NEC

SL1000

Hardware Manual

A50-031170-001
ISSUE 1.0
January 2011

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Printed in Japan

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Regulatory

BATTERY DISPOSAL

The SL1000 system includes the batteries listed below. When disposing of these batteries, KSU, and/or Unit, you must comply with applicable federal and state regulations regarding proper disposal procedures.

Unit Name	Type of Battery	Quantity
IP4[ ]-CPU-A1	Lithium	1
External Battery (IP4WW-Battery Box)	Sealed Lead	2 per IP4WW-Battery Box

The SL1000 IP4[ ]-CPU-A1 provides memory 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 TRASH! 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 SL1000 system contains the following labels regarding proper disposal.

Pb

CONTAINS SEALED LEAD BATTERY.
BATTERY MUST BE RECYCLED. MUST NOT BE DISPOSED OF IN MUNICIPAL WASTE.

EUROPEAN UNION INFORMATION

Notice to the user

The system described in this manual is intended to be connected to analog and digital networks and supports a wide range of peripheral equipment. The following interfaces are available for connection to public analog and digital telecommunication networks:

- TBR3 ISDN basic rate interface
- TBR4 ISDN primary rate interface
- ES203-021 Analogue interface

To take advantage of all features of this system and the connected equipment, the country or network specific features should match the supported features of the system. For an overview of the supported features, refer to the detailed documentation that comes with this system, contact your local NEC Unified Solutions representative or the support desk of NEC Unified Solutions.

Declaration of conformity

Hereby, NEC Unified Solutions, declares that the SL1000 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

For the Declaration of Conformity, visit: http://www.nec-unified.com/doc

CE

Electromagnetic Compatibility

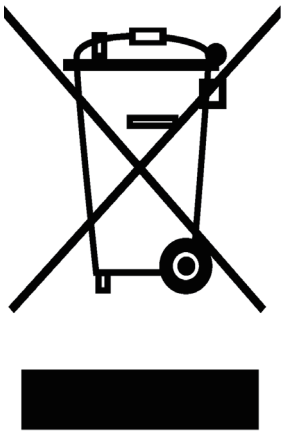
For the SL1000 system the following warning is applicable:

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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.

At you can find information about separate disposal and environmentally sound recycling.

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 SL1000 System Hardware Manual.

Memo

Introduction

SECTION 1 GENERAL INFORMATION

The SL1000 is designed to grow a small businesses with rich system features, The SL1000 can provide legacy line/trunk and comes complete with Digital Network (ISDN BRI/PRI, E1,.etc) and IP trunks (SIP), hybrid extension port to support 4-Wire Multi-Line Telephone, Analog Telephone or Door-Boxes. And built-in Answering feature is initially equipped. The SL1000 is designed for simple installation and easy operation for the users. The SL1000 comes with a basic configuration of 4 trunks and 8 extensions and build up to maximum 48 trunks /128 extensions (max.96 extensions by Multi-Line Telephone).

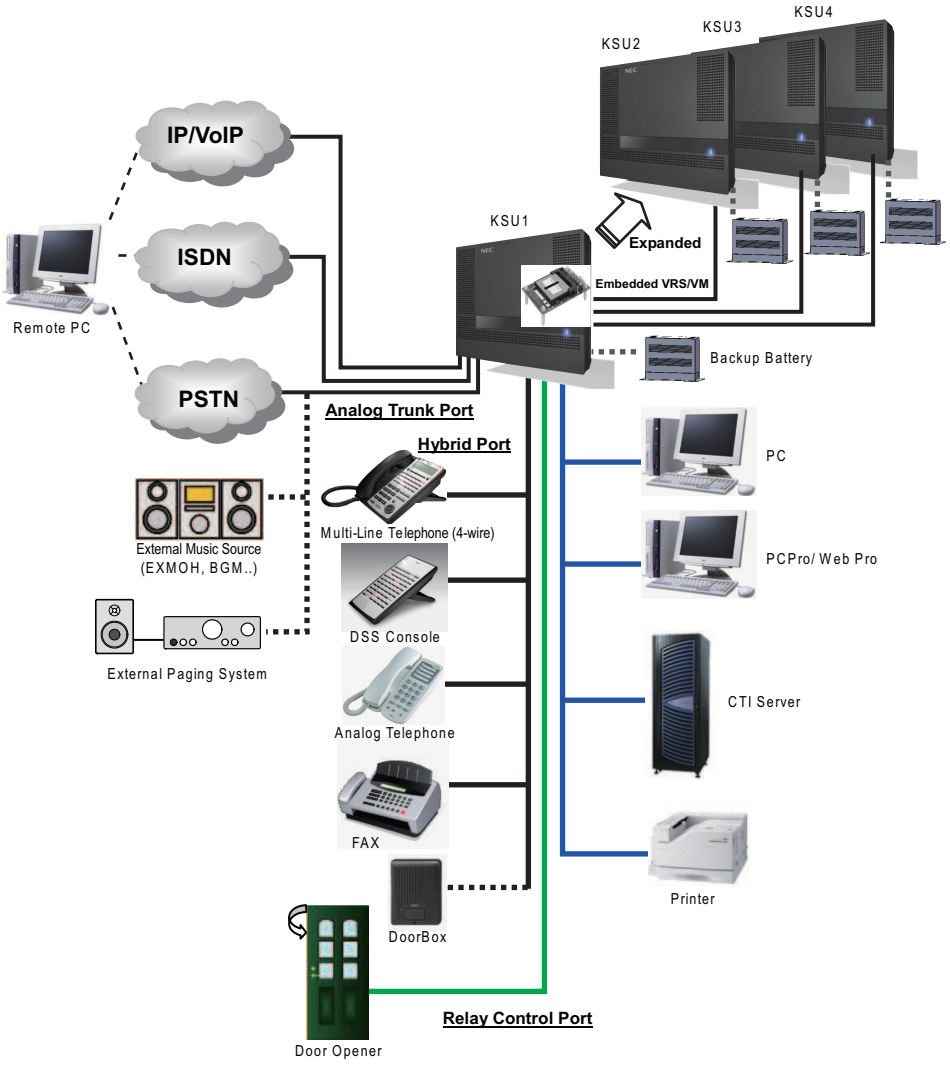


Figure 1-1 System Configuration

SECTION 2 EQUIPMENT LIST

The following table lists all equipment for the SL1000 system.

Stock Number	Equipment Name	Equipment Description
BE110231	IP4WW-1632M-A KSU w/o C	IP4WW-1632M-A KSU without AC Cable <Including> IP4WW-CPU-A1, IP4WW-408M-A1, Power Supply
BE110232	IP4WW-1632M-A KSU	IP4WW-1632M-A KSU with AC Cable <Including> IP4WW-CPU-A1, IP4WW-408M-A1, Power Supply
BE110233	IP4EU-1632M-A KSU w/o C	IP4EU-1632M-A KSU without AC Cable (for EMEA) <Including> IP4EU-CPU-A1, IP4WW-408M-A1, Power Supply
BE110234	IP4EU-1632M-A KSU	IP4EU-1632M-A KSU with AC Cable (for EMEA) <Including> IP4EU-CPU-A1, IP4WW-408M-A1, Power Supply
BE110235	IP4U-1632M-A KSU	IP4WW-1632M-A KSU with AC Cable (for China) <Including> IP4WW-CPU-A1, IP4WW-408M-A1, Power Supply
BE110236	IP4WW-1632ME-A EXP w/o C	IP4WW-1632ME-A EXP without AC Cable <Including> IP4WW-EXIFE-C1, IP4WW-408M-A1, Power Supply
BE110237	IP4WW-1632ME-A EXP	IP4WW-1632ME-A EXP with AC Cable <Including> IP4WW-EXIFE-C1, IP4WW-408M-A1, Power Supply
BE110238	IP4U-1632ME-A EXP	IP4WW-1632ME-A EXP with AC Cable (for China) <Including> IP4WW-EXIFE-C1, IP4WW-408M-A1, Power Supply
BE110258	IP4WW-EXIFB-C1	Expansion KSU Interface Unit, 3 jacks
BE110239	IP4WW-Battery Box	External Battery Box without Batteries
BE110250	IP4WW-408E-A1	4-port Loop Start Trunks and 8-port Hybrid Station Interface
BE110251	IP4WW-008E-A1	8-port Hybrid Station Interface
BE110252	IP4WW-000E-A1	Extension board for 2BRIDB daughter board
BE110257	IP4WW-2BRIDB-C1	2 Basic Rate Interface, mounted on 008E-A1/000E-A1 board
BE110255	IP4WW-1PRIU-C1	1 Primary Rate Interface (PRI/E1/T1)
BE110246	IP4WW-MEMDB-C1	Memory Expansion on CPU
BE110247	IP4EU-MEMDB-C1	Memory Expansion on CPU (for EMEA)
Future Available	IP4WW-VOIPDB-C1	16-channel VOIP on CPU
BE106339	PZ-VM21	16 Channels for Voice Mail with a Single Channel V34 Modem
BE107874	PZ-VM21 (for China)	
BE110730	IP4WW-CFVRS-C1	Compact Flash for VRS (512MB, VRS: 4ch (default))
BE110731	IP4WW-CFVMS-C1	Compact Flash for VRS and InMail (512MB, 15 hours, VRS: 4ch (default)/InMail: 2ch (default))
BE110732	IP4WW-CFVML-C1	Compact Flash for VRS and InMail (1GB, 40 hours, VRS: 4ch (default)/InMail: 4ch (default))
BE110261	IP4WW-12TXH-A-TEL (WH)	4-wire 12-key Multi-Line Telephone
BE110262	IP4WW-12TXH-A-TEL (BK)	
BE110263	IP4WW-24TXH-A-TEL (WH)	4-wire 24-key Multi-Line Telephone
BE110264	IP4WW-24TXH-A-TEL (BK)	
BE110277	IP4WW-24TIXH-C-TEL (WH)	24-Keys, Multi-Line IP Telephone
BE110278	IP4WW-24TIXH-C-TEL (BK)	
BE110281	IP4WW-60D DSS-A CONSOLE (WH)	60-button Direct Station Selection (DSS) Console
BE110282	IP4WW-60D DSS-A CONSOLE (BK)	

Stock Number	Equipment Name	Equipment Description
BE108045	DP-D-1D	Doorphone
BE106914	DP-D-1A	
BE109741	DX4NA Doorphone	
BE109742	HS.D503DOR-A	
Future Available	SL-IP-SIPTRK/SIPEXT-1 LIC	SIP Trunk/Standard SIP Terminal License (1 port)
Future Available	SL-IP-ENCRYPTION LIC	Encryption License for Multi-Line IP Telephone (1 license per system)
Future Available	SL-IP-NAPT LIC	NAPT License for Multi-Line IP Telephone (1 license per system)
BE110755	SL-VM-CHANNEL-2 LIC	Additional In-Mail Channel License (2 ports)
BE110733	SL-VM-ADVANCE LIC	In-Mail Advanced Features License (1 license per system)
BE110756	SL-SYS-MOBILE-1 LIC	Additional Mobile Extension Port License (1 port)
BE110757	SL-SYS-HOTEL LIC	Hotel/Motel Feature License (1 license per system)
BE110855	IP4NA-KSU AC CABLE	AC Cable
BE110856	IP2BR-924M AC CABLE	AC Cable
BE110857	IP2AP-924M AC CABLE (L)	AC Cable
BE110858	IP2AP-924M AC CABLE	AC Cable
Future Available	IP4WW-WALL MOUNT UNIT	Wall Mount Unit for IP4WW-24TIXH-C-TEL

2.1 KSUs and Optional Unit

2.1.1 IP4[ ]-1632M-A KSU

This is the main cabinet. The following facilities are initially equipped.

- CPU with main software (CPU-A1)
- Power supply (110V/240V)
- 1 External backup battery connector
- 3 mounting spaces for 408E/008E/000E/1PRIU (3rd Slot of each KSU can not use for 4-Wire Multi-Line Telephone or DSS Console.)
- 4 trunks + 8 hybrid Ext. I/F (408M-A1)
- 1 power failure transfer circuit
- 1 slot for EXIFB-C1
- 2 door unlock relay
- SLT ringer
- Message waiting lamp driver
- One built-in answering circuit (VRS)

And, the on-board DSP provides:

- 20 telephony resources (DTMF/Dial tone/Busy tone/FSK caller-ID receiver/sender)
- 128 tone sender resources (System tones sender/DTMF sender)
- 32 ch conference resources

2.1.2 IP4[ ]-1632ME-A EXP

This is the expansion cabinet to expand the system capacity. Up to three 1632ME EXPs can be connected to the 1632M Main KSU. The KSU shape and structure are exactly same as 1632M KSU, however the capability is different. The following facilities are initially equipped.

- Power supply (110V/240V)
- 1 external backup battery connector
- 3 mounting spaces for 408E/008E/000E/1PRIU
  (3rd Slot of each KSU can not use for 4-Wire Multi-Line Telephone or DSS Console.)
- 4 trunks + 8 hybrid Ext. I/F
- 1 power failure transfer circuit
- EXIFE-C1 (1 connector for 1632M-A KSU)
- 2 door unlock relay
- SLT ringer
- Message waiting lamp driver

And, the EXIFE DSP provides:

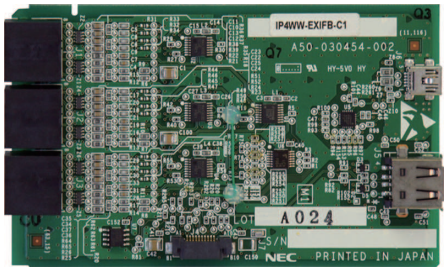
- 32 telephony resources (DTMF/Dial tone/Busy tone/FSK caller-ID receiver/sender)

1632ME-A EXP does **NOT** have CPU and main software, therefore it shall not activate by stand-alone.

2.1.3 IP4WW-EXIFB-C1

The Expansion KSU(s) is/are connected to the Main KSU individually. EXIFB-C1 card must be installed to the Main KSU and use CAT5 cable to connect to EXIFE-C1 on the Expansion KSU.

- Install this card to the main KSU.
- 3 connectors to connect to expansion KSUs
- DIM monitor circuit for maintenance



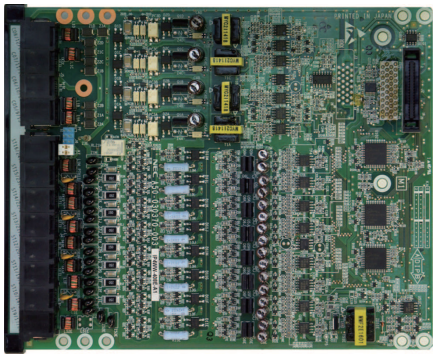
2.1.4 IP4WW-Battery Box

This is the external backup battery box to supply the DC power to the system when the AC power is failed. It is connected to the power supply for each KSU. The battery itself must be prepared by local supplier.

- Connect this box to the power supply at each KSU.
- Wall/floor mountable
- One KSU can be mounted on the Battery box.
- Backup duration is approximately 1 hour.

2.2 Trunk/Extension/ISDN Expansion Interface Cards

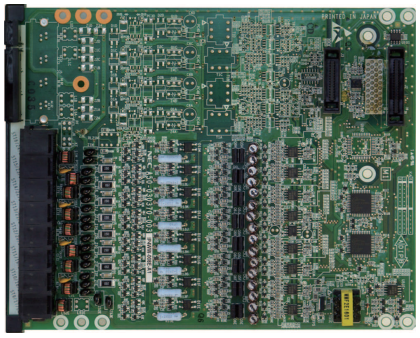
2.2.1 IP4WW-408E-A1



This is the expansion interface card, and is installed into 1632M KSU/1632ME EXP. Up to 4 analog trunk and 8 hybrid extension ports are mounted per a card. Also, 1 Power Failure transfer circuit is equipped on this card (1st trunk port to 8th extension port).

- Install this card to the expansion card slot at main/expansion KSU
- Enables to connect the DSS console to hybrid Ext. port No.8
- 1 power failure transfer circuit

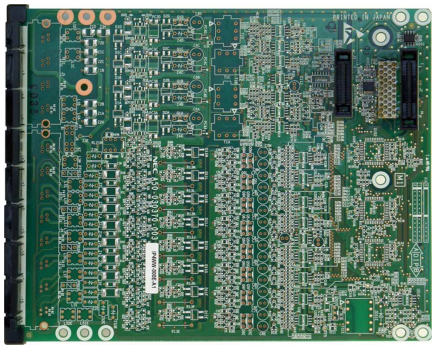
2.2.2 IP4WW-008E-A1



This is the expansion interface card. This is installed into 1632M KSU/1632ME EXP. Up to 8 hybrid extension ports are mounted per a card, and the ISDN BRI daughter board (2BRIDB) can be mounted on this card.

- Install this card to the expansion card slot at main/expansion KSU
- Enables to connect the DSS console to hybrid extension port No.8
- 1 connector for ISDN BRI daughter board

2.2.3 IP4WW-000E-A1



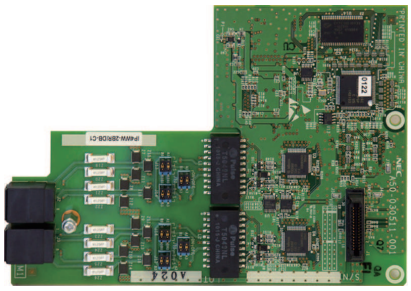
This is an expansion card for mounting 2BRIDB card, and is installed into 1632M KSU/1632ME EXP.

- Install this card to the expansion card slot at main/expansion KSU
- 1 connector for ISDN BRI daughter board

2.2.4 IP4WW-2BRIDB-C1

This is an interface daughter board that accommodates an ISDN (Basic Rate) circuit, and is installed onto the 008E or 000E card. Up to nine 2BRIDBs can be installed per system and three 2BRIDB per KSU.

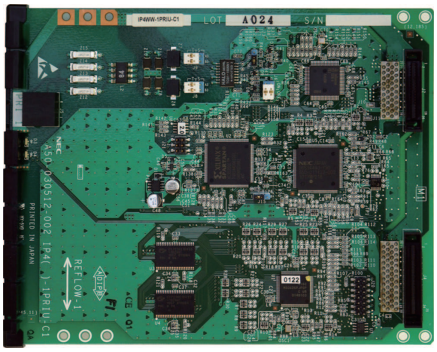
- Install this card onto the 008E or 000E card.
- Supports T/S point connection (Hard-switch).
- All ISDN circuits are not supplied with DC power from the system.



2.2.5 IP4WW-1PRIU-C1

This is provided for either ISDN Primary Rate Interface or T1 interface or E1 Interface, and is installed into 1632M KSU/1632ME EXP. Up to three 1PRIU cards can be installed per system and one 1PRIU card per KSU.

- Install this card to the expansion card slot at main/expansion KSU.
- Supports T/S point connection (Hard-switch).



2.3 Optional Interface Cards

2.3.1 IP4[ ]-MEMDB-C1

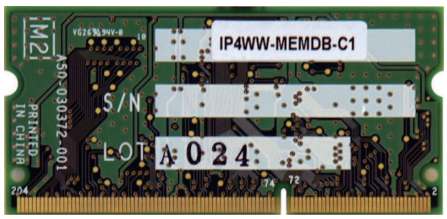
This card provides additional expansion memory Interface. Following memories are equipped on this card.

Table 1-1 Memory Capacity of MEMDB-C1

Memory Type	Capacity
SDRAM	64 MB
Flash Memory	32 MB

Install onto the CPU card (MEMDB slot) at main KSU. Following features need this card:

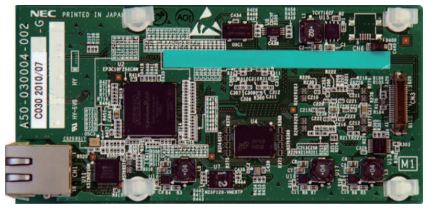
- Expansion KSU(s)
- VoIP
- CTI
- Remote Upgrade (main software)
- VRS Channel Control
- InMail channel control



2.3.2 IP4WW-VOIPDB-C1 {Feature Available}

This card provides the voice (RTP/RTCP) processing function.

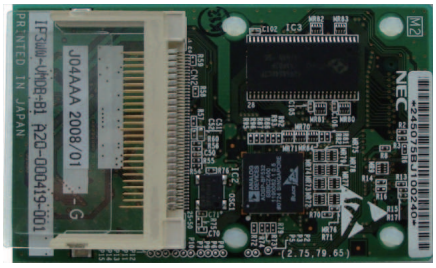
- Install this card onto the CPU card (VoIPDB slot) at main KSU.
- Initially provide 4 channels (Max. 16 channels by license control).



2.3.3 PZ-VM21

This card provides additional VRS/VMS (VRS: Voice Recording Service, VMS: Voice Mail Service) function by CF Interface and modem (V.34 analog modem) functions (for remote maintenance).

- Install this card onto the CPU card (VMDB slot) at main KSU.
- V34 (33.6kbps) analog modem is initially mounted (for remote maintenance.
- VRS/VM CF card is separate preparation.



2.3.4 IP4WW-CFVRS-C1/IP4WW-CFVMS-C1/IP4WW-CFVML-C1

These are CF cards to use VRS/VM feature and 3 types are available.

- Install onto the PZ-VM21 on CPU card at main KSU.
- CFVRS: VRS only (512 MB)
- CFVMS: VRS and 2-channel In-Mail (512 MB/15 hours)
- CFVML: VRS and 4-channel In-Mail (1 GB/40 hours)

2.4 Multi-Line Telephones and Optional Terminals

2.4.1 IP4WW-12TXH-A TEL

This is hybrid (4 wires) Multi-Line Telephone.

- Programmable keys: 12
- LCD: 16 digits x 2 lines
- Handsfree: Half-duplex
- Backlit dial pad: No
- Angle Adjustment: 2-steps (Base)
- Wall mounting kit: Built-in

2.4.2 IP4WW-24TXH-A TEL

This is hybrid (4 wires) Multi-Line Telephone.

- Programmable keys: 24
- LCD: 16 digits x 2 lines
- Handsfree: Half-duplex
- Backlit dial pad: No
- Angle Adjustment: 2-steps (Base)
- Wall mounting kit: Built-in

2.4.3 IP4WW-24TIXH-C TEL {Feature Available}

This is Multi-Line IP Telephone.

- Programmable keys: 24
- LCD: 24 digits x 3 lines
- Handsfree: Full-duplex
- Backlit dial pad: Yes
- Angle Adjustment: 2-steps (Base)
- Wall mounting kit: Built-in

2.4.4 IP4WW-60D DSS-A

This is 60 programmable keys console, and is connected to extension port No. 8.
The main purpose of this console is DSS (Direct Station Selection) for operator, however, unused keys can be assigned as other function keys such as Feature Access key, One-Touch key, and so on.

- Connect this console to extension port No. 8 at 408M/408E/008E of each KSU.
- Programmable keys: 60
- Angle Adjustment: 2-steps (Base)
- Wall mounting kit: Built-in

2.4.5 DP-D-1D

This is the Doorphone Box.

- Connect this box to hybrid port No. 6 and 7 at 408M of each KSU.

SECTION 3 SYSTEM CAPACITY

3.1 System Capacity

Table 1-2 System Capacity

Items		1 KSU (1632)	2 KSU (3264)	3 KSU (4896)	4 KSU (64128)	Note
Expansion Slot		3	6	9	12	***4th slot of each KSU can not be used for 4w Key Set. *4th KSU can not be used for COI, 2BRIDB and 1PRIU.**
System Maximum Port		66	132	198	230	1KSU: 408M+PRI+408Ex2 2KSU: 408Mx2+PRIx2+408Ex4 3KSU: 408Mx3+PRIx3+408Ex6 4KSU: 408Mx4+PRIx3+408Ex6 +008Ex3-400Mx1(4th KSU)
Trunk Port Max.		42	84	126	126	1KSU: 408M+PRIx1+408Ex2 2KSU: 408Mx2+PRIx2+408Ex4 3/4KSU: 408Mx3+PRIx3+408Ex6
Trunk Port	**Analog Trunks (COT)**	16	32	48	48	1KSU: 408M+408Ex3 2KSU: (408M+408Ex3) x2 3/4KSU: (408M+408Ex3)x3
	BRI	12	24	36	36	1KSU: 2BRIx3 on 408E/008E/000E 2KSU: 2BRIx6 3/4KSU: 2BRIx9
	PRI (E1)	30	60	90	90	**Max. 1 PRI/KSU Max. 3 PRI/sys**
	IP Trunk (SIP/H.323)	16				Needs MEMDB
	External Paging (Audio Out)	1	2	3	3	1 audio In/Out and 2 audio In circuits on 408M (COI port 2: Paging, 3: MOH, 4: BGM) Need the Program Setting. Alternative use with COT
	External MOH (Audio In)	1				
	External BGM (Audio In)	1				
Station Port Max.		32	64	96	128	1KSU: 408M+408Ex3 2KSU: 408Mx2+408Ex6 3KSU: 408Mx3+408Ex9 4KSU: 408Mx4+408Ex12
Station Port	**4W Key Set**	24	48	72	96	**Max. 24/KSU**
	SLT (–28V)	32	64	96	128	1KSU: 408M+408Ex3 2KSU: 408Mx2+408Ex6 3KSU: 408Mx3+408Ex9 4KSU: 408Mx4+408Ex12
	BRI (S-Point)	12	24	36	36	1KSU: 2BRIx3 on 008E/000E 2KSU: 2BRIx6 on 008E/000E 3KSU: 2BRIx9 on 008E/000E 4KSU: 2BRIx12 on 008E/000E
	4W DSS Console	3	6	9	12	**Max. 3/KSU** Connect to HBI Port 8 at 408M/408E/008E
	Door Phone	2	4	6	8	2DPH I/F on 408M (HBI port 6,7) Needs Program setting. Alternative use with SLT
	SIP-MLT/ SIP Std. terminal	16				Needs MEMDB
Virtual Extension		50				
Relay		2	4	6	8	2 circuits on 408M

Items	1 KSU (1632)	2 KSU (3264)	3 KSU (4896)	4 KSU (64128)	Note
Power Failure Transfer	4	8	12	12	1PFT circuit on 408M and 408E (COI port 1 and HBI port 8) Needs HW switch change. Alternative use with SLT.
Ethernet Port	1				1 circuit on CPU
Built-In Answering Machine Channel	1				1 circuit on CPU
VoIP Channels	16				Needs MEMDB
VRS Channels	4				CFVRS-C1 (512M)
	Max. 16				When MEMDB installed
VM/VRS Channels	2 VM ports/ 4 VRS ports (default) (Total Max.8 w/o MEMDB or 16 w/MEMDB)				CFVMS-C1 (512M) Port incresed by license.
	4 VM ports/ 4 VRS ports (default) (Total Max.8 w/o MEMDB or 16 w/MEMDB)				CFVML-C1 (1G) Port incresed by license.
V34 Modem	1				1 circuit on PZ-VM21
Conference Circuits	32 (Max. 16 parties per Conference)				Mounted on CPU
DSP Resource *1	20				For 1632M KSU (CPU)
	16				With VMDB
	-	32	64	96	For 1632ME EXP 32ch DSP on each EXIFE-C1
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 KSU Capacity

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

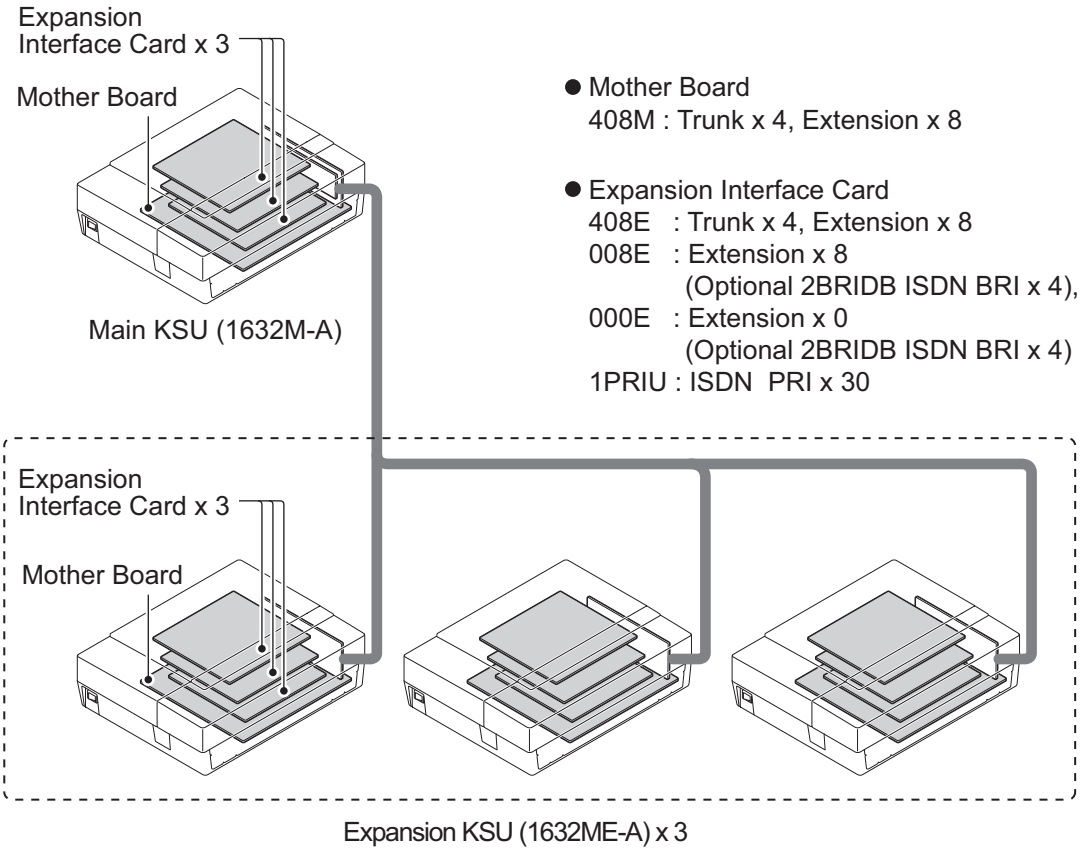


Figure 1-2 System Image

3.2.1 Expandability of Trunk and Extension (without PRI)

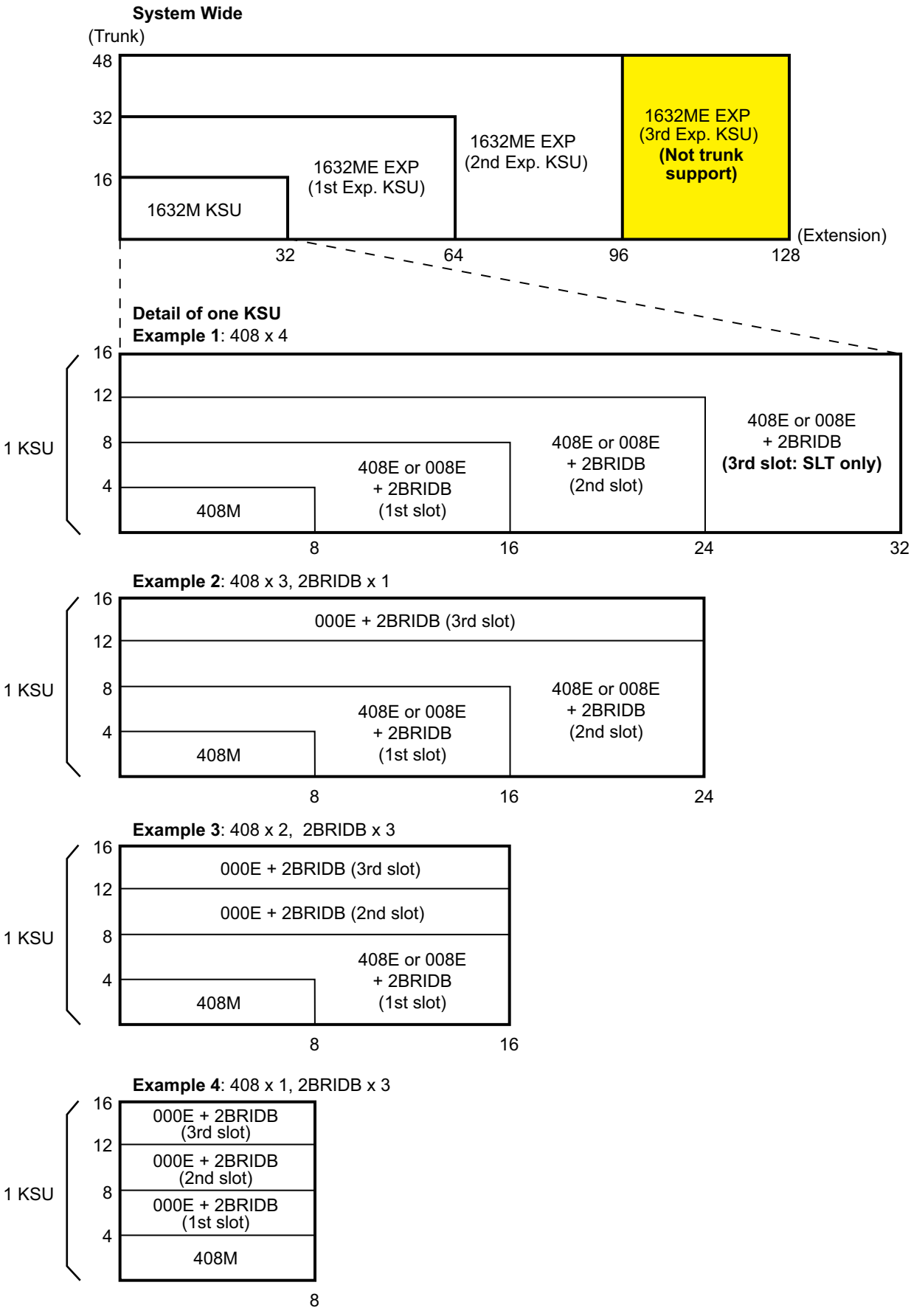


Figure 1-3 Maximum KSU capacity - Expandability of Trunk and Extension (without PRI)

3.2.2 Expandability of Trunk and Extension (with PRI)

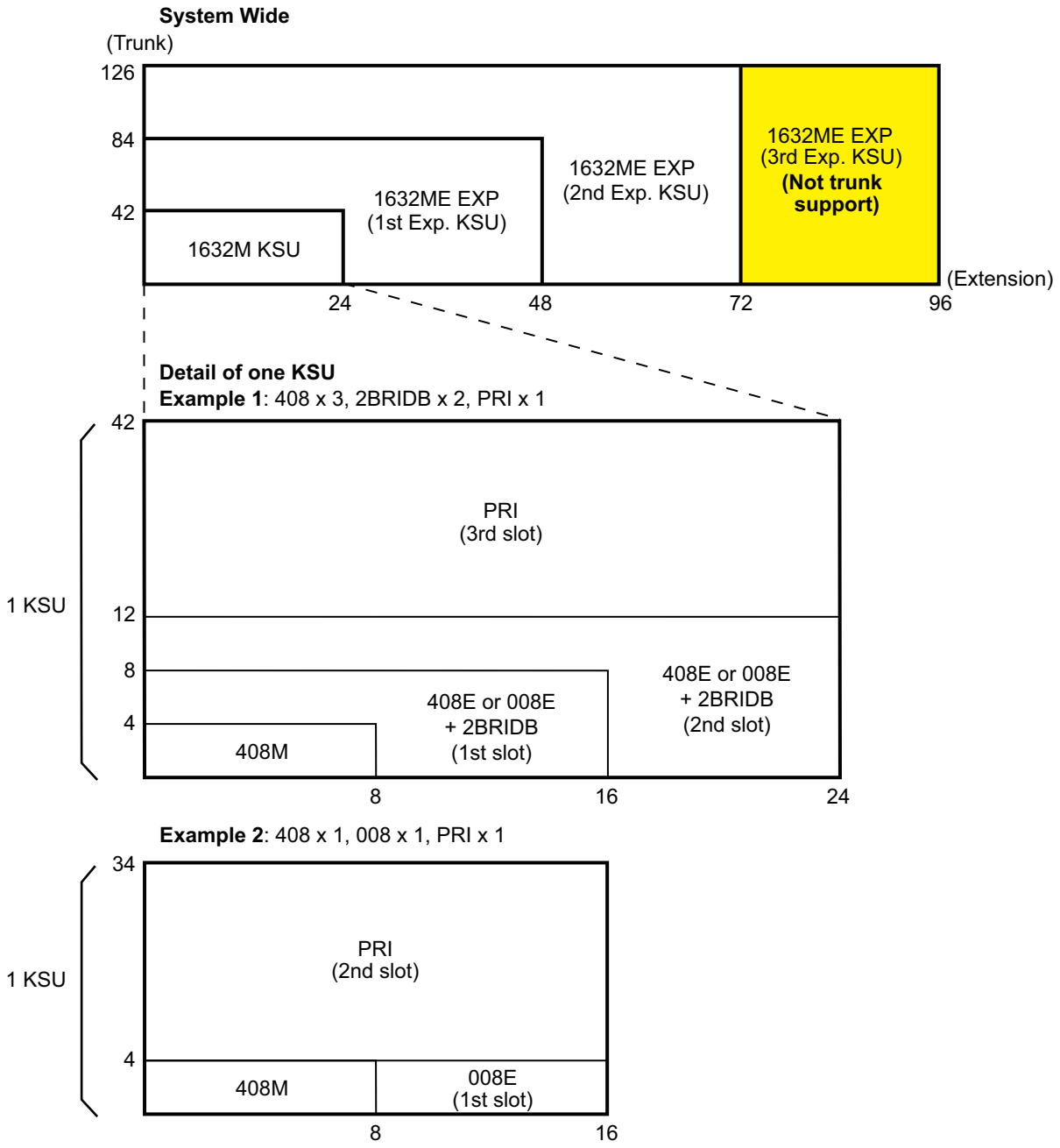


Figure 1-4 Maximum KSU capacity - Expandability of Trunk and Extension (with PRI)

Installation

2

Installation

SECTION 1 INSTALLING THE MAIN & EXPANSION KSUS

1.1 Before Installing the KSU(s)

Each Main or Expansion KSU(s) can have the optional Battery Box connected, before deciding on the mounting location refer to Figure 2-4 Horizontal Arrangement of the KSUs on page 2-5 and refer to INSTALLING THE EXTERNAL BACKUP BATTERY on page 2-18.

1.1.1 General Precautions

- To avoid shock or damage, do not plug in or turn the system power on before completing the installation process.
- Avoid working with the KSU during electrical storms.
- Use only commercial AC power to prevent shock or fire.
- Do not bundle AC Power cords together, the cords may over heat.
- Make sure the KSU has proper Earth ground.
- If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.

1.1.2 Unpacking

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

Table 2-1 Unpacking the KSU

Items	List of Contents	QTY
1632M-A KSU	1632M-A KSU	1
	AC Power Cord (AC Power Cord is not attached for IP4[ ]-1632M-A KSU w/o C type)	1
	Manual CD	1
	Screws (M4.1x25)	4
	Template for Wall Mounting	1
1632ME-A EXP	1632ME-A EXP	1
	AC Power Cord (AC Power Cord is not attached for IP4[ ]-1632ME-A EXP w/o C type)	1
	Screws (M4.1x25)	4
	Expansion Cable	1
	Template for Wall Mounting	1

1.1.3 Preparations

- Make sure the necessary tools (screw driver set, pliers set, etc) are prepared.

- 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.

1.1.4 Site Requirements

- The system without the IP4WW-Battery Box should be wall-mounted only. The system with the IP4WW-Battery Box can be installed either on the floor or wall. Ensure that enough space is available to allow the installation of KSU(s) and/or battery box.
- A dedicated 100V-120V/220V/230V/240VAC circuit located within 2 meters of the KSU is required. A separate dedicated AC outlet is necessary for each KSU.

1.1.5 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).

1.2 Installing the Main KSU (1632M-A KSU)

The Main KSU has a CPU-A card, 4 trunks and 8 hybrid extension Interface with one power failure transfer circuit, and control relay circuit for External device. And three mounting space for optional card (408E-A1/008E-A1/000E-A1/1PRIU-C1) are available.

When the IP4[ ]-MEMDB-C1 is installed into the CPU card, Expansion KSU can be installed to increase the capacity of the system. Each KSU (Main or Expansion) is powered by a power supply.

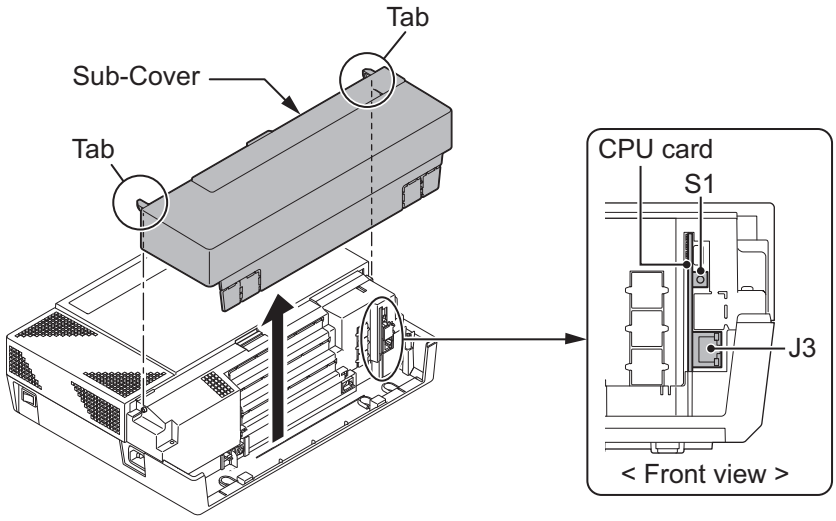
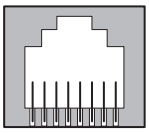


Figure 2-1 Parts Location of the CPU card

Table 2-2 Items on the CPU card

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

Item	Description	
J3 (RJ45)  87654321	Ethernet Cable Connection (for SMDR (PC, Printer), PCPro or WebPro….etc)	
	Pin No.	**Connection**
	1	Tx+
	2	Tx-
	3	Rx+
	4	-
	5	-
	6	Rx-
	7	-
	8	-

For the detail of LED (D1 - D5), refer to Figure 4-17 Inserting the CF Card on page 4-10 and Table 4-2 CPU LED Indications on page 4-13.

1.3 Wall-Mounting the KSU(s)

1.3.1 KSU Size

The dimension of main KSU (1632M-A) and expansion KSU (1632ME-A) are as below.

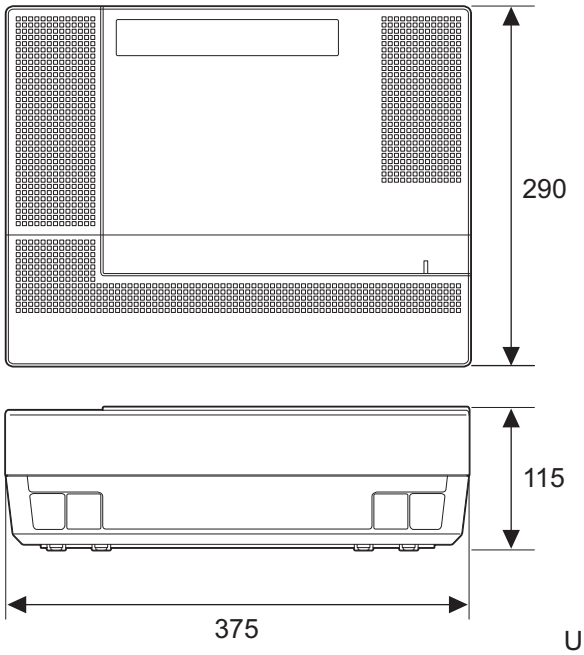


Figure 2-2 Dimension of the KSU

1.3.2 KSU(s) Install Location to the Wall

The main KSU (1632M-A) and expansion KSU(s) (1632ME-A) must be mounted onto the wall. Before installing, secure the appropriate spacing as below. Refer to Mounting one KSU on the Battery Box on page 2-31 for mounting with IP4WW-Battery Box.

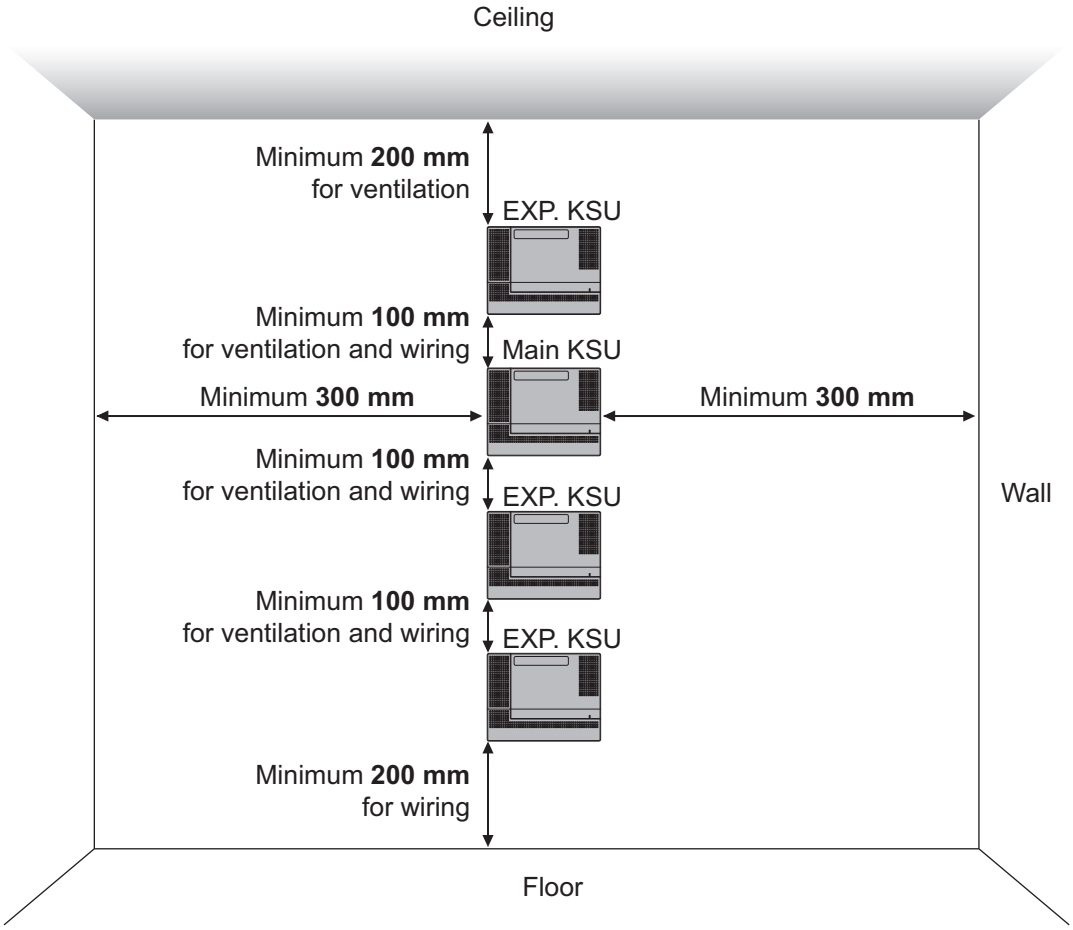


Figure 2-3 Vertical Arrangement of the KSUs

- *Due to the limit of extension cable length to connect Main KSU and Expansion KSU(s), the install location of Main KSU and each Expansion KSU(s) must be considered as above or as the next figure.*
- *When KSU is fixed on the Battery Box, it can not be wall-mounted for vertically as above.*
- *In the case, the KSU with Battery Box must be wall-mounted horizontally as shown on the next figure.*

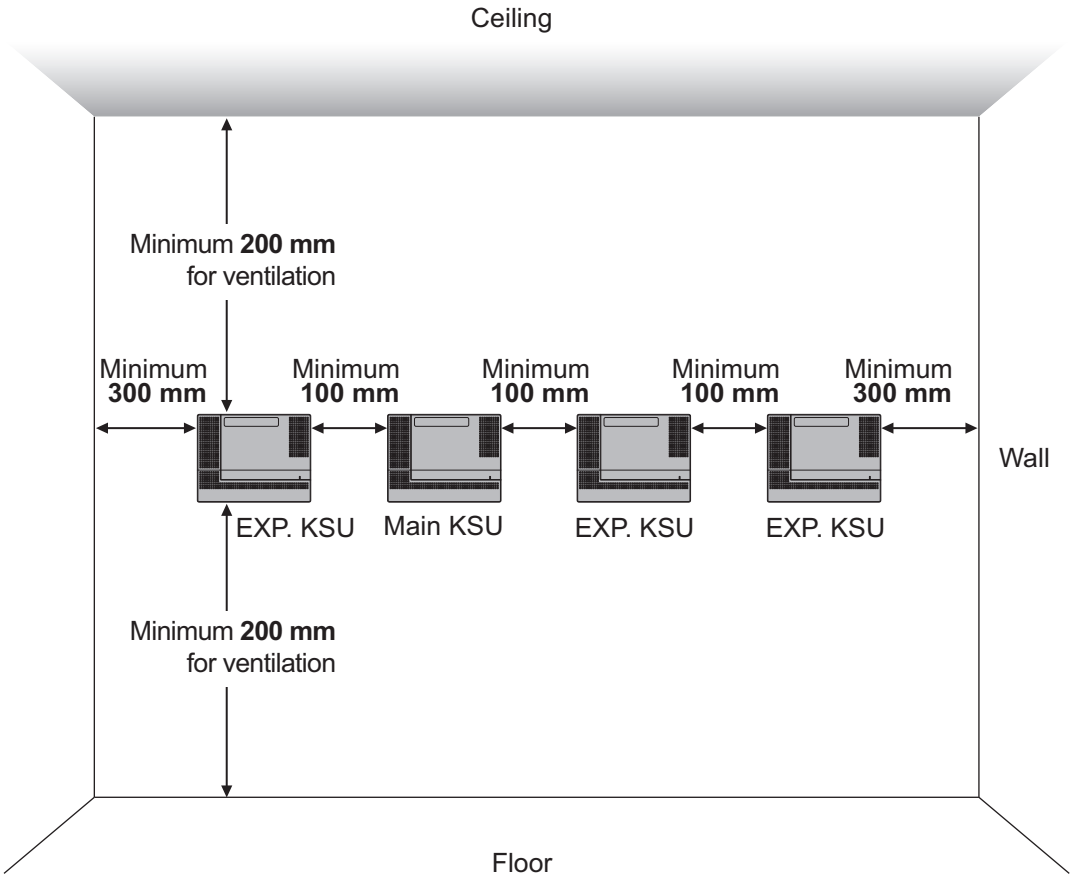


Figure 2-4 Horizontal Arrangement of the KSUs

Due to the limit of extension cable length to connect between Main KSU and Expansion KSU(s), the install location of Main KSU and each Expansion KSU(s) must be considered as above figure.

1.3.3 Mounting Procedure of KSU

One Main KSU or Expansion KSU(s) can be mounted per a IP4WW-Battery Box. For the mounting, refer to *Mounting one KSU on the Battery Box on page 2-31*.

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

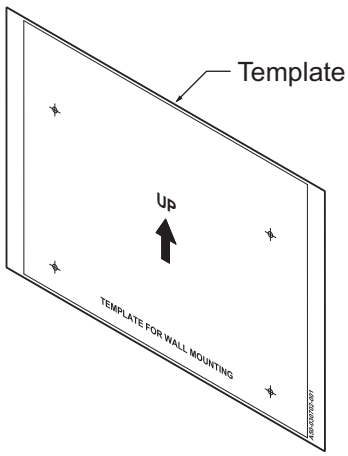


Figure 2-5 Template for Wall Mounting

2. Install four screws into the wall. The screw heads must be remained about 2.5 to 3.5 mm.

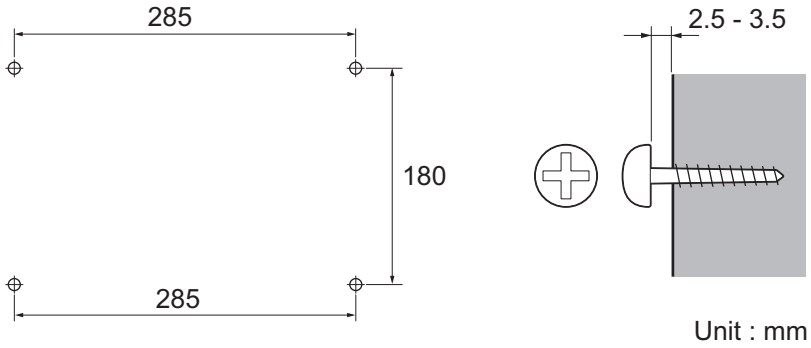


Figure 2-6 Screw Positions

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

3. Push the center of the Sub-Cover and slide it.

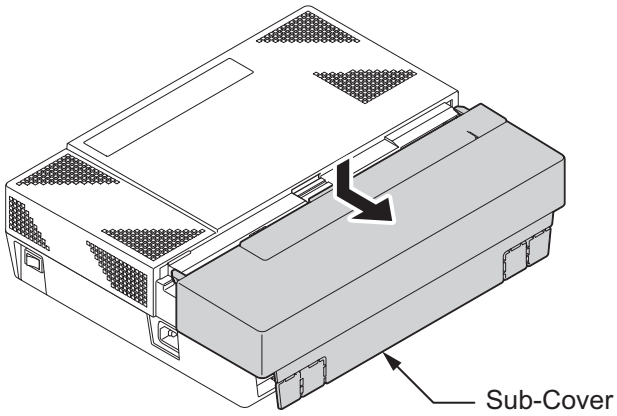


Figure 2-7 Sub-Cover Slide-out

4. Pull out the Sub-Cover by opening up the tabs.

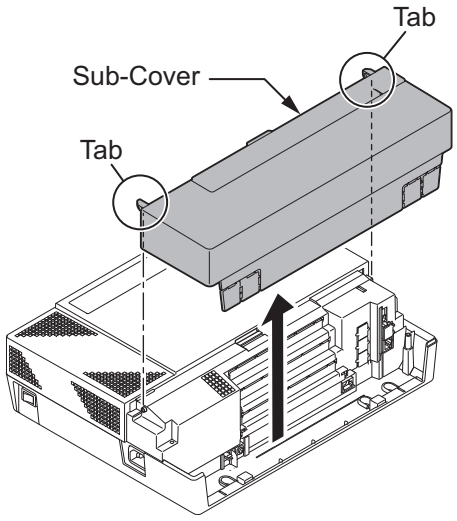


Figure 2-8 Removing the Sub-Cover

- The Sub-Cover can be opened and hold as following figure.

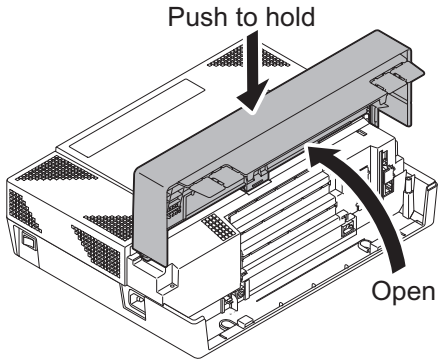


Figure 2-9 Sub-Cover Open and Hold

5. Hook the KSU on the screw heads, and fasten two screws.

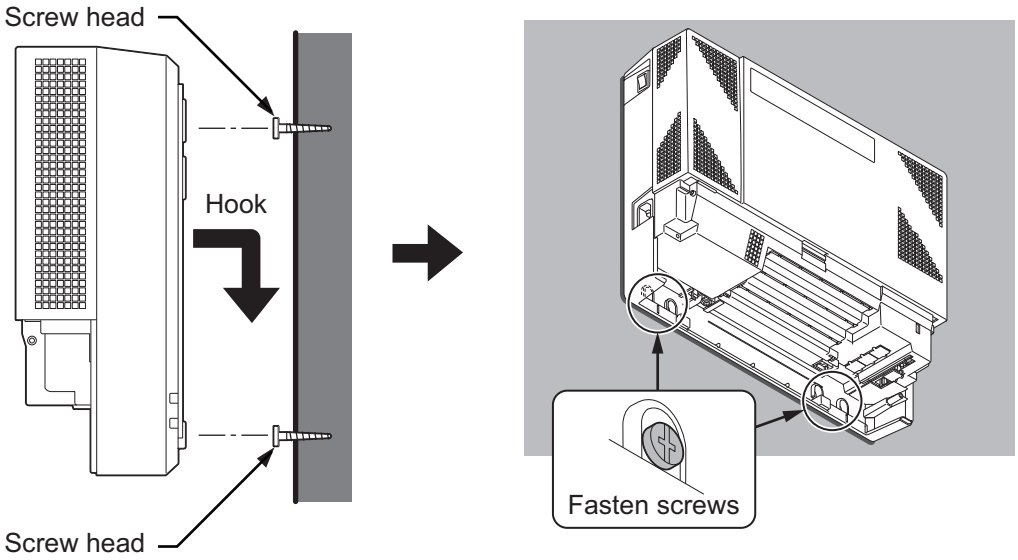


Figure 2-10 Mounting the KSU

1.4 Installing the Expansion KSU(s)

1.4.1 General

The expansion KSU(s) is/are connected to the main KSU individually. The EXIFB-C1 card and the MEMDB-C1 card must be installed to the main **KSU (1632M-A)**. (Refer to Installing the Expansion Memory Card (MEMDB-C1) on page 2-56 for MEMDB-C1 card)

1.4.2 Unpacking (EXIFB-C1)

Unpack the EXIFB-C1 and check it against the following list. Inspect for physical damage.

Table 2-3 Unpacking the EXIFB-C1

Items	List of Contents	QTY
EXIFB-C1	EXIFB-C1 PCB	1

1.4.3 Connectors Location (EXIFB-C1)

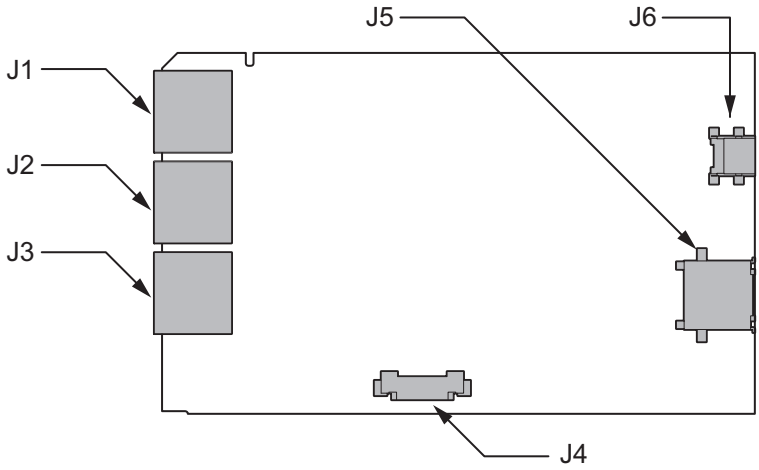


Figure 2-11 Connectors of EXIFB-C1

Table 2-4 Connectors of EXIFB-C1

No.	Connectors	Connectable Devices
J1	Expansion Connector	Expansion KSU 3
J2	Expansion Connector	Expansion KSU 2
J3	Expansion Connector	Expansion KSU 1
J4	Mother PCB	J1 connector on 408M-A1
J5, J6	Debug Purpose (Not used)	-

1.4.4 Installing the EXIFB-C1 PCB

Do Not Power on until all installation have been completed.

1. Turn off the system power and disconnect the AC cord from KSU.
2. Open and pull out the Sub-Cover of the main KSU.

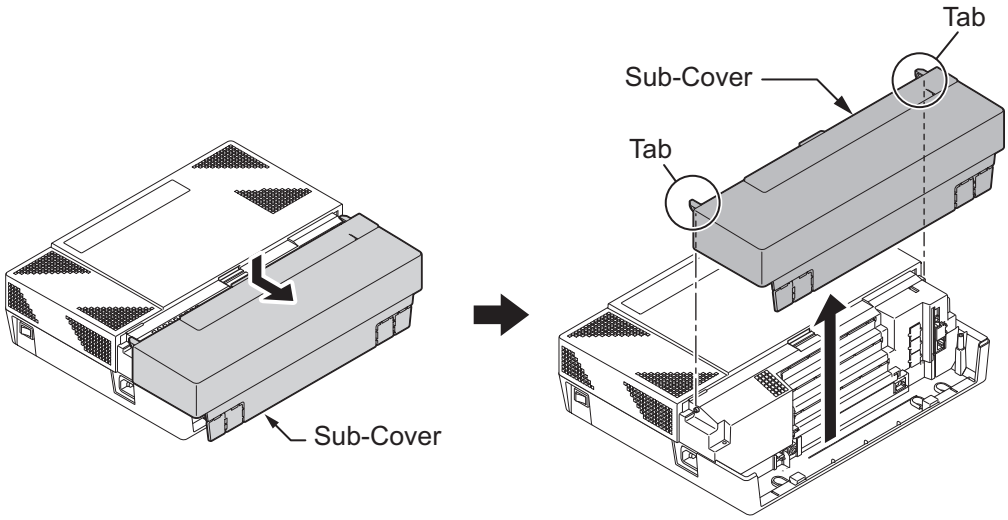


Figure 2-12 Removing the Sub-Cover

3. Loosen two screws and pull out the Main-Cover by opening up two hooks.

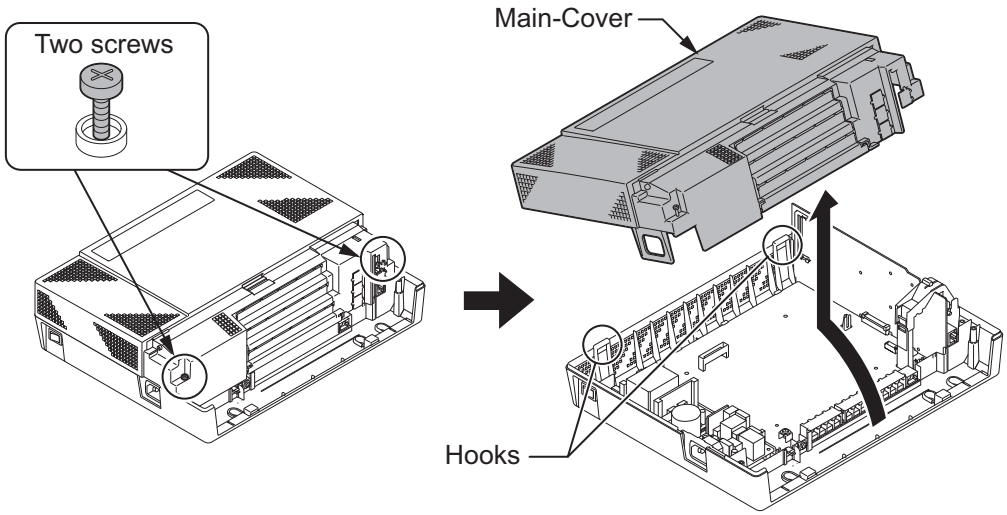


Figure 2-13 Removing the Main-Cover

4. Push A-part and open up the CPU support.

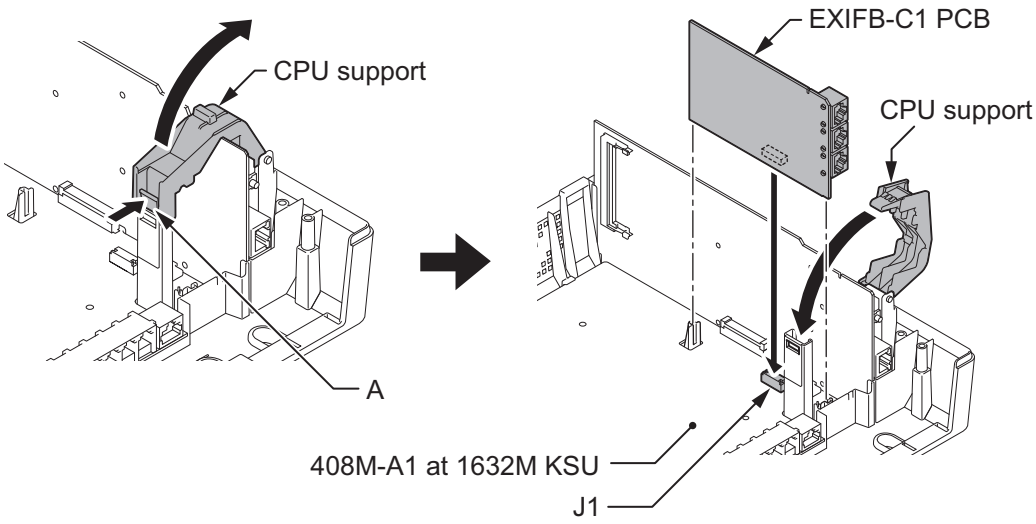


Figure 2-14 EXIFB-C1 PCB Installation

5. Insert the EXIFB-C1 PCB to J1 connector on 408M-A1 at 1632M-A KSU.
6. Close down the CPU support and make sure the A-part must be locked.
7. Cut and remove the plastic filter pieces for EXP connectors.

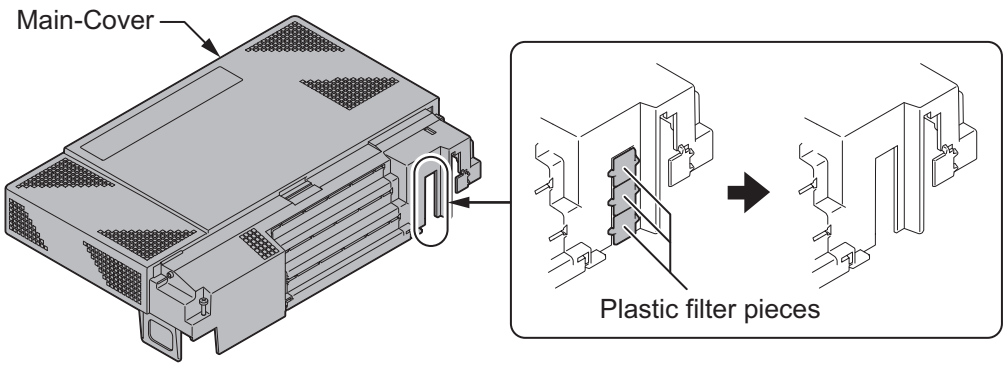


Figure 2-15 Removing the Plastic Filter Pieces

8. Replace the Main-Cover and fasten two screws.

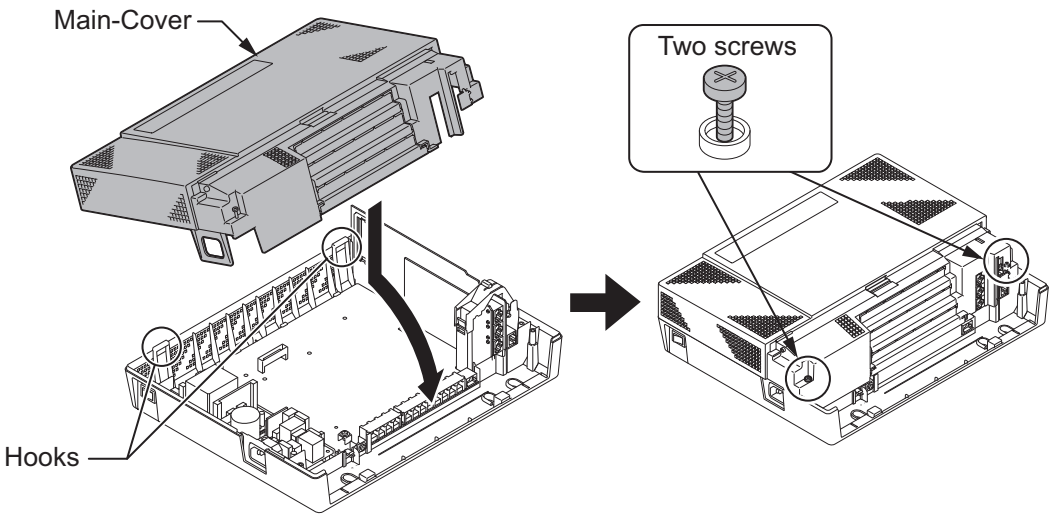


Figure 2-16 Replacing the Main-Cover

1.4.5 KSUs Inter-connection

1. Connect the main KSU (1632M-A) and expansion KSU (1632ME-A) by the cables which are attached to the expansion KSU.

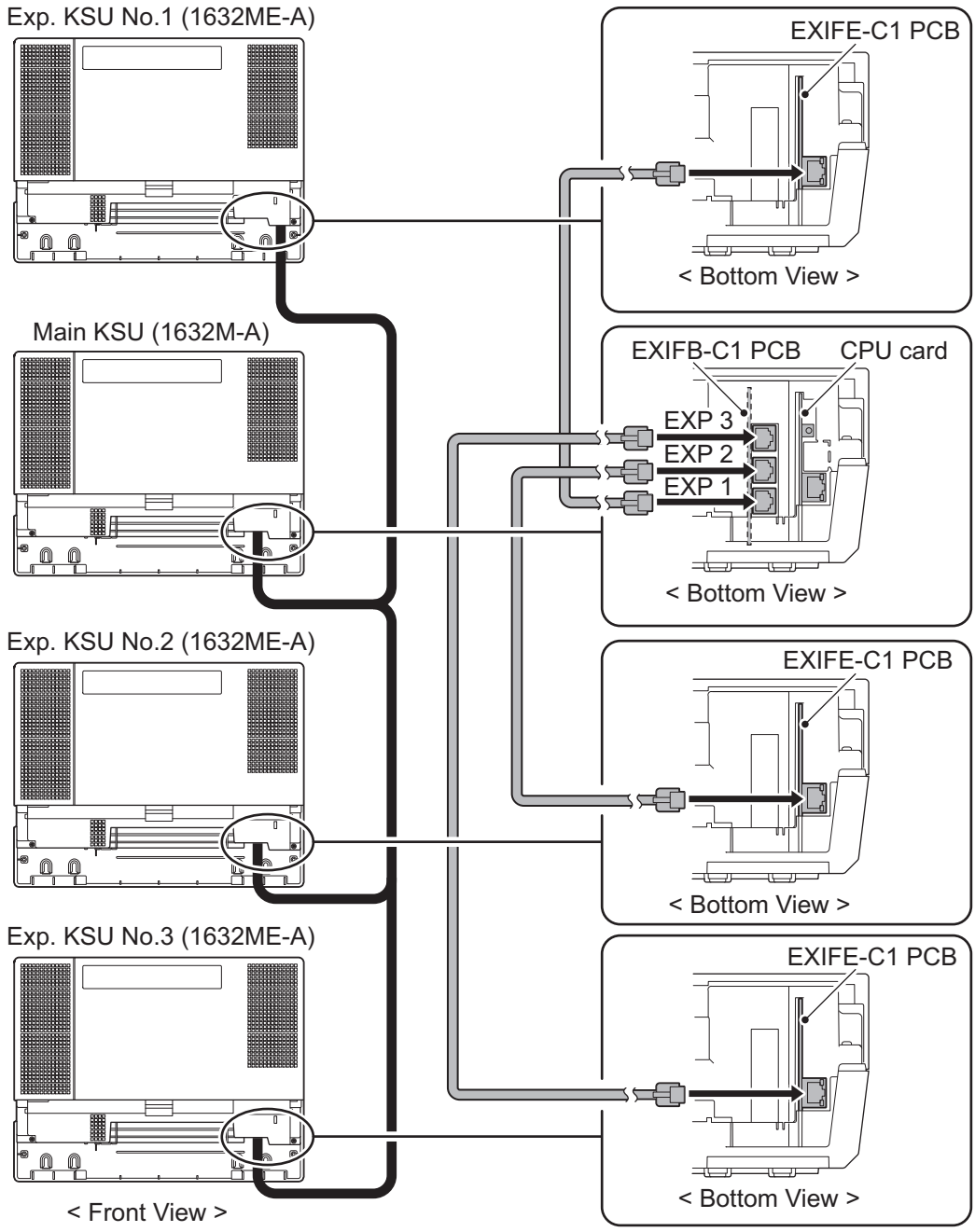


Figure 2-17 Connection of KSUs

Use attached cables for the above inter-connection.
According to the cable length, the KSU position must be limited.

1.5 Grounding and AC Cabling

The "ETH" lug is located near the power supply on each KSU. The Sub-Cover must be opened in order to access to it.

1.5.1 Grounding the KSU

Ensure all Main and Expansion KSU(s) are powered off and unplug the AC cord.

In each KSU, connect "ETH" (Earth Ground) lug to the verified Earth Ground point using minimum cable size 14AWG (Φ2.0 mm) wire.

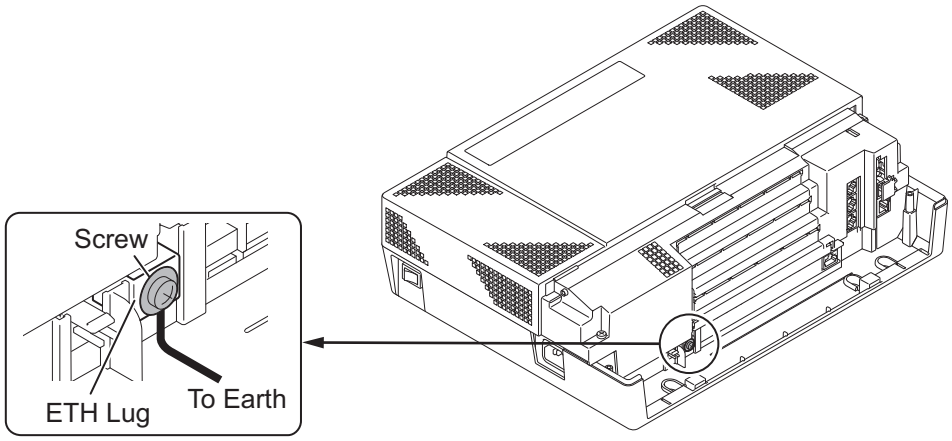


Figure 2-18 ETH Lug

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

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

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.

1.5.2 AC Power Requirement

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

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

Table 2-5 Power Requirement

	110 VAC	220 VAC	230 VAC	240 VAC
Power Requirements	110 VAC@15 A	220 VAC@15 A	230 VAC@15 A	240 VAC@15 A
Power Consumption	Main KSU = 144 VA 4 KSU Total = 576 VA	Main KSU = 172 VA 4 KSU Total = 688 VA	Main KSU = 175 VA 4 KSU Total = 700 VA	Main KSU = 175 VA 4 KSU Total = 700 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			
Grounding Requirement	No.14 AWG Copper Wire			
Feeding Voltage	SLT: 20 mA/-27 V			
AC Input I	Main KSU = 1.31 A 4 KSU Total = 5.24 A	Main KSU = 0.78 A 4 KSU Total = 3.12 A	Main KSU = 0.76 A 4 KSU Total = 3.04 A	Main KSU = 0.73 A 4 KSU Total = 2.92 A
KWh	Main KSU = 0.144 KWh 4 KSU Total = 0.576 KWh	Main KSU = 0.172 KWh 4 KSU Total = 0.688 KWh	Main KSU = 0.175 KWh 4 KSU Total = 0.700 KWh	Main KSU = 0.175 KWh 4 KSU Total = 0.700 KWh
BTU (KWhx3413)	Main KSU = 491 BTU 4 KSU Total = 1964 BTU	Main KSU = 587 BTU 4 KSU Total = 2348 BTU	Main KSU = 597 BTU 4 KSU Total = 2388 BTU	Main KSU = 597 BTU 4 KSU Total = 2388 BTU

1.5.3 AC Power Cord

The AC power switch and AC power inlet are located at the left side of each KSU. 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 left side of each KSU 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.***

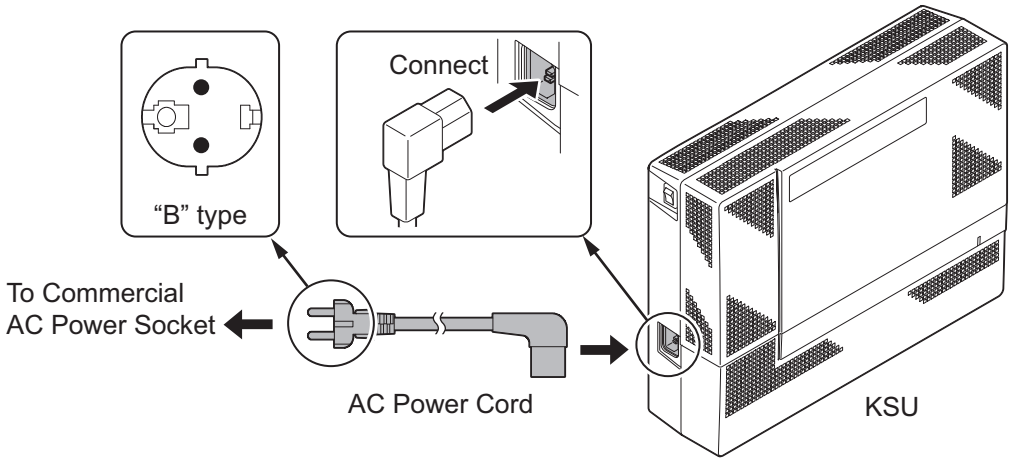


Figure 2-19 AC Power Cord

- ***Each KSU must have an own commercial AC power socket.***
- ***DO NOT POWER ON until all installations have been completed.***

1.6 Trunk/Extension Cabling

1.6.1 General

The system provides RJ11 modular jacks for analog trunk and extension connection.

1.6.2 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 are run on the floor.
- Aerial distribution wiring is not allowed.
- Trunks must be installed with lightning protectors.

1.6.3 Trunk Cabling

Ensure all Main and Expansion KSU(s) are powered off and unplug the AC cord.

1. Open the Sub-Cover.

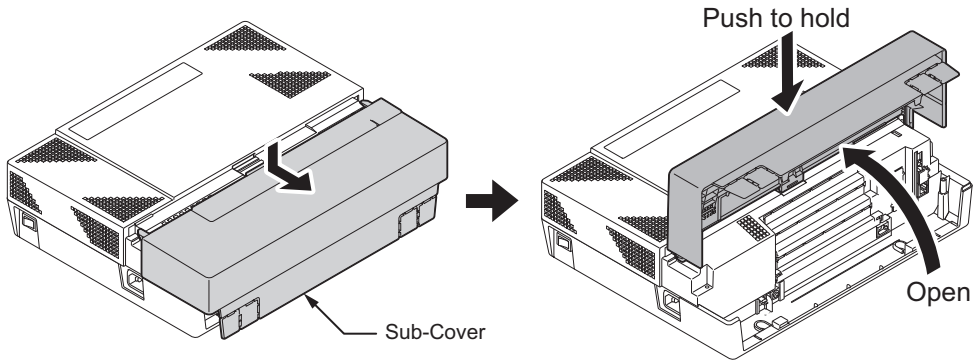


Figure 2-20 Sub-Cover Open and Hold

2. Insert the modular plugs of the trunk line cords into the analog trunk modular jacks on the system.

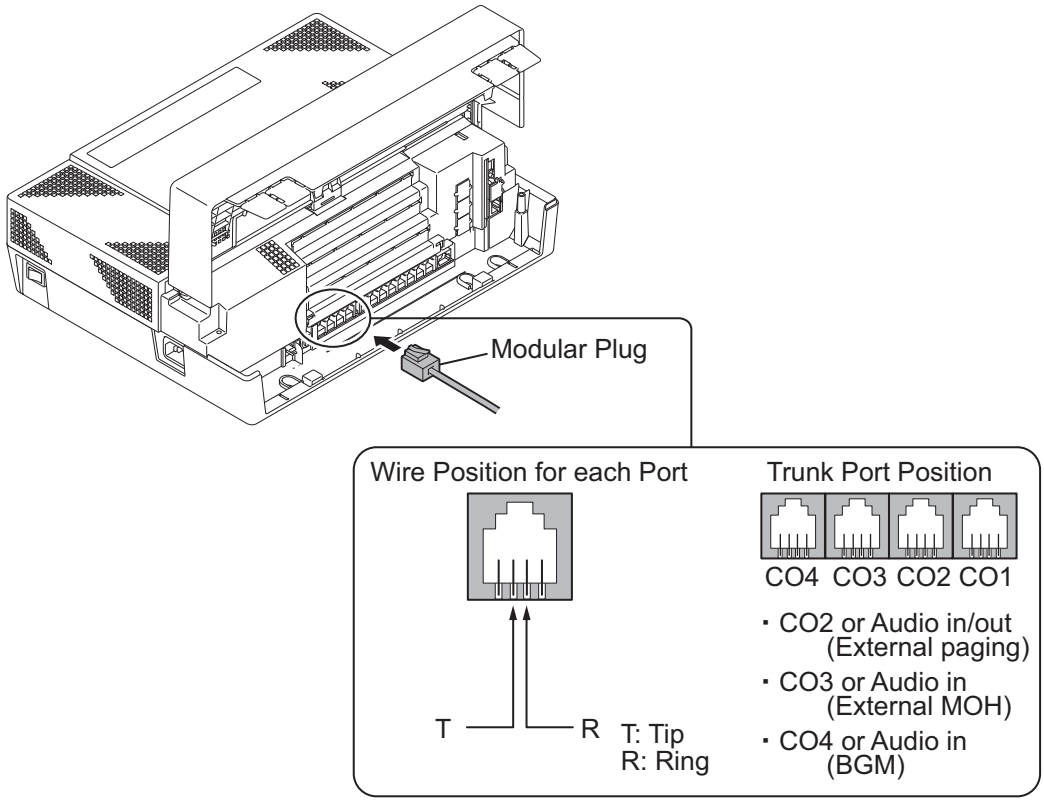


Figure 2-21 Trunk Cabling

The lightning protectors MUST BE INSTALLED on a trunk.

- *Unused CO port (CO2 to CO4) can be used for Audio port (External paging, External MOH or BGM).*
- *The program setting must be required when using Audio port instead of Trunk port in the system.*
- *The External Paging can be set for 408M-A1 PCB at each KSU.*
- *The External MOH and BGM can be set only one port for each External source in the system.*
- *Using a single port, Trunk port and Audio port can not be used at the same time.*
- *Door phone box can not be used on the Trunk port.*

1.6.4 Extension Cabling

Before Plug-In the Multi-Line Telephone, DSS Console, Single line Telephone, Doorphone or External Sensor Device, ensure all the Main and Expansion KSU are powered off and unplug the AC cord.

1. Open the Sub-Cover.
2. Insert the modular plugs of the extension line cords (2-wire/4-wire) into the extension modular jacks on the KSU.

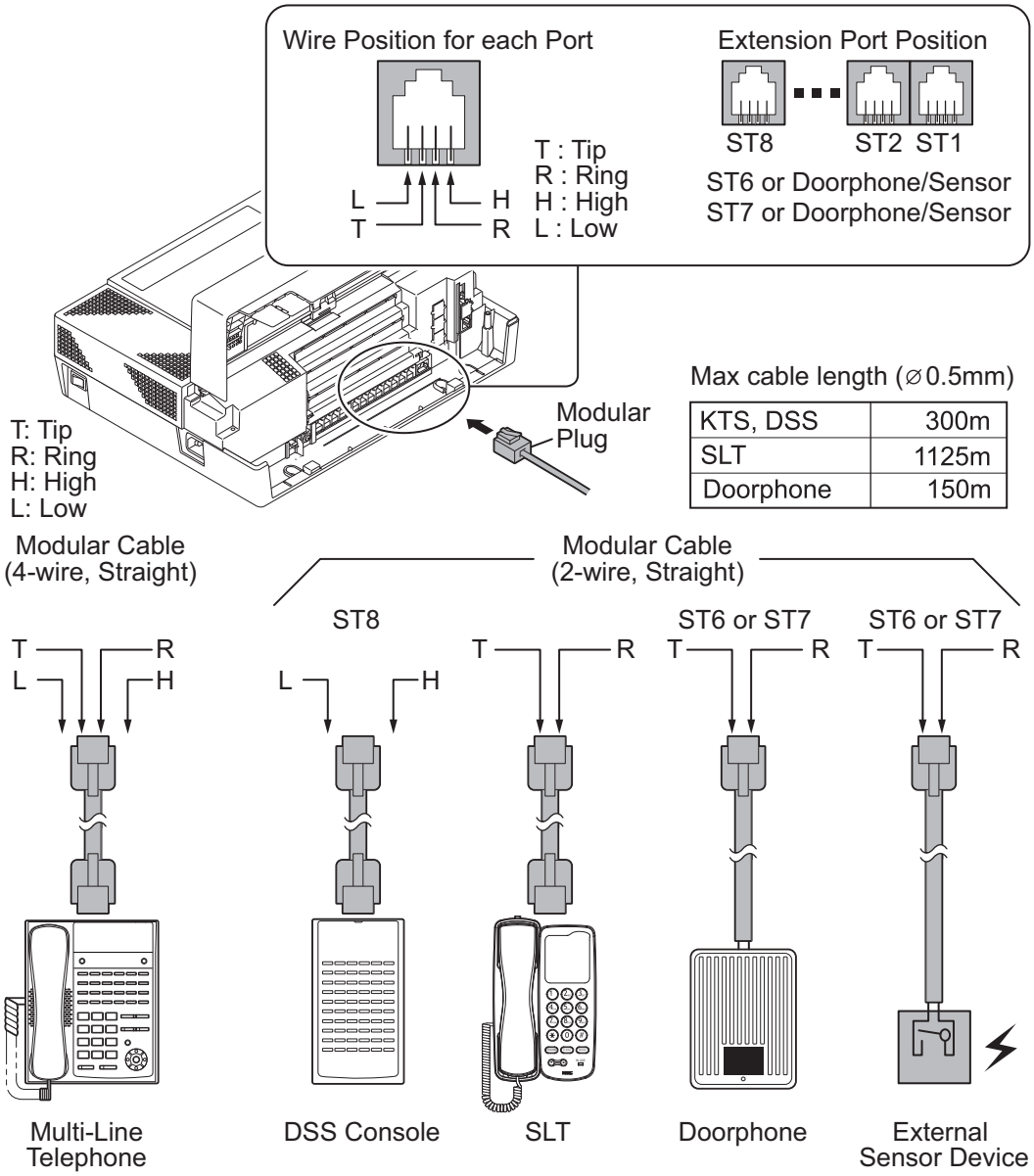


Figure 2-22 Extension Cabling

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

- *DSS Console must be connected to the LAST PORT.*
- *Doorphone/External Sensor Device must be connected to the No. 6 or 7 PORT of each 408M-A1.*
- *The program setting must be required when connect a Doorphone/External Sensor Device.*

1.6.5 Power Failure Transfer

1.6.5.1 General

In the event of AC power failure, the specified trunks are directly connected to the specified extension ports as below. And SLT must be connected to the specified extension. The multi-line telephone (4W) does not work when connected to the specified extension port.

Trunk Port No. 1 → Extension Port No. 8

- *The connected extension must be SLT (Single Line Telephone).*
- *Hardware switch (J6) must be set from "KT" to "PF" side (default: KT) when use the Power failure transfer circuit.*
- *Refer to Power Failure Transfer on page 2-54 for Power Failure Transfer of 408E-A1.*

1.6.5.2 Power Failure Setting

1. Use Needle-nose pliers to change the switch position of "J6" from **"KT" to "PF"** as below. (Default: KT)

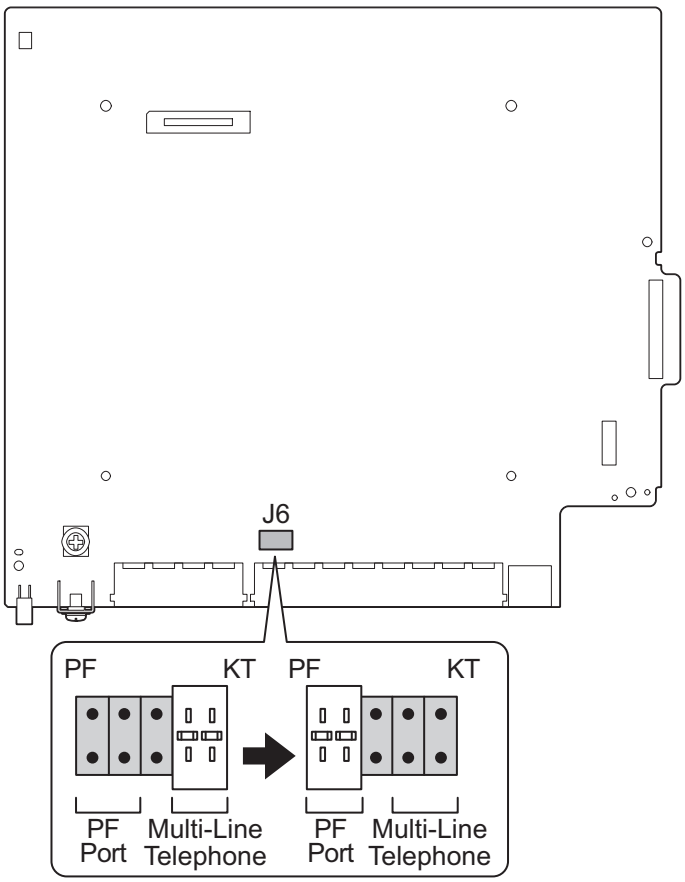


Figure 2-23 PF/KT Switch of 408M-A1

2. Connect a SLT to the extension port No. 8.

1.6.6 Cable Routing and Clamping

1. Depending on the cabling, select either Right route or Left route for the cabling. Clamp and route cable to outside.

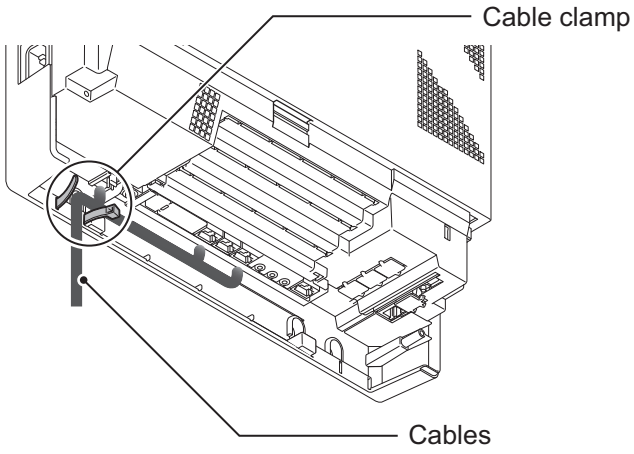


Figure 2-24 Cabling

2. Cut and remove the plastic filter piece(s) at the Sub-Cover for cables.

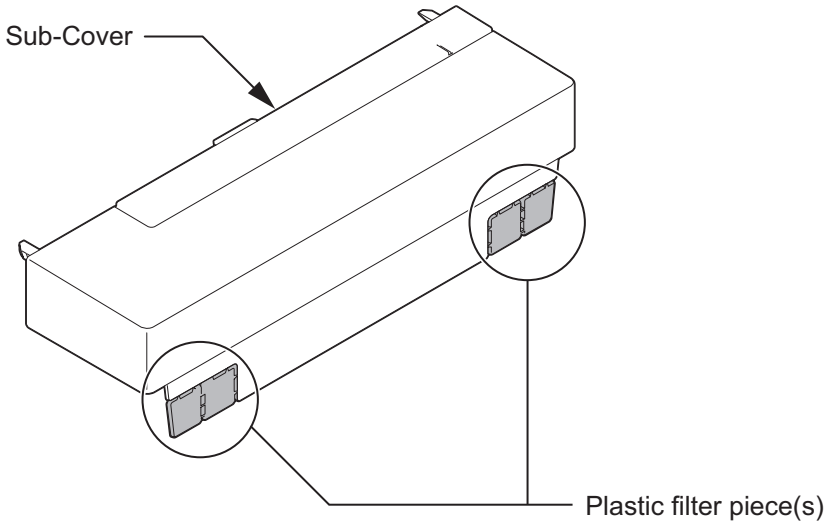


Figure 2-25 Sub-Cover

3. Replace the Sub-Cover.

SECTION 2 INSTALLING THE EXTERNAL BACKUP BATTERY

2.1 General

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

- *The Batteries must be prepared by local supplier.*
- *Each KSU should have own IP4WW-Battery Box respectively.*

2.2 Unpacking

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

Table 2-6 Unpacking the IP4WW-Battery Box

Items	List of Contents	QTY
IP4WW-Battery Box	Battery Box	1
	Cable with Connector (Black & Red)	1
	Cable (Blue)	1
	Screws: M4 x 8 M3 x 6 with Washer Screws: M4.1 x 16	10 1 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 Size

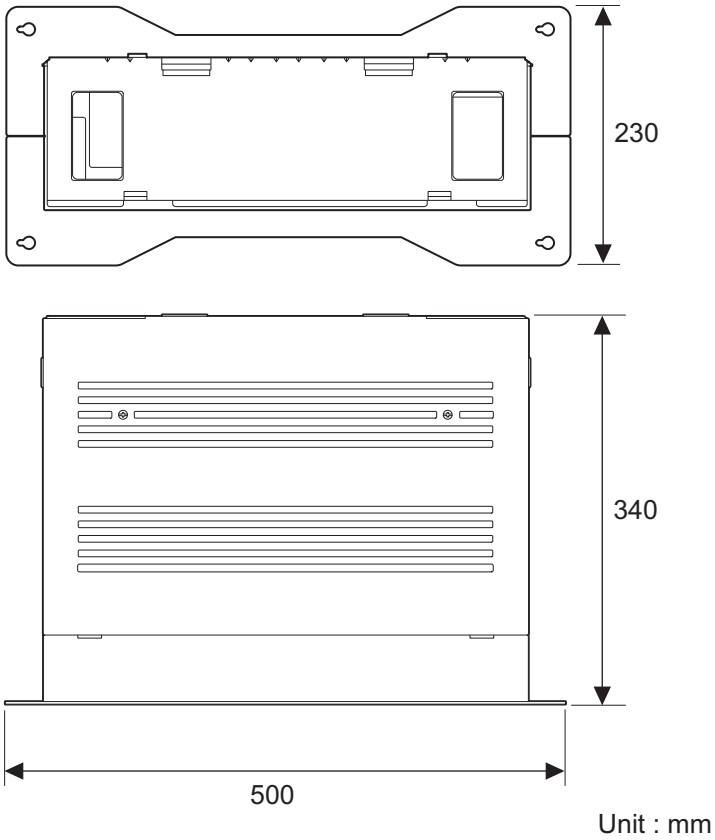


Figure 2-26 Dimension of the IP4WW-Battery Box

2.4 Battery Specifications

Table 2-7 Specifications of the IP4WW-Battery Box

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 a Box)	2 pcs
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.

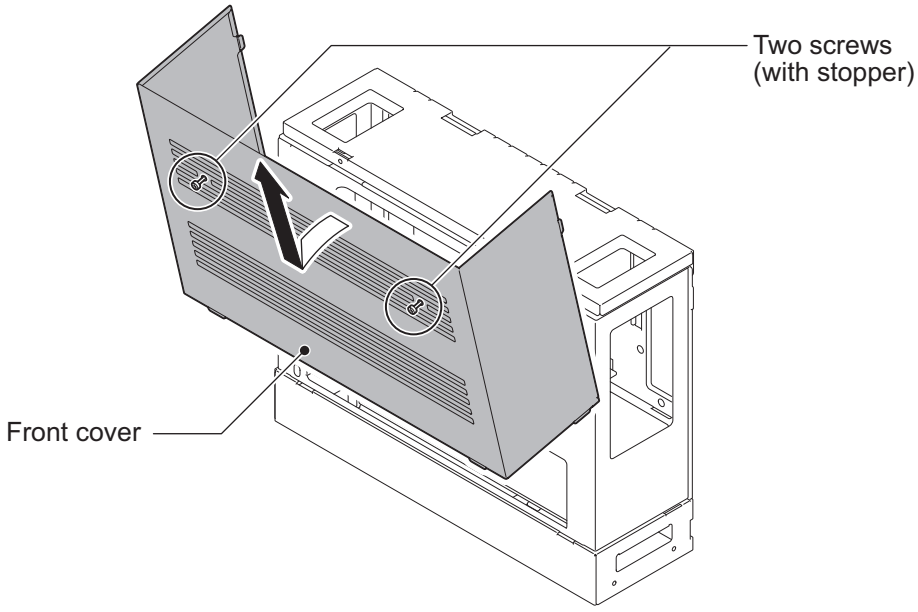


Figure 2-27 Removing the Front Cover

2. Remove the Battery Connection Cable from the Fuse Unit.

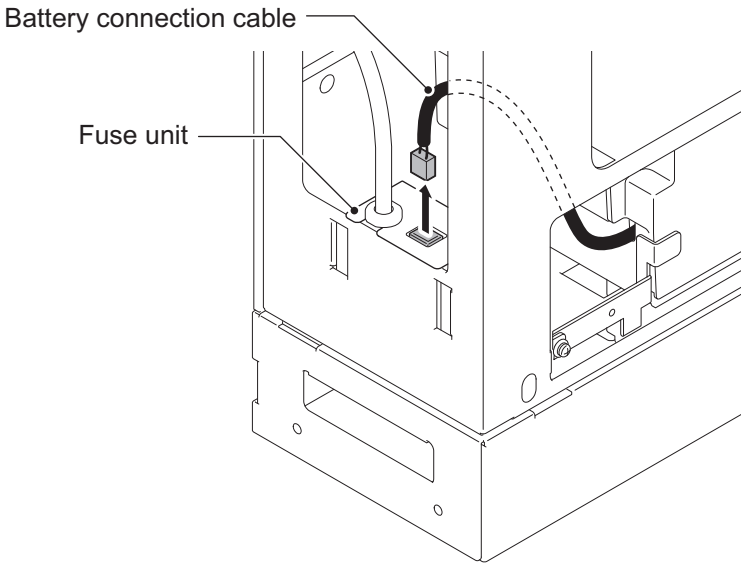


Figure 2-28 Disconnect from Fuse Unit

3. Loosen the screw and pull up the Batt stopper.

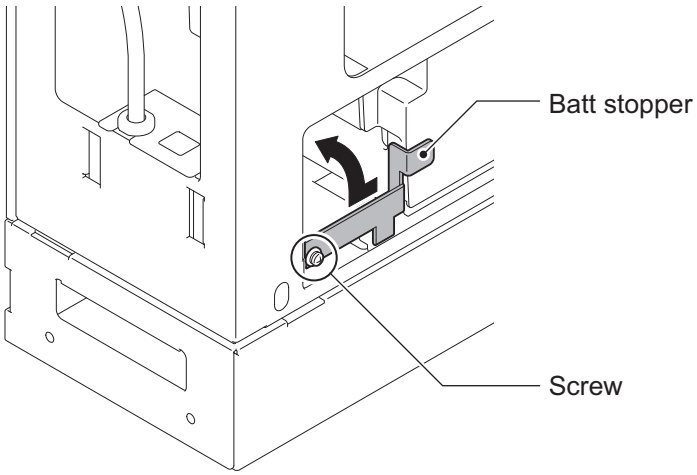


Figure 2-29 Batt Stopper

4. Pull out the Battery tray.

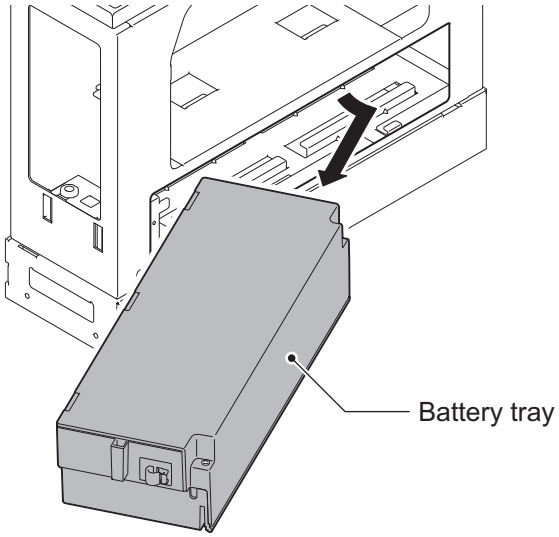


Figure 2-30 Pulling out the Battery Tray

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

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

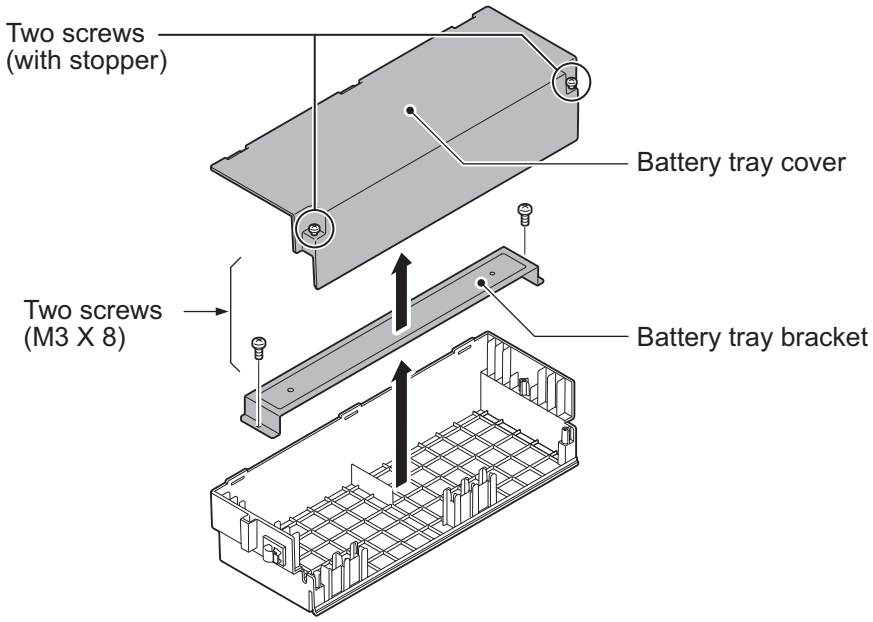


Figure 2-31 Removing the Battery Tray Bracket

7. Install two batteries into the Battery tray as below.

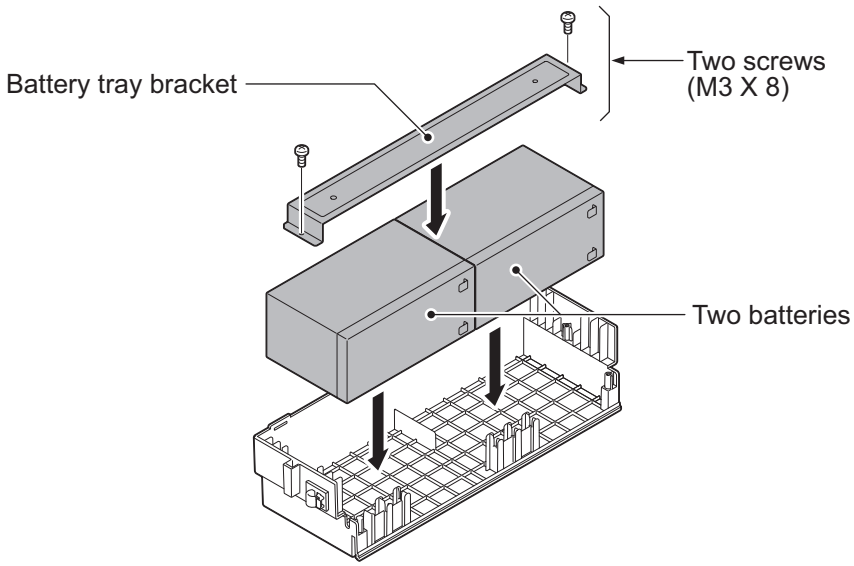


Figure 2-32 Batteries Installation

8. Connect the battery cables as below.

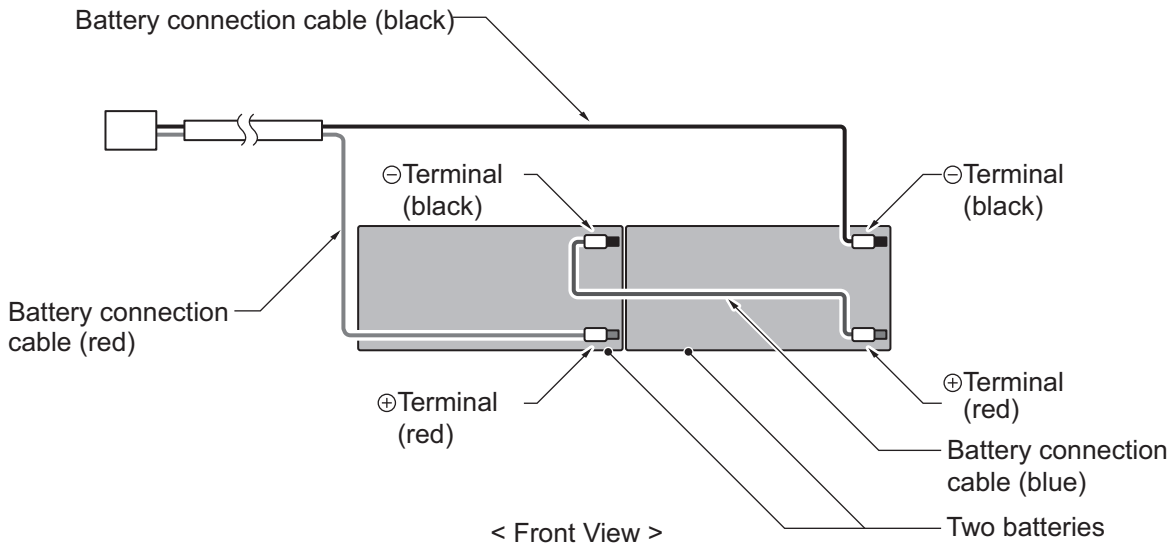


Figure 2-33 Connecting the Battery Cables

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

9. Insert Battery connection cable into the Cable guides as shown in the next diagram.
10. Install the Battery tray cover fitting to the three tabs and tighten the two screws.

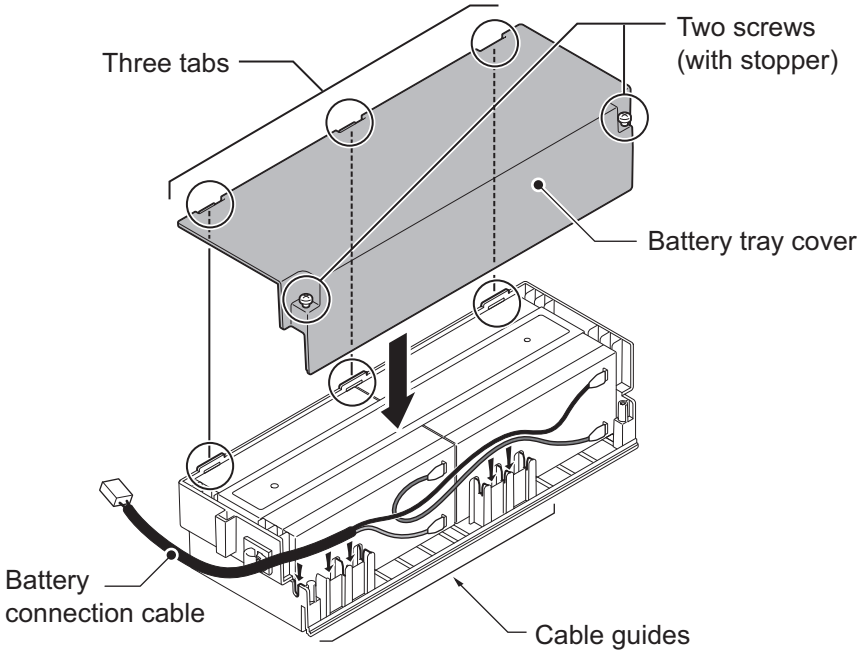


Figure 2-34 Installation of Battery Tray Cover

- ***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.

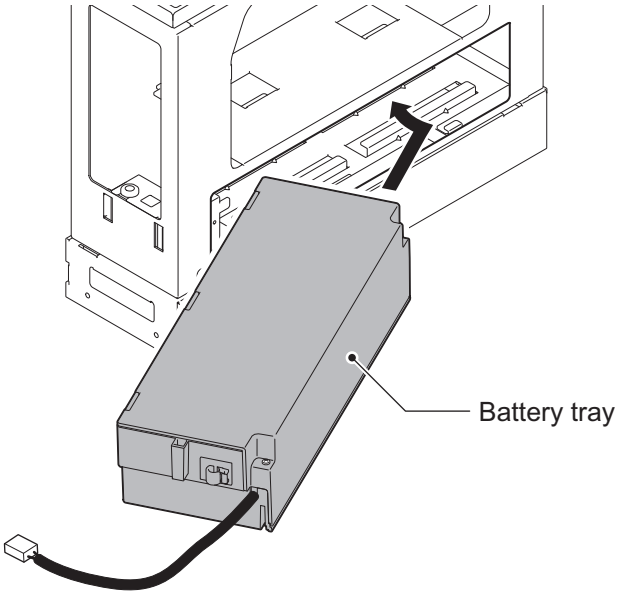


Figure 2-35 Inserting the Battery Tray

12. Replace the Batt stopper to Battery tray and tighten the screw.

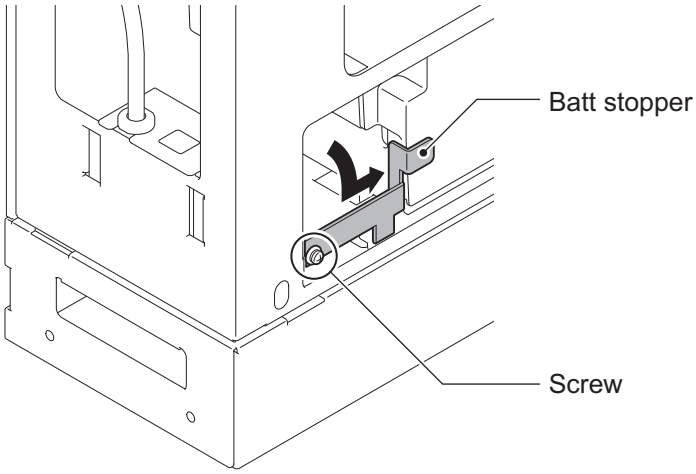


Figure 2-36 Replacing the Batt stopper

13. Plug the Battery connection cable into the Fuse unit as below.

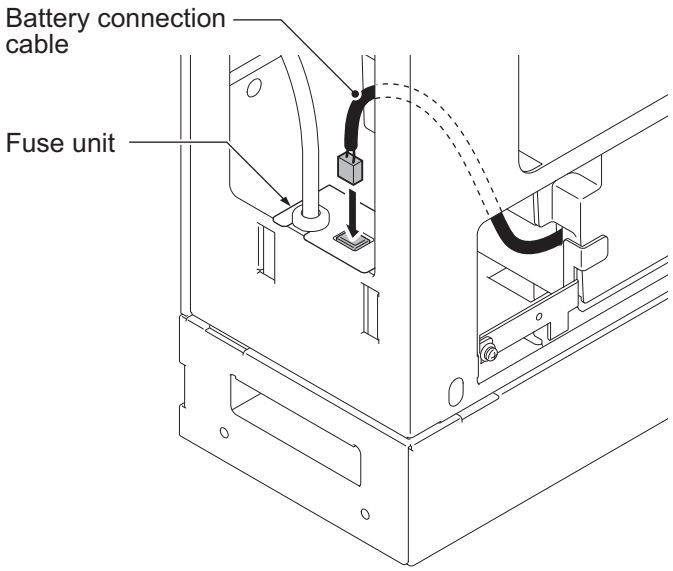


Figure 2-37 Plugging the Battery Connection Cable

14. Insert six tabs (a to f) on Front cover into the holes (A to F) on Battery box. Slide the Front cover and tighten the two screws.

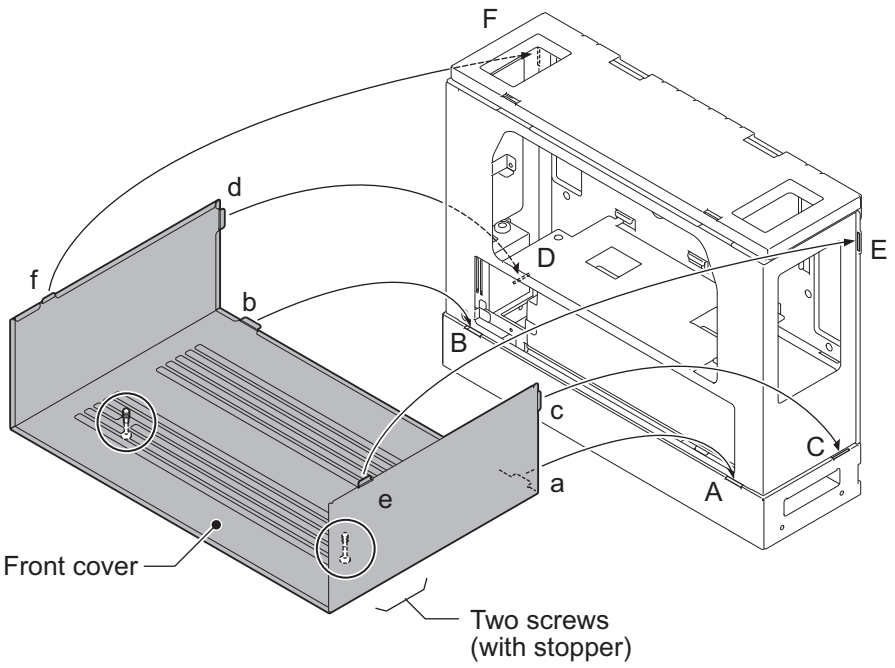


Figure 2-38 Installation of Front Cover

2.6 Mounting the IP4WW-Battery Box

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

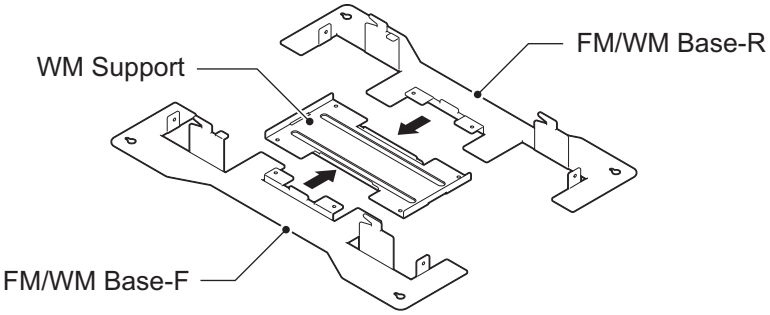


Figure 2-39 Bases and Support of the Battery Box

2. Refer to Figure 2-40 Floor-Mount Spacing Guide on this page 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.
3. Using anchor bolts, secure the FM/WM Base to the floor.

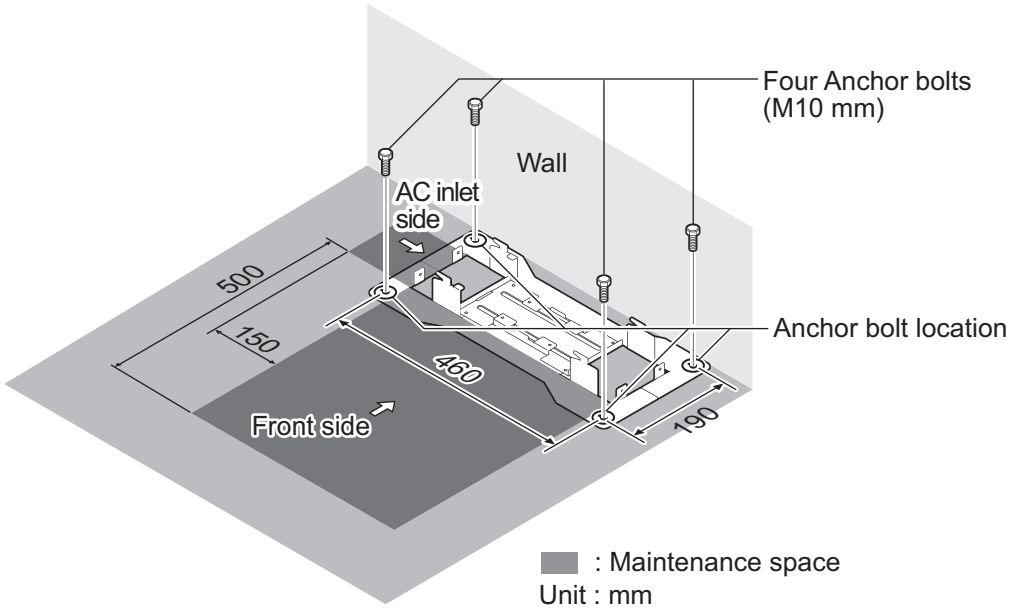


Figure 2-40 Floor-Mount Spacing Guide

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

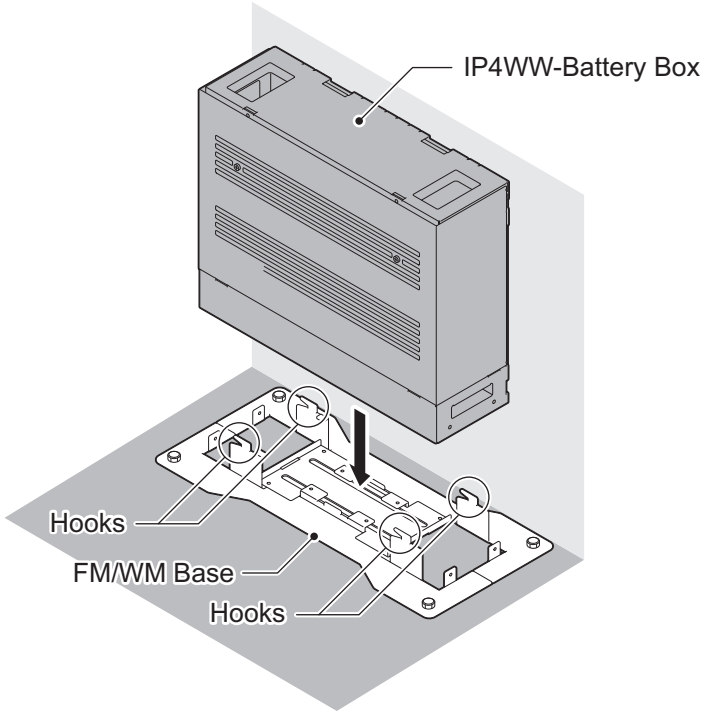


Figure 2-41 Mounting the Battery Box

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

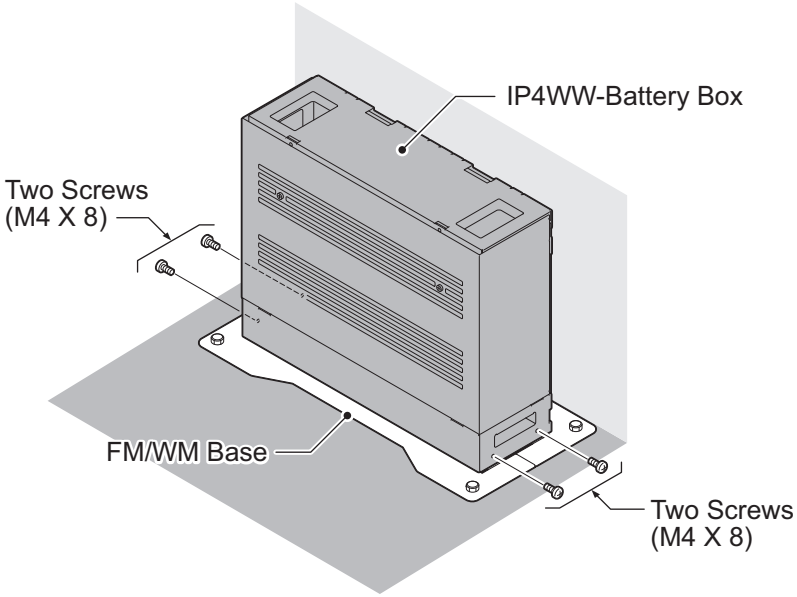


Figure 2-42 Securing the Battery Box

2.6.2 Wall-Mounting the IP4WW-Battery Box

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

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

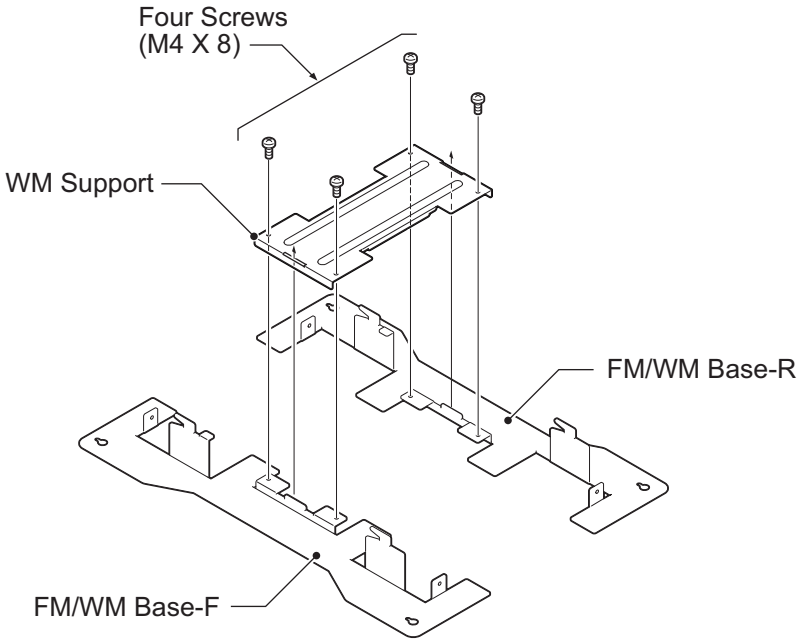


Figure 2-43 Bases and Support of the Battery Box

2. Refer to Figure 2-44 Wall-Mount Spacing Guide on the next page 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.

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

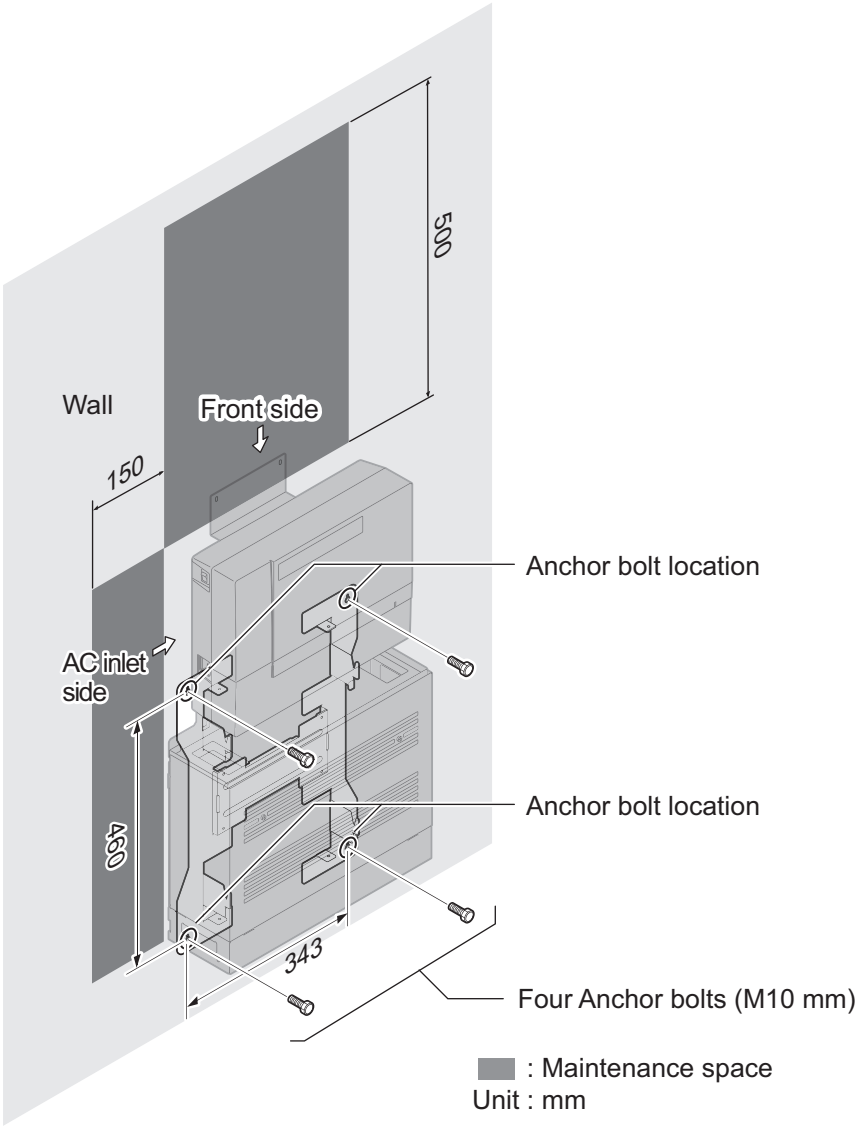


Figure 2-44 Wall-Mount Spacing Guide

4. Loosen two screws and remove the Front Cover.

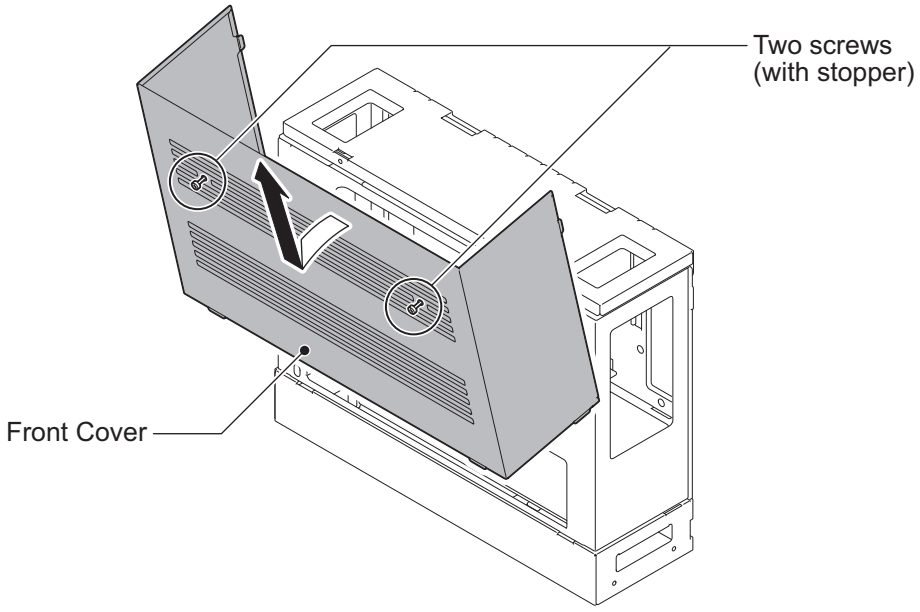


Figure 2-45 Removing the Front Cover

5. Hook the IP4WW-Battery Box on the FM/WM Base using four square holes.

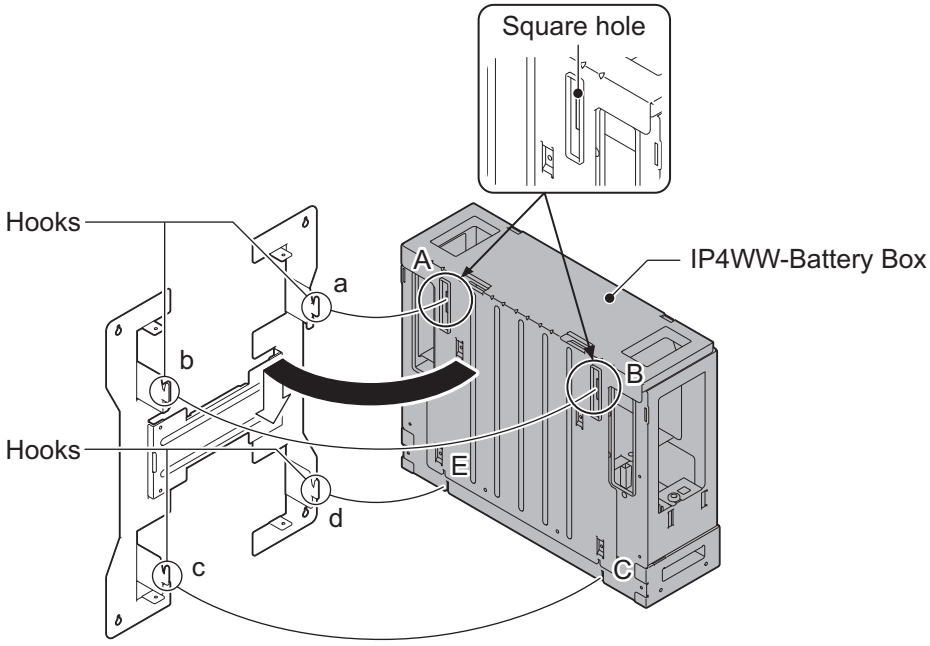


Figure 2-46 Hook the Battery Box

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

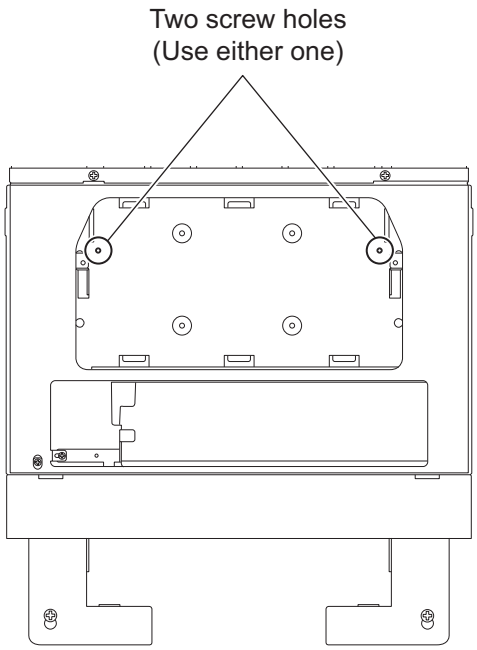


Figure 2-47 Securing the Battery Box

2.6.3 Mounting one KSU on the Battery Box

Before wall-mounting or floor-mounting the IP4WW-Battery Box, one KSU can be mounted on the box.

1. Loosen two screws and remove the Front Cover of the Battery Box.

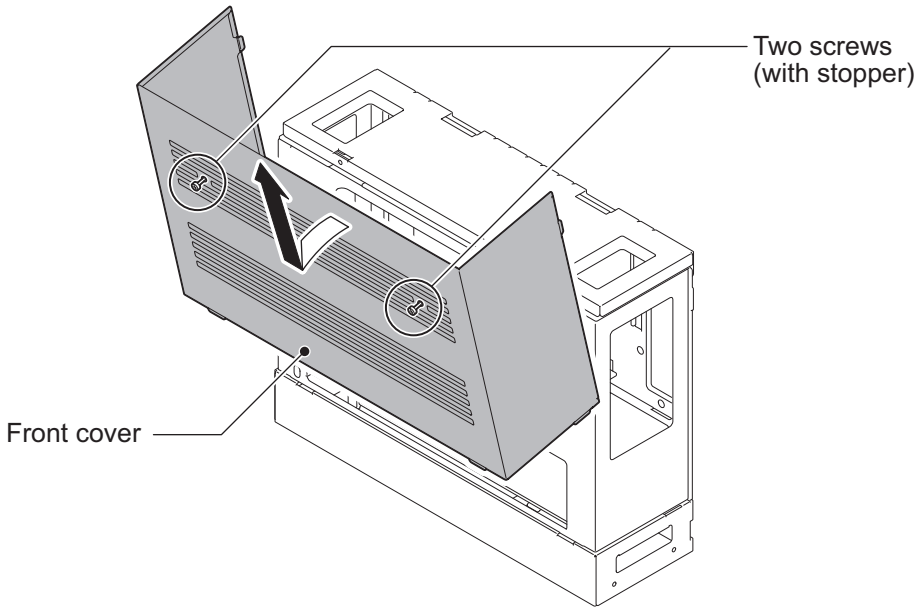


Figure 2-48 Removing the Front Cover

2. Loosen two screws and remove the L-Bracket.

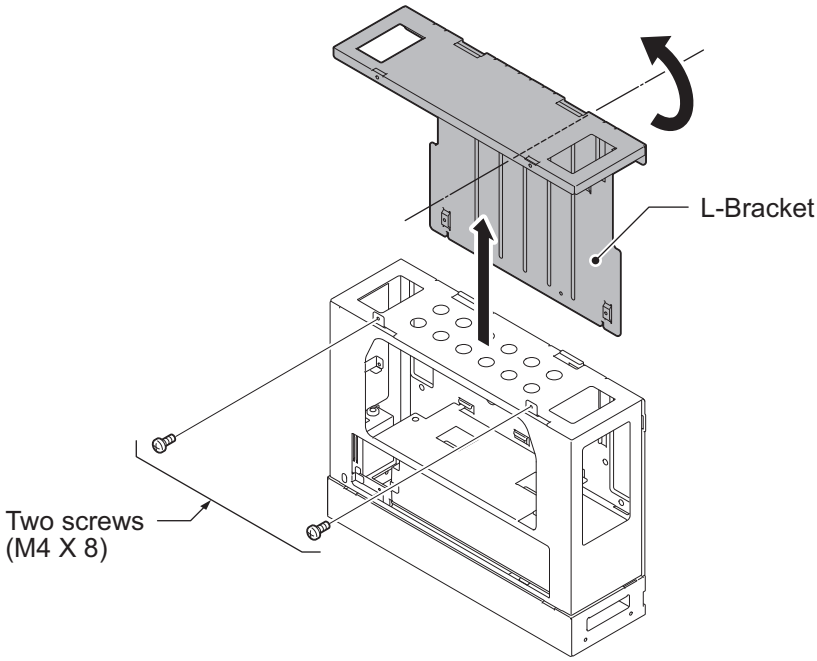


Figure 2-49 Removing the L-Bracket

3. Turn the L-Bracket upside down.

   Rotate the L-Bracket 180 degrees so that the upper FACE as shown in above figure "Removing the L-Bracket" is Located at the bottom as shown by below figure "Securing the L-Bracket and WM Hook".
4. Insert tabs on Battery Box into holes on L-Bracket.

   Secure the L-Bracket to the Battery Box using two screws.
5. Using two screws (M4x8), secure the WM Hook to the L-Bracket.
6. Using two anchor bolts (locally procured), secure the WM Hook to the wall.

The WM Hook securing must be required both Floor mount and Wall mount cases.

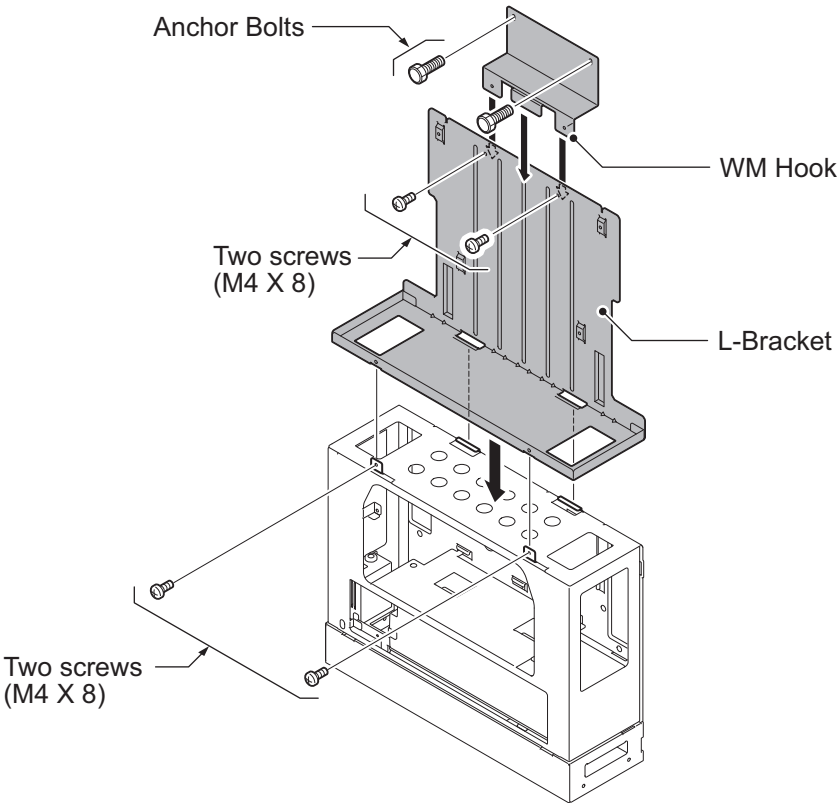


Figure 2-50 Securing the L-Bracket and WM Hook

7. Install four screws into the L-Bracket.
   The screw heads must be remained about 2.5-3.5 mm. Affix the KSU on the screw heads.

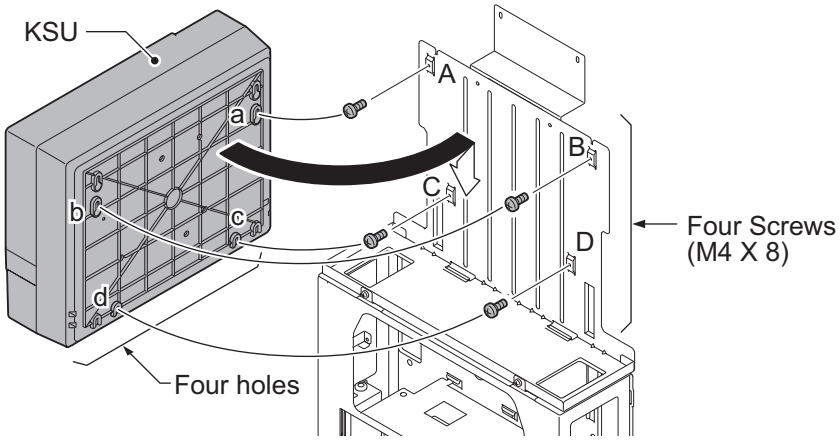


Figure 2-51 Affixing the KSU

8. Open and hold the Sub-Cover of the KSU, and fasten two screws to fix the KSU.

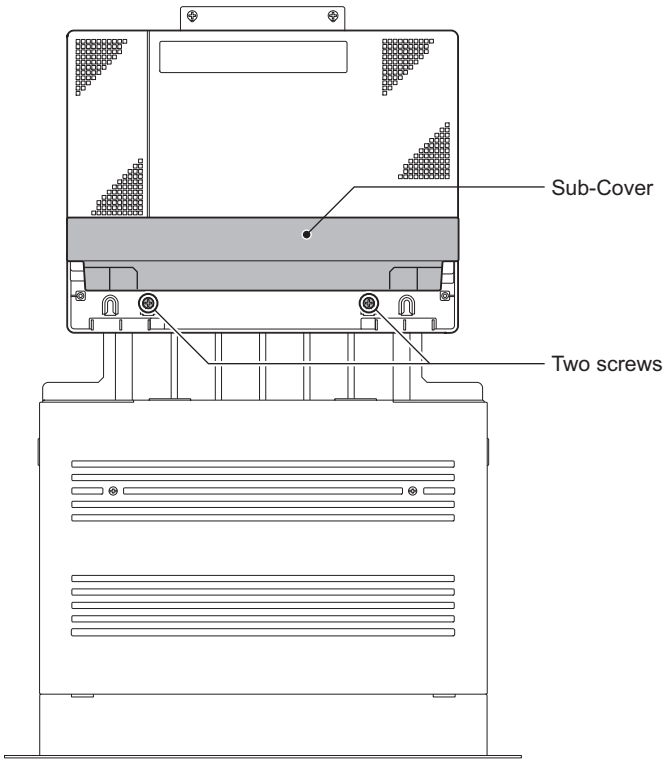


Figure 2-52 Fixing the KSU

2.7 IP4WW-Battery Box to KSU Connection

- ***Make sure the system power is off.***
- ***If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.***

1. Power off the KSU and disconnect AC cord.
2. Open the Sub-Cover of the KSU.

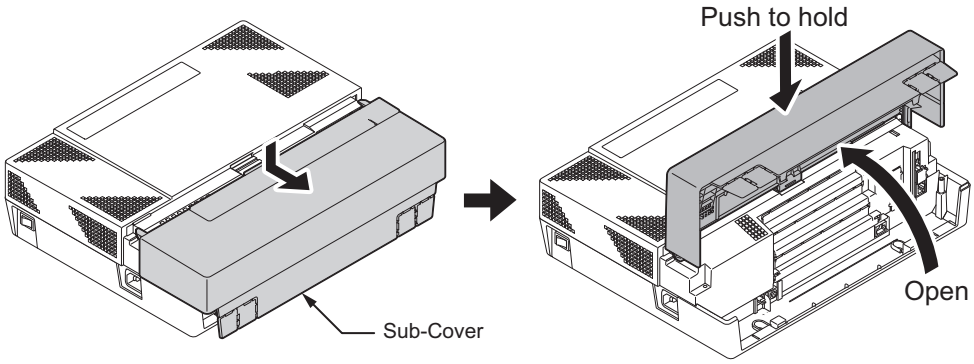


Figure 2-53 Sub-Cover Open and Hold

3. Cut and remove specified plastic filter piece at the Sub-Cover for Battery connection cable.

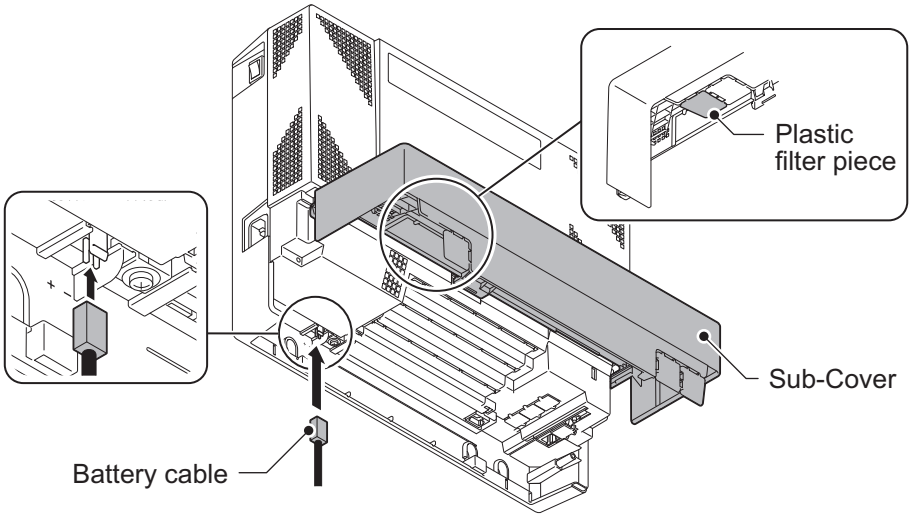


Figure 2-54 Connection of Battery Connection Cable

4. Connect Battery cable from the Battery box to Battery connector on the KSU.

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 (250VT8AL).*
- *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 the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.*

1. Power off the KSU and disconnect AC cord.
2. Loosen two screws and remove the Front Cover.

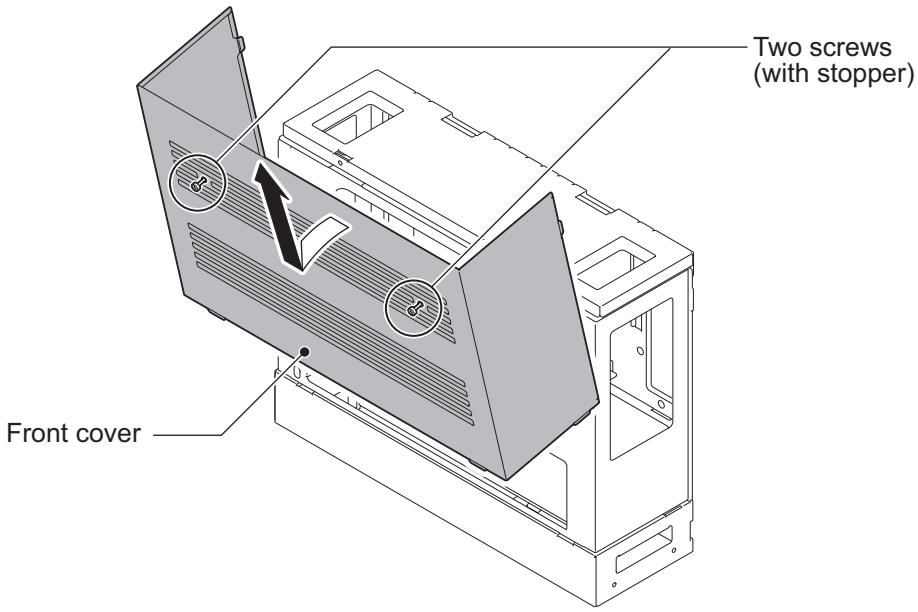


Figure 2-55 Removing the Front Cover

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

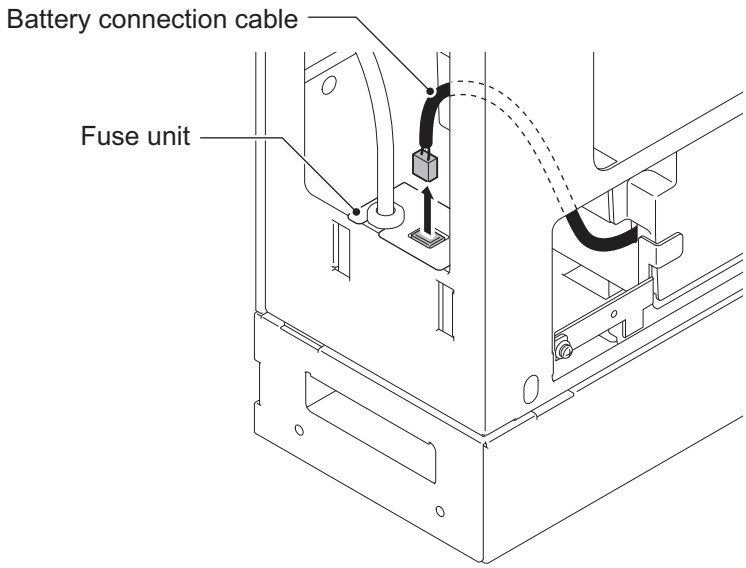


Figure 2-56 Disconnecting the Battery Connection Cable

4. Loosen the screw from the Fuse unit.

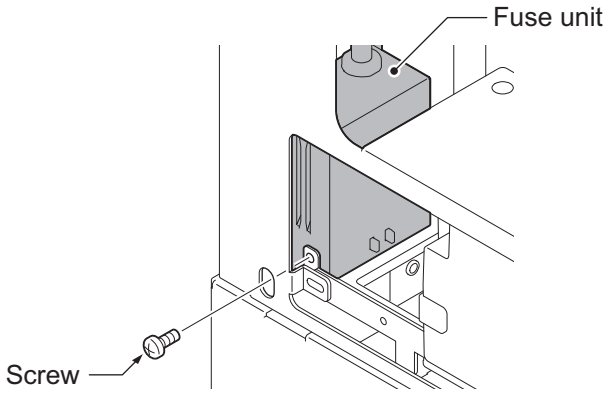


Figure 2-57 Loosen the Screw of Fuse Unit

5. Slide Fuse unit out of the Battery box.
6. Exchange the fuse (250VT8AL) as below.

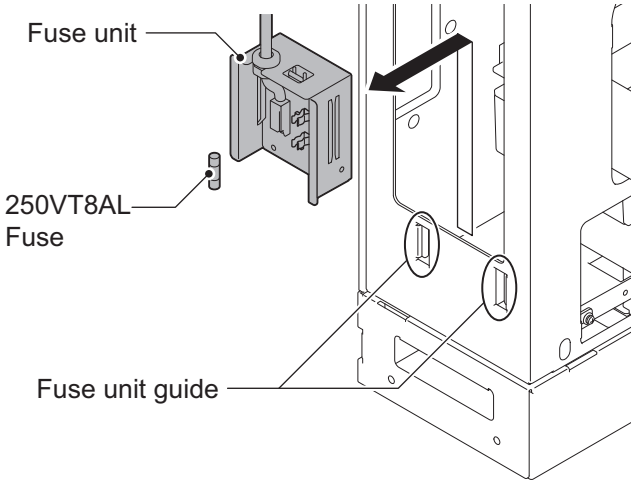


Figure 2-58 Exchanging the Fuse

7. Slide back the fuse unit to the Fuse unit guides.

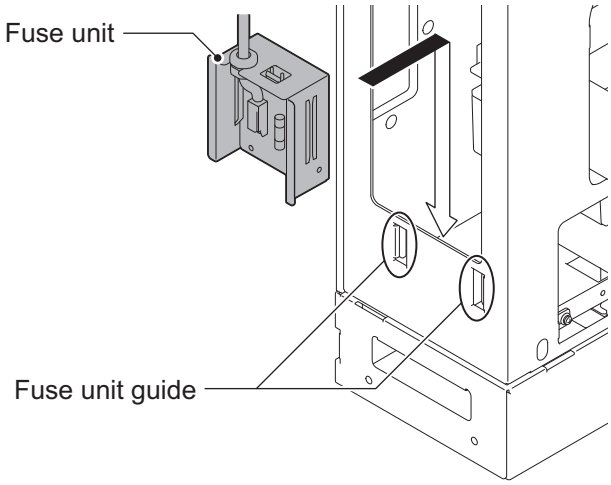


Figure 2-59 Attaching the Fuse Unit

8. Fix the Fuse unit by tighten the screw.

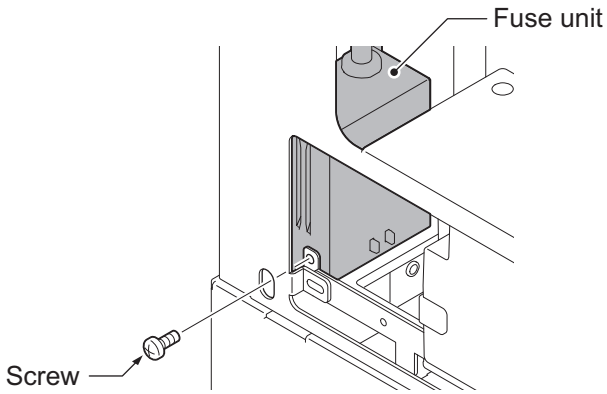


Figure 2-60 Fixing the Fuse Unit

9. Connect the Battery connection cable to the Fuse unit.

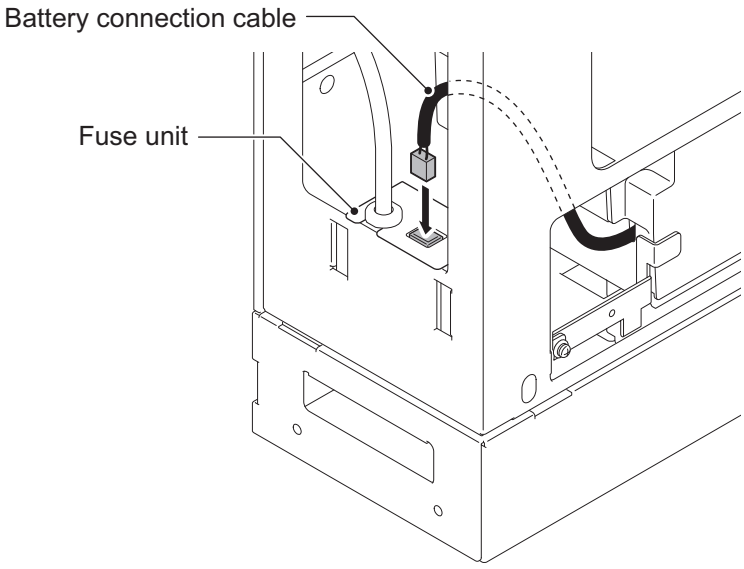


Figure 2-61 Connection of Battery Connection Cable

10. Insert six tabs (a to f) on Front Cover into the holes (A to F) on the Battery box. Slide the Front Cover and tighten the two screws.

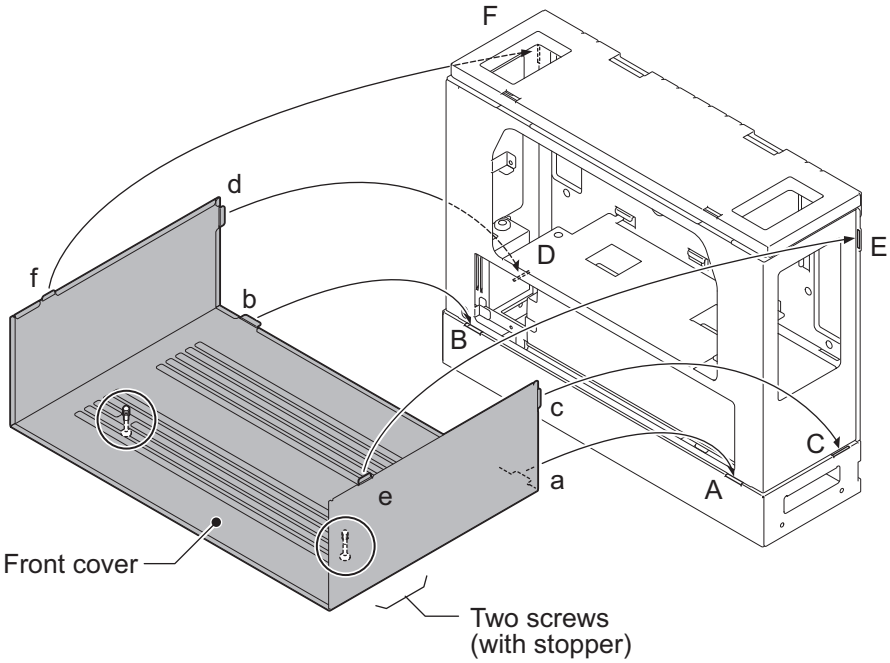


Figure 2-62 Installation of the Front Cover

SECTION 3 INSTALLING THE EXPANSION INTERFACE CARDS

3.1 General

In order to expand the system capacity, up to three expansion interface cards can be installed per KSU.

Table 2-8 Type of the Expansion Cards

Expansion Interface Card	Description
IP4WW-408E-A1	4 analog trunks and 8 hybrid extensions card
IP4WW-008E-A1	8 hybrid extensions card
IP4WW-000E-A1	0 trunk/extension card for ISDN BRI
IP4WW-2BRIDB-C1	2 Euro-ISDN BRI daughter board (Mount on the 008E-A1 or 000E-A1)
IP4WW-1PRIU-C1	1 Euro-ISDN PRI (E1 for Latin America) card

The 408E-A1, 2BRIDB-C1 or 1PRIU-C1 should not be installed into the 3rd Expansion KSU. The 3rd Expansion KSU does not support any trunks.

- *The function of IP4WW-000E-A1 card is just a mounting card for the 2BRIDB.*
- *The 2BRIDB-C1 can be installed as following combinations;*

Daughter Board	Option Unit			
	408M-A1	408E-A1	008E-A1	000E-A1
2BRIDB-C1	No	No	Yes	Yes

3.2 Unpacking

Unpack the 408E-A1/008E-A1/000E-A1/2BRIDB-C1/1PRIU-C1 and check it against the following list. Inspect for physical damage.

Table 2-9 Unpacking the Expansion Interface Cards

Items	List of Contents	QTY
IP4WW-408E-A1	408E-A1 PCB (with PKG Spacer)	1
	Nylon Spacers	2
	Metal Spacers	2
	Screws (with circular washer)	2
IP4WW-008E-A1	008E-A1 PCB (with PKG Spacer)	1
	Nylon Spacers	2
	Metal Spacers	2
	Screws (with circular washer)	2
IP4WW-000E-A1	000E-A1 PCB (with PKG Spacer)	1
	Nylon Spacers	2
	Metal Spacers	2
	Screws (with circular washer)	2

Items	List of Contents	QTY
IP4WW-2BRIDB-C1	2BRIDB-C1 PCB	1
	Nylon Spacers	2
	2BRI Label	1
	Metal Spacers	1
	Screws (with circular washer)	2
IP4WW-1PRIU-C1	1PRIU-C1 PCB (with PKG Spacer)	1
	Nylon Spacers	2
	Metal Spacers	2
	Screws (with circular washer)	2

3.3 Mounting the Expansion Interface Card

DO NOT POWER ON until all installations have been completed.
Fit the optional 2BRIDB-C1 daughter boards before installing the 000E-A1/008E-A1 PCBs. Set the switches on the 2BRIDB-C1 board before mounting it onto the 000E-A1/008E-A1 PCB.

3.3.1 Mounting the 408E-A1/008E-A1/000E-A1/1PRIU-C1 PCBs

The procedure for mounting the expansion interface cards is as follows;

- ***Do Not Power on until all installation have been completed.***
- ***If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.***

1. Turn off the system power and disconnect the AC cord from KSU.
2. Open and pull out the Sub-cover.

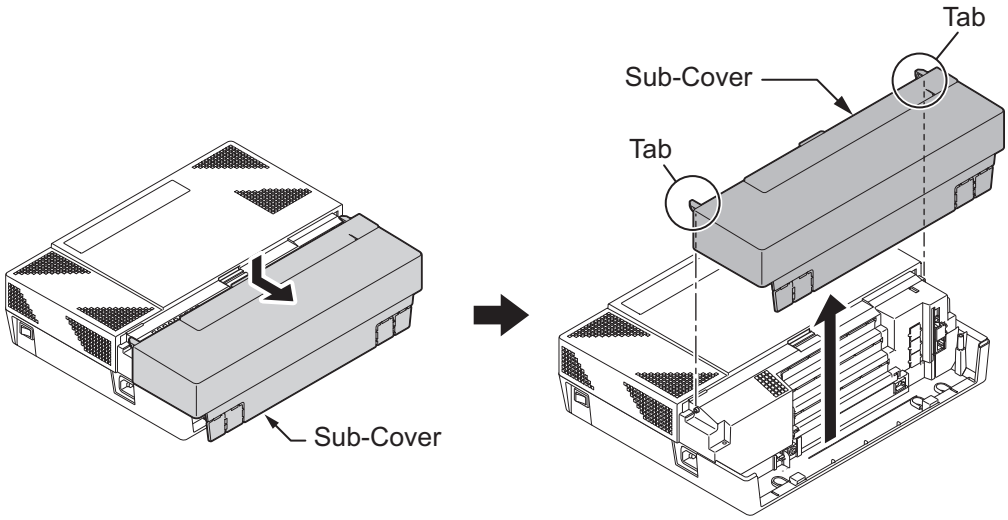


Figure 2-63 Removing the Sub-cover

3. Loosen two screws and remove the Main-cover.

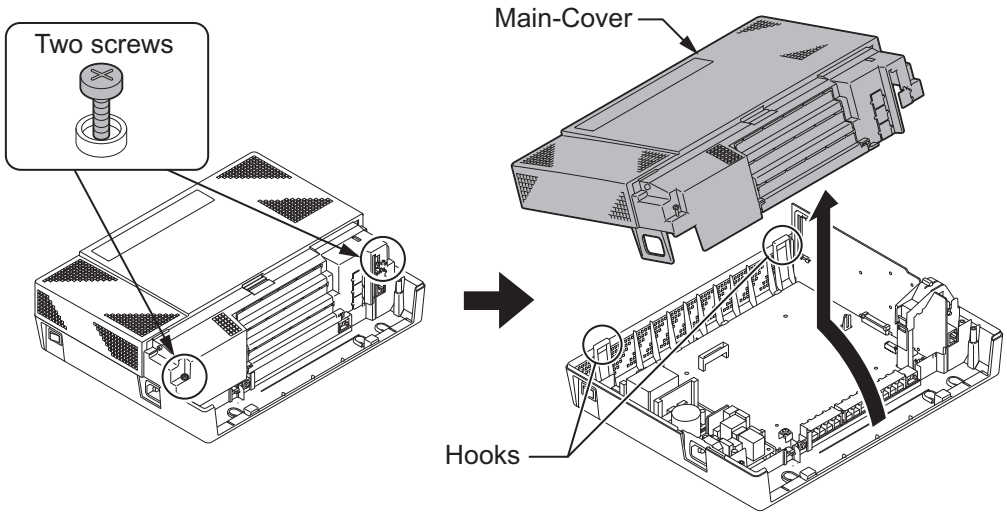


Figure 2-64 Removing the Main-cover

4. Insert two Nylon-spacers into the specified holes, and fasten two Metal-spacers into the specified holes. (Both Nylon and Metal spacers are provided with 408E/008E/000E/1PRIU)

   If no more Expansion Interface card is mounted on the 1st PCB, fasten two screws to fix the 1st PCB at the top of 408E/008E/000E/1PRIU.

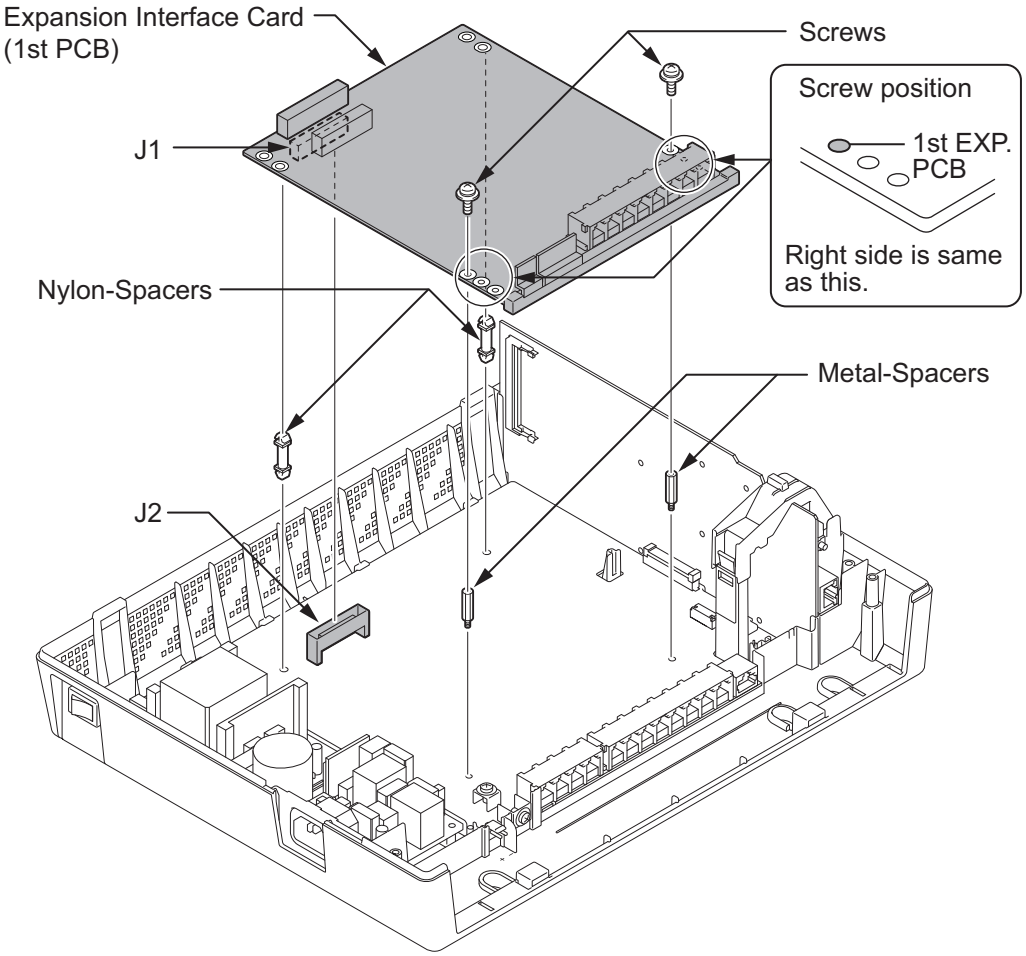


Figure 2-65 Mounting of the 1st Expansion Interface Card

5. In case the 2nd PCB is mounted, insert two Nylon-spacers into the specified holes, and fasten two Metal-spacers into the specified holes. (Both Nylon and Metal spacers are provided with 408E/008E/000E/1PRIU)

   If no more Expansion interface card is mounted on the 2nd PCB, fasten two screws to fix the 2nd

PCB at the top of 408E/008E/000E/1PRIU.

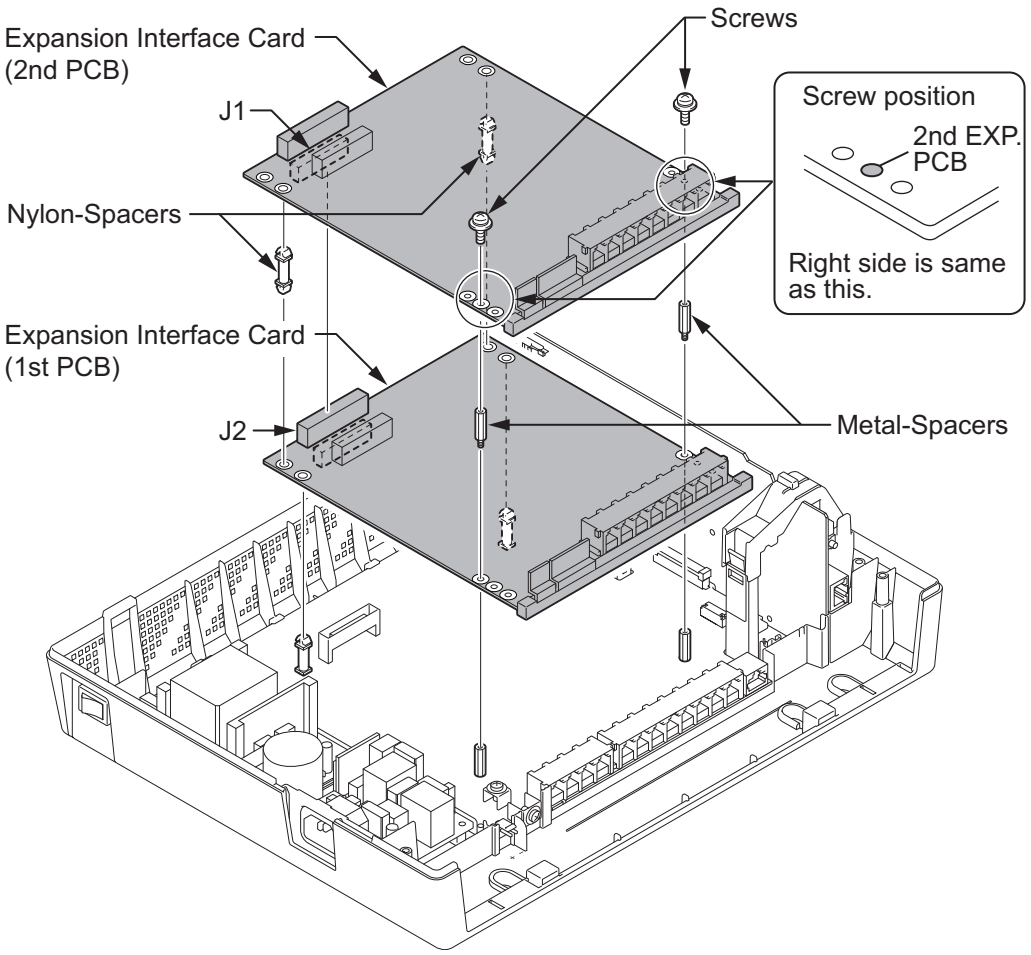


Figure 2-66 Mounting the 2nd Expansion Interface Card

6. In case the 3rd PCB is mounted, insert two Nylon-spacers into the specified holes, and fasten two Metal-spacers into the specified holes. (Both Nylon and Metal spacers are provided with 408E/008E/000E/1PRIU)

Fasten two screws to fix the 3rd PCB at the top of 408E/008E/000E/1PRIU.

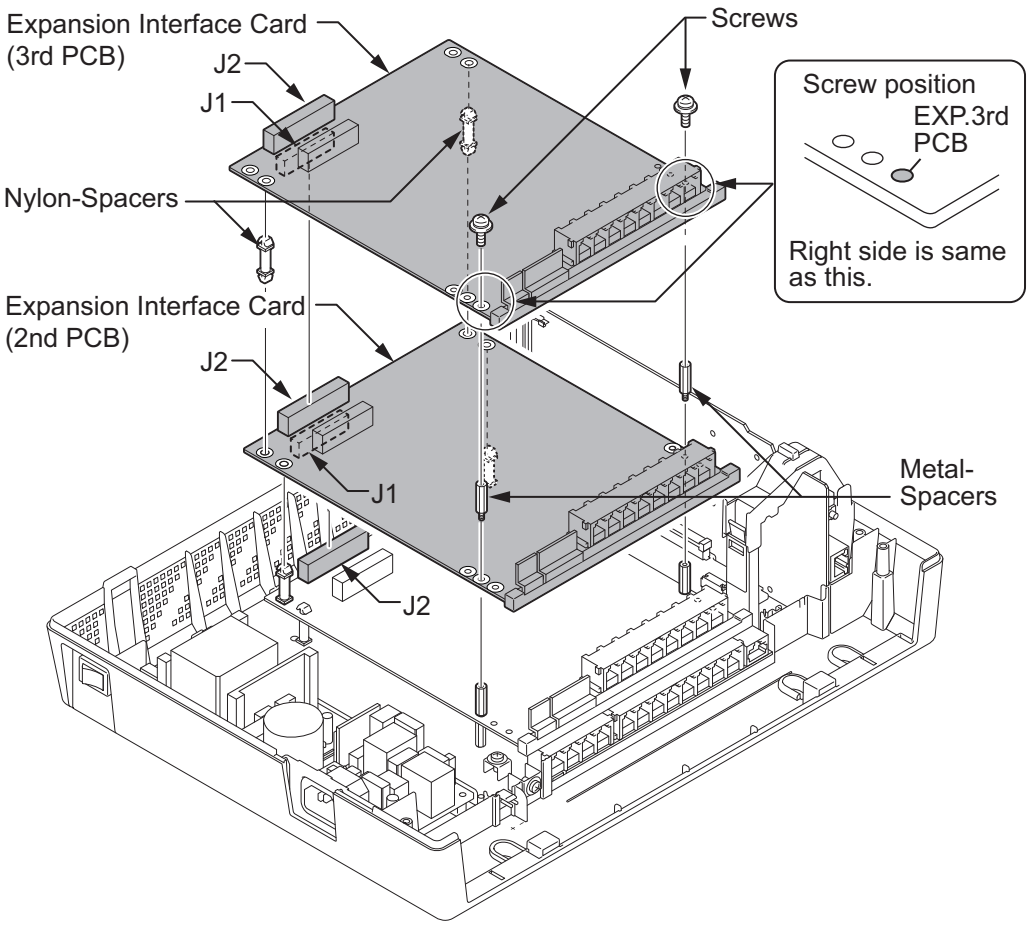


Figure 2-67 Mounting the 3rd Expansion Interface Card

7. Following illustration shows an example for installing 3 expansion PCBs onto the KSU.

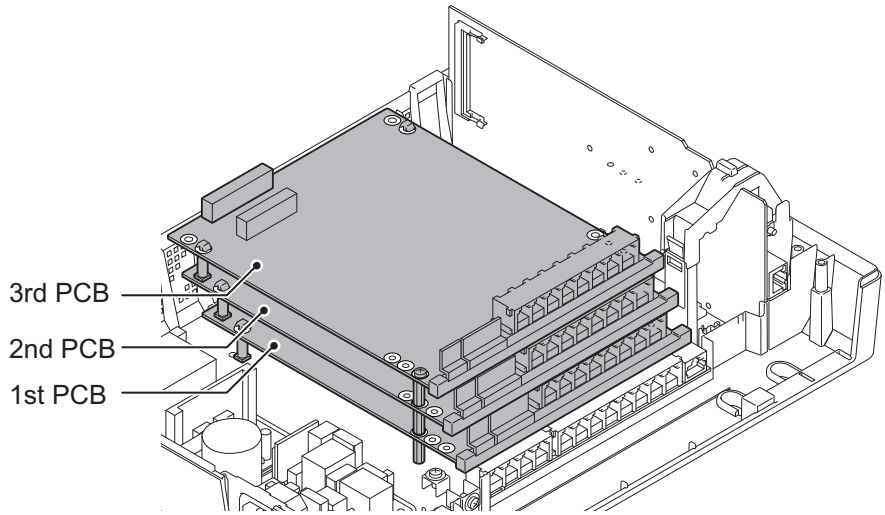


Figure 2-68 Mounting Three Expansion Interface Cards

8. Cut and remove the plastic filter piece for each Expansion interface card.

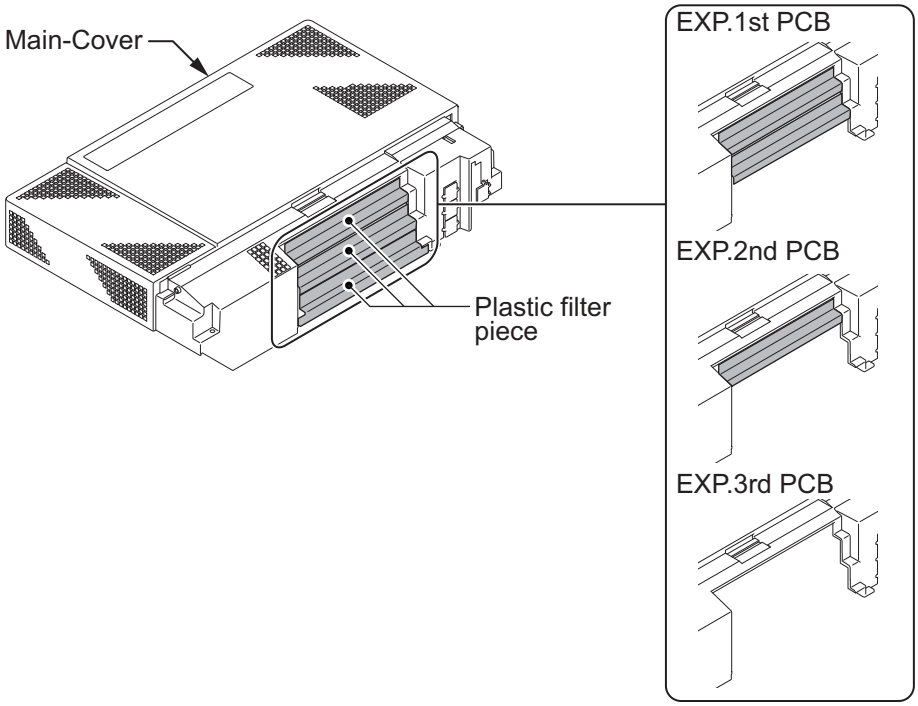


Figure 2-69 Plastic Filter Piece

9. Replace the Main-cover and fasten two screws.

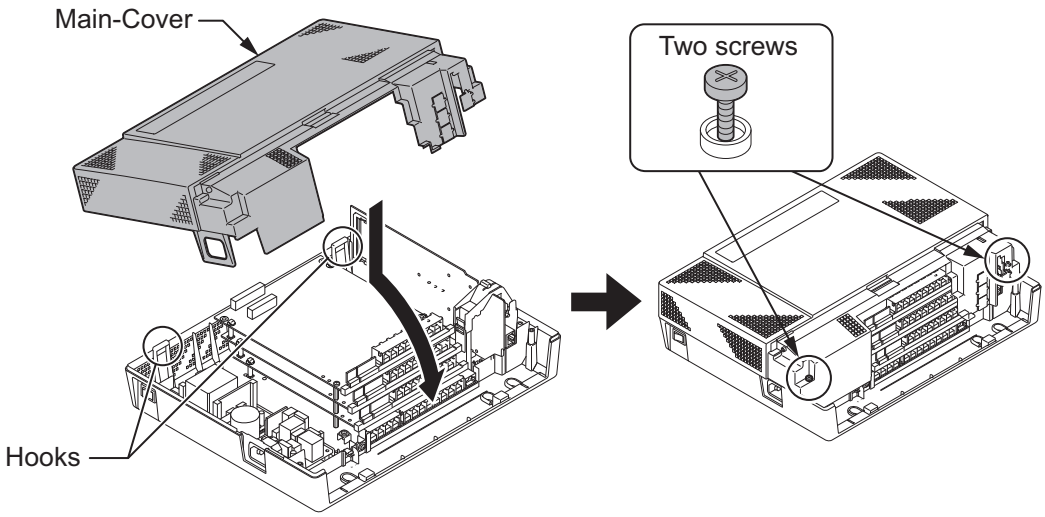


Figure 2-70 Replacing the Main-cover

3.3.2 Mounting the 2BRIDB PCB

Select the switches on the 2BRIDB-C1 PCB before mounting it onto the 008E-A1/000E-A1 PCB, refer to the Switch Setting on page 2-49.

1. Cut and remove specified piece(s) of PKG spacer on the 008E-A1/000E-A1 PCB.

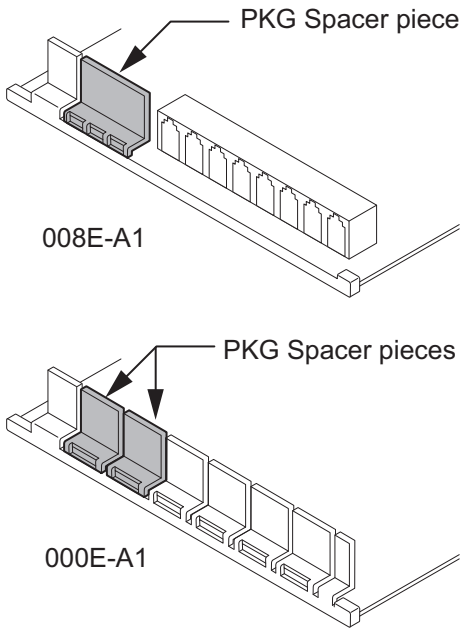


Figure 2-71 PKG Spacers of 008E-A1/000E-A1

2. Insert two Nylon-spacers into the specified holes and use one Metal-spacer and fasten screw onto the 2BRIDB-C1 PCB.
3. Mount the 2BRIDB-C1 PCB onto the 008E-A1/000E-A1 PCB using two Nylon-spacers and one screw. (Refer to Figure 2-72 Additional Installing the 2BRIDB-C1 on this page)
4. Stick the 2BRI Label to the specified position on the 008E-A1/000E-A1 PCB.

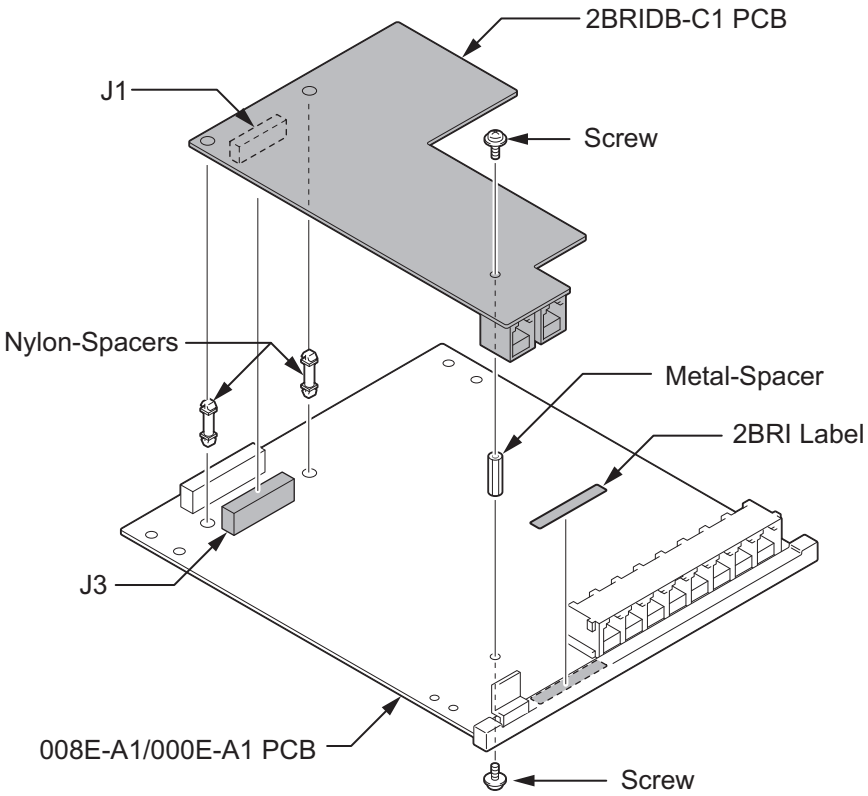


Figure 2-72 Additional Installing the 2BRIDB-C1

The 2BRIDB-C1 can not be mounted on the 408M-A1/408E-A1/1PRIU-C1 PCB.

5. Mount the 2BRIDB-C1 with 008E-A1/000E-A1 PCB into the KSU.

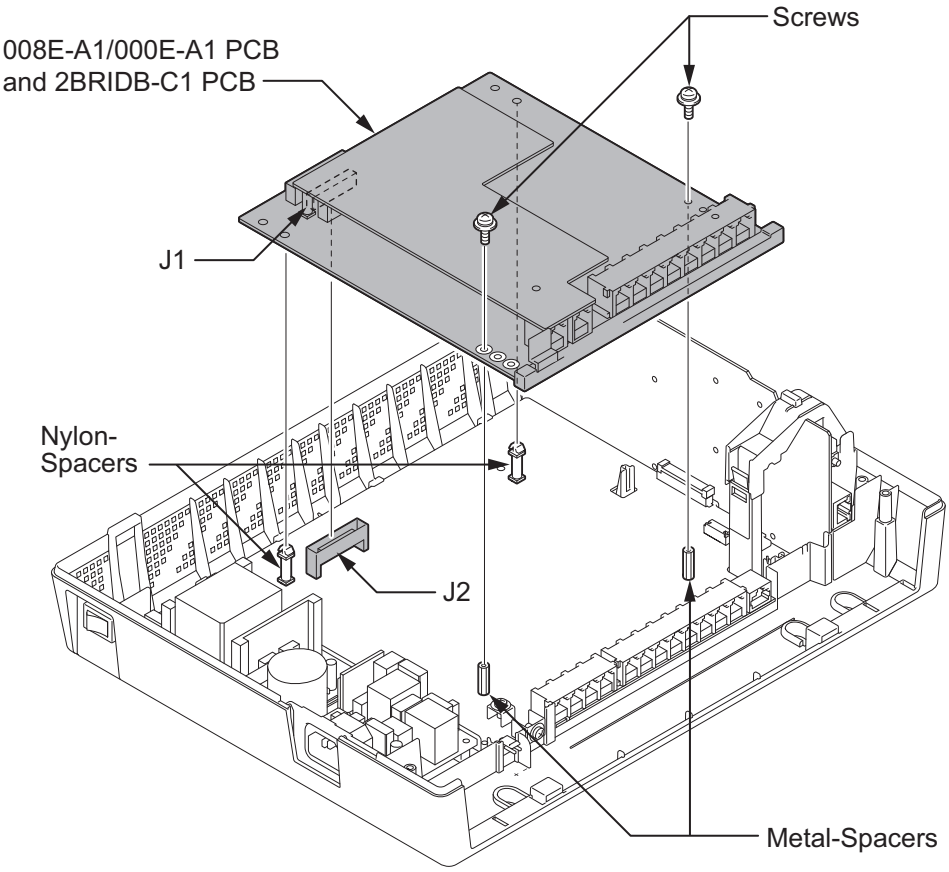


Figure 2-73 Additional Mounting the 2BRIDB-C1

6. Replace the Main-cover and fasten two screws.

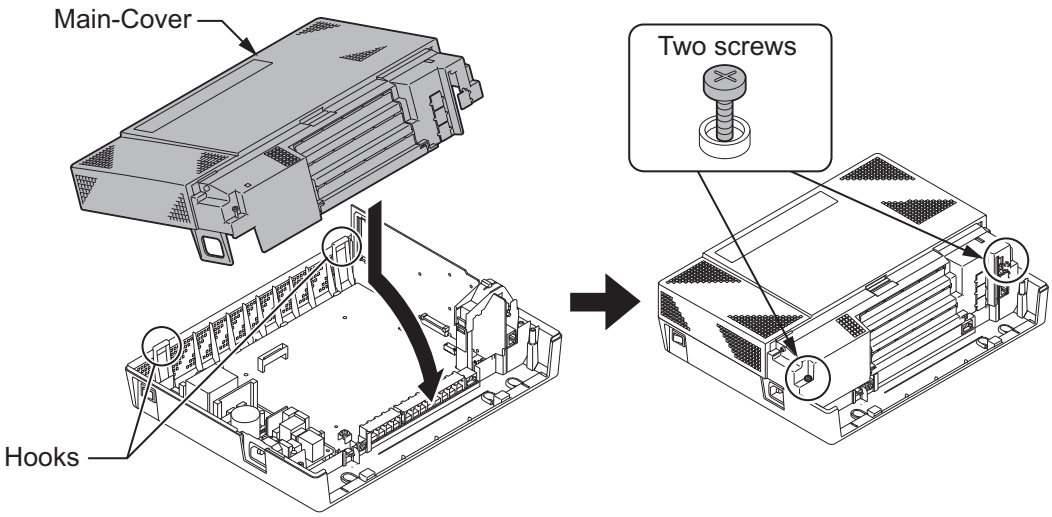


Figure 2-74 Replacing the Main-cover

3.4 Cabling and Setting the Expansion Interface Card

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.

3.4.1 Cabling IP4WW-408E-A1

This IP4WW-408E-A1 PCB provides "RJ11" modular jacks for four analog trunks and eight extension connectors.

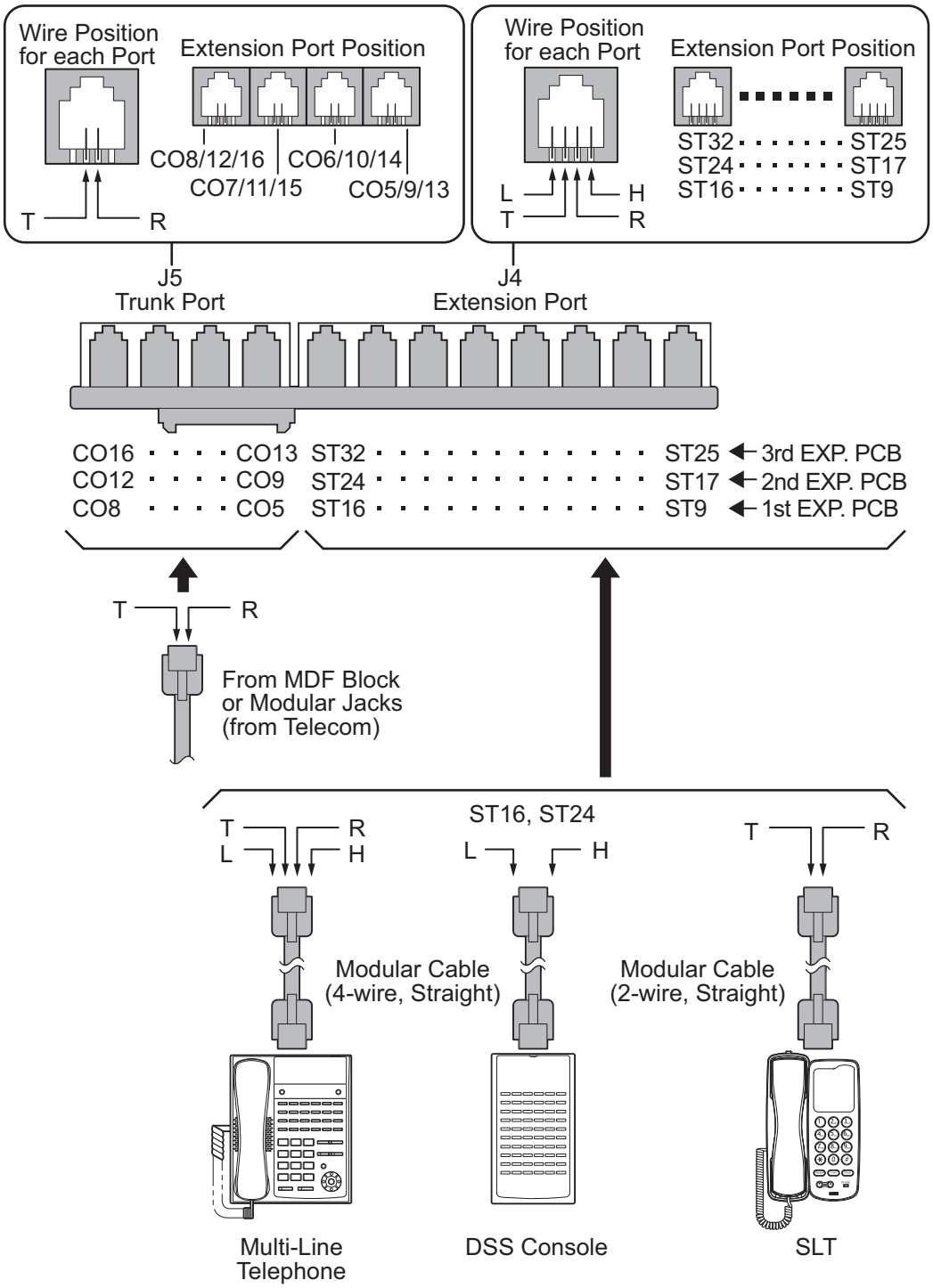


Figure 2-75 Connectors of 408E-A1

Only Analog Telephones can be connected when this PCB is installed as the 3rd PCB in each Main or Expansion KSU. Multi-line Telephones and DSS Console must not be connected.

3.4.2 Cabling IP4WW-008E-A1

This IP4WW-008E-A1 PCB provides "RJ11" Modular Jacks for eight extensions connector.

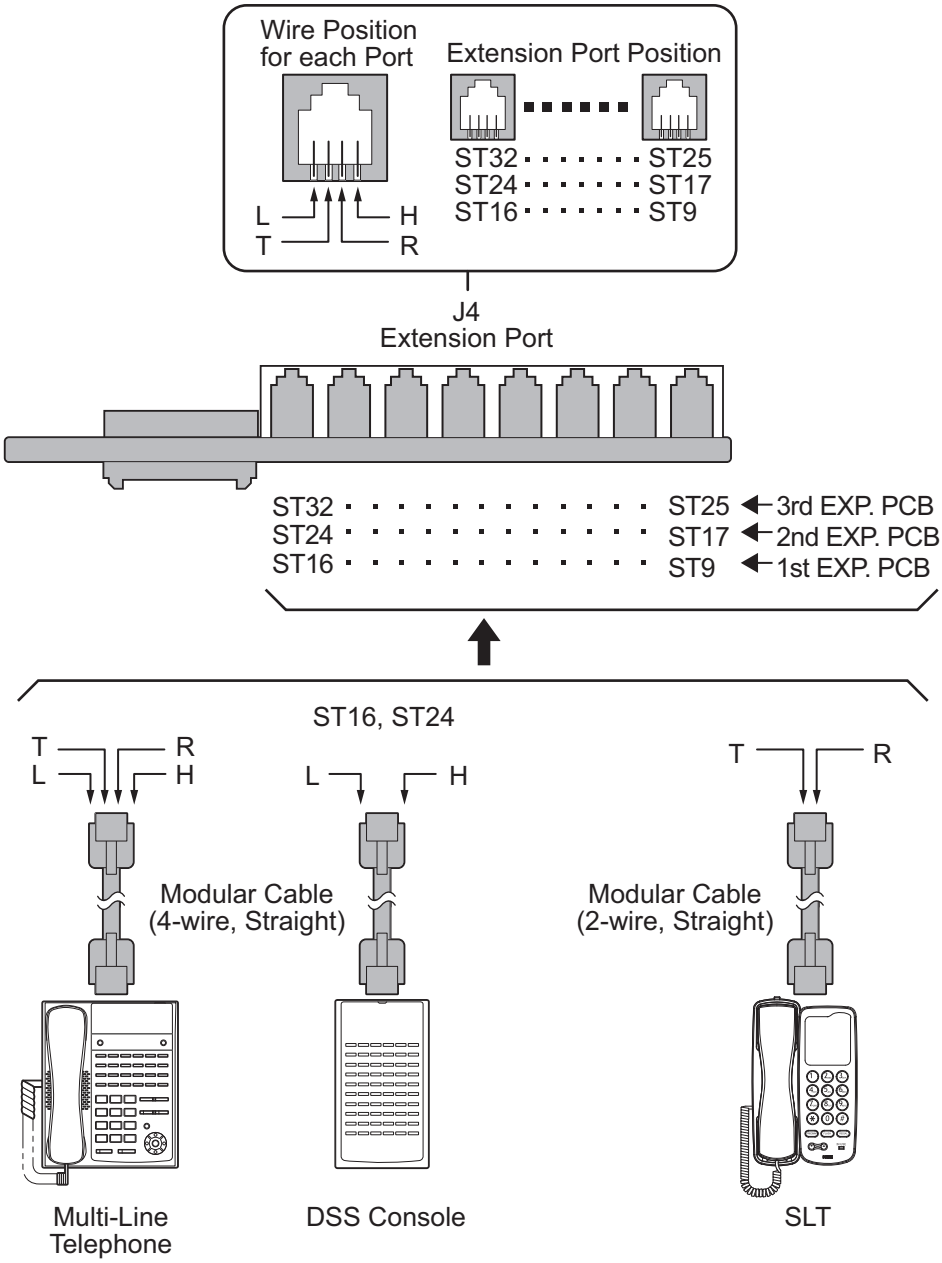


Figure 2-76 Connectors of 008E-A1

Only Analog Telephones can be connected when this PCB is installed as the 3rd PCB in each Main or Expansion KSU. Multi-line Telephones and DSS Console must not be connected.

3.4.3 Cabling IP4WW-000E-A1

This IP4WW-000E-A1 PCB does not have any connector for cabling.

3.4.4 Cabling and Setting IP4WW-2BRIDB-C1

This IP4WW-2BRIDB-C1 PCB provides "RJ61" modular jacks for two BRI connectors.

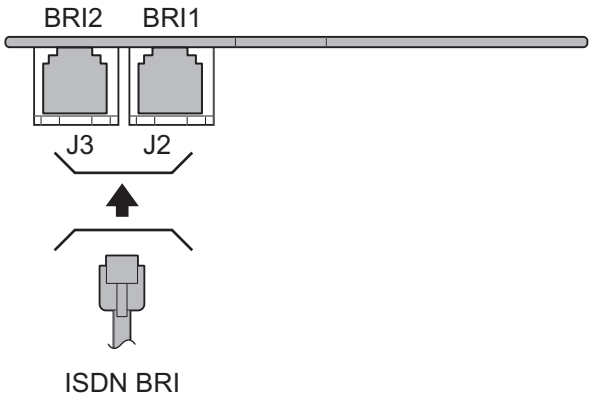
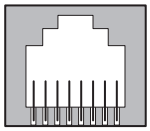


Figure 2-77 Connectors of 2BRIDB-C1

3.4.4.1 Connectors

The following table shows the pin-outs for the RJ-61 cable connector for S-Bus and T-Bus connections.

Table 2-10 BRI1, BRI2: BRI Port Connector (RJ-61)

	Pin No.	RJ-61 Cable Connector-2BRIDB-J2,J3 S-Bus Connection	RJ-61 Cable Connector-2BRIDB-J2,J3 T-Bus Connection
 87654321	1	-	-
	2	-	-
	3	RA	TA
	4	TA	RA
	5	TB	RB
	6	RB	TB
	7	-	-
	8	-	-

3.4.4.2 Switch Setting

The following figure shows the location of the connectors and switches on the IP4WW-2BRIDB-C1.

1. Set the switches J12 to J17 according as the system referring the table.

Table 2-11 Switch Setting of 2BRIDB-C1

Switch No.	Switch Position	Description
J12/J15	ON (default)	Termination register is ON. This SW should be ON in case: • T-Bus Point-to-Point connection is selected. • T-Bus Point-to-Multipoint is selected, and if the system is Terminal 8. (last device on the bus) • S-Bus.
	OFF	P-MP (Terminal 7)
J13, J14/J16, J17	T (default)	T-Bus connection
	S	S-Bus connection

J12 & J15 do not configure the connection type on the system, they only add/remove the termination of the circuit.
J13,J14 & J16, J17 do not configure the connection type on the system, they only select the polarity of the connector J2/J3.
The 2BRIDB-C1 circuits must also be setup within the system configuration.

2. Connect the cables from the NT1 Network Termination cable to the J2 or J3 connector on the 2BRIDB-C1 daughter board.
   Connector J2 - BRI1: Use switches J12, J13, J14
   Connector J3 - BRI2: Use switches J15, J16, J17

Ensure that you set all switches correctly for each BRI circuit.

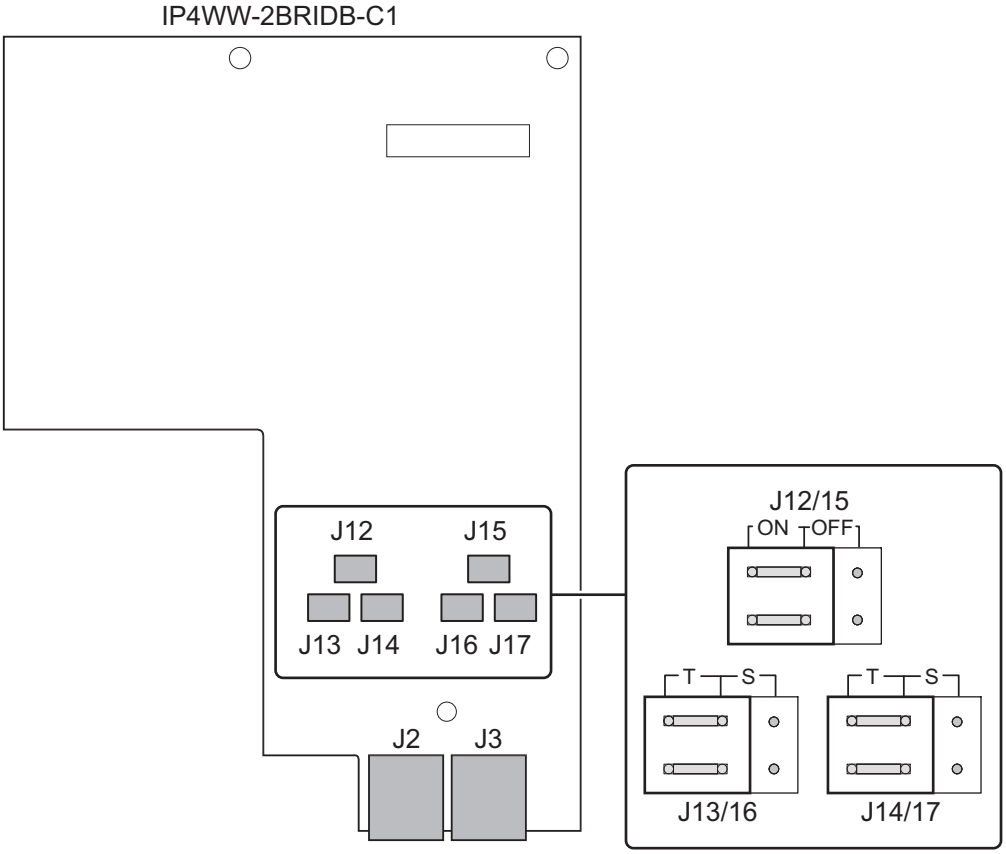


Figure 2-78 Switches Location of 2BRIDB-C1

3.4.5 Cabling and Setting IP4WW-1PRIU-C1

This IP4WW-1PRIU-C1 PCB provides "RJ45" Modular Jack for one PRI connector.

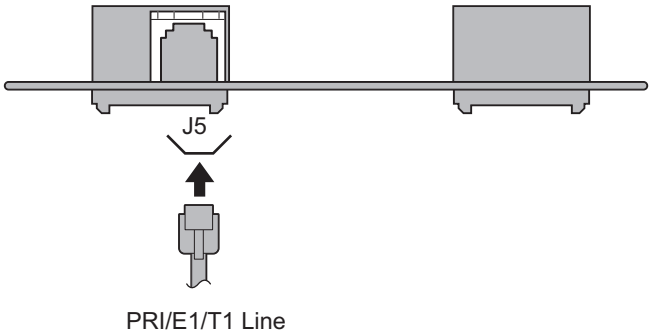
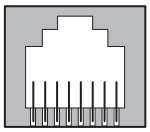


Figure 2-79 Connector of 1PRIU-C1

3.4.5.1 Connector

Following table shows the pin-outs for the RJ-45 cable connector for S-Bus and T-Bus RJ-45 connections.

Table 2-12 J5: PRI Port Connector (RJ45)

	Pin No.	RJ-45 Cable Connector-PRIU-J5 S-Bus Connection	RJ-45 Cable Connector-PRIU-J5 T-Bus Connection
	1	TA	RA
	2	TB	RB
	3	-	-
	4	RA	TA
	5	RB	TB
	6	-	-
	7	-	-
	8	-	-

3.4.5.2 Switch Setting

The following figure shows the location of the switches and LEDs on the IP4WW-1PRIU-C1 Card.

1. Set the switches J6 to J9 according as the system referring the table.

Table 2-13 Switch Setting of 1PRIU-C1

Switch No.	Switch Position	Description
J6, J7	2M (default)	Connect PRI/E1 (2.048 Mb/s) line
	1.5M	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 1PRIU-C1 Card.
3. Assign whether the unit works as PRI/T1/E1 by PRG10-51-01.

With normal operation, D4 LED flashes green.

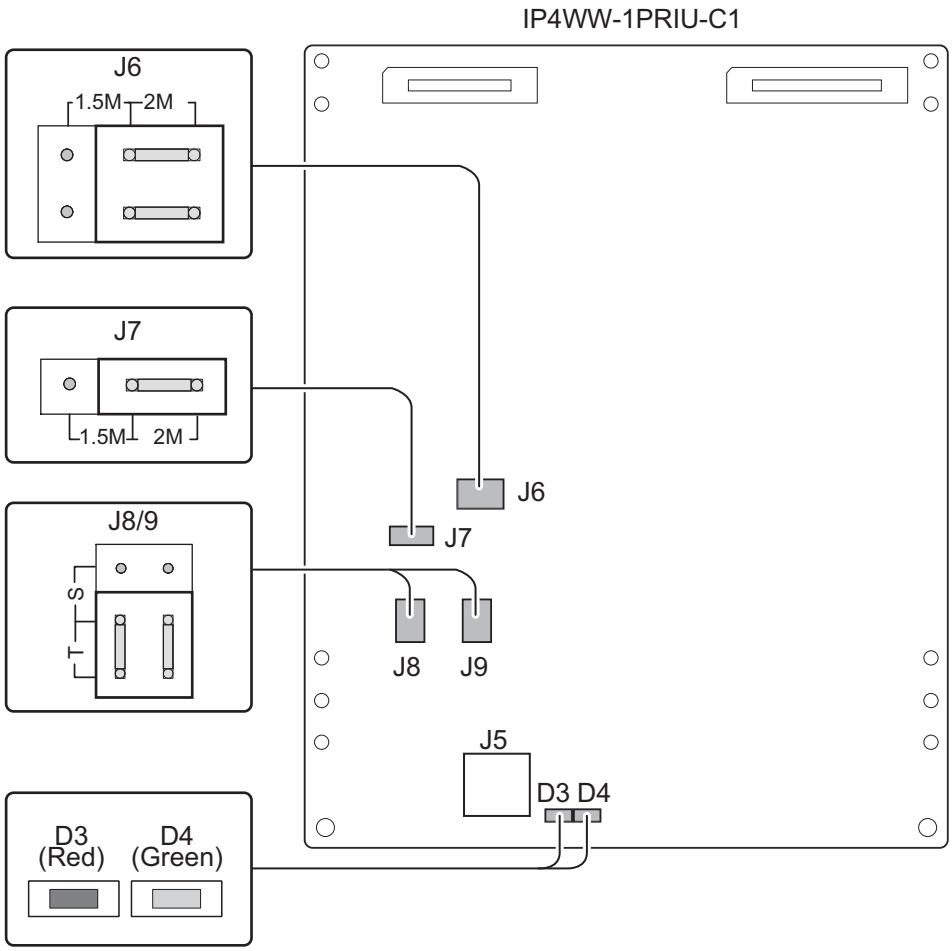


Figure 2-80 Switches and LEDs Location of 1PRIU-C1

3.4.5.3 LED Indication

LED indications for the IP4WWW-1PRIU-C1 are listed in following table. Each LED is listed with its associated function and LED and operational status.

Table 2-14 LED Indication

LED Indication		Operation Status		Remarks
Live LED (D4) (Green)	**Busy LED (D3) (Red)**			
On	On	System Initializing		-
Flash (1s)	On	The assignment of the unit is refused		When you exceed the system capacity. When the main software version is not matched.
	Flash (1s)	Trouble found during self-diagnostics.		-
Flash (100ms)	On	Normal Operation	A Channel is busy (use another from Ch1 - Chx)	-
	Off		All channels are Idle.	-
Off	On	Unit Busy	A Channel is busy (use another from Ch1 - Chx)	-
	Off		All channels are Idle.	-
	Flash 80ms (On/Off) x3/ 400ms Off	Downloading firmware		-

T1 Alarm Mode

Refer to following figure for LED pattern information. LED indications for the T1 are listed in following table.

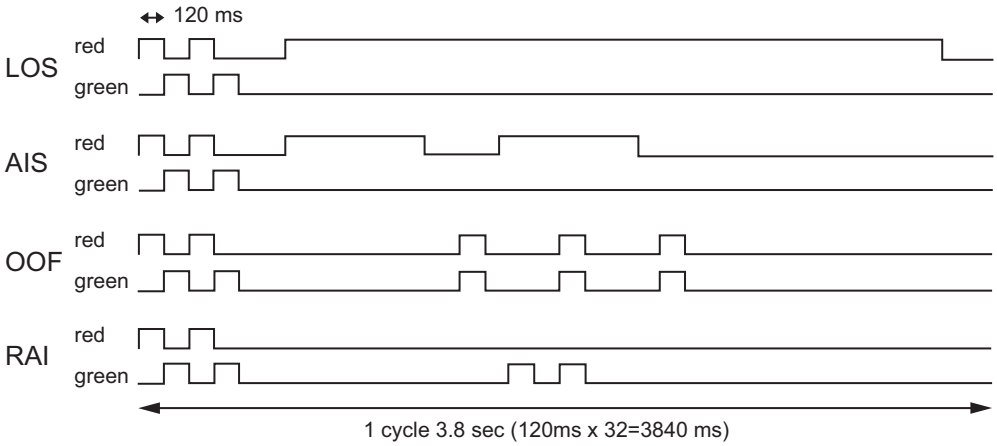


Figure 2-81 1PRIU-C1 LED Indication Pattern of Layer 1 on T1 Unit

Table 2-15 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 (red, green, red, green), a red LED lighting up.
AIS	AIS (Alarm Indication Signal (Blue Alarm))	Following an alarm blink (red, green, red, green), a red LED flashes on and off slowly twice
OOF	OOF (Out of Frame (Red Alarm))	Following an alarm blink (red, green, red, green), a red LED and a green LED flash on and off 3 times simultaneously.
RAI	RAI (Remote Alarm Indication (Yellow Alarm))	Following an alarm blink (red, green, red, green), a green LED flashes on and off twice.
No alarm	System does LED control	

E1 Alarm Mode

Refer to following figure for LED pattern information. LED indications for the E1 are listed in following table.

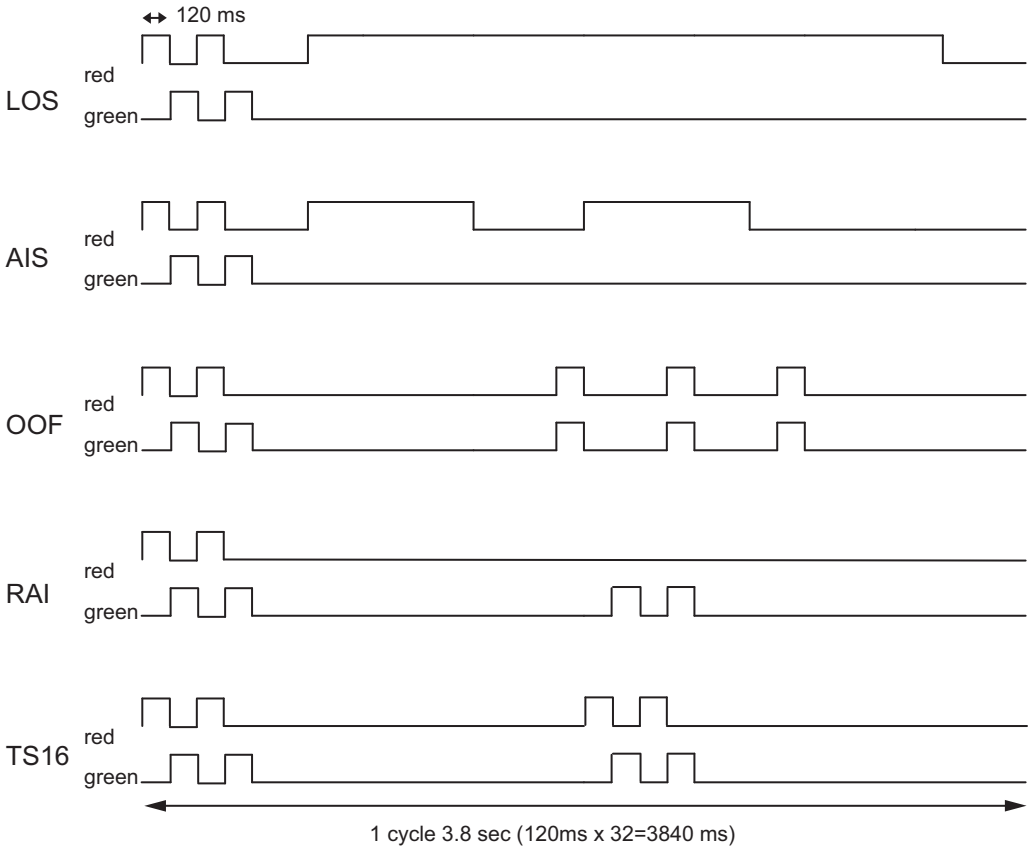


Figure 2-82 1PRIU-C1 LED Indication Pattern of Layer 1 on E1 Unit

Table 2-16 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 (red, green, red, green), a red LED lighting up.
AIS	AIS (Alarm Indication Signal (Blue Alarm))	Following an alarm blink (red, green, red, green), a red LED flashes on and off slowly twice
OOF	OOF (Out of Frame (Red Alarm))	Following an alarm blink (red, green, red, green), a red LED and a green LED flash on and off 3 times simultaneously.
RAI	RAI (Remote Alarm Indication (Yellow Alarm))	Following an alarm blink (red, green, red, green), a green LED flashes on and off twice.
TS16	TS16 (Receive Time Slot 16 all Alarm)	An alarm blink repeat twice by 1 cycle.
No alarm	System does LED control	

3.5 Power Failure Transfer (408E-A1 only)

3.5.1 General

In the event of AC power failure, the specified trunks are directly connected to the specified extension ports as below. And SLT must be connected to the specified extension. The multi-line telephone (4W) does not work when connected to the specified extension port.

Trunk Port No. 5 → Extension Port No. 16
Trunk Port No. 9 → Extension Port No. 24

Trunk Port No. 13 → Extension Port No. 32

- *The connected extension must be SLT (Single Line Telephone).*
- *Hardware switch (J6) must be set from "KT" to "PF" side (default: KT) when use the Power failure transfer circuit.*
- *Refer to Power Failure Transfer on page 2-15 for Power Failure Transfer of 408M-A1.*

3.5.2 Power Failure Setting

Hardware switch (J6) must be set from "KT" to "PF" side (default: KT) when use the Power failure transfer circuit.

1. Use Needle-nose pliers to change the switch position of "J6" from **"KT" to "PF"** as below. (Default: KT)

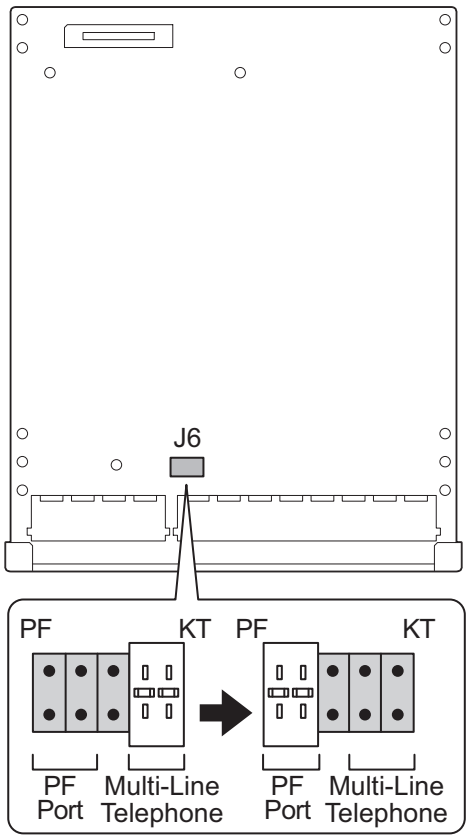


Figure 2-83 PF/KT Switch of 408E-A1

2. Connect SLT to the extension port No. 16/24/32.

SECTION 4 INSTALLING THE OPTIONAL INTERFACE CARDS

4.1 Installing the Expansion Memory Card (MEMDB-C1)

4.1.1 General

The Memory expansion daughter board (IP4[ ]-MEMDB-C1) provides additional memory for the system to use following features;

- A System with multiple KSU
- To use VoIP Card (IP4WW-VOIPDB-C1)
- Remote Upgrade (Main Software)
- E-Mail Notification (InMail)
- VRS Channel increase from 4 to 16 channels
- VRS/InMail channel increase from 8 to 16 channels

This daughter board is mounted on the CPU card and provides the SDRAM and flash memories.

4.1.2 Unpacking

Table 2-17 Unpacking the MEMDB-C1

Items	List of Contents	QTY
IP4[ ]-MEMDB-C1	MEMDB-C1 PCB	1

4.1.3 Installing the MEMDB PCB

- ***Do not remove or install the CPU card with power on.***
- ***If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.***

1. Turn off the system power and disconnect AC cord.
2. Open and pull out the Sub-cover.

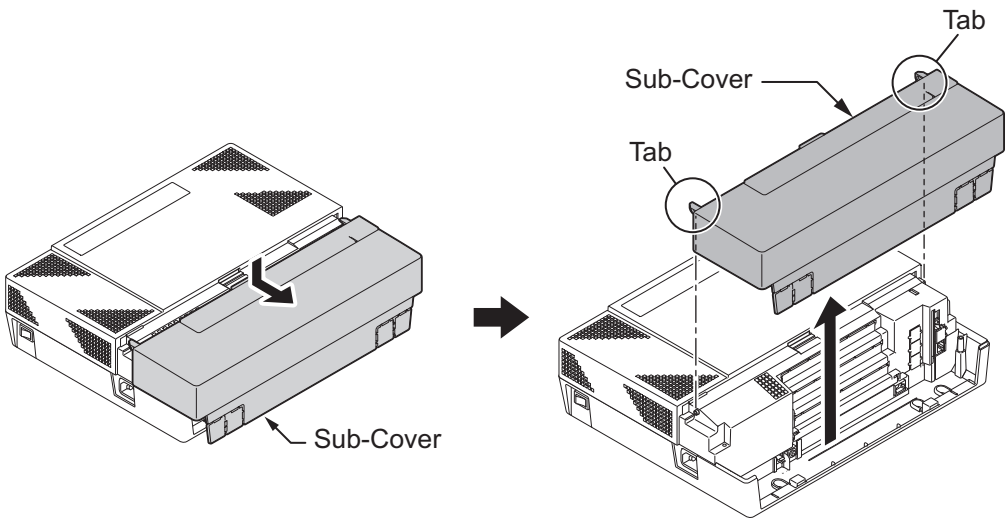


Figure 2-84 Removing the Sub-cover

3. Loosen two screws and remove the Main-cover.

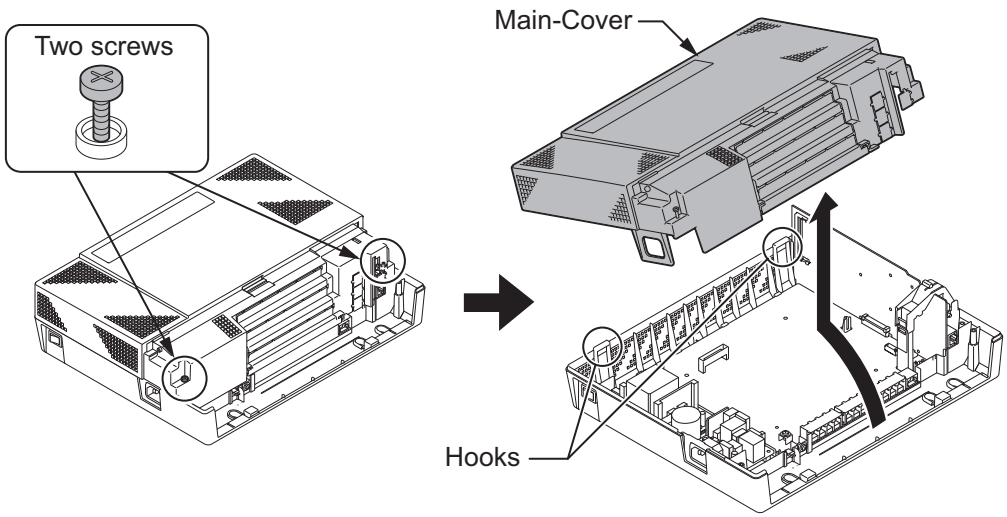


Figure 2-85 Removing the Main-cover

4. Push A-part in the following figure to release the CPU support. Remove the CPU card.

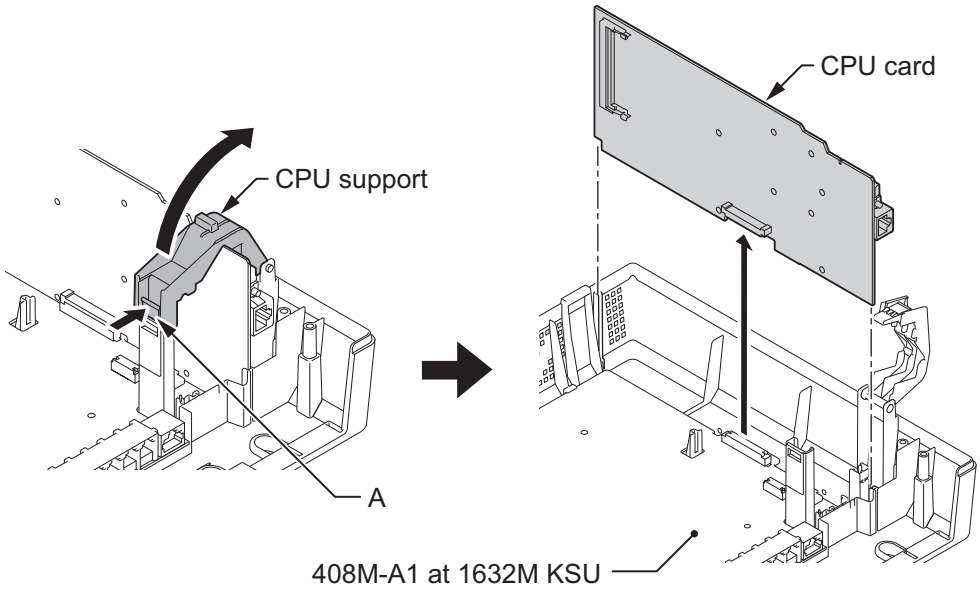


Figure 2-86 Removing the CPU Card

5. Insert the MEMDB-C1 daughter board to J4 socket on the CPU card and press down the MEMDB-C1 daughter board to fix.

In case, the both levers must be fixed to the notch-A.

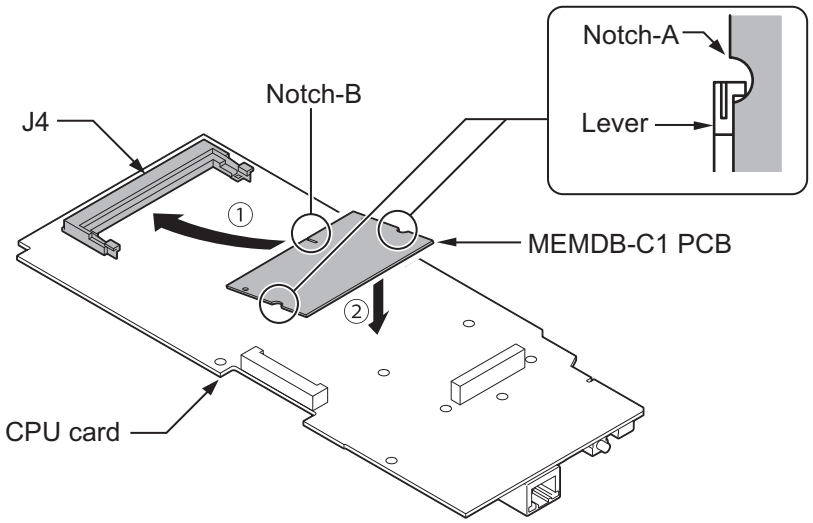


Figure 2-87 Installing the MEMDB PCB

6. Insert the CPU card to the 408M-A1 mother board, and close the CPU support to fix to the KSU.

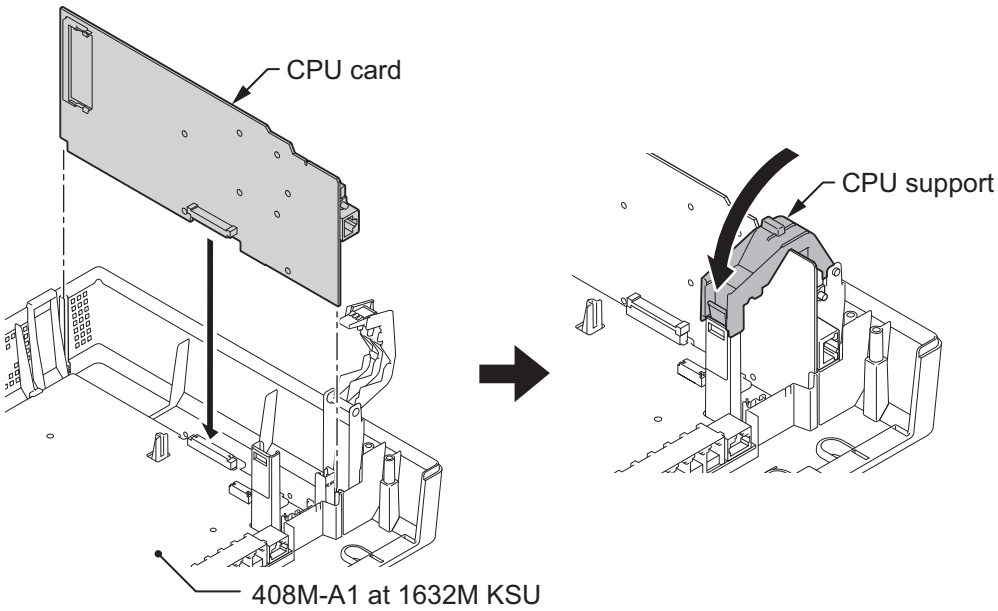


Figure 2-88 Installing the CPU Card

7. Replace the Main-cover and fasten two screws.

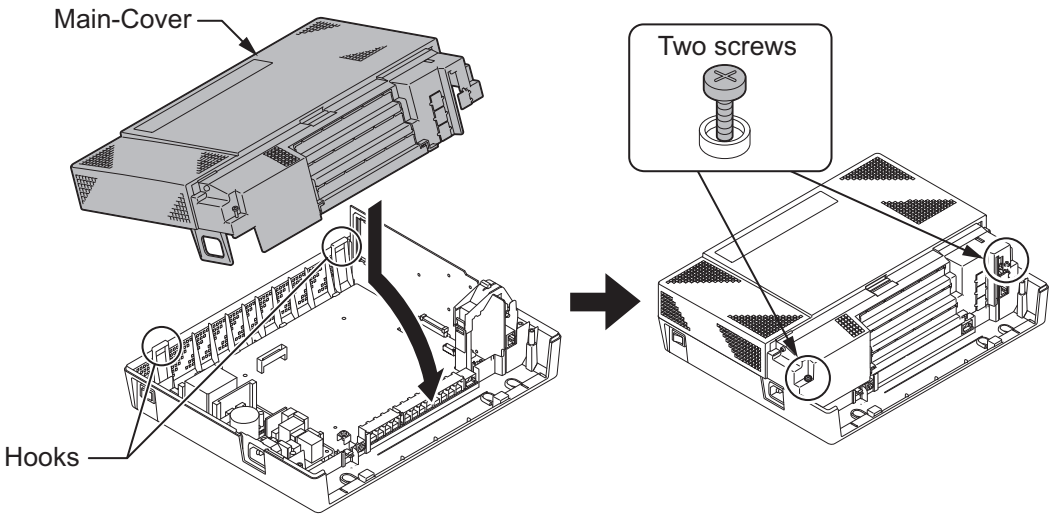


Figure 2-89 Replacing the Main-Cover

4.2 VoIP Card (VOIPDB-C1) {Future Available}

4.2.1 General

The IP4WW-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 card.

4.2.2 Unpacking

Table 2-18 Unpacking the VOIPDB-C1

Items	List of Contents	QTY
IP4WW-VOIPDB-C1	IP4WW-VOIPDB-C1	1
	Ferrite Core (for Ethernet Cable)	1

4.2.3 Installing the VOIPDB-C1 PCB

- ***Do not remove or install the CPU Card with the power on.***
- ***If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.***

1. Turn off the system power and disconnect AC cord.

2. Open and pull out the Sub-cover.

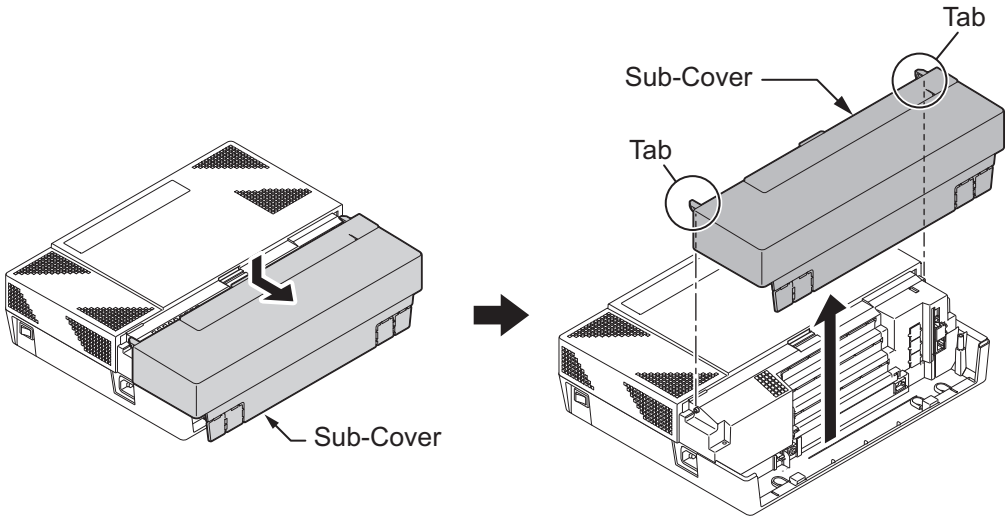


Figure 2-90 Removing the Sub-cover

3. Loosen two screws and remove the Main-cover.

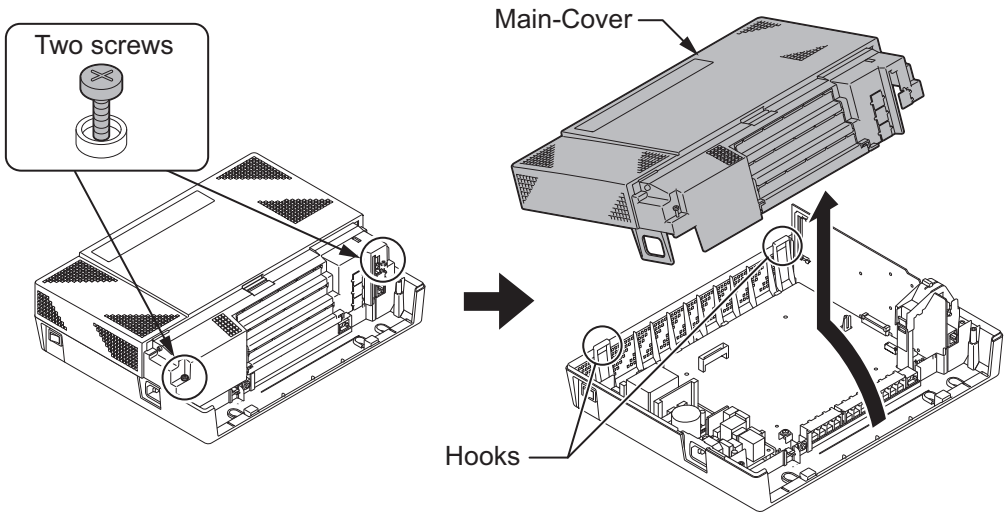


Figure 2-91 Removing the Main-cover

4. Push A-part in following figure to release the CPU support. Remove the CPU card.

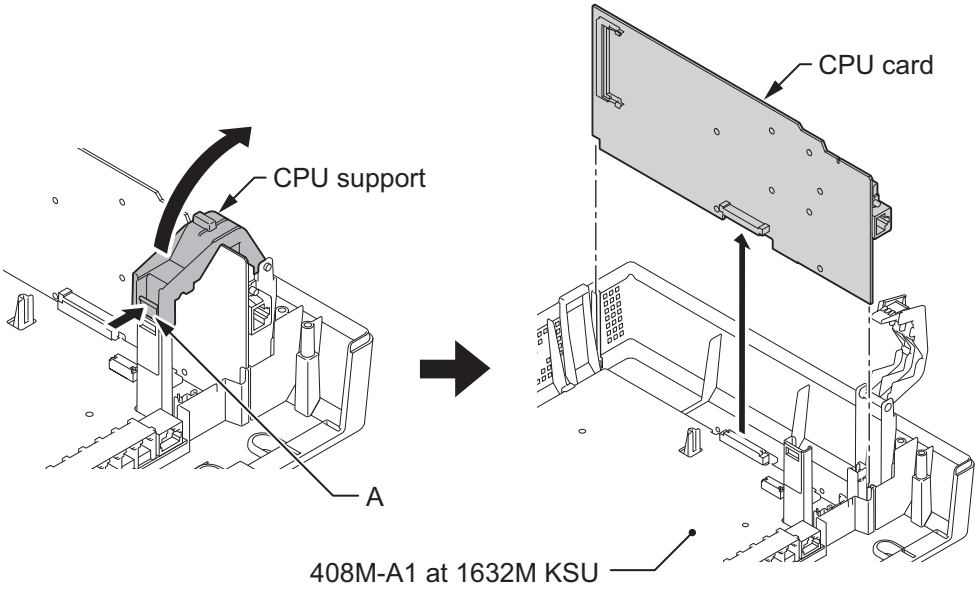


Figure 2-92 Removing the CPU Card

5. Install the VOIPDB-C1 daughter board to J5 connector on the CPU card.

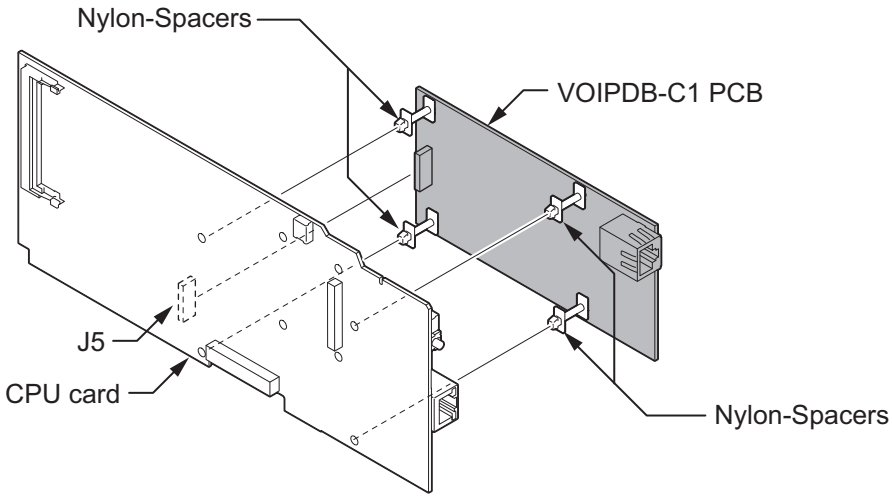


Figure 2-93 Installing the VOIPDB-C1 PCB

6. Insert the CPU card to the 408M-A1 mother board, and close the CPU Support to fix to the KSU.

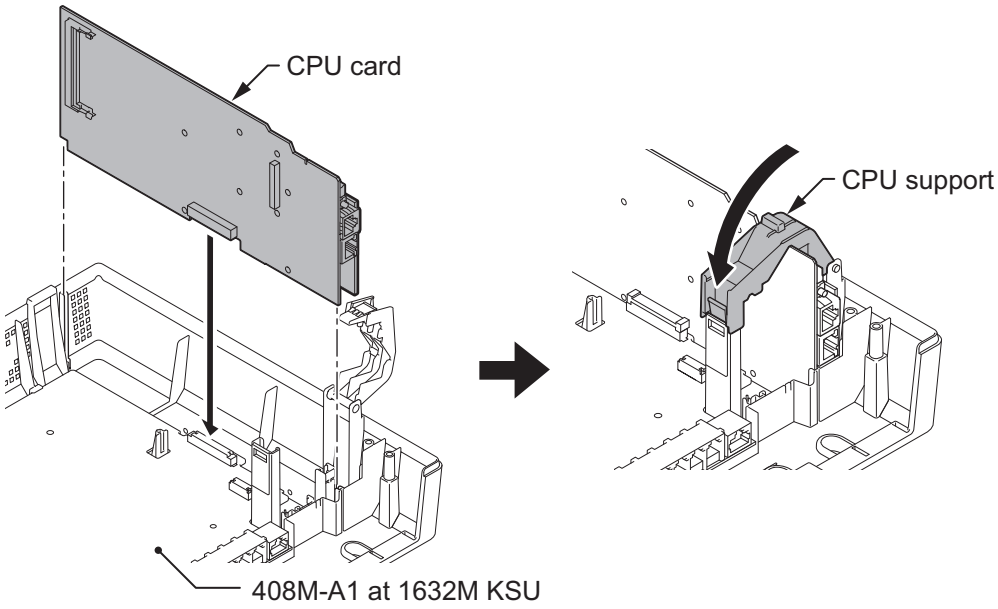


Figure 2-94 Installing the CPU Card

7. Cut and remove the plastic filter piece for VoIP connector, then replace the Main-cover and fasten two screws.

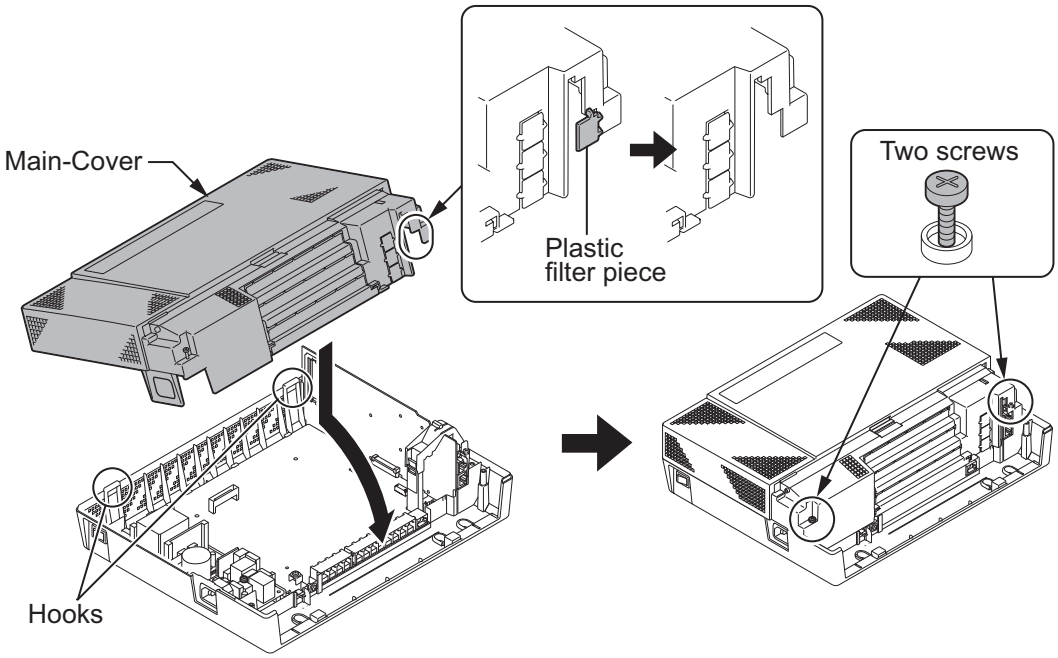


Figure 2-95 Removing the Plastic Filter Piece and Replacing the Main-Cover

8. Connect the VOIPDB-C1 to an Switching hub using an Ethernet Cable.
   <Before the Cabling>

The Ether Cable must pass 2 times (2 rounds) through the Ferrite Core as below. (Ferrite Core is attached with VOIPDB-C1)

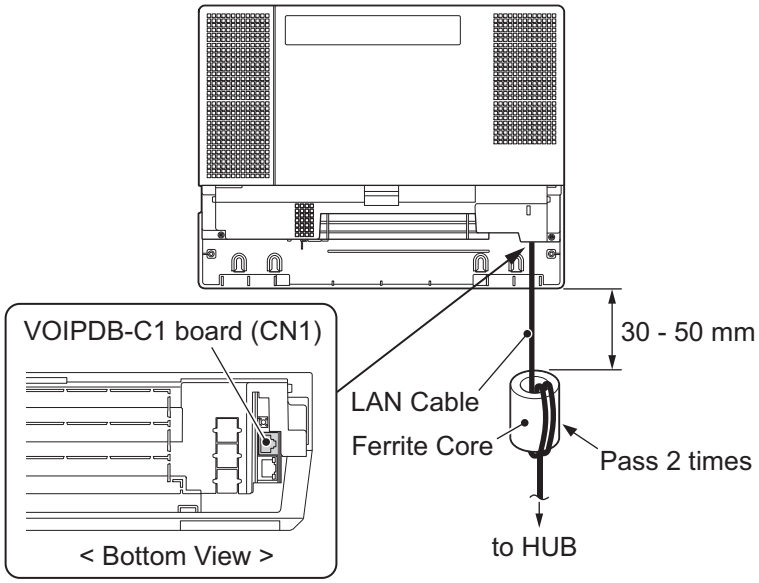


Figure 2-96 Connecting a LAN Cable

9. Refer to the Programming Manual for detailed programming instructions.
   The VoIP Trunk feature is required to set related program. For the details of setting and operation, refer to the Features & Specifications Manual (separate issue).

4.3 VRS/Voice Mail Card (PZ-VM21)

4.3.1 General

The PZ-VM21 daughter board provides additional DSP resource with 8/16 ch VRS (Voice Response system) and Voice Mail Service (a compact flash card (CFVRS/CFVMS/CFVML) is required) and a Single Channel V.34 (33.6 kbps) modem for remote maintenance functions. The daughter board is installed onto the CPU card.

4.3.2 Unpacking

Table 2-19 Unpacking the PZ-VM21

Items	List of Contents	QTY
PZ-VM21	PZ-VM21 PCB	1
	Nylon Spacers	4

4.3.3 Installing the PZ-VM21 PCB

- ***Do not remove or install the CPU Card with the power on.***
- ***If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.***

1. Turn off the system power and disconnect AC cord.

2. Open and pull out the Sub-cover.

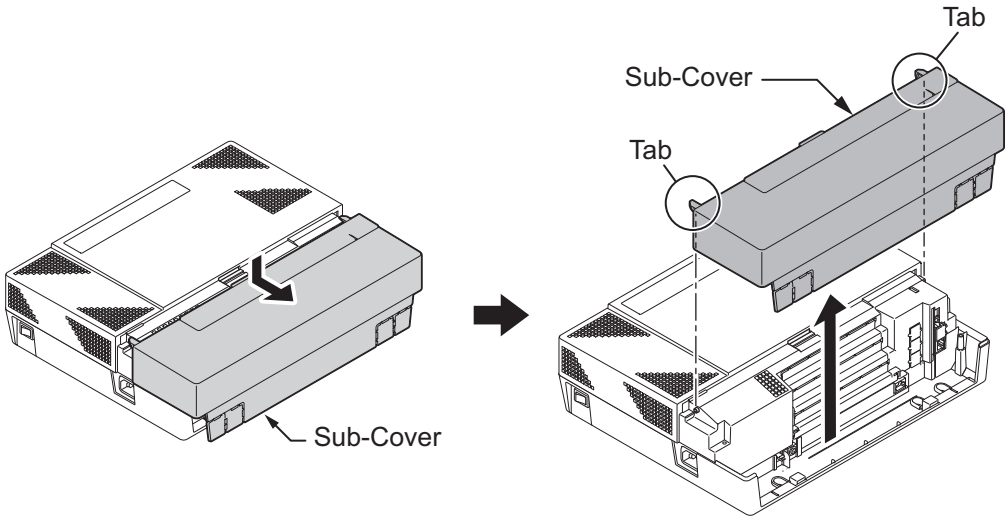


Figure 2-97 Removing the Sub-cover

3. Loosen two screws and remove the Main-cover.

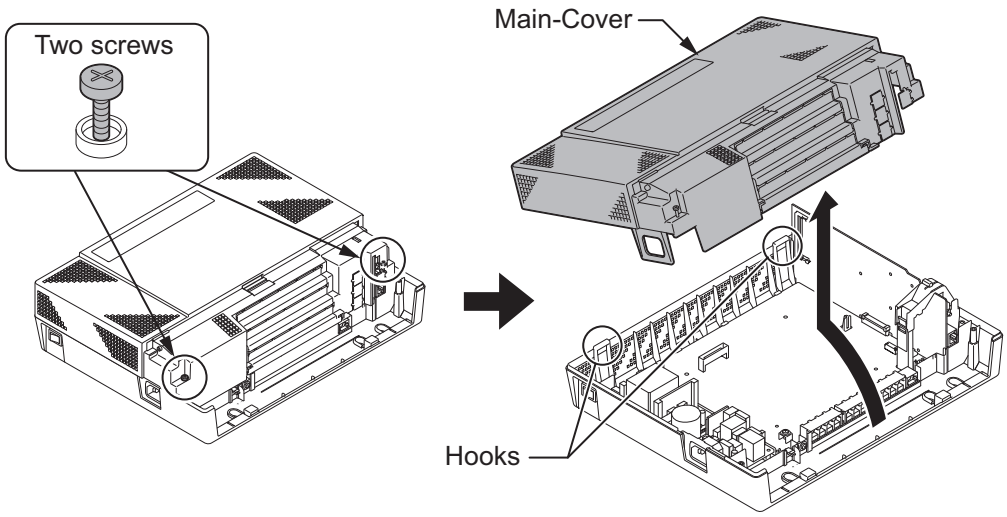


Figure 2-98 Removing the Main-cover

4. Push A-part in following figure to release the CPU support. Remove the CPU card.

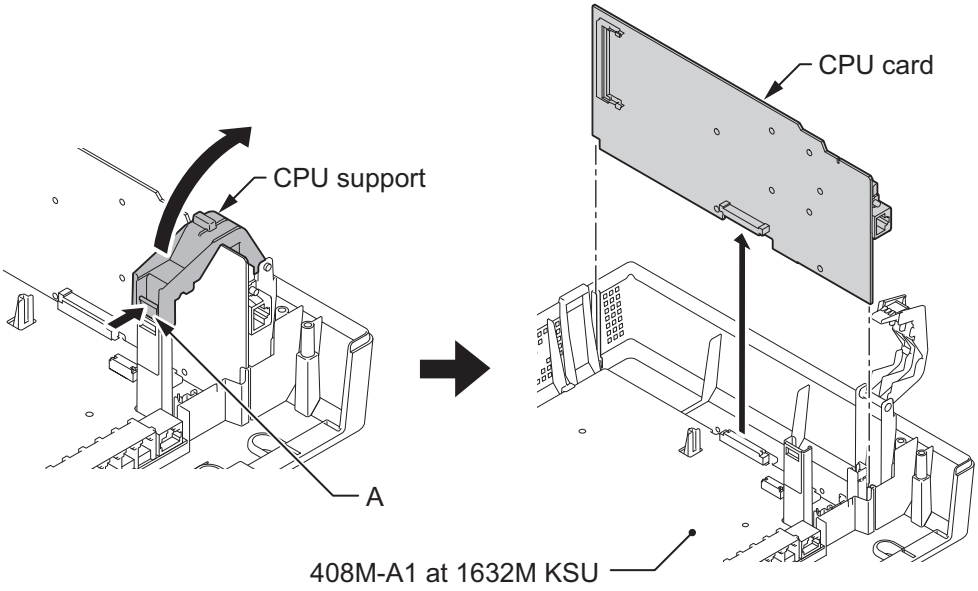


Figure 2-99 Removing the CPU Card

5. Install the PZ-VM21 daughter board to J6 connector using four Nylon-spacers on the CPU card.

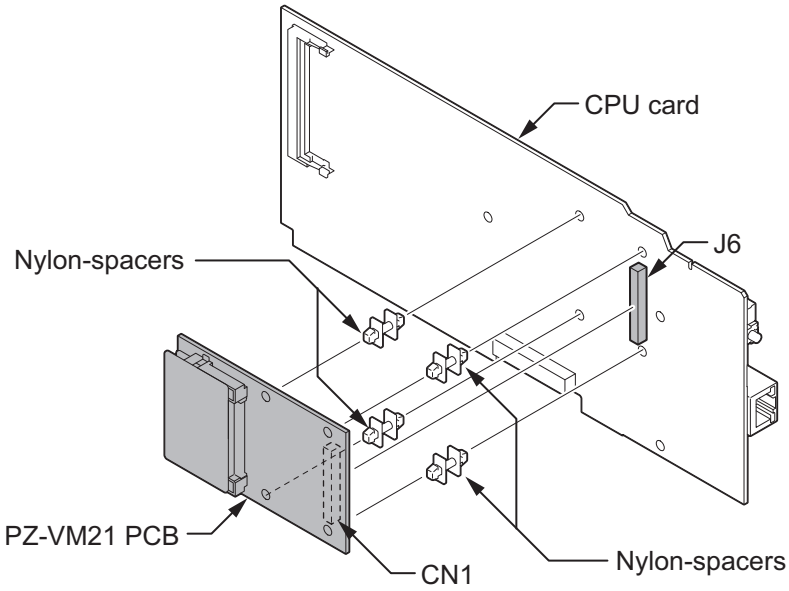


Figure 2-100 Installing the PZ-VM21 PCB

6. Insert the CPU card to the 408M-A1 mother board, and close the CPU Support to fix to the KSU.

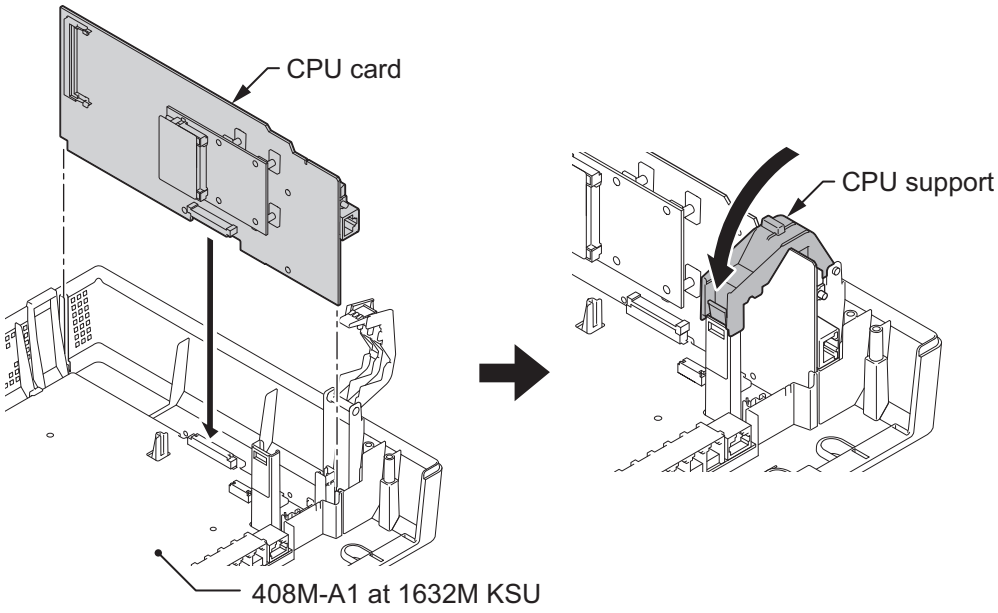


Figure 2-101 Installing the CPU Card

7. Replace the Main-cover and fasten two screws.

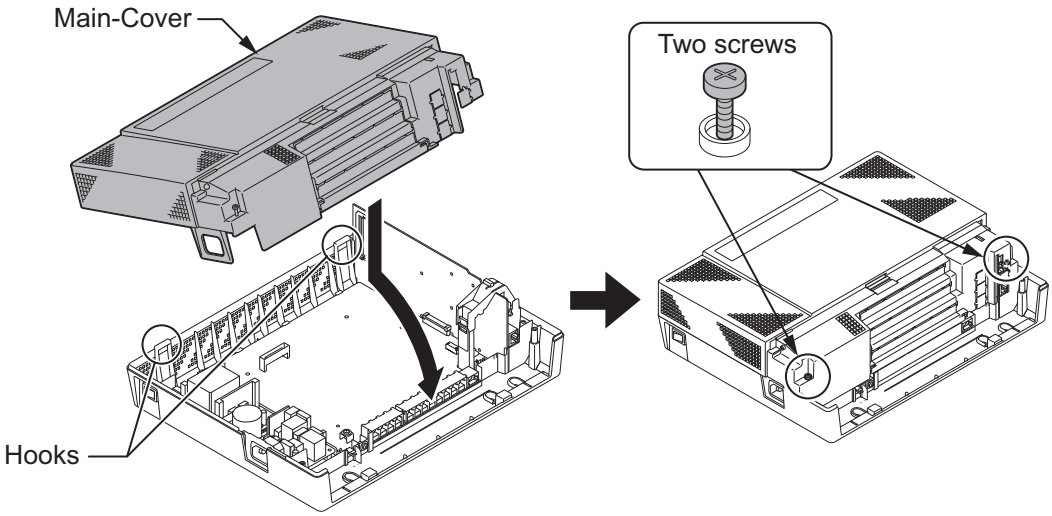


Figure 2-102 Replacing the Main-Cover

4.4 Installing the CF Card (CFVRS/CFVMS/CFVML)

- ***Do not remove or install the CPU Card with the power on.***
- ***If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.***

1. Turn off the system power and disconnect AC cord

2. Remove the CPU card and insert the compact flash card into the CF slot (CN2).

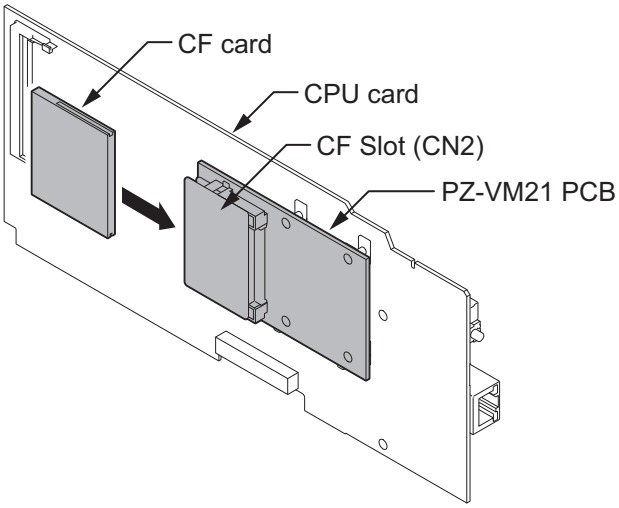


Figure 2-103 Installing the CF Card

3. Insert the CPU card to the 408M-A1 mother board, and close the CPU Support to fix to the KSU.

SECTION 5 INSTALLING THE MULTI-LINE TELEPHONES AND OPTIONAL TERMINALS

5.1 Installing the Multi-Line Telephones

5.1.1 Location of Controls

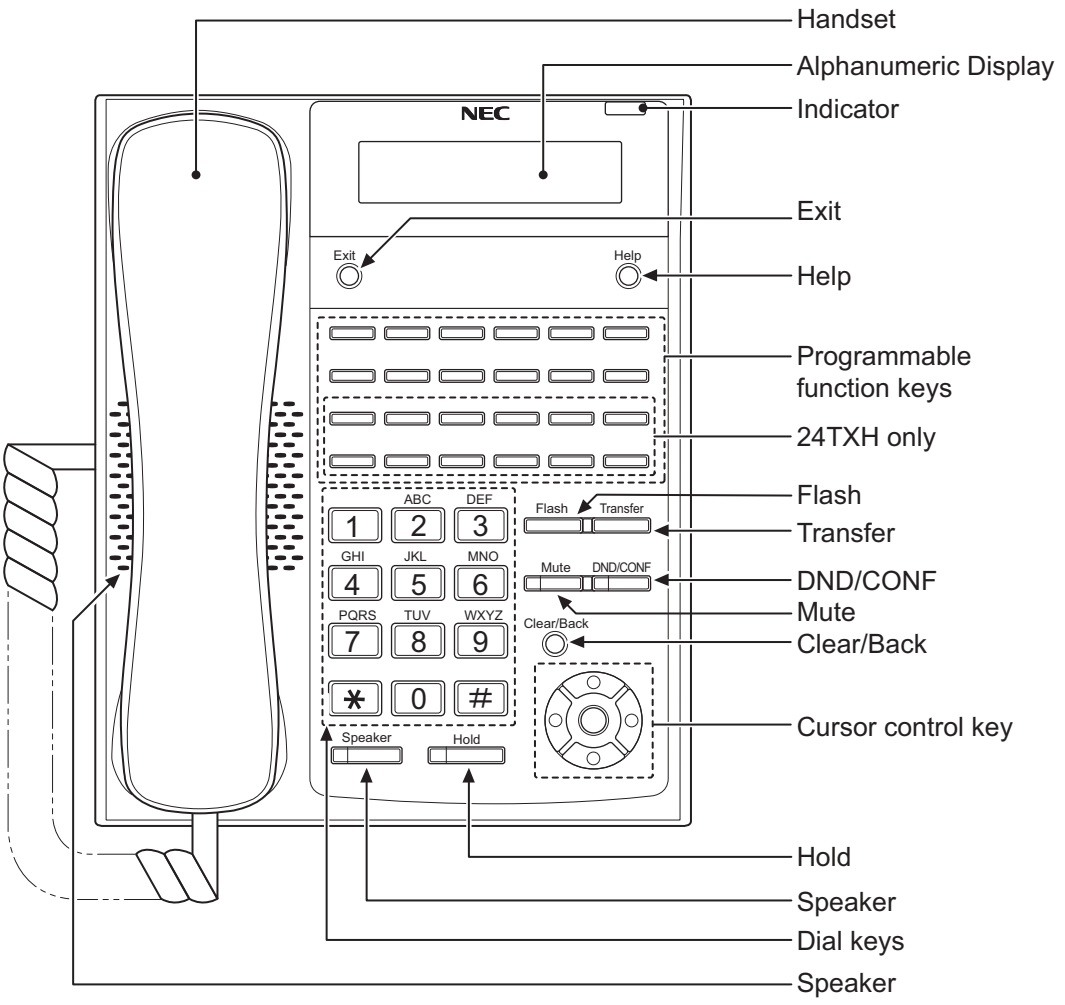


Figure 2-104 12TXH/24TXH Multi-Line Telephone

Table 2-20 Functions of 12TXH/24TXH Multi-Line Telephone

Functions	12TXH	24TXH
Programmable Keys	12 (Busy lamp field: Red-Green)	24 (Busy lamp field: Red-Green)
Display	16-digit x 2 lines	16-digit x 2 lines
Handsfree	Half-duplex	Half-duplex
Wall Mount Kit	Yes (Built-in)	Yes (Built-in)

5.1.2 Multi-Line Telephone Legs Adjustment

The Multi-Line Telephone provides the leg 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.

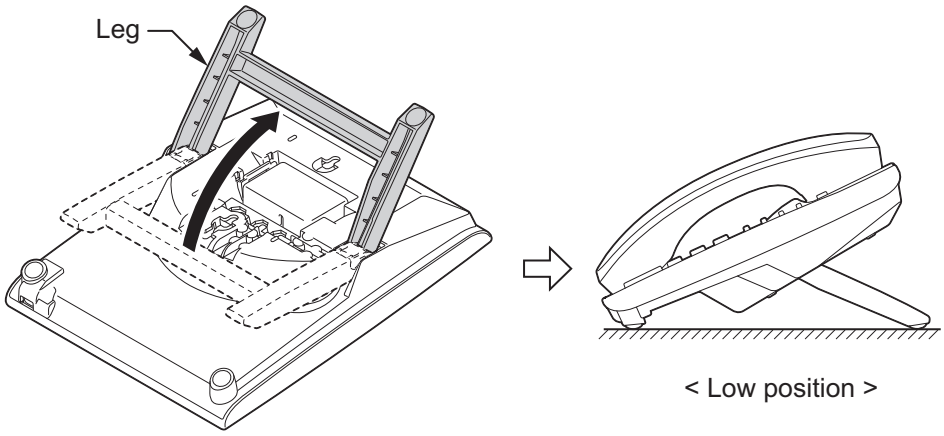


Figure 2-105 Leg Setting for Low Position

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

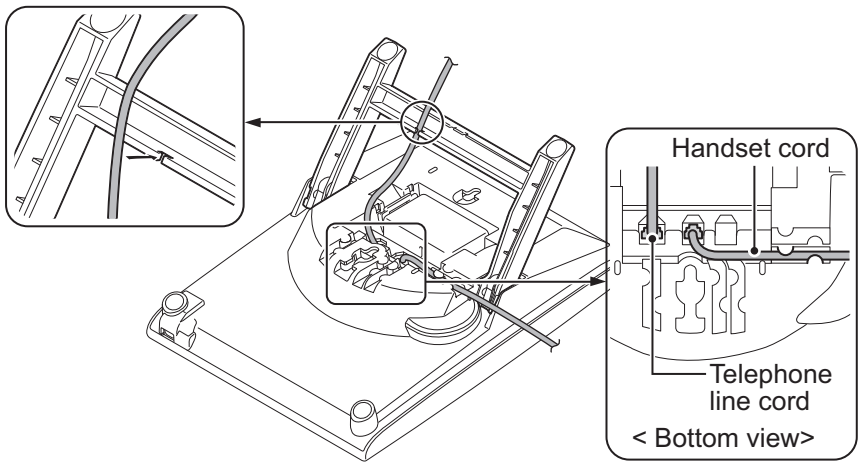


Figure 2-106 Cabling of Multi-Line Telephone

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.

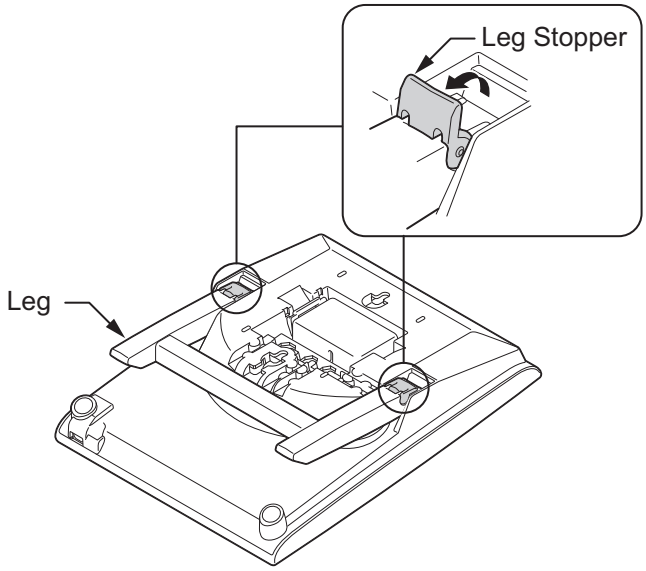


Figure 2-107 Setting for High Position

3. Adjust the Legs to desired height.

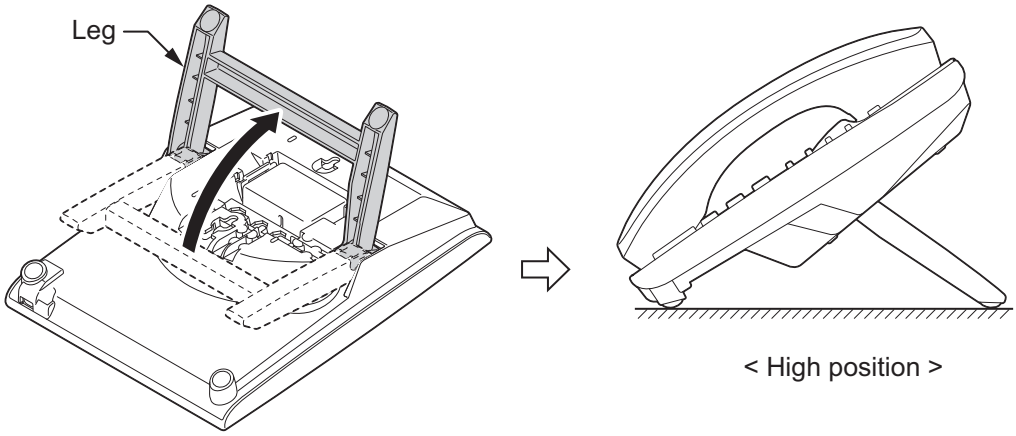


Figure 2-108 Leg setting for high position

4. Lead the Line and Handset cords through the applicable grooves. (Refer to Figure 2-106 Cabling of Multi-Line Telephone on the previous page)

5.1.3 Wall-Mounting the Multi-Line Telephone

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

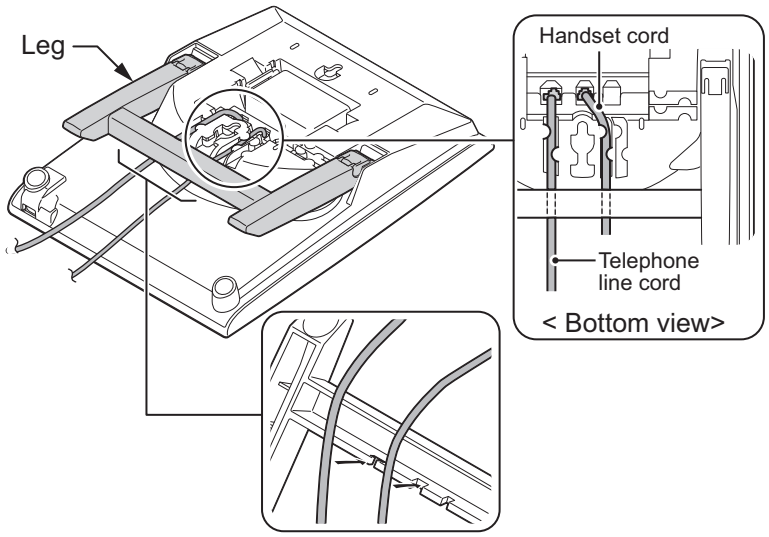


Figure 2-109 Cabling for Wall-Mount

2. Remove the hook-switch hanger and Insert the hook-switch hanger in the slot below the hook-switch.

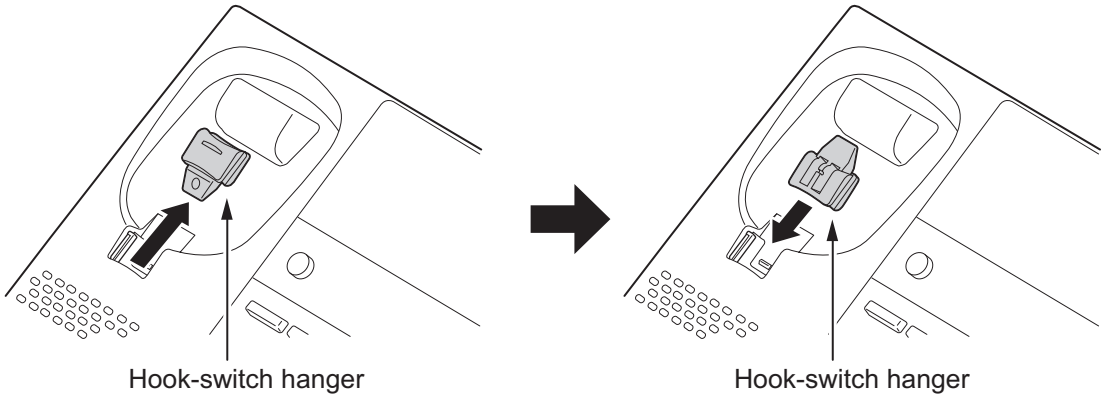
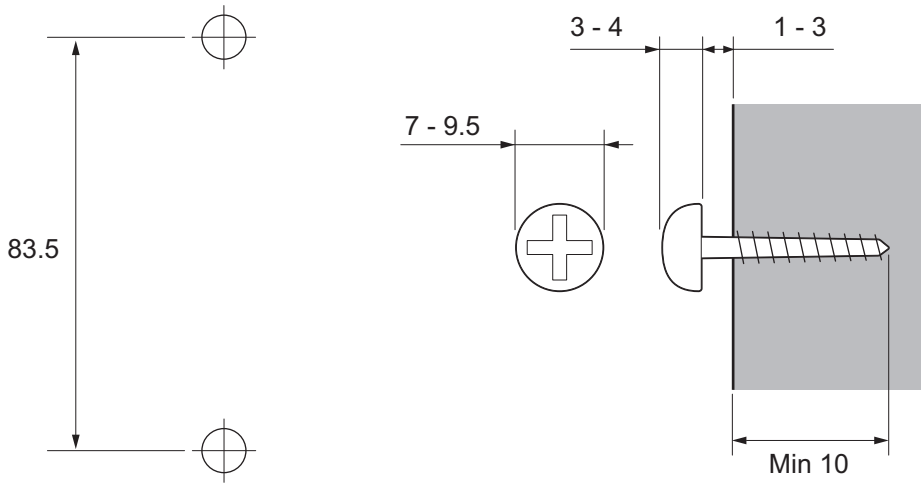


Figure 2-110 Hook-Switch Hanger

3. Install 2 screws into a wall. The screw heads must be remained about 3 mm.



Unit : mm

Figure 2-111 Screw Position for Wall-Mount

4. Affix the phone to the wall.

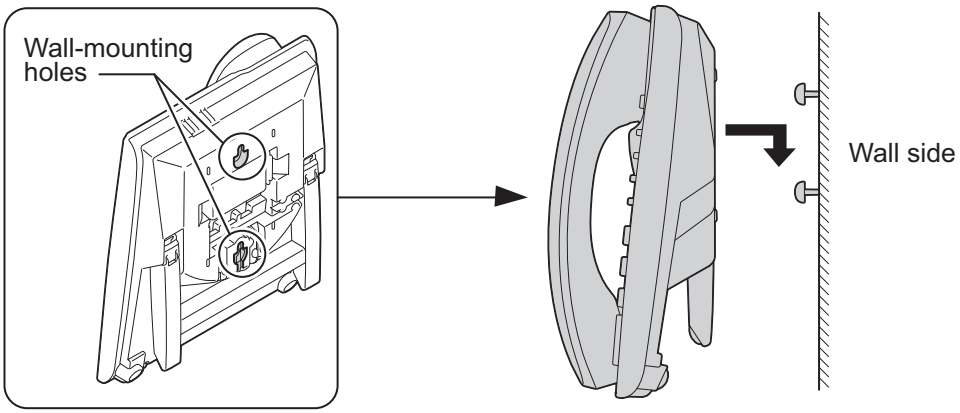


Figure 2-112 Affixing the Multi-Line Telephone

5.2 Installing the DSS Console

60D DSS-A Console should be installed to the last hybrid extension ports (ST8/ST16/ST24) of each 408M-A1/408E-A1/008M-A1 card directly. The pair extension for DSS Console shall be assigned by system programming. For the details of setting, refer to the Features & Specifications Manual.

5.2.1 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).

5.2.1.1 Low Position Setting

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

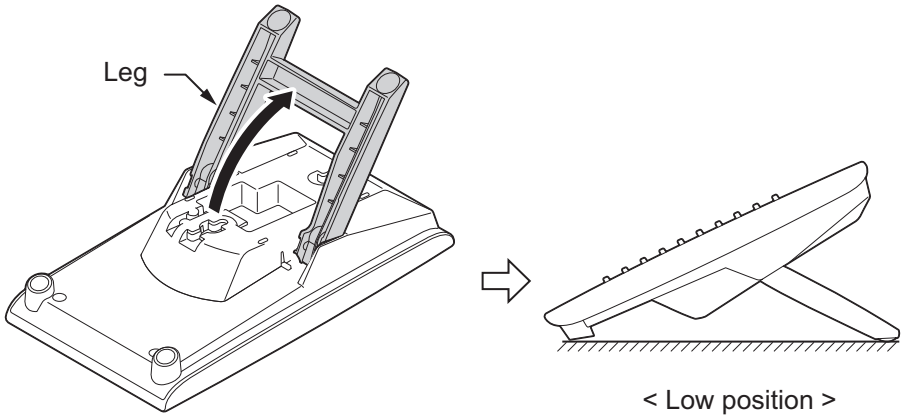


Figure 2-113 Leg setting for Low Position

3. Lead the Line cord through the applicable grooves.

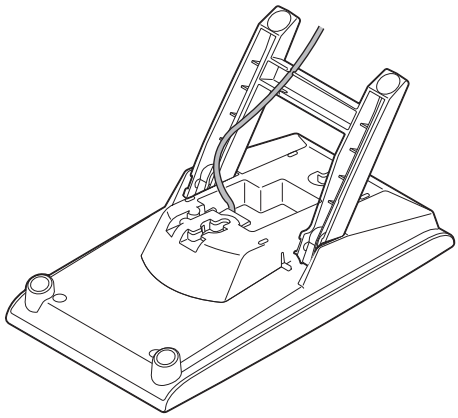


Figure 2-114 Cabling of DSS

5.2.1.2 High position setting

1. Turn DSS Console over (button side down).
2. Pull-up the Leg Stoppers.

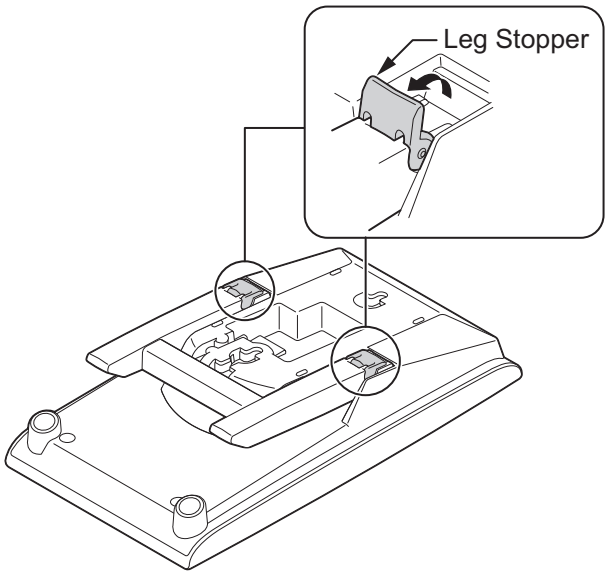


Figure 2-115 Leg Stopper of DSS Console

3. Adjust the Legs to desired height.

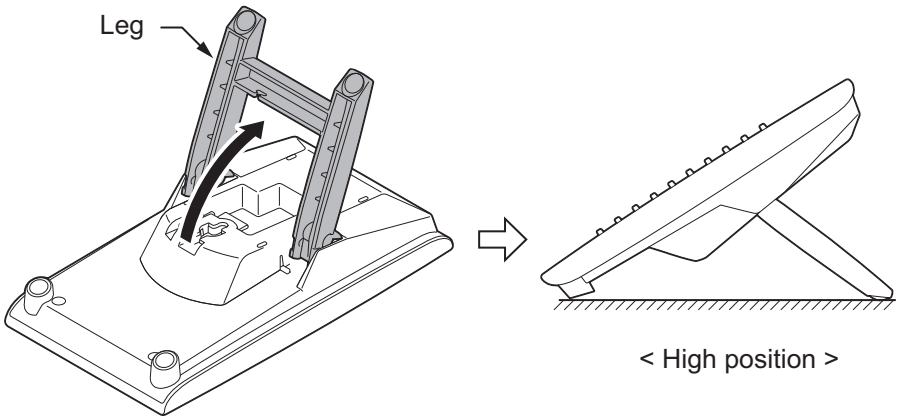


Figure 2-116 Leg Setting for High Position

4. Lead the Line cord through the applicable grooves. (Refer to Figure 2-114 Cabling of DSS on the previous page)

5.2.2 Wall-Mounting the DSS Console

1. Replace the leg and the cable must be follow as below.

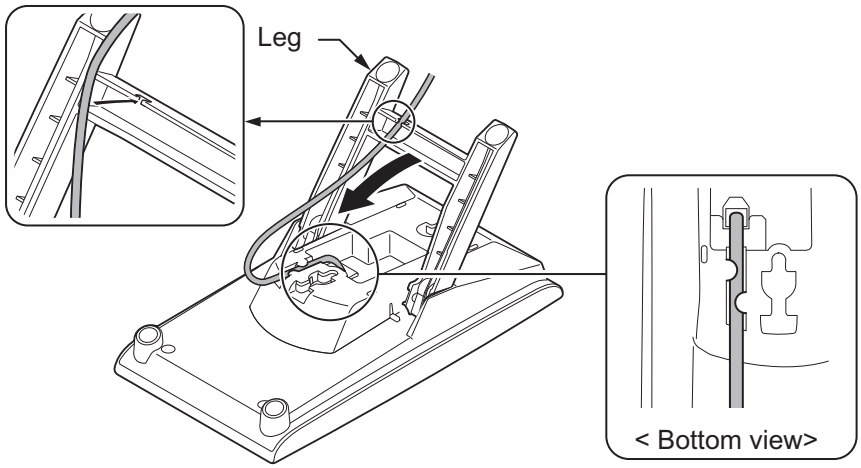
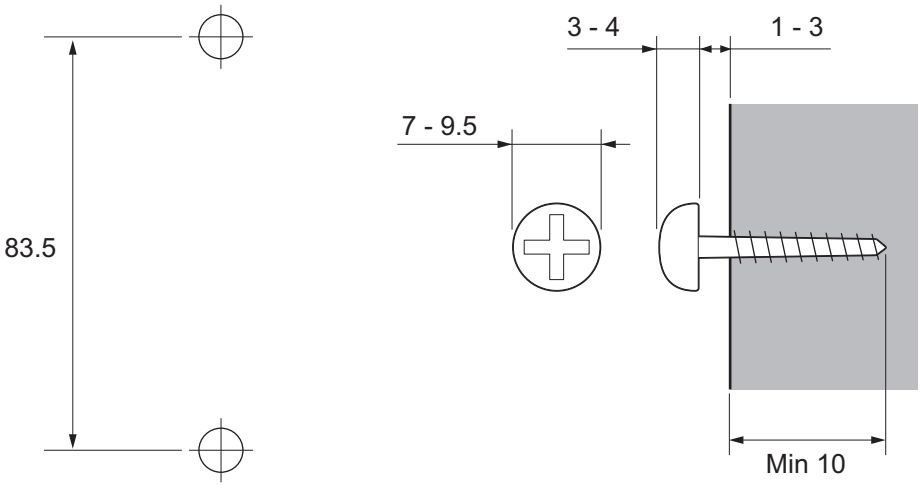


Figure 2-117 Cabling for Wall-Mount

2. Install 2 screws into a wall. The screw heads must be remained about 3 mm.



Unit : mm

Figure 2-118 Screw Position for Wall-Mount

3. Affix the DSS Console to the wall.

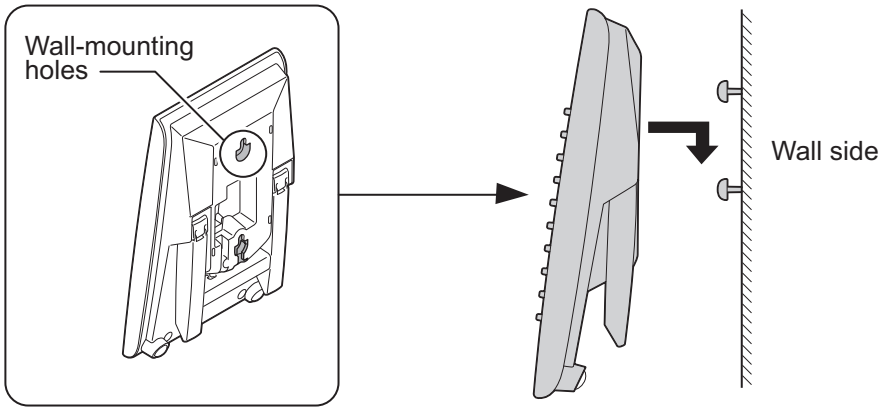
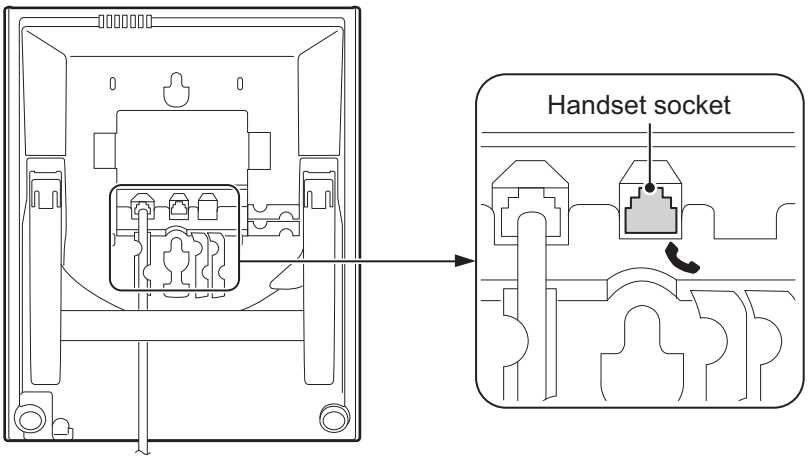


Figure 2-119 Affixing the DSS

5.3 Installing the Headset

The Multi-Line 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. Remove the Handset cord from the Multi-Line Telephone.
2. Connect the Headset cord into the Handset socket.



< Bottom view>

Figure 2-120 Handset Socket

<Recommended Headset>

- HW251N-A10-NE

This Item is made by Plantronics, inc.

For the details of setting and operation, refer to the Feature & Specifications Manual. (separate issue)
The headset configuration shall be assigned by system programming.

5.4 Installing the Doorphone Box

5.4.1 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 at Doorphone box. (No polarity sensitive)

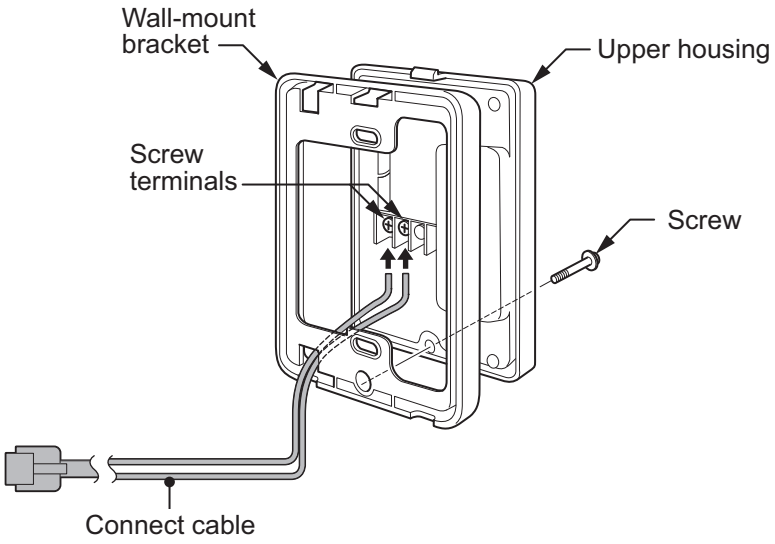


Figure 2-121 Doorphone Box and Bracket

4. Fix the Wall-Mount bracket on the wall by attached screws.
5. Replace the Upper housing and re-fix the screw.

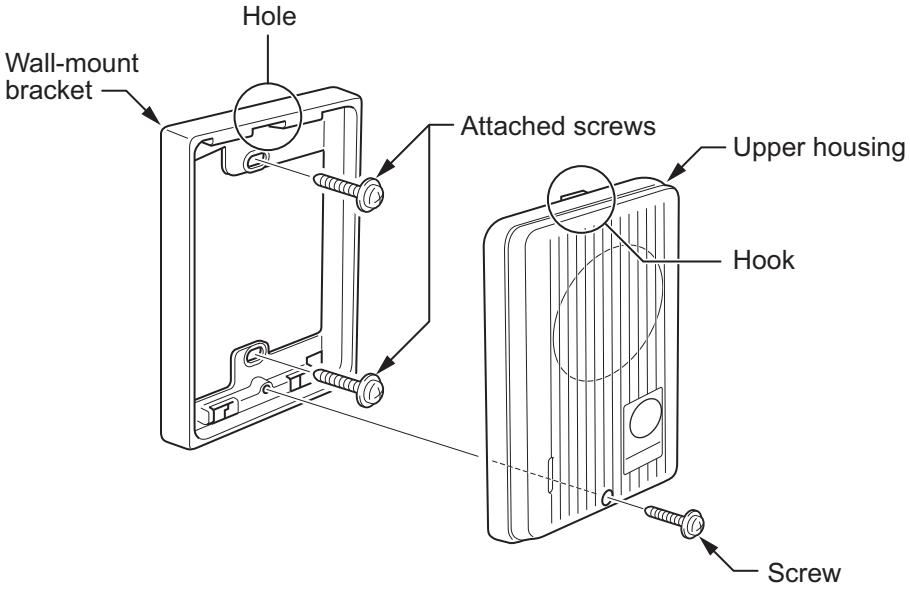


Figure 2-122 Doorphone

5.4.2 Connecting the Doorphone

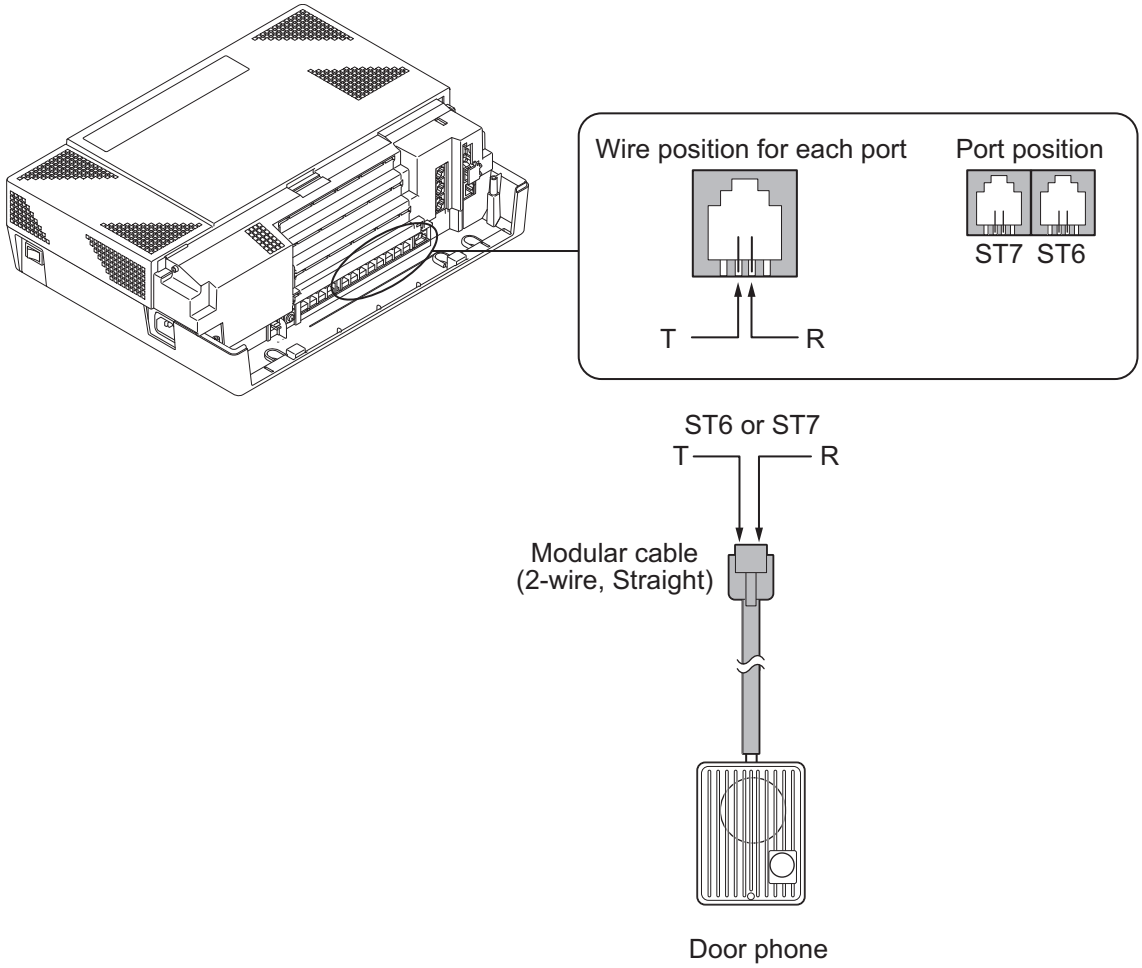


Figure 2-123 Connecting the Doorphone

The Doorphone configuration shall be assigned by system programming.

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

5.4.3 Doorphone Interface Specifications

Table 2-21 Doorphone Interface Specifications

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

5.5 Installing the Door Unlock Devices

Up to 2 door unlock devices can be connected to per a KSU.

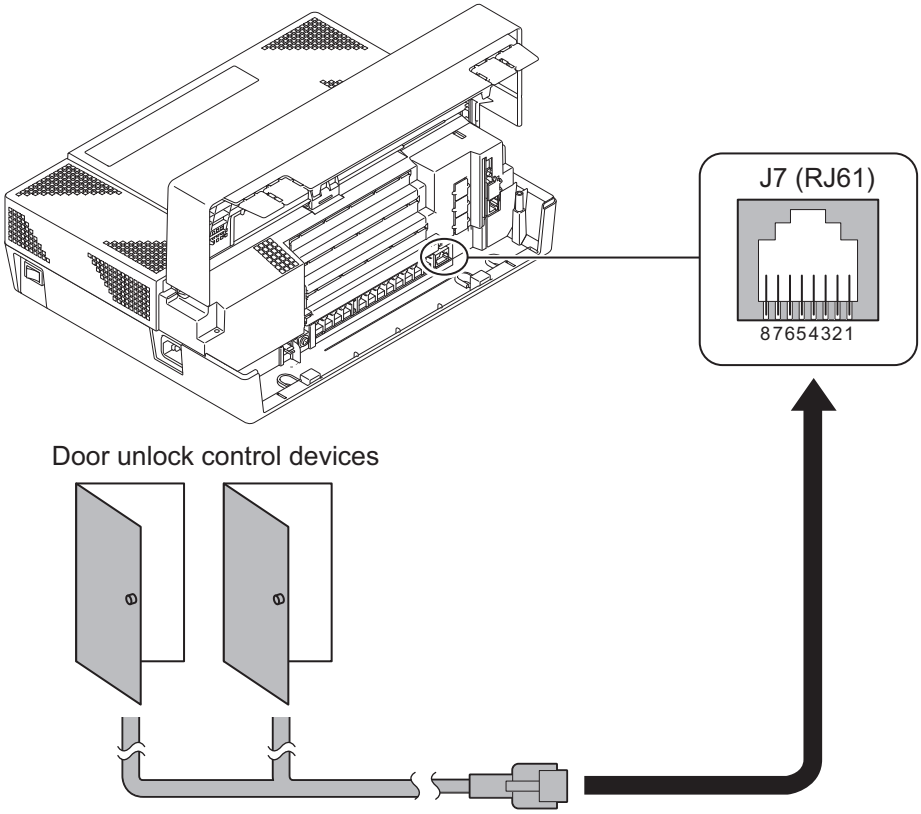


Figure 2-124 Connecting the Door Unlock Device

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

Table 2-22 J7: Door Unlock Relay Control Connector (RJ61)

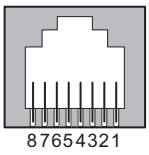
	Pin No.	Connection
 87654321	1	-
	2	-
	3	Relay 2
	4	Relay 1
	5	Relay 1
	6	Relay 2
	7	-
	8	-

Table 2-23 Door Unlock Relay Specifications

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

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

5.6.1 Connecting the Audio Equipment

- *The trunk ports CO2 to CO4 can be used for audio port (External paging, External MOH, BGM)*
- *Audio port configuration shall be assigned by system programming.*
- *External paging can be set for the 408M-A1 PCB of each KSU except 3rd Expansion KSU.*
- *The External MOH and BGM can be set for the 408M-A1 PCB of the Main KSU only.*

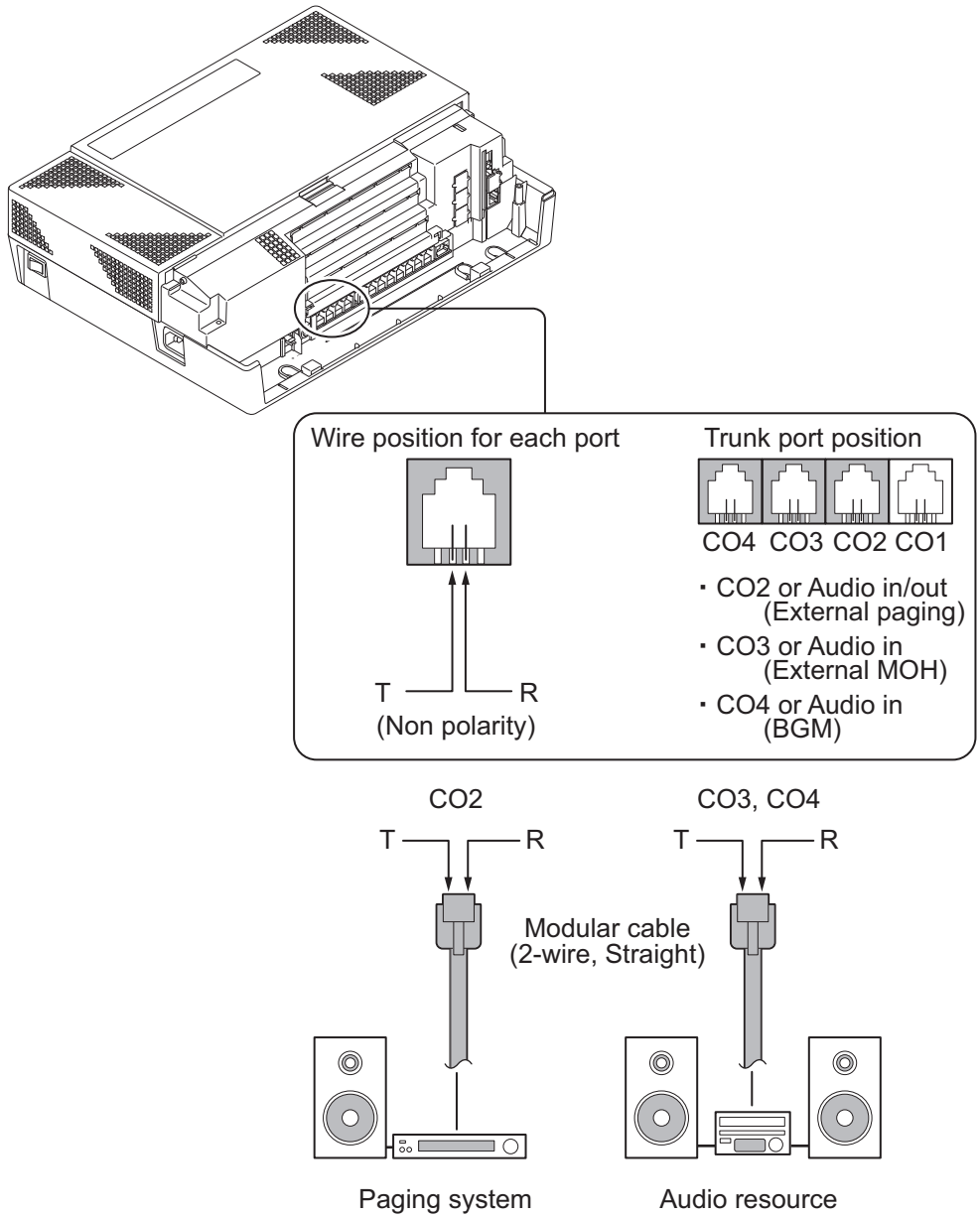


Figure 2-125 Connecting Audio Equipment

5.6.2 External Paging Output Specifications

Table 2-24 External Paging Output Specifications

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

5.6.3 BGM/External MOH Source Input Specifications

Table 2-25 BGM/External MOH Source Input Specifications

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

5.7 SMDR (Station Message Detail Recording)

5.7.1 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 Printer or PC via LAN port (J3) on the CPU card.

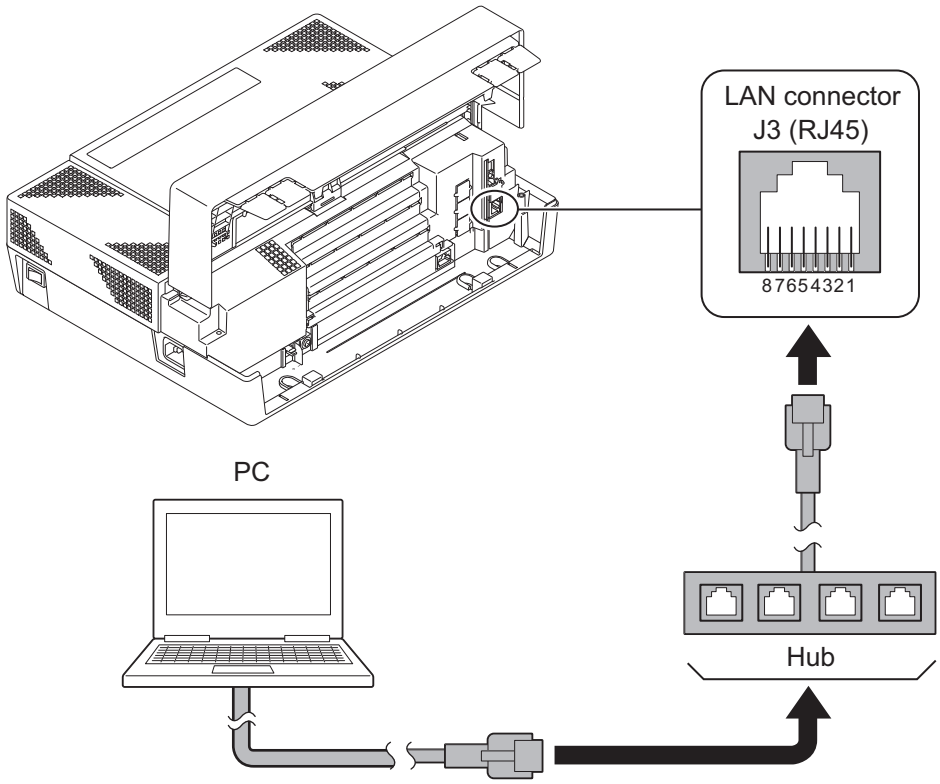


Figure 2-126 Connecting a PC for SMDR

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

The SMDR feature shall be assigned by system programming.

System Start Up

SECTION 1 SYSTEM START UP

1.1 Before Starting Up the System

Before starting up the system, make sure:

- KSU(s) is/are installed correctly.
- All extensions are cabled correctly.
- All earth ground and PSTN Trunks are cabled correctly.
- All PCBs are configured, equipped, and secured correctly.
- AC power cord is cabled correctly.
- At least one Display type Multi-Line Telephone is connected to the system. (for Programming)
- Pull out the Lithium battery protection sheet, before starting up the system.

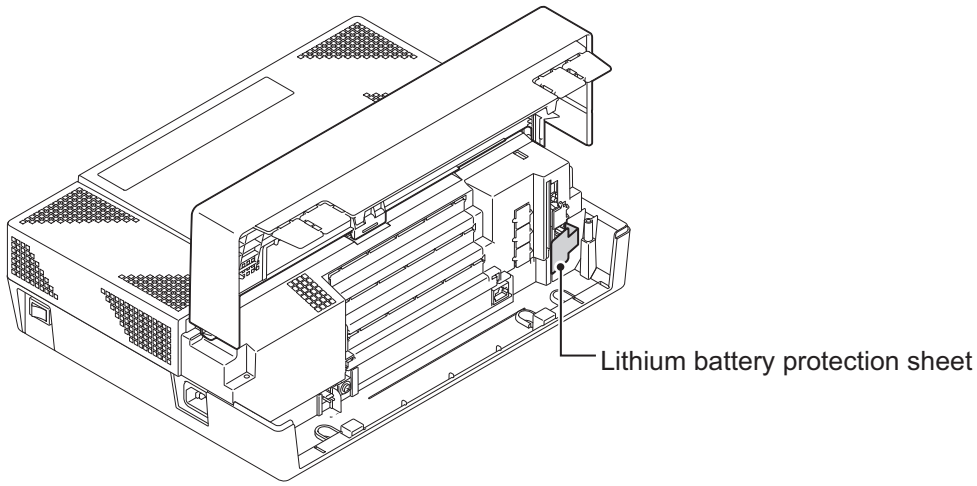


Figure 3-1 Lithium Battery Protection Sheet

- If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.

1.2 Starting Up the System

There are 2 types of start up method as below.

Table 3-1 Start Up Method

Start Up Method	Description	Purpose
COLD Start	The factory setting data is loaded.	• First time start up • System Initialization
HOT Start	The customer setting data is loaded.	• 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 deleting.

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

If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.

To perform a Cold Start;

1. Set the power switch is off position.

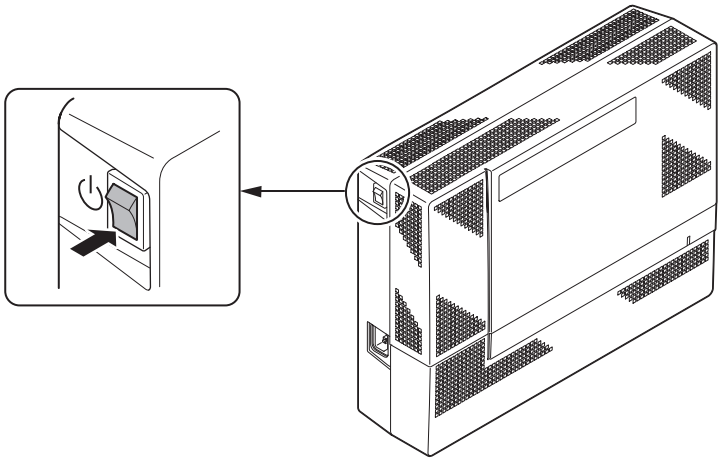


Figure 3-2 Power Switch Location

2. Open the Sub-Cover at the main KSU and make sure the Load button (S1) location on the CPU card.

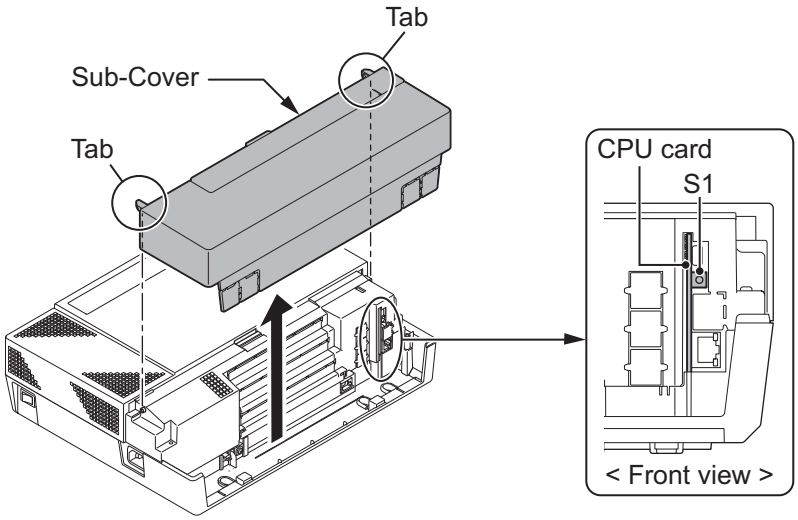


Figure 3-3 Load Button (S1) Location

3. Connect the AC power cord to the KSU, then plug the AC power cord into an AC outlet.
4. Once the system has powered off, push in and hold the Load button (S1).

If the Expansion KSU(s) is/are installed, the Power Switch must be ON at Expansion KSU(s).

5. Turn the power switch ON at the Main KSU.

6. Continue holding the Load button (S1) for approximately three second or until Status LED (D5) starts flashing red.

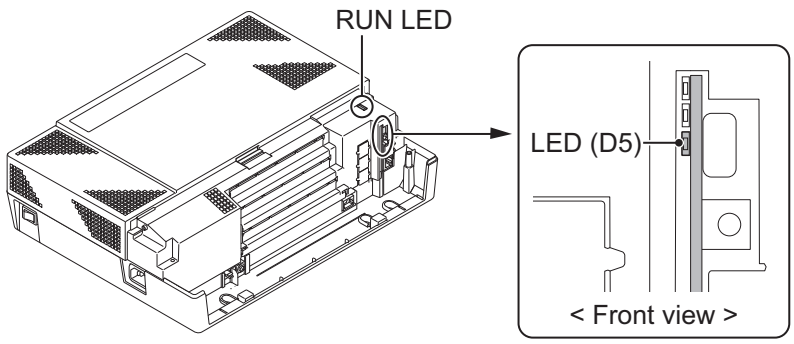


Figure 3-4 Status LED (D5) and RUN LED Location

7. Release the Load button.
8. When the system has completed reloading the software (about two minutes), the RUN LED is flashing blue on the CPU card and the connected Multi-Line Telephone's display will show the Time & Date and Extension Number.

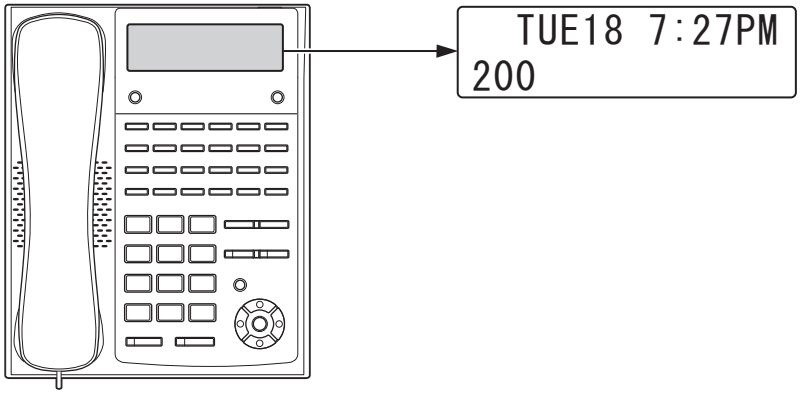


Figure 3-5 Display Indication (Idle)

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

If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.

To perform a Hot Start;

1. Turn the system power off.
2. After it has powered off, turn the power switch back to ON and power on the system again. Wait approximately two minutes.
3. When the system has completed reloading the software, the RUN LED is flashing blue on the CPU card, and the connected Multi-Line Telephone's display will show the Time & Date and Extension Number as Figure 3-5 Display Indication (Idle) on this page.

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 Multi-Line Telephone. (Up to 2 users can enter to the 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 3-6 Entering the Programming Mode Display 1

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

Figure 3-7 Entering the Programming Mode Display 2

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

2.2 Exiting the Programming Mode

1. Press **Mute** key several times to return the "PRG No. Entering Screen".

Figure 3-8 Exiting the Programming Mode Display 1

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

Figure 3-9 Exiting the Programming Mode Display 2

The system shall automatically save 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 exit 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 CF Card for backup purpose. The PZ-VM21 daughter board must be installed to the CPU card with a **BLANK** CF card inserted.

For the details of PZ-VM21 daughter board installation, refer to Installing the PZ-VM21 PCB on page 2-63.

1. Turn the system power off, insert the blank CF card (32 MB or upwards) to the CF slot on PZ-VM21.

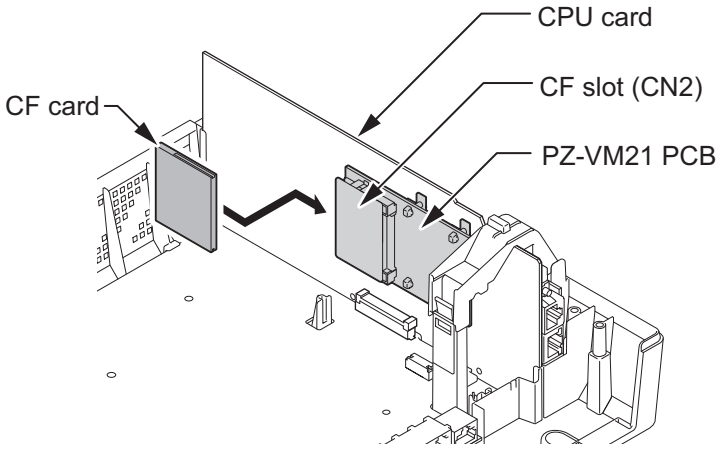


Figure 3-10 Inserting the CF card

2. Turn the power on, enter to the PRG90-03 at the Programming Mode.

Figure 3-11 PRG90-03 Display

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

Figure 3-12 PRG90-04 Display

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

The saved data on CF Card can not be edited by the PC.

2.4 Loading the Customer Data

The backed up customer data can be loaded to the system by CF Card. The PZ-VM21 daughter board must be installed to the CPU card with a CF card inserted that has the saved customer data loaded.

For the details of PZ-VM21 daughter board installation, refer to *Installing the PZ-VM21 PCB on page 2-63*.

1. Turn the power off, insert the Customer Data CF card to the CF Slot on PZ-VM21.

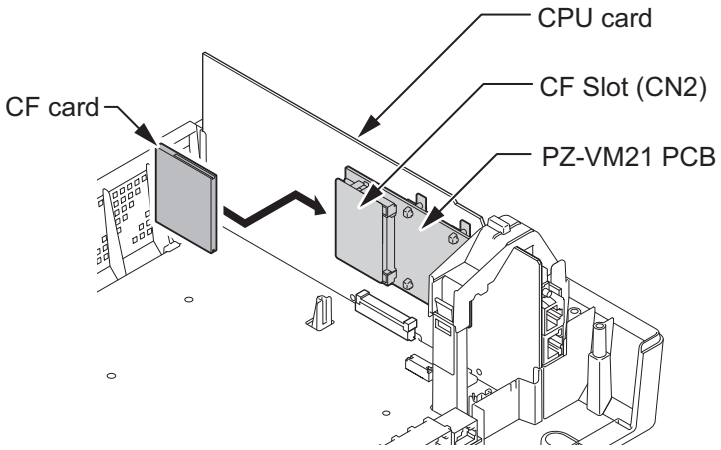


Figure 3-13 Inserting the CF Card

2. Turn the power on, enter to the PRG90-04 at the Programming Mode.

Figure 3-14 PRG90-04 Display

3. Dial **1** and press **Hold** Key.
4. When the data backup to the CF card is completed, the display will be changed to the next PRG.

Figure 3-15 Next PRG Display

5. Remove the CF card and exit from the Programming Mode.

SECTION 3 SYSTEM SHUT DOWN

3.1 Powering Off the System

1. Turn the all KSU(s) power off by the power switch.

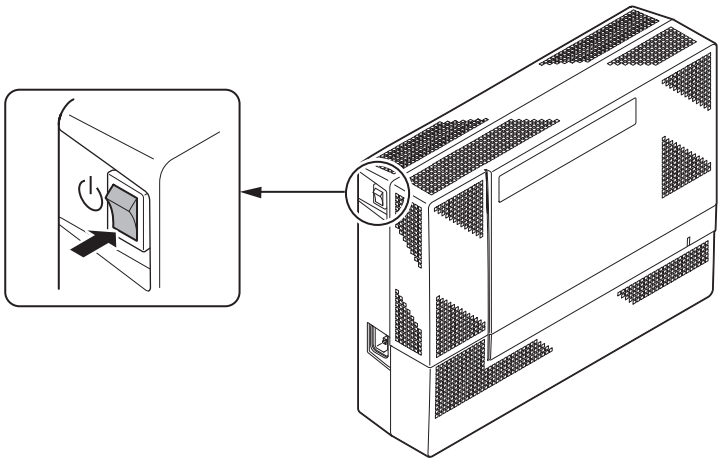


Figure 3-16 Power Switch Location

- *If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.*
- *DO NOT power off by disconnecting the AC (or DC for battery backup) power. Always use the Power Switch on the Main/Expansion KSU.*
- *All calls in progress will be cut off when the system is powered off, and if the Power Failure is set, the applicable extension will become operational.*
- *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 by "Power OFF and ON" operation.

Memo

Maintenance

SECTION 1 FUSE REPLACEMENT

1.1 Replacing the Fuse

If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.

1. Turn off the system power and disconnect AC cord.
2. Open and pull out the Sub-cover.

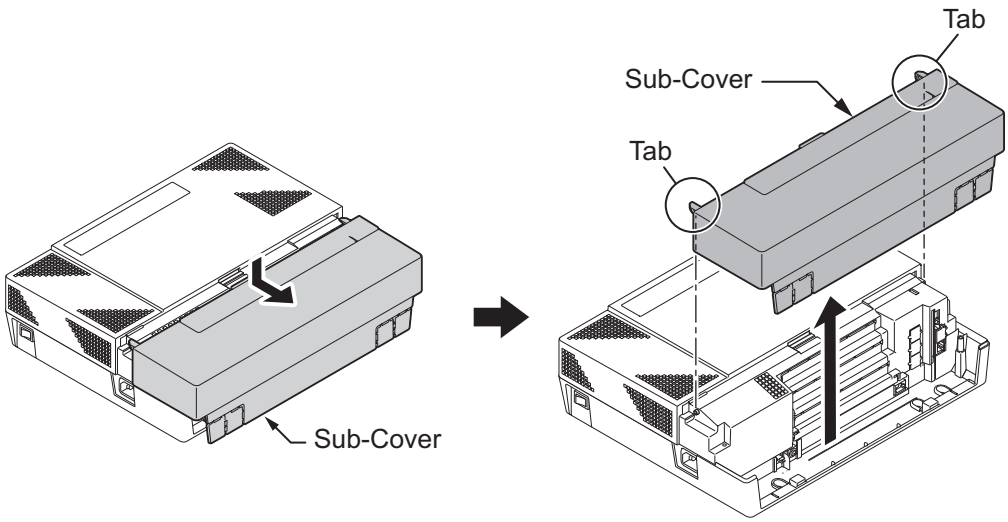


Figure 4-1 Removing the Sub-cover

3. Loosen two screws and remove the Main-cover.

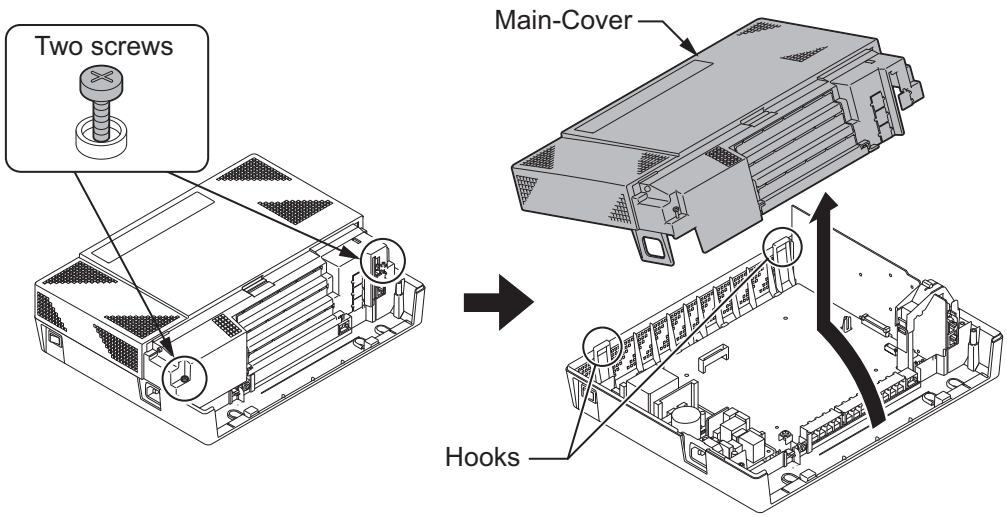


Figure 4-2 Removing the Main-cover

4. Exchange the fuse (250 V/8 A) on 408M-A1 PCB.

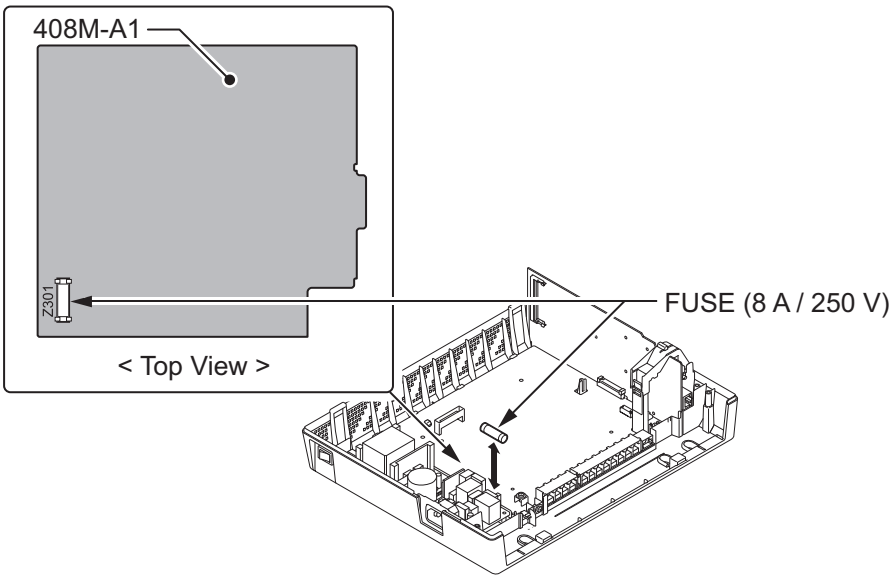


Figure 4-3 Exchanging the Fuse

5. Replace the Main-cover and fasten two screws.

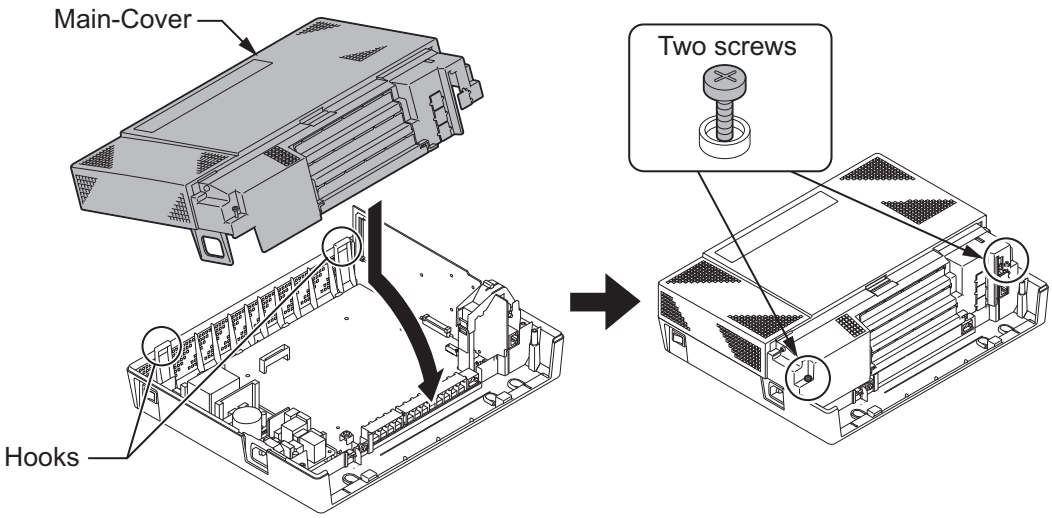


Figure 4-4 Replacing the Main-Cover

SECTION 2 LITHIUM BATTERY REPLACEMENT

2.1 General

The Lithium Battery (CR2032) is initially installed on the CPU Card in Main KSU. It provides the battery-backup of the RAM memory for approximately 36 months. When the battery life becomes almost over, the system will inform the "Warning Message" to the assigned Display Multi-Line Telephone as below.

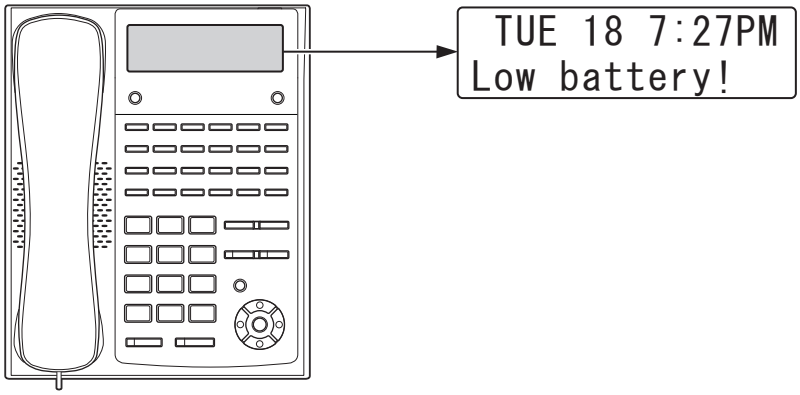


Figure 4-5 Warning of Low Battery

2.2 Lithium Battery Specification

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

It is recommended that you have a backup of the customer data before powering off the system (either PCPro file or CF 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 the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.***

2.3 Replacing the Lithium Battery

1. Remove the Sub-cover at the main KSU.

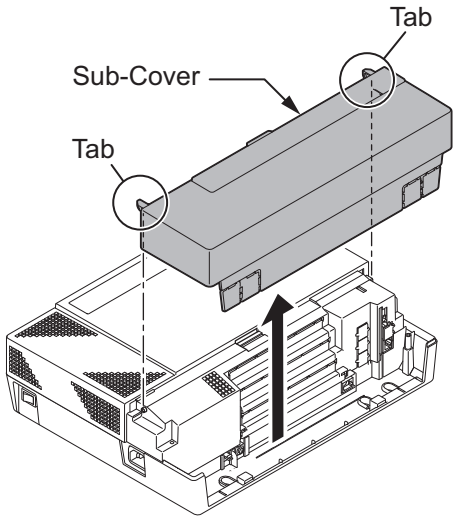


Figure 4-6 Removing the Sub-cover

2. Power off the system, and remove the AC plug from the AC outlet.
3. Disconnect the AC power cord from the KSU.

AC power cord must be disconnected, unless otherwise the Main-cover does not open.

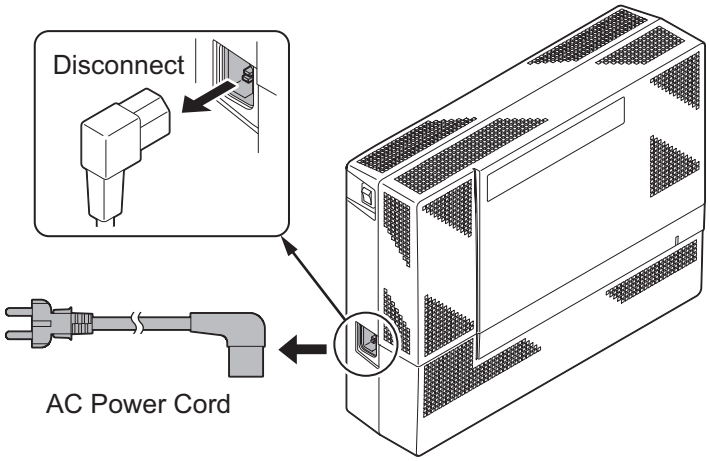


Figure 4-7 Disconnecting the AC Power Cord

4. Loosen two screws and remove the Main-cover.

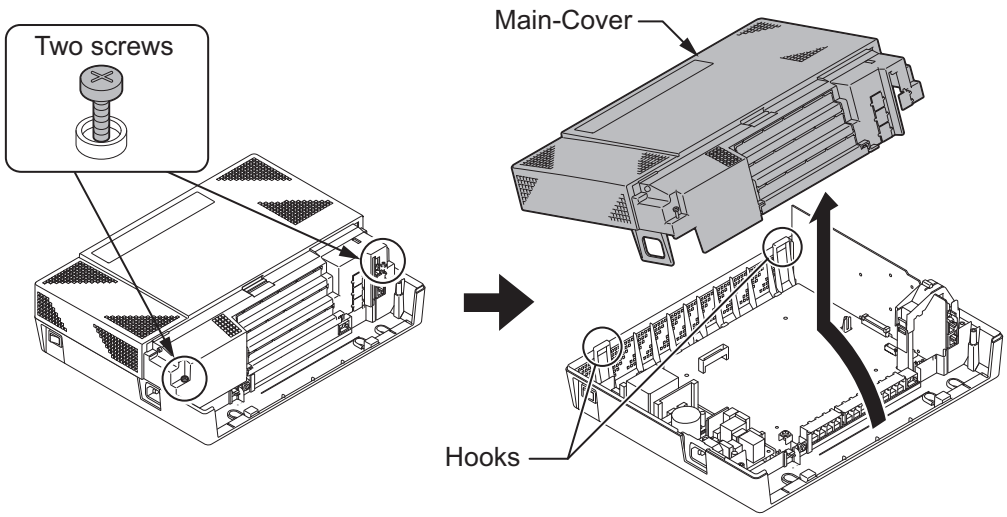


Figure 4-8 Removing the Main-cover

5. Press A-part in following figure and open the CPU support.
6. Remove CPU card from the Main KSU.

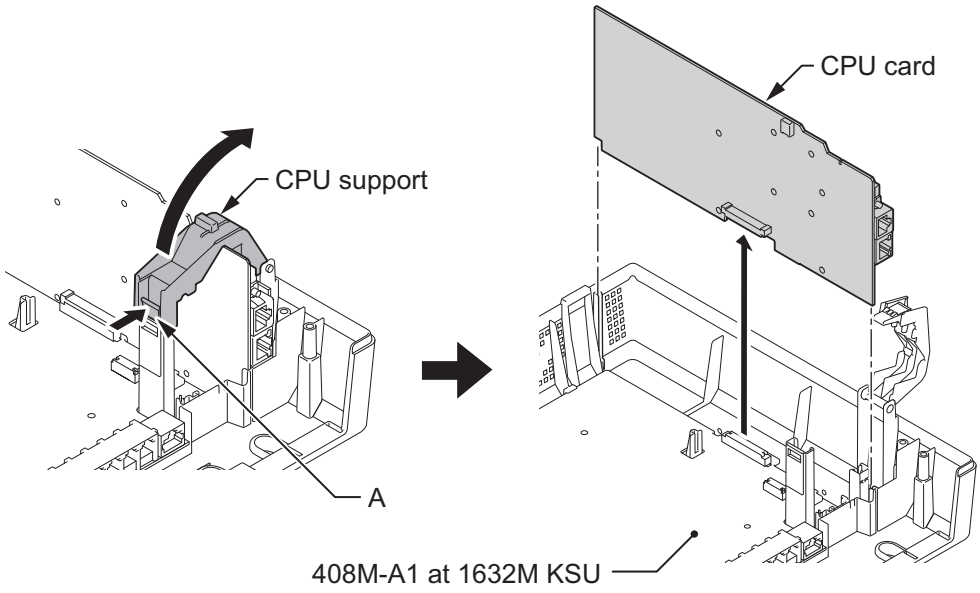


Figure 4-9 Removing the CPU Card

7. Refer to following figure for the Lithium battery location on the CPU card.

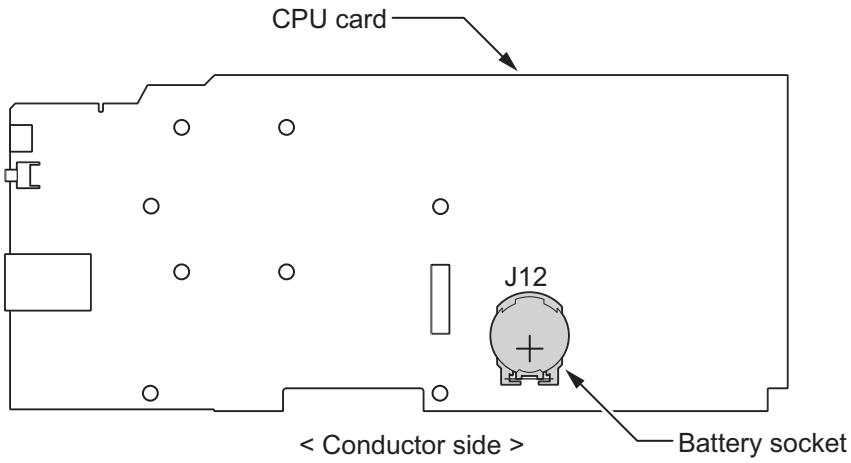


Figure 4-10 Location of Lithium Battery Socket

8. Remove the old Lithium battery and insert new one to the socket.

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

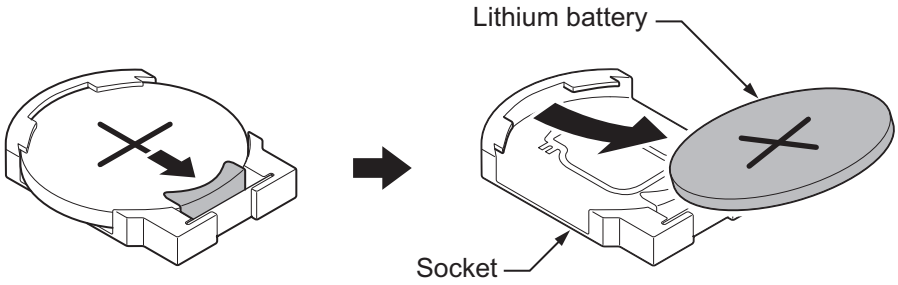


Figure 4-11 Removing the Lithium Battery

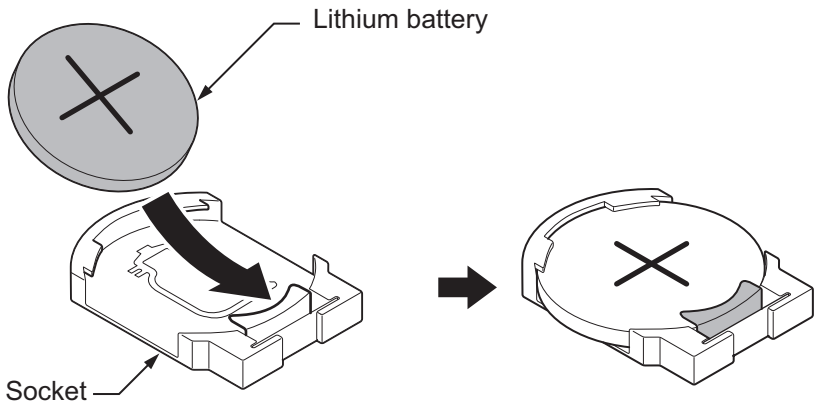


Figure 4-12 Inserting the Lithium Battery

9. Replace the CPU card.

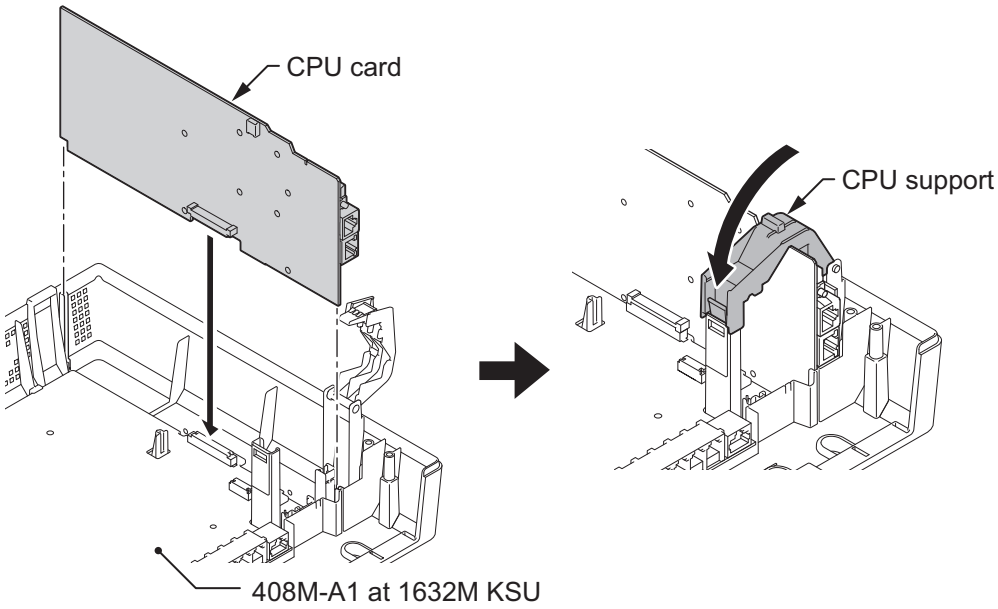


Figure 4-13 Installing the CPU Card

10. Replace the Main-cover and Sub-cover.

SECTION 3 MAIN SOFTWARE UPGRADING

3.1 General

The system main software is initially stored in the Flash memory located on the CPU card of the Main KSU. It can be upgraded by the new software on the CF (Compact Flash) card.

3.2 Before Upgrading the Main Software

It is recommended that you have a backup of the customer data before upgrading the main software (either PCPro file or CF card backup).

Before upgrading the Main software, the following preparations are necessary.

- Prepare the CF Card (32MB, or upwards and formatting by FAT(16)), and store the new main software on the CF card by PC. (New Main software shall be supplied from NEC.)
- Prepare the PZ-VM21 PCB. (if the system does not have it.)

3.3 Main Software Version Confirmation

The Main software version is able to confirm by the following operation at the display type Multi-Line Telephone.

1. On-hook Condition.

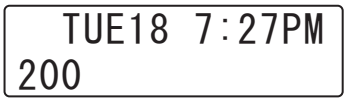
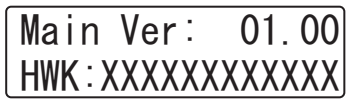


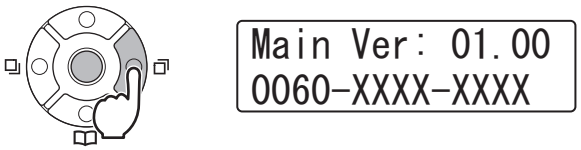
Figure 4-14 Display of Multi-Line Telephone

2. Press Enter Key (Navigation Key).

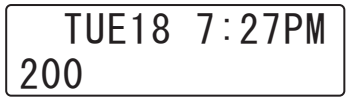
3. Dial **821** to show the Main Software version & Hardware Key Code.



4. Press Right Key (Navigation Key) to show the Main Software version & MAC address.



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



3.4 Upgrading the Main Software

If the Expansion KSU(s) is/are installed, turn the power on/off in the order of Exp 3 KSU, Exp 2 KSU, Exp 1 KSU and then Main KSU.

1. Power off the system and disconnect the AC cord from the KSU.

2. Remove the Sub-Cover.

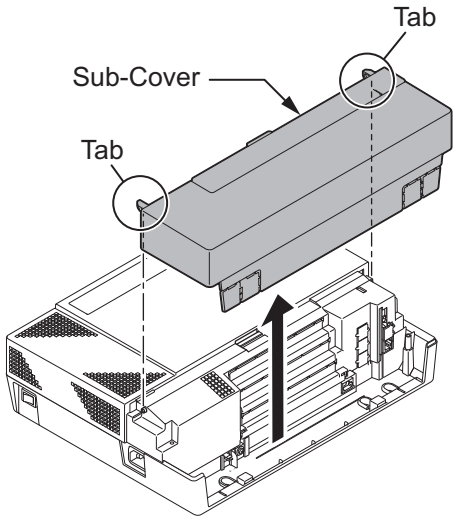


Figure 4-15 Removing the Sub-cover

3. Loosen two screws and remove the Main-cover.

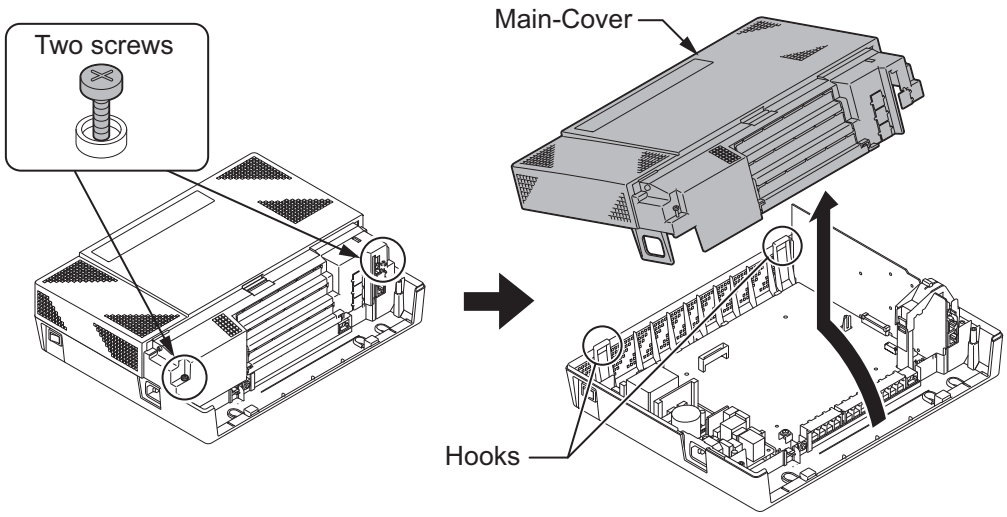


Figure 4-16 Removing the Main-cover

4. Insert the CF card (with the new Main software loaded) to the CF slot on PZ-VM21 daughter board. (PZ-VM21 should be temporary installed if the system does not have it.)

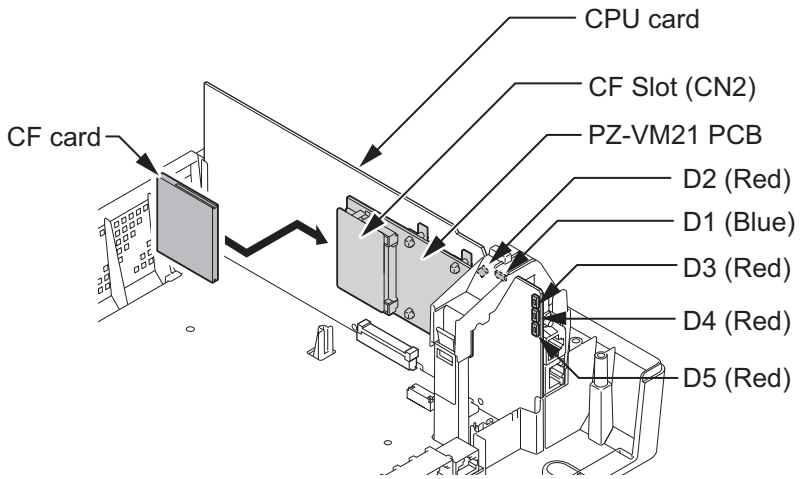


Figure 4-17 Inserting the CF card

5. Push in and hold the Load button (S1 on the CPU card).

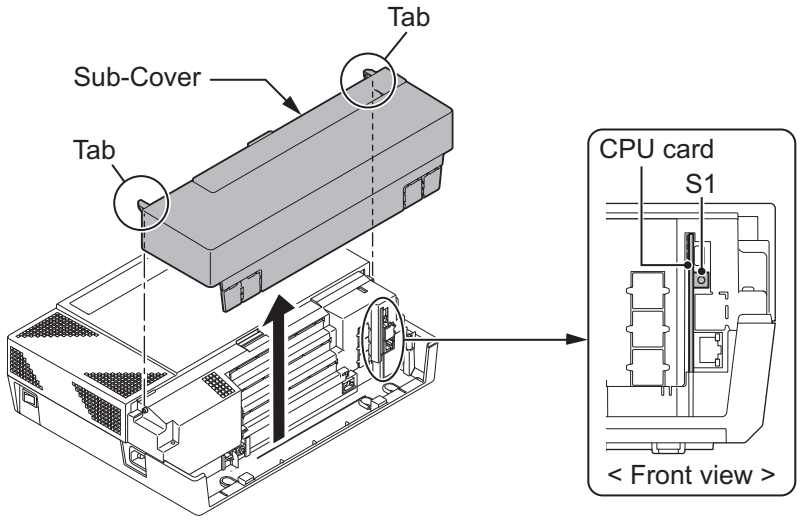


Figure 4-18 Load Button (S1) Location

6. Turn the system power on.
7. Continue holding the Load button (S1) for approximately 10 seconds or until Status LED (D5) starts flashing red.
8. Release the Load button (S1).
9. Wait until the Status LEDs (D2 to D5) on the CPU card has the following indications (approximately two minutes).

Table 4-1 Status LEDs

LED No.	Indication	Remarks
D2	Flashing Red	
D3	Flashing Red	
D4	Flashing Red	
D5	Off	

10. Turn the power off and remove the CF card from the CF slot on PZ-VM21.

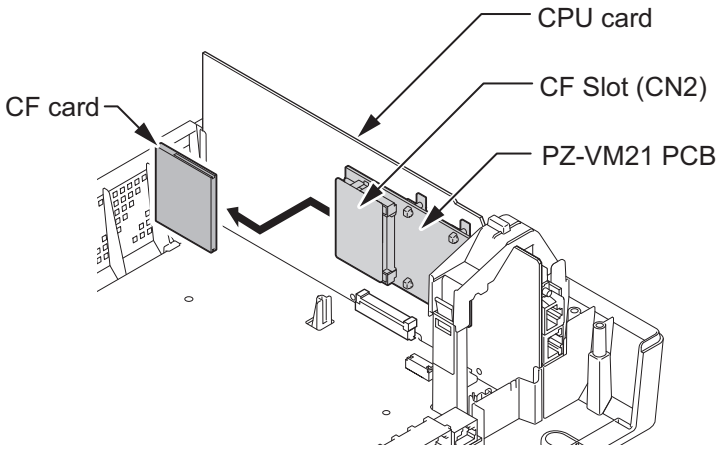


Figure 4-19 Removing the CF card

11. Replace the Main-cover and Sub-cover.
12. Turn the system power back on.

13. When the system has completed reloading the software, the RUN LED (D1) is flashing blue.

- *To confirm the new software version number by press Navigation key on any display telephone to view the system version number.*
- *The existing system data in the flash memory is replaced, but the customer data (stored in the RAM) is saved.*

SECTION 4 LED INDICATIONS

The LEDs on the CPU indicate the following:

- RUN (D1) = The CPU is operating (Blue)
- D2, and D3 = Alarms (Red)
- D4 = Flash access indication (Red)
- D5 = Boot status (Red)
- Refer to Program 90-10: System Alarm Setup for details on assigning alarm LEDs.

Below table "CPU LED Indications" provides a list of each LED and associated operation and status indications. Refer to Figure 4-17 Inserting the CF card on page 4-10 for the location of the LEDs on the CPU.

Table 4-2 CPU LED Indications

Status	LED Indication				
	RUN (D1)	D2	D3	D4	D5
System Operating Normally	Blinking	Off	Off	Off	Off
System Operate Normal + File accessing	Blinking	Off	Off	Access Blinking	Off
System Starting Up	On	Off	Off	Off	Off
Boot is starting	On	Off	Off	Off	Blinking
Initializing the disk or formatting	Blinking	Off	Off	Off	Off
Reading System Program	Blinking	Off	On	Access Blinking	Off
Reading Error of System Program	Off	On	Off	Off	Off
System Initializing + DSP loading process	On	Off	On	Access Blinking	Off
Initializing System Program	Blinking	Off	On	Access Blinking	Off
Upgrading System Program (in the Flash Memory)	Off	Blinking	Off	Access Blinking	Off
Batch file Error	Off	On	On	Off	Off
Completed the System Program Upgrade	Off	Blinking	Blinking	Blinking	Off
Security Tip Error	Off	Blinking	Off	Off	Off
Error alarm (Major) occurred	Blinking	Blinking	Off	Off	Off
Error alarm (Minor) occurred	Blinking	Blinking	Off	Off	Off
Shutting Down	Blinking	Off	Off	Off	Off
Power Off	Off	Off	Off	Off	Off

Memo

Specifications

SECTION 1 SYSTEM CAPACITY

Table 5-1 System Capacity

Items		1 KSU	2 KSU	3 KSU	4 KSU	Remarks
Trunk port Max.		42	84	126	126	1KSU: 408M + PRI x1 + 408E x2 2KSU: (408M + PRI x1 + 408E x2) x2 3/4KSU: (408M + PRI x1+408E x2) x3
Trunk port	Analog Trunk	16	32	48	48	1KSU: 408M + 408E x3 2KSU: (408M + 408E x3) x2 3/4KSU: (408M + 408E x3) x3
	ISDN BRI	12	24	36	36	1KSU: 2BRI x3 on 008E/000E 2KSU: 2BRI x6 on 008E/000E 3/4KSU: 2BRI x9 on 008E/000E
	ISDN PRI/E1 (2M)	30	60	90	90	Max 1 PRI/KSU Max 3 PRI/system
	IP Trunk (SIP/H.323)	16				Need MEMDB
	External Paging (Audio out)	1	2	3	3	CO2: Paging, CO3: MOH, CO4: BGM on 408M Need the Program setting
	External MOH (Audio in)	1				
	BGM (Audio in)	1				
Extension port Max.		32	64	96	128	(408M + 408E/008E x3) /KSU
Extension port	4W Multi-Line Telephone	24	48	72	96	(408M + 408E/008E x2) /KSU
	SLT	32	64	96	128	(408M + 408E/008E x3) /KSU
	BRI (S-point)	12	24	36	36	(2BRI x3 on 008E/000E) /KSU
	4W DSS Console	3	6	9	12	
	Doorphone	2	4	6	8	Need the Program setting
Virtual Extension		50				
Door Relay		2	4	6	8	2 circuits on 408M
Power Failure Transfer		4	8	12	12	1 circuit on 408M Need the hardware switch setting
Ethernet Port		1				1 circuit on CPU PCB
Built-in Answering		1				1 circuit on CPU PCB
VoIP Channel		16				Need MEMDB
VRS Channels		4				CFVRS-C1 (512M)
		Max. 16				When MEMDB installed

Items	1 KSU	2 KSU	3 KSU	4 KSU	Remarks
VM/VRS Channels	2 VM ports/ 4 VRS ports (default) (Total Max.8 w/o MEMDB or 16 w/MEMDB)				CFVMS-C1 (512M) Port incresed by license.
	4 VM ports/ 4 VRS ports (default) (Total Max.8 w/o MEMDB or 16 w/MEMDB)				CFVML-C1 (1G) Port incresed by license.
V34 Modem	1				1 circuit on PZ-VM21
Conference Circuit	32 (16 parties max per Conference)				Mounted on CPU
DSP Resource	20				For 1632M KSU (CPU)
	16				With VMDB
	-	32	64	96	For 1632ME-A1 EXP 32ch DSP on each EXIFE-C1
DSP Sender	128				

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
KSU, PCBs and Multi-Line 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 KSU is only for wall mounting use, and it is available to mount it on the floor with External Backup Battery.

2.5 AC Power Requirement

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

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

Table 5-3 Power Requirement

	110 VAC	220 VAC	230 VAC	240 VAC
Power Requirements	110 VAC@15 A	220 VAC@15 A	230 VAC@15 A	240 VAC@15 A
Power Consumption	Main KSU = 144 VA 4 KSU Total = 576 VA	Main KSU = 172 VA 4 KSU Total = 688 VA	Main KSU = 175 VA 4 KSU Total = 700 VA	Main KSU = 175 VA 4 KSU Total = 700 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			

	110 VAC	220 VAC	230 VAC	240 VAC
Grounding Requirement	No.14 AWG Copper Wire			
Feeding Voltage	SLT: 20 mA/-27 V			
AC Input I	Main KSU = 1.31 A 4 KSU Total = 5.24 A	Main KSU = 0.78 A 4 KSU Total = 3.12 A	Main KSU = 0.76 A 4 KSU Total = 3.04 A	Main KSU = 0.73 A 4 KSU Total = 2.92 A
KWh	Main KSU = 0.144 KWh 4 KSU Total = 0.576 KWh	Main KSU = 0.172 KWh 4 KSU Total = 0.688 KWh	Main KSU = 0.175 KWh 4 KSU Total = 0.700 KWh	Main KSU = 0.175 KWh 4 KSU Total = 0.700 KWh
BTU (KWhx3413)	Main KSU = 491 BTU 4 KSU Total = 1964 BTU	Main KSU = 587 BTU 4 KSU Total = 2348 BTU	Main KSU = 597 BTU 4 KSU Total = 2388 BTU	Main KSU = 597 BTU 4 KSU Total = 2388 BTU

2.6 Electrical Specifications <Power Supply> (per a KSU)

Table 5-4 Electrical Specifications of KSU

Item	Specification
Output Voltage	-27 V (81 W)
Related Voltage	-27 V
Load Fluctuation	-25.92 V to -28 V (-27.0 V ±4%)
Output Current	3.0 A
Ripple/Noise	200 mVp-p or less
Noise	-65 dBm or less
Over Voltage Protection	-31.2 V to -36.9 V
Over Current Protection	3.3 A to 3.9 A
Load Capacity	5000 μF

2.7 Mechanical Specifications

Table 5-5 Mechanical Specifications

Equipment	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)
1632M-A1 KSU, 1632ME-A1 EXP	375	115	290	approx. 2
External Backup Battery	500	230	340	10.3 (excluding battery) 15.6 (including battery)
4W Multi-Line Telephone	180	221	136	0.85
DSS Console	122	221	113	0.45
Doorphone	98	28.5	130	0.2

2.8 Optional Unit Mechanical Specifications

Table 5-6 Optional Unit Mechanical Specifications

Unit	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)
IP4[ ]-MEMDB-C1	67.5	32	2	0.01
IP4WW-VOIPDB-C1	66	138	18	0.05

Unit	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)
PZ-VM21	53	85	13	0.03
IP4WW-408E-A1	160	198	32	0.21
IP4WW-008E-A1	160	198	32	0.18
IP4WW-000E-A1	160	198	32	0.12
IP4WW-1PRIU-C1	160	198	32	0.15
IP4WW-2BRIDB-C1	122	168	25	0.09
IP4WW-EXIFB-C1	70	115	16	0.04
IP4WW-CFVRS-C1	43	37	3.5	0.01
IP4WW-CFVMS-C1	43	37	3.5	0.01
IP4WW-CFVML-C1	43	37	3.5	0.01

2.9 Doorphone Interface Specifications

Table 5-7 Doorphone Interface Specifications

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

2.10 Door Unlock Relay Specifications

Table 5-8 Door Unlock Relay Specifications

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

2.11 External Paging Output Specifications

Table 5-9 External Paging Output Specifications

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

2.12 BGM/ExMOH Source Input Specifications

Table 5-10 BGM/External MOH Source Input Specifications

Item	Specification
Output Impedance	600 Ω @ 1 kHz

Item	Specification
Input Level	Nominal 250 mV (-10 dBm)
Maximum Input	1 V RMS

2.13 External Sensor Device Interface Specifications

Table 5-11 External Sensor Device Interface Specifications

Applied Voltage during Sensor Off	Loop Current during Sensor On	Port Assignment
24 V	40 mA	Program10-03-05: 0
5 V		Program10-03-05: 1

The External Sensor device configuration shall be assigned by system program and the programming is different with a Sensor Type.

2.14 CPU Card LAN Port Specifications

Table 5-12 CPU Card LAN Port Specifications

Item	Specification
Standard	IEEE802.3 10Base-T and 100Base-TX Compliant
Access	CSMA/CD
I/F (Layer 1)	Speed: 10 Mbps/100 Mbps Auto Negotiation Cable: CAT5 or better, Straight/Cross Auto Crossover

2.15 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, use cable protectors.
- Cable runs for Multi-Line 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.

2.16 Cable Requirements

Table 5-13 Cable Requirements

Device	Cable Type	Cable Run Length (m)
Multi-Line Telephone	24 AWG (Φ0.5 mm)	300
Multi-Line IP Telephone	CAT5 Straight Cable	100
DSS Console	24 AWG (Φ0.5 mm)	300
Single Line Telephone Analog Terminals (20mA)	24 AWG (Φ0.5 mm)	1,125
Doorphone Box	24 AWG (Φ0.5 mm)	150
CPU LAN Port to External Device	Ethernet Cross Cable	100
CPU LAN Port to Switching Hub	Ethernet Straight Cable	100

Device	Cable Type	Cable Run Length (m)
ISDN Terminal	4-wire, 24 AWG (Φ0.5 mm)	100 (P-MP Short-passive) 300 (P-MP Long-passive) 500 (P-P)
1632ME-A1 EXP	Ethernet Straight Cable (Attached to 1632ME-A EXP)	1.2

Memo

Memo

SL1000

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