

Digital Keyphone System

DCS-408

Installation Manual

EU Declaration of Conformity (RTTE)

Samsung Electronics Co, Ltd.

259 Gongdan-Dong, Gumi City Kyungbuk, Korea, 730-030

(factory name, address)

declare under our sole responsibility that the product

Digital Keyphone System "DCS 408"

to which this declaration relates is in conformity with

RTTE Directive 1995/5/EC (Annex)

Low Voltage Directive 73/23/EEC

EMC Directive 89/336/EEC:92/31/EEC

By application of the following standards

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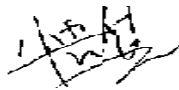
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Class A

This product is registered as one complying with transmission of electromagnetic waves suitable for business use. Sellers or users should notice this fact and be careful in using this unit. If you improperly purchase this product, Samsung recommends that you exchange it for another product for domestic use.

Notice

No part of this manual may be used or reproduced without permission from Samsung Electronics Co., Ltd.

The specifications and appearance of this product may be changed for quality improvement without prior notice. Accordingly, all information contained in this manual is also subject to change without notice.

Manual Organization

This manual is an installer's guide containing information on system specification, how to install and set up the DCS-408 digital keyphone system and how to connect the additional equipment.

The chapters of this manual include the following contents.

Chapter 1, “**DCS-408 Digital Keyphone Sytem Overview**”, describes the features of the DCS-408 digital keyphone system, appearance and internal structure of the system, and precautions related to system installation.

Chapter 2, “**DCS-408 Digital Keyphone System Installation**”, describes general information on the DCS-408 digital keyphone system installation.

Chapter 3, “**Additional Equipment Connection**”, describes various equipment that can be additionally installed on the DCS-408 digital keyphone system.

Appendix A, “**System Specification**”, describes the specifications for power, environment, and line necessary to know to use DCS-408 digital keyphone system.

Appendix B, “**Trouble Shooting**”, describes the problmes which may occur during using DCS-408 digital keyphone system and the solutions to handle them.

Appendix C, “**Explanation of Terms**”, explains the meaning of terms used frequently in this manual.

Appendix D, “**Peg Paper**”, provides the peg paper necessary to hang up the DCS-408 digital keyphone system on the wall.

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Chapter 1

DCS-408 Digital Keyphone System

Overview

Chapter 1 DCS-408 Digital Keyphone System Overview

The DCS-408 digital keyphone system is designed to be suitable for a small office, and can accommodate a maximum of 12 lines (4 analog trunk lines and 8 station lines). The DCS-408 digital keyphone system is composed of a baseboard to which 8 station lines (4 circuits for digital keysets and 4 lines for analog telephones) can be connected and a trunk board to which 4 analog trunk lines can be connected.

System Features

- This is a digital keyphone system having a simple and slim design.
- This system supports the Plug & Play function and is easy to install.
- This system displays the call list.
- This system supports DPIM connection allowing connection of a door-phone.
- This system can accommodate 4 analog trunk lines and 8 station lines.



The DCS-408 digital keyphone system does not serve AOM and KDB-DLI and KDB-SLI keysets.

System Overview

System Details

System items	Details
CPU	MC68EC000 (16MHz) 16Bit Mode
Memory	ROM : 1 Mbytes (2x27C4001) RAM : 256 Kbytes (2x681000)
Switch Structure	256 x 256 Time Slot
SIO port	RS-232C (SIO)

System Specifications

Items	Height (mm)	Width (mm)	Depth (mm)	Mass (Kg)
DCS-408	190	350	60	2.0
DPIM	29	90	120	0.2

System Structure

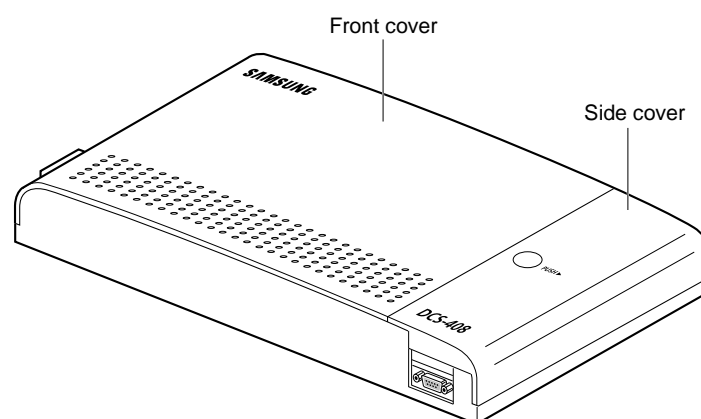
System Capacity

Analog trunk	4 lines
Station	8 lines (4 lines for digital keysets and 4 lines for analog telephones)
Music-on-hold/ Background music channel	1 (internal or external)
General-purpose dry contact	1
SIO port	1

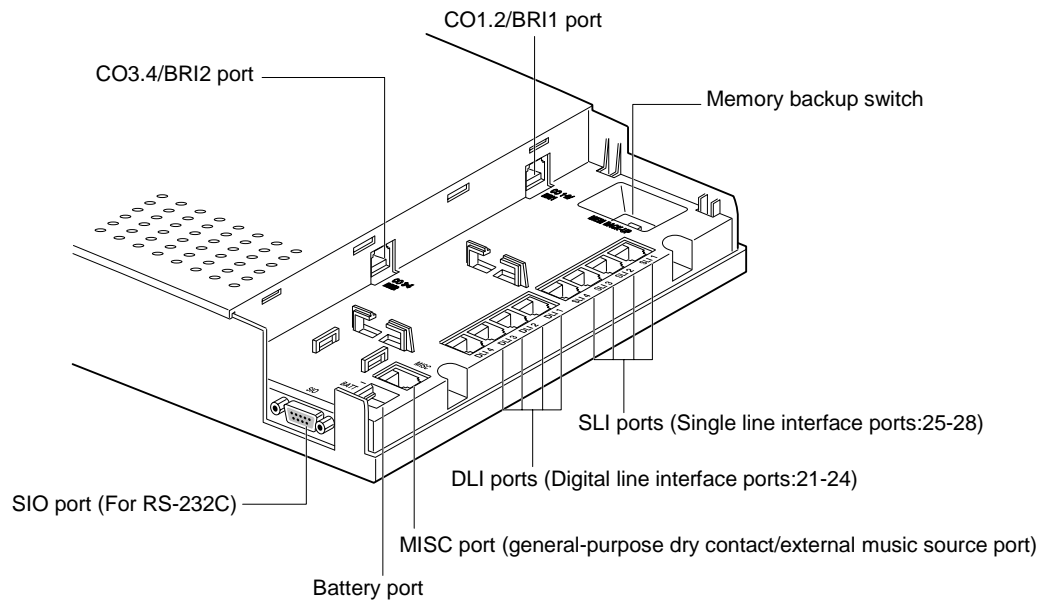


The station lines have a fixed configuration of 8 lines, such as 4 lines for digital keysets and 4 lines for analog telephones. It is impossible to modify the line configuration.

Front View of System

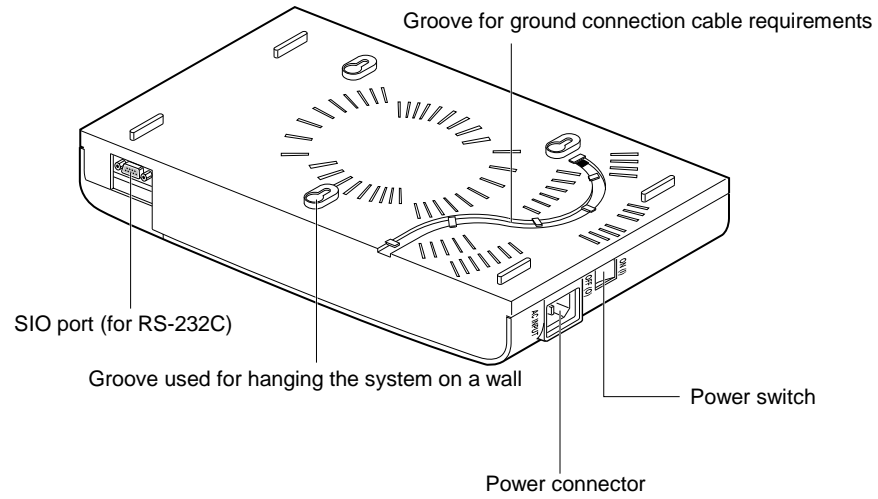


System Ports (After Removing Side Cover)



The DCS-408 digital keyphone system does not use BRI feature. [BRI1, BRI2] are printed on the equipment for future use.

Bottom View of System



Product Safety Precautions

Precautions on Installation

Do not install the unit in a place subject to moisture or wetness.

May cause a malfunction or shorten the life span of parts.

Do not install the unit in a location near a heat source such as a heater.

May cause a fire.

Precautions on Cleaning

Do not spray directly on the unit, and do not clean the unit with benzene, thinner or alcohol.

May cause a fire or an electric shock.

Precautions on Use

Do not disassemble, repair or modify on your own.

Contact a service center when repair is required.

When abnormal sound, smell or smoke comes from a telephone, immediately unplug the telephone line and contact a service center.

If the unit is left in this state, a fire may be caused.

Chapter 2

DCS-408 Digital Keyphone System Installation

Chapter 2 DCS-408 Digital Keyphone System Installation

This chapter describes the installation conditions of the DCS-408 digital keyphone system, installation procedure, and precautions for user's safety. Read this chapter carefully to ensure correct operation before installing the system,

Installation Environment

- Temperature : 0 40 (32°F 104°F)
- Humidity : Maximum 90%
- Power Specifications : Power supply of 60 or more watts
220VAC~240VAC, 1.6A
- Regular Frequency : 50Hz

Keep this unit far away from static electricity and electrical noise

If there is a possibility of static electricity occurring in a place where the DCS-408 digital keyphone system is installed (due to a carpet, electronic machines, etc), a system for preventing occurrence of static electricity should be prepared.

Install the unit in a place which is not exposed to influential factors

Be careful not to expose the DCS-408 digital keyphone system to direct sunlight, corrosive vapor, dust, regular vibration or high levels of magnetic field generated by a motor or a copy machine.

Installation Precautions

Selecting Place

Select a place having sufficient space and proper levels of brightness to facilitate installation of the DCS-408 digital keyphone system.

Preventing Static Electricity

This DCS-408 digital keyphone system should not be installed in a carpeted place. An installer or a repairman should discharge the static electricity from the body (by contacting part of the body with the metal portion of a grounded object or with the ground connection of the system) before installing or repairing the system, to ensure safety.

In addition, for protection and stable operation of the DCS-408 digital keyphone system, standard grounding construction should be used.

Correct Cable Requirements

Select a place minimizing the length of the system cable, and properly wire so that all the lines or cables output from/input into the DCS-408 digital keyphone system is not damaged.

In addition, be careful not to neglect electromagnetic waves or not to arrange the electromagnetic waves to be parallel to an AC power cable.

Refer to the cable requirements shown in the following table.

Equipment	Cables	AWG	MAX FEET(ft)	MAX METER(m)
Digital keyset	1PR. Twisted	24	1300	400
Analog telephone	1PR. Twisted	24	3000	1000
Door phone	2PR. Twisted	24	330	100
DPIM	1PR. Twisted	24	1000	300

Conditions of Line

When using AWG 24, the maximum length of a line for an analog telephone is 1000m (3000ft), and the maximum length of a line for a digital keyset is 400m (1300ft).

Be careful not to fold cables or make contact with other utensils during installation of lines and not to transform or damage cables. Do not expose the lines to the outside of the building.

Checking Power

When the system shares AC power with other machines, noise, malfunction of the DCS-408 digital keyphone system due to voltage drop and a fire may be caused. Moreover, interruption of power at night may cause malfunction in the DCS-408 digital keyphone system and breakdown of the battery. Therefore, use a stable AC power continuously supplied.



.....
Connect the DCS-408 digital keyphone to an AC receptacle independently. When the DCS-408 digital keyphone system shares AC power with other machines, it can cause noise, malfunction of the system due to voltage drop.
.....

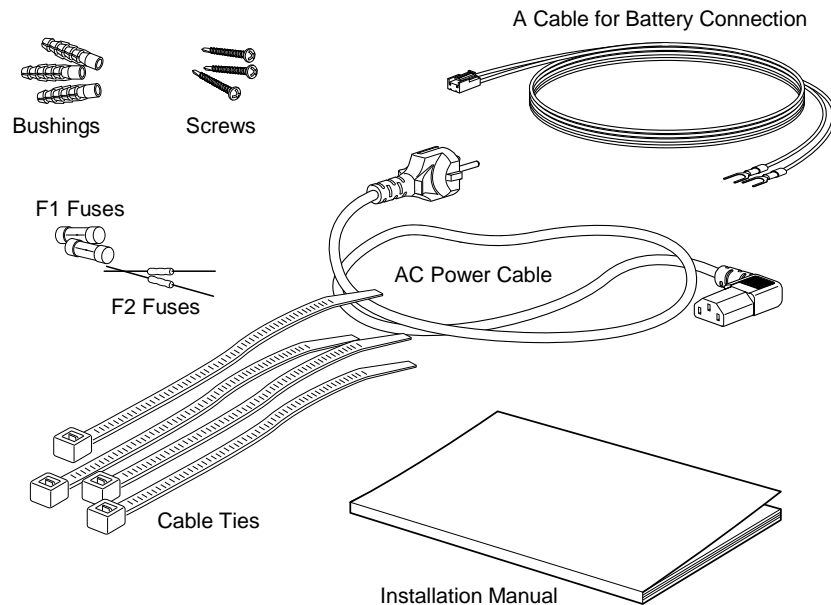
Installing System

Prior to Installation

On purchasing the DCS-408 digital keyphone system, check whether the DCS-408 digital keyphone system and other parts are not physically damaged after removing the package. If you discover any damage, contact your retailer prior to installation of this unit to take proper steps.

Check the following items contained in the package of the product.

- DCS-408 digital Keyphone System
- 3 Screws and 3 Bushings for hanging up the system on the wall
- A cable for battery connection
- 2 AC power Fuses (F1 Fuses) - 250V, 2A
- 2 Battery Fuses (F2 Fuses) - 125V, 3A
- An AC power cable
- 4 Cable Ties
- This Manual



Installing System

1. Inside view of the System

Before installing the DCS-408 digital keyphone system, let's look around inside of the system.

Opening System Cover

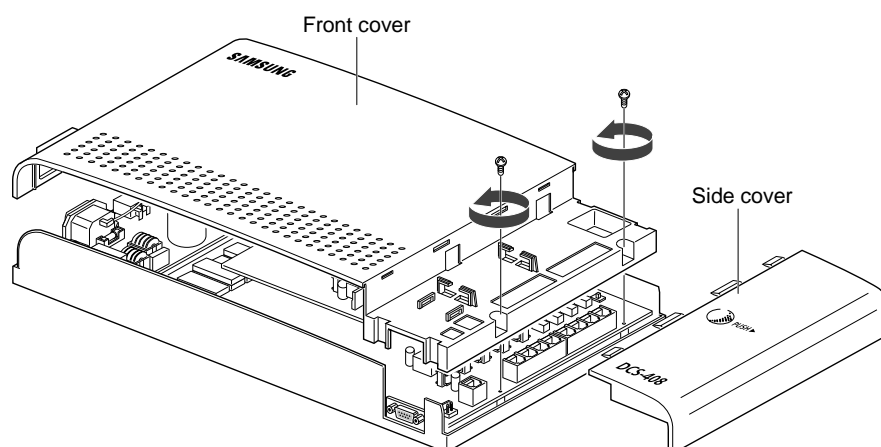
The DCS-408 digital keyphone system cover is divided into the front cover and the side cover.

1. Opening the Side Cover

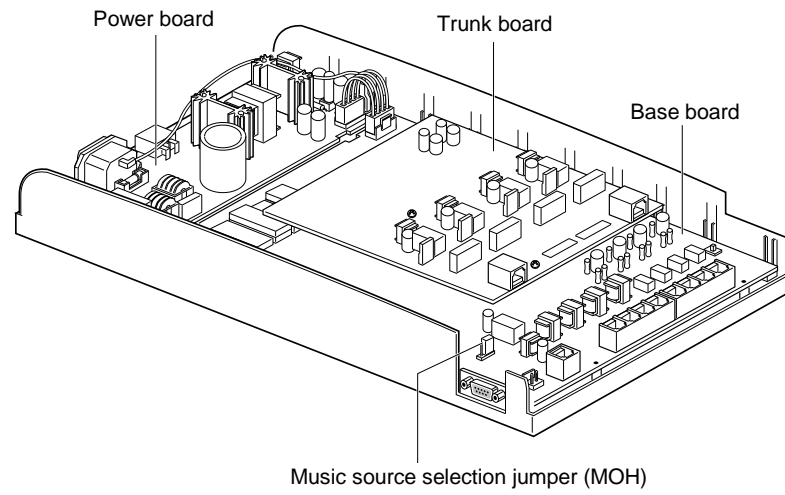
Viewed from the top, the small cover on the right side is the side cover. A round groove is provided at the center of the side cover with letters [PUSH]. Pull the side cover to the right with softly pushing the groove to take off the cover.

2. Opening the Front Cover

After removing the side cover, loosen the screws at the upper and lower right portions of the front cover. After removing the screws, hold the upper and lower sides of the front cover and softly pull it.



Inside view of the system



2. Fixing DCS-408 digital keyphone system on the wall

The DCS-408 digital keyphone system is housed in a plastic cabinet so that the unit can be installed on a wall or a floor. The following description shows how to install the system on the wall.

1. Cut out the peg paper found in the Appendix D of this manual. Carefully cut along the dotted line and do not to tear the paper.
2. Adhere the peg paper to the wall and make holes on the wall for the screws using an electric drill.

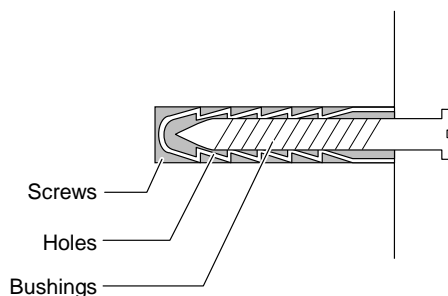


If the wall is build of plaster or brick, or if the building is a prefabricated one, you should place a wood plate having a thickness of about 2 cm on the wall. Otherwise, you may greatly damage the wall.

3. If the wall is built of concrete, it is hard to drive the screws. In this case, insert the bushings into the holes first and then insert the screws into the bushings. Fasten the screws securely.

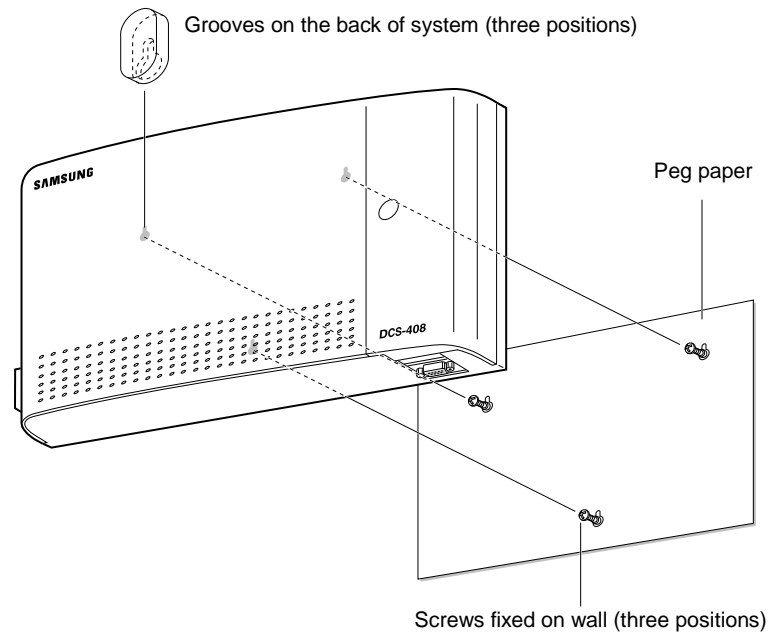


It is difficult to drive the screws directly into the concrete wall. Therefore, you should make a hole using an electric drill and insert the bushings into the holes first, and then insert the screws into the bushings. Driving the screws directly into the concrete wall without using an electric drill or not using the bushings may cause the fall down of the DCS-408 digital keyphone system and breakdown of the system.



4. Hang up the DCS-408 digital keyphone system on the screws and check whether the system is steadily fixed. If the system is unstably fixed, re-fix it to be stable.

The diagram of installation is as below.

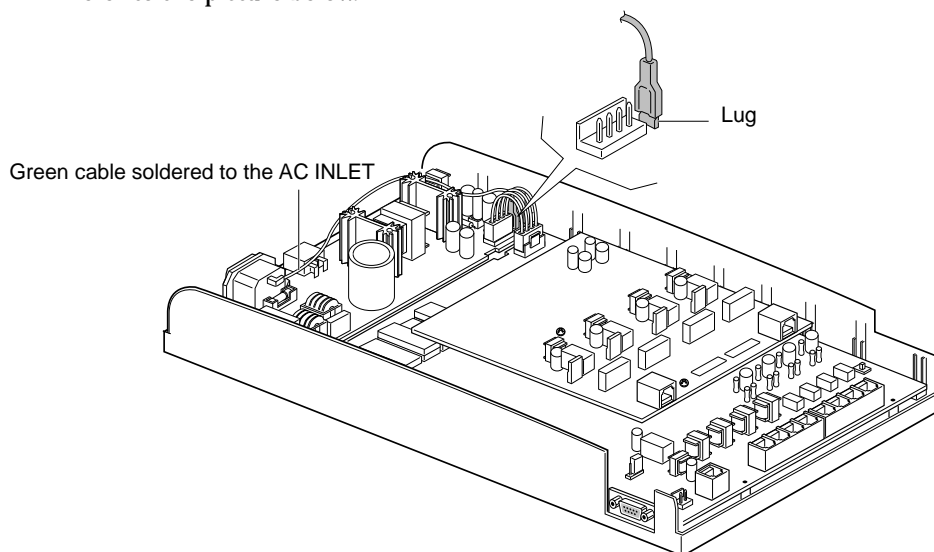


3. Grounding

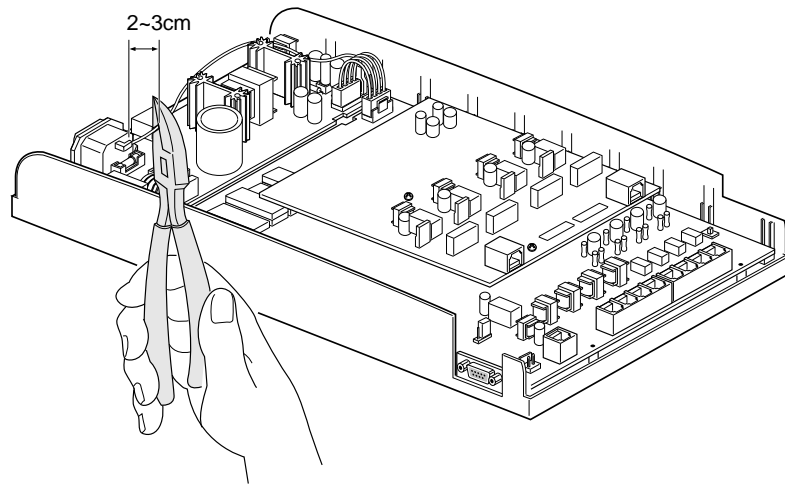


Plug out the AC power cord before installing the grounding connection. When the grounding operation is done with the AC power cord plugged in, high voltage causing mortal damage may be generated.

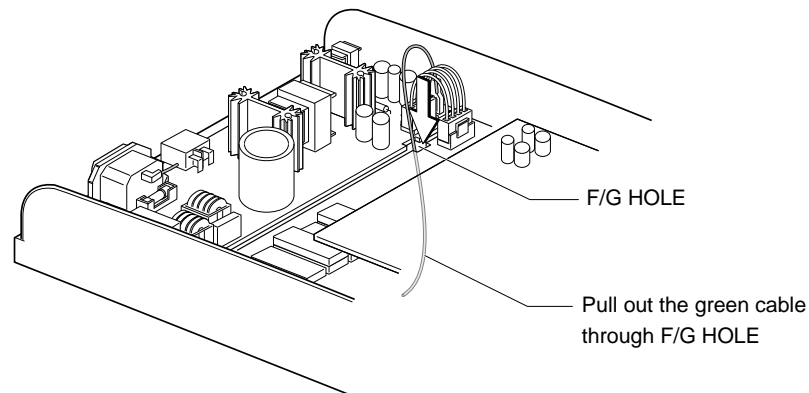
- Grounding must be done to protect users and the DCS-408 digital keyphone system from strikes of lightning, static electricity and other instant high voltage.
- When the AC power receptacle does not include ground connection, separate grounding (external grounding) should be done. Separate grounding should be done when the AC power receptacle has a grounding problem even if the AC power receptacle includes a ground connection.
- Improper grounding may cause malfunction in the DCS-408 digital keyphone system .
- External grounding is performed according to the following steps.
 1. There is a green cable soldered to the grounding end of the AC power cable connection end (AC INLET) within the DCS-408 digital keyphone system. The other end of the green cable is attached to the FRG lug within the power supply unit. Refer to the picture below.



2. Cut the end of the green cable soldered to the grounding end of the AC power cable connection end (AC INLET). The right position is 2~3cm (1 inch) apart from the grounding end of the AC INLET.

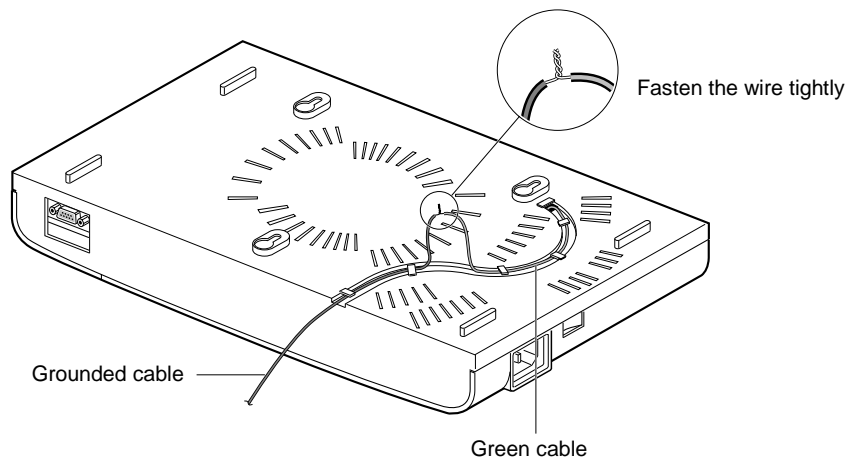


3. Next, pull out the cut end of the green cable through the F/G HOLE. F/G HOLE is located near to the FRG lug within the power supply unit, to which the other end of the green cable is attached. Pull out the cut end of the green cable along the groove on the bottom of the DCS-408 digital keyphone system.



4. Prepare an AWG 10 cable for external grounding and ground it to the outside. Lead the cable along the groove on the bottom of the DCS-408 digital keyphone system and fix the cable to the green cable, which was pulled out by the step 3. There are 2 ways of fixing the 2 cables:

- ❶ Solder the end of the 2 cables to each other
- ❷ Remove some clothing of the 2 cables at the end and fasten the wire tightly



The cable for external grounding is not provided by default so that the installer has to prepare it for himself.

4. Installing Battery

Selecting Battery

You need a battery to operate the DCS-408 digital keyphone system during power shortage. The capacity of an available battery for DCS-408 digital keyphone system is DC 48V (6AH~ 40AH). When an excessively large capacity of battery is used, this may cause a breakdown of the DCS-408 digital keyphone system. On the other hand, if the capacity of a battery is too small, the DCS-408 digital keyphone system may not operate well during power shortage.

Battery Specification

Consider the following specifications of the battery when you select a battery.

Items	Charge	Discharge
Minimum load current (A)	0	0.04
Maximum load current (A)	0.3	0.4
Rated output current (A)	0.1	0.2
Rated output voltage (V)	54	48

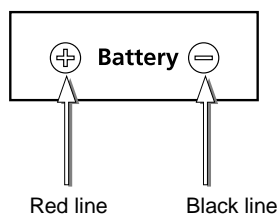
Current consumption of general telephone:30mA

How to Install the Battery

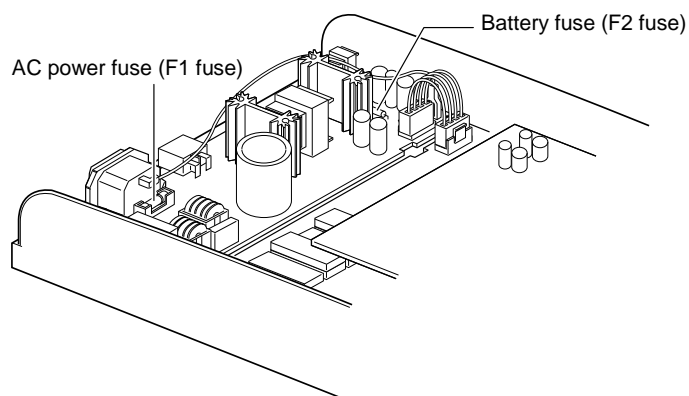


Check whether the power is on before connecting a cable for battery connection. When the battery is connected with power off, sparks may occur, and this is very dangerous.

1. Connect the red line of the battery connection cable to the positive (+) terminal of the battery and then connect the black line to the negative (-) terminal. If polarity is not correctly set, the battery fuse (F2 fuse) in the power supply unit will be blown.

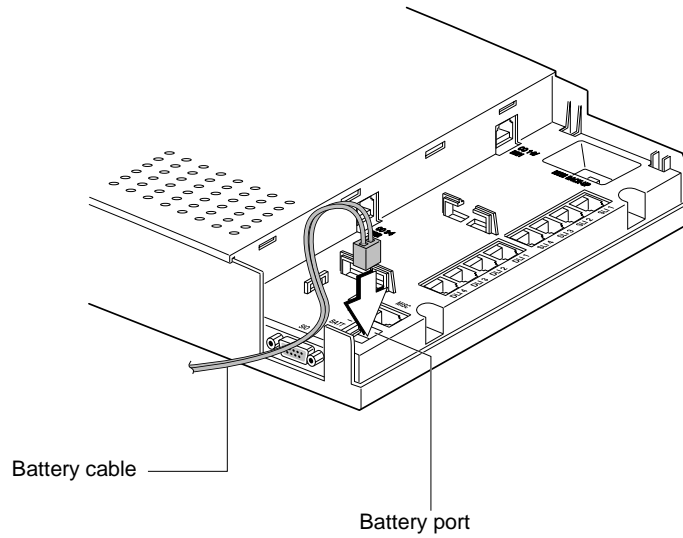


The locations of battery fuse (F2 fuse) and AC power fuse (F1 fuse) are as follows. Be cautions not to confuse their locaions.



2. Turn on the AC power switch of the DCS-408 digital keyphone system.

3. When you remove the side cover of the DCS-408 digital keyphone system, the port for battery connection is seen at the lower right side of the front cover. Connect the other end of the battery connection cable to this port.



4. Turn off the AC power switch of the DCS-408 digital keyphone system and check whether the system operates normally.
5. Turn on the AC power switch of the DCS-408 digital keyphone system.

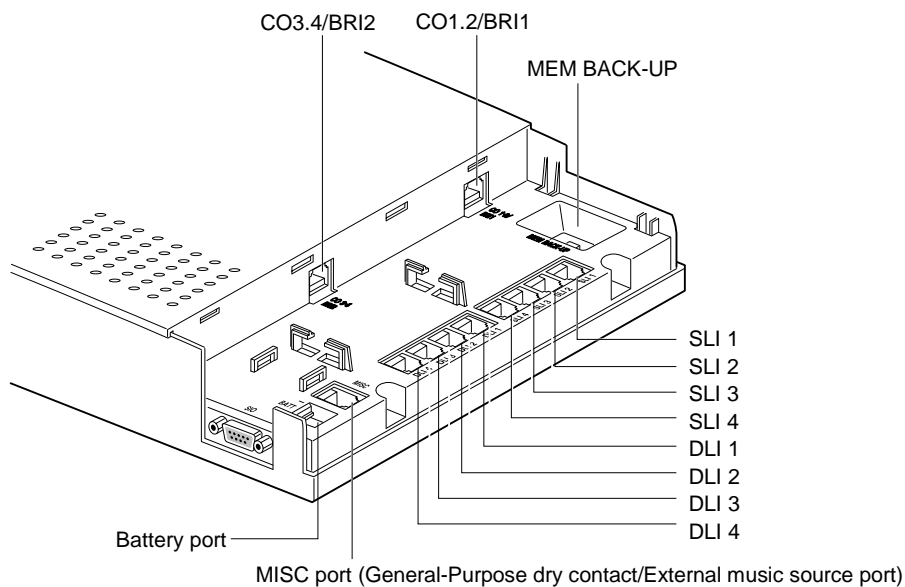


When a battery is used to operate the DCS-408 digital keyphone system during power shortage, which is maximum configured, it lasts for a minimum of 4 hours if its capacity is DC 48V/6AH, and lasts for a minimum of 8 hours if its capacity is DC 48V/12AH.

The expected duration may vary with the operating time of the telephone and the charged state of the battery.

5. Working on Cabling

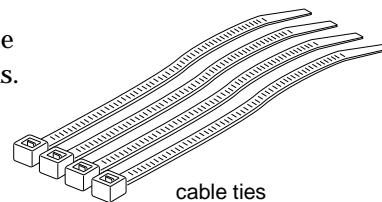
All the lines of the DCS-408 digital keyphone system are connected through the modular jack (RJ-11 (6 pin)) of the DCS-408 digital keyphone system after removing the side cover. The locations of each modular jack are shown below.



The RJ-11 cable is not the item provided as a default when the user purchase DCS-408 digital keyphone system. The user should prepare it by himself/herself.

Tie the Cables

You must tie the all the cables using the cable ties contained in the package of the DCS-408 Digital Keophone System unit after completing the cabling of modular jacks.



Modular Jack (RJ-11 (6pin)) Pin Arrangement Layout

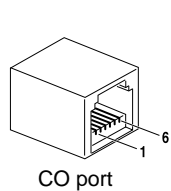
Connect lines according to the following modular jack pin arrangement layout.

Modular jack Printing	Pin number	Description	Modular jack Printing	Pin number	Description
CO1.2/ BRI1	1	Trunk 2 power failure transfer : Ring line (Reserved- Not Use)	CO3.4/ BRI2	1	Trunk 3 power failure transfer : Ring line (Reserved- Not Use)
	2	Trunk 2 : Ring line		2	Trunk 4 : Ring line
	3	Trunk 1 : Ring line		3	Trunk 3 : Ring line
	4	Trunk 1 : Tip line		4	Trunk 3 : Tip line
	5	Trunk 2 : Tip line		5	Trunk 4 : Tip line
	6	Trunk 2 power failure transfer : Tip line (Reserved- Not Use)		6	Trunk 3 power failure transfer : Tip line (Reserved- Not Use)
SLI1	1,4	Not Use	DLI1	1,4	Not Use
	2,3	Analog telephone port 1		2,3	Digital keyphone port 1
SLI2	1,4	Not Use	DLI2	1,4	Not Use
	2,3	Analog telephone port 1		2,3	Digital keyphone port 1
SLI3	1,4	Not Use	DLI3	1,4	Not Use
	2,3	Analog telephone port 1		2,3	Digital keyphone port 1
SLI4	1,4	Not Use	DLI4	1,4	Not Use
	2,3	Analog telephone port 1		2,3	Digital keyphone port 1

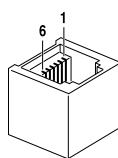
Modular jack Printing	Pin number	Description	Modular jack Printing	Pin number	Description
MISC	1,6	NC (Not use)			
	2,5	General-Purpose Dry contact			
	3,4	External music			

**NOTE**

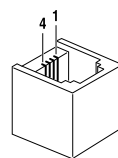
Power Failure Transfer is not a basic service.



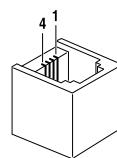
CO port



MISC port



SLI port



DLI port

6. Connecting Trunks

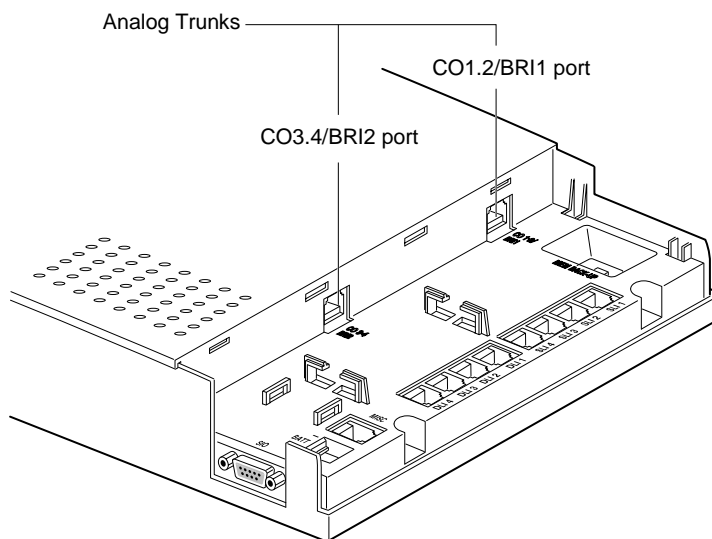


Observe the installation procedure described in the following to install trunks or telephone lines. Failure to install the lines in the manner described in this document can cause fatal injury to a worker.

1. Never carry out installation of trunks or telephone lines when there is a storm or when lightening flashes.
2. Do not install a telephone jack in a damp place if the jack is not specially manufactured for use in a wet place.
3. Do not touch telephone lines or interface terminals when they are connected with the telephone lines.
4. Pay attention to the DCS-408 digital keyphone system power when you install or check the telephone lines.

Analog Trunks (Loop Start Lines)

All trunks and stations are connected to the system through the modular jacks (RJ-11 (6pin)). (See [Working on Cabling] on pages 2-15 and 2-17)



MPD/PRS Selection and Installation

The DCS-408 digital keyphone system has four analog trunk interface lines. Each trunk interface line has either a Metering Pulse Detection (MPD) function or a Polarity Reverse Detection (PRS) function as an option.

When using the MPD function, insert a 12-KHz or 16-KHz MPD Hybrid IC into the socket of each trunk interface line and add a capacitor of 4.7nF/400V to each of both tip and ring.

Trunk Port No.	12KHz /16KHz MPD Hybrid IC	4.7nF/400V Capacitor
Port #1	P101	C102, C103
Port #2	P201	C202, C203
Port #3	P301	C302, C303
Port #4	P401	C402, C403

When using the PRS function, insert a PRS Hybrid IC to the socket of each trunk interface line and short the capacitors of both tip and ring.

Trunk Port No.	PRS Hybrid IC	Short
Port #1	P101	C102, C103
Port #2	P201	C202, C203
Port #3	P301	C302, C303
Port #4	P401	C402, C403

7. Connecting Station Terminals

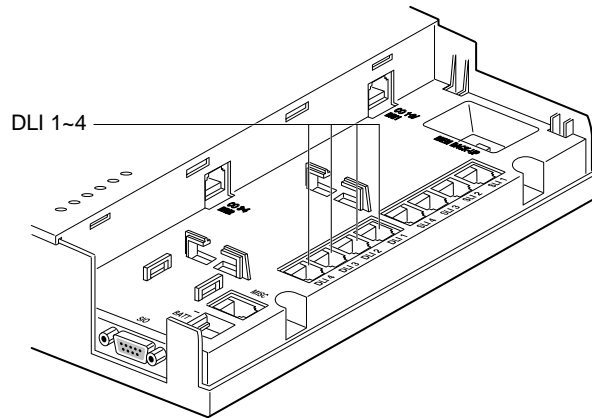


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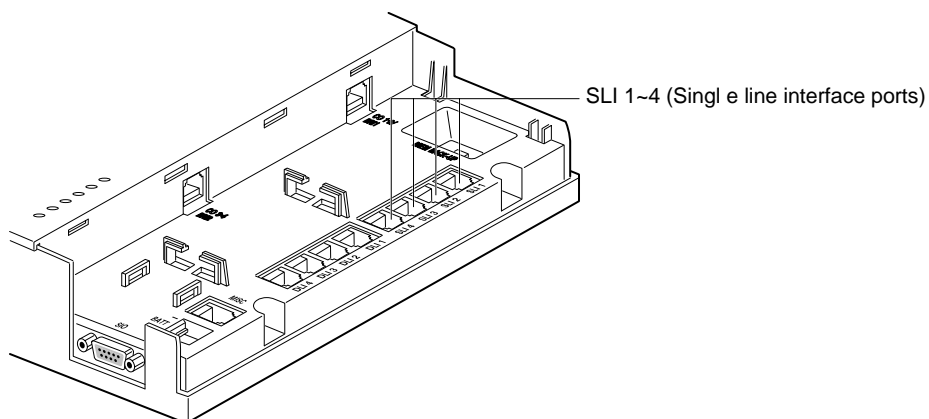
Digital Keyset

Connect the digital keyset to a desired DLI port using a pair of cables such as #24 AWG or #26 AWG. The DCS-408 digital keyphone system provides 4 ports, DLI1 through DLI4, for digital keysets.



Analog Telephone

Connect an analog telephone to a desired SLI port using a pair of cables such as #24 AWG or #26 AWG. The DCS-408 digital keyphone system provides 4 ports, SLI1 through SLI4, for analog telephones.



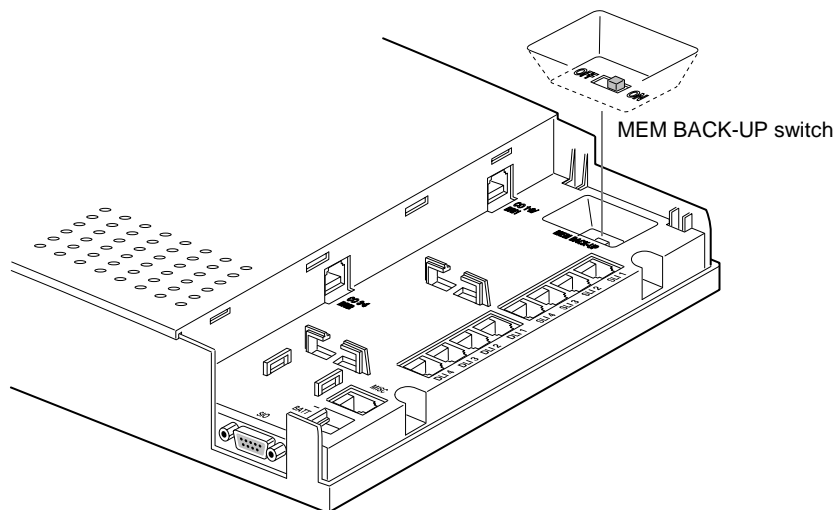
Checking Options of System

The DCS-408 digital keyphone system includes several kinds of optional hardware for memory backup selection, music source selection, etc.

Memory Backup Selection

The DCS-408 digital keyphone system is provided with a memory backup circuit (MEM BACK-UP switch) employing 256-K memory and a super capacitor for preparation of power failure such as a shutdown. A MEM BACK-UP switch locates on the upper right part of the front cover of the DCS-408 digital keyphone system.

The MEM BACK-UP switch is set to [OFF] by default. Turn the switch to ON after system programming (MMC). If the switch is not turned ON, programmed data is deleted in the case of power shortage.



Music Source Selection

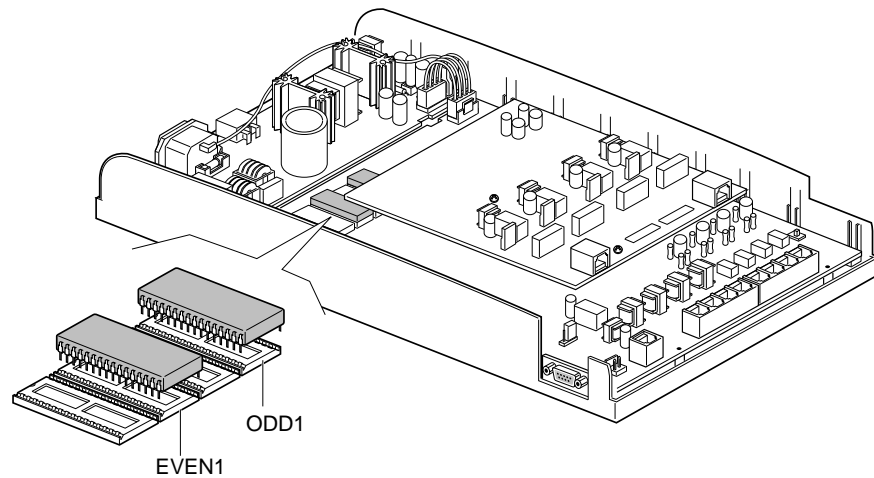
You can connect an external music source such as a CD player or a radio to the MISC port of DCS-408 digital keyphone system and use this music source for melody used in the DCS-408 digital keyphone system.

A music source selection jumper is on the baseboard of the DCS-408 digital keyphone system. You can select an internal or an external music source using this jumper. Refer to Chapter 3 [Additional Equipment Connection] in this manual for the detailed function of the music source selection jumper.

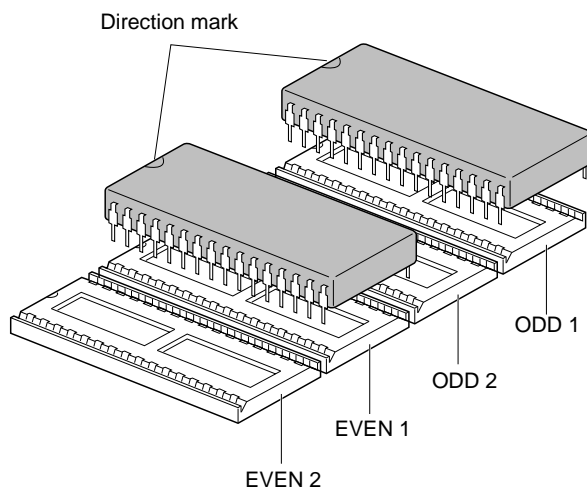
Replacing ROMs

You need to replace ROMs when upgrading the DCS-408 digital keyphone system program or fixing bugs in the program. Replace the ROMs according to the following steps.

1. Before replacing the ROMs of the DCS-408 digital keyphone system, read [Replace ROMs] in this page to next page carefully. If there is any difficulty, contact your retailer from whom you purchased the system. Do not try to replace the ROMs by yourself if anything is left unclear.
2. Remove the side cover of the DCS-408 digital keyphone system and check whether the MEM BACK-UP switch is set to 『ON』. If you edit a new system program (MMC), first set MEM BACK-UP switch to 『OFF』 to initialize the previous system program (MMC) data.
3. Remove the front cover of the DCS-408 digital keyphone system.
4. When an external battery is installed, remove the external battery.
5. There are two ROMs on the baseboard. Take out the two ROMs from the baseboard and keep them safe for reinstallation in the case of emergency.



6. Install the new ROMs with caution in the designated locations (ODD1 and EVEN1) according to directions.



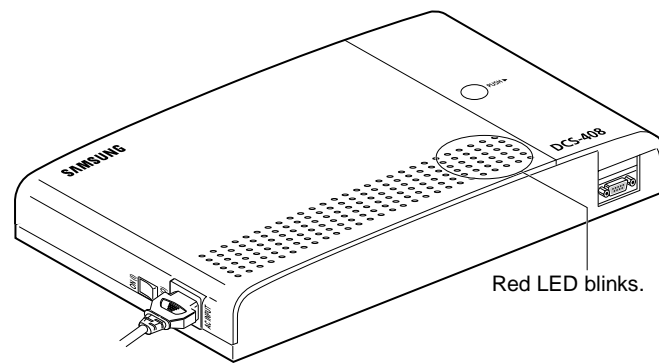
7. Check the state of operation after turning on the power of the DCS-408 digital keyphone system. If the DCS-408 digital keyphone system does not operate, remove the new ROMs and re-install the old ones. Check the state of operation again. If the system still does not operate, contact your retailer from whom the DCS-408 digital keyphone system was purchased.
8. Set the MEM BACK-UP switch back to 『ON』 in case of newly editing the system program (MMC) after initializing the previous data (In that case, the MEM BACK-UP switch is set to 『OFF』 in step 2).
9. In the case where an external battery was installed, re-connect the cable for battery connection.
10. Close the front and side covers of the DCS-408 digital keyphone system. Re-enter the system program (MMC) when necessary.

Testing Initial System Operation

Connecting Power Supply to System

Check whether the DCS-408 digital keyphone system operates normally before connecting cables to modular jacks when the system is initially installed.

1. Check whether the AC power switch is off.
2. When the switch is off, connect the power cord for the DCS-408 digital keyphone system to an AC power supply unit.
3. Turn on the AC power switch. Check to see if a red LED blinks under the lower right part of front cover of DCS-408 digital keyphone system.



4. Take the following steps when the red LED does not blink.
 - ❶ A red LED is on but does not blink.
 - Turn off the power and remove the trunk board. With removing the trunk board, turn on the power again and check to see if the red LED blinks.
 - If the red LED blinks without trunk board, the board is defective. Contact your retailer from whom the DCS-408 digital keyphone system was purchased.
 - If the red LED still does not blink, the baseboard is defective. Contact your retailer from whom the DCS-408 digital keyphone system was purchased.

- ② A red LED is not on at all.
- Remove the power plug and inspect the AC fuse (F1 fuse) after removing the cover of the DCS-408 digital keyphone system.
 - If the fuse is normal, check the power supply and output voltage.
 - If the red LED is still off and there are no other problems, contact your retailer from whom the DCS-408 digital keyphone system was purchased.

Trunk Line and Station Line Basically Assigned

1. After checking all the ports, the CPU stores the result values as basic installation environment values.
2. A trunk number is assigned starting from 71 to 74, and a station number is assigned from 21 to 28. The numbers assigned to the ports are following:

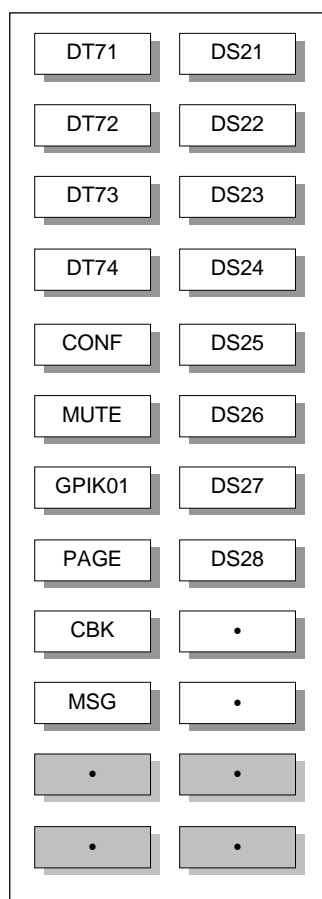
Port	Number
Trunk Port	CO1.2/BRI1 : 71~72
	CO3.4/BRI2 : 73~74
DLI Port(1~4)	21~24
SLI Port(1~4)	25~28

Descriptions of Keypad Buttons

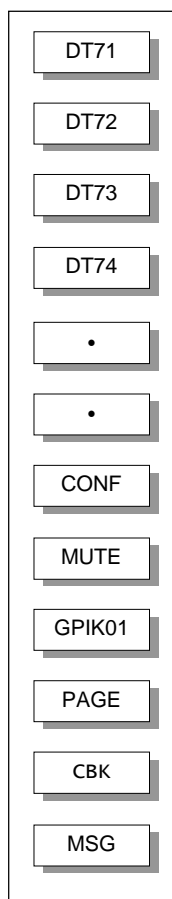
The DCS-408 digital keyphone system can automatically program as many as 24 DSS buttons of various keysets. The DCS-408 digital keyphone system programs those buttons to have functions such as frequently used direct trunks and direct stations.

The DSS buttons of Euro keysets are as follows :

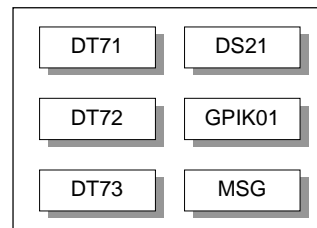
< 24B Keypad DSS layout >



< 12B Keypad DSS Layout >



< 6B Keypad DSS Layout >



The following description shows the functions of DSS buttons.

Buttons	Descriptions	Buttons	Descriptions
DT	Direct Trunk (Trunk selection button)	CBK	Call Back (Call wait button)
DS	Direct Station (Station selection button)	GPIK	Group Pickup (Group answering button)
CONF	Conference (Conference button)	MUTE	Mute (Outgoing call blocking button)
MSG	Message (Message button)	PAGE	Page Key

Chapter 3

Additional Equipment Connection

Chapter 3 Additional Equipment Connection

Connecting Additional Equipment

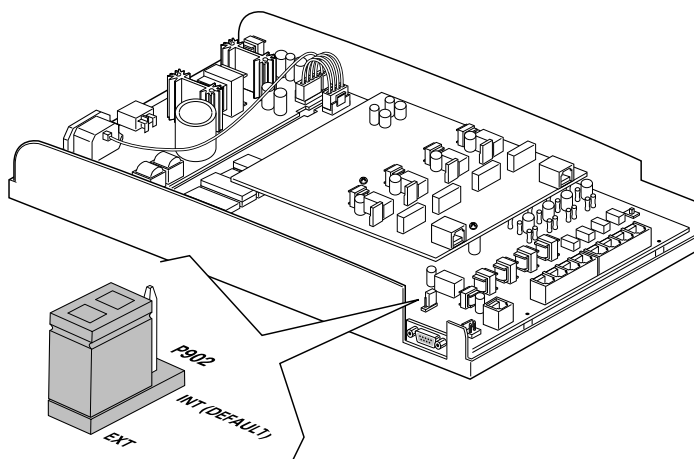
Music-on-Hold/Background Music

You can select an internal music source or an external music source by moving a jumper within the DCS-408 digital keyphone system. Various media such as a CD player and a radio can be used as the external music source.

You can program the DCS-408 digital keyphone system such that music can be received by the system during conversation over a trunk or a station. In this case, when the music-on-hold button of the digital keyphone is pressed, the system sends tone or internal music to a trunk or a station (trunk:MMC 408, station:MMC309). In addition, a digital keyset can be served with an external music source or an internal music source as a background music (MMC 308).

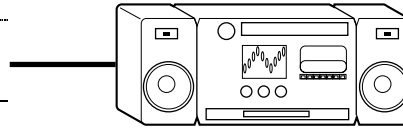
An external music source can be used after sequentially following the steps below.

1. Remove the side cover and the front cover from the DCS-408 digital keyphone system. A small jumper (MOH) is provided at the lower right side of the baseboard. You can select an internal (INT) music source or an external (EXT) music source by moving this jumper.
2. The jumper is set [INT] by default. To use external music, set the jumper to [EXT].



3. Connect a external music source (such as CD-ROM, radio) to the music source pin of the MISC port.
4. Refer to the following table showing the arrangement of modular jack pins of the MISC port when you use the music-on-hold/background music function.

MISC (RJ-11 (6pin) Modular Jack)	
Pin number	Features
1 6	Not use
2 5	General-Purpose Dry contact
3 4	Music source



Common Bell

If you connect a common bell to the general-purpose dry contact pins of the MISC port of the DCS-408 digital keyphone system, the common bell can receive a call signal as if it is one of the stations. You can select a continuous bell or an interrupted bell using the system program (MMC 510). When an interrupted bell is selected, a trunk call signal (1-second ON / 2-second OFF) should be designated.

After connecting a common bell, you can designate a station group through system programming (MMC 601) using a common bell code.



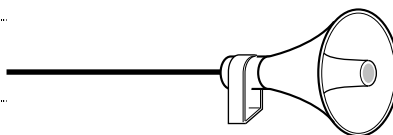
You can use a common bell as an object receiving a call from a particular direct trunk. A relay controlling a common bell is used with low voltage and low current so that the common bell can be used under the conditions of 5Vdc and 40mA only.

Installing Common Bell

1. Connect a common bell to the general-purpose dry contact pins of the MISC port.
2. Set a common bell controlling method to a continuous type or an interrupted type (MMC 510).
3. Assign the common bell to a particular station group (MMC 601).

4. Designate the station group where common bell is included as an object which receives a call from a particular direct trunk.
5. The following table shows the arrangement of pins of the modular jack in the case of connection of a common bell.

MISC (RJ-11 (6pin) Modular Jack)	
Pin number	Features
1 6	Not use
2 5	General-purpose dry contact
3 4	Music source

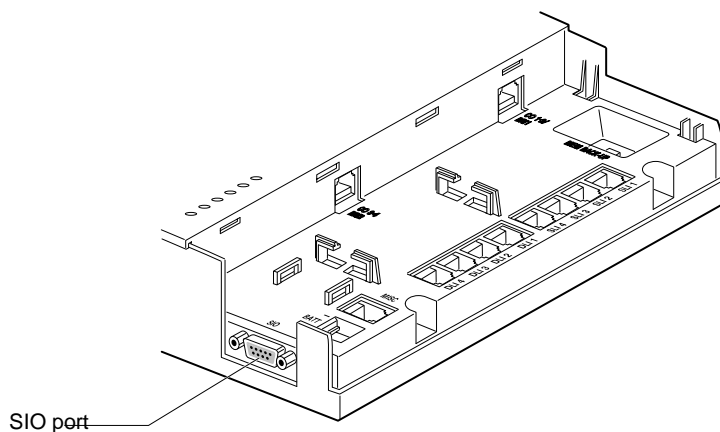


Do not directly connect a common bell to a commercial AC power supply. It can cause immediate breakdown of the system and a fire.

Station Message Detail Recording (SMDR)

Connect a serial printer to the SIO serial port of the DCS-408 digital keyphone system using an RS-232C cable.

Here, use a shielded computer cable with a required length of longer than 5m. The maximum length of the cable required is 15m.



SMDR output printer options are set in system programming 725 (MMC 725). Parameters are set in system programming 804 (MMC 804).

SIO port		Printer port
RXD(2)	< -----	TXD(2)
TXD(3)	----->	RXD(3)
GND(5)	-----	GND(7)

Voice Mail/Auto Attendant

If you connect voice mail or automatic attendant to a corresponding circuit of a DCS-408 digital keyphone system, the common bell can receive a call signal as if it is one of the stations.

Set a port in [System Programming 207 (MMC 207) Voice Mail/Auto Attendant Port Setting] and set necessary parameters in [System Programming 726(MMC 726) Voice Mail/Auto Attendant Option Setting]. You should connect Voice mail/ auto attendant to the SLI4 port only.

The following table shows the arrangement of pins of a modular jack in the case of connection of a voice mail/auto attendant.

SLI4 port (RJ-11 (6pin)Modular Jack)	
Pin number	Printing and features
1, 4	Not Use
2, 3	SLI4



The SLI4 port has a special feature removing the restriction of stations. Accordingly, connect the voice mail/auto attendant to the SLI4 port to get the most effectivity. Connecting the voice mail/auto attendant to SLI1 ~ SLI3 Port can cause a critical error.

Door-Phone and Door Closing/Opening Equipment

Connect a door-phone Interface Module(DPIM) to a desired DLI port using a pair of #24 AWG cables or a pair of #26 AWG cables. Next, Connect to the DPIM to a door-phone using another pair of #24 AWG cable or #26 AWG cables.

Refer to [Working on Cabling (MDF)] on pages 2-14 and 2-15 for connection between DPIM and a port.

If you want to use automatic door closing/opening equipment, connect the corresponding door closing/opening port of the DPIM to the closing/opening equipment.



Use only a Samsung 4-line keyset door-phone for this feature, which you can purchase separately.



The door closing/opening port is standardized so that it is used only for controlling a low voltage relay. Standard values are 5Vdc and 40mA.



Do not directly connect the door closing/opening port of DPIM to a commercial AC power supply. It may cause immediate breakdown of the DCS-408 digital keyphone system and a fire.

Appendix A

System Specification

Appendix A System Specifications

Power Specifications

Items	Specifications
AC Input	220~ 240 VAC, 50Hz, 1.6A
Maximum Power Consumption	44 Watts

Environment Specifications

Items	Specifications
Operating Temperature	0 40 (32°F 104°F)
Relative Humidity	10%~ 90%
Keeping Temperature	-10 ~ + 50 (14°F 122°F)

Line Specifications

Items	Specifications
Digital Keypad	2-line cable, maximum 400M(1300Ft) (AWG #24)
Analog Telephone	2-line cable, maximum 1KM(3000Ft) (AWG #24)
DPIM	2-line cable, maximum 300M(1000Ft) (AWG #24)
Door-Phone	2-line cable, maximum 100M(330Ft) (AWG #24)
Printer	RS-232C cable, 15M(50 Ft)

Others

Items	Specifications
External music source input characteristics	Impedance of 600 ohm, maximum 350 mV

Appendix B

Troubleshooting

Appendix B Troubleshooting

During use of the DCS-408 digital keyphone system, unexpected accidents can occur, and the system may not properly function. This situation may result from actual serious fault in the system, but there are many cases where such a situation can be solved by taking simple steps.

In this appendix, several problems, which may occur when using the DCS-408 digital keyphone system, and troubleshooting tips will be briefly described.

If the problem persists even after you take the steps described in this manual, contact your retailer from whom DCS-408 digital keyphone system was purchased and refer servicing to qualified service personnel.



.....
Samsung recommends to contact your retailer from whom the DCS-408 digital keyphone system was purchased and refer servicing to qualified service personnel if you are not familiar with using the system even when the problem is described in this manual.
.....

Troubleshooting

No	Condition	Suspected cause	Checking steps and countermeasure
1	DCS-408 digital keyphone system is not powered ON.	<ul style="list-style-type: none"> - Fault in power code connection - Fault in the power supply unit 	<ul style="list-style-type: none"> - Check connection state of the power code. - Check the fuses (check the AC input and the DC output) - Check whether red LED under the front cover blinks.
2	Nothing is displayed on LCD of keyset.	<ul style="list-style-type: none"> - Fault in DCS-408 digital keyphone system connection 	<ul style="list-style-type: none"> - Check whether the modular jack is removed. - Check whether the connection cables short-circuit
3	Keyset does not operate.	<ul style="list-style-type: none"> - Fault in the keyset - Fault in data communication 	<ul style="list-style-type: none"> - Replace the keyset with another one and check whether the new one operates. - Check the ports to find out whether voltage output is normal.
4	Volume control does operate.	<ul style="list-style-type: none"> - Fault in the keyset 	<ul style="list-style-type: none"> - Replace the keyset with another one and check whether the new one operates.
5	Ringer does not operate.	<ul style="list-style-type: none"> - Fault in the keyset - Fault in the SLI ports when using the analog telephone 	<ul style="list-style-type: none"> - Replace the keyset with another one and check whether the new one operates. - Check ring output if the problem still exists with respect to another analog telephone.
6	Tone is not heard.	<ul style="list-style-type: none"> - Fault in the keyset - Fault in talking line connection 	<ul style="list-style-type: none"> - Replace the keyset with another one and check whether the new one operates

Appendix C

Explanation of Terms

Appendix C Explanation of Terms

No	Terms	Explanation
1	COMMON BELL	A function of making a group of phones simultaneously ring when there is an incoming call, by assigning a bell to the group when designating the group.
2	TRUNK	A telephone line connected between a telephone office and the DCS-408 digital keyphone system.
3	STATION	A telephone line connected between a DCS-408 digital keyphone system and a user terminal.
4	MODULAR JACK	A jack facilitating connection of various circuits to the DCS-408 digital keyphone system .
5	MEM BACK-UP SWITCH	A switch for connecting the battery and supplying the power to the DCS-408 digital keyphone system when power is interrupted to keep data for a predetermined time. The switch must be turned 'ON' after the data is input.
6	DISA	A function allowing a user to call the DCS-408 digital keyphone system from the outside and then make a call using the system. When a user makes a call abroad or to a different province using this function, call charges are billed to the system.
7	RING	A sound provided for aurally informing a user of an incoming call. There is a station/trunk ring, off-hook ring provided while a call is being connected, etc.
8	BATTERY (BACK-UP BATTERY)	An auxiliary power supply unit for temporarily operating the DCS-408 digital keyphone system when the main power is interrupted.
9	AUXILIARY RING	A function of allowing a station to be designated to make a pair with another station and allowing the two stations to ring simultaneously when there is an incoming call on either station.

No	Terms	Explanation
10	SYSTEM PROGRAMMING (MMC)	Parameters for setting up the operation system with various functions provided by the DCS-408 digital keyphone system to be suitable for a user's purpose. The procedure of carrying out a function cannot be modified.
11	TONE	Sound for aurally informing a user of the operating state of the DCS-408 digital keyphone system. There is a dial tone, a ring back tone, a busy tone, etc.
12	VOICE MAIL (VMS)	A system for recording and storing voice messages.
13	SINGLE LINE INTERFACE (SLI) PORT	A port for connecting an analog telephone generally used at home or office.
14	POWER FAILURE TRANSFER (PFT)	A function for directly connecting some trunks to particular analog telephones when power is not applied to the DCS-408 digital keyphone system, thereby allowing a call to be made regardless of operation/non-operation of the system.
15	DND	A function of denying incoming calls to a user's phone from the moment when the function is set and until it is released.
16	DIGITAL LINE INTERFACE (DLI) Port	A port for connecting a digital keyset exclusively used for the DCS-408 digital keyphone system to which the telephone is interlocked.
17	STATION MESSAGE DETAIL RECORDING (SMDR)	A function of outputting information of a trunk through the DCS-408 digital keyphone system using additional equipment such as a PC or a printer.
	PORT (CIRCUIT)	A unit circuit for operating an individual trunk, digital keyset or an analog telephone.
19	CALL	Indicates an interval from the moment the phone rings to the completion of conversation, in the case of an incoming call, and an interval from the moment a telephone number is dialed up to the completion of conversation, in the case of an outgoing call.
20	IDLE STATE	A state where a telephone is not in use, that is, the transceiver is hung up.

Appendix D

Peg Paper

Appendix D Peg Paper