

Panasonic®



Installation Manual DECT 6.0 Repeater

Model No. **KX-A405**

Thank you for purchasing a Panasonic DECT 6.0 Repeater.
Please read this manual carefully before using this product and save this manual for future use.

Important Information

SAVE THESE INSTRUCTIONS

Safety Notices

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

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

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

WARNING

SAFETY REQUIREMENTS

- 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.
- Make sure that the wall that the unit will be attached to is strong enough to support the unit (approx. 80 g [2.8 oz]). If not, it is necessary for the wall to be reinforced.
- Only use the wall-mounting equipment (screws, washers) included with the unit.
- When this unit is no longer in use, make sure to detach it from the wall.
- Do not connect or disconnect the AC plug with wet hands.
- Disconnect the unit from the AC outlet and contact the dealer if:
 - The AC adaptor cord or AC plug becomes damaged or frayed.
 - The unit is exposed to rain, water, or any other liquid.
 - The unit is dropped or damaged.
 - Internal components are exposed due to damage.
 - The unit does not operate properly.
 - Performance deteriorates.
- Disconnect the unit from the AC outlet if the unit emits smoke, an abnormal smell, or makes unusual noise. These conditions can cause fire or electric shock. Confirm that smoke has stopped and contact an authorized service center.
- Clean the AC plug periodically with a soft, dry cloth to remove dust and other debris.
- Do not touch the unit or AC adaptor during a lightning storm.
- Use only the included AC adaptor (PQLV219).
- Do not allow anything to rest on the AC adaptor cord. Do not locate this unit where the AC adaptor cord may be stepped on or tripped on.

CAUTION

SAFETY REQUIREMENTS

- The unit should be kept free of dust, moisture, high temperature (more than 40 °C [104 °F]), low temperature (less than 0 °C [32 °F]), and vibration, and should not be exposed to direct sunlight.
- The unit should not be placed outdoors (use indoors).
- The unit should not be placed near high-voltage equipment.
- The unit should not be placed on a metal object.

- When driving the screws into the wall, be careful to avoid touching any metal laths, wire laths or metal plates in the wall.
- To prevent malfunction, deformity, overheating, rust, and discoloration, do not install or place equipment in the following types of locations:
 - Locations where air ventilation is poor.
 - Locations that may be exposed to sulphurous gas, such as near hot springs.
 - Near devices that emit heat, such as heaters.
 - Near devices that emit electromagnetic noise, such as radios or televisions.
 - Near devices that emit high-frequency noise, such as sewing machines or welders.
- Do not stretch or bend the cable. Also, do not allow anything to rest on the cable.
- The unit and the cable should never be placed near or over a radiator or other heat source.
- Do not bundle the cable that is connected to the unit with the AC power cords of machines located nearby.
- Make sure the cable is securely fastened to the wall.
- The AC adaptor is used as the main disconnect device. Ensure that the AC adaptor is located near the unit and is easily accessible.
- Disconnect the AC adaptor cord from the unit before cleaning. Clean the unit with a soft, dry cloth. Do not use liquid, aerosol cleaners, abrasive powders, or chemical agents to clean the unit.
- When left unused for a long period of time, disconnect the unit from the AC outlet.
- **Medical**—consult the manufacturer of any personal medical devices, such as pacemakers, to determine if they are adequately shielded from external RF (radio frequency) energy. (The unit operates in the frequency range of 1920 MHz to 1930 MHz, and the output peak power level is less than 0.12 W.) Do not use the unit 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 equipment that could be sensitive to external RF (radio frequency) energy.

SECURITY REQUIREMENTS

Preventing Data Disclosure Over the Network

- To ensure the security of private conversations, only connect the unit to a secure network.
- To prevent unauthorized access, only connect the unit to a network that is properly managed.

Notice

SAFETY REQUIREMENTS

- Before connecting the unit, confirm that the unit supports the intended operating environment.
- If the unit does not operate properly, disconnect the AC adaptor cord, then connect again.
- The unit may not operate in the event of a power failure.
- Do not move the unit while it is in use.
- Satisfactory operation, interoperability, and compatibility cannot be guaranteed with all equipment connected to the unit, nor with all services provided by telecommunications providers over networks connected to the unit.

SECURITY REQUIREMENTS

Privacy of communications may not be ensured when using the wireless systems.

Additional Information

F.C.C. REQUIREMENTS AND RELEVANT INFORMATION

CAUTION

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

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 distance between the equipment and receiver.
- Connect the equipment to 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.

Some wireless telephones operate at frequencies that may cause interference to nearby TVs and VCRs. To minimize or prevent such interference, the repeater should not be placed near or on top of a TV or VCR. If interference is experienced, move the repeater and wireless telephone further away from the TV or VCR. This will often reduce, or eliminate, interference.

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 product and a person's body (excluding hands, wrists and feet) during wireless modes of operation.

This transmitter must not be co-located or operated in conjunction with any other antennas or transmitters.

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1 Overview

System Overview

A repeater is used when you need to extend the range of a DECT 6.0 Portable Station (PS) or DECT 6.0 Cell Station (CS) connected to a PBX, to include areas where reception was previously not available. The repeater extends the range in all directions, allowing several floors to be covered.

Up to 6 repeaters can be registered to one CS, and up to 3 repeaters can be arranged in a cascade configuration.

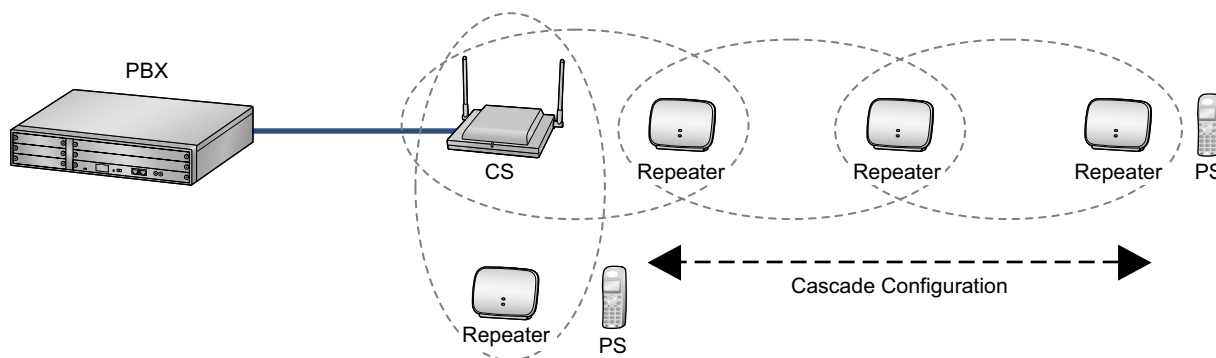
The number of simultaneous calls on a CS is reduced by adding a repeater. This is by design. Each repeater is controlled using one speech path. The repeater can support up to a maximum of 4 simultaneous calls.

Note

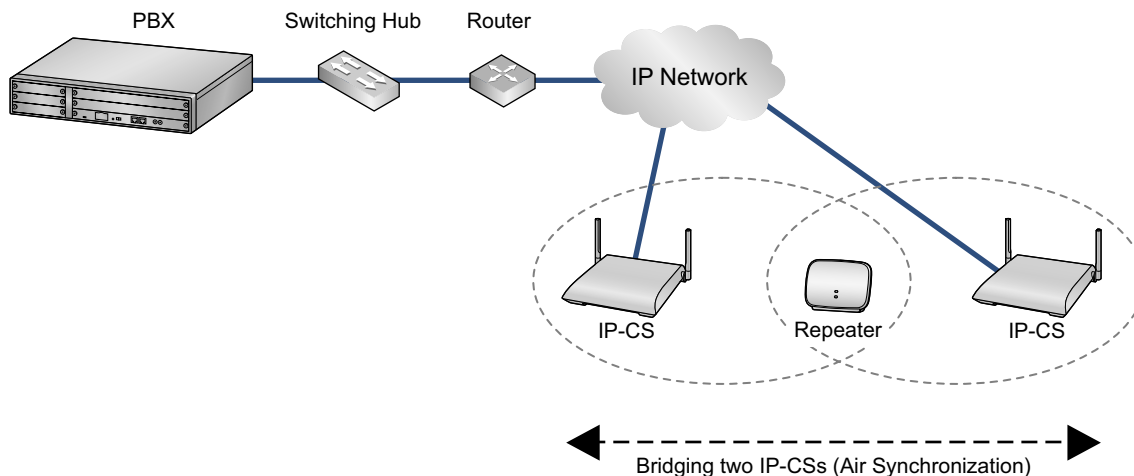
In this manual, the illustrations of the PBX are based on the KX-NCP500.

System Connection Examples

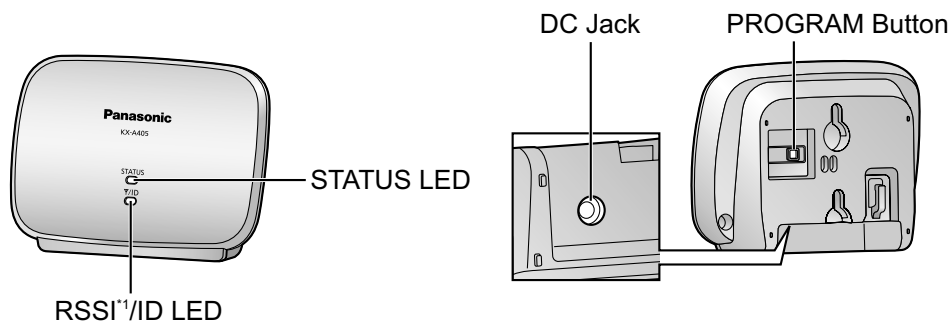
Example 1: Extending the range of a CS



Example 2: Connecting two IP-CSs



Names and Locations



*1 RSSI: Received Signal Strength Indication

Unpacking

Unpack the box and check the items below:

Repeater (KX-A405)	1
AC Adaptor (PQLV219)	1
Screws	2
Washers	2

LED Indications

Mode	Status	LED	
		STATUS	RSSI/ID
—	Power Off	Off	Off
De-registration Mode	Entering De-registration mode (0–5 seconds)	Red Flashing	Off
	Entering De-registration mode (5–10 seconds)	Quick Red Flashing	
	De-registration complete (after 10 seconds)	Red On	
Registration Mode (Easy/Manual)	Searching for devices	Red Flashing	Off

Mode	Status	LED	
		STATUS	RSSI/ID
Operation Mode	Standby (signal is strong)	Green On	Green On
	Standby (signal is weak)		Amber On
	Standby (out of range)	Red On	Red On
	Talking (signal is strong)	Green Flashing	Green On
	Talking (signal is weak)		Amber On
	Busy (signal is strong)	Quick Green Flashing	Green On
	Busy (signal is weak)		Amber On
Manual Registration Mode	ID1	Amber Flashing	One Red Flash
	ID2		Two Red Flashes
	ID3		Three Red Flashes
	ID4		Four Red Flashes
	ID5		Five Red Flashes
	ID6		Six Red Flashes
	Confirming ID		Red On
ID Modification Mode	ID1	Amber On	One Red Flash
	ID2		Two Red Flashes
	ID3		Three Red Flashes
	ID4		Four Red Flashes
	ID5		Five Red Flashes
	ID6		Six Red Flashes
	Confirming ID		Red On
ID Confirmation Mode/ Verification Tone Mode	ID1	Amber On	One Green Flash
	ID2		Two Green Flashes
	ID3		Three Green Flashes
	ID4		Four Green Flashes
	ID5		Five Green Flashes
	ID6		Six Green Flashes

Mode	Status	LED	
		STATUS	RSSI/ID
Site Survey Mode	Channel 1	One Green Flash	Off
	Channel 2	Two Green Flashes	
	Channel 3	Three Green Flashes	
	Channel 4	Four Green Flashes	
	Channel 0	Five Green Flashes	

Flashing Speeds

LEDs flash in a cycle at the following speeds:

Type of Flashing	Speed
Regular Flashing	640 ms On → 640 ms Off
Quick Flashing	320 ms On → 320 ms Off
One Flash	640 ms On → 640 ms Off → 3 s Off
Two Flashes	(640 ms On → 640 ms Off) × 2 → 3 s Off
Three Flashes	(640 ms On → 640 ms Off) × 3 → 3 s Off
:	:

Compatible Devices

Compatible Device	Model No.
CS	<ul style="list-style-type: none"> • KX-T0155 • KX-TDA0156 • KX-T0158 • KX-NCP0158 (IP-CS)
PS	<ul style="list-style-type: none"> • KX-TD7685 • KX-TD7695 • KX-TD7696 • KX-WT125 • KX-WT126

Specifications

Basic Specifications

Maximum Number of Simultaneous Calls	4
Maximum Number of Cascade Steps	3
Maximum Number of Repeaters Registered to a CS	6

General Specifications

Dimensions	111 mm (W) × 82 mm (H) × 39 mm (D) (4-3/8 in × 3-1/4 in × 1-1/2 in)
Weight	80 g (2.8 oz)
Power Supply	AC Adaptor (PQLV219) Input: AC 120 V, 60 Hz Output: DC 6.5 V, 500 mA
Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)

RF Specifications

Wireless Interface	DECT 6.0
Radio Access Method	MultiCarrier TDMA-TDD
Frequency Band	1920 MHz to 1930 MHz
Number of Carriers	5
Carrier Spacing	1728 kHz
Bit Rate	1152 kbps
Modulation Scheme	GFSK

2 Registering the Repeater

Easy Registration

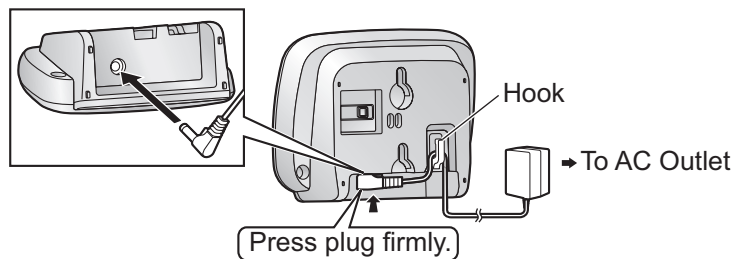
In easy registration, the repeater can be registered to a CS easily.

WARNING

When installing or testing a product with an external AC adaptor, the AC adaptor should be plugged into a wall outlet or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.

Note

- Easy registration cannot be performed if the repeater is already registered to another CS. Please follow the procedure in "De-registration" before attempting easy registration.
 - We recommend that you power down any CS that you do not wish to connect to the repeater prior to registration.
1. Ensure that the repeater is turned off by disconnecting the AC adaptor.
 2. Turn on the repeater by connecting the AC adaptor.



The STATUS LED will turn amber for 2 seconds.

3. If the repeater is unregistered, the STATUS LED will flash red, and the repeater automatically enters Easy Registration mode.
4. When the repeater has found a CS, the STATUS LED will turn green. Registration is complete.

Note

If easy registration is unsuccessful within 2 minutes, the repeater will be reset and easy registration will be repeated automatically.

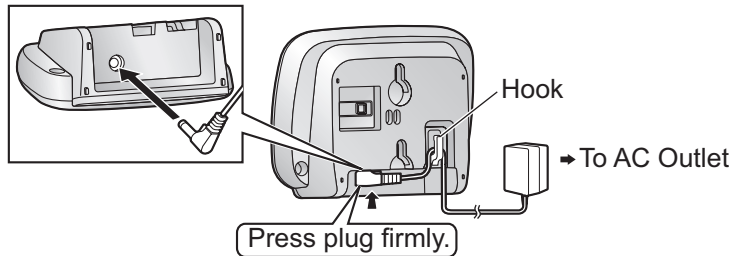
Manual Registration

In manual registration, the repeater can be registered to another repeater to create a cascade configuration.

WARNING

When installing or testing a product with an external AC adaptor, the AC adaptor should be plugged into a wall outlet or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.

1. Ensure that the repeater is turned off by disconnecting the AC adaptor.
2. Turn on the repeater by connecting the AC adaptor.



The STATUS LED will turn amber for 2 seconds.

3. **When the repeater is unregistered:**
The STATUS LED will flash red, and the repeater automatically enters Easy Registration mode.
When the repeater is registered:
The repeater automatically enters Operation mode.
4. Check the ID of the repeater you are attempting to register to (destination repeater).
 - a. In Operation mode, press the destination repeater's PROGRAM button to switch to ID Confirmation mode.
The ID is indicated by the number of times the RSSI/ID LED flashes green.
 - b. Return the destination repeater to Operation mode by pressing the PROGRAM button again.
5. On the repeater you are registering, press and hold down the PROGRAM button for 5 seconds to enter Manual Registration mode.
The STATUS LED will flash amber.
The RSSI/ID LED will flash red once to indicate that the ID is currently set to 1.
6. If the ID of the destination repeater was not 1, press the PROGRAM button to select the ID that matches the destination repeater.
The ID can be selected from 1 through 6 by pressing the PROGRAM button. The ID will increase by one each time the button is pressed.
7. Press and hold down the PROGRAM button for 5 seconds to assign the ID to the repeater.
The RSSI/ID LED will turn red.
8. Release the PROGRAM button to reset the repeater.
The STATUS LED will turn amber for 2 seconds and then start flashing red. The repeater will then start searching for a repeater with the assigned ID.
9. When the repeater has found a repeater with the assigned ID, the STATUS LED will turn green.
Registration is complete.

Note

If a repeater with the assigned ID cannot be found within 2 minutes, the repeater will automatically reset and start searching for a repeater with the same ID again.

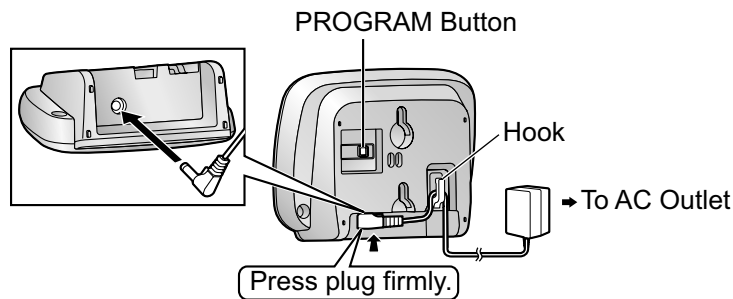
De-registration

Perform de-registration to delete the ID of the CS/repeater that the repeater is registered to.

WARNING

When installing or testing a product with an external AC adaptor, the AC adaptor should be plugged into a wall outlet or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.

1. Ensure that the repeater is turned off by disconnecting the AC adaptor.
2. While pressing and holding down the PROGRAM button, turn on the repeater by connecting the AC adaptor.



3. Continue to hold down the PROGRAM button for 10 seconds. When the STATUS LED turns red, de-registration is complete.

Note

If the PROGRAM button is released after 5 seconds but before 10 seconds have elapsed, while the STATUS LED is flashing quickly, the repeater will enter Site Survey mode.

4. Release the PROGRAM button to reset the repeater. The repeater automatically enters Easy Registration mode. For details about the easy registration procedure, refer to "Easy Registration".

ID Modification

In ID Modification mode, the ID of the repeater (RPN [Radio Part Number]) can be selected. Registered repeaters are automatically assigned an ID during the registration process. This ID can be changed by following the procedure below.

1. In Operation mode, or Easy Registration mode if the repeater is unregistered, press and hold down the PROGRAM button for 8 seconds to enter ID Modification mode.
The STATUS LED will turn amber.
The RSSI/ID LED will flash red once to indicate that the ID is currently set to 1.
2. Press the PROGRAM button to select the desired ID.
The ID can be selected from 1 through 6 by pressing the PROGRAM button. The ID will increase by one each time the button is pressed.
3. Press and hold down the PROGRAM button for 5 seconds to assign the ID to the repeater.
The RSSI/ID LED will turn red.
4. Release the PROGRAM button to reset the repeater.
The STATUS LED will turn amber for 2 seconds and then the repeater will return to Operation mode, or Easy Registration mode if the repeater is unregistered.

3 Using the Repeater

ID Confirmation Mode/Verification Tone Mode

The ID of currently registered repeaters can be checked in ID Confirmation mode. Also, repeater coverage can be checked using a PS, in Verification Tone mode. When the beep is no longer heard, the PS is no longer in range of the repeater.

1. In Operation mode, press the PROGRAM button to switch to ID Confirmation mode/Verification Tone mode. The STATUS LED will turn amber.
2. The current ID is indicated by the number of times the RSSI/ID LED flashes green. At the same time, the verification tone will be activated, and the coverage of the repeater can be checked.
3. Return the repeater to Operation mode by pressing the PROGRAM button again. The verification tone will be deactivated.

Note

If you press and hold down the PROGRAM button for 5 seconds, the repeater will enter "Manual Registration" mode.

Site Survey Mode

This function can be used to measure the transmission quality, and identify problematic transmission areas of the repeater installation. This function can be used when registered or de-registered.

WARNING

When installing or testing a product with an external AC adaptor, the AC adaptor should be plugged into a wall outlet or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.

Note

- The repeater's Site Survey mode works independently from the CS. This means that the CS does not have to be placed into Site Survey mode.
- When using more than 1 repeater in Site Survey mode simultaneously, please ensure repeaters are set to different channels.

1. Ensure that the repeater is turned off by disconnecting the AC adaptor.
2. While pressing and holding down the PROGRAM button, turn on the repeater by connecting the AC adaptor.
The STATUS LED will flash red.
3. Continue to hold down the PROGRAM button for 5 seconds.
The STATUS LED will flash red quickly.

Note

If you continue to hold down the PROGRAM button for 10 seconds, the repeater will enter De-registration mode.

4. Release the PROGRAM button.
The STATUS LED will flash red to indicate the current channel number, and a carrier sense will start to check whether the current channel is available (idle) or not.
5. If the current channel is available, the STATUS LED will change to flash green.
Site Survey mode on the current channel is now operational.

Note

A carrier sense is performed regularly in Site Survey mode. If the selected channel is not available (busy), the STATUS LED will flash red to indicate the channel number and the repeater will stop transmitting.

6. Activate the site survey function on the PS to measure the radio signal strength level. The repeater CSID is 1234567890.

Note

For details about using the PS during a site survey, refer to the appropriate CS Quick Installation Guide.

7. To change the site survey channel, press the PROGRAM button.
The channel number will increase by one each time the button is pressed. The channel number can be selected from 0 through 4.
8. To turn off Site Survey mode, turn off the repeater by disconnecting the AC adaptor, and then turn on the repeater by connecting the AC adaptor.

4 Wall Mounting

Mounting

WARNING

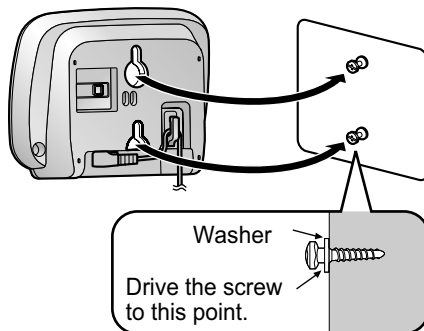
- Make sure that the wall that the unit will be attached to is strong enough to support the unit (approx. 80 g [2.8 oz]). If not, it is necessary for the wall to be reinforced.
- Only use the wall-mounting equipment (screws, washers) included with the unit.
- When this unit is no longer in use, make sure to detach it from the wall.

CAUTION

- When driving the screws into the wall, be careful to avoid touching any metal laths, wire laths or metal plates in the wall.
 - Do not stretch or bend the cable. Also, do not allow anything to rest on the cable.
 - The unit and the cable should never be placed near or over a radiator or other heat source.
 - Do not bundle the cable that is connected to the unit with the AC power cords of machines located nearby.
 - Make sure the cable is securely fastened to the wall.
1. Place the reference for wall mounting on the wall to mark the 2 screw positions.
 2. Install the 2 screws and washers (included) into the wall.

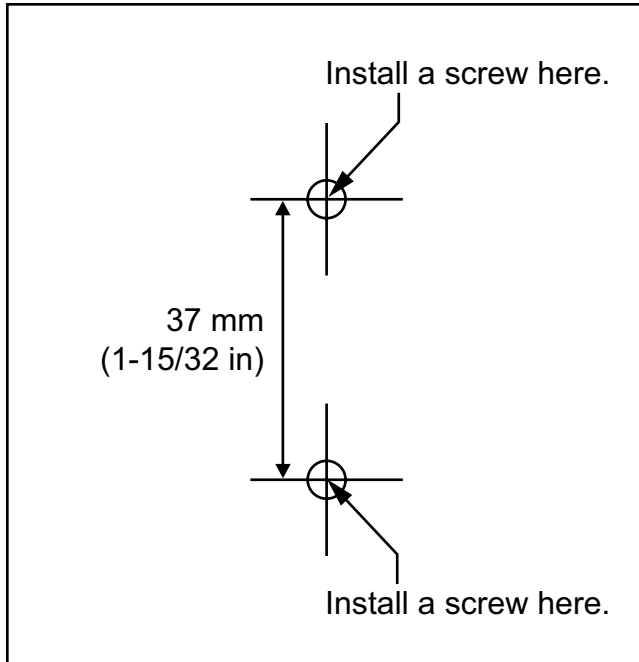
Note

- Make sure that the screw heads are at the same distance from the wall.
 - Install the screws perpendicular to the wall.
3. Hook the repeater on the screw heads.



Reference for Wall Mounting

Print this page and use as a reference for wall mounting.



Note

Make sure to set the print size to correspond with the size of this page. If the dimension of the paper output still deviates slightly from the measurement indicated here, use the measurement indicated here.

5 Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
<ul style="list-style-type: none"> The repeater does not turn on. 	<ul style="list-style-type: none"> The AC adaptor is not connected properly. 	<ul style="list-style-type: none"> Make sure that the AC adaptor is properly connected to both the repeater and the AC outlet.
<ul style="list-style-type: none"> Cannot register the repeater. (The STATUS LED and RSSI/ID LED flash green and red alternately.) 	<ul style="list-style-type: none"> The CS is out of range. 	<ul style="list-style-type: none"> Move the repeater closer to the CS and repeat the registration procedure.
	<ul style="list-style-type: none"> The CS is not turned on. 	<ul style="list-style-type: none"> Confirm that the CS is on.
<ul style="list-style-type: none"> The PS is beeping. 	<ul style="list-style-type: none"> The verification tone is turned on. 	<ul style="list-style-type: none"> Turn the verification tone off.
<ul style="list-style-type: none"> Poor audio quality. 	<ul style="list-style-type: none"> The CS is out of range. 	<ul style="list-style-type: none"> Move the repeater closer to the CS.
	<ul style="list-style-type: none"> The PS is out of range. 	<ul style="list-style-type: none"> Move the PS closer to the repeater.
<ul style="list-style-type: none"> A ringing call suddenly stops when moving between CS/repeater zones. 	<ul style="list-style-type: none"> There is a delay when moving from a CS zone to a repeater zone when receiving a call in group ring mode. 	<ul style="list-style-type: none"> Answer the call before moving between CS/repeater zones.
<ul style="list-style-type: none"> When talking and moving between zones, you hear an alarm or continuous noise, or your call is disconnected. 	<ul style="list-style-type: none"> The new zone is "busy", so handover cannot occur. 	<ul style="list-style-type: none"> Return to the original zone and continue your call.

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

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