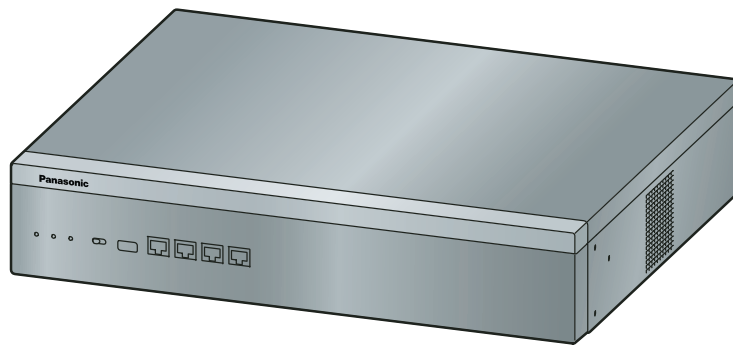# Panasonic®

Installation Manual

Video Intercom System — Control Box

Model No. VL-VN1700

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.

PNMPR Software File Version 001.00000 or later

Manuals and supporting information are provided on the Panasonic Web site at:
http://panasonic.net/pcc/support/intercom/vn1900

System Components

Equipment Compatibility

The Control Box can be used with Panasonic SIP phones. Consult your dealer for more information.

Compatible Panasonic SIP phones[1]

- KX-HDV130
- KX-HDV230
- KX-HDV430

[1] As of March 2017

The Control Box also supports the following equipment:

- Lobby Station (VL-VN1900)
- Door Station (VL-VN1500)
- Room Monitor (VL-MN1000)

Note

- For the equipment (e.g., Add-on Key Module, USB Module, Headset) that can be connected to a particular telephone, refer to the telephone's manual.
- For other equipment that can be connected to the Control Box, refer to "2.1.2 System configuration".

Notice

- 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

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., VL-VN1700**BX**) is omitted unless necessary.

List of Abbreviations

- DHCP → Dynamic Host Configuration Protocol
- DSP → Digital Signal Processor
- SIP Extension → Extensions which use Session Initiation Protocol for communication

Introduction

This Installation Manual is designed to serve as an overall technical reference for the Panasonic Video Intercom System Control Box. It provides instructions for installing the hardware, and programming the Control Box using Web Maintenance Console.

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 Control Box, including the system capacity and specifications.

Section 3 Installation
Describes the procedures to install the Control Box. Detailed instructions for planning the installation site and cabling of peripheral equipment are provided.

Section 4 Programming Information
Describes structure and functions of the Web Maintenance Console for programming IP telephones and the Control Box.

Section 5 Networking Information
Provides information about topics such as using the Control Box in a VoIP network, and the TCP ports used by the Control Box.

Section 6 Troubleshooting
Provides information on the Control Box and telephone troubleshooting.

Section 7 Appendix
Provides information about System Prompt Languages.

About the Other Manuals

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

Feature Manual
Describes all basic, optional and programmable features of the Control Box.

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

Operating Manual
Provides operating instructions for end users using SIP telephones.

About the software version of your Control Box

The contents of this manual apply to a certain software version, as indicated on the cover of this manual. To confirm the software version, see "How do I confirm the software version of the Control Box?" in "2.3 Frequently Asked Questions (FAQ)" of the PC Programming Manual.
To update the software, see "5.1 System Control—Program Update" in the PC Programming Manual.

Trademarks

• All trademarks identified herein are the property of their respective owners.

Table of Contents

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.

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

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

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

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

Notice

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

⚠ **WARNING**

For All Telephone Equipment

🚫

- Do not install the product in any other way than described in relevant manuals.
- Do not install the product in a place exposed to rain or moisture, or a place where water, oil, or other liquids can drip or splash onto on the product. Such conditions can lead to fire or electric shock, and may impair the performance of the product.
- Do not install the system in the following locations:
    a. Areas where shocks or vibrations are frequent or strong. Such activity may lead to the product falling over and causing injury, or may impair the product's performance.
    b. Areas with high amounts of dust. High amounts of dust can lead to fire or electric shock, and impair the performance of the product.

- Do not place the product on an unstable or uneven surface. If the product were to fall over, it may cause injury or damage to the product.

- Do not supply power to a combination of devices that exceeds the total rated capacity of the wall outlets or extension cables used. If outlets, power strips, extension cords, etc. are used in a manner that exceeds their rated capacity, they emit large amounts of heat, which could cause a fire.

- The product must only be installed and serviced by qualified service personnel. The product should be used as-is from the time of purchase; it should not be disassembled or modified. Disassembly or modification can cause a fire, electric shock, or damage to the product.

- Follow all warnings and instructions marked on the product.

- Small objects, such as the hook clip, 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 available, 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.

- Unplug the product from the wall outlet and have it serviced by qualified service personnel in the following cases:

  a. When the power supply cord or plug is damaged or frayed.

  b. If liquid has been spilled into the product.

  c. If the product has been exposed to rain or water.

  d. If the product does not operate according to the operating instructions. Adjust only the controls that are explained in the operating instructions. Improper adjustment of other controls may result in damage and may require service by a qualified technician to restore the product to normal operation.

  e. If the product has been dropped or the cabinet has been damaged.

  f. If product performance deteriorates.

For the Control Box

- Do not insert foreign objects of any kind into this unit, 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 mount the unit on a wall; it is designed to be mounted only on a 19-inch rack. If it is mounted on a wall, it may fall and cause serious injury.

- Do not open the top cover of the unit. Panasonic assumes no responsibility for injuries or property damage resulting from doing so.

- When mounting the unit on a 19-inch rack, only use the 19-inch rack mounting equipment (attachment bracket, screws) included with the unit.

- 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 unit, be sure to follow these guidelines when performing any wiring or cabling:

    a. Before performing any wiring or cabling, unplug the unit'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 unit's power cord with the power cords of other devices.

    c. Do not place any objects on top of the cables connected to the unit.

    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.

- 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 unit and to ensure electromagnetic compatibility. A permanent connection between earth and the earth terminal of the unit must be made.

- Proper earthing (connection to earth) is very important to reduce the risk to the user of electrocution or to protect the unit from the bad effects of external noise in the case of a lightning strike. (See "3.2.3 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 mother board. 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.

For All Telephone Equipment

- The product should be kept free of dust, moisture, high temperature (more than 40 ℃) and vibration, and should not be exposed to direct sunlight.

- Unplug the product from the wall outlet before cleaning. Wipe the product with a soft cloth. Do not clean with abrasive powders or with chemical agents such as benzine or thinner. Do not use liquid cleaners or aerosol cleaners.

For the Control Box

- Do not install the system in the following locations:

  a.   In direct sunlight and hot, cold, or humid places. (Temperature range: 0 ℃ to 40 ℃)

  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 unit. Be especially careful to leave at least 5 cm to the sides of the unit for ventilation.

  e.   Locations where condensation can occur.

- When the unit is mounted on a 19-inch rack, allow space of at least 5 cm to the sides of unit and at least 10 cm to the rear of the unit for ventilation of the fan.

- Do not block the vents around the fan with cables or other objects.

- The Storage Memory Card contains software for all the processes of the unit and all the customer data. Therefore, do not allow unauthorised access to prevent data leakage.

- Once you have started the unit, if you unplug the unit, do not initialise it again as described in "System Initialisation Procedure". Otherwise, your programmed data will be cleared. To restart the unit, refer to "6.1.3 Restarting the Control Box".

- Before touching the unit, discharge static electricity by touching ground or wearing an earthing strap. Failure to do so may cause the unit to malfunction due to static electricity.

- The power supply cord is used as the main disconnect device. Ensure that the AC outlet is located near the equipment and is easily accessible.

- Slots and openings in the back and right side 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 unit on a bed, sofa, rug, or other similar surface while in use. The unit should never be placed near or over a radiator or other heat source. This unit should not be placed in a sealed environment unless proper ventilation is provided.

- When this unit is no longer in use, make sure to detach it from the rack.

- 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.

- When the unit is mounted on a 19-inch rack, make sure that the installation of the unit does not cause the temperature of the rack to exceed its limit.

- If the unit is not installed properly using the securing correct methods, the unit may fall causing serious damage.

- To prevent data leakage, render the Storage Memory Card physically unusable before disposal.

- 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.

- For earthing wire, green-and-yellow insulation is required, and the cross-sectional area of the conductor must be more than 0.75 mm^2 or 18 AWG.

- If the heat sensor inside the Control Box detects abnormally high temperatures, power supply to the unit will be forcefully stopped. In that case, turn off the Control Box using the power switch, then turn it on again.

- If the feature is enabled, an error log will indicate when abnormal fan operation is detected in the system heat control. In that case, consult the system administrator to replace of the fan.

- The operating conditions (e.g., CPU usage percentage, memory usage, and Storage Memory Card product life) are monitored, and monitoring results will be notified by methods such as the error log, MIB, and system alarm. For details, consult your system administrator.

Notice

For All Telephone Equipment

- Read and understand all instructions.

For the Control Box

- 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 unit.

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 unit 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.

- Rack Mount Instructions—The following or similar rack-mount instructions are included with the installation instructions:

  a. Elevated Operating Ambient—If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

  b. Reliable Earthing—Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

SAVE THESE INSTRUCTIONS

1.3 Precautions

General information

- In the event of problems, you should contact your equipment supplier in the first instance.

- After removing the product and any included items from the packaging, store, dispose, or recycle the packaging and the AC plug cap as necessary. Note that certain types of packaging may be a suffocation or choking hazard.

Graphical symbols for use on equipment and their descriptions

Symbol	Explanation	Symbol	Explanation
∼	Alternating current (A.C.)	☐	Class Ⅱ equipment (equipment in which protection against electric shock relies on Double Insulation or Reinforced Insulation)
⎓	Direct current (D.C.)	|	"ON" (power)
⏚	Protective earth	○	"OFF" (power)
⏚	Protective bonding earth	⏻	Stand-by (power)
⏚	Functional earth	⏼	"ON"/"OFF" (power; push-push)
⌂	For indoor use only	⚡	Caution, risk of electric shock

Disposal of Old Equipment and Batteries
(Only for European Union and countries with recycling systems)
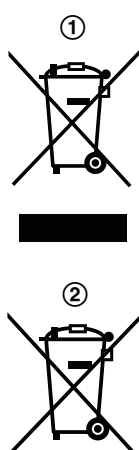
①

②

These symbols (①, ②) on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries must not be mixed with general household waste.
For proper treatment, recovery and recycling of old products and batteries, please take them to applicable collection points in accordance with your national legislation.
By disposing of them correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment.
For more information about collection and recycling, please contact your local municipality.
Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

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 (①, ②) 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
This symbol (②) 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 India only

Declaration of Conformity with the requirements of the E-Waste (Management) Rules
The Product is in conformity with the requirements of the reduction of hazardous substances of the E-Waste Rules.
The content of hazardous substance with the exemption of the applications listed in SCHEDULE II of the E-Waste Rules:

1. Lead (Pb) – not over 0.1% by weight;

2. Cadmium (Cd) – not over 0.01% by weight;

3. Mercury (Hg) – not over 0.1% by weight;

4. Hexavalent chromium (Cr6+) – not over 0.1% by weight;

5. Polybrominated biphenyls (PBBs) – not over 0.1% by weight;

6. Polybrominated diphenyl ethers (PBDEs) – not over 0.1% by weight.

Disposal information
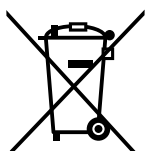
For the purpose of recycling to facilitate effective utilisation of resources, please return this product to a nearby authorised collection centre, registered dismantler or recycler, or Panasonic service centre when disposing of this product.
Please see the Panasonic website for further information on collection centres, etc., or call the toll-free number below.

Website:
http://www.panasonic.com/in/corporate/sustainability/panasonic-india-i-recycle-program.html
Service helpline: 1800 103 1333 or 1800 108 1333

For users in the United Kingdom

FOR YOUR SAFETY, PLEASE READ THE FOLLOWING TEXT CAREFULLY.

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

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

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

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

WARNING

This appliance must be earthed.

How to replace the fuse: Open the fuse compartment with a screwdriver and replace the fuse and fuse cover.
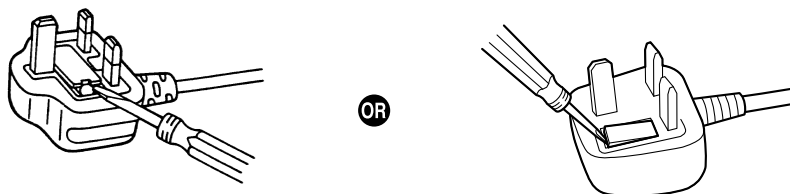
For users in Germany only

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

For users in 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 (Server) associated with this modem. In order to operate within the limits for compliance with Telecom's Specifications, the associated Server 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 Server 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 Server 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.

1.4 Data Security

In order to use the Control Box 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 Control Box by a third party.
- Interference or suspension of service caused by a third party.

What is User Information?
User Information is defined as:

1. Information stored on the Storage Memory Card:
   System data and error data.

2. Information sent from the Control Box to a PC:
   System data.

Requirements

1. The Storage Memory Card contains software for all the processes of the Control Box and all the customer data.
   Therefore, do not allow unauthorised access to prevent data leakage.

2. Always make backups of data stored on the Storage Memory Card.

3. To prevent illegal access from the Internet, activate a Firewall.

4. To avoid unauthorised access and possible abuse of the Control Box, we strongly recommend:

   a. Keeping the password secret.

   b. Selecting a complex, random password that cannot be easily guessed.

   c. Changing your password regularly.

5. Perform the following when sending the Control Box for repair or handing it over to a third party.

   a. Make a backup of data stored on the Storage Memory Card.

   b. Using a formatter, format the Storage Memory Card so that information cannot be retrieved from it.

6. To prevent data leakage, render the Storage Memory Card physically unusable before disposal.

7. When user information is sent from the Control Box to a PC, the confidentiality of that information becomes the responsibility of the customer. Before disposing of the PC, ensure that data cannot be retrieved from it by formatting the hard disk and/or rendering it physically unusable.

8. When configuring email addresses, make sure all information is entered correctly. Incorrect information could cause user information to be disclosed to unintended recipients.

9. Note that user information may be deleted or initialised when the product is repaired.

10. Refer all repairs to a trusted Panasonic service centre.

11. Protect user information stored on the computer used to configure the system.

    - When user information is stored on a computer, the confidentiality of that information becomes the responsibility of the installer. Take precautions to prevent the unauthorised use of the computer and the setup tool used for performing system configuration or maintenance.

    - Connect the computer to the network only when performing system configuration or maintenance, and disconnect the computer from the network as soon as the work is complete.

Section 2

System Outline

This section provides general information on the Control Box, 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 the Control Box's operation.
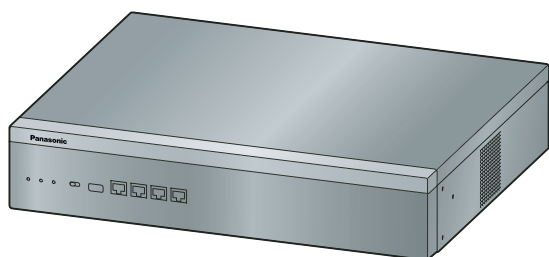
2.1.2 System configuration

Fully expanded system example (up to 2000 SIP devices[1], requires control box)

*1   "SIP devices" include lobby stations, room monitors, door stations, and SIP phones.

Maximum number of devices

SIP devices

	Item		Maximum number of devices	
❶		Lobby station	50[*1]	
❷		Room monitor[*2]	5 per room[*3]	2000
❸		Door station[*2]	1 per room	
❹		SIP phone	50[*4]	

Other devices

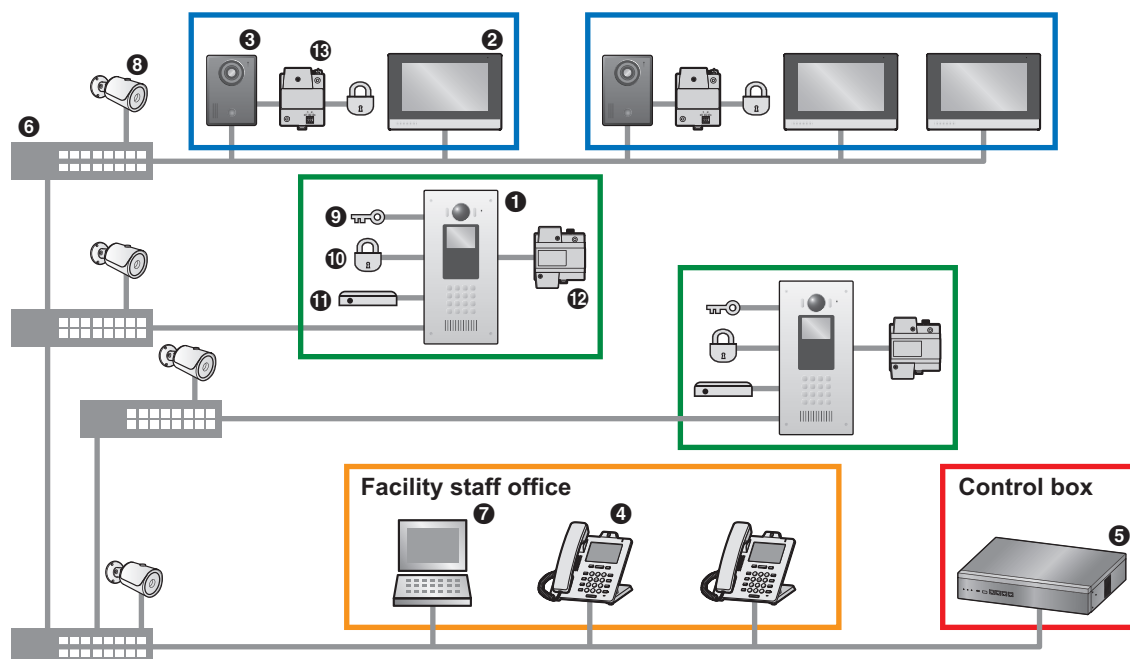|	Item		Maximum number of devices
❺		Control box	1
❻		Switching hub[*5]	—
❼		Computer (for programming)	—
❽		Network camera	500[*6]
❾		Access controller	1 per lobby station
❿		Electric lock	1 per lobby station 1 per door station
⓫		Open door sensor	1 per lobby station
⓬		Power supply unit	1 per lobby station 1 per room monitor[*2] 1 per door station[*2]

Item		Maximum number of devices
⓭	Relay box	1 per door station[7]

[1]   Up to a combined total of 8 lobby station and door station cameras can be registered to a room monitor for easy camera monitoring.

[2]   If room monitors and door stations are not powered by Power over Ethernet (PoE), a power supply unit is required.

[3]   Up to 256 rooms can have multiple room monitors. All other rooms can have only one room monitor. For more information, refer to the documentation of the control box (PC Programming Manual).

[4]   Up to 18 SIP phones can be registered to a room monitor for easy calling.

[5]   If PoE-compatible switching hubs are used, they can supply power to room monitors and door stations.

[6]   Up to 32 network cameras can be registered to a room monitor for easy camera monitoring.

[7]   A relay box is used to connect an electric lock to a door station.

2.2 Specifications

2.2.1 General Description

Main CPU		Intel ATOM E3845 (Quad core 1.91 GHz)	
Power Input	Rated Voltage	AC 100 – 240 V	
	Frequency	50/60 Hz	
	Current/Power	0.95 - 0.6 A	
Power Consumption		Under 50 W	
External Backup Battery		External battery port is not supported.	
Memory Backup Duration		7 years	
Operating Environment	Temperature	0 ℃ to 40 ℃	
	Humidity	10 % to 90 % (non-condensing)	
RJ45 Port	MNT Port	Gigabit LAN Interface (for Maintenance)	10BASE-T/100BASE-TX/ 1000BASE-T (Auto MDI/ MDI-X)
	LAN1 Port	Gigabit LAN Interface (for IP Extension)	
	LAN2 Port	Gigabit LAN Interface (for IP Extension)	
	LAN3 Port	Gigabit LAN Interface (Factory use only)	
Air-cooling method		FAN	
Dimension		430 mm (W) × 88 mm (H) × 340 mm (D)	
Weight		4.5 kg	

2.2.2 System Capacity

Maximum Devices

This Control Box supports the following number of devices.

Type		Maximum Capacity
Device for User (Extension)		2000
	Door Station	1000
	Room Monitor	2000
	Lobby Station	50
	KX-HDV Series SIP phone	50

2.2.2 System Capacity

Section 3

Installation

This section describes the procedures to install the Control Box. Detailed instructions for planning the installation site, installing the main unit, and cabling of peripheral equipment are provided.

3.1 Before Installation

3.1.1 Before Installation

Please read the following notes concerning installation and connection before installing the Control Box 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.

Installation Precautions

The Control Box is suitable for mounting on a 19-inch rack and should be installed in a location where it is accessible for inspections and maintenance.
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 ℃ to 40 ℃)

- 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 unit. Be especially careful to leave at least 5 cm to the sides of the unit 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 of radios and televisions. (The Control Box should be at least 1.8 m away from such devices.)

Do not perform the following:

- Do not block the openings of the Control Box.

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.

Notice

- Mis-wiring may cause the Control Box to operate improperly.
- If an extension does not operate properly, disconnect the telephone from the extension line and connect it again, or turn off the Control Box using the power switch, then turn it on again.

Hardware Maintenance Precautions

Be sure to follow these instructions when performing hardware maintenance of the unit:

CAUTION

- If the heat sensor inside the Control Box detects abnormally high temperatures, power supply to the unit will be forcefully stopped. In that case, turn off the Control Box using the power switch, then turn it on again.
- If the feature is enabled, an error log will indicate when abnormal fan operation is detected in the system heat control. In that case, consult the system administrator to replace of the fan.
- The operating conditions (e.g., CPU usage percentage, memory usage, and Main Storage Memory Card product life) are monitored, and monitoring results will be notified by methods such as the error log and system alarm. For details, consult your system administrator.

Notice

- The following contents will be recorded in the log:
  - Memory usage
  - SWAP memory free space
  - Page In/Out speed
  - Disk memory usage
  - Main Storage Memory Card product life time
  - Amount data sent/received per virtual NIC
  - Number of sent/received packets and packet loss per virtual NIC

3.2 Installation of the Control Box

3.2.1 Unpacking

Unpack the box and check the items below:

- Main unit
- Manual(s)
- Hook clip
- 19-inch rack attachment bracket x 2
- Screw x 6
- AC power cord(s)

3.2.2 Names and Locations

Front

Back
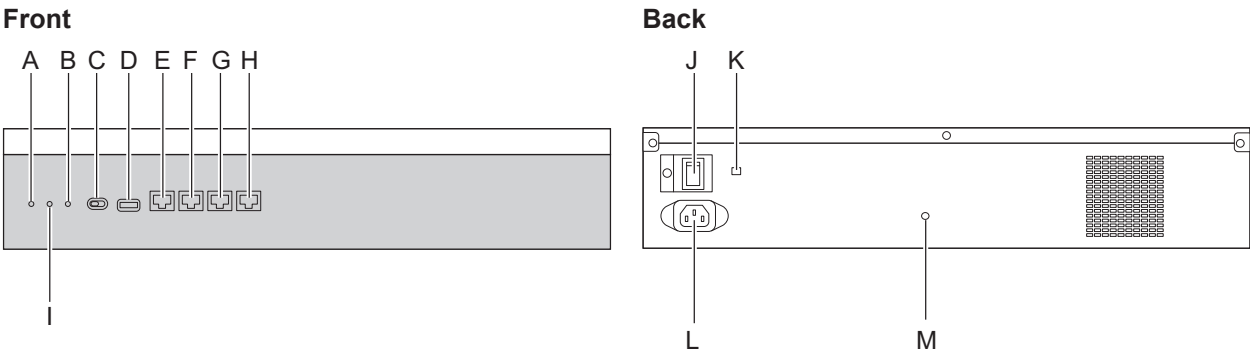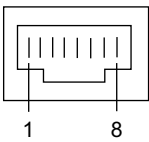
A. STATUS Indicator

B. SYSTEM MODE Indicator[1]

C. System Mode Switch

D. USB Port

E. MNT Port

F. LAN 1 Port

G. LAN 2 Port

H. LAN 3 Port

I. BATT ALARM Indicator

J. Power Switch

K. Earth Terminal

L. AC Inlet

M. Hook Clip Hole
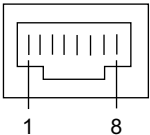
[1]   For details about the SYSTEM MODE indicator, refer to "LED Indications".

Pin Assignments

MNT Port/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	–	–

MNT Port/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	Control Box status indication • OFF: Power Off • ON: Power On and running • Flashing: Starting up/Logging in
	Amber	Control Box status indication • ON: Ready to shutdown • Flashing: Shutting down
	Red	Control Box status indication • ON: Alarm The cause may be one of the following: – Power was cut without performing the shutdown procedure. – No IP address assigned for the DSP card by the DHCP server. • Flashing: Initialise failed
BATT ALARM	Red	Alarm indication • OFF: Normal (During operation, indicates that the voltage of the lithium battery is normal.) • ON: Alarm (During operation, indicates that the lithium battery needs to be replaced.) Ready to shutdown (After shutdown, lights when it is safe to turn off the power.)
SYSTEM MODE	Green	Primary unit status indication • ON: Normal
	Amber	Primary unit status indication • ON: Ready to shutdown

3.2.3 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.
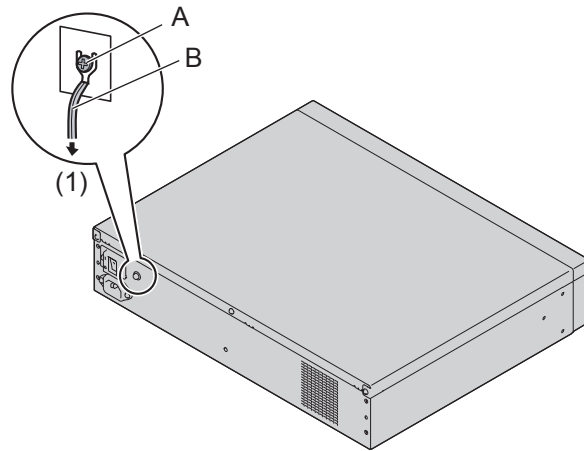
A. Screw

B. Earthing wire

(1) To earth

WARNING

- **Proper earthing (connection to earth) is very important to reduce the risk to the user of electrocution or to protect the unit 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 unit and to ensure electromagnetic compatibility. A permanent connection between earth and the earth terminal of the unit 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 mm^2 or 18 AWG.

Notice

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

3.2.4 19-inch Rack Mounting

WARNING

- **Be careful not to drop any components. Dropping components may damage them or cause an injury.**
- **When mounting the unit on a 19-inch rack, only use the 19-inch rack mounting equipment (attachment bracket, screws) included with the unit.**

CAUTION

- When the unit is mounted on a 19-inch rack, make sure that the installation of the unit does not cause the temperature of the rack to exceed its limit.
- When the unit is mounted on a 19-inch rack, allow space of at least 5 cm to the sides of unit and at least 10 cm to the rear of the unit for ventilation of the fan.

- If the unit is not installed properly using the securing correct methods, the unit may fall causing serious damage.
- When this product is no longer in use, make sure to detach it from the rack.

Notice

When mounting the unit on a 19-inch rack, confirm that the rated current listed on the unit's name plate does not exceed the threshold current for the breaker.

1. Fix the attachment brackets to the left and right sides of the unit with 3 screws on each side. (Recommended torque: 0.8 N·m [8.2 kgf·cm] to 1.0 N·m [10.2 kgf·cm])→ ❶

2. Place the unit in the 19-inch rack and fix both attachment brackets to the rack with the rack's proprietary mounting equipment. → ❷
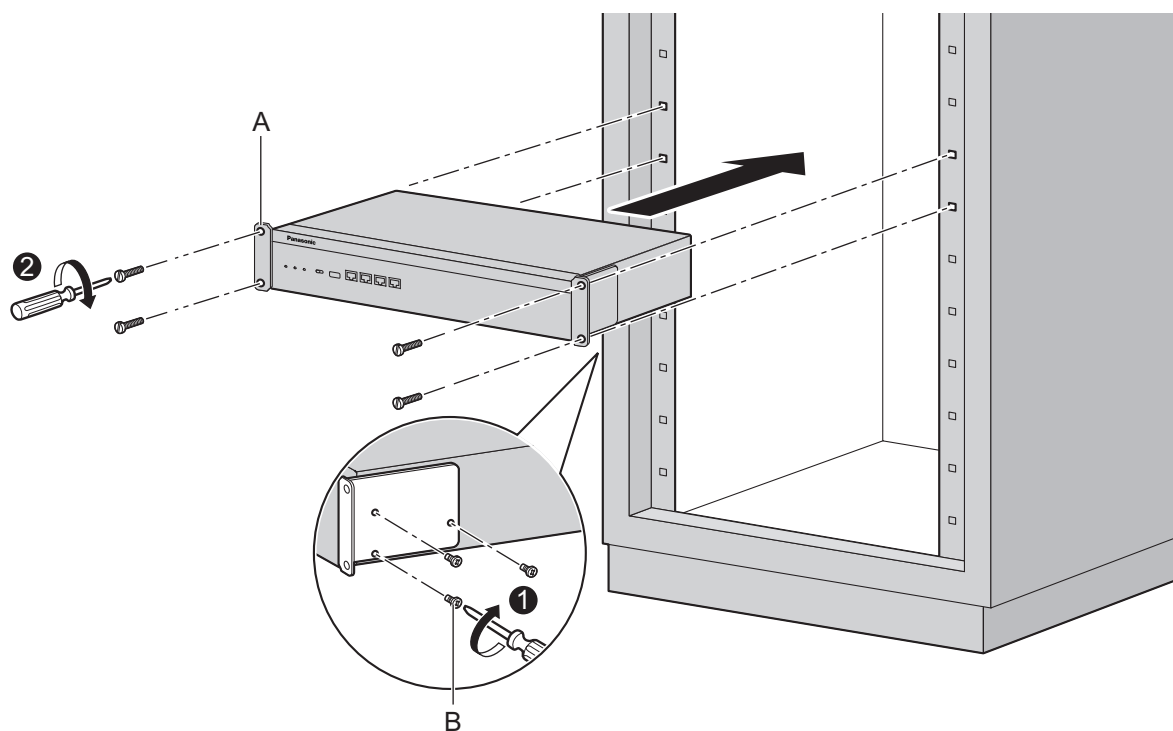
A. Attachment Bracket

B. Screw

3.3 Connection of Peripherals

Maximum Distance
100 m

PC
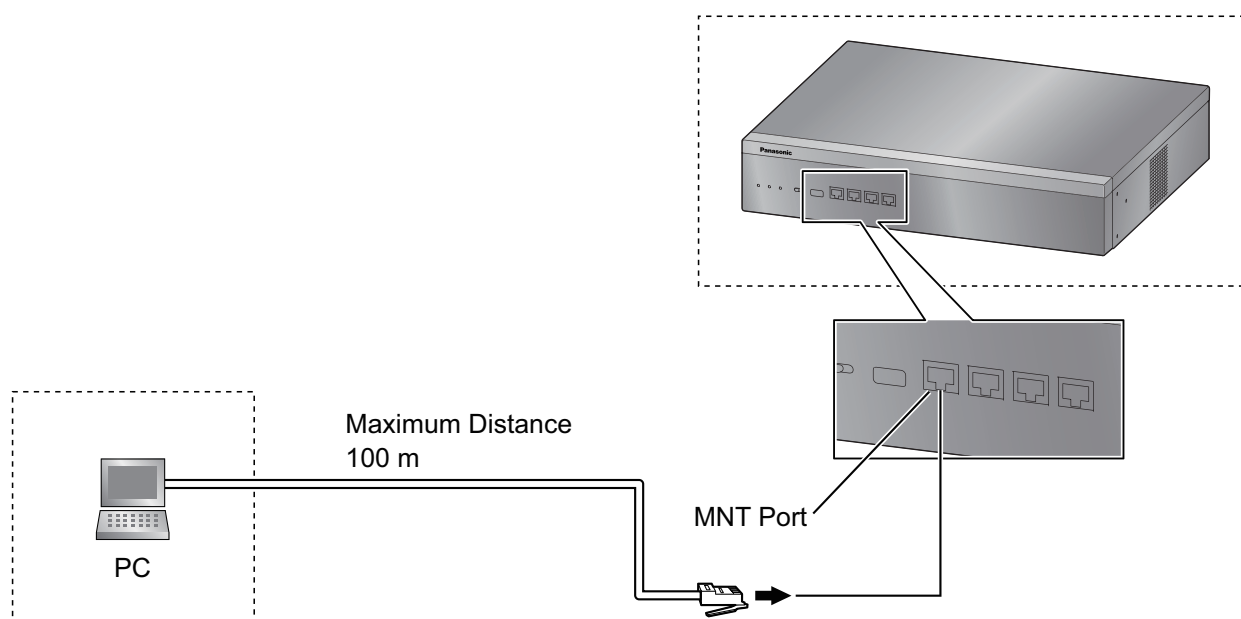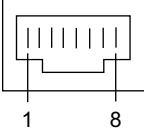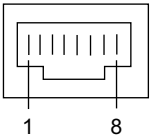
MNT Port

PC (via MNT Port)

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

Pin Assignments for 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	–	–

Pin Assignments for 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 (-)

Note

You can use 1000BASE-T cables for 10BASE-T/100BASE-TX connections.

3.4 LAN Connection

3.4.1 LAN Connection for the Main Unit

Connecting the Main Unit to the LAN

The Control Box is equipped with a LAN port for connecting to a LAN so that SIP phones and PCs can be connected on a private IP network. When the Control Box is connected to the LAN for the first time, you must assign IP addressing information to the Control Box. See "4.4 Programming the Control Box" for instructions.

LAN Port

Switching Hub

Ethernet Cable
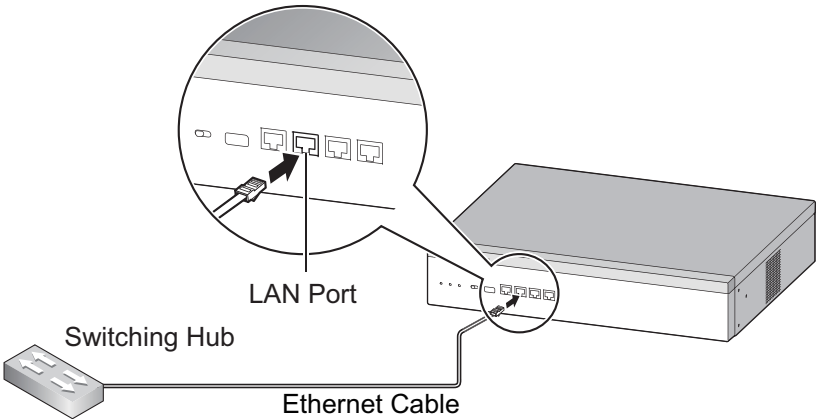
Connection for 10BASE-T/100BASE-TX

Switching Hub   Control Box (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   Control Box (LAN Port)

Signal Name	Pin No.		Pin No.	Signal Name
TRD0 (+)	1	↔	1	TRD0 (+)
TRD0 (-)	2	↔	2	TRD0 (-)
TRD1 (+)	3	↔	3	TRD1 (+)
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 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 system performance may degrade.

- When using the VLAN feature on the network, make sure that the Control Box 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 Control Box is connected must be set to "Untagged". Consult your network administrator for details.

3.4.2 LAN Connections for IP Telephones

When an IP telephone is connected to the LAN and power is supplied for the first time, you will need to set network parameters. The network parameters must be set for the IP telephone before it can be used. Refer to "4.5 Assigning Networking Information to IP Telephones" for instructions.

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.

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, no AC adaptor is needed for the IP telephones.
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.

3.5 Starting the Control Box

WARNING

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

CAUTION

- Before touching the unit, discharge static electricity by touching ground or wearing an earthing strap. Failure to do so may cause the unit to malfunction due to static electricity.

- Once you have started the unit, if you unplug the unit, do not initialise it again as described in "System Initialisation Procedure". Otherwise, your programmed data will be cleared. To restart the unit, refer to "6.1.3 Restarting the Control Box".

- The power supply cord is used as the main disconnect device. Ensure that the AC outlet is located near the equipment and is easily accessible.

Installing the Hook Clip for the AC Power Cord

1. Insert the hook clip into the hook clip hole.
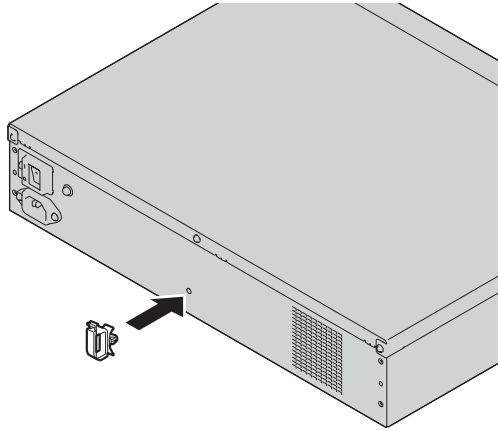
Note

Use only the hook clip included with the Control Box.

Connecting the AC Power Cord

1. Plug the AC power cord into the Control Box and pass the cord through the hook clip as indicated. Push the hook clip in the direction of the arrow until it clicks.

Note

For safety reasons, do not stretch or pinch the AC power cord.
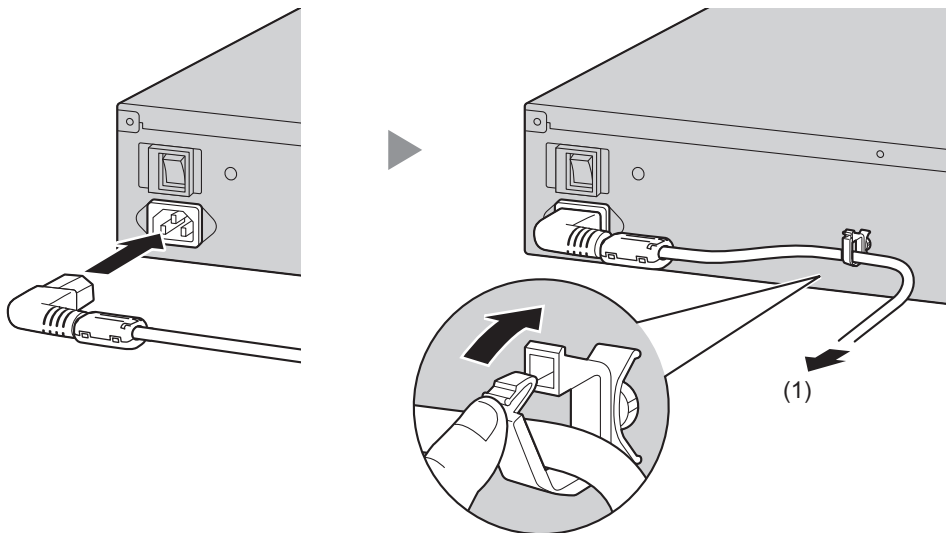
(1) To AC outlet

2. Plug the other end of the cord into an AC outlet.

System Initialisation Procedure

All data, except for system prompts, will be erased. Data that is erased includes Unified Messaging data. The settings for the Control Box will be initialised to their default values.

Note

> After the Control Box is initialised, you must configure the mandatory settings with Quick Setup Wizard. For details refer to "4.4.1 Quick Setup Wizard".

1. Slide the System Mode Switch to the "SYSTEM INITIALIZE" position.
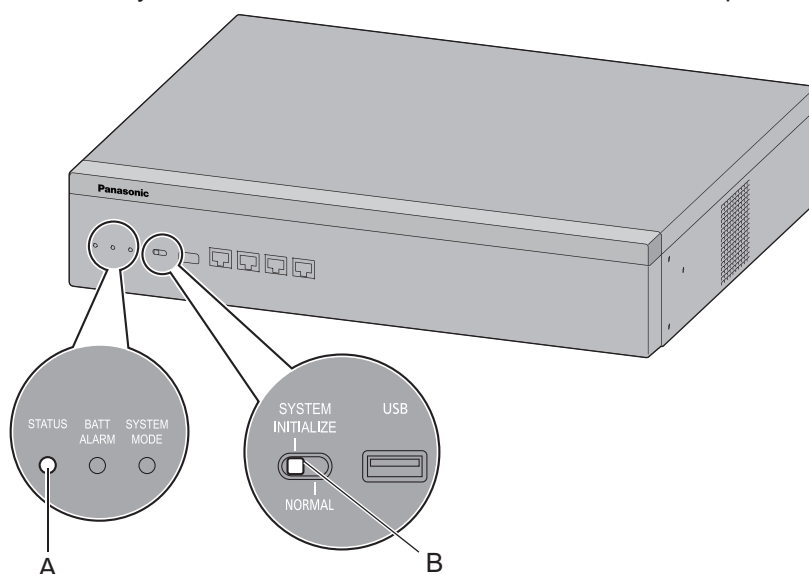
A. STATUS Indicator

B. System Mode Switch

2. Turn on the power switch of the Control Box. The STATUS indicator will flash green.

3. While the STATUS indicator is flashing green, slide the System Mode Switch back to the "NORMAL" position. Depending on the configuration, initialisation takes about 2.5 minutes. If successfully executed, the STATUS indicator will stop flashing and remain lit up.

3.5 Starting the Control Box

Section 4

Programming Information

This section describes the structure and functions of the Web Maintenance Console for programming IP telephones and the Control Box. Further information on programming the Control Box for use with a VoIP network is included.

4.1 Overview of Web Maintenance Console

Web Maintenance Console is designed to serve as an overall system programming reference for the Control Box. You can programme and control the Control Box over an IP network using Web Maintenance Console. This section describes programming basic items using Web Maintenance Console.
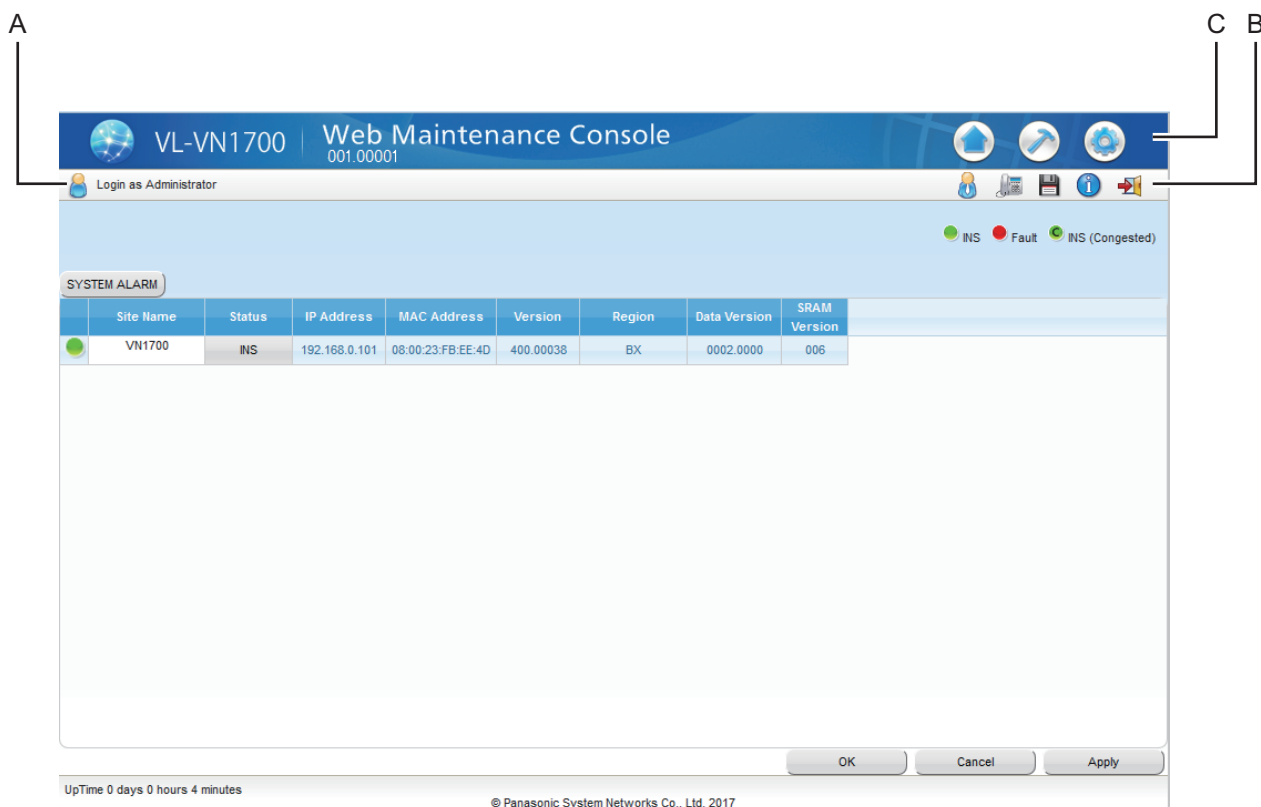
A. Login Status

B. Web Maintenance Console Features

C. Menu Buttons

Note

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

4.2 PC Connection

Control Box has 4 physical ports for PC and LAN connections. A default IP address is assigned to each port. You can connect a PC to the Control Box either directly or over a LAN using the appropriate method for the port being used.

Port	Default IP Address	Default Subnet Mask
MNT Port	223.0.0.1	255.255.255.0
LAN Port	192.168.0.31	255.255.240.0

Direct Connection
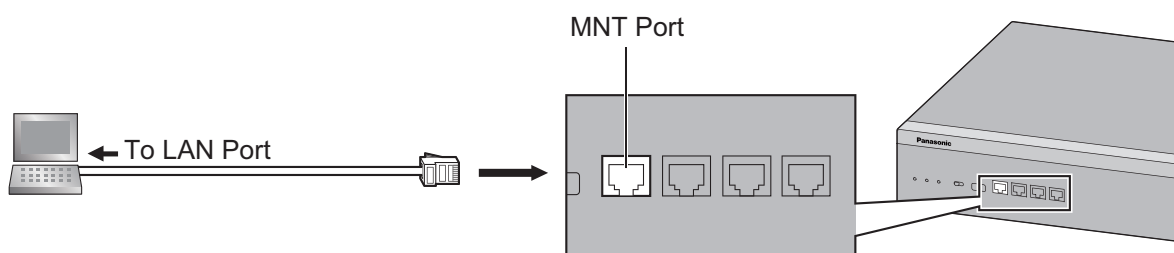
Notice

When connecting the PC to the MNT 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 Control Box.

Note

- Use an Ethernet cable with an RJ45 connector to connect a PC to the Control Box.
- For pin assignments and maximum cabling distance, refer to "3.3 Connection of Peripherals".

Connection via LAN
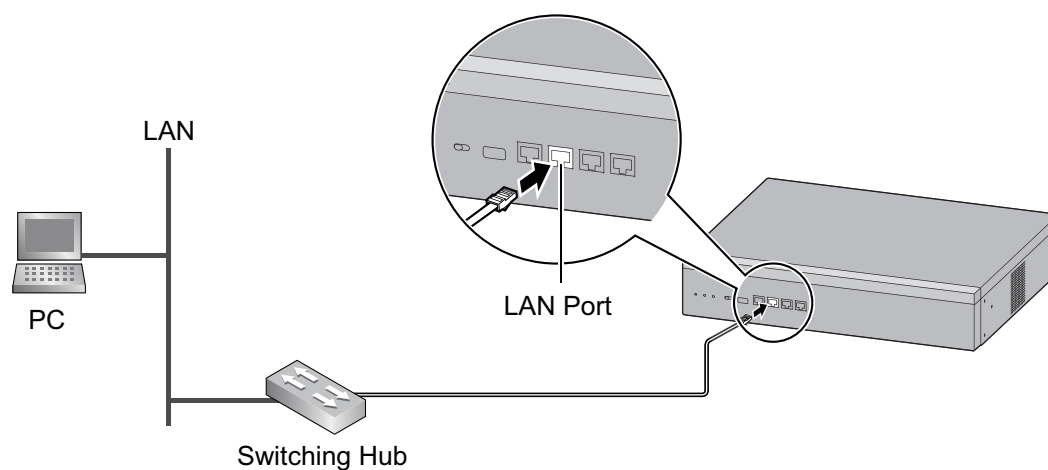
Note

For details about connecting a switching hub to the Control Box, refer to "3.4.1 LAN Connection for the Main Unit".

Connection via Virtual Private Network (VPN)
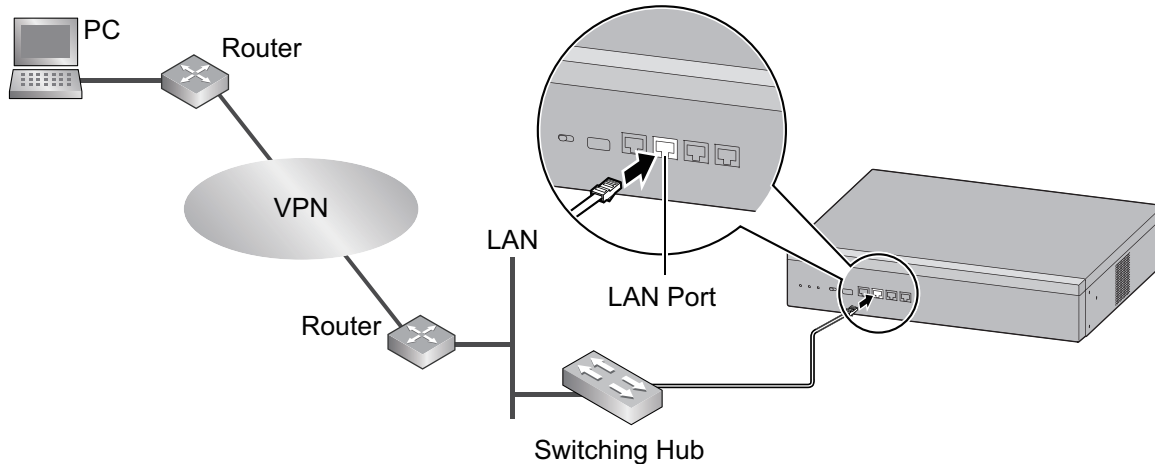
Notice

To access the Control Box via VPN, the PC must be in the same VPN.

Note

For details about connecting a switching hub to the Control Box, refer to "3.4.1 LAN Connection for the Main Unit".

4.3 Starting Web Maintenance Console

System Requirements

For the system requirements of the PC (operating system, hardware specifications, supported browsers, etc.), refer to "1.2.1 Starting Web Maintenance Console" in the PC Programming Manual.

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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Password Security

CAUTION

To the Administrator regarding the system password

1. Please provide all system passwords to the customer.

2. To avoid unauthorised access and possible abuse of the Control Box, 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 Control Box has default passwords preset. For security, change these passwords the first time that you programme the Control Box.

4. Change the passwords periodically.

5. It is strongly recommended that passwords of 10 numbers or characters be used for maximum protection against unauthorised access. For a list of numbers and characters that can be used in system passwords, refer to "1.1.3 Entering Characters" in the PC Programming Manual.

Connecting to Web Maintenance Console

- When no operations are performed for more than 60 minutes (default), you will be automatically logged out from Web Maintenance Console and unsaved data will be lost.

1. Connect the PC to the Control Box:

   - Connect the Control Box to a PC with the MNT port and access the Control Box directly from the PC. For details, refer to "Direct Connection" in "4.2 PC Connection".

   - Connect the Control Box to a network with the LAN port and access the Control Box from a PC in your LAN or VPN. For details, refer to "Connection via LAN", "Connection via Virtual Private Network (VPN) " and "3.4.1 LAN Connection for the Main Unit".

2. Access Web Maintenance Console:

   MNT Port Connection:
   Launch your Web browser and in the address bar, enter the following address exactly as shown:

   – **223.0.0.1**

   Note

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

   - If connecting using 223.0.0.1 takes a long time, configure a static IP address for the PC.

   LAN or VPN Connection:
   Launch your Web browser and input the IP address of the Control Box 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 Control Box.
   The default IP address for the LAN port of the Control Box is 192.168.0.31, and the default Web Maintenance Console port number is 80. Accordingly, the address to enter to connect to the Control Box for the first time will be as follows (enter the address exactly as shown):
   http://192.168.0.31

   Note

   The default subnet mask for the LAN port is 255.255.240.0.

   Note

   The IP address and Web Maintenance Console port number for the Control Box can be changed from their default values. If settings for the LAN port's IP address or port number have been forgotten, connect using the MNT port connection as described above and confirm the LAN port's IP address in "16.1 Network Service—[1] IP Address/Ports—Basic Settings", and the port in "16.2.2 Network Service—[2-5] Server Feature—HTTP" in the PC Programming Manual.

3. The Web Maintenance Console login screen is displayed. Log in with the specified account name and password to launch Quick Setup Wizard. For details about Quick Setup Wizard, see "4.4.1 Quick Setup Wizard".

4.4 Programming the Control Box

4.4.1 Quick Setup Wizard

In Quick Setup Wizard, you configure the mandatory settings for the Control Box. When you log in to Web Maintenance Console and the Control Box is in its initialised, factory default state, Quick Setup Wizard starts automatically. You must log in using the following user name and password.

– The user name is "INSTALLER".

– The default password is "1234".

Welcome to Panasonic VL-VN1700

On this screen, you can either import a previously configured system data file or proceed to manually configure the Control Box's settings.

To import a previously configured system data file

1. Log in to Web Maintenance Console (interactive mode).

2. Click **File Import**.

3. In **Offline Data Import** screen, click **Browse**, and then select a preconfigured DNSYS file.

4. Click **Execute**.

5. When you are prompted to restart the Control Box, click **OK**.

To configure the Control Box's settings manually

1. Click **Install** next to **installation setup**.

2. On the screen that appears, specify the settings as explained below.
   UM Prompt Setting

   – Language: Select your language from the drop-down list.
   Password Setting
   An administrator account with the user name "97000" and the password you specify here will be created.

   – Installer password: Enter a new password (except default password).

   – Re-enter: Enter the new password (except default password) again for confirmation.

3. Click **Start Setup Wizard**, and then continue the configuration.

Date & Time

On this screen, you can specify the settings for the system date and time.
When you have finished specifying the settings, click **Next** to continue.

System Time

• Time Zone: Select the time zone from the drop-down list.

• Local Time: Click the **Local Time** box, and then specify the date and time.

SNTP Setting

• IP Address: Enter the **IP Address** or host name of the SNTP Server.

• Port: Enter the TCP Port for the SNTP Server.

Daylight Saving

• Select whether to enable or disable summer time (daylight saving time).

User

On this screen, you can specify the settings for users and extensions for the Control Box.
When you have finished specifying the settings, click **Next** to continue.

Number of Users

• User: specify the number of users.

Users Information Setting

• WebMC Language: Select the language for the user portal site from the drop-down list.

LAN

On this screen, you can specify the settings for the LAN the Control Box is on.

The IP addresses for the Control Box, DNS server, and DSP cards can be assigned automatically through a DHCP server or entered manually.

Notice

• If an external DHCP server is in use, it must be able to use the "client identifier" option specified by RFC 2131.

• If an external DHCP server is in use, the Control Box DHCP Server feature must be disabled.

• The Control Box will not start properly if IP addresses cannot be assigned automatically by the DHCP server when the Control Box has been set to obtain IP addresses automatically. In this case, you need to consult your network administrator because the DHCP server in your network may not be running or a network failure may have occurred. If the DHCP server is not available, enter IP addresses manually, then restart the Control Box. If the Control Box cannot be accessed over the network, connect the PC directly to the Control Box with an Ethernet cable and access Web Maintenance Console using a direct connection.
For details about connecting the PC directly to the Control Box, refer to "Direct Connection" in "4.2 PC Connection".

• The appropriate values for these settings depend on your network configuration. For details, consult your network administrator.

Note

If the IP addresses are changed from their default values, a notice about restarting the Control Box is displayed at the end of Quick Setup Wizard. Click **OK** to restart the Control Box. After the Control Box restarts, start Web Maintenance Console again (refer to "Connecting to Web Maintenance Console" in "4.3 Starting Web Maintenance Console").
When you have finished specifying the settings, click **Next** to continue.

IP Address for main unit

1. Select the method for setting the IP address information.

   • Obtain an IP address automatically

   • Use the following IP address

2. If you selected **Use the following IP address**, specify the following settings.

   • IP Address: Enter the IP address for the Control Box.

- Subnet Mask: Enter the subnet mask of the LAN.
- Default Gateway: Enter the IP address of the LAN's default gateway.

IP Address for DNS server

1. Select the method for setting the IP address information.
    - Obtain DNS server address automatically
    - Use the following DNS server address
2. If you selected **Use the following DNS server address**, specify the following settings.
    - Preferred DNS IP Address: Enter the IP Address of the preferred DNS server.
    - Alternative DNS IP Address: Enter the IP Address of the alternative DNS server.

IP Address for DSP

1. Select the method for setting the IP address information.
    - Obtain DSP IP address automatically
    - Use the following DSP IP address
2. If you selected **Use the following DSP IP address**, specify the following items for **DSP Card #1**.
    - IP Address1: Enter the IP Address 1 of the DSP card.

Import File

On this screen, you can import 4 types of files configured for the Control Box in CSV format.

4.4.2 After Quick Setup Wizard has been Completed

Changing IP Address Settings

- Do not change the IP address of the Control Box once IP telephones are registered to the Control Box using the set IP address. The IP telephones will not operate properly if the IP address of the Control Box is changed. When an external DHCP server is used to automatically assign IP addresses, it must be configured to always allocate the same IP address to the Control Box. For details, consult your network administrator.

IP addressing information for the Control Box can also be changed from Web Maintenance Console. For details about programming IP addresses, refer to "16.1 Network Service—[1] IP Address/Ports—Basic Settings" in the PC Programming Manual.

4.4.3 Enabling the DHCP Server Feature

This Control Box has a DHCP Server feature. When the feature is enabled, it allows you to centrally manage and automate the assignment of IP addresses for the devices located in same LAN using Web Maintenance Console.

1. Click **Setup → Network Service → Server Feature → DHCP**.
2. On the **DHCP Server** tab, select **Enable** for **DHCP Server**.
3. Enter valid settings for the **IP address auto assignment**.

    Note

    For details about **IP address auto assignment** settings, refer to "16.2.1 Network Service—[2-1] Server Feature—DHCP(LAN)" in the PC Programming Manual.

4. Click **OK**.

Note

If an external DHCP server is in use, do not enable the DHCP Server feature. Doing so may allocate inappropriate IP addressing information to the devices.

4.5 Assigning Networking Information to IP Telephones

An IP telephone cannot be used unless it is registered in the User Container, even if the IP addressing information is assigned to the telephone as explained in this section.

4.5.1 Assigning IP Addressing Information

The IP telephone's IP address, subnet mask address and default gateway address, as well as the IP address of the registering Control Box must be assigned to the IP telephone before it can be used on the network. This IP addressing information can be assigned in the following ways:

Using a DHCP server (DHCP Server feature or an external DHCP server) to automate the assignment of IP addressing information
The IP address of the SIP phone, the subnet mask address, and the default gateway address can be assigned to the SIP phone automatically by the DHCP server.
The Control Box's IP address must be assigned manually on the SIP phone side.
For instructions, refer to the documentation of the SIP phone.

Not using a DHCP server (DHCP Server feature or an external DHCP server) when assigning IP addressing information
All of the IP addressing information must be assigned manually.
For instructions, refer to the documentation of the SIP phone.

Note

- A SIP phone can only receive IP addressing information from a DHCP server on its own LAN. Therefore, when SIP phones are located on several LANs, a DHCP server is required on each LAN.

- When the DHCP client function is enabled for SIP phones, simply connect them to the LAN to use the DHCP server. For details about the DHCP client function setting, refer to the documentation of the SIP phone.

4.6 Registering IP Telephones

4.6.1 Registering IP Telephones

After connecting SIP phones to the Control Box over a network, register those IP terminals to the Control Box manually.
Follow the procedure below for registration.

1. Do the following settings.

   a. Click **Setup → Control Box Configuration → Configuration→ Slot**.

   b. Click **V-SIPEXT**.

   c. Click **Port Property**.

2. Set passwords for the SIP extensions.

   a. Click the cell in the **Connection** column for each SIP extension you wish to register. The Command Connection screen appears.

      b. Click **OUS**.

      c. Enter a password in the **Password** cell for each SIP extension.

      d. Click **Apply**.

      e. Click the cell in the **Connection** column for each SIP extension to which a password has been assigned. The Command Connection screen appears.

      f. Click **INS**.

      g. Click **OK**.

      Note

- Alternatively, it is possible to set an extension number as a password for each SIP extension automatically.
- In order to set the password automatically, do the following in substitution for step **c** of the procedure above.

        1. Click **Copy to**. A screen will appear with information on assigned extension numbers for SIP extensions.

        2. Click **Select All**.

        3. Click **Execute** to copy each Extension Number to Password.

- When copying extension numbers to passwords, you can also use the 🗐 icon on the bottom left of the Virtual SIP Extension Port Property screen.

3. Programme the SIP extension you wish to register.

      a. Set the IP address of the Control Box, extension number, and password in the corresponding fields for your SIP extension.

      b. Send a request from the SIP extension to the Control Box for registration.

- If the authentication information of the SIP extension and the Control Box match, the registration is successful.

      Note

- When programming the SIP extension, the names of the corresponding fields may differ depending on the type of SIP phone you are using.
- For details about the actual operation of SIP phones, refer to the documentation of the SIP phone.
- For certain SIP phones, you may need to set a Sign-in name, which should consist of the extension number and the IP address of the Control Box (e.g., 350@192.168.0.31).

4.6.2 De-registering IP Telephones

De-registration of SIP Phones

The de-registration of SIP phones is carried out by deleting either the extension number or password registered in the Control Box.

1. Do the following settings.

      a. Click **Setup → Control Box Configuration → Configuration→ Slot**.

      b. Click **V-SIPEXT**.

      c. Click **Port Property**.

2. Do the following settings.

    a. Click the cell in the Connection column for the port of the SIP phone to de-register.

    b. In the Command window, click **OUS** to change the status of the port to "OUS".

3. Repeat step **2** for each SIP phone to de-register.

4. Delete either the extension number or password for the SIP phone to de-register, as shown here.

5. Click **OK**.

4.7 Programming UM System Manager Features

The System Manager can send a message to multiple subscribers at one time (Broadcasting Messages).
If you will use the System Manager, you should change the password from its default value of "1234".
For details about changing the password, refer to "15 UM Configuration—[7] System Security" in the PC Programming Manual.
For information about how to use Broadcasting Messages, refer to "2.1.1 System Manager Features" in the Operating Manual.

Section 5

Networking Information

This section provides information about topics such as using the Control Box in a VoIP network, and the TCP ports used by the Control Box. Further information on programming the Control Box for use with a VoIP network is included.

5.1 Information about Using an IP Network

This section explains common IP network information necessary for setting up networks.

5.1.1 Using a VoIP Network with the Control Box

This Control Box supports SIP (Session Initiation Protocol) devices (Lobby Station, Door Station, and Room Monitor) and SIP phones for communication on a Voice over Internet Protocol (VoIP) network.

Network Parameters

You will need to have the following IP addressing and QoS information to establish VoIP communication on your network. This information is typically supplied by a network administrator.
Consult your network administrator for specific values.

Parameter	Description
IP telephone IP Address	Identifies the location of IP telephones on the network. Each IP telephone must have a unique IP address.
Subnet Mask Address	Defines which digits of an IP address are used for the network address and the host address at each network location. The IP addresses of the IP telephones and the Control Box must fall within the same subnet as that of the default gateway (e.g., router) of the LAN.
Default Gateway Address	Identifies the IP address of the primary gateway (typically a router or similar device) that exchanges IP packets with the other gateways on the VoIP network.
IP Address	Identifies the location of the Control Box in the network during VoIP communications.
VLAN ID	Identifies the ID of the logical segment within the corporate LAN, through which voice packets from IP telephones travel. For details, refer to "5.1.3 VLAN (Virtual LAN)".

5.1.2 DHCP (Dynamic Host Configuration Protocol) Server

To establish communication over a VoIP network, IP addresses must be assigned to IP telephones and the Control Box to identify their locations on the network. While these addresses can be assigned manually, it is also possible to use a DHCP server to automatically assign IP address information. The Control Box has a DHCP Server feature. Therefore, the Control Box can act as a DHCP server or DHCP client depending on its settings. When the Control Box's DHCP Server feature is enabled, it allows you to centrally manage and automate the assignment of IP addresses with Web Maintenance Console. For details, refer to "16.2.1 Network Service—[2-1] Server Feature—DHCP(LAN)" in the PC Programming Manual.
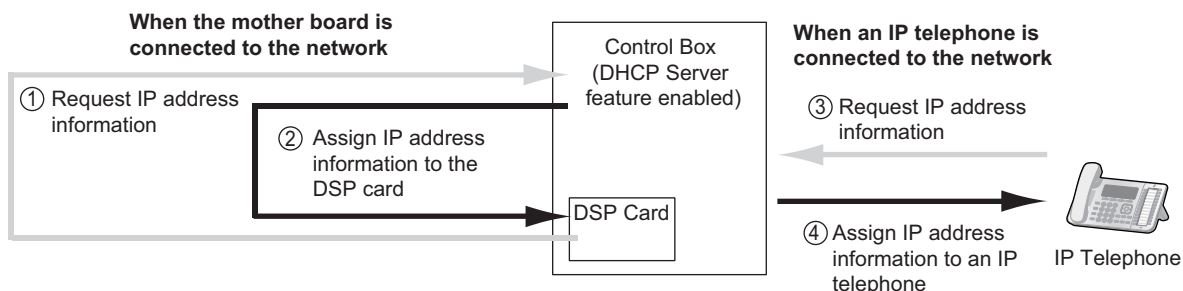
Note

- The DHCP Server feature is disabled by default. To enable the feature, refer to "4.4.3 Enabling the DHCP Server Feature".

- An IP telephone and the mother board/DSP card cannot request IP addresses from a DHCP server on another LAN (connected through an IP network). They can only receive IP addresses from a DHCP server on the same LAN. Therefore, when IP telephones are located on several LANs, a DHCP server is required on each LAN. If a DHCP server is not present on the LAN, IP addresses for IP telephones and the mother board/DSP card on that LAN must be assigned manually.

- When the Control Box has been set to act as a DHCP client, use an external DHCP server to assign IP address information automatically.

- When the Control Box is set as the DHCP client and cannot receive appropriate IP addressing information from an external DHCP server, the Control Box keeps using the previous effective IP addressing information and checks whether any overlapping of IP addresses exists. If the IP address of the Control Box overlaps with another IP address, the Control Box displays a warning to encourage changing the IP address of the Control Box.

5.1.3 VLAN (Virtual LAN)

VLANs are logical segments within a corporate LAN. By assigning VLAN settings to IP telephones, it is possible to separate the packets transmitted by an IP telephone according to the type of data and specify which VLAN each data type will be sent over. This allows you to avoid generating unnecessary network traffic on each segment and to reduce the load on the network. As a consequence, speech quality can be assured. Therefore, we recommend using the VLAN feature to perform VoIP communication effectively.

Notice

The Control Box's LAN port does not support VLAN tagging. Therefore, connect the Control Box's LAN port to a port of the switching hub that is set to "Untagged", and the IP telephone to a port set to "Trunk", to allow VLAN tagging. Consult your network administrator for details.

5.1.4 Jitter Buffer

When voice signals are packetised and transmitted, individual packets can take different paths through the network and arrive at the destination at varied timings. This is referred to as "jitter", and it can cause degradation in speech quality. To compensate for jitter problems, the "jitter buffer" accumulates the packets temporarily for processing.
To set the size of the jitter buffer, refer to "9.3.1 Control Box Configuration—[1-1] Configuration—Slot—Site Property—Main—VoIP-DSP Options" in the PC Programming Manual.

5.1.5 Voice Activity Detection (VAD)

VAD conserves bandwidth by detecting silent periods during a call and suppressing the packets of silence from being sent to the network. This feature can be enabled or disabled for codec G.711.

5.1.6 Network Configuration

You must evaluate the structure of the existing network to see if a VoIP network can be implemented. Below are the points that should be evaluated.

Is it possible to have static IP addressing?

IP telephones on the network always perform VoIP communications through the Control Box. Therefore, the Control Box must be assigned static IP addresses, which must be programmed to each IP telephone on the network.

Note

> When the DHCP Server feature is disabled and external DHCP servers are not used, static IP addressing must also be enabled for all IP telephones.

5.1.7 Network Devices

You must evaluate the network devices that are used in the existing network to see if a VoIP network can be implemented. Below are the points that should be evaluated.

Are layer 2 or higher switches used?

Use of repeater hubs can increase the network load, and therefore may result in degradation in speech quality.
To ensure high speech quality, use only layer 2 or higher switches. Use of layer 2 or higher switches is also strongly recommended for connecting IP telephones.

Note

> Note that the port of the switching hub that connects to the mother board should be set to operate under "Auto Negotiation" mode.

Does all equipment on the LAN support 1000BASE-T connection?

To use the Gigabit Ethernet feature for the LAN, all equipment on the LAN must support 1000BASE-T. For more information, consult your network administrator.

Are Category 5 (CAT 5) or higher cables used for 10BASE-T/100BASE-TX?

When connecting network devices, make sure to use CAT 5 or higher cables for 10BASE-T/100BASE-TX connection. If other types of cables are used, communication may not be carried out normally.

Are Enhanced Category 5 (CAT 5e) or higher cables used for 1000BASE-T?

When connecting network devices, make sure to use CAT 5e or higher cables for 1000BASE-T. If other types of cables are used, communication may not be carried out normally.

5.1.8 Network Time Protocol (NTP)

The Control Box can be configured to contact an NTP server to receive and update its time setting automatically.

For a SIP phone to receive and update its time setting via the Control Box, the NTP server feature must be enabled. To enable this feature refer to "16.2.3 Network Service—[2-6] Server Feature—NTP" in the PC Programming Manual.

If the NTP server feature is enabled:

• Case 1: An NTP server is specified in Web Maintenance Console.

– The SIP phones use the specified IP address and contact the NTP server directly.

• Case 2: An NTP server is *not* specified in Web Maintenance Console.

– The SIP phones use the IP address of the Control Box as their NTP server.
(The Control Box acts as an NTP server for the SIP phones.)

To specify the IP address of the NTP server, refer to "10.1.2 Control Box Configuration—[2-1-2] System—Date & Time—SNTP / Daylight Saving" in the PC Programming Manual.

If the NTP server feature is disabled, the SIP phones use their own time settings.

5.2 Port Security

The following table shows the Control Box's ports used for IP communications. Any access to the ports not in this list is ignored.

Port Numbers for LAN Port

Port Number	Protocol	Application	Client/Server	Changeable/ Fixed
25	TCP/UDP	SMTP	Server	Changeable
53	UDP	DNS	Server	Fixed
67	UDP	DHCP	Server	Changeable
68	UDP	DHCP	Client	Changeable
80	TCP	HTTP	Server	Changeable
123	UDP	NTP	Server	Fixed
443	TCP	HTTPS	Server	Changeable
2300	TCP	Telnet-SMDR	-	Changeable
5060	UDP	SIP UA (EXT)	-	Changeable
33321	TCP	Access Point Login (Telnet)	Server	Changeable

Port Numbers for MNT Port

Port Number	Protocol	Application	Client/Server	Changeable/ Fixed
25	TCP/UDP	SMTP	Server	Changeable
53	UDP	DNS	Server	Changeable
67	UDP	DHCP	Server	Changeable
80	TCP	HTTP	Server	Changeable
123	UDP	NTP	Server	Fixed
443	TCP	HTTPS	Server	Changeable
8080	TCP	Web Maintenance Console	-	Changeable
33321	TCP	Access Point Login (Telnet)	Server	Changeable

Port Numbers for DSP Card

Port Number	Protocol	Application	Client/Server	Changeable/ Fixed
12000–13535	UDP	RTP/RTCP	-	Changeable

5.2 Port Security

Section 6

Troubleshooting

This section provides information on the Control Box and telephone troubleshooting.

6.1 Troubleshooting

6.1.1 Installation

PROBLEM	PROBABLE CAUSE	SOLUTION
You cannot make/receive calls via an IP network.	• 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 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.
SIP phones do not operate.	• 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 in length. • Make sure that a straight cable is used for connection to a switching hub.
	• Network malfunction	• Make sure that all network devices in use are switched on.
The Control Box does not operate properly.	-	• Restart the Control Box (refer to "6.1.3 Restarting the Control Box"). • Turn off the power switch, and then turn it back on. • Turn off the power switch, and then unplug the Control Box. After 5 minutes, plug the Control Box back in, and turn the power switch back on.
The STATUS indicator on the front of the cabinet turns on red.	• A major system error has occurred in the Control Box.	• See the error log using Web Maintenance Console (refer to "6.1.4 Troubleshooting by Error Log").

6.1.2 Operation

PROBLEM	PROBABLE CAUSE	SOLUTION
• 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.

PROBLEM	PROBABLE CAUSE	SOLUTION
• The IP address of the Control Box for networking has been forgotten.	-	• Connect a PC to the MNT port of the Control Box directly and start the Web Maintenance Console using the default IP address of the MNT port, and then confirm the IP address assigned for the LAN port. For details of connecting the PC directly to the Control Box, refer to "4.2 PC Connection". For details of checking current IP address of the mother board, refer to "16.1 Network Service—[1] IP Address/Ports—Basic Settings—LAN Setting—IP Address" in the PC Programming Manual.

6.1.3 Restarting the Control Box

If the Control Box does not operate properly, restart the Control Box using Web Maintenance Console. Before restarting the Control Box, try the system feature again to confirm whether there definitely is a problem or not.

Note

• With this procedure, data stored in memory is not cleared.

• Be aware that restarting the Control Box with the System Mode Switch in the "SYSTEM INITIALIZE" position clears all data stored in the Control Box. Do not perform this operation unless you intend to delete all data from the Control Box.

• When the Control Box is set to obtain IP addressing information automatically, and the Control Box is not able to obtain appropriate IP addressing information from an external DHCP server, the Control Box starts up with its default IP addresses and the STATUS indicator on the front of the cabinet turns red. For the default IP addresses, refer to "4.3 Starting Web Maintenance Console".

Operation

If the Control Box does not operate properly:

1. Slide the System Mode Switch to the "NORMAL" position.
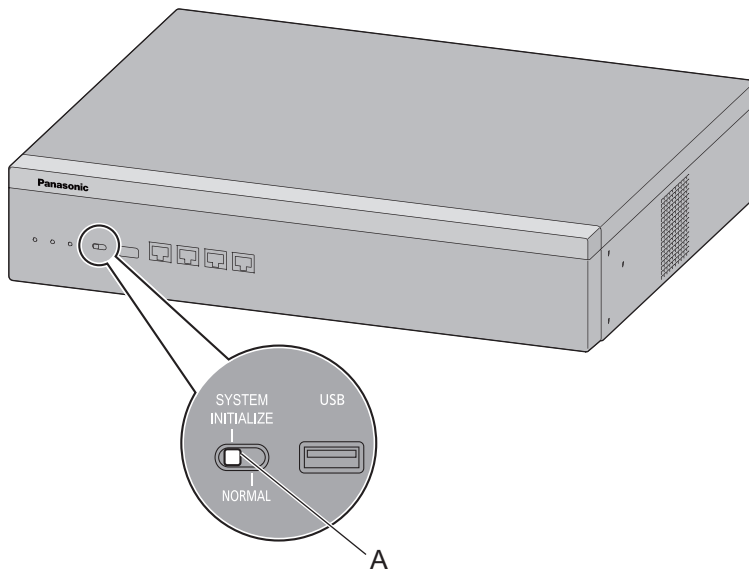
A. System Mode Switch

2. Start the Web Maintenance Console.

3. Log in using an Administrator level account.

4. On the Home screen, click **Maintenance → System Control → System Reset → System Reset**.

5. Follow the prompts.
Restarting the Control Box will start.

To reset the system at a preset time:

1. Confirm that the System Mode Switch is in the "NORMAL" position.

2. Start the Web Maintenance Console.

3. Log in using an Administrator level account.

4. On the Home screen, click **Maintenance → System Control → System Reset → Timed Reset**.

5. Set the **Reset Mode** and **Reset Time** for the system reset.
For details about the settings, refer to the PC Programming Manual.

6. Click **Apply** or **OK** to set the system reset.
The Control Box will restart at the specified time.

PC Programming Manual References

5.2 System Control—System Reset

6.1.4 Troubleshooting by Error Log

When a major system error occurs in the Control Box, the STATUS indicator on the front of the cabinet turns red, and the system logs the error information.

Error Log Display Format

Below is the display format of the error log. For information about how to view the error log using Web Maintenance Console, refer to "7.2.1 Utility—Log—Error Log" in the PC Programming Manual.

Example: Web Maintenance Console
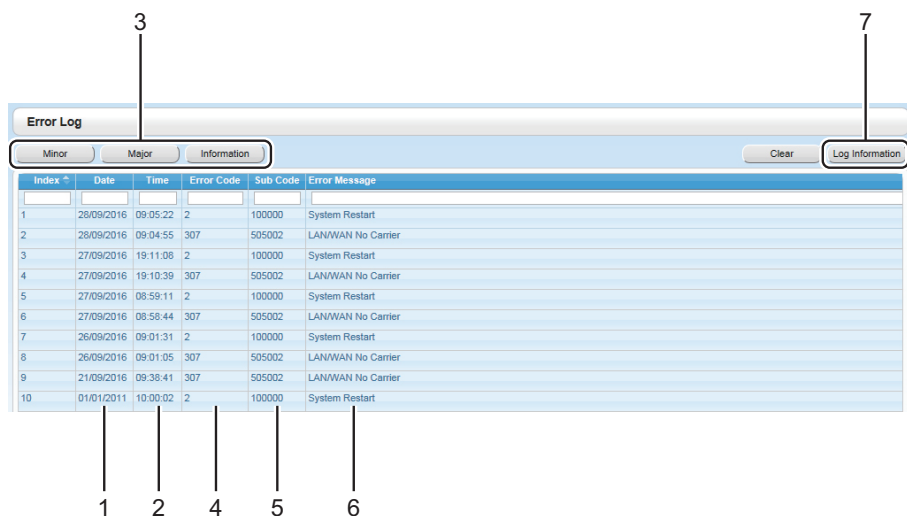
Example: Station Message Detail Recording (SMDR)

```
01/01/10 01:00AM MJ ALM  #014 00 10000 FAN Alarm
01/01/10 01:29AM MN ALM #533 01 50401 Unit start up error
```

```
  1        2        3       4     5          6
```

Description

	Item		Description
1	Date		The date of the error detection.
2	Time		The time of the error detection.
3	Level	Minor (MN ALM)	Displays minor errors, which affect only a certain part of system operation.
		Major (MJ ALM)	Displays major errors, which affect operation of the whole system, or result in system failure.
		Information	Displays information log.
4	Error Code		The 3-digit error code assigned by the Control Box. For details about the error code, refer to item 7 in this table.
5	Sub Code		**SMDR**: The 10-digit sub code of the relevant hardware (BBBWXYYZZZ). **Web Maintenance Console**: The 7-digit sub code of the relevant hardware (WXYYZZZ). For details about the contents of error sub codes, refer to "7.2.1 Utility—Log—Error Log" in the PC Programming Manual.
6	Error Message		A description of the error.
7	Log Information		Clicking this button displays a list of errors and solutions in PDF format, as shown below.

[Sample] List of Errors and Solutions

For each error code, the error message, probable cause, and solutions are explained.

List of Errors and Solutions

The tables below list the errors and their solutions.
When an error whose error code is indicated with "*" occurs in the Control Box, the ALARM indicator on the front of the shelf turns on red, and the system logs the error information.

When errors are logged, the ALARM indicator will turn off only when the log for major or minor errors is cleared from the Maintenance Console.

System Start-up and On-line Operation

Error Code	Error Message	PROBABLE CAUSE	SOLUTION
000*	MPR WDT overflow	• Control Box main board malfunction	• Perform a system reset of the Control Box through Web Maintenance Console (If the system reset cannot be performed, turn off the power switch, and then turn it on)
001	SDRAM bit error	• Erroneous processing of Control Box software • Software error due to external factors	• Re-program the Control Box • Exchange the Control Box
002	System Restart	• A system shutdown or reset was performed using Web Maintenance Console • The power switch of the Control Box was turned off, and then turned on • Power failure • The Control Box was automatically reset due to a system fault or ... restoration	• This message indicates occurrences of system resets

Section 7

Appendix

This section provides information about System Prompt Languages.

7.1 System Prompt Languages

System prompt languages stored in the Storage Memory Card (installed by default)

No. 1 (Primary)	UK-English
No. 2	Spanish
No. 3	French
No. 4	German
No. 5	Dutch
No. 6	Italian
No. 7	Swedish

Note

For Future Reference

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

Note

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

MODEL NO. _____

SERIAL NO. _____

DATE OF PURCHASE _____

NAME OF DEALER _____

DEALER'S ADDRESS _____

_____

_____

_____

DEALER'S TEL. NO. _____

For Europe

Contact to Authorised Representative:
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Panasonic Corporation

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