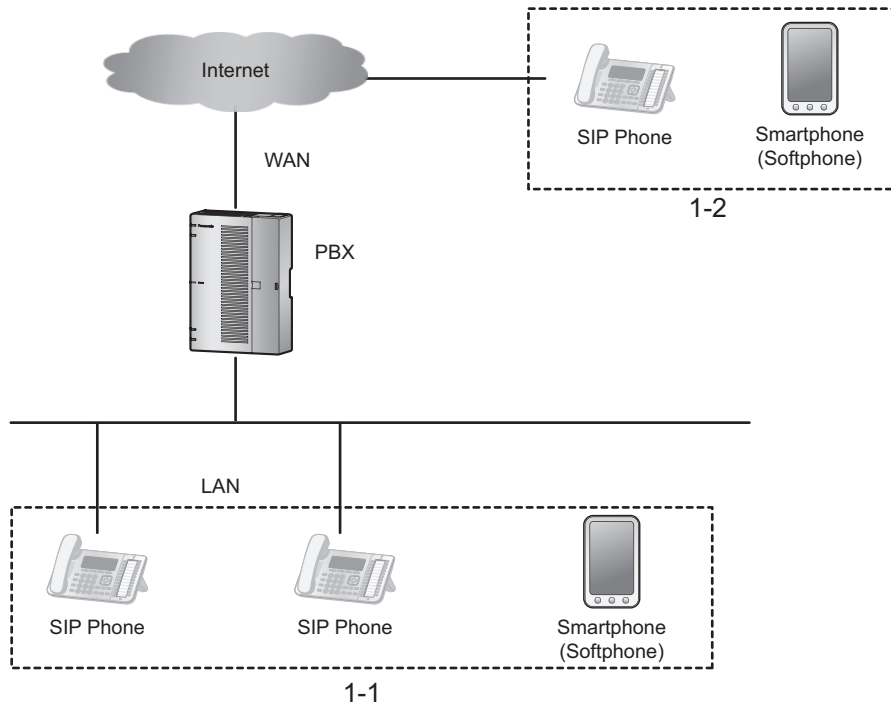
3.5 Connecting Extensions

3.5.1 Connecting SIP Extensions

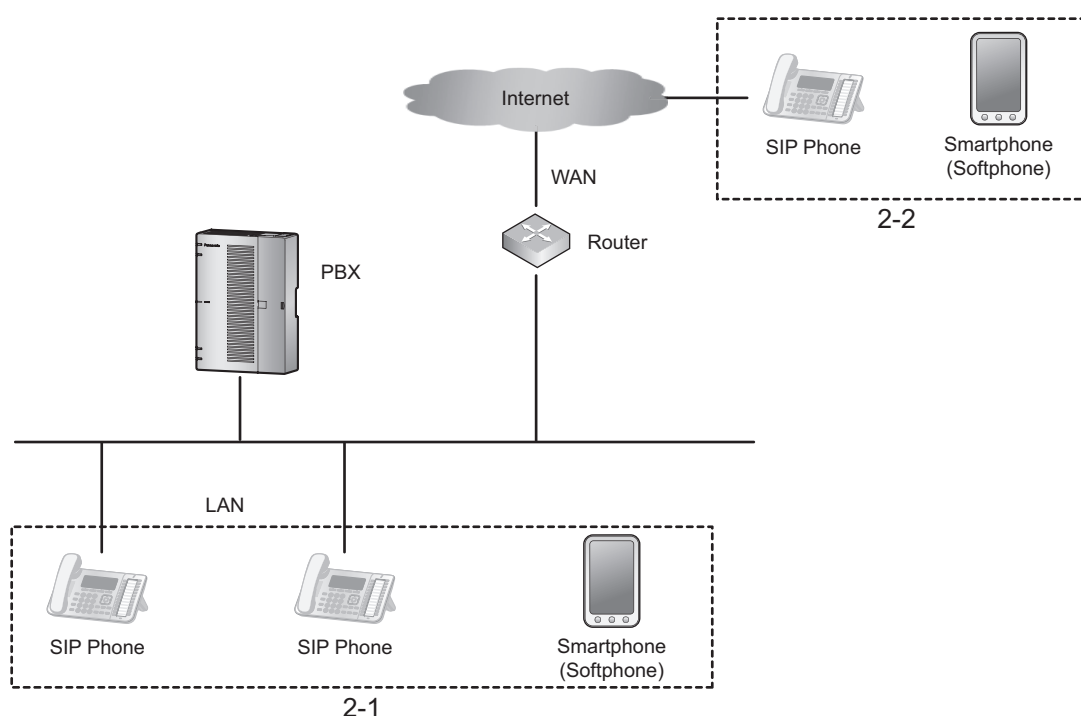
A typical connection example for SIP extensions is shown below.

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

1. Setting IP addresses of SIP phone (automatic setting by DHCP)
2. Setting the IP address and port of the connection destination main unit (automatic setting by DHCP Option 66)
3. Acquisition of SIP phone configuration data (distributed by main unit via HTTP)
4. SIP registration to main unit (using SIP authentication data written in the configuration data)
5. Firmware update functions
 - a. To connect to the Internet via the internal router
 - 1-1: LAN connection of internal router
 - 1-2: Connection via WAN of internal router



- b. To connect to the Internet via an external router
 - 2-1: LAN connection of external router
 - 2-2: Connection via WAN of external router



For Panasonic SIP devices (for compatible models, see Panasonic Web site)

Relationships between registration (provisioning), firmware updates, and the installation environment are shown below. Note that each SIP phone extension can be set for whether or not to accept connections from outside networks.

	Function	1-1	1-2	2-1	2-2
1	Setting IP addresses to SIP phones	Automatic (DHCP)	Automatic or manual (Depends on environment)	Automatic or manual (Depends on environment)	Automatic or manual (Depends on environment)
2	IP address and port settings for connection destination main unit	Automatic (DHCP Option 66)	N/A	Manual (Phone's web settings)	N/A
3	Acquisition of SIP phone configuration data	Automatic (SIP/HTTP)	N/A	Automatic (SIP/HTTP)	N/A
4	SIP registration to main unit	Automatic (SIP)	Manual ^{*1} *2 (SIP)	Automatic (SIP)	Manual ^{*1} *3 (SIP)
5	Firmware update	Automatic (SIP/HTTP)	N/A	Automatic (SIP/HTTP)	N/A

*1 For general SIP phones, the SIP server address and port settings of the HTS824 are required.

*2 Port forwarding settings for the SIP ports of the HTS824 internal router are required.

*3 Port forwarding settings for the SIP ports of the external router are required.

For non-Panasonic SIP devices

The relationships of the setting environment are shown below.

	Function	1-1	1-2	2-1	2-2
1	Setting IP addresses to SIP phones	Automatic (DHCP)	Automatic or manual	Automatic or manual	Automatic or manual

3.5.2 LAN Connections for IP Telephones

	Function	1-1	1-2	2-1	2-2
			(Depends on environment)	(Depends on environment)	(Depends on environment)
2	IP address and port settings for connection destination main unit	N/A	N/A	N/A	N/A
3	Acquisition of SIP phone configuration data	N/A	N/A	N/A	N/A
4	SIP registration to main unit	Manual ^{*1} (SIP)	Manual ^{*1 *2} (SIP)	Manual ^{*1} (SIP)	Manual ^{*1*3} (SIP)
5	Firmware update	N/A	N/A	N/A	N/A

^{*1} For general SIP phones, the SIP server address and port settings of the HTS824 are required.

^{*2} Port forwarding settings for the SIP ports of the HTS824 internal router are required.

^{*3} Port forwarding settings for the SIP ports of the external router are required.

3.5.2 LAN Connections for IP Telephones

When an IP telephone 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 IP telephone before it can be used.

Connecting an IP Telephone to a Switching Hub

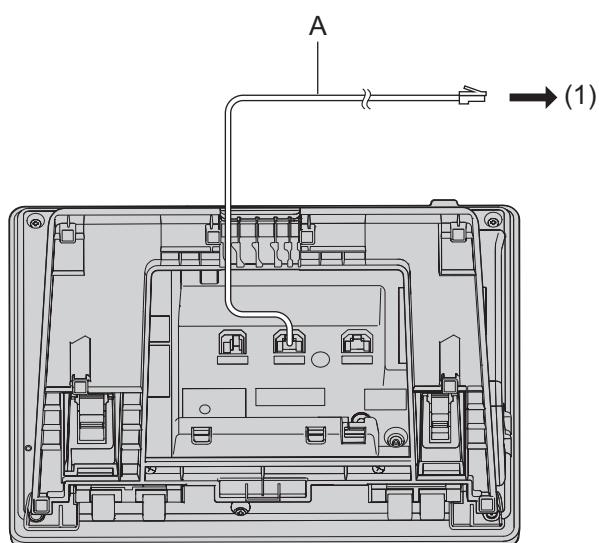
When connecting an IP telephone to the LAN, connect it to a switching hub.

Note

- Use an Ethernet straight cable with an RJ45 connector to connect the IP telephone 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 IP telephone is connected to must be set to "Trunk" port, to allow VLAN tagging. Consult your network administrator for details.
- Since an IP softphone is installed and operates on a PC, the PC must be connected to the LAN to use the IP softphone on the network.

The diagram below is for connecting an P-SIP 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

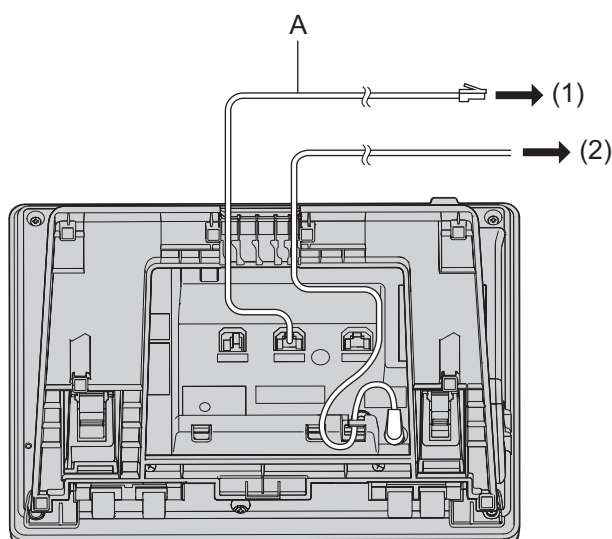
Connecting an AC Adaptor to an IP Telephone

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

Note

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

Example: KX-HDV230



A Ethernet Straight Cable

(1) To a Switching Hub

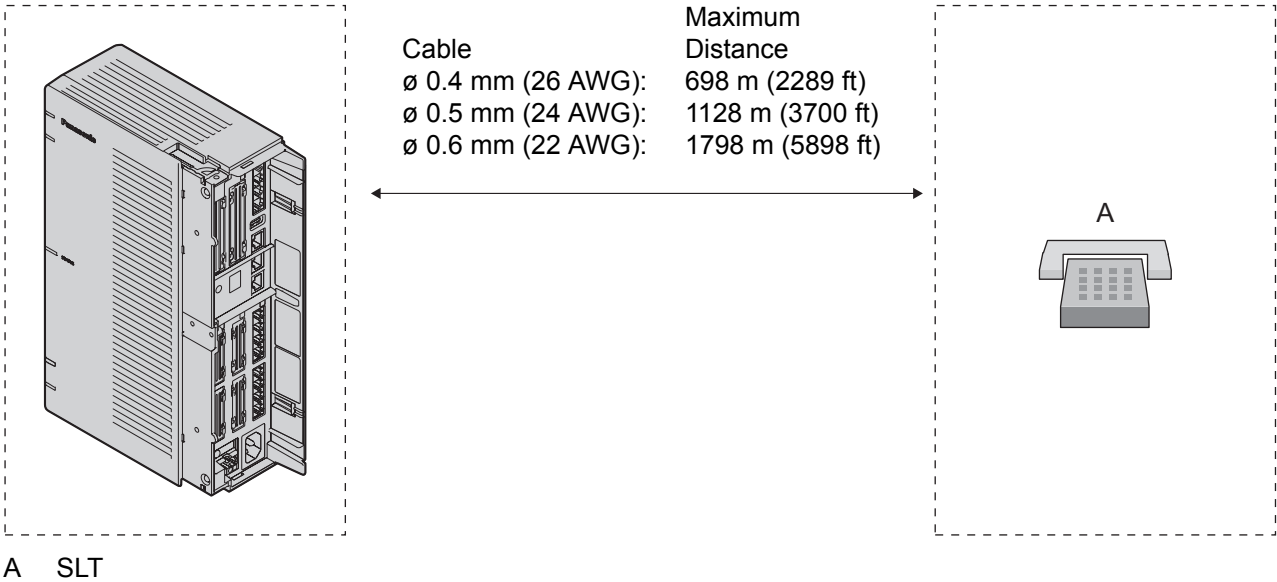
(2) To Wall Socket

Connecting a PC to an IP Telephone

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

- Note**
- Use an Ethernet straight cable with an RJ45 connector to connect a PC to the IP telephone. 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 IP telephone. Other IP telephones 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 IP telephone connection to the PBX is disconnected or reset, LAN communication to the PC will also be disrupted.

3.5.3 Connecting Analogue Extensions Maximum Cabling Distances of the Extension Wiring (Twisted Cable)



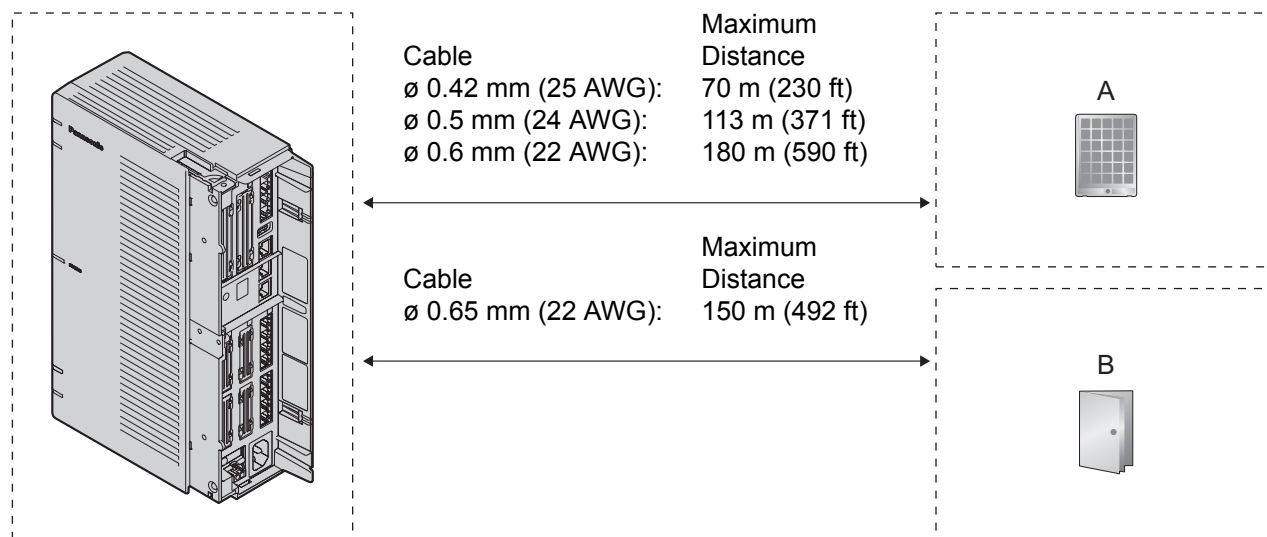
Notice

The maximum cabling distance may vary depending on the conditions.

3.6 Connecting Doorphones and Door Openers

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

Maximum Cabling Distance



A Doorphone

B Door Opener

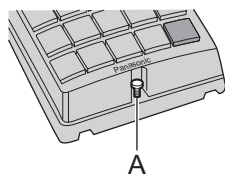
Door opener current limit: 30 V DC/30 V AC, 3 A maximum

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

Note

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

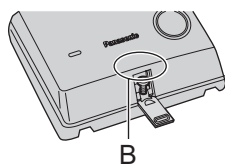
1. Loosen the screw to separate the doorphone into 2 halves.



A Screw

Note for KX-T7765 Users

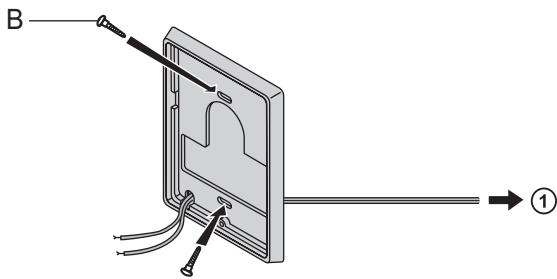
When loosening/tightening the screw, do not scratch the cabinet wall with the driver shaft.



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.

3.6 Connecting Doorphones and Door Openers



B Screw

■ To DPH2 Card

Note

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

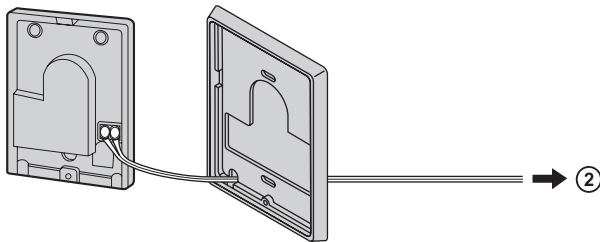


: when a doorphone plate has been fixed to the wall



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

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

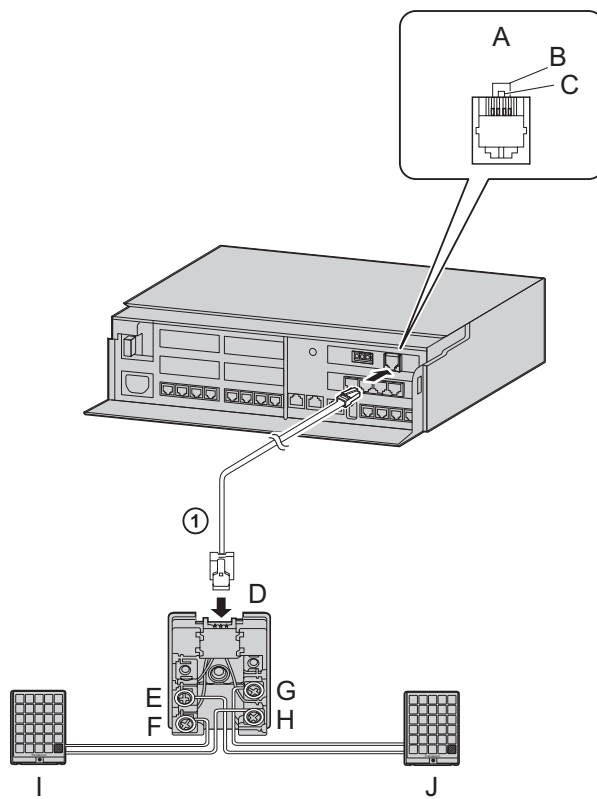


■ To DPH2 Card

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

Connecting Doorphones (KX-T30865/KX-T7765)

1. Connect the doorphone card to the terminal box using 4-conductor wiring and modular connectors.
2. Connect the wires of doorphone 1 to the red and green screws on the appropriate terminal box.
3. Connect the wires of doorphone 2 to the yellow and black screws on the appropriate terminal box.



A View of Doorphone Connector Jack

B Doorphone 2

C Doorphone 1

D Terminal Box

E Yellow

F Red

G Black

H Green

I Doorphone 1

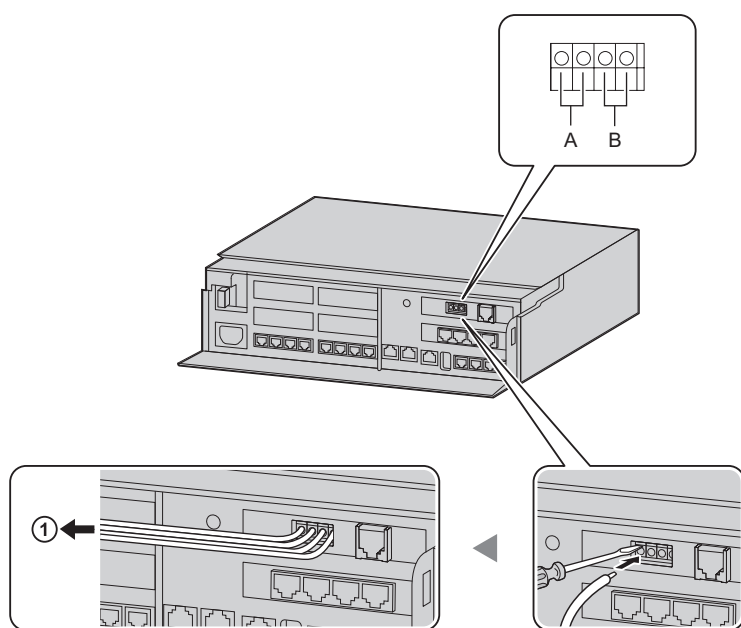
J Doorphone 2

■ 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.

3.6 Connecting Doorphones and Door Openers



A Door Opener 2

B Door Opener 1

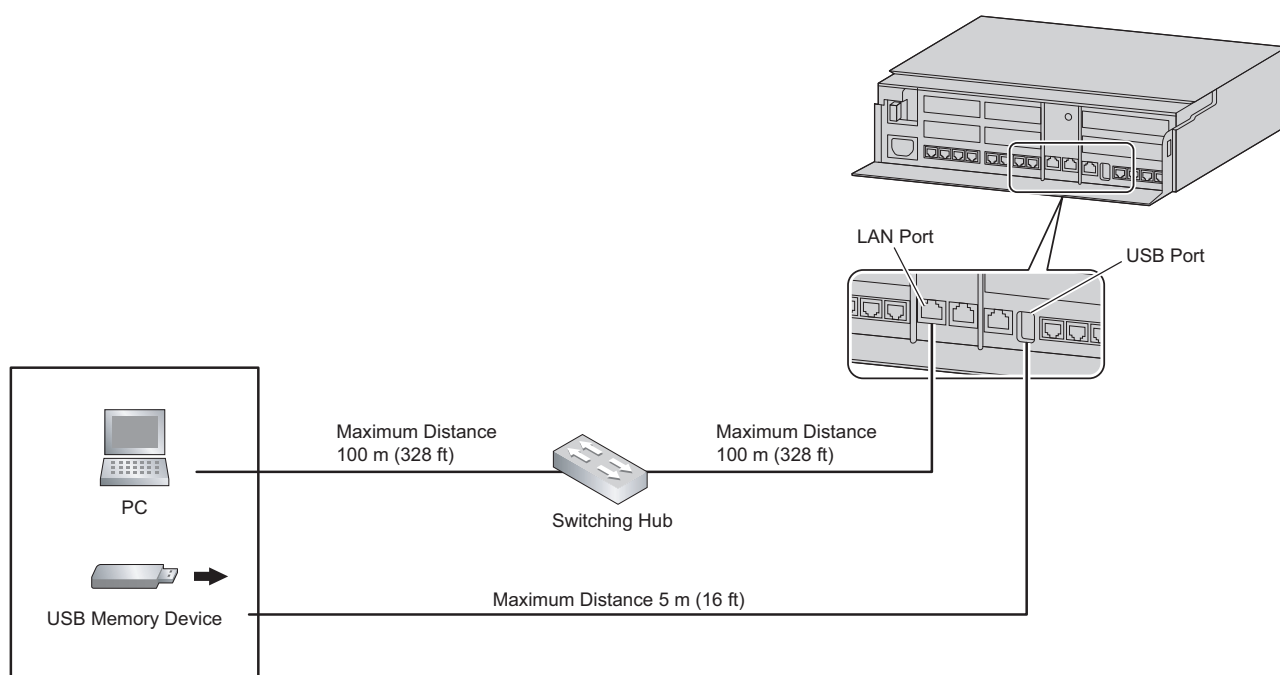
■ To the door openers

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



3.7.1 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 earthed, then securely connect the 3-pin AC plug including the earthed pin.

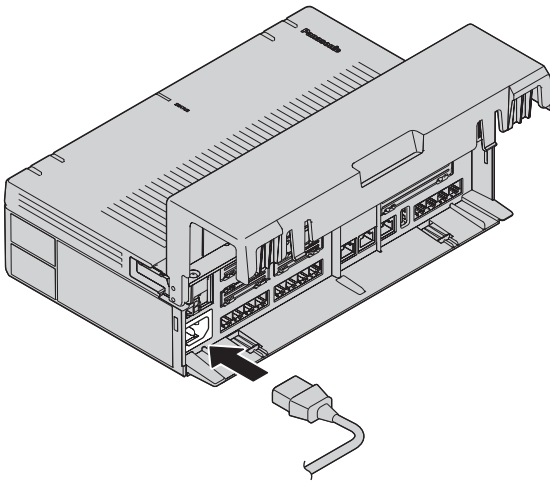
CAUTION

- 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 earthing 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 initialise it again as described in "System Initialisation 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 Initialisation Procedure

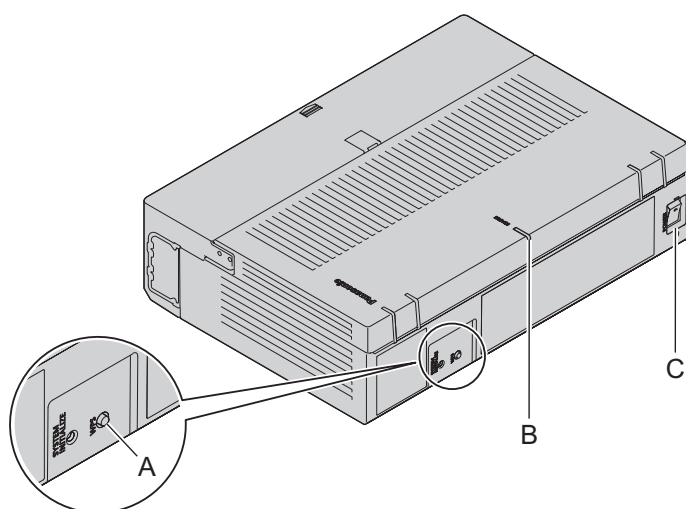
The system can be reset to its original default state by pressing the Initialize switch while turning the system power on.

The system initialisation startup operation is as follows.

- Turn on the system power and press and hold the Initialize switch (for 3 seconds).
 1. Initialize switch press and hold (3 seconds) recognised: Green (high-speed flashing at 120 flashes/minute)
 2. Initialize switch press and hold (3 seconds) confirmed: Amber (flashes 3 times)
 3. Initialise process and system startup process: Green (low-speed flashing at 60 flashes/minute)
- When system initialisation is complete, operation begins (green LED illuminated).

Performing a system initialisation returns the system data to its default settings.

The memory state is also cleared.



- A Initialize switch
- B STATUS Indicator
- C Power switch

Note

- After the PBX is initialised, 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 "Maintenance-[2-3]System Control-System Data Backup & Restore" in the Programming Item List."
- After the PBX is initialised, you must set up the mandatory settings required for the PBX with Easy Setup Wizard. For details refer to "Connecting to Web Maintenance Console" and "3.9.4.1 Easy Set-up Wizard".
- When a Backup Batteries is connected, make sure it is started as instructed in the documentation for the Backup Batteries.

Confirming the Trunk Connection

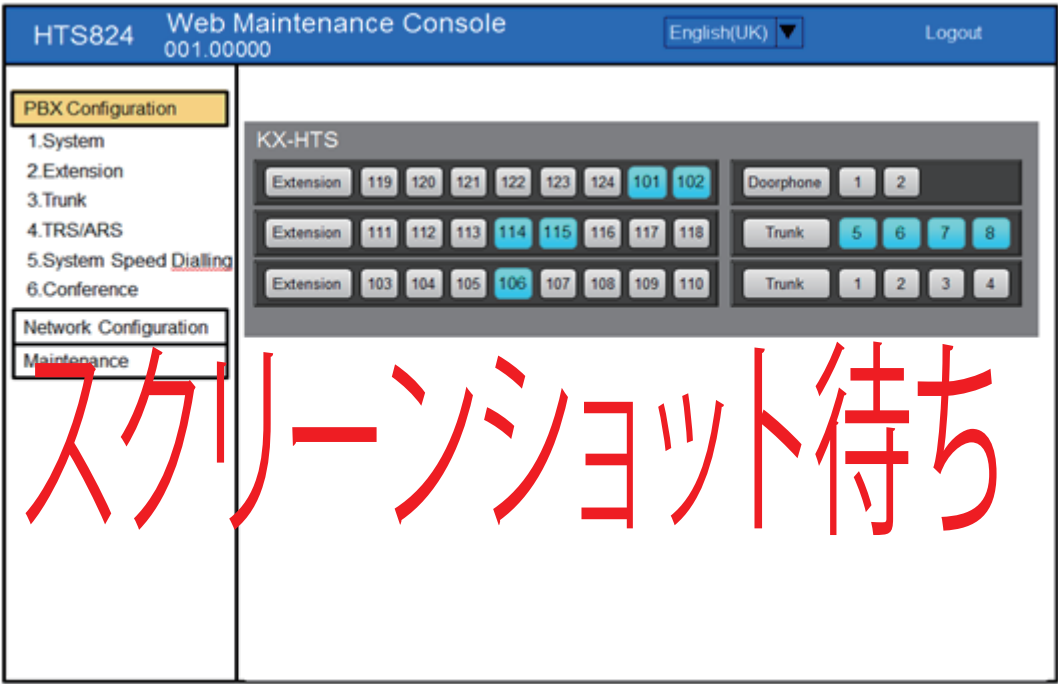
After the PBX starts up, programme the PBX and connect trunks to the PBX.

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

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 programme and control the PBX over an IP network using Web Maintenance Console. This section describes programming basic items using Web Maintenance Console.



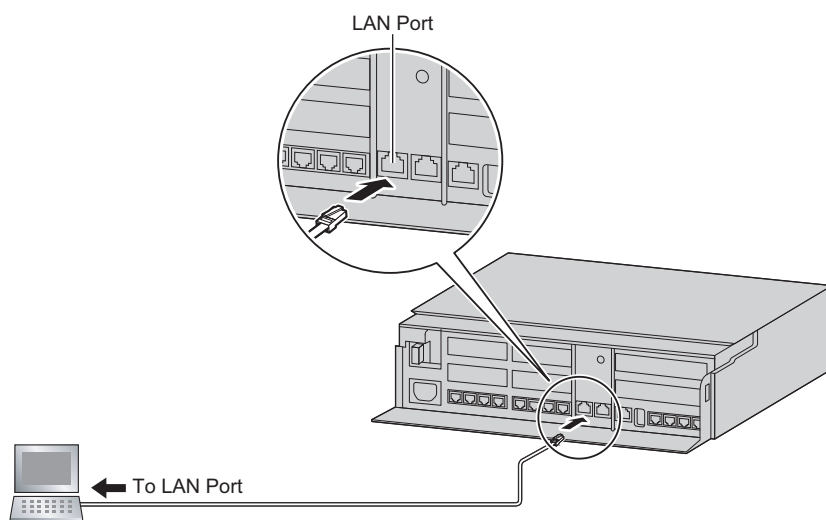
Note
The contents and design of the software are subject to change without notice.

3.9.2 PC Connection

The Main Unit has a LAN port for PC to programme 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

3.9.2.1 Direct Connection



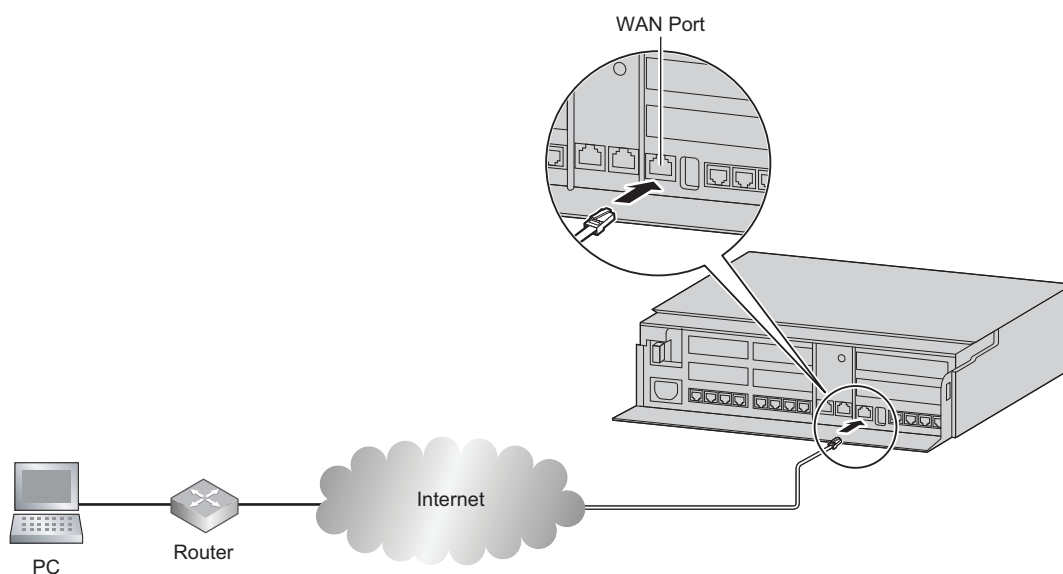
Notice

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.

Note

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

Connection via Internet



CAUTION

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.

Note

For details about connecting a switching hub 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 "3.9.3 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

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 of the PBX followed by the Web Maintenance Console port number 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, and the default Web Maintenance Console port number is 80. 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

Note

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

Internet Connection (TLS Connection):

When the PC is accessing the PBX from a connection over the internet, the use of TLS is strongly recommended. When using a TLS encrypted connection, the default port is 443. The format of the address to enter to connect to the PBX using a TLS encrypted 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 port number. The network router's port forwarding settings must be configured so that traffic arriving at port "yyy" is forwarded to the correct IP address and port of the PBX in the LAN.
- Port forwarding settings must specify the IP address and the port number of the network router ("xxx.xxx.xxx.xxx:yyy") to transfer the packets to the PBX in the LAN, so that the packets sent to the global IP address and specified port of the router will be transferred to the IP address and specified port of the PBX in the LAN.
- Note the usage of "https" instead of "http".
- If you connect to Web Maintenance Console using TLS, a security alert window is displayed. Follow the prompts to install a security certificate. The procedure may vary according to your browser.

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".

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 initialised, 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".

Set the following items in the setting screens.

1. 1. Web MC Language
2. Date & Time
3. Line Access/Operator No.
4. LAN Setting

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 "PBX Configuration-[1-1]System-Date & Time-◆Date & Time" in the Programming Item List.

- Automatic Time Adjustment
- Daylight Saving Adjustment
- Daylight Saving Time
- Time Zone

3.11 Network and Router Function

Following table describes networking functions and router functions. For details about data and time settings, refer to "2.1.1 PBX Configuration-[1-1]System-Date & Time" in the Programming Item List.

Functions		Description
WAN	Interface	10/100/1000 Mbps Ethernet
LAN (Wired)	Interface	10/100/1000 Mbps Ethernet
Wireless LAN	Interface	IEEE 802.11b/g/n
	WLAN	WEP64,WEP128/WPA/WPA2/MixedWPA/WPA2
	Automatic WLAN Channel Selection	Yes
	WLAN Associations Filtering (ACL)	Yes (per SSID basis)
	WPS (Wi-Fi Protected Setup)	Yes
Link Layer Protocols	PPP	Point-to-Point Protocol (PPP) PPP in HDLC-like Framing Link Control Protocol (LCP) Compression Control Protocol (CCP) PPP Internet Protocol Control Protocol (IPCP) PPP Authentication Protocols (PAP) PPP Challenge Handshake Authentication Protocol (CHAP) MS-CHAP v1/MS-CHAP v2 PPP Encryption Control Protocol (ECP) PPPoE PPP Connection Keep Alive PPP DialOn Demand PPPoE relay from LAN Ethernet over WAN Ethernet
	Bridging	802.1d LearningBridge and Filtering
Network Layer Protocols	IPv4 Networking	Yes (IPv6 is not supported.)
	Multicast	IGMPv3 & IGMPv2 – Proxy – Snooping – Host
Network Core Functions	Static Routing	Yes
	Firewall	Packet Filtering (IPv4, MAC address, port numbers and protocols) Stateful Packet Inspection (SPI) DMZ host Basic DoS Attack Prevention
	NAT/NAPT	Yes
	NATPass-through	IPsec/IKE pass through

3.11 Network and Router Function

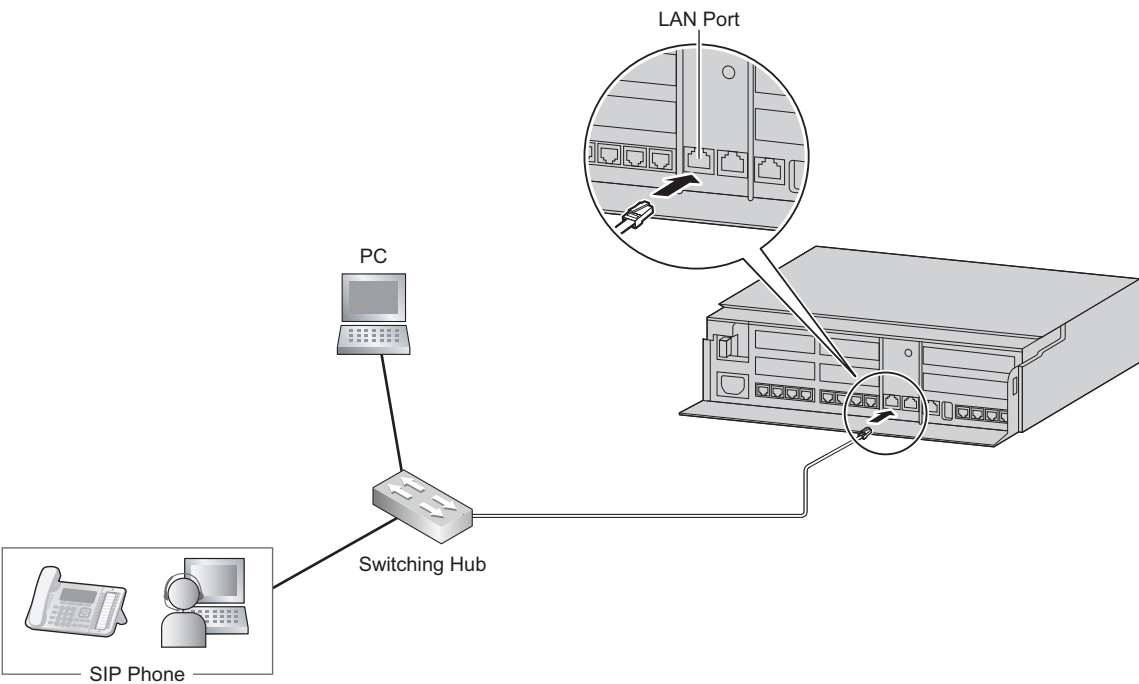
Functions		Description
		L2TP Pass through
	Quality of Service	DiffServ for IP-QoS. AF/EF Priority Queueing/Weighted FairQueueing (WFQ) Random Early Discard (RED)/Drop-Tail (DT) WLAN QoS supported through WMM(IEEE802.11e).
Networking Applications	DHCP	DHCPv4
	NTP	NTP Client
	DNS	DNSv4
	DNS Proxy or Relay	Yes
	DynamicDNS (DDNS)	Yes
	TFTP	TFTP Server
	FTP	FTP Server
	Telnet Server	Telnet Server
	HTTP Server	HTTP-1.0, Secured-HTTP (HTTPs)

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 IP telephones (SIP phones) 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 "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
TX+	1	1	RX+
TX-	2	2	RX-
RX+	3	3	TX+
RX-	6	6	TX-

Connection for 1000BASE-T

Switching Hub		PBX (LAN Port)	
Signal Name	Pin No.	Pin No.	Signal Name
TRD0 (+)	1	1	TRD0 (+)
TRD0 (-)	2	2	TRD0 (-)
TRD1 (+)	3	3	TRD1 (+)

3.12.2 Wireless LAN Connection

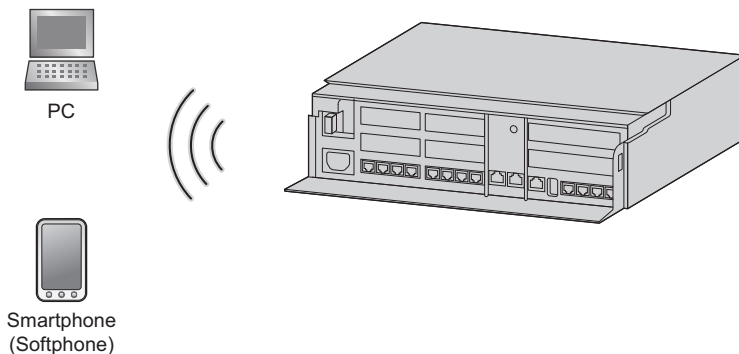
TRD2 (+)	4	↔	4	TRD2 (+)
TRD2 (-)	5	↔	5	TRD2 (-)
TRD1 (-)	6	↔	6	TRD1 (-)
TRD3 (+)	7	↔	7	TRD3 (+)
TRD3 (-)	8	↔	8	TRD3 (-)

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 card to operate under "Auto Negotiation" mode.
- 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 VLAN feature on the network, make sure that the PBX is connected to a layer 2 switch that is IEEE 802.1Q compliant, and that is configured for VLANs. In addition, the port of the switching hub to which the PBX is connected must be set to "Untagged". Consult your network administrator for details.

3.12.2 Wireless LAN Connection

Connecting the Main Unit to the Wireless LAN



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 "Network Configuration-6.Wireless" in the Programming Item List.
2. Wireless extension connections
Select one of the following connection methods for using the Wi-Fi function of the wireless extension.
 - a. Connection using the WPS button
 - Refer to the instruction manual of the wireless extension and configure it to enable WPS.
 - Press and hold the WPS button on the side of the HTS Series unit for 3 seconds. (STATUS Indicator : Green flashing (240/minute) - Wi-Fi Protected Setup (WPS) in progress)

- Press the WPS setting button on the wireless extension for the specified amount of time.
- b. Connection using PIN code input

There is a connection method where the PIN code set at the HTS Series unit is input into the wireless extension, and a connection method where the PIN code set at the wireless extension is input into the HTS Series unit. The procedure described here is for inputting the PIN code set at the HTS Series unit into the wireless extension.

 - Input the PIN code as the HTS Series' Current Router PIN. For details about the Wireless LAN Connection, refer to "Network Configuration-6.Wireless" in the Programming Item List.
 - Refer to the instruction manual of the wireless extension and register the PIN code set in the HTS Series unit to the wireless extension.
 - Click the "Connect" button of the HTS Series unit.
 - Perform PIN code receiving using the wireless extension.
- c. 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.

Note that according to wireless LAN specifications, it is possible to break through the security settings using special methods. Therefore, use security settings with a full understanding of them.

Note

For details about what values to use for configuring the protocol for specifying an IP address, consult the network administrator.

3.13 WAN Connection

Description

The following protocols are supported for setting the IP address of the WAN interface.

WAN Type	Description
Dynamic IP Address	Retrieves an IP address dynamically from your service provider.
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 "Network Configuration-[3-6]WAN Status" in the Programming Item List.

Conditions

- If the protocol for setting the IP address is changed, you must perform a System Reset and restart the PBX before the setting can be applied.
- When the built-in router is active, it serves as the default gateway on the LAN-side of the network. The gateway address distributed by the DHCP feature will be changed to the LAN port's IP address.
- 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 dialling 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 outside line group access number (8xx). (Dial tone is not heard.)
xx : outside line group number(01-08)
Confirm all ports for the connected trunk lines.
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.

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 "Maintenance-[2-3]System Control-System Data Backup-◆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".

Restoring 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 "Maintenance-[2-3]System Control-System Data Backup-◆System Data Restore" in the Programming Item List.

Note

- 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 "Maintenance-[2-3]System Control-System Data Backup-◆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 "Maintenance-[2-3]System Control-System Data Backup-◆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.

Regular Automatic Backup Feature

The PBX regularly backs up the system data every 30 minutes.

The backup file is saved in the "Panasonic" folder in the internal memory of the main unit.

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.

Installing an update can be done either manually via Web Maintenance Console, or on a set schedule.

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

Data Type	Description
Main software data	Operating system data area on the PBX's mother board.
SIP extension software data ^{*1}	Firmware of supported SIP extensions

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

Note

- The software version of the mother board can be confirmed through system programming.
- For details, refer to "Maintenance-[2-1]System Control-Firmware Transfer to PBX" in the Programming Item List.
- For details, refer to "Maintenance-[2-2]System Control-Firmware Update to PBX" in the Programming Item List.

5.3 System Initialisation 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 initialised state. The LED will light green.
All data will be erased. Data that is erased includes Unified Messaging data, call logs, etc. The settings for the PBX as well as all optional service cards will be initialised to their default values.

Note

- After the PBX is initialised, 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 Back-up and Restore".
- After the PBX is initialised, you must set up the mandatory settings required for PBXs. For details refer to "3.9.4.1 Easy Setup Wizard".

Section 6

Troubleshooting

This section provides information on the PBX and telephone troubleshooting.

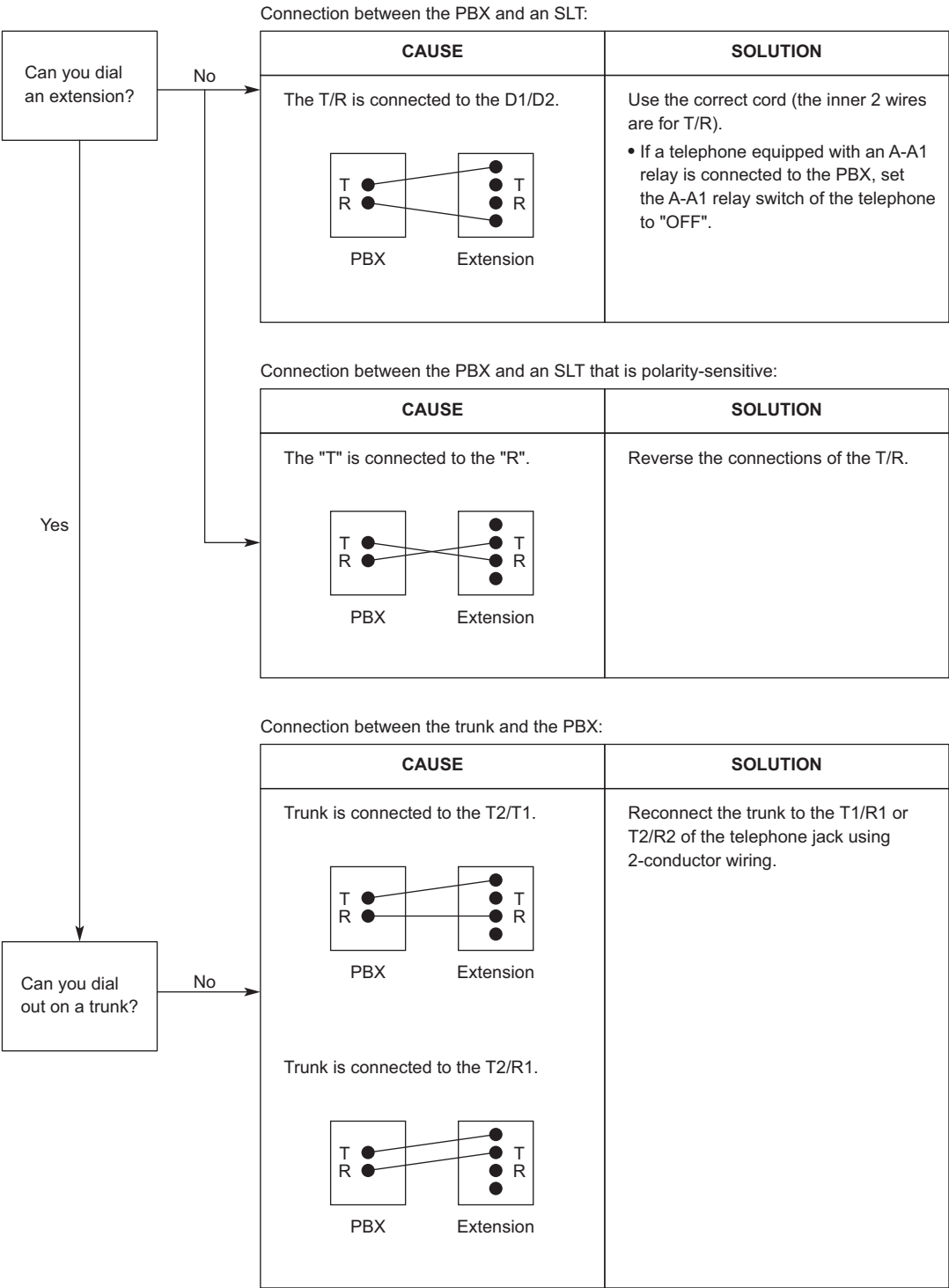
6.1 Troubleshooting

6.1.1 Installation

PROBLEM	PROBABLE CAUSE	SOLUTION
You cannot make/receive calls via an IP network.	• Mother board malfunction	• Replace the mother board (be sure to turn off the PBX when replacing).
	• Poor connection	• Make sure that an 8-pin twisted pair cable is used for connection. • Make sure that none of the CAT 5/CAT 5e cables in use are over 100 m (328 ft) in length. • Make sure that a straight cable is used for connection to a switching hub.
	• Network malfunction	• Make sure that all network devices in use are switched on. • Make sure that there is no unwanted firewall in the IP network.
SIP phones do not operate.	• Mother board malfunction	• Replace the mother board (be sure to turn off the PBX when replacing).
	• SIP phone not registered	• Register the corresponding SIP phone.
	• SIP phone malfunction	• Replace the SIP phone.
	• Poor connection	• Make sure that an 8-pin twisted pair cable is used for connection. • Make sure that none of the CAT 5/CAT 5e cables in use are over 100 m (328 ft) in length. • Make sure that a straight cable is used for connection to a switching hub.
	• Network malfunction	• Make sure that all network devices in use are switched on. • Make sure that the SIP phone is not blocked by the firewall or other network devices.
Extensions do not operate.	• Extension card malfunction	• Replace the corresponding card.
	• Poor connection between the PBX and the extension	• Take the extension and plug it into the same extension port using a short telephone cord. If the extension works, then the connection between the PBX and the extension must be repaired.
	• Extension malfunction	• Take the extension and plug it into another extension port that is working. If the

PROBLEM	PROBABLE CAUSE	SOLUTION
		extension does not work, replace the extension.
The PBX does not operate properly.		- Restart the PBX (refer to "6.1.4 Restarting the PBX"). - Turn off the power switch, and then turn it back on. - Turn off the power switch, and then unplug the PBX. After 5 minutes, plug the PBX back in, and turn the power switch back on.
Noise on external paging.	Induced noise on the wire between the PBX and the amplifier.	Use a shielded cable as the connection wire between the PBX and amplifier. A short shielded cable is recommended.
The STATUS indicator on the front of the cabinet turns on red.	A major system error occurs in the PBX.	See the error log using Web Maintenance Console.
The LINK indicator of the mother board does not turn on.	Mother board malfunction	Replace the mother board (be sure to turn off the PBX when replacing).
	Poor connection.	- Make sure that an 8-pin twisted pair cable is used for connection. - Make sure that none of the CAT 5/CAT 5e cables in use are over 100 m (328 ft) in length. - Make sure that a straight cable is used for connection to a switching hub.
	Network malfunction	Make sure that all network devices in use are switched on.

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.	An unusable value is being set.	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")
Cannot register the SIP Phone.	The necessary network parameters are not set to the SIP Phone.	- 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. - When using the DHCP Server feature or an external DHCP server, enter the PBX IP address.
The SIP Phone cannot connect to the PBX.	The wrong IP address, subnet mask address, PBX IP address, or default gateway address was entered.	Check each parameter and enter the correct value.
	The Ethernet cable is not connected correctly.	Check the Ethernet cable connections.
	The DHCP server is not active.	- Restart the external DHCP server. - Confirm whether the DHCP Server feature is enabled. - Disable DHCP and re-enter settings as appropriate.
Whenever you try to make calls using a SIP phone, a busy tone is heard.	The status of the port that the SIP phone is connected to is Out of Service.	Change the port status from Out of Service to In Service using Web Maintenance Console.
The SIP Phone does not ring.	The ringer volume is off.	Turn on the ringer volume.
The status of the port property of an SLT extension is FAULT.	The telephone is off-hook.	Put the telephone on-hook and restart the PBX.
	There is a problem in the wiring.	Disconnect all cabling between the PBX and SLTs, and restart the PBX. After restarting, if operation is normal, there is probably a problem in the wiring or connection. (For example, there might be a short circuit in the switchboard or cabling.)
	The SLT circuitry is damaged.	Consult a certified dealer.

6.1.4 Restarting the PBX

If the PBX does not operate properly, restart the PBX using Web Maintenance Console. 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:
 - Camp-on is cleared.
 - Calls on hold are terminated.
 - Calls on exclusive hold are terminated.
 - Calls in progress are terminated.
 - Call park is cleared.
- Other data stored in memory, except the above, are not cleared.

Operation

For details about DHCP server setting, refer to "Maintenance-[4-2]System Reset-◆System Reset" in the Programming Item List.

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
 - CA: Canada
 - BR: Brazil
- No. 1 is set by default. For details, see "PBX Configuration-[1-6]System Options- ♦Prompt Language" in the Programming Item List.

System prompt languages stored in the System Memory

KX-HTS Series Suffix	AG	AL	BR	HK	US	ML
No.1 (Primary)	LA-Spanish	UK-English	BR- Portuguese	US-English	US-English	US-English
No.2	US-English		US-English	Mandarin	LA-Spanish	Mandarin
No.3				Taiwan Mandarin		Taiwan Mandarin
No.4				Cantonese		Cantonese
No.5						

No.1 (Primary)	NZ	RU	SA	BX
No.1 (Primary)	UK-English	Russian	UK-English	US-English
No.2		Ukrainian		LA-Spanish
No.3		US-English		
No.4				
No.5				

TEMPLATE FOR WALL MOUNTING

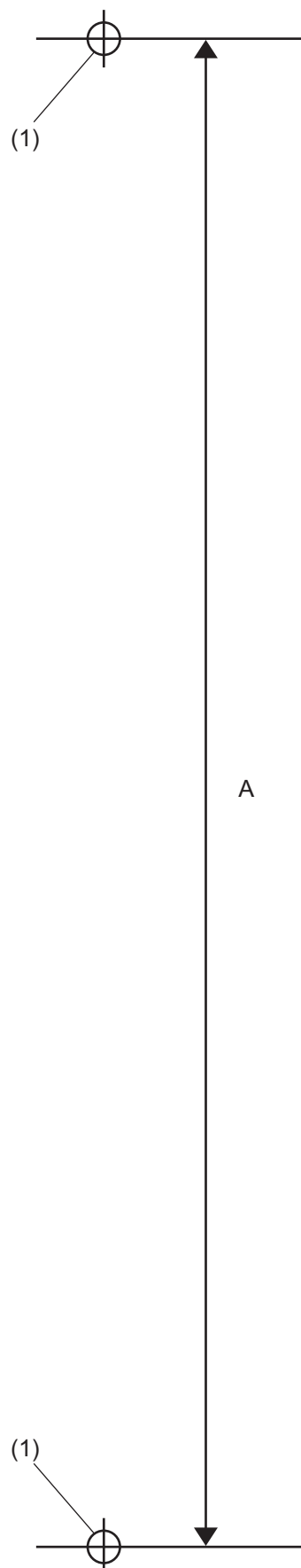
1. Copy or print this template and place it on the wall.
2. Install the screws as marked. If you mount the main unit on a concrete, fit anchor plugs(not included) into the wall beforehand.
3. Hook the unit onto the screw heads.

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.



CE 0197

The KX-HTS32NE is designed to interwork with the:

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

Panasonic System Networks Co., Ltd. declares that the KX-HTS32NE 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 Future Reference

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

Note

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

Panasonic System Networks Co., Ltd.

1-62, 4-chome, Minoshima, Hakata-ku, Fukuoka 812-8531, Japan

Web Site: <http://www.panasonic.net/>

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