iPECS UCM

Installation Manual

Please read this manual carefully before operating System.
Retain it for future reference.

iPECS is an Ericsson-LG Brand

ERICSSON | LG

Regulatory Information

Before making connections to the telephone network, you may be required to notify your local serving telephone company of your intention to use "customer provided equipment." You may further be required to provide any or all of the following information:

PSTN Telephone numbers to be connected to the system.

- Model name: iPECS UCM
- Local regulatory agency registration number: locally provided
- Ringer equivalence: 0.7B
- Cable connector: Champ cable connectors (32 pairs)

This equipment complies with the following regulatory standards, that is, the safety requirements of EN60950-1, and the EMC requirements of EN55032 and EN55024.

If the telephone company determines that customer provided equipment is faulty and may possibly cause harm or interruption in service to the telephone network, it should be disconnected until repair can be affected. If this is not done, the telephone company may temporarily disconnect service.

The local telephone company may make changes in its communications facilities or procedures. If these changes could reasonably be expected to affect the use of the iPECS UCM or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

The iPECS UCM complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user

European Union Declarations of Conformity

Ericsson-LG Enterprise Co.,Ltd. declare that the equipment specified in this document bearing the "CE" mark conforms to the European Union Radio Equipment Directive(RED, 2014/53/EU), including the Electromagnetic Compatibility Directive(EMCD,2014/30/EU) and Low Voltage Directive(LVD, 2014/35/EU). Copies of these Declarations of Conformity (DoCs) can be obtained by contacting your local sales representative

FCC/CSA Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense.

This device complies with part 15 /RSS-GEN of the FCC/IC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference; and (2) This device must accept any interference received, including interference that may cause undesired operation.

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations, CAN ICES-3(A)/NMB-3(A)

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

The use of this device in a system operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations. For further information, contact your Local Industry Canada office.

CAUTION

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

ATTENTION: Tout changement ou modification dans la construction de cet appareil qui ne sont pas expressément approuvé par la partie responsable de la conformité pourraient annuler l'autorité de l'utilisateur à utiliser l'équipement.

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.

WARNING

This system employs a Lithium battery as back-up power for the real-time clock and memory. Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.

WARNING

This equipment generates and uses R.F. energy, and if not installed and used in accordance with the Instruction Manual, it may cause interference to radio communications. It has been tested and found to comply with the appropriate limits for a telecommunication device. The limits are designed to provide reasonable protection against such interference, when operated in a commercial environment. Operation of this equipment in a residential area could cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion;
- Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas;
- A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.
- This system with a lithium battery must be operated below 2000m altitude.

Disposal of Old Appliance

When the displayed symbol (crossed-out wheeled bin) is adhered to a product, it designates the product is covered by the European Directive 2012/19/EC.

- All electric and electronic products should be disposed of only in special collection facilities appointed by government or local/municipal authorities.
- The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.
- For more detail information about disposal of your old appliances, please contact your city office, waste disposal service or the place of product purchase.

Revision History

ISSUE	DATE	DESCRIPTION OF CHANGES
1.0	2017/11/24	Initial Release
1.1	2019/03/11	SW version: 2.5.x. - General Update - S2K Shut down methods for operating OS programs

Table of Contents

1 INTRODUCTION

This Installation Manual provides the information required for installation, operation and maintenance of the Ericsson-LG Enterprise iPECS UCM (Unified Communication Manager) system.

For system feature and programming, refer to the iPECS UCM F&O (Feature and Operation) and WMS Manual provided separately.

2 General Description

This chapter shows the brief description of iPECS UCM, Gateway Modules and Cabinets.

2.1 iPECS UCM Overview

The iPECS UCM is Ericsson-LG Enterprise's Internet Protocol (IP) Enterprise Communications Solution designed to meet the telecommunication needs of the large sized business. iPECS UCM uses advanced packet voice and IP switching technology, which is combined with a rich feature content, to set a new standard in Voice over IP (VoIP) systems.

The iPECS UCM consists of a family of intelligent Gateway Modules, media gateway cabinets and Call Server, which are interconnected over Ethernet LAN, easing the installation process. A variety of Gateway Modules are available including analog and digital network access gateways, which connect to the Public Switched Telephone Network (PSTN), Integrated Services Digital Network (ISDN) or public and private VoIP networks.

The Gateway Modules, which make up the iPECS UCM, can be installed in a Media Gateway Cabinet (1U or 7U type). The cabinet can be on floor or 19" rack, as best fits the user needs and equipment room.

The iPECS UCM supports a variety of Phones; LIP phones, standard VoIP phones (SIP), WLAN Phone, analogue SLT and various of soft clients including Phontage, UCS client and Mobile Client. With the LIP Phones, commonly used features are activated by selection of a single button. Additionally, most functions can be accessed from any telephone by dialing specific codes. For LIP users, these "dial codes" may be assigned to Flexible buttons for easy access. In addition to the LIP Phones, optional LIP DSS Consoles are available to expand the number of Flexible buttons available to the user.

The iPECS UCM provides an environment rich in features beyond today's traditional circuit switched telephone systems. In addition to a fully featured voice intercom, iPECS UCM incorporates basic Auto Attendant/Voice Mail, Least Cost Routing, Automatic Call Distribution, and VoIP network interface, as well as Web Management System. iPECS UCM incorporates an interface to the iPECS UCM Applications Service Provider, a TAPI 3.1 TSP/MSP, TR-87, SNMP, CSTA and Ericsson-LG Enterprise propriety interface (UCTI, SAPP). Unified Communications Services (UCS), iPECS Attendant is supported through optional application software providing enhanced communications and presence. An optional Network Management Server (UCM-NMS) software package is available allowing monitoring and management of environments.

The reliability, extensive feature content, the ability to support present and future applications with iPECS UCM Call Server and the capability to use an array of Gateway Modules and instruments, permit iPECS UCM to be tailored to meet the short and long term needs of the most demanding customer requirements.

Figure 2-1 shows the iPECS UCM configuration. It is a diagram of the various Gateway Modules, terminals and applications available with iPECS UCM.

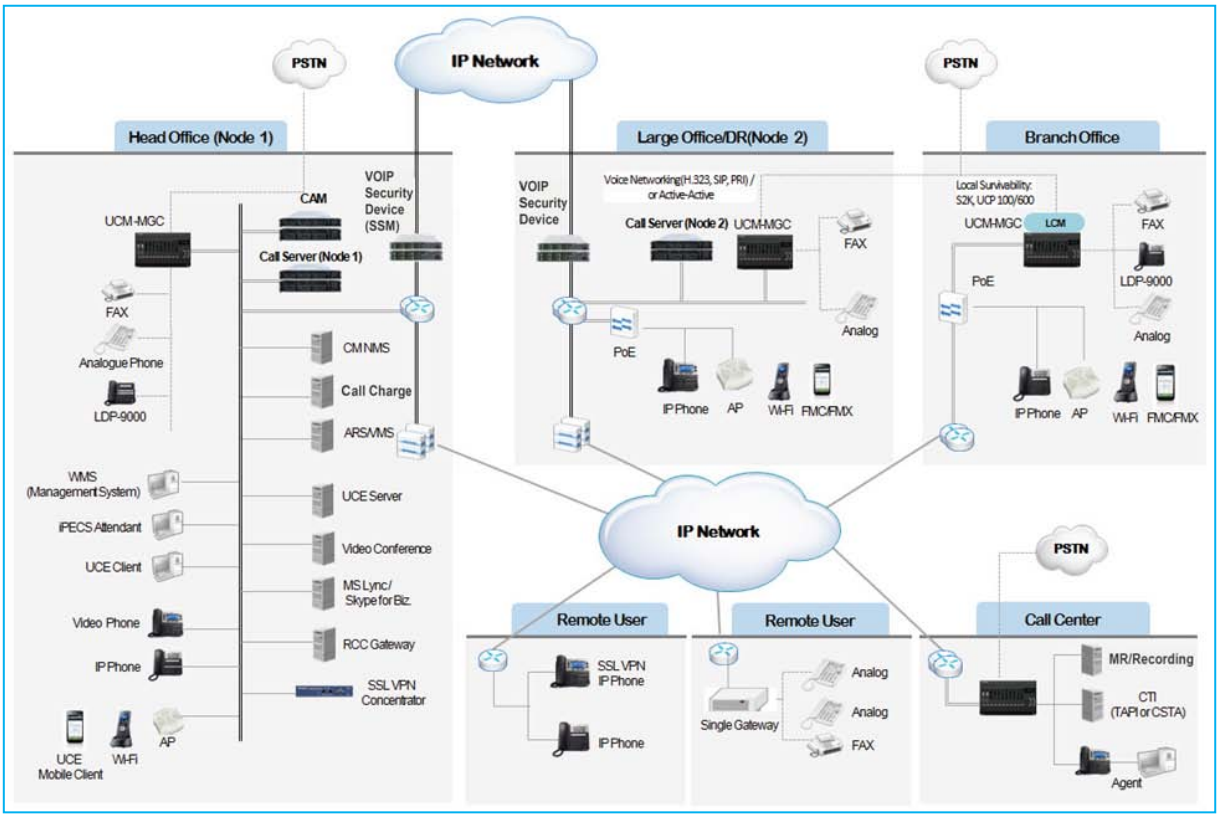


Figure 2-1 iPECS UCM configuration

Figure 2-2 shows the iPECS UCM Systems configuration at the 19” Rack Mount

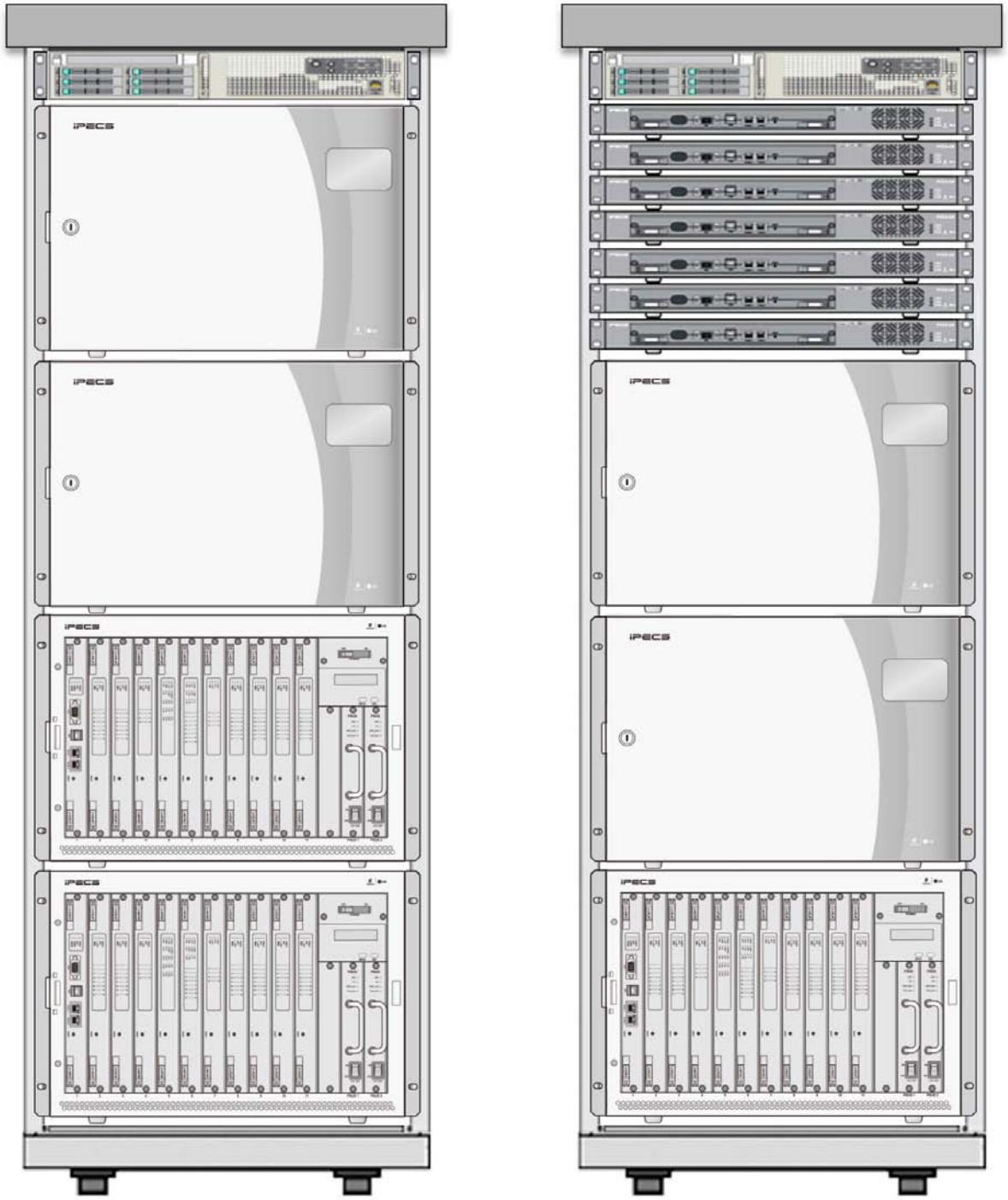


Figure 2-2 iPECS UCM Systems 19” Rack Mount Configuration

2.2 System Configuration and Components

Category	Name		Description
Call Server	UCM-S2K		2,000 Ports Embedded Gateway Module Type Server.
	UCM-S4K		4,000 ports Commodity Server.
	UCM-S10K		10,000 ports Commodity Server.
	UCM-S30K		30,000 ports Commodity Server.
	UCM-S60K		60,000 ports Commodity Server
	UCM-S120K		120,000 ports Commodity Server only in ACT-ACT
	UCM-S240K		240,000 ports Commodity Server only in ACT-ACT
	UCM-S480K		480,000 ports Commodity Server only in ACT-ACT
	UCM-S960K		960,000 ports Commodity Server only in ACT-ACT
Gateway Module	UCM-ASLM		Analog Subscriber Line Gateway Module.
	UCM-DSLM		Digital Subscriber Line Gateway Module.
	UCM-MATM		Multi-function Analog Trunk Gateway Module
	UCM-MATM option Unit	UCM-COIU	Central Office Interface Unit.
		UCM-EMIU	Ear and Mouth Interface Unit.
		UCM-LDIU	Loop Dial Interface Unit.
	UCM-MDTM2		Multi-function Digital Trunk Gateway Module.
	UCM-MDTMX2		Multi-function Digital Trunk Gateway Module. 2 Link
	UCM-VPCM		Voice Prompt and Conference Gateway Module.
Cabinet	UCM-MGC3		Media Gateway Cabinet on 7U type Rack Mount
	POWER	UCM-PSUD	DC/DC Power Supply Unit
	UCM-1URMC		Media Gateway Cabinet on 1U type Rack Mount

Note)

UCM-S120K/UCM-S240K/UCM-S480K/UCM-S960K licenses are only used in the ACT-ACT mode.

2.2.1 Call Server

The iPECS UCM has 2 types of server, embedded Gateway Module type and commodity type. The embedded Gateway Module type servers are UCM-S2K. The commodity servers are UCM-S4K, UCM-S10K and UCM-S30K and UCM-S60K in the ACT-STB mode.

In the ACT-ACT mode, the commodity servers are UCM-S4K, UCM-S10K, UCM-S30K, UCM-S60K, UCM-S120K. UCM-S240K, UCM-S480K, and UCM-960K.

2.2.1.1 UCM-S2K

The UCM-S2K (2,000 Ports Embedded Gateway Module Type Server) is equipped with an embedded CPU Gateway Module and can accommodate up to 2,000 ports. It supports max. 4GB DDR3 memory, SATA2 128GB SSD, 2 USB ports supporting USB 2.0, 10/100/1000Mbps Ethernet 2 ports and VGA (Video Graphics Array) port.

Specifications

CPU

- Intel CPU ATOM N2800 1.8GHz

Memory

- DRAM: SO-DIMM DDR3 4GB
- SSD 128GB

Network interface

- 10/100/1000Mbps Ethernet 2 ports
- USB 2.0 x 2 ports
- VGA 1 port

Others

- Coin Battery: 3V(CR2032)
- Reset switch
- Status LED

Mechanical specification

- Gateway Module dimension (W x L): 255 mm x 334.5 mm (Including card edge)
- Gateway Module weight: 970g

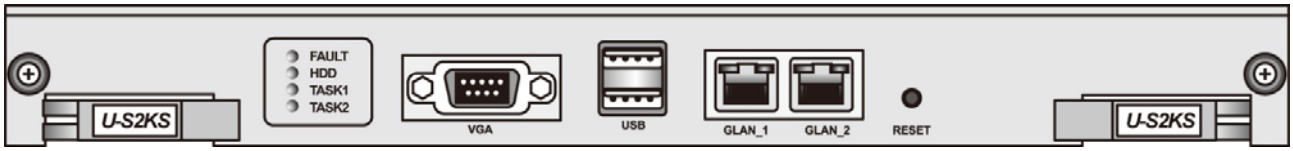


Figure 2-3 UCM-S2K

2.2.1.2 UCM-S960K/UCM-S60K/UCM-S30K/UCM-S10K/UCM-S4K

The UCM-S960K, UCM-60K, UCM-S30K, UCM-S10K and UCM-S4K are commodity servers whose specifications should be better than the following examples.

UCM Server Minimum Requirements

	UCM-S960K	UCM-S60K	UCM-S30K	UCM-S10K	UCM-S4K
Max. Ports	960,000	60,000	30,000	10,000	4,000
CPU	Intel Xeon E5-2637	Intel Xeon E5-2637	Intel Xeon E3-1220	Intel Xeon E5-2690	Intel Xeon E5-2609
CPU CORE	8		4		2
CPU CLOCK	3.5 GHz		3.1 GHz	2.93 GHz	2.5 GHz
RAM	8 GB			4 GB	
HDD	1 TB	300 GB			
Ethernet	2 Ports (10/100/1000Mbps)				

2.2.2 Media Gateway Modules Description

The iPECS UCM is consist of 6 media gateway Modules, which are mounted in UCM-MGC3 or UCM-1URMC.

- UCM-ASLM (Analog Subscriber Line Gateway Module)
- UCM-DSLM (Digital Subscriber Line Gateway Module)
- UCM-MATM (Multi-function Digital Trunk Gateway Module)
- UCM-MDTM2 (Multi-function Digital Trunk Gateway Module)
- UCM-MDTMX2 (Multi-function Digital Trunk Gateway Module 2 Links)
- UCM-VPCM (Voice Prompt and Conference Gateway Module)

2.2.2.1 UCM-ASLM

The UCM-ASLM (Analog Subscriber Line Gateway Module) provides analog interfaces between SLTs (Single Line Telephones) and iPECS UCM System. It consists of 32 SLT line interface circuits and a LAN interface circuit.

It supports -48V DC power feed, ring signal supply, CID (Caller ID) transmission and DTMF dial signal detection for SLTs. The UCM- ASLM Gateway Module supports message waiting signal generation and 5 REN (Ringer Equivalence Number).

Maximum SLT installation distance is 8Km (26,000 feet) in case of using AWG24 or UTP5 cable.

Specifications

Maximum capacity (Voice data length per packet)

- G.711: 32 Channels

Interface specification

- 10/100Base-T Ethernet 1port
- SIO 1 port

Others

- Status LED
- Channel LED
- Reset switch

Electrical specification

- Supply Power Input: -48V, +5V, DGND, FGND

Mechanical specification

- Gateway Module dimension (W x L): 255 mm x 334.5 mm (Including card edge)

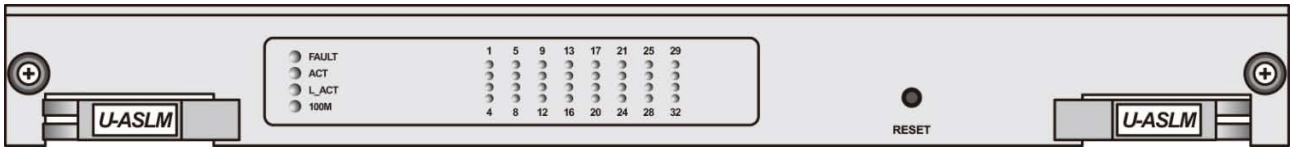


Figure 2-4 UCM-ASLM

2.2.2.2 UCM-DSLM

The UCM-DSLM (Digital Subscriber Line Gateway Module) provides digital interfaces between DKTs (Digital Key Telephones) and iPECS UCM System. It consists of 32 DKTs interface circuits and a LAN interface circuit.

It supports LDP-61xx series and LDP-9130D.

Specifications

Maximum capacity (Voice data length per packet)

- G.711: 32 Channels

Maximum installation distance

- 1Km(AWG 22 ~ 24 or UTP 5 Cable)

DKTs Feeding Voltage

- DC -48V

Interface specification

- 10/100 Base-T Ethernet 1port
- SIO 1 port

Others

- Status LED
- Channel LED
- Reset switch

Electrical specification

- Supply Power Input: -48V, +5V, DGND, FGND

Mechanical specification

- Gateway Module dimension (W x L): 255 mm x 334.5 mm (Including card edge)
- Gateway Module weight: 667g

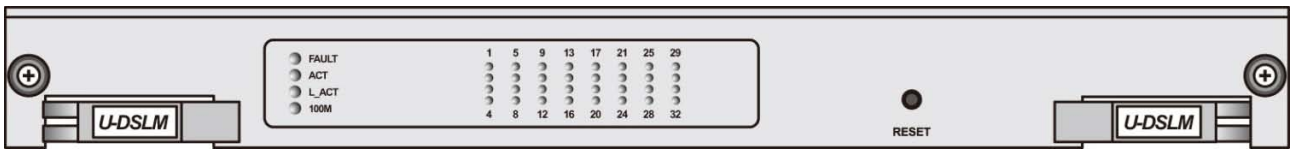


Figure 2-5 UCM-DSLM

2.2.2.3 UCM-MATM

UCM-MATM (Multi-function Analog Trunk Gateway Module) supports CO/LD/EM analog trunk interface and provides Packet to PCM and PCM to Packet conversion for voice communication in the IP network.

Option Modules (UCM-COIU, UCM-LDIU, UCM-EMIU) are used for analog trunk interface.

Specifications

Trunk capacity (Max. 16 ports)

Trunk Type	Max. Port
CO/ LD/RD	16 port
2-wire E&M	16 port
4-wire E&M	8 port

Analog trunk type and option Module

Trunk Type	Option Module
CO	UCM-COIU (Central Office Interface Unit)
LD	UCM-LDIU (Loop Dial Interface Unit)
E&M	UCM-EMIU (E&M Interface Unit)

* Each option Module provides 4 ports (except 4-wire E&M providing 2 ports) and 3 option Modules can be mounted in the UCM-MATM Gateway Module.
Different types of option Modules can be used simultaneously.

Interface specification

- 10/100Base-T Ethernet 1port
- SIO 1 port
- Others
- Status LED
- Channel LED
- Reset switch

Electrical specification

- Input power: -48V, +5V, DGND, FGND

Mechanical specification

- Gateway Module dimension (W x L): 255 mm x 334.5 mm (Including card edge)
- Gateway Module weight: 940g

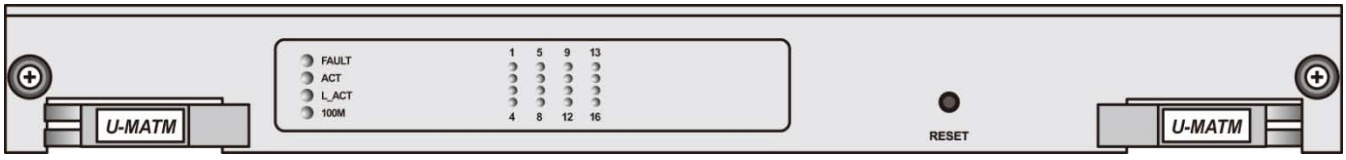


Figure 2-6 UCM-MATM

2.2.2.3.1 UCM-COIU

The UCM-COIU (Central Office Interface Unit) is the option Module for CO interface and performs the hardware functions as follows:

- Loop seizure
- Ring detection
- Polarity-reverse detection
- Pulse dialing

2.2.2.3.2 UCM-EMIU

The UCM-EMIU (Ear & Mouth Interface Unit) is the option module for E&M interface and performs the hardware functions listed as below:

- E&M Type: Type V only supported (using two lines for supervisor signaling: E, M)
- E line: Detect the off-hook condition of the other party (supplying DC -48V)
- M line: Connected to the ground in order to indicate the off-hook condition or opened to inform the on-hook condition.
- 2-wire E&M: Voice TIP, voice RING, E, M
- 4-wire E&M: voice TX_TIP, voice TX_RING, voice RX_TIP, voice RX_RING, E, M

2.2.2.3.3 UCM-LDIU

The UCM-LDIU (Loop Dial Interface Unit) is the option Module for LD interface and performs the hardware functions as below:

- Voice signal loop
- Loop seizure
- Pulse dialing
- Polarity-reverse sending
- Polarity-reverse detection

2.2.2.4 UCM-MDTM2

The UCM-MDTM2 (Multifunction Digital Trunk Gateway Module) supports one digital trunk

It provides digital trunk (E1/T1, 2048K/1544K bps ISDN PRI, CCS No.7) and it is available selectively with switch or Gateway Module initialization information.

For trunk line interface,
E1 Cable line impedance matching jumper should be set to 120Ω .
T1 Cable line impedance matching jumper should be set to 100Ω.

UCM-MDTM2 can match the frequency synchronization over the network system through LANU after extracting the clock from a particular trunk.

Specifications

Channel capacity

- 2,048Kbps E1 Trunk / ISDN PRI European mode: 32 Ch. (30B+1D)
- 1,544Kbps T1 Trunk / ISDN PRI American mode: 24 Ch. (23B+1D)

Line characteristics (E1 / T1)

- E1 (ITU-T G.703 and G.704)
- Transfer rate: 2.048Mbps +/- 50ppm
- Impedance: 120 ohm
- Line code: HDB3
- T1 (ITU-T G.703 and G.704)
- Transfer rate: 1.544Mbps +/- 50ppm
- Impedance: 100 ohm
- Line code: AMI / B8ZS

Interface specification

- Digital line interface: E1 / T1 / PRI / No.7
- 10/100Base-T Ethernet 1 port
- SIO 1 port

Others

- Status LED
- Channel LED
- Reset switch

Electrical specification

- Input power: +5V, DGND, FGND

Mechanical specification

- Gateway Module dimension (W x L): 255 mm x 334.5 mm (Including card edge)
- Gateway Module weight: 540g

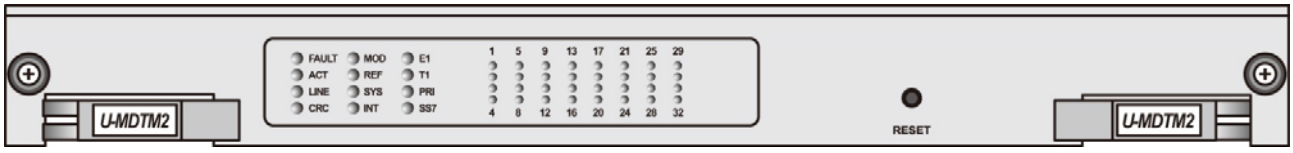


Figure 2-7 UCM-MDTM2

2.2.2.5 UCM-MDTMX2

The UCM-MDTMX2 (Multifunction Digital Trunk Module, 2 Link) supports two digital trunks. It provides digital trunk (E1 / T1, 2048K / 1544K bps ISDN PRI, CCS No.7) interworking function in iPECS UCM system, and you can choose the way by the trunk switch configuration and module initialization information.

Line impedance of digital trunks are set automatically when you selected E1 / T1 mode. See below impedance. Two digital trunk lines connected to the digital trunk MDTMX2 must be in the same manner provided by the same operator. If you do not use the same way or if it is not the same operators must be configured separately using the MDTM2.

Specifications

Digital trunk capacity 2Link

Two digital trunks are only supported with the same network synchronization

- 2,048Kbps E1 Trunk / ISDN PRI European mode: 32 Ch. (30B+1D)
- 1,544Kbps T1 Trunk / ISDN PRI American mode: 24 Ch. (23B+1D

Line characteristics (E1 / T1)

- E1 (ITU-T G.703 and G.704)

- Transfer rate: 2.048Mbps +/- 50ppm
- Impedance: 120 ohm
- Line code: HDB3

- T1 (ITU-T G.703 and G.704)

- Transfer rate: 1.544Mbps +/- 50ppm
- Impedance: 100 ohm
- Line code: AMI / B8ZS

Interface specification

- Digital line interface: E1 / T1 / PRI / No.7
- 10/100Base-T Ethernet 1port
- SIO 1 port

Others

- Status LED
- Dip Switch for setting Mode
- Channel LED
- Reset switch

Electrical specification

- Input power: +5V, DGND, FGND

Mechanical specification

- Gateway Module dimension (W x L): 255 mm x 334.5 mm (Including card edge)
- Gateway Module weight: 495g

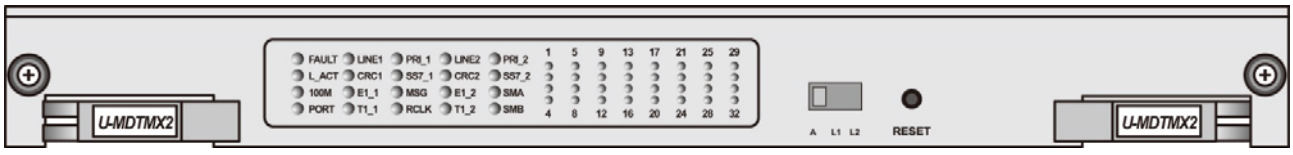


Figure 2-8 UCM-MDTMX2

2.2.2.6 UCM-VPCM

The UCM-VPCM (Voice Prompt & Conference Gateway Module) is the supplementary VoIP function Gateway Module that supports voice prompt, storage, conference, trans-coding, RTP/RTCP packet security (SRTP) in iPECS UCM System. UCM-VPCM can provide up to 256 channels (based on G.711 Codec) for all functions above except for voice trans-coding. The maximum number of channels available for voice trans-coding may be less than 256 channels, depending on the Codec type. Voice announcement data can be uploaded using FTP and is stored in the CFC card. For voice conference, maximum 128 subscriber channels can be accommodated in a conference group. The UCM-VPCM consists of CPU block, memory block, LAN switch block, SRTP block, DSP block, MFP (Multi-Function Processing) block, Oscillators and DC/DC power block.

Specifications

Voice prompt & storage

- File format: A-law / u-law PCM 8 bit (Mono)
- File storage: eMMC Memory Card (32GB)

Voice conference

- Max number of channels accommodated per group: Max. 128 channels
- Group-specific gain control range: 0 dB ~ (-) 30 dB

Maximum capacity per Codec (Voice data length per packet)

- G.711: 256 channels (20 ms), 160 channels (10 ms), 80 channels (5 ms)
- G.723.1: 80 channels
- G.729. A: 100 channels
- G.729. E: 48 channels
- Opus: 16 channels

SRTP

- RFC 3711 Compliance
- Session capacity: MAX. 512 sessions (RTP: 256 sessions, RTCP: 256 sessions)
- Encryption algorithm
- Encryption algorithm: AES-CM (Advanced Encryption Standard – Counter Mode)
- HMAC Algorithm: SHA-1 (Secure Hash Algorithm 1)
- Very Low Encryption/Decryption Delay (About 50us in case of G.711 20ms)

Interface specification

- 10/100Base-T Ethernet 1port and SIO 1 port

Others

- Status LED and Reset switch

Electrical specification

- Input power: +5V, DGND, FGND

Mechanical specification

- Gateway Module dimension (W x L): 255 mm x 334.5 mm (Including card edge)
- Gateway Module weight: 460g

Figure 2-9 UCM-VPCM

2.2.3 Cabinet

The UCM-MGC3 and UCM-1URMC are the Cabinets for iPECS UCM
The UCM-MGC3 (Media Gateway Cabinet) provides 11 slots for UCM-S2K or Media Gateway Modules.
The UCM-1URMC supports 1 slot for UCM-S2K or Media Gateway Module.

2.2.3.1 UCM-MGC3 (Media Gateway Cabinet)

The UCM-MGC3 is designed for floor standing or 19" Rack mounting. It accommodates UCM-S2K or Media Gateway Modules. It consists of Cabinet, Front Cover (Option sales item), UCM-LCDU, UCM-LANU, UCM-MGBP3, Fan unit.

Front view

The UCM-S2K or Gateway Modules are installed on the 11 universal slots from the left side and the LCDU and two PSUDs are installed on the right side.

Figure 2-10 UCM-MGC3 Front view (with Front cover)

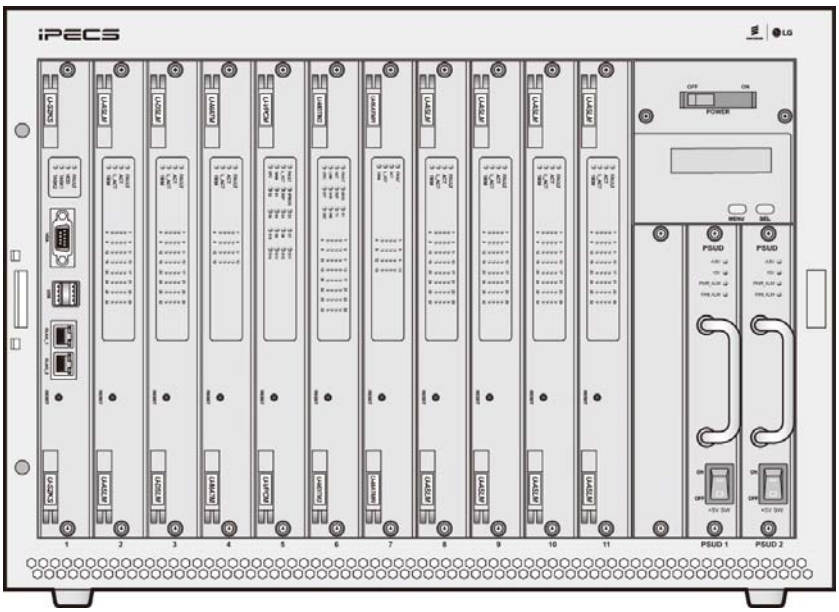


Figure 2-11 UCM-MGC3 Front view (without Front cover)

Rear view

There are Input DC power terminal block (connecting rectifier), RJ11 port (AC/DC Power monitoring), four RJ45 ports, 11 champ connectors, two SIO ports, two Fan units. For more detail, refer to the chapter3 General Installation Procedure

LAN1 and LAN2 support Gigabit Ethernet.

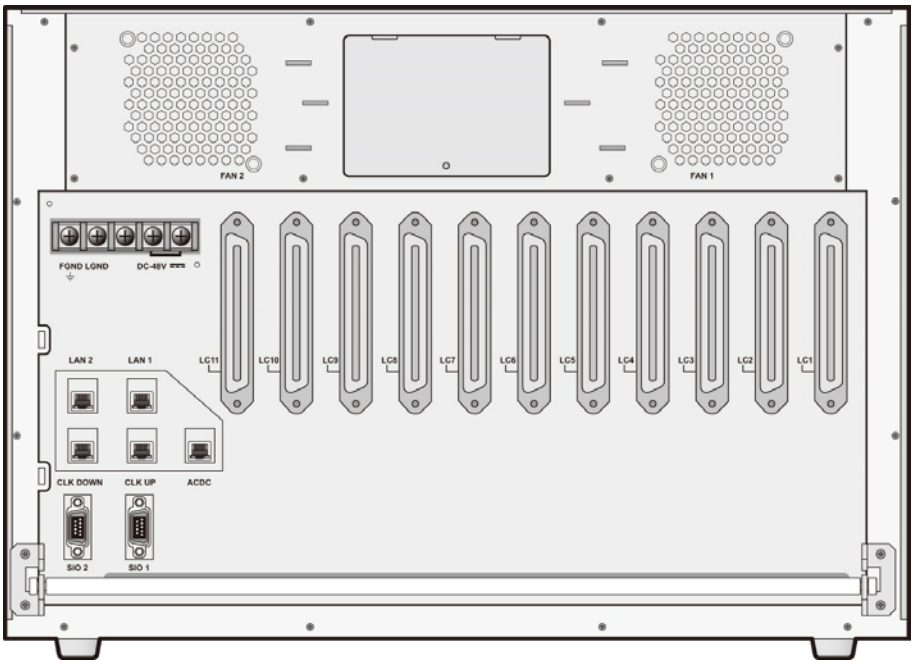


Figure 2-12 UCM-MGC3 Rear view

Specifications

Capacity

- Analog Subscriber Line: 352 ports
- Analog trunk: 176 ports
- Digital trunk: 352 ports

External connectors

- RJ45 connectors for LAN (10/100/1000 Ethernet) : 2 ports
- RJ45 connectors for synchronization: 2 ports
- RS232C connectors for SIO connection : 2 ports
- 11 champ connectors

Circuit Protector switch

- Rated Current: 30A
- DC -48V ON/OFF switch

Terminal block

- DC -48V input (It is used DC -48V power source that is input from the rectifier)
- System grounding pin (FGND)

Mechanical specification

- Mechanical dimension (W x L x H): 443 mm x 409.3 mm x 310.3mm
- Weight (included the PSUD): 17.3Kg

2.2.3.1.1 UCM- LANU (LAN Unit)

The UCM-LANU (LAN Unit) provides LAN connection between Gateway Modules and connection with external LAN switch. It is installed in UCM-MGC3 and has 11-port 10/100Base-T Ethernet interface to connect the Gateway Modules installed on the same UCM-MGC3. It also provides duplicated 2-port uplink 10/100/1000Mbps Ethernet interface and duplicated 2-port RS-232C interface. The UCM-LANU provides 8 kHz system clock to all UCM-MDTM2, UCM-MDTMX2 and other UCM-LANU in a synchronization group to synchronize the reference clock of the digital trunk line. The 8 kHz synchronous system clock is extracted from the digital trunk line of UCM-MDTM2 and UCM-MDTMX2 assigned as the system reference clock by Call Server. The UCM-LANU detects the status of Power, Fan and Gateway Module and reports this information to the call server. The UCM-LANU also displays the information on UCM-LCDU and the displayed information is as below.

- Ethernet link status, MAC & IP address information
- Humidity and temperature in the system
- Voltage level of power supply
- Fan and Power alarm

In addition, the UCM-LANU controls the FAN speed according to an internal temperature and raises an audible alarm when the status is abnormal.

Specifications

Interface specification

- 11 ports 10/100Mbps Ethernet to each Gateway Module
- 2 ports 10/100/1000Mbps Ethernet for External Links
- Internal SIO 11 ports, External SIO 2 ports

Electrical specification

- Supply Power Input: +5V, DGND, FGND

Mechanical specification

- Option Module dimension (W x L): 145 mm x 307.3 mm
- Option Module weight: 550g

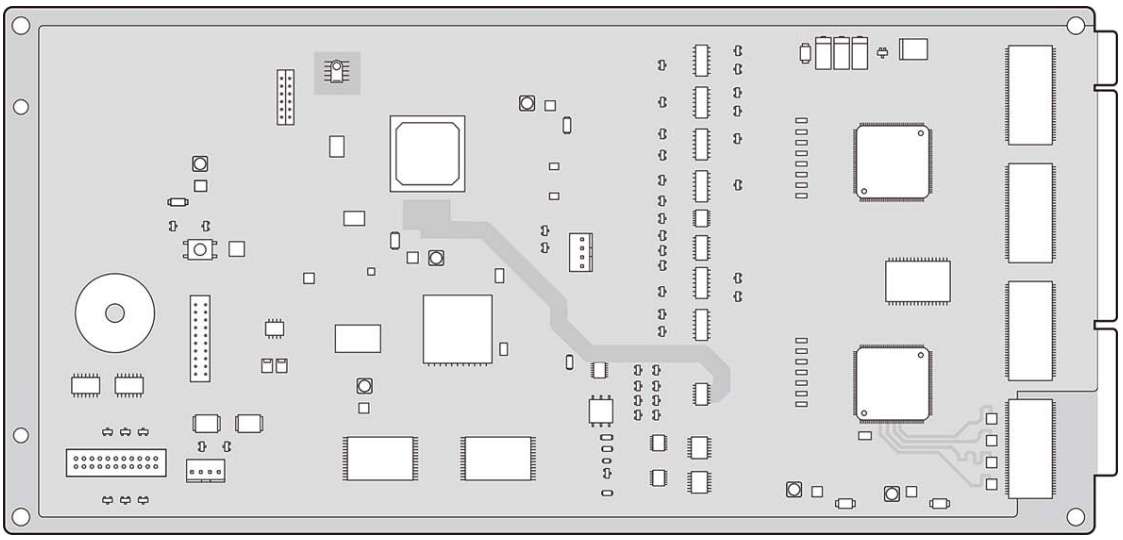


Figure 2-13 UCM-LANU

2.2.3.1.2 UCM-LCDU (LCD Unit)

The UCM-LCDU (LCD Unit) is installed on the UCM-MGC3.

It is connected to the UCM-LANU through the cable and displays the characters received from the UCM-LANU.

The various system status can be shown with manipulation of MENU and SELECT buttons on the front panel.

Specifications

Interface specification

- 2 buttons (Menu and Select)
- 16 characters x 2 lines LCD

Electrical specification

- Supply Power Input: +5V, DGND, FGND

Mechanical specification

- Option Module dimension (W x L): 120 mm x 60 mm
- Option Module weight: 120g

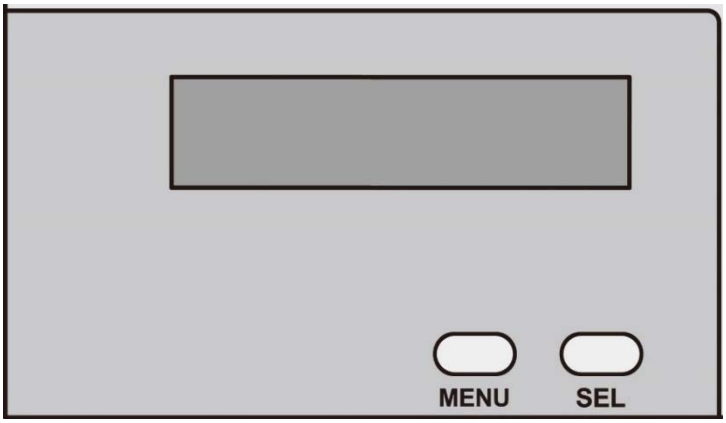


Figure 2-14 UCM-LCDU Front View

2.2.3.1.3 UCM-PSUD (DC/DC Power Supply Unit)

The UCM-PSUD (DC/DC Power Supply Unit) is installed on the UCM-MGC3 in a redundancy configuration. It converts DC -48V received from the rectifier to DC +5V.

Figure 2-15 UCM-PSUD

Electrical characteristics

- Rated input voltage: DC -48V
- Input voltage range: DC -44V ~ -58V
- Rated output

Rated Output Voltage	Max. Load Current	Line Regulation	Load Regulation	Ripple / Noise mVp-p(max)
DC +5.0V	30A	±0.1V	±0.2V	50/100mVp-p

Over-current protection

The output current is restricted to 110% ~ 140% of the maximum output current within the input voltage range.

Over-voltage protection

When +5V output is DC +5.5V ~ DC +7.0V, the over-voltage protection function is enabled to shut down the output and it is enable to block the input power.

Output short-circuit protection

Alarm functions(Status indication LED)

- Input -48V
- Output +5V
- Output low voltage indication
- FAN fault indication

2.2.3.2 UCM-1URMC (1U type Rack Mount Media Gateway Cabinet)

The UCM-1URMC has one slot and it accommodates UCM-S2K or Media Gateway Modules.

It consists of Cabinet, back plane, Fan unit and AC/DC power module. It can be mounted on a 19" rack .

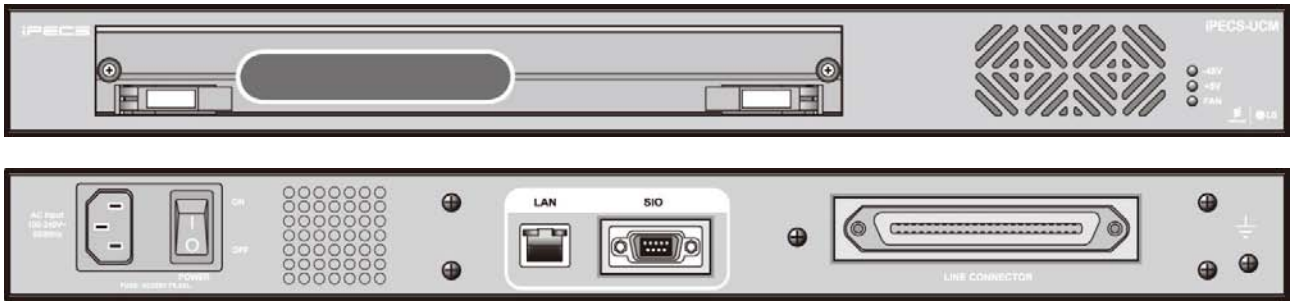


Figure 2-16 UCM-1URMC View (Front and Rear)

UCM-1UBP (1U Back PCB)

The UCM-1UBP is connected to UCM-LANU to provide LAN interface through RJ45 and SIO interface through RS232C. It provides a 100-pin edge connector to mount a Gateway Module, a 10 pin connector to connect the power Gateway Module and a champ connector to connect subscriber cables.

It provides max. 32 ports through one slot (32 port/slot 1) and accommodates function Gateway Modules such as SLT, CO, E1/PRI, etc.

Electrical specification

- AC/DC Power
- Input : AC 230V(±20%), 50Hz ~ 60Hz(±3Hz)
- Output :DC -50V/2.5A, DC +5V/3A
- Double pole Fuse : T2A, AC250V

CAUTION

The power supply cord must be connected to a socket-outlet with earth connection

The additional earth should be a permanent connection to protective earth with a cross-sectional area of not less than 2.5mm².

2.2.4 iPECS UCM IP Phone & Digital Phone

The iPECS UCM supports standard SLT, Digital phone, IP phone and WLAN phone.

The list of phones can be changed without notice. For more information or list about supported phones, contact the Ericsson-LG Enterprise sales team.

Table 2-2 Ericsson-LG Enterprise Hard Phones

Type	Model	Description
IP Phones	LIP-7008D	LIP Phone, 8 button and basic 2-line display
	LIP-7016D	LIP Phone, 16 button, 3-line display
	LIP-7024D	LIP Phone, 24 button, 3-line display
	LIP-7024LD	LIP Phone, 24 button, Large LCD display
	LIP-7048DSS	LIP-7000 DSS Console with 48 buttons
	LIP-8004D	LIP Phone, 4 button and 1-line display, LAN 1 port
	LIP-8012D	LIP Phone, 12 button, 3-line display
	LIP-8024D	LIP Phone, 24 button, 4-line display
	LIP-8040L	LIP Phone, 10 button, 9-line display
	LIP-8048DSS	LIP-8000 DSS Console with 48 buttons
	LIP-8012DSS	LIP-8000 DSS Console with 12 buttons
	LIP-8012LSS	LIP-8000 LCD DSS Console with 12 buttons
	LIP-8050V	LIP Video Phone, 4.3” Color Graphic, 5 buttons
	LIP-8002AE/2E	LIP Phone, 4 button, 2-line display
	LIP-8008E	LIP Phone, 8 button, 5-line display
	LIP-8012E	LIP Phone, 12 button, 3-line display, Gigabit
	LIP-8024E	LIP Phone, 24 button, 4-line display, Gigabit
	LIP-8040E	LIP Phone, 10 button, 9-line display, Gigabit
	LIP-8050E	LIP Phone, 4.3” Color Graphic, 5 buttons, Gigabit
	LIP-9002	LIP Phone, 4 button, 2-line display
	LIP-9010	LIP Phone, 5 button, 3-line display, Gigabit
	LIP-9020	LIP Phone, 10 button, 4-line display, Gigabit
	LIP-9030	LIP Phone, 8 button, 6-line display, Gigabit
	LIP-9040	LIP Phone, 12 button, 8-line display, Gigabit
	LIP-9070	LIP Video Phone,7' Color Graphic
	LIP-9071	LIP Video Phone,7' Color Graphic
SIP Phones	IP8815	SIP Phone, 8 button, 5-line display
	IP8820	SIP Phone, 12 button, 3-line display
	IP8830	SIP Phone, 24 button, 4-line display
	IP8840	SIP Phone, 10 button, 9-line display
	IP8850	SIP Video Phone, 4.3” Color Graphic, 5 button
	IP8815E	SIP Phone, 8 button, 5-line display
	IP8820E	SIP Phone, 12 button, 3-line display, Gigabit
	IP8830E	SIP Phone, 24 button, 4-line display, Gigabit
	IP8840E	SIP Phone, 10 button, 9-line display, Gigabit

Type	Model	Description
	IP8850E	SIP Phone, 4.3” Color Graphic, 5 buttons, Gigabit
	LIP-9002 SIP	SIP Phone, 4 button, 2-line display
	LIP-9008 SIP	SIP Phone, 8 button, 4-line display
	LIP-9008G SIP	SIP Phone, 8 button, 4-line display, Gigabit
	LIP-9010 SIP	SIP Phone, 5 button, 3-line display, Gigabit
	LIP-9020 SIP	SIP Phone, 10 button, 4-line display, Gigabit
	LIP-9030 SIP	SIP Phone, 8 button, 6-line display, Gigabit
	LIP-9040 SIP	SIP Phone, 12 button, 8-line display, Gigabit
	LIP-9040C SIP	SIP Phone, 4.3” Color Graphic, 12 buttons, Gigabit
	LIP-9050 SIP	SIP Phone, 5” Color Graphic, 12 buttons, Gigabit
	LIP-9070 SIP	SIP Phone, 7” Color Graphic, Gigabit
	LIP-9071 SIP	SIP Phone, 7” Color Graphic, Gigabit
LDP Phones (with UCP-DTIM)	LDP-7004N	4 Flexible Button Normal
	LDP-7004D	4 Flexible Button Display
	LDP-7008D	8 Flexible Button Display
	LDP-7016D	16 Flexible Button Display
	LDP-7024D	24 Flexible Button Display
	LDP-7024LD	24 Flexible Button Large Display
	LDP-7048DSS	LDP-7000 DSS Console with 48 buttons
	LDP-9008D	8 Flexible Button Display
	LDP-9030D	30 Flexible Button Display
	LDP-9048DSS	LDP-9000 DSS Console with 48 buttons
	LDP-9208D	8 Flexible Button Display
	LDP-9224D	24 Flexible Button Display
	LDP-9224DF	24 Flexible Button Graphic Display with Backlit
	LDP-9240D	2*12 Flexible Button Graphic Display with Backlit
	LDP-9248DSS	LDP-9200 DSS Console with 48 buttons
LDP Phones (with UCM-DSLM)	LDP-9130D	24 Flexible Button Graphic Display with Backlit
	LDP-9148DSS	LDP-9100 DSS Console with 48 buttons
Wi-Fi phone	WIT-400H	WLAN 802.11b/g phone

For further information on the products above, see the Quick Guide or User Guide of each model.

2.3 System Characteristics

This chapter shows the characteristics of iPECS-UCM.

2.3.1 Maximum Capacity

Table 2-3 Maximum Capacity

Server Type	Max. Capacity	Max. Trunk Port	Max Extension Port
UCM-S60K	60,000	30,000	60,000
UCM-S30K	30,000	10,000	30,000
UCM-S10K	10,000	5,000	10,000
UCM-S4K	4,000	2,000	4,000
UCM-S2K	2,000	1,000	2,000

* The total sum ports of Trunk and Extension can't exceed the Maximum Capacity.

2.3.2 Dimension and Weight

Table 2-4 Dimension and Weight

Item	W (mm)	L (mm)	H (mm)	Weight (kg)
UCM-MGC3	443	409.3	310.3	17.3
UCM-1URMC	440	361.8	43.4	5.5
Gateway Module	255	334.5	30	*-
UCM-PSUD	140	334.7	59.7	0.85

* Each Gateway Module has a different weight.

2.3.3 Environment Specifications

Table 2-5 Environmental Specifications

Environment		Condition
Temperature	Operation	0~40℃
	Storage	0~70℃
Humidity	Operation	20~80% non-condensing
	Storage	10~95% non-condensing

2.3.4 Power Specifications

Table 2-6 Power Specifications

Item		Specification
UCM-PSUD	DC Voltage Input	DC -44V ~ -58V
	Fuse	T6.3A, AC250V
	DC Output Power	+5V DC/30 A
PSUA-1U	AC Voltage Input	88-276 VAC @ 50/60 Hz
	Fuse	T6.3A, AC250V
	DC Output Power	-50V DC/2.5A, +5V DC/3A

2.3.5 CO LOOP Specification

Table 2-7 CO LOOP Specifications

Item		Specification
Ring Detect Sensitivity		40 Vrms @ 16~30 Hz
		30 Vrms @ 30~37 Hz
DTMF Dialing	- Frequency Deviation	Less than +/-1.8%
	- Signal Rise Time	Max. 5ms
	- Tone Duration, on time	Min. 50ms
	- Inter-digit Time	Min. 30ms
Pulse Dialing	- Pulse Rate	10 pps
	- Break/Make Ratio	60/40% or 67/33%

3 General Installation Procedure

The basic steps to install an iPECS UCM are;

1) Locate the area for installing the system
2) Unpacking
3) Install the cabinets
4) Grounding
5) Power connection
6) Install the Gateway Modules in the cabinet
7) Wire the Gateway Modules to the appropriate termination points
8) Wire and connect terminals
9) Initial power-up to default the database
10) Configure the system referring to iPECS UCM F&O manual and WMS manual.
11) Verify the installation.

3.1 Installation and Safety Precautions

Please read the following guidelines concerning installation and wiring before installing the iPECS UCM System. Also, be sure to comply with applicable local regulations.

When installing the telephone wiring, basic safety precautions always should follow to reduce the risk of fire, electric shock, and personal injury, including the following:

- Do not install the telephone wiring during a lightning storm.
- Do not install the telephone jack in wet locations unless the jack specifically is designed for wet locations.
- Do not touch un-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Anti-static precautions should be taken during installation.

The iPECS UCM System is designed for floor standing or 19” rack mounting.

Avoid installing in the following places:

- In direct sunlight and extremely hot, cold, or humid places (optimal temperature range = 0^{o} to 40^{o}C).
- Places where shocks or vibrations are frequent or strong.
- Dusty places or places where the System may encounter water or oil.
- Near high frequency generating devices such as sewing machines or electric welding machines.
- On or near computers, fax machines, or other office equipment, as well as microwave ovens or air conditioners.

Be sure to follow these precautions when wiring:

- Do not wire the telephone cable in parallel with an AC power source, computer, fax machine, etc. If the cables are run near such wires, shield the cables with metal tubing or use shielded cables and ground the shields.
- If the cables are run on the floor, use protectors to prevent the wires from being damaged by foot traffic. Avoid wiring under carpets.
- Do not use the same power supply outlet for computers, fax machine, and other office equipment to avoid inducing RF noise into the iPECS UCM system.
- The power and battery switches must be OFF during wiring. After wiring is completed, the power switch may be turned ON.
- If an extension does not operate properly, disconnect the telephone from the extension line and then re-connect, or turn the System power OFF and then ON again.
- Use unshielded twisted pair cable for connecting CO lines and stations.

3.2 Unpacking

Check to see that each iPECS UCM carton includes the following items:

- UCM-MGC3
- UCM-1URMC
- UCM-S2K

3.3 Cabinet Installation

The iPECS UCM has 2 kind of cabinet. All of them can be used floor standing or 19” rack mounting.

- UCM-MGC3
- UCM-1URMC

3.3.1 UCM-MGC3 Installation

The UCM-MGC3 provides 11 slots to install Gateway Modules. It provides LCD to display system status and environmental condition alarms in the upper right of cabinet. The UCM-MGC3 can accommodate duplicated Power Supply Unit in the lower right of cabinet. To check the LCD display, the part of the front cover is semi-transparent.

The cover is easily opened and closed by pressing the button on left side of cabinet. Make sure that the cover is locked to allow access to the interior without permission.

3.3.1.1 Closing and Opening the front cover

The front cover is provided as standard equipment with the UCM-MGC3.

Assembling UCM-MGC3 Cover

Install the cover to the cabinet as the following steps:

1) Align the notched tab on the left/right sides of the cover with the slot in the both sides of the cabinet as shown Figure 3-1.
2) Push the tab in the direction of arrow into the slot in the cabinet.
3) Fix the front cover to the cabinet with the button on the left side of the front cover.

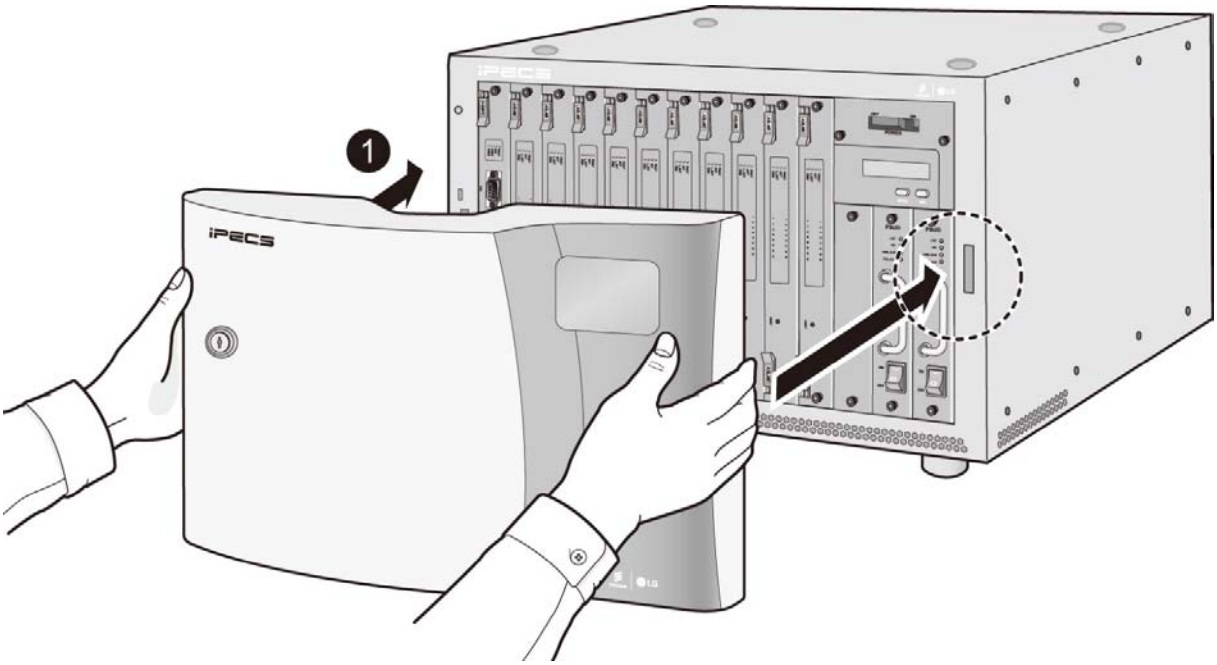


Figure 3-1 Assembling UCM-MGC3 Cover

Separating UCM-MGC3 Cover

Separate the front cover from cabinet as the following steps:

1) Push the button on the left side of the font cover to open as shown in Figure 3-2.
2) Remove the front cover in the direction of arrow, and then place it on the safety zone to avoid damaging the front cover.

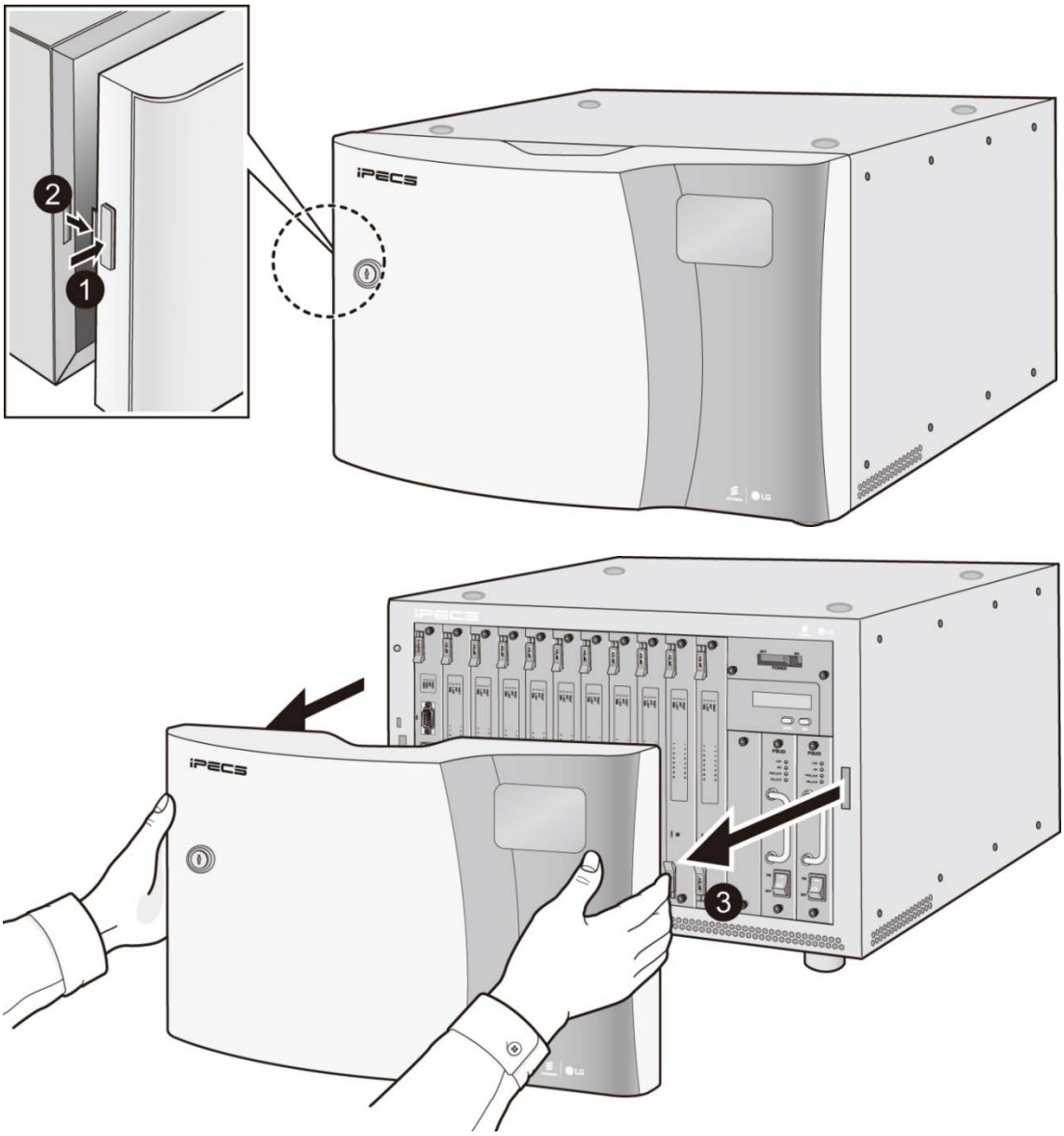


Figure 3-2 Separating UCM-MGC3 Cover

3.3.1.2 Installing Single and Multiple cabinet-Floor mount & Rack mount

The UCM-MGC3 can be installed by floor standing or rack mounting type depending on the environment. Do not attempt to floor mount more than three cabinets. The cabinet is damaged if the cabinets fall down.

Floor mounting

Remove the front cover of the cabinet prior to installation to avoid damaging the covers and to allow access to the interior. Place the upper cabinet on top of the lower cabinet ensuring that the upper cabinet locating bumps are snug in the lower cabinet locating dimples securely. After floor mounting, close the front covers.

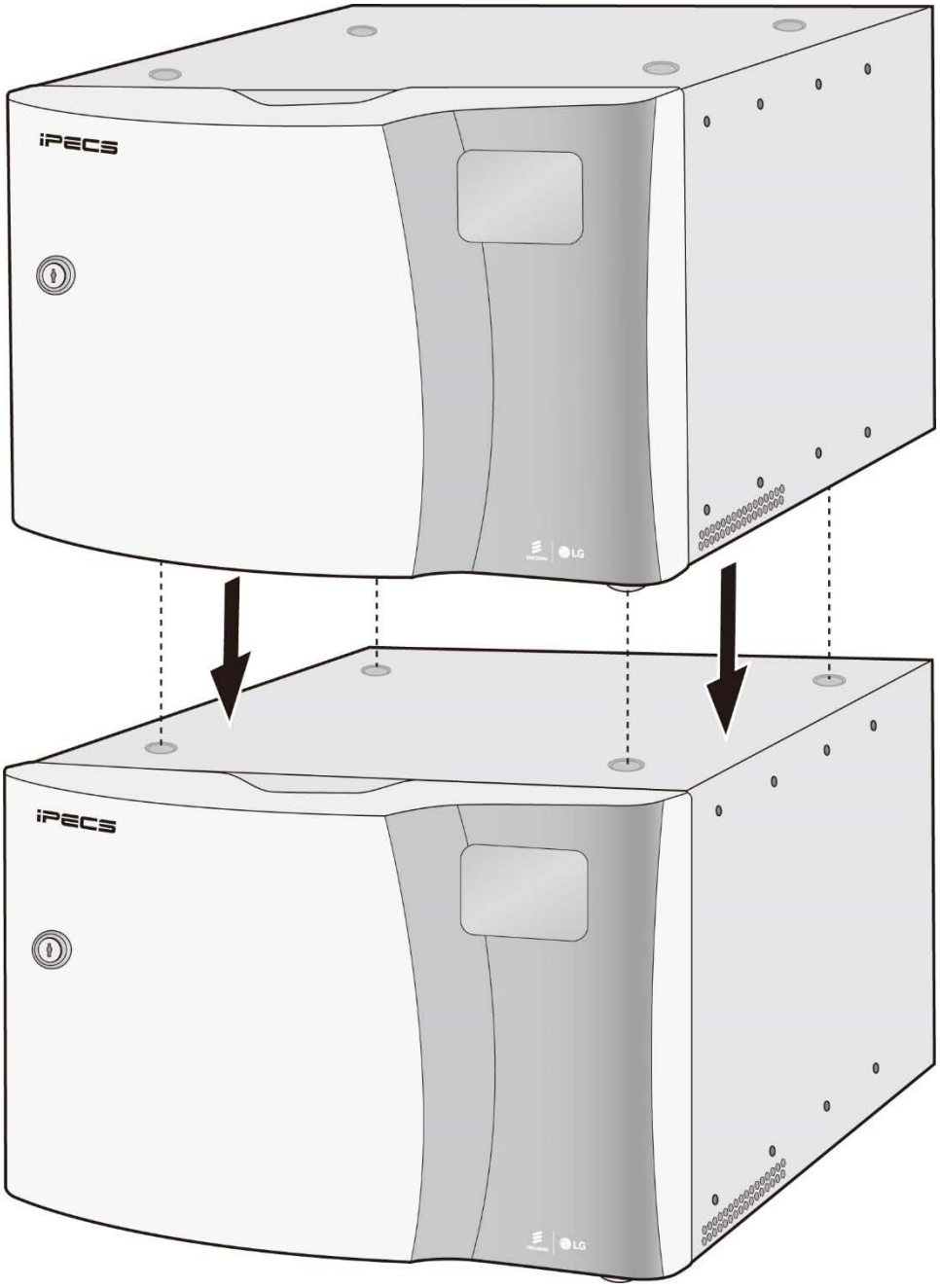


Figure 3-3 UCM-MGC3 2 layers Floor mount

Rack mounting UCM-MGC3

Remove the front cover of the cabinets prior to installation to avoid damaging the covers and to allow access to the interior. After rack mounting, close the front covers.

Rack mount brackets are provided as standard equipment with the UCM-MGC3. These brackets attach to the both sides of the UCM-MGC3.

To rack mount the UCM-MGC3:

1) Attach each bracket to the UCM-MGC3 Cabinet by using 8 screws provided.
2) Install the cabinet in the rack and secure Cabinet with 4 screws in the mounting flange holes.

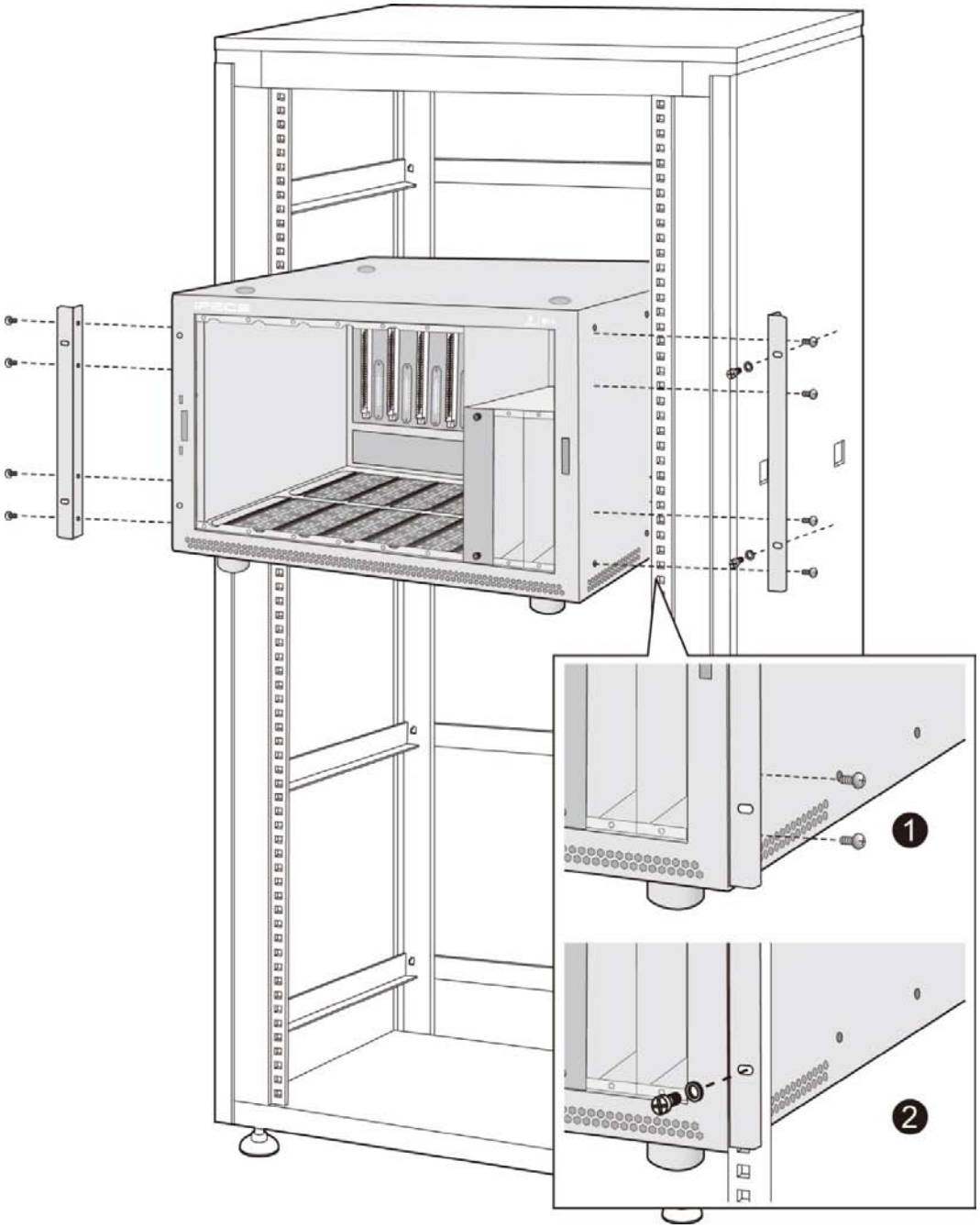


Figure 3-4 UCM-MGC3 Rack mounting

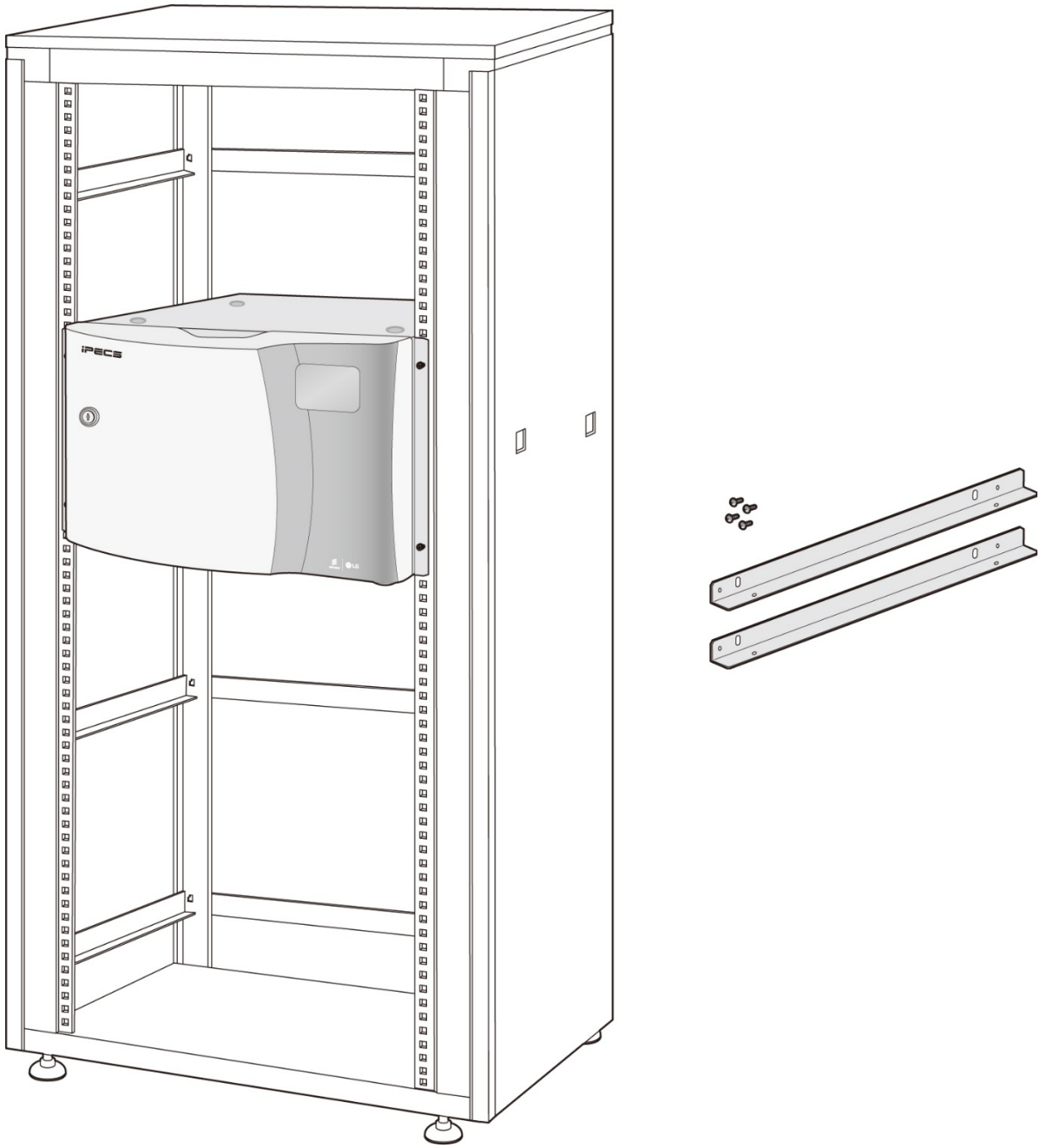


Figure 3-5 UCM-MGC3 Rack mounting installation (19 inch)

3.3.1.3 UCM Synchronization

UCM Synchronization is connected to CLK_UP port and CLK_DOWN port on RJ45 in the rear side.

Figure 3-6 UCM-MGC3 CLK DOWN & CLK UP LED

Table 3-1 Description of the Synchronization LED Status

Port	LED Color	Description
CLK_ UP	Yellow	LED ON: Receiving 8KHz system clock from UCM-MDTM2 directly LED OFF: Not Receiving
CLK_ DOWN	Yellow	LED ON: Receiving 8KHz system clock from UCM-MDTM2 directly LED OFF: Not Receiving
CLK_ UP	Blue	LED ON: Receiving 8KHz system clock from CLK_DOWN port of other UCM-MGC3 LED OFF: Not Receiving
CLK_ DOWN	Blue	LED ON: Receiving 8KHz system clock from CLK_UP port of other UCM-MGC3 LED OFF: Not Receiving

UCM Synchronization Cable Connection

Ethernet straight cable (UTP-5) can be used as UCM-SYNC cable. CLK_UP port should be connected to CLK_DOWN port of other UCM-MGC3 and CLK_DOWN port to CLK_UP port of other UCM-MGC3.

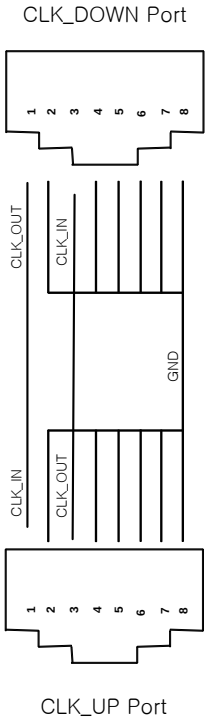


Figure 3-7 UCM-SYNC cable pin assignment

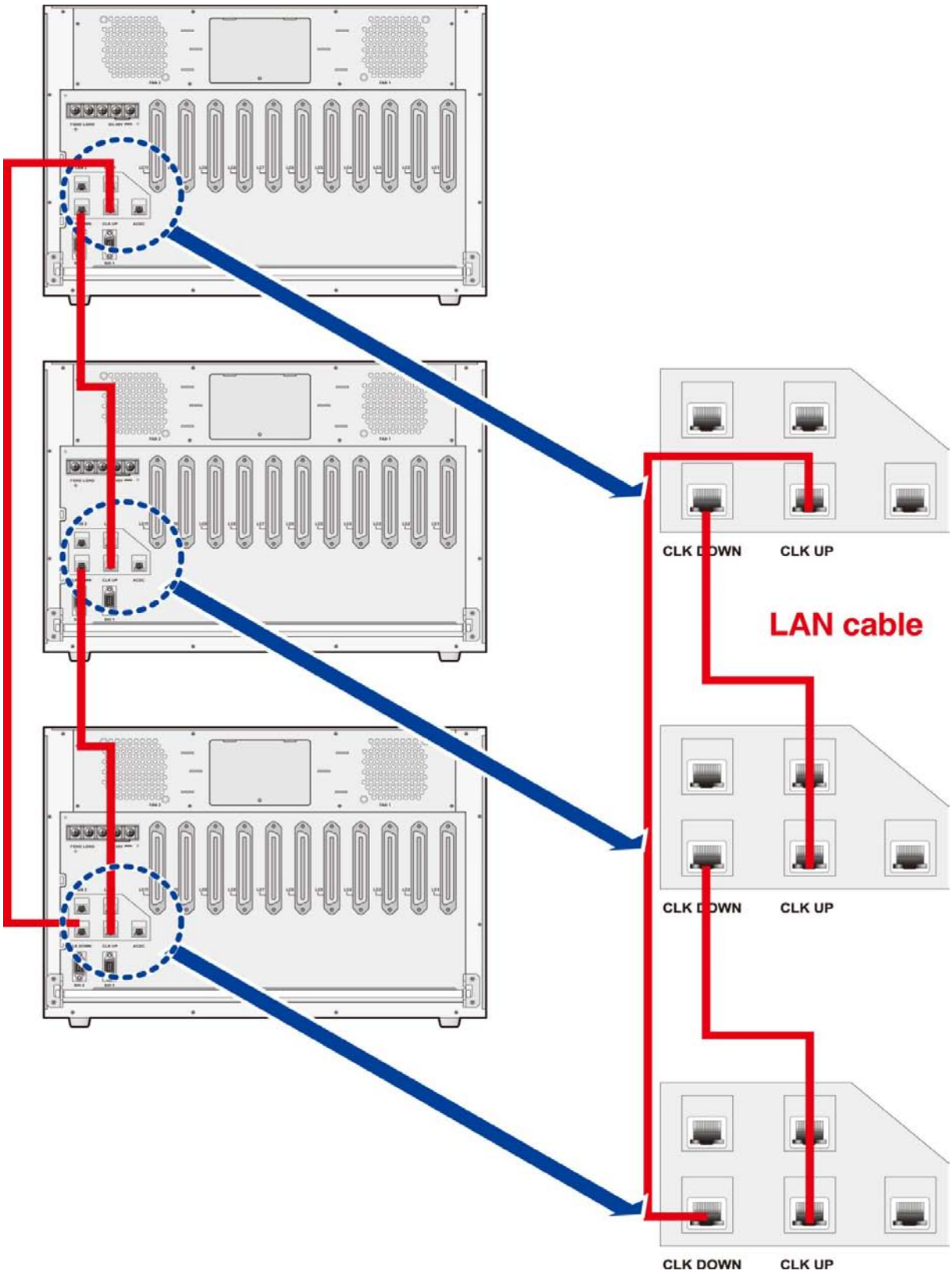


Figure 3-8 UCM Clock wiring

Synchronization groups

- Number of UCM-MGC3 in one Synchronization group: Max 6
- Cable length: Max 5m
- LGND terminals of all UCM-MGC3 belonging to a Synchronization group should be together connected to one protective earth ground bar.

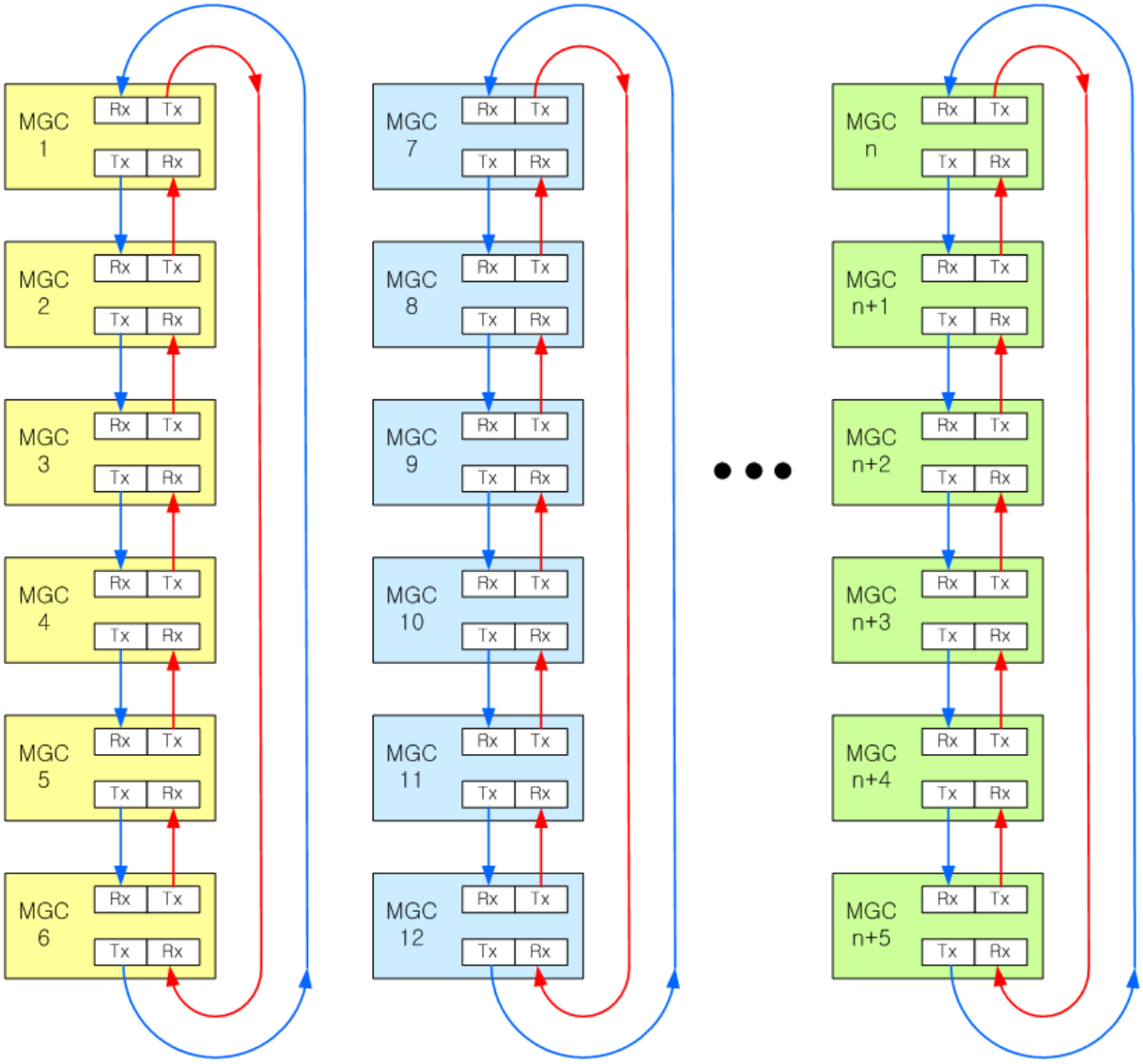


Figure 3-9 Block diagram of Synchronization group

3.3.1.4 UCM-MGC3 Grounding

CAUTION

Before connection to power, the UCM-MGC3 must be connected to a protective earth ground in conformance with the appropriate IEEE recommendations. A protective earth ground is required for user safety and to minimize EMC interference.

To ensure proper system operation and safety purposes, it is important to be required a protective earth ground. Connect to the communication ground of the building where available.

If AC power ground is used without separate communication ground, check induction of noise from other equipment. For wiring, see the system power and ground cable wiring diagram.

A 8 AWG UL type 1015 or thicker copper wire is recommended as the protective earth ground connection wire. However, check the appropriate national and local codes for proper conductor type and size.

The wire should be kept as short as possible; it is recommended that the wire be no longer than 1 meter (about 3.3 feet).

For protective ground ⏚, unscrew the FGND terminal of the terminal block on the rear side of the cabinet, connect the ground cable and tighten the screw. Refer to Figure 3-10

Connect the cabinet to the ground.

1) Loosen the screw.
2) Insert the grounding wire.
3) Tighten the screw.
4) Connect the grounding wire to the ground.

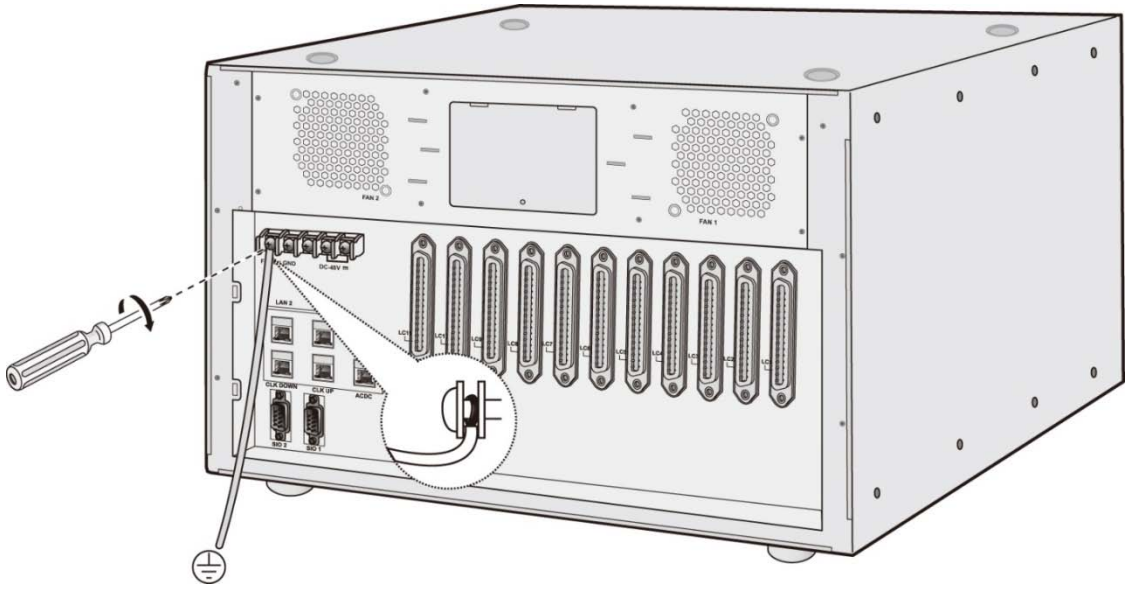


Figure 3-10 UCM-MGC3 Grounding

If more than one cabinet are installed in a 19” rack, Ground bar must be installed in the 19” rack and the FGND terminal of each cabinet must be connected to the ground bar which is connected to protective earth ground with thicker wire than 8 AWG cable.

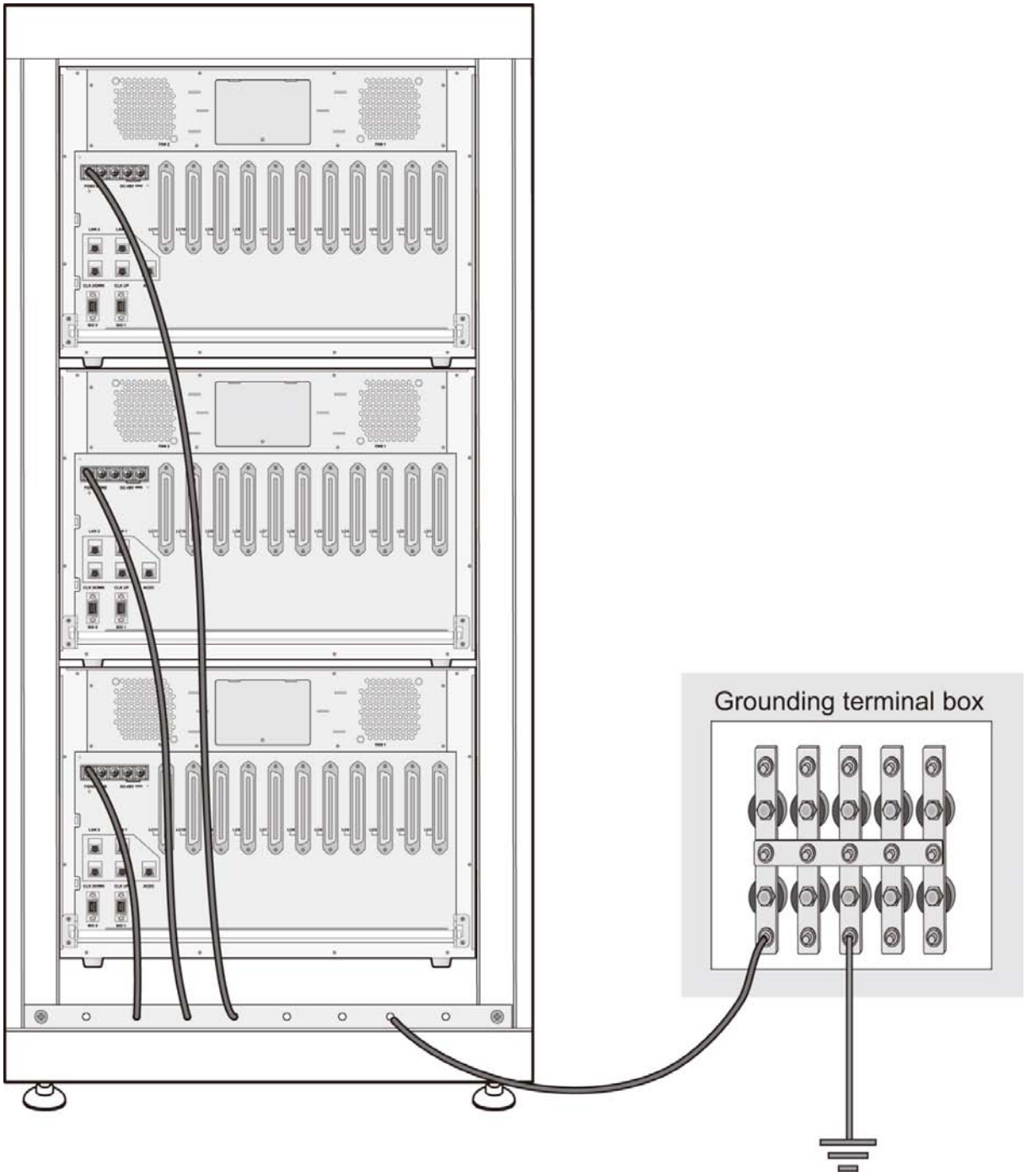


Figure 3-11 Correct Grounding Method

It must be absolutely prohibited to connect the FGND terminal of each cabinet to protective earth ground in a series as shown below.

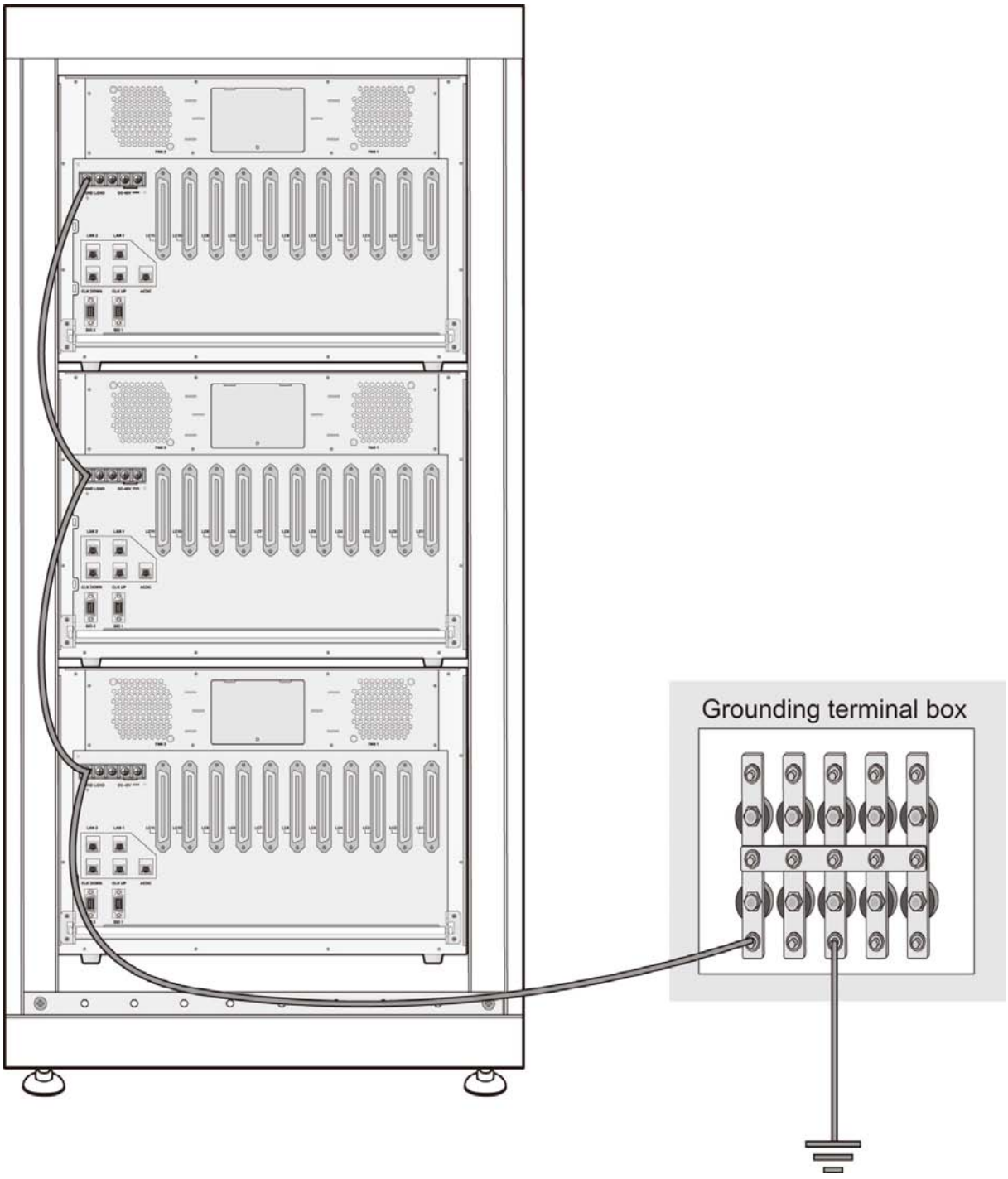


Figure 3-12 Incorrect Grounding Method

3.3.1.5 UCM-PSUD installation for UCM-MGC3

The UCM-PSUD is the power supply unit of the UCM-MGC3.

It distributes +5V to UCM-MGC3 by receiving DC -48V power from the rectifier.

3.3.1.5.1 PSUD Installation

PSUD (DC/DC Power Supply Unit) is installed in the UCM-MGC3 in a redundancy configuration and distributes DC +5V output by receiving DC -48V from the UCM-MGC3 terminal block.

Front LED

PSUD provides 4 statuses LED listed in the Table 3-2 below:

Figure 3-13 UCM-PSUD

Table 3-2 UCM-PSUD LED Statuses

LED Name	Color	Description
-48V	Green	On: DC -48V input normal, Off: Failure
+5V	Green	On: DC +5V output normal, Off: Failure (Below 3.7V~4.1V)
PWR_ALM	Red	On: DC +5V output is low voltage, Off: Normal output
FAN_ALM	Red	On: Fan operation is fault, Off: Normal operation

+5V switch

This switch is located on the PSUD front and is used to switch on/off the +5V output.

DC power switch and terminal block

The DC input power on/off switch of PSUD is located above the terminal block on the UCM-MGC3 rear panel. DC-48V is fed from the terminal block.

Fuse

PSUD includes a fuse of T6.3A / L250V.

PSUD Installation

CAUTION

Make sure to turn off the +5V output switch (+5V SW) on the front panel of UCM-PSUD before turning on or off the -48V input switch on the rear panel of UCM-MGC3. The reason is to prevent harmful arc discharge being produced in the -48V input switch.

1) Install PSUD at the bottom right slot of the cabinet in a redundancy configuration.
2) Tighten the thumbscrews in and then clockwise to affix PSUD to the UCM-MGC3.
3) Connect DC-48V input from the rectifier to the -48V pin of the terminal block on the UCM-MGC3 rear.
4) Turn on the DC switch ON to supply power.

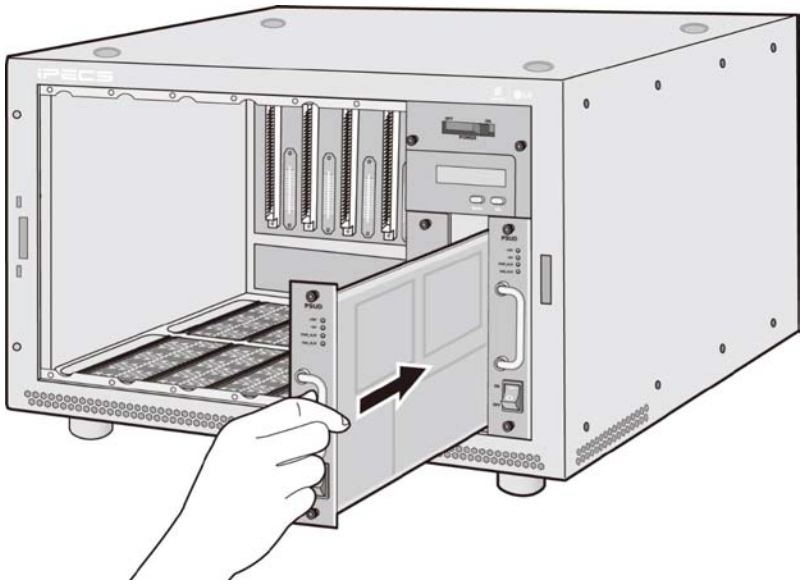


Figure 3-14 PSUD Installation 1

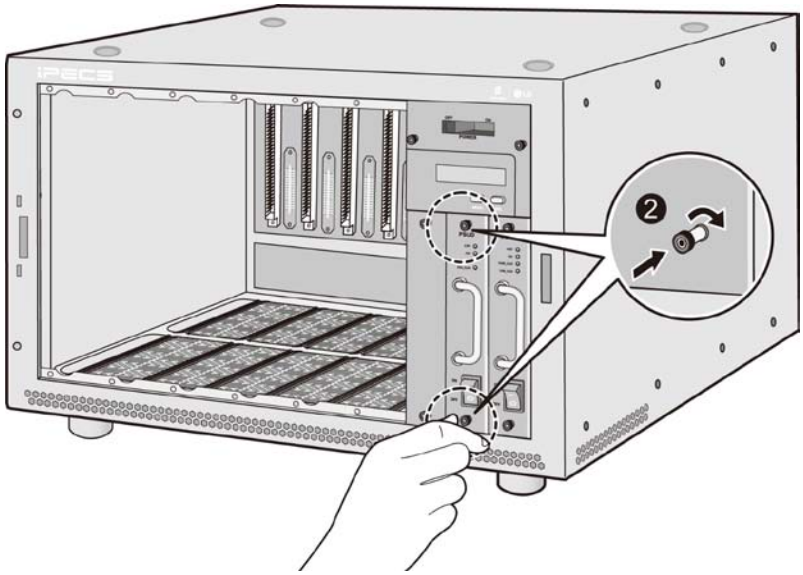


Figure 3-15 PSUD Installation 2

3.3.1.5.2 Rectifier Installation Requirements

Rectifier output characteristics

- Rated voltage: -48V
- Rated current: Depends on capacity
- Voltage range: - 46 ~ -54V
- Ripple & Noise: rms 2mV and less (Voice Band, 200 Hz ~ 4 KHz), rms 50mV and less (Other Band)
- Input voltage stability (at full load): ± 5% and less
- Output load stability (10 %~ 100 % Load): 5% and less

Wiring

To prevent voltage drop, keep wiring as short as possible using cables of sufficient capacity.

3.3.1.5.3 UCM-PSUD Power Cable Connection

-48V cable connection

- Determine the length of power cables taking into account of SYS – rectifier and rectifier – battery voltage drop.
- Pay attention to the cable color of -48V (blue) when assembling the cables.
- Fix the cable to the terminal with a jig and do soldering.
- Make sure to use an insulating shrink tube to prevent short circuit.

Note)

Use 8 AWG stranded wire.

GND cable connection

- Determine the length of power cables taking into account of SYS – rectifier and rectifier – battery voltage drop.
- Fix the cable to the terminal with a jig and do soldering.
- Use GND (Red/Black) cable.
- Make sure to use an insulating shrink tube to prevent short circuit.

DC cable specification and connection

When PSUD is used for UCM-MGC3, connect the rectifier as shown in Figure 3-15 below. Make sure to connect FGND and LGND to the rectifier instead of the system.

Table 3-3 DC cable specification

System	Max Load Current	Cable Specification
UCM-MGC3	30 A	More thick than 8 AWG (8.4 SQ)

(Based on cable length 10m, allowable voltage drop 0.5V)

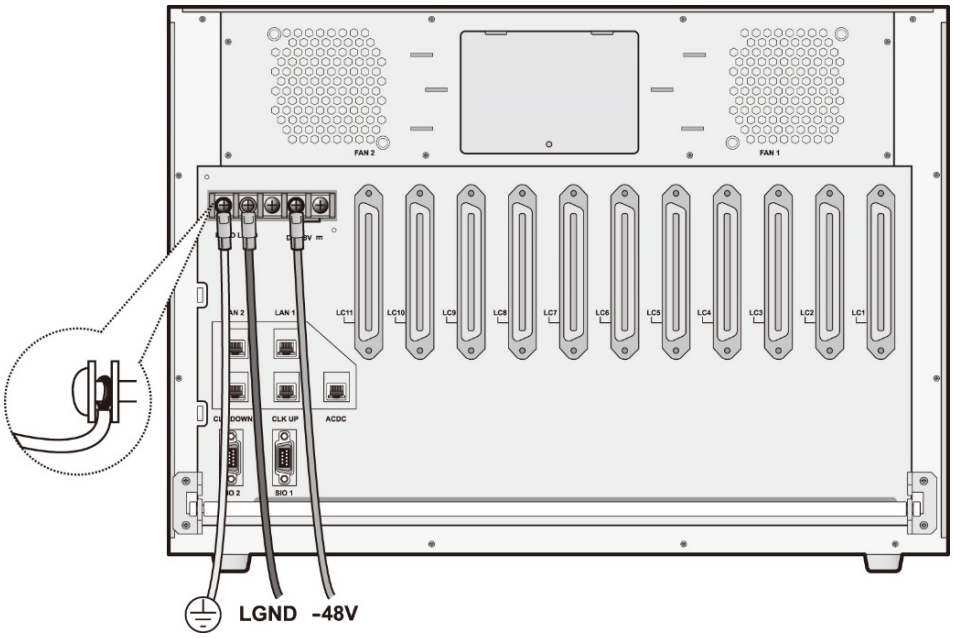


Figure 3-16 UCM-MGC3 Power Cable Connection after PSUD installation

3.3.1.5.4 Rectifier Cable Connection

Rectifier cable connection diagram

When PSUD is used for the UCM-MGC3, a rectifier is used to feed DC -48V power. Power and ground cable connected from the rectifier to the system should have the same size and length. Figure 3-16 shows rectifier and UCM-MGC3 cable connection.

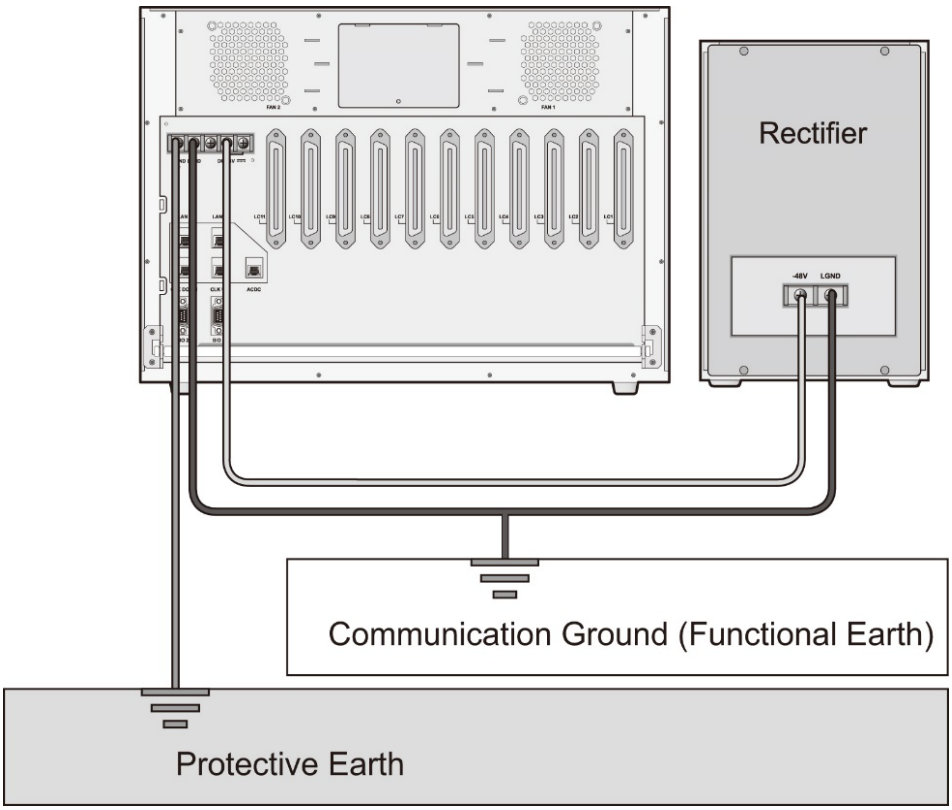


Figure 3-17 Rectifier Cable Connection Diagram

CAUTION

Make sure to turn the -48V/BATT SW switch OFF on the UCM-MGC3 rear panel before connecting power cables. If more than one cabinet are installed in a 19” rack, PDU (DC Power Distribution Unit) must be installed in the 19” rack and the DC power input terminal of each cabinet must be connected to the PDU to which a rectifier supply DC power (DC -48V).

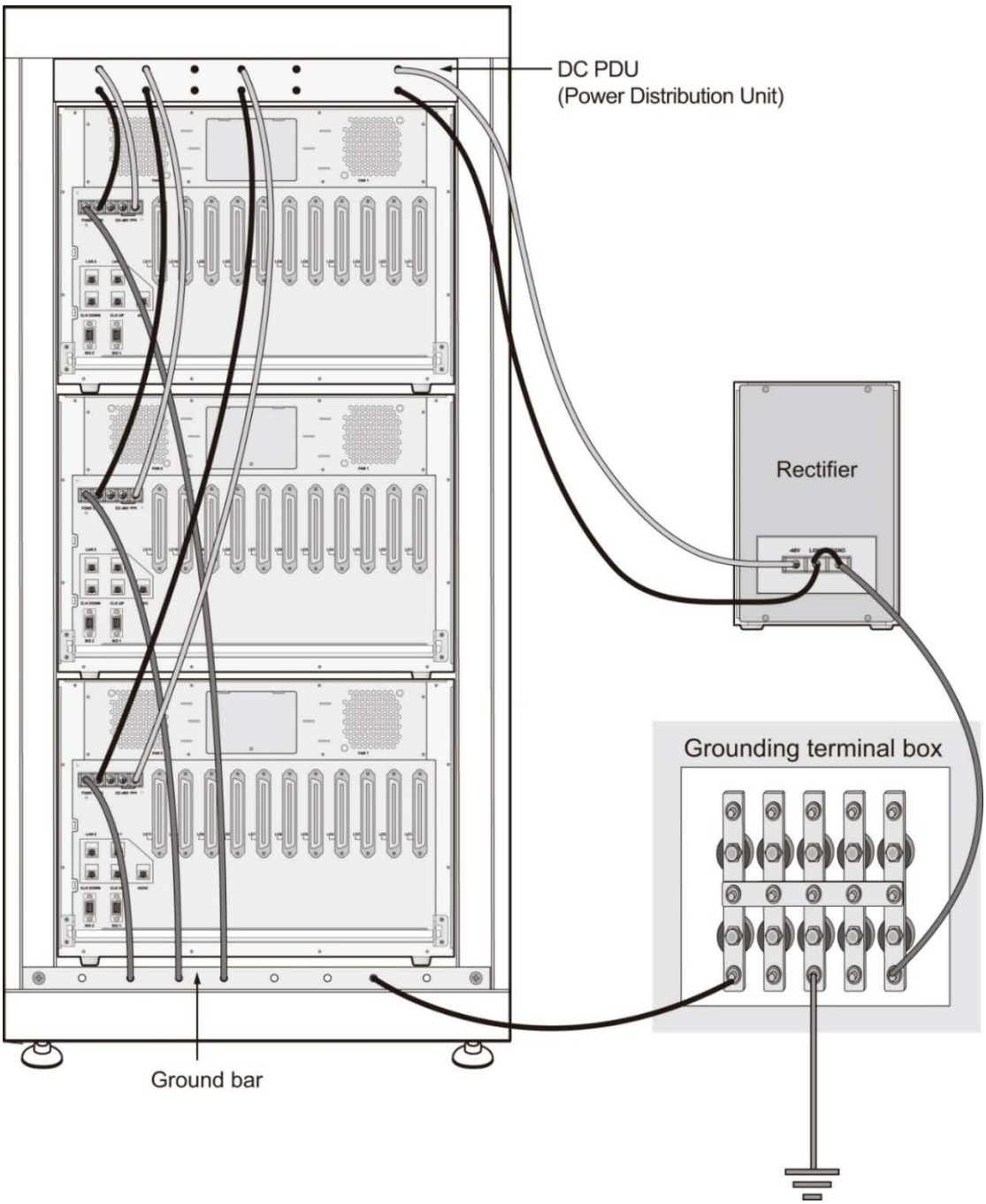


Figure 3-18 Correct Example of Rectifier Cable Connection

It must be absolutely prohibited to connect the DC power input terminal of each cabinet to the rectifier in a series as shown below.

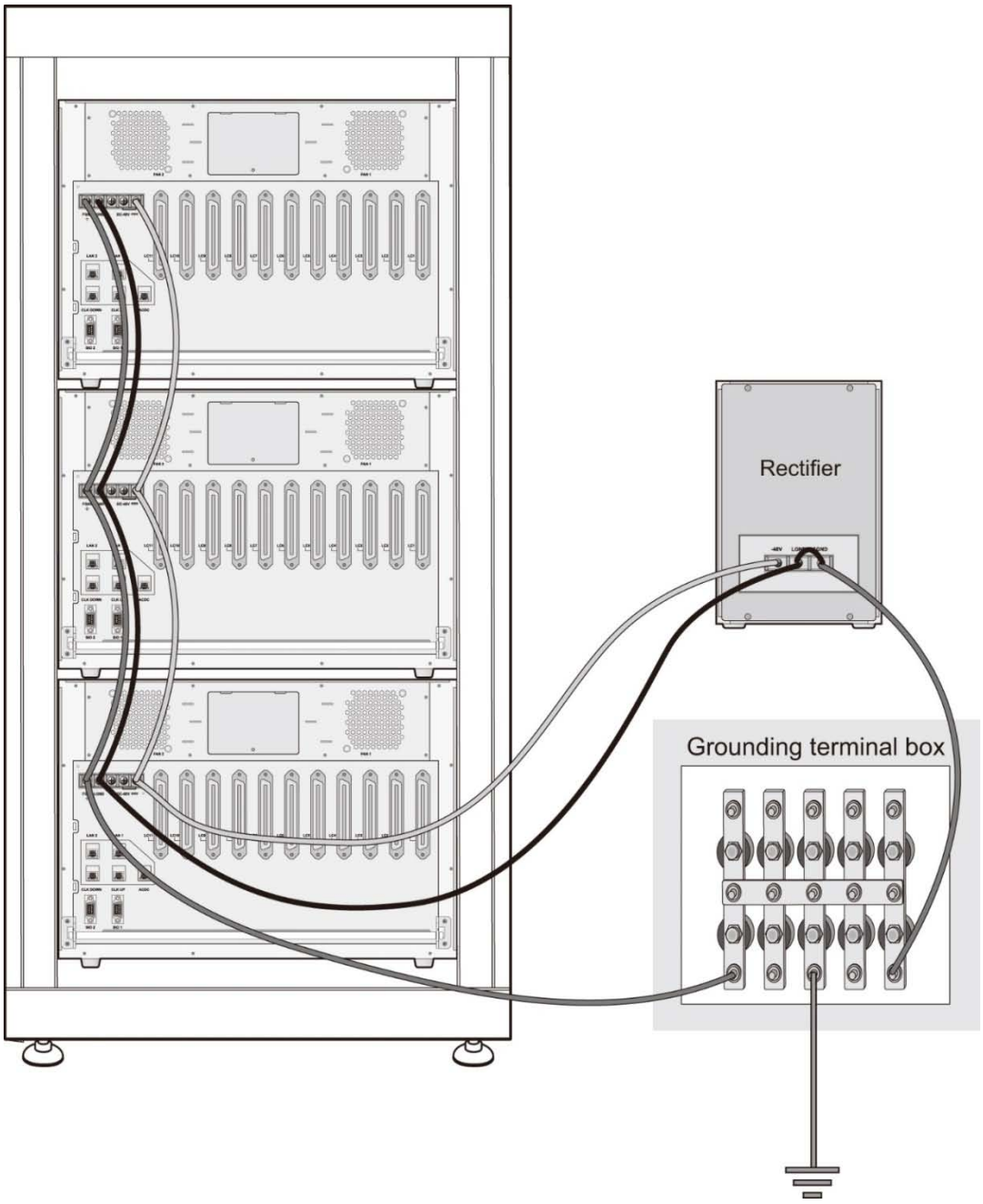


Figure 3-19 Incorrect Example of Rectifier Cable Connection

Refer to the following table for the DC power cable specifications.

Current	15 A ~ 25 A	25 A ~ 40 A	40 A ~ 60 A	60 A ~ 100 A
Wire Thickness	10 AWG (5.3 SQ, diameter : 2.6 mm)	8 AWG (8.4 SQ, diameter : 3.3 mm)	6 AWG (13 SQ, diameter : 4.1 mm)	6 AWG (13 SQ, diameter : 4.1 mm)

(Based on cable length 5m, allowable voltage drop 2%)

3.3.2 UCM-1URMC Installation

The UCM-1URMC provides 1 slot for S2K or Gateway Module.

3.3.2.1 Installing Floor mount & Rack mount

The UCM-1URMC uses to floor standing or rack mounting depending on the environment.

Floor Standing UCM-1URMC

The cabinet must be installed on flat place.

Rack mounting UCM-1URMC

Install the UCM-1URMC in the rack and fix it with the 4 screws in the mounting flange holes.

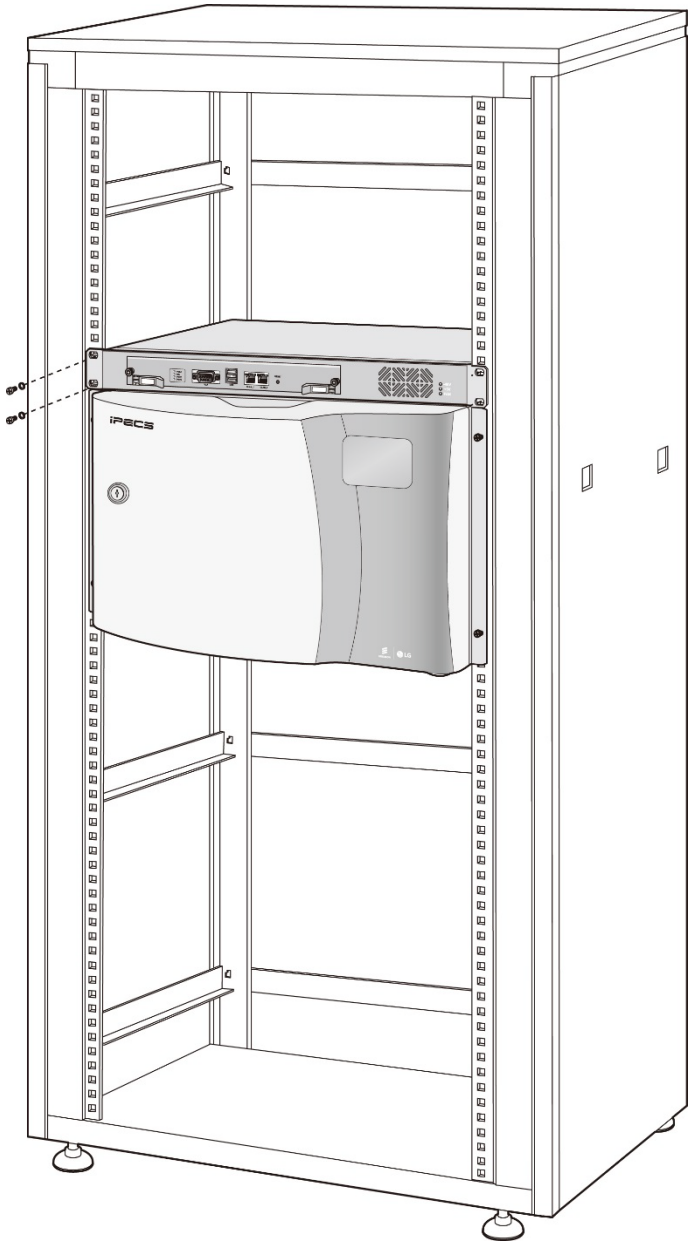


Figure 3-20 UCM-1URMC Installation at the 19" Rack

3.3.2.2 UCM-1URMC Grounding

CAUTION

Before connection to AC power, the UCM-1URMC must be connected to a protective earth ground in conformance with the appropriate IEEE recommendations. A protective earth ground is required for user safety and to minimize EMC interference.

The UCM-1URMC grounding is the same as UCM-MGC3 grounding. It is important to be required a good protective earth ground for proper system operation and safety. If AC power ground is used without separate communication ground, check introduction of noise from other equipment. For wiring, see the system power and ground cable wiring diagram given in 3.5 PSU Installation.

A 14 AWG UL type 1015 or larger copper wire is recommended as the protective earth ground connection wire. However, check the appropriate national and local codes for proper conductor type and size. The wire should be kept as short as possible; it is recommended that the wire be no longer than 1 meter (about 3.3 feet).

For protective ground ⏚ , unscrew the FGND terminal of the terminal block on the rear side of the cabinet, connect the ground cable and then tighten the screw. Refer to Figure 3-20.

Connect the cabinet to the ground.

1) Loosen the screw.
2) Insert the grounding wire.
3) Tighten the screw.
4) Connect the grounding wire to the ground.

Figure 3-21 UCM-1URMC Grounding

If more than one cabinet are installed in a 19” rack, Ground bar must be installed in the 19” rack and the FGND terminal of each cabinet must be connected to the ground bar which is connected to protective earth ground.

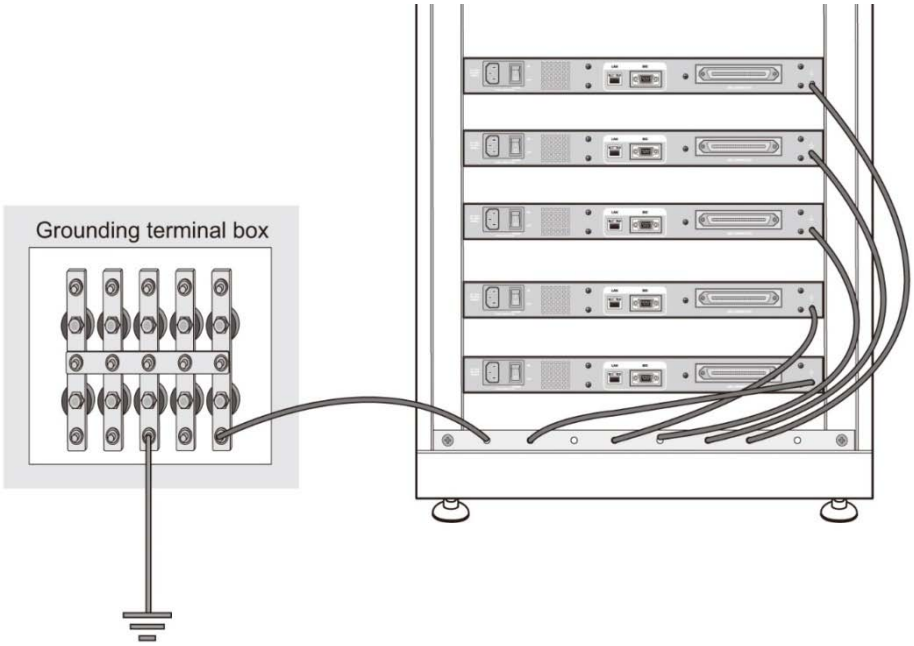


Figure 3-22 Correct Grounding Examples

3.3.2.3 UCM-1URMC Power Cable Connection

The UCM-1URMC power supply unit is composed of the PSUA-1U (AC/DC Power Supply Unit for 1URMC), which is installed in the UCM-1URMC and converts AC110V/230V input to DC –50V/+5V.

AC Power Cord specification

Since the UCM-1URMC uses AC/DC power supply unit, PSUA-1U, the AC power cord must be connected.

Table 3-5 AC Cable Specification

System Capacity	Expected Max Load Current	Cable Specification
UCM-1URMC	1 A	Use the cable supplied together with the UCM-1URMC

Figure 3-23 UCM-1URMC AC Power Cable Connection

CAUTION

Make sure to turn the AC SW switch OFF to connect the power cord for AC power supply.

3.4 Call Server Installation

The iPECS UCM provides two types of Call Server, Cabinet type and Module type.
The Cabinet types are UCM-S4K, UCM-S10K and UCM-S30K, It has own cabinet.
The Module type is UCM-S2K which can install in UCM-MGC3 or UCM-1URMC.

3.4.1 UCM-S2K Installation

When the UCM-S2K is mounted in a UCM-MGC3, it can be installed in any of the 11 slots but it is recommended to install in the left slot, Slot 1 of UCM-MGC3. It can also be installed in UCM-1URMC for stand-alone operation.

LED

Table 3-8 UCM-S2K Status LED

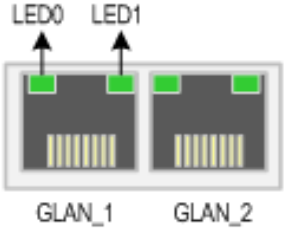
LED No.	Name	LED Description
LED 1	**FAULT**	Red LED on when UCM-S2K is abnormal
LED 2	**HDD**	Green LED blink in the event of SATA SSD disk access
LED 3	**TASK1**	Reserved for S/W
LED 4	**TASK2**	Reserved for S/W

LAN cable connection

To connect the LAN cable of the UCM-S2K to an external Ethernet switch, connect the cable to the RJ45 connector on the front side of the Gateway Module.

If the front cover of UCM-MGC3 is closed, make a through-hole on the front cover to induce the cable outward as shown in Figure 3-26.

There are two Ethernet port LED on the UCM-S2K and each port has 2 LED (LED0, LED1) for indicating the Ethernet speed.



LED 0	LED 1	Link Speed
OFF	OFF	10 Mbps
ON (Blink)	OFF	100 Mbps
OFF	ON	1000 Mbps

Figure 3-24 UCM-S2K Ethernet Port LED

CAUTION

Pay attention when using the 1000 base-T (Giga LAN).
The UTP-5e or UTP-6 must be used.

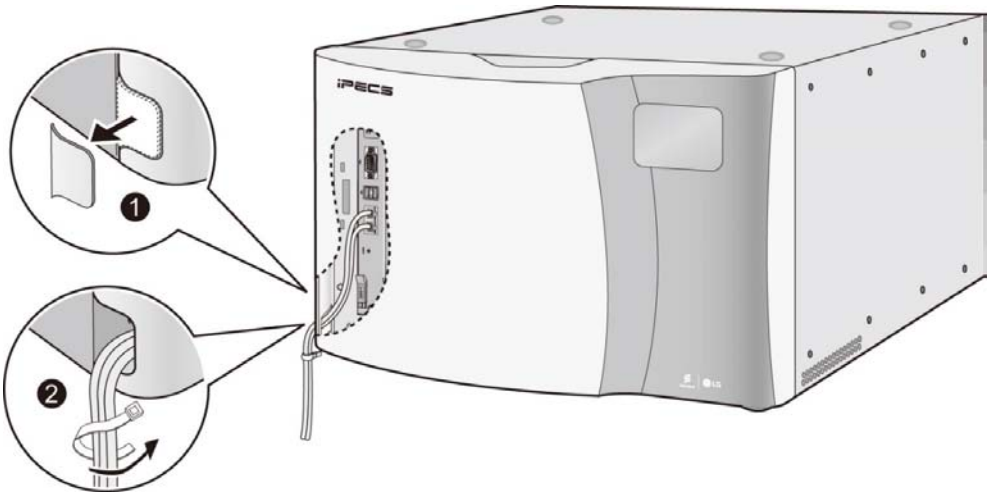
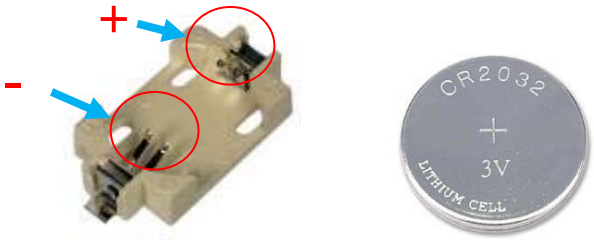


Figure 3-25 UCM-S2K LAN Cable Connection

Coin or Cell Type Lithium battery

Coin type lithium battery inserted in the holder is used to maintain the BIOS information of the CPU Gateway Module.



Battery holder **Coin type lithium battery**

CAUTION

- ✓ Pay attention to the polarity when replacing the battery. The system will not properly work if the battery replaced incorrectly.
- ✓ Make sure to replace the battery with the recommended type (CR2032, 3V).
- ✓ The features (CR2032) are as below

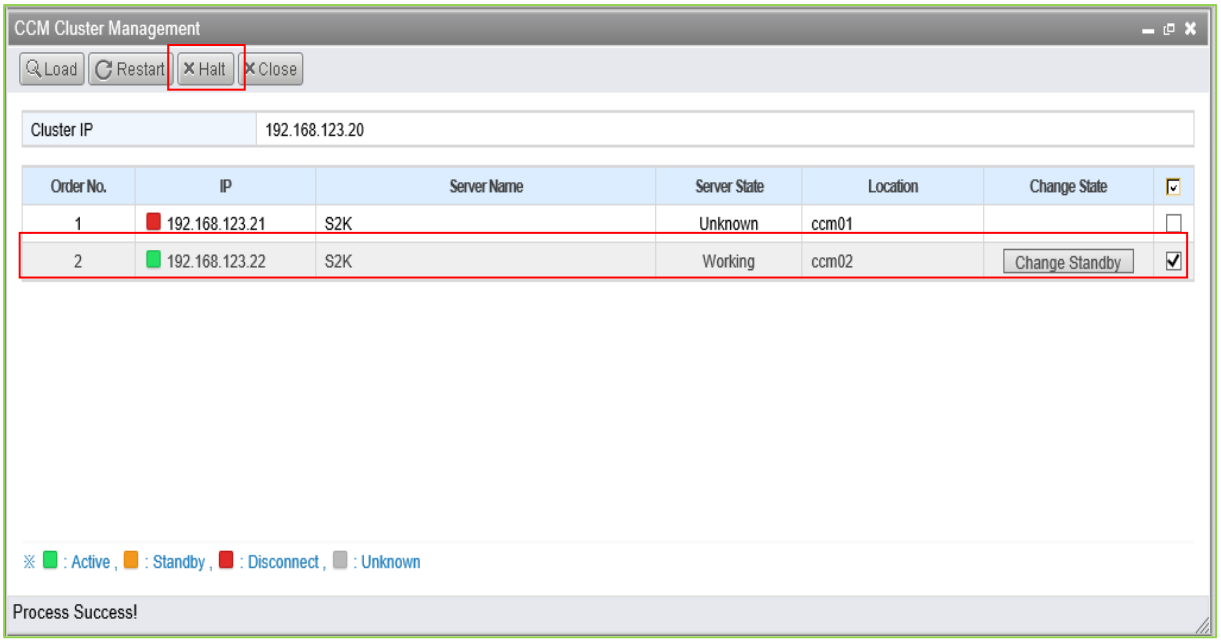
- . Very safe (poly-carbon-mono-fluoride lithium)
- . Extremely strong load pulse characteristics (manganese dioxide lithium)
- . Operating temperature range: -30ºC ~ +60ºC

- ✓ Treat the used battery in accordance with manufacturer's instructions.
- ✓ Be careful about short circuit when inserting it into the holder.
- ✓ Let the + polarity face upward and insert the battery while pressing the Θ pin of the holder until the + pin presses the upper side of the battery.

Shut down methods for operating OS programs

If the UCM-S2K needs to be unplugged, the UCM-S2K OS program should be shut down first. There are three way to shut down as following step.

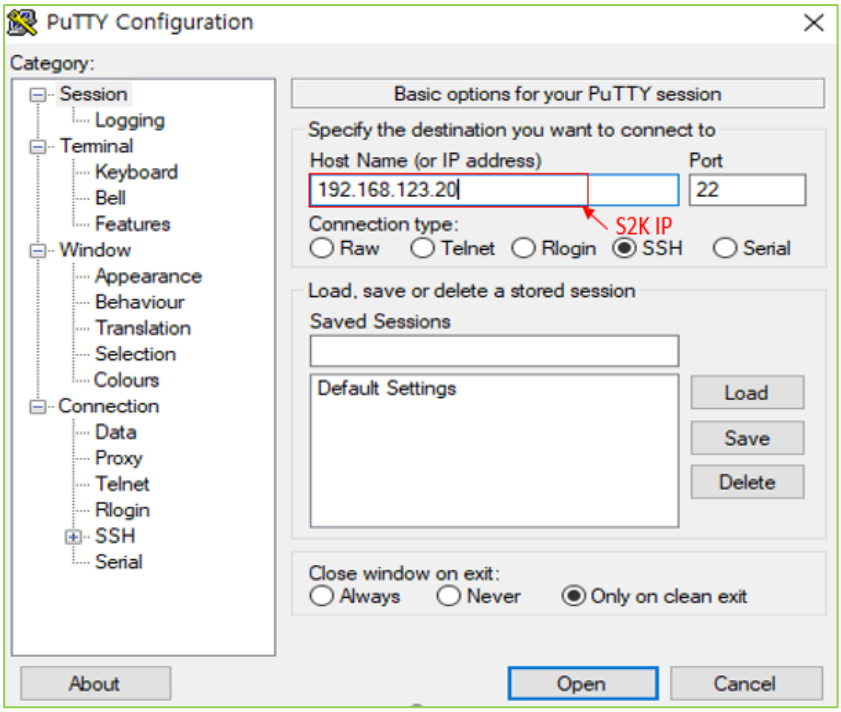
1) Access WMS (Recommend)



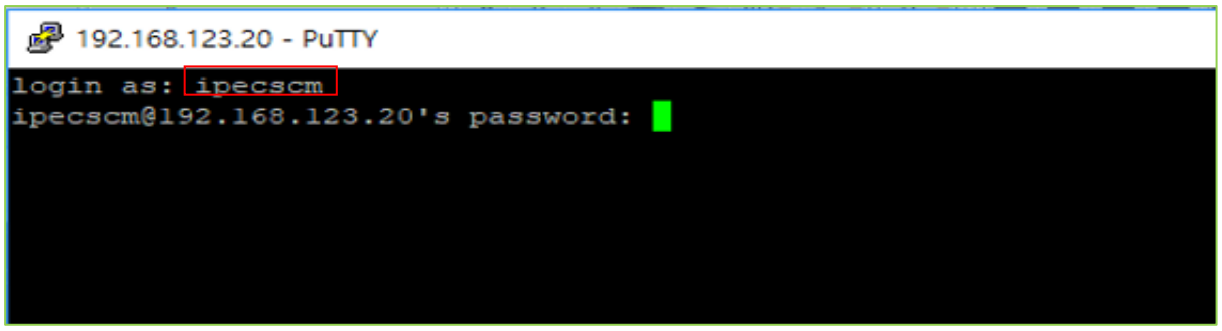
- Check S2K that wants to shut down
- Click the 'Halt' button
- S2K power off

2) Access SSH (Putty, Teraterm.)

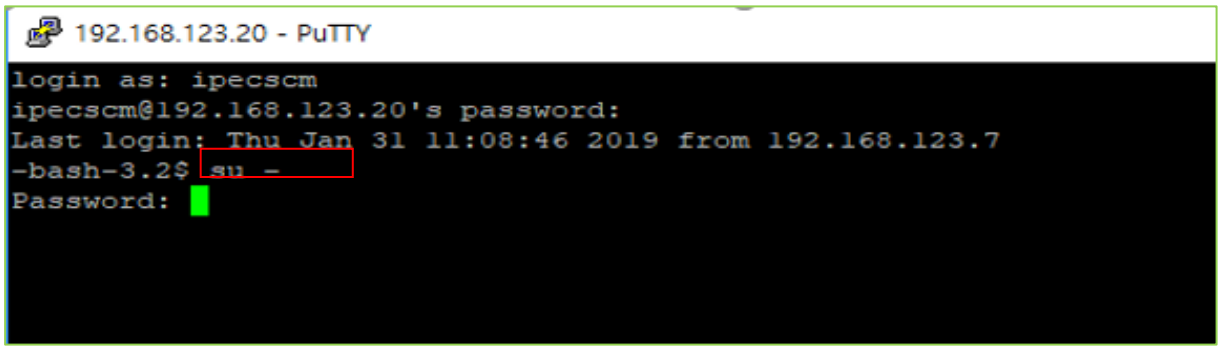
- Connect to S2K by SSH Programs such as Putty



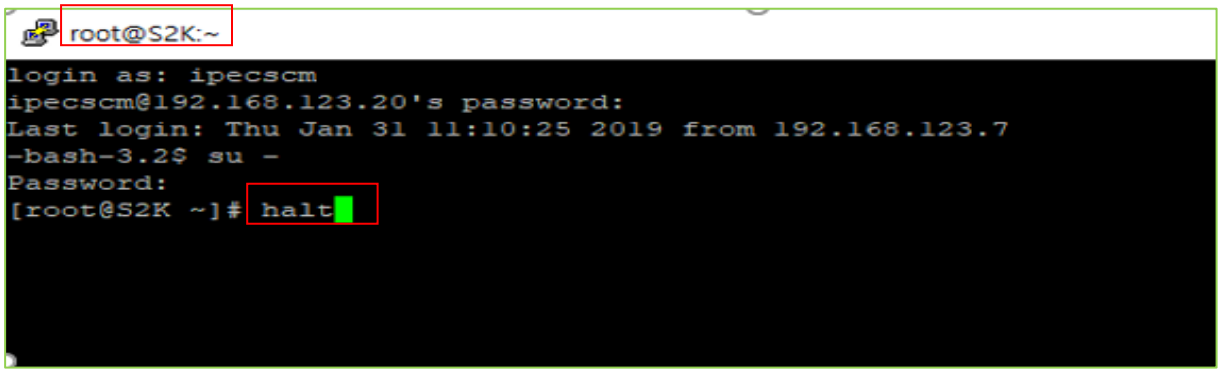
- Log in to 'ipecscm' account and enter 'password '



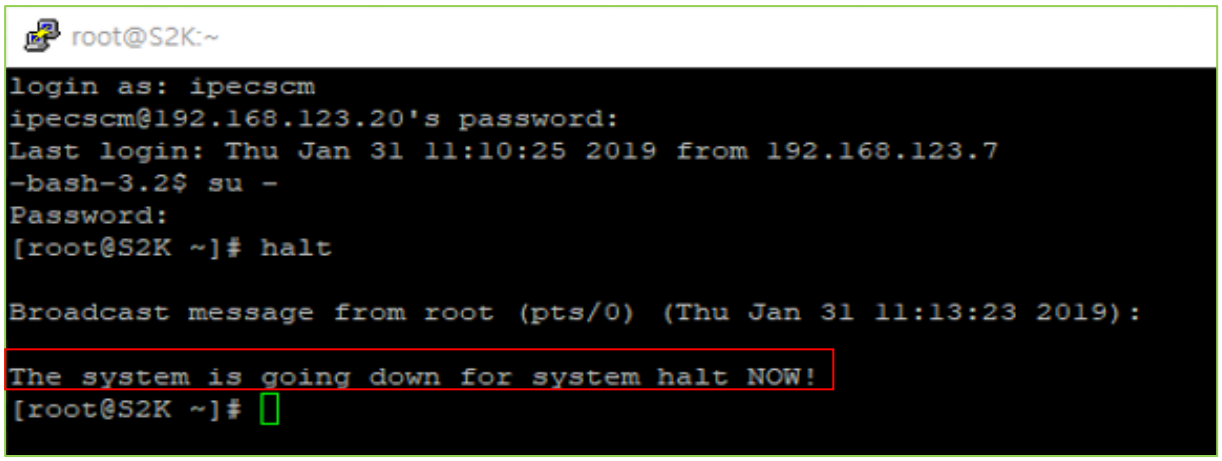
- Change authority to Super User and enter 'password'.



- Enter 'halt' after checking root account access

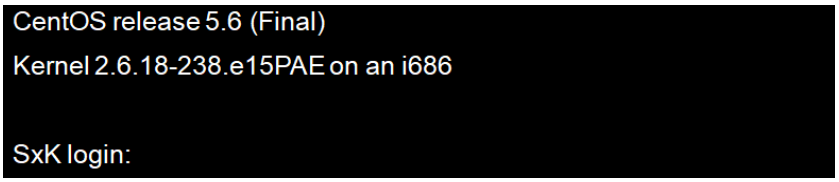


- Power off after checking the Halt status

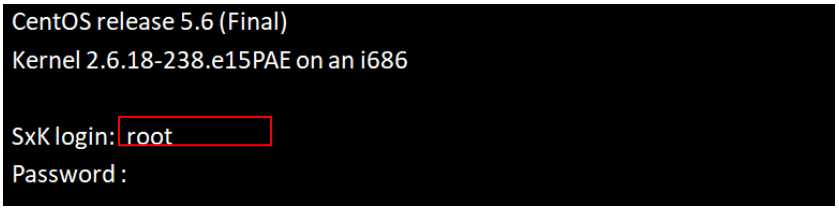


3) S2K Direct Access

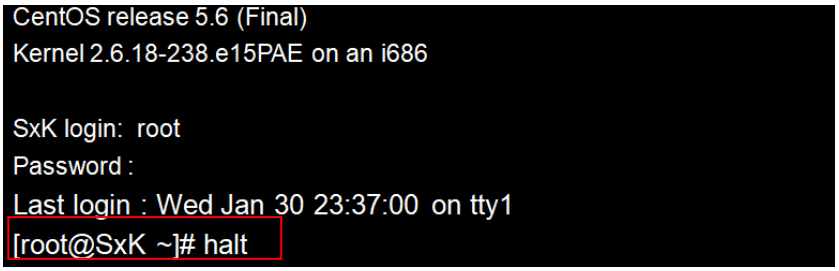
- Create command window (connect monitor to S2K VGA port and USB port)



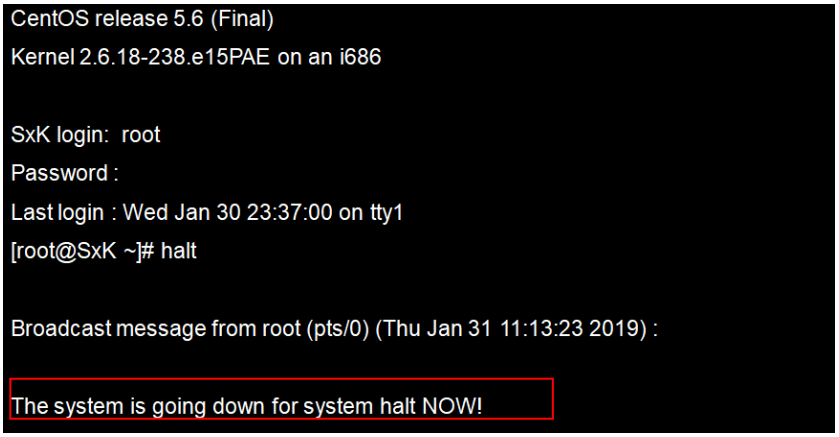
- Log in to 'root' account and enter 'Password'



- Enter 'halt' in root account



- Power off after checking the Halt status



CAUTION

The UCM-S2K has internal HDD/SSD, which are sensitive products that can cause damage in the external environment or during use, so be careful not to be impacted.

- During the process of disassembling or installing the system, external shocks can cause data corruption.
- If the system suddenly shuts down during HDD/SSD operation, such as power down or power off, the HDD/SSD can be damaged.
- Moving or impacting the system during HDD/SSD operation can damage the file or damage the HDD/SSD.

3.4.2 UCM-S30K/S2K Redundancy Connection

Redundancy connection

Both the UCM-S30K and the UCM-S2K provide 2 10/100/1000Mbps Ethernet ports for cable link redundancy as shown in Figure 3-27 ~3-30. When a single Ethernet switch is used without redundancy, all cables are connected to the Ethernet switch as shown in Figure 3-27 and Figure 3-28. When duplicated switches are used, duplicated UCM-S30K/UCM-S2K are connected to each switch respectively as shown in Figure 3-29 and Figure 3-30. The UCM-S10K can be connected in the same way as the UCM-S30K.

Duplicated UCM-S2Ks can be installed in different UCM-MGC3s as shown in Figure 3-28 or can be installed in the same UCM-MGC3 as shown in Figure 3-30.

See the iPECS UCM Software Manual for the detailed information on redundancy connection

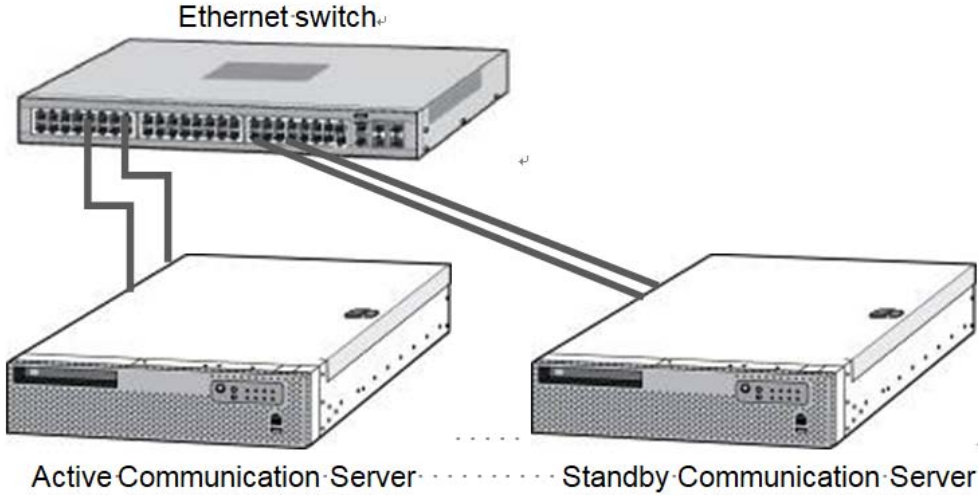


Figure 3-26 UCM-S30K Redundancy Connection (One Ethernet switch is used)

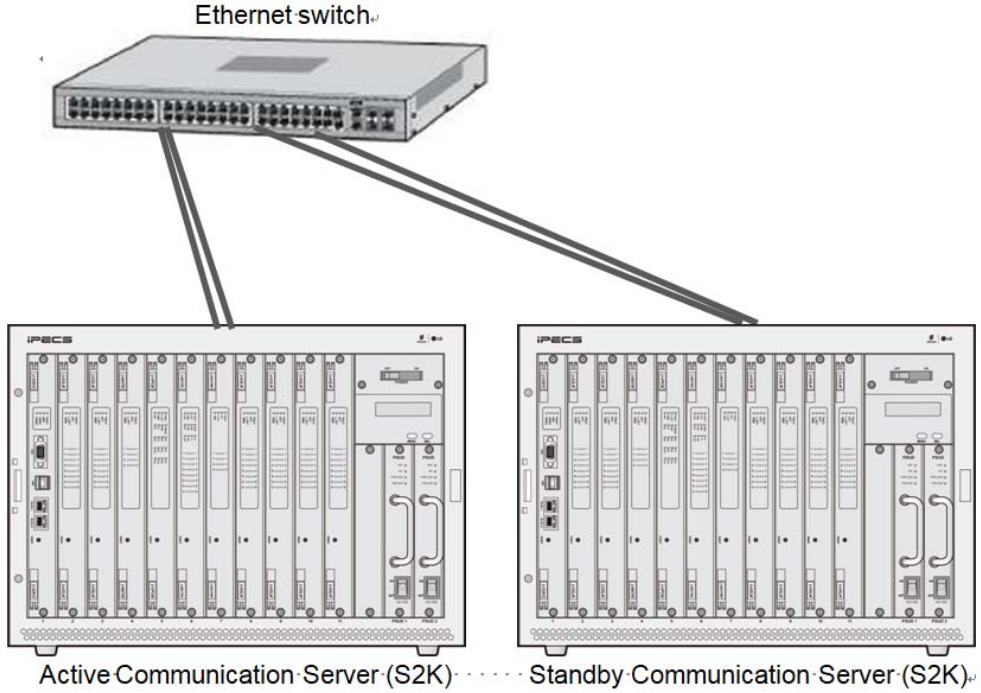


Figure 3-27 UCM-S2K Redundancy Connection (One Ethernet switch is used)

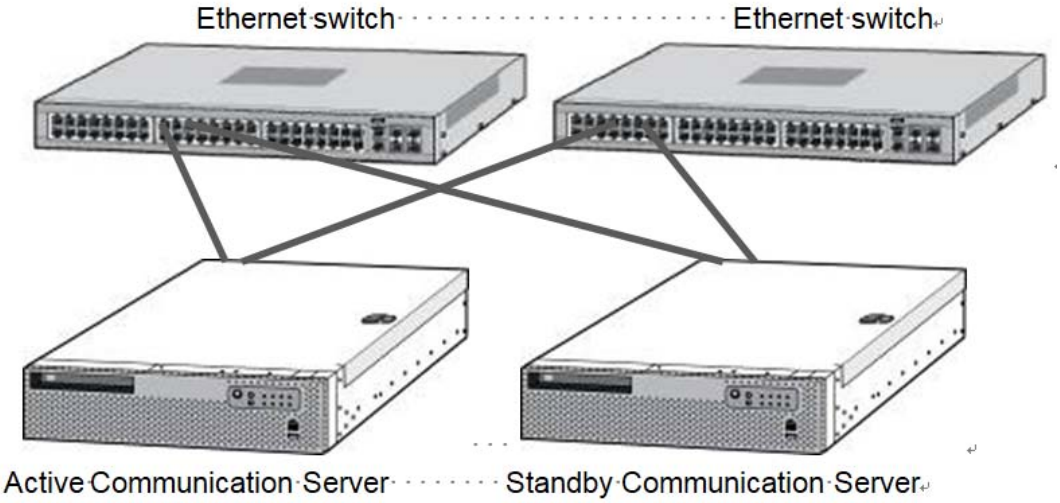


Figure 3-28 Redundancy Connection for UCM-S30K and Ethernet Switch

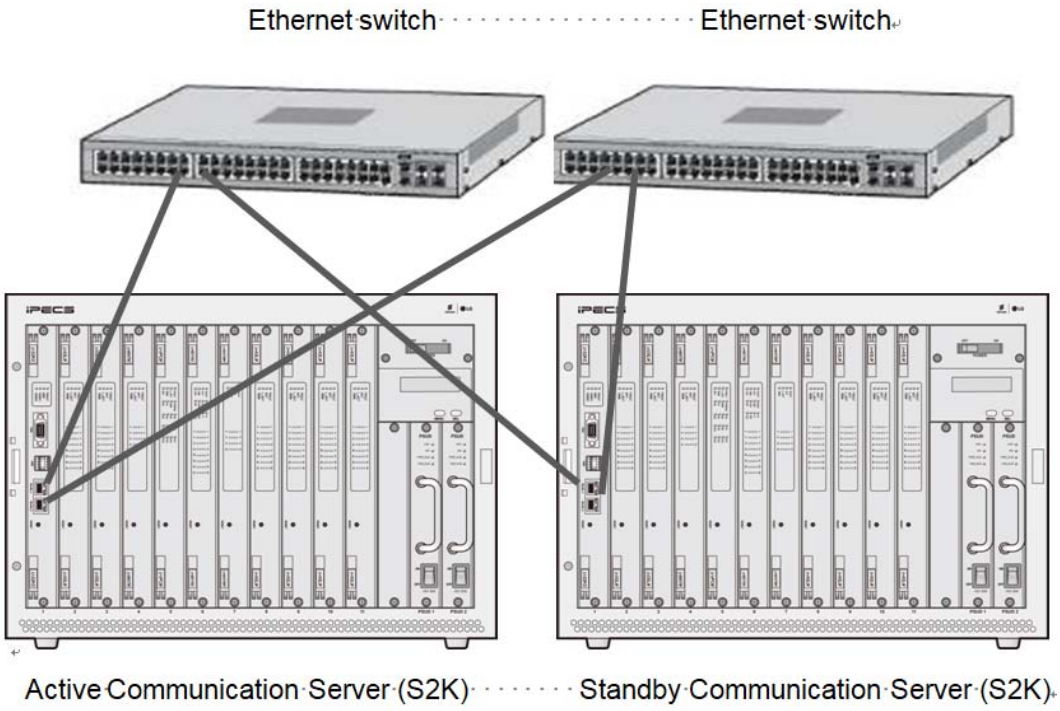


Figure 3-29 Redundancy Connection for UCM-S2K and Ethernet Switch

CAUTION

Pay attention to using the 1000 base-T (Giga LAN). The UTP-5E or UTP-6 must be used

3.5 Gateway Module Installation

All Gateway modules are installed in UCM-MGC3 or UCM-1URMC.

3.5.1 Gateway Module Insertion and Removal

Gateway Modules are easily installed in a cabinet. Insert the gateway Module into a desired slot in the cabinet by exactly aligning the gateway Module connector to the back plane and gently push it until you feel resistance. And fix it firmly by tightening the screws on both sides of the front panel. To remove the gateway Module, release the screws on both sides of the front panel and eject the Gateway Module forward by pulling the ejector on the lateral side.

Insert a gateway Module in the order of step 1 to step 5 and remove it in the reverse order of the mounting procedure as shown in Figure 3-31.

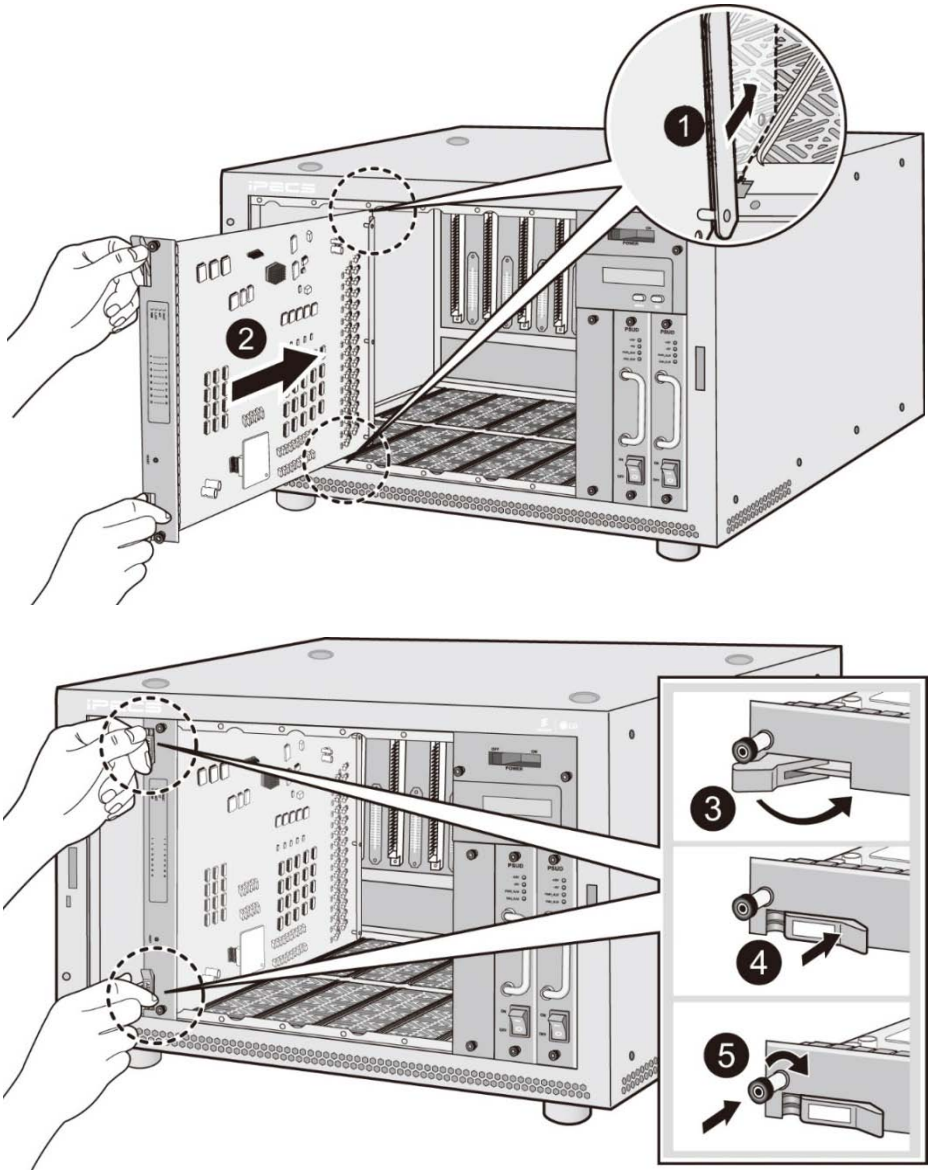


Figure 3-30 Gateway Module Installation and Removal on UCM-MGC3

3.5.2 UCM-ASLM Installation

The UCM-ASLM can be installed on either UCM-MGC3 or UCM-1URMC. When installed on the UCM-MGC3, it can be in any of the 11 slots. It can also be installed stand alone in UCM-1URMC.

LED

There are 36 LED on the UCM-ASLM front panel for the status and diagnosis as shown in the Table 3-9.

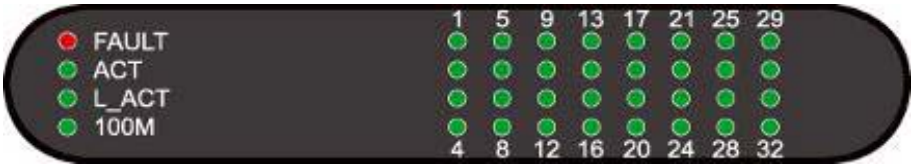


Table 3-9 UCM-ASLM Status LED

LED	LED Function	Description
FAULT	CPU status	Off–Normal, On – Fault (or reset)
ACT	Gateway Module status	Blink at active
L_ACT	Ethernet traffic (External port)	Off – No traffic, Blink - Traffic
100M	Ethernet speed (External port)	Off - 10 Mbps, On - 100 Mbps
1 ~ 32	Port status	Off – on-hook(idle), On – off-hook(busy), Blink – Ring supplied

Wiring Connectors

To install the UCM-ASLM on the UCM-1URMC, connect it to the iPECS UCM system through the RJ-45 connector marked “LAN” on the rear side of the cabinet.There is a 64 pin (LB) champ connector connected through the PCB edge on the rear side of the cabinet:

- Wire each champ connector to an SLT device/MDF.
- Tag or Number wiring for maintenance.

Champ connector wiring (UCM-ASLM)

Description	Pin No	Pin No	Description
Port 1 TIP	1	33	Port 1 RING
Port 2 TIP	2	34	Port 2 RING
Port 3 TIP	3	35	Port 3 RING
Port 4 TIP	4	36	Port 4 RING
Port 5 TIP	5	37	Port 5 RING
Port 6 TIP	6	38	Port 6 RING
Port 7 TIP	7	39	Port 7 RING
Port 8 TIP	8	40	Port 8 RING
Port 9 TIP	9	41	Port 9 RING
Port 10 TIP	10	42	Port 10 RING
Port 11 TIP	11	43	Port 11 RING
Port 12 TIP	12	44	Port 12 RING
Port 13 TIP	13	45	Port 13 RING
Port 14 TIP	14	46	Port 14 RING
Port 15 TIP	15	47	Port 15 RING
Port 16 TIP	16	48	Port 16 RING
Port 17 TIP	17	49	Port 17 RING
Port 18 TIP	18	50	Port 18 RING
Port 19 TIP	19	51	Port 19 RING
Port 20 TIP	20	52	Port 20 RING
Port 21 TIP	21	53	Port 21 RING
Port 22 TIP	22	54	Port 22 RING
Port 23 TIP	23	55	Port 23 RING
Port 24 TIP	24	56	Port 24 RING
Port 25 TIP	25	57	Port 25 RING
Port 26 TIP	26	58	Port 26 RING
Port 27 TIP	27	59	Port 27 RING
Port 28 TIP	28	60	Port 28 RING
Port 29 TIP	29	61	Port 29 RING
Port 30 TIP	30	62	Port 30 RING
Port 31 TIP	31	63	Port 31 RING
Port 32 TIP	32	64	Port 32 RING

3.5.3 UCM-DSLM Installation

The UCM-DSLM can be installed on either UCM-MGC3 or UCM-1URMC. When installed on the UCM-MGC3, it can be in any of the 11 slots. It can also be installed stand alone in UCM-1URMC.

LED

There are 36 LED on the UCM-DSLM front panel for the status and diagnosis as shown in the Table 3-10.

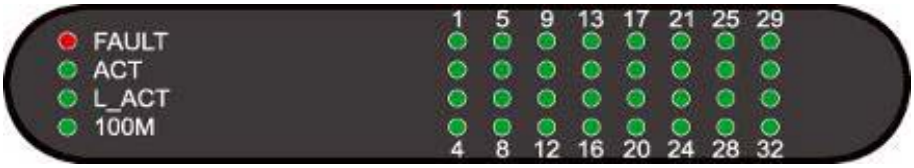


Table 3-10 UCM-ASLM Status LED

LED	LED Function	Description
FAULT	CPU status	Off–Normal, On – Fault (or reset)
ACT	Gateway Module status	Blink at active
L_ACT	Ethernet traffic (External port)	Off – No traffic, Blink - Traffic
100M	Ethernet speed (External port)	Off - 10 Mbps, On - 100 Mbps
1 ~ 32	Port status	Off – not connected, On – Idle, Blink – busy

Wiring Connectors

To install the UCM-DSLM on the UCM-1URMC, connect it to the iPECS UCM system through the RJ-45 connector marked “LAN” on the rear side of the cabinet.There is a 64 pin (LB) champ connector connected through the PCB edge on the rear side of the cabinet:

- Wire each champ connector to an SLT device/MDF.
- Tag or Number wiring for maintenance.

Champ connector wiring (UCM-DSLM)

Description	Pin No	Pin No	Description
Port 1 TIP	1	33	Port 1 RING
Port 2 TIP	2	34	Port 2 RING
Port 3 TIP	3	35	Port 3 RING
Port 4 TIP	4	36	Port 4 RING
Port 5 TIP	5	37	Port 5 RING
Port 6 TIP	6	38	Port 6 RING
Port 7 TIP	7	39	Port 7 RING
Port 8 TIP	8	40	Port 8 RING
Port 9 TIP	9	41	Port 9 RING
Port 10 TIP	10	42	Port 10 RING
Port 11 TIP	11	43	Port 11 RING
Port 12 TIP	12	44	Port 12 RING
Port 13 TIP	13	45	Port 13 RING
Port 14 TIP	14	46	Port 14 RING
Port 15 TIP	15	47	Port 15 RING
Port 16 TIP	16	48	Port 16 RING
Port 17 TIP	17	49	Port 17 RING
Port 18 TIP	18	50	Port 18 RING
Port 19 TIP	19	51	Port 19 RING
Port 20 TIP	20	52	Port 20 RING
Port 21 TIP	21	53	Port 21 RING
Port 22 TIP	22	54	Port 22 RING
Port 23 TIP	23	55	Port 23 RING
Port 24 TIP	24	56	Port 24 RING
Port 25 TIP	25	57	Port 25 RING
Port 26 TIP	26	58	Port 26 RING
Port 27 TIP	27	59	Port 27 RING
Port 28 TIP	28	60	Port 28 RING
Port 29 TIP	29	61	Port 29 RING
Port 30 TIP	30	62	Port 30 RING
Port 31 TIP	31	63	Port 31 RING
Port 32 TIP	32	64	Port 32 RING

3.5.4 UCM-MATM Installation

The UCM MATM can be installed in either UCM-MGC3 or UCM-1URMC. When installed in the UCM-MGC3, it can be installed in any slot. Hot swap is supported to enable inserting/removing the Gateway Module while power is applied to the cabinets. To interface different types of Trunk, optional Gateway Modules are used with MATM.

LED

The MATM has 20 LED for status and diagnostic information as in Table 3-11 MATM Status LED.

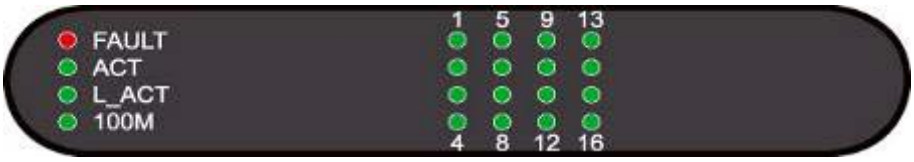


Table 3-11 MATM Status LED

LED Name	LED Function	LED Description
FAULT	CPU status	Off–Normal, On – Fault (or reset)
ACT	Gateway Module status	Blink at active
L_ ACT	Ethernet traffic (External port)	Off – No traffic, Blink - Traffic
100M	Ethernet speed (External port)	Off - 10 Mbps, On - 100 Mbps
Port (1~ 16)	Port status	ON= seized, OFF= idle, Others: Blink twice at call server access

Analog trunk types and option Modules

Each option Module provides 4 ports (Except 4-wire E&M providing 2 ports) and 3 option Modules can be mounted on MATM. The MATM can use different types of option Modules mixed with each other.

Trunk Type	Option Module
CO	COIU (Central Office Interface Unit)
LD	LDIU (Loop Dial Interface Unit)
E&M	EMIU (E&M Interface Unit)

COIU/LDIU/EMIU option Module installation

Each module must be installed at the specified location on the MATM and each option module must be matched with each S/W data

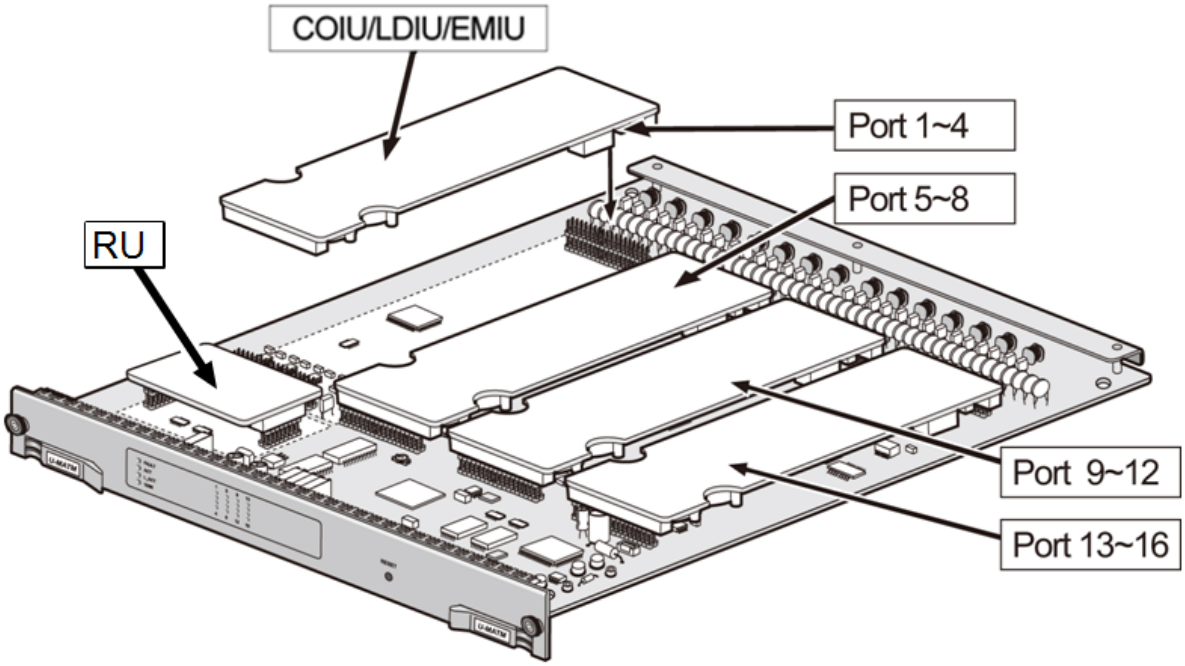


Figure 3-31 MATM Option Module Installation

CAUTION

- To avoid damage to Gateway Module from electricity and static discharge, install or remove an option Module without power supplied to the MATM and under an antistatic environment.
- Be careful not to be pricked or scratched by pins of the option Module when you insert or remove an option Module.
- Check the option Module is properly inserted (Pay attention not to make the Gateway Module overturned or the connector thrust aside.)

To remove an option Module

Hold the two round groove parts located on the left of the Gateway Module in your left hand and slowly take out the Gateway Module while twisting it little by little, by holding the PCB edge on the right of the Gateway Module.

Champ connector wiring (CO/LD)

Port No.	Signal Name	Pin No.		Signal Name
1	TIP0	1	33	RING0
2	TIP1	2	34	RING1
3	TIP2	3	35	RING2
4	TIP3	4	36	RING3
5	TIP4	5	37	RING4
6	TIP5	6	38	RING5
7	TIP6	7	39	RING6
8	TIP7	8	40	RING7
9	TIP8	9	41	RING8
10	TIP9	10	42	RING9
11	TIP10	11	43	RING10
12	TIP11	12	44	RING11
13	TIP12	13	45	RING12
14	TIP13	14	46	RING13
15	TIP14	15	47	RING14
16	TIP15	16	48	RING15
17	-	17	49	-
18	-	18	50	-
19	-	19	51	-
20	-	20	52	-
21	-	21	53	-
22	-	22	54	-
23	-	23	55	-
24	-	24	56	-
25	-	25	57	-
26	-	26	58	-
27	-	27	59	-
28	-	28	60	-
29	-	29	61	-
30	-	30	62	-
31	-	31	63	-
32	-	32	64	-

Champ connector wiring (2-wire E&M)

Port No.	Signal Name	Pin No.		Signal Name
1	TIP0	1	33	RING0
2	TIP1	2	34	RING1
3	TIP2	3	35	RING2
4	TIP3	4	36	RING3
5	TIP4	5	37	RING4
6	TIP5	6	38	RING5
7	TIP6	7	39	RING6
8	TIP7	8	40	RING7
9	TIP8	9	41	RING8
10	TIP9	10	42	RING9
11	TIP10	11	43	RING10
12	TIP11	12	44	RING11
13	TIP12	13	45	RING12
14	TIP13	14	46	RING13
15	TIP14	15	47	RING14
16	TIP15	16	48	RING15
1	E0	17	49	M0
2	E1	18	50	M1
3	E2	19	51	M2
4	E3	20	52	M3
5	E4	21	53	M4
6	E5	22	54	M5
7	E6	23	55	M6
8	E7	24	56	M7
9	E8	25	57	M8
10	E9	26	58	M9
11	E10	27	59	M10
12	E11	28	60	M11
13	E12	29	61	M12
14	E13	30	62	M13
15	E14	31	63	M14
16	E15	32	64	M15

Champ connector wiring (4-wire E&M)

Port No.	Signal Name	Pin No.		Signal Name
1	TIP0_TX	1	33	RING0_TX
	TIP0_RX	2	34	RING0_RX
2	TIP1_TX	3	35	RING1_TX
	TIP1_RX	4	36	RING1_RX
3	TIP2_TX	5	37	RING2_TX
	TIP2_RX	6	38	RING2_RX
4	TIP3_TX	7	39	RING3_TX
	TIP3_RX	8	40	RING3_RX
5	TIP4_TX	9	41	RING4_TX
	TIP4_RX	10	42	RING4_RX
6	TIP5_TX	11	43	RING5_TX
	TIP5_RX	12	44	RING5_RX
7	TIP6_TX	13	45	RING6_TX
	TIP6_RX	14	46	RING6_RX
8	TIP7_TX	15	47	RING7_TX
	TIP7_RX	16	48	RING7_RX
1	E0	17	49	M0
	-	18	50	-
2	E1	19	51	M1
	-	20	52	-
3	E2	21	53	M2
	-	22	54	-
4	E3	23	55	M3
	-	24	56	-
5	E4	25	57	M4
	-	26	58	-
6	E5	27	59	M5
	-	28	60	-
7	E6	29	61	M6
	-	30	62	-
8	E7	31	63	M7
	-	32	64	-

3.5.5 UCM-MDTM2 Installation

The UCM-MDTM2 can be installed in any of the 11 slots of the UCM-MGC3 and can also be installed in the UCM-1URMC. Hot Swap is supported to enable installing/removing while power is supplied to the cabinet.

LED

The UCM-MDTM2 provides a Reset S/W, 12 LED for diagnostics and function display and 32 channel statuses LED as shown in the Table 3-12.

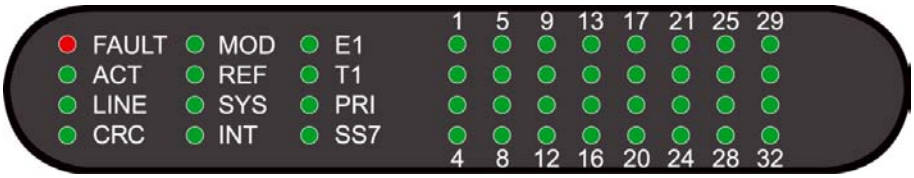


Table 3-12 UCM-MDTM2 Status LED

Column	LED	Color	Function	Description
1	FAULT	RED	CPU status	Off–Normal, On – Fault (or reset)
	ACT	GREEN	ACT	PRI/SS7: Blink in L2 normal, ON in L3 normal E1/T1: Blink in normal
	LINE	GREEN	LINE ACT	LED ON at synchronization with remote digital trunk
	CRC	GREEN	CRC ON/OFF	LED ON when CRC is on
2	MOD	GREEN	NT/TE mode	On : NT mode, Off : TE mode
	REF	GREEN	Reference clock out	LED ON : Supply a Reference clock to other MDTM2
	SYS	GREEN	Reference clock in	LED ON : Receive a Reference clock from other MDTM2
	INT	GREEN	Self Clock	LED ON : Operating with Self Clock
3	E1/T1	GREEN	LINE E1/T1	Gateway Module service mode. European mode (E1 ON)' American mode (T1 ON)
	PRI	GREEN	PROTOCOL LED	LED ON when PRI is used
	SS7	GREEN	PROTOCOL LED	LED ON when Signaling System No.7 is used
4~11	CH1~32	GREEN	Channel LED	LED corresponding to the channel is ON when a channel is in service.

Wiring Connectors

A champ connector to connect E1 / T1 / PRI / SS7 lines is located on the rear side of the UCM-MGC3 / UCM-1URMC panel in which the UCM-MDTM2 is installed.

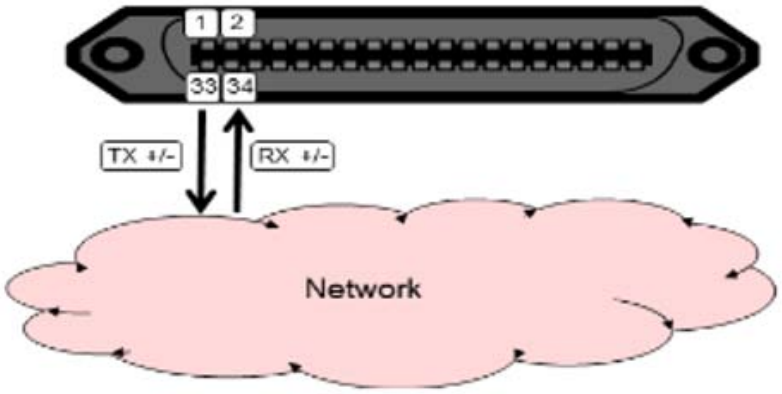


Figure 3-32 UCM-MDTM2 E1/T1/PRI/SS7 LINE Connecting diagram

Champ connector wiring (UCM-MDTM2)

Signal Name	Pin No.		Signal Name
TX+	1	33	TX-
RX+	2	34	RX-
-	3	35	-
-	4	36	-
-	5	37	-
-	6	38	-
-	7	39	-
-	8	40	-
-	9	41	-
-	10	42	-
-	11	43	-
-	12	44	-
-	13	45	-
-	14	46	-
-	15	47	-
-	16	48	-
-	17	49	-
-	18	50	-
-	19	51	-
-	20	52	-
-	21	53	-
-	22	54	-
-	23	55	-
-	24	56	-
-	25	57	-

-	26	58	-
-	27	59	-
-	28	60	-
-	29	61	-
-	30	62	-
-	31	63	-
-	32	64	-

Protocol S/W and Shunt Setting

The UCM-MDTM2 Gateway Module provides E1 / T1 / PRI / SS7 selection switches to select protocols depending on service type. Figure 3-33 shows the case where just the E1 line is used.

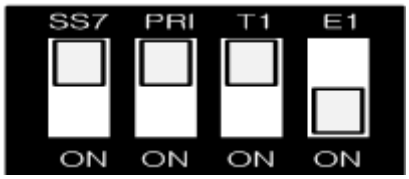


Figure 3-33 Protocol Selection Switch

The UCM-MDTM2 Gateway Module provides header pins to set lines to switch impedance based on E1 / T1 line interface. Figure 3-34 below shows shunt change depending on E1 / T1 usage.

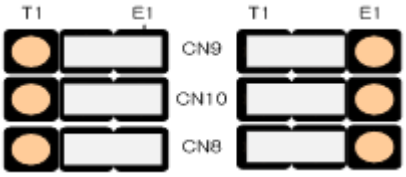


Figure 3-34 E1 / T1 Line Switch

3.5.6 UCM-MDTMX2 Installation

The UCM-MDTMX2 can be installed in any of the 11 slots of the UCM-MGC3 and can also be installed in the UCM-1URMC. Hot Swap is supported to enable installing/removing while power is supplied to the cabinet.

LED

The UCM-MDTMX2 provides a Reset S/W, 20 LED for diagnostics and function display and 32 channel statuses LED as shown in the Table 3-13.

Table 3-13 UCM-MDTMX2 Status LED

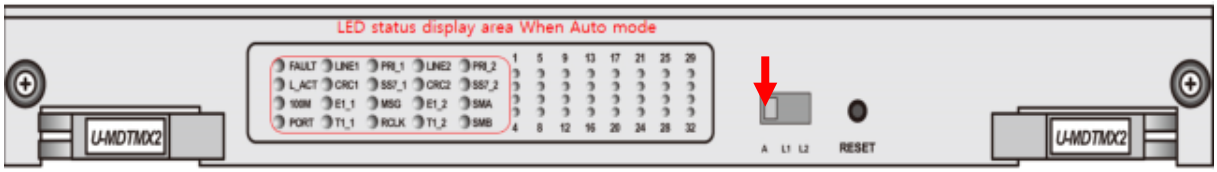
Column	Silk	MDTMX2	Remark
1	FAULT	Fault (OFF - Normal, ON - Fault)	
	L_ACT	Ethernet Link/ ACT (External)ON - Idle, Blink - Traffic	
	100M	Ethernet Speed (External) OFF - 10Mbps, ON - 100Mbps	
	PORT	MDTM Port (ON- Port #1, OFF- Port #2)	Port Indication – by CPU GPIO 19
2	LINE 1	Line 1 Connection Status (ON : Good Status)	Port #1
	CRC 1	CRC #1 (ON - CRC is ON)	
	E1_1	Line Signaling Indication (ON : E1)	Blink - L2 ~ L3 Abnormal
	T1_1	Line Signaling Indication (ON : T1)	Blink - L2 ~ L3 Abnormal
3	PRI_1	Line Signaling Indication (ON : PRI)	Blink - L2 ~ L3 Abnormal
	SS7_1	Line Signaling Indication (ON : SS7)	Blink - L2 ~ L3 Abnormal
	MSG	Master of Synchronization Group (ON : Master)	
	RCLK	Reference Clock Indication (ON : Line1, OFF : Line2)	
4	LINE 2	Line 2 Connection Status (ON : Good Status)	Port #2
	CRC 2	CRC #2 (ON - CRC is ON)	
	E1_2	Line Signaling Indication (ON : E1)	Blink - L2 ~ L3 Abnormal
	T1_2	Line Signaling Indication (ON : T1)	Blink - L2 ~ L3 Abnormal
5	PRI_2	Line Signaling Indication (ON : PRI)	Blink - L2 ~ L3 Abnormal
	SS7_2	Line Signaling Indication (ON : SS7)	Blink - L2 ~ L3 Abnormal
	SMA	Synchronization Mode Indication A	SMA/SMB(0 : OFF, 1 : ON) 00 : Locking to Line clock 01 : Locking to Internal(System) clock 10 : Internal(Free-run) mode 11 : Exclude DPLL (Using directly PLL Block of Line I/F Framer)
	SMB	Synchronization Mode Indication B	
6	1 29 4 32	Channel 1 ~ 32	Port #1 and #2 (Common use)

SLIDE SWITCH

MDTMX2 have a lot of LED, because of supporting 2 LINK and many channels. Using the SLIDE switch, you can recognize the LINK STATUS separately.

Auto mode [Default mode] set

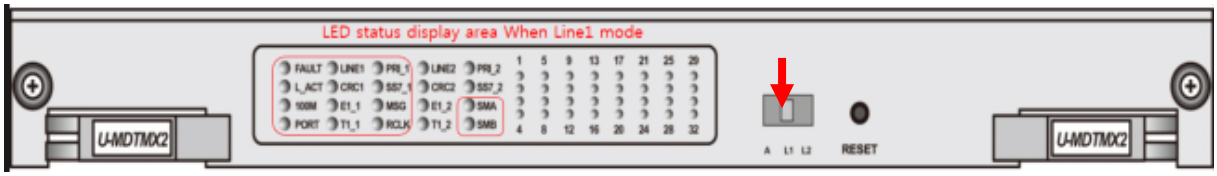
The status information of Line1 and Line2 is always displayed, and the channel occupancy information of each Line is alternately displayed every 4 seconds. Here Line status can be seen by the Port LED. (On : Line1, Off : Line2)



SLIDE switch A: Auto mode [Default mode] set

Line 1 set

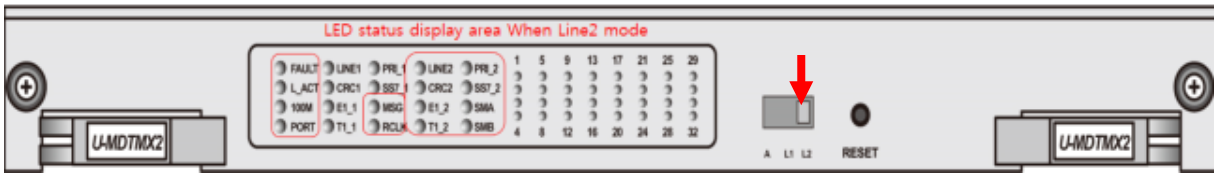
Displays status information and only if it occupied Channel



SLIDE switch L1: Line 1 set

Line 2 set

Displays status information and only if it occupied Channel

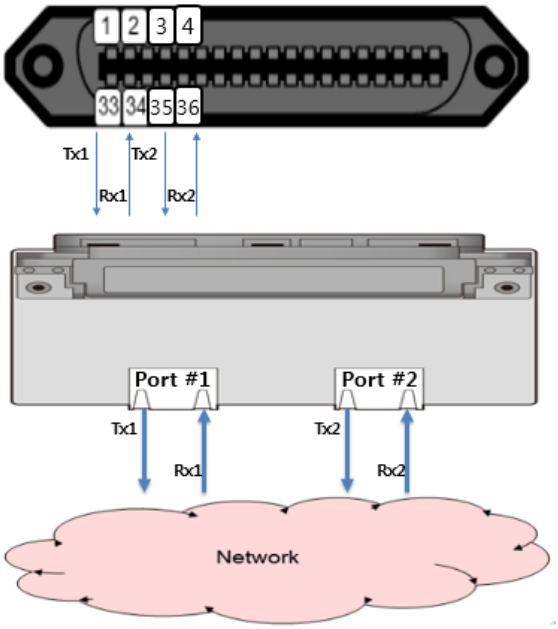


SLIDE switch L2: Line 2 set

Wiring connector

There is a champ connector in back side of UCM-MGC3 / CM-1URMC, including UCM-MDTMX2.

This connector is connected as shown in the figure 3-35.



Champ connector wiring (UCM-MDTMX2)

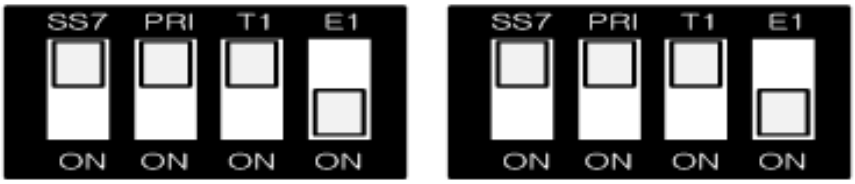
Signal Name	Pin No.		Signal Name
TX1+	1	33	TX1-
RX1+	2	34	RX1-
TX2+	3	35	TX2-
RX2+	4	36	RX2-
-	5	37	-
-	6	38	-
-	7	39	-
-	8	40	-
-	9	41	-
-	10	42	-
-	11	43	-
-	12	44	-
-	13	45	-
-	14	46	-
-	15	47	-
-	16	48	-
-	17	49	-
-	18	50	-
-	19	51	-
-	20	52	-
-	21	53	-

-	22	54	-
-	23	55	-
-	24	56	-
-	25	57	-
-	26	58	-
-	27	59	-
-	28	60	-
-	29	61	-
-	30	62	-
-	31	63	-
-	32	64	-

Protocol S/W and Shunt Setting

The internal module of UCM-MDTMX2 has E1 / T1 / PRI / SS7 selector switch, allowing you to choose a protocol for your application.

The following figure shows the case of using only E1 links for Port 1 and port 2.



SW3 (Port1) SW4 (Port2)

Figure 3-36 Protocol Port selection switch

The UCM-MDTMX2 modules have a function that can be set inside the line impedance, it is to change the initial value according to the E1 / T1 line interfaces. Special shunt location change is unnecessary as a MDTM2

3.5.7 UCM-VPCM Installation

The VPCM can be installed in either UCM-MGC3 or UCM-1URMC. When installed in the UCM-MGC3, it can be in any slot. Hot Swap is supported to enable inserting/removing the Gateway Module while power is supplied to the cabinet.

LED

There are 20 LED on the VPCM front panel for the status and diagnosis as shown in the Table 3-14.

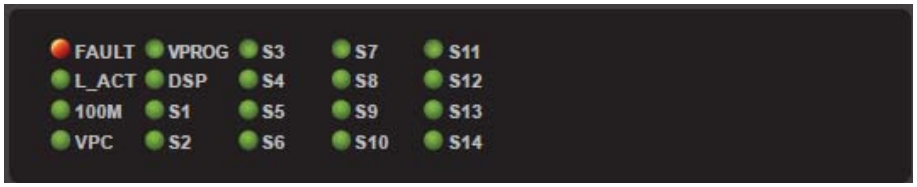


Table 3-14 VPCM Status LED

Column	Silk (VPCM)	VPCM
1	FAULT	Fault (OFF - Normal, ON - Fault)
	L_ACT	Ethernet Link/ ACT (External) : ON - Idle, Blink – Traffic
	100M	Ethernet Speed (External) : OFF - 10Mbps, ON - 100Mbps
	VPC	VPC LED (OFF - Normal, ON - Fault)
2	VPROG	VPC(FPGA) Initialization (ON - Success, OFF - Failure)
	DSP	DSP Initialization (ON - Success, OFF - Failure)
	S1	Register (ON - Success, OFF - Failure)
	S2	Polling - Toggle(30sec) when received polling command
3	S3	Board Status - Toggle(200ms) when the board is working
	S4	DSP Active - Toggle(600ms) when DSP is active - OFF when DSP is idle
	S5	Ramdisk full status - FULL(ON)
	S6	eMMC memory full status - FULL(ON)
4	S7	IP Redirect Call - Connected(ON)
	S8	Transcoding Call - Connected(ON)
	S9	Conference Call - Connected(ON)
	S10	Voice Prompt Call - Connected(ON)
5	S11	Total call count > 0 (ON)
	S12	Total call count > 20 (ON)
	S13	Total call count > 50 (ON)
	S14	Total call count > 100 (ON)

3.6 Cable Installation

The connectors that are connected to trunk, SLT, LAN, power and RS-232 are in general located on the rear panel of the cabinet.

3.6.1 Trunk/Extension Champ Connector Cable Connection

Analog/digital trunks or SLTs are connected using the champ connector available on the rear panel of the cabinet.

The champ connector pin layout is shown in Figure 3-36. On the rear panel of the cabinet, there are receptacles to which the plug-in type connectors are connected.

Figure 3-37 shows the connection diagram for the vertical champ connector used where there is no space to turn a cable to the right like the 19” rack

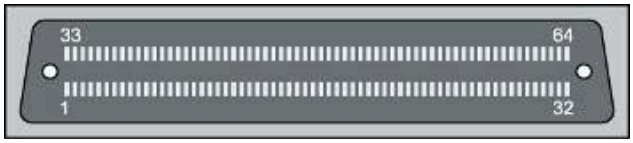


Figure 3-37 Rear Panel Champ Connector Pin layout

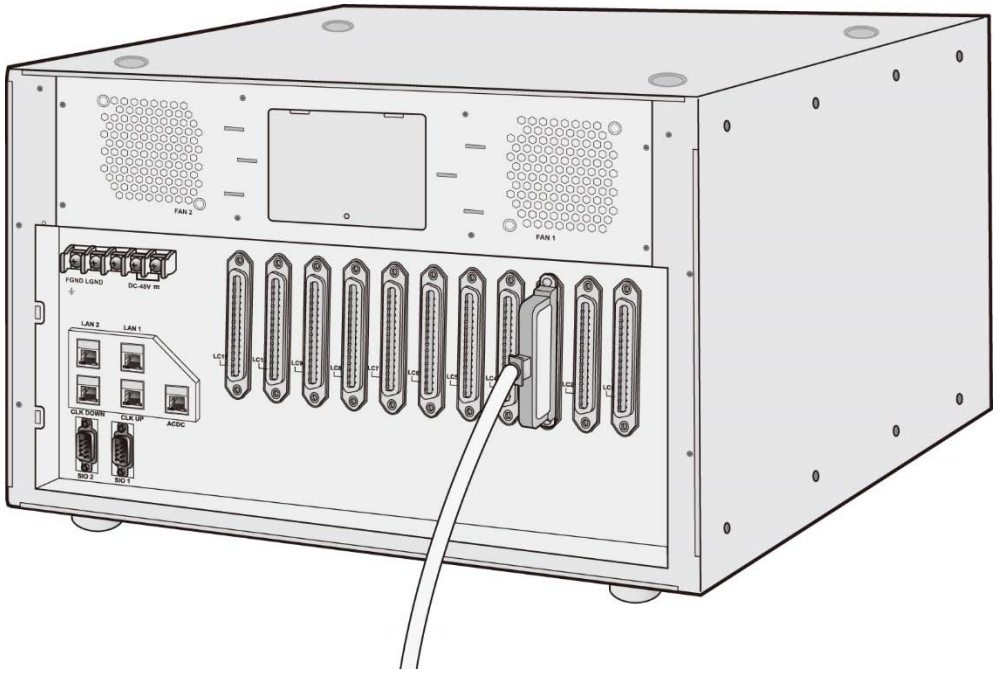


Figure 3-38 Vertical Type Champ Connectors

3.6.2 LAN Cable Connection

The UCM-MGC3 supports 10/100/1000Mbps Ethernet and is linked to Ethernet switch through duplicated RJ-45 connectors. The UCM-1URMC supports 10/100 Base-T Ethernet and is linked to the Ethernet switch through the RJ-45 connector. UCM-MGC3 and UCM-1URMC are connected to a single Ethernet switch as shown in Figure 3-38. In a redundancy configuration, duplicated Ethernet link cables of UCM-MGC3 are connected to each Ethernet switch as in Figure 3-39. Figure 3-40 shows LAN connector pin layout. Each connector provides green Link/Activity LED and orange LAN speed LED (ON for 100 Base-T).

All LAN wiring should be category 5 Unshielded Twisted Pair (CAT 5 UTP) or category 6 Unshielded Twisted Pair (CAT 6 UTP) and the length should not exceed 100 meters.

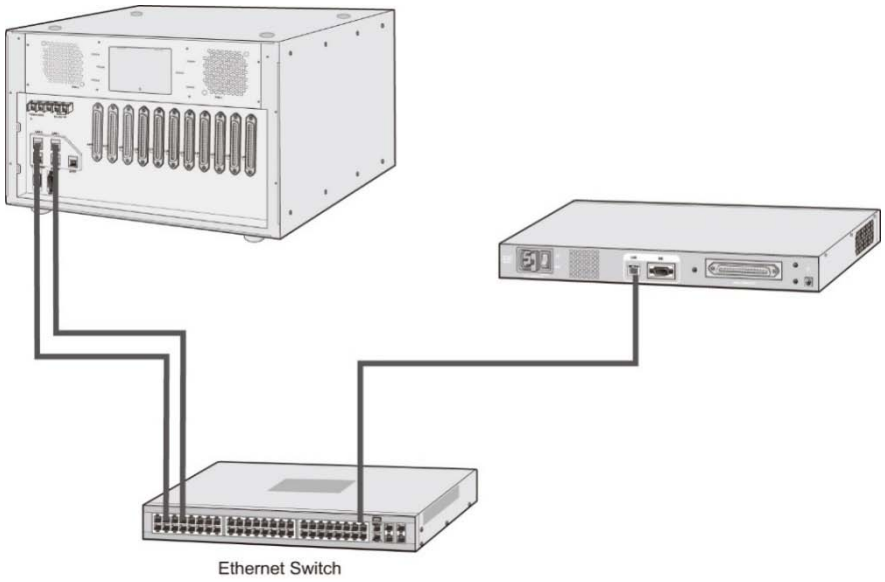


Figure 3-38 LAN Cable Connection of UCM-MGC3 and UCM-1URMC (single switch is used)

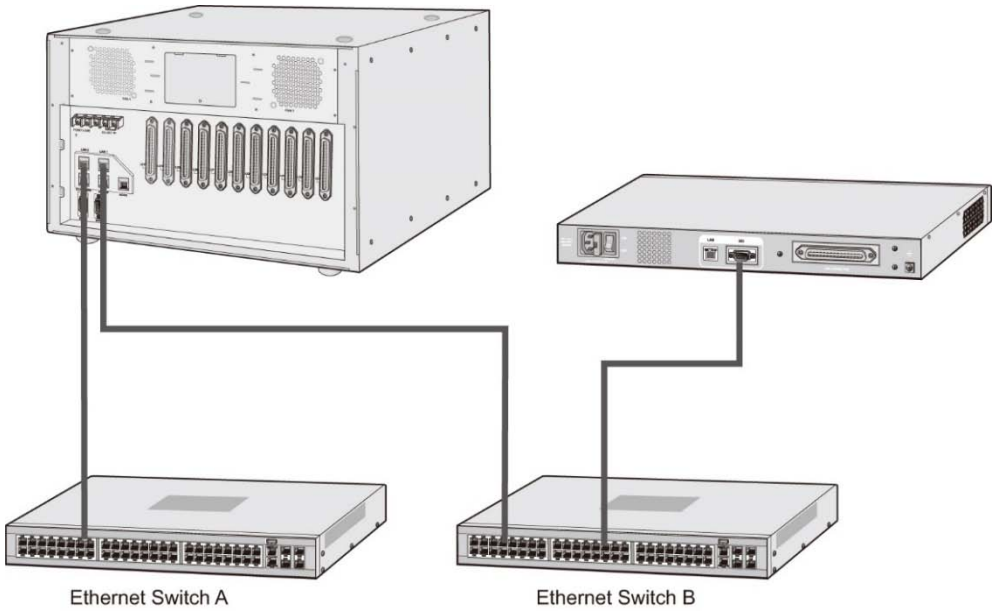


Figure 3-39 LAN Cable Connections of UCM-MGC3 and UCM-1URMC (dual switches are used)

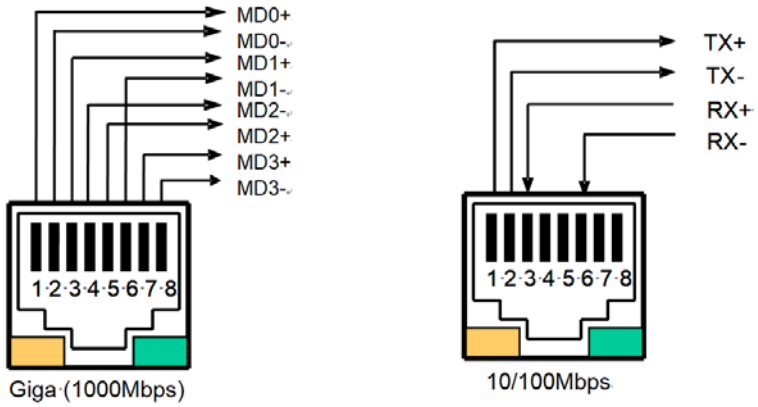


Figure 3-40 LAN Connector (RJ-45) Pin Assignment

CAUTION

If 1000base-T is connected, CAT-5e or CAT-6 UTP cable must be used.

3.6.3 LAN Wiring Structure

The LAN wiring architecture used for connecting the iPECS UCM to the LAN is dependent upon several factors including:

- Shared or iPECS only LAN infrastructure
- External VoIP calling requirements
- Voice and data network separation or modification in the legacy network
- IP phone power option: Adapter or PoE

When the network is shared with other systems, a PC can be connected to the PC port of LIP phone using a standard LAN cable.

In the shared environment, both data and voice will have access to the WAN, which also permits external VoIP calling. In the non-shared LAN environments, the system must be connected to the WAN to support external VoIP connections.

3.6.4 RS-232 Connections

The DB-9 connector located on the rear panel of the cabinet is an RS-232 serial port. The connector is employed to provide system trace and diagnostic routines for the individual gateway Modules. Two duplicated ports are provided. For the iPECS UCM RS-232 cable pin assignment, refer to Figure 3-41.

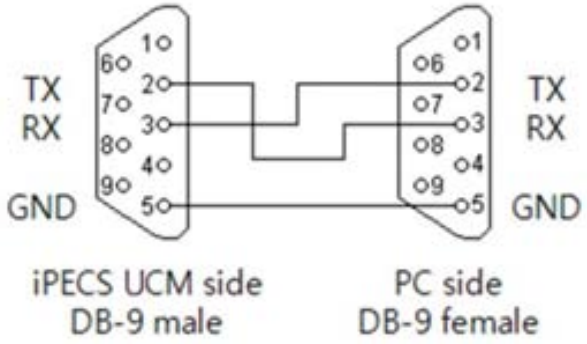


Figure 3-41 RS-232 DB-9 – Pin Assignments

3.7 Checklist after System Power On

After power on the cabinet, check the system as follows:

UCM-MGC3

Switch on the power unit (PSUD) and check from the front LED that power is normally supplied. Then check the system alarms and operation status using the menu buttons of the LCDU.

Note)

If alarms are founded in the system after power on, contact Ericsson-LG Enterprise's local service center or perform troubleshooting in accordance with the Service Manual.

Check the PSUD power on according to work order

1) Turn on the CP (Circuit Protector) switch (-48V input) on the front panel of the UCM-MGC3 and check that -48V LED is lighted on the faceplate of the PSUD.
2) Turn on the +5V output switch (+5V SW) on the PSUD and check that +5V LED is lighted on the front panel of the PSUD.
3) Turn off the +5V output switch (+5V SW) on the PSUD and check that +5V LED on the faceplate of the PSUD turns off. Then check that the ALM LED turns on and off after a while (The ALM LED indicating low voltage alarm is lighted when the power is under +4.6V).

Check power alarm and voltage level on the LCDU

1) Check the power alarm and voltage level of duplicated –48V and +5V power by pressing the menu buttons of the LCDU in order (For further information, see the LCDU button description below and refer to Figure 3-42.)

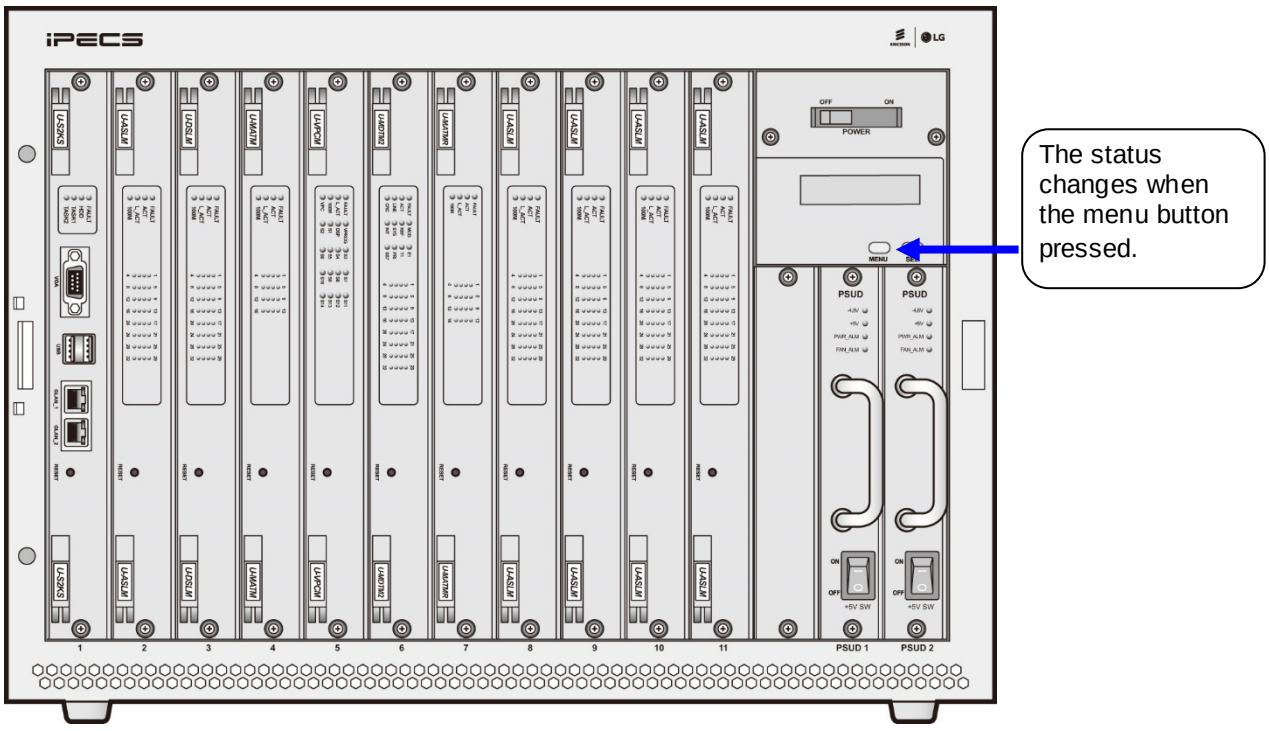


Figure 3-42 UCM-MGC3 Front Panel (PSUD mounted)

2) Connect the LAN cable to the LAN connector (RJ45) LAN1, LAN2 on the rear panel of the UCM-MGC3 and check the LED status, refer to Figure 3-43.

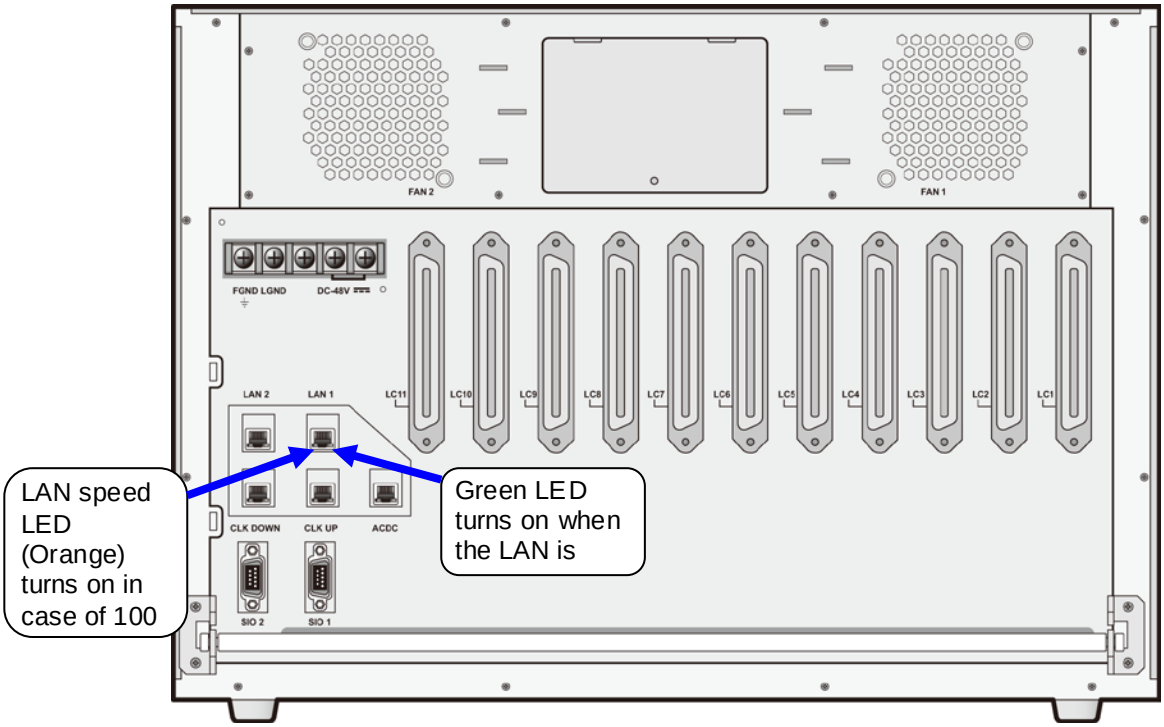


Figure 3-43 Checking LED status on UCM-MGC3 Rear Panel

Check the status of the LCDU of UCM-MGC3 in accordance with the work order. If you want to go next step, press the MENU button

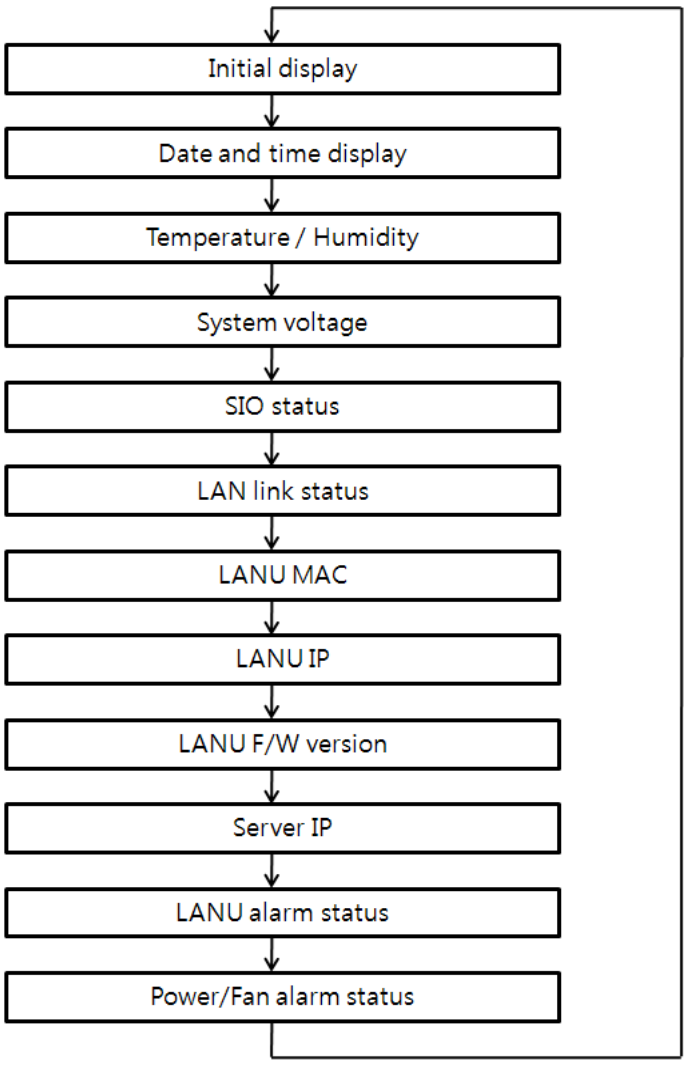


Figure 3-44 UCM-LCDU Display Output Flow

- Initial display

- Before Call Server access: iPECS-UCM Connecting
- After Call Server access (blinking 3~4 times): iPECS-UCM Connected

- Date and time display: Displays current date and time
- Temperature/humidity display (Temperature in ℃ (Celsius), relative humidity)
- System voltage display
- SIO status display

- Displays the Gateway Module monitored through SIO1 and SIO2 on the rear panel.
- Default: SIO1:GW1, SIO2: LANU
- 1~B: Slot1~Slot11 (Slot10: A, Slot11: B), L: LANU

- 6. LAN Link (Ethernet Link) status display

- Displays link status of each Gateway Module and LAN1 and LAN2 on the rear panel
- LAN1, LANU – 10/100/1000Mbps
- :100Mbps, :10Mbps, G:1000Mbps (Gigabit Link)

- 7. LANU MAC display

- 8. LANU IP display
- 9. LANU F/W version display
- 10. Server IP display
- 11. LANU alarm status display: Critical, Major, Minor Diagnostic status
- 12. Power/FAN Alarm display

- Power/FAN Alarm is displayed in the event of power/fan fault.
- The initial screen is displayed when the alarm is cleared.
- PWR: PSUD Alarm
- FAN: FAN Alarm
- 1, 2: PSUD, FAN indication
- Blinking in the event of an alarm

UCM-1URMC

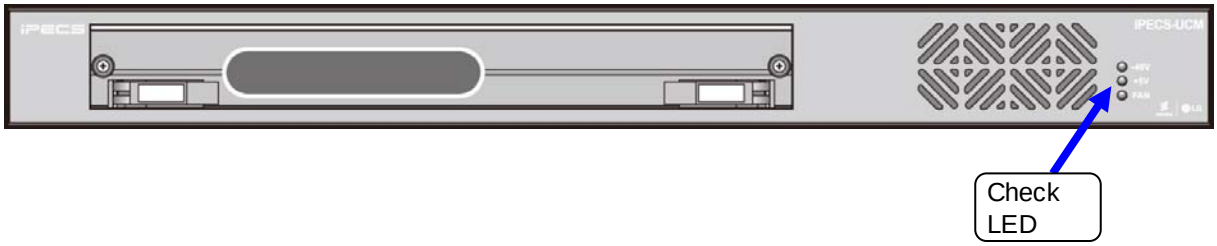
Turn on the UCM-1URMC power switch and check from the front LED whether power is normally supplied.

Check the UCM-1URMC power on

1) Turn on the AC input switch (AC SW) on the rear panel of the UCM-1URMC
2) Check the -48V LED and +5V LED are lighted on the front panel.

Check the FAN operation

1) Turn on the AC input switch (AC SW) on the rear panel of the UCM-1URMC
12) Check the fan runs and check the FAN LED turn on.



4 Appendix A. Open Source Software

The following Apache and BSD License used in this product are subject to each License Agreements.

Opensource SW	Application	Opensource SW License
Ambient	UCM P5 Only (WMS)	GNU General Public License v2.0 or later
FIPS-46-3 compliant Triple-DE	UCM P5 Only	GNU General Public License v2.0 or later
hex.js	UCM P5 Only (WMS)	GNU General Public License v2.0 or later
OpenSSL	UCM	the OpenSSL License and the original SSLeay license
Zeromq	UCM P10.0 Only	GNU Lesser General Public License v3.0 or later
Boost C++ Libraires - boost	UCM P10.0 Only	Boost Software License 1.0
Boost C++ Libraires - boost-subparts	UCM P10.0 Only	Boost Software License 1.0
b64: Base-64 Encoding Library	UCM	BSD 3-clause "New" or "Revised" License
jsbn	UCM	BSD 3-clause "New" or "Revised" License
Libnet Packet Construction Library	UCM	BSD 3-clause "New" or "Revised" License
Net SNMP - net-snmp	UCM	BSD 3-clause "New" or "Revised" License
c-ares	UCM	MIT License
Expat XML Parser - libexpat	UCM	MIT License
Jansson	UCM	MIT License
JavaScript tabifier	UCM	MIT License
libnet	UCM	Xclustered
Simple AJAX Code-Kit - SACK	UCM	MIT License
Swiper	UCM	MIT License
Table Sorting and Utils	UCM	MIT License
tomcat	WMS	Apache License
hsqldb	WMS(DB)	BSD License
jquery	WMS(UI script)	MIT License
ibatis	WMS(DB Access Object)	Apache License
poi	WMS(Excel/PDF)	Apache License
quartz	WMS(schedule management)	Apache License
gson	WMS(data json conversion)	Apache License
sDashboard	WMS(Monitoring UI)	MIT License

Opensource SW	Application	Opensource SW License
jazzlib	WMS(Zip compress/decompress)	GPL License
u-boot	GW	GPL License
linux	GW	GPL License
busybox	GW	GPL License

Ericsson-LG Enterprise offers to provide source code to you on CD-ROM for a charge covering the cost of performing such distribution, including the cost of media, shipping and handling upon e-mail requests to Ericsson-LG Enterprise at opensource@ericssonlg.com. This offer is valid for a period of three (3) years from the date of this product distribution by Ericsson-LG Enterprise.

5 Appendix B. Power Consumption Calculation

This chapter shows the description about the calculation of the power consumption, the battery capacity and the rectifier DC output power needed in a system. The examples of calculation are described in detail in the cases of each kind of system configuration.

The following table shows the power consumption of each item of the iPECS UCM system.

This material is not precise. These are the approximate data estimated assuming the maximum consumption so that power consumption can be estimated easily.

Therefore, the actual measured data during system operation may be different.

Power Consumption

ITEM	Power (Max.)	Note
UCM-S2K	25W	Mounted in UCM-MGC3 or UCM-1URMC.
UCM-ASLM	50W	In the case that SLT line busy rate is 20 %
	80W	In the case that SLT line busy rate is 100 %.
UCM-MATM	15W	Use this value in the case of CO 16 ports.
	40W	Use this value in the case of EM/LD 16 port.
UCM-MDTM2/X2	7W	-
UCM-VPCM	7W	-
UCM-MGC3	20W	Consumed by LANU and FAN Unit.
UCM-PSUD (duplicated)	10W	Calculating maximum output capacity, add this value to total power consumption in a UCM-MGC3.

In the case where DC -48V power is supplied from rectifier, UCM-PSUD is mounted in UCM-MGC3. UCM-PSUD consumes 10 W as the maximum power for playing the role of DC/DC converter to produce DC + 5 V power from DC -48V power.

First of all, sort out items mounted in UCM-MGC3. Secondly, calculate the maximum power consumed by items mounted in UCM-MGC3. Thirdly, add to the result the total power consumed by UCM-S2K and items mounted in UCM-1URMC.

The AC power consumption calculated as above is able to be used to check on the electrical equipment or to calculate UPS capacity needed for the system.

Rectifier DC Output Power Calculation

Example 1)

ITEM	Count	Power (Max.)	Note
UCM-S2K	2 ea	50W	Mounted in UCM-MGC3. Call Server duplicated.
UCM-MGC3	2 ea	40W	Providing 22 Slots.
UCM-ASLM	13 ea	650W	Mounted in UCM-MGC3. SLT uses 1 REN.
UCM-MATM	2 ea	30W	Mounted in UCM-MGC3. Case of CO 32 ports.
UCM-MDTM2	4 ea	28W	Mounted in UCM-MGC3.
UCM-VPCM	1 ea	7W	Mounted in UCM-MGC3.

Items mounted in all UCM-MGC3 (2 ea)

UCM-S2K (2 ea), UCM-ASLM (13 ea), UCM-MATM (2 ea), UCM-MDTM2 (4 ea), UCM-VPCM (1 ea), UCM-PSUD (4 ea)

Total Power Consumption (Max.) of UCM-MGC3 :

(UCM-S2K power consumption x 2) + (UCM-ASLM power consumption x 13) +
(UCM-MATM power consumption x 2) + (UCM-MDTM2 power consumption x 4) +
(UCM-VPCM power consumption x 1) + (UCM-MGC3 power consumption x 2) +
(UCM-PSUD Power Consumption x 4) = (50 W + 650 W + 30 W + 28 W + 7 W + 40 W + 20 W) = 845 W

Example 2)

ITEM	Count	Power (Max.)	Note
UCM-S2K	1 ea	25W	Mounted in UCM-1URMC.
UCM-MGC3	1 ea	20W	Providing 11 Slots.
UCM-ASLM	8 ea	400W	Mounted in UCM-MGC3. SLT support 1 REN.
UCM-MDTM2	3 ea	21W	Mounted in UCM-MGC3.
UCM-ASLM	1 ea	80W	Mounted in UCM-1URMC. SLT support 5 REN.
UCM-MATM	1 ea	40W	Mounted in UCM-1URMC. Case of EM 16 ports.

Items mounted in all UCM-MGC3 (1 ea) :

UCM-ASLM (8 ea), UCM-MDTM2 (3 ea), UCM-PSUD (2 ea)

Total Power Consumption (Max.) of UCM-MGC3 :

(UCM-ASLM power consumption x 8) + (UCM-MDTM2 power consumption x 3) +
(UCM-MGC3 power consumption x 1) + (UCM-PSUD Power Consumption x 2)
= (400 W + 21 W + 20 W + 20 W) = 461 W

UCM-1URMC Total Power Consumption :

{ (UCM-S2K power consumption x 1) + (UCM-ASLM power consumption x 1) + (UCM-MATM power consumption x 1) } / UCM-1URMC Power efficient (80%) = (25W + 80W + 40W) / 0.8 = 145W / 0.8
= 181.25W

System side Total Power Consumption:

UCM-MGC3 Total Power Consumption + UCM-1URMC Total Power Consumption
= 461W + 181.25W = 642.25W

DC output power of the rectifier should be more than the total power consumption of UCM-MGC3.

Thanks for purchasing iPECS UCM

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