

SL2100

Hardware Manual

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Before use

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

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Regulatory

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MEMO

PRODUCT LIABILITY




USING THE EQUIPMENT SAFELY







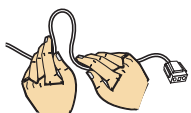
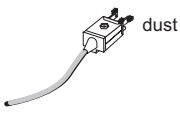
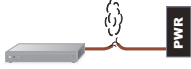


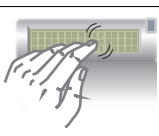

The following safety information describes how to avoid injuries while working with the equipment and how to prevent damage to the equipment. Learn the meaning of the following symbols and then read this section carefully before using the equipment.



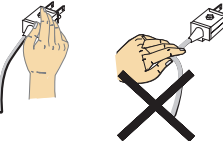

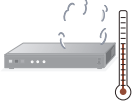



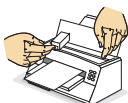
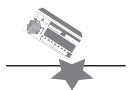
SYMBOL	DESCRIPTION
<p>DANGER</p> 	<p>Incorrect use of the equipment may cause personal injury or death.</p>
<p>WARNING</p> 	<p>Incorrect use of the equipment may cause personal injury or a serious system fault.</p>
<p>CAUTION</p> 	<p>Incorrect use of the equipment may limit the system performance or cause the system to fail.</p>
<p>The telephone system can only be used in NEC-designated countries. If a system-down, malfunction, defect or external factor such as an electrical failure indirectly causes a loss of profit, the company (or affiliates) will not be held responsible. The goal is to produce a comprehensive and accurate manual. However, if errors or omissions are found in this manual, please notify NEC Corporation. If the system requires installation or repair, contact the dealer or its service technician. Carefully read all the manuals that relate to the system.</p>	



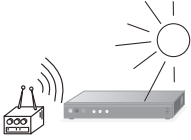
SAFETY CONSIDERATIONS

The following describes the safety considerations that must be observed before using the system, the powerrelated equipment and the peripheral equipment, such as consoles, the Main Distribution Frame (MDF), telephones, PCs, printers, etc.

<p style="text-align: center;">DANGER</p> 	
	<p>If the system emits smoke or a burning, acrid odor, immediately turn off the system power. Operating the system in this state might cause a fire, an electrical shock, or a system failure. After turning off the power and confirming that the smoke has disappeared, contact the dealer.</p>
	<p>If any equipment, such as the system, the main power source, a cabinet or peripheral equipment tips over, turn off the power and contact the dealer.</p>

<p>DANGER</p> 	
	<p>System knockout panels are only allowed to be cut using side cutters. Box cutter/knife is not allowed to be used.</p>
	<p>If liquid reaches the inside of the system or the main power source, turn off the power. Operating the system in this state might cause a fire, an electrical shock, or a system failure.</p>
	<p>Do not touch the internal parts of the main power source to disassemble or configure it. This action may cause a fire, an electrical shock or a system failure. NEC Corporation does not take any responsibility for disassembled or reconfigured equipment.</p>
	<p>Do not put any container objects (such as a vase or a cup) on the main power source or any peripheral equipment. It might cause a fire, an electrical shock or a system failure.</p>
	<p>Be sure to use cables designated by NEC or cables attached to the equipment. If cables are not designated particularly, choose cables with considering safety and transmission performance carefully. Ask the dealer or your local agency if needed.</p>
	<p>Do not tamper with, modify, forcefully bend, forcefully remove or twist an electrical cord or any wiring to or from the system, the main power source or any peripheral equipment. It might cause a fire, an electrical shock, or a system failure. If the wiring is damaged, contact the dealer.</p>
	<p>Correctly insert all of the electrical plugs into the electrical outlets. Before inserting a plug into an electrical outlet, ensure that there is no dust on the plug's blades. If there is dust on a blade, it might cause a fire.</p>
	<p>Do not use power other than the power that was designated for the system when it was installed.</p>
	<p>Do not attempt to repair or move the main power source without assistance from the dealer.</p>
	<p>Do not put any metal or combustible objects into a vent of the system, the main power source, or any peripheral equipment. Operating the system in this state might cause a fire, an electrical shock, or a system failure. If this occurs, turn off the power and contact the dealer.</p>
	<p>Be careful when using any peripheral equipment's Liquid Crystal Display (LCD). If the liquid leaks, it can be harmful to the user and to the system.</p>
	<p>Before connecting any non-NEC, customer-provided equipment, check with the supplier to ensure that the equipment is compatible. If the supplier cannot confirm the compatibility, do not connect the equipment. Connecting incompatible equipment might cause a fire or an electrical shock.</p>


<p>WARNING</p> 	
	<p>Do not place any object on the system or the main power source. If the object falls, it might cause personal injury or damage to the equipment.</p>
	<p>When removing a plug from an outlet, be sure to grip the plug, not the cord. Gripping the cord to remove the plug could cause a fire or an electrical shock to occur.</p>
	<p>If lightning causes a fault, contact the dealer.</p>
	<p>Provide the appropriate temperature, humidity, and ventilation on an around-the-clock basis. For example, at a height that is one meter (3.28 feet) above the floor, the temperature should be between 20°C and 25°C (68°F to 77°F) and the humidity should be approximately 50%.</p>
	<p>Take appropriate anti-static measures so that the other end of the anti-static kit can be connected to the metal part of the frame.</p>
	<p>Observe the following precautions when using any optional batteries:</p> <ul style="list-style-type: none"> • The system's emergency back-up battery may be a rechargeable lead battery. Check the emergency battery for an electrical failure. • Battery acid (electrolyte) is extremely harmful to human skin and eyes. If battery acid contacts skin, wash the affected area with soap and water. If battery acid contacts the eyes, flush the eyes with water. In either event, seek medical attention. If there is battery acid on a cloth, use water to wash the battery acid from the cloth. • Do not intentionally short batteries. Do not put the battery near a fire or in a fire. Do not disassemble the battery, drop it or knock it against another object. • The battery's life expectancy is affected by its environment. The normal battery life is approximately three years. If the battery is used in an outdoor setting and is exposed to high temperatures, its life expectancy drops to approximately one year. • Perform periodic diagnostic tests and maintenance procedures on the emergency battery and its terminals to ensure their readiness. If there is a power failure and the emergency battery is not ready, then the system will not work. Additionally, a damaged or dead battery, or terminals that need replacement might cause battery acid to leak, which might cause smoke or a fire. The battery and terminals are periodic replacement parts (the cost is chargeable to the customer). A service contract, with the supplier or service technician, to perform routine maintenance for the battery is recommended.
	<p>Do not touch peripheral equipment with wet hands. Do not allow any liquid to touch any of the peripheral equipment.</p>
	<p>Do not touch the printer's internal components when replacing disposables such as a cartridge or a ribbon. Ensure that the printer is turned off and that it is not hot in order to prevent burns from any accidental contact with the internal components.</p>
	<p>Do not drop the peripheral equipment or knock it against another object. These actions might cause an equipment failure.</p>

<p>CAUTION</p> 	
 <p>Thinner</p>	<p>Do not use benzine, thinner or alcohol for cleaning. When removing dust and dirt, put diluted, mild detergent on a cloth and then wring out the cloth. Remove the dust and dirt with the cloth and then wipe the cleaned area with a dry cloth.</p>
	<p>Do not place any equipment in the following environments:</p> <ul style="list-style-type: none"> • Locations that are exposed to direct sunlight • Locations where the moisture level exceeds the allowed level • Locations where the equipment might be exposed to water, oil, or chemicals • Locations with very low temperatures, such as in a walk-in cooler or freezer • Locations that are exposed to Electromagnetic Interference (EMI) from devices such as television sets and two-way radios • Locations that receive illegal electric waves <p>The life expectancies of the system and the main power source will be shortened if placed in a location that is affected by hydrogen sulfide or salt, such as a seaside area.</p>


Installation Environment

Consider the following items before the installation.


Stability

<p>WARNING</p> 	<p>Install the system with anchor bolts to prevent constant movement or vibration, such as from a nearby motor or automatic door, and to resist catastrophic movement from natural disasters, such as an earthquake. If the system moves or falls, an injury could occur.</p>
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Floor, Wall and Ceiling

<p>WARNING</p> 	<p>The wall and ceiling materials must be resistant to Electrostatic Discharge (ESD) and provide heat insulation. Since the battery's life expectancy depends on the ambient temperature, the room where the battery is installed must be well ventilated and vented to the outside. Check the battery specifications to determine if the battery can or cannot be installed near a motor or a power transformer.</p>
	<p>The floor material that is under and around the system must be resistant to ESD.</p>


Windows

<p>CAUTION</p> 	<p>Keep all of the windows closed if the location is affected by dust, sea breeze or corrosive gas. Curtains or blinds are necessary to avoid direct sunlight.</p>
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Fire Extinguisher

<p>WARNING</p> 	<p>Place a fire extinguisher for electrical fires (such as a carbon-gas fire extinguisher or a halon-gas fire extinguisher) near the system. It is recommended that the room also be equipped with an automatic fire-detection system. In the event of smoke and fire, turn off the main power source and the backup battery, then use the fire extinguisher to put out the fire while trying to avoid inhaling any smoke.</p>
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Safety Environment

WARNING 	Consider measures to deal with disasters (such as fires, floods and earthquakes) and to ensure the safety of the staff.
	Regularly clean the room or rooms where the switching equipment resides.
	Do not spray any insecticides directly on the equipment (insecticides can adversely affect the switching equipment).


Air Conditioning Facilities

WARNING 	The system and the air conditioning system must be installed separately and have separate power sources.
	To prevent an electromagnetic arc from causing noise, attach a surge-limiting capacitor and resistor on the air conditioner's electromagnetic switch's coil.
	It might be necessary to adjust the ventilation so the air conditioning is equally effective throughout the equipment room.
	Do not place the system in a location where condensation might fall from an air conditioner or a duct.
	Do not place the system in a location where hot and humid air is exhausted, as this might damage the system.


Lightning Strikes

WARNING 	The grounding system must protect the system, MDF, main power source, PCPro, printer, modems, etc. from damage caused by lightning strikes and electrical surges.
	<p>All the grounding conductors must have a resistance of less than one Ω to bring a zero-voltage reference to the system components.</p> <p>To achieve this, the following ground conductors must connect to the Primary Ground Bar:</p> <ul style="list-style-type: none"> • The Earth Ground (E) from the Rectifier • The Frame Ground (FE) from the system • The Power Ground (PE) from the system, through the Rectifier • The Frame Ground (FE) from the MDF • The AC service outlets, with plug outlets, for the PCPro, printer, modems and any measurement devices, such as a protocol analyzer.

Electromagnetic Interference

CAUTION 	When installing an additional device in the vicinity of the system, observe the installation and operating instructions for the device.
	Otherwise, EMI noise from the device may cause a malfunction of the system.

Disposables and Periodic-replacement Parts

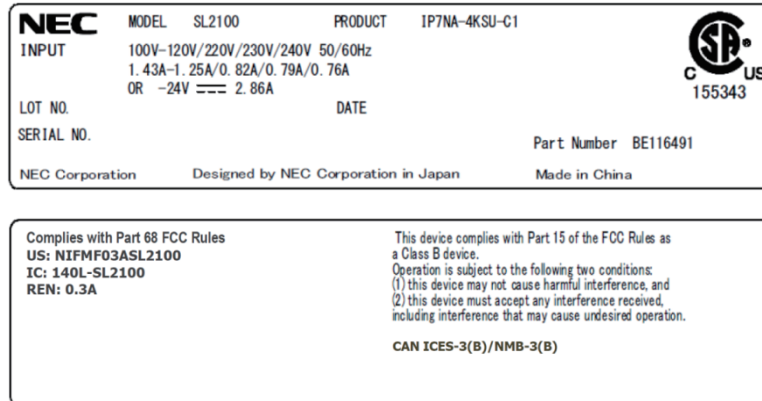
CAUTION 	Many parts, such as batteries, backup batteries, fuses and displays need to be replaced on a periodic basis. In the event of sudden traffic, a part that is past due for replacement might lead to a system failure and damage to the system.
	A service contract with the dealer or its service technician to monitor the replacement cycles and to supply the replacement parts and the necessary disposables is recommended.

MEMO

Regulatory

CERTIFICATION LABELS

The product certification labels can be found on the outside surface of the main unit. These labels have important safety and regulatory compliance information.



SAFETY INFORMATION

This equipment has been certified by Canadian Standards Association (CSA) and found to comply with all applicable safety requirements for North America:

- CAN/CSA C22.2 No. 60950-1-07+ Safety of Information Technology Equipment --
A1:2011+A2:2014
Part I: General Requirements

RADIO FREQUENCY INTERFERENCE

In compliance with FCC Part 15 rules, the following statements are provided.

NOTE

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

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

CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For Canada: CAN ICES-3(B)/NMB-3(B)

TELEPHONE TERMINAL EQUIPMENT (TTE)

This equipment complies with Part 68 of the FCC rules and requirements adopted by ACTA (Administrative Council for Terminal Attachments). On the main chassis of this equipment is a label that contains, among other information, the FCC Registration Number (or product identifier) in the format: US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

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

The Ringer Equivalence Number (REN) applies to analog telephone lines (or trunks) and is used to determine the maximum number of devices that may be connected to a telephone line. Excessive devices on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the FCC Registration Number (or product identifier) in the format: US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). The REN and the FCC Registration Number for this product are provided below.

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

For single and two-line equipment that connects to the telephone network via a plug and jack, the plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by ACTA. A compliant telephone cord and modular plug may be provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.

TELEPHONE/SERVICE PROVIDER COMPANY NOTIFICATION

Before connecting this telephone system to the telephone network, the telephone company may require the following information.

Site Telephone Number	
FCC Registration Number	US: NIFMF03ASL2100
Ringer Equivalence Number (REN)	0.3A
Service Order Codes (SOC)	9.0F (analog), 6.0P (digital)
Facility Interface Codes (FIC)	02LS2, 04DU9-BN, 04DU9-DN, 04DU9-1KN, 04DU9-1SN
USOC Jacks	RJ11C, RJ48C, RJ61X

ALARM DIALING EQUIPMENT

If the SL2100 system is used with alarm dialing equipment, ensure that the installation of the SL2100 does not disable your alarm dialing equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

ELECTRICAL SAFETY ADVISORY

Telephone companies report that electrical surges, typically lightning transients, are very destructive to customer terminal equipment connected to AC power sources. This has been identified as a major nationwide problem. Therefore it is recommended that you use a surge arrestor on the AC power input.

INCIDENCE OF HARM

Should this product cause harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice is not practical, you will be notified as soon as possible. Additionally the telephone company may request that you disconnect the equipment until the problem is resolved. Also, you will be advised of your right to file a complaint with the FCC, should you feel it is necessary.

REPAIR SERVICE REQUIREMENTS


If the equipment malfunctions, all repairs must be performed by an authorized agent of NEC Corporation of America. The user requiring service is responsible for reporting the need for service to an NEC Corporation of America authorized agent or to NEC Corporation of America.

HEARING AID COMPATIBILITY

NEC Multiline Terminals and NEC Single Line Telephones that are provided for this system are hearing aid compatible (HAC). The manufacturer of other Single Line Telephones for use with the system must provide notice of hearing aid compatibility to comply with FCC rules that prohibit the use of non-hearing aid compatible telephones.


OTHER

TOLL RESTRICTION AND LEAST COST ROUTING EQUIPMENT

 *The software contained in the SL2100 to allow user access to the network must be upgraded to recognize newly established network area codes and exchange codes as they are placed into service.*


Failure to upgrade the premises system or peripheral equipment to recognize the new codes as they are established will restrict the customer and the customer's employees from gaining access to the network and these codes.

EQUAL ACCESS REQUIREMENTS


 *This equipment is capable of providing users access to interstate providers of operator services through the use of access codes. Modification of this equipment by call aggregators to block access dialing codes is a violation of the Telephone Operator Consumers Act of 1990.*

DIRECT INWARD DIALING (DID)

VOICE ANNOUNCEMENT/MONITORING OVER DID LINES

 *When using the Voice Announcement feature to eavesdrop or record sound activities at the other end of the telephone line may be illegal under certain circumstances and laws. See section below, **RECORDING CONVERSATIONS** or **MONITORING AUDIO**, for more details.*

ANSWER SUPERVISION

 *Allowing this equipment to be operated in such a manner as to not provide for proper Answer Supervision is a violation of Part 68 of the FCC Rules. Proper Answer Supervision is when:*

1. This equipment returns answer supervision to the Public Network when DID calls are:
 - Answered by the called station
 - Answered by the Attendant
 - Routed to a recorded announcement that can be administered by the Customer Premise Equipment (CPE) user
 - Routed to a dial prompt
2. This equipment returns answer supervision on all DID calls forwarded to the Public Network. Permissible exceptions are:
 - A call is unanswered
 - A busy tone is received
 - A reorder tone is received.

RECORDING CONVERSATIONS or MONITORING AUDIO



The use of monitoring, recording, or listening devices to eavesdrop, monitor, retrieve, or record telephone conversations or other sound activities, whether or not contemporaneous with transmission, may be illegal in certain circumstances under federal or state laws. This includes using the Voice Announcement feature for recording or monitoring purposes. Legal advice should be sought prior to implementing any practice that monitors or records any telephone conversation. Some federal and state laws require some form of notification to all parties to a telephone conversation, such as using a beep tone or other notification methods or requiring the consent of all parties to the telephone conversation, prior to monitoring or recording the telephone conversation. Some of these laws incorporate strict penalties.

MUSIC ON HOLD



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CANADA - TELEPHONE TERMINAL APPARATUS

Notice:

This equipment meets the applicable Innovation, Science and Economic Development Canada (ISED) Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that ISED technical specifications were met. It does not imply that ISED approved the equipment.

Avis:

Le présent matériel est conforme aux spécifications techniques applicables d'Innovation, Sciences et Développement économique Canada (ISED) au matériel terminal. Cette conformité est confirmée par le numéro d'enregistrement. Le sigle IC, placé devant le numéro d'enregistrement, signifie que l'enregistrement s'est effectué conformément à une déclaration de conformité et indique que les spécifications techniques d'ISED ont été respectées. Il n'implique pas qu'ISED a approuvé le matériel.

Notice:

The Ringer Equivalence Number (REN) for this terminal equipment is 0.3. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

Avis:

L'indice d'équivalence de la sonnerie (IES) du présent matériel est de 0.3. L'IES assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

ISED Registration Number: IC: 140L-SL2100

Ringer Equivalence Number (REN): 0.3

BATTERY DISPOSAL

The SL2100 system includes the batteries listed below. When disposing of these batteries, Chassis, and/or Unit, you must comply with applicable federal and state regulations regarding proper disposal procedures.

Unit Name	Type of Battery	Quantity	Note
IP7[]-CPU-C1	Lithium	1	
External Battery (IP4WW-Battery Box)	Sealed Lead	2 per IP4WW-Battery Box	
DTZ-8R-1 Cordless Handset	Ni-MH	1	
ML440 Wireless Handset	Lithium-ion	1	

The SL2100 IP7[]-CPU-C1 provides Real-Time Clock backup for approximately three years. The Lithium battery should be replaced every two years.

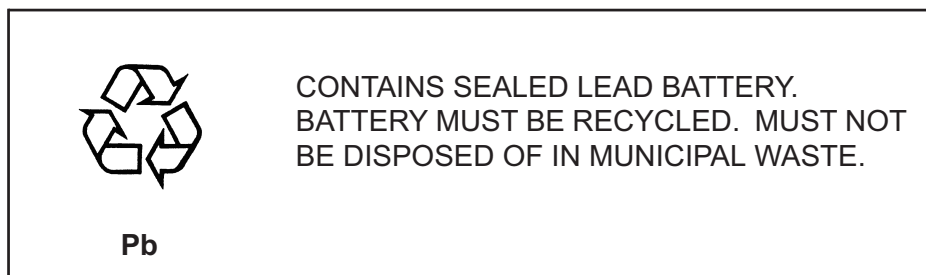
IMPORTANT SAFEGUARDS FOR BATTERY DISPOSAL

DO NOT PLACE USED BATTERIES IN YOUR REGULAR WASTE! THE PRODUCT YOU PURCHASED CONTAINS LITHIUM, SEALED LEAD BATTERIES. LITHIUM, SEALED LEAD BATTERIES MUST BE COLLECTED, RECYCLED, OR DISPOSED OF IN AN ENVIRONMENTALLY SOUND MANNER.

The incineration, landfilling or mixing of sealed lead batteries with the municipal solid waste stream is PROHIBITED BY LAW in most areas. Contact your local solid waste management officials for other information regarding the environmentally sound collection, recycling, and disposal of the battery.

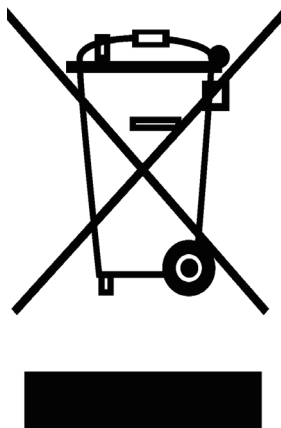
Sealed lead batteries must be returned to a federal or state approved sealed lead battery recycler. This may be where the batteries were originally sold or a local seller of automotive batteries. Contact your local waste management officials for other information regarding the environmentally sound collection, recycling and disposal of the battery contained in this product.

The packaging for the SL2100 system contains the following labels regarding proper disposal.



PRODUCT DISPOSAL INFORMATION

For Countries in the European Union



The symbol depicted here has been affixed to your product to inform you that electrical and electronic products should not be disposed of as municipal waste.

Electrical and electronic products including the cables, plugs and accessories should be disposed of separately to allow proper treatment, recovery and recycling. These products should be taken to a designated facility where the best available treatment, recovery and recycling techniques are available. Separate disposal has significant advantages: valuable materials can be re-used and it prevents the dispersion of unwanted substances into the municipal waste stream. This contributes to the protection of human health and the environment.

Please be informed that a fine may be imposed for illegal disposal of electrical and electronic products via the general municipal waste stream.

To facilitate separate disposal and environmentally sound recycling arrangements have been made for local collection and recycling. If your electrical and electronic products must be disposed of please refer to your supplier or the contractual agreements that your company has made upon acquisition of these products.

BATTERY INFORMATION

Defective or exhausted batteries should never be disposed of as municipal waste. Return old batteries to the battery supplier, a licensed battery dealer or a designated collection facility. Do not incinerate batteries. This product uses Lithium batteries. Do not use any other type.

For an overview of the location of batteries used in these systems, the battery replacement or removal instructions, please refer to the SL2100 System Hardware Manual.

Introduction

SECTION 1 GENERAL INFORMATION

The SL2100 system is a progression from SL1000/SL1100 system and is newly provide a legacy and IP communication system for All-In-One Small Box to support Small and Medium Business with easy installation and easy operation.

The SL2100 has new designed Multiline Terminals and a new small compact chassis comes with the four universal slots and one CPU/EXIFE slot for Slot-In design chassis.

The SL2100 system enable to expand up to three chassis (one Main and two Expansion chassis) by bus connection and provides a maximum of 36 analog trunks and 72 Multiline Terminals also equipped to support IP Networking, Digital Networking (BRI/PRI, T1/E1) and IP Trunks or IP extensions.

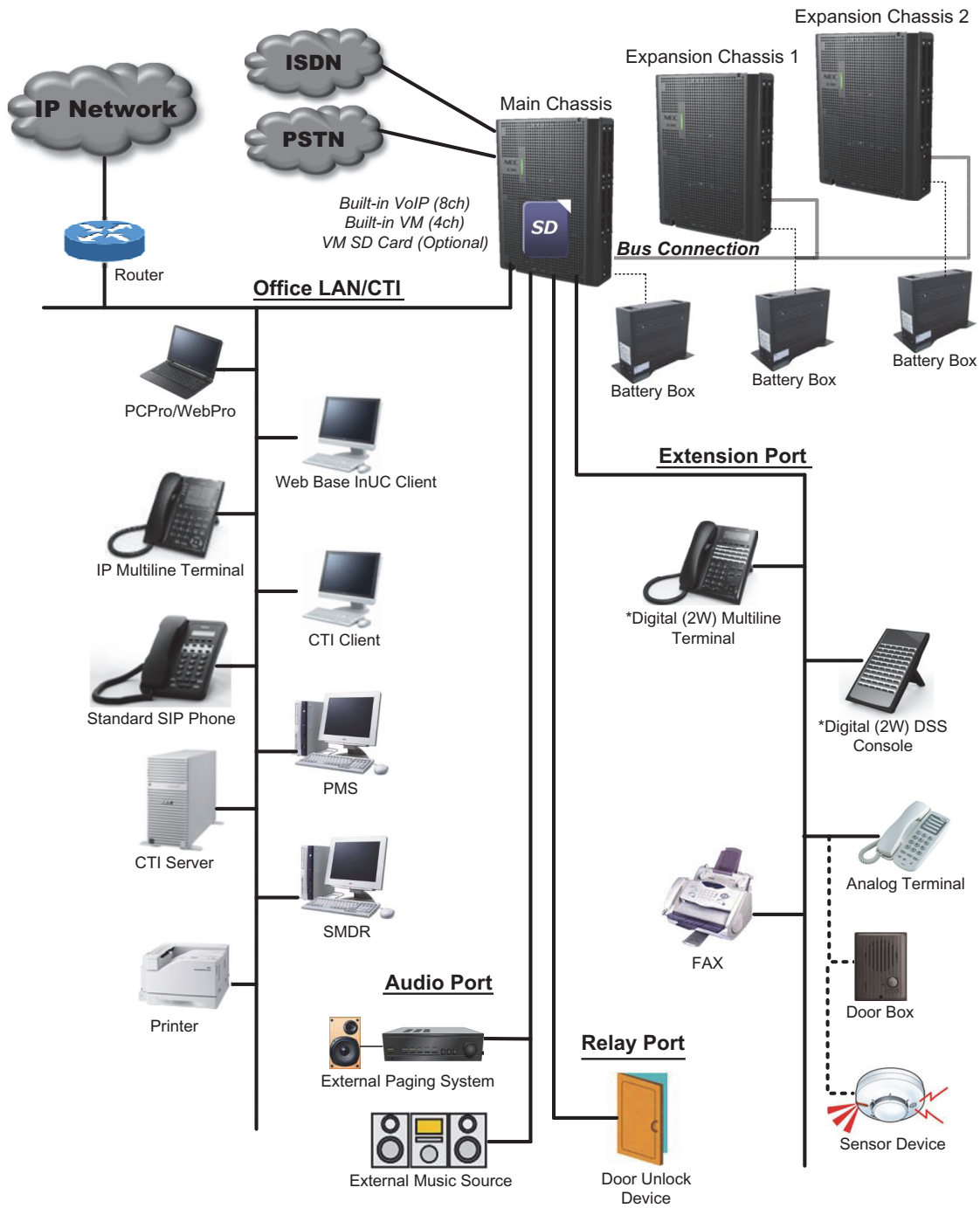


Figure 1-1 System Configuration

SECTION 2 EQUIPMENT LIST

Table 1-1 Hardware Equipment List

Category	Stock Number	Equipment Name	Equipment Description	Note
Hardware Kit	BE117448	SL2100 KSU & CPU Package	The Kit is Included; <ul style="list-style-type: none"> BE116491 IP7NA-4KSU-C1 1pc BE116496 IP7NA-CPU-C1 1pc 	
	BE117449	SL2100 Digital Kit w/ 12B Tels	The Kit is Included; <ul style="list-style-type: none"> BE116491 IP7NA-4KSU-C1 1pc BE116496 IP7NA-CPU-C1 1pc BE116506 IP7WW-082U-B1 1pc BE116510 IP7WW-3COIDB-C1 1pc BE116502 IP7WW-SDVMS-C1 1pc BE117451 IP7WW-12TXH-B1 TEL(BK) (C) 4pcs A20-030439-001 INSTALLATION CABLE: MOD8-25PAIR 1pc 	
	BE117450	SL2100 Digital Kit w/ 24B Tels	The Kit is Included; <ul style="list-style-type: none"> BE116491 IP7NA-4KSU-C1 1pc BE116496 IP7NA-CPU-C1 1pc BE116506 IP7WW-082U-B1 1pc BE116510 IP7WW-3COIDB-C1 1pc BE116502 IP7WW-SDVMS-C1 1pc BE117452 IP7WW-24TXH-B1 TEL(BK) (C) 4pcs A20-030439-001 INSTALLATION CABLE: MOD8-25PAIR 1pc 	
Chassis	BE116491	IP7NA-4KSU-C1	Main/Expansion Chassis with AC Cable (US type) <ul style="list-style-type: none"> Power Supply with Backup Battery Circuit CPU/EXIFE Slot : 1, Universal Slot : 4 	
CPU	BE116496	IP7NA-CPU-C1	SL2100 Main Processor Board (with US Main Software) <ul style="list-style-type: none"> VoIPDB Daughter Board Connector : 1 EXIFB Daughter Board Connector : 1 SD Card Slot : 1 	
Boards for Chassis expand	BE116501	IP7WW-EXIFB-C1	System Expansion Bus Daughter Board (mount to CPU) <ul style="list-style-type: none"> 2 Bus connectors for Expansion Chassis Additional Telephony Resources VRS/VM (InMail) Channels expansion (up to 16ch) Analog Modem (V.34) 	
	BE116504	IP7WW-EXIFE-C1	Bus Board for Expansion Chassis (Install to CPU/EXIFE Slot of Exp. Chassis)	
Backup Battery Unit	BE110239	IP4WW-Battery Box	External Backup Battery Box (Battery itself is NOT attached)	
Extension Boards	BE116506	IP7WW-082U-B1	8 Digital Extensions (2W) + 2 Analog Extensions Board	
	BE116507	IP7WW-008U-C1	8 Hybrid/Analog Extensions Board	
	BE116509	IP7WW-000U-C1	0 Extensions Board (for Trunk DB)	
Trunk Daughter Boards	BE116510	IP7WW-3COIDB-C1	3 Analog Trunks Daughter Board (mount to 082U/008U/000U)	
	BE116512	IP7WW-1PRIDB-C1	1 ISDN PRI/T1 Daughter Board (mount to 082U/008U/000U)	
Option Items on CPU	BE116500	IP7WW-VOIPDB-C1	VoIP GW Daughter Board (mount to CPU) Max 128ch	
	BE116502	IP7WW-SDVMS-C1	SD Card (1GB) for VRS/VM (InMail) Storage	
	BE116503	IP7WW-SDVML-C1	SD Card (4GB) for VRS/VM (InMail) Storage	

Category	Stock Number	Equipment Name	Equipment Description	Note
Multiline Terminals (Legacy)	BE117451	IP7WW-12TXH-B1 TEL(BK) (C)	12 Keys,Digital (2W) Multiline Terminal (Black) with color packing sleeve	
	BE117452	IP7WW-24TXH-B1 TEL(BK) (C)	24 Keys,Digital (2W) Multiline Terminal (Black) with color packing sleeve	
SL1100 Terminals	1100060	IP4WW-12TXH-B-TEL (WH)	12 Keys, Digital (2W) Multiline Terminal (White)	
	1100061	IP4WW-12TXH-B-TEL (BK)	12 Keys, Digital (2W) Multiline Terminal (Black)	
	1100062	IP4WW-24TXH-B-TEL (WH)	24 Keys, Digital (2W) Multiline Terminal (White)	
	1100063	IP4WW-24TXH-B-TEL (BK)	24 Keys, Digital (2W) Multiline Terminal (Black)	
IP Multiline Terminals	BE117453	IP7WW-8IPLD-C1 TEL(BK) (C)	8 Keys, IP DESI-Less Multiline Terminal (Black) with color packing sleeve <ul style="list-style-type: none"> • Support the "Giga" • Support to expand the number of keys (up to 16/32) • No Ethernet Cable is attached 	
SL1100 IP Multiline Terminals	BE110277	IP4WW-24TIXH-C-TEL (WH)	24 Keys, IP Multiline Terminal (White)	
	BE110278	IP4WW-24TIXH-C-TEL (BK)	24 Keys, IP Multiline Terminal (Black)	
Terminal Options	BE116519	IP7WW-60D DSS-B1 CONSOLE (BK)	60 Keys, Digital (2W) DSS Console (Black)	
	BE110790	IP4WW-WALL MOUNT UNIT	Wall-Mount Unit for IP7WW-8IPLD-C1TEL	
	BE113158	DX7NA-WHA-A1	Cordless Headset Adapter	
SIP Terminals	BE112179	ITX-1DE-1W(BK) TEL	Standard SIP Phone	
Door Box	BE106914	DP-D-1A	Doorphone	
Options		DTZ-8R-1 Cordless Handset	Cordless DECT Handset	
		DTL-RPT-2 Repeater	Repeater for DTL-8R-1	
		AP20 Base Unit	Base Unit for ML440	
		ML440 Multiline Wireless Handset	ML440 Multiline Wireless Handset	
		NEC 1-Port Digital Logging Unit	1-Port Digital Logging Unit	
		NEC 1-Port IP Logging Unit	1-Port IP Logging Unit	
		Installation Cable - Open Ended 25 pair with (6) 8-pin Plugs	Provides connection to MDF for line and station ports	

Table 1-2 License Line-Up

Category	Stock Number	License Name	Description	Note
IP Related	BE116744	SL2100 IP CHANNEL-16 LIC	Additional VoIP Resource License (16ch per License) for VOIPDB	
	BE116745	SL2100 IP TRUNK-01 LIC	IP Trunk License	
	BE116746	SL2100 IP EXT-01 LIC	IP Extension License for Std-SIP Terminal	It is NOT required for SL2100 IP Terminal
	BE116747	SL2100 ENCRYPTION LIC	Encryption License for IP Multiline Terminal	
Networking	BE116749	SL2100 SL NET-08 LIC	SL Net License (Enable to connect between SL/SL2100 only)	Max Node : 50

Category	Stock Number	License Name	Description	Note
System Features	BE116750	SL2100 REMOTE CONF-01 LIC	Conference Bridge (Remote Conference) License	
	BE116751	SL2100 VM E-MAIL NOTIFY LIC	InMail E-Mail Notification License	No extra Hardware is required
	BE116752	SL2100 IN-ACD LIC	In ACD License	
	BE116753	SL2100 HOTEL LIC	Hotel/Motel Feature License	
	BE116756	SL2100 3RD CTI LIC	3rd Party CTI Feature License	
	BE117472	SL2100 SMDR LIC	SMDR Feature License	
	BE117668	SL2100 ACD P-EVENT LIC	ACD P-EVENT Feature License	
Client	BE116757	SL2100 MOBILE EXT-01 LIC	Additional Mobile Extension Port License	
	BE116758	SL2100 IN-UC WEB CLIENT-01 LIC	InUC Web Client License (by WebRTC technology)	
	BE117473	SL2100 IN-UC 1ST CTI-01 LIC	1st Party CTI License for InUC	
	BE116760	SL2100 WEB VIDEO CNF-01 LIC	Web Video Conference License for InUC Web Client	
	BE117552	SL2100 IN-UC CLIENT-01 LIC	InUC Web Client License with telephony control	
	BE117743	SL2100 DT CLIENT-01 LIC	Desktop Client License for UC Suite	
	BE117745	SL2100 SOFTPHONE-01 LIC	Softphone License for UC Suite	
	BE117747	SL2100 CRM INTEGRATION-01 LIC	CRM integration License for UC Suite	
	BE117749	SL2100 INMAIL INT-01 LIC	InMail integration License for UC Suite	
On-Board Apps	BE116763	SL2100 INGUARD LIC	Toll Fraud Guard License	
Local Apps.	BE116765	SL2100 CC MIS LIC	<Application> ACD-MIS Feature License	
	BE116766	SL2100 CC MIS MONITOR-01 LIC	<Application> ACD MIS Monitor Feature License	
	BE117547	SL2100 INCONTROL CR PKG LIC	UCS InControl Call Reporting Feature License	

2.1 Chassis/CPU and Boards For Chassis Expand

2.1.1 IP7NA-4KSU-C1

This is one common chassis used for the Controlling (Main) chassis or Expansion chassis, A maximum of three chassis (one controlling and two expansion chassis) can be connected by bus connection. And support four chassis (one controlling and three expansion chassis) by IP connection to expand the system capacity. (Future Available)

The following are included with the chassis.

- Four universal slots
- One CPU/EXIFE slot
- Power Supply with Backup Battery Circuit
- One connector for External Backup Battery
- Back Plane Board (one connector for CPU/EXIFE slot, four connectors for Option Board slots)
- AC Cable:



AC125V, 7A

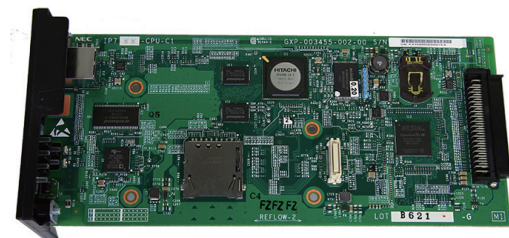


2.1.2 IP7[]-CPU-C1

The CPU-C1 board is installed into the CPU/EXIFE Slot in the Controlling Chassis and controls all the functions and operations of the SL2100 system using the system software loaded into the CPU-C1 memory. One CPU-C1 board must be installed in the Controlling Chassis.

The CPU-C1 provides;

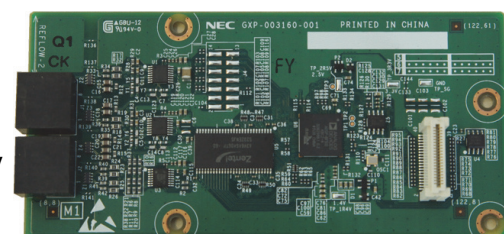
- Built-In 8ch VoIP Resources
- Built-In 4ch VRS/VM (InMail) capability
- 2 hours VRS/VM (InMail) storage without SD Card
- Four clients of Mobile Extension
- Maximum Four participants of Web Video Conference
- One Voice Prompt of VRS/VM (InMail) as default
 - Default Language: US English
- One VoIPDB daughter board connector
- One Ethernet (100M) port (RJ45)
- One EXIFB daughter board connector
- One SD Card slot (for expand VRS/VM storage)



2.1.3 IP7WW-EXIFB-C1

Using a Cat5 cable, EXIFB-C1 board mount onto the CPU-C1 board is individually connected to each EXIFE-C1 board (on Expansion Chassis)

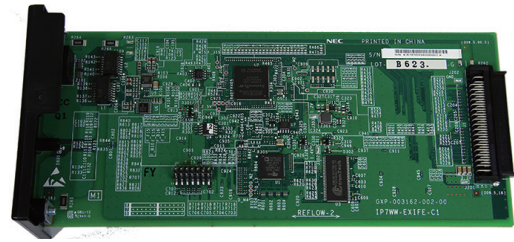
- VRS/VM (InMail) channels expansion (Up to 16ch)
- Additional 48 Telephony resources (DTMF/Dial tone/Busy tone/FSK caller-ID receiver/sender)
- Support Analog Modem (V.34)



2.1.4 IP7WW-EXIFE-C1

The EXIFE-C1 board is installed into the CPU/EXIFE slot on the Expansion Chassis.

- Additional 32 telephony resources (DTMF/Dial tone/Busy tone/FSK caller-ID receiver/sender) for Expansion Chassis
- One Bus connectors for Main Chassis (RJ61)



2.2 Backup Battery Unit

2.2.1 IP4WW-Battery Box

Connected to each Chassis power supply, the external backup battery provides DC power in case a loss of AC power occurs. An optional (locally procured), external battery source can be used to provide power during a power failure.

- Connect this box to the power supply at each Chassis.
- Wall/floor-mountable
- Backup duration is approximately one hour per chassis.
- Battery itself is local procure.
(12 V, 7 AH x 2 pcs of GS Yuasa NP7-12)

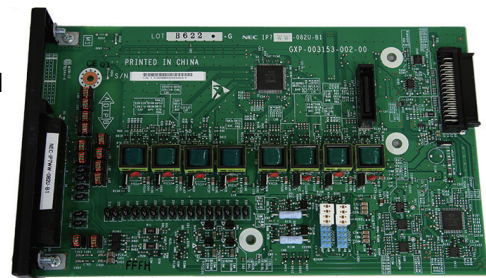


2.3 Trunk/Extension/ISDN Expansion Interface Boards

2.3.1 IP7WW-082U-B1

This 082U-B1 board is installed to the Universal slot in the IP7[]-4KSU-C1 chassis and provides a total of eight digital extension ports and two analog extension ports. Two general purpose relay, one Audio-In and Audio-Out ports are initially available. Either the analog trunk daughter board (3COIDB) or ISDN PRI/T1/E1 daughter board (1PRIDB) can be mounted on this board.

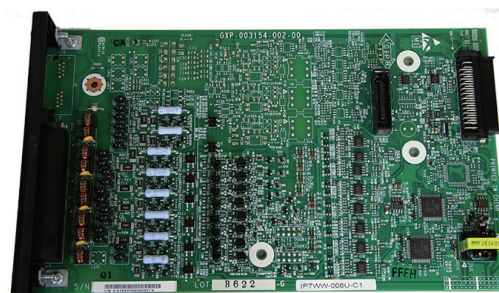
- Install this board to the Universal slot at Controlling/Expansion Chassis
- Enable to connect DSS console to any digital extension port.
- Enable to connect up to two Door Boxes to analog extension ports on this board.



2.3.2 IP7WW-008U-C1

This 008U-C1 board is installed to the Universal slot in the IP7[]-4KSU-C1 chassis and provides a total of eight analog extension ports. Either the analog trunk daughter board (3COIDB) or ISDN PRI/T1/E1 daughter board (1PRIDB) can be mounted on this board.

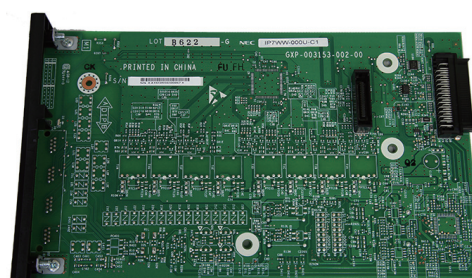
- Install this board to the Universal slot at Controlling/Expansion Chassis
- Enable to connect DSS console to hybrid/ analog extension port No.8.
- One Trunk daughter board connection



2.3.3 IP7WW-000U-C1

This is an expansion board for mounting a 3COIDB-C1 or 1PRIDB daughter board, and is installed to the Universal slot in the IP7[]-4KSU-C1 chassis.

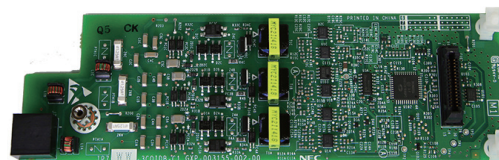
- Install this board to the Universal slot at Controlling/Expansion Chassis



2.3.4 IP7WW-3COIDB-C1

This 3COIDB-C1 daughter board provides three analog trunk and is mount on the 082U-B1, 008U-[]1 or 000U-C1 board. A total of four 3COIDB boards can be mounted per Chassis.

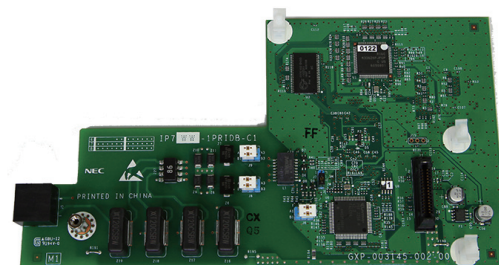
- Mount to the 082U/008U/000U
- No power failure transfer circuit
- No Ground Start Trunk Supported



2.3.5 IP7WW-1PRIDB-C1

The 1PRIDB-C1 daughter board is mounted on the 082U-B1, 008U-[]1 or 000U-C1 board and installed to the Universal slot in the IP7[]-4KSU-C1 chassis and provides either an ISDN Primary Rate Interface, T1 Interface or E1 interface. A total of three 1PRIDBs can be installed per system or one 1PRIU per Chassis.

- Mount to the 082U/008U/000U
- Supports T/S point connection (Hard-switch).
- All ISDN circuits are not supplied with DC power from the system

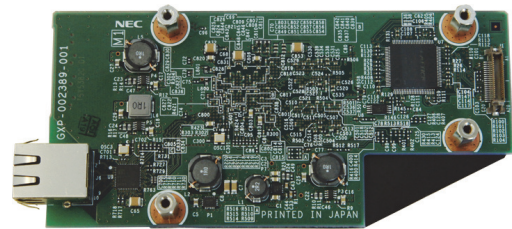


2.4 Optional Interface Boards


2.4.1 IP7[J]-VOIPDB-C1

The VOIPDB-C1 daughter board provides the RTP/RTCP voice processing function and mount this board onto the CPU-C1 board (VOIPDB slot) at controlling chassis.

- Maximum 128 channels are available by license control.
- One Gigabit port (RJ45)



2.4.2 IP7WW-SDVMS-C1/IP7WW-SDVML-C1

 *The total 2 hours storage and one voice prompt is initially available on the CPU-C1. The SDVM[J]-C1 is required when the VRS/VM (InMail) storage is expanded more than 2 hours and the 26 language of voice prompts.*

Two types of VRS/VM (InMail) SD cards are for storage purpose and mount onto the CPU-C1 board (SD Card Slot)

- SDVMS-C1: 1GB (Approx. 15 hours recording)
- SDVML-C1: 4GB (Approx. 120 hours recording)
- Up to 26 languages of voice prompts are available



2.5 Multiline Telephones and Optional Equipment

2.5.1 IP7WW-12TXH-B1 TEL

The 12TXH-B1 TEL is a 2-wire digital multiline telephone featuring:

- Color: Black
- Connected to: Digital Extension Port
- Programmable keys: 12
- Soft Keys: 4
- LCD: 24 digits x 3 lines with Backlit
- Handsfree: Full-duplex
- Backlit dial pad: No
- Headset port: Yes
- Angle Adjustment: 2-steps
- Wall-Mounting kit: Built-in
- EHS Support: by WHA (Optional)
- PC Port: No



2.5.2 IP7WW-24TXH-B1 TEL

The 24TXH-B1 TEL is a 2-wire digital multiline telephone featuring:

- Color: Black
- Connected to: Digital Extension Port
- Programmable keys: 24
- Soft Keys: 4
- LCD: 24 digits x 3 lines with Backlit
- Handsfree: Full-duplex
- Backlit dial pad: No
- Headset port: Yes
- Angle Adjustment: 2-steps
- Wall-Mounting kit: Built-in
- EHS Support: by WHA (Optional)
- PC Port: No



2.5.3 IP4WW-12TXH-B TEL

The 12TXH-B TEL is a 2-wire digital multiline telephone featuring:

- Programmable keys: 12
- Soft Keys: 4
- LCD: 24 digits x 3 lines with Backlit
- Handsfree: Full-duplex
- Backlit dial pad: Yes
- Angle Adjustment: 2-steps
- Wall-Mounting kit: Built-in
- EHS Support: by WHA (Optional)
- PC Port: No



2.5.4 IP4WW-24TXH-B TEL

The 24TXH-B TEL is a 2-wire digital multiline telephone featuring:

- Programmable keys: 24
- Soft Keys: 4
- LCD: 24 digits x 3 lines with Backlit
- Handsfree: Full-duplex
- Backlit dial pad: Yes
- Angle Adjustment: 2-steps
- Wall-Mounting kit: Built-in
- EHS Support: by WHA (Optional)
- PC Port: No



2.5.5 IP7[]-8IPLD-C1 TEL

The 8IPLD-C1 TEL is an IP multiline telephone featuring:

- Color: Black
- Programmable keys: 32
- Soft Keys: 4
- LCD: 168 x 128 Dots with Backlit
- Handsfree: Full-duplex
- Interfaces 2: 1 x LAN and 1 x PC Ethernet Port (10Base T/100Base TX/1000Base TX)
- Power Feeding: PoE (IEEE802.3af) Only
- Support CODEC: G.711/G.729a
- Backlit dial pad: No
- Headset port: Yes
- Angle Adjustment: 2-steps
- Wall-Mounting kit: IP4WW-WALL MOUNT UNIT (Optional)
- EHS Support: by EHS Cable (Plantronics APD-80 (locally procure*))



2.5.6 IP4[]-24TIXH-C TEL

The 24TIXH-C TEL is an IP multiline telephone featuring:

- Programmable keys: 24
- Soft Keys: 4
- LCD: 24 digits x 3 lines with Backlit
- Handsfree: Full-duplex
- Interface: 2 x RJ45 Ethernet Ports (10Base-T/100Base-TX) for LAN and PC
- Power Feeding: AC Adapter (optional) or PoE (IEEE802.3af)
- Support CODEC: G.711/G.729a/G.722
- Backlit dial pad: Yes
- Angle Adjustment: 2-steps
- Wall-Mounting kit: IP4WW-WALL MOUNT UNIT (Optional)



2.5.7 IP7WW-60D DSS-B

The DSS console gives a multiline terminal user a Busy Lamp Field (BLF) and one-button access to extensions, trunks and system features. Mainly designed for operator use, the 60-button DSS console provides an additional 60 programmable keys.

- Connect this console to digital extension port at 082U of each Chassis.
- Programmable keys: 60
- Angle Adjustment: 2-steps
- Wall-Mounting kit: Built-in



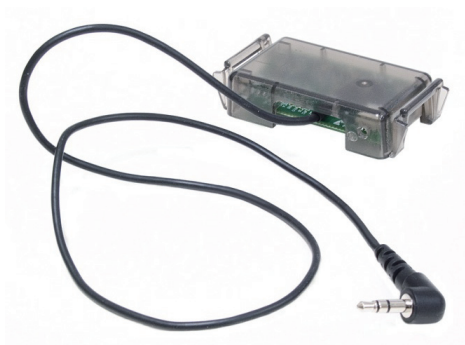
2.5.8 IP4WW-WALL MOUNT UNIT

The Wall Mount Unit is used for IP7[]-8IPLD Terminal and IP4[]-24TIXH-C Terminal only.



2.5.9 Wireless Headset Adapter (WHA)

The Wireless Headset Adapter allows you to connect a Plantronics Wireless Headset System directly to your IP7WW-12/24TXH-B1 telephone's headset socket. The Wireless Headset Adapter tightly integrates your headset system with the SL2100 to provide enhanced wireless mobility and call answering. The Plantronics lifter is not required.



2.5.10 DP-D-1A/1D/HS.D503DOR-A

This is the Doorphone Box.

- Connect to Analog extension port No. 1 or No. 2 on the 082U.
- Wall-Mounting kit: Built-in



2.5.11 ITX-1DE-1W (BK) TEL

ITX-1DE-1W(BK) TEL is a standard SIP Phone featuring:

- 8 Speed Dial keys and 11 Function keys
- Scroll UP/DOWN keys with SELECT & MENU/EXIT key
- Graphic LCM (132 x 32 dots)
- Handsfree: Full-duplex
- RJ45 10/100 Ethernet LAN port x 1
- Power over Ethernet (PoE): IEEE802.3af
- Narrowband Codec: G.711u/A, G.729A



2.6 Wireless DECT Telephones

2.6.1 DTZ-8R-1 Cordless DECT Telephone

DTZ-8R-1 is a single-cell cordless DECT telephone that is adapted for digital NEC SL2100 system. It is designed for use in the office environment.

The following are included with the DTZ-8R-1 Cordless DECT Telephone.

- DTZ-8R-1 Base Unit
- DTZ-8R-1 Cordless Handset



2.6.2 DTL-RPT-[] Cordless DECT Telephone Repeater

DTL-RPT-[] is a repeater to extend the coverage area of DTZ-8R-1 Cordless DECT telephone system in all directions.



2.6.3 ML440 and AP20 Wireless DECT Telephone

ML440 and AP20 is a multi-cell wireless DECT telephone that is adapted for digital NEC SL2100 System. It is designed for use in the office environment.

The following are included with the ML440 Wireless DECT.

- AP20 Base Unit
- ML440 Wireless Handset



2.7 Call Logging Unit

2.7.1 NEC 1-port Digital Call Logging Unit

The NEC 1-port Digital Call Logging Unit simply connects in line with SL2100 digital telephones and plugs into the USB connector on any PC. Recorded conversations are stored in the same high quality format as your digital telephone ensuring excellent sound quality.



2.7.2 NEC 1-Port IP Call Logging Unit

The NEC 1-Port IP Call Logging Unit is a USB device that can record SIP audio in one of two ways. SIP audio can be recorded by installing the Call Logging Unit in line with the SIP phone thus recording only those calls to or from the selected SIP phone. The Call Logging Unit can be installed in line with the VoIPDB to record either an extension or a SIP trunk. When recording SIP trunks, a maximum of eight trunk members can be monitored and recorded simultaneously providing licenses are present in the Call Logging unit. This unit is not supported on Digital or Analog phones.



SECTION 3 SYSTEM CAPACITY

3.1 System Capacity

Table 1-3 System Capacity

Number of Chassis	1 Chassis	2 Chassis	3 Chassis	Description
Number of Universal Slot	4	8	12	
Number of CPU	1			
Total System Ports (Trunk + Extension)	256			128 Trunk Ports + 128 Extensions (software)
Total Legacy Ports (Trunk + Extension)	96	176	256	Max. 80 ports per Chassis + 16ch for VM (In-Mail)
	Trunks (Max)			Max number of Trunk Port (software) is 128.
	Analog			Max 4pcs of 3COIDB per Chassis
	ISDN PRI/E1/T1 (1.5M)			Max 1pc of 1PRIDB per Chassis, Max 3pcs of 1PRIDB per System
	Extensions (Max)			Max number of Extension Port (software) is 128.
	Digital Extensions (2W)			Max 3pcs of 082U per Chassis
	Analog Extensions			Max 4pcs of 008U per Chassis
	DSS Console (2W)			Max 12pcs of DSS Console per System, connect to a Digital Ext. Port
	Doorphone			Max 6pcs of Doorphone per System, connect to an Analog Ext. Port
	VRS/VM (InMail) Channel			Increase the number of channels by EXIFB (4ch -> 16ch)
	I P	IP Trunks (SIP/H323)		
IP Extensions (IP-MLT/Std-SIP)			Number of available extensions is decided by license	
Audio/Others				
Relay		6		082U is required
Paging		3		082U is required
External MOH		1		082U is required
BGM		1		082U is required
Ethernet Port		1		on CPU
Analog Modem		1		EXIFB is required
VRS/VM				
Built-In VM (InMail) Channels		4		Enable to increase the number of channels by EXIFB (4ch -> 16ch)
Built-In VRS/VM (InMail) Storage		Approx. 2 hours		Available number of VRS MSG : 100
Built-In Voice Prompts for VRS/VM		1 language		Enable to change the language by WebPRO
VRS/VM Storage (by SD)		Approx. 15 Hours (S) / Approx. 120 Hours (L)		S : SDVMS, L : SDVML Available number of VRS MSG : 100
Voice Prompts for VRS/VM		26 languages		
VoIP				

Number of Chassis	1 Chassis	2 Chassis	3 Chassis	Description
Built-In VoIP Channel		8		
VoIP Channel (by VOIPDB)		128		Number of available channels is decided by license
Conference Circuits ^{*1}	32 (Max. 16 parties per Conference)			
DSP Resource ^{*1}		1 Chassis: 72 2 Chassis: 104 3 Chassis: 136		1 Chassis: CPU (24) + EXIFB (48) 2 Chassis: CPU (24) + EXIFB (48) + EXIFE (32) 3 Chassis: CPU (24) + EXIFB (48) + EXIFE (32) + EXIFE (32)
DSP Sender ^{*2}		128		

^{*1}. Service Tone receiver, DTMF receiver, Caller ID sender / receiver, MF receiver, MFC receiver

^{*2}. Service Tone sender, DTMF sender, MF sender, MFC sender

3.2 Chassis Capacity

System image of Chassis capacity (ISDN, Trunk, Extension) is shown as below.

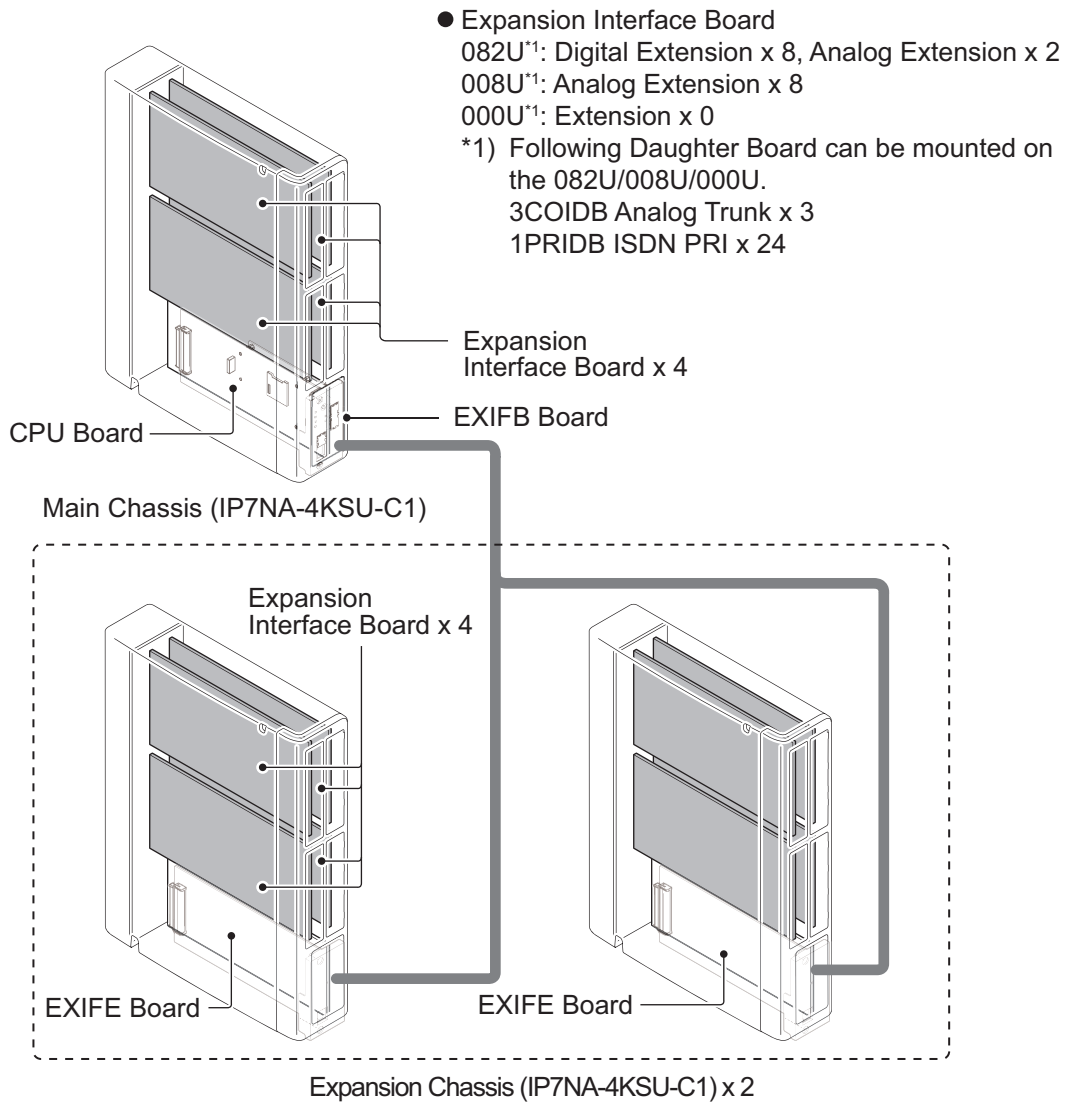


Figure 1-2 System Image

3.2.1 Expandability of Trunk and Extension (without PRT)

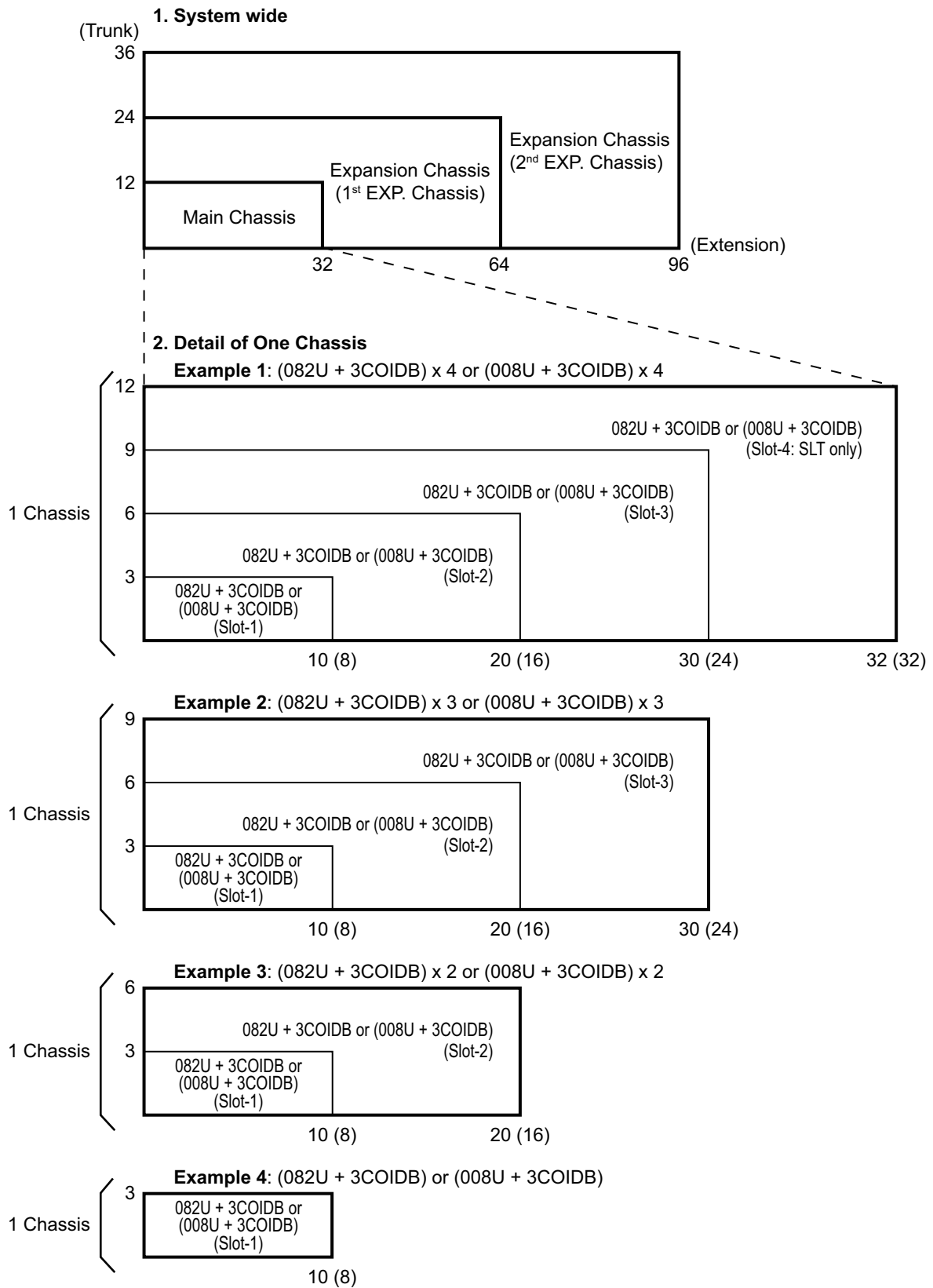


Figure 1-3 Expandability of Trunk and Extension (without PRT)

3.2.2 Expandability of Trunk and Extension (with PRT)

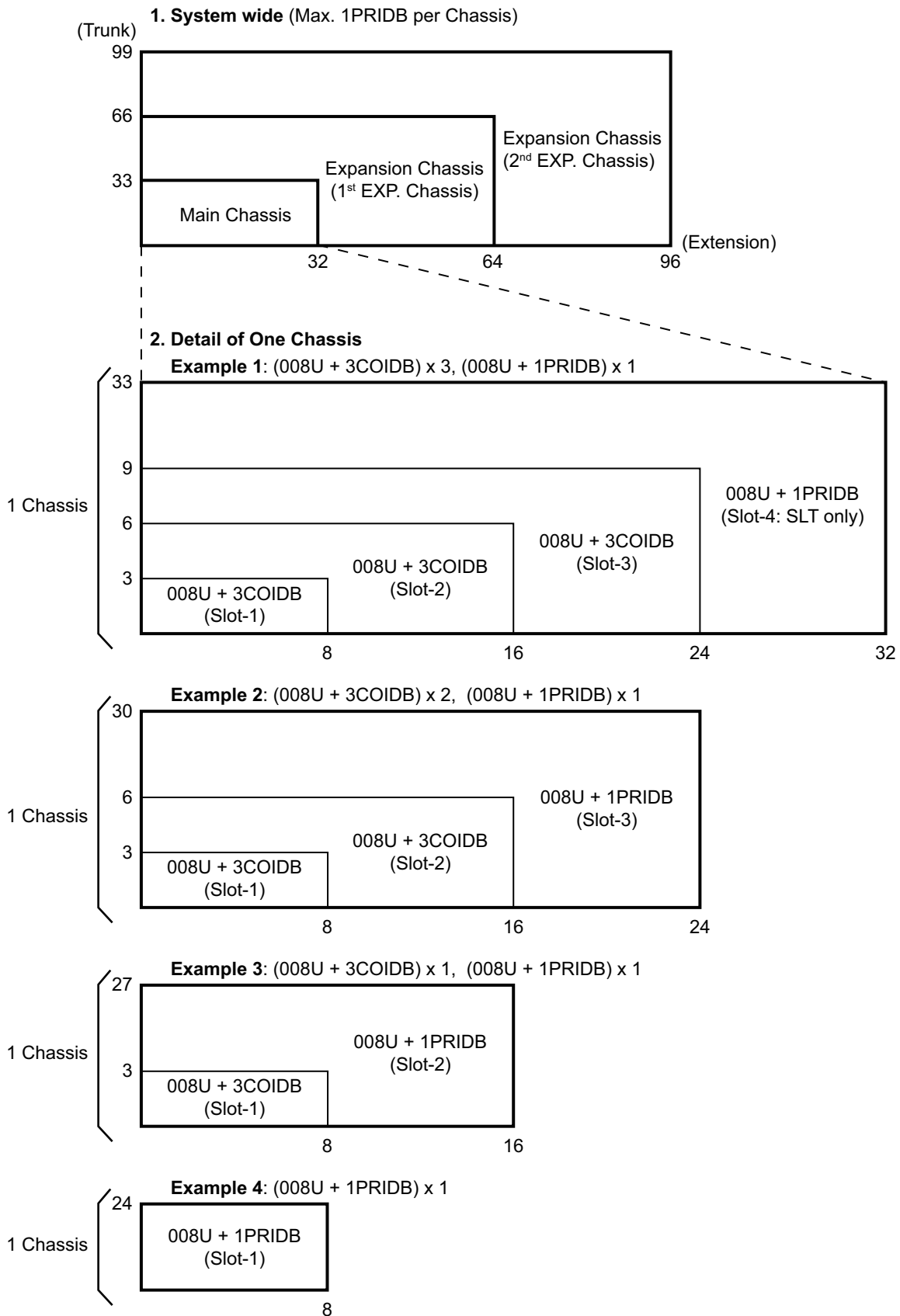


Figure 1-4 Expandability of Trunk and Extension (with PRI)

Installation

SECTION 1 INSTALLING THE MAIN & EXPANSION CHASSIS

1.1 Before Installing the Chassis

Please read following precautions carefully before installation.

1.1.1 General Precautions

- To avoid shock or equipment damage, do not plug in or turn the system power on before completing the installation process.
- Avoid working with the Equipment during electrical storms.
- Use only commercial AC power to prevent shock or fire.
- Use the power cord supplied with the Chassis.
- Install batteries with the correct polarity to prevent damaging equipment.
- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- To avoid damage, the Chassis should not be placed on unstable surfaces.
- To avoid damage the Plastic parts, never use an Electric Screw Driver to tighten the screws.
- To prevent overheating, do not bundle AC power cords together.
- Make sure the Chassis has proper Earth ground.
- If Expansion Chassis are installed, turn the power on/off in the following order:
Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis



Not all boards are hot swappable. Do not remove or install from the chassis when powering up.

1.1.2 Preparations

- The following tools will be required when installing hardware into an SL2100.
 - Screw driver set
 - Side cutters to cut out knockouts
 - Pliers for removing daughter board stand offs
 - Screw driver socket 5 mm for EXIFB-C1 board
- Make sure you have a building plan showing common equipment, extensions, the telecom demarcation, and earth ground location. The installation site must meet the following site / environmental requirements.

1.1.3 Site Requirements

Each Main or Expansion Chassis can have the optional Battery Box (IP4WW-Battery Box) connected, before deciding on the mounting location refer to [Figure 2-8 Horizontal Arrangement of the Chassis on page 2-8](#) and [INSTALLING THE EXTERNAL BACKUP BATTERY on page 2-23](#).

- The system without the IP4WW-Battery Box should be wall-mounted only. The chassis can not be mounted to the IP4WW-Battery Box. The IP4WW-Battery Box can be installed on either the floor or wall (horizontally). Ensure enough space exists to allow the installation of additional Chassis and/or battery box.
- A dedicated 100V-120V/220V/230V/240VAC circuit located within two meters of the Chassis is required. A separate dedicated AC outlet is necessary for each Chassis.

1.1.4 Environmental Requirements

Meeting established environmental standards maximizes the life of the system. Make sure that the site is not:

- In direct sunlight or in hot, cold or humid places.
- In dusty areas or in areas where sulfuric gases are produced.
- In places where shocks or vibrations are frequent or strong.
- In places where water or other fluids comes in contact with the equipment.
- In areas near high-frequency machines or electric welders.
- Near computers, telexes, microwaves, air conditioners, etc.
- Near radio antennas (including shortwave).

1.1.5 Unpacking

Table 2-1 Chassis Packing List

Items	List of Contents	QTY
IP7[]-4KSU-C1	4KSU-C1 Chassis	1
	AC Power Cord	1
	Screws (M4.1x25)	4
	Wall-Mounting Template	1

1.2 Installing the Main Chassis (IP7[]-4KSU-C1)

A Chassis has one CPU/EXIFE board slot and four universal slots for legacy line/trunk board. When the CPU-C1 board is installed in the first chassis, it is called the main chassis. Additional chassis, called expansion chassis.

An Expansion Chassis can be added increasing system capacity. Each Chassis (Main or Expansion) is powered by its own power supply.

For the detail of LED (RUN, ALM), refer to [Table 4-1 CPU LED Indications on page 4-13](#).

1.3 CPU Board (IP7[]-CPU-C1)

1.3.1 Unpacking

Unpack the CPU board and check it against the following list. Inspect for physical damage.

Table 2-2 CPU Packing List

Items	List of Contents	QTY
IP7[]-CPU-C1	CPU Board	1
	Lithium Battery	1

1.3.2 Connectors Location

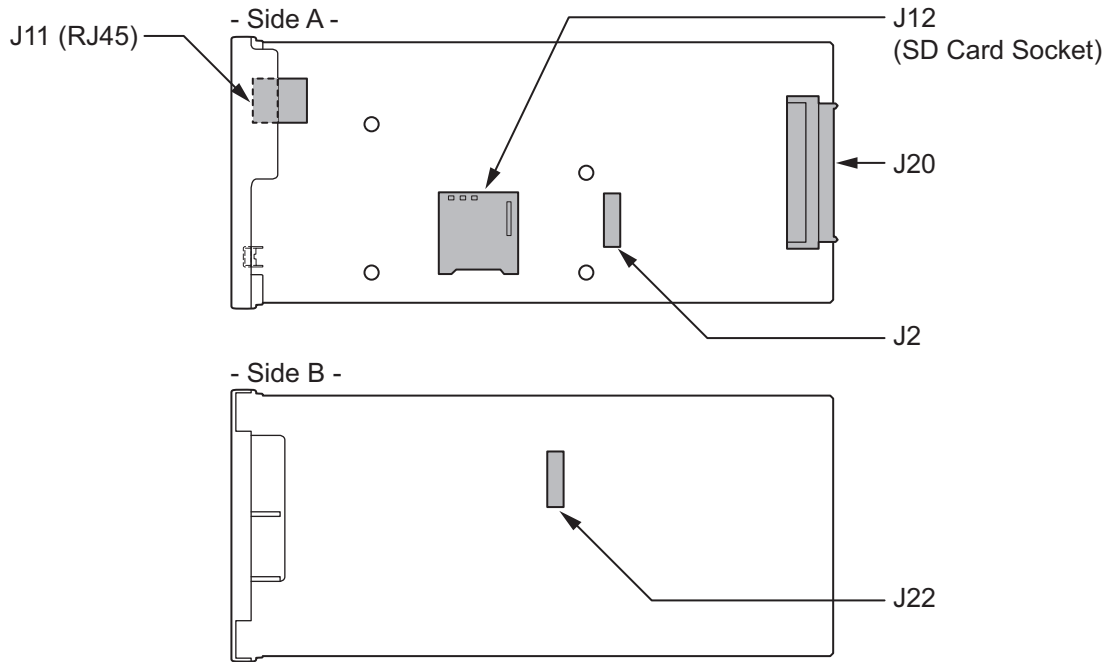


Figure 2-1 Connectors of CPU-C1

Table 2-3 Connectors of CPU-C1

No.	Connectors	Connectable Devices
J2	VOIPDB-C1	J1 connector on the VOIPDB-C1
J11	LAN (RJ45)	Ethernet connector
J12	SD Card	SD card slot (for expand VRS/VM storage or maintenance)
J20	Back Plane Board	Connector on the Back Plane Board
J22	EXIFB-C1	J3 Connector on the EXIFB-C1

1.3.3 Installing the CPU Board (IP7[]-CPU-C1)

 ***Not all boards are hot swappable. Do not remove or install from the chassis when powering up.***

 ***Do Not Power on until all installations have been completed.***

1. Turn off the system power.

2. Refer to following figure for the Lithium battery location on the CPU board.

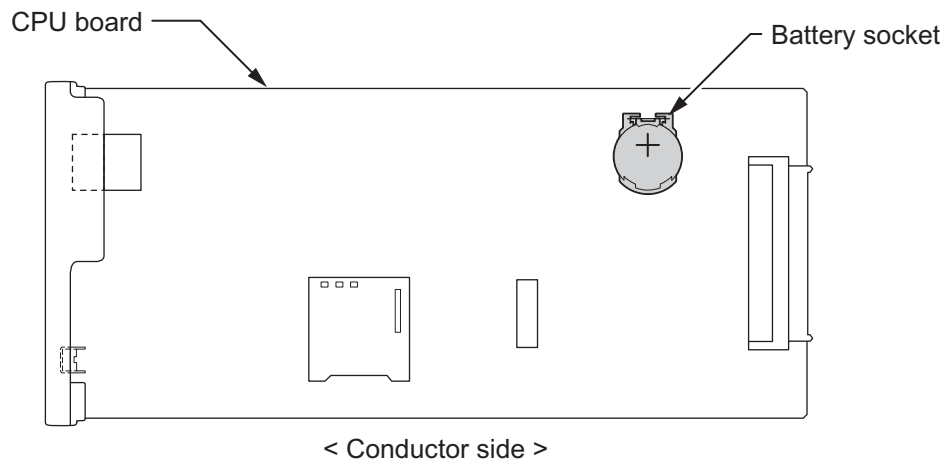



Figure 2-2 Location of Lithium Battery Socket

3. Insert the supplied lithium battery into the socket.

 *The polarity "+" symbol must be on top as illustrated in following figure.*

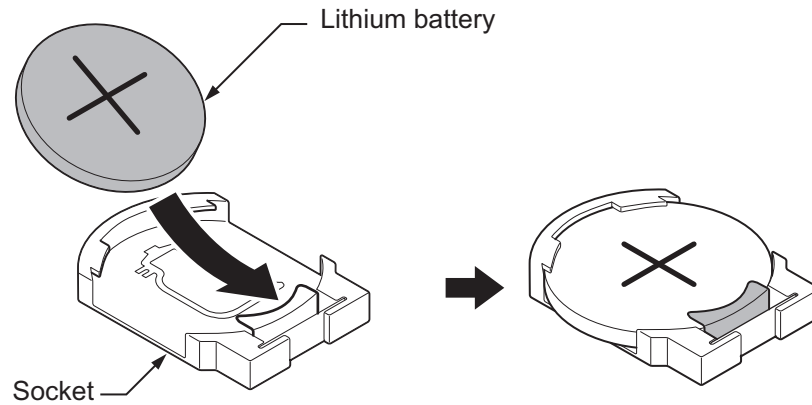


Figure 2-3 Inserting the Lithium Battery

4. Insert the CPU board in the guide rail of Main Chassis and push it securely into position and tighten the two screws of CPU board.

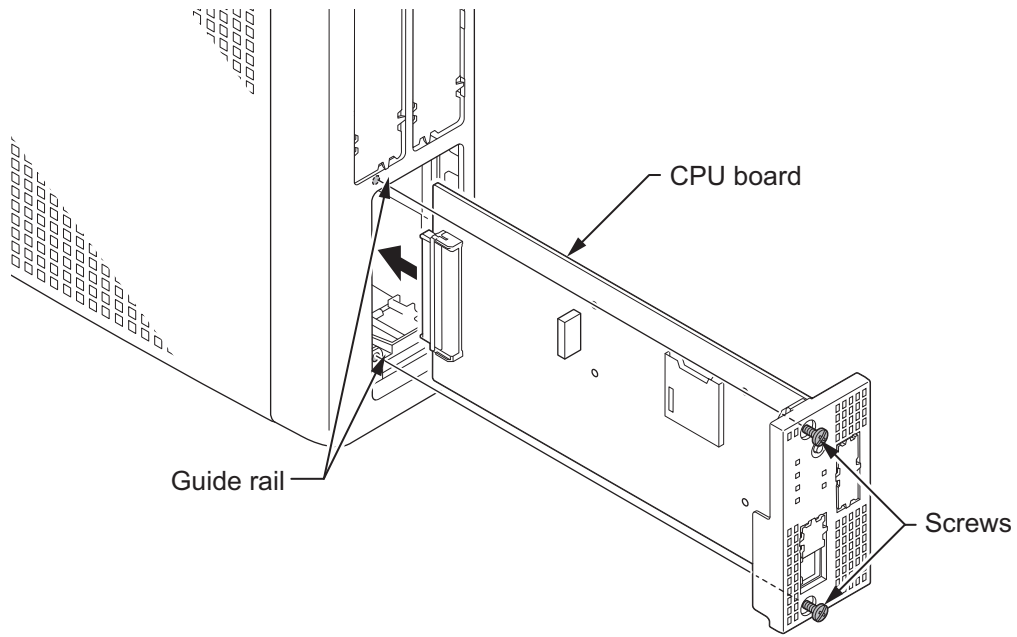


Figure 2-4 Insert the CPU Board

1.3.4 Connector and Switch

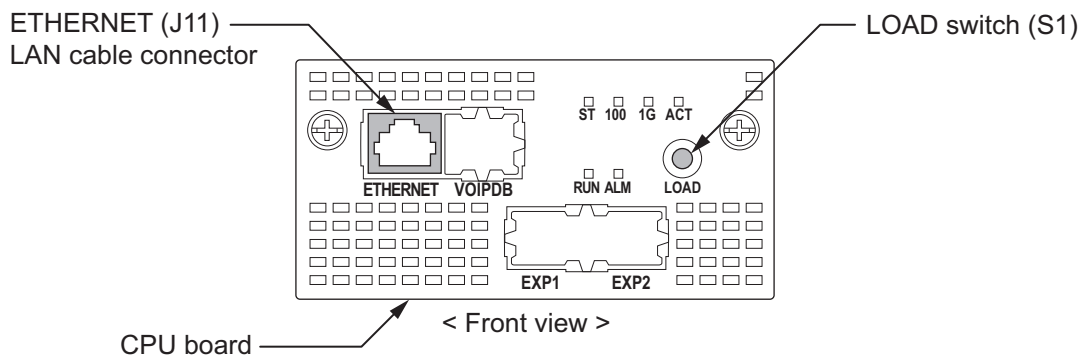
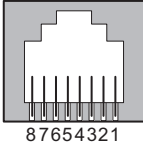


Figure 2-5 Connector and Switch Location on the CPU Board

Table 2-4 Items on the CPU Board

Item	Description
LOAD Switch (S1)	Switch for System Restart/System Reset (Cold start occurs)/Upload Software

Item	Description	
<p>ETHERNET (J11: RJ45)</p> 	Ethernet Cable Connection (for SMDR (PC, Printer), PCPro or WebPro....etc)	
	Pin No.	Pin Function
	1	Tx+
	2	Tx-
	3	Rx+
	4	-
	5	-
	6	Rx-
	7	-
8	-	

1.4 Chassis Dimensions

For Dimensions of the Chassis, refer to [Figure 2-6 Dimension of the Main and Expansion Chassis on page 2-6](#).

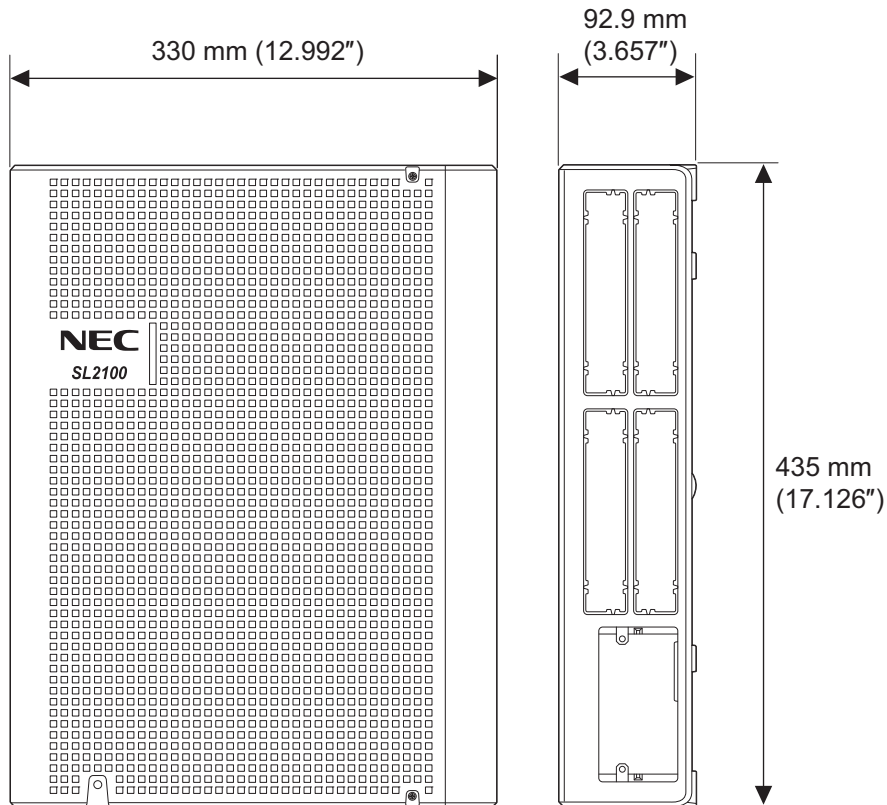


Figure 2-6 Dimension of the Chassis


1.5 Wall-Mounting the Chassis



To prevent damage, choose a safety area to install the chassis even if the chassis is fall down from the wall.

1.5.1 Wall Installation of Chassis

The Main Chassis and Expansion Chassis can be mounted on the wall. Before installing, ensure the appropriate spacing exists as shown below.

 Due to the limit of extension cable length to connect Main Chassis and Expansion Chassis, the install location of Main Chassis and each Expansion Chassis must be considered as above or as [Figure 2-8 Horizontal Arrangement of Chassis on page 2-8](#).

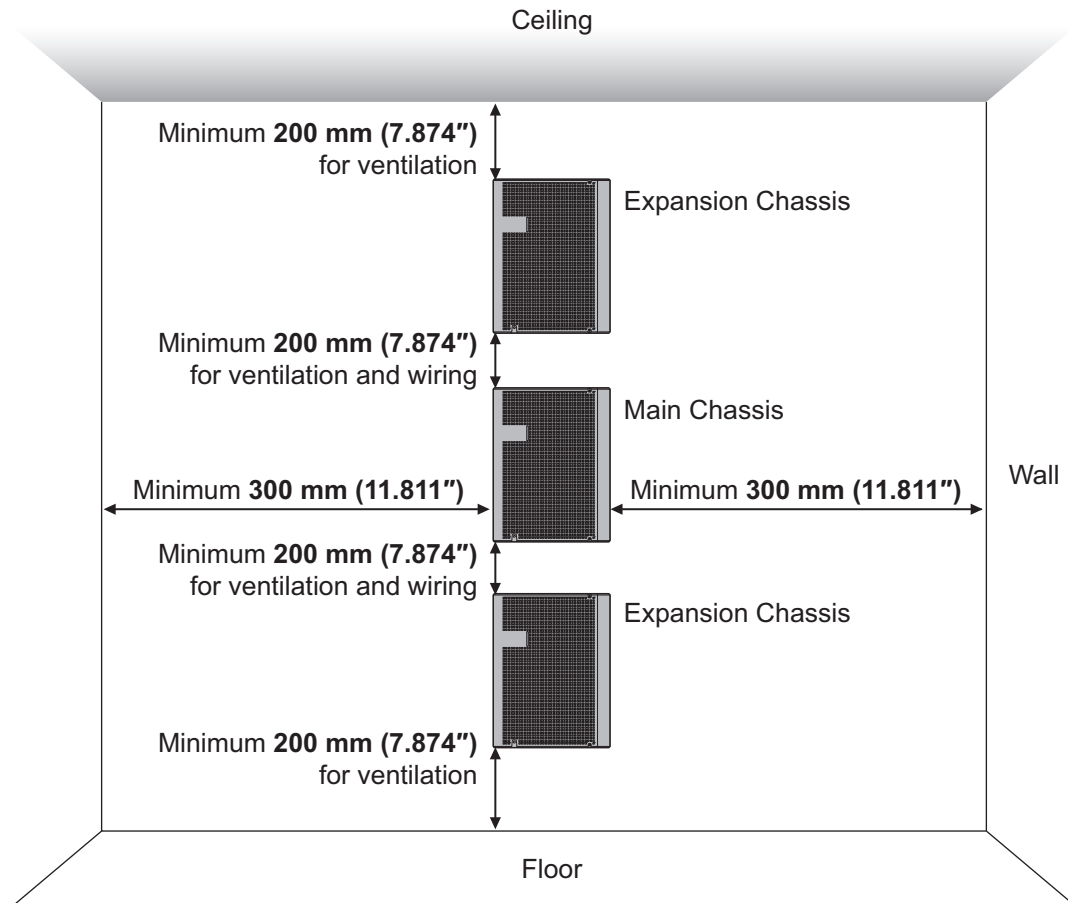


Figure 2-7 Vertical Arrangement of Chassis

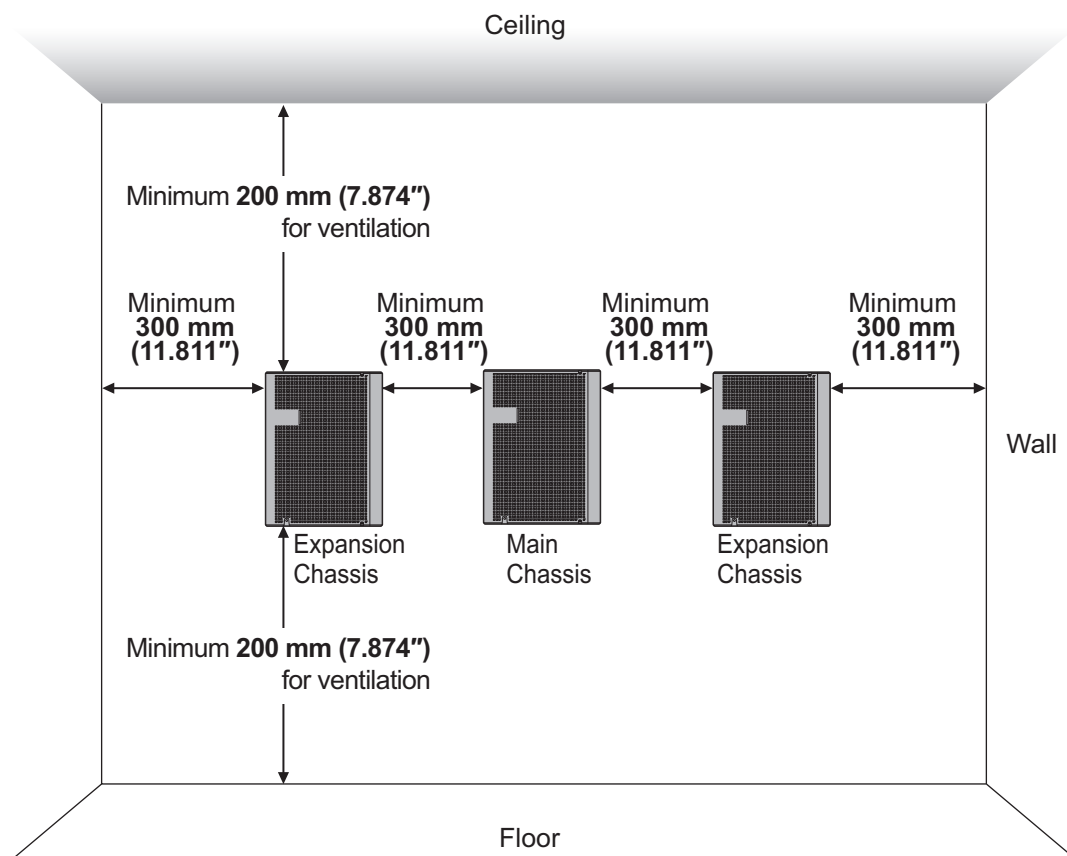



Figure 2-8 Horizontal Arrangement of Chassis

 Due to the limit of extension cable length to connect Main Chassis and Expansion Chassis, the install location of Main Chassis and each Expansion Chassis must be considered as [Figure 2-8 Horizontal Arrangement of Chassis on page 2-8](#).

1.5.2 Mounting Procedure of Chassis

1. Place the attached template on the wall to mark the four screw positions.

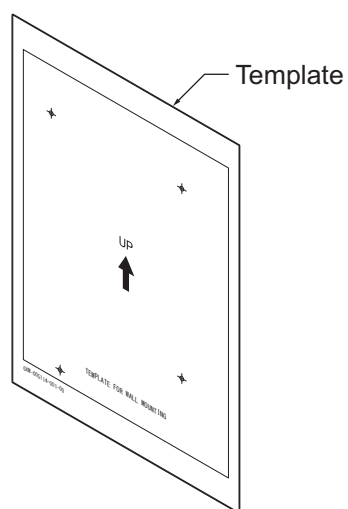


Figure 2-9 Wall-Mounting Template

2. Install three screws into the wall. The screw heads must stand off from the wall about 2.5 mm (0.098") to 3.5 mm (0.138").

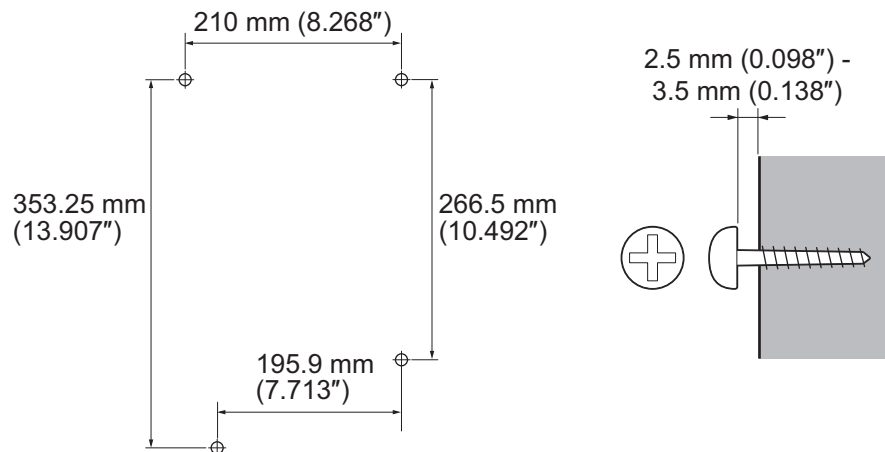



Figure 2-10 Screw Positions

- The screw diameter is 4 mm (0.158") to 4.5 mm (0.177").
- Wall-Mounting Screws (M4.1x 25: 4 pcs) are attached to the Chassis.

 *The other screw is installed after slide the chassis into the position.*

3. Align the three holes on the back of the Chassis with the three screws installed in the wall.

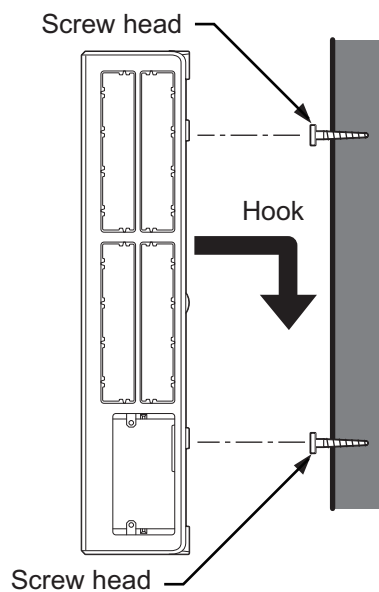


Figure 2-11 Mounting the Chassis

4. Tighten the other screw at the lower left after slide the chassis into the wall.

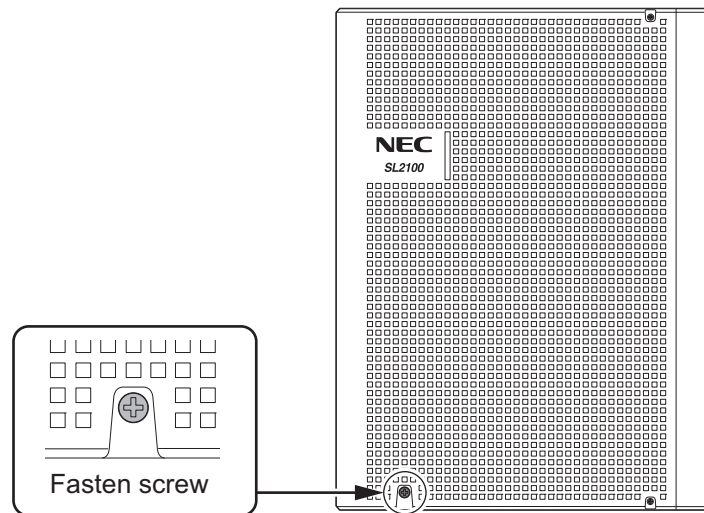




Figure 2-12 Fixing the Chassis

1.5.3 Wall Mounting the Chassis and the Backup Battery (IP4WW-Battery Box)

-  For the details of IP4WW Battery Box installation, refer to [INSTALLING THE EXTERNAL BACKUP BATTERY](#) on page 2-23.

Vertical Arrangement of Chassis and Battery Boxes

For Wall Mounting the Chassis and the IP4WW-Battery Box, refer to [Figure 2-13 Vertical Arrangement of Chassis and Battery Boxes](#) on page 2-11.

-  Due to the limit of extension cable length to connect Main Chassis and Expansion Chassis, the install location of Main Chassis and each Expansion Chassis must be considered as [Figure 2-13 Vertical Arrangement of Chassis and Battery Boxes](#) on page 2-11.

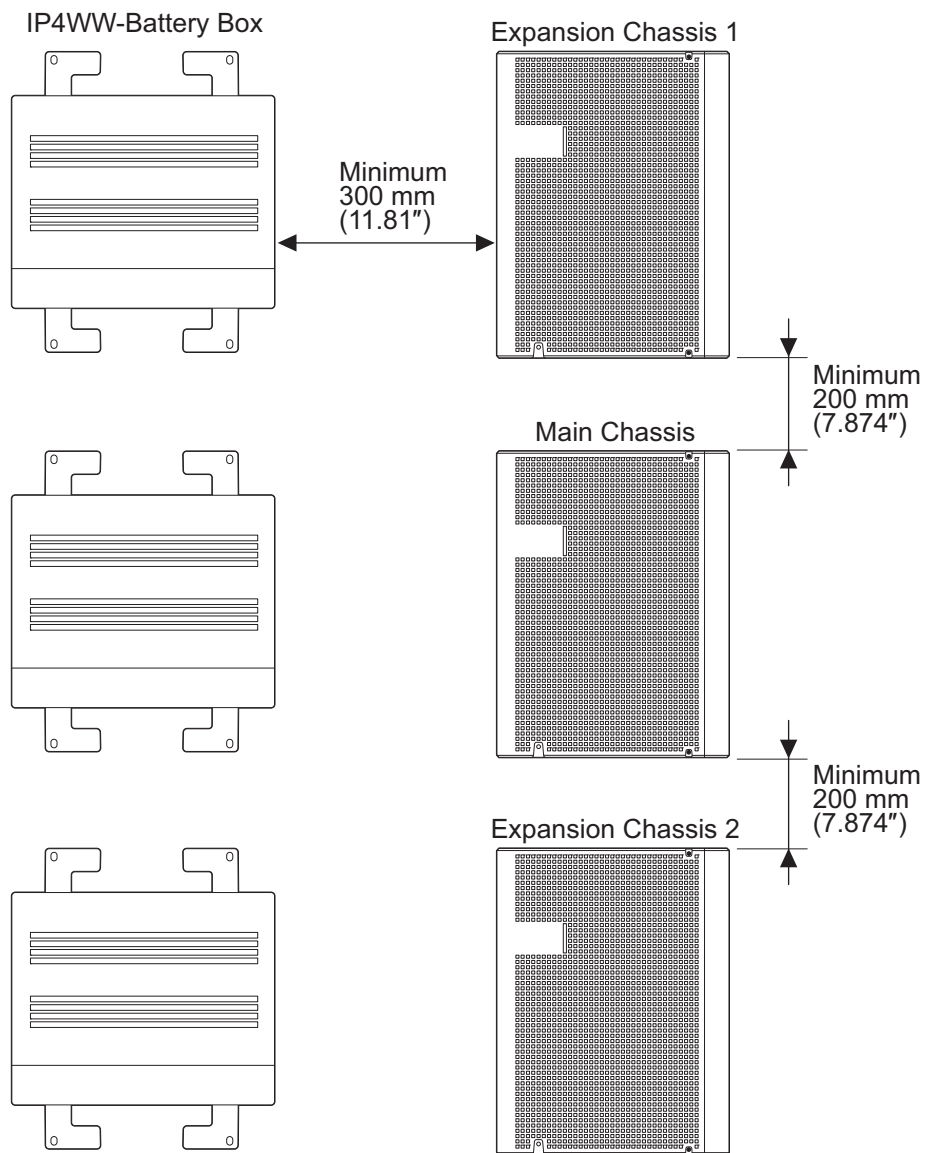



Figure 2-13 Vertical Arrangement of Chassis and Battery Boxes

Horizontal Arrangement of Chassis and Battery Boxes

For Wall Mounting the Chassis and Floor Mounting the IP4WW-Battery Box, refer to [Figure 2-14 Horizontal Arrangement of Chassis and Battery Boxes on page 2-12](#).

 Due to the limit of extension cable length to connect Main Chassis and Expansion Chassis, the install location of Main Chassis and each Expansion Chassis must be considered as above or as [Figure 2-14 Horizontal Arrangement of Chassis and Battery Boxes on page 2-12](#).

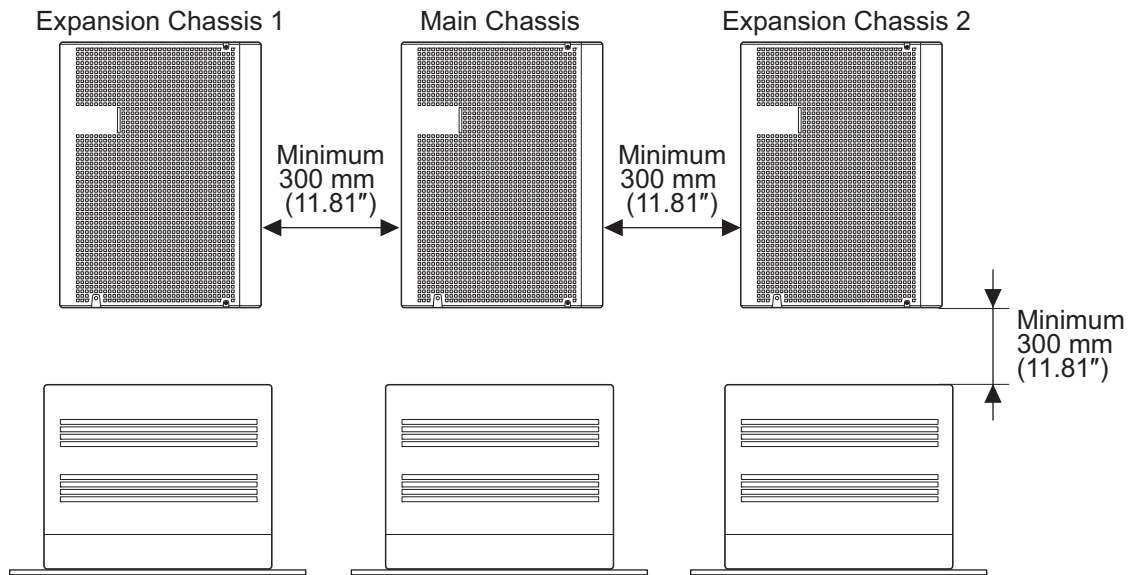


Figure 2-14 Horizontal Arrangement of Chassis and Battery Boxes

1.6 Rack Mounting the Chassis

Main or Expansion chassis can be put into 19 inch rack using a shelf plate one by one refer to [Figure 2-15 Rack Mounted Chassis](#) on page 2-12.

If the system required two or three chassis simultaneously put on the shelf plate of 19 inch rack, the space must be required between chassis for heat ventilation.

Do not stack two or three chassis per one shelf plate.

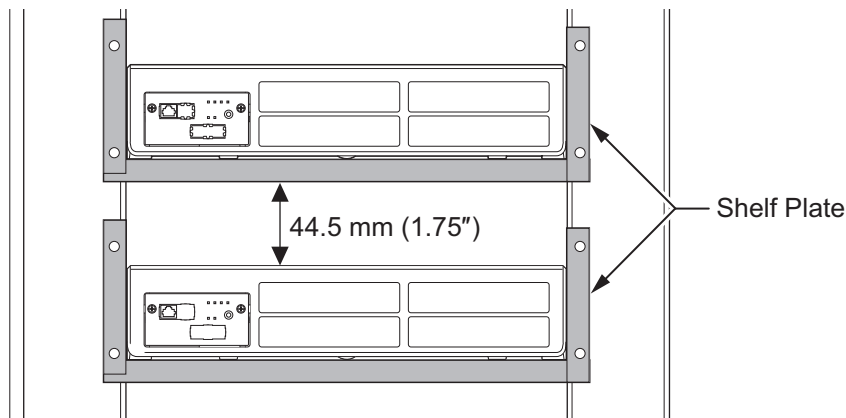


Figure 2-15 Rack Mounted Chassis

1.7 Installing the Expansion Chassis

1.7.1 General

Each Expansion Chassis is connected to the Main Chassis individually. The EXIFB-C1 board must be installed on the CPU board in the Main Chassis. And the EXIFE-C1 board must be installed on the Each Expansion Chassis.

1.7.2 Installation of the EXIFB-C1

1.7.2.1 Unpacking

Unpack the EXIFB-C1 and check it against physical damage.

Table 2-5 EXIFB-C1 Packing List

Items	List of Contents	QTY
EXIFB-C1	EXIFB-C1 Board	1
	Metal Spacers	4
	Screws (with Circular Washer)	4
	Springwashers	4
	Nuts	4

1.7.2.2 Connectors Location

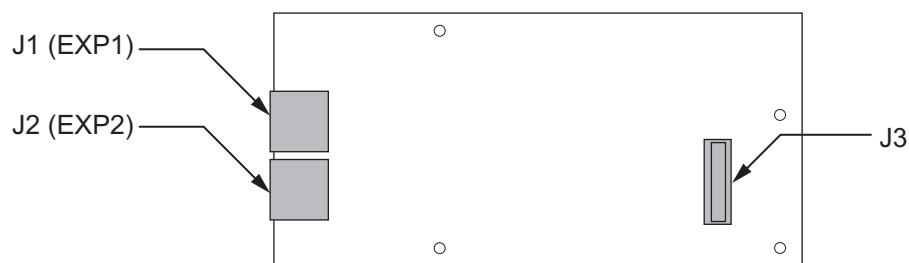


Figure 2-16 Connectors of EXIFB-C1

Table 2-6 Connectors of EXIFB-C1

No.	Connectors	Connectable Devices
J1 (EXP1)	Expansion Connector	J2 (EXP) connector on the EXIFE-C1 board of the Expansion Chassis 1
J2 (EXP2)	Expansion Connector	J2 (EXP) connector on the EXIFE-C1 board of the Expansion Chassis 2
J3	CPU Board	J22 connector on the CPU-C1

1.7.2.3 Installing the EXIFB-C1 Board



Not all boards are hot swappable. Do not remove or install from the chassis when powering up.



Do Not Power on until all installations have been completed.

1. Turn off the system power.

2. Loosen two screws and pull out the CPU board.

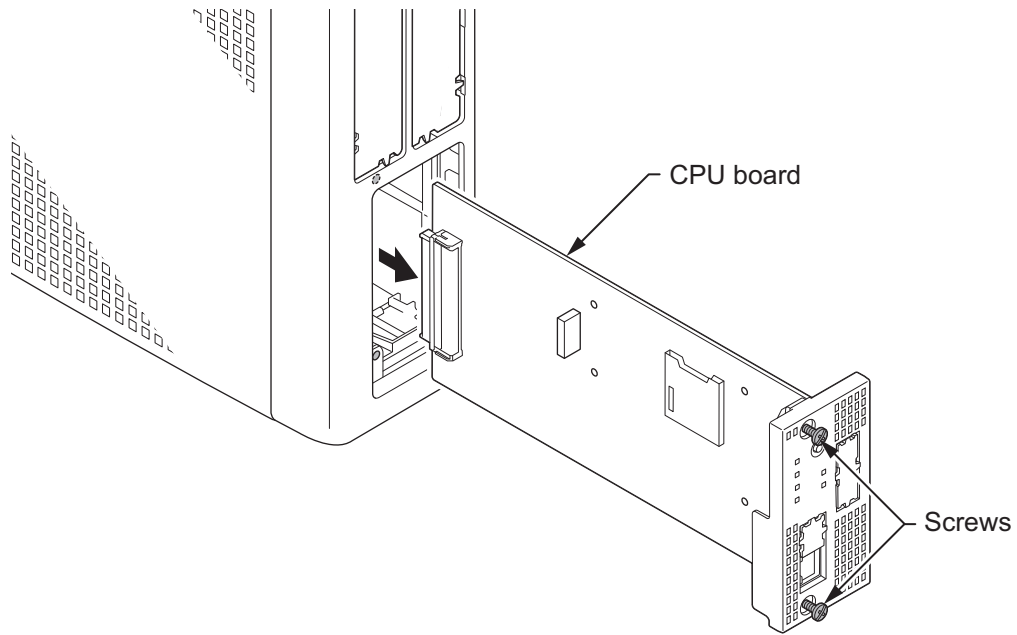


Figure 2-17 Removing the CPU Board

3. Cut and remove the Plastic Knockouts.

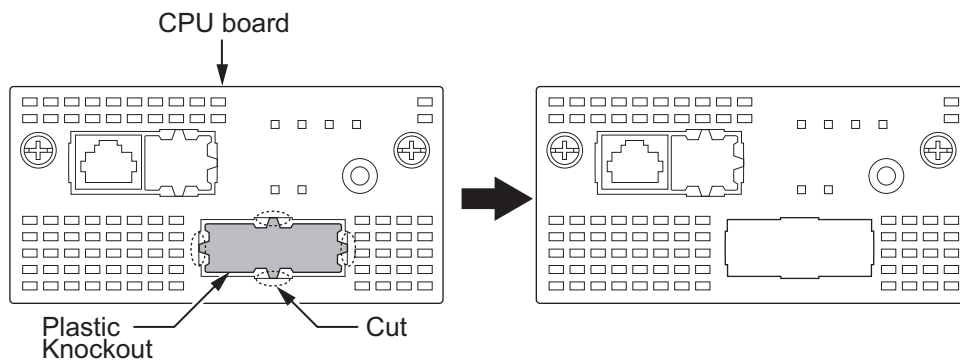


Figure 2-18 Removing the Plastic Knockouts

4. Mount the EXIFB-C1 daughter board onto the CPU board using four Metal Spacers, four springwasher, four screws and four nuts.
To install the EXIFB-C1 daughter board:
 1. Four Metal spacers, nuts, spring washers and screws are included with the EXIFB-C1 daughter board. Install the metal spacers through the CPU-C1 board using four nuts and spring washers.
 2. Position the EXIFB-C1 J3 connector over the J22 connector on the CPU-C1 board. Press the CPU-C1 board and EXIFB-C1 daughter board together.
 3. Screw the EXIFB-C1 daughter board using four screws. (refer to [Figure 2-19 EXIFB-C1 Board Installation on page 2-15](#))



Be careful not to damage the components on the CPU board and EXIFB daughter board when installing.

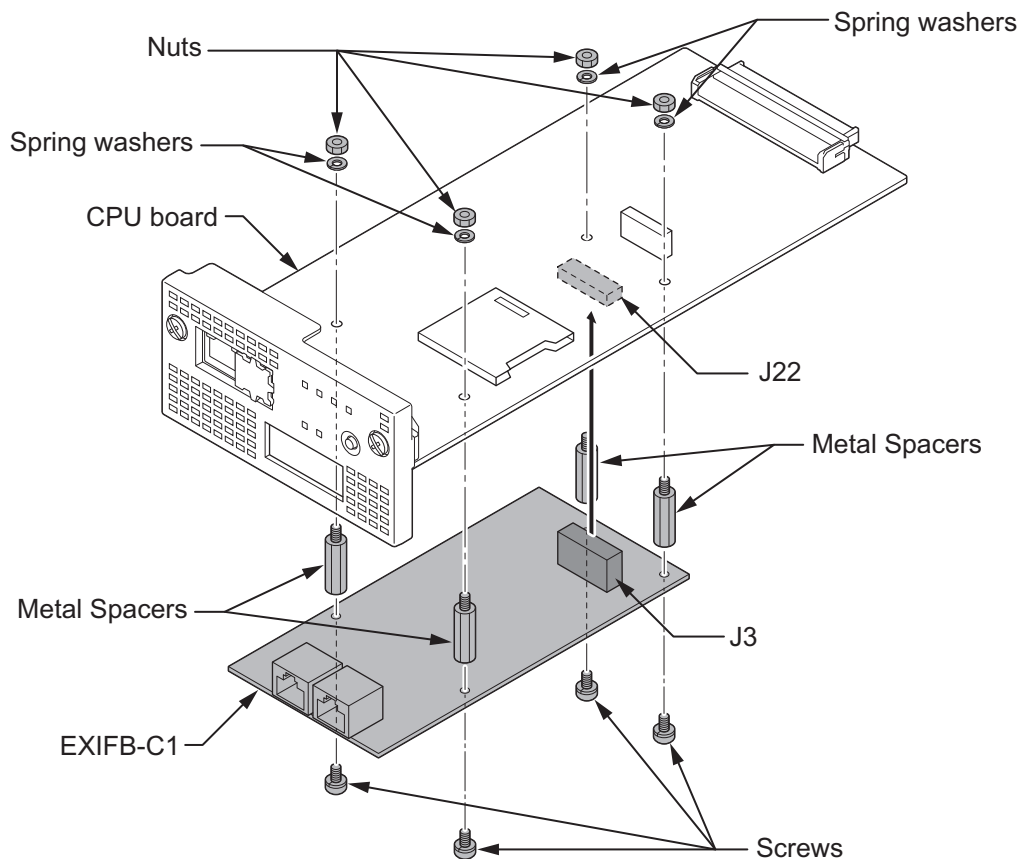


Figure 2-19 EXIFB-C1 Board Installation

5. Insert the CPU board in the guide rail of Main Chassis and push it securely into position, and tighten the two screws.

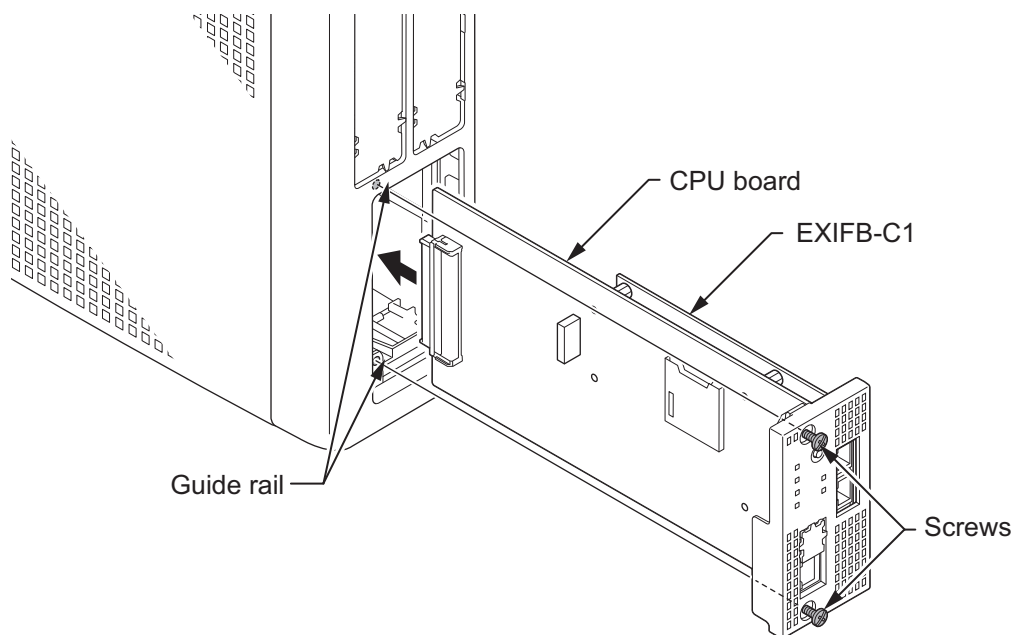


Figure 2-20 Insert the CPU Board

1.7.3 Installation of the EXIFE-C1

1.7.3.1 Unpacking

Unpack the EXIFE-C1 and check it against physical damage.

Table 2-7 EXIFE-C1 Packing List

Items	List of Contents	QTY
EXIFE-C1	EXIFE-C1 Board	1
	Expansion Cable	1
	Ferrite Core	1

1.7.3.2 Connectors Location

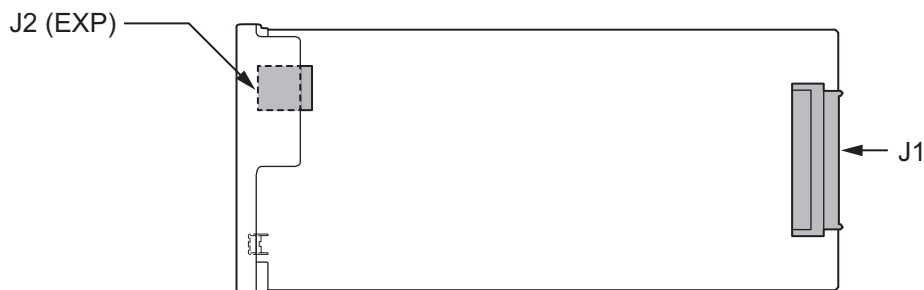


Figure 2-21 Connectors of EXIFE-C1

Table 2-8 Connectors of EXIFE-C1

No.	Connectors	Connectable Devices
J1	Back Plane Board	Connector on the Back Plane Board
J2 (EXP)	Expansion Connector	J1 (EXP1) or J2 (EXP2) connector on the EXIFB-C1 board of the Main Chassis

1.7.3.3 Installing the EXIFE-C1 Board

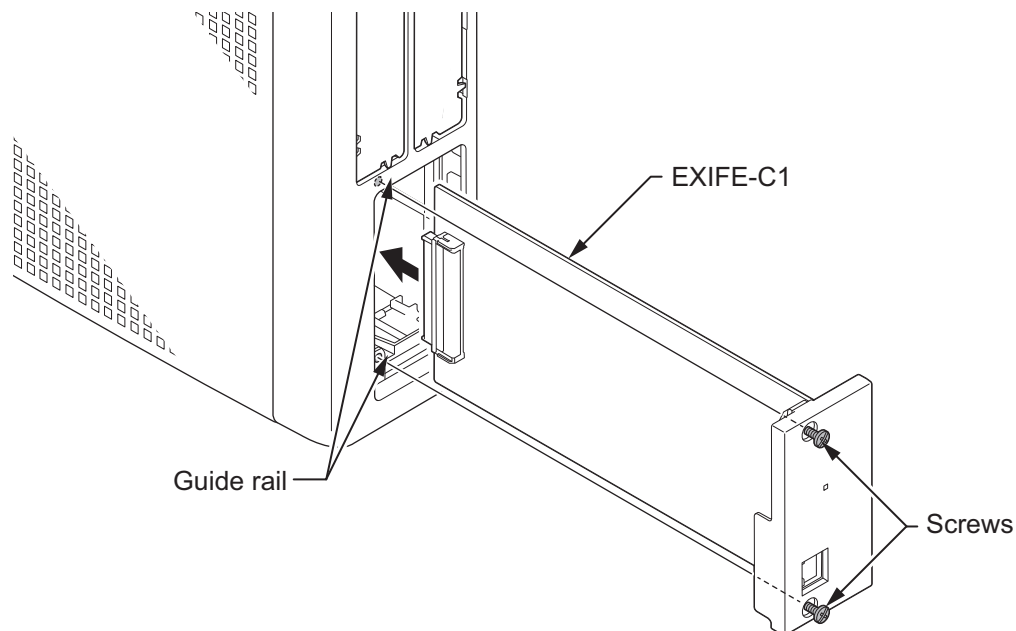


Not all boards are hot swappable. Do not remove or install from the chassis when powering up.



Do Not Power on until all installations have been completed.

1. Turn off the system power.
2. Insert the EXIFE-C1 board in the guide rail of Expansion Chassis and push it securely into position and tighten the two screws of EXIFE board.

**Figure 2-22 Insert the EXIFE-C1 Board**

1.7.4 Chassis Inter-connection

1. Connect the Main Chassis and Expansion Chassis using the NEC provided CAT5 straight-through cable, attached to the EXIFE-C1 board. The cable must pass two times (two rounds) through the Ferrite Core and Ferrite Core must be attached about 300 mm from the Main Chassis side refer to

Figure 2-24 System Expansion Cabling on page 2-19. (Ferrite Core is attached with the EXIFE-C1.)



Make sure you do not apply undue force and damage the cable when clamping on ferrite core.



To prevent damage, when the cable is clamping on ferrite core, do not connect both side of the cable to EXIFB board and EXIFE board. It applied excessive stress to the RJ61 connectors on both EXIFB board and EXIFE board.

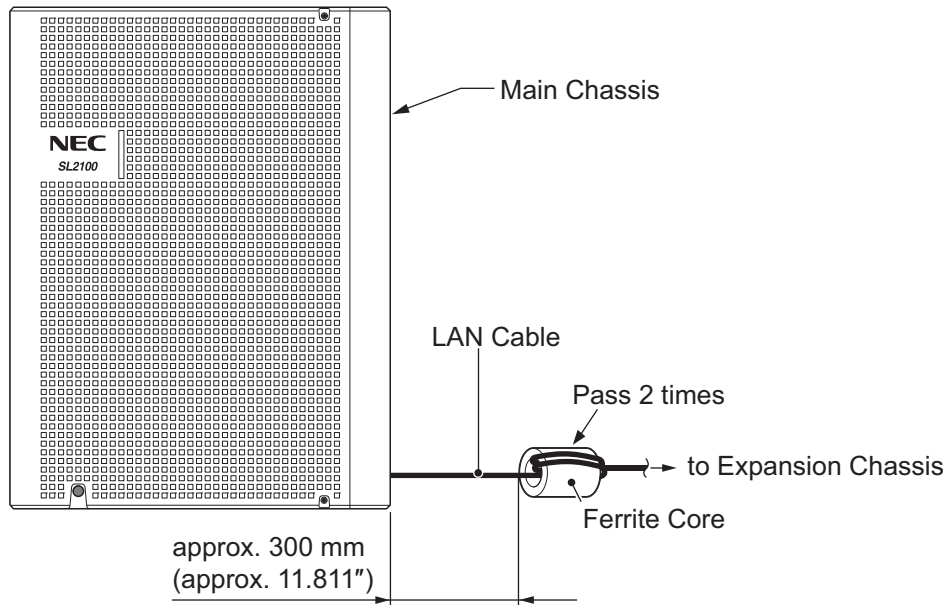


Figure 2-23 Installing Ferrite Core

Attach one end to each Expansion Chassis EXT connector on the EXIFE board (see [Figure 2-24 System Expansion Cabling on page 2-19](#)). Attach the opposite end to the EXP1, EXP2 connector on the EXIFB of the Main Chassis.

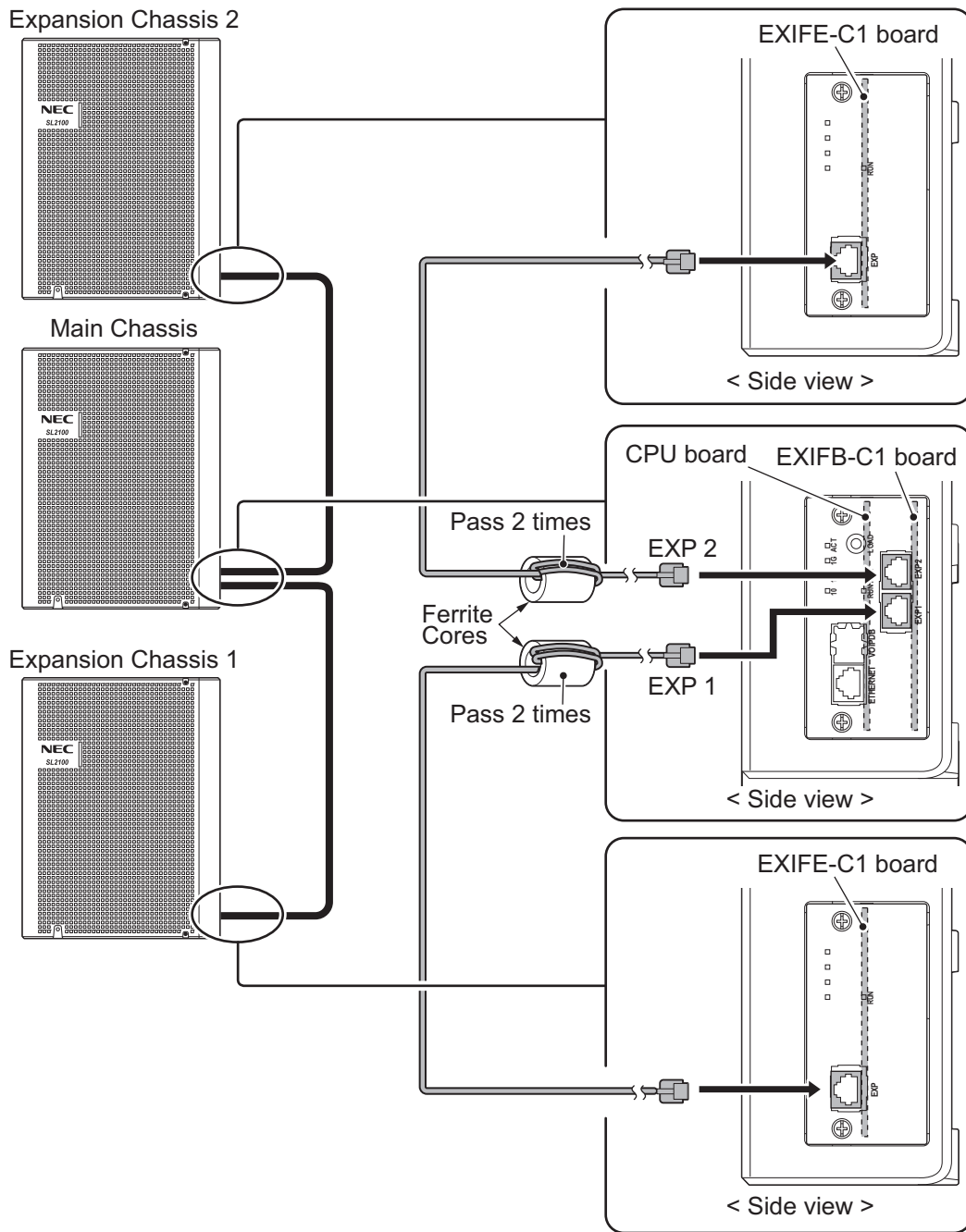


Figure 2-24 System Expansion Cabling

1.8 Grounding and AC Cabling

The ETH (Earth Ground Lug) is located near the AC power inlet on each Chassis.

1.8.1 Grounding the Chassis



Ensure all Main and Expansion Chassis are powered off and unplug the AC cord.

In each Chassis, connect the ETH lug to the verified grounding point using a minimum cable size of 14AWG (Φ2.0 mm) wire.

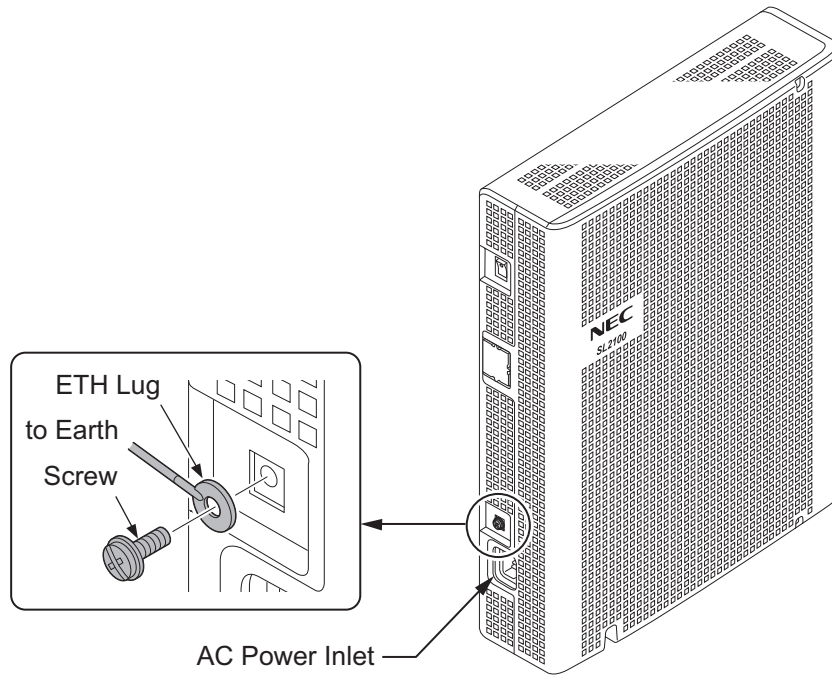



Figure 2-25 ETH Lug

- The grounding cable is supplier-provided.(not attached to the system)

Each chassis in the system must be grounded separately using the procedure listed below.

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

 ***Proper grounding is very important to protect the system from external noise and to reduce the risk of electrocution in the event of a lightning strike.***

1.8.2 AC Power Requirement

A dedicated 100V-120V/220V/230V/240V 50/60Hz circuit located within two meters of the Chassis is required. A separate dedicated AC outlet is necessary for each Chassis.

 ***Double Pole/Neutral Fusing (Power supply fuses are located at both the L and N side.)***

Table 2-9 Power Requirement

	110VAC	120VAC	220VAC	230VAC	240VAC
Power Requirement	110 VAC@15 A	120 VAC@15 A	220 VAC@15 A	230 VAC@15 A	240 VAC@15 A
Power Consumption	Main Chassis = 143 VA	Main Chassis = 150 VA	Main Chassis = 185 VA	Main Chassis = 182 VA	Main Chassis = 182 VA
	3 Chassis Total = 429 VA	3 Chassis Total = 450 VA	3 Chassis Total = 541 VA	3 Chassis Total = 545 VA	Chassis Total = 547 VA
Input Voltage (Rated Voltage)	90 VAC to 264 VAC (100VAC/120VAC/220VAC/230VAC/240VAC)				
Frequency	47 Hz - 63 Hz (Rated Frequency: 50/60 Hz)				
Phase and Wire	Single Phase, 2 Line + PE Type				

	110VAC	120VAC	220VAC	230VAC	240VAC
Ground Requirement	No.14 AWG Copper Wire				
Feeding Voltage	SLT: 20 mA/ -27 V				
AC Input I	Main Chassis = 1.43 A 3 Chassis Total = 4.29 A	Main Chassis = 1.25 A 3 Chassis Total = 3.75 A	Main Chassis = 0.82 A 3 Chassis Total = 2.46 A	Main Chassis = 0.79 A 3 Chassis Total = 2.37 A	Main Chassis = 0.76 A 3 Chassis Total = 2.28 A
KWh	Main Chassis = 0.143 KWh 3 Chassis Total =0.429 KWh	Main Chassis = 0.150 KWh 3 Chassis Total =0.450 KWh	Main Chassis = 0.185 KWh 3 Chassis Total =0.541 KWh	Main Chassis = 0.182 KWh 3 Chassis Total =0.545 KWh	Main Chassis = 0.182 KWh 3 Chassis Total =0.547 KWh
BTU (KWh x 3413)	Main Chassis = 488 BTU 3 Chassis Total =1464 BTU	Main Chassis = 512 BTU 3 Chassis Total =1536 BTU	Main Chassis = 631 BTU 3 Chassis Total =1894 BTU	Main Chassis = 621 BTU 3 Chassis Total =1863 BTU	Main Chassis = 621 BTU 3 Chassis Total =1863 BTU

1.8.3 AC Power Cord

The AC power switch and AC power inlet are located at the back side of each Chassis. The AC power cord is connected to the AC inlet and the commercial AC power socket.



Before connecting the AC power cord, make sure:

- ***The power switch at the back side of each Chassis is turned OFF.***
- ***The power switch at the commercial AC power socket is turned OFF.***
- ***The AC plug fits the commercial AC power socket. The plug adapter is necessary if it does not fit.***
- ***To prevent damage, do not use a hammer to connect the AC power cord to AC power jack on the chassis, it must be connected by hand.***

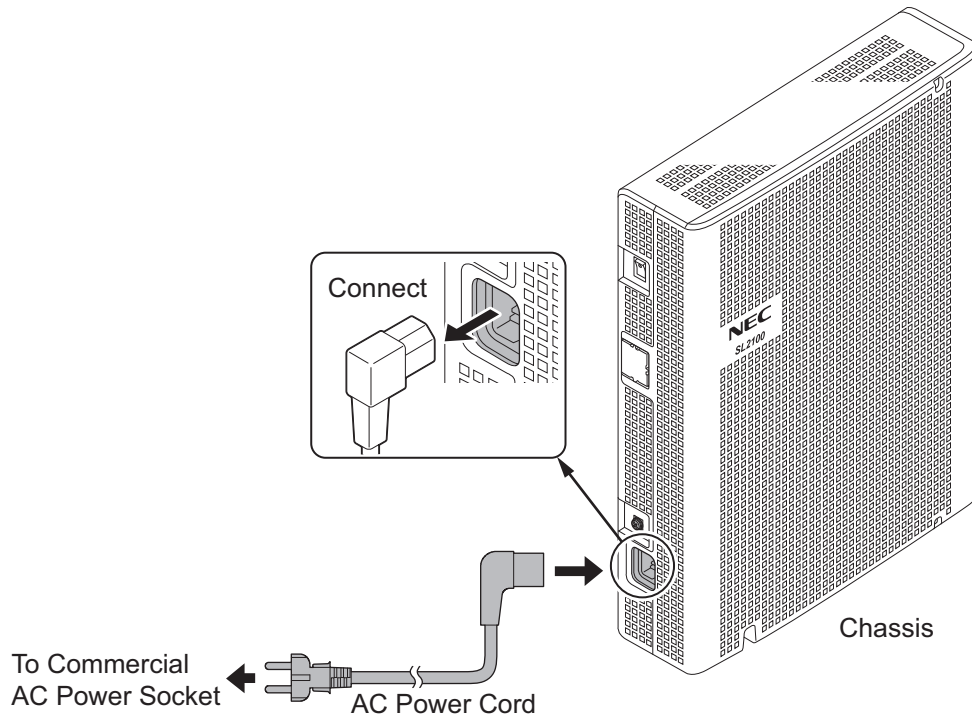


Figure 2-26 AC Power Cord





- *Each Chassis must have its own commercial AC power socket.*
- ***DO NOT POWER ON** until all Chassis installation has been completed.*

SECTION 2 INSTALLING THE EXTERNAL BACKUP BATTERY

2.1 General

The external backup battery box (IP4WW-Battery Box) with batteries provides power to the system when AC power fails. It is connected to the power supply of each Chassis.

-  • An optional (locally procured), external battery source can be used to provide power during a power failure.
- Each Chassis must have own IP4WW-Battery Box.

 **To avoid damage to equipment, do not install the Topaz Battery Box (DX2E-32i/NX7E Battery Box) to the SL2100 system.**

2.2 Unpacking

Unpack the IP4WW-Battery Box and check it against the following list. Inspect for physical damage.

Table 2-10 IP4WW-Battery Box Packing List

Items	List of Contents	QTY
IP4WW-Battery Box	Battery Box	1
	Battery Connection Cable (Black & Red)	1
	Battery Connection Cable (Blue)	1
	Screws: M4 x 8	10
	M3 x 6 with Washer	1
	Screws: M4.1 x 16	6
	Battery Box FM/WM Base-F Battery Box FM/WM Base-R	1 1
Battery Box WM Support Battery Box WM Hook	1 1	

2.3 Battery Box Dimensions

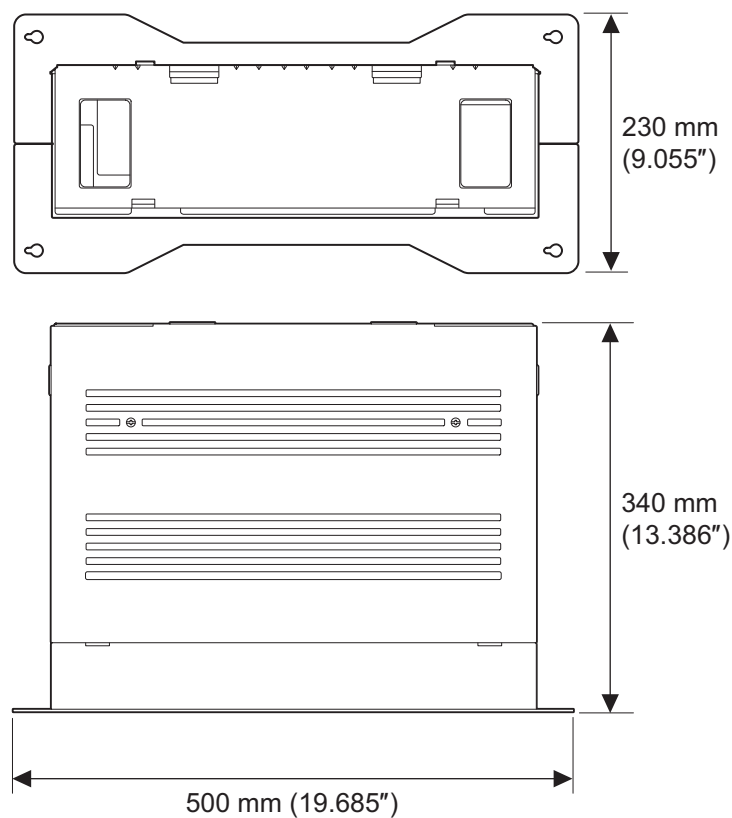


Figure 2-27 Dimension of the IP4WW-Battery Box

2.4 Battery Specifications

Table 2-11 Battery Specifications

Item	Data
Capacity	12 V, 7.0 Am/H or equivalent (Voltage must be 12 V)
Recommended Battery	GS Yuasa NP7-12 (151 x 65 x 97.5 mm / 2.7 kg) <GS Yuasa International LTD.> The Battery must be UL recognized product.
Number of Batteries (per Box)	2
Backup Duration (Estimated)	1 hour

2.5 Battery Installation

Before floor-mounting or wall-mounting the IP4WW-Battery Box, the batteries must be installed into the IP4WW-Battery Box.

1. Loosen two screws and remove the Front Cover.

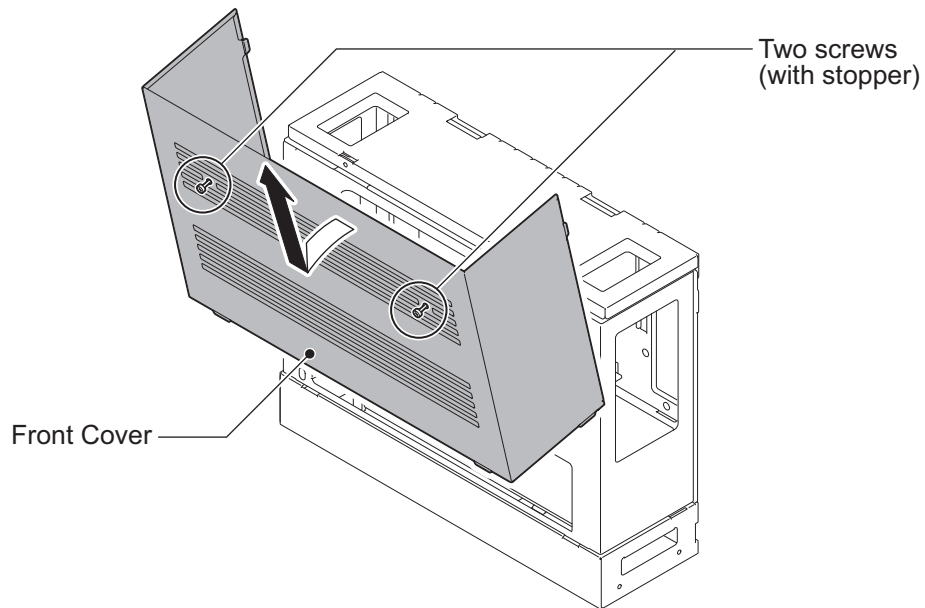


Figure 2-28 Removing the Front Cover

2. Disconnect the Battery Connection Cable from the Fuse Unit if the cable is plugged already.

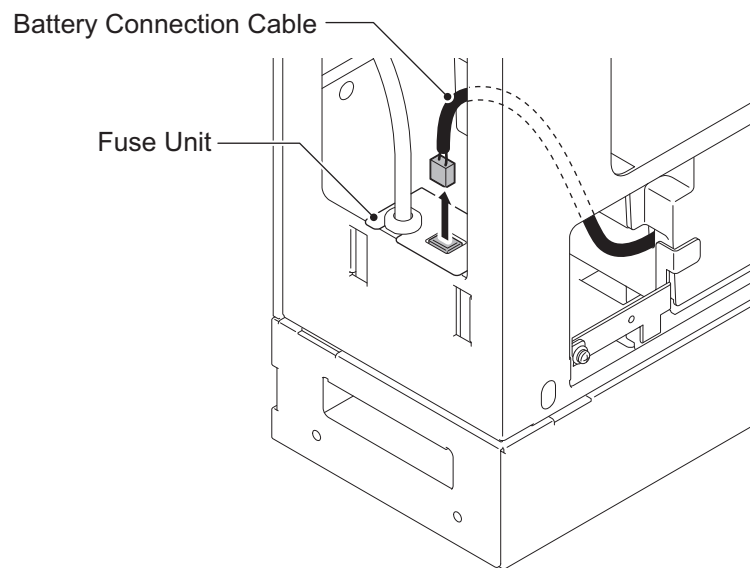


Figure 2-29 Disconnect Battery Connection Cable

3. Loosen the screw and lift the Batt Stopper.

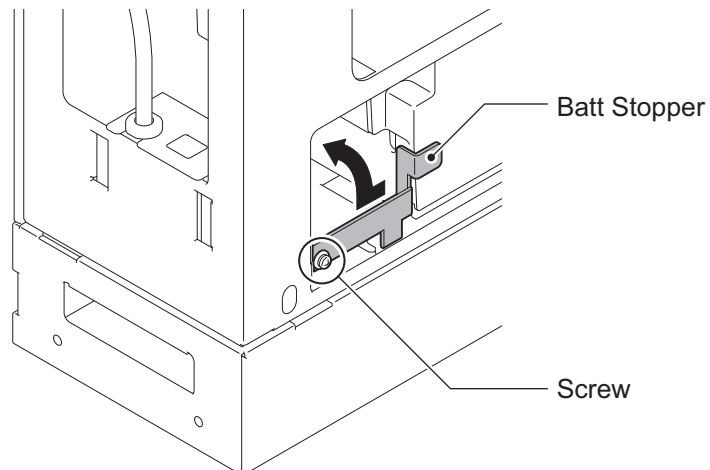


Figure 2-30 Batt Stopper

4. Pull out the Battery tray.

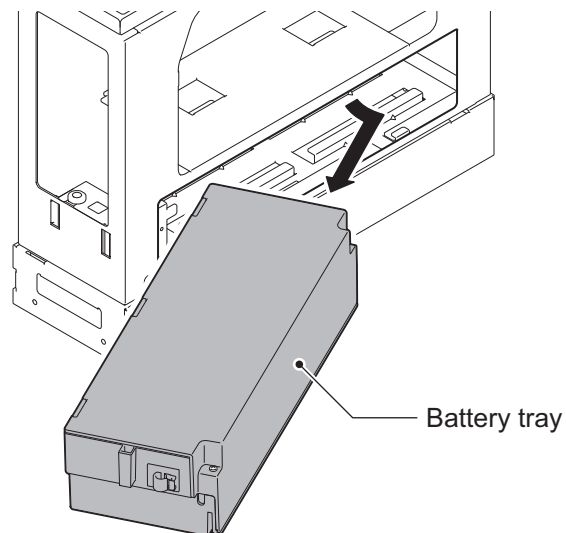


Figure 2-31 Pulling out the Battery Tray

5. Loosen two screws and remove the Battery tray cover.

6. Remove two screws and remove the Battery tray bracket.

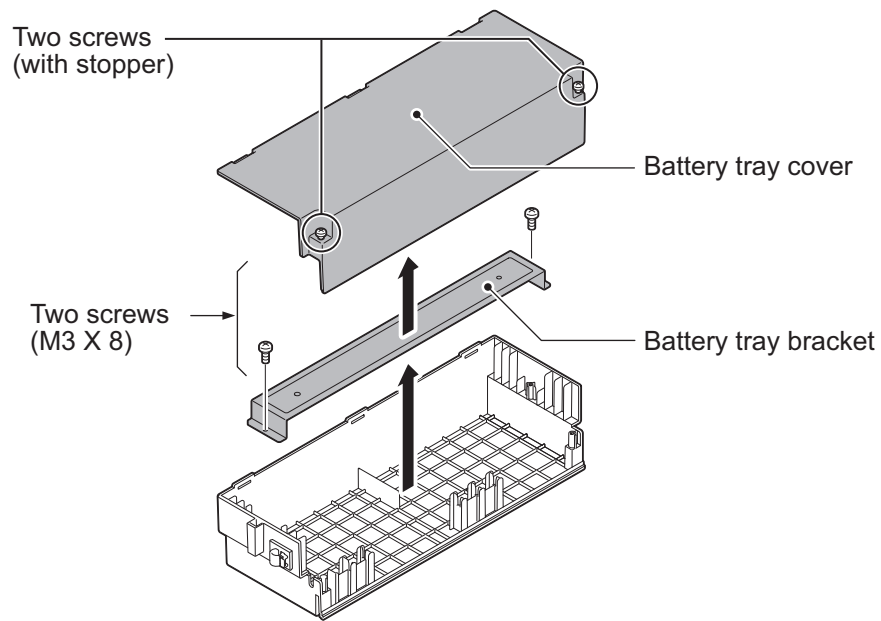


Figure 2-32 Remove the Battery Tray Bracket

7. Install two batteries into the Battery tray.

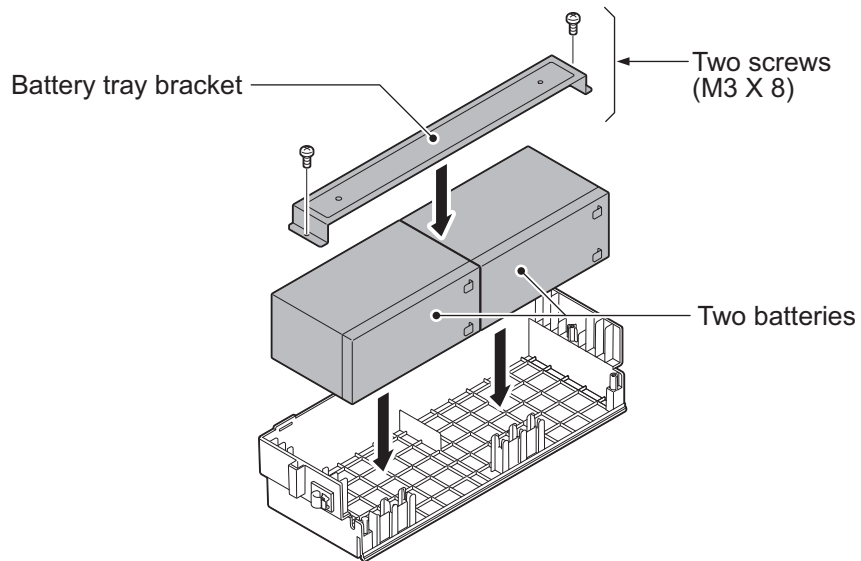


Figure 2-33 Battery Installation

8. Connect the battery cables.

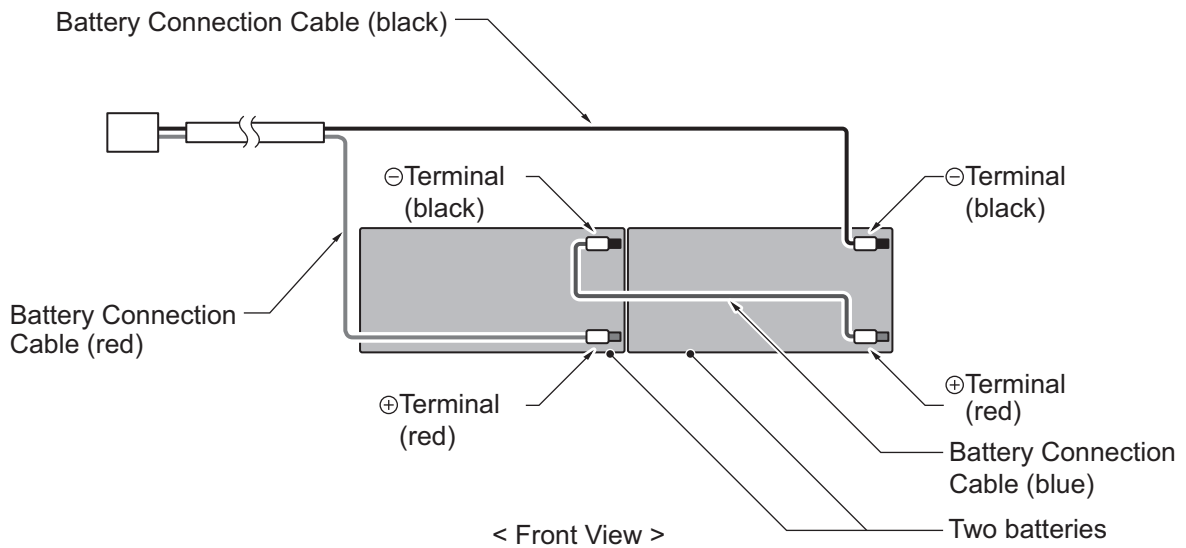


Figure 2-34 Connecting the Battery Cables



Incorrect installation of batteries may damage the Fuse Unit or cause possible fire.

9. Insert Battery Connection Cable into the Cable guides as shown in the next diagram.
 10. Install the Battery tray cover aligning the three tabs and tightening the two screws.

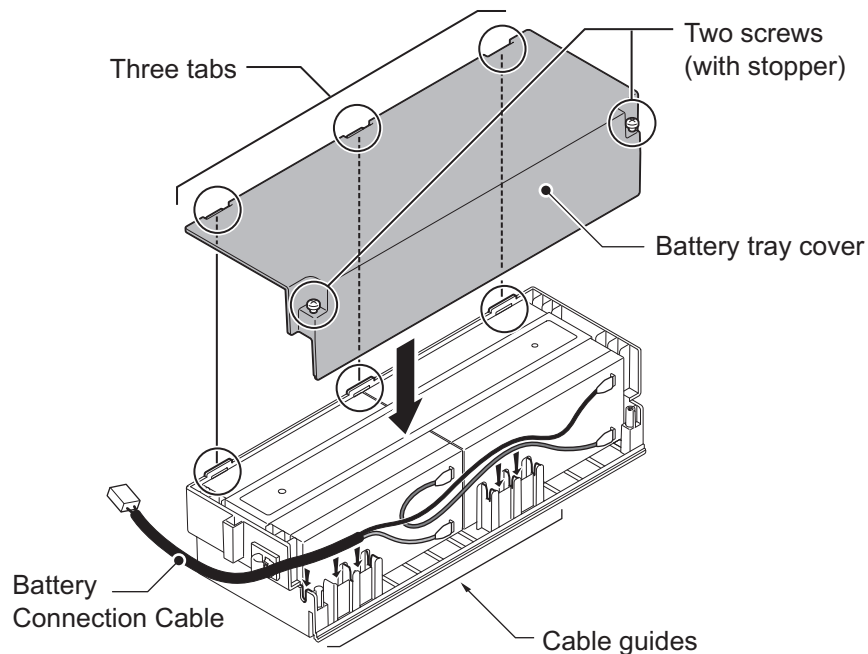


Figure 2-35 Installation of Battery Tray Cover



- ***Do not pull the Battery connection cable strongly.***
- ***Be careful not to catch the Battery Connection Cable when installing the Battery tray cover.***



Write down the year and month of the next battery replacement in the label on Front cover.

11. Insert the Battery tray into the Battery Box.

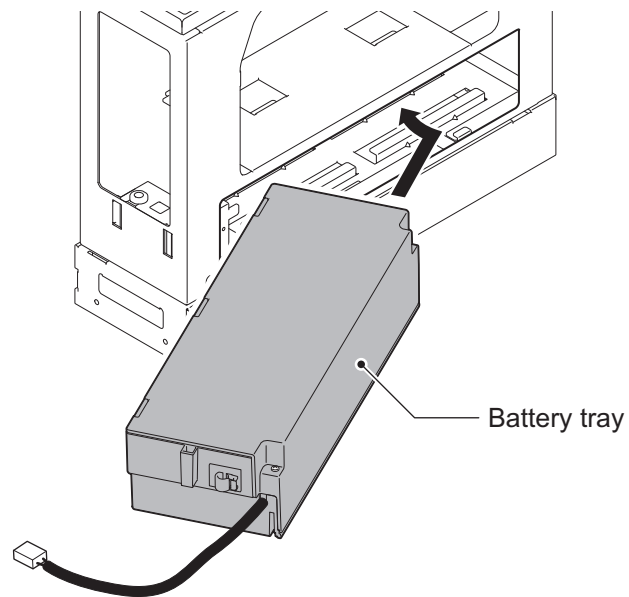


Figure 2-36 Inserting the Battery Tray

12. Set the Batt Stopper bracket in place and secure with screw.

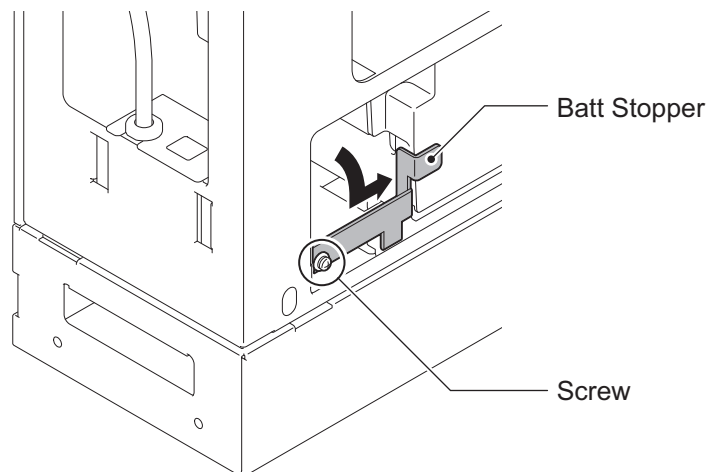


Figure 2-37 Secure Batt Stopper Bracket

13. Plug the Battery Connection Cable into the Fuse unit.

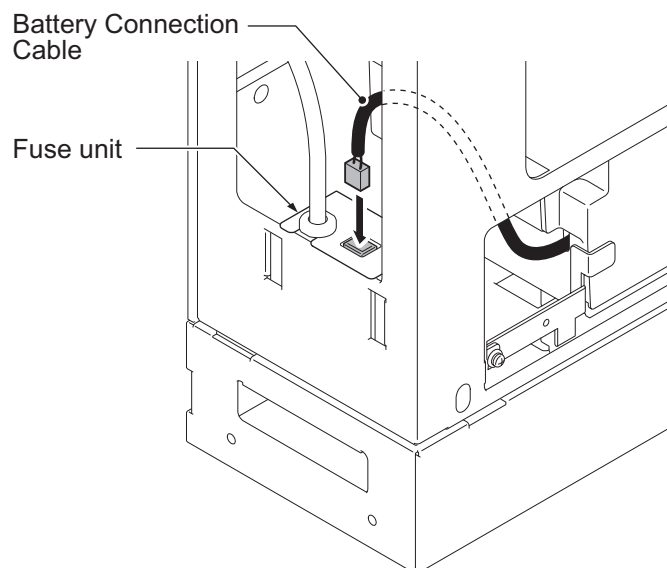


Figure 2-38 Connecting the Battery Connection Cable

14. Align tabs a to f to holes A to F on Battery Box. Slide the Front cover and tighten the two screws.

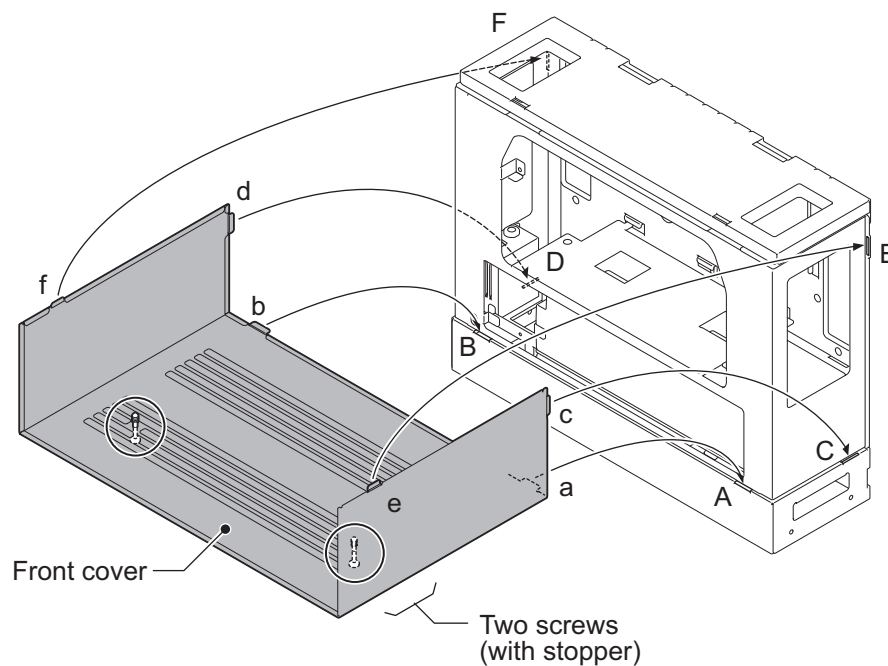


Figure 2-39 Installation of Front Cover

2.6 Mounting the IP4WW-Battery Box

The IP4WW-Battery Box can be installed on either the floor or wall. One Chassis can be mounted on an IP4WW-Battery Box.

2.6.1 Floor-Mounting the IP4WW-Battery Box

Battery box can be mounted on the floor using the FM/WM Base-F, FM/WM Base-R and WM Support. (Note: FM = Floor-Mount and WM = Wall-Mount)

1. Assemble the FM/WM Base-F, Base-R and WM Support.

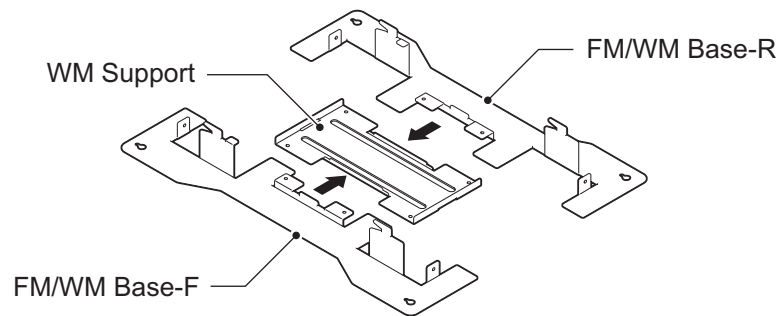


Figure 2-40 Bases and Support of the Battery Box

2. Refer to [Figure 2-41 Floor-Mount Spacing Guide on page 2-31](#) for required spacing before drilling holes for 10 mm (0.394") anchor bolts (locally procured). Mark and drill the four holes required to install the FM/WM Base.
3. Using anchor bolts, secure the FM/WM Base to the floor.

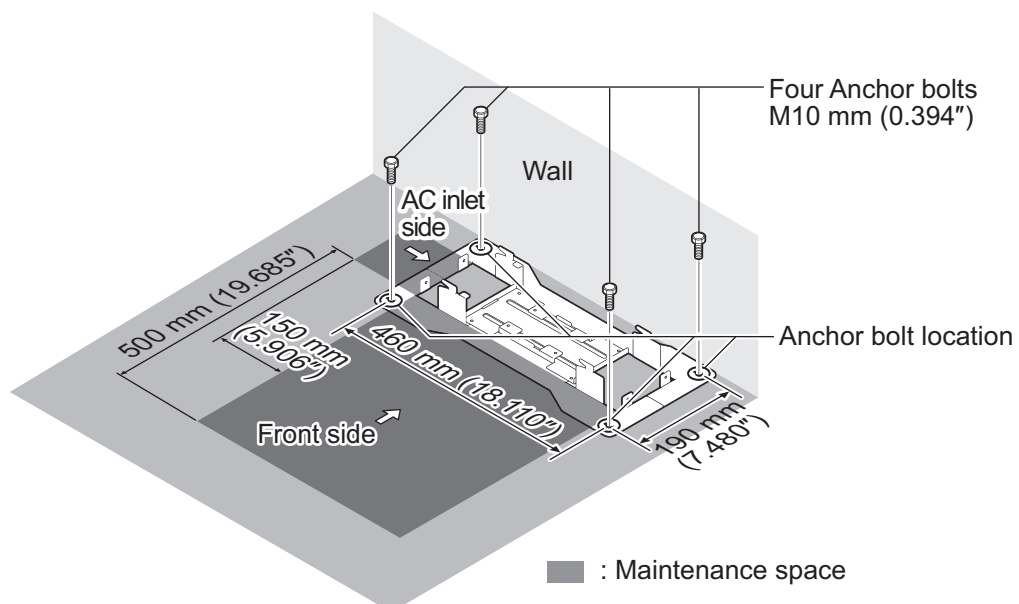


Figure 2-41 Floor-Mount Spacing Guide

- Using the four hooks on the FM/WM Base mount the IP4WW-Battery Box on the Base.

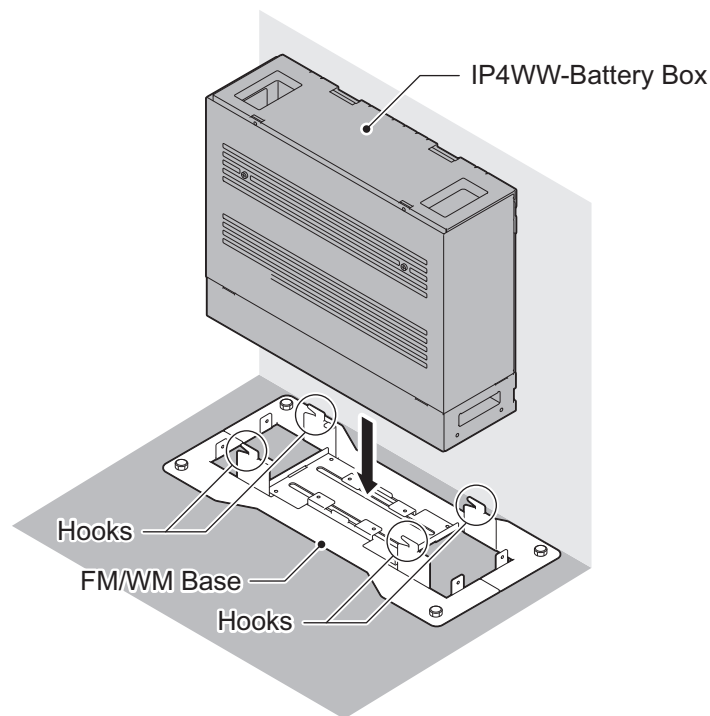


Figure 2-42 Mounting the Battery Box

- Using four supplied screws, secure the IP4WW-Battery Box to the FM/WM Base.

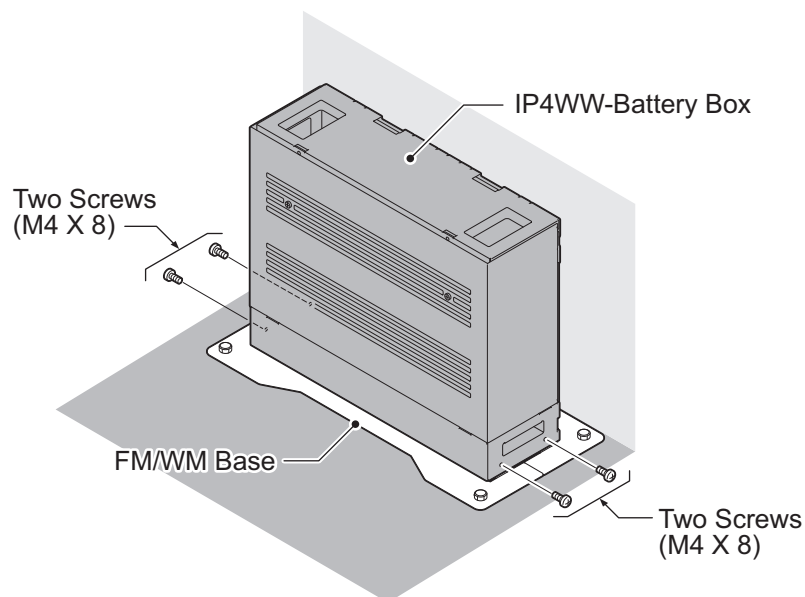



Figure 2-43 Securing the Battery Box

2.6.2 Wall-Mounting the IP4WW-Battery Box



When wall-mounting the IP4WW-Battery Box, ensure the wall can support the weight of the Battery Box (Total weight=17.6 kg (620.75 oz) - Including 2-batteries, cord, Chassis, etc). The Battery Box is secured to the wall using the FM/WM BASE. Ensure that enough space is available to allow the installation of additional Chassis.

 *Plywood should first be installed on the wall where the Battery Box will be positioned. This allows secure anchoring of the screws which support the weight of the Battery Box.*

1. Using four supplied screws, secure the WM Support to the FM/WM Base-F and Base-R.

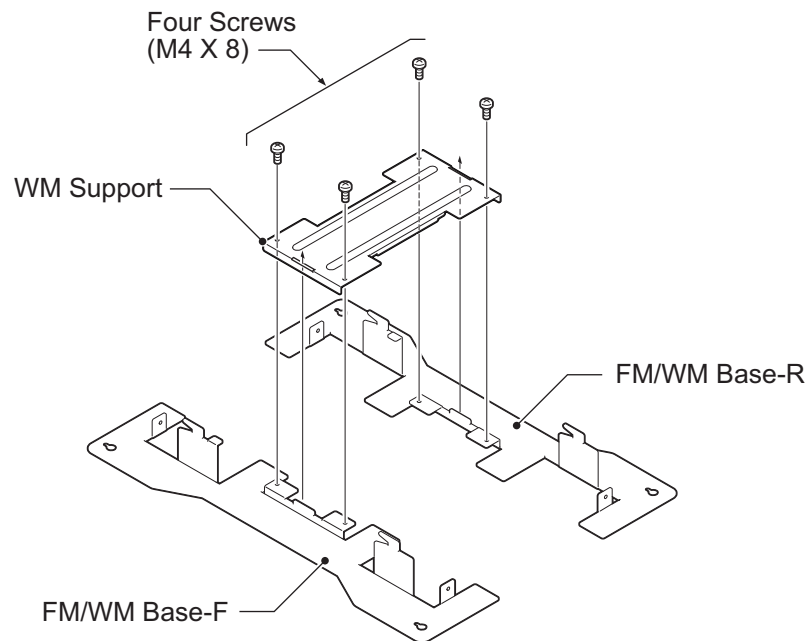


Figure 2-44 Assemble Battery Box Base

2. Refer to [Figure 2-45 Wall-Mount Spacing Guide on page 2-34](#) for required spacing before drilling holes for 10 mm anchor bolts (locally procured). Mark and drill the four holes required to install the FM/WM Base.

- Using anchor bolts, secure the FM/WM Base to the wall.

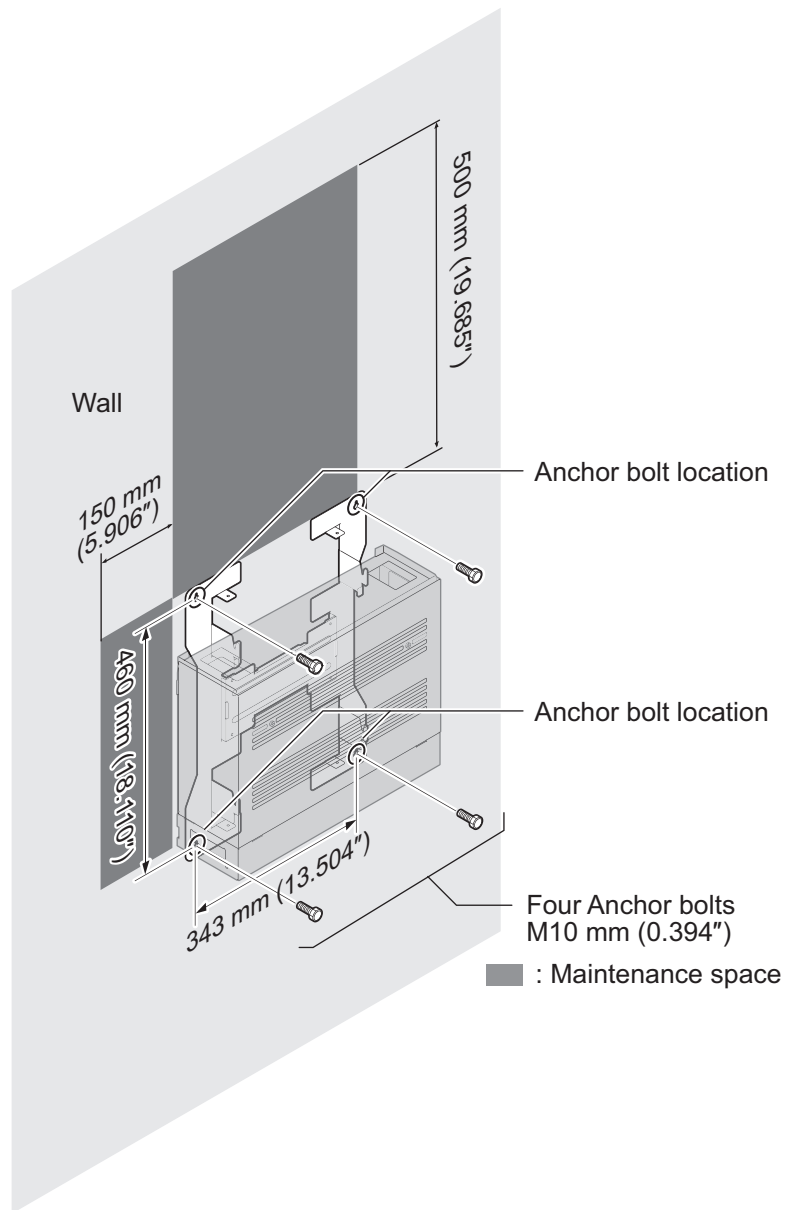


Figure 2-45 Wall-Mount Spacing Guide

- Loosen two screws and remove the Front Cover.

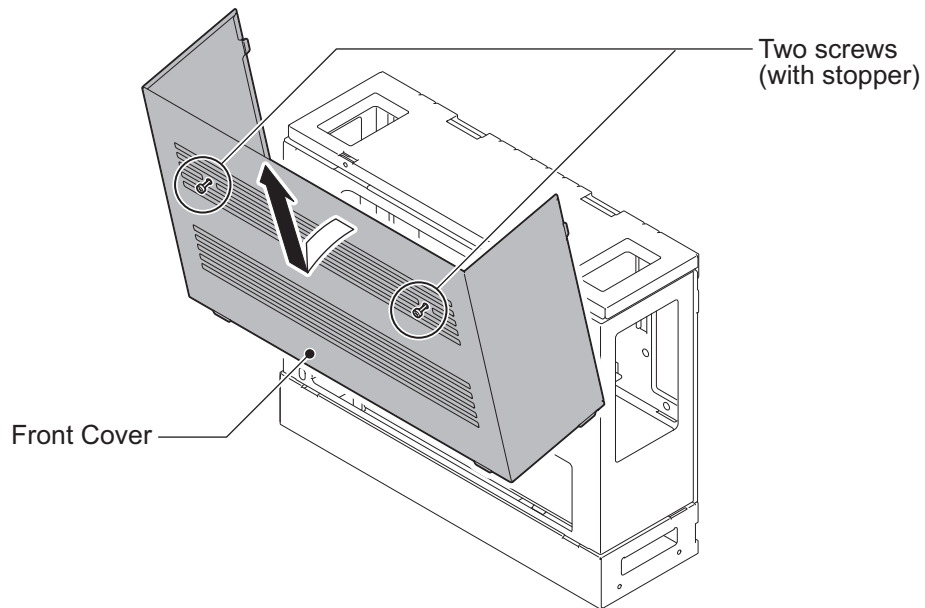


Figure 2-46 Removing the Front Cover

- Using the four hooks on the FM/WM Base mount the IP4WW-Battery Box to the Base.

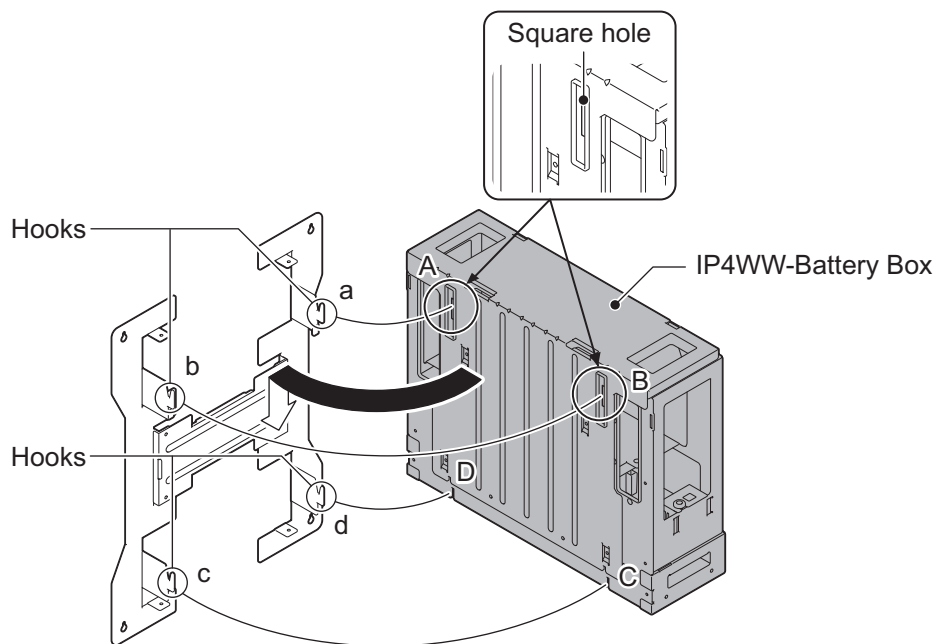


Figure 2-47 Mounting the Battery Box

- Using one supplied screw (M3x6 with washer), secure the back plane of the Battery Box to the FM/WM Base.

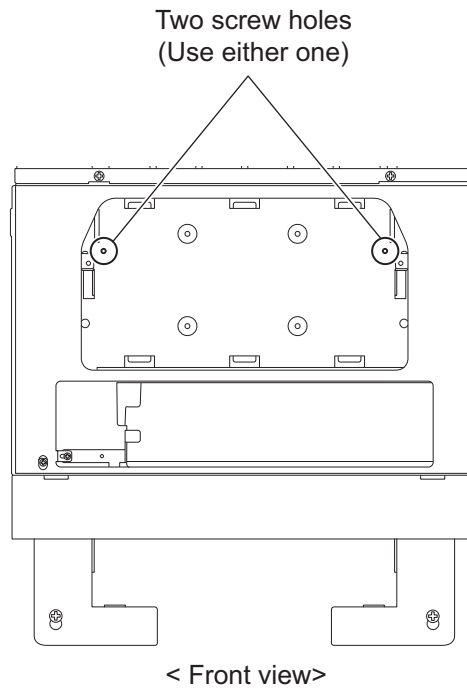


Figure 2-48 Securing the Battery Box

2.7 IP4WW-Battery Box to Chassis Connection



To avoid damage to equipment, do not install the Topaz Battery Box (DX2E-32i/NX7E Battery Box) to the SL2100 system.



- Make sure the system power is off.*
- If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.*

- Power off the Chassis and disconnect AC cord.

- Cut and remove Plastic Knockout from the Sub-Cover to connect Battery cable.



For your safety, smooth the cut edges after removing the plastic knockout.

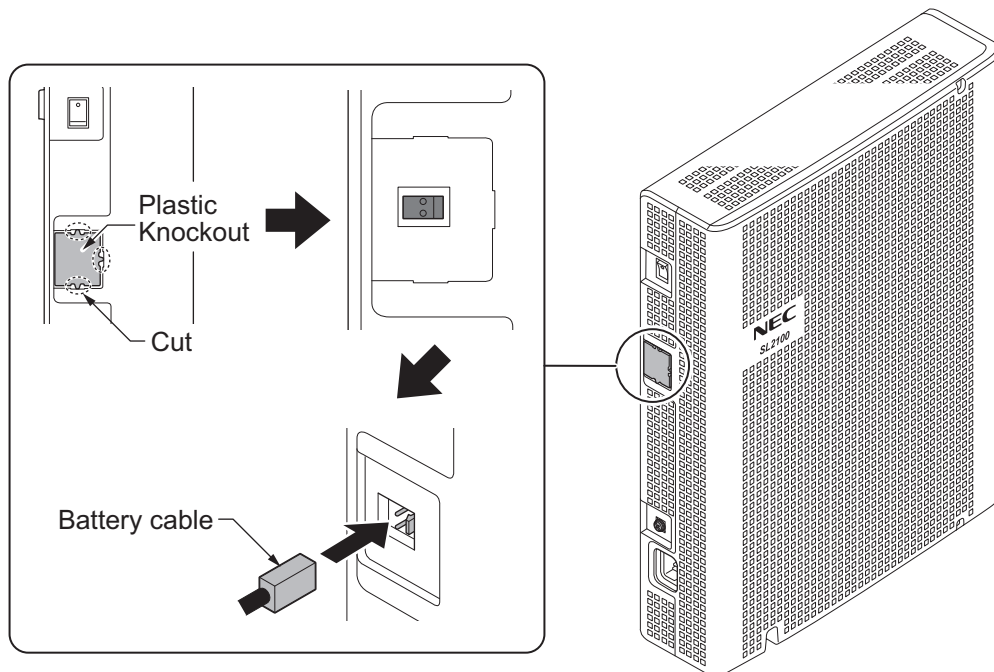


Figure 2-49 Connecting Battery Cable

- Connect Battery cable from the Battery box to Battery connector on the Chassis.

2.8 IP4WW-Battery Box Fuse Replacement



- In the event of a blown fuse correct the fault causing the fuse to blow before replacing the fuse; otherwise you may cause fire or electrical hazards.*
- Be sure to use only the specified fuse (250V T8AL).*
- Be sure to install the fuse into the correct location.*
- Be careful not to burn yourself on the heated fuse. The blown fuse may be heated soon after blowing.*
- If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.*

- Power off the Chassis and disconnect AC cord.

2. Loosen two screws and remove the Front Cover.

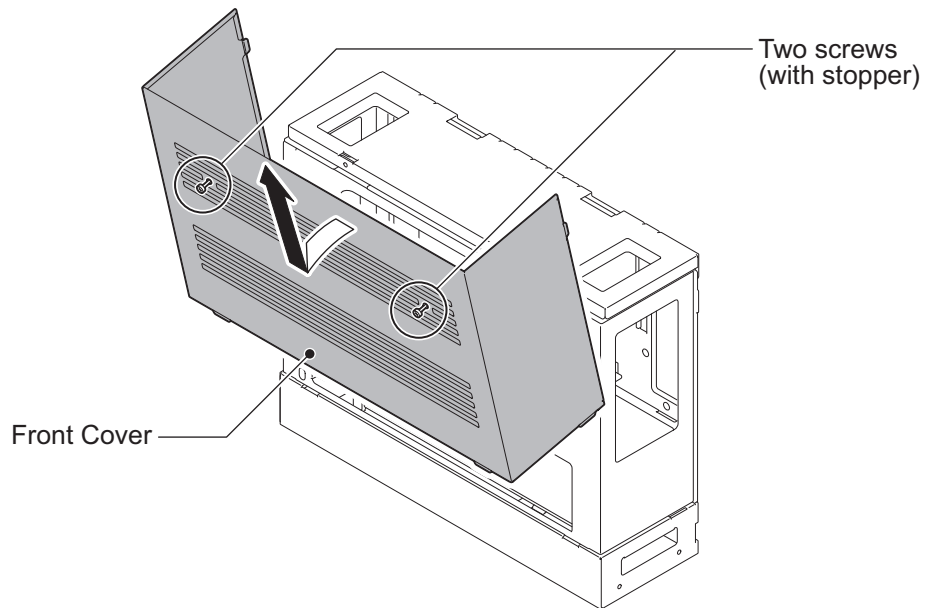


Figure 2-50 Removing the Front Cover

3. Disconnect the Battery connection cable from the Fuse Unit.

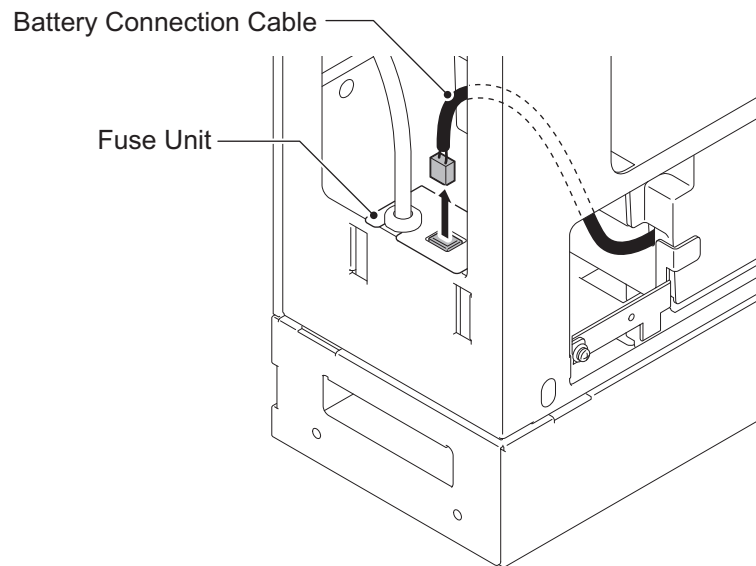


Figure 2-51 Disconnecting the Battery Connection Cable

4. Loosen the screw from the Fuse Unit.

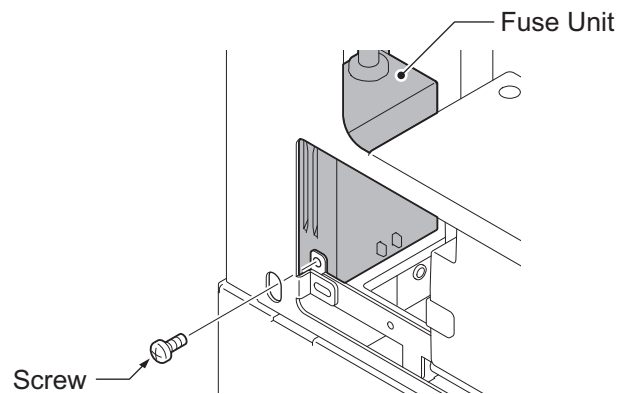


Figure 2-52 Loosen the Fuse Unit Screw

5. Slide Fuse Unit out of the Battery box.
6. Replace the fuse (250VT8AL).

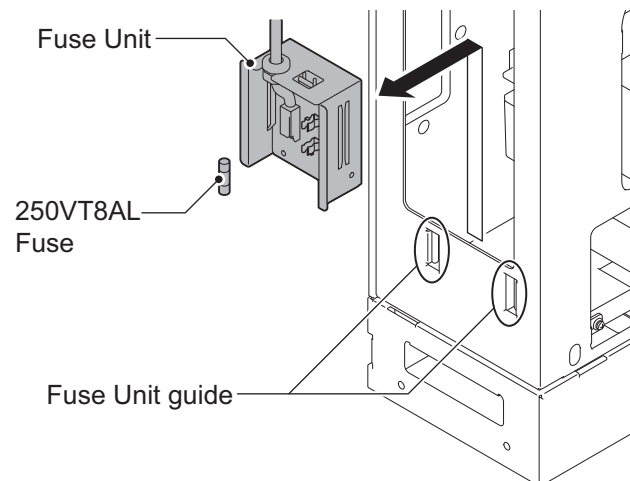


Figure 2-53 Replacing the Fuse

7. Using the Fuse Unit guides, slide the Fuse Unit into the Battery Box.

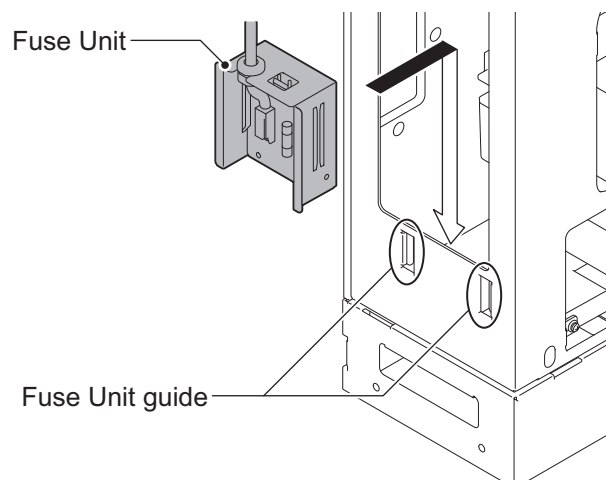


Figure 2-54 Install the Fuse Unit

- Secure the Fuse Unit by tightening the screw.

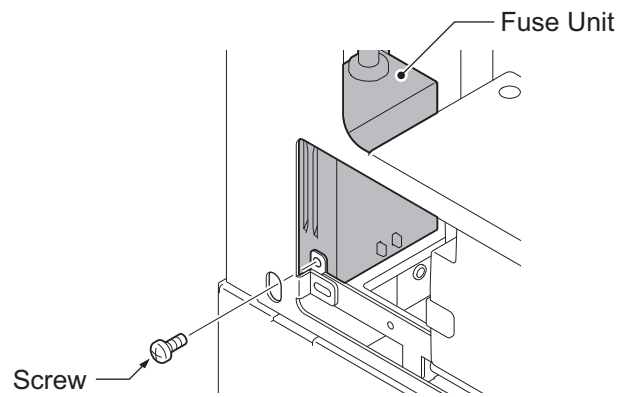


Figure 2-55 Securing the Fuse Unit

- Reconnect the Battery Connection Cable to the Fuse Unit.

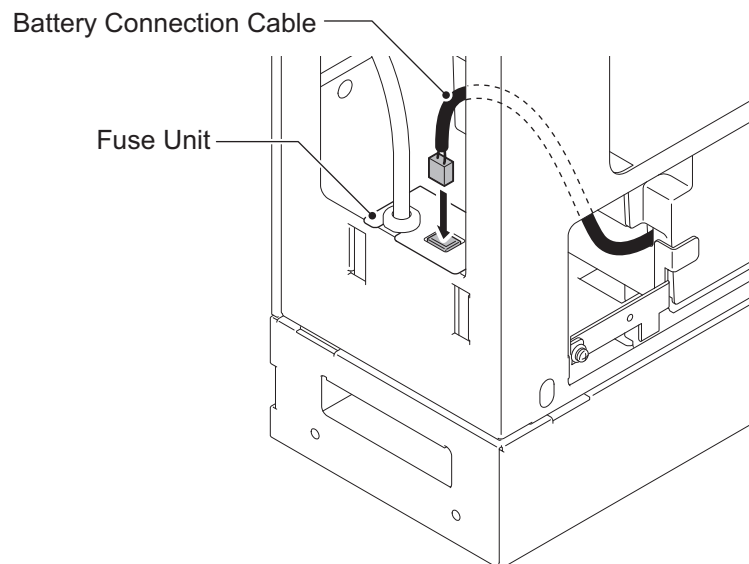


Figure 2-56 Connect Battery Connection Cable

10. Align tabs a to f to holes A to F on Battery Box. Slide the Front Cover into position and tighten the two screws.

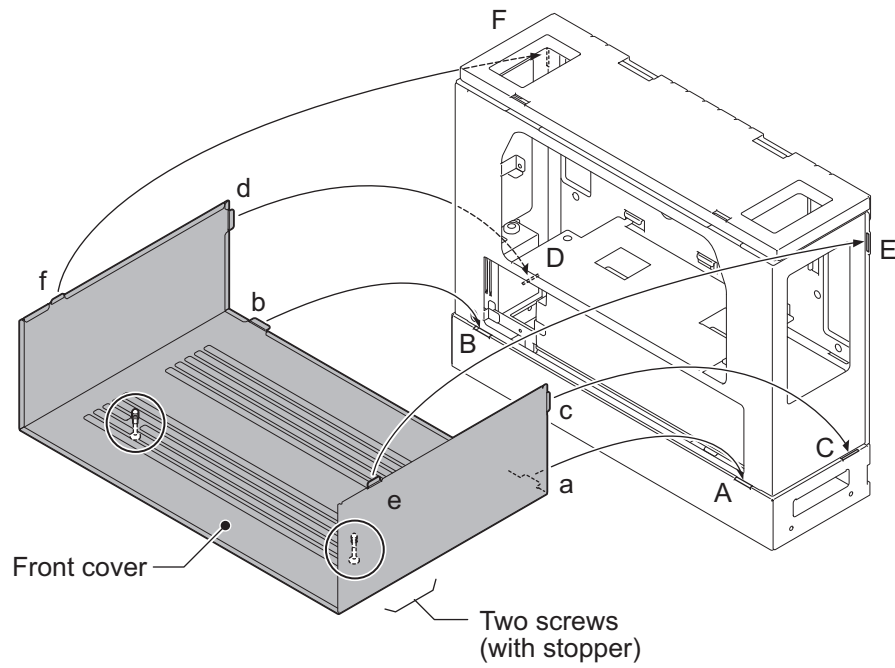


Figure 2-57 Installation of the Front Cover

SECTION 3 INSTALLING THE EXPANSION INTERFACE BOARDS

3.1 General



Not all boards are hot swappable. Do not remove or install from the chassis when powering up.

Except 1PRIDB daughter board, up to four expansion interface boards can be installed per Chassis.

Equipment Name	Equipment Description	Note
IP7WW-082U-B1	8 Digital Extensions + 2 Analog Extensions Board	
IP7WW-008U-C1	8 Analog Extensions Board	
IP7WW-000U-C1	0 Extensions Board (for Trunk DB)	
IP7WW-3COIDB-C1	3 Analog Trunks Daughter Board (mount to 082U/008U/000U)	
IP7WW-1PRIDB-C1	1 ISDN PRI/T1/E1(for Latin America) Daughter Board (mount to 082U/008U/000U)	



- The function of IP7WW-000U-C1 board is just a mounting board for the 3COIDB or 1PRIDB.
- One 1PRIDB can be installed per one chassis.
- The 3COIDB-B1 and 1PRIDB-C1 can be installed in following combinations;

Daughter Board	Option Board		
	082U-B1	008U-C1	000U-C1
3COIDB-C1	Yes	Yes	Yes
1PRIDB-C1	Yes	Yes	Yes

3.2 Unpacking

Unpack the 082U-B1/008U-C1/000U-C1/3COIDB-C1/1PRIDB-C1 and check it against the following list. Inspect for physical damage.

Table 2-12 Expansion Board Packing List

Items	List of Contents	QTY	Note
IP7WW-082U-B1	082U-B1 Board	1	
IP7WW-008U-C1	008U-C1 Board	1	
IP7WW-000U-C1	000U-C1 Board	1	
IP7WW-3COIDB-C1	3COIDB-C1 Board	1	
	Screw (with Washer and Spring Washer)	1	
IP7WW-1PRIDB-C1	1PRIDB-C1 Board	1	
	Screw (with Washer and Spring Washer)	1	

3.3 Mounting the Expansion Interface Board



*DO NOT POWER ON until all installation has been completed.
Fit the optional 3COIDB-C1/1PRIDB-C1 daughter boards before installing the 082U-B1/008U-C1/000U-C1 boards.*

3.3.1 Slot Location

Each 4KSU-C1 has four universal slots for station, trunk and optional boards excluding CPU/EXIFE slot. However the Slot 4,8,12 does NOT Support any types of Multiline Terminals. Analog extensions (and any types of Trunks) shall work. The slot location in the 4KSU-C1, refer to [Figure 2-58 Slot Numbers](#) on page 2-43.

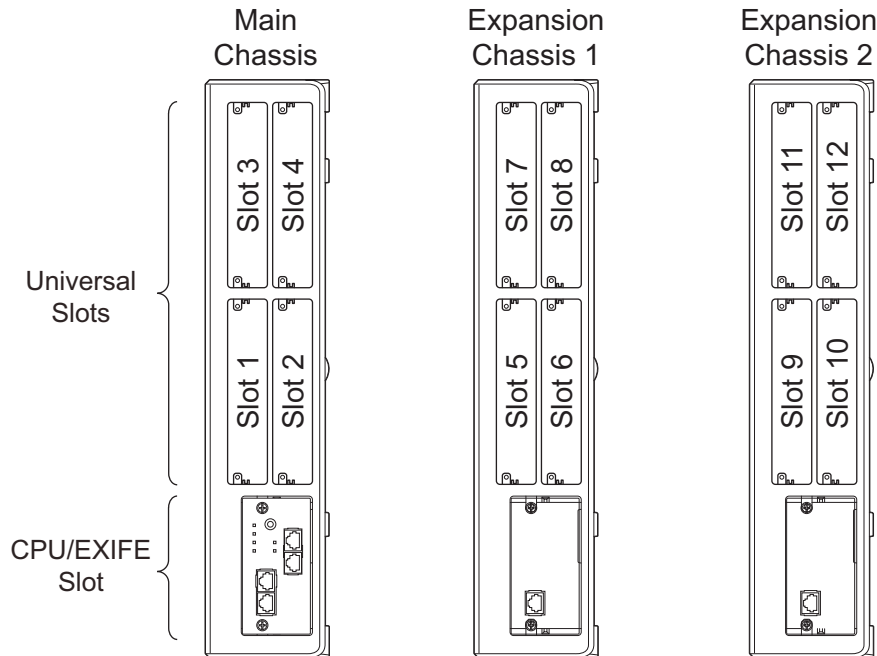






Figure 2-58 Slot Numbers

3.3.2 Mounting the 082U-B1/008U-C1/000U-C1 Boards

The procedure for mounting the expansion interface boards are as follows;

 *The following procedure is being explained only for slot No.1. However the other slots are also the same procedure as slot No.1.*

 ***Not all boards are hot swappable. Do not remove or install from the chassis when powering up.***

-  ***Do Not Power on until all installation have been completed.***
-  ***If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.***
-  ***For your safety, smooth the cut edges after removing the plastic knockout.***

1. Turn off the system power.

- Cut and remove the Plastic Knockouts as required for each Expansion interface board.

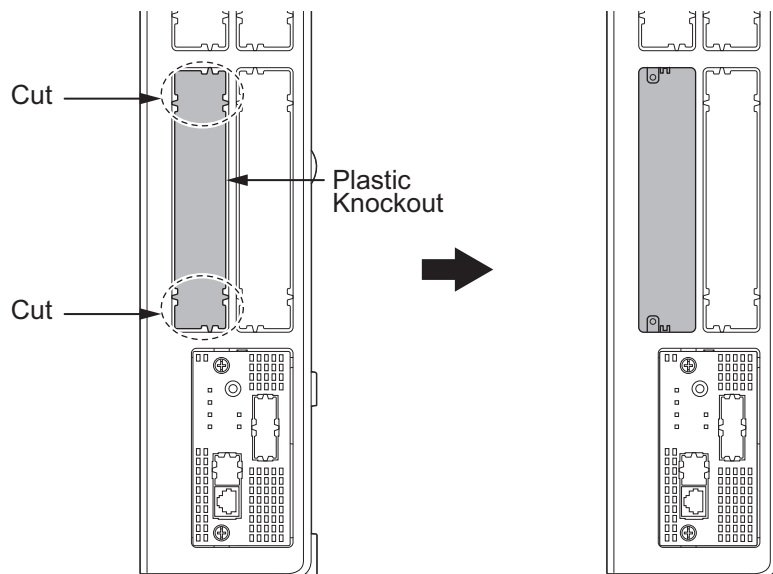


Figure 2-59 Plastic Knockouts

- Insert a Expansion Interface Board in the guide rail of chassis and push it securely into position and tighten the two screws of the board.

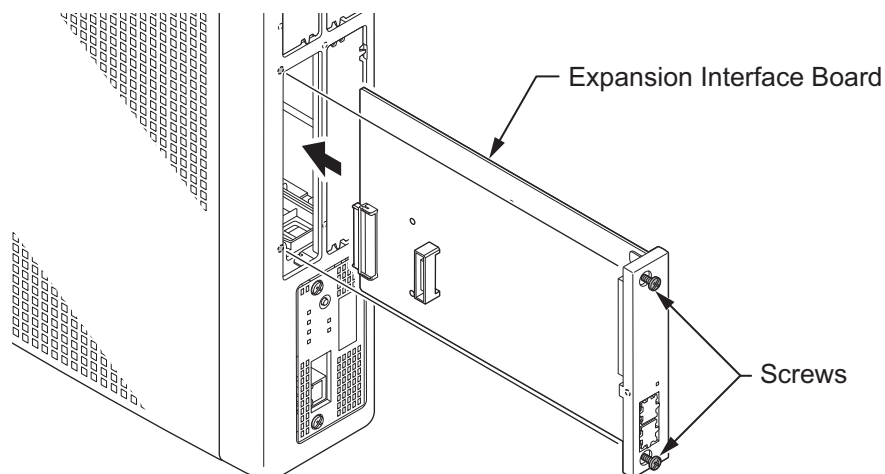


Figure 2-60 Mounting the Expansion Interface Board

3.3.3 Mounting the 3COIDB/1PRIDB Board



For your safety, smooth the cut edges after removing the plastic knockout.

- Turn off the system power.

2. Loosen two screws and pull out the 082U/008U/000U.

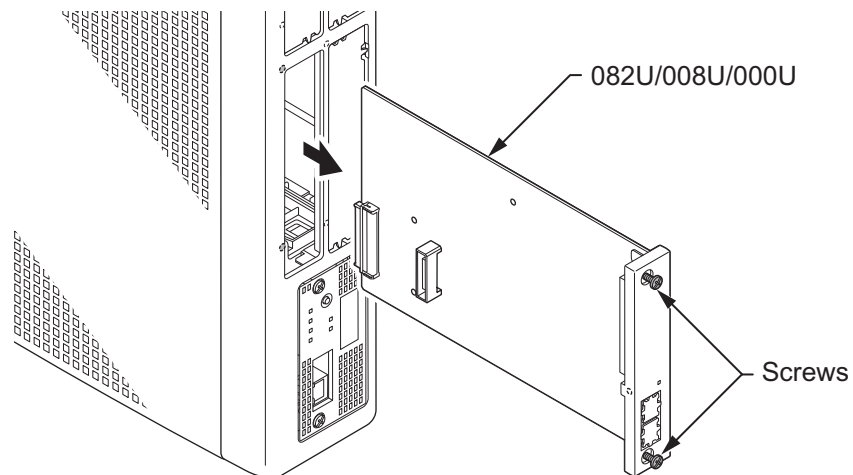


Figure 2-61 Remove 082U/008U/000U

3. Cut and remove specified Plastic Knockouts on the 082U/008U/000U board.

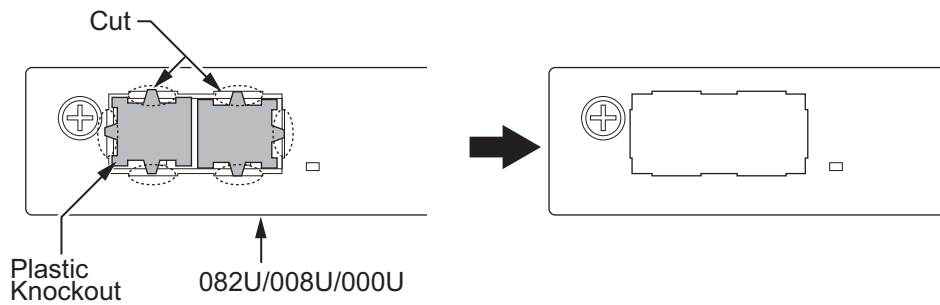


Figure 2-62 Plastic Knockouts on 082U/008U/000U

4. Mount the 3COIDB/1PRIDB board onto the 082U/008U/000U board using one screw.

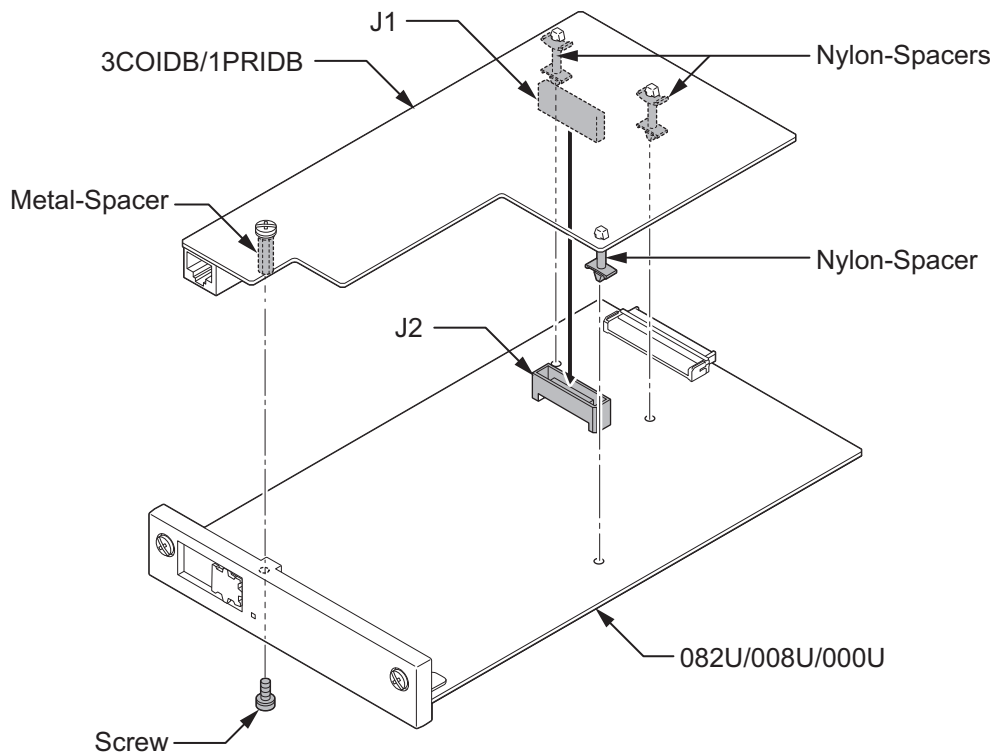


Figure 2-63 Mounting the 3COIDB/1PRIDB

5. Insert the 082U/008U/000U board with 3COIDB/1PRIDB board in the guide rail of chassis and push it securely into the Chassis.

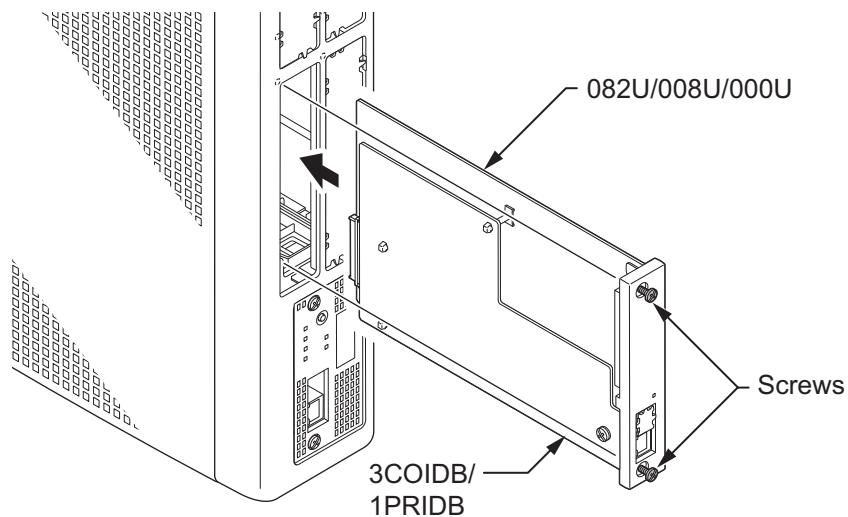


Figure 2-64 Installing the 3COIDB/1PRIDB

3.3.4 How to recognize the type of Trunk Daughter Board

The type of installed Trunk Daughter Board can be easily recognized by checking the position of RJ61/RJ45 connectors at Front Panel, without removing the installed board from Chassis.

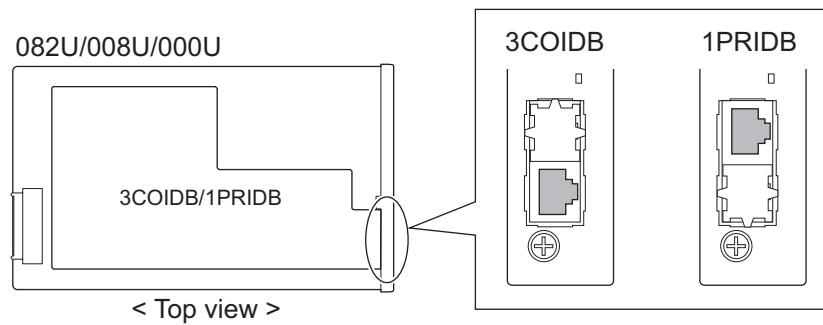


Figure 2-65 How to recognize the type of Trunk Daughter Board

3.4 Extension/Trunk Cabling

3.4.1 General

The system provides RJ61 modular jack for analog trunk and extension connections. PRI connections for RJ45 modular jack.

Precautions for Cabling

- Do not wire the cable with an AC cable, computer, etc.
- Do not run the cable near the high frequency generating device.
- Use cable protectors in case the cables run on the floor.
- Aerial distribution wiring is not allowed.
- Trunks must be installed with lightning protectors.
- Do not install the DSX Terminal in the SL2100 system, it does not work properly.
- Do not connect the Ethernet (10Base-T/100Base-T()/1000Base-T()) port (RJ45) to a telephone line or any Telco line (for example; T-1 or RJ48 lines).

3.4.2 Cabling IP7WW-082U-B1

The 082U-B1 board within each Chassis provides two RJ61 modular jacks for digital extension (8 ports) and one for Analog extensions (2 ports).



Before plugging in the Multiline Telephone, DSS Console, Single line Telephone or Doorphone, ensure all Main and Expansion Chassis are powered off.



DSX Terminal does not work properly when it connected.

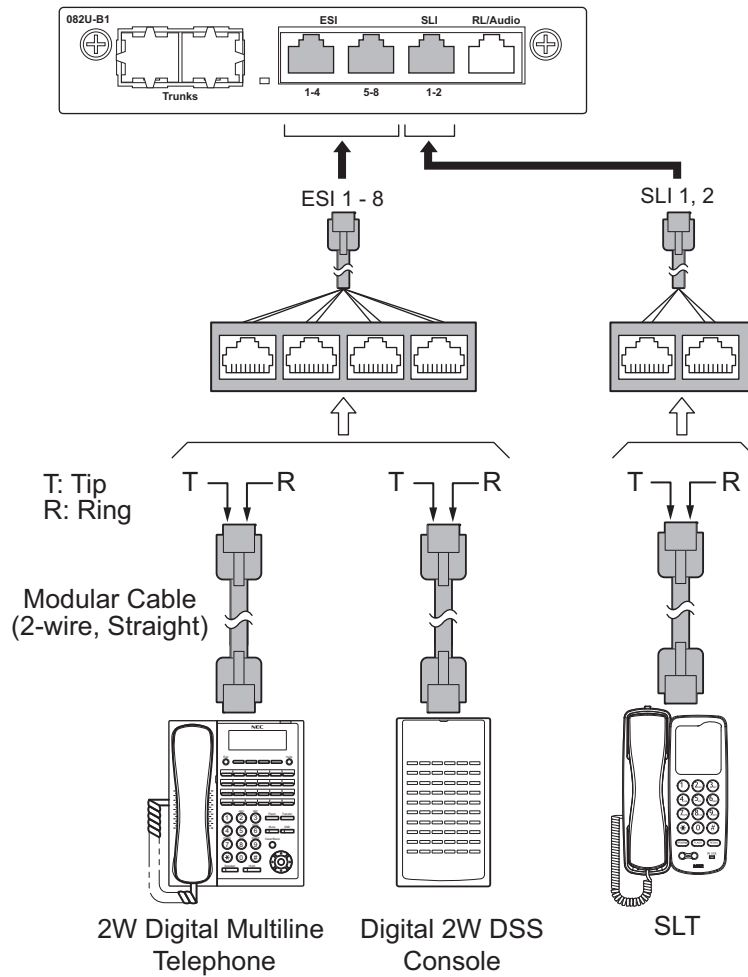



Figure 2-66 Connectors of 082-B1

 **While an Analog Telephone (port) is ringing or MW-lamp is flashing on an Analog Phone (port), do not disconnect the phone from the port and or connect another type of the terminal to this port.**

3.4.2.1 Connectors

The following table shows the pin-outs for the RJ-61 cable connector for 2W Digital/Analog extension connections.

Table 2-13 RJ-61 Digital Connector Pin-Outs (J4 (ESI))

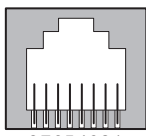
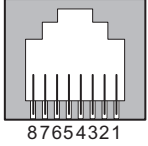
	Pin No.	Pin Function (ESI: 1-4 / 5-8)
 <p>87654321</p>	1	ESI 4/8 (Tip)
	2	ESI 3/7 (Tip)
	3	ESI 2/6 (Tip)
	4	ESI 1/5 (Ring)
	5	ESI 1/5 (Tip)
	6	ESI 2/6 (Ring)
	7	ESI 3/7 (Ring)
	8	ESI 4/8 (Ring)

Table 2-14 RJ-61 Analog Pin-Outs (J4 (SLI))

	Pin No.	Pin Function (SLI: 1-2)
	1	-
	2	-
	3	SLI 2 (Tip)
	4	SLI 1 (Ring)
	5	SLI 1 (Tip)
	6	SLI 2 (Ring)
	7	-
	8	-

3.4.3 Cabling IP7WW-008U-C1

The 008U-C1 board within each Chassis provides four RJ61 modular jacks for Analog extension (8 ports).

 **Before plugging in the Single Line Telephone, ensure all Main and Expansion Chassis are powered off.**

 **DSX Terminal does not work properly when it is connected.**

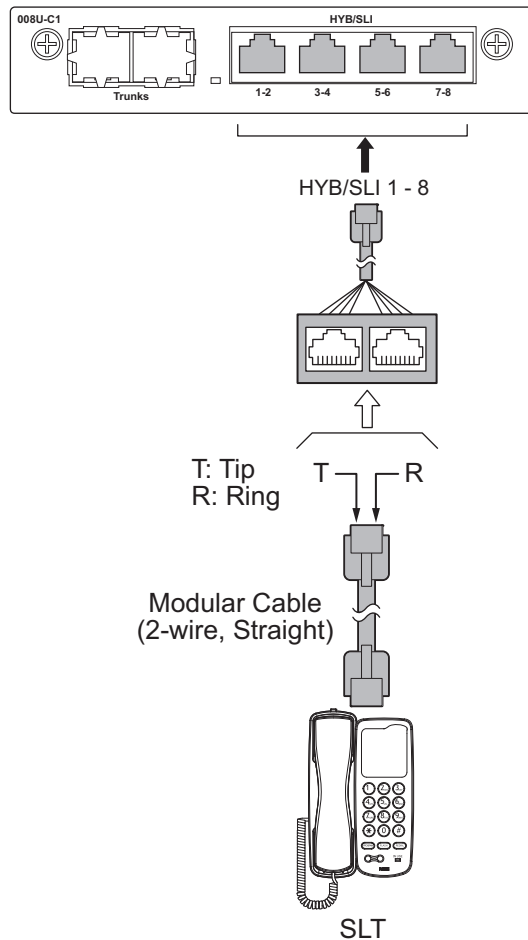
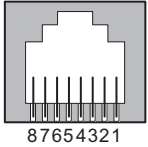


Figure 2-67 Analog Extension Cabling of 008U-C1

3.4.3.1 Connectors

The following table shows the pin-outs for the RJ-61 cable connector for Analog extension connections.

Table 2-15 RJ-61/Analogue Pin-Outs (J4)

	Pin No.	Pin Function (SLI: 1-2 / 3-4 / 5-6 / 7-8)
	1	-
	2	-
	3	SLI 2/4/6/8 (Tip)
	4	SLI 1/3/5/7 (Ring)
	5	SLI 1/3/5/7 (Tip)
	6	SLI 2/4/6/8 (Ring)
	7	-
	8	-

3.4.4 Cabling IP7WW-000U-C1

This IP7WW-000U-C1 board does not have any connection for cabling.

3.4.5 Cabling and Setting IP7WW-3COIDB-C1

This IP7WW-3COIDB-C1 board provides one RJ-61 connection for CO lines.

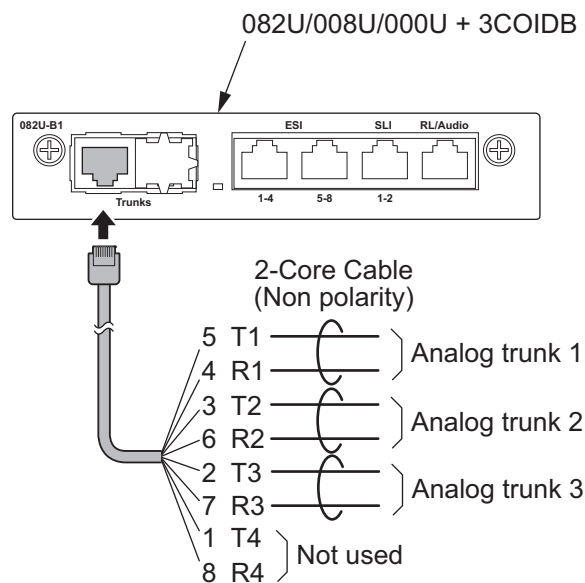
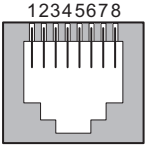


Figure 2-68 Connector of 3COIDB-C1

3.4.5.1 Connectors

The following table shows the pin-outs for the RJ-61 cable connector for CO connection.

Table 2-16 RJ-61 CO Pin-Outs (J2)

	Pin No.	Pin Function
	1	-
	2	CO 3 (Tip)
	3	CO 2 (Tip)
	4	CO 1 (Ring)
	5	CO 1 (Tip)
	6	CO 2 (Ring)
	7	CO 3 (Ring)
	8	-

3.4.6 Cabling and Setting IP7WW-1PRIDB-C1

 *The E1 standard may differ from country by country. The conformity test must be required before setting the E1 Trunk.*

This IP7WW-1PRIDB-C1 board provides one RJ-45 PRI/T1/E1 connection.

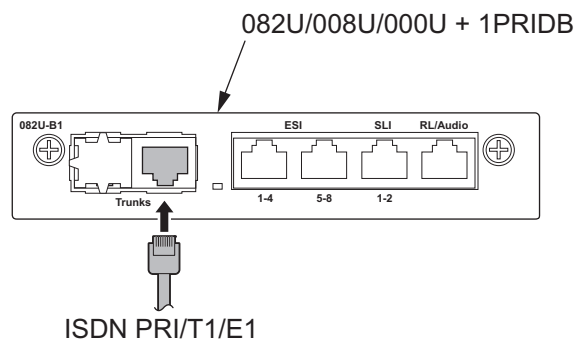
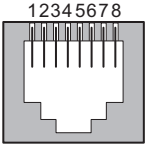


Figure 2-69 Connector of 1PRIDB-C1

3.4.6.1 Connector

The following table shows the pin-outs for the RJ-45 cable connector for PRI/T1/E1 connection.

Table 2-17 RJ-45 PRI/T1/E1 Pin-Outs (J5)

	Pin No.	Pin Function
	1	RA 1
	2	RB 1
	3	-
	4	TA 1
	5	TB 1
	6	-
	7	-
	8	-

3.4.6.2 Switch Setting


The following figure shows the location of the switches on the IP7WW-1PRIDB-C1 board.

1. Set the switches J6 to J9 according to the system, referring the [Table 2-18 Switch Setting of 1PRIDB-C1 on page 2-52](#).

Table 2-18 Switch Setting of 1PRIDB-C1

Switch No.	Switch Position	Description
J6, J7	2M	Connect PRI/E1 (2.048 Mb/s) line
	1.5M (default)	Connect PRI/T1 (1.544 Mb/s) line
J8, J9	T (default)	T-Bus connection
	S	S-Bus connection

2. Connect the cables from the NT1 Network Termination cable to the J5 connector on the 1PRIDB-C1 board.
3. Assign whether the board works as PRI/T1 by PRG10-51-01.

 *With Normal operation, Status LED on the base board flashes (100 ms On/100 ms Off) green.*

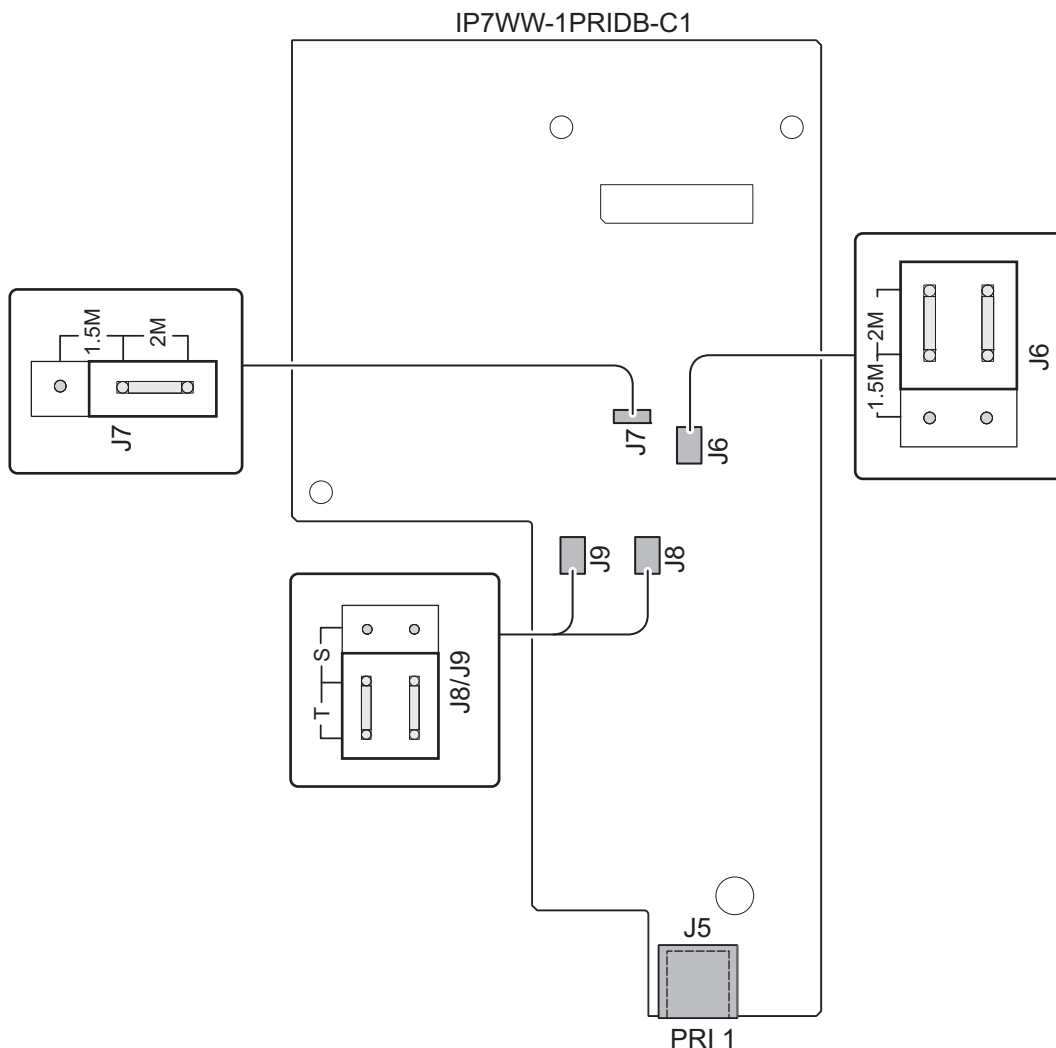


Figure 2-70 Switches Location of 1PRIDB-C1

3.4.7 LED Indication

A Status LED is available only for the base board (082U, 008U, 000U) and the daughter board (3COIDB, 1PRIDB) does not have the status LED, therefore a Status LED on base board is used in common about LED indication related to the daughter board.

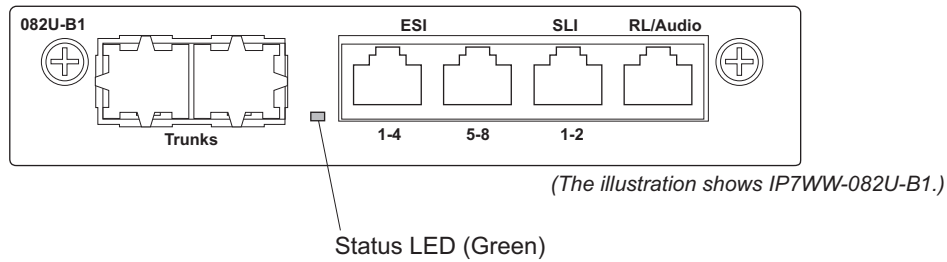


Figure 2-71 Location of Status LED

The order of priority (No.1 ~ 8) is set up to each status and when more than one different status are occurred, the highest priority LED indication pattern (status) will be indicated. Refer to [Table 2-19 PRI LED Indications on page 2-53](#).

Table 2-19 PRI LED Indications

Priority No.	Operation Status		LED Indication on the Base Board	Remarks
1	System Initializing		On	
2	The assignment of the board is refused.		3s On / 3s Off	<ul style="list-style-type: none"> When you exceed the system capacity. When the main software version is not matched.
3	Trouble found during self-diagnostics.		1s On / 1s Off	
4	Normal Operation	A Channel is busy (use another from CH1 ~ CHx).	500ms On / 100ms Off	
5		All channels are idle.	100ms On / 100ms Off	
6	Board Busy	A Channel is busy (use another from CH1 ~ CHx).	100ms On / 2s Off	
7		All channels are idle.	Off	
8	Downloading firmware.		80ms On / 80ms Off / 80ms On / 80ms Off / 80ms On / 400ms Off	

T1 Alarm Mode

Refer to following figure for LED pattern information. LED indications for the T1 are listed in [Table 2-20 T1 LED Indications on page 2-54](#).

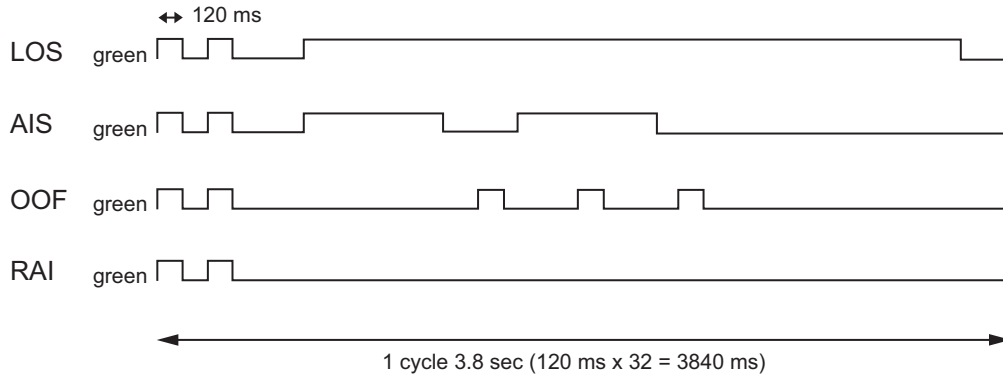


Figure 2-72 Indication Pattern of Layer 1 on T1 Board

Table 2-20 T1 LED Indications

Alarm	Details of the Alarm	The LED Indication Pattern
LOS	LOS (Loss of Signal (Red Alarm)) No Signal (Analog Interface)	Following an alarm blink twice (green), a green LED light up.
AIS	AIS (Alarm Indication Signal (Blue Alarm))	Following an alarm blink twice (green), a green LED flashes on and off slowly twice
OOF	OOF (Out of Frame (Red Alarm))	Following an alarm blink twice (green), a green LED flash on and off 3 times simultaneously.
RAI	RAI (Remote Alarm Indication (Yellow Alarm))	Following an alarm blink twice (green), a green LED goes off.
No alarm	System does LED control	

The order of priority is set up to alarm in the order LOS → AIS → OOF → RAI.

E1 Alarm Mode

Refer to following figure for LED pattern information. LED indications for the E1 are listed in [Table 2-21 E1 LED Indications on page 2-54](#).

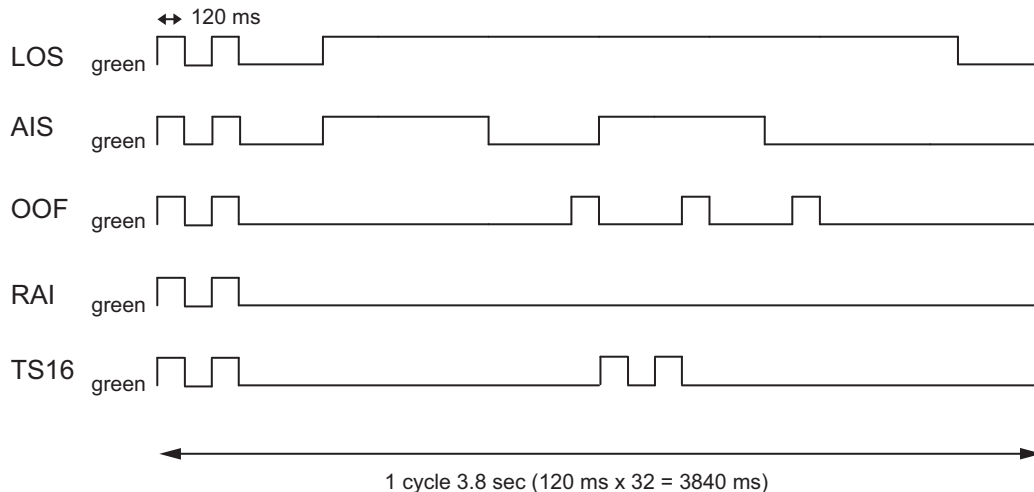


Figure 2-73 LED Indication Pattern of Layer 1 on E1 Board

Table 2-21 E1 LED Indications

Alarm	Details of the Alarm	The LED Indication Pattern
LOS	LOS (Loss of Signal (Red Alarm)) No Signal (Analog Interface)	Following an alarm blink twice (green), a green LED lighting up.

Alarm	Details of the Alarm	The LED Indication Pattern
AIS	AIS (Alarm Indication Signal (Blue Alarm))	Following an alarm blink twice (green), a green LED flashes on and off slowly twice
OOF	OOF (Out of Frame (Red Alarm))	Following an alarm blink twice (green), a green LED flash on and off 3 times simultaneously.
RAI	RAI (Remote Alarm Indication (Yellow Alarm))	Following an alarm blink twice (green), a green LED goes off.
TS16	TS16 (Receive Time Slot 16 all Alarm)	An alarm blink repeat twice by 1 cycle.
No alarm	System does LED control	

The order of priority is set up to alarm in the order LOS → AIS → OOF → RAI → TS16.

SECTION 4 INSTALLING THE OPTIONAL INTERFACE BOARDS

4.1 VoIP Board (VOIPDB-C1)

4.1.1 General

The IP7WW-VOIPDB-C1 daughter board is used to convert the RTP (Real Time Transfer Protocol) packets via the IP Network and PCM highway. The daughter board is installed on the CPU board.

4.1.2 Unpacking

Table 2-22 VOIPDB-C1 Packing List

Items	List of Contents	QTY
IP7WW-VOIPDB-C1	IP7WW-VOIPDB-C1	1
	3 x 8 Screw with Washer and Spring Washer	4

4.1.3 Installing the VOIPDB-C1 Board



The boards are hot swappable. Do not remove or install from the chassis when powering up.



- *Do not remove or install the CPU board with the power on.*
- *If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.*
- *When the VOIPDB-C1 is installed on the CPU-C1, the NIC card on the CPU does not function anymore.*

1. Turn off the system power.
2. Loosen two screws and pull out the CPU board.

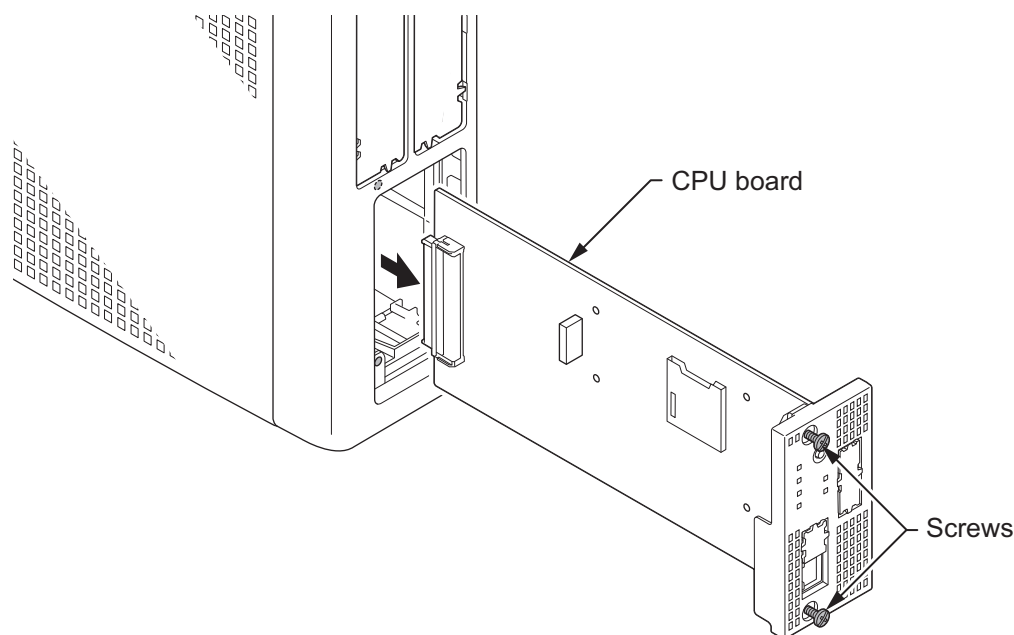


Figure 2-74 Removing the CPU Board

3. Cut and remove the plastic knockout.

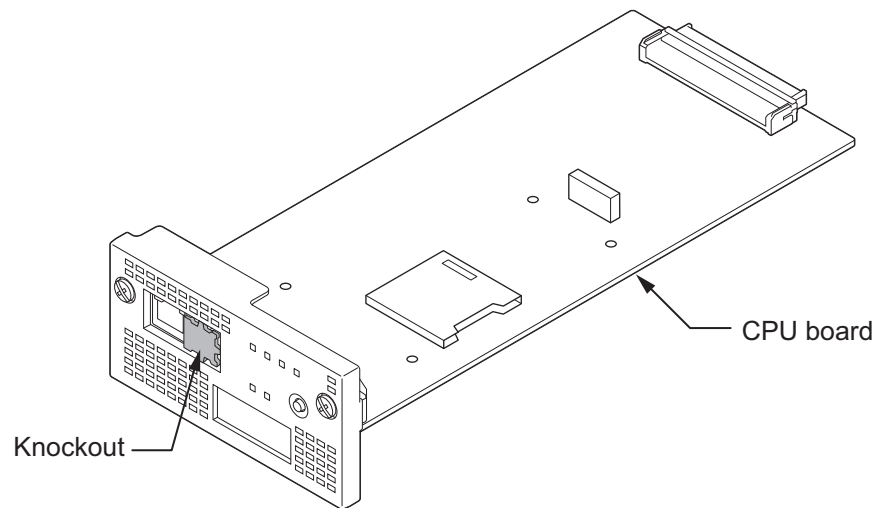


Figure 2-75 Removing the Plastic Knockout

4. Install the VOIPDB-C1 board to J2 connector on the CPU board, and tighten the four screws.



Be careful not to damage the components on the CPU board when installing.

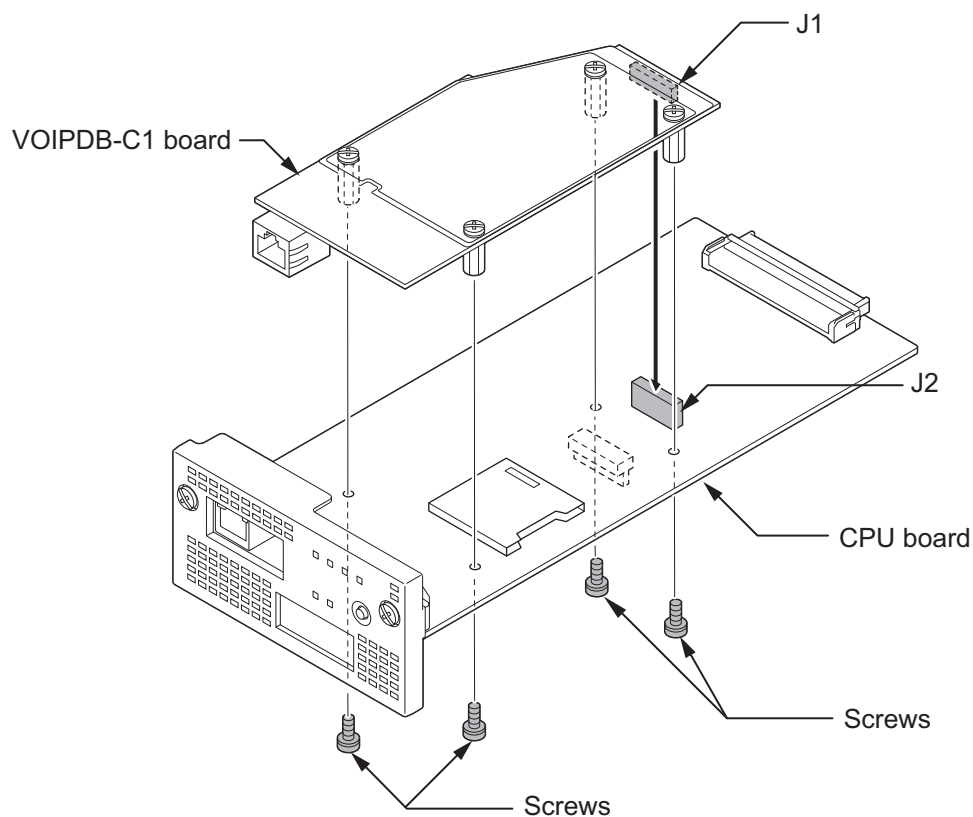


Figure 2-76 Installing the VOIPDB-C1 Board



When the VOIPDB-C1 and EXIFB-C1 are mounted on the CPU board, refer to the following installation as [Figure 2-77 Installing the VOIPDB-C1 and EXIFB-C1 on page 2-59](#).



Be careful not to damage the components on the CPU board and EXIFB daughter board when installing.

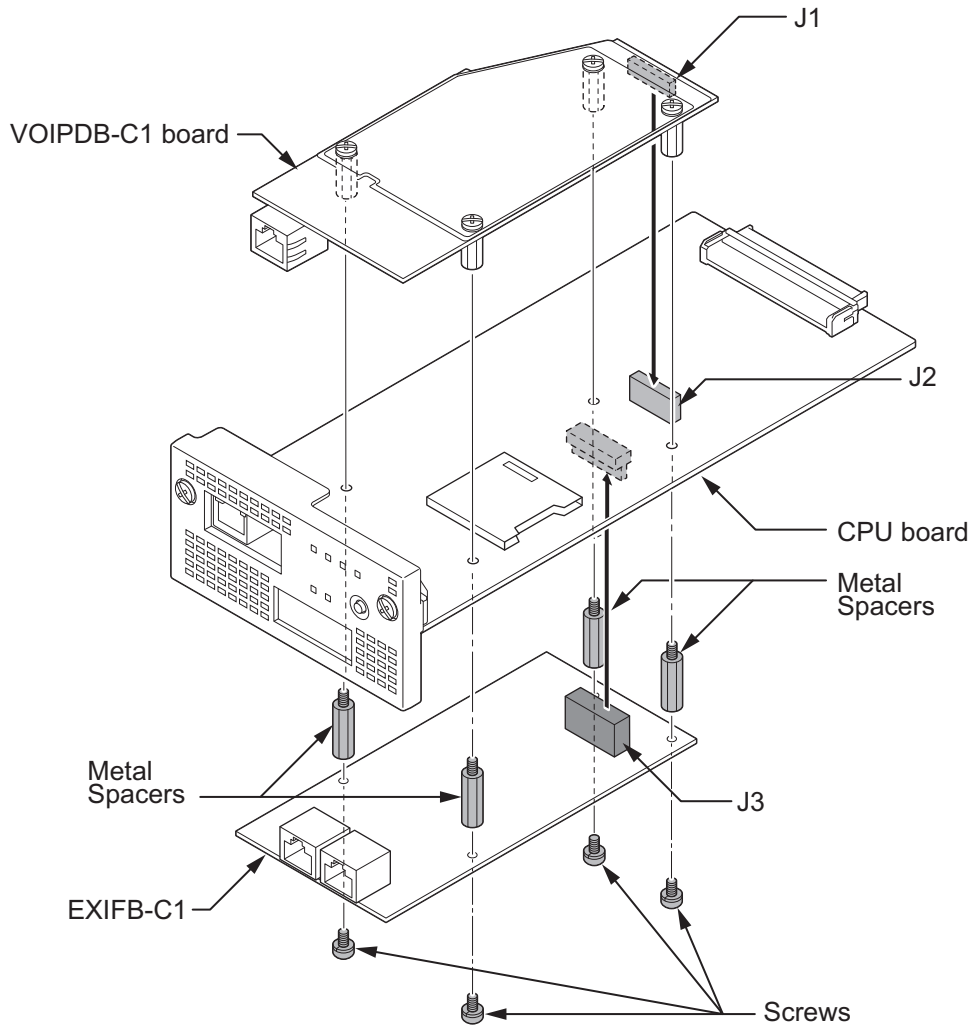


Figure 2-77 Installing the VOIPDB-C1 and EXIFB-C1

5. Insert the CPU board in the guide rail of chassis and push it securely into position, and tighten the two screws.

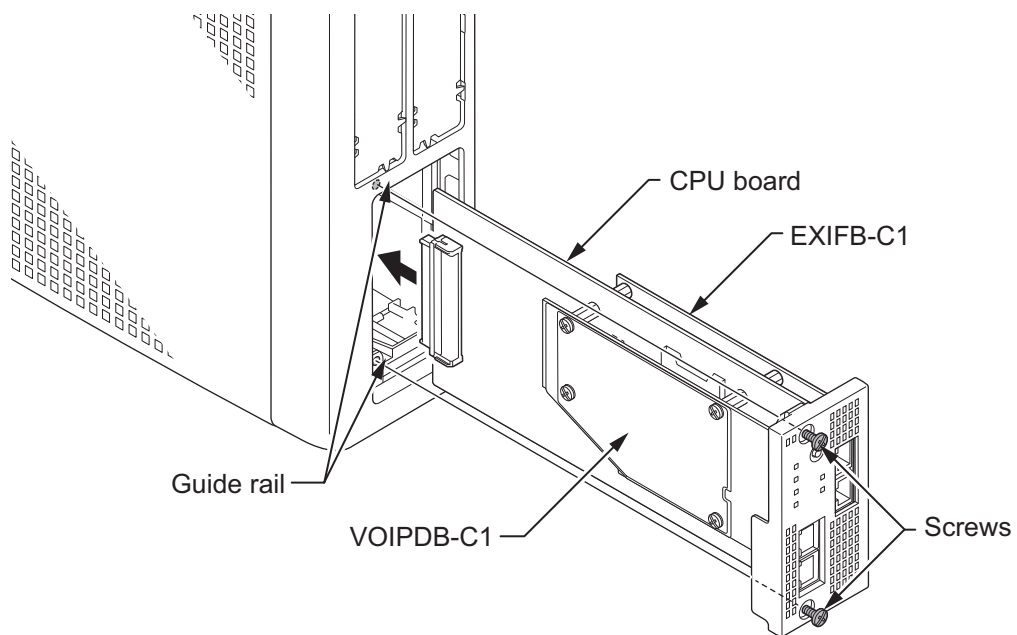


Figure 2-78 Installing the CPU Board

- Connect the VOIPDB-C1 to a Switching hub using a LAN Cable.

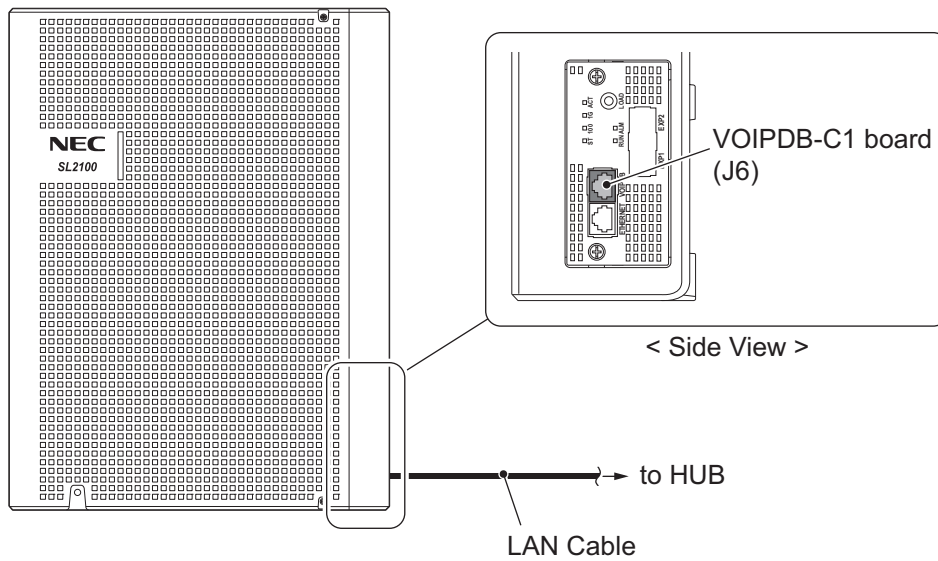


Figure 2-79 Connecting a LAN Cable

- Refer to the SL2100 Programming Manual for detailed programming instructions.
The VoIP feature requires system configuration.
For the details of setting and operation, refer to the SL2100 Features & Specifications Manual (separate issue).

4.1.4 LED Indication

LED indications for the IP7WW-VOIPDB-C1 are listed [Table 2-23 VOIPDB LED Indications on page 2-60](#). Each LED is listed with its associated function and operational status.

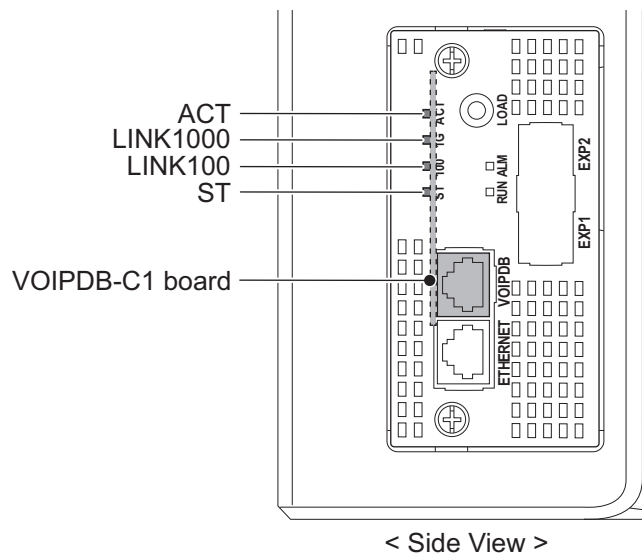


Figure 2-80 Location of LEDs

Table 2-23 VOIPDB LED Indications

LED	Function	LED Status	Operation status
ACT	Link activity or data transmission and reception.	On Green	LED lights when link up is completed. LED flash when data is transmitting or receiving.
LINK1000	1000Base-T link speed indicator	On Yellow	Lights up when 1000Base-T link up.

LED	Function	LED Status	Operation status
LINK100	100Base-TX link speed indicator.	On Red	Lights up when 100Base-TX link up.
ST	Status indicator.	On Red	Table 2-24 Operation of VOIPDB LED Indications on page 2-61

Table 2-24 Operation of VOIPDB LED Indications

LED				Operation status
ACT	LINK1000	LINK100	ST	
Off	Off	Flash	Flash	Internal Error (Hardware Error)
Off	On	Flash	Flash	
On	On	Flash	Flash	
On	Off	Flash	Flash	State of half duplex transmission (Not support) Please change HUB etc. to full duplex transmission.
Flash	Blinking one by one			The firmware is being updated.

4.2 Installing the SD Card (SDVMS/SDVML)



- *Do not remove or install the CPU board with the power on.*
- *If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.*
- *When installing a SD card onto the CPU board the system MUST be powered off. Never install or uninstall the SD card while the system is under power.*

1. Turn off the system power.
2. Remove the CPU board and insert the SD card (Label side up) into the slot until it clicks.

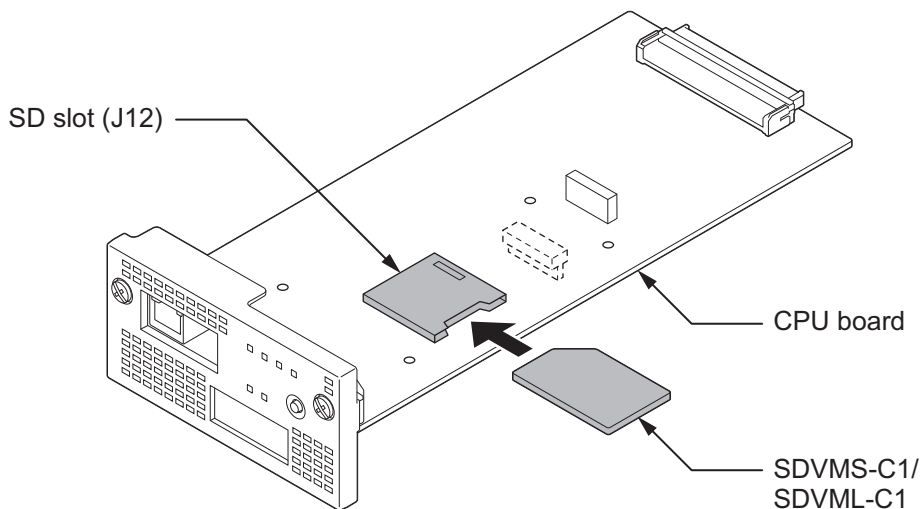


Figure 2-81 Installing the SD Card

3. Reinstall the CPU board into the Chassis.
To Remove: Carefully push on the SD card until it clicks and release. Card can be removed from the slot.

SECTION 5 INSTALLING THE MULTILINE TELEPHONES AND OPTIONAL TERMINALS

5.1 Installing the Digital Multiline Telephones

There are two types of Multiline Telephones available in the SL2100 system.

- IP7WW-12/24TXH-B1 TEL
- IP7[]-8IPLD-C1 TEL

5.1.1 Location of Controls

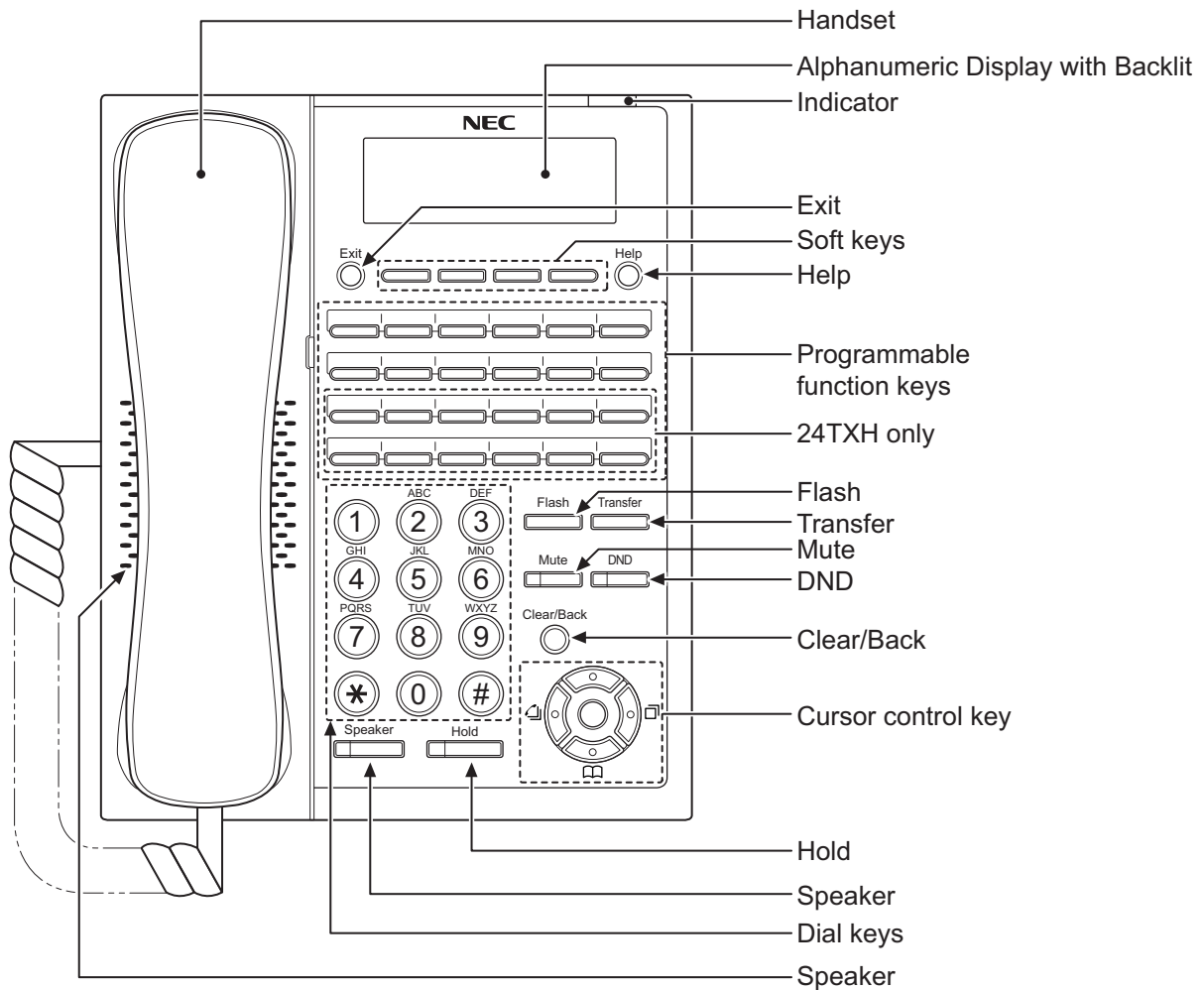


Figure 2-82 Digital Multiline Telephone (12TXH-B1/24TXH-B1)

Table 2-25 Digital Multiline Telephone Functions (12TXH-B1/24TXH-B1)

Functions	12TXH-B1	24TXH-B1
Programming Keys	12 (Busy lamp field: Red-Green)	24 (Busy lamp field: Red-Green)
Display	24-digit x 3 lines with Backlit	
Handsfree	Full-duplex	
Wall-Mount Kit	Yes (Built-in)	
SoftKeys	Yes	
Backlit Dial Pad	No	

Functions	12TXH-B1	24TXH-B1
Incoming LED	2 colors (Red/Green)	
Connected to	Digital Extension Port	
Headset Port	Yes	
Power Feeding	Digital Extension Port	

5.1.2 Multiline Telephone Legs Adjustment

The Multiline Telephone provides adjustable legs for angling the phone to best suit each user. The leg can be set for two different heights (Low/High).

5.1.2.1 Low Position Setting

1. Turn telephone over (button side down).
2. Adjust the legs to desired height.

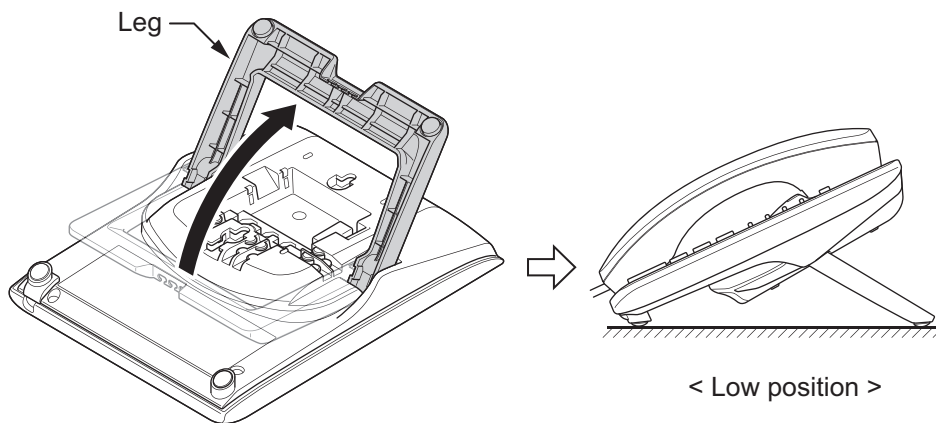


Figure 2-83 Leg Setting for Low Position

3. Lead the Line and Handset cords through the applicable grooves.

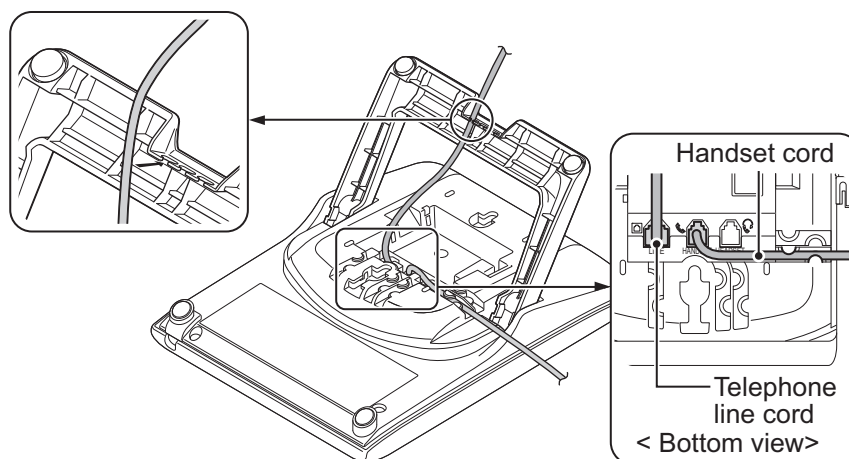


Figure 2-84 Cabling of Multiline Telephone

4. Turn telephone over (button side up).

5.1.2.2 High position setting

1. Turn telephone over (button side down).

2. Pull up the Leg Stoppers.

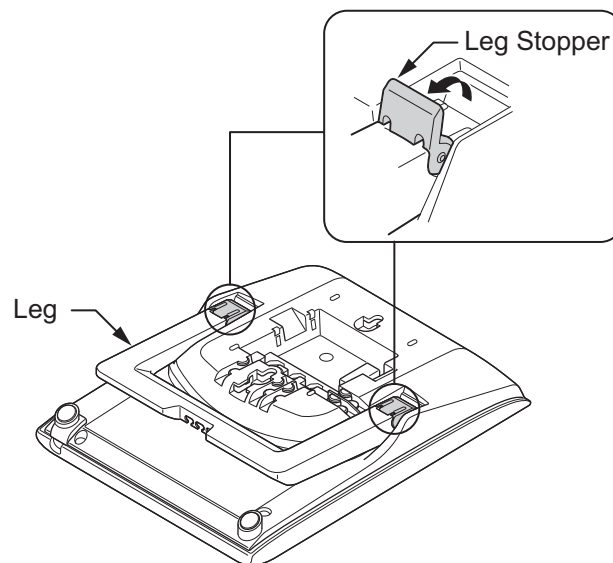


Figure 2-85 Leg Stopper

3. Adjust the leg to desired height.

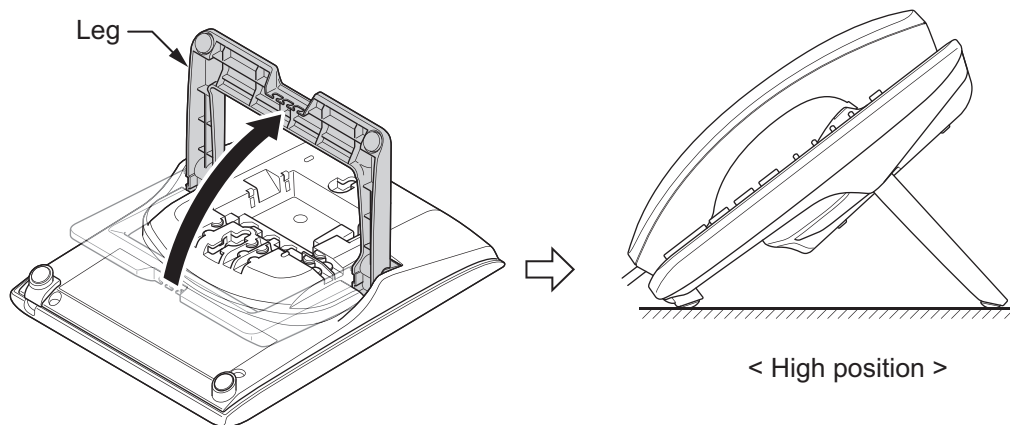


Figure 2-86 Leg Setting for High Position

4. Lead the Line and Handset cords through the applicable grooves.
(Refer to [Figure 2-84 Cabling of Multiline Telephone on page 2-63](#))

5.1.3 Wall-Mounting the Multiline Telephone

1. Arrange the cables and put down the leg as shown below.

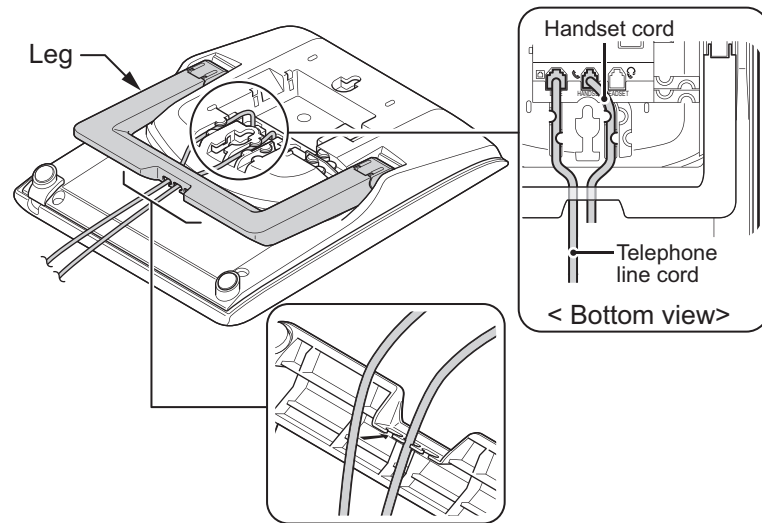


Figure 2-87 Cabling for Wall-Mount

2. Remove the switch-hook from the unit. Turn the tab toward the top. Then slide the hook-switch into position.

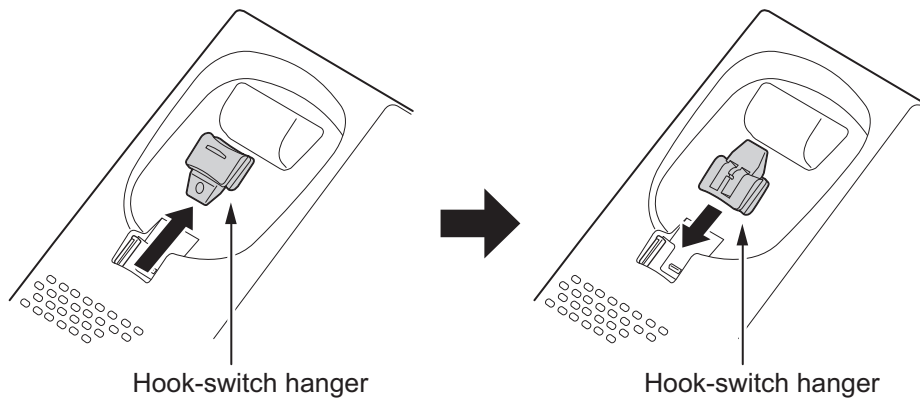


Figure 2-88 Hook-Switch Hanger

3. Install two screws into a wall. The screw heads must be remained about 3 mm (0.12").

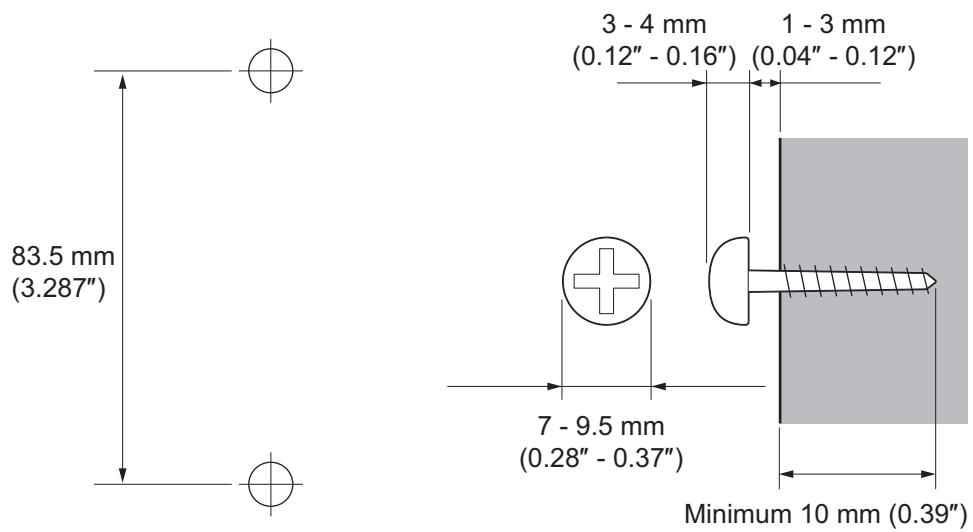


Figure 2-89 Wall-Mount Screw Guide

4. Mount the telephone on the wall.

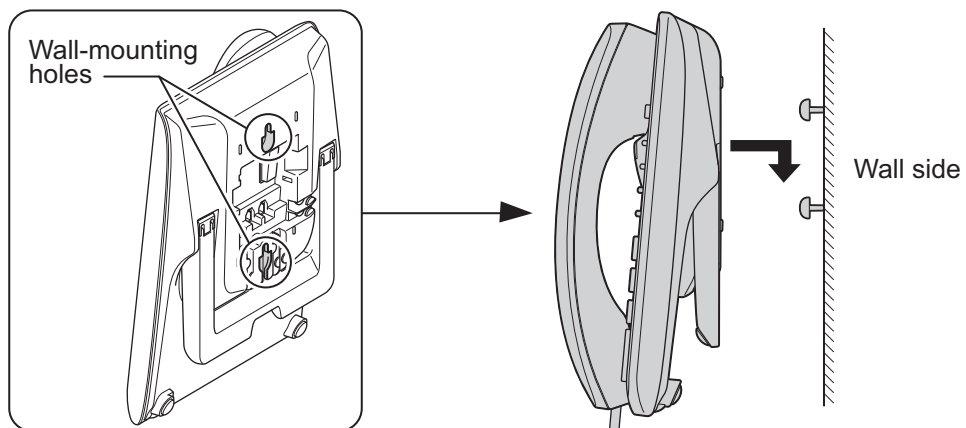


Figure 2-90 Mounting the Multiline Telephone

5.2 Installing the IP Multiline Telephone (IP7[]-8IPLD-C1 TEL)

5.2.1 Location of Controls

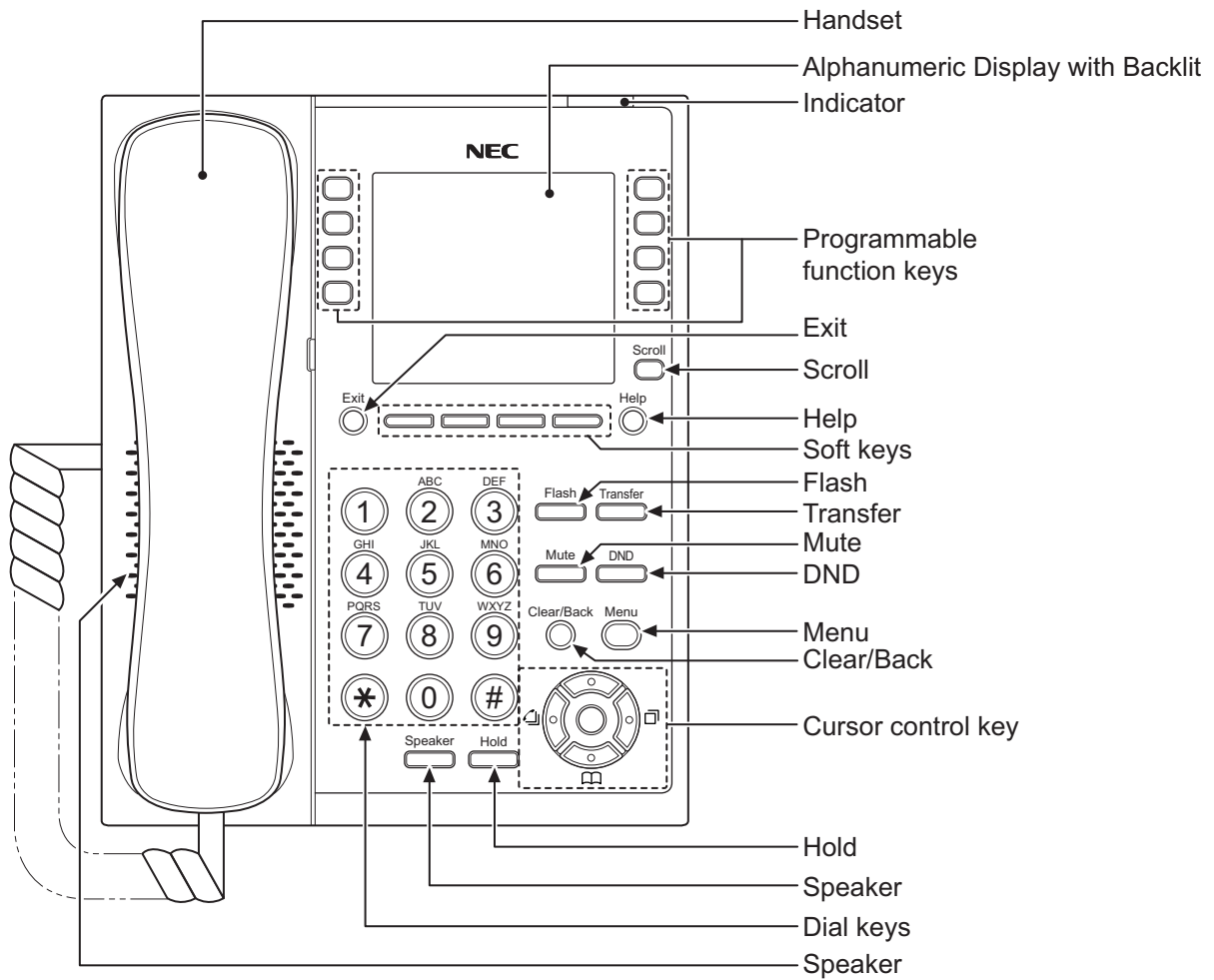


Figure 2-91 IP Multiline Telephone (8IPLD)

Table 2-26 IP Multiline Telephone Functions (8IPLD)

Functions	8IPLD
Programming Keys	8 (Busy lamp field: Red-Green)
Display	168 x 128 dots with Backlit
Handsfree	Full-duplex
Wall-Mount Kit	Yes (Optional)
SoftKeys	Yes
Backlit Dial Pad	No
Incoming LED	2 colors (Red/Green)
Connected to	Ethernet Port at LAN (10M/100M/Giga)
Headset Port	Yes
Power Feeding	PoE

5.2.2 System Connection

The IP Multiline Telephone is connected via PoE SWITCH.

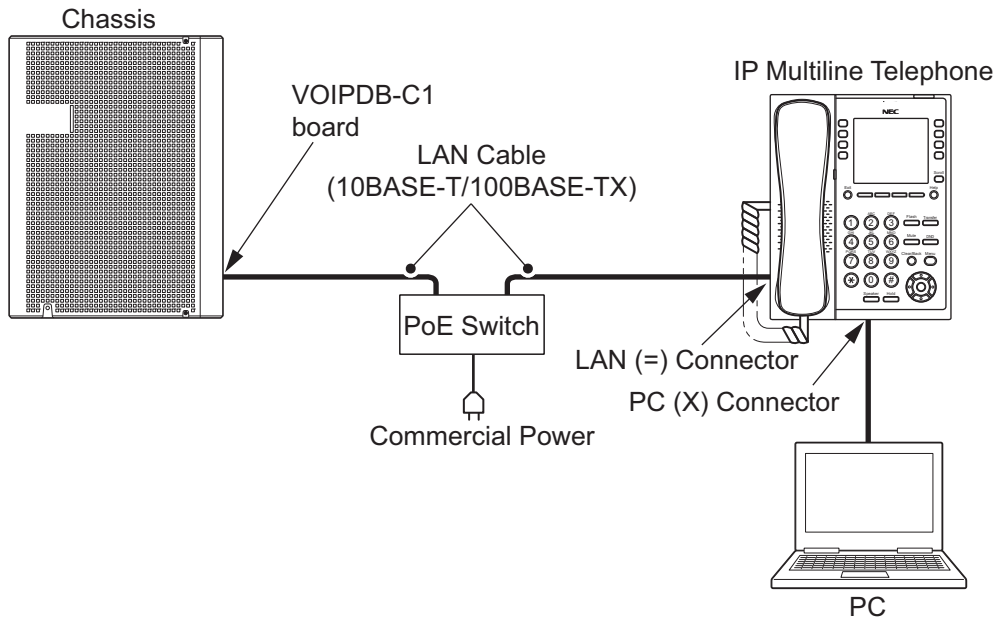


Figure 2-92 IP Multiline Telephone Connection

5.2.3 Connecting the IP Multiline Telephone

1. Connect the LAN Network 10Base-T/100Base-TX cable to the **LAN(=)** connector.
2. Power Feeding is used by PoE, and AC/DC Adapter is not used.
3. The IP Multiline Telephone has a Switching HUB to connect a PC to the LAN Network. Connect the 10Base-T/100Base-TX straight cable used for connection to the PC to the **PC(X)** connector and to the PC.

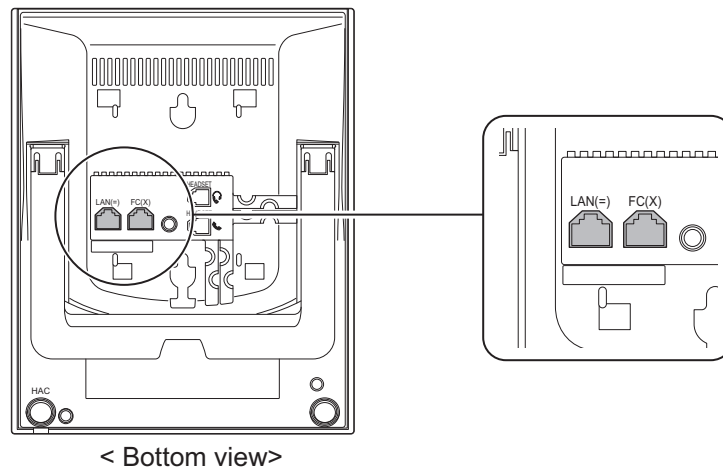


Figure 2-93 IP Multiline Telephone Connectors

5.2.4 Applying Power to the IP Multiline Telephone

IP Multiline Telephone (IP7[]-8IPLD-C1) supports PoE power source for the Telephone.

- PoE(IEEE802.3af)
PoE (Power Over Ethernet) is a LAN technology that allows standard 10Base-T/100Base-TX data cables to pass electrical current from a power source to a requesting end device.

5.2.5 IP Multiline Telephone Legs Adjustment

Legs adjustment is the same as other Multiline Telephone.
Refer to [Multiline Telephone Legs Adjustment on page 2-63](#).

5.2.6 Wall-Mounting the IP Multiline Telephone

1. Arrange the cables and put down the leg as shown below.

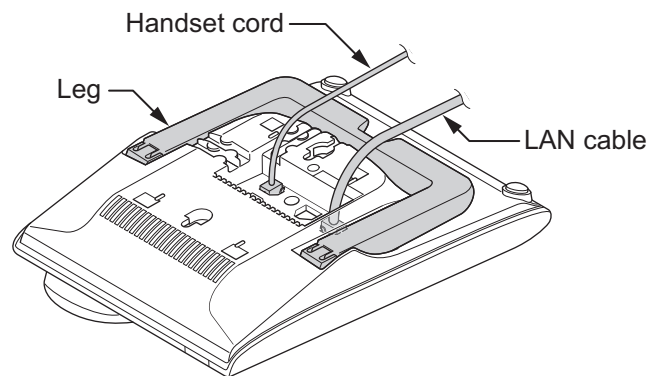


Figure 2-94 Put down the leg

2. Attach the IP4WW-WALL MOUNT UNIT to the bottom panel and arrange the cables as shown below.

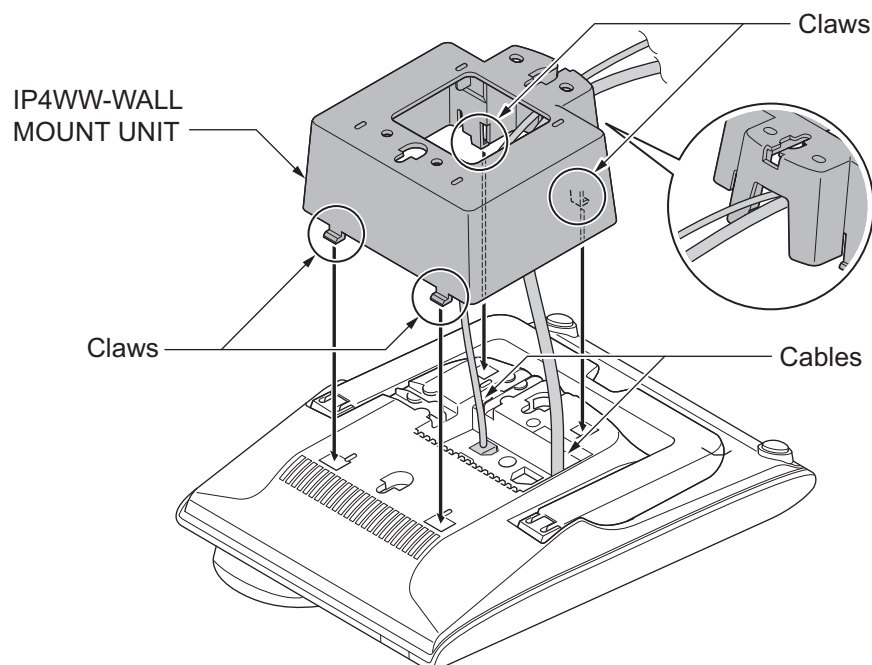


Figure 2-95 Wall-Mount Unit

- Remove the switch-hook from the unit. Turn the tab toward the top. Then slide the hook-switch into position. Refer to [Figure 2-88 Hook-Switch Hanger](#) on page 2-65.

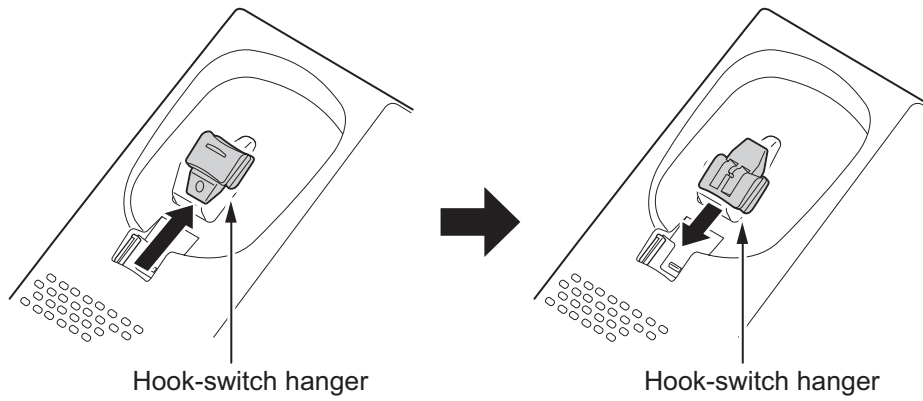


Figure 2-96 Hook-Switch Hanger

- Install two screws into a wall. The screw heads must be remained about 3 mm (0.12").

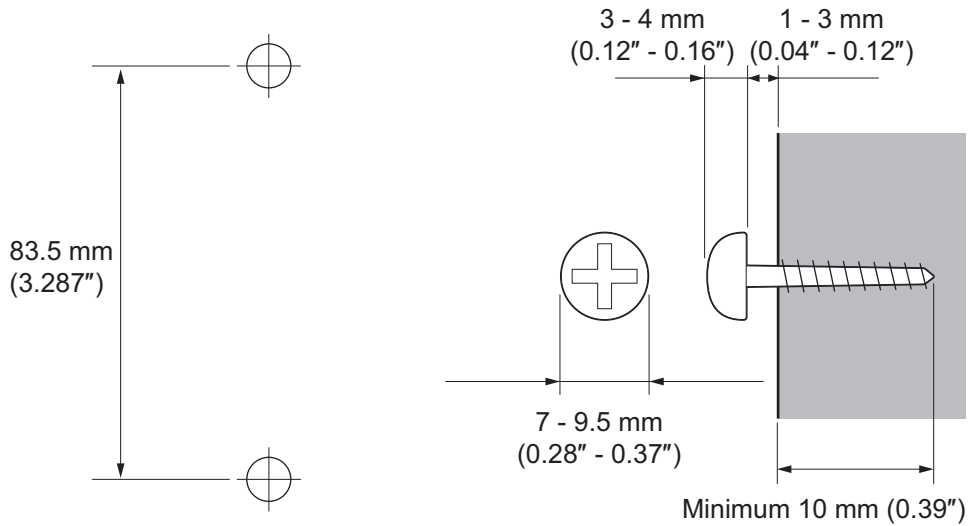


Figure 2-97 Wall-Mount Screw Guide

- Mount the telephone on the wall.

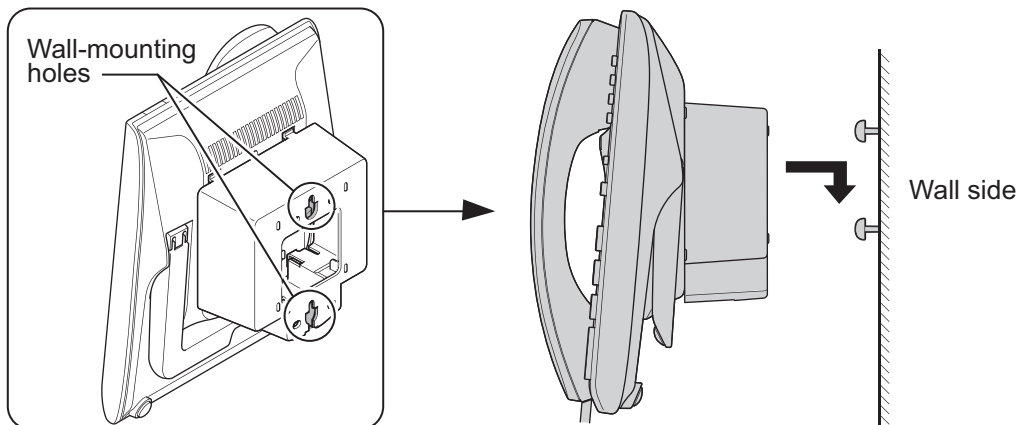


Figure 2-98 Mounting the IP Multiline Telephone

5.3 Installing the DSS Console

The 60D DSS-B1 Console can be installed on any digital extension port of each 082U-B1 board directly. The pair extension for the DSS Console is assigned using system programming. For the settings, refer to the SL2100 Features & Specifications Manual.

5.3.1 DSS Console Leg Adjustment

The DSS Console provides the leg for angling the console to best suit each user. The leg can be set for two different heights (Low/High).

5.3.1.1 Low Position Setting

1. Turn DSS Console over (button side down).
2. Adjust the legs to desired height.

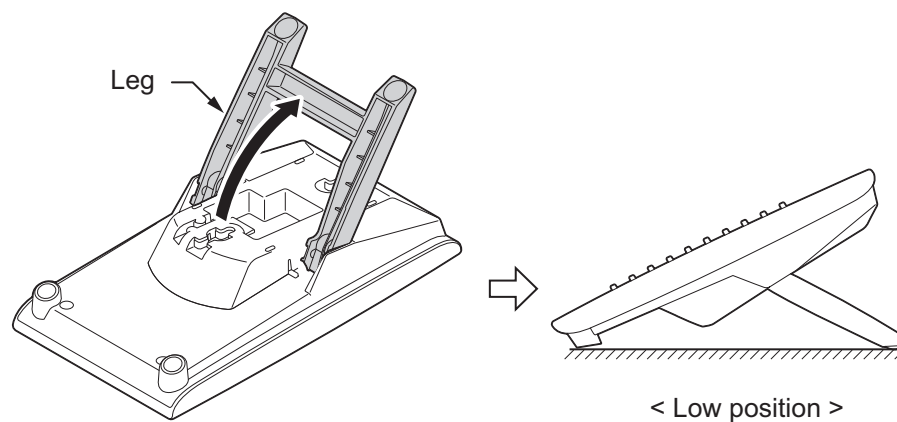


Figure 2-99 Low Position Setting

3. Lead the Line cord through the applicable grooves.

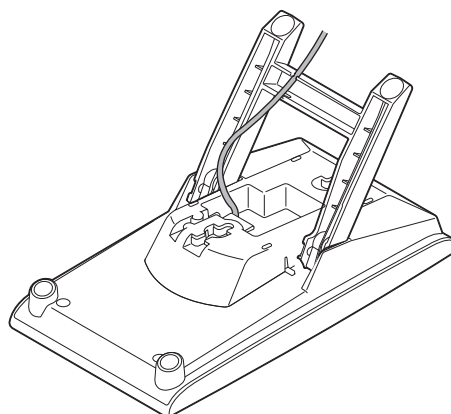


Figure 2-100 Cabling of DSS

5.3.1.2 High position setting

1. Turn DSS Console over (button side down).

2. Pull up the Leg Stoppers.

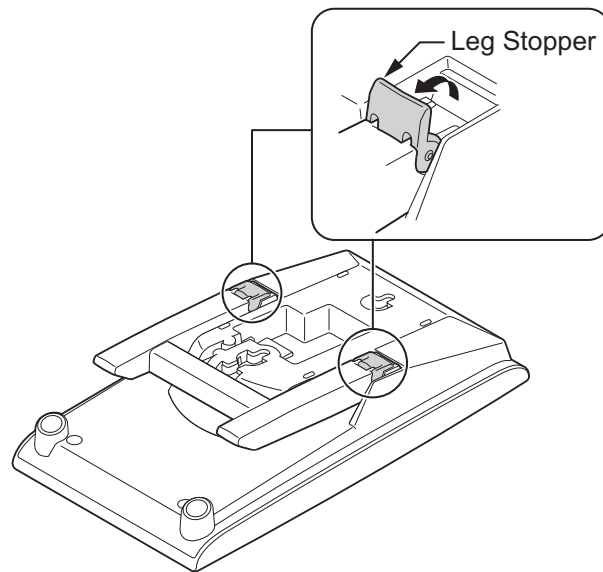


Figure 2-101 Leg Stopper of DSS Console

3. Adjust the leg to desired height.

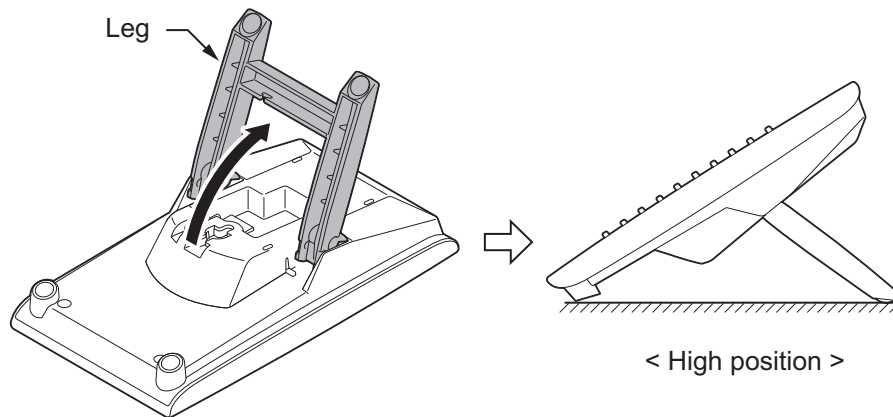


Figure 2-102 High Position Setting

4. Lead the Line cord through the applicable grooves.
(Refer to [Figure 2-100 Cabling of DSS on page 2-71](#))

5.3.2 Wall-Mounting the DSS Console

1. Lift the leg and lead the cable through the applicable grooves. Refer to [Figure 2-103 Cabling for Wall-Mount on page 2-73](#). Lower leg to stowed position.

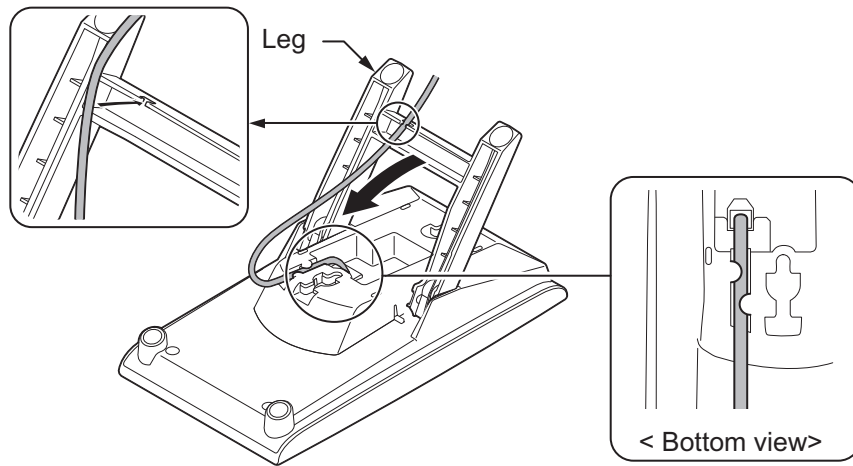


Figure 2-103 Cabling for Wall-Mount

2. Install two screws into a wall. The screw heads must be remained about 3 mm (0.12").

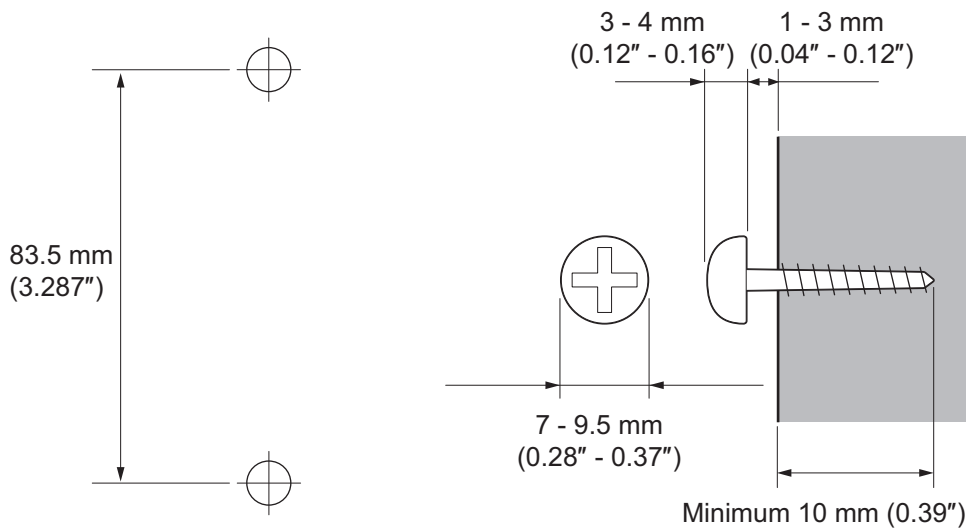


Figure 2-104 Wall-Mount Screw Guide

3. Mount the DSS Console to the wall.

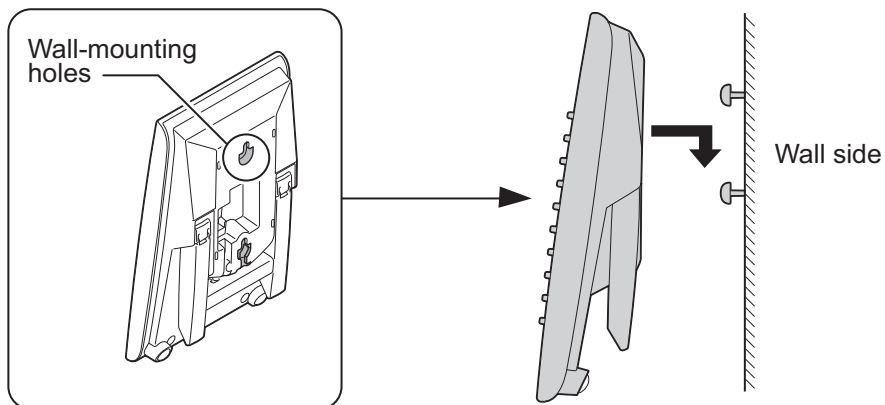
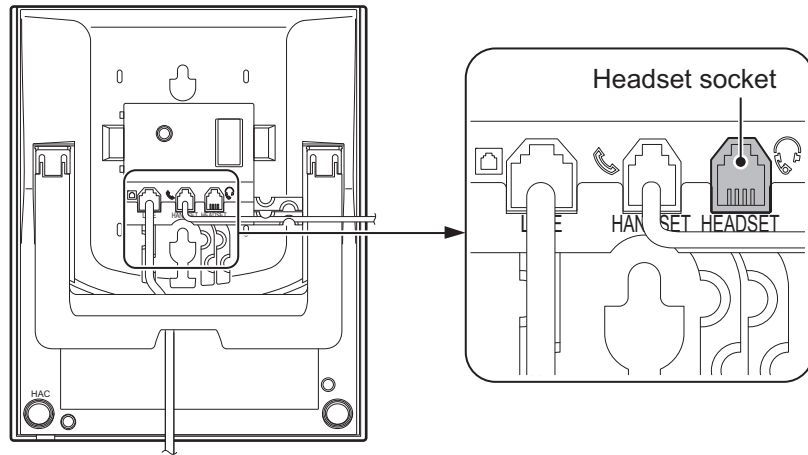


Figure 2-105 Mounting the DSS

5.4 Installing the Headset

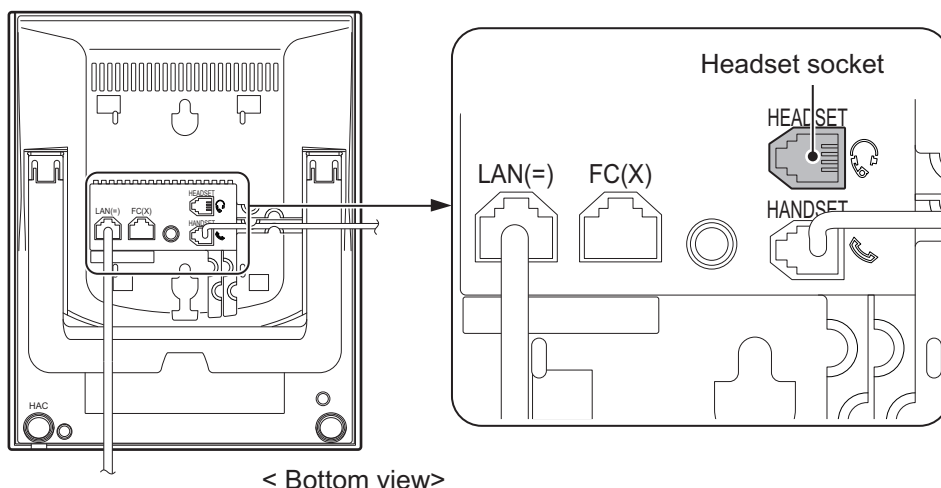
The Multiline Telephone user can utilize a customer-provided headset in place of the handset. Like using Handsfree, using the headset frees up the user's hands for other work. However, Headset Operation provides privacy not available from Handsfree.

1. Connect the Headset cord into the Headset socket.



< Bottom view >

Figure 2-106 Headset Socket (Digital Multiline Telephone)




< Bottom view >

Figure 2-107 Headset Socket (IP Multiline Telephone)

<Recommended Headset>

- HW251N-A10-NE
This Item is made by Plantronics, inc.

 For the details of setting and operation, refer to the SL2100 Feature & Specifications Manual. (separate issue)

The headset configuration is assigned using system programming.

5.5 Installing the Doorphone Box, Security Sensor Device (locally procure)

The Doorphone Box is a self-contained, water-resistant, Intercom unit typically used to monitor an entrance door. A visitor at the door can press the Doorphone Box call button (like a door bell). The Doorphone Box then sends chime tones to all extensions programmed to receive chimes. The External Sensor device can be connect to the system. The system can have up to six Doorphone

Boxes or Security Sensor devices. A maximum two Doorphone Boxes or Security Sensor devices can be connected per 082U-B1.

5.5.1 Wall-Mounting the Doorphone

1. Remove the screw on the front of the Doorphone Box.
2. Remove the Wall-Mount bracket from the Doorphone Box.
3. Connect the cable to the screw terminals on the Doorphone box. (No polarity sensitive)

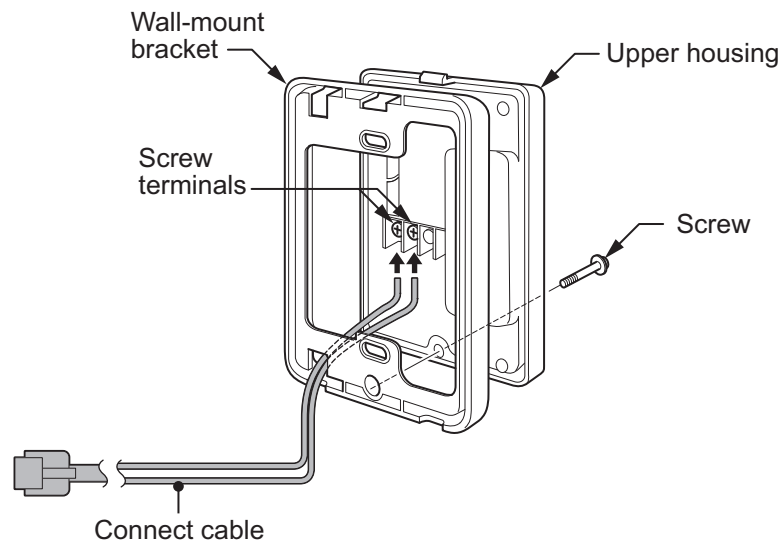


Figure 2-108 Doorphone Box and Bracket

4. Mount the Wall-Mount bracket on the wall using supplied screws.
5. Replace the Upper housing and tighten the screw.

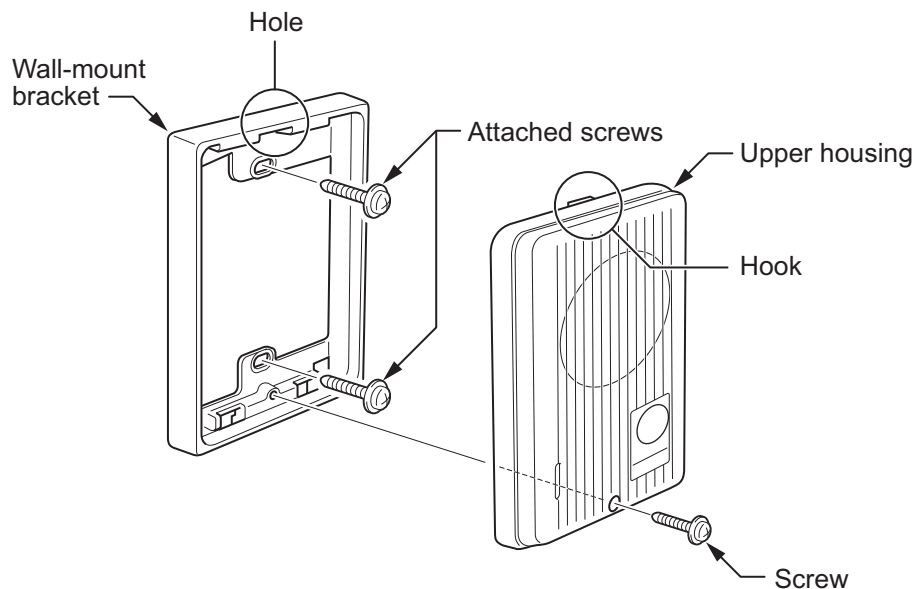



Figure 2-109 Doorphone

5.5.2 Connecting the Doorphone/External Sensor Device

The Doorphone Box/Security Sensor device configuration is assigned using by hardware switch setting on the 082U-B1.

1. Use Needle-nose pliers to set the switches J8 and J9 to the DOOR1 (Sensor1)/DOOR2 (Sensor2) side as required. (The default is SLT1/SLT2 side.)

 *Activation of sensor mode should be set on Doorphone by "Hard-Switch".*

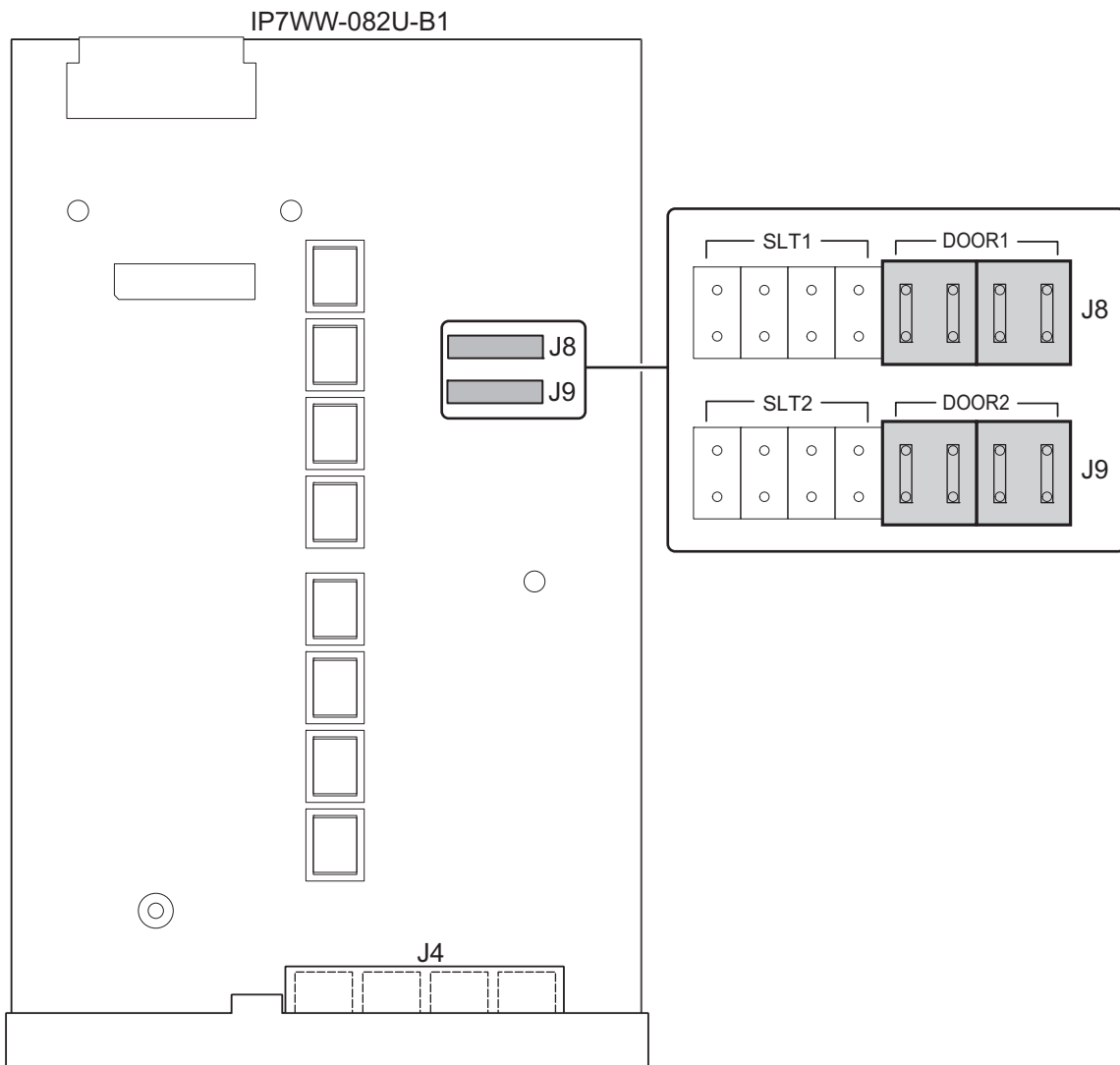


Figure 2-110 Switches Location of 082U-B1

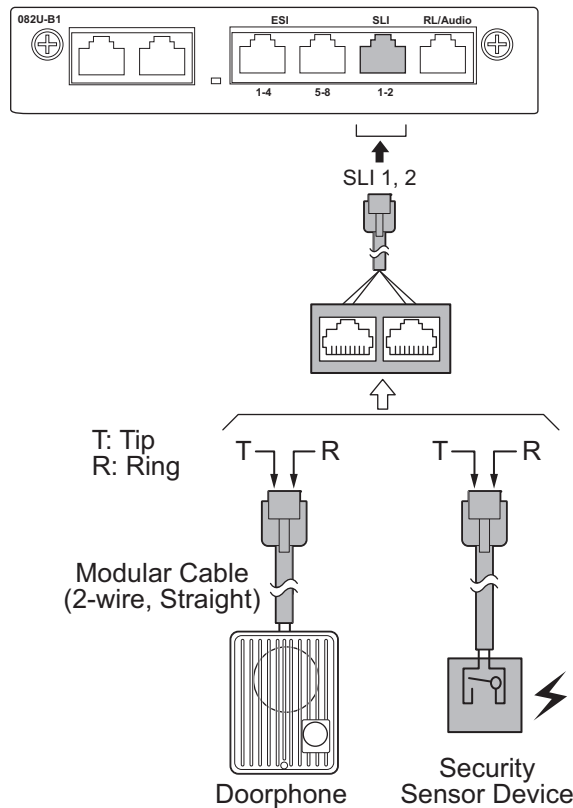


Figure 2-111 Connecting the Doorphone (082U-B1)

5.5.3 Connectors

The following table shows the pin-outs for the RJ-61 cable connector for Doorphone and External Sensor device connections.

Table 2-27 RJ-61Doorphone/Sensor Pin-Outs (082U: SLI: 1-2)

	Pin No.	Connection
	1	
	2	
	3	Door2/Sensor2(Tip)
	4	Door1/Sensor1(Ring)
	5	Door1/Sensor1(Tip)
	6	Door2/Sensor2(Ring)
	7	
	8	

The Doorphone/Security Sensor configuration is assigned using system programming and switch setting of 082U.

The 3rd party Doorphone Boxes cannot be connected to the port.

5.5.4 Doorphone/Security Sensor Device Interface Specifications

Table 2-28 Doorphone Interface Specifications

Item	Specification
Output Impedance	600 Ω
Output Level	Nominal 500 mV (-10 dBm)
Maximum Output	1.75 V RMS

Applied Voltage during Sensor Off	Loop Current during Sensor On	Port Assignment
25 V	40 mA	Program 10-03-05:1 (Read only) * Port assignment should be set on Doorphone mode by Hardware-Switch on board.

5.6 Installing the Door Unlock Devices

A maximum of two door unlock devices can be connected to each Chassis.

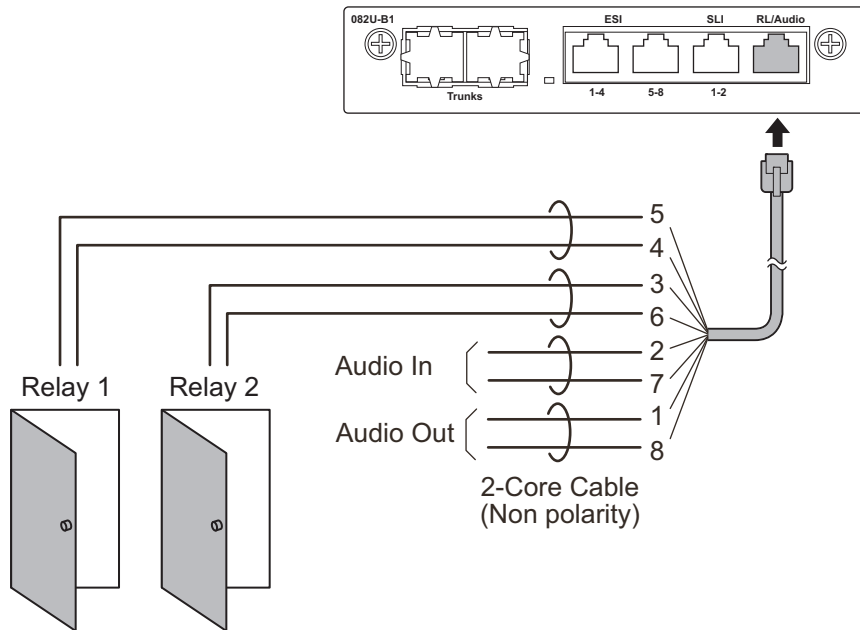


Figure 2-112 Connecting the Door Unlock Device (082U-B1)

The following table shows the pin-outs for the RJ-61 cable connector.

Table 2-29 RJ-61 Relay/Audio Pin-Outs (082U-B1: J4)

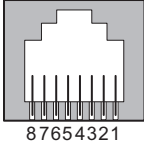

	Pin No.	Connection
 <p>87654321</p>	1	Audio Out
	2	Audio In
	3	Relay 2
	4	Relay 1
	5	Relay 1
	6	Relay 2
	7	Audio In
	8	Audio Out

Table 2-30 General Purpose/Door Unlock Relay Specifications

Item	Specification
Rated Voltage	DC 48 V Maximum
Rated Current	DC 320 mA Maximum
Contact	Normally Open

5.7 Installing the External Paging Speaker/External MOH/BGM Sources

5.7.1 Connecting the Audio Equipment

-  *The audio In/Out port labeled "RL/Audio" on 082U-B1 can be used for audio port (External paging, External MOH, BGM)*
- Audio port configuration is assigned using system programming.*

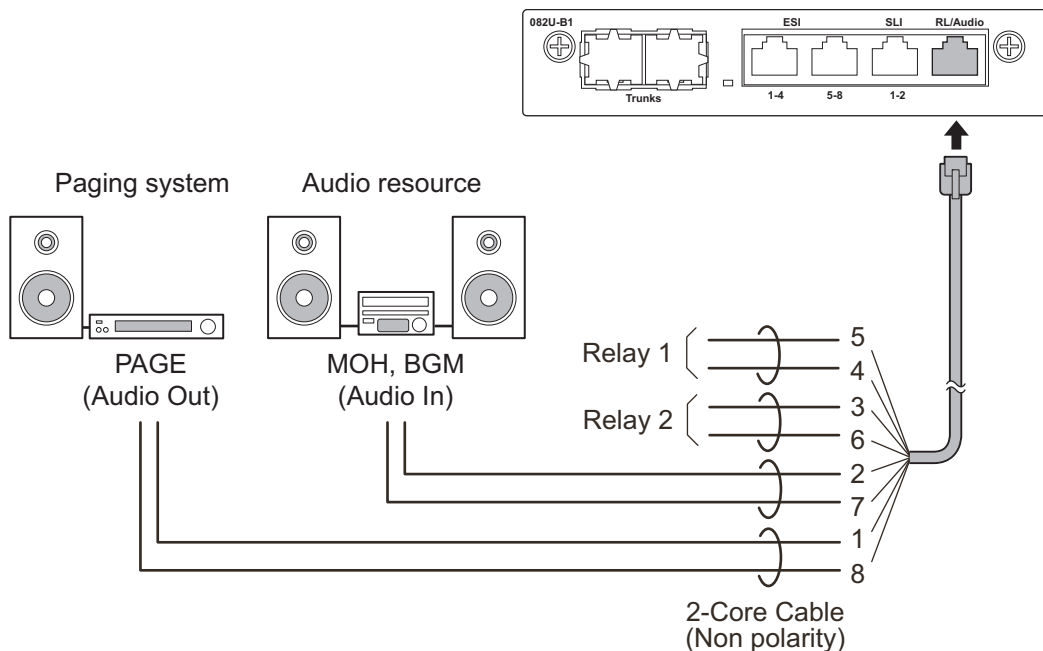
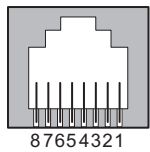


Figure 2-113 Connecting Audio Equipment (082U-B1)

The following table shows the pin-outs for the RJ-61 cable connector.

Table 2-31 RJ-61 Relay/Audio Pin-Outs (082U-B1: J4)

	Pin No.	Connection
	1	Audio Out
	2	Audio In
	3	Relay 2
	4	Relay 1
	5	Relay 1
	6	Relay 2
	7	Audio In
	8	Audio Out

5.7.2 External Paging Output Specifications

Table 2-32 External Paging Output Specifications

Item	Specification
Output Impedance	600 Ω @ 1kHz
Output Level	Nominal 250 mV (-10 dBm)
Maximum Output	400 mV RMS

5.7.3 BGM/External MOH Source Input Specifications

Table 2-33 BGM/External MOH Source Input Specifications

Item	Specification
Input Impedance	High Impedance (>10 k Ω)
Input Level	Nominal 250 mV (-10 dBm)
Maximum Input	1 V RMS

5.8 SMDR (Station Message Detail Recording)

5.8.1 General

SMDR (Station Message Detail Recording) provides a record of the system's outside calls. Typically, the record outputs to a customer-provided SMDR device such as PC via LAN port (ETHERNET) on the CPU board.

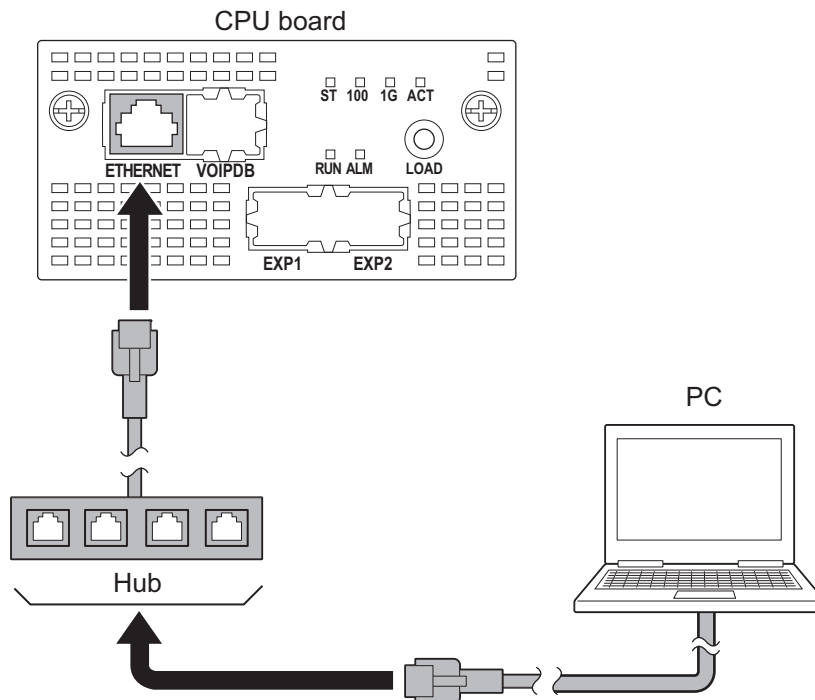


Figure 2-114 Connecting a PC for SMDR

1. Connect the straight type Ethernet cable (CAT5) between the system and In-house LAN.



The SMDR feature is assigned using system programming.

5.9 Wireless Headset Adapter (WHA)

5.9.1 Operation

Refer to the *Plantronics User Guide* for additional details.

5.9.2 General Notes

- The WHA is compatible with all 2W Digital Multiline Terminal: - 12/24TXH-B1 Digital Telephones (BE116515/BE116516)
- A "HEADSET" key does not need to be programmed on the SL2100 Telephone.
- Installation of the WHA must be done by your NEC dealer.

5.9.2.1 Installing the Wireless Headset Adapter

Installation notes:

Refer to the *Plantronics User Guide* for additional details.

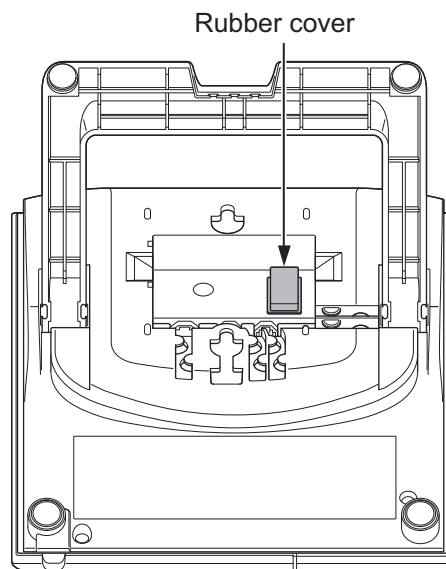
- Installation of the WHA must be done by your NEC dealer.
- Disconnect the telephone line cord from its wall jack.
- Plug the cord from the cordless headset base unit into the IP7WW-12/24TXH-B1 TEL headset socket.
- Plug the AC Adapter cord into the cordless headset base unit.
- Refer to the cordless headset user guide and adjust the audio controls on the cordless headset base unit to match the IP7WW-12/24TXH-B1 Telephone.

Removing the Auxiliary Connector Rubber Cover

The Wireless Headset Adapter plugs into the Auxiliary Connector on the bottom of your telephone. When your telephone comes from the factory, the Auxiliary Connector is protected by a rubber cover. You must remove this cover before installing the adapter.

To remove the Auxiliary Connector Rubber Cover:

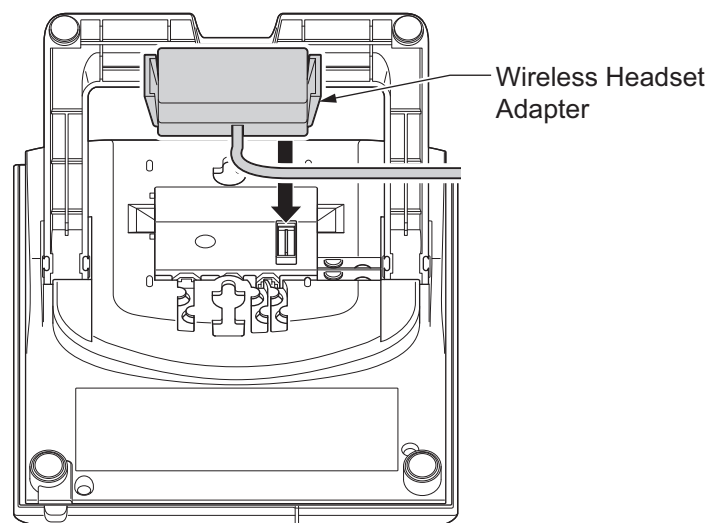
1. Turn your telephone over and place it on a smooth, soft surface.
2. Remove a rubber cover.



Installing the Headset Adapter

To install the Headset Adapter:


1. Turn your telephone over and place it on a smooth, soft surface.
2. Line up the connector in the Headset Adapter with the Auxiliary Connector on the telephone.
3. Carefully snap the Wireless Headset Adapter into the telephone base.

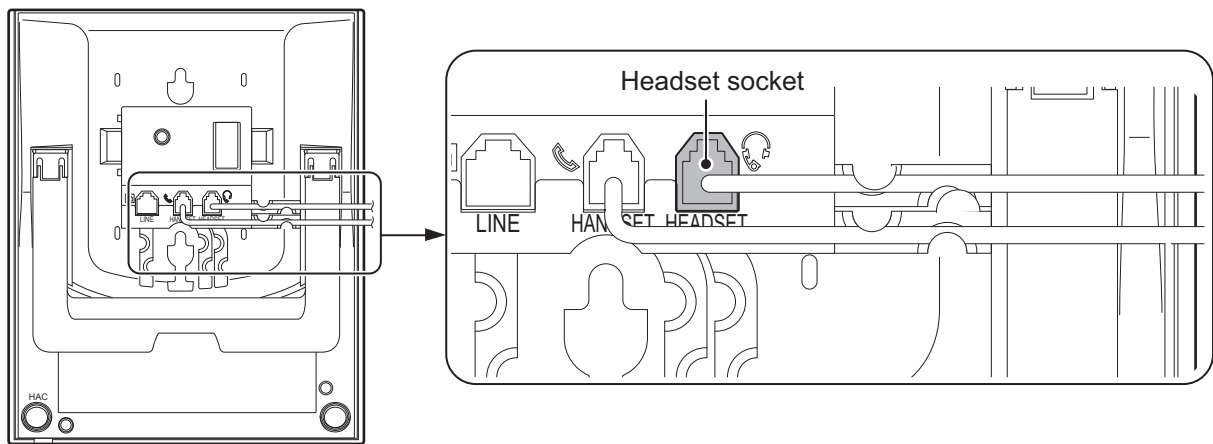


Connecting to the Headset System Base

To connect your telephone to the Headset System Base:

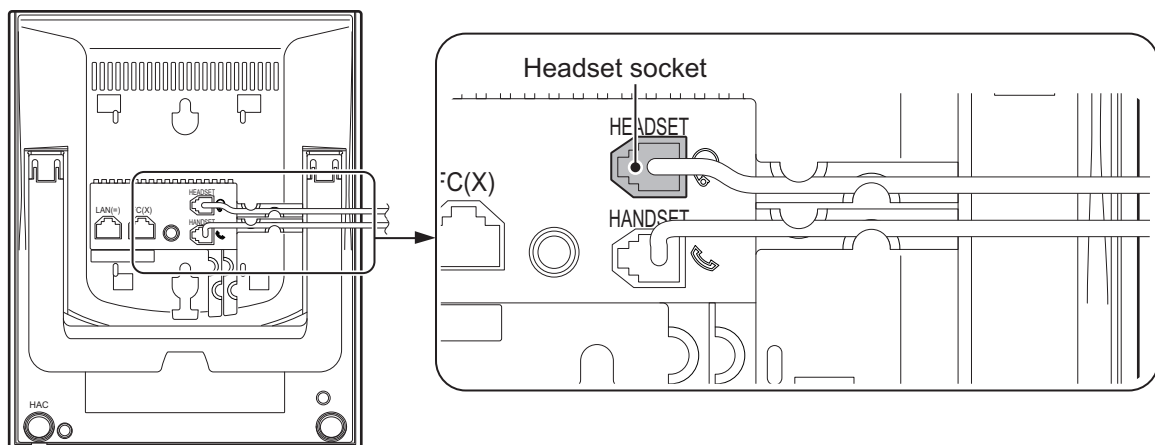
1. Plug the cord into the telephone's headset socket and the socket on the Headset System base. Insert the Headset Adapter plug into the lifter jack on the Headset System base.

 Please see the Plantronics User Guide for connecting between the Terminal and Device.



< Bottom view >

Figure 2-115 Headset Socket (Digital Multiline Telephone)



< Bottom view >

Figure 2-116 Headset Socket (IP Multiline Telephone)

2. Plug the extension's line cord into the socket on the bottom of the telephone.

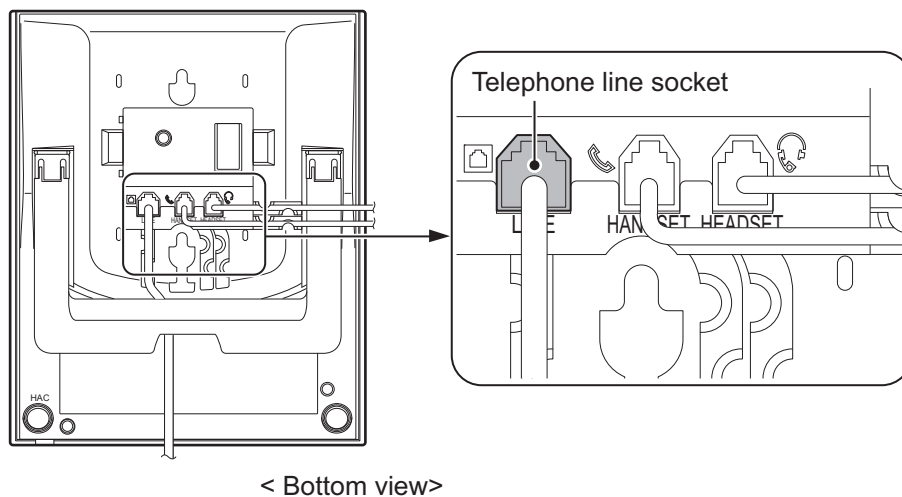


Figure 2-117 Telephone Line Socket (Digital Multiline Telephone)

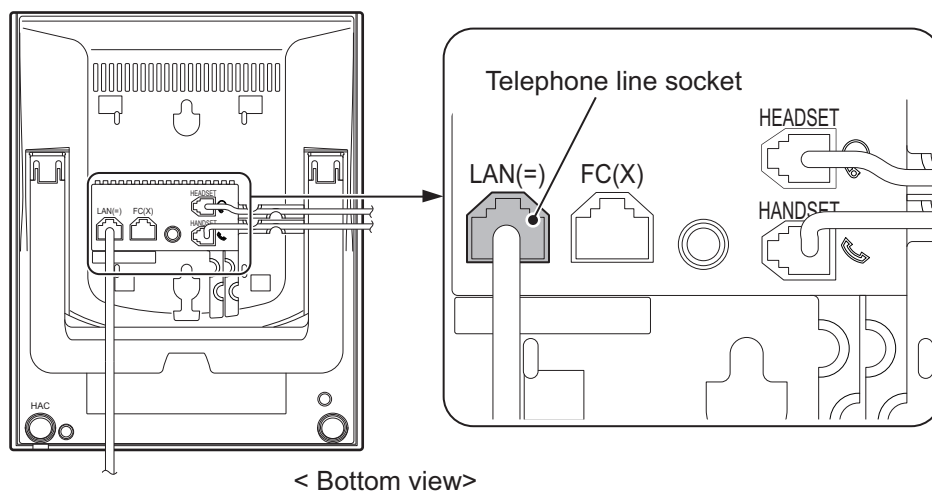


Figure 2-118 Telephone Line Socket (IP Multiline Telephone)

5.9.3 Recommended Model

NEC recommends the following Plantronics cordless headsets for SL2100 applications:

- Savi W700 Series Bluetooth technology (W710 / W720 / W730 / W740 / W745)
- CS500 Series DECT 6.0 technology (CS510 / CS520 / CS540)
- CS50 900MHz Technology
- CS55 DECT 6.0 technology
- CS70N DECT 6.0 technology
- CS351N DECT 6.0 technology
- CS361N DECT 6.0 technology
- Voyager 510 Bluetooth technology

Some of the above models are sold with and without the Plantronics Handset Lifter.

Refer to www.plantronics.com for details.

The SL2100 Telephone must be equipped with the NEC WHA (Wireless Headset Adapter – P/N BE113158).

5.10 Installing the IP4WW-12/24TXH-[] Multiline Terminals and options

5.10.1 Connecting the IP4WW-12/24TXH-[] Multiline Terminals and options to the SL2100 system

Refer to SL1100 System Hardware Manual for installing the IP4WW-12/24TXH-[] Multiline Terminals.

5.10.2 Special Notes

- The IP4WW-12/24TXH-[] Multiline Terminal can be connected according to the following terminal power factor. Do not connect more than this value.
- The Illuminance sensor does not function when the IP4WW-12/24TXH-B Terminal connected to the SL2100 system.
- Due to Illuminance sensor does not function, the Automatic brightness control of LCD backlit cannot be controlled when the IP4WW-12/24TXH-B Terminal connected to the SL2100 system.

Table 2-34 Terminal Power Factor

Terminal Power Factor	
1 Chassis = < 38	
Item	Power Factor
IP7WW-12/24TXH-[]1 TEL	1
IP7WW-60D DSS-[]1	1
Single Line Telephone	1
IP4WW-12/24TXH-[] TEL	1

Table 2-35 Maximum Number of Terminal installed

Terminal (Power Factor)	Maximum Number of Terminal installed			Remarks
	1 Chassis	2 Chassis	3 Chassis	
IP7WW-12/24TXH-[]1 (1)	24	48	72	
IP7WW-60D DSS-B1 (1)		12		
Single Line Telephone (1)	32	64	96	
IP4WW-12/24TXH-[]TEL (1)	24	48	72	

5.11 Installing the ITX-1DE-1W(BK) TEL

5.11.1 Connecting the Phone

The following SIP phone is available in the SL2100 system.

5.11.2 Location of Controls

Front View

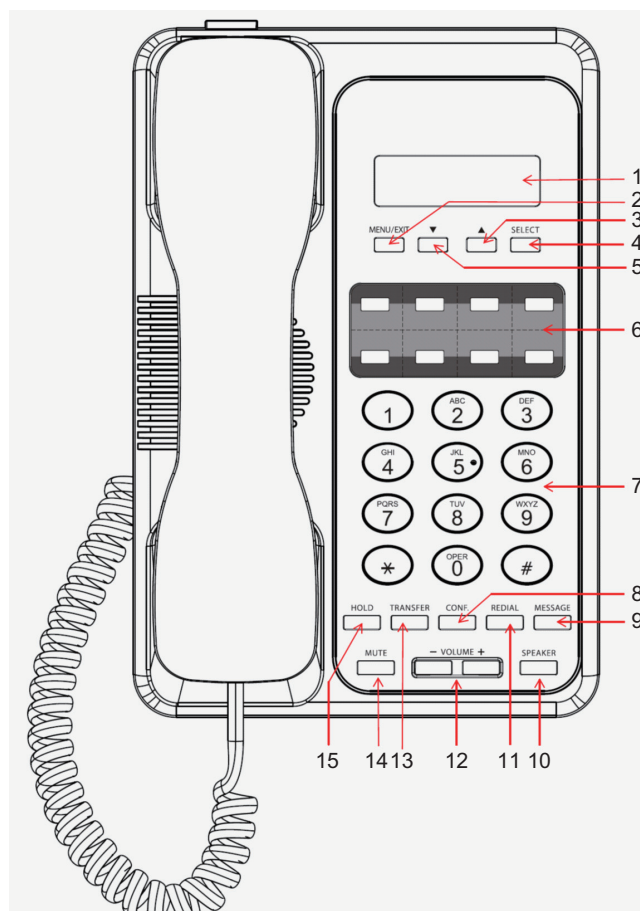


Figure 2-119 SIP Phone - Front View

Table 2-36 Location of Controls (Front Side)

No.	Name	Description
1	Display screen	Displays calls and status information.
2	MENU/ EXIT	Press to access the menu options or cancel your selection and return to the previous level.
3	UP	Press to scroll through lists and menus on the display.
4	SELECT	Press to enter a menu or confirm a selection.
5	DOWN	Press to scroll through lists and menus on the display.
6	Programmable speed dial keys	Press any of the keys to speed dial the preset contact number. (To write something on the sheet, please remove the plastic cover first)
7	Alphanumeric keys	Press these keys to enter phone numbers and texts.
8	CONF	Press to activate the three-way conference call.
9	MESSAGE key with indicator	Press to listen to voice mail messages. Red light indicates unheard messages.
10	SPEAKER key with indicator	Activates the speakerphone to allow hands free conversations.
11	REDIAL	Press to call the last dialed number.
12	VOLUME	Press to increase or decrease the volume of the ringer tone, handset, or speakerphone.
13	TRANSFER	Press to transfer an active call to another phone on the system.

No.	Name	Description
14	MUTE key with indicator	Press to mute MIC.
15	HOLD key with indicator	Press to put an active call on hold.

Back View

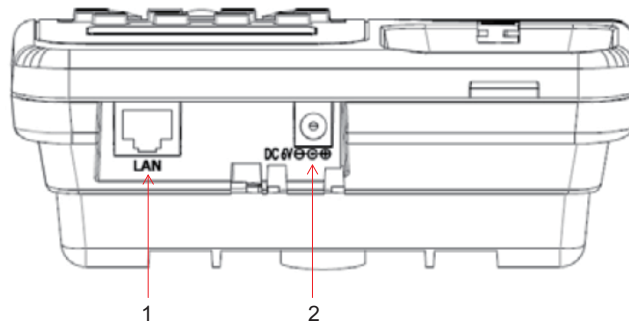


Figure 2-120 SIP Phone - Back View

Table 2-37 Location of Controls (Back Side)

No.	Name	Description
1	LAN port	Connects to switch, or hub
2	DC Jack	DC 6V Power Jack, it is covered by a cap

5.11.3 System Connection

1. Connect the LAN Network 10Base-T/100Base-TX cable to the LAN(=) connector via PoE Hub.

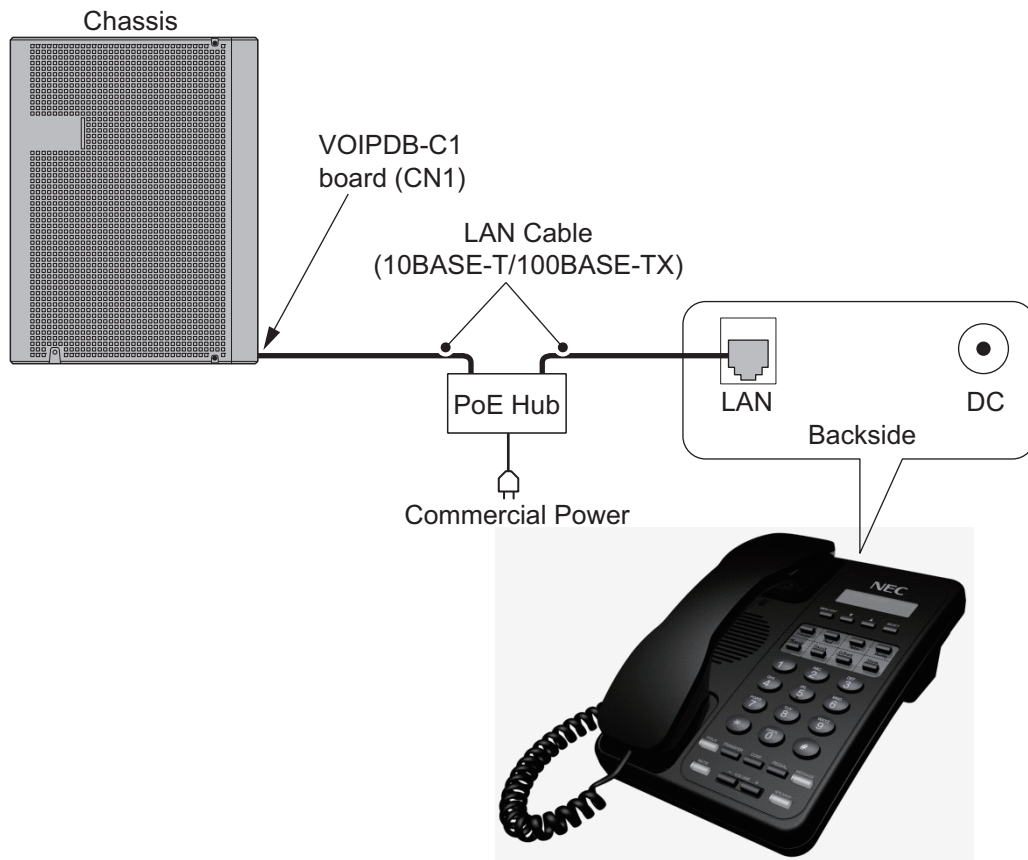


Figure 2-121 System Connection

SECTION 6 INSTALLING WIRELESS DECT TELEPHONES

6.1 Installing the DTL-8R-1 Cordless DECT Telephone

DTL-8R-1 is a cordless telephone that is adapted for NEC SL2100 System. It is designed for use in the office environment.



Figure 2-122 Cordless DECT Telephone (DTL-8R-1)



- *A Handset and wired phone cannot be used at the same time.*
- *The Handset and Base Station must have the original ID that is written on each unit at the factory.*

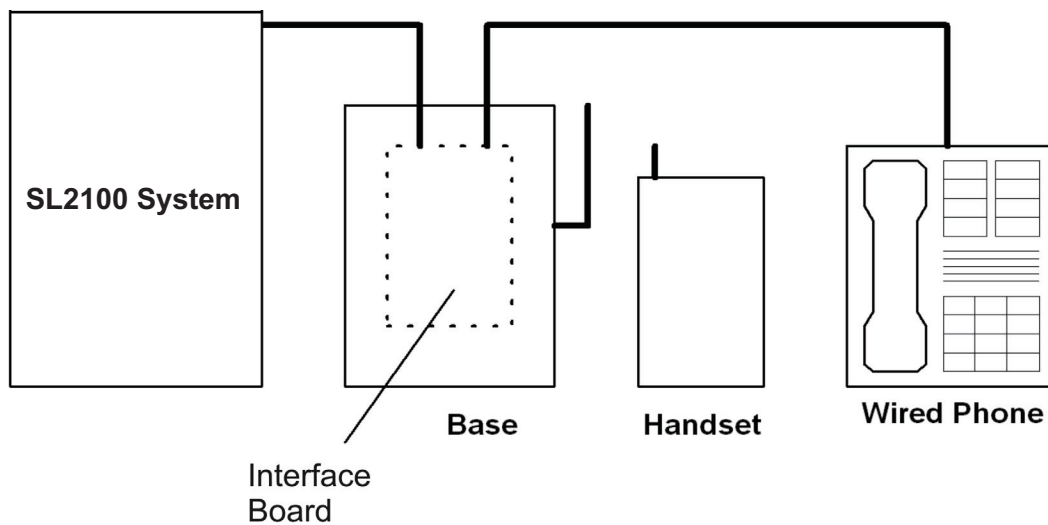


Figure 2-123 System Overview

6.1.1 Selecting a Location

Select a location for the DTL-8R-1 Cordless DECT to avoid excessive heat or humidity. The base unit of the DTL-8R-1 Cordless DECT can be placed on a desk or tabletop near a standard 120 V AC outlet and telephone line jack. The base unit can also be mounted on a standard wall plate using the wall mount adapter. Keep the base unit and handset away from sources of electrical noise (motors, fluorescent lighting, computers, PC monitor).

6.1.2 Installation Precautions

To ensure optimum performance follow these guidelines.

- Base units must be placed at least 20 feet apart.
- Always place the base unit on top of a desk or on higher shelves. Avoid locations surrounded by metal surfaces.
- Place the base away from any electrical component such as a PC, monitor and other telephone.

6.1.3 Connecting the Telephone Cords

When connecting the telephone cords, observe the following precautions.



- *Never install telephone wiring during a lightning storm.*
- *Never touch bare telephone wires or terminals unless the telephone line is disconnected at the network interface.*
- *Use caution when installing or modifying telephone lines.*

To connect the telephone cords:

1. Connect the cord from the telephone jack to the Line In on the DTL-8R-1 Cordless DECT.

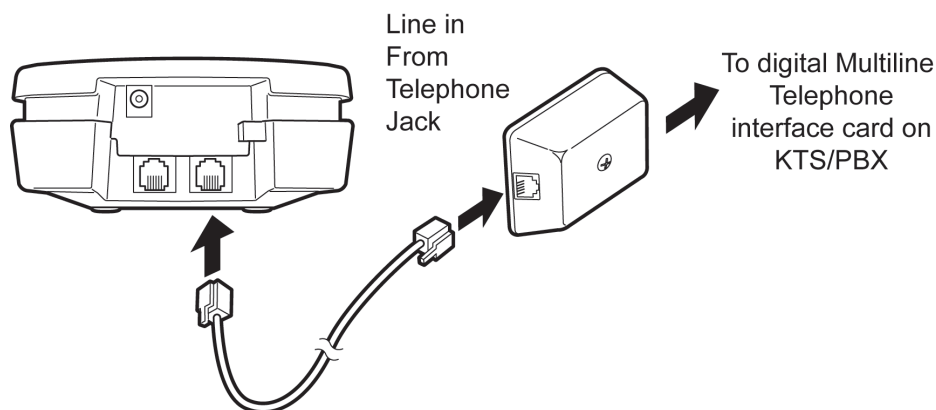


Figure 2-124 Connecting Telephone Cords to the Telephone Jack

2. Connect a SL2100 digital multiline terminal to the DTL-8R-1 Cordless DECT.

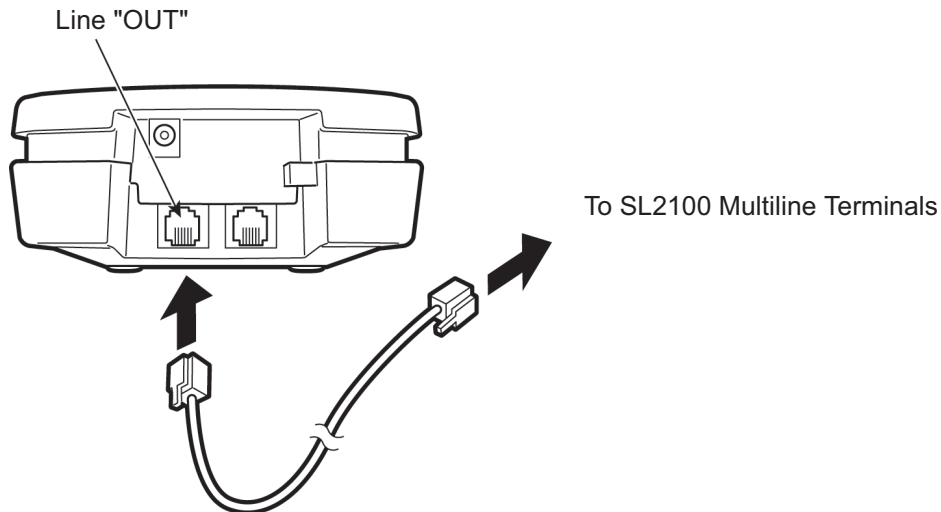


Figure 2-125 Connecting the DTL-8R-1 Cordless DECT to the Multiline Terminal

6.1.4 Applying Power to the Charging Unit

The unique design of the telephone allows the user to place the handset in the charging unit with or without the belt clip attached. The charging unit can charge a second battery with or without the handset being charged. The battery packs can be recharged automatically either in or out of the handset.

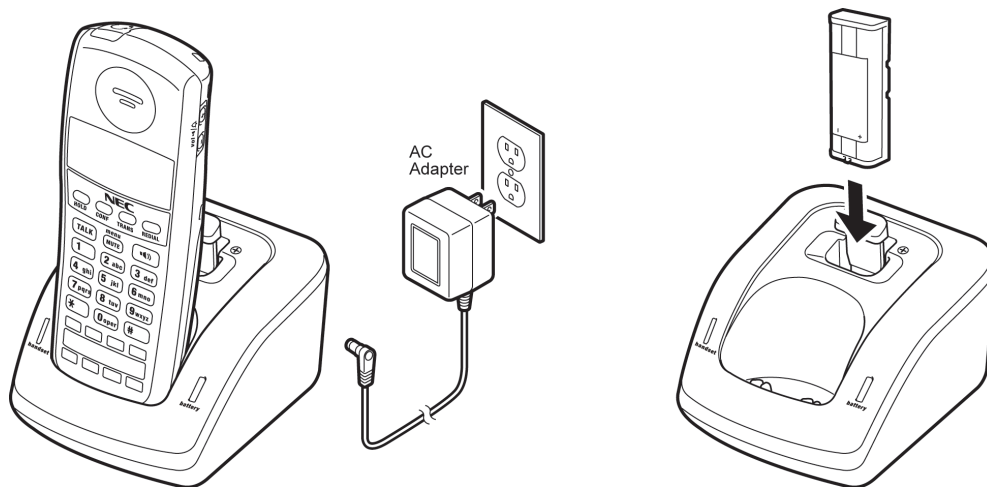


Figure 2-126 Applying Power to the Charging Unit



Use only the supplied AC adapter for the charging unit.

The AC adapter furnished with this telephone usually has a polarized line plug with one blade wider than the other. This plug fits in the power outlet only one way. If you cannot insert the plug fully in the outlet, try reversing the plug.

Refer to [Figure 2-127 Polarized Plug](#) on page 2-92.

If you cannot plug the AC adapter in the outlet, you may need to replace it.



Route the power cord where it can not create a trip hazard, or where it could become chafed and create a fire or other electrical hazards.

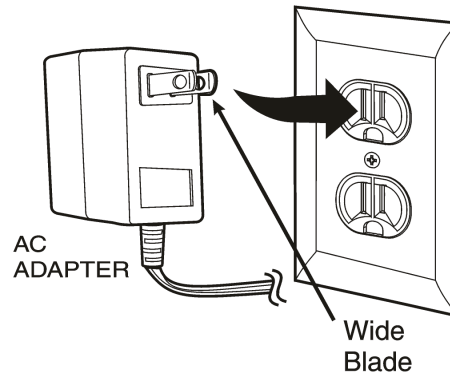


Figure 2-127 Polarized Plug

6.1.5 Mounting the Base to a Standard Wall Plate

The base unit can be mounted on a standard wall plate. To attach the wall mount stand to the base unit:

1. Slide the wall mount stand in the notches at the top of the base unit. Rotate the wall mount stand down and snap it into place.

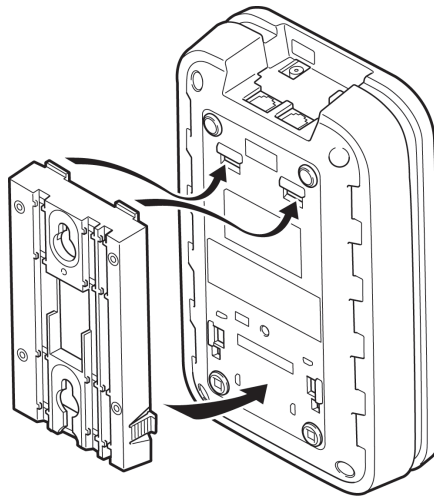


Figure 2-128 Attaching the Wall Mount Stand to the Base Unit

2. Plug the AC adapter into the base unit.

3. Place the AC adapter cord inside the molded channel of the wall mount stand.

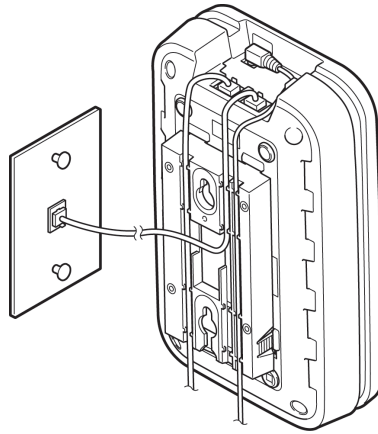


Figure 2-129 Placing the AC Adapter Cord Inside the Wall Mount Stand

4. Plug one end of the short telephone cord (locally supplied) in the **LINE** jack on the base unit. Plug one end of the SL2100 digital multiline terminal into the **PHONE** jack. Place the telephone cords inside the molded channels on the bottom of the wall mount stand.
5. Plug the other end of the short telephone cord into the modular wall jack in the center of the wall plate.
6. Place the base unit on the posts of the wall plate and push down until it is firmly seated.

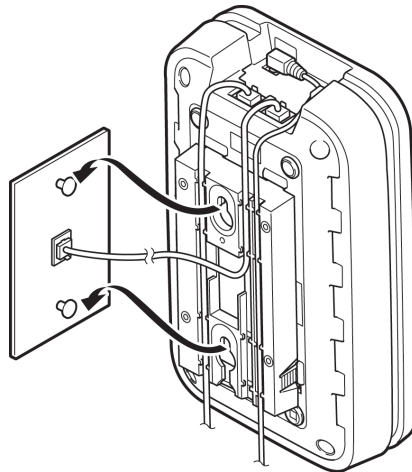




Figure 2-130 Placing the Base Unit on the Posts of the Wall Plate

 *Because of variation in wall plates, this method is not recommended.*

- Plug the AC adapter into a standard 120 Vac wall outlet.

 Do not use an outlet controlled by a wall switch.

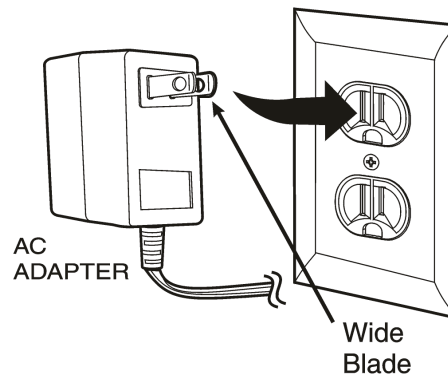


Figure 2-131 Plugging the AC Adapter into the AC Wall Outlet

6.1.6 Mounting the Base Directly to the Wall

If a standard wall plate is not available, mount the telephone directly on the wall. Before mounting the telephone, consider the following:

- Select a location away from electrical cables, pipes, or other items behind the mounting location that could cause a hazard when inserting screws into the wall.
- Make sure the wall material can support the weight of the base unit.
- Use #10 screws with anchoring devices suitable for the wall material where the base unit will be placed.

To mount the telephone:

1. Insert two mounting screws 3-15/16 inches apart. Allow about 3/16 of an inch between the wall and screw heads for mounting the telephone.

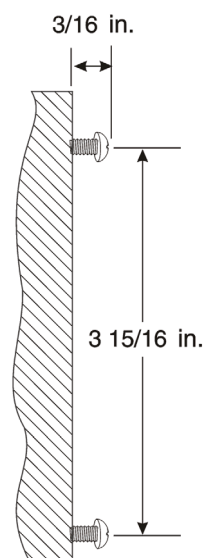


Figure 2-132 Inserting Screws into the Wall for Wall Mounting the Telephone

2. Plug in and secure the AC adapter.
3. Plug the AC adapter into the base unit.

4. Plug one end of the short telephone cord into the **LINE** jack on the base unit. Then plug one end of a SL2100 multiline terminal into the **PHONE** jack. Place the telephone cords inside the molded channels on the bottom of the wall mount stand.

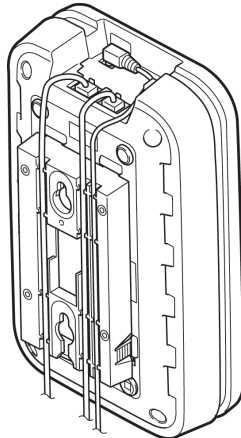


Figure 2-133 Placing the Telephone Cords Inside the Wall Mount Stand

5. Place the base unit on the posts of the wall screws and push down until it is firmly seated.

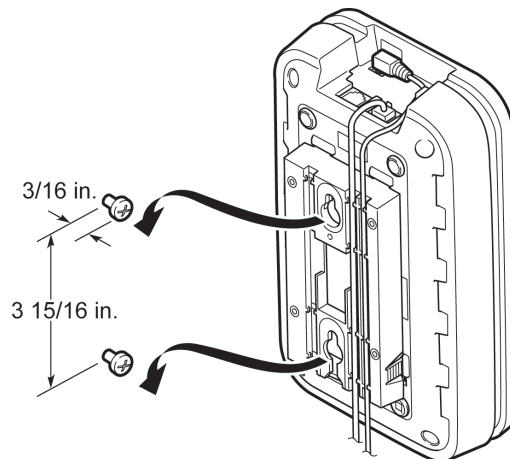


Figure 2-134 Attaching the Wall Mount Unit to the Wall

6. Plug the other end of the short telephone cord into a telephone wall jack.
7. Plug the AC adapter into a standard 120 Vac wall outlet. Refer to [Figure 2-131 Plugging the AC Adapter into the AC Wall Outlet on page 2-94](#).



Do not use an outlet controlled by a wall switch.

6.1.7 Wall Mounting the Charging Unit

The charging unit can be wall mounted as well. Before mounting the charging unit, consider the following:

- Select a location away from electrical cables, pipes, or other items behind the mounting location that could cause a hazard when inserting screws into the wall.
- Make sure the wall material can support the weight of the charging unit.
- Use #10 screws with anchoring devices suitable for the wall material where the charging unit will be placed.

To mount the charging unit:

1. Insert two mounting screws as shown below. Allow about $\frac{3}{16}$ of an inch between the wall and screw heads for mounting the telephone.

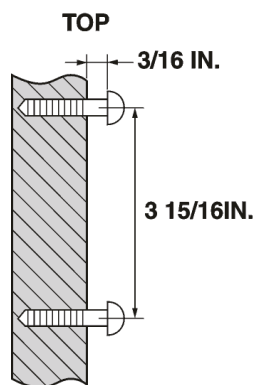


Figure 2-135 Inserting Screws for Wall Mounting

2. Plug the AC adapter in the charging unit. Wrap the AC adapter cord around the strain relief.

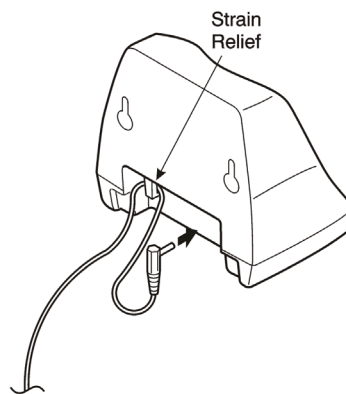


Figure 2-136 Wrapping the AC Adapter Cord Around the Strain Relief

3. Place the charging unit on the posts of the wall screws and push down until it is firmly seated.

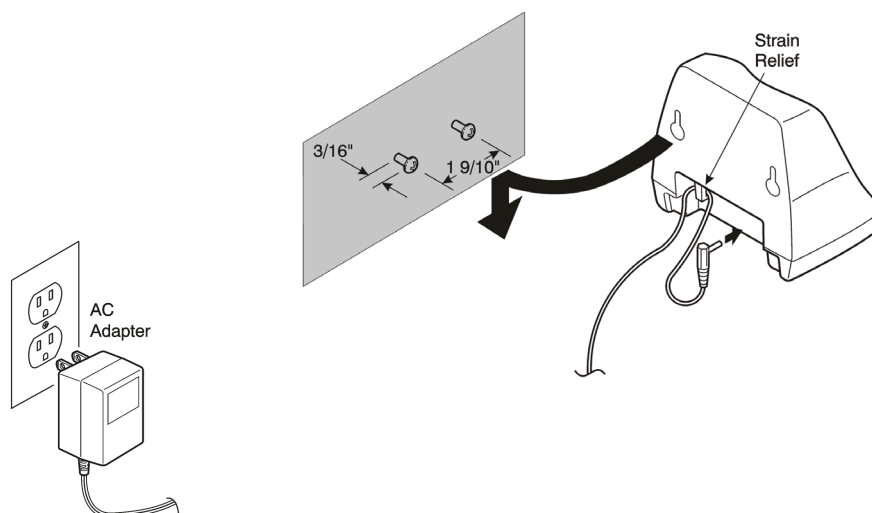


Figure 2-137 Placing the Charging Unit on the Wall

4. Plug the AC adapter into a standard 120 Vac wall outlet. Refer to [Figure 2-137 Placing the Charging Unit on the Wall](#) on page 2-96.

6.1.8 Attaching and Removing the Belt Clip

A belt clip can be used to attach the handset to a belt or pocket for convenient portability.

1. Slide the clip into the tab slots. Press firmly until it snaps into place. The belt clip fits snugly onto the handset.

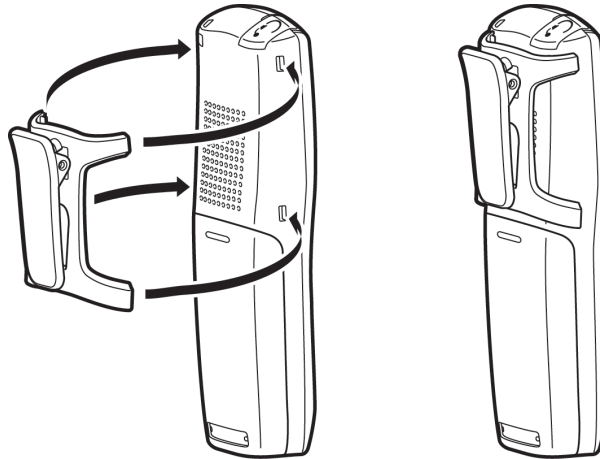


Figure 2-138 Attaching the Belt Clip to the Handset

2. To remove the clip, press the retaining clip in toward the belt clip blade and slide the clip up at the same time.

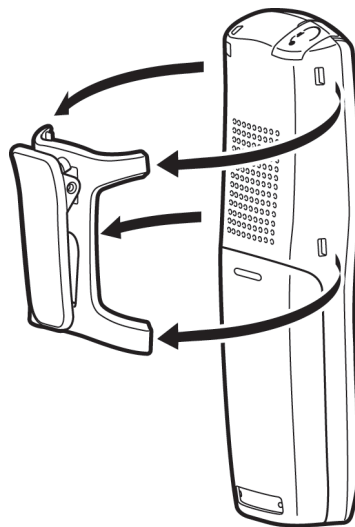


Figure 2-139 Removing the Belt Clip

6.1.9 Installing the Handset Battery Pack

Before installing batteries, refer to *D^{term}*® Cordless DECT Owner's Manual Specifications and Battery Safety. It is important to follow safety regulations when handling batteries.

1. Remove the battery cover by pressing the latch and sliding the cover down and off of the handset.

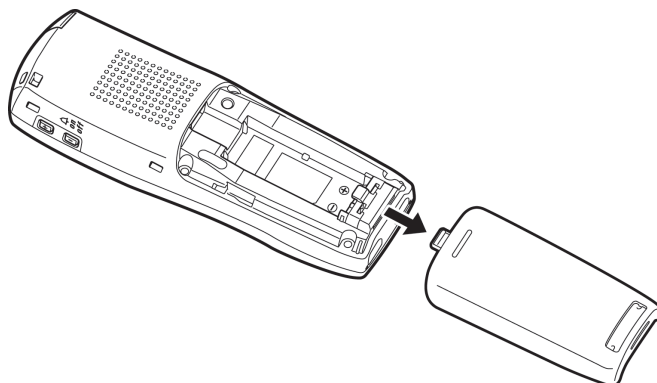


Figure 2-140 Removing the Battery Cover

2. Slide the battery pack down into the handset.



It may be necessary to remove the old battery at this time.

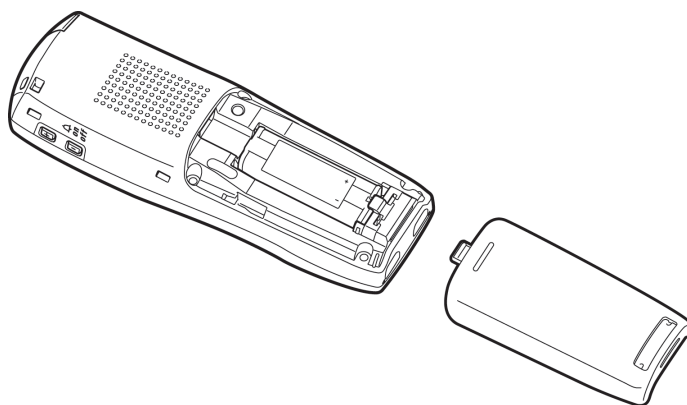


Figure 2-141 Replacing the Battery Pack

3. Replace the cover and slide it up until it latches onto the handset.

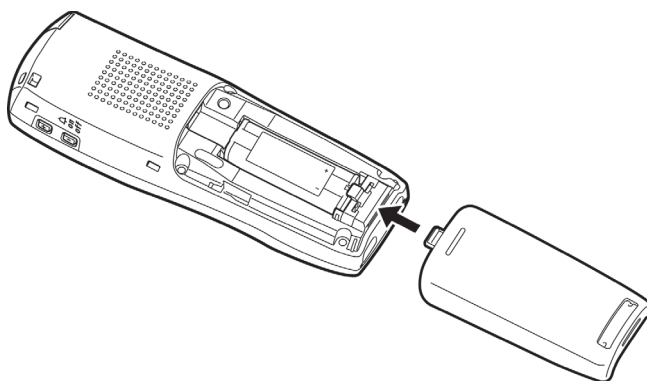


Figure 2-142 Replacing the Battery Cover

6.1.10 Charging Batteries

The rechargeable battery pack must be fully charged before using the DTL-8R-1 Cordless DECT for the first time.



Charge the battery pack without interruption for five to eight hours.

6.1.11 Charging Spare Battery Packs

The DTL-8R-1 Cordless DECT is equipped with a battery charger for charging the spare battery pack.

6.2 Installing the DTL-RPT-1 Cordless DECT Telephone REPEATER

The DTL-RPT-1 repeater lets you extend the coverage area of your cordless DECT telephone system in all directions.



Figure 2-143 Cordless DECT Telephone Repeater DTL-RPT-1

If the repeaters are installed so their coverage area overlaps the coverage area of the base, the base can hand-off calls to the repeaters as the user moves from one coverage area to another. When connected to the repeater, the mobile handset operates the exact same way as it does when connected to the base, and the hand-off from the base to the repeater can be completely invisible to the end user, even during an active call.

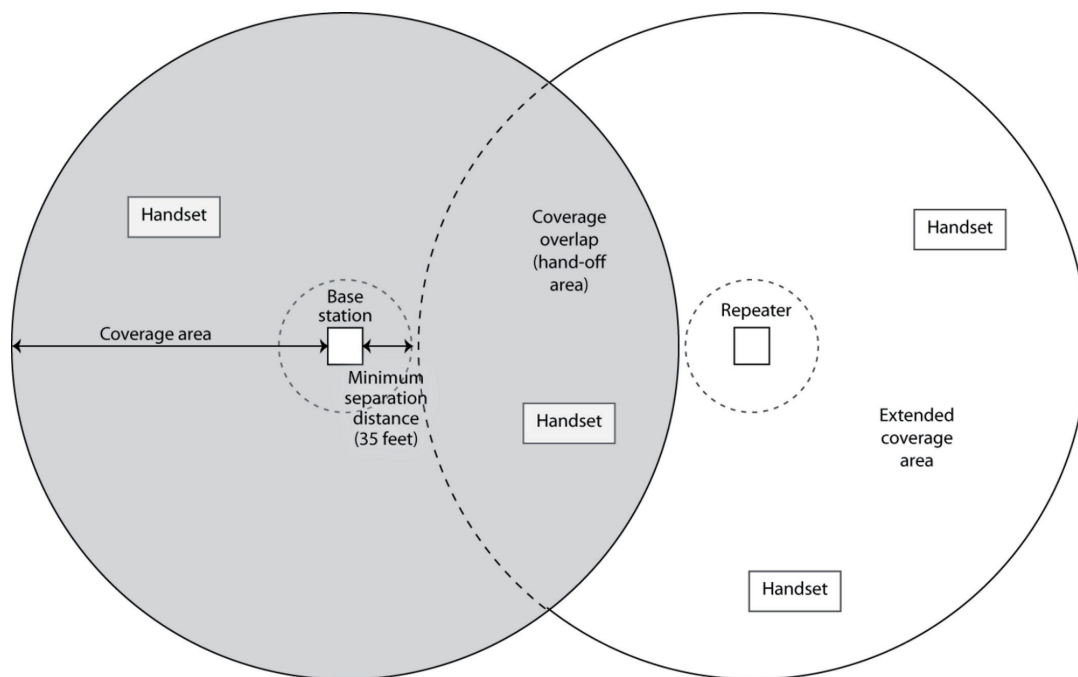


Figure 2-144 Single Repeater Attached to Base

Each base supports up to six repeaters, so you can extend coverage in all directions, including through floors and ceilings:

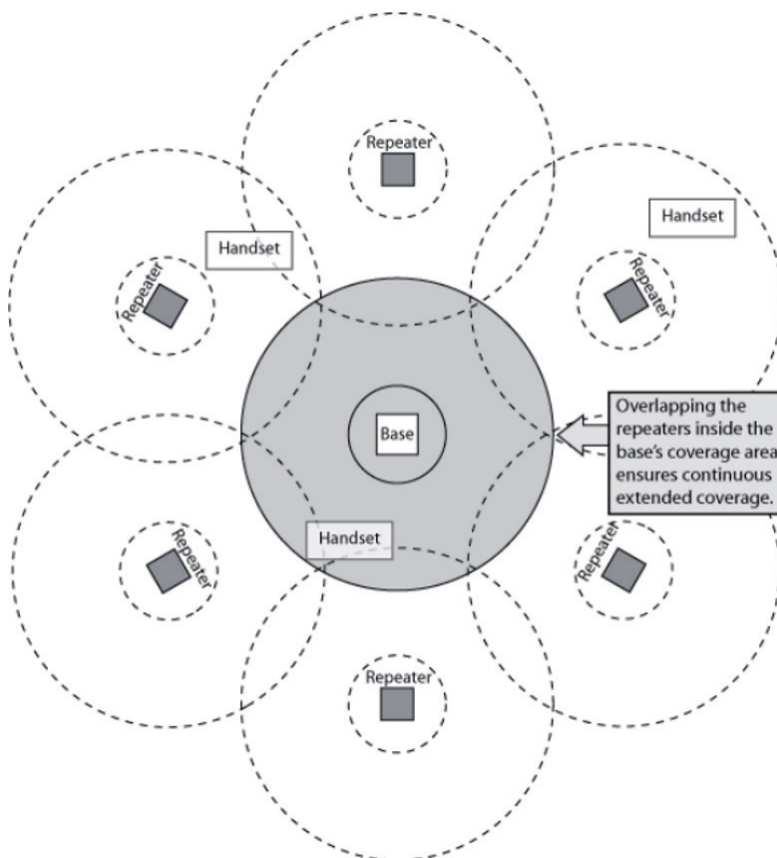


Figure 2-145 Six Repeaters Attached to Base

In addition, the DTL-RPT-1 supports a sequential or "daisy-chain" layout to extend coverage in a single direction. Up to three repeaters can be installed in sequence:

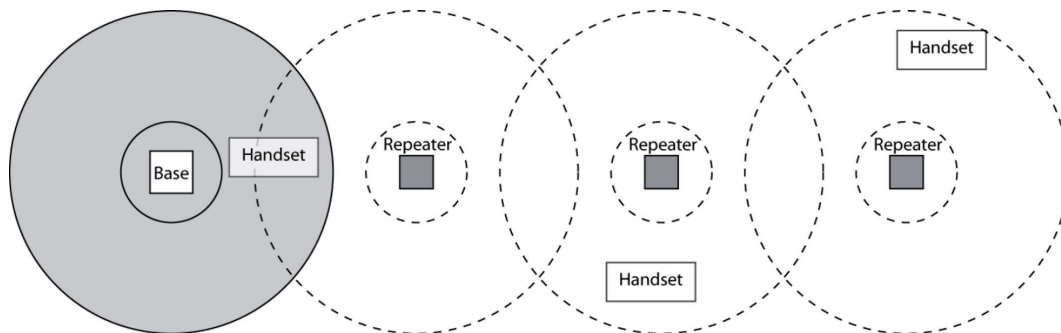


Figure 2-146 Daisy-Chain Layout



For detailed information on daisy-chain layout and configuration, contact your installer or refer to the *DTL-RPT-1 Administrator's Guide*.

6.2.1 Setting Up Your Repeater

Before installing the repeater, you must activate the repeater mode on your base and then register the repeater to the base and any handsets. Before you start the registration process, be sure you have:

- A working base
- A working handset registered to that base
- Any repeaters you want to register to this base (you must complete the registration process separately for each repeater)
- At least one of the AC adapters supplied with the repeaters



Use **ONLY** the power adapter that came with your repeater. A different power adapter may cause an electrical hazard or damage the repeater.

6.2.1.1 Changing the Telephone System PIN

Before you start the registration process, you must reset the system PIN of your telephone to **0000** (consult the manual that came with your base for more information). After you reset the PIN, make sure to register the handset you used back to the base station.

6.2.1.2 Automatic Registration

The repeater seeks out the base with strongest DECT/GAP signal and automatically registers to that base.

1. Make sure the repeater is powered off (i.e., the AC power adapter is not connected).
2. Set the base in registration mode. (Consult the owner's manual that came with your base station for more information.)
3. Use the AC adapter to connect the repeater to a standard 120 V AC outlet. (Do not use a power outlet controlled by a wall switch.) The LED on the repeater flashes briefly, then remains on and steady.



If the LED continues to flash, register the repeater again.

The repeater is now registered to this base and is ready to use.

You can safely disconnect the power and move the repeater to the selected location; the repeater stays registered to the base.

6.2.1.3 Manual Registration

If you are registering more than one repeater to the same base, you must use the manual registration procedure.

1. Connect the repeater to power for 1 ~ 5 seconds and then disconnect it.
2. Reconnect the power to the repeater. The LED on the repeater flashes slowly, indicating the repeater is in registration mode.



The repeater stays in registration mode for five minutes. If you cannot complete the registration in five minutes, repeat the procedure starting with step 1.

3. Set the base in registration mode. (Consult the owner's manual that came with your base station for more information.)
4. The LED on the front of the repeater flashes quickly, with no interruptions.



If the LED has brief interruptions in the flash, you need to reset your telephone system PIN to 0000. (Refer to [Changing the Telephone System PIN on page 2-101.](#))

5. Press the handset TALK key to go off-hook. The LED stops flashing.
6. Use the number pad on the handset to assign a repeater number. Press a number between 2 and 7. Each repeater number can be used only once per base. (These numbers are independent of any handset extension number.)
7. When the repeater accepts the assignment, the LED flashes a corresponding number of times.
8. Press the STAR key to confirm the registration, and then the END key. The LED goes off for two seconds, flashes for a brief moment, and then remains on steady.

The repeater is now registered to this base station. You can repeat the procedure with each repeater that you want to register to this base, or you can disconnect the power and move the repeater to the selected location.



The repeater remains registered even if you disconnect the AC adapter or there is a power failure. If you want to clear the registration (for example, so you can register to a different base), you must reset the repeater.

6.2.1.4 Registration for a Daisy-Chain Layout

Registering the repeaters to operate in a daisy-chain or sequential layout requires network administrator access and configuration software. Contact your installer or refer to the DTL-RPT-1 Administrator's Guide (provided with the configuration software) for more information.

6.2.1.5 Registering to a Different Base

After the repeater is registered, you must reset it before you can change the registration to a different base. If you want to reset the repeater and clear its registration, follow the steps below:

1. Disconnect the power.
2. Connect the power for one to five seconds, and disconnect it again.
3. Connect the power for 25 ~ 35 seconds.
4. Disconnect the power, and perform the registration procedure with the new base.

6.2.2 Installing the Repeater

6.2.2.1 Finding the Right Location

To get the best operating conditions for the repeater, it is important to place it correctly. Here are a few tips for placing repeaters:

- Place the repeater as high as possible, but at least six feet above the floor.

- Make sure you have good reception from the base.
- Make sure the location is close to a standard 120 V AC power outlet. Never install electrical cords across a traffic area: they can create a trip hazard or become damaged and create a fire or electrical hazard.
- Allow at least 30 feet between repeaters (if you are installing repeaters across multiple floors, remember to allow 30 feet vertically, also).
- Avoid sources of electrical interference, such as hi-fi systems, office equipment or microwave ovens.
- Avoid heat sources and direct sunlight.
- Avoid things that can interfere with radio signals, such as metal doors, thick walls, niches and cupboards.

6.2.2.2 Map the Base Coverage Area

To find the best location for the repeater, you need to determine the base coverage area. Stand near the base and make a call. Walk away from the base with the handset, and make a note where the signal becomes weaker. The optimum location for the repeater is as far from the base as possible while still maintaining a good signal, or just inside the location where the signal became weaker.

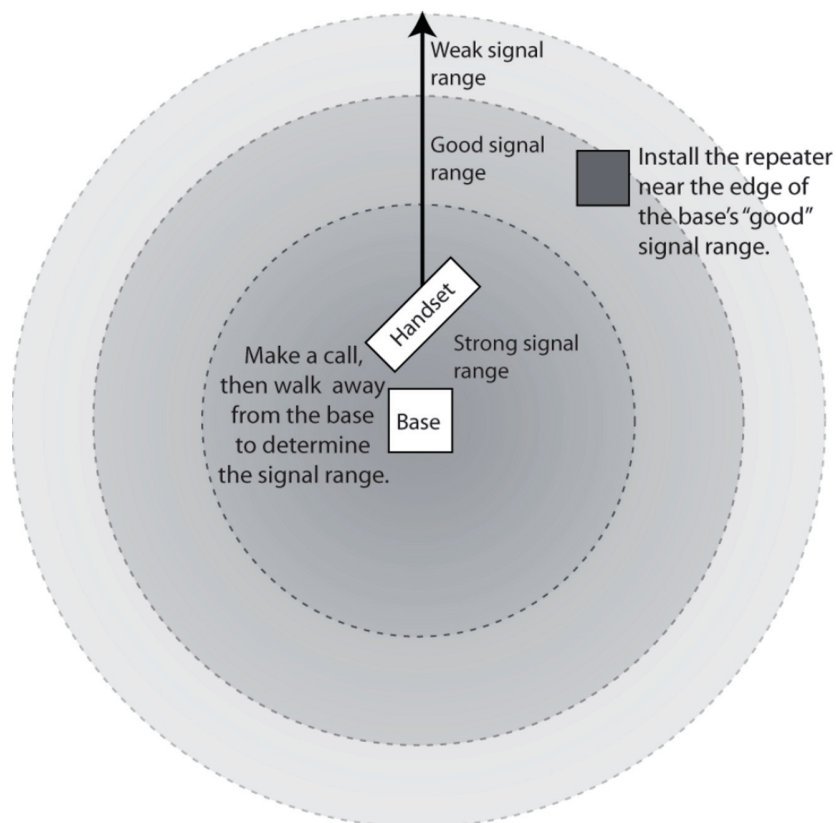


Figure 2-147 Base Coverage Area

6.2.2.3 Test the Location

To test the location, plug the AC adapter into the repeater, then hold the repeater in the place where you plan to mount it. The LED should remain on and steady, indicating that the repeater has a good signal from the base.

If the LED flashes, the repeater is not getting a good signal. The repeater may be too far away from the base, there may be interference from electronic devices, or the signal might be blocked by thick walls or metal objects. Try moving the repeater to another location.

6.2.2.4 Installing the Repeater



Be sure the wall material can hold the weight of the repeater. Never install a repeater in damaged or decaying wall material.

1. Hold the repeater in its final location, and mark the center of the top edge.
2. From the edge mark, measure down approximately 1-1/2 inches, and mark the screw location.
3. At the screw location, use a 3/16ths drill bit to make a pilot hole approximately one inch deep.
4. Place the wall anchor into the pilot hole and tap it gently with a hammer until the anchor is flush with the wall.
5. Insert the mounting screw into the anchor, leaving approximately 1/4 inch space between the screw head and the wall.
6. Put the repeater over the screw head and slide it down into place.
7. Connect the repeater to the 120V AC power outlet.

6.2.2.5 Multiple Repeater Systems

You can register up to six repeaters to one base as long as the repeaters are a minimum of 30 feet apart. **Remember** that the signal can cross through walls and floors.

Incorrect Installation

Figure 2-148 [Incorrect Installation on page 2-104](#) illustrates repeaters that are incorrectly installed.

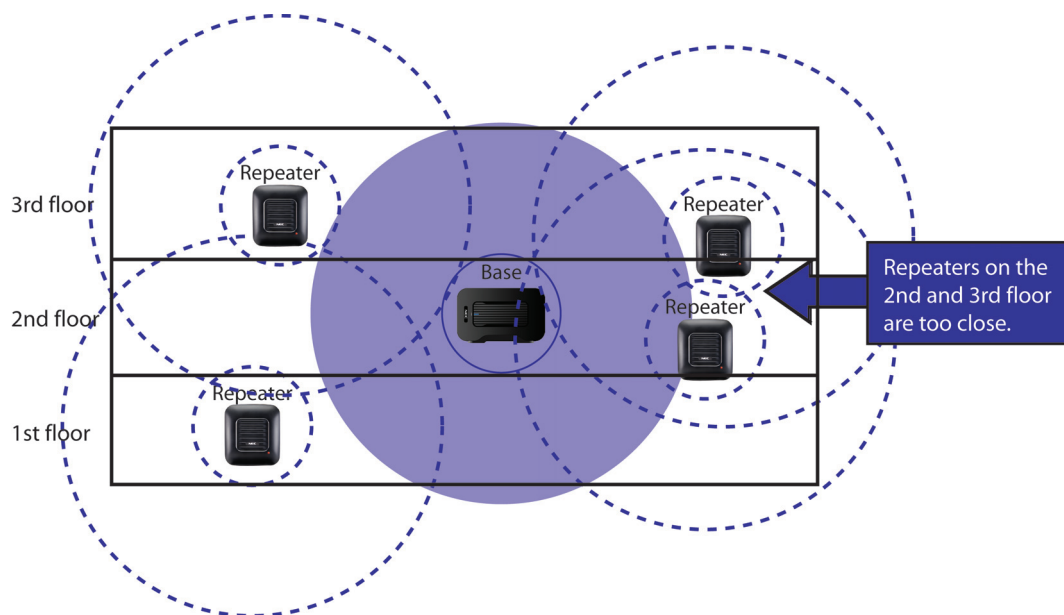


Figure 2-148 Incorrect Installation

Correct Installation

Figure 2-149 [Base Coverage Area on page 2-105](#) illustrates repeaters that are correctly installed.

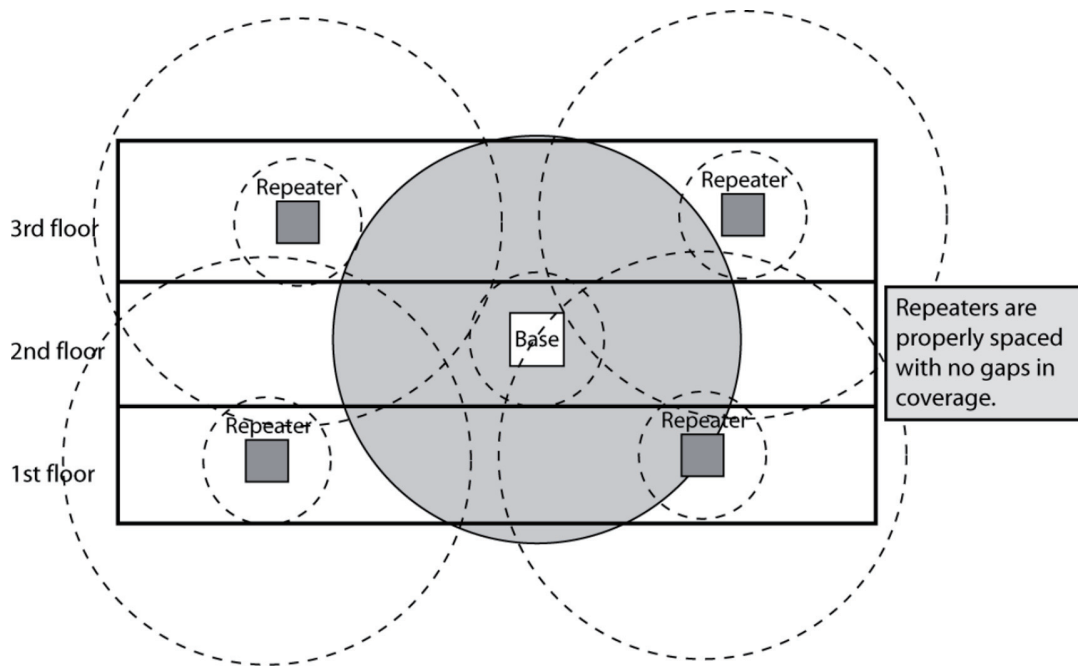


Figure 2-149 Base Coverage Area

Daisy-Chain Installation

You can combine normal and daisy-chain connections to create a wide variety of coverage configurations, as long as you have no more than six repeaters per base unit.

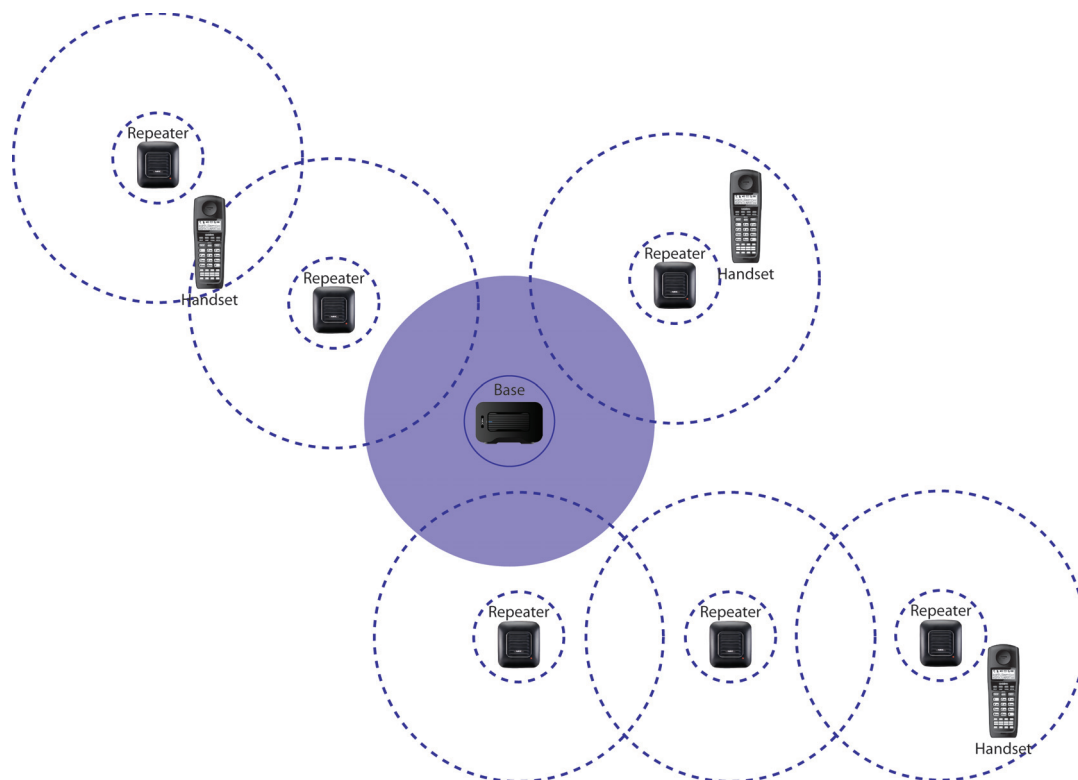


Figure 2-150 Daisy-Chain Layout

6.2.3 Troubleshooting Chart

To review common problems and possible solutions, refer to the Cordless DECT Repeater Guide DTL-RPT-1.

6.2.4 Turning on the Verification Tone

To activate the verification tone to aid in troubleshooting installation problems, refer to the Cordless DECT Repeater Guide DTL-RPT-1.

6.2.5 Maintenance

For user maintenance of the repeater, refer to the Cordless DECT Repeater Guide DTL-RPT-1.

6.3 Installing the DTL-RPT-2 Cordless DECT Telephone REPEATER



Do not mix DTL-RPT-1 and DTL-RPT-2 repeaters on the same Cordless DECT Terminal (DTL-8R-1).

The DTL-RPT-2 Repeater repeater lets you extend the coverage area of your D^{term} DECT Cordless telephone system in all directions, including up and down. If the repeaters are installed so their coverage area overlaps the coverage area of the base, the base can hand-off calls to the repeaters as the user moves from one coverage area to another. When connected to the repeater, the mobile handset operates the exact same way as it does when connected to the base, and the hand-off from the base to the repeater can be completely invisible to the end user, even during an active call.

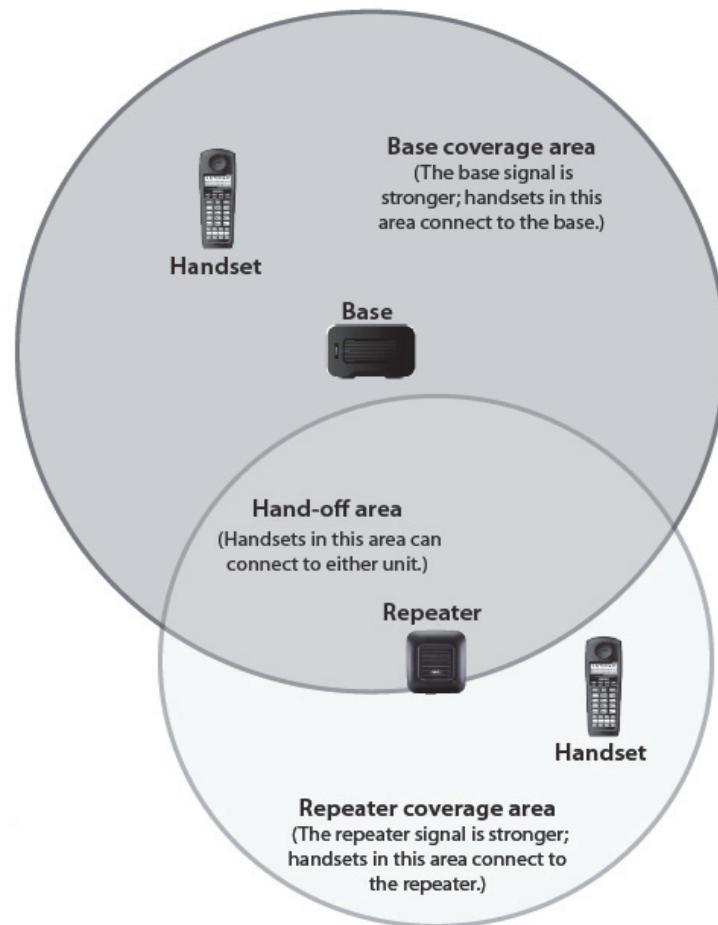


Figure 2-151 Single Repeater Attached to Base

6.3.1 Configurations

Each base supports up to six repeaters, so you can extend coverage in all directions, including through floors and ceilings.

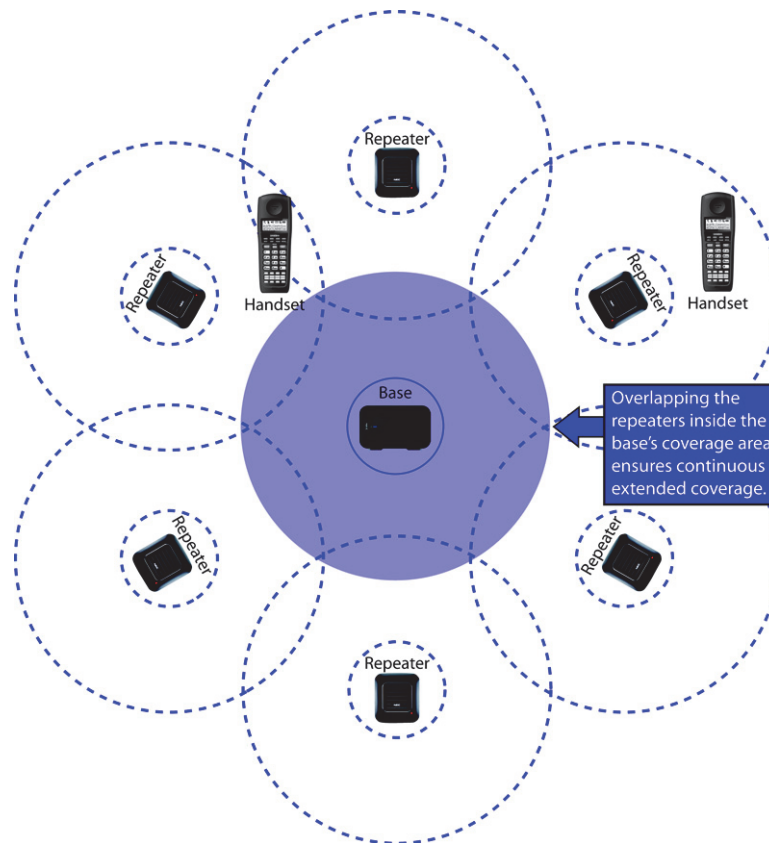


Figure 2-152 Six Repeaters Attached to Base

In addition, the DTL-RPT-2 Repeater supports a sequential or “daisy chain” layout to extend coverage in a single direction. Up to three repeaters can be installed in sequence.

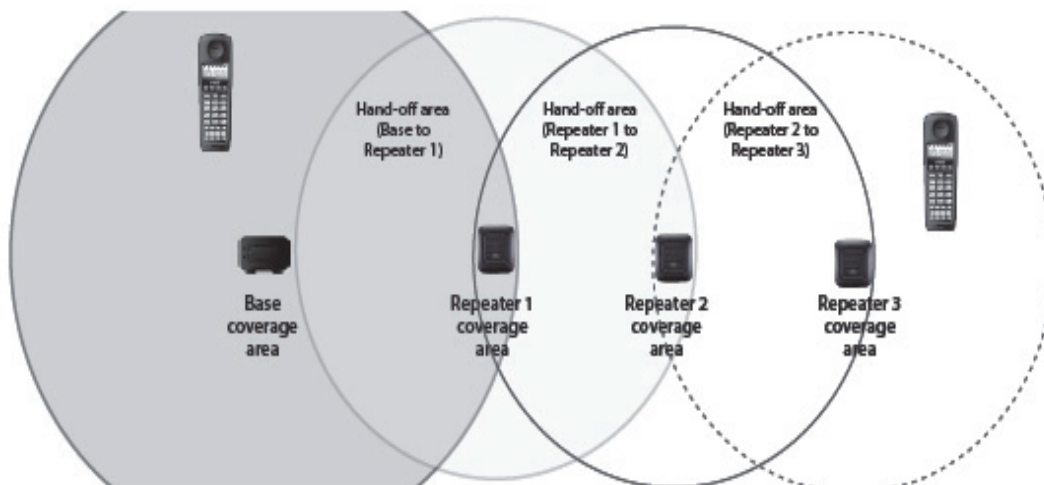


Figure 2-153 Daisy-Chain Layout

When a repeater powers on, it searches for signals from the base and any other repeaters registered to the same base. The repeater will automatically connect to the strongest available signal. You can combine “star” and “daisy chain” layouts to create a wide variety of coverage configurations, as long as you have no more than six repeaters per base unit.

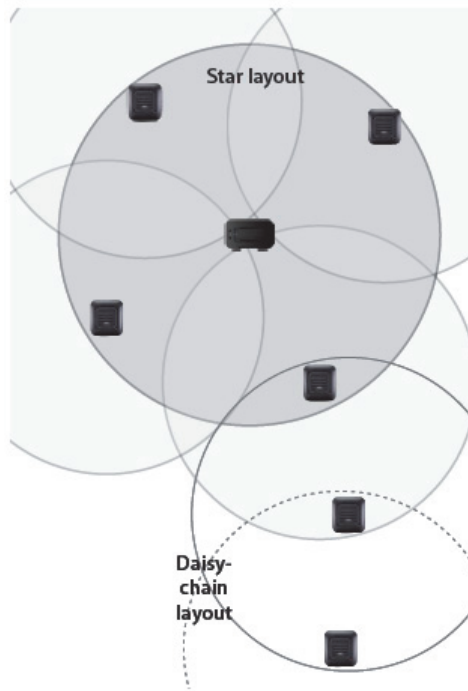




Figure 2-154 Combo Star and Daisy-Chain Layout

6.3.2 Setting Up Your Repeater

Setting up the repeater involves four basic steps:

1. Install the AC adapter on the repeater unit.
2. Register the repeater to the base.
3. Position the repeater at the proper installation site.
4. Install the repeater in its final location.

 Use *ONLY* the power adapter that came with your repeater. A different power adapter may cause an electrical hazard or damage the repeater.

 You can register up to six repeaters to a base. Repeat these steps as needed.

These procedures refer to items on the back of the DTL-RPT-2 Repeater:

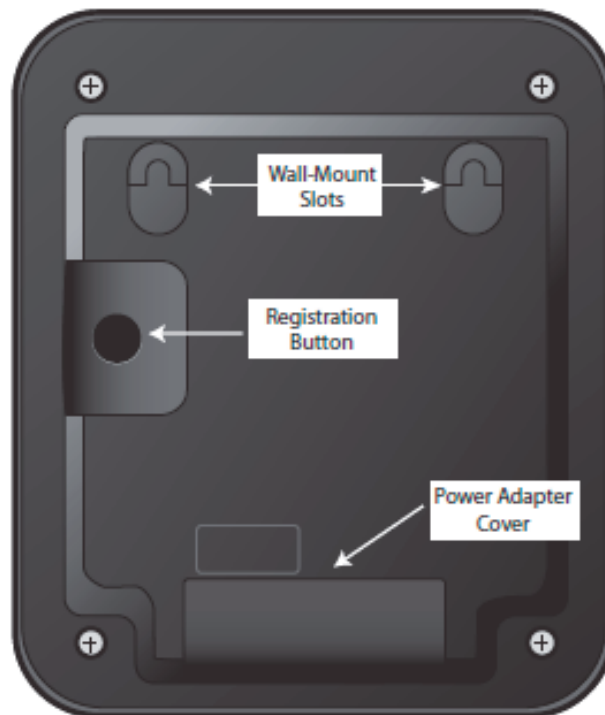


Figure 2-155 Back View of the DTL-RPT-2 Repeater

During registration, the LED on the front of the repeater will blink. The table explains what the LED blink patterns indicate.

Table 2-38 Repeater LED Patterns

State	Meaning
Steady On	The repeater is registered to a base and has a good signal from that base (or another repeater registered to that base).
Slow blink (one blink per second)	Standby mode. The repeater is not registered or cannot be connected to the registered base.
Flicker (2 rapid blinks per second)	The repeater is in registration mode (it is looking for a base to register to).

6.3.3 Installing The AC Adapter

1. Using both thumbs, press down on the raised ridges of the adapter cover on the repeater until you hear a click.

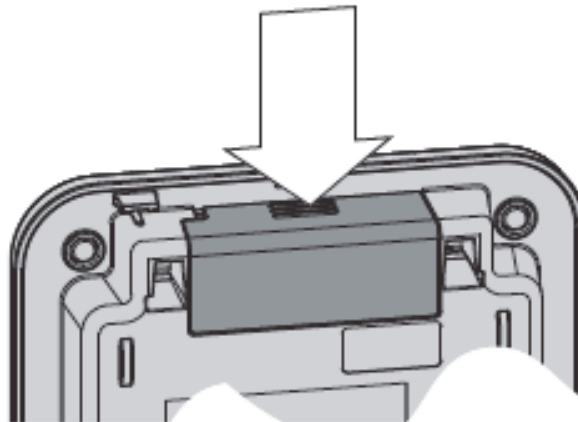


Figure 2-156 Removing the Adapter Cover

2. Being careful not to angle the cover, gently pull to remove it.
3. Insert the AC adapter connector into the yellow adapter opening. Thread the cord according to the illustration.

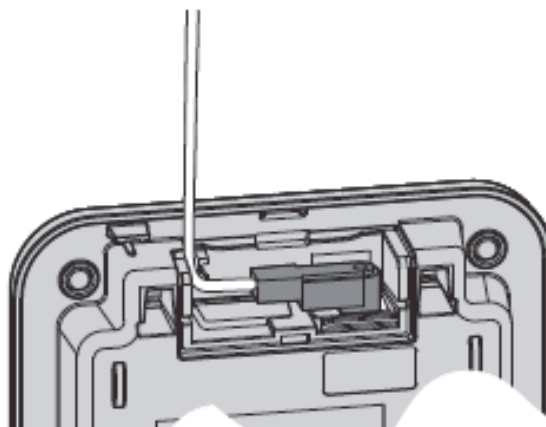



Figure 2-157 Threading the AC Adapter Cord

4. Carefully replace the cover, and press until you hear it click. Do not angle it as you replace it.
5. Use the AC adapter to connect the repeater to a standard 120 V AC outlet. (Do not use an outlet controlled by a wall switch!) The LED on the repeater flashes briefly, then remains on and steady.

6.3.4 Activate Registration Mode On Base

You need to activate registration mode on your base before you can register your repeater to it. Refer to the Owner's Manual for your base unit for registration instructions.

 *You only have to activate registration on the base once, regardless of how many repeaters you want to register (up to 6).*


6.3.4.1 Register Repeater to Base

You can register up to six repeaters to each base. Repeat these steps as needed for each repeater. The repeater seeks out the base with strongest DECT/GAP signal and automatically registers to that

base. Make sure no other bases in range are in registration mode. If more than one base is in registration mode at the same time, you cannot control which base the repeaters register to.

Before you start the registration process, be sure you have:

- A working base
- A working handset registered to that base
- Any repeaters you want to register to that base (you must complete the registration process separately for each repeater).
- At least one of the AC adapters supplied with the repeaters. If you have multiple repeaters to register, you can power up one repeater, register it, power it off, and then use that AC adapter for the next repeater. The repeater remains registered to the base, even if power is disconnected.

 Use *ONLY* the power adapter that came with the repeater. A different adapter may cause an electrical hazard, or damage the repeater.

6.3.4.2 Registration

1. Press and hold the registration button on the base until the Power LED on the base begins to blink.
2. On the back of the repeater, press and hold the registration button until the repeater LED on the front settles into a slow blinking pattern. The repeater is now in registration mode.
3. Release the button on the repeater and wait for the LEDs on the repeater and base to stop blinking and remain steady on (this can take about 60 seconds).

If the LED...	Try...
Continues to flash	Registering the repeater again.
Does not turn on (no power to unit)	<ul style="list-style-type: none"> • Disconnect the repeater's AC adapter and wait about 10 seconds. Reconnect the adapter and try these procedures again. • Checking that only one repeater is in registration mode. Only one repeater can be registered at a time. • Plugging the adapter into a different outlet.

4. The repeater is now registered to this base and is ready to use. You can safely disconnect the power and move the repeater to the selected location.; the repeater will stay registered to the base even if you disconnect the AC adapter, or there is a power failure.

6.3.4.3 Changing Registration

To change the registration (register the repeater to a different base), just register the repeater to the new base. The repeater automatically erases the link to the old base when it registers to the new one.

6.3.5 Positioning the Repeater(s)

To get the best operating conditions for the repeater, it is important to place it correctly. Here are a few tips for placing repeaters:


- Place the repeater as high as possible, but **at least 6 feet off** the ground.
- Make sure you have good reception from the base.
- Make sure the location is close to a standard 120 V AC power outlet. Never install electrical cords across a traffic area: they can create a trip hazard or become damaged and create a fire or electrical hazard.
- Allow **at least 35 feet** between repeaters (if you are installing repeaters across multiple floors, remember to allow 35 feet **vertically**, also).
- Avoid sources of electrical interference, such as hi-fi systems, office equipment or microwave ovens.
- Avoid heat sources and direct sunlight.

- Avoid things that can interfere with radio signals, such as metal doors, thick walls, niches and cupboards.

6.3.5.1 Map the Base's Coverage Area

To find the best location for the repeater, you need to determine the base coverage area:

1. Stand near the base and make a call on the handset that is registered to that base.
2. Continue the call and carry the handset away from the base. Make sure you travel at least 35 feet (about 10 meters) away from the base.
3. Make a note where you begin hearing noise on the line (the signal is getting weaker). The best location for the repeater is as far from the base as possible while still maintaining a good signal, or just inside the location where the noise became noticeable.

 *Make sure the repeater is at least 35 feet away from any bases or any other repeaters (no matter which base they are registered to).*

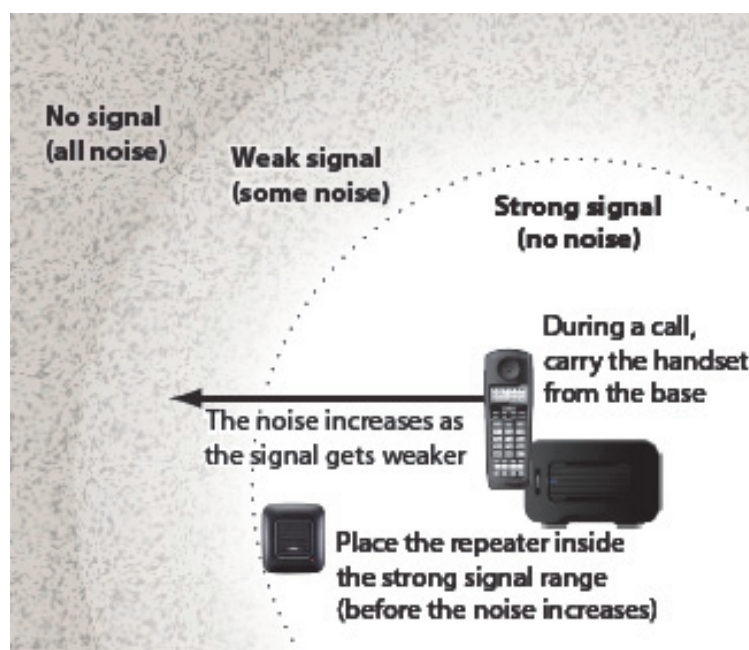


Figure 2-158 Mapping the Base's Coverage Area

6.3.5.2 Test the Location

To test the location, plug the AC adapter into the repeater, then hold the repeater in the place where you plan to mount it. The LED should remain on and steady, indicating that the repeater has a good signal from the base.

If the LED flashes, the repeater is not getting a good signal. The repeater may be too far away from the base, there may be interference from electronic devices, or the signal might be blocked by thick walls or metal objects. Try moving the repeater to another location.

6.3.5.3 Daisy-chaining Repeaters

To install repeaters in a daisy chain layout, you need to find the coverage area of each repeater.

1. Stand near Repeater 1 and make a call on the handset.
2. Continue the call and carry the handset away from Repeater 1, just as you did to determine the coverage area for the base.

3. Make a note where you begin to hear noise on the line (the signal is getting weaker). The best location for Repeater 2 is as far from Repeater 1 as possible while still maintaining a good signal.
4. Repeat the process with Repeater 3, if necessary.

6.3.5.4 Multiple Repeater Systems

You can register up to six repeaters to one base as long as the repeaters are a minimum of 35 feet apart. Remember the signal can cross through walls and floors. [Figure 2-159 Incorrect Installation on page 2-114](#) illustrates repeaters that have been incorrectly installed.

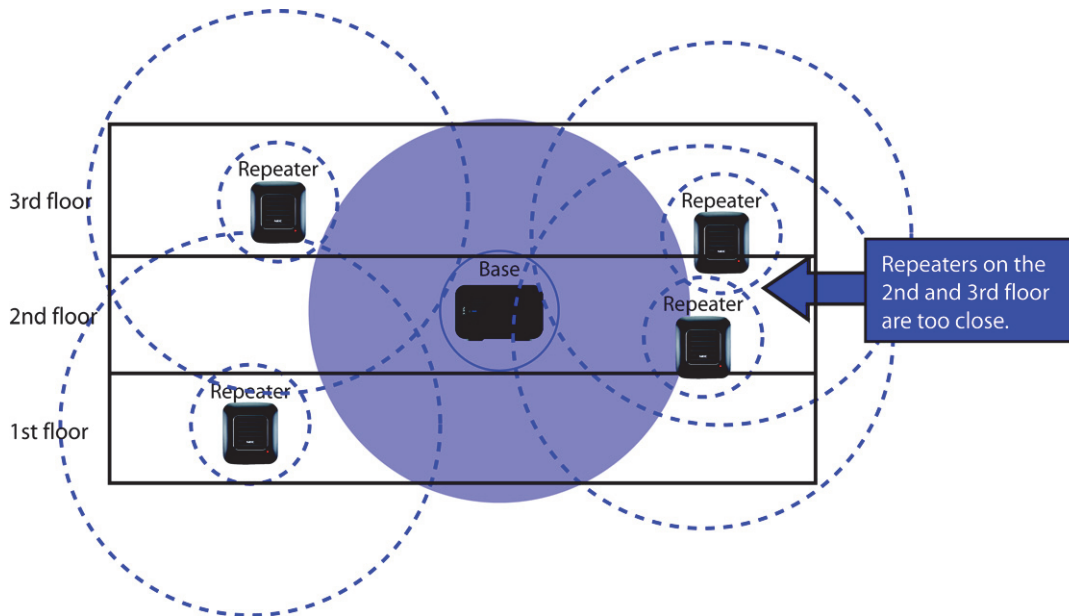


Figure 2-159 Incorrect Installation

[Figure 2-160 Correct Repeater Installation on page 2-114](#) illustrates repeaters that have been correctly installed.

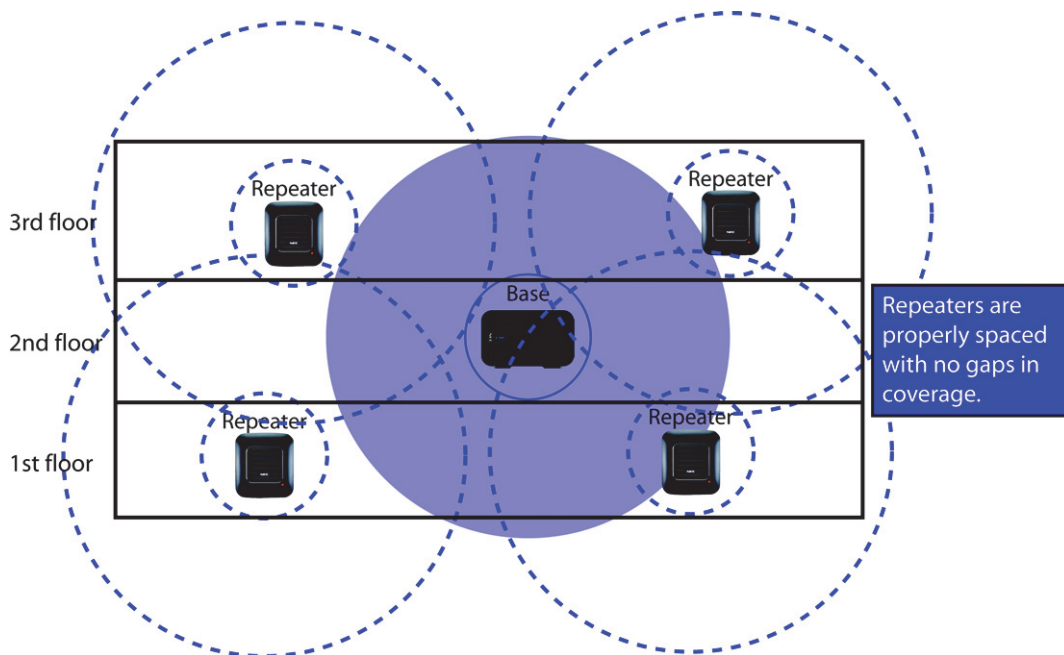


Figure 2-160 Correct Repeater Installation

6.3.6 Installing The Repeater



Be sure the wall material can hold the weight of the repeater. Never install a repeater in damaged or decaying wall material.

1. Hold the repeater in its final location, and mark the location of one of the two wall slots along the top of the repeater.
2. From that mark, measure down approximately 1-1/2 inches (about 38mm), and mark the screw location.
3. Measure over 2-3/8th inches (about 60mm) and mark the second screw location.
4. At the screw location, use a 3/16ths drill bit to make a pilot hole approximately one inch deep.
5. Place the wall anchor into the pilot hole and tap it gently with a hammer until the anchor is flush with the wall.
6. Insert the mounting screw into the anchor, leaving approximately 1/4 inch space between the screw head and the wall.
7. Repeat steps 4~6 for the second mounting screw.
8. Place the repeater over the screw heads and slide it down into place.
9. Connect the repeater to the 120 V AC power outlet.

6.3.7 Troubleshooting Chart

To review common problems and possible solutions, refer to the Cordless DECT Repeater Guide DTL-RPT-2.

6.3.8 Maintenance

For user maintenance of the repeater, refer to the Cordless DECT Repeater Guide DTL-RPT-2.

6.4 Install the DTZ-8R-1 CORDLESS DECT Telephone

The DTZ-8R-1 is a cordless telephone that is adapted for NEC SL2100 System. It is designed for use in the office environment. When the phone is connected to the SL2100, it must have a SL2100 expansion board inside the base station.



- ***A handset and wired phone cannot be used at the same time.***
- ***The handset and base station must have the original ID that is written on each unit at the factory.***
- ***Some digital PBX expansion boards require a wired telephone to make the call.***



Figure 2-161 Cordless DECT (DTZ-8R-1)

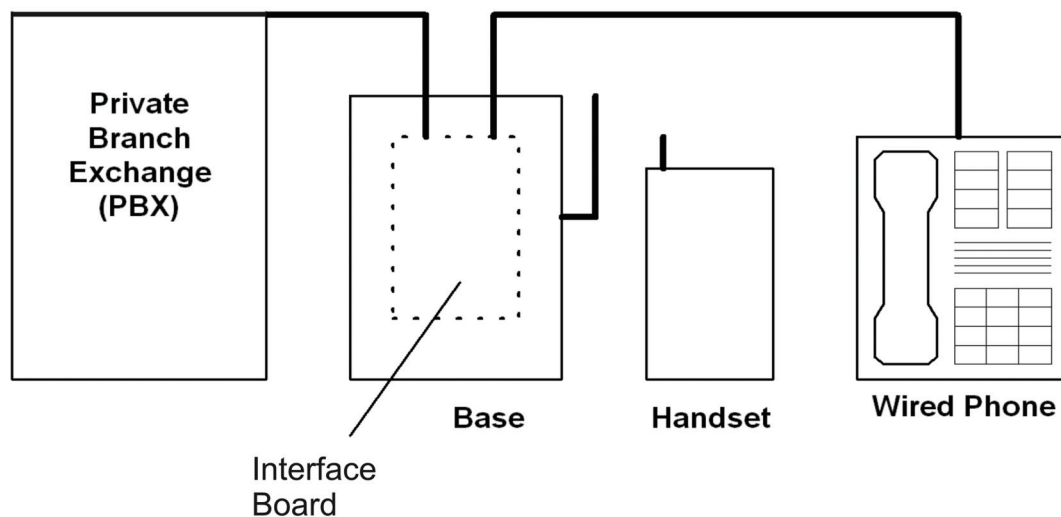


Figure 2-162 System Overview

6.4.1 Selecting a Location

Select a location for the DTZ-8R-1 Cordless DECT to avoid excessive heat or humidity. The base unit of the DTZ-8R-1 Cordless DECT can be placed on a desk or tabletop near a standard 120V AC outlet and telephone line jack. The base unit can also be mounted on a standard wall plate using the wall mount adapter. Keep the base unit and handset away from sources of electrical noise (motors, fluorescent lighting, computers, PC monitor).

6.4.2 Installation Precautions

To ensure optimum performance follow these guidelines.

- Base units must be placed at least 20 feet apart.
- Always place the base unit on top of a desk or on higher shelves. Avoid locations surrounded by metal surfaces.
- Place the base away from any electrical component such as a PC, monitor and other telephone.

6.4.3 Connecting the Telephone Cords

When connecting the telephone cords, observe the following precautions.



- *Never install telephone wiring during a lightning storm.*
- *Never touch bare telephone wires or terminals unless the telephone line is disconnected at the network interface.*
- *Use caution when installing or modifying telephone lines.*

To connect the telephone cords:

1. Connect one line cord from SL2100 digital station port to the Line In connector on the DTZ-8R-1 Cordless DECT base unit. Connect another line cord from the Line Out connector to a qualified digital multiline telephone.

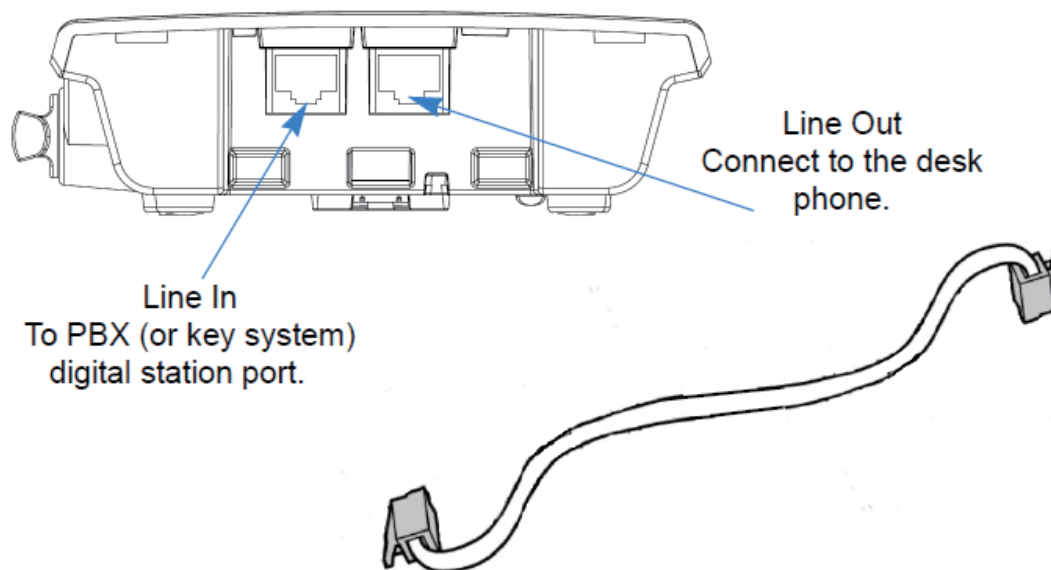


Figure 2-163 Connecting Telephone Cords



Do not connect the DTZ-8R-1 line cord directly to SL2100 station board as the DTZ-8R-1 will not function. Connect the line cord to the jack with a single pair connected back to one digital station port.

6.4.4 Applying Power to the Charging Unit

The unique design of the telephone allows the user to place the handset in the charging unit with or without the belt clip attached.

Connect the AC adapter with the green tip to the charging unit and to a suitable AC power source. The battery pack is charged automatically when the handset is placed on the charger.

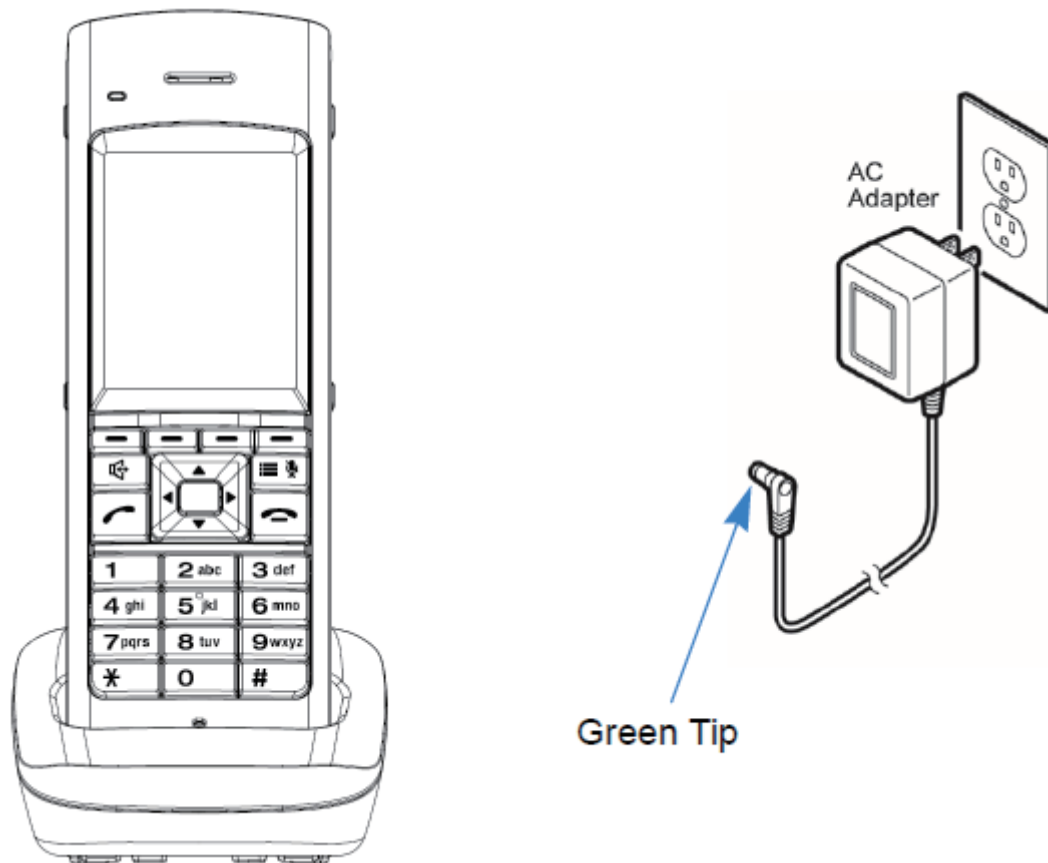


Figure 2-164 Applying Power to the Charging Unit



Use only the supplied AC adapter for the charging unit.



Route the power cord where it can not create a trip hazard, or where it could become chafed and create a fire or other electrical hazards.

6.4.5 Mounting the Base to a Standard Wall Plate

The DTZ-8R-1 does not support the Wall Plate mount.

6.4.6 Mounting the Base Directly to the Wall

Before mounting the telephone, consider the following:

- Select a location away from electrical cables, pipes, or other items behind the mounting location that could cause a hazard when inserting screws into the wall.
 - The location must be near a 120Vac power outlet so that the AC power adapter can reach.
 - Also consider proximity to the PBX (key system) so that the telephone line cord will not be excessively long.
- Make sure the wall material can support the weight of the base unit.
- Use #10 screws with anchoring devices suitable for the wall material where the base unit will be placed.

To mount the telephone:

1. Insert two mounting screws 3-15/16 inches apart. Allow about 3/16 of an inch between the wall and screw heads for mounting the telephone.

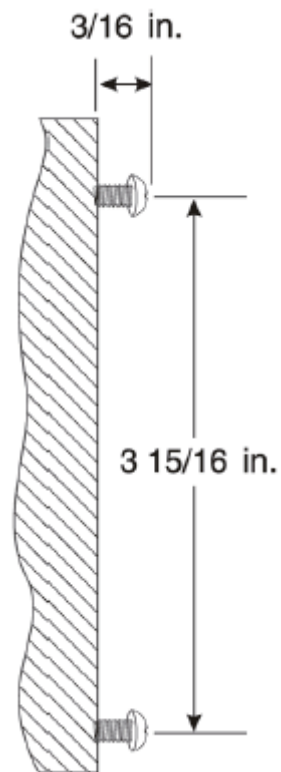


Figure 2-165 Inserting Screws into the Wall for Wall Mounting the Telephone

2. Plug the AC adapter (yellow tip) into the base unit, and route the cord through the molded channel on the back of the base unit.
3. Plug one end of the short telephone cord (locally supplied) in the **LINE** jack on the base unit. If an NEC multiline (wired) telephone will be used, connect a line cord from the **LINE OUT** jack on the base unit to the multiline telephone.

4. Place the base unit on the posts of the wall screws and push down until it is firmly seated.

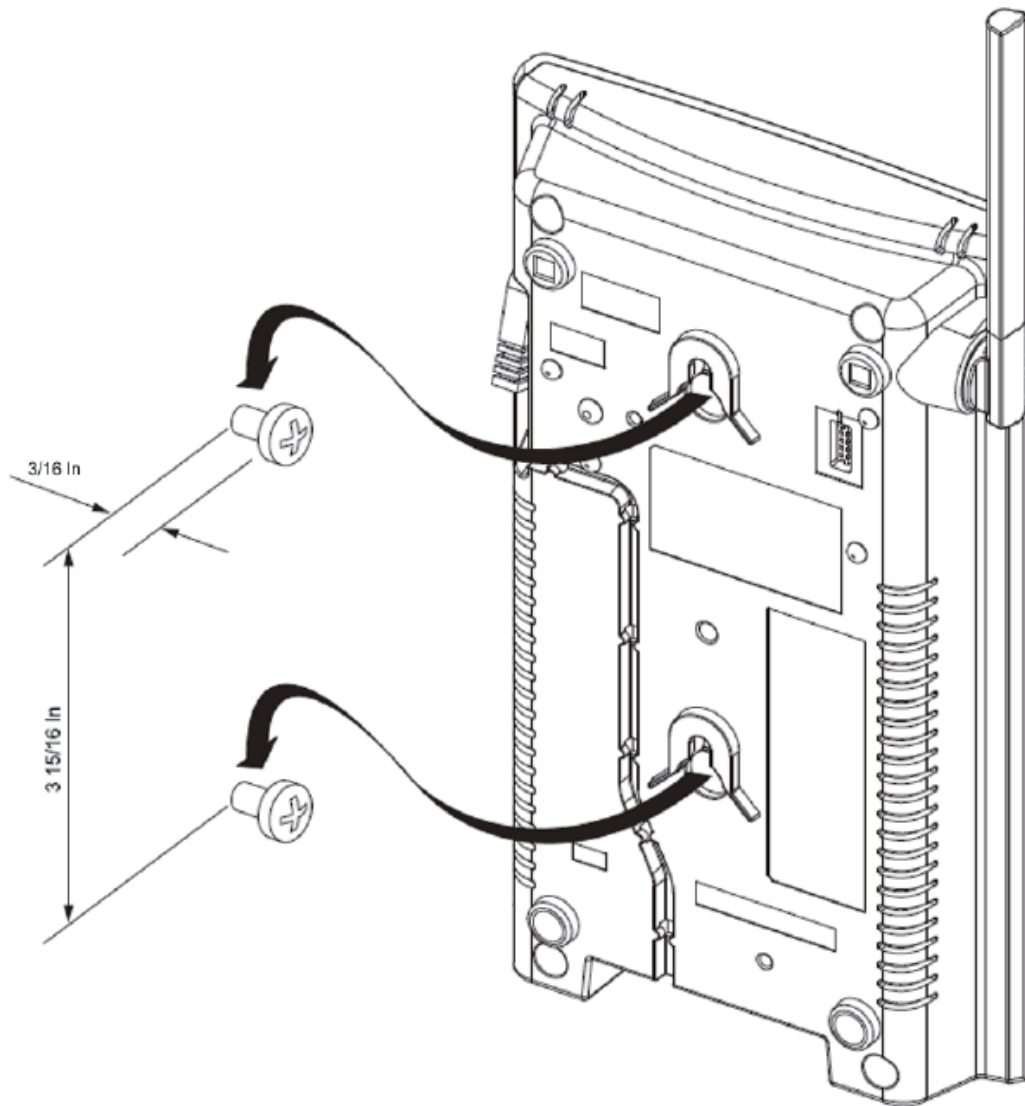


Figure 2-166 Attaching Base Directly to Wall

5. Plug the other end of the short telephone cord into a telephone wall jack.
6. Plug the AC adapter into a standard 120 Vac wall outlet.



Do not use an outlet controlled by a wall switch.

6.4.7 Attaching and Removing the Belt Clip

A belt clip can be used to attach the handset to a belt or pocket for convenient portability.

1. Slide the clip into the tab slots. Press firmly until it snaps into place. The belt clip fits snugly onto the handset.

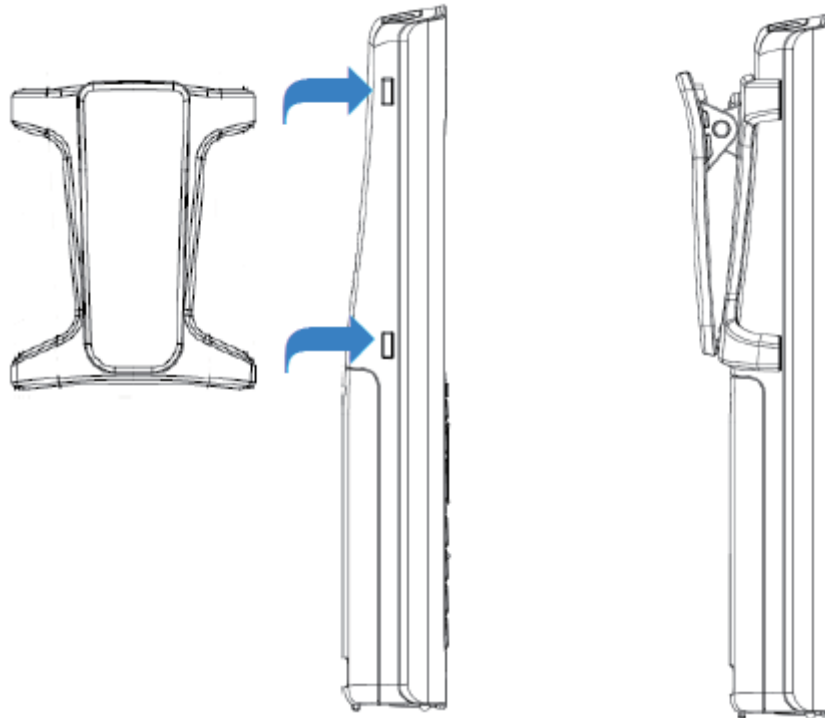


Figure 2-167 Attaching the Belt Clip to the Handset

2. To remove the clip, press the retaining clip in toward the belt clip blade and slide the clip up at the same time.

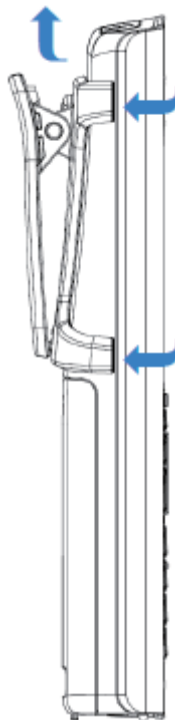


Figure 2-168 Removing the Belt Clip

6.4.8 Installing the Handset Battery Pack

Before installing batteries, refer to Dterm® Cordless DECT Owner's Manual DTZ-8R-1 Specifications and Battery Safety section. It is important to follow safety regulations when handling batteries.

1. Remove the battery cover by pressing the latch and sliding the cover down and off of the handset.

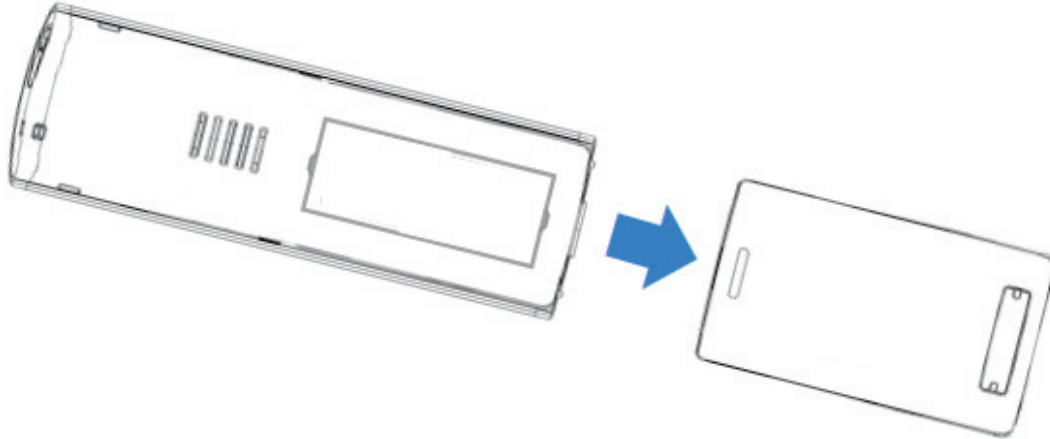


Figure 2-169 Removing the Battery Cover

2. Install the two AAA batteries (AAA Ni-MH, 1.2 V, 900 mAh re-chargeable batteries), observing the polarity orientation.



Batteries must be the same size and type (AAA Ni-MH, 1.2 V, 900 mAh re-chargeable batteries). Use of other battery types may be hazardous and will void the product warranty.

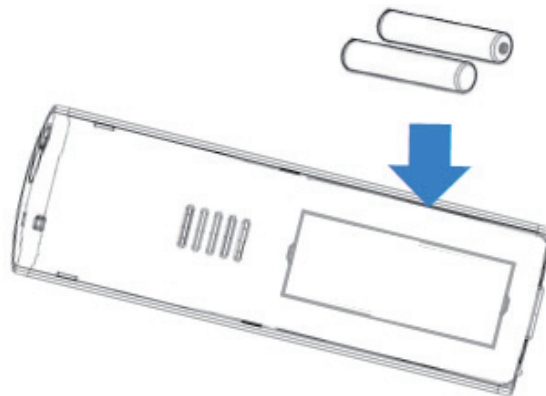


Figure 2-170 Installing the Batteries

3. Replace the cover and slide it up until it latches onto the handset.

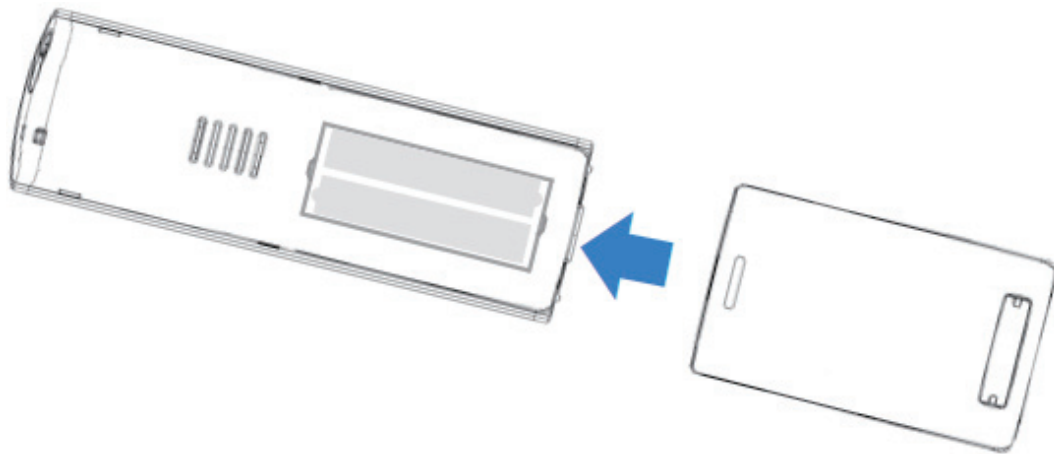


Figure 2-171 Replacing the Battery Cover

6.4.9 Charging the Handset Batteries

The rechargeable battery pack must be fully charged before using the handset for the first time.



Charge the battery pack without interruption for at least 10 hours.

1. Place the handset in the charging unit.
2. Make sure the **Handset Charging** LED indicator lights. If the **Handset Charging** LED does not come on, check to see if the AC adapter is plugged in and that the handset is making good contact with the charging contacts on the charging unit.



The Handset Charging LED turns blue during and after charging the handset with the battery.

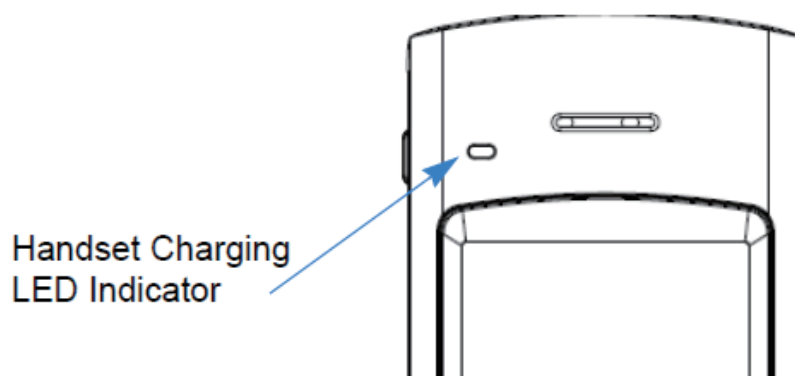


Figure 2-172 Handset Charging LED Indicator

6.5 Installing the ML440 and AP20 Wireless DECT Telephone

This section outlines the steps for connecting and mounting the base station, charging the battery, and powering on the handset.

The following topics are included in this section:

- [Connecting the Base Station on page 2-124](#)
- [Wall Mounting the Base Station on page 2-125](#)
- [Handset and Charger on page 2-126](#)

6.5.1 Connecting the Base Station

Figure 2-173 Base Station Front and Back View on page 2-124 provides a front and rear view of the base station.

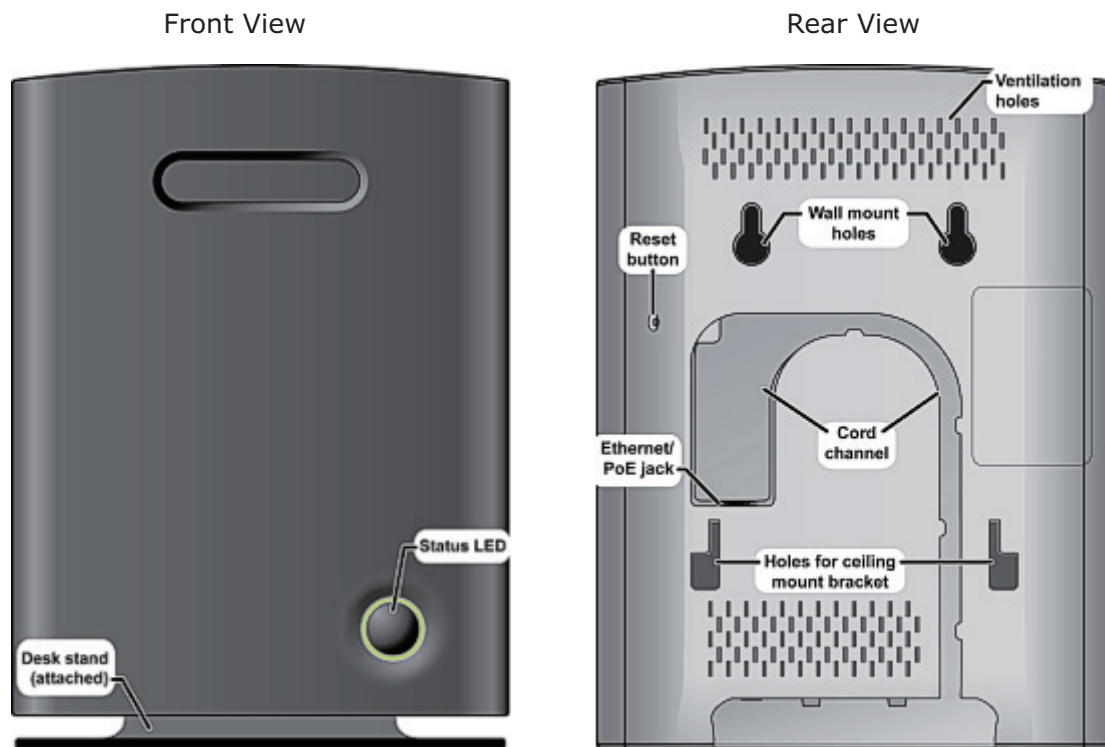



Figure 2-173 Base Station Front and Back View

 *If your network connection does not provide Power Over Ethernet, you will need to order a base station AC adapter and a standard Ethernet-to-PoE adapter. Contact Customer Service.*

Follow the steps below to connect the base station.

1. Connect a standard Ethernet cable (Cat 5 or higher) to the Ethernet/PoE jack on the rear of the base station.

- Route the cable through the channel as shown in [Figure 2-174 Connecting the Base Station on page 2-125](#).

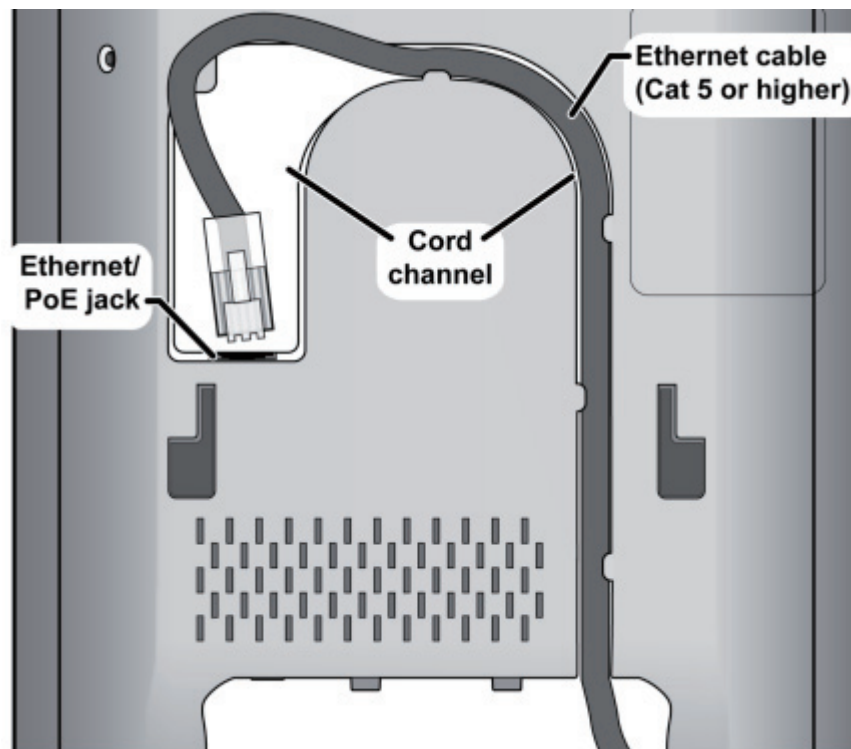


Figure 2-174 Connecting the Base Station

- Connect the other end of the cable to your TCP/IP network. When the base station powers on, the STATUS LED on the front briefly lights orange and then turns off while it initializes and connects to the network. After the base station successfully initializes and connects to the network, the LED lights green and remains steady on. [Table 2-39 Base Station LEDs States and Meanings on page 2-125](#) provides a list of base station LEDs and their meanings.

Table 2-39 Base Station LEDs States and Meanings

Color	State	Meaning
Green	Flickering	Stage in base flash memory rewrite at the end of the base firmware update.
Green	Steady on	All operations normal.
N/A	Off	No power in unit OR initializing and connecting to the network.
Orange	Briefly on	Powering on.
Orange	Flickering	Stage in base flash memory rewrite at the end of the base firmware update.
Red	Blinking	Factory reset warning. A factory reset has been initiated or is in progress.
Red	Blinking	No Ethernet connection available OR handset registration failed.
Red	Flickering	Stage in base flash memory rewrite at the end of the base firmware update.
Red	Steady on	Critical error. Contact technical support.

6.5.2 Wall Mounting the Base Station

Follow the steps below to mount the base station to a wall.

Be sure the wall material can hold the weight of the base.

1. Hold the base in its final location and mark the screw location based on the measurements shown in [Figure 2-175 Base Mounting Dimensions on page 2-126](#).

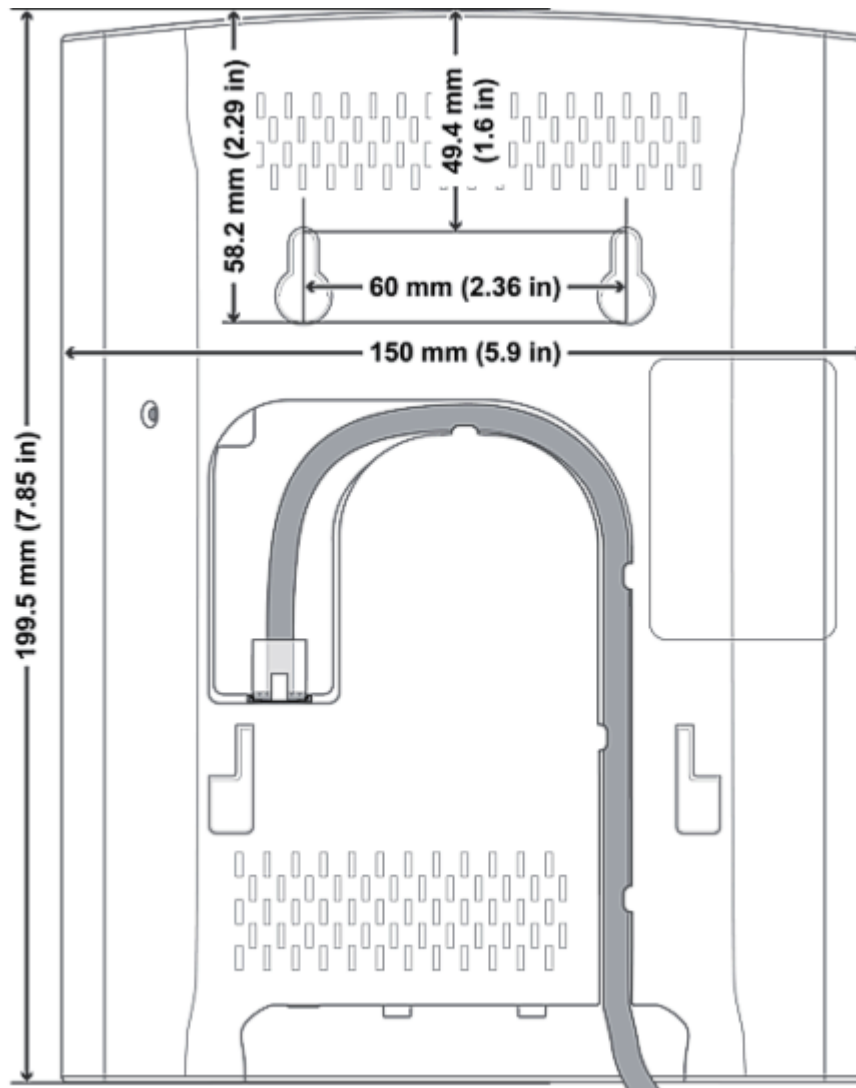


Figure 2-175 Base Mounting Dimensions

2. Insert the appropriate anchors for the wall material.
3. Insert the mounting screws into the anchors, leaving about 1/4 inch of space between the screw head and the wall.
4. Connect the Ethernet cable and route the cord as shown in [Figure 2-175 Base Mounting Dimensions on page 2-126](#).
5. Place the base over the screw heads and slide it down into place.

6.5.3 Handset and Charger

[Figure 2-176 Handset Front View on page 2-127](#) provides a front view of the handset and [Figure 2-177 Charger Top View on page 2-128](#) provides a top view of the charger.



Figure 2-176 Handset Front View

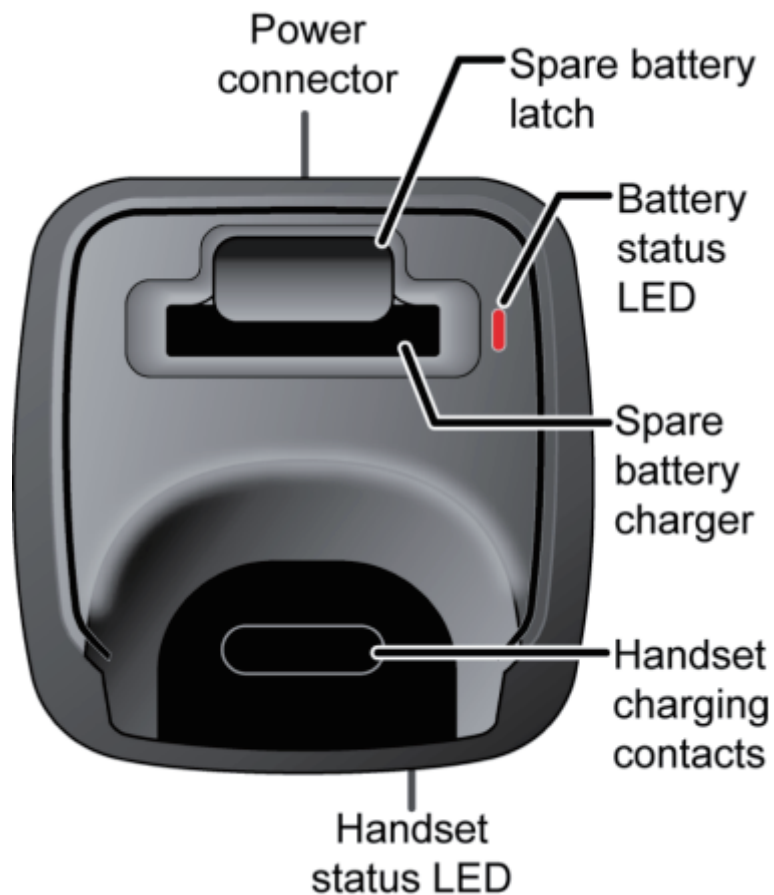


Figure 2-177 Charger Top View

6.5.3.1 Charging the Battery

Follow the steps below to charge the battery.

1. Install the handset battery as shown below in [Figure 2-178 Installing the Handset Battery on page 2-128](#).

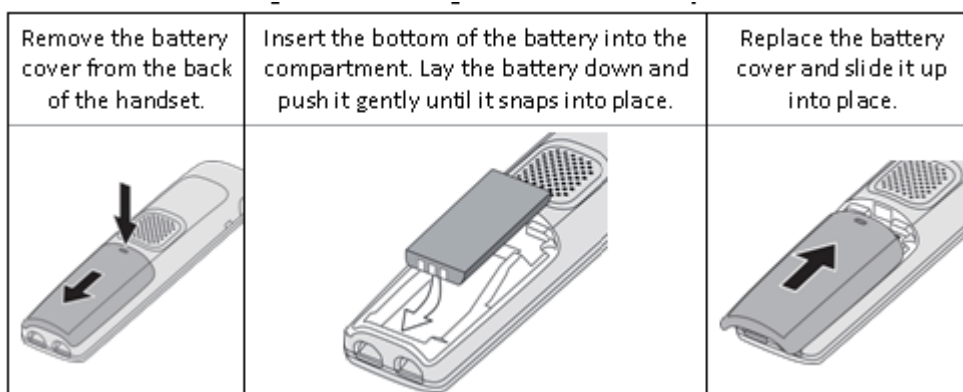


Figure 2-178 Installing the Handset Battery

2. Use the charger AC adapter to connect the charger's AC jack to a standard 120 V AC power outlet.
3. Place the handset in the charger with the display facing forward. The HANDSET STATUS LED should turn on; if it doesn't, reseal the handset or try plugging the AC adapter into a different outlet.

4. Place the spare battery (if available) in the back section of the charger; the BATTERY STATUS LED should turn on. (Pull the battery latch back slightly to fit the battery in the slot.) See [Figure 2-179 Inserting Handset into the Charger on page 2-129](#).

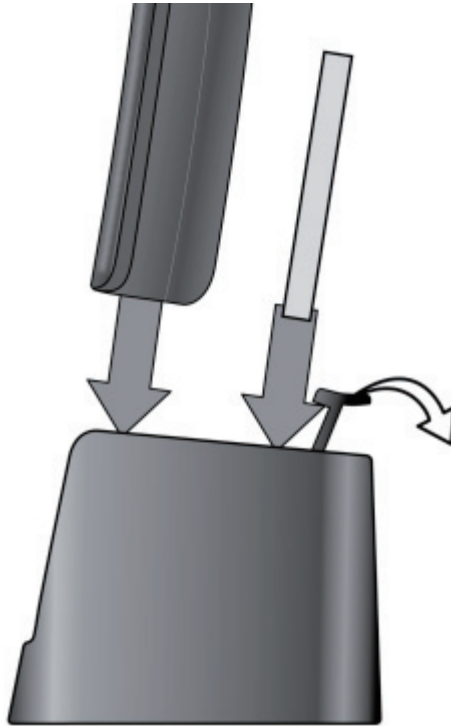


Figure 2-179 Inserting Handset into the Charger



Charge each battery completely (about 10 hours) before use.

6.5.3.2 Powering on the Handset

To power up the handset, press and hold **End** until the display flashes once (about 3 seconds). The handset searches for the base station or multi-cell chain it is registered to and connects to the unit with the strongest signal.

SECTION 7 INSTALLING OPTIONAL EQUIPMENT

7.1 NEC Digital Call Logger

There are many different reasons to record a phone call and NEC's Digital Call Logging software will cover all your needs. NEC's 1-Port Digital Logging Unit records and plays phone calls to and from one digital terminal and when properly installed does not require any other call logging applications to be fully functional.

7.1.1 NEC 1-Port Digital Logging Unit

The NEC 1-Port Digital Logging Unit is a USB device that taps across the digital extension pair of the NEC telephone system allowing digital recording of the telephone user's conversation. The file created is saved either to the local PC or to a network location, depending on the application blade. This adapter is for use with digital multiline terminals. It cannot be used with analog or VoIP.

This device meets all applicable FCC and UL requirements for this type of communication device.



Figure 2-180 1-Port Digital Logging Unit

7.1.1.1 PC Compatibility

The NEC 1-Port Digital Logging unit application supports Microsoft operating systems which support USB devices such as Windows XP and Windows 7.

7.1.1.2 Connection Configuration

The configuration connection is shown in [Figure 2-181 VSR Connection Configuration on page 2-131](#).

7.1.1.3 Connectors

- One PC USB connector that provides power and streams all speech and control channel information to the host PC and desktop software.
- Two digital telephone line connections that passively tap across the digital connection and listen in high impedance mode to the signaling on the line.

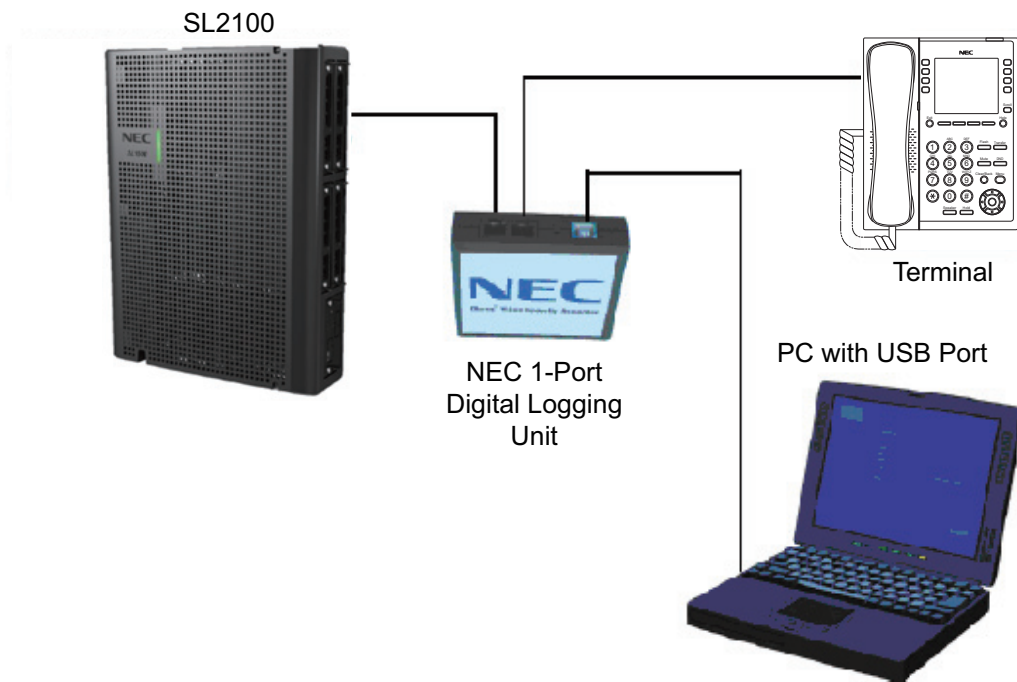


Figure 2-181 VSR Connection Configuration

7.1.1.4 Installation

The VSR is packaged with everything necessary for installation including:

- Software CD
- USB Cable
- Telephone connection lead
- Quick-start installation manual



The use of monitoring, recording, or listening devices to eavesdrop, monitor, retrieve, or record telephone conversation or other sound activities, whether or not contemporaneous with transmission, may be illegal in certain circumstances under federal or state laws. Legal advice should be sought prior to implementing any practice that monitors or records any telephone conversation. Some federal and state laws require some form of notification to all parties to a telephone conversation, such as using a beep tone or other notification methods or requiring the consent of all parties to the telephone conversation, prior to monitoring or recording the telephone conversation. Some of these laws incorporate strict penalties.

1. Unplug the line cord from your telephone and connect it to either port on the call logging unit.
2. Connect the NEC telephone system to the remaining port on the call logging unit. You are now ready to record.

For Windows 7

1. Using the USB cable provided, connect the USB interface on the NEC 1-Port Digital Logging Unit to your PC. Windows automatically detects the new hardware and starts the New Hardware

Wizard. This displays a dialog box similar to the one shown below. Select the second option, **Install from a list or specific location**, and press **Next>**.


 *When using Windows 7 the device driver software is installed automatically.*



Figure 2-182 Hardware Update Welcome Screen

2. Insert the NEC Installation CD in your CD drive and press **Next>**.

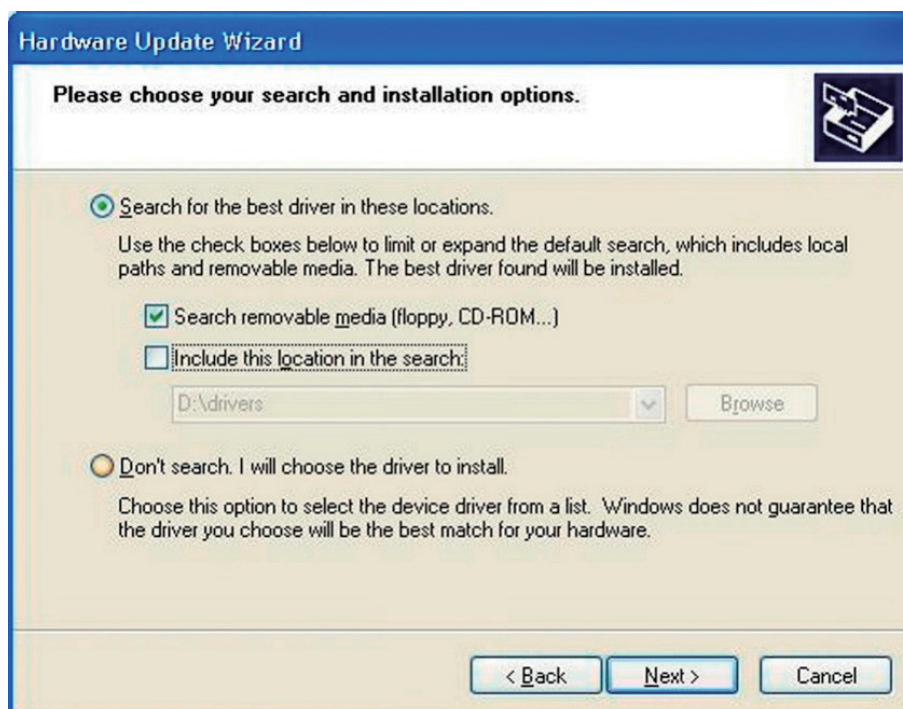


Figure 2-183 Hardware Update Screen – Installation Options


-  If you downloaded the files from the internet or FT server, uncheck the **Search removable media box**, select the **Include this location...** box and enter the location where you stored the downloaded files (e.g. C:\My Documents). Press **Next>** (refer to [Figure 2-184 Hardware Installation – Logo Testing Screen on page 2-133](#)).



Figure 2-184 Hardware Installation – Logo Testing Screen

3. The software is fully tested, but has not yet been submitted to Microsoft for approval. Press **Continue Anyway**.
4. Press **Finish** to close the dialog box.
5. Using the USB cable provided, connect the USB interface of the NEC call logging unit to an available USB port on your PC.
6. Unplug the line cord from your telephone and connect the phone to either port on the call logging unit.
7. Connect the NEC telephone system to the remaining port on the NEC 1-Port Digital Logging Unit.

7.1.1.5 Call Logging Application Software

A user guide that steps the user through the various options and operation is provided and should be utilized for setup and operation of this product.

7.2 NEC IP Call Logger

NEC offers the 1-Port IP Call Logging Unit to both record and listen to calls made from SIP phones.

7.2.1 NEC 1-Port IP Call Logging Unit

The NEC 1-Port IP Call Logging Unit is a USB device that can record SIP audio in one of two ways. SIP audio can be recorded by installing the Call Logging Unit in line with the SIP phone thus recording only those calls to or from the selected SIP phone. The Call Logging Unit can be installed in line with the VoIPDB to record either an extension or a SIP trunk. When recording SIP trunks, a maximum of eight trunk members can be monitored and recorded simultaneously providing licenses are present in

the Call Logging unit. This is covered in more detail in the NEC 1-Port IP Call Logging Unit User Guide. This unit is not supported on Digital or Analog phones.



Figure 2-185 1-Port IP Call Logging Unit

7.2.1.1 PC Compatibility

The NEC 1 Port IP Call Logging Unit application supports Microsoft operating systems which support USB devices such as Windows XP and Windows 7.

7.2.1.2 Hardware and Software Requirements

- Minimum Hardware Requirements
 - Processor: Pentium IV-class 1.6GHz or equivalent or higher.
 - Memory: 256MB
 - Disk Space: 100MB
 - Soundcard and Sound output like PC speakers or headphones.
- Minimum Software Requirements
 - Operating Systems
 - Windows XP
 - Windows 7 (32- and 64-bit)
- Screen Resolution
 - NEC's product line makes up a visual application environment featuring dynamic graphical elements which may function at lower resolutions. However, for best performance and to view these items correctly, it's recommended that you set the screen resolution to a minimum of 1024x768. You can do this from the **Control Panel > Display Settings > Advanced Settings** tab for Windows XP users.
 - If using Windows 7, go to **Control Panel > Display** (you may need to select view by icons), then click change display settings and adjust the resolution.

7.2.1.3 Connectors

- One PC USB connector that provides power and streams all speech and call control information to the host PC and desktop software.
- Two Ethernet connections that monitor SIP signaling for call set up messages from the selected VoIP phone or SIP trunk then records RTP streams to a predetermined folder on the local PC.

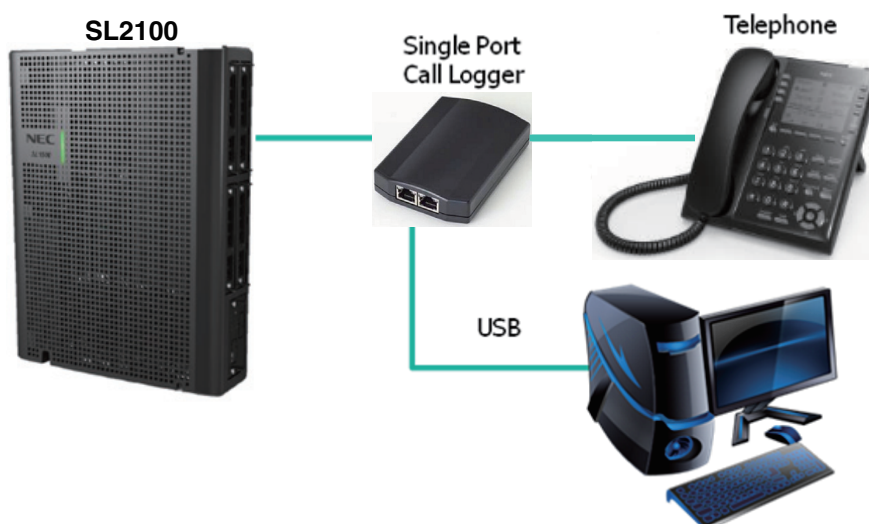


Figure 2-186 IP Call Logger Configuration

7.2.1.4 Installation

The NEC 1-Port IP Call Logging Unit is packaged with everything necessary for installation including:

- USB cable
- Ethernet cable
- Quick start installation manual
 - Information on where to download the software.
- IP Call Logging Unit



The use of monitoring, recording, or listening devices to eavesdrop, monitor, retrieve, or record telephone conversation or other sound activities, whether or not contemporaneous with transmission, may be illegal in certain circumstances under federal or state laws. Legal advice should be sought prior to implementing any practice that monitors or records any telephone conversation. Some federal and state laws require some form of notification to all parties to a telephone conversation, such as using a beep tone or other notification methods or requiring the consent of all parties to the telephone conversation, prior to monitoring or recording the telephone conversation. Some of these laws incorporate strict penalties.

1. Connecting the Call Logging unit in line with the phone for recording calls from a selected VoIP phone.
 - Unplug the Ethernet connection from your SIP phone and connect it to the Network connection on the Call Logging unit.
 - Connect the SIP phone to the IP phone connection port on the Call Logging unit.

-Or-

Connecting the Call Logging unit in line with the VoIPDB for recording calls from a selected VoIP phone or a SIP trunk.

 - Unplug the Ethernet connection from the VoIPDB and connect it to the Network connection port on the Call Logging unit.
 - Connect another Ethernet cable from the IP phone port on the Call Logging unit and connect it to the VoIPDB port where the cable was removed from in the previous step.

For Windows 7

1. Using the USB cable provided, connect the USB interface on the NEC 1-Port IP Call Logging Unit to an available USB port on your PC. Windows automatically detects the new hardware and starts the New Hardware Wizard. This displays a dialog box similar to the one shown below.


 *When using Windows 7 the device driver software is installed automatically.*



Figure 2-187 IP Call Logger – Hardware Update Wizard

2. Select **Install from a list or specific location**, and press **Next**.
3. Navigate to the location where you saved the application download.

4. Double click **Setup.exe** to start the installation process then follow the screens below.

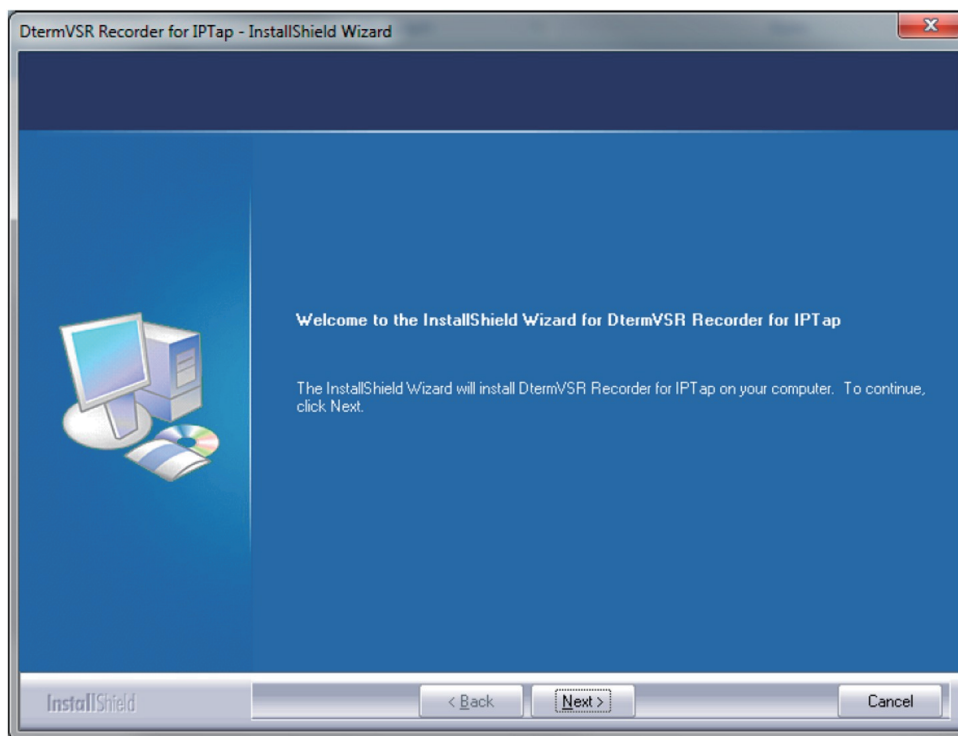


Figure 2-188 IP Tap – InstallShield Wizard

5. Click **Next**.

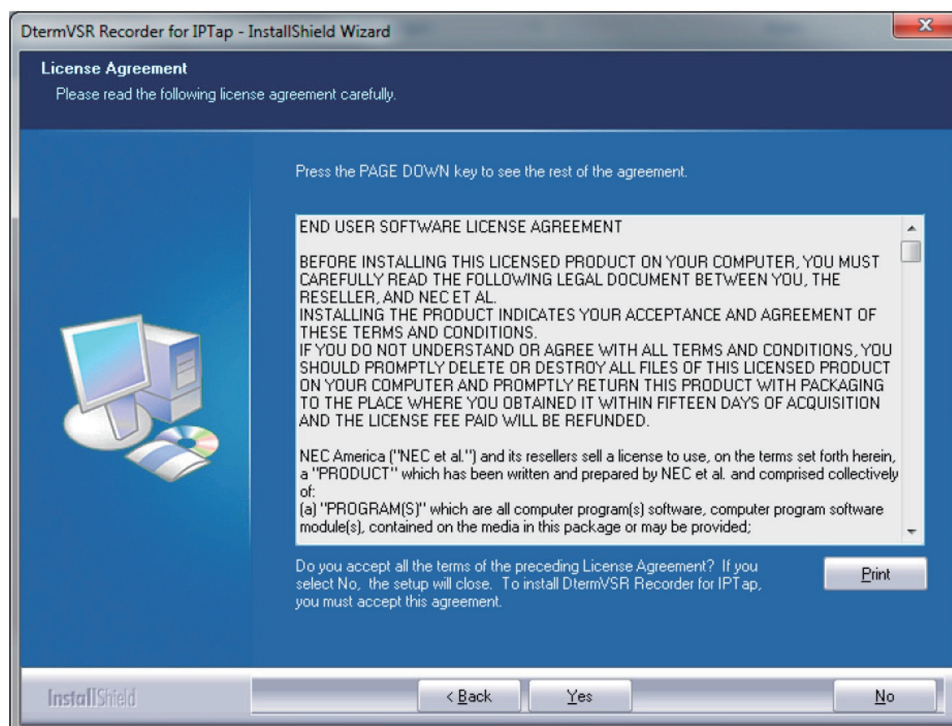


Figure 2-189 IP Tap – License Agreement

6. Read the license agreement. Click **Yes** to accept.

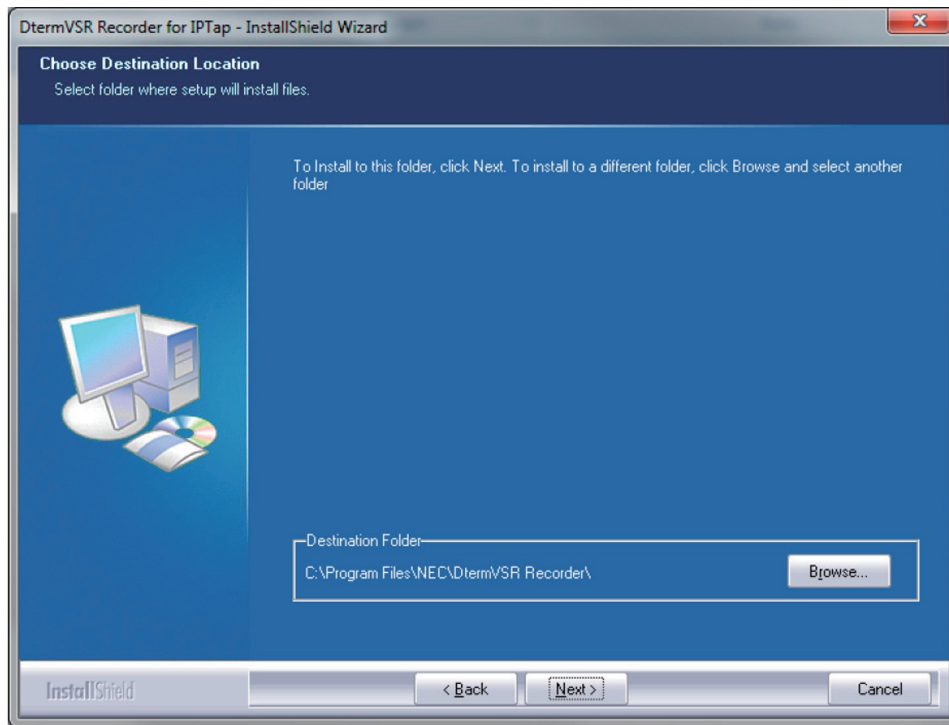


Figure 2-190 IP Tap – Choose Destination Location

7. Choose destination location then click **Next**.

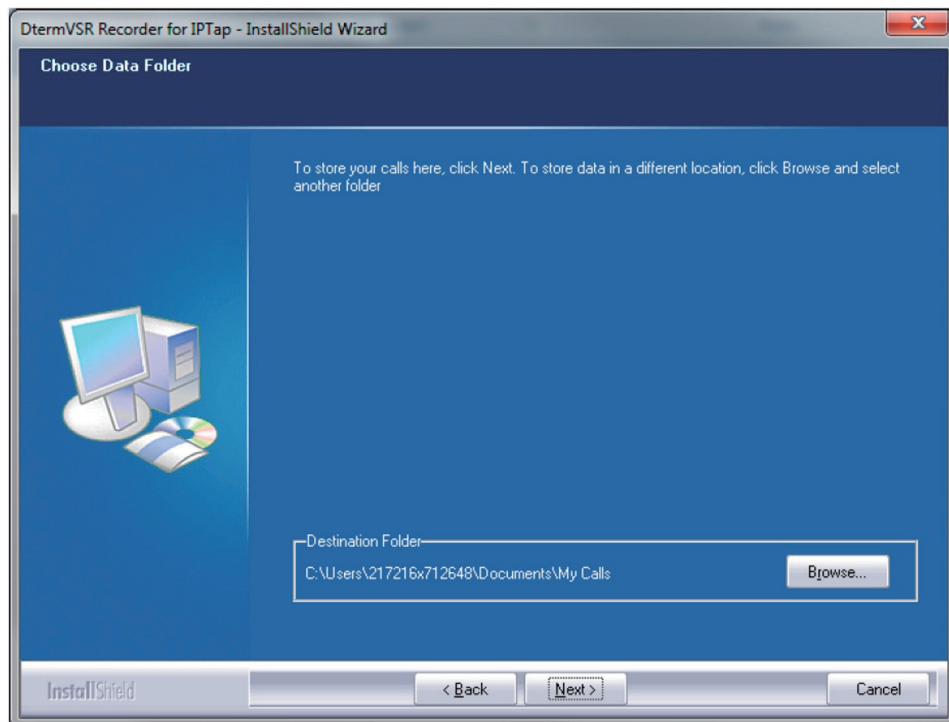


Figure 2-191 IP Tap – Choose Data Folder

- Choose destination folder to store recorded calls then click **Next**.

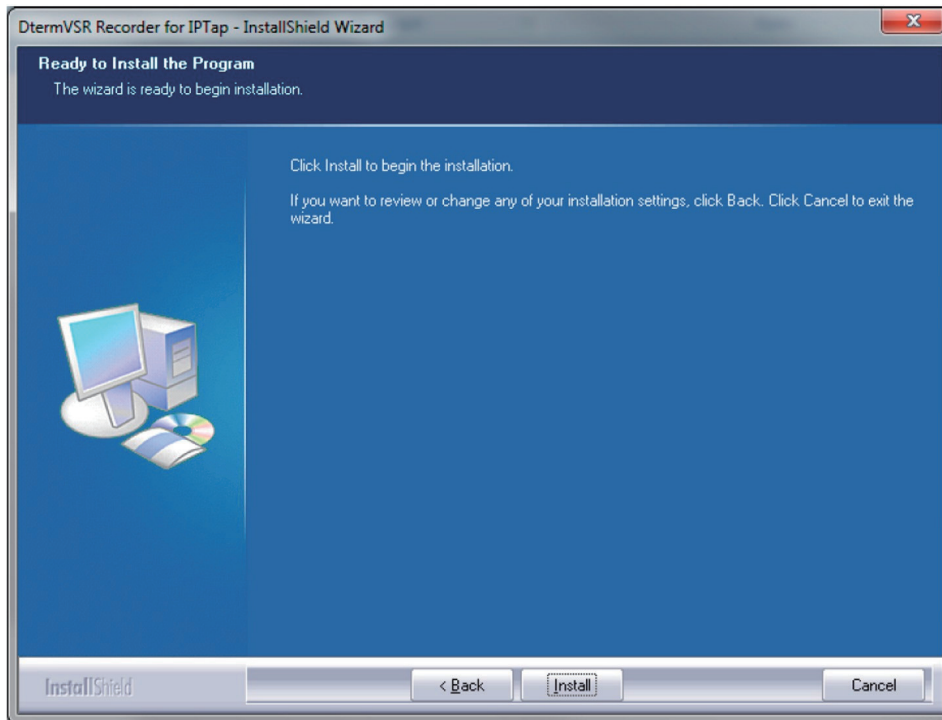


Figure 2-192 IP Tap – Ready to Install the Program

- Click **Install**.

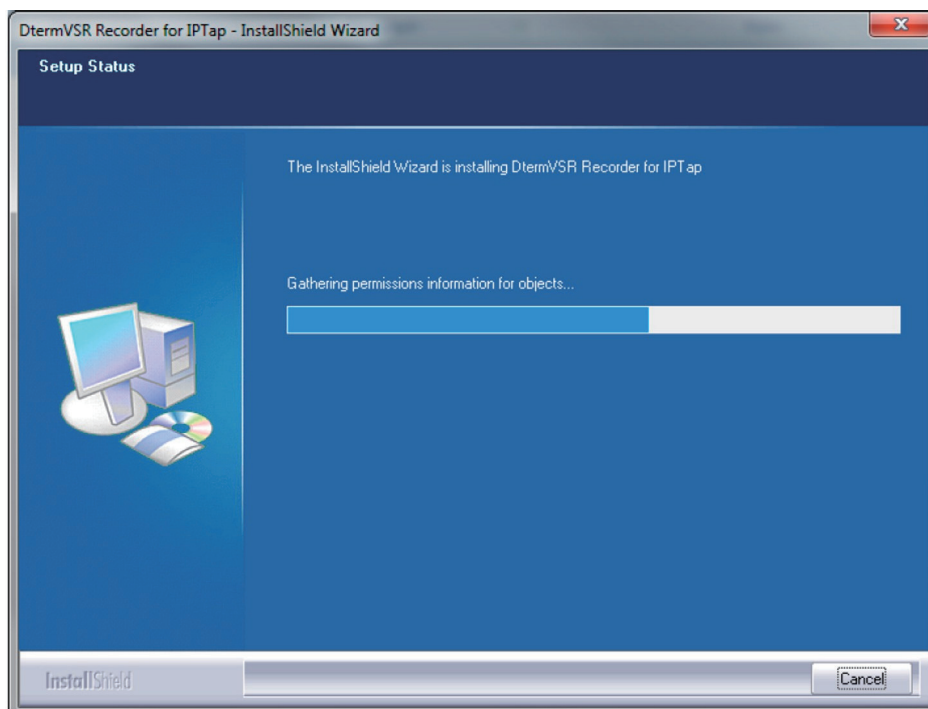


Figure 2-193 IP Tap – Setup Status

10. Graphics bar indicates level of installation completion.

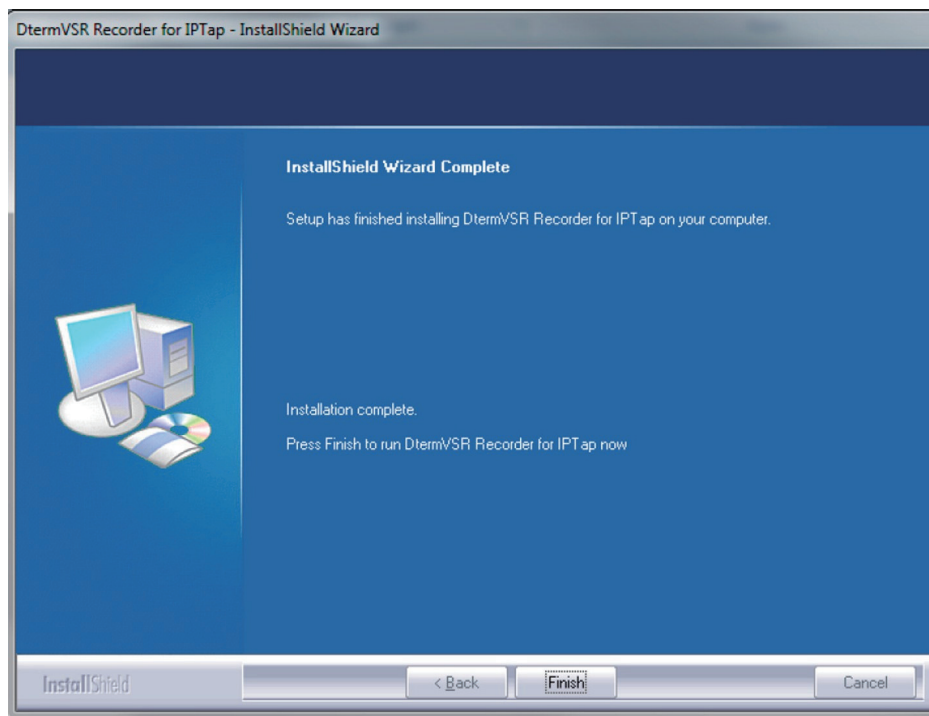


Figure 2-194 IP Tap – Wizard Complete

11. Select **Finish**.

Installation complete, for detailed instructions setting up and using this product, refer to documentation included with the NEC 1-Port IP Call Logging Unit or go to the www.necunifiedsolutions.com website.

7.3 NEC Digital Player Requirements

This section assists you with the installation of the software and helps you start using your Call Logging product.

The NEC Digital Call Logging products for listening require the below minimal PC standards.

7.3.1 Hardware and Software Requirements

7.3.1.1 Minimum Hardware Requirements

- Processor: Pentium IV-class 1.6GHz or equivalent or higher.
- Memory: 256MB
- Disk Space: 100MB
- Soundcard and Sound output like PC speakers or headphones.

7.3.1.2 Minimum Software Requirements

- Operating Systems
 - Windows XP
 - Windows 7 (32- or 64-bit)
- Microsoft .Net Framework 2.0+

7.3.1.3 Screen Resolution

NEC's product line makes up a visual application environment featuring dynamic graphical elements which may function at lower resolutions. However, for best performance and to view these items correctly, it's recommended that you set the screen resolution to a minimum of 1024x768. You can do this from the **Control Panel** → **Display Settings** → **Advanced Settings** tab for Windows XP users.

If using Windows 7, go to **Control Panel** → **Display** (you may need to select view by icons), then click **change display settings** and adjust the resolution.

7.3.1.4 Is Microsoft.Net Framework 2.0 Installed?

NEC Digital Manager requires the Microsoft .Net Framework, which should be installed on your PC prior to installing the Manager. If your Windows operating system has been kept updated with Windows Service Packs, the Microsoft .Net Framework 2.0 likely has already been installed.

To check if you have the Microsoft.Net Framework installed:

1. Navigate to **Control Panel** → **Add and Remove Programs** (Windows XP) or **Programs and Features** (Windows 7).
2. Look for an entry referencing the Microsoft .Net Framework 2.0 or later.
3. If the Microsoft.Net Framework is not installed, you can download it from the Microsoft web site.



The link to Microsoft .Net Framework download at time of this writing: <http://www.microsoft.com/download/en/search.aspx?q=.net%20framework2.0>.

7.4 NEC Digital Player/Recorder Installation

To listen to the recorded calls NEC offers an NEC Digital Player, Manager . All of these perform the listening function but offer increasing levels of additional features. Those three playback options are described in greater detail below.

The NEC Digital Player is used by an individual user to play back their own archive of calls or to play back NEC Digital BackOffice calls stored on their PC or network drive. It easily manages calls from one storage location. It does not offer many of the advanced functions of the Manager, such as establishing preset shortcuts to any number of storage folders for quick and easy access. However the Players basic functionality is the same as the NEC Digital Manager.

7.4.1 Installing the NEC Digital Player

1. Insert the Digital Player CD in the computer CD ROM drive or navigate to the location where you have saved your application download.

2. Double-click on the **Setup.exe** icon, the *D^{term}* VSR Player Welcome screen is displayed.

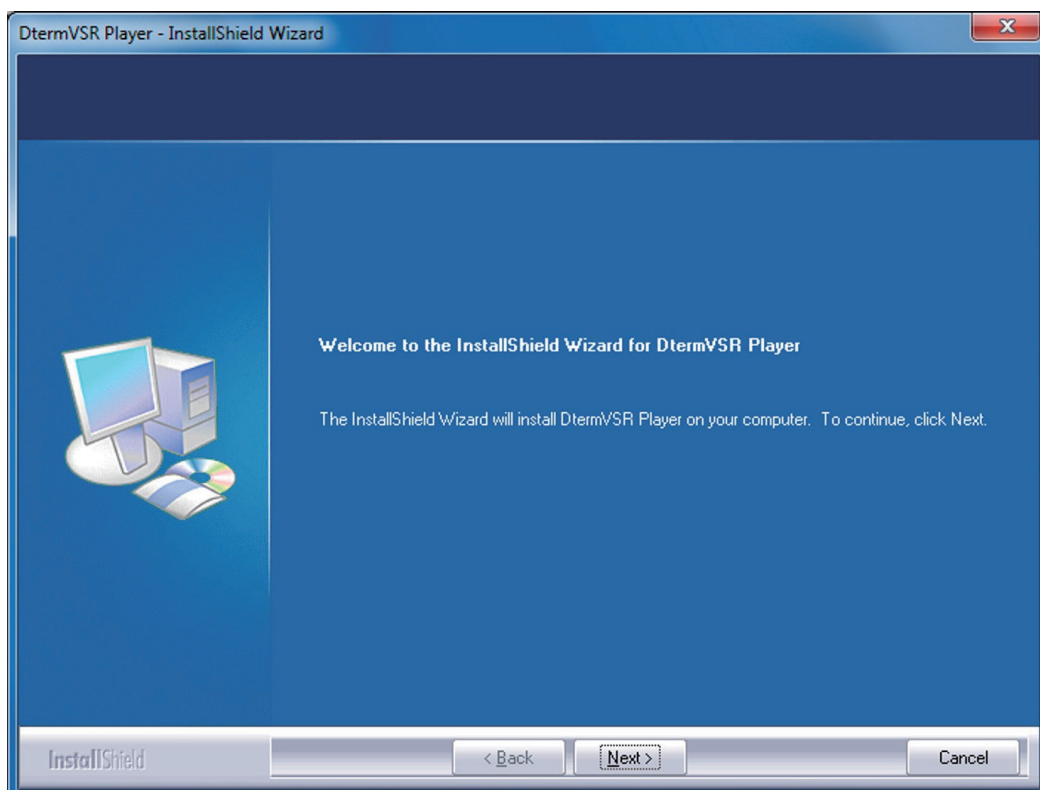


Figure 2-195 *D^{term}* VSR Player – Welcome Screen

3. Click **Next** the License Agreement screen opens.

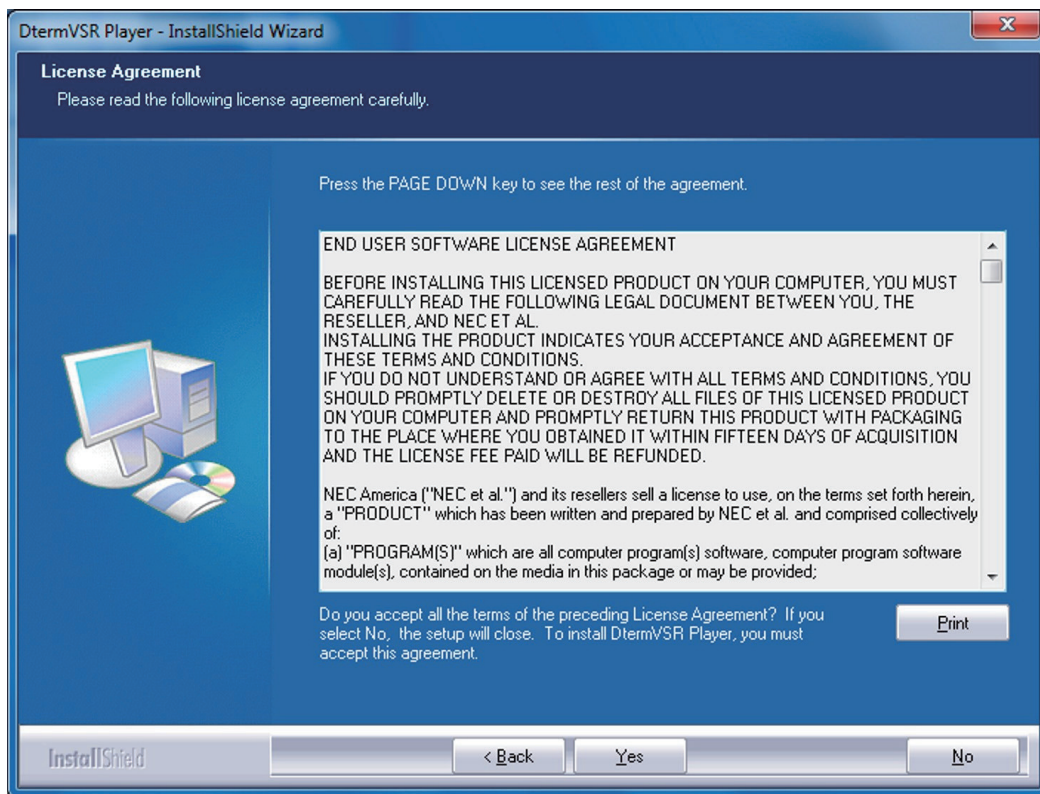


Figure 2-196 *D^{term}* Player – License Agreement

4. Select **Yes**, the Choose Destination Location screen opens.

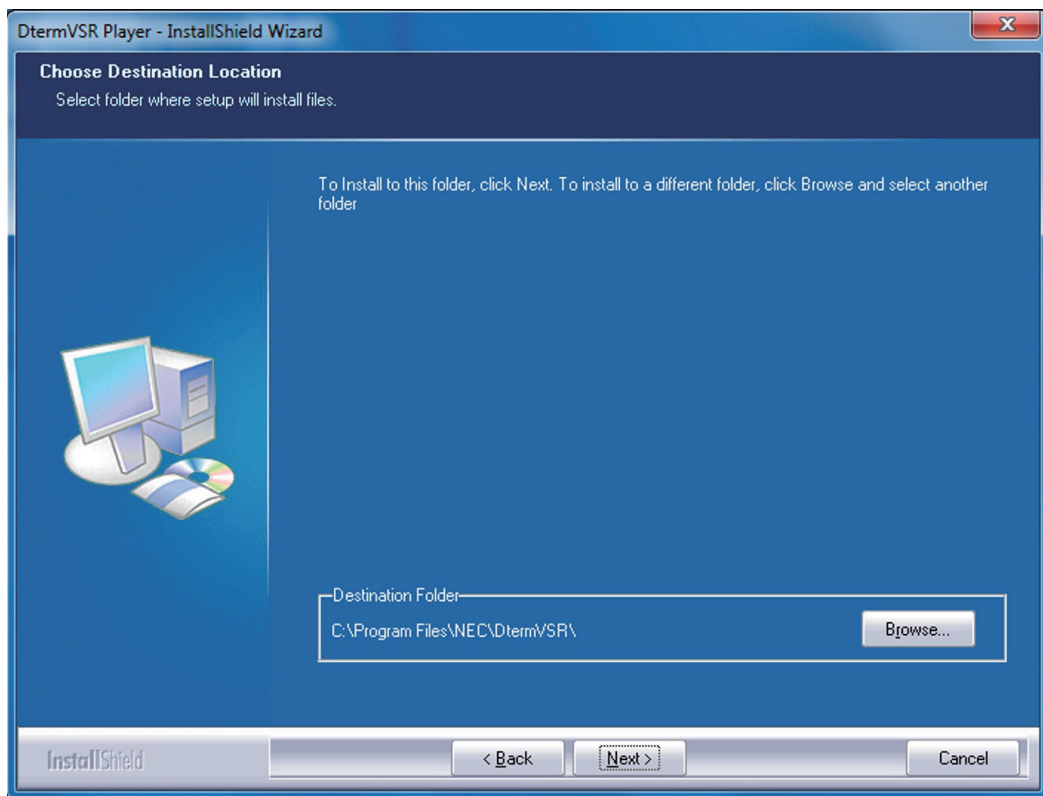


Figure 2-197 *D^{term}* VSR Player – Choose Destination Location

5. Click **Next**, the Choose Data Folder screen is displayed.

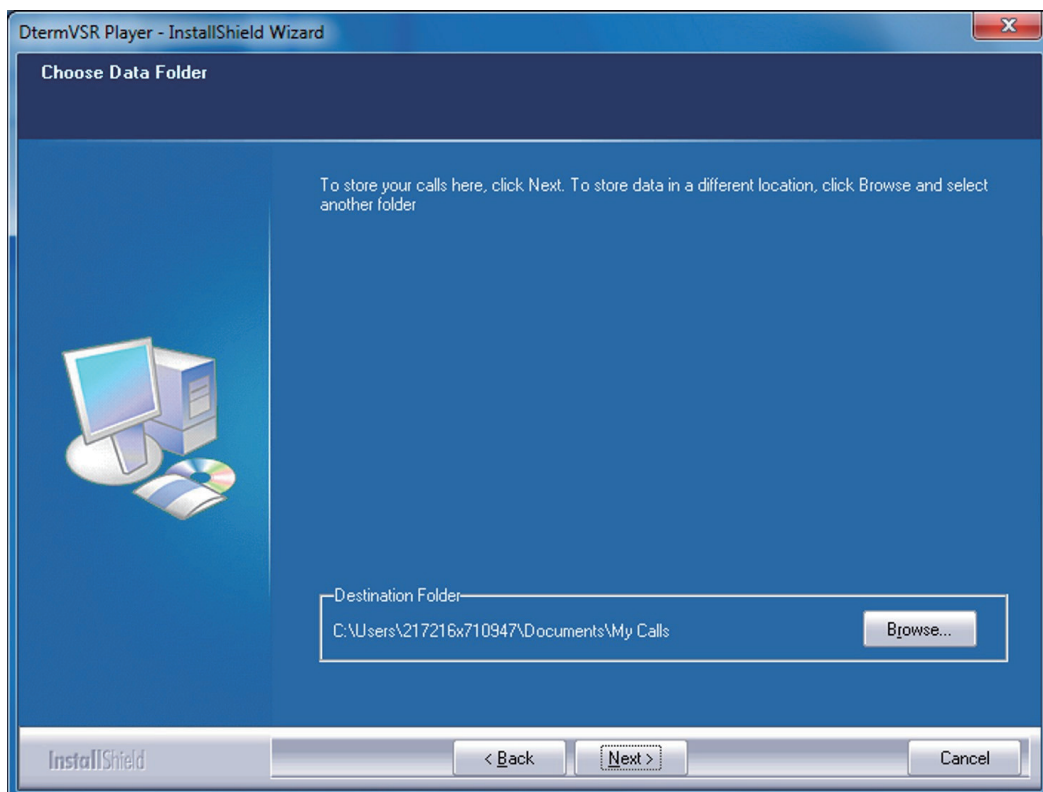


Figure 2-198 *D^{term}* VSR Player – Choose Data Folder

- Click **Next**, the Ready to Install the Program screen is displayed.

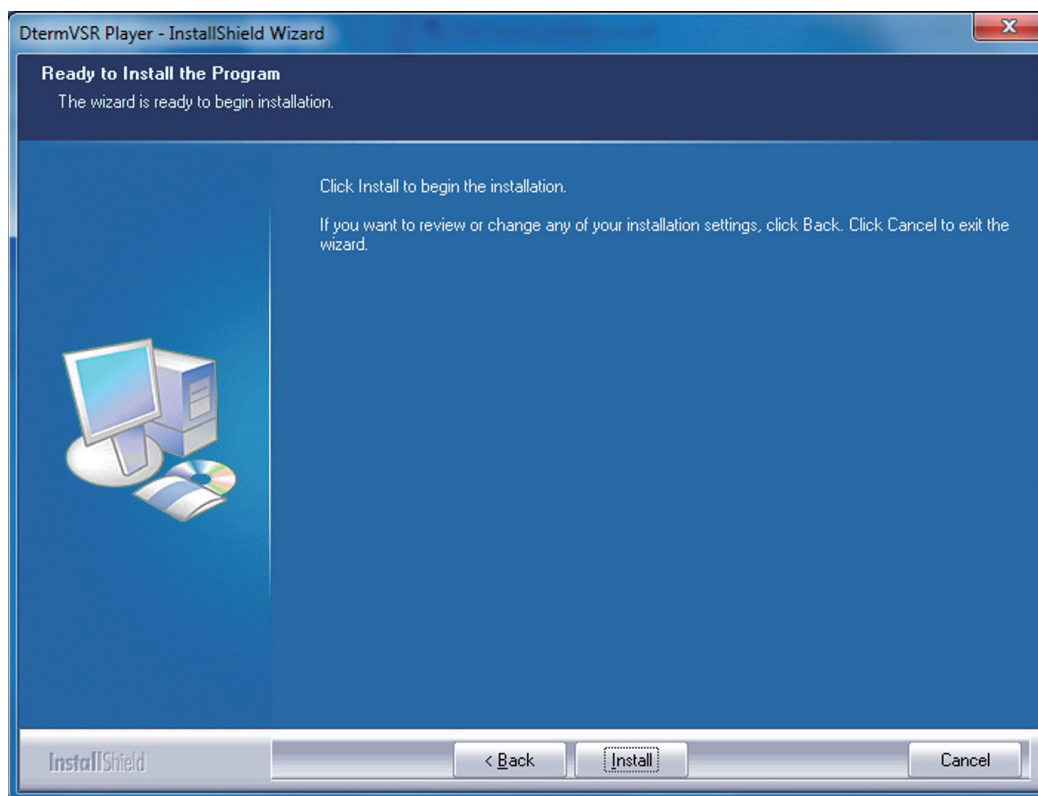


Figure 2-199 *D^{term}* VSR Player – Ready to Install the Program

- Click **Install**, a screen displaying installation progress is displayed. When installation completes, a Wizard Complete screen opens.

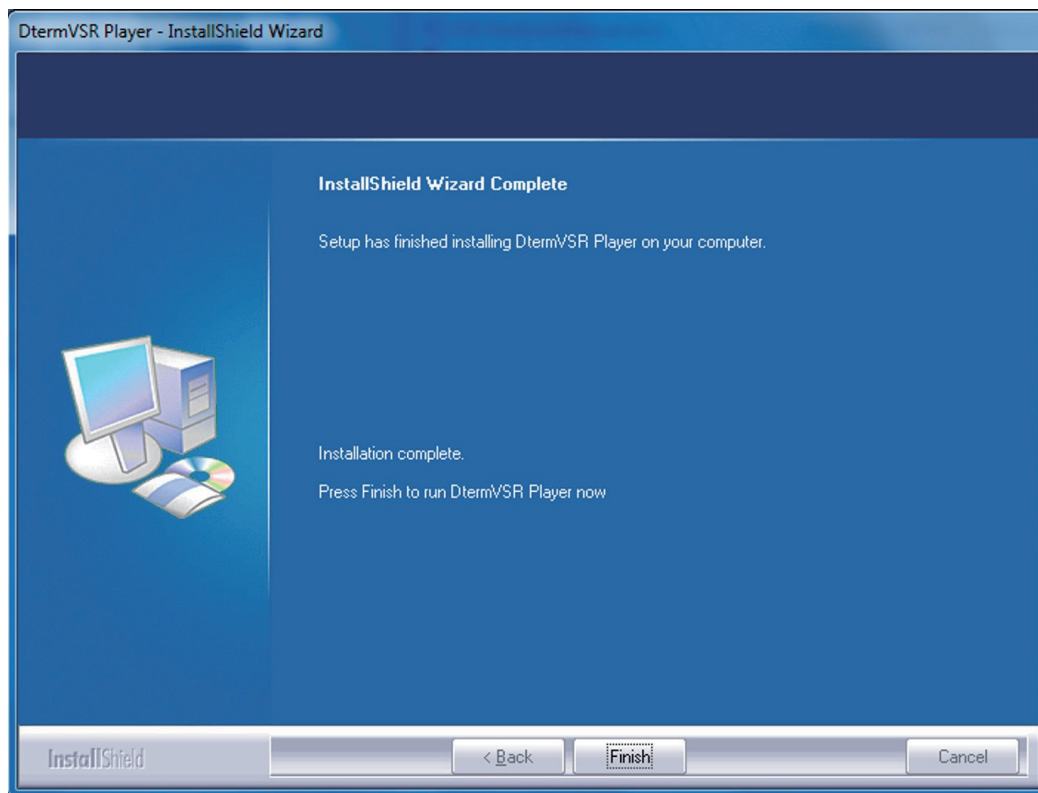


Figure 2-200 *D^{term}* VSR Player – Wizard Complete Screen

8. Select **Finish**.

For detailed instructions setting up and using this product, refer to the User Guide documentation included with the NEC Digital Player or contact your product manager.

MEMO

System Start Up

SECTION 1 SYSTEM START UP

1.1 Before Starting Up the System

Before starting up the system, make sure:

- Chassis are installed correctly.
- All extensions are cabled correctly.
- All earth ground and PSTN Trunks are cabled correctly.
- All boards are configured, equipped, and secured correctly.
- AC power cord is cabled correctly.
- At least one display type Multiline Telephone is connected to the system. (for Programming)
- If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.

1.2 Starting Up the System

There are two methods for startup (COLD Start and HOT Start).

Table 3-1 Start Up Method

Start Up Method	Description	Purpose
COLD Start	The factory setting data is loaded.	<ul style="list-style-type: none"> • First time start up • System Initialization
HOT Start	The customer setting data is loaded.	<ul style="list-style-type: none"> • System Reboot

1.2.1 Perform a Cold Start

This section describes the process for starting the system for the first time or starting a system that requires the customer data be deleted.



System software is loaded from flash memory, and the customer data is deleted from RAM memory.



If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.

To perform a Cold Start;

1. Set the power switch to off position.

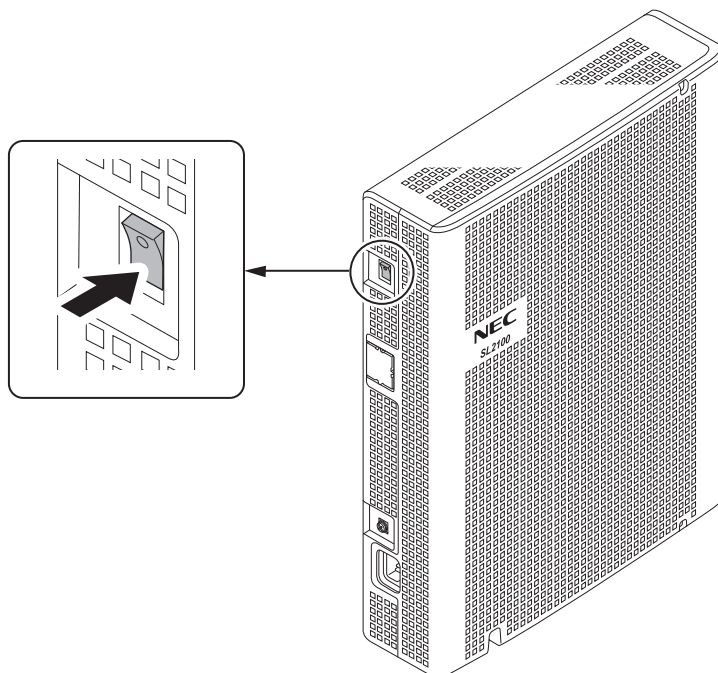


Figure 3-1 Power Switch Location

2. Once the system has powered off, push in and hold the **LOAD** button on the CPU board.



If Expansion Chassis are installed, the Power Switch must be ON at Expansion Chassis.

3. Turn the power switch ON at the Main Chassis.
4. Continue holding the **LOAD** button for approximately three seconds or until ALM LED lights (red).

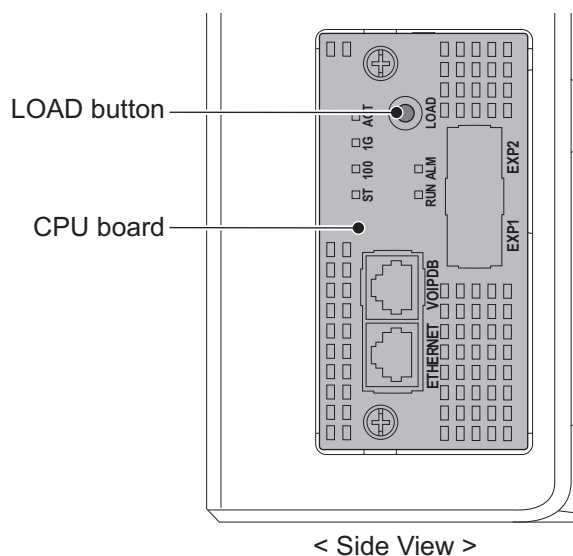


Figure 3-2 ALM LED and RUN LED Location

5. Release the **LOAD** button.

- When the system has completed reloading the software (about one minute), the RUN LED is flashing green on the CPU board and the connected Multiline Telephone's display will show the Time & Date and Extension Number.

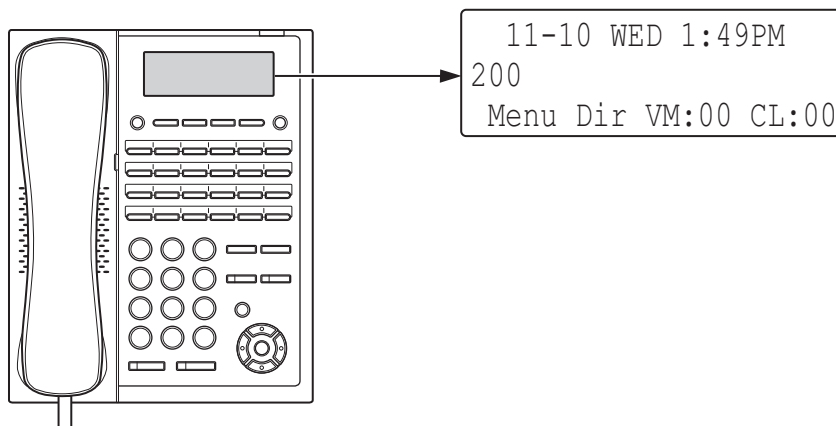


Figure 3-3 Display Indication (Idle) (12TXH/24TXH-B1)

1.2.2 Perform a Hot Start

This section describes how to load system software from flash memory, and the customer data from RAM memory.



System Software and customer data are loaded from flash memory.



If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.


To perform a Hot Start;

- Turn the system power off.
- After it has powered off, turn the power switch back to ON. Wait approximately one minute.
- When the system has completed reloading the software, the RUN LED is flashing green on the CPU board, and the connected Multiline Telephone's display will show the Time & Date and Extension Number as [Figure 3-3 Display Indication \(Idle\) on page 3-3](#).

SECTION 2 PROGRAMMING MODE

2.1 Entering the Programming Mode

The installer/system administrator can enter to the system programming mode from the Display Type Multiline Telephone. (A maximum of two users can enter mode at the same time)

 In a newly installed system, use extension port 1.

1. Press **Speaker** key. (Do not lift the handset)
2. Dial # * # *.

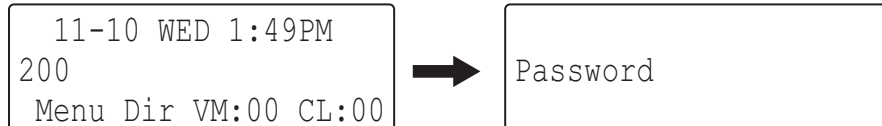


Figure 3-4 Entering Programming Mode Display 1 (12TXH/24TXH-B1)

3. Dial the system password, then press **Hold** key to enter the Program Mode.

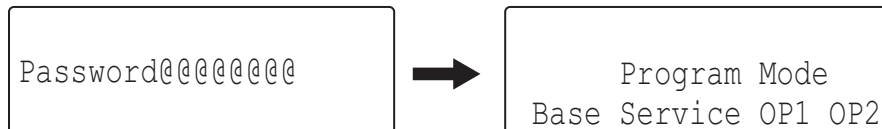



Figure 3-5 Entering Programming Mode Display 2 (12TXH/24TXH-B1)

 For the details of programming, refer to the SL2100 Programming Manual. (separate issue)

2.2 Exiting the Programming Mode

1. Press **Mute** key several times to return to the "Program Mode" Screen.

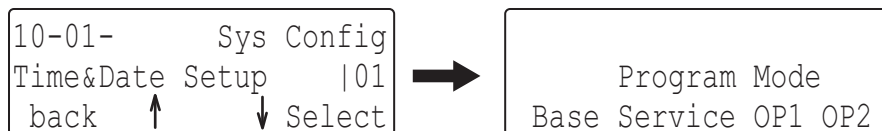


Figure 3-6 Exiting the Programming Mode Display 1 (12TXH/24TXH-B1)

2. Press **Speaker** key to exit.

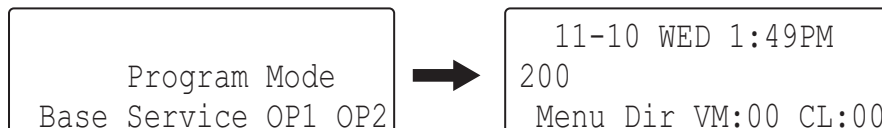



Figure 3-7 Exiting Programming Mode Display 2 (12TXH/24TXH-B1)

 The system automatically saves the customer data to the memory which is backed up by lithium battery.

2.3 Saving (Backup) the Customer Data

When the installer/system administrator exits from the programming mode, the system will automatically save the customer data to the on-board memory which is backed up by lithium battery. Additionally, the customer data can be saved to a SD Card for backup purpose. The **BLANK** SD Card is inserted to the SD slot on the CPU board.

1. Turn the system power off, insert the blank SD Card (1 GB or larger) to the SD slot on the CPU board.

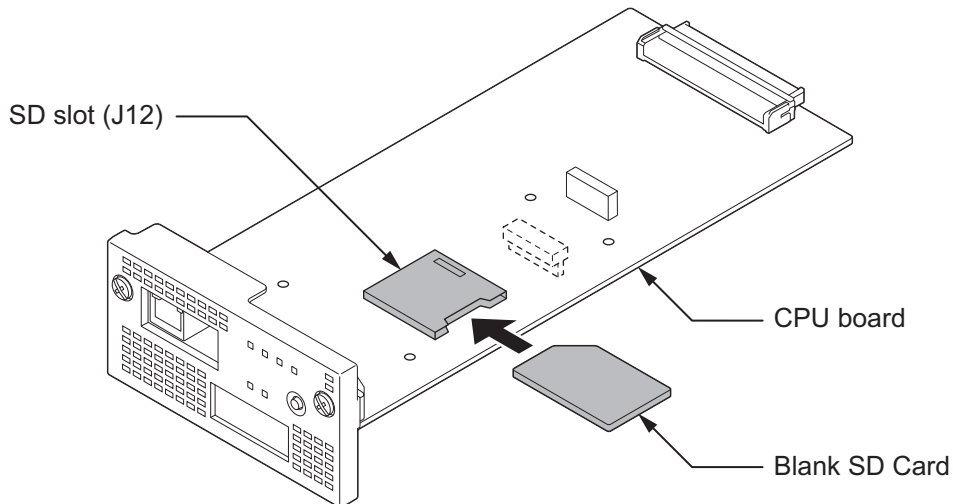


Figure 3-8 Inserting the SD Card

2. Turn the power on, enter the Program Mode then PRG90-03.

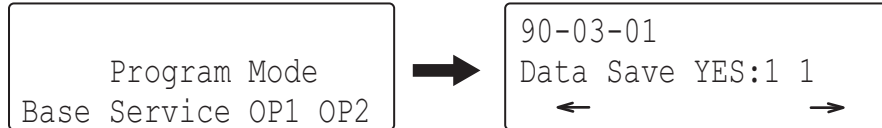


Figure 3-9 PRG90-03 Display (12TXH/24TXH-B1)

3. Dial **1** and press **Hold** key.
4. When the data backup to the SD Card is completed, the display will be changed to the next PRG.

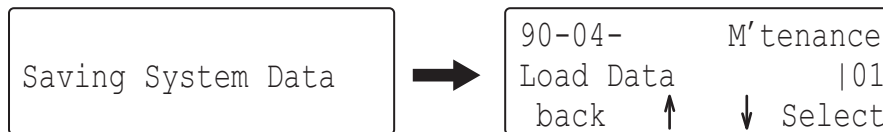


Figure 3-10 PRG90-04 Display (12TXH/24TXH-B1)

5. Remove the SD Card and exit from the Programming Mode.



The saved data on SD Card cannot be edited by the PC.

2.4 Loading the Customer Data

The backed up customer data can be loaded to the system by SD Card.



For the details of the CPU board installation, refer to Installing the CPU board (IP7[]-CPU-C1).

1. Turn the power off, insert the Customer Data SD card into the SD Slot on CPU board.

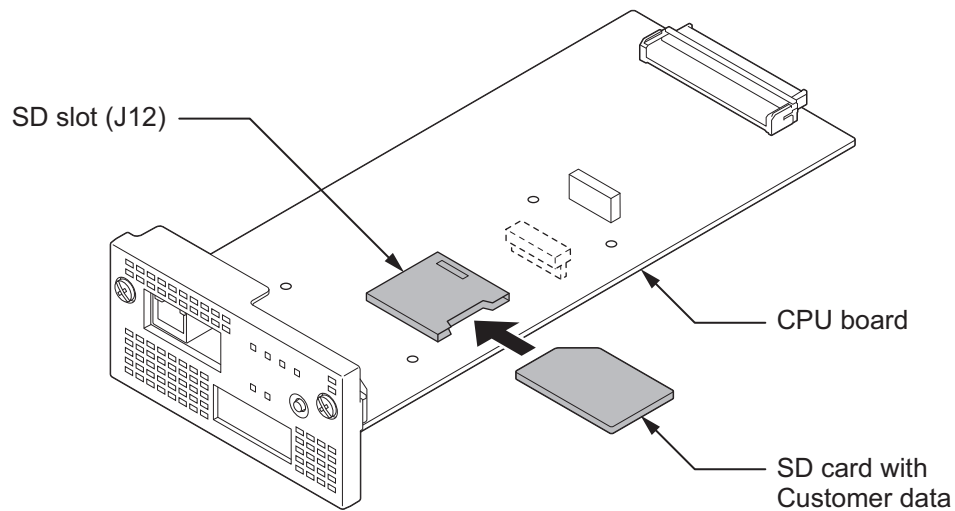


Figure 3-11 Inserting the SD card

2. Turn the power on, enter the Program Mode then PRG90-04.

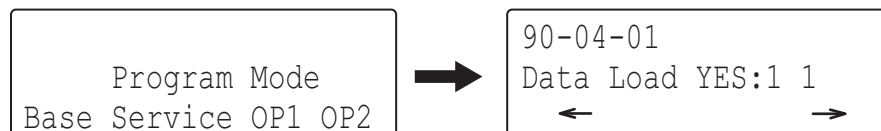


Figure 3-12 PRG90-04 Display (12TXH/24TXH-B1)

3. Dial 1 and press **Hold** key.
4. When the data loading is completed, the display changes to the next PRG.

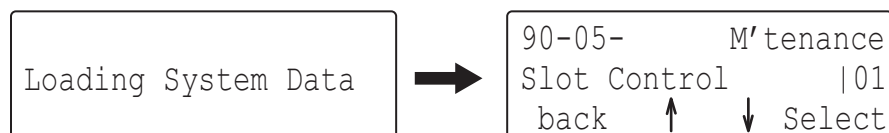


Figure 3-13 Next PRG Display (12TXH/24TXH-B1)

5. Remove the SD card and exit from the Program Mode.

SECTION 3 SYSTEM SHUT DOWN

3.1 Powering Off the System

1. Turn the all Chassis power off using the power switch.

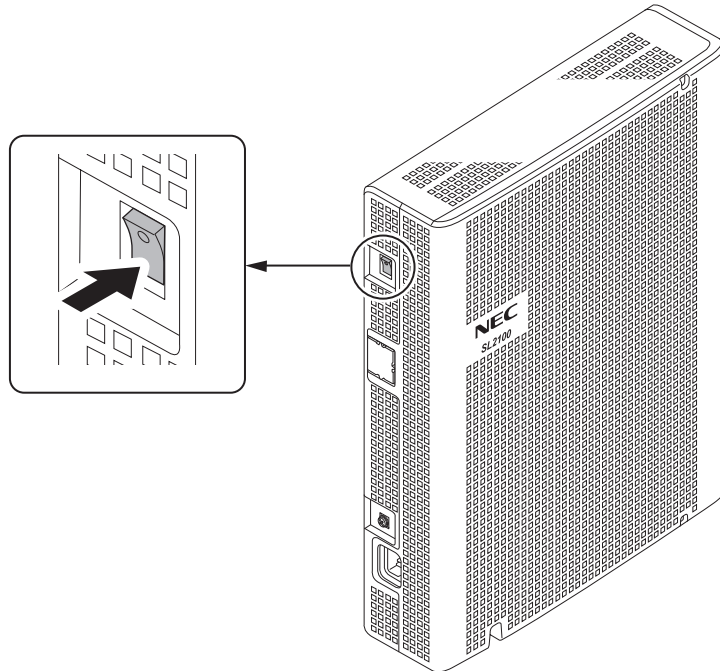


Figure 3-14 Power Switch Location



- *If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.*
- *DO NOT power off by disconnecting the AC (or DC for battery backup) power. Always use the Power Switch on the Main/Expansion Chassis.*
- *All calls in progress will be cut off when the system is powered off, or if the Power Failure occurred.*
- *All user's setting (such as Call Forward, Camp-On, etc) will be kept.*

3.2 Resetting the System

The system reset is carried out using the "Power OFF and ON" operation.

MEMO

Maintenance

SECTION 1 LITHIUM BATTERY REPLACEMENT

1.1 General

The Lithium Battery (CR2032) is installed on the CPU-C1 board in Main Chassis. It provides the battery-backup of the RAM memory for approximately 36 months. When the battery power becomes low, the system will display a "Warning Message" to the assigned Display Multiline Telephone as below.

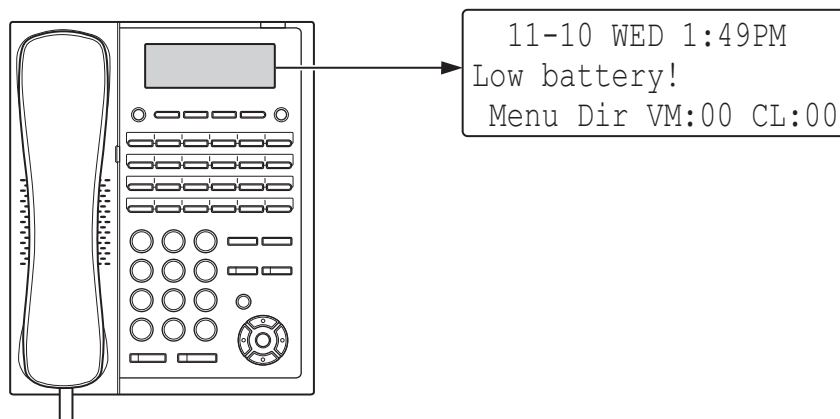


Figure 4-1 Warning of Low Battery (12TXH/24TXH-B1)

1.2 Lithium Battery Specification

Before replacing the Lithium battery, make sure which type of Lithium battery is required and prepare the new Lithium battery. (CR2032)



NEC recommends that a backup of the customer data is performed before powering off the system (either PCPro file or SD card backup) in order to replace the backup battery.

- *Risk of explosion if the battery is replaced by an incorrect type.*
- *Dispose of used batteries as instructed by the manufacturer of the battery.*
- *If Expansion Chassis are installed, turn the power on/off in the order of Expansion 2 Chassis, Expansion 1 Chassis and then Main Chassis.*

1.3 Replacing the Lithium Battery



Not all boards are hot swappable. Do not remove or install from the chassis when powering up.

1. Power off the system.

2. After the system powers down, loosen two screws and pull out the CPU board.

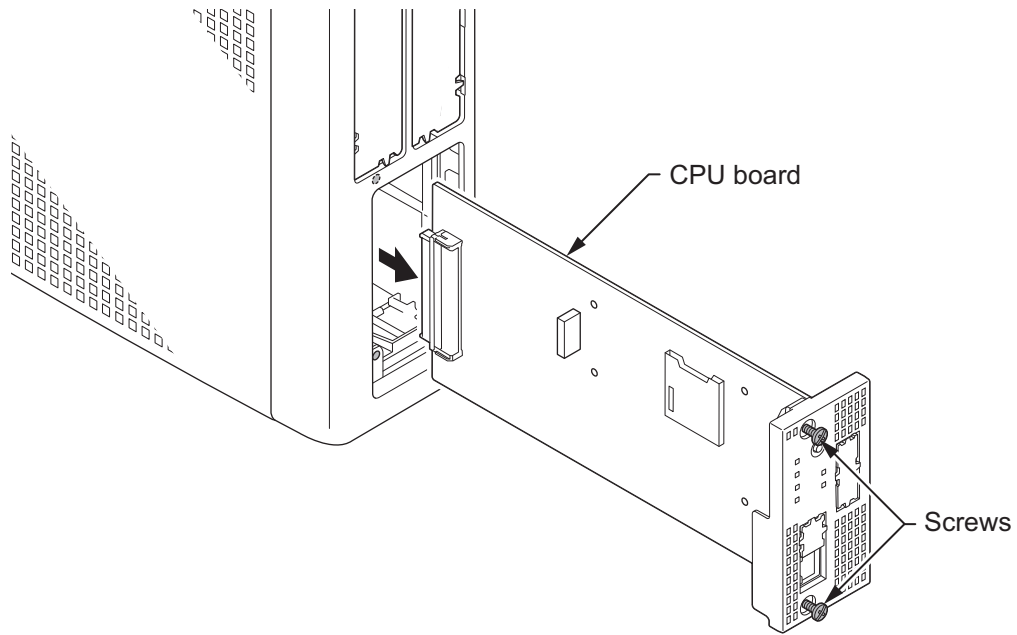


Figure 4-2 Removing the CPU Board

3. Refer to following figure for the Lithium battery location on the CPU board.

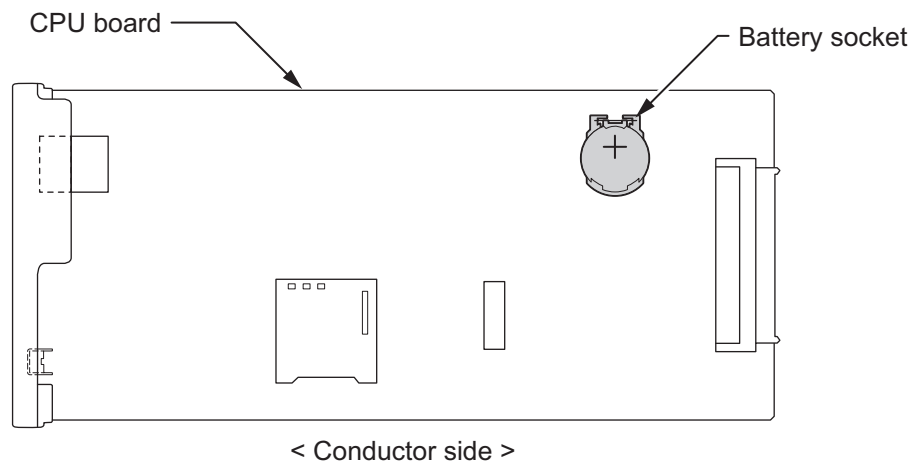



Figure 4-3 Location of Lithium Battery Socket

4. Remove the old Lithium battery and insert the new one into the socket.

 *The polarity “+” symbol must be on top as illustrated in following figure.*

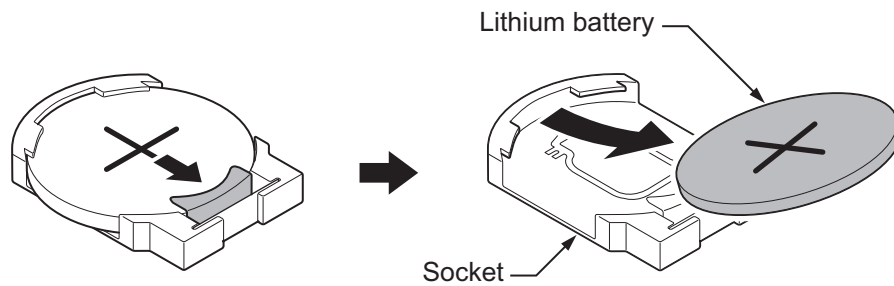


Figure 4-4 Removing the Lithium Battery

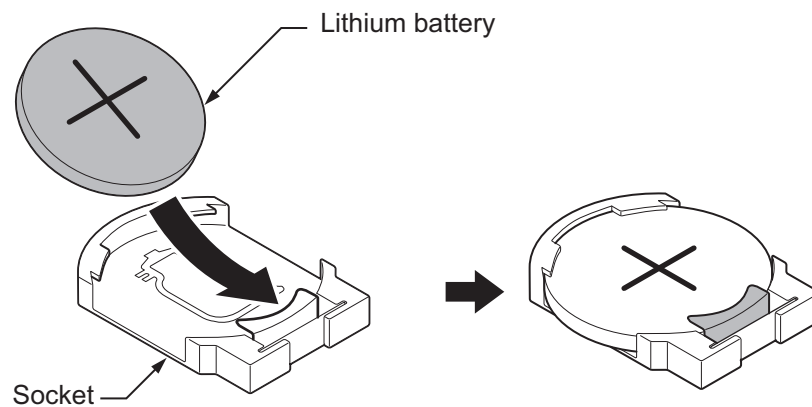


Figure 4-5 Inserting the Lithium Battery

5. Insert the CPU board in the guide rail of chassis and push it securely into position, and tighten the two screws.

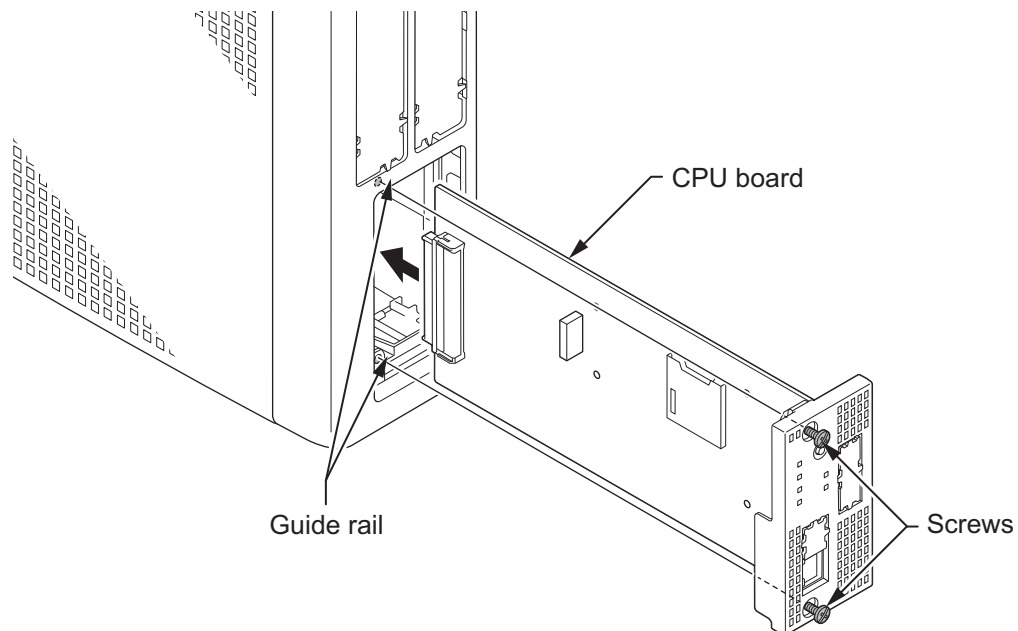


Figure 4-6 Installing the CPU Board

SECTION 2 MAIN SOFTWARE UPGRADING

2.1 General


The main system software is initially stored in the Flash memory located on the CPU-C1 board of the Main Chassis. It can be upgraded by the new software on the SD card.

2.2 Before Upgrading the Main Software

 **NEC recommends that a backup of the customer data is performed before upgrading the main software (either PCPro file or SD card backup).**


Before upgrading the main system software, the following preparations are necessary.

- Prepare the SD Card (1 GB, or upwards and formatting by FAT), and store the new main software on the SD card by PC. (New main system software is supplied by NEC.)

 *The Formatting of the SD card will be used SD Formatter. It is supplied by SD Association.*

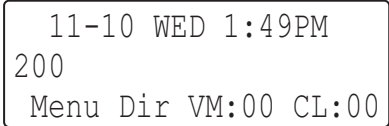
2.3 Main Software Version Confirmation

The main system software version is confirmed by the following operation at the display type Multiline Telephone.

 *The following steps assume that program 15-02-60 is set to Advanced 1 or Advanced 2. If set to Standard the operation is as follows:*

1. On-hook Condition.
2. Press Enter Key (Navigation Key).
3. Press "3" On Keypad to show the Main System Software version and Hardware Key Code.

1. On-hook Condition.

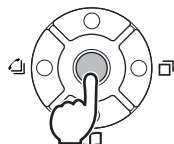
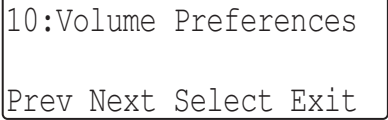


```

11-10 WED 1:49PM
200
Menu Dir VM:00 CL:00
  
```

Figure 4-7 Display of Multiline Telephone (12TXH/24TXH-B1)

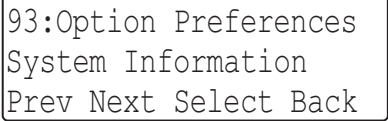
2. Press Enter Key (Navigation Key).

```

10:Volume Preferences
Prev Next Select Exit
  
```

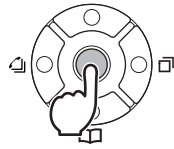
3. Dial **93**.



```

93:Option Preferences
System Information
Prev Next Select Back
  
```


- Press Enter Key (**Navigation Key**) to show the main system software version and Hardware Key Code.



```
VERSION:      01.00
MAC:  00-60-B9-D8-DF-8E
HKEY:  3810-0000-0000
```

(12TXH/24TXH-B1)

- Off-Hook and return to Time & Date mode.

```
11-10 WED 1:49PM
200
Menu Dir VM:00 CL:00
```

(12TXH/24TXH-B1)

2.4 Upgrading the Main Software

SL2100 system provides the Main Software upgrade for easy maintenance.

- [Using SD Card on page 4-5](#)
- [Using Web Programming on page 4-7](#)

2.4.1 Using SD Card



Not all boards are hot swappable. Do not remove or install from the chassis when powering up.

- Power off the system.
- After the system powers down, remove the CPU-C1 board from Main Chassis.
- Insert the SD card (with the new main system software loaded) to the SD card slot on CPU-C1 board. (If the other SD cards (such as SDVMS or SDVML) are already fitted, remove the card.)

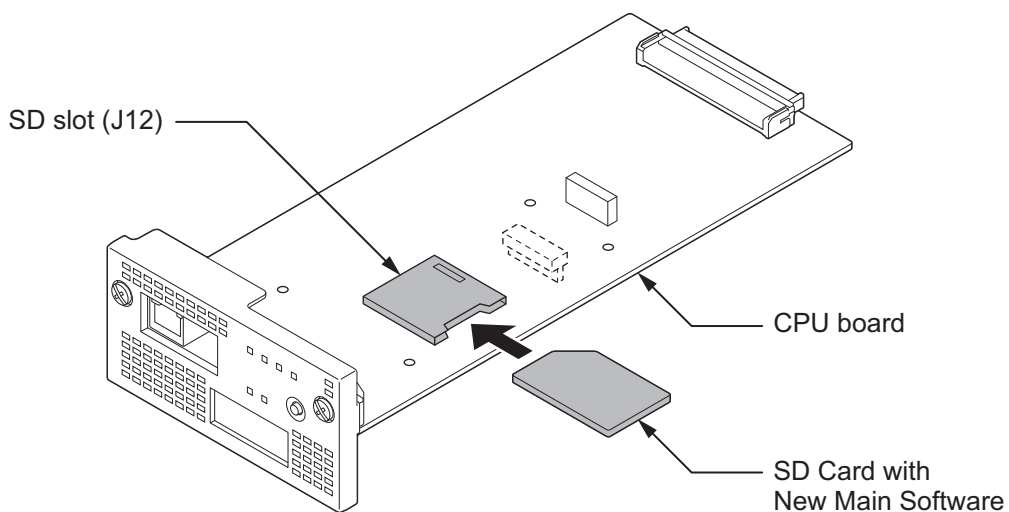


Figure 4-8 Insert the SD card

- Insert the CPU-C1 board.

5. Push in and hold the **LOAD** button on the CPU-C1.

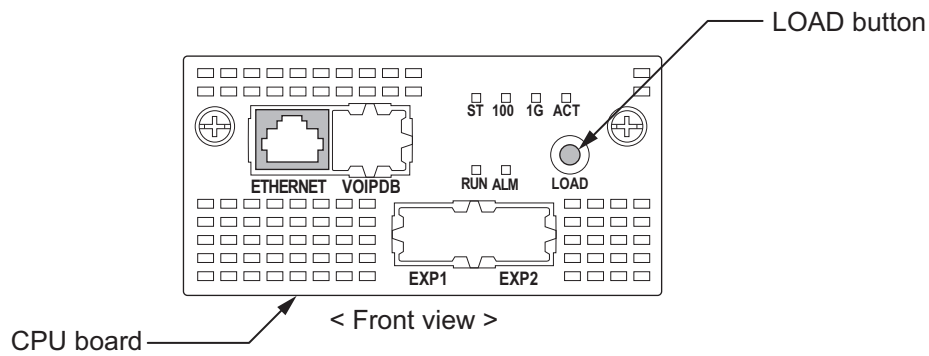


Figure 4-9 Push in and hold the LOAD button

6. Turn the system power on.
7. Continue holding the **LOAD** button for approximately 10 seconds or until RUN LED lights.
8. Release the **LOAD** button.
9. Wait until the RUN LED (green) and ALM LED (red) starts flashing (1s on/1s off) on the CPU-C1 board has the following indications (approximately seven minutes).

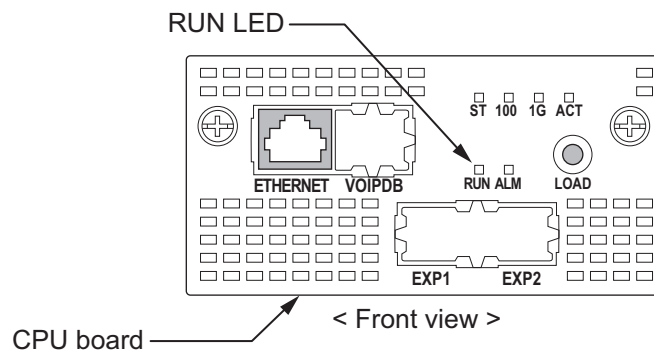


Figure 4-10 Status LED

10. Turn the power off (wait about 10 seconds) and remove the CPU-C1 board from Main Chassis and SD card from the SD slot on the CPU-C1.

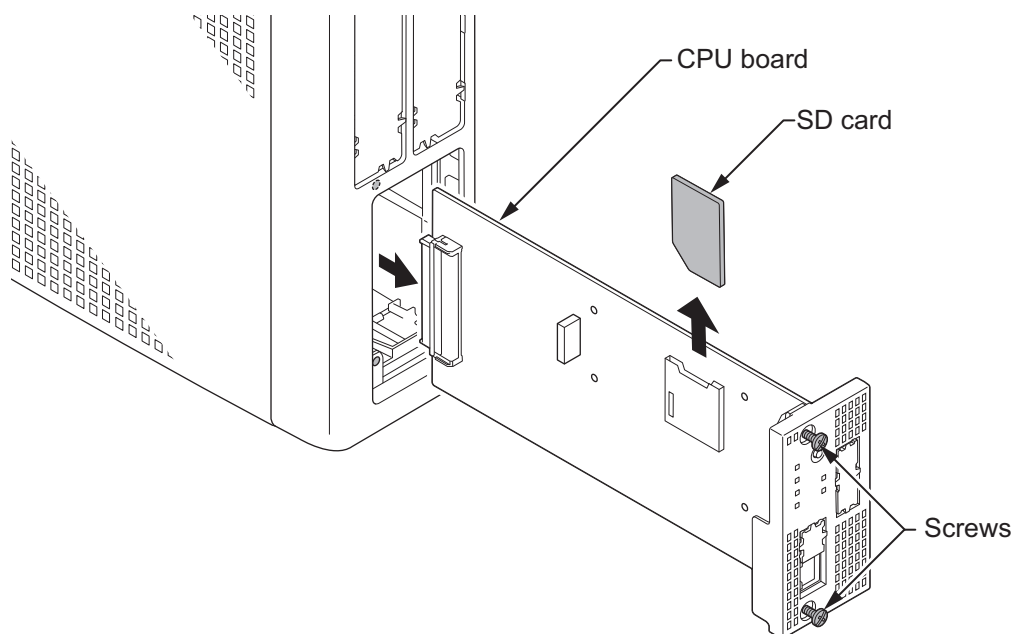



Figure 4-11 Remove the SD card

11. Replace the CPU-C1 board. (If the system required the SDVM[] SD card, replace it to the CPU-C1)
12. Turn the system power back on.
13. When the system has completed reloading the software, the RUN LED will flash green. (1s on/1s off)
 -  • To confirm the new software version number, press the Navigation key on any display telephone to view the system version number see [Main Software Version Confirmation on page 4-4](#).
 - The existing system data in the flash memory is replaced, but the customer data (stored in the RAM) is saved.

2.4.2 Using Web Programming

The Firmware can be updated in a system remotely at a scheduled time or immediately from the PC. This feature saves times and effort in comparison to performing the task manually. A Firmware Update can update when the WebPro or PCPro is connected to a chassis. This section explains the manual firmware update (Upload from PC/Immediately Reset) using the WebPro.

2.4.2.1 Preparation

- Firmware package file (xxxxxx.bin) from NEC.
 - Download the Upgraded firmware (xxxxxx.bin) and save it to the USB drive or PCs hard disc drive.
 - User Level (PRG90-02-03) has to be 2 = IN (Installer Level).
 - The following browsers are supported for the WebPro:
 - Internet Explorer 11 or higher
 - Chrome 52 or higher
 - Firefox 42 or higher
1. Connect the PC to the Ethernet port on the CPU-C1 using a LAN cable.

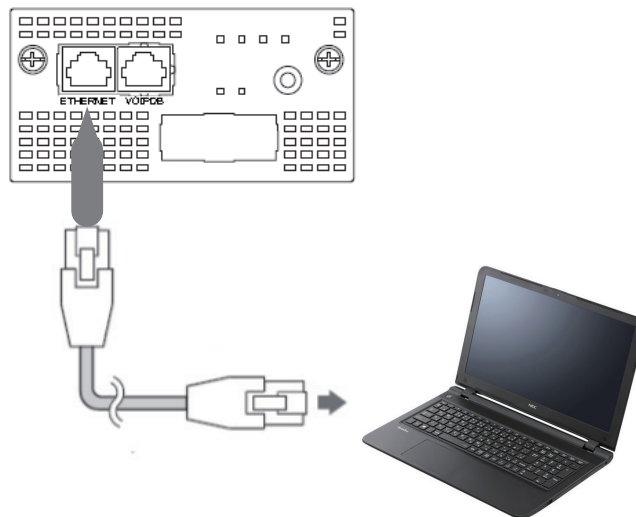



Figure 4-12 Preparation of Web Programming

-  Before you start the Web Programming, set the following settings:
 - Set your PC's IP address for the system.
 - Enable JavaScript in your browser by accessing your browser settings.

2.4.2.2 Accessing Firmware Update using Web Programming

1. To log in, launch any support browser and enter the IP address of the SL2100 LAN port.
IP Address is 192.168.0.10 (by default).
2. WebPro Login Screen is displayed, enter the **User Name** and **Password** (using PRG90-02). Click the **Login** button.

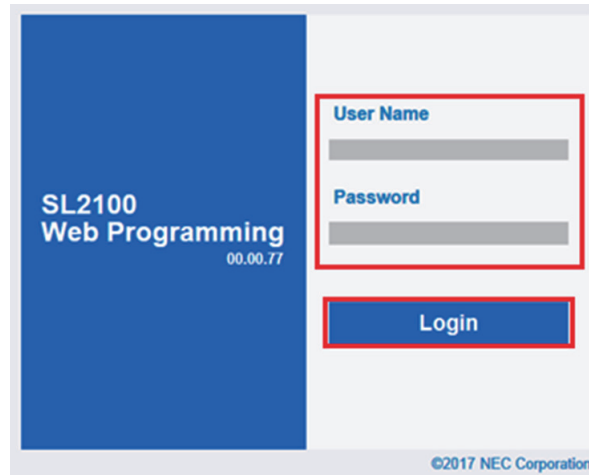


Figure 4-13 WebPro Login Screen

3. If the login is successful, the WebPro Home screen is displayed.

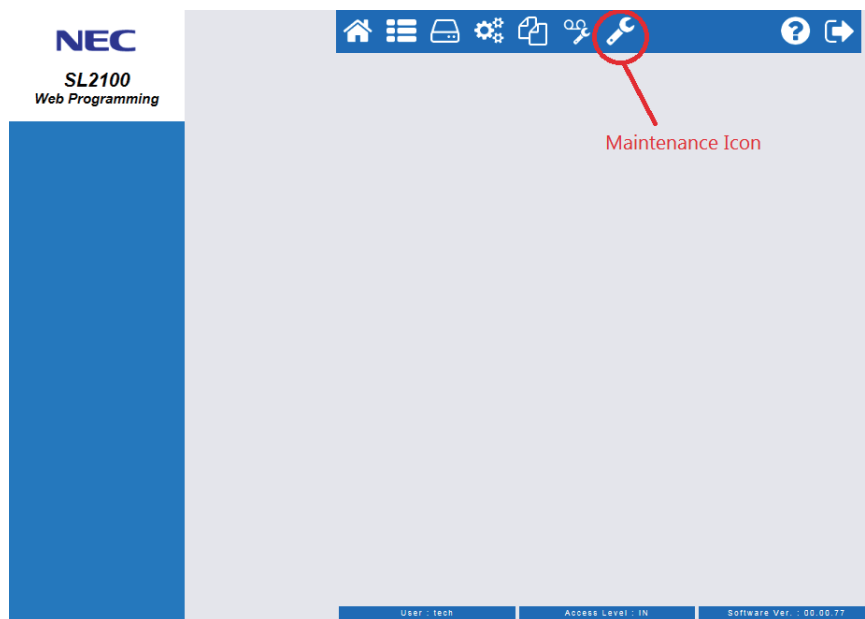



Figure 4-14 WebPro Home Screen

- Click the Maintenance Icon . Session Management screen is displayed and Click the “Software Update” at the left side menu.

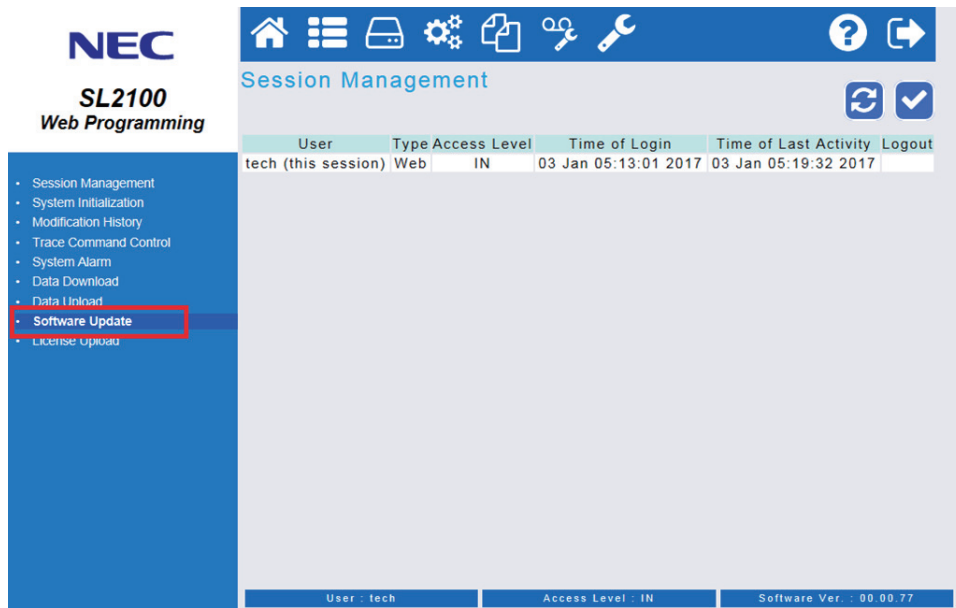


Figure 4-15 Session Management Screen

- Software Update screen is displayed. In the lower part of the Software Update screen (Manual Update area), select the “**Upload from PC**” and **browse** the update firmware package file (A file type is *.bin) which provided by NEC.

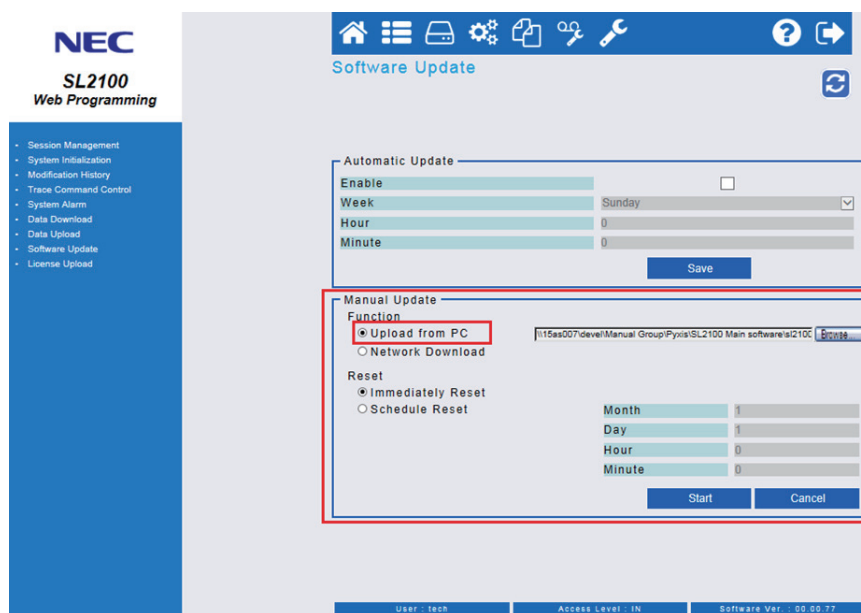





Figure 4-16 Software Update Screen

6. Select the “Immediately Reset”.

 *There are Immediately Reset or Schedule Reset can be selected when the firmware update will occur. The changes of the Firmware Update will only occur after the chassis is reset.*

 ***The Firmware Update should be executed at a suitable time when the chassis is not actively in use.***

 *If you choose the schedule reset, check “Schedule Reset” and set the **Month, Day, Hour** and **Minute**. WebPro uploads the firmware package file, and updates the system at the time you specified.*

 ***The time you specify should be relative to the time on the chassis, not the local time of the PC.***

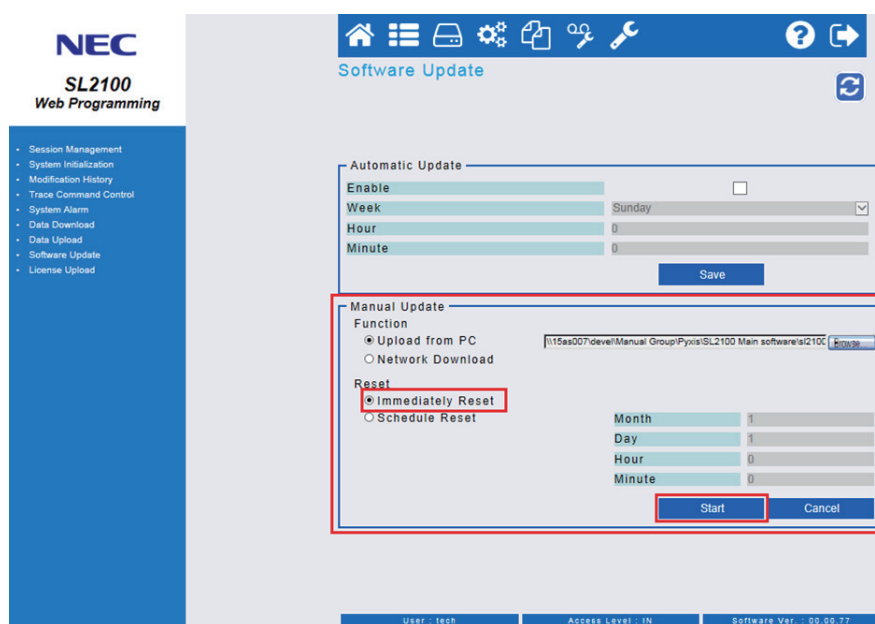


Figure 4-17 Select the “Immediately Reset”

Then, Click the **Start** button.

7. Following Message is displayed and click **OK** to start uploading to the system.

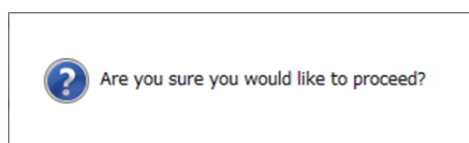



Figure 4-18 Confirmation Message

 *The time to upload the firmware package file is directly related to the file size. At present, the Firmware package file is about 60MB, so over LAN it may take several minutes.*

8. WebPro starts uploading and the following message is displayed on the screen.



Wait until the following message appears on the window.

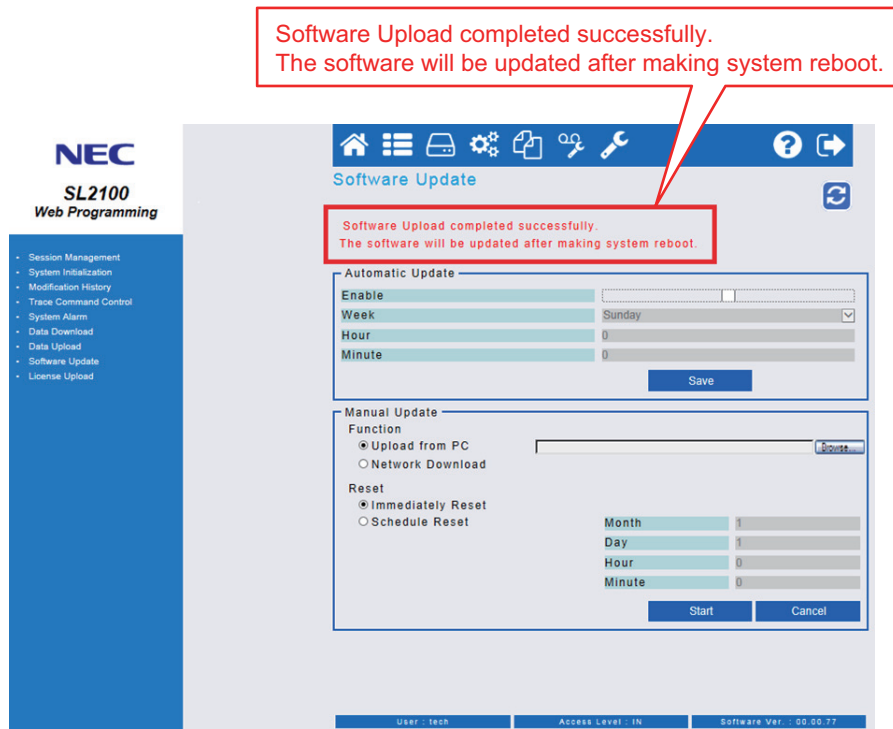


Figure 4-19



***DO NOT** click the Home or Back buttons on the browser, or close the WebPro browser, during uploading the Firmware, otherwise Upload stops.*



*If you choose the Schedule Reset, the following message appears in Home screen until specified time. If you want to Cancel the update, click the **Cancel Update** button to cancel the update.*

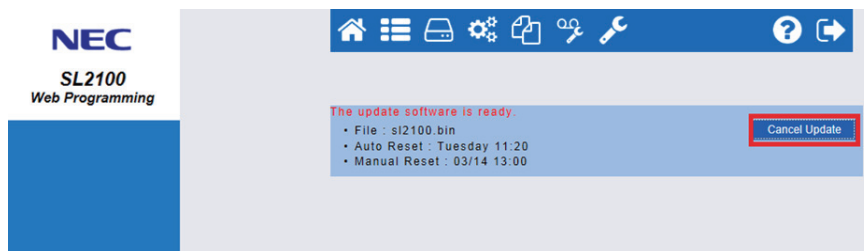


Figure 4-20 Cancel Update Screen

9. It will take about 10 minutes, the system reboot automatically and update is completed.



*The WebPro will be disconnected from the system due to system rebooting. When the system re-started, press **F5** key (on your PC) to re-connecting the WebPro and confirm the new firmware version.*



Figure 4-21



Press the Navigation key in any display telephone to view the system Version Number, see [Main Software Version Confirmation](#) on page 4-4.

SECTION 3 LED INDICATIONS

The LEDs on the CPU indicate the following:

- RUN (D1) = The CPU is operating (Green)
- ALM (D2) = Alarm (Red)
- Refer to Program 90-10: System Alarm Setup for details on assigning alarm LEDs.

Table 4-1 CPU LED Indications on page 4-13 provides a list of each LED and associated operation and status indications.

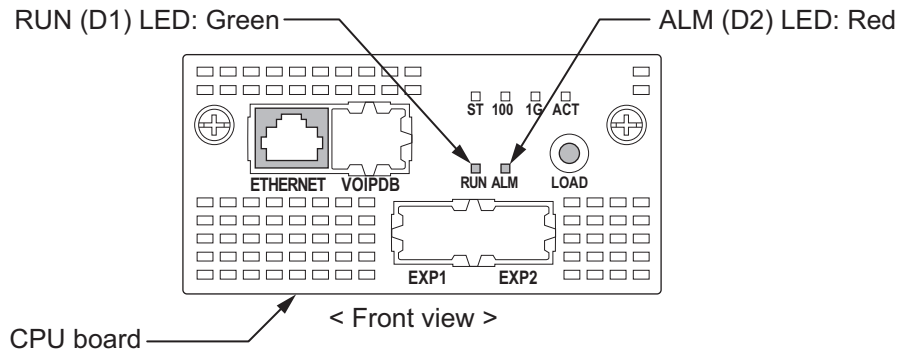


Figure 4-22 Location of the LEDs on the CPU Board

The priority order (No.1 ~ 16) is set up to each status and when more than one different status are occurred, the highest priority LED indication pattern (status) will be indicated.

Table 4-1 CPU LED Indications

Priority No.	Status	LED Indication	
		RUN (D1): Green	ALM (D2): Red
1	When system has started Up (only U-boot is execute)	Off	Off
2	Shutting down accept status (going to be powered off)	500ms On / 500ms Off	Off
3	Boot error	On	1s On / 1s Off
4	DSP/FPGA Download Error	Off	100ms On / 100ms Off
5	Security Tip Error	100ms On / 100ms Off	100ms On / 100ms Off
6	Reading Error of System Program	1s On / 1s Off	100ms On / 100ms Off
7	Completed the System Program Upgrade	1s On / 1s Off	1s On / 1s Off
8	Initializing System Program	Off	On
9	DSP/FPGA downloading	Off	1s On / 1s Off
10	Boot is starting	On	Off
11	IP address lease request	300ms On / 200ms Off / 300ms On / 200ms Off / 300ms On / 700ms Off	Off
12	DHCP Reset request	300ms On / 200ms Off / 300ms On / 200ms Off / 300ms On / 700ms Off	On
13	File accessing (SD Memory card/Frash ROM data is up-dating)	100ms On / 100ms Off / 100ms On / 100ms Off / 100ms On / 500ms Off	Off
14	Error alarm (Major) occurred	100ms On / 100ms Off	1s On / 1s Off
15	Error alarm (Minor) occurred	1s On / 1s Off	On
16	System Operating Normally	1s On / 1s Off	Off

MEMO

Specifications

SECTION 1 SYSTEM CAPACITY

Table 5-1 System Capacity

Hardware	Main Chassis	Main Chassis + Expansion Chassis 1	Main Chassis + Expansion Chassis 1 + Expansion Chassis 2	Comments
Number of Universal Slot (s) for Interface Board	4 Slots	8 Slots	12 Slots	
Chassis:				
IP7[]-4KSU-C1	1	2	3	
Battery:				
IP4WW-Battery Box (External Battery Box)	1	2	3	Batteries are not included.
Common Control Boards:				
IP7[]-CPU-C1 (Main Processor Board)	1	1	1	Insert to CPU/EXIFE exclusive slot in Main Chassis.
IP7WW-VoIPDB-C1 (VoIP Daughter Board)	1	1	1	Mount to the CPU-C1. This board provides 128 VoIP Gateway channels.
Expansion Boards:				
IP7WW-EXIFB-C1 (2-jack Expansion Daughter Board for Main Chassis)	1	1	1	Mount to the CPU-C1 in Main Chassis.
IP7WW-EXIFE-C1 (1-jack Expansion Board for Expansion Chassis)	0	1	2	Insert to CPU/EXIFE exclusive slot in Expansion Chassis.
Station Boards:				
IP7WW-082U-B1 (8 Digital Extension and 2 Analog Extension Interface with Relay/Audio ports)	4	8	12	Slot No.4 of each Chassis does not support any type of Multiline Terminals.
IP7WW-008U-C1 (8 Hybrid/Analog Extension Interface)	4	8	12	
IP7WW-000U-C1 (Extension board for mount a Trunk Daughter Board)	4	8	12	
Trunk Daughter Boards:				
IP7WW-3COIDB-C1 (3 Analog Trunk Interface)	4	8	12	
IP7WW-1PRIDB-C1 (1 Primary Rate or T1 Interface)	1	2	3	
Optional Items:				

Hardware	Main Chassis	Main Chassis + Expansion Chassis 1	Main Chassis + Expansion Chassis 1 + Expansion Chassis 2	Comments
IP7WW-SDVMS-C1	1	1	1	
IP7WW-SDVML-C1	1	1	1	

SECTION 2 SYSTEM SPECIFICATIONS

2.1 General Precautions

- Never attempt to insert wires, pins, etc. into the vents or other holes of the equipment.
- Do not use benzene, thinner, or the like, or any abrasive powder to clean the equipment. Wipe it with a soft cloth.

2.2 Environmental Requirements

Meeting established environmental standards maximizes the life of the system. Be sure that the site is not:

- In direct sunlight or in hot, cold or humid places.
- In dusty areas or in areas where sulfuric gases are produced.
- In places where shocks or vibrations are frequent or strong.
- In places where water or other fluids comes in contact with the equipment.
- In areas near high-frequency machines or electric welders.
- Near computers, telexes, microwaves, air conditioners, etc.
- Near radio antennas (including shortwave)

2.3 Operating Conditions

Table 5-2 Operating Conditions

Unit	Operating Conditions
Chassis, Boards and Multiline Telephones	Temperature: 0 to +40 degree C (32 to 104 degree F) Humidity: 10 to 90% (non-condensing)
Doorphone Box	Temperature: -20 to +60 degree C (-4 to 140 degree F) Humidity: 20 to 80% (non-condensing)

2.4 Site Requirements

A Chassis can only be wall-mounted or 19 Inch rack mounted (using the shelf plate).

2.5 AC Power Requirement

A dedicated 100V-120V/220V/230V/240V 50/60Hz circuit located within 2 meters of the Chassis is required. A separate dedicated AC outlet is necessary for each Chassis.



Double Pole/Neutral Fusing
(Power supply fuses are located at both the L and N side.)

Table 5-3 Power Requirement

	110VAC	120VAC	220VAC	230VAC	240VAC
Power Requirement	110 VAC@15 A	120 VAC@15 A	220 VAC@15 A	230 VAC@15 A	240 VAC@15 A
Power Consumption	Main Chassis = 143 VA	Main Chassis = 150VA	Main Chassis = 185 VA	Main Chassis = 182 VA	Main Chassis = 182 VA
	3 Chassis Total = 429 VA	3 Chassis Total = 450VA	3 Chassis Total = 541 VA	3 Chassis Total = 545 VA	3 Chassis Total = 547 VA
Input Voltage (Rated Voltage)	90 VAC to 264 VAC (100VAC/120VAC/220VAC/230VAC/240VAC)				

	110VAC	120VAC	220VAC	230VAC	240VAC
Frequency	47 Hz - 63 Hz (Rated Frequency: 50/60 Hz)				
Phase and Wire	Single Phase, 2 Line + PE Type				
Ground Requirement	No.14 AWG Copper Wire				
Feeding Voltage	SLT: 20 mA/-27 V				
AC Input I	Main Chassis = 1.43 A 3 Chassis Total = 4.29 A	Main Chassis = 1.25 A 3 Chassis Total = 3.75 A	Main Chassis = 0.82 A 3 Chassis Total = 2.46 A	Main Chassis = 0.79 A 3 Chassis Total = 2.37 A	Main Chassis = 0.76 A 3 Chassis Total = 2.28 A
KWh	Main Chassis = 0.143 KWh 3 Chassis Total =0.429 KWh	Main Chassis = 0.150 KWh 3 Chassis Total =0.450 KWh	Main Chassis = 0.185 KWh 3 Chassis Total =0.541 KWh	Main Chassis = 0.182 KWh 3 Chassis Total =0.545 KWh	Main Chassis = 0.182 KWh 3 Chassis Total =0.547 KWh
BTU(KWh x 3413)	Main Chassis = 488 BTU 3 Chassis Total =1464 BTU	Main Chassis = 512 BTU 3 Chassis Total =1536 BTU	Main Chassis = 631 BTU 3 Chassis Total =1894 BTU	Main Chassis = 621 BTU 3 Chassis Total =1863 BTU	Main Chassis = 621 BTU 3 Chassis Total =1863 BTU

2.6 Electrical Specifications <Power Supply> (Chassis)

Table 5-4 Electrical Specifications of Chassis


Item	Specification
Output Voltage	-27 V (54 W)
Output Current	2.0 A

2.7 CPU

SL2100		
CONTROL SYSTEM		Digital
MPU	Manufacturer/ Name	HITACHI OPV5HB-23-C
	MPU Architecture	Cortex-A9 (3core)
	Core Frequency	800 MHz
PROGRAM STORAGE	Nand Flash	256 MB
DATA STORAGE	SDRAM	128 MB x 2
SWITCHING (Time Division Matrix)		402 x 402 (Non-Blocking)

2.8 Traffic Capacity

Traffic Capacity	Basic System Package	Expanded System Package
Traffic Capacity	2540 BHCA	2540 BHCA

 2540 Busy-Hour Call Attempts (BHCA) is based on a Full Capacity.

2.9 IP Terminal Power Chart

Table 5-5 IP Terminal Power Chart

IP Terminal	IEEE 802.3af Class	Label Indication (Maximum Current with All Options)				Note
		48 VDC		27 VDC		
IP7WW-8IPLD-C1 TEL	Class1	75 mA	3.6 W	-	-	
IP4WW-24TIXH-C TEL	Class 2	130 mA	6.2 W	235 mA	6.3 W	
ITX-1DE-1W(BK) TEL	Class 2	60 mA	2.88 W	-	-	

2.10 IEEE802.af Class Specification

Table 5-6 IEEE802.af Class Specification

IEEE802.af	Minimum	Maximum
Class 1	-	3.84 W
Class 2	3.84 W	6.49 W

2.11 SLT Ring Signal Specification

Table 5-7 SLT Ring Signal Specification

Description		Specification
Normal Current		20 mA
Ring Signal	Voltage	75 VAC
	Frequency	20 Hz or 25 Hz

2.12 Mechanical Specifications

Table 5-8 Mechanical Specifications

Equipment	Width	Depth	Height	Weight	Note
IP7[]-4KSU-C1	330 mm (12.99 in)	92.9 mm (3.66 in)	435 mm (17.13 in)	2.2 kg (excluding option board) (77.60 oz) 4.0 kg (including five option boards) (141.10 oz)	
IP4WW-Battery Box	500 mm (19.69 in)	230 mm (9.06 in)	340 mm (13.39 in)	10.3 kg (excluding battery) (363.32 oz) 15.6 kg (including battery) (550.27 oz)	Battery itself is NOT attached
IP7WW-12TXH-B1 TEL (BK)	181mm (7.13 in)	221mm (8.70 in)	136mm (5.35 in)	0.86kg (30.34 oz)	
IP7WW-24TXH-B1 TEL (BK)	181mm (7.13 in)	221mm (8.70 in)	136mm (5.35 in)	0.87kg (30.69 oz)	
IP7WW-8IPLD-C1 TEL (BK)	178mm (7.01 in)	221mm (8.70 in)	133mm (5.24 in)	0.9kg (31.75 oz)	
IP7WW-60D DSS-B1 CONSOLE (BK)	122mm (4.80 in)	221mm (8.70 in)	133mm (5.24 in)	0.43kg (15.17 oz)	

Equipment	Width	Depth	Height	Weight	Note
Door Box (DP-D-1())	98mm (3.85 in)	28.5mm (1.12 in)	130mm (5.12 in)	0.2kg (7.05 oz)	
Standard SIP Phone ITX-1DE-1W (BK) TEL	152mm (5.98 in)	225mm (8.86 in)	95mm (3.74 in)	0.72kg (25.40 oz)	

2.13 Optional Unit Mechanical Specifications

Table 5-9 Optional Unit Mechanical Specifications

Unit	Width	Depth	Height	Weight	Note
IP7[]-CPU-C1	103.2 mm (4.063 in)	232.7 mm (9.16 in)	51.6 mm (2.03 in)	150 g (5.29 oz)	
IP7WW-EXIFB-C1	65.5 mm (2.58 in)	138 mm (5.43 in)	17.5 mm (0.69 in)	55 g (1.94 oz)	
IP7WW-EXIFE-C1	103.2 mm (4.063 in)	232.7 mm (9.16 in)	51.6 mm (2.03 in)	128.3 g (4.53 oz)	
IP7WW-082U-B1	137 mm (5.39 in)	232.7 mm (9.16 in)	27.8 mm (1.09 in)	208.7 g (7.36 oz)	
IP7WW-008U-C1	137 mm (5.39 in)	232.7 mm (9.16 in)	27.8 mm (1.09 in)	171.5 g (6.05 oz)	
IP7WW-000U-C1	137 mm (5.39 in)	232.7 mm (9.16 in)	27.8 mm (1.09 in)	140.8 g (4.97 oz)	
IP7WW-3COIDB-C1	60 mm (2.36 in)	202 mm (7.95 in)	23.4 mm (0.92 in)	68.6 g (2.42 oz)	
IP7WW-1PRIDB-C1	110 mm (4.33 in)	203 mm (7.99 in)	23.4 mm (0.92 in)	90.4 g (3.19 oz)	
IP7WW-VOIPDB-C1	66 mm (2.60 in)	146.5 mm (5.77 in)	18 mm (0.71 in)	71.5 g (2.52 oz)	
IP7WW-SDVMS-C1	24 mm (0.94 in)	32 mm (1.26 in)	2.1 mm (0.08 in)	1.7 g (0.06 oz)	
IP7WW-SDVML-C1	24 mm (0.94 in)	32 mm (1.26 in)	2.1 mm (0.08 in)	1.7 g (0.06 oz)	

2.14 Doorphone Interface Specifications

Table 5-10 Doorphone Interface Specifications

Item	Specification
Output Impedance	600 Ω
Output Level	Nominal 500 mV (-10 dBm)
Maximum Output	1.75 V RMS

2.15 General Purpose/Door Unlock Relay Specifications

Table 5-11 General Purpose/Door Unlock Relay Specifications

Item	Specification
Rated Voltage	DC 48 V Maximum
Rated Current	DC 320 mA Maximum

Item	Specification
Contact	Normally Open

2.16 External Paging Output Specifications

Table 5-12 External Paging Output Specifications

Item	Specification
Output Impedance	600 Ω @ 1 kHz
Output Level	Nominal 250 mV (-10 dBm)
Maximum Output	400 mV RMS

2.17 BGM/ExMOH Source Input Specifications

Table 5-13 BGM/External MOH Source Input Specifications

Item	Specification
Input Impedance	High Impedance (>10 k Ω)
Input Level	Nominal 250 mV (-10 dBm)
Maximum Input	1 V RMS

2.18 External Sensor Device Interface Specifications

Table 5-14 External Sensor Device Interface Specifications

Applied Voltage during Sensor Off	Loop Current during Sensor On	Port Assignment
25 V	40 mA	Program 10-03-05: 1 (Read only) * Port assignment should be set on Doorphone mode by Hardware-Switch on 082U board.

The External Sensor device configuration shall be assigned by Hardware Switch and applied voltage during sensor off is supported 25 V type only.

2.19 CPU Board LAN Port Specifications

Table 5-15 CPU Board LAN Port Specifications

Item	Specification
Standard	IEEE802.3 100Base-TX Compliant (Full Duplex only)
Access	CSMA/CD
I/F (Layer 1)	Speed: 100 Mbps Full duplex Cable: CAT5 or better, Straight/Cross Auto Crossover

2.20 Cabling Requirements

- Do not run extension cable in parallel with the AC source, telex or computer etc. If the cables are near cable runs to those devices, use shielded cable with grounded shields or install the cable in conduit.
- When cables must be run on the floor, cable protectors must be used.
- Cable runs for Multiline Telephones, DSS Consoles, Single Line Telephones, and Doorphone Boxes must be a dedicated, isolated cable pair.
- Aerial distribution cabling is not allowed.
- Trunk Lines must be installed with lightning protectors.
- Do not use 4-wire cabling for SLT connections.

2.21 Cable Requirements

Table 5-16 Cable Requirements

Device	Cable Type	Cable Run Length
2W Digital Multiline Telephone	24 AWG (Φ0.5 mm)	300 m (984.3 ft)
IP Multiline Terminal Standard SIP Phone	CAT5 Straight Cable	100 m (328.1 ft)
DSS Console	24 AWG (Φ0.5 mm)	300 m (984.3 ft)
Single Line Telephone Analog Terminals (20mA)	24 AWG (Φ0.5 mm)	1,125 m (3,691ft)
Doorphone Box	24 AWG (Φ0.5 mm)	150 m (492.1 ft)
CPU LAN Port to External Device	Ethernet Cross Cable	100 m (328.1 ft)
CPU LAN Port to Switching Hub	Ethernet Straight Cable	100 m (328.1 ft)
ISDN Terminal	4-wire, 24 AWG (Φ0.5 mm)	100 m (328.1 ft) (P-MP Short -passive) 300 m (984.3 ft) (P-MP Long -passive) 500 m (1,640.4 ft) (P-P)
4KSU-C1 Expansion	Ethernet Straight Cable (Attached to IP7WW-EXIFE-C1)	1.2 m (3.9 ft)

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Hardware Manual

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