



LG - ERICSSON



ipLDK-60

Hardware Description and Installation Manual



Regulatory Information

Before connecting the ipLDK-60 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 line Telephone numbers to be connected to the system

Model name	ipLDK-60
Local regulatory agency registration number	locally provided
Ringer equivalence	0.5B
Registered jack	RJ11C & RJ45

The required regulatory agency registration number is available from your local representative of LG-Ericsson. This equipment complies with the following regulatory standards, that is, the safety requirements of EN60950-1, UL 60950-1/CSA C22.2 No. 60950-1-03 and the EMC requirement of EN55022 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 ipLDK-60 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 ipLDK-60 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.

FCC Interference Statement

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

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

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

Copyright© 2010 LG-Ericsson Co., Ltd. All Rights Reserved

This material is copyrighted by LG-Ericsson Co., Ltd. Any unauthorized reproductions, use or disclosure of this material, or any part thereof, is strictly prohibited and is a violation of Copyright Laws. LG-Ericsson reserves the right to make changes in specifications at any time without notice. The information furnished by LG-Ericsson in this material is believed to be accurate and reliable, but is not warranted to be true in all cases.

ipLDK-60 are trademarks of LG-Ericsson Co., Ltd.

All other brand and product names are trademarks or registered trademarks of their respective companies.

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.

Compliance Statement for Canada

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Statement : The term "IC" before the radio certification number only signifies that Industry Canada technical specifications were met.

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

RF Exposure Statement:

This equipment complies with FCC/IC RF radiation exposure limits set forth for an uncontrolled environment.

Use of other accessories may not ensure compliance with FCC/IC RF exposure guidelines.

This device must not be co-located or operating in conjunction with any other antenna or transmitter.

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

Base Station :

This equipment complies with FCC/IC RF radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Revision History

ISSUE	DATE	Contents of Changes
1.0	2007.01	Initial Release
1.1	2009.02	Added PRHB8
2.0	2010.07	Added EMU2, CKB316, LDP-7200 series, LIP-7000 & 8000 series IP phones General edits
2.1	2011.06	Added GDC-600BE

Table of Contents

1 INTRODUCTION	1
1.1 Important Safety Instructions	1
1.1.1 Safety Requirements	1
1.2 Precaution	2
1.2.1 Caution.....	2
1.2.2 Disposal of Old Appliance.....	2
1.3 Manual Usage	3
1.4 Abbreviations	4
2 SYSTEM OVERVIEW	2
2.1 ipLDK-60 System Highlights	2
2.1.1 System Connection Diagram.....	3
2.2 System Components	4
2.3 Specifications	6
2.3.1 General Specifications.....	6
2.3.2 System Capacity	7
2.3.3 Base station specification (GDC-400B/600B/600BE)	7
2.3.4 Wireless Terminal specification	8
3 KSU INSTALLATION	9
3.1 Pre-Installation	9
3.1.1 Safety Installation Instructions.....	9
3.1.2 Installation precautions	9
3.1.3 Wiring Precautions.....	9
3.2 KSU Installation	10
3.2.1 Unpacking	10
3.2.2 KSU Exterior and Dimension.....	11
3.2.3 Opening and Closing the Front Cover.....	12
3.2.4 Power Supply Unit Installation.....	14
3.2.5 Frame Ground Connection	15
3.2.6 External Backup Battery Installation.....	16
3.2.7 KSU Mounting.....	17
3.3 Expansion KSU Installation	21
3.3.1 Unpacking	21
3.3.2 Connecting Expansion KSU to Basic KSU.....	22
3.3.3 Expansion KSU Mounting.....	24

4 BOARD INSTALLATION	28
4.1 Installation of the Boards.....	28
4.2 Main Board Unit (MBU).....	29
4.2.1 Modular Jack (MJ1 – MJ3) Pin Assignment.....	31
4.2.2 Switches and LED Indications	32
4.3 Expansion Main Board Unit (EMBU).....	33
4.3.1 Modular Jack (MJ1 – MJ3) Pin Assignment.....	35
4.4 Expansion Main Board Unit 2 (EMBU2).....	36
4.4.1 Modular Jack (MJ1 – MJ2 & CN13) Pin Assignment	38
4.5 Installation of the CO Line & Extension Board.....	39
4.5.1 CHB308 (3 CO Line and 8 Hybrid Interface Board)	39
4.5.2 CKB316 (3 CO and 16 Digital Phone Interface Board)	41
4.5.3 CSB316 (3 CO and 16 SLT Interface Board).....	42
4.5.4 SLIB8 (8 SLT Interface Board)	44
4.5.5 VOIB (Voice over Internet protocol Board).....	45
4.5.6 E1HB8 (E1R2 and 8 Hybrid Interface Board).....	47
4.5.7 PRHB8 (PRI and 8 Hybrid Interface Board).....	49
4.5.8 PRHB8 (T1) (PRI Board w/T1 for N.A. Only)	51
4.6 Function Board Installation	53
4.6.1 Voice Mail Interface Unit (VMIU)/ Auto Attendant Function Unit (AAFU).....	53
4.6.2 VMIB8 Voice Mail Interface Board 8 Hours.....	54
4.6.3 Modem Function Unit (MODU).....	54
5 TERMINAL CONNECTION AND WIRING	55
5.1 Terminal and Door Phone Models	55
5.1.1 Terminal Cabling Distance.....	57
5.1.2 DKT and DSS	57
5.1.3 SLT	57
5.1.4 LIP-7000& LIP-8000 Series Keypad.....	58
5.1.5 Connecting Miscellaneous Terminals.....	60
5.2 Cable Wiring	61
5.2.1 Wall Mount Wiring.....	61
5.2.2 Rack Mount Wiring	62
6 DECT INSTALLATION.....	63
6.1 Introduction	63
6.2 WDIB4 Installation	64
6.3 Base Station Installation	67
6.3.1 Installation of the Ferrite core and wiring.....	70

7 STARTING THE IPLDK-60	71
7.1 Before Starting the ipLDK-60 System.....	71
7.2 Basic Programming	71
7.2.1 DKT Programming	71
7.2.2 Entering the Programming Mode.....	73
7.2.3 Pre-Programming	73
8 TROUBLESHOOTING	81

1 INTRODUCTION

1.1 Important Safety Instructions

1.1.1 Safety Requirements

- ✓ When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and other personal injury, including the following:
- ✓ Please read and understand all instructions.
- ✓ Follow all warnings and instructions marked on the product.
- ✓ Unplug this product from the wall outlet before cleaning. A damp cloth should be used for cleaning; do not use liquid or aerosol cleaners.
- ✓ Do not use this product near water, such as in a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
- ✓ Do not place this product on an unstable stand or table. The product may fall, causing serious damage to the product or serious injury.
- ✓ Slots and openings in the KSU and the back or bottom are provided for ventilation, to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, or other similar surface. This product should never be placed near or over a radiator or other heat source. This product should not be placed in a built-in installation without proper ventilation.
- ✓ This product should be operated only from the type of power source indicated on the product label. If you are not sure of the type of power supply to your location, consult your dealer or local power company.
- ✓ Do not allow anything to rest on the power cord. Do not locate this product where the cord could be abused by people walking on it.
- ✓ Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.
- ✓ Never push objects of any kind into this product through KSU slots or connectors as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
- ✓ To reduce the risk of electric shock, do not disassemble this product. Instead, take it to a qualified person when service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risk. Incorrect reassemble can cause electric shock when the appliance is subsequently used.
- ✓ Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - When the power supply cord or plug is damaged or frayed.
 - If liquid has been spilled into the product.
 - If the product has been exposed to rain or water.
 - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
 - If the product has been dropped or the KSU has been damaged.
 - If the product exhibits a distinct change in performance.
- ✓ Avoid using a telephone during an electrical storm. There may be a remote risk of electric shock from lightning.
- ✓ In the event of a gas leak, do not use the telephone near the leak.

1.2 Precaution

- ✓ Keep the system away from heating appliances and electrical noise generating devices such as florescent lamps, motors and televisions. These noise sources can interfere with the performance of the ipLDK-60 System.
- ✓ This system should be kept free of dust, moisture, high temperature (more than 40 degrees) and vibration, and should not be exposed to direct sunlight.
- ✓ Never attempt to insert wires, pins, etc. into the system. If the system does not operate properly, the equipment should be repaired by an authorized LG-Ericsson service center.
- ✓ Do not use benzene, paint thinner, or an abrasive powder to clean the KSU. Wipe it with a soft cloth only.

1.2.1 Caution

- ✓ This system should only be installed and serviced by qualified service personnel.
- ✓ When a failure occurs which exposes any internal parts, disconnect the power supply cord immediately and return this system to your dealer.
- ✓ To prevent the risk of fire, electric shock or energy hazard, do not expose this product to rain or any type of moisture.
- ✓ To protect PCB from static electricity, discharge body static before touching connectors and/or components by touching ground or wearing a ground strap.



WARNING

- Danger of explosion if battery is not correctly replaced.
- Replace only with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

1.2.2 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 2002/96/EC.



- All electric and electronic products should be only be disposed of 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 information about disposal of your old appliances, please contact your city office, waste disposal service or the place of product purchase.

1.3 Manual Usage

This document provides general information covering the hardware description and installation of the ipLDK-60 System. While every effort has been taken to ensure the accuracy of this information LG-Ericsson makes no warranty of accuracy or interpretations thereof.

Section 2. System Overview

Provides general information on the ipLDK-60 System, including the system specifications and capacity.

Section 3. KSU Installation

Describes detailed instructions for planning the installation site and procedures to install the ipLDK-60 System.

Section 4. Board Installation

Describes detailed instructions for installing components of the ipLDK-60 Board.

Section 5. Terminal Connections and Wiring Method

Describes the kinds of terminals, maximum distance, and other device connections for the terminal.

Section 6. Starting the ipLDK-60 System

Provides general information for starting the System and basic Admin programming.

Section 7. Troubleshooting

Provides information on the ipLDK-60 System and deals with common troubleshooting issues.

1.4 Abbreviations

AAFU: Auto Attendant Function Unit	JTAG: Joint Test Action Group
AC: Alternating Current	KSU: Key Service Unit
ACD: Automatic Call Distributor	LAN: Local Area Network
ADPCM: Adaptive Differential Pulse Code Modulation	Max.: Maximum
AIS : Alarm Indication Signal	MBU: Mother Board Unit
ARM7TDMI: a 16-bit/32-bit RISC CPU designed by ARM	Min.: Minimum
ASIC: a BASIC dialect and shareware compiler for MS-DOS systems	MJ: Modular Jack
AWG: American Wire Gauge	MODU: Modem Unit
CEPT: European Conference of Postal and Telecommunications Administrations	MOHU: Music On Hold Unit
CHB308: 3 CO lines and 8 hybrid interface board	NT: Network Terminal
CID: Caller ID	PCB: Printed Circuit Board
CKB316: 3 CO lines and 16 DKT interface board	PCM: Pulse Code Modulation
CMU50PR: Call Metering (50KHz) and Polarity Reversal Detection Unit	PFTU: Power Failure Transfer Unit
CMU12PR: Call Metering (12KHz or 16KHz) and Polarity Reversal Detection Unit	PSTN: Public Switched Telephone Network
CN: Connector	PSU: Power Supply Unit
CO: Central Office	RX: Receive Signal
CPU: Central Processing Unit	SLIB8: Single Line Interface Board with 8ports
CSB316: 3 CO lines and 16 SLT interface board	SLT: Single Line Telephone
DC: Direct Current	SMS: Short Message Service
DKTU: Digital Key Telephone Unit	TD: Transmitted Data
DSP: Digital signal processing	TDM: Time Division Multiplexing
DSS: Direct Station Selection	TE: Terminal Equipment
DTMF: Dual Tone Multi Frequency	TEGND: Terminal Equipment Ground
EMI: Electromagnetic Interference	TX: Transmitting signal
ESD: Electrostatic Discharge	UCD: User Call Distribution
ETS: European Telecommunications Standards	UL: Underwriters Laboratories
FSK: Frequency-shift keying	UTP: Unshielded Twisted Pair
GND: Ground	VR: Voice Ring
IP: Internet Protocol	VT: Voice Tip
	VMIU: Voice Mail Interface Unit
	VOIB: Voice Over Internet Protocol interface Board
	VOIP: Voice over IP
	VOIU: Voice Over Internet Protocol Interface Unit

2 SYSTEM OVERVIEW

2.1 ipLDK-60 System Highlights

Features of the ipLDK-60 System include:

- ✓ Flexible architecture
- ✓ Simple system structure
- ✓ Powerful PC application via LAN, Modem, RS-232C
- ✓ Enhanced voice features
- ✓ Easy installation & efficient system management
 - Remote admin & software upgrade through LAN connection
 - Remote admin & software upgrade through PSTN modem
- ✓ Value-Added features
 - Distinctive Voice mail (ADPCM 32 Kbps)
 - Basic CID (CO & SLT) Function
 - 8 Poly internal MOH (13 Music sources)

2.1.1 System Connection Diagram

The following Figure shows the components that make up the ipLDK-60 System:

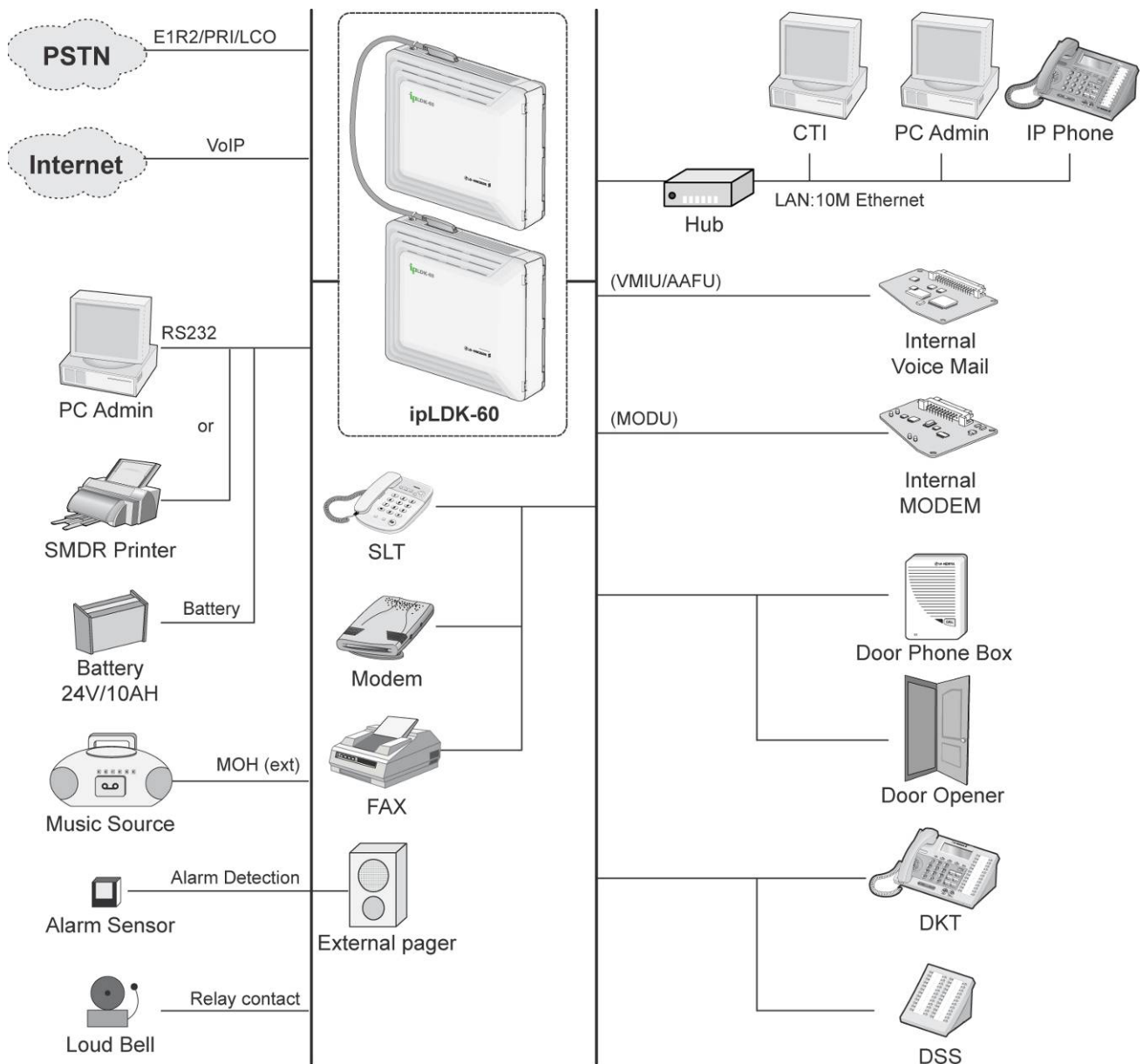


FIGURE 2.1.1 SYSTEM CONNECTION DIAGRAM

2.2 System Components

BASIC KSU

ITEM		OPTION BOARD	DESCRIPTION
KSU			Key Service Unit
PSU			Power Supply Unit
Main Board	MBU		Main Board Unit (3CO, 1DKT and 7 Hybrid)
		CO and Extension Boards	CO Line and DKT/SLT interface boards (CHB308, CSB316, SLIB8, E1HB8, PRHB8, T1/PRIHB and VOIB)
		Function Boards	VMIU, AAFU, MODU, CMU50PR, CMU12PR can be installed
CO Line and Extension Boards	CHB308		3CO Lines and 8 Hybrid Interface Board
		CMU50PR	Call Metering (50Hz) and Polarity Reversal Detection Unit (3 channels)
		CMU12PR	Call Metering (12KHz or 16KHz) and Polarity Reversal Detection Unit (3 channels)
	CSB316		3 CO Lines and 16 SLT Interface Board
		CMU50PR	Call Metering (50Hz) and Polarity Reversal Detection Unit (3 channels)
		CMU12PR	Call Metering (12KHz or 16KHz) and Polarity Reversal Detection Unit (3 channels)
		SLU8	8 SLT Interface Unit Installed on CSB316 as a default
	SLIB8		8 SLT Interface Board
	VOIB		Voice over IP Board (4ch)
		VOIU	Voice over IP unit (4ch)
	E1HB8		E1R2 and 8 Hybrid Interface Board
		SLU8	8 SLT Interface Unit Installed on E1HB8 as a default
	PRHB8		PRI and 8 Hybrid Interface Board
SLU8		8 SLT Interface Unit Installed on PRHB8 as a default	
T1/PRIHB		T1/PRI for N.A. and 8 Hybrid Interface Board	
Function Boards	WDIB4		4 Base Wireless Terminal Interface Board
	VMIU		Voice Mail Interface Unit, 4 channels
	AAFU		Auto Attendant Function Unit, 4 channels
	MODU		MODEM unit (33Kbps)
	CMU50PR		Call Meeting (50Hz) and Polarity Reversal Detection Unit (3 channels)
	CMU12PR		Call Metering (12KHz or 16KHz) and Polarity Reversal Detection Unit (3 channels)

EXPANSION KSU

Item		Option Board	Description
KSU			Key Service Unit
PSU			Power Supply Unit
Main Board	EMBU		Expansion Main Board Unit (3 CO and 8 Hybrid)
		CO and Extension Boards	CO Line and DKT/SLT interface Boards (CHB308, CSB316, SLIB8)
		Function Boards	CMU12PR, CMU50PR can be installed
	EMBU2		Expansion Main Board 2 (3 CO and 16 DKT)
		CO and Extension Boards	CO Line and DKT/SLT Boards (CHB308, CKB316 only)
		Function Boards	Not applicable
CO Line and Extension Boards	CHB308		3 CO Lines and 8 Hybrid Interface Board
		CMU50PR	Call Metering (50Hz) and Polarity Reversal Detection Unit (3 channels)
		CMU12PR	Call Metering (12KHz or 16KHz) and Polarity Reversal Detection Unit (3 channels)
	CKB316		3CO Lines and 16 Digital Telephone Interface Board
	CSB316		3 CO Lines and 16 SLT Interface Board
		CMU50PR	Call Metering (50 Hz) and Polarity Reversal Detection Unit (3 channels)
		CMU12PR	Call Metering (12KHz or 16KHz) and Polarity Reversal Detection Unit (3 channels)
		SLU8	8 SLT Interface Unit, installed on CSB316 as a default.
SLIB8		8 SLT Interface Board	
Other Boards	WDIB4		4 Base Wireless Terminal Interface Board
	CMU50PR		Call Metering (50Hz) and Polarity Reversal Detection Unit (3 channels)
	CMU12PR		Call Metering (12KHz or 16KHz) and Polarity Reversal Detection Unit (3 channels)

2.3 Specifications

2.3.1 General Specifications

Item	Description	Specification
CPU		ARM7 TDML core(32bit, 50MHz)
Switching Device		Custom Mixed-Signal ASIC Device
Memory Back-up Duration		7years
PSU	AC Voltage Input	100~240 +/- 10% Volt AC @47-63Hz
	AC Power consumption	90W
	AC Input Fuse	2A @250Volt AC
	DC Output Voltage	+5, -5, +27, +30Volt DC
External Backup Battery	Input Voltage	+24 Volt DC(+12VDC x 2ea)
	Battery Fuse	5.0A @250Volt AC
	Charging Current	Max. 200mA
	Battery Load Current	Max. 3A (only BKSU), Max. 6A (BKSU + EKSU)
Ring Signal		75Vrms, 25Hz
External Relay Contact		1A @30Volt DC
Music Source Input		0dBm @600ohm
External Paging Port		0dBm @600ohm
Ring Detect Sensitivity		30Vrms @16-55Hz
DTMF Dialing	Frequency Deviation	Less than +/-1.8%
	Signal Rise Time	5ms
	Tone Duration, on time	Min. 50 ms, Normally 100ms
	Inter-digit Time	Min. 30ms, Normally 100ms
Pulse Dialing	Pulse Rate	10PPS
	Break/Make Ratio	60/40% or 66/33%
Operating Environment	Temperature	0° – 40° C
	Humidity	0 - 80% (non-condensing)
Dimension	KSU	339mm(W) x 288mm(H) x 85mm(D)
	Expansion KSU	339mm(W) x 288mm(H) x 85mm(D)
Weight	KSU	1.8Kg
	Expansion KSU	1.8Kg
MODU	Analog Modem	Bell, ITU-T, V.34 V.32BIS, V.90
	Speed	300bps up to 33Kbps speed rate
	Connection	Automatic rate negotiation
VOIB	LAN Interface	10 Base-T Ethernet (IEEE 802.3)
	Speed	10 Mbps (Auto-Negotiation)
	Duplex	Half Duplex or Full Duplex (Auto-Negotiation)
	VOIP Protocol	H.323 Revision 2
	Voice Compression	G.711/G.726/G729/G.723.1
	Voice/Fax Switching	T.38
	Echo cancellation	G.165

2.3.2 System Capacity

Description	Capacity/Board	Total
Time Slots		128
CO Line Ports	3/MBU, 3/EMBU, 3/(CHB308, CKB316, CSB316), 8/VOIB, 30/E1HB8	Max. 36
Max Direct Station (DKT, SLT, DSS) Connections	8/MBU, 8/EMBU, 16/EMBU2, 8/CHB308, 16/CKB316, 16/CSB316, 8/VOIB, 8/E1HB8, 8/PRHB8	Max. 48
External relay contact	2/MBU	4
LAN	MBU, VOIB, E1HB8, 8/PRHB8	3
MODEM Channel	1/MODU	1
Attendant Positions	Max. 5 + 1/Tenancy Group	
Intercom Links	Non-Blocking	
Paging - All Call - Internal		1 zone 5 zones
Station Speed Dial	100/station, 24 digits each	500
System Speed Dial	24 digits each	500
Last Number Redial	15 ~ 50 (by admin programming)	32 digits
CO Line Group	8	8
Station Group	10	10
Conference	3~15 Party	All ports are available
Multi-Conference	3~15 Party	Max. 3 groups
Internal MOH (13 Music Sources)	1/MBU	1
External MOH	1/MBU	1
External Paging port	1/MBU	1
External Relay Contact	2/MBU, 2/EMBU	4
Alarm Input	1/MBU	1
RS-232C Port	1/MBU	1
DTMF/CPT Receiver channels	16 channels/MBU	16 channels
FSK Receiver channels	16 channels/MBU	16 channels
PFT Circuit	1/MBU, 1/EMBU, 1/CHB308, 1/CSB316	4

2.3.3 Base station specification (GDC-400B/600B/600BE)

Item	Specification
Power feeding	+30V DC
Transmission Max Power	250mW
Access Method/Duplex	TDMA/TDD
Frequency Band	1,880 ~ 1,900MHz
Channel Spacing	1.728MHz
Modulation	GFSK
Data rate	1.152Mbps
Max. Base Station distance from the WTIB	600m (twisted 2-pair cable)

2.3.4 Wireless Terminal specification

Item	Specification
Max. Transmission Power	250mW
Modulation Method	GFSK
Frequency Band	1,880MHz ~ 1,900MHz

3 KSU INSTALLATION

3.1 Pre-Installation

Please read the following guidelines concerning installation and connection before installing the ipLDK-60 System. Be sure to comply with applicable local regulations.

3.1.1 Safety Installation Instructions

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

- ✓ Never install the telephone wiring during a lightning storm.
- ✓ Never install the telephone jack in wet locations unless the jack is specifically designed for wet locations.
- ✓ Never 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.

3.1.2 Installation precautions

The ipLDK-60 System is designed for wall mounting or a free-standing rack. Avoid installing in the following places:

- ✓ In direct sunlight and hot, cold, or humid places. Temperature range = 0 to 40°C.
- ✓ Places where shocks or vibrations are frequent or strong.
- ✓ Dusty places or places where water or oil may be exposed to the System.
- ✓ Near radio-frequency generating devices such as sewing machines or electric welders.
- ✓ On or near computers, fax machines, or other office equipment, as well as microwave ovens or air conditioners.
- ✓ Do not obstruct the openings on the sides or top of the ipLDK-60 System.
- ✓ Do not stack up the optional service boards.

3.1.3 Wiring Precautions

Be sure to follow these precautions when wiring:

- ✓ Do not wire the telephone cable in parallel with an AC power source, such as a computer, fax machine, etc. If the cables are run near such wire, 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 stepped on. Avoid wiring under carpets.
- ✓ Avoid using the same power supply outlet for computers, fax machine, and other office equipment to avoid induction noise when using the ipLDK-60 near other machines.
- ✓ The power and battery switches must be OFF during wiring. After wiring is completed, the power switch may be turned ON.
- ✓ Incorrect wiring may cause the ipLDK-60 System to operate improperly.
- ✓ 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 twisted pair cable for connecting CO lines.

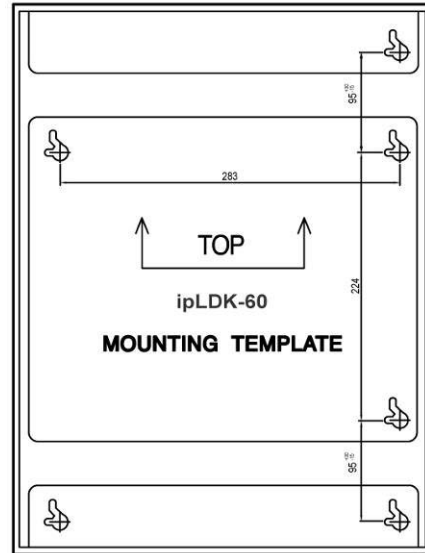
3.2 KSU Installation

3.2.1 Unpacking

Open the box and verify that the items shown in Figure 3.2.1 are included with the Basic KSU:



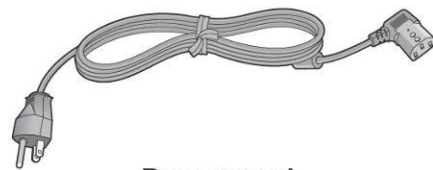
Key Service Unit



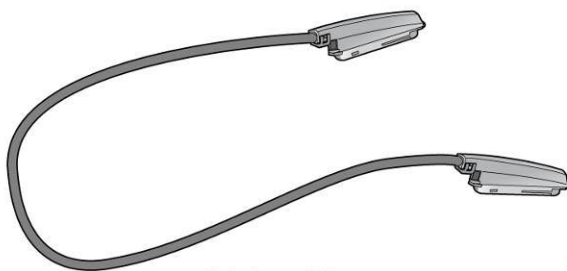
Mounting template



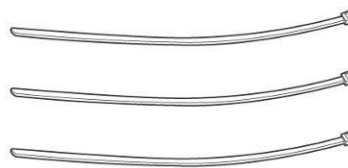
CD manual



Power cord



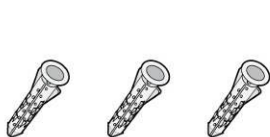
Link cable



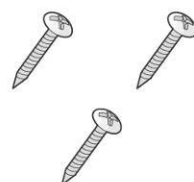
Tie cable



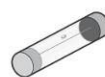
Rubber feet



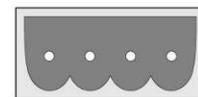
Anchor plug



Screw



Fuse



Relay connector

FIGURE 3.2.1 CARTON CONTENTS

3.2.2 KSU Exterior and Dimension

Figure 3.2.2 shows the exterior and dimensions of the KSU in milli-meters.

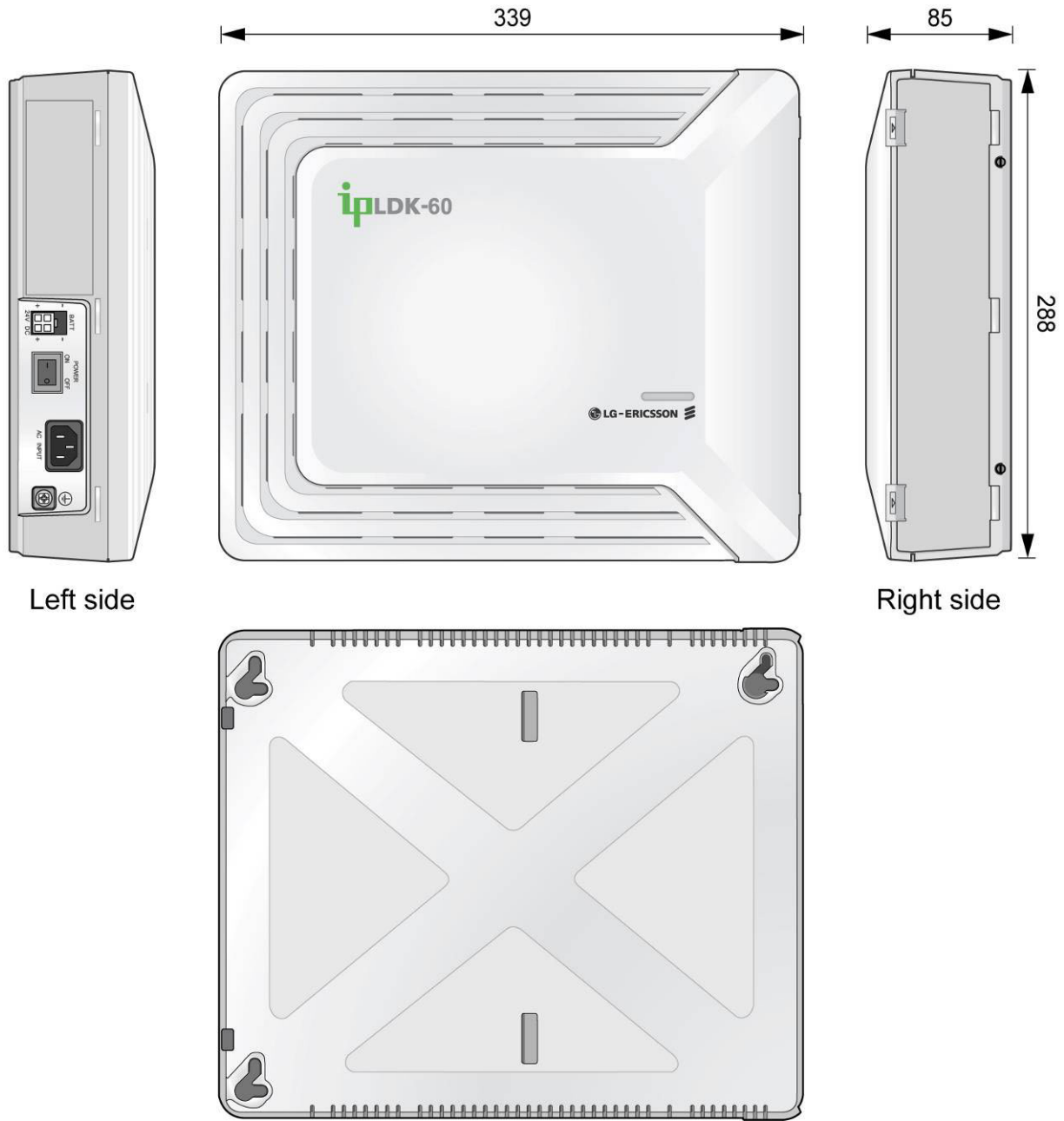


FIGURE 3.2.2 KSU EXTERIOR AND DIMENSION

3.2.3 Opening and Closing the Front Cover

3.2.3.1 Opening the Front Cover

1. Open the Cord cover and turn the screws counter-clockwise to loosen as shown in Figure 3.2.3.1.
2. Lift the front cover in the direction of the arrow as shown.



FIGURE 3.2.3.1 OPENING THE FRONT COVER

3.2.3.2 Closing the Front Cover

1. Insert the front cover into the slots of the KSU as shown in Figure 3.2.3.2.
2. Then put the front cover down on the KSU in the direction of the arrow, as shown.
3. Turn the screws clockwise to tighten and close the Wiring Tray cover as in the Figure.



FIGURE 3.2.3.2 CLOSING THE FRONT COVER

Note

- Prior to operation, the front cover of the ipLDK-60 should be closed and the screws tightened.

3.2.4 Power Supply Unit Installation

Before installation, assure that the AC plug is not connected to an AC outlet. The PSU is located at the left in the KSU and is pre-installed in the ipLDK-60 KSU. The PSU provides three DC voltage power sources to MBU through the 7-pin connector, CN7.

Description	Specification
AC Voltage Input	100~240 VAC +/- 10 %
AC Frequency	47-63Hz
AC Power Consumption	90W
AC Input Fuse	2A @250Volt AC
DC Output Voltage	+5V/3A, -5V/0.2A, +27V/0.2A, +30/1.5A
DC Input Voltage	+24 Volt DC (+12VDC x 2ea)
Battery Fuse	5.0A @250Volt
Battery Charging Current	200mA

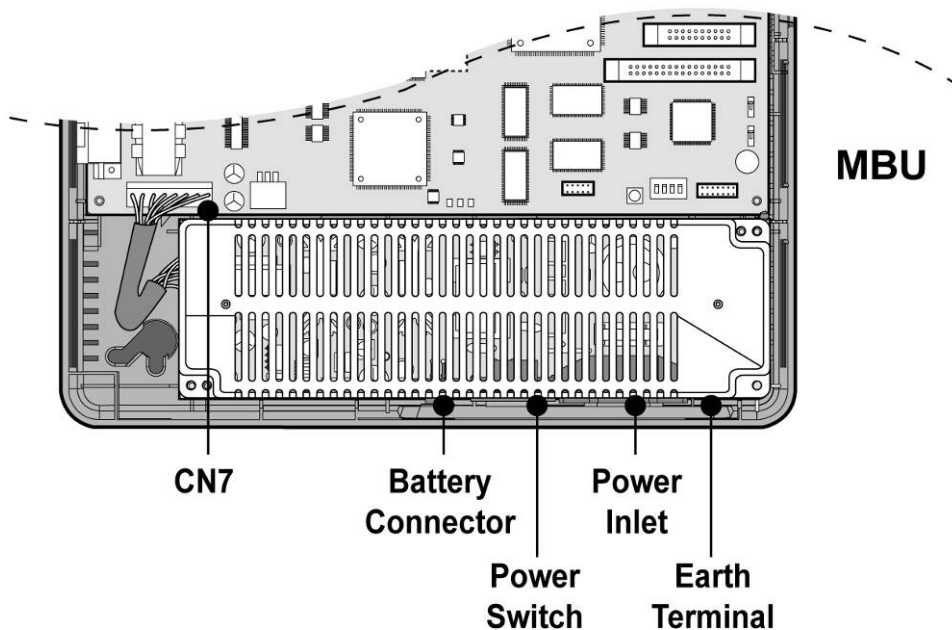


FIGURE 3.2.4 PSU INSTALLATION

3.2.5 Frame Ground Connection

It is very important that the frame of the ipLDK-60 System is grounded. Proper grounding reduces RF noise and reduces the potential damage from Lightning strikes.

1. Turn the grounding screw counter clockwise to loosen, as shown in Figure 3.2.5.
2. Insert the grounding wire and tighten the screw.
3. Then connect the grounding wire to an appropriate ground source (refer to Caution).

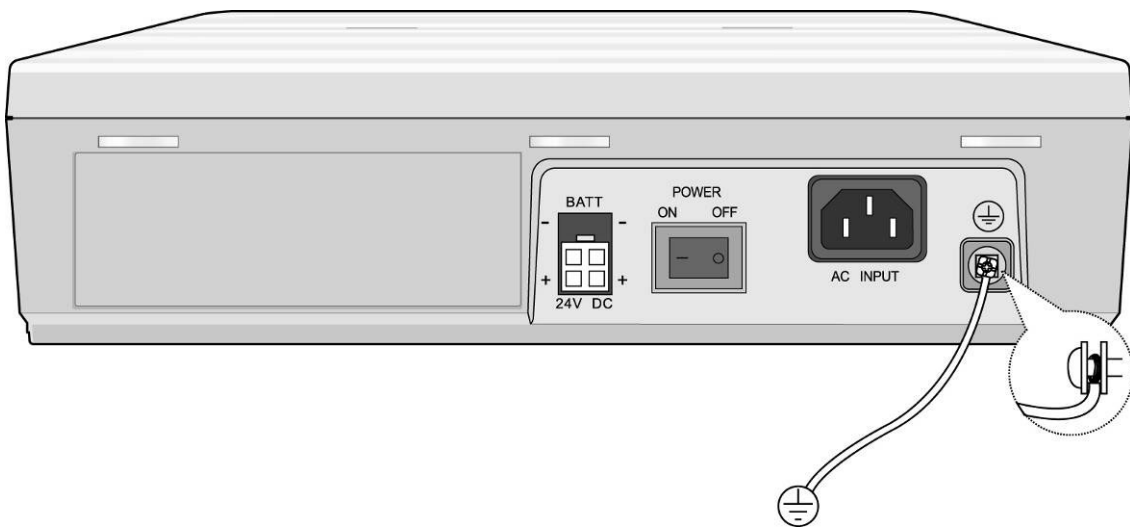


FIGURE 3.2.5 GROUNDING THE KSU

CAUTION—

- ✓ The equipment should be connected to a socket-outlet with a protective ground connection.
- ✓ For ground wire, green-and-yellow insulation is required and using a UL 1015 AWG #18 (1.0mm) or larger conductor. It is recommended that the ground wire is shorter than 1m (3.28ft).
- ✓ Proper grounding is very important to protect the ipLDK-60 from external noise and to reduce the risk of electrocution in the event of lightning strike.
- ✓ Be sure to comply with applicable local regulations.

3.2.6 External Backup Battery Installation

In case of power failure, the external backup batteries automatically maintain uninterrupted power for the ipLDK-60 System. The external batteries must provide 24V DC; this is generally accomplished by connecting two 12V batteries in a series arrangement as shown. The cable used to connect the battery is supplied with the KSU.

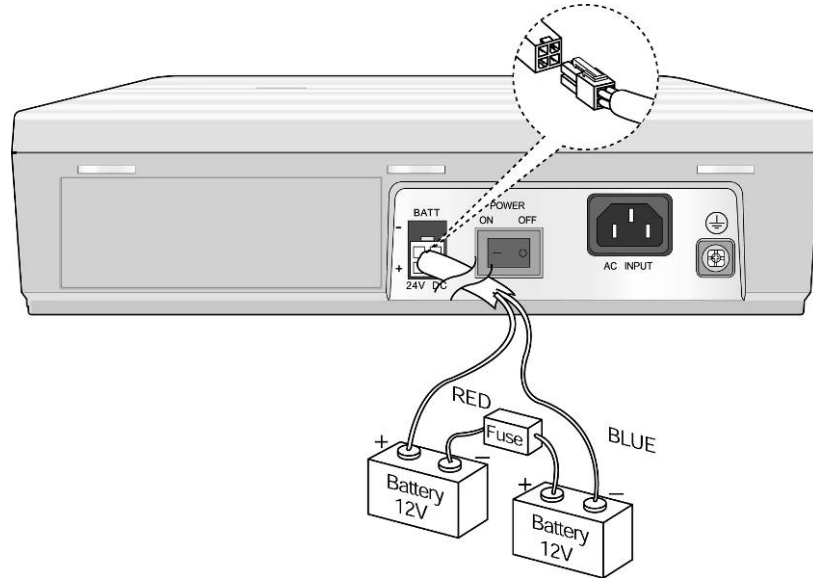


FIGURE 3.2.6 EXTERNAL BACKUP BATTERY INSTALLATION

Battery operation is controlled by the PSU. The PSU will provide charging current to the batteries during normal AC power operation at a maximum of about 200mA. PSU battery operation will be halted if the AC power is re-connected or if the battery voltage is too low to maintain full-system operation.

The external batteries can maintain System operation as needed depending on several elements such as battery charge status, condition and capacity of the batteries, and System configuration (number of Station ports).

CAUTION—

- ✓ It is recommended to use an external backup battery fuse (5A @250V) between the battery and the System.
- ✓ Recommended battery capacity is 24V/20AH MF; the ipLDK-60 System should be able to operate more than 3 hours with batteries that are in good condition.
- ✓ Carefully check the battery polarity with cable colors (Red and Blue) when connecting the battery to the System.
- ✓ Make sure that you do not short out the external batteries and cables.
- ✓ There is a danger of explosion if external batteries are incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

3.2.7 KSU Mounting

3.2.7.1 Wall Mounting

1. Install three (3) anchor plugs in the wall using the mounting template included for accurate placement (Figure 3.2.7.1A).
2. Attach the mounting template using the three (3) screws and anchors included.
3. Hook the KSU onto the screws, making sure that the System slides down securely (Figure 3.2.7.1B).

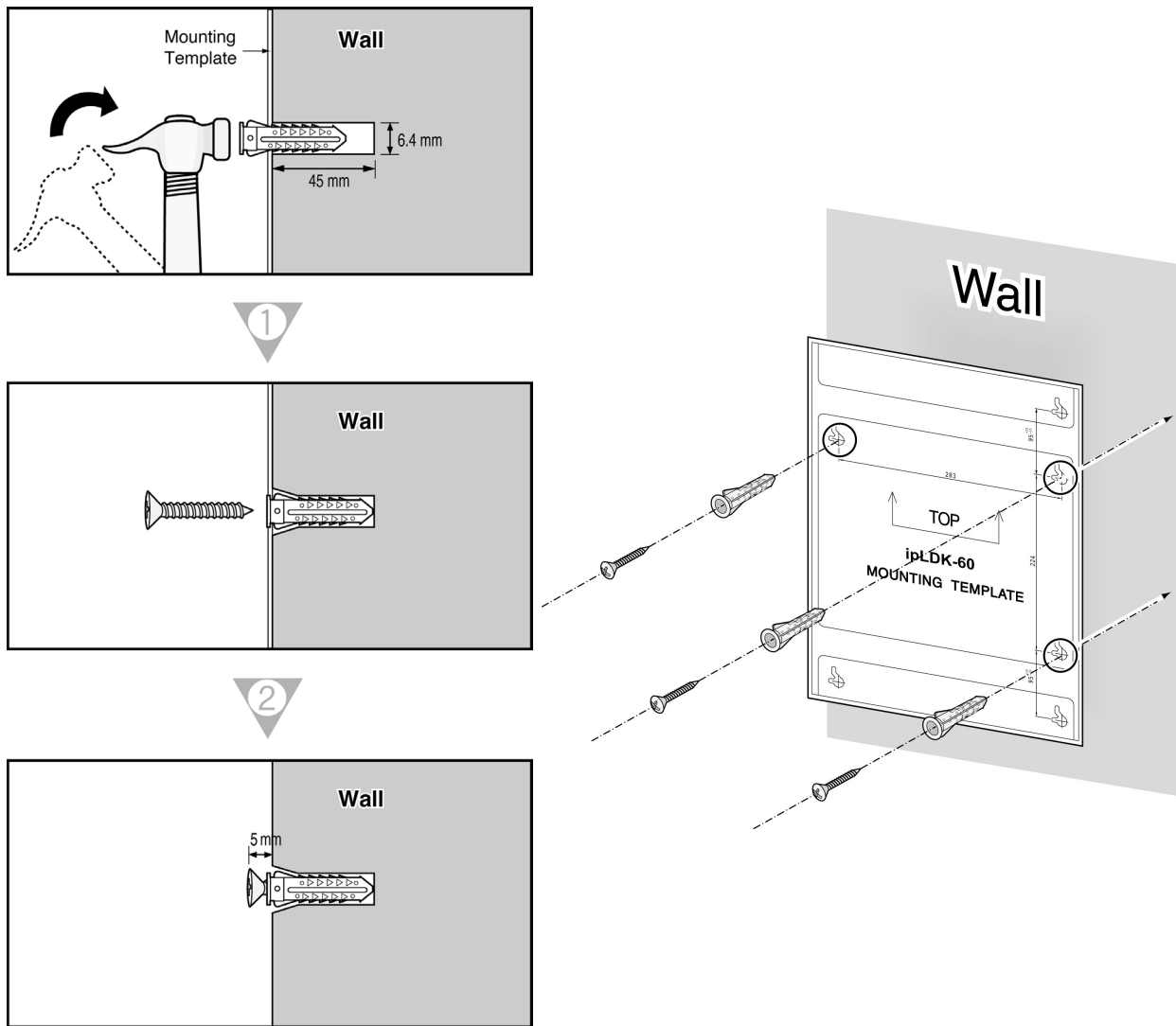


FIGURE 3.2.7.1A MOUNTING TEMPLATE

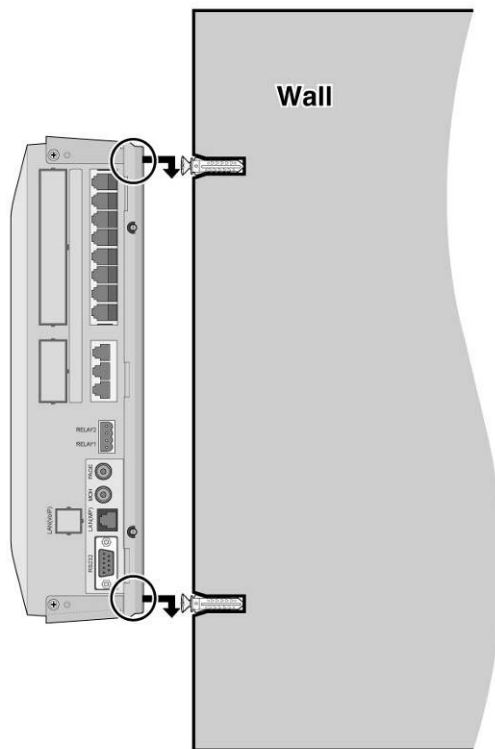
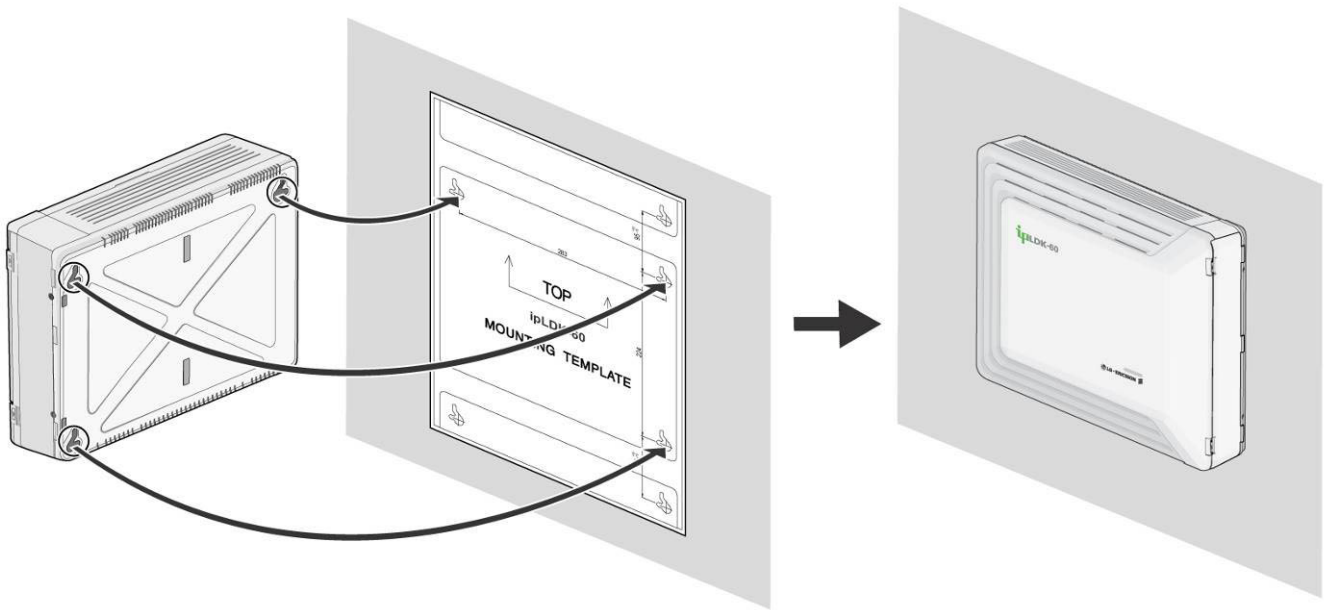


FIGURE 3.2.7.1B KSU WALL MOUNTING

Note

- Be careful not to drop the KSU.