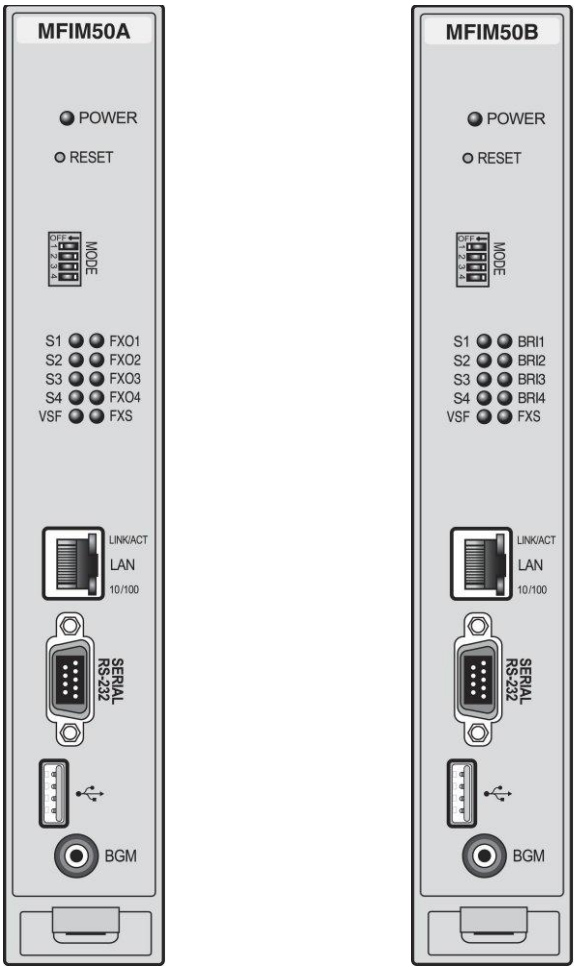

IPECS 50A & 50B
Hardware Description
&
Installation Manual

Update Revision History

ISSUE	DATE	DESCRIPTION OF CHANGES
1.0	JUL. 2008	Initial Release
1.1	Oct. 2009	Manual is merged
1.2	Aug. 2010	Changed the new CI (LG-Ericsson)
1.2.1	Jun. 2012	Update by W.Smith

CD Manual Revision History

ISSUE	DATE	DESCRIPTION OF CHANGES
1.3	5 Oct. 2009	Manual is merged
1.5	Aug. 2010	Changed the new CI (LG-Ericsson)

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-LIK50 /
Local regulatory agency registration number:	locally provided
Ringer equivalence:	0.7B
Registered jack:	RJ-45 w/Desk Holder/Wall Mount/Rack Mount
	RJ-11 w/Desk Holder/Wall Mount/Rack Mount

The required regulatory agency registration number is available from your local LG-Ericsson representative.

This equipment complies with the following regulatory standards, FCC Part 15 and 68, IC (Industry Canada) CS03, TBR21 (iPECS-LIK50A) and TBR03 (iPECS-LIK50B). Also, this equipment complies with the safety requirements of UL60950-1, CSA60950-1, EN60950-1, EN55022 and EN55024

iPECS-LIK50 have been designed to comply with the Hearing Aid Compatibility requirements as defined in Section 68.316 of Part 68 FCC Rules.

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 your 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 iPECS-LIK50 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.

iPECS-LIK50 comply 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:

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 their own expense, will be required to take whatever measures may be required to correct the interference.

CAUTION

This system employs a Lithium battery as back-up power for the real-time clock and memory. The battery is not replaceable in the field. RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. Dispose of used batteries in accordance with the manufacturer's instructions.

Table Of Contents

1. INTRODUCTION

1.1 OVERVIEW

iPECS-LIK50 systems are LG-Ericsson's internet Protocol (iP) Enterprise Communications Solutions designed to meet the telecommunication needs of the small sized business. They use advanced packet voice and IP switching technology, which are combined with a rich feature content, to set a new standard in Voice over IP (VoIP) systems.

iPECS-LIK50 is available in two models, LIK-MFIM50A MFIM50B. The LIK-MFIM50A integrates VOIP (H323/SIP), miscellaneous functions, VSF, USB, FXS, and FXO ports in a module, which connects to the Public Switched Telephone Network (PSTN), or public and private VoIP networks. The LIK-MFIM50B integrates VOIP (H323/SIP), miscellaneous functions, VSF, USB, FXS, and ISDN-BRI ports in a modules, which connect ISDN, or public and private VoIP networks. integrates VOIP (H323/SIP), VSF, USB, two FXS and two 10/100 Base- T Ethernet ports in a module, which connects to the public and private VoIP networks. These models work with existing iPECS gateways and LIP Phones, which provide the user simple access to the many features and functions of the iPECS.

iPECS-LIK50 can be installed in the Desk mount Holder, Wall Mount Holder, or
1U Rack Mount Bracket. They are separately powered from an AC/DC adapter, which converts 100-240 VAC to 12VDC for use by the module.

iPECS-LIK50 support a variety of LIP Phones, standard VoIP phones (SIP and H.323 V3) and analogue single line devices. 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 and digital Phone 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.

iPECS-LIK50 provide an environment rich in features beyond today's traditional circuit switched telephone systems. In addition to a fully featured voice intercom, the iPECS incorporates enhanced messaging, basic Auto Attendant/Voice Mail, Least Cost Routing, and Automatic Call Distribution, as well as Web based Admin, and VoIP network interface. iPECS incorporates an interface to the iPECS Applications Service Provider, a TAPI 3.1 TSP/MSP. The Application Service Provider links the iPECS for advanced Computer-Telephony applications of the iPECS Feature Server. In addition to the iPECS Auto Attendant/Voice Mail and iPECS Unified Messaging applications developed by LG-Ericsson, third party TAPI 3.1 application support is provided. Unified Communications Services (UCS) are supported through optional application software providing enhanced communications and presence. An optional Network Management Server (NMS) software package is available allowing monitoring and management of environments encompassing multiple iPECS installations.

By employing packet voice and IP switching, the iPECS infrastructure can be employed for or can share the enterprise data network. Further, since all modules and terminals have a unique IP address, they can be moved anywhere with access to a broadband network that can connect to

iPECS and function without the need for “re-programming”. The use of the single common infrastructure and ability to easily install or relocate modules and telephones results in significant savings at installation and over the life of the system.
The reliability, extensive feature content, the ability to support present and future applications with the iPECS Feature Server and the capability to use an array of modules and instruments, permit the iPECS to be tailored to meet the short and long-term needs of the most demanding customer requirements.

Figure 1.1-1 below is a diagram of the system, terminals and applications available with iPECS-LIK50A.

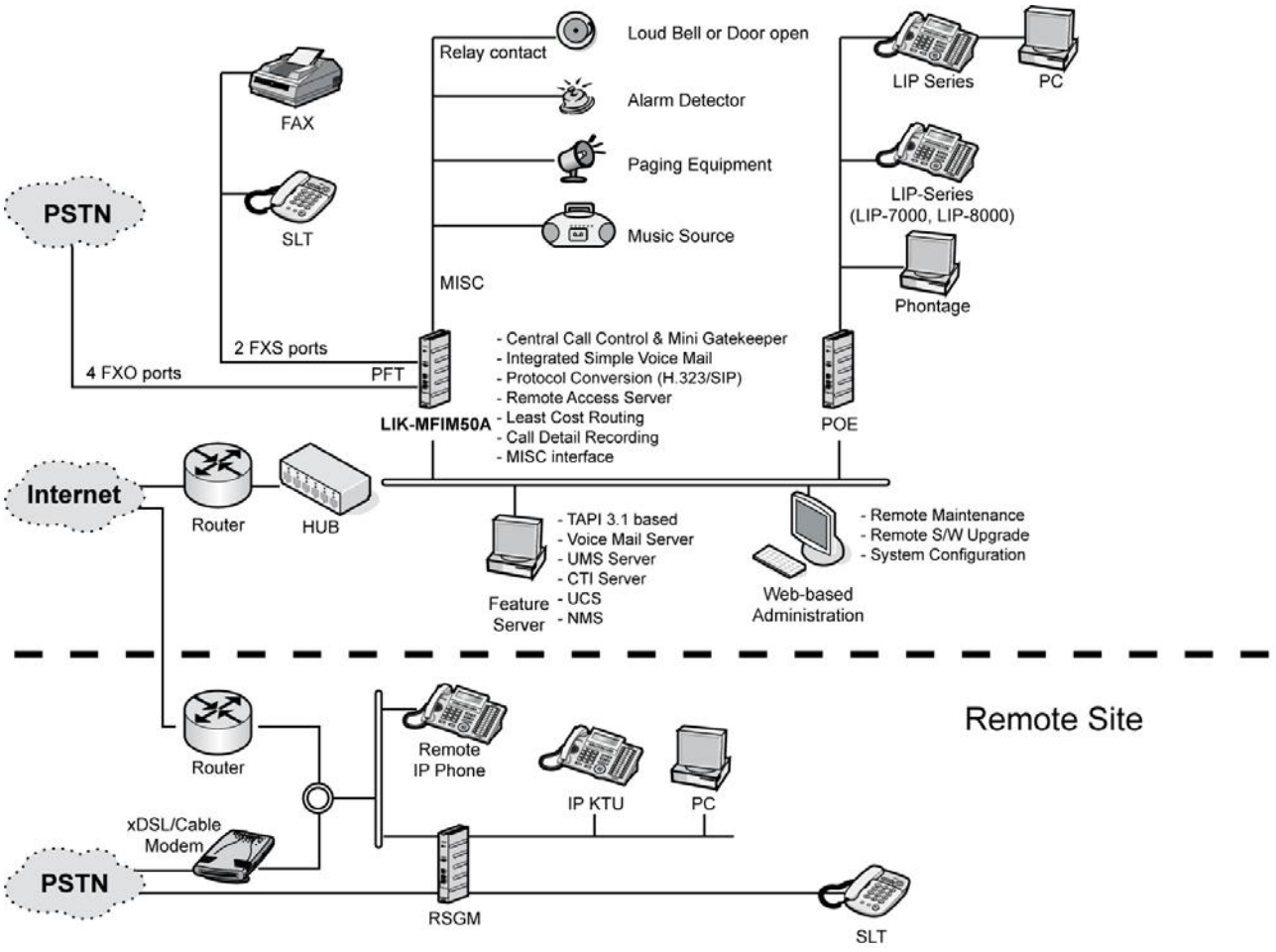

Figure 1.1-1 iPECS-LIK50A Structure

Figure 1.1-2 below is a diagram of the system, terminals and applications available with iPECS-LIK50B.

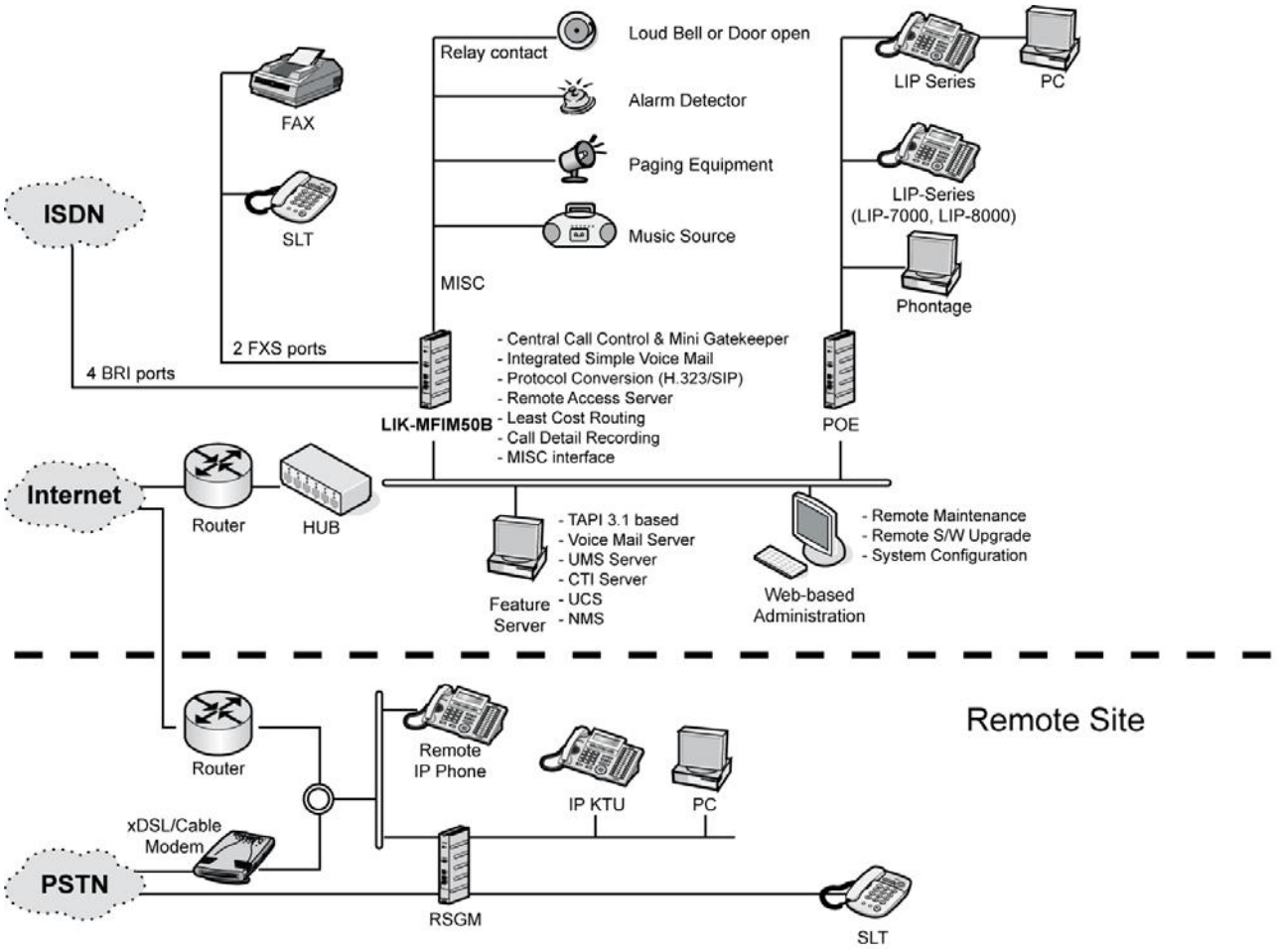

Figure 1.1-2 iPECS-LIK50B Structure

Figure 1.1-23 NA. .

Figure 1.1-3 NA.

1.2 HARDWARE COMPONENTS

Table 1.2-1 provides a description of the hardware components that make-up iPECS-LIK50 . All of these Modules and terminals are connected over a 10/100 Base-T Ethernet LAN.

Table 1.2-1 Modules and Terminals of iPECS-LIK50

ITEM		DESCRIPTION
1	LIK-MFIM50A	Multi-Function Interface gateway Module, 50 ports w/Analog trunk
	LIK-MFIM50B	Multi-Function Interface gateway Module, 50 ports w/ISDN-BRI
2	AC/DC Adapter	AC/DC Adapter MFIM50A/B module (12VDC, 1.5A)
3	AC/DC Adapter –K-	AC/DC Adapter for LIP Phones and DSS Console (48VDC, 0.3A)
4	DHLD	Desk mount Holder for module
5	DHE	Desk mount Holder Extender, one (1) required for each Module
6	WHLD	Wall mount Holder for module
7	1U-RMB	1U Rack mount Bracket
8	LIP-7004N	LIP Phone, Basic 4 button no display
9	LIP-7008D	LIP Phone, 8 button and basic 2-line display
10	LIP-7016D	LIP Phone, 16 button, 3-line display w/Menu, Soft & Nav. buttons
11	LIP-7024D	LIP Phone, 24 button, 3-line display w/Menu, Soft & Nav. buttons
12	LIP-7024LD	LIP Phone, 24 button, Large display w/Menu, Soft & Nav. buttons
13	LIP-7048DSS	LIP DSS Console with 48 buttons
14	LIP-8002	LIP Phone, 4 button and 1-line display, LAN 1 port
15	LIP-8004D	LIP Phone, 4 button and 1-line display, LAN 1 port
16	LIP-8012D	LIP Phone, 12 button, 3-line display w/Menu, Soft & Nav. buttons
17	LIP-8024D	LIP Phone, 24 button, 4-line display w/Menu, Soft & Nav. buttons
18	LIP-8040L	LIP Phone, 10 button, 9-line display w/Menu, Soft & Nav. buttons
19	LIP-8048DSS	LIP DSS Console with 48 buttons
20	LIP-8012DSS	LIP DSS Console with 12 buttons
21	LIP-8012LSS	LIP DSS Console with 12 buttons, w/12-line LCD button label
22	LIP-7004WMK	Wall Mount Kit for LIP-7004N
23	LIP-7008WMK	Wall Mount Kit for 7008D
24	LIP-7024WMK	Wall Mount Kit for LIP-7016D, 7024D & 7024LD
25	WIT-300HE/400H	iPECS WLAN Phone
25	WIT-400H	iPECS WLAN Phone
26	GDC-400B	DECT Base Station
27	GDC-600B	DECT Base Station
28	GDC-400H	DECT Handset
29	GDC-450H	DECT Handset

** Note: All iPECS-LIK modules can be connected to iPECS-LIK50 over a 10/100 Base-T Ethernet. Refer to the iPECS-100/300/600/1200 Description and Installation manual.*

2. HARDWARE DESCRIPTION

2.1 iPECS-LIK50

2.1.1 LIK-MFIM50 (Multi-Function Interface gateway Module 50)

Multi-Function Interface gateway Modules (LIK-MFIM50A, LIK-MFIM50B), which are the main controller for iPECS-LIK50 and employ the iPECS protocol, extend telephony resources and call processing to the iPECS modules and terminals. LIK-MFIM50A incorporates CO line interfaces for CO/PBX Loop Start Line MFIM50B incorporates ISDN Basic Rate Interface (2B+D). Both models support FXS interfaces for standard analog Single Line Telephone (SLT) devices, miscellaneous interfaces for Music-On-Hold (MOH), Background Music (BGM), contact monitors for Alarm and Doorbell inputs, and Loud Bell Contacts. Power Fail Transfer(PFT) relays is only MFIM50A. In addition, LIK-MFIM50A MFIM50B include battery back-up circuitry using a long-life Lithium battery to maintain the real-time clock and prevent loss of system database during power fail, refer to section 4.4.1 & 4.4.2.

There are two types of MFIMs as shown in Table 2.1.1-1.

Table 2.1.1-1 LIK-MFIM50 Comparison Chart

ITEM	LIK-MFIM50A	LIK-MFIM50B
System Capacity	50	50
CO/IP Lines	42	42
Stations	50	50
VoIP Channels	8 (4)	8 (4)
VSF	280 min	280 min
FXS port	2	2
FXO port (Analog trunk)	4	No
FXD port (ISDN BRI)	No	4
Relay Contacts	1	1
Ext. BGM	1	1
Ext. Paging	1	1
Alarm input	1	1
PFT	1	No
USB Host port	1 port	1 port

Not all capacities can be simultaneously achieved, for detailed capacity specifications refer to section 3.1.

Each MFIM50 incorporates an IP Gateway for access to standards based (SIP and H.323 v3) and iPECS protocol Voice over IP (VoIP) communications networks and a voice storage medium, the VSF. The IP gateway supports up to 8 simultaneous full duplex packet voice channels with transcoding for major codecs (G.711, G.729a, G.723.1) provided by on-board DSP circuitry. The VSF is used for the integrated Automated Attendant and Voice Mail services available in the

iPECS software with voice storage capacity of approximately 270 minutes. Each MFIM50 has a 10/100 Base-T Ethernet interface, the “LAN” RJ-45 type connector, which is to interface the iPECS call server features and functions. The Ethernet port incorporate auto MDI, MDIX switching, therefore, both straight and cross cables can be used.

LIK-MFIM50A

MFIM50A provides four (4) FXO interfaces to support CO/PBX Loop Start Lines, and two (2) FXS interfaces, which allow standard analog Single Line Telephone (SLT) devices access to CO Lines, other stations, and most features of the system using “dial codes”.

The FXO interfaces support pulse or DTMF dial signals. Each Interface contains ring and loop current detection circuits, speech codec and compression functions and loop signaling circuits. The circuitry and software support tone detection. An optional Call Metering Unit is available to support call-metering functions. Each LIK-CMU supports four (4) ports and there are two versions, based on protocol LIK-CMU1216 CMU-50PR. Each version is for different regions as shown below.

1216 – Australia, Denmark, Italy, Spain, Sweden, Belgium, India, Israel, Norway, South Africa

50PR – Australia, India, South Africa, South Korea, United Kingdom

FXS interfaces provide 48 volt DC feed circuit, pulse, DTMF dial signal detection, and T.38 protocol for Fax over IP. A ring generator and message wait source are integrated. FXS allows Single Line Telephones to be connected up to 4 Kilometers (13,000 feet) from the gateway using 24 AWG wire.

MFIM50A have a front panel as shown in Figure 2.1.1-1, which include:

- Power status LED,
- Reset Switch,
- Four (4)-position DIP-switch for mode selections,
- Ten (10) LEDs,
  - Four (4) red LEDs display the operating status of the main processor,
  - One (1)red LED displays the operating status of VSF,
  - Four (4) green LEDs, one for status of each CO line,
  - One (1)red LED displays the operating status of FXS ports,
- One (1) “LAN” RJ-45 Female LAN connector with Speed and Link/Activity LEDs,
- One (1) DB-9 RS-232 connector and one (1) USB host port,
- RCA jack for one music (audio) source -BGM-.

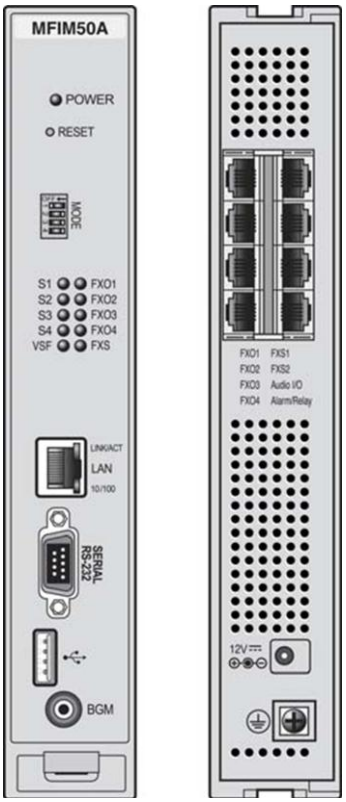

Figure 2.1.1-1 LIK-MFIM50A Front & Rear Panel

On the rear panel, MFIM50A has:

Eight (8) RJ-45 female connectors; for 4 FXO ports, 2 FXS ports, BGM/MOH and External Page outputs, Control Relay input and Alarm Input,
Ground Lug,
Power jack for the AC/DC adapter; see section 2.1.3.

LIK-MFIM50B

MFIM50B provides four (4) ISDN Basic Rate Interface ports (2B+D) which support the 'T' interface as described by ETSI 300.012 based on the ITU-T Recommendations I.430, and two (2) FXS interfaces which allow standard analog Single Line Telephone (SLT) devices access to BRI Lines, other stations, and most features of the system through the use of "dial codes".

ISDN-BRI interfaces can be installed in the TE (**T**erminal **E**quipment) mode

FXS interfaces provide 48 volt DC feed circuit, pulse, DTMF dial signal detection, and T.38 protocol for Fax over IP... A ring generator and message wait source are integrated. FXS allows Single Line Telephones to be connected up to 4 Kilometers (13,000 feet) from the gateway using 24 AWG wire.

MFIM50B have a front panel as shown in Figure 2.1.1-2, which include:

Power status LED,
Reset Switch,
Four (4)-position DIP-switch for mode selections,
Ten (10) LEDs,
- Four (4) red LEDs display the operating status of the main processor,
- One (1)red LED displays the operating status of VSF,
- Four (4) green LEDs, one for status of each BRI line,
- One (1)red LED displays the operating status of FXS ports,

One (1) "LAN" RJ-45 Female LAN connector with Speed and Link/Activity LEDs,
One (1) DB-9 RS-232 connector and one (1) USB host port,
RCA jack for one music (audio) source -BGM-.

On the rear panel, each MFIM50a has:

Eight (8) RJ-45 female connectors; for 4 BRI ports, 2 FXS ports, BGM/MOH and External Page outputs, Control Relay input and Alarm Input,
Ground Lug,
Power jack for the AC/DC adapter; see section 2.1.3.

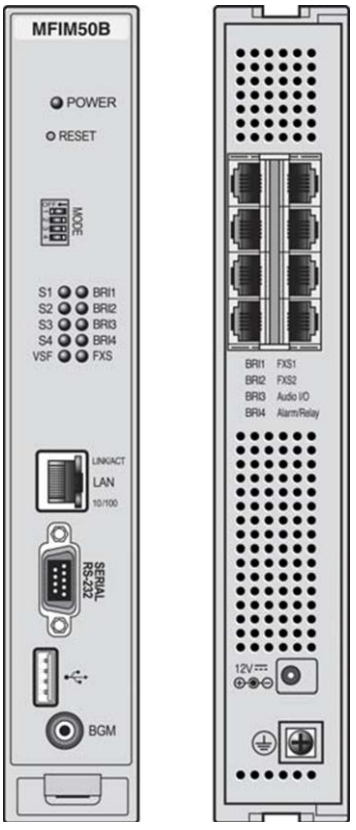

Figure 2.1.1-2 LIK-MFIM50B Front & Rear Panel

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2.1.2 AD/DC adapter for LIK-MFIM50 Modules

LIK-MFIM50A/B, Figure 2.1.3-1, are packaged with an AC/DC adapter. The adapter is supplied with a two (2) meter (six (6) foot) AC cord terminated with the nationally relevant AC blade type. The adapter supports AC input power systems with rated voltage range of 100-240 VAC @ 50/60 Hz. The adapter provides 12 VDC, 1.5A amps. The DC output connector is cabled to the adapter with a two (2) meter (six (6) foot) cable.

CAUTION

LIK-MFIM50A/B use a **12Vdc/1.5A AC/DC adapter**. Before connecting the AC/DC adapter to an LIK-MFIM50A/B , please check the rated output voltage of the Adapter.

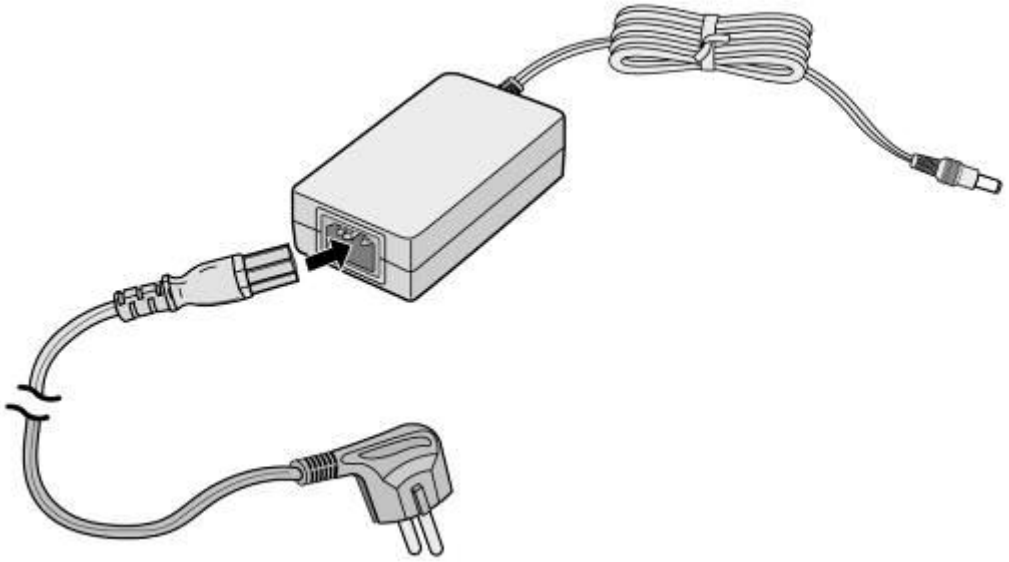


Figure 2.1.3-1 AC/DC adapter MFIM50A/B

2.2 LIP PHONES & TERMINALS

iPECS-LIK50 works with a number of telephone types including standard SLTs, VoIP phones (SIP or H.323 v3) and the LIP Phones. The LIP Phones are available in several models as shown in Table 2.2-1.

Table 2.2-1 LIP Phones

MODEL	DESCRIPTION
LIP-7004N	Basic LIP Phone, 4 Flex buttons, no display
LIP-7008D	LIP Phone w/8 Flex buttons and 2 line display
LIP-7016D	LIP Phone w/16 Flex buttons, 3-line display, Navigation and soft-keys
LIP-7024D	LIP Phone w/24 Flex buttons, 3-line display, Navigation and soft-keys
LIP-7024LD	LIP Phone w/24 Flex buttons, Multi-line large display, Navigation and soft-keys
LIP-7048DSS	LIP DSS Console with 48 Flex buttons,
LIP-7004WMK	Wall Mount Kit for LIP-7004N
LIP-7008WMK	Wall Mount Kit for 7008D
LIP-7024WMK	Wall Mount Kit for LIP-7016D, 7024D & 7024LD
WIT300HE/400H	iPECS WLAN Wireless Phone
LIP-8002	LIP Phone, 4 button and 1-line display, LAN 1 port
LIP-8004D	LIP Phone, 4 button and 1-line display, LAN 1 port
LIP-8012D	LIP Phone, 12 button, 3-line display w/Menu, Soft & Nav. buttons
LIP-8024D	LIP Phone, 24 button, 4-line display w/Menu, Soft & Nav. buttons
LIP-8040L	LIP Phone, 10 button, 9-line display w/Menu, Soft & Nav. buttons
LIP-8048DSS	LIP DSS Console with 48 buttons
LIP-8012DSS	LIP DSS Console with 12 buttons
LIP-8012LSS	LIP DSS Console with 12 buttons, 12-line display

Note: All LIP Phones are compliant to IEEE 802.3af standards.

2.2.1 LIP-8000 series Phones

The LIP-8000 series phones are available in four models as well as three models of matching DSS/BLF Consoles. The models include:

LIP-8002, 4-button 1 line display
LIP-8004D, 4-button 1 line display
LIP-8012D, 12-button 3 line display
LIP-8024D, 24-button 4 line display
LIP-8040L, 10-button large display
LIP-8048DSS, 48-button DSS/BLF Console
LIP-8012DSS, 12-button DSS/BLF Console
LIP-8012LSS, 12-button 12 line LCD DSS/BLF Console

Each of the above models is shown in Figure 2.2.1- to Figure 2.2.1-7. The LIP-8004D has a single LAN port for connection to the external 10/100 Base-T LAN. The other phones in the LIP-8000 series have two (2) LAN ports and thus two (2) RJ-45 connectors. One port is for connection to the LAN, the other can be connected to the desktop data device (PC) or other LAN interface

terminal. The ports are connected to an intelligent 10/100Base-T switch, which gives LAN access to the data device while giving priority to voice packets.
The LIP-8000 series DSS Consoles are used to expand the number of flexible buttons available to a user by 12 or 48 buttons and are connected to the LIP-8000 phone via a flat cable. A maximum of two (2) 12-button consoles (LED or LCD version) may be connected to an LIP-8000 phone. The LIP8012DSS and LIP-8012LSS are connected in a daisy chain and receive power from the associated LIP-8000 phone. Up to four (4) 48-button consoles may be connected in a daisy chain to one LIP-8000 phone. The LIP8048DSS is powered from an AC/DC adapter only.

Each LIP-8000 series IP phone has a standard 12-button dial-pad, color coordinated handset, an array of 4 (four) to twenty-four (24) “Flexible buttons”, and fixed feature access buttons. All of the Flexible and most Fixed buttons, incorporate a long-life, super-bright LED to indicate the circuit or feature status.

The fixed feature buttons for each model include the following:

LIP-8002

- Menu
- Trans/PGM
- Conference
- Redial
- Volume Control
- Mute
- Speaker

LIP-8004D

- DND
- Speed
- Volume Control
- Trans/PGM
- Hold/Save
- Call Back
- OHD (On-Hook Dial)

LIP-8012D, LIP-8024D & LIP-8040L

- Menu
- MSG
- Navigation
- DND
- Speed
- Volume Control
- Trans/PGM
- Hold/Save
- Mute
- Speaker

In addition, the LIP-8012D, 8024D and 8040L include 3 soft buttons. The function of these buttons is interactive and shown in the lower line of the LCD. These models also incorporate a full duplex speakerphone.

The LIP-8000 series phones include a Liquid Crystal Display (LCD). The LIP-8004 has a single line 24-character display; the LIP-8012 and LIP8024D have graphic displays that show three (3) lines with up to 24-characters per line. The lower line is used to display the interactive function of the three soft buttons. The LIP-8040L has a large graphic display that displays the function of the ten flexible buttons and a line to display the function of the three interactive soft buttons.

The LIP-8000 series phone circuitry includes Digital Signal Processing to implement packet voice encoding and decoding, and echo cancellation as well as tone generation and speakerphone operation. Note the LIP-8804D does not include speakerphone operation. The Volume controls, which consist of separate volume up/down buttons, adjusts the level of the handset receiver, speaker as well as the headset receiver, when used.

The LIP-8000 series phone may be powered locally with the AC/DC Adapter, reference section 2.2.3, or powered over the LAN with the POE8 or other 802.3af compliant Ethernet switch. If both the AC/DC Adapter and powered LAN port are connected to the LIP-8000 terminal, the Adapter will provide the required power.

The LIP-8000 series phones incorporate wall mounting in the base of the phone, no additional hardware is required. Note; the matching DSS Console is also wall-mountable.

The DSS Consoles are provided in three models. The LIP-8048DSS has 48 flexible buttons with LED status indicators. The LIP-8012DSS has 12 flexible buttons with LED status indicators. The LIP-8012LSS has 12 flexible buttons and an LCD. The LCD displays the designation and status for each button with up to 20 characters.

Figure 2.2.1-1 LIP-8002

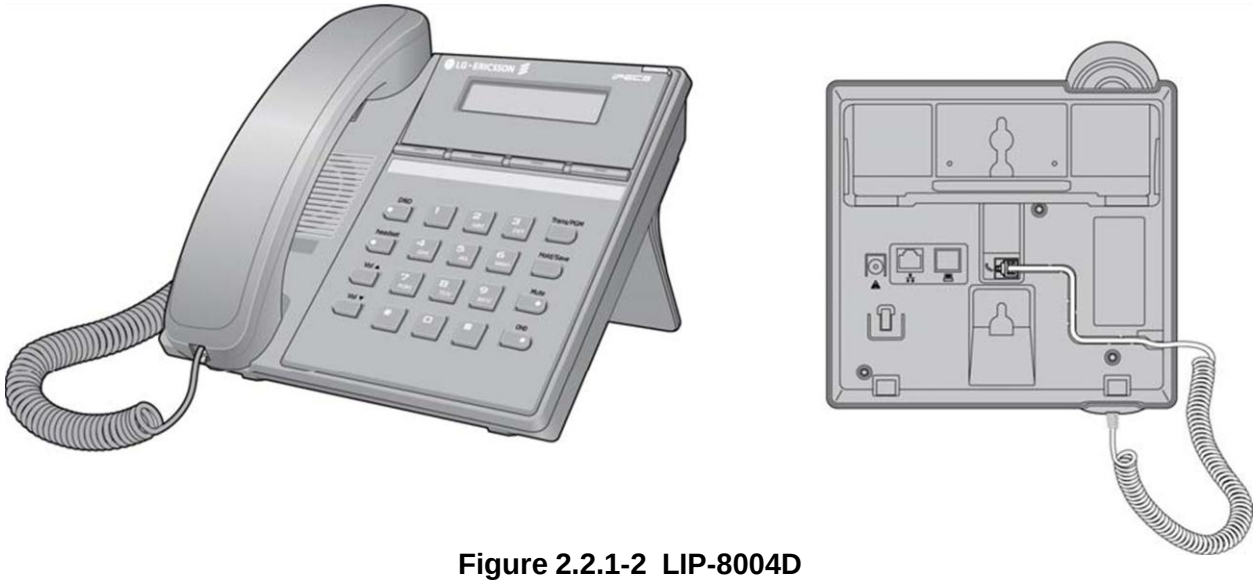


Figure 2.2.1-2 LIP-8004D

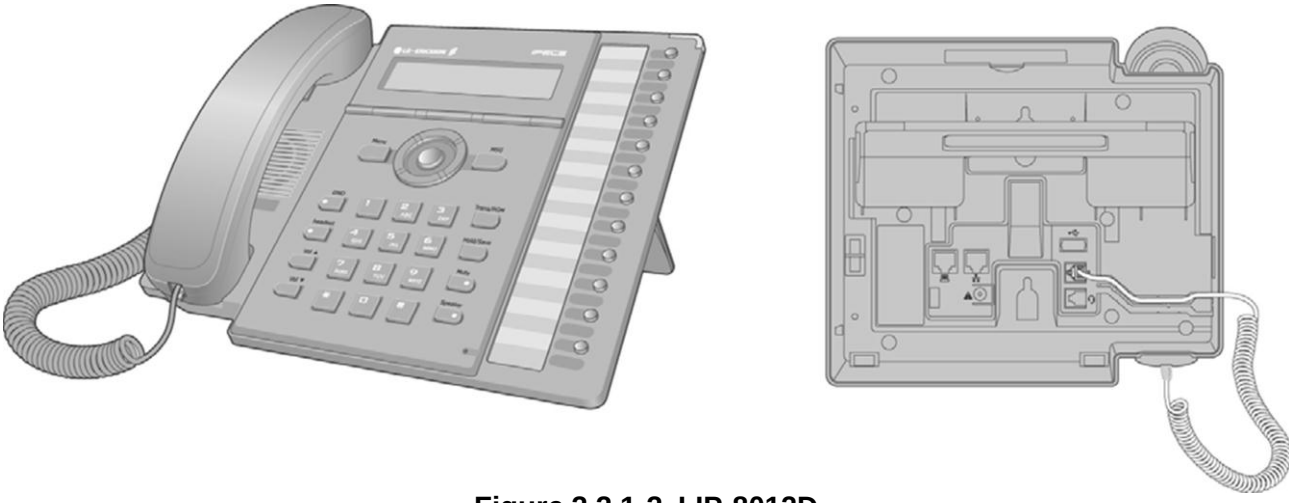


Figure 2.2.1-2 LIP-8012D

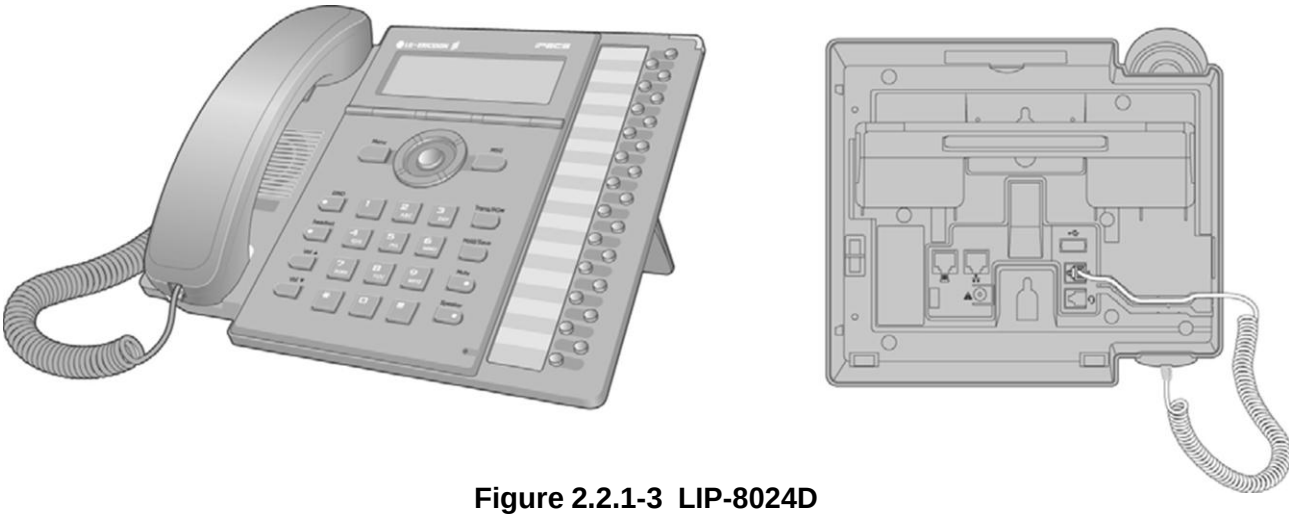


Figure 2.2.1-3 LIP-8024D

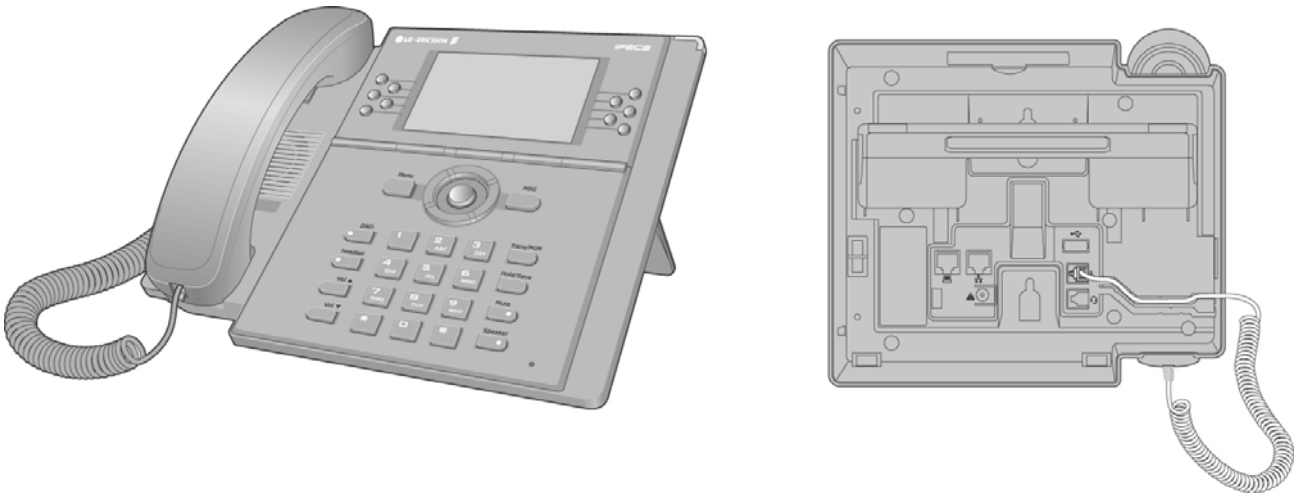


Figure 2.2.1-4 LIP-8040L

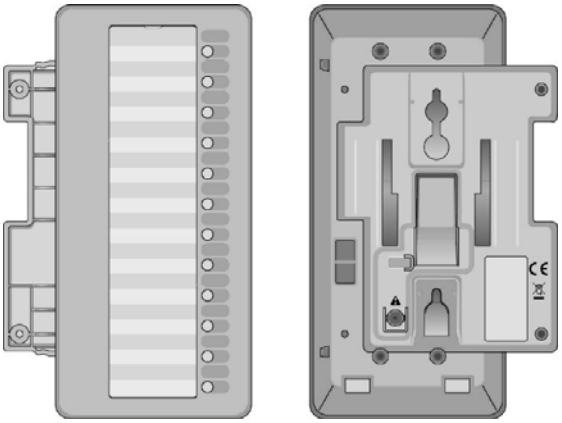


Figure 2.2.1-5 LIP-8012DSS

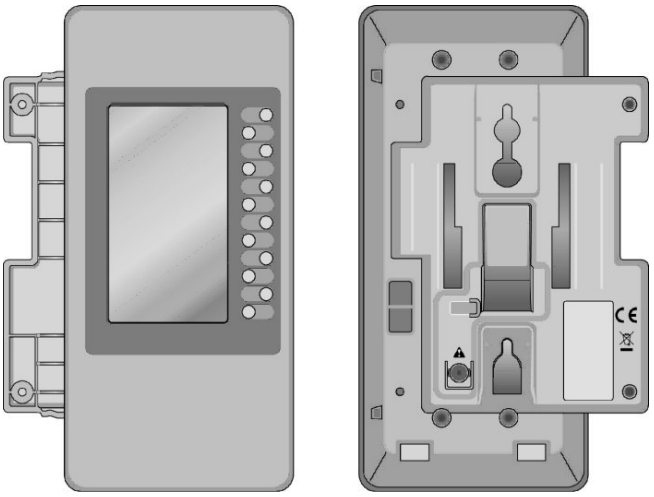


Figure 2.2.1-6 LIP-8012LSS

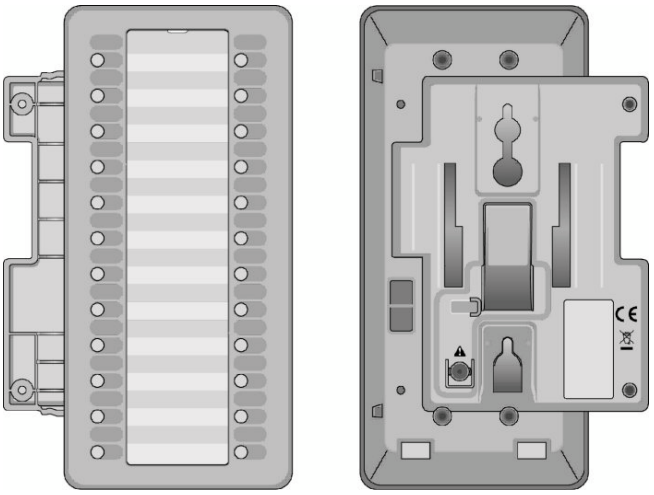


Figure 2.2.1-7 LIP-8048DSS

2.2.2 LIP-7000 series Phones

The LIP-7000 series IP phones are available in five (5) models as well as a matching DSS/BLF Console. Models available include:

LIP-7004N, 4-button non-display
LIP-7008D, 8-button 2-line display
LIP-7016D, 16-button 3-line display
LIP-7024D, 24-button 3-line display
LIP-7024LD, 24-button large display
LIP-7048DSS, 48-button DSS/BLF Console.

Each of the above models and Wall Mount kits are shown Figure 2.2.2-1 in to Figure 2.2.2-6. The LIP-7004N and 7008D have a single LAN port for connection to the external 10/100 Base-T LAN. The LIP-7016D, 7024D and 7024LD models have two (2) LAN ports and thus two (2) RJ-45 connectors. One port is for connection to the LAN, the other can be connected to the desktop data device (PC) or other LAN interface terminal. The ports are connected to an intelligent 10/100 Base-T switch, which gives LAN access to the data device while giving priority to voice packets.

The LIP-7048DSS Console, which is used to expand the number of Flexible buttons available to a user by 48 buttons, has two (2) LAN ports. When the console is locally powered with the AC/DC Adapter, the LIP-7048DSS Console can be connected to the PC LAN port of the LIP-7016D, 7024D or 7024LD.

Each LIP-7000 series phone has a standard 12-button dial-pad, color coordinated handset, an array of 4 (four) to twenty-four (24) “Flexible buttons”, and fixed feature access buttons. All of the Flexible and most Fixed buttons, incorporate a long-life, super-bright LED to indicate the circuit or feature status.

The fixed feature buttons for each model include the following:

LIP-7004N

OHD (Off-Hook Dial)
Hold/Save
Volume Control
Speed (preprogrammed Flex button)
Trans/gm (preprogrammed Flex button)

LIP-7008D

Speaker (Speakerphone)
Hold/Save
Volume Control
Speed
Trans/Pgm
Dnd (preprogrammed Flex button)
Call Back (preprogrammed Flex button)

LIP-7016D, 7024D, & 7024LD

- Hold/Save
- Volume Control
- Speed
- Trans/Pgm
- Dnd
- Call Back
- Navigation buttons

In addition, the LIP-7016, 7024D and 7024LD include 3 Soft buttons. The function of these buttons is interactive and shown in the lower line of the LCD.

The LIP-7008D includes a 2-line, 48-character (24 characters per line) Liquid Crystal Display (LCD). The LCD provides an alphanumeric display to assist the user in operation of features. In the idle mode, the display will show the station name or number on the top line and the time and date on the 2nd line. The LCD is employed to support features such as Dial-By-Name (Directory Dial) using the Volume control to scroll through name displays to find a telephone number in the directory.

The LIP-7000 series IP phone circuitry includes Digital Signal Processing to implement packet voice encoding and decoding, and echo cancellation as well as tone generation and speakerphone operation. The Volume control, which consists of a single volume up/down rocker button, adjusts the level of the handset receiver, speaker as well as the headset receiver, when used.

The LIP-7000 series IP phone may be powered locally with the AC/DC Adapter, reference section 2.2.3, or powered over the LAN with the POE8 or other 802.3af compliant Ethernet switch. If both the AC/DC Adapter and powered LAN port are connected to the LIP-7000 terminal, the Adapter will provide the required power.

Using the appropriate Wall Mount Kit, the LIP-7000 terminal can be mounted on a wall. Two handset hooks, which are used to keep the handset in-place, are molded as part of the Wall Mount bracket. One hook must be removed from the bracket and inserted in the slot just below the hook-switch to hold the handset when wall mounted. Note; the matching Console is not wall-mountable.

Figure 2.2.2-1 LIP-7004N

Figure 2.2.2-2 LIP-7008D

Figure 2.2.2-3 LIP-7016D

Figure 2.2.2-4 LIP-7024D

Figure 2.2.2-5 LIP-7024LD

Figure 2.2.2-6 7000 Series Phones Wall Mount Bracket

2.2.3 AC/DC Adapter for LIP-Phones & Console

When an LIP-7000 or LIP-8000 series terminal is to be powered from local AC (not provided power over the LAN), a separate AC/DC adapter, Figure 2.2.3-1, must be used for power. The adapter is supplied with a two (2) meter (six (6) foot) AC cord terminated with the nationally relevant AC blade type. The adapter supports AC input power systems with rated voltage range of 100-240 VAC @ 50/60 Hz. The adapter provides 48 VDC at 0.3 amps. The DC output connector is cabled to the adapter with a two (2) meter (six (6) foot) cable.

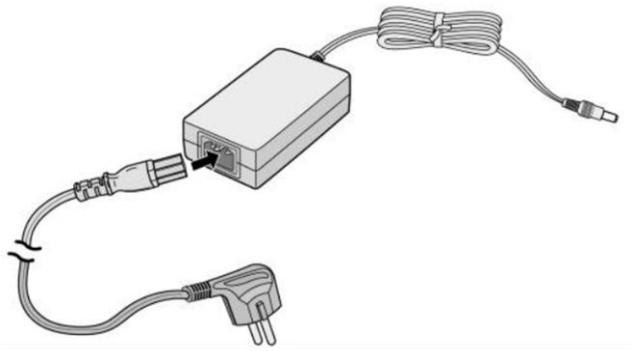


Figure 2.2.3-1 AC/DC Adapter for LIP-Phones & Console

2.3 MOUNTING HARDWARE MODULE

LIK-MFIM50A /B can be installed in several different manners:

Desk mounted using the **Desk Mount Holder**,
Wall mounted individually using the **Wall Mount Holder**, or
19” rack mounted individually using the **1U-Rack Mount Bracket**.

The following paragraphs describe the mounting hardware MFIM50/B . Refer to iPECS Description and Installation manual for instructions on installation of additional modules, if required.

2.3.1 DHLD (Desk mount HoLDer)/DHE (Desk mount Holder Extender)

The DHLD (Module Desk Mount Holder) consists of a pair of “book-ends” and DHE (Desk Mount Holder Extender). One Extender is installed between the bookends for each module, and the modules mounted between the bookends. The DHLD & DHE are shown in Figure 2.3.1-1.

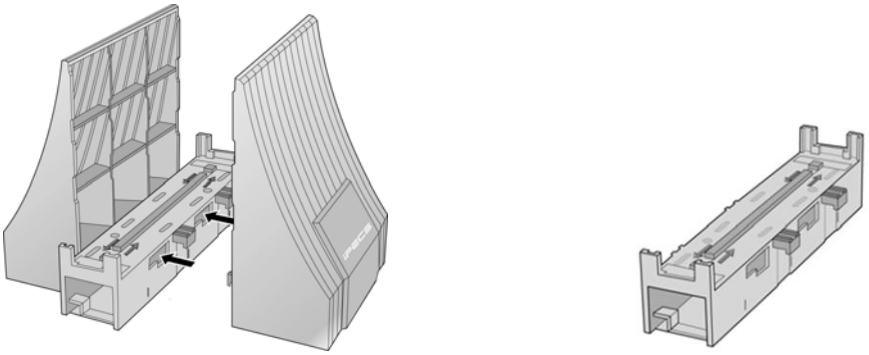


Figure 2.3.1-1 DHLD &DHE

2.3.2 WHLD (Wall mount HoLDer)

LIK-MFIM50A/B can be individually wall mounted in the WHLD (module Wall Mount Holder), shown in Figure 2.3.2-1. The WHLD provides wall mounting for a single module.

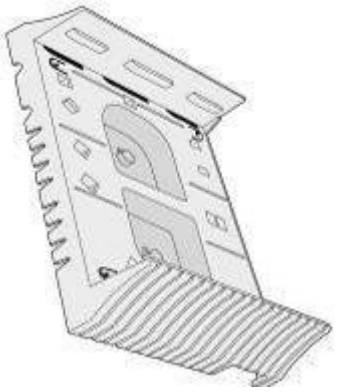


Figure 2.3.2-1 Module Wall Mount Holder

2.3.3 1URMB (1U Rack Mount Bracket)

LIK-MFIM50A/B can be individually wall mounted in the 1U RMB (1U Rack Mount Module), shown in Figure 2.3.2-1. The 1URMB provides wall mounting for a single module.

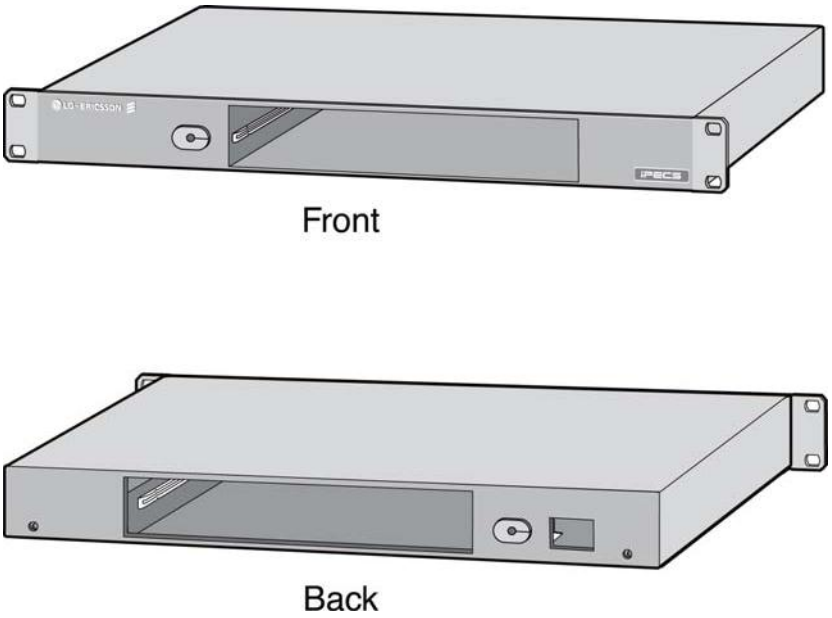


Figure 2.3.3-1 1URMB (1U Rack Mount Module)

2.4 SOFTWARE COMPONENTS

iPECS software comes pre-loaded in the various system modules. In addition, application and services software have been developed to expand and enhance iPECS functionality. Applications and Services offered include:

- iPECS Phontage PC SoftPhone
- iPECS Phontage PDA SoftPhone
- iPECS TSP/MSP - TAPI 3.1
- iPECS Auto Attendant, Voice Mail
- iPECS Unified Messaging Services
- iPECS ez-Attendant
- iPECS Networking
- iPECS UCS (Unified Communications Services)
- iPECS NMS (Network Management Services)
- iPECS AIM (Advanced Integration Messaging)

These software packages are documented in other manuals. Contact your local LG-Ericsson representative for a list of other documents available for iPECS.

3. SYSTEM SPECIFICATIONS

3.1 SYSTEM CAPACITY

Table 3.1-1 System Capacities

	CAPACITY		
	LIK-MFIM50A	**LIK-MFIM50B**	**LIK-**
System Capacity	50	50	31
Stations *1	50	50	26
PSTN/ISDN circuits*2	42 (Basic: 4 PSTN +VoIP)	42 (Basic: 4 ISDN-BRI +VoIP)	5 (Basic: 5 VoIP)
Max. RSGMs *3	25	25	13
Attendants	4	4	4
Serial Port (RS-232C)	1	1	0
USB Host port	1	1	1
Alarm/Door bell input	1	1	0
External Control Relays(s)	1	1	0
Music Source Inputs	1	1	0
Power Fail Circuit (PFT) *4	1	0	0
External Page Zones	1	1	0
Internal Page Zones	10	10	10
System Speed Dial	800 (48 digits)	800 (48 digits)	800 (48 digits)
System Speed Dial Zones (Groups)	10	10	10
Station Speed Dial	20 (48 digits)	20 (48 digits)	20 (48 digits)
Last Number Redial	10 (48 digits)	10 (48 digits)	10 (48 digits)
Save Number Redial	1 (48 digits)	1 (48 digits)	1 (48 digits)
DSS Consoles/Station	9	2	3

Note 1 2 FXS ports are provided in LIK-MFIM50A/B as standard.
Note 2 4 FXO (Analog CO/ 4 FXD (ISDN-BRI) ports are provided on LIK-MFIM50A/LIK-MFIM50B standard, respectively.
Note 3 For maximum RSGM connection ports, calculation formula is = (available station ports)/2, there must be enough VoIP channels for RSGM operation.
Note 4 1 PFT circuit is provided on LIK-MFIM50A only. It is connected between FXS port 1 and FXO port 1.

3.2 DIMENSION AND WEIGHT

Table 3.2-1 Dimensions and Weight

ITEM	HEIGHT (mm/in)	WIDTH (mm/in)	DEPTH (mm/in)	WEIGHT (kg/lbs)
LIK-MFIM50A/B	230/9.1	38.8/1.5	194.5/7.7	0.7/1.54
1U RMB	38.3/1.5	482.6/19	183.27.2	2/4.4
DHLD *[1]	146/5.7	111.5/4.4*[1]	128/5	0.4/0.9
WHLD	280/11.0	60/2.4	188.3/7.4	0.2/0.4

Note 1 The width of the Desk mount does not include approximately 40mm/3.2 inches for each installed module.

3.3 ENVIRONMENT SPECIFICATION

Table 3.3-1 Environmental Specifications

	DEGREES (^{0}C)	DEGREES (^{0}F)
Operation Temperature	0~40	32~104
Optimum Operation Temperature	20~26	68~78
Storage Temperature	-20~60	-4~140
Relative Humidity	0~80% non-condensing	

3.4 ELECTRICAL SPECIFICATIONS

3.4.1 System Electrical Specification

Table 3.4.1-1 System Electrical Specifications

	SPECIFICATIONS
AC/DC Adapter for MFIM50A/	
- AC Voltage Input	100-240 VAC, +/-10% @ 50/60 Hz
- AC Power	0.5 A
- DC Output Power	12 VDC, 1.5 A max
AC/DC Adapter for LIP Phones	
- AC Voltage Input	100-240 VAC, +/-10% @ 50/60 Hz
- AC Power	0.5 A
- DC Output Power	48 VDC, 0.3 A
External Relay Contact	2 A @ 30 VDC
Music Source Input	0 dBm @ 600 ohm
External Paging Port	0 dBm @ 600 ohm

3.4.2 Interface Specifications

Table 3.4.2-1 Interfaces

Interfaces	Specifications
Ethernet	
Connector	RJ-45 unshielded
Ethernet	10/100 BASE-T
Maximum Wiring Distance	100m / 0.328Kft
USB	
Connector	USB Female Plug type A
Mode	Host V 1.1
RS-232	
Connector	DB-9, 3 -wire
FXS Connector	
Loop Distance	RJ-45
Ring Capacity	3 Km, AWG #24 (0.5mm)
Ring Frequency	3 US REN (US 7K model) 25Hz
FXO	
Connector	RJ-45
REN (Ringer Equivalent Number)	0.7B
ISDN-BRI	
Connector	RJ-45
Network Type	T interface

3.4.3 Maximum Station Distance from Gateway Module

Table 3.4.3-1 Maximum Station Wiring Distance

ITEM	AWG 22 (m/Kft)	AWG 24 (m/Kft)
LIP Phone	100/0.328	100/0.328
SIP or H.323 VoIP phone	100/0.328	100/0.328
Single Line Telephone (FXS)	6,000/20	4,000/13

Note 1 All the LIP Phones are compliant to IEEE 802.3af POE standards. In addition, according to the standards, LIP Phones all operate over distances of up to 100 meters from the switch.

3.5 PSTN SPECIFICATION

Table 3.5-1 PSTN Specifications

ITEM	SPECIFICATION
Ring Detect Sensitivity	Min 20 Vrms @ 16~67 Hz
DTMF Dialing	
- Frequency Deviation	Less than +/-1.8%
- Signal Rise Time	Max. 5ms
- Tone Duration, on time	Min. 65 ms
- Inter-digit Time	Min. 65 ms
Pulse Dialing	
- Pulse Rate	10 pps
- Break/Make Ratio	60/40% or 67/33%

Note 1 The Specification on Analogue CO lines will vary from one regulatory region to another.

4. INSTALLATION

4.1 OVERVIEW

As with any sophisticated communications device, installation of iPECS-LIK50 require the care and forethought of a competent technician. Recommended installation proceeds in 6 major steps:

Site Preparation
Equipment verification
Cabinet/Desk/Wall Mount Holder installation, as required
Module installation and wiring
LIP Phone and other terminal installation
System Programming and Verification

By utilizing the instructions that follow, the installation is quick and efficient. Directions for system programming and verification are given in the **iPECS Admin & Program Manual**.

4.2 SITE PREPARATION

4.2.1 General site consideration

The first step is to locate an acceptable site for the Module mounting hardware (Desk Mount Holder, Wall Mount Holder or 1U Rack Mounting Bracket). When locating the mounting site, the following points must be considered:

The iPECS-LIK50 can be Desk, 19" Rack or Wall mounted.

The location must have access to an appropriate 100~240 VAC @ 50-60 Hz power source with a circuit breaker or fuse rated at 1 A and must be surge protected. An appropriate grounded outlet should be within approximately 2 meters (6 feet) of the equipment location. When employing the Desk Mount Holder, an outlet will be required for each Module; a multi-outlet extension cord can be used.

The location must have access to a good protective earth ground, such as a metallic cold water pipe with no non-metallic joints. The ground source should be located as close as possible to the equipment.

The system should be located in a well-ventilated area with a temperature of around 20^0C (68^0F) and a relative humidity of 0-80% (non-condensing).

The equipment should be located within 8 meters (25 feet) of the telephone company's termination point. If the system is to share the LAN with data devices or be connected to an external VoIP network, the system must be within 100 meters (330 feet) of the WAN connection. Also, the location should be within the prescribed station loop lengths for all phones and terminals refer to section 3.4.3. If existing cabling is employed, the location of existing cabling and conduits should be considered.

The location should have adequate accessibility, space and lighting for future servicing and should consider the need for future expansion.

The site should be away from radio transmitting equipment, arc-welding devices, copy machines, and other electrical equipment capable of generating high levels of electrical interference. The system should be protected from flooding and heavy machinery as well as excessive dust and vibration.

4.2.2 Verify Equipment On-Site

Once the equipment installation site has been identified and a dedicated AC outlet, protective earth ground, lighting and ventilation are available, verify that all equipment and tools required are on-site and the equipment has not been damaged during shipment. Assure there is no shipping damage. Check that the type and quantity of Modules and terminals received are correct. Also, assure optional equipment and Power Line Surge Protector are on-site. The individual Modules and terminals need not be unpacked at this time.

If any equipment appears damaged or missing, notify appropriate personnel to correct the situation.

4.3 MODULE MOUNTING HARDWARE INSTALLATION

4.3.1 Desk mount Holder Installation

To assemble the Desk Mount Holder, refer to the instructions below and Figure 4.3.1-1. Note a Desk Holder Extender is required for each Module.

Place key-hole slots on the side of the Extender over the keys on the side of the bookend.
Slide the Extender and bookend in opposite directions to the locked position.
Repeat for additional Extenders and the other bookend.
Then, insert the Module(s) from top position.

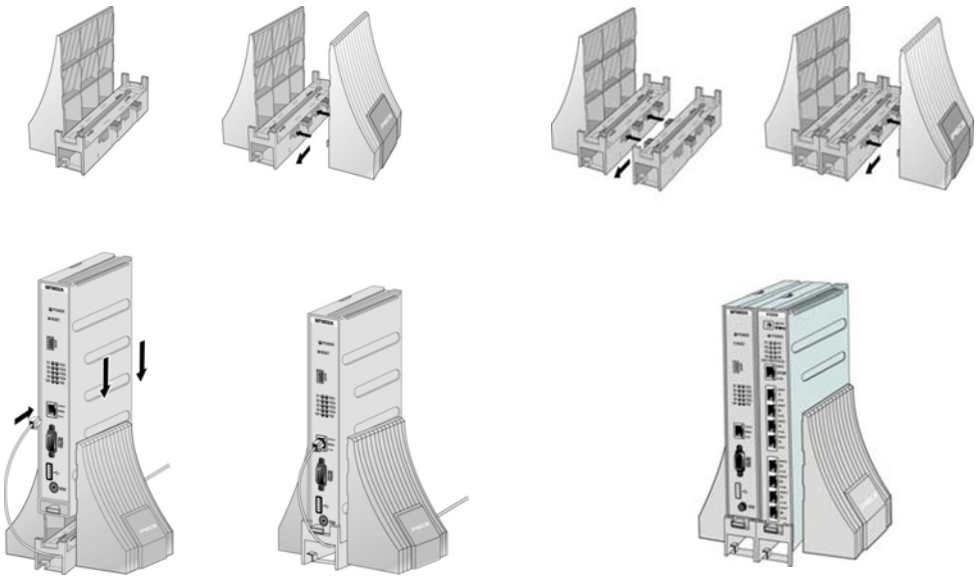


Figure 4.3.1-1 Mounting Module in Desk Mount Holder

4.3.2 Wall Mount Holder Installation

The Module Wall Mount Holder will house a single Module. To install, refer to Figure 4.3.2-1 and instructions below:

Place the Wall Mount Holder in position and mark two (2) holes over a wall stud.
Drill two (2) 7 mm holes for the plastic wall anchors provided.
Insert the two (2) anchors into the holes, then insert and tighten the 2 screws leaving about 6 mm (¼-inch) exposed.
Arrange wiring on the back of the Wall Mount Holder.
Place (hang) the Wall Mount Holder on the screws and tighten securely.
Slide the Module into the Wall Mount Holder until it locks.
Connect all wiring to the Module as appropriate, refer to section 4.4

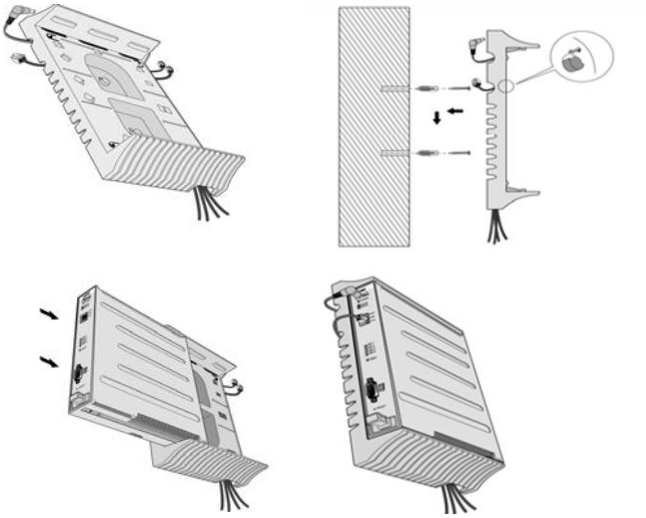


Figure 4.3.2-1 Mounting Module in Wall Mount Holder

4.3.3 1U-Rack Mount Bracket Installation

The Module 1U-Rack Mount Bracket will house a single Module and an AC/DC adapter to power the Module. To install, refer to figures and instructions below:

1. Install the AC/DC adapter in the 1U-RMB. Refer to Figure 4.3.3-1.
   Remove the two (2) screws on the rear of 1U-RMB to release the upper housing.
   Lift up and remove the upper housing.
   Remove the two (2) screws holding the adapter bracket.
   Lift up and remove the adapter bracket.
   Install the 12VDC Adapter MFIM50A/B , placing another adapter bracket MFIM50A/B over the adapter and fasten the two (2) screws.
   Insert the DC plug of the through the hole in the rear of 1U-RMB.
   Insert the rubber grommet over the DC cable of the adapter and insert the grommet in the hole in the rear of the housing.
   Replace the upper housing and fasten the two (2) screws.
   Check the voltage rate beside AC inlet with the oil pen.

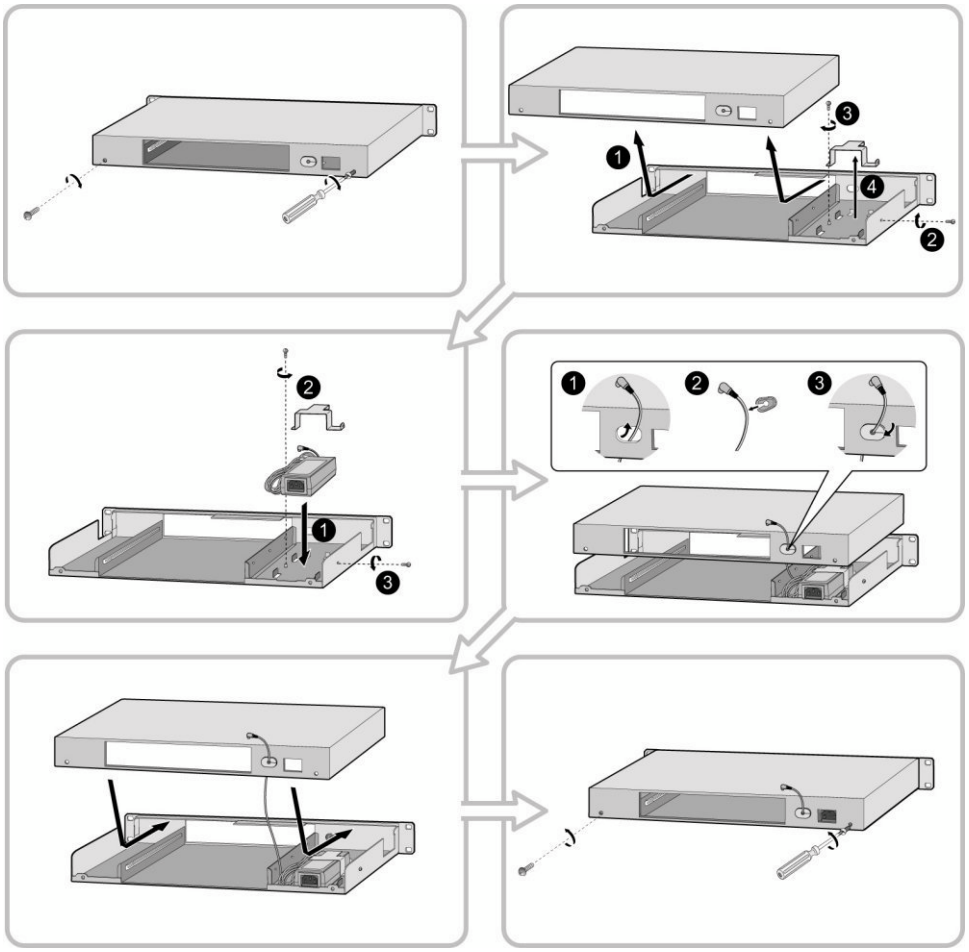


Figure 4.3.3-1 1URMB Adapter Installation

2. Install LIK-MFIM50A/B Module into the 1U-RMB and connect the adapter plug, refer to Figure 4.3.3-2.
   Slide the Module into the 1U-RMB.
   Connect the adapter DC plug to the LIK-MFIM50A/B .
   Tighten the DC cable using the cable tie.

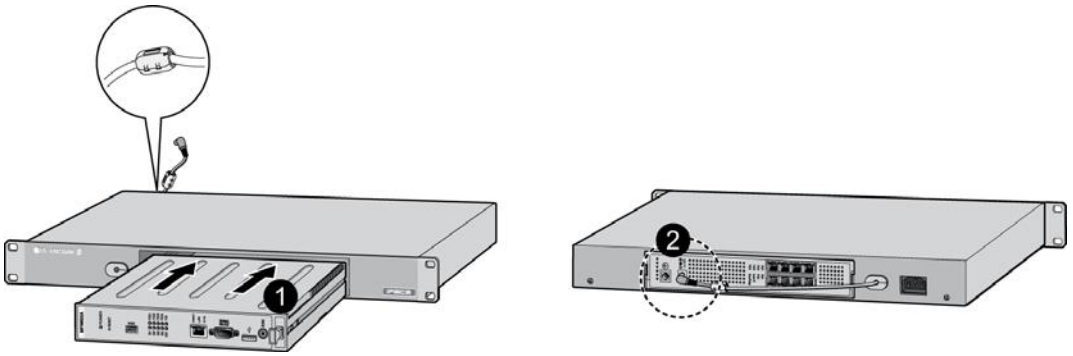


Figure 4.3.3-2 Mounting Module in 1URMB

3. Install the 1U-RMB in a standard 19” rack securely with four (4) appropriate machine screws, nuts and lock-washers. Refer to Figure 4.3.3-3.

Wire the Module as described in section 4.4.
Connect the AC cable to the adapter and wall outlet to power the Module.

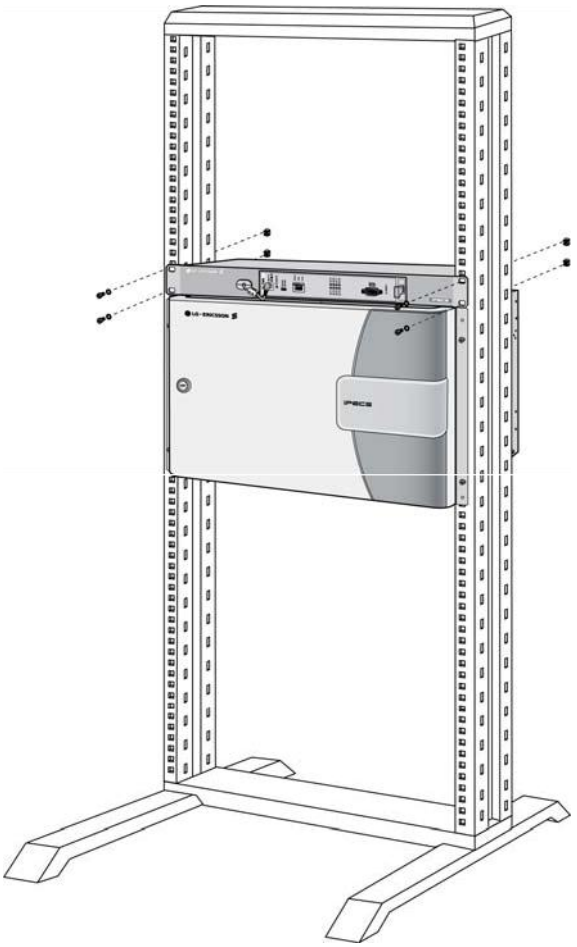


Figure 4.3.3-3 Installing 1URMB on the Rack

4.4 INSTALLATION

4.4.1 LIK-MFIM50A Installation

LIK-MFIM50A can be installed in the Desk Mount Holder, Wall Mount Holder and 1U Rack Mount Bracket.

LIK-MFIM50A contains a long life Lithium battery, which protects the memory and real-time clock in the event of a power failure. Minimum battery life is 10 years and the battery is not field-replaceable.

LEDs

In addition to the Power and LAN LEDs, LIK-MFIM50A has ten LEDs for status and diagnostic information as in Table 4.4.1-1.

Table 4.4.1-1 MFIM50A Status LED Functions

LED DESIGNATION	LED STATUS FUNCTION - ON -
S1	Serial/TCP debug active
S2	Call Processing active
S3	Active data communication with Modules and IP Phones
S4	CPU active (100ms flashing)
VSF	VSF Active (Flashing)
FXO1	CO Port 1 In-use
FXO2	CO Port 2 In-use
FXO3	CO Port 3 In-use
FXO4	CO Port 4 In-use
VSF	FXS ports In-use

MODE Switch & Settings

MFIMs have a four (4) position DIP-switch identified as the "**MODE**" switch. The function of each switch position is given in Table 4.4.1-2 below.

Table 4.4.1-2 MFIM50A MODE Switch Functions

Name	Contact	FUNCTION	ON	OFF
MODE	1	Database write protect	Protect	Unprotect
	2	Boot mode protect	Enable	Disable
	3	Registration	Allow registration	Deny Registration
	4	initialization	Initialize DB on reset	Read Stored DB on reset

To enter data in the system's database, the Write Protect switch must be in the OFF position. In the ON position, the database cannot be modified. Thus, placing the switch in the ON position eliminates the potential for remote database modification. If remote data entry is not desired, after all installation and database entries are complete place the switch in the ON position.

When new gateway Modules and/or terminals are connected to a LAN, they will automatically attempt to register with an LIK-MFIM50A. With the Registration switch (switch 3) in the ON position, the system will recognize and respond to the registration request. With the switch in the OFF position, the system will not respond to the request. During initial installation, the switch should be placed in the ON position to permit the system to recognize and respond to registration requests. If it is desired to deny future registrations, the switch should be placed in the OFF position. This is useful when multiple systems may be connected to the same LAN. For details on gateway Module and terminal registration, refer to the **iPECS Admin & Program Manual**.

The system database is initialized based on switch position 4. In the ON position, the system will load default values in the system database when power is applied to LIK-MFIM50A or the Reset button is pressed. Note if the system looses power for any reason with the switch in the ON position, the database will be initialized. Place the switch in the ON position then, after completing the system wiring and prior to any database entries, place the switch in the OFF position. For a description of the initialization process, refer to the **iPECS Admin & Program Manual**.

PFT (Power Failure Transfer)

In the event of a power failure, LIK-MFIM50A will connect “FXO port 1” directly to the telephone terminal on “FXS port 1” using the internal PFT relay.

CMU (Call Metering Unit)

LIK-MFIM50A supports call metering with installation of an optional CMU module. Two types of module, based on protocol, are available LIK-CMU1216, LIK-CMU50PR; each is for different regions as shown in the chart of section 2.1.1.

Before installing the CMU4 module, make sure that power is turned Off. The figure 4.4.1-1 shows the procedure for installing a LIK-CMU unit on the LIK-MFIM50A. Check the connector numbers of the LIK-CMU unit prior to installation.

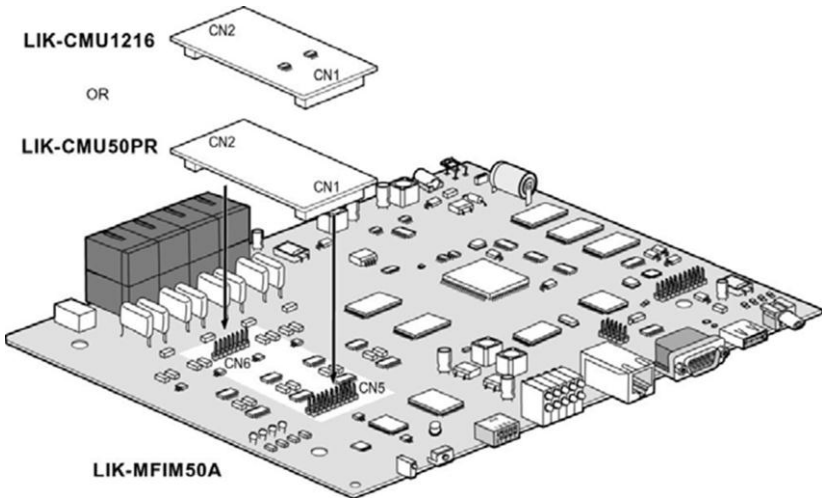


Figure 4.4.1-1 Installing a LIK-CMU unit on LIK-MFIM50A

Table 4.4.1-3 CMU Connector numbers

MFIM50A Connector	LIK-CMU1216 or CMU50PR Connector
CN8	CN1
CN9	CN2

Wiring Connectors

Before wiring LIK-MFIM50A, first connect the “ ⏚ ” screw on the back of the Module to a known ground, refer to section 4.4.4.7.

On the front of LIK-MFIM50A, there is the “LAN” RJ-45 type connector. It should be wired to the appropriate LAN points as Figure 4.4.1-2 and discussed in section 4.4.4.5.

Wire “LAN 1” to a 10/100 Base-T switch, a POE8 can be used to connect to the LAN; refer to the section 4.4.4.4 for RJ-45 pin assignments.
Tag or number wiring for maintenance

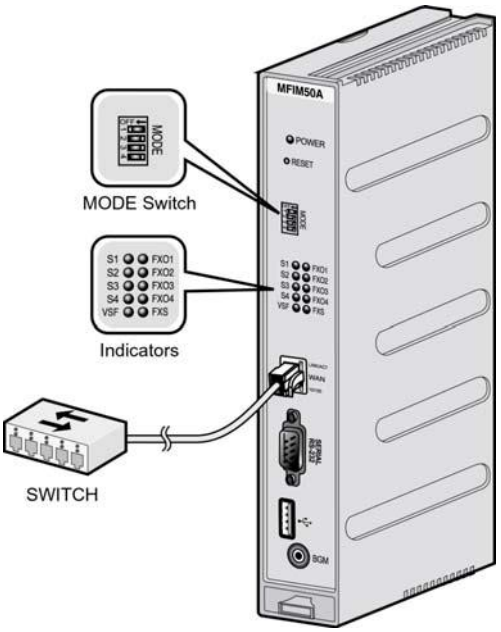


Figure 4.4.1-2 LAN Connection and Indicators in the front s

The eight (8) RJ-45 connectors on the rear panel of LIK-MFIM50A are terminated for miscellaneous functions, FXO Line, and FXS devices. The Miscellaneous and telephony connectors are terminated as shown in 4.4.4.1 and section 4.4.4.2, respectively.

Wire Miscellaneous function connectors as depicted in the sketches of Figure 4.4.1-3.
Wire the FXO/FXS (telephony) ports as shown in Figure 4.4.1-3.
Tag or number wiring for maintenance.

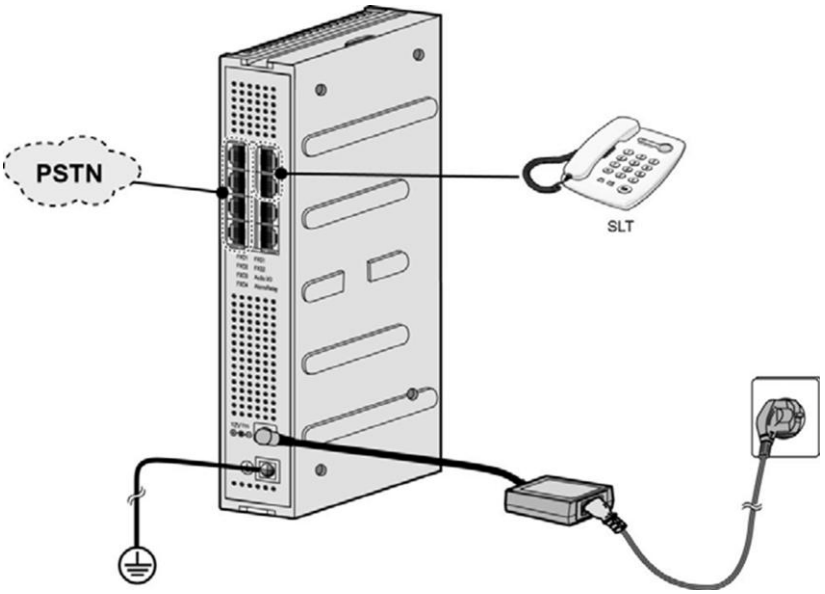


Figure 4.4.1-3 Wiring in the rear side of LIK-MFIM50A

AC/DC Adapter

The AC/DC Adapter is plugged into a live AC outlet and the Power jack of LIK- MFIM50A.
Assure that the rating of DC voltage is 12Vdc.

4.4.2 LIK-MFIM50B Installation

LIK-MFIM50B can be installed anywhere in 1U Data Rack Holder, Desk Mount Holder or Wall Mount Holder.

LIK-MFIM50B contains a long life Lithium battery, which protects the memory and real-time clock in the event of a power failure. Minimum battery life is 10 years and the battery is not field-replaceable.

LEDs

In addition to the Power and LAN LEDs, LIK-MFIM50B has ten LEDs for status and diagnostic information as in Table 4.4.2-1.

Table 4.4.2-1 MFIM50B Status LED Functions

LED DESIGNATION	LED STATUS FUNCTION - ON -
S1	Serial/TCP debug active
S2	Call Processing active
S3	Active data communication with Modules and IP Phones
S4	CPU active (100ms flashing)
VSF	VSF Active (Flashing)
BRI1	BRI Port 1 In-use
BRI2	BRI Port 2 In-use
BRI3	BRI Port 3 In-use
BRI4	BRI Port 4 In-use
VSF	FXS ports In-use

MODE Switch & Settings

MFIMs have a four (4) position DIP-switch identified as the "**MODE**" switch. The function of each switch position is given in Table 4.4.2-2 below.

Table 4.4.2-2 MFIM50B MODE Switch Functions

Name	Contact	FUNCTION	ON	OFF
MODE	1	Database write protect	Protect	Unprotect
	2	Boot mode protect	Enable	Disable
	3	Registration	Allow registration	Deny Registration
	4	initialization	Initialize DB on reset	Read Stored DB on reset

To enter data in the system's database, the Write Protect switch must be in the OFF position. In the ON position, the database cannot be modified. Thus, placing the switch in the ON position eliminates the potential for remote database modification. If remote data entry is not desired, after all installation and database entries are complete place the switch in the ON position.

When new gateway Modules and/or terminals are connected to a LAN, they will automatically attempt to register with an LIK-MFIM50B. With the Registration switch (switch 3) in the ON position, the system will recognize and respond to the registration request. With the switch in the

OFF position, the system will not respond to the request. During initial installation, the switch should be placed in the ON position to permit the system to recognize and respond to registration requests. If it is desired to deny future registrations, the switch should be placed in the OFF position. This is useful when multiple systems may be connected to the same LAN. For details on gateway Module and terminal registration refer to the **iPECS Admin & Program Manual**.

The system database is initialized based on switch position 4. In the ON position the system will load default values in the system database when power is applied to LIK-MFIM50B or the Reset button is pressed. Note if the system looses power for any reason with the switch in the ON position, the database will be initialized. Place the switch in the ON position then, after completing the system wiring and prior to any database entries, place the switch in the OFF position. For a description of the initialization process refer to the **iPECS Admin & Program Manual**.

Wiring Connectors

Before wiring any of the Modules, first connect the "⏚" screw on the back of the Module to a known ground, refer to section 4.4.4.7.

On the front of LIK-MFIM50B, there is the "LAN" RJ-45 type connector. It should be wired to the appropriate LAN points as Figure 4.4.2-1 and discussed in section 4.4.4.5.

Wire "LAN 1" to a 10/100 Base-T switch, a POE8 can be used to connect to the LAN; refer to the section 4.4.4.4 for RJ-45 pin assignments.
Tag or number wiring for maintenance

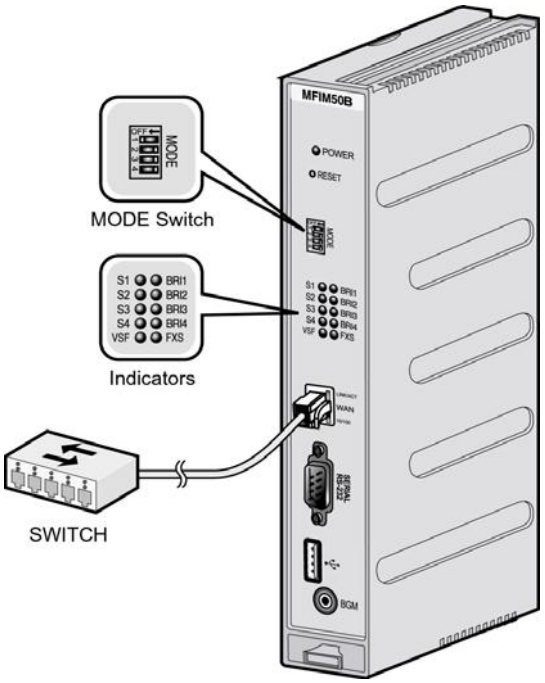


Figure 4.4.2-1 LAN Connection and Indicators in the front side

The eight (8) RJ-45 connectors on the rear panel of LIK-MFIM50B are terminated for miscellaneous functions, BRI Lines, and FXS devices. The Miscellaneous, BRI and telephony connectors are terminated as shown in section 4.4.4.1, section 4.4.4.3 and section 4.4.4.2, respectively.

Wire Miscellaneous function connectors as depicted in the sketches of Figure 4.4.2-2.
Wire the FXS telephony ports as shown in Figure 4.4.2-2.
Wire the ISDN-BRI lines as shown in the figure.
Tag or number wiring for maintenance.

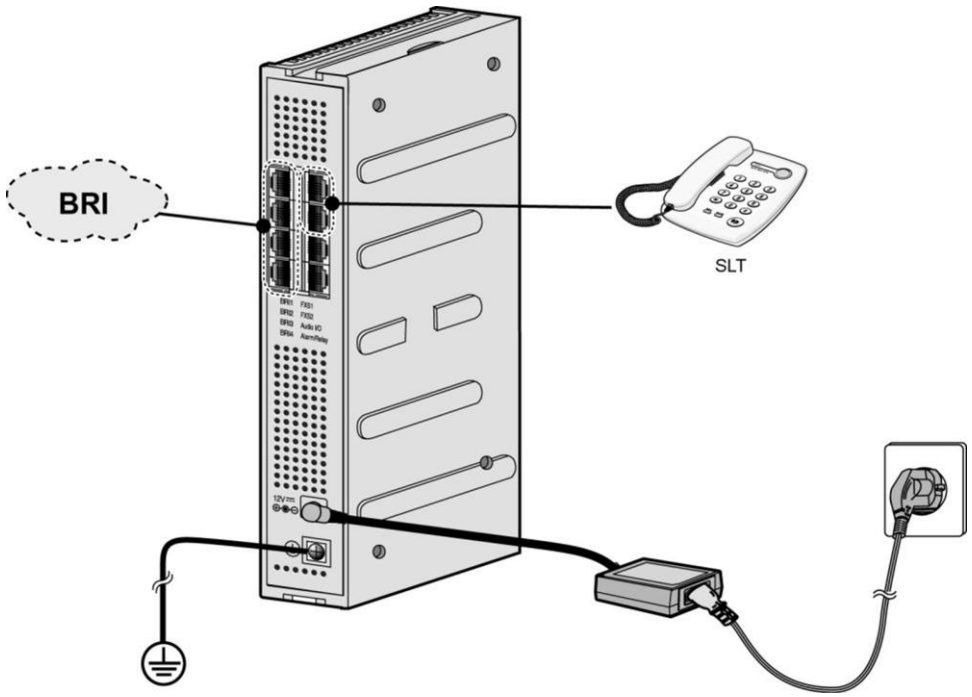


Figure 4.4.2-2 Wiring in the rear side of LIK-MFIM50B

AC/DC Adapter

The AC/DC Adapter is plugged into a live AC outlet and the Power jack of LIK-MFIM50B.
Assure that the rating of DC voltage is 12Vdc.

4.4.3 Blank

BLANK

BLANK

BLANK

4.4.4 General Installation

The following paragraphs provide general and common installation and wiring practices and procedures for both LIK-MFIM50A and LIK-MFIM50B.Procedures such as LAN wiring are common for all LAN ports and are discussed here. Prior to installation of any Module, it is recommended the installer be thoroughly familiar with the information in this section.

CAUTION *Modules must be installed in a Wall Mount Holder, Desk Holder or 1URMB for proper ventilation. Do not stack Modules or limit airflow as this may cause over-heating, leading to pre-mature failure and/or faulty operation of the equipment.*

4.4.4.1 Miscellaneous Connections

Miscellaneous connections are via RJ-45 type jacks in the rear of LIK-MFIM50A MFIM50B are wired as in Figure 4.4.4.1-1.

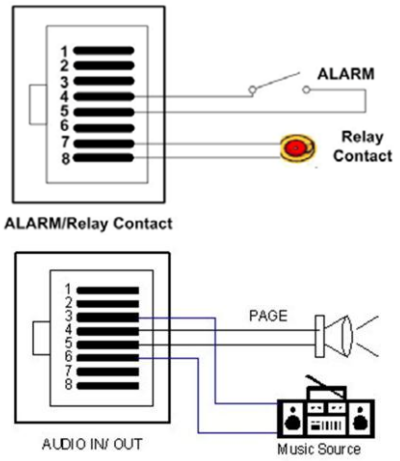


Figure 4.4.4.1-1 Miscellaneous connections

4.4.4.2 Telephony (FXS/FXO) Connections

FXO and FXS (PSTN and SLT telephone) connections via RJ-11 or RJ-45 type jacks in the rear of LIK-MFIM50A/B (RJ-45) are wired as in Figure 4.4.4.2-1. All telephone wiring should use standard two (2)-pair twisted 24 or 26 AWG wiring.

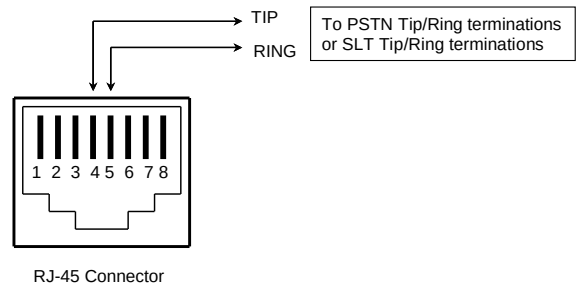


Figure 4.4.4.2-1 Pin Assignments of Telephony (RJ11 or RJ-45) Connector

CAUTION *To reduce the risk of fire, use only 26 AWG or larger UL List or CSA Certified Telecommunication Line Cord.*

4.4.4.3 BRI Line Connections

BRI Line connectors should be wired to the telephone company termination point (‘T” Mode). The connector pin assignments for the RJ-45 type jacks of BRI Ports are shown in Figure 4.4.4.3-1.

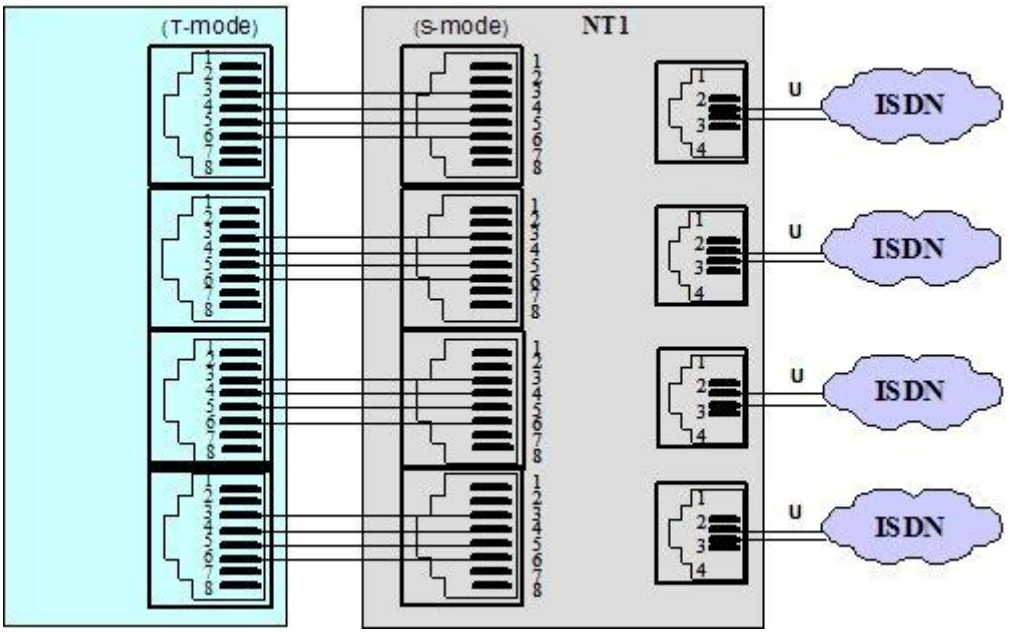


Figure 4.4.4.3-1 BRI Line Connector Configuration

4.4.4.4 LAN Connections

LAN connections are made by way of RJ-45 connectors on the front panel of each Module and in the rear side of LIP Phones. These connectors are shown in Figure 4.4.4.4-1. Each connector has a green Link/Activity LED and a yellow LAN speed LED, On for 100 Base-T.

The gateway Module “LAN” ports and the POE8 “UPLINK” ports as well as the LIP Phone LAN port are terminated in the standard Media Dependent Interface (MDI) configuration shown in Figure 4.4.4.4-1. The POE8 “**X**” LAN ports are terminated in the mating MDIX (crossover) configuration as shown in the figure. The POE8 can provide power over the LAN with 48 VDC across pin pairs 4&5 and 7&8. This configuration mates with the LIP Phone as shown in the figure. Finally, the LIP-7016D/7024D/7024LD and LIP-8012D/8024D/8040L Phones are equipped with a second LAN port, designated “PC” to connect a PC or similar device allowing a shared LAN infrastructure. This connector is terminated in the MDIX configuration mating to a typical PC with a straight cable.

All LAN wiring should use Category 5 Unshielded Twisted Pair (CAT 5 UTP) cable. No single run of LAN cable should exceed 100 meters (about 330 feet).

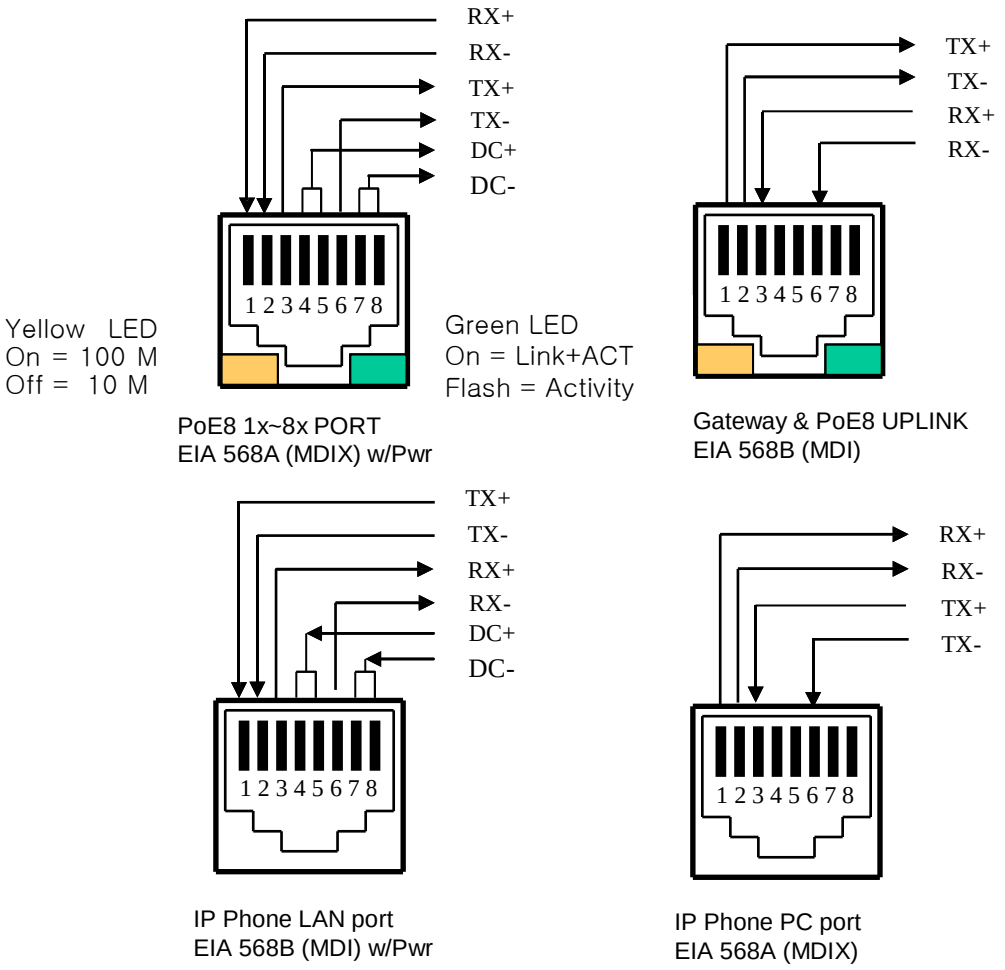


Figure 4.4.4.4-1 Pin Assignments of LAN Connector (RJ-45)

4.4.4.5 LAN Wiring Structure

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

Shared or iPECS only LAN infrastructure
External VoIP calling requirements
New or existing voice and/or data installation
Remote LAN power or local AC power for iPECS Phones

The “PC” LAN port of equipped LIP Phones can be connected to the user’s desktop using a standard LAN cable terminated with RJ-45 LAN jacks. The LAN jack is wired to an Ethernet switch, which has access to the LIK-MFIM50A/B, other iPECS Modules and LIP Phones. This connection can be through a connection to the same switch or by an indirect connection through multiple switches.

For a new installation or, where LAN power to the LIP Phone is desired, the POE8 can be employed for the corporate LAN. For existing installations, it may be necessary to replace existing switches in a shared environment in order to provide remote power to the LIP Phones.

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.

Due to the advantages of the shared environment, support for remote LAN power, and external VoIP calling, the POE8, which is a standard Ethernet switch, should be employed. The recommended structure, called here "hierarchal" wiring, employs all "straight" LAN cables (MDI to MDIX) and is shown in Figure 4.4.4.5-1. Additional POE8 Modules are connected using the UPLINK port to the switched ports of the primary POE8. A sufficient number of POE8 modules are connected to provide the total number of ports required. Each Module, LIP Phone, and LIP-series Console requires a single port and the LIK-MFIM50A/B will require a single port. Thus, 24 station system would require a total of 25 ports (LIK-MFIM50A = 1 port, and 24 LIP Phones = 24 ports), and would be structured as in the Figure 4.4.4.5-1.

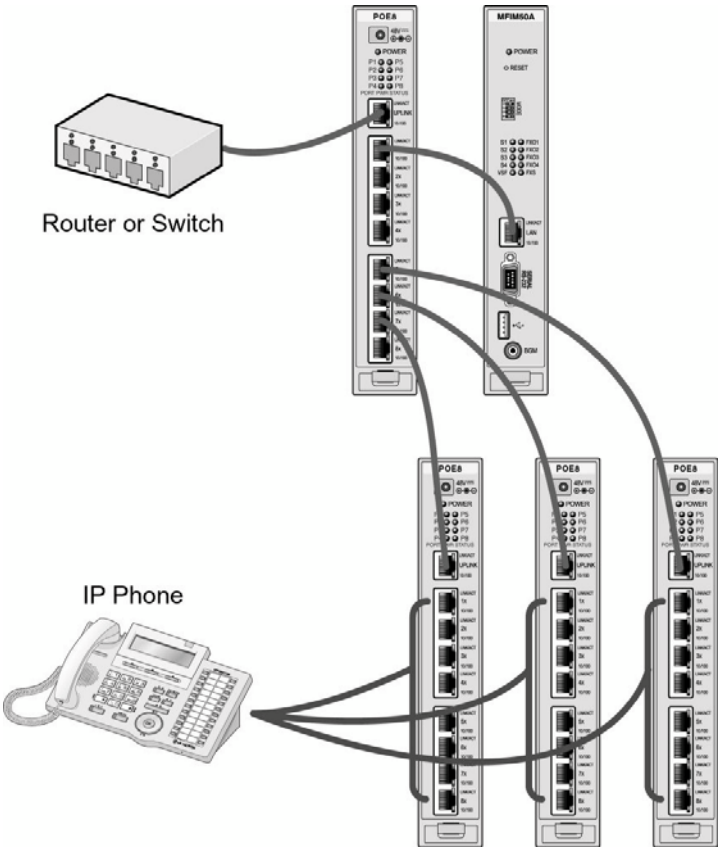


Figure 4.4.4.5-1 iPECS LAN Wiring

Cascading

When the station loop limit is beyond the 100-meter (330 feet) limit, switches may be cascaded to extend the range. For example of the POE8, simply connect the extension switches with their UPLINK port to a LAN 1X~8X port of the previous POE8 in the cascade.

CAUTION *The POE8 does not support spanning tree. Do not create a loop when connecting these switches to each other or other network components.*

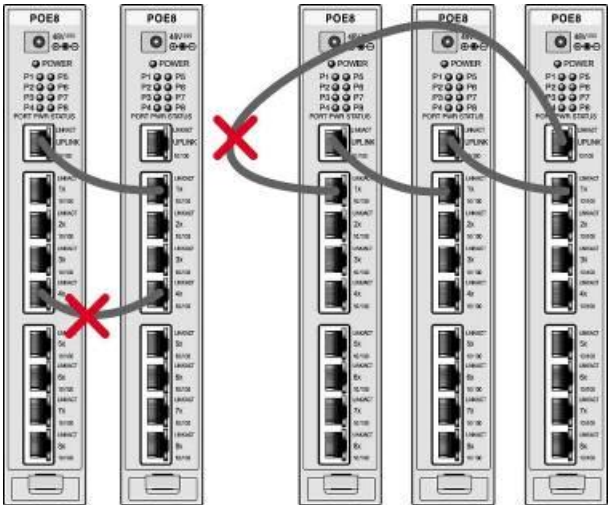


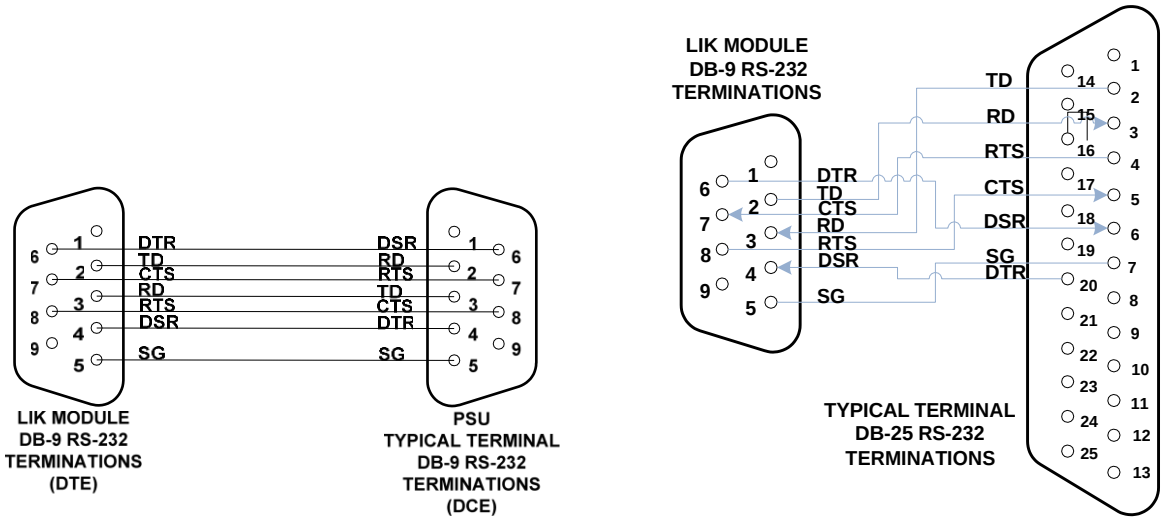
Figure 4.4.4.5-2 Erroneous Loop Wiring

4.4.4.6 RS-232 Connection

The DB-9 connector located on the front panel of LIK-MFIM50A/MFIM50B is an RS-232 serial port. The connector is employed to provide system trace and diagnostic routines for the individual Modules. The MFIMs have one such port, which may be assigned for the desired function (SMDR, ACD, etc.). Refer to the **iPECS Admin & Program Manual**.

LIK-MFIM50A/B are set-up for 8-bits, no parity, and one (1) stop bit running at 115,200 bps. To modify the speed and other settings, refer to the **iPECS Admin & Program Manual**.

The RS-232 connectors MFIM50A/B are terminated in a Data Communications Equipment (DCE) configuration as displayed in Figure 4.4.4.6-1. Use a cable pre-terminated with DB-9 connectors to connect an appropriate device (terminal, printer, etc.) to the Module.



Designation.	Function
TD	Transmitted Data
RD	Received Data
RTS	Request To Send
CTS	Clear To Send
DTR	Data Terminal Ready
DSR	Data Set Ready

Figure 4.4.4.6-1 RS-232 DB-9 Pin-outs

4.4.4.7 Module Grounding

As shown in Figure 4.4.4.7-1, a "⏚" or "⏚" screw is located on the rear panel of each Module. For proper operation and code compliance, the grounding screw should be connected to a known protective earth ground using a #12 AWG or larger UL-1015 type copper wire. The wire should be located between the toothed lock washer and the plain washer. Note that when using the cabinet, a separate ground connection to the individual Modules is not required.

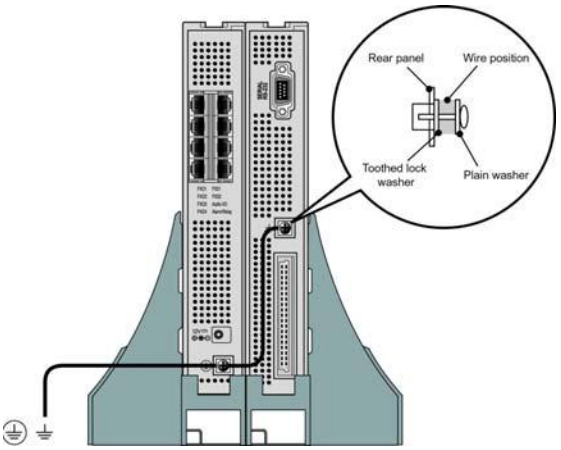


Figure 4.4.4.7-1 Module Grounding

4.4.4.8 Module Installation Sequence

A **SEQUENCE NUMBER** is assigned to gateway modules based on the sequence of registration with the system, refer to the **iPECS Admin & Program Manual** for further details. This **SEQUENCE NUMBER** determines the logical CO Line and station numbers assigned in the system database.

Although the **SEQUENCE NUMBER** in the database can be changed, connecting the gateway Modules to the iPECS in the desired sequence based on type of Module is recommended. The Module **SEQUENCE NUMBER** can be easily established at installation by controlling the order of connection of the Module's LAN port to the system.

Station numbers are also assigned consecutively based on the order of connection to the system. Since the first phone installed is assigned as the Admin Station (station number 100), it is recommended an LIP Phone be connected to the system prior to installing any SLT gateway Module.

4.5 LIP PHONE INSTALLATION

LIP Phones and Consoles can be connected to any standard 10/100 Base-T Ethernet switch port. When connected to an 802.3af compliant switch port, such as the POE8, the LIP Phone and LIP-7000 series consoles can derive power from the Ethernet port. When LAN power is not available, the optional AC/DC adaptor must be used.

Wiring Connectors

The LIP 7004N, 7008D, 8004D and LIP-7000 series consoles all have a single Ethernet port that is connected to the LAN using an RJ-45 plug terminated category 5 cable supplied with the Phone. A 3-meter (9 foot) cable is provided for desk mount installation. Using the cable, one RJ-45 plug is inserted into the "LAN" jack in the bottom of the Phone. The other RJ-45 plug is inserted into the RJ-45 jack previously wired to an Ethernet switch port accessible by the MFIM. To power the LIP Phone over the LAN, the switch port must support POE (Power over Ethernet) standard 802.3af.

The LIP 7016D and 7024L 8012D, 8024D, 8040L phones have two (2) 10/100 Base-T Ethernet ports, a “LAN” port and a “PC” port. An intelligent switch, which implements voice packet priority, connects the two (2) ports. This permits the LAN to be shared between the LIP Phone and the desktop PC or other Ethernet terminal without significant affect on the voice or data traffic. The “LAN” port is connected to the LAN as described above for the single port Phones. The “PC” port is connected to a desktop device using any standard straight through category 5 cable.

The LIP-8000 series consoles connect to the LIP-8000 phone using a flat serial cable. Multiple consoles, maximum 3, are supported by chaining the consoles. One console is connected to the phone, the second console is connected to the first and the final console is connected to the second using the flat serial cable provided.

Power

All LIP Phones and LIP-7000 consoles can be powered by the AC/DC Adapter-K- (48 VDC @0.1A) or over the LAN cable using the POE8 or other 802.3af compliant switch. Note the LIP-8000 series 12 button consoles, maximum 2, are powered by the associated LIP-8000 series IP phone while the 48 button must be powered by an AC/DC Adapter-K.

Using the AC/DC Adapter, after connecting the Phone to the LAN, the Adapter’s DC voltage plug is inserted into the power-input jack in the base of the Phone. One end of the AC power cord is inserted into the mating receptacle of the AC Adapter; the other end is inserted into the AC power outlet.

Wall Mount

The LIP-8000 series phones incorporate wall mount into the base of the phone housing. Using the instructions below and Figure 4.5-1, wall mount the LIP-8000 phone.

Mark and drill two (2) 7mm holes for plastic wall anchors.
Insert the two (2) anchors into the holes, then insert and tighten the 2 screws leaving about 2.5 mm (1/8-inch) exposed. Refer to Figure 4.5-1.

Slide the LIP-8000 phone over the screws and assure the phone is secure. Note it may be necessary to remove the phone and tighten or loosen the screws for a secure mounting. Remove the Handset hook from the phone as shown in the figures below. Reverse the hook and re-install in the LIP-8000 phone so that the hook catches the groove in the handset receiver.

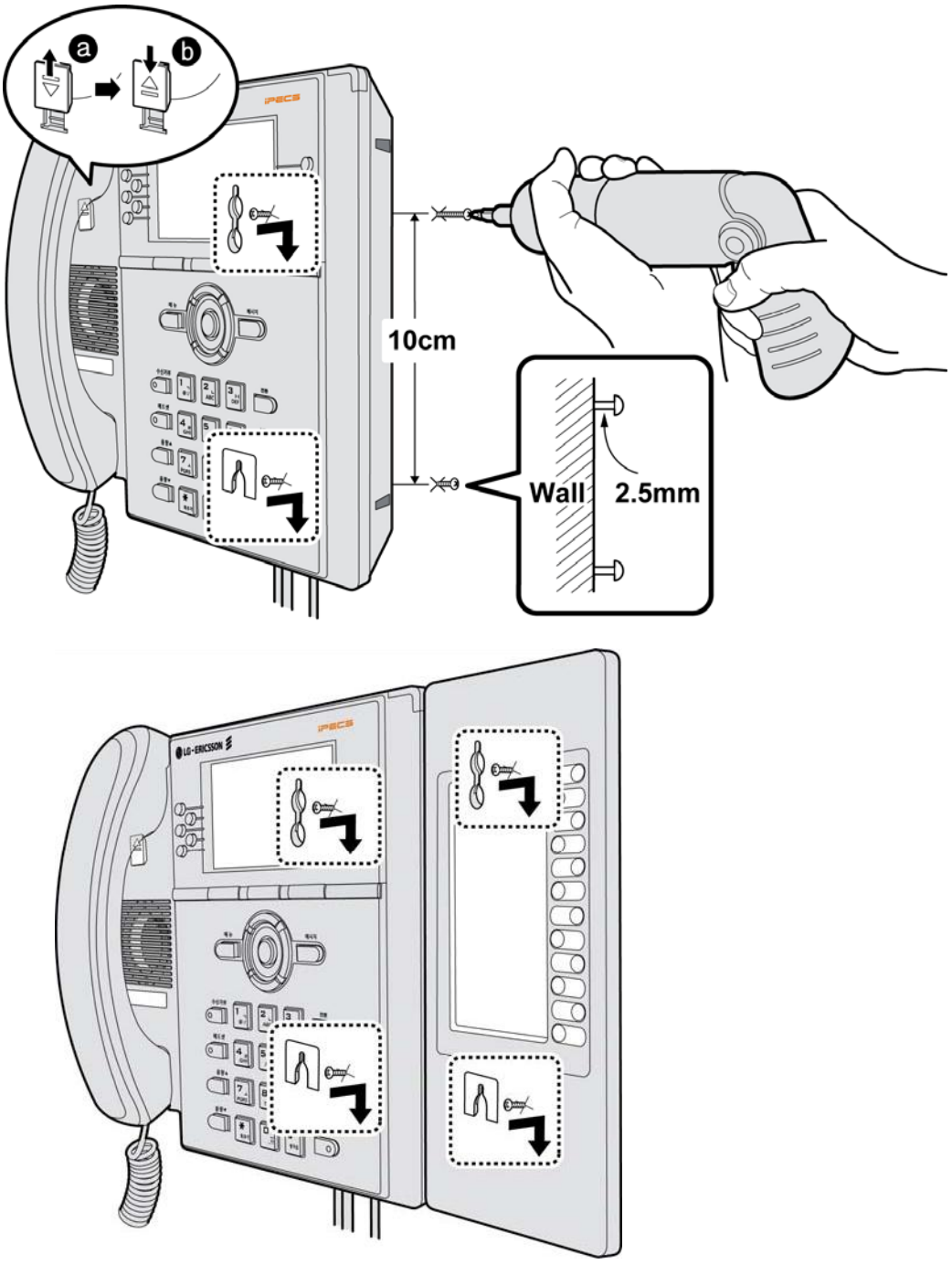


Figure 4.5-1 LIP-8000 Wall Mount Installation

A DSS console can be installed with the LIP-8000 series phone as shown in Figure 4.5-2 to Figure 4.5-5. Up to 3 consoles may be daisy chained as shown using the flat cable provided.

Keep in mind the following conditions when installing LIP-8000 DSS consoles.

1) The AC/DC adapter must be used for LIP-8048DSS.
2) Up to two (2) LIP-8012LSS and/or LIP-8012DSS can be installed with LIP-8000 Phone.
3) The LIP-8048DSS must be separately powered.

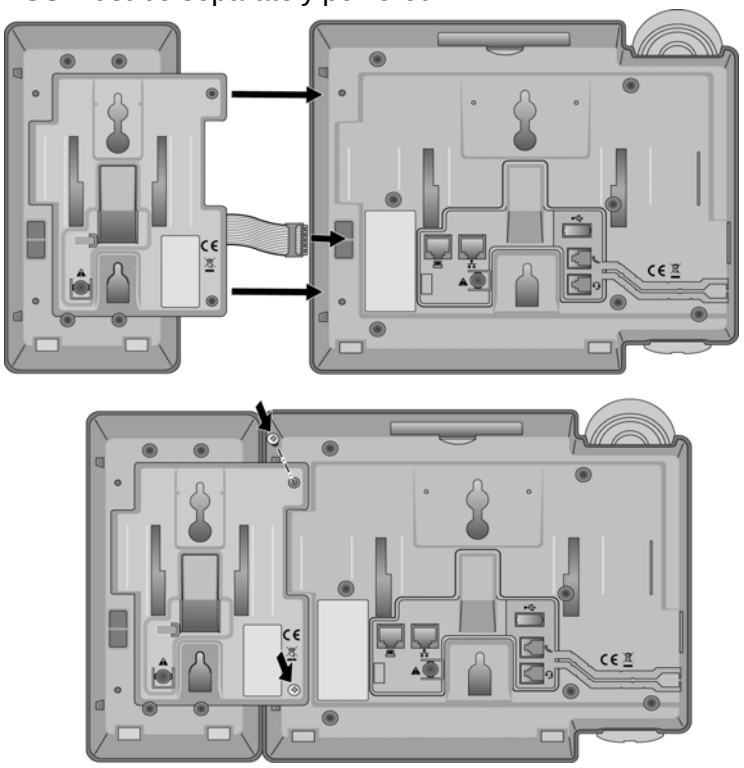


Figure 4.5-2 LIP-8000 DSS Installation

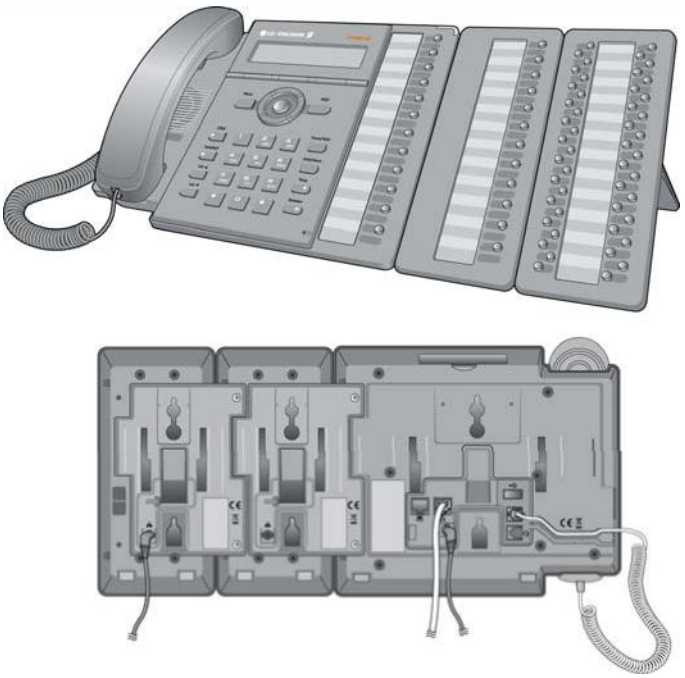


Figure 4.5-3 LIP-8000 DSS Installation (12DSS + 48DSS)

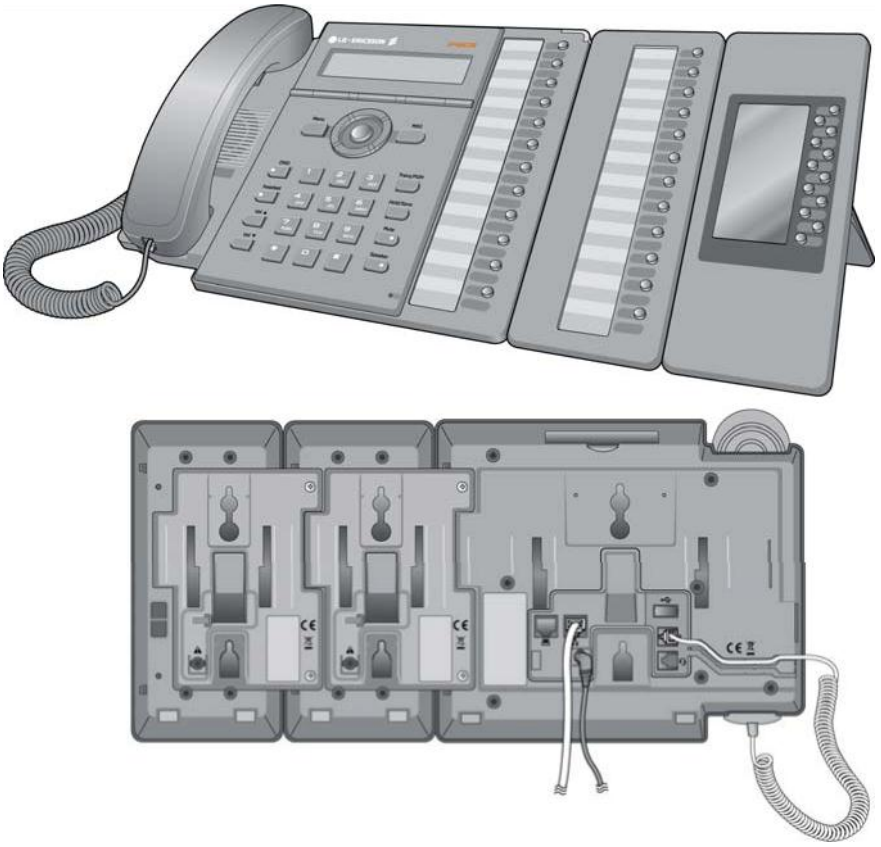


Figure 4.5-4 LIP-8000 DSS Installation (12DSS + 12LSS)

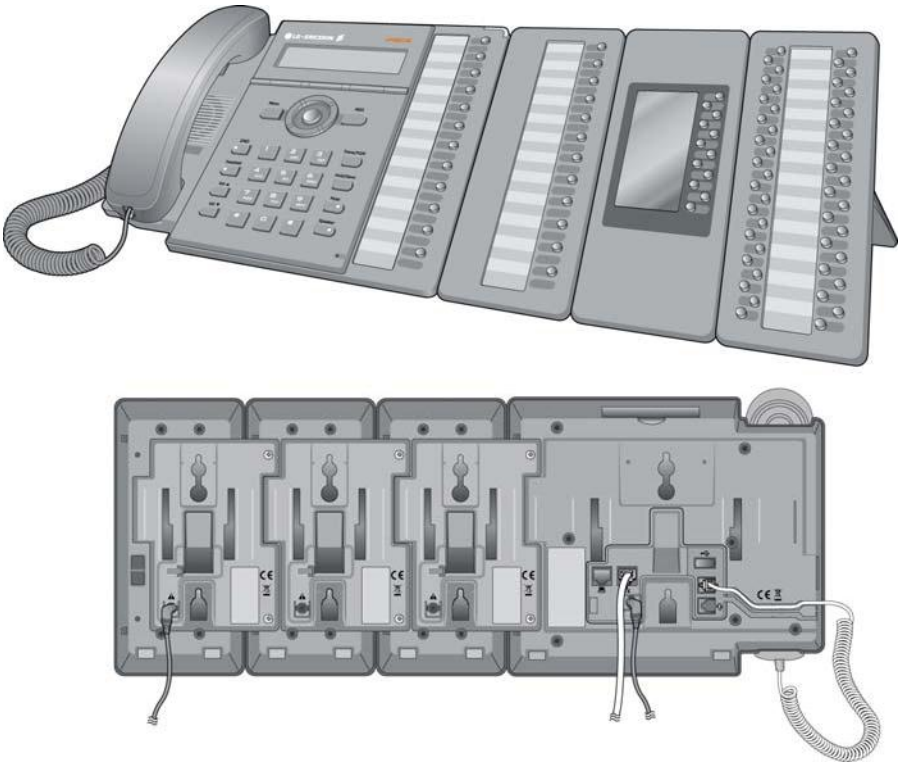


Figure 4.5-5 LIP-8000 DSS Installation (12DSS + 12LSS+48DSS)

The LIP-24D/DH or LIP 7000 Phones can be mounted on the wall using the appropriate Wall Mount Kit. The Wall Mount Kit is installed as described below and shown in Figure 4.5-6.

Using the Wall Bracket, mark and drill two (2) 7 mm holes for the plastic wall anchors provided.
Insert the two (2) anchors into the holes and insert and tighten the 2 screws leaving about 6 mm (¼-inch) exposed. Refer to Figure 4.5-6.
Slide the Wall Mount bracket over the screws and tighten securely.
Connect a short Cat 5 cable, to the LIP-24D/DH or LIP 7000 series Phone and the wall jack.
Mount the LIP-24D/DH or LIP 7000 series Phone onto the Wall Mount bracket.
Insert the Wall Mount handset hook to prevent the handset from slipping when wall mounted. For the LIP-7000 series, the Handset hook is molded as part of the Wall Mount bracket as shown in Figure 4.5-6.

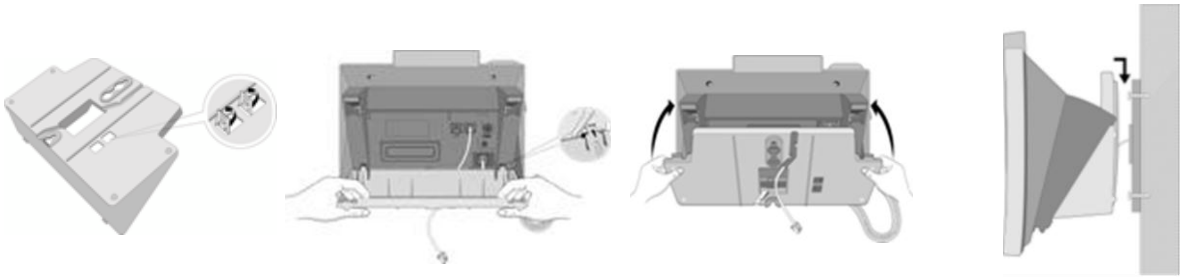


Figure 4.5-6 LIP-7000 Wall Mount Installation

The DSS Console installation with the LIP-7000 series phone is shown in Figure 4.5-7.

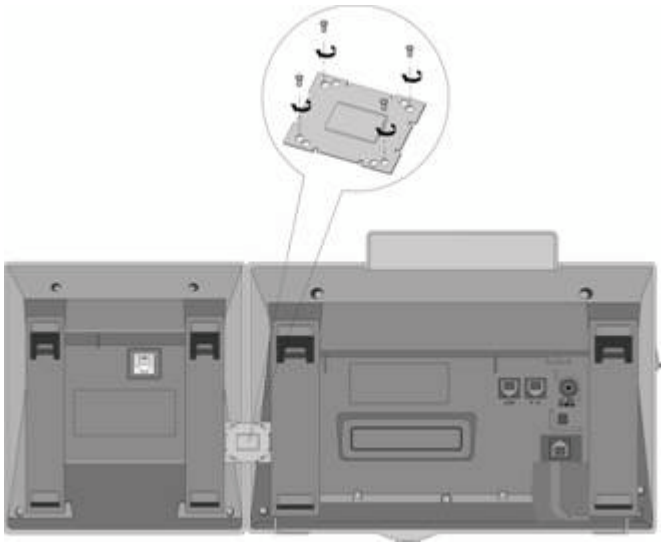


Figure 4.5-7 LIP-7000 DSS Installation

5. APPENDIX. USEFUL INFORMATION

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3. **busybox**
4. **dhcpcd**
5. **pptp**
6. **u-boot**