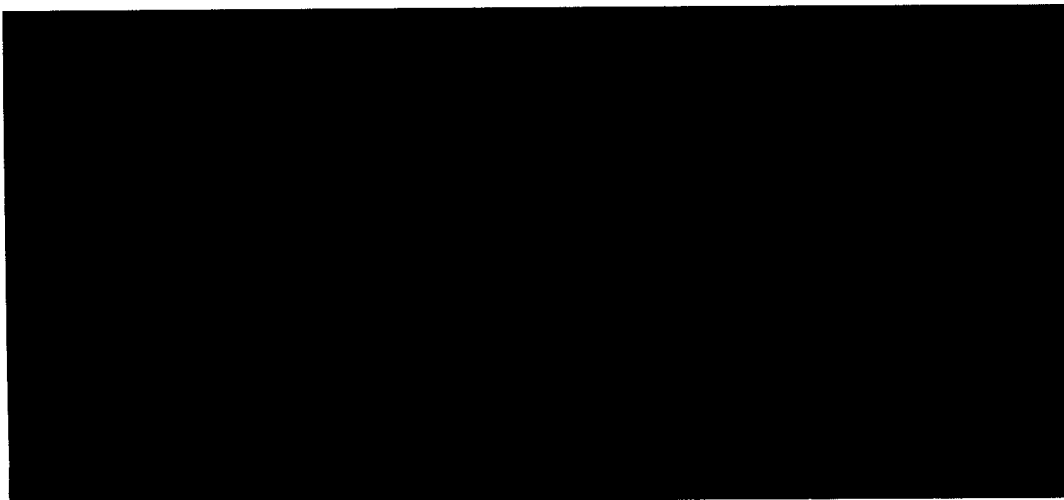




# **Digital Key Telephone System Installation Manual**

**MODEL : GDK-16  
GDK-16A  
GDK-16E  
GDK-16EA**







<b>SECTION 6. ADMIN PROGRAMMING</b> .....	57
6.1 General Description .....	57
6.1.1 Introduction.....	57
6.1.2 To Enter the Programming Mode .....	57
6.1.3 How to Program .....	58
6.1.4 Button Definition .....	59
6.2 Admin Programming .....	60
6.2.1 Admin Programming Index .....	60
6.2.2 Default Values .....	63

## SECTION 1. INTRODUCTION

### 1.1 PURPOSE

This manual provides the information necessary to install, program, operate, and maintain the LG Digital Key Telephone System, GDK-16.

### 1.2 REGULATORY INFORMATION

#### TELEPHONE COMPANY NOTIFICATION

Before connecting the GDK-16 to the telephone network, you may be required to notify your local servicing Telephone Company of your intention to use "customer provided equipment". You may further be required to provide any or all of the following information;

- Number of telephone lines to be connected to the system
- Model name GDK-16
- Local regulatory agency registration number
- Ringer equivalence
- Registered jack

The necessary information is available from your local LG Electronics representative.

#### INCIDENCE OF HARM

If the Telephone Company determines that the customer provided equipment is faulty any possibly causing harm or interruption in service to the telephone network, it should be disconnected until repair can be effected. If this is not done, the Telephone Company may temporarily disconnect service.

#### CHANGES IN SERVICE

The local Telephone Company may make changes in its communication facilities or procedures. If these changes could reasonably be expected to affect the use of the GDK-16 system or compatibility with the network, the Telephone Company is required to give advanced written notice to user, allowing the user to take appropriate steps to maintain telephone service.

#### MAINTENANCE LIMITATIONS

Maintenance on the GDK-16 Digital Key Telephone System must only be performed by the LG Electronics Inc. or its authorized agent. The user may not make any changes and/or repairs except as specifically noted in this manual. Unauthorized alternations or repairs may affect the regulatory status of the system and may void any remaining warranty.

#### NOTICE OF RADIATED EMISSIONS

The GDK-16 Digital Key Telephone System 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.

**WARNING :**

"This equipment generates and uses R.F. energy, and if not installed and used in accordance with the Instruction Manual, it may cause interference to radio communications. It has been tested and found to comply with the appropriate limits for a telecommunication device. The limits are designed to provide reasonable protection against such interference, when operated in a commercial environment.

Operation of this equipment in a residential area could cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference."

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**HEARING AID COMPATIBILITY**

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The GDK-16 Digital Key Telephone System has been designed to comply with the Hearing Aid Compatibility requirements as defined in Section 68.316 of Part 68 FCC Rules.

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**REPLACEMENT OF LITHIUM BATTERIES**

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The GDK-16 Digital Key Telephone System is provided with replaceable Lithium Batteries on MBU for the purpose of protecting SRAM data including the system database and the real-time-clock from power loss. When the authorized Serviceman replaces them, it has to be carefully considered as followings,

**CAUTION :**

- . Danger of explosion if battery is incorrectly replaced.
- . Replace only with the same or equivalent type recommended by the manufacturer.
- . Dispose of used batteries according to the manufacturer's instructions.

**Notice 1:**

**If this equipment is not equipped with a standby battery supply it will not be possible to make calls to the emergency services when the power fails. Alternative arrangements should be made for access to emergency services.**

**Notice 2:**

The equipment has been approved to [Commission Decision "CTR21"] for pan-European single terminal connection to the Public Switched Telephone Network(PSTN). However, due to differences between the individual PSTNs provided in different countries the approval does not, of itself, give an unconditional assurance of successful operation on every PSTN network termination point.

In the event of problems, you should contact your equipment supplier in the first instance.

## SECTION 2. GENERAL DESCRIPTION

### 2.1 INTRODUCTION

The GDK-16 Digital Key Telephone System is a fully digital hybrid Key Telephone System, designed to meet the telecommunication need of small sized business offices & home base.

The GDK-16 System incorporates state of the art digital technology for command processing and voice switching, utilizing a Pulse Code Modulation/Time Division Multiplexing (PCM/TDM) distributed switching matrix. The system supports both "A" and "μ" law voice encoding rule based on the requirements of local regulations.

The GDK-16 System achieves a high level of flexibility by providing support for different types of instrumentation.

The GDK-16 has Four types, GDK-16 ,GDK-16 A, GDK-16 E, GDK-16 EA

GDK-16/GDK-16E have BRI on MBU but GDK-16A/GDK-16EA don't.

GDK-16E/GDK-16EA support DSIB but GDK-16/GDK-16A don't.

The following table shows the difference among each model.

**Table 2.1.1 The basic difference among GDK-16 Series**

	GDK-16	GDK-16A	GDK-16E	GDK-16EA
BRI on MBU	O	X	O	X
DSIB	Not support	Not support	Support	Support

The GDK-16 KSU is wall mounted plastic cabinet that houses the MBU (Main Board Unit) and contain board slots for the CO line/Key Station/SLT interface boards S/T interface boards, and other useful PCBs. There are five option board slots in the system.

The SLOT1 is used to install one of the LCOBA/LCOB4/LCOB6/LCOB/LCOB2/LCOBE or STIB2/STIB. SLOT2 is used to install the DVIB/DVIBE(Digitized voice interface board) and DTRB(DTMF receiver board).

SLOT3 & SLOT4 is used to install extension boards such as SLIB, DTIB and DSIB.

SLOT5 is only used to install the MFB (multi function board)

The system architecture has been designed to allow a high level of software control over the system's hardware. The software incorporates a vast array of features and capabilities including PC Database Administration, ISDN feature, etc.

The GDK-16 System supports a combination of Digital Keysets(LKD, KD, KD/E, KD/S KD/C series), and various kinds of ISDN terminals as well as analogue single line devices. With the keysets, commonly used features are activated by direct button selection. Additionally, many functions may be accessed by dialing specific codes or optionally, by assigning these dial codes to Flexible Buttons on the keyset. In addition to key telephones, an array of optional terminals is available including Intercom/Door Box

With the flexibility of the GDK-16 extensive feature content, and the capability to use an array of instruments, the GDK-16 can be tailored to meet the short and long-term needs of the most demanding customer requirements.

## 2.2 SYSTEM CAPACITY

The following Table and Chart provide system capacities and display the system's configuration flexibility.

**Table 2.2.1 System Capacities**

Description	Basic & Expansion	Total
Time Slots		48
CO Line Ports		Max. 6 (analog CO and/or ISDN BRI)
Max direct Station connections		20
Max Stations via 2B modules		6(direct stations limited to 8)
Max Stations via ISDN So bus		2
DSS/DLS Consoles per station		0
Attendant Positions	1-System	
Intercom Links		Non-blocking
Paging		
- All Call		1 zone
- Internal		2 zones
Station Speed Dial	20/station, 24 digits each	20
System Speed Dial	24 digits each	79
Last Number Redial		32 digits
Music Source Inputs	1/MBU	1
External Control Contacts	1/MBU, 1/MFB	2
Alarm Input	1/MBU	1
RS-232C Ports	1/MFB	1
DTMF Receivers	2/MBU, 2/DTRB or 2/DVIBE	4
CO Line Groups		4
Intercom Groups		4
Conference	3-party	no limit

**\* Note :**

1. Not all-maximum capacities may be achieved simultaneously.
2. Refer to the System configuration on chapter 5.2.6 Configuration.



## 2.3 SYSTEM SPECIFICATIONS

The following Tables provide general system specifications.

**Table 2.3.1 Dimensions & Weights**

Item	Height	Width	Depth	Weight
Key Service Unit	346mm 13.6in	246mm 9.7in	90mm 3.5in	2.2Kg
Digital Key Set	236mm 9.3in	192mm 7.6in	84mm 3.3in	1.5 Kg
Digital ICM/Door Box	45mm 1.8in	140mm 5.5in	100mm 3.9in	0.5 Kg

**Table 2.3.2 Environmental Specifications**

Item	Degrees C	Degrees F
Operating Temperature	0-50	32-122
Optimum Operating Temperature	20-26	68-78
Storage Temperature	0-70	32-158
Relative Humidity	0-85% non-condensing	

**Table 2.3.3 Electrical Specifications**

	GDK-16/GDK-16A	GDK-16E/GDK-16EA
Power Supply:		
- AC Voltage Input	220-240 Volts AC @ 50-60Hz	
- AC Power	45W	
- AC Input Fuse	T500mAH 250 V	T800mAH 250 V
- DC Output Voltages	+5, -5, +30Volts(28-35V)	
Back-up Battery :		
- Battery Back-up Voltage	24 Volt DC	
- Battery Back-up Fuse	T5AH 250V	
- Charging Current	Max. 100mA	
- Battery load Current	Max. 1A(with Analog CO or ISDN CO)	
Ext. Relay Contacts	3 A @ 30 Volt DC	
Music Source Input	600 ohm @ 0 dBm	
STIB & STIB2 Power	Max. 3W(40Volt DC, 80mA)	

**Table 2.3.4 Electrical Specifications**

Item	22 AWG Wire	24 AWG Wire
Digital Keypad - 2-wire loop	500 m (1.6K feet)	330 m (1K feet)
2B modules(with Power Adapter,24Vdc/200mA) - System - Primary Keypad - Primary Keypad - Secondary Keypad - Primary Keypad - Secondary SLT	Refer to Installation Manual of 2B_DTIU and SLIU.	
2B modules(without Power Adapter) - Primary Keypad - Secondary Keypad - Primary Keypad - Secondary SLT	Refer to Installation Manual of 2B_DTIU and SLIU.	
Single Line Telephone	1,600 m (5.3K feet)	1,000 m (3.3K feet)

**Table 2.3.5 CO Loop Specifications**

Ring Detect Sensitivity	@ 20-60 Hz, 38 Vrms
DTMF Dialing	
- Frequency Deviation	less than $\pm 1\%$
- Signal Rise time	3 msec, maximum
- Tone Duration, on-time	75 msec, minimum
- Interdigit time	75 msec, minimum
Pulse Dialing	
- Pulse Rate	10 pps
- Break/Make Ratio	60/40% or 66/33%

**Table 2.3.6 Miscellaneous Specifications**

Main System Memory	
Read-Only-Memory, (FLASH MEMORY or EPROM)	1 Megabyte Max. U1 : 512Kbyte (MEMU U2 : 512Kbyte)
Random Access Memory, SRAM (Battery Backed-up)	256 Kbytes Max U7= 128 Kbytes (MEMU U3= 128 Kbytes)

**2.4 SYSTEM COMPONENTS**

Item	Slot Position	Circuit Number	Description	Remark
GDK-16, 16E KSU			1BRI + 2DKT + 2SLT (on MBU)	
GDK-16A, 16EA KSU			2DKT + 2SLT(on MBU)	
LCOB6	1	6	Loop Start CO Interface	
LCOB4	1	4	Loop Start CO Interface	PRU4, PRCPTU
LCOBA	1	2	Loop Start CO Interface	PRU4, PRCPTU
PRU4	LCOB4/ LCOBA	4	Polarity Reverse Detect 4 ports	
PRCPTU4	LCOB4/ LCOBA	4	Polarity Reverse Detect 4 ports + Call Progress Tone Detect 4 ports	
MEMU	MBU		Default installed on MBU	
LCOB	1	2	Loop Start CO Interface	
LCOBE(SP)	1	2	Loop Start CO Interface (Call Progress Tone Detect 2 ports)	
LCOBE(w/PRU)	1	2	Loop Start CO Interface (Polarity Detect 2 ports)	
LCOB2	1	4	Loop Start CO Interface	
STIB	1	1(2B)	ISDN 1So/To Interface	
STIB2	1	1(4B)	ISDN 1So/To + 1To Interface	
DVIB	2	2	Digital Voice Interface	
DVIBE	2	2	Digital Voice Interface + DTMF Receiver 2EA	
DTRB	2	2	DTMF Receiver 2EA	
DTIB	3, 4	4(8B)	DKT Interface	
SLIB	3, 4	4	SLT Interface	
DSIB	3, 4	4+4(8B)	SLT & DKT Interface	
MFB	5		Battery Changing, RS-232C, Auto FAX	
DVEU	DVIB/ DVIBE		Voice Memory Expansion Unit	

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### **Key Service Unit (KSU)**

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The KSU is a plastic cabinet designed for wall mounting. The KSU contains a MBU (Main Board Unit) and POWER Transformer and Mechanical parts.

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### **Main Board Unit (MBU)**

---

The Power Supply Circuit is on the left upper side of the MBU and an LED in right side of the MBU panel indicates the state of system.

A Power Supply Circuit is required in the Key Service Unit. The Power Supply Circuit converts local AC power (110~240 VAC @ 50~60Hz) to DC 31.5V for distribution to other system components. This DC 31.5V output are provided: to MBU for generation +/-5V

The MBU contains 2 DTMF receiver circuits. Each receiver is time-shared under the control of the system software. The MBU, incorporates the system's memory, master clock, one internal and one external MOH ports, two DTMF receivers, one alarm detection circuit, one general purpose relays, watchdog circuitry and 2 ports digital terminal interface circuits and 2ports SLT circuits as well as the system's PCM voice processing and main micro-processor. The micro-processor is a 16 bit high speed CPU that receives and transmits signaling information from/to other PCBs, controls feature activation, and PCM time-slot interchange. The MBU contains 128 Kbytes of RAM with battery backed-up and can be expanded up to 256 Kbytes with an optional MEMU. RAM associated with the system database and the real time clock are protected from power loss by a long life high-energy lithium battery. For digital voice processing, two ROM's contain PCM tone, gain table, etc.

Two (2) FLASH MEMORY (512Kbytes U1 & U2) contain the basic system operating software. Both U1 and U2 should be installed for the operation of the system. U1 is on the MBU and U2 is on the expansion card.

There are four basic ports on MBU for two digital terminals and two SLT.

The SLOT1 is used to install one of the LCOBA/LCOB4/LCOB6/LCOB/LCOB2/LCOBE or STIB2/ STIB.

SLOT2 is used to install the DVIB/DVIBE(Digitized voice interface board) and DTRB(DTMF receiver board).

SLOT3 & SLOT4 are used to install one of the SLIB, DTIB or DSIB boards.

SLOT5 is only used to install the MFB (multi function board)

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### **CO Line Interface Board - Loop Start**

---

Analog CO/PABX Line interface (Loop-start line interface) board such as LCOB is installed at the SLOT1. There are five kinds of LCOB, LCOBA/LCOB4/LCOB6/LCOBE/LCOB2. These boards have 2 CO,4 CO or 6 CO Loop Start Lines with ring and loop current detection, A/D and D/A conversions, and pulse signaling.

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### **Single Line Interface Board (SLIB)**

---

The SLIB provides the capability to connect 4 SLTs to the system with appropriate A/D and D/A conversions. The SLIB allows the SLT to access to CO Lines connected to the system, other stations, and most features of the system through the use of dial codes. Connections to the single line telephones are made by external pair wire. The SLIB allows a Single Line Telephone to be connected up to 1.6 Kilometers (5.3 Kfit) from the system by using 22 AWG wire. In addition, one LED is mounted on the PCB to indicate the state of POWER ON/OFF, LED will turn on when system's POWER is ON.

\* **India only** : Loop Impedance for SLT : 300 ohm(Include SLT : 500 ohm)

**Digital Terminal Interface Board (DTIB)**

---

The DTIB provides 4 ports of the LGE proprietary digital port interface for the system. The DTIB provides 2-wire interface to digital terminals. The DTIB sends/receives digitized voice and data signals to/from the digital terminals by using the TERMINAL BLOCK(CN2) on the DTIB. In addition, one LED is mounted on the PCB to indicate the state of POWER ON/OFF, LED will turn on when system's POWER is ON. The DTIB allows for either 1 or 2 bearer voice channels from a single hardware port under the control of system software. Note that each keyset requires only a single channel however, 2-channel operation can be provided for simultaneous voice and data applications or future feature as 2B phone.

The permitted keyset types are as following.

- KD-36D, KD-36N, KD-24D, KD-24N
- KD/E-36EXE, KD/E-36ENH, KD/E-24EXE, KD/E-24ENH, KD/E-8BTN
- LKD-2NS, LKD-8DS, LKD-30DS, etc

**This board should be installed on the SLOT3 & SLOT4(STA SLOT1 & STA SLOT2).**

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**DKT & SLT Interface Board (DSIB)**

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The DSIB provides the function of SLIB and DTIB simultaneously. The DSIB circuit contains exactly the same as Single Line Interface and Digital Terminal Interface circuits. Note that you should consider the same condition mentioned above Single Line Interface Board and Digital Terminal Interface Board.

***DSIB should be installed on the SLOT3 and the SLOT4.***

---

**S/T Interface Board (STIB2)**

---

The S,T interface is based on the existing interface described in ETSI 300. 012 which is based upon ITU\_T Recommendations I.430 and provides modifications and further requirements.

This is applied at the S or T reference points for the basic interface structure defined in ITU\_T I.412. Layer 1 interfacing requires a balanced metallic transmission medium, for each direction of transmit capability to support 192Kbps(2B+D). For interface circuits, one per transmission direction, are used for transmit digital signals. Data & bit clock are transmitted by the NT master and extracted by TE slave. The GDK-16 system can be positioned at reference point Ia or Ib on ETS 300. 012 that are TE-slave without power feeding or NT-master with power feeding. By selecting the short pin and DIP switch on each line interface, the STIB can support either S0-interface (Line board function) or T-interface (Trunk function).

The board line's specific circuitry contains PEB2086 for Physical layer and data link layer. This board is comprised of one T only port and one S/T Switchable port.

**STIB2 can be installed on the SLOT1.**

### **S/T Interface Board (STIB)**

---

The S,T interface is based on the existing interface described in ETSI 300. 012 which is based upon ITU\_T Recommendations I.430 and provides modifications and further requirements.

This is applied at the S or T reference points for the basic interface structure defined in ITU\_T I.412. Layer 1 interfacing requires a balanced metallic transmission medium, for each direction of transmit capability to support 192Kbps(2B+D). For interface circuits, one per transmission direction, are used for transmit digital signals. Data & bit clock are transmitted by the NT master and extracted by TE slave. The GDK-16 system can be positioned at reference point Ia or Ib on ETS 300. 012 that is TE-slave without power feeding or NT-master with power feeding. By selecting the short pin and DIP switch on each line interface, the STIB can support either S0-interface (Line board function) or T-interface (Trunk function).

The board line's specific circuitry contains PEB2086 for Physical layer and data link layer.

This board is comprised of one S/T Switchable port.

**STIB can be installed on the SLOT1**

### **Memory Expansion Unit (MEMU)**

---

The MBU contains the basic system flash memory U1 and RAM U17. The RAM provides the memory for the system database, speed dial numbers, SMDR buffer, etc. The MEMU consists of flash memory U2 and RAM U3. The size of each flash memory is 512Kbytes. U1 and U17 are installed on the MBU basically. The MEMU should be installed for normal operation of the system. Because the size of the system software is over than 512Kbyte.

### **Multi Function Board (MFB)**

---

The Multi Function Board (MFB) Provides a RS-232C interface port with 9-pin connector. The maximum baud rate is 38400bps in BASIC II S/W. The MFB is useful for system maintenance, PC based admin, SMDR print out.

The MFB includes circuitry for float charging an externally connected 24-volt battery and control the operation of the battery back-up circuits. And the MFB will provide system-operating voltages from the battery if local AC power fails. In addition, circuitry is incorporated in the MFB to disconnect the battery when it is in deep discharge.

The MFB includes circuitry for Fax Tone Detection. By Admin-program, User use the MBU SLT Port 1 as Fax port instead of Analog CO port.

Fax Tone Detection Circuit & Function is supported from the MFB Issue 2 and BASIC II S/W.

The MFB includes one External Relay for General purpose

### **Digitized Voice Interface Board (DVIB)**

---

- DVIB provides 2 channel Record/Play
- DVIB provides Time & System prompt
- All message are saved in Flash memory
- Max record time : Without DVEU (68 Minutes), With DVEU(136 Minutes)  
(DVIB: 68 Min, DVEU: 68Min)  
System/time stamp: 8 Min  
User record time: 128 Min
- Max. Number of User Voice Message : 400ea(With DVEU)  
(DVIB: 200ea, DVEU: 200ea)
- DVEU(Digitized Voice Expansion Unit) : Optional PCB of DVIB

\* **Note:** User Greeting does not lost by system power off or reset because of this message is stored in FLASH memory MBU SW7-1 controls the protection of recorded messages.

**DVIB should be installed on SLOT2.**

## SECTION 3. INSTALLATION

### 3.1 INTRODUCTION

As with any sophisticated communications device, installation of the GDK-16 System requires the care and fore-thought of a competent technician. Installation proceeds in 4 major steps:

- Site Preparation
- KSU Installation
- PCB Installation
- System Wiring

### 3.2 SITE PREPARATION

#### General Site Considerations

The first step is to locate an acceptable site for the common equipment.(KSU, boards, etc.)

When locating a mounting site for the KSUs, the following points must be considered:

1. The KSUs are designed for wall mounting and should not be mounted directly to a masonry or plaster board wall. It is recommended that a 1/2 inch thickness plywood back-board be firmly mounted to the wall first and then the KSU.
2. The location must have access to 220~240 Volt AC, 50 - 60 Hz with a circuit breaker or fuse rated at 15 amps. A 3-wire parallel blade grounded outlet should be within approximately 2 meters (6 feet).
3. The location must have access to a good 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 system.
4. The system should be located in an area which is well ventilated with a recommended temperature of 20 - 26 degrees C (68 - 78.8 degrees F) and a relative humidity of 5 - 85 % (non-condensing).
5. The system should be located within 8 meters (25 feet) of the telephone company's termination point. Also, the location should be within the prescribed station loop lengths for all keysets and terminals. If existing cabling is to be employed, the location of existing cabling and conduits should be considered.
6. The location should have adequate accessibility, space and lighting for future servicing and should consider the need for future expansion.
7. The site should be away from radio transmitting equipment, arc-welding devices, copy machines, and other electrical equipment capable of generating electrical interference. The system should be protected from flooding and heavy machinery as well as excessive dust and vibration.



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### **Back-Board Installation**

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A wooden backboard is recommended for all installations and must be installed when the location has masonry or plasterboard walls. A  $\frac{1}{2}$  inch plywood material is sufficient for most installations. The backboard should be mounted at a convenient height, about 1 meter above the floor, and be bolted in two number of places to distribute the weight of the system..

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### **Verify On-Site Equipment**

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Once the equipment installation site has been identified and a dedicated earth ground, and lighting and ventilation are available, verify that all equipments required are on-site and have not been damaged during shipment. Assure there is no shipping damage. Note that a mounting template is packed with KSU and this template will be required later in the installation. Check that the type and quantity of boards received is correct and optional equipments are on-site.

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

### 3.3 KSU & POWER INSTALLATION

GDK-16 system consists of KSU and some optional boards. The exterior view of the GDK-16 is shown in Figure 3.3.1.

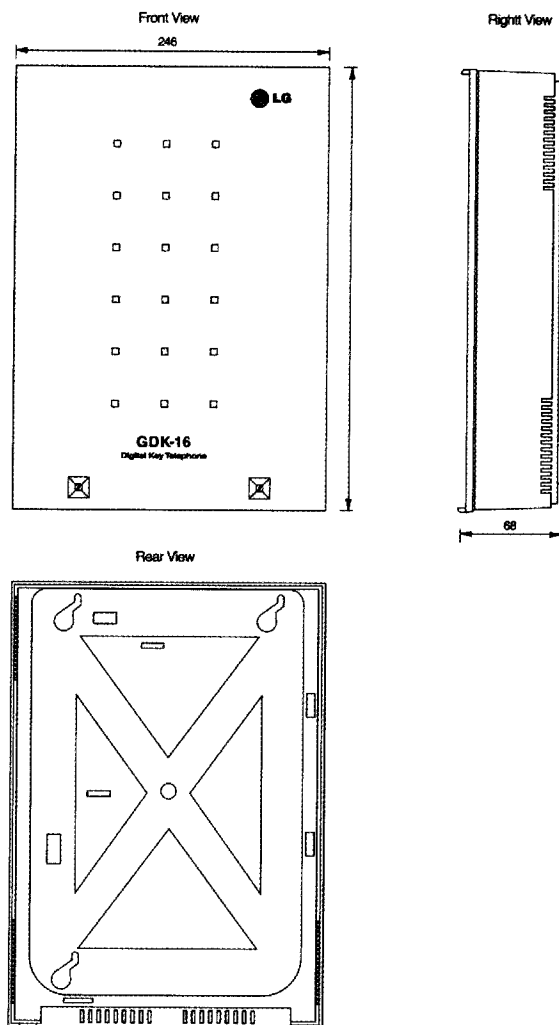
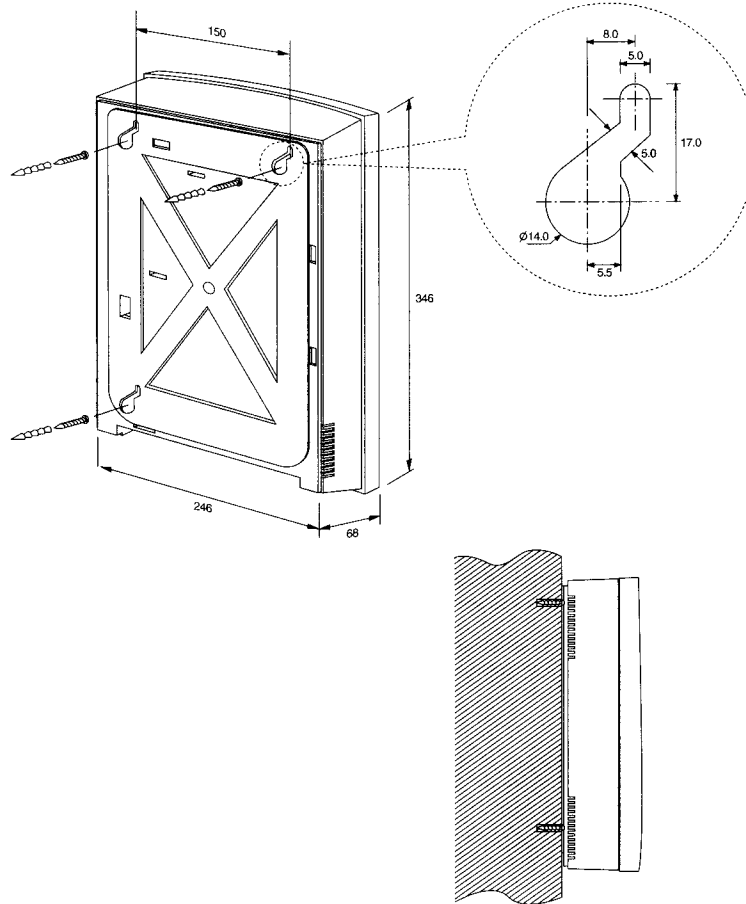


Figure 3.3.1 GDK-16 Exterior View

**Mounting the KSU**

The KSU is a plastic frame cabinet designed for wall mounting. Employing the KSU mounting template provided with the KSU, mark the location of the two screws to mount the KSU. Again, the KSU must not be mounted on a masonry or dry-wall surface, in this case a wooden backboard is required, refer to paragraph **[Back Board Installation]**. The distance between mounting holes is shown in Figure 3.3.2.

The KSU is mounted with two #10 or larger, 1.5 inch or longer screws. First, drill pilot holes in the two locations marked, insert the screws and tighten leaving about 0.5 inch exposed. Hang up the KSU on the screws and tighten the KSU.



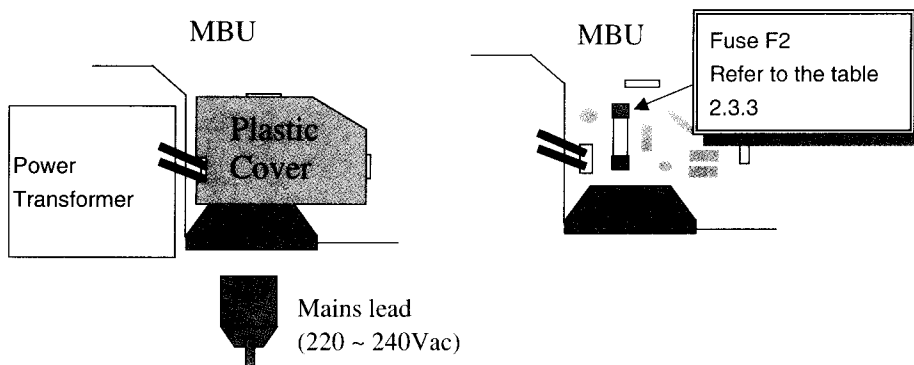
**Figure 3.3.2 KSU Mounting Holes & Installation layout**

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### Power Installation

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The Power Supply Circuit of the MBU provides DC power for the system boards and telephones, converting the AC Input Voltage to appropriate DC voltages. Before installation, assure that the AC power cord is **NOT** plugged into the AC INLET. The Power Supply Circuit is located on the left upper side of the MBU. The GDK-16 Power can only operate 220~240 VAC based on the connection of the cable(2-wired)by the CN16 from the transformer and the connection of the cable(2-wired)by the CN17 to the transformer.



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### KSU Grounding

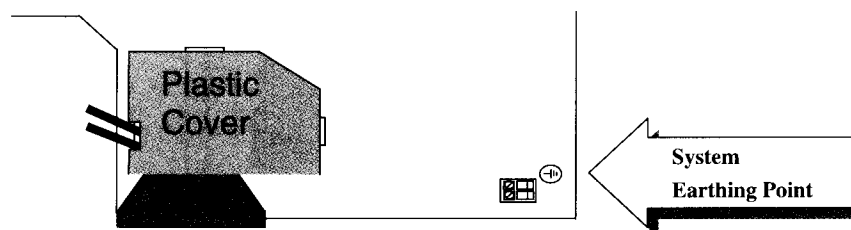
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The GDK 16 mains lead must be connected to a building mains supply that includes an earth connection in conformance with current IEEE requirements.

Earthing is required for user safety and to minimize EMC interference.

If does not connected mains earth, to ensure proper system operation and for safety purpose, a good earth ground is required. A metallic COLD water pipe usually provides a reliable ground. Carefully check that the pipe does not contain insulated joints that could isolate the ground path. If insulated joints exist, another earth ground source must be used or, if allowed, the joints may be bridged.

A #14 AWG or larger copper wire should be used between the ground source and the KSU. The wire should be kept as short as possible, it is recommended that the wire be no longer than 8 meters.(about 25 feet)



### 3.4 PCB INSTALLATION

#### PCB Handling & General Installation

**Do Not insert or remove any boards with the system power on!**

Power must be turned off prior to insertion or removal of the PCB.

The system PCBs contain digital circuitry which can be damaged by exposure to excessive static electricity. When handling PCBs, a grounded wrist strap should be used to protect the boards from static discharges. Also, use common sense when handling the PCBs. For example, do not place a PCB in locations where heavy objects might fall on the PCB and damage components.

To insert a PCB, hold the PCB and, with component side facing right, insert the board into the MBU's din connector firmly and tighten. To remove a PCB, reverse the procedure. Installation method of PCB is shown in Figure 3.4.1.

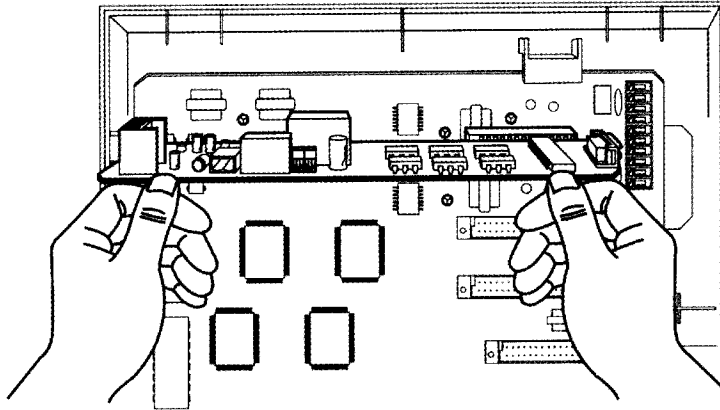


Figure 3.4.1 PCB Installation

There are 5 slots in the GDK-16 system for extend or modify the system configuration. But, there are some restrictions when optional board installation. Note that the system can not operate properly with wrong installation. The SLOT1 of the MBU is reserved for LCOB2 or LCOB or STIB2 or STIB, the next slot is reserved only for DVIB, the SLOT3 & SLOT4 are reserved for one of SLIB, DTIB or DSIB and the SLOT5 is reserved for MFB.

To summarize, see the following table 3.4.1.

Slot No.	Boards	Remark
SLOT1	LCOBs, STIB2, STIB	Option board for CO, ISDN
SLOT2	DVIB, DVIBE, DTRB	Fixed slot for DVIB
SLOT3(STA SLOT1)	SLIB, DTIB, DSIB	DKT, SLT Interface board
SLOT4(STA SLOT2)		
SLOT5	MFB	Fixed slot for MFB

[Table 3.4.1] Option Boards Installation Table

When the system power on, the default slot assignment is automatically redefined according to board installation status.

### Main Board Unit (MBU) Installation

The MBU is installed in the KSU default. It comprised of main processor, two(2) Digital Terminal interface circuits, two(2) Single Line Telephone interface circuits, five(5) board slots for optional boards, memory, real-time clock circuit and data communication circuit which transmits and receives to/from other boards. The MBU may be equipped with one daughter boards; a MEMU for FLASH MEMORY & RAM expansion . Refer to Figure 3.4.2.

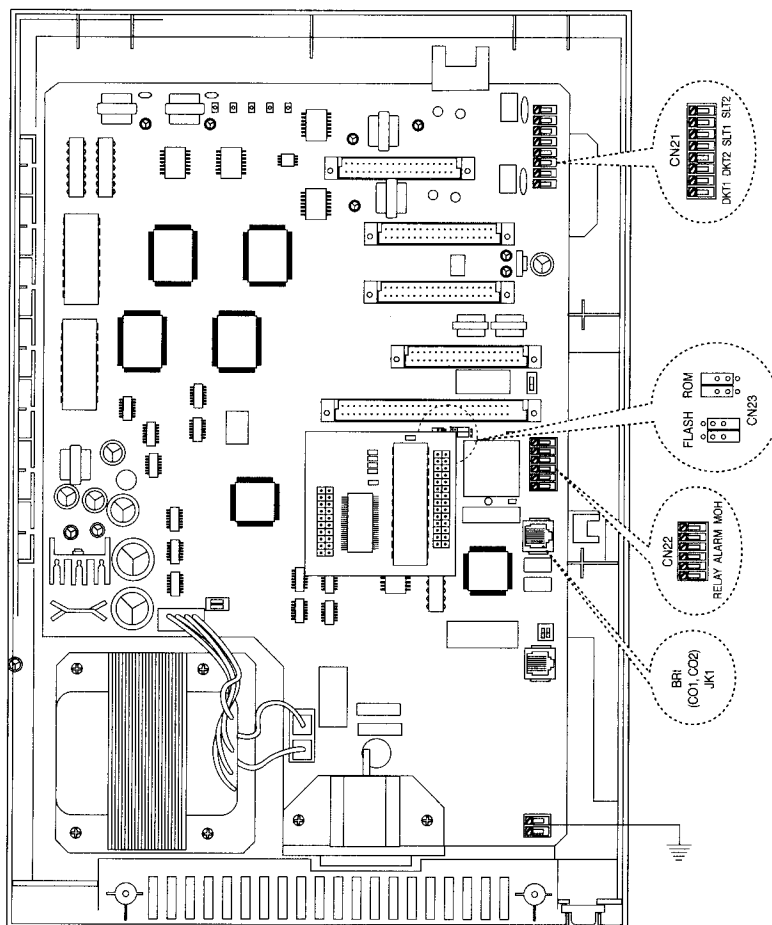


Figure 3.4.2 MBU & MEMU Installation

The MBU contains a lithium dry-cell to keep the memory contents and real-time clock functions during power off. The battery is soldered to the MBU, and connected circuitry by an on/off DIP switch(SW3). So the **DIP switch knob must be ON** position before the MBU installation. Refer to Figure 3.4.3.

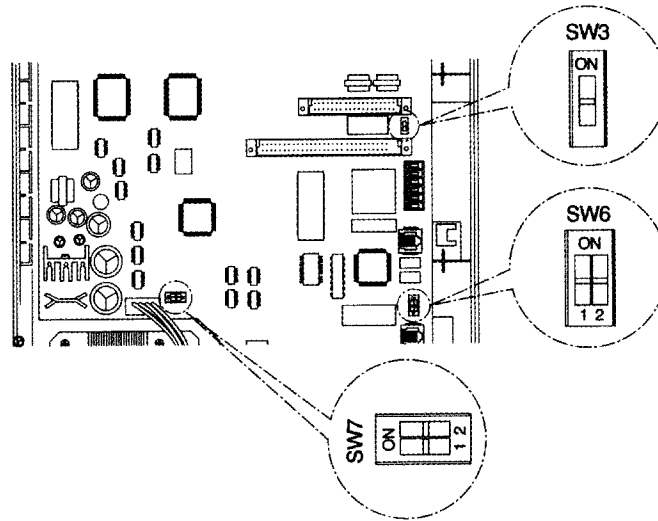


Figure 3.4.3 Memory back-up switch setting

Following table shows the switches on GDK-16 MBU.

Switch		Description	Remark
Switch No.	Manufacturer setting		
SW 3	OFF	ON: Battery ON. OFF: Battery OFF.	Turn ON the switch before system power on.
SW 7	7-1 ( OFF)	ON: For database protection. OFF: For system default.	Turn ON the switch after system power on.
	7-2 (OFF)	OFF : Loop back OFF	OFF (Always)
SW 6-1, 2	ON	ON: Termination resistor ON (BRI).	
		OFF: Termination resistor OFF (BRI).	

The MBU also has a two position DIP switch(SW7). The following is the function of each switch position :

- Knob 1 System data base initialization when power on**
  - On : Do not initialize system data base when power on.
  - Off : Initialize system data base when power on.
- Knob 2 ISDN Loop Back on**
  - On : Loop Back on
  - Off : Loop Back off

Before programming the system, SW7(knob 1) should be placed in the Off position and turn the system power off and on for initialize the system database to default. Once the database has been initialized, SW(knob 1) should be placed in the on position to protect the database in the memory. Refer to Figure 3.4.3. And there are four red LEDs and one dual color LEDs on the MBU, the function of them are as follows.

- LD1 Display system software operation**
  - This LED will turn on and turn off at every 100 msec
- LD2 Display task changing (software testing purpose)**
  - This LED will be turn on/off toggle when software task changing
- LD3 Display event processing**
  - This LED will turn on during event processing
- LD4 Indication for DKT data comm. error**
  - This LED will be turn on/off toggle for keyset data comm. error.
- LD5 Basic BRI in-use LED**
  - Green: In\_Use.
  - Red : Layer error.

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### MEMU Installation

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The MEMU must be installed on the MBU for the normal operation of the system and following specifications. Refer to Figure 3.4.2.

- Support the CTI for the SMDR record function
- Support the LCR function
- Support the Fax Tone Detector function
- Support the Various Enhanced S/W Packages

**Although MEMU can be separated from MBU, the contents of the Memory are preserved for 1 hour.**

**MEMU should be positioned correctly.**

**If MEMU is incorrectly aligned, it may cause damage for the parts of MEMU or MBU.**

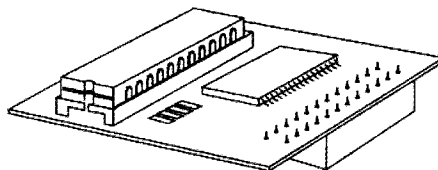


Figure 3.4.4 MEMU Installation



**MFB Installation**

The RS-232C of MFB board is used for the function of system maintenance, PC based Admin, SMDR print. The Followings are the list of the system's output.

- Administration data base
- Off-Line SMDR(on-demand)
- On-Line SMDR
- Statistical Information
- System Trace data

The installation method is shown in Figure 3.4.5.

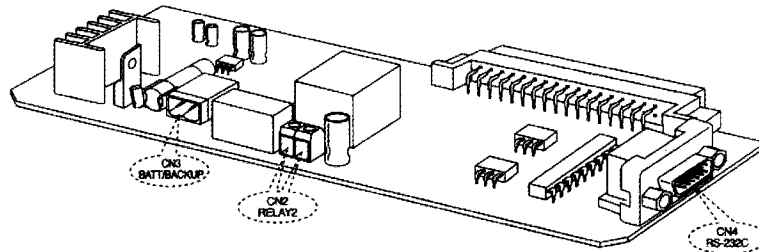


Figure 3.4.5 MFB installation

**Analog CO/PABX Line Interface Boards (LCOB: Loop-start) Installation**

The LCOBA, LCOB4, LCOB6, LCOB, LCOB2 and LCOBE can be installed on the SLOT1. The exterior of them are shown in Figure 3.4.6.

This board provides two(2) Loop Start ports and four(4) Loop Start ports.

Board	Slot	Port No.
LCOBA, LCOB, LCOBE	SLOT1	2
LCOB2, LCOB4	SLOT1	4
LCOB6	SLOT1	6

[Table 3.4.2] LCOBs

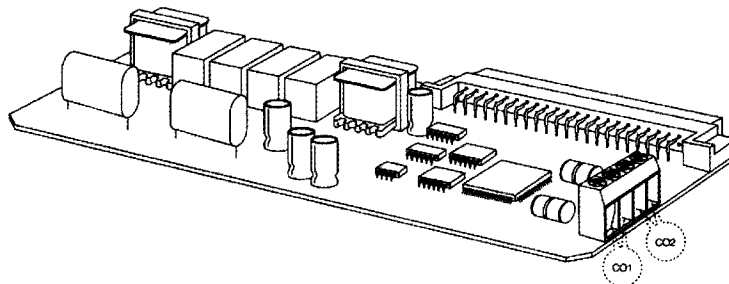
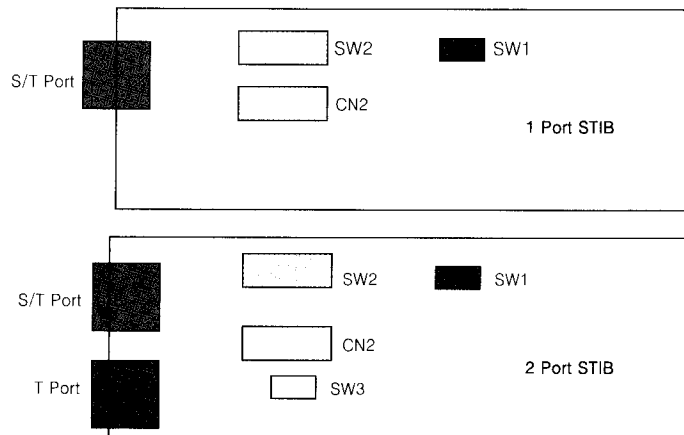


Figure 3.4.6 Analog CO Interface Boards

**ISDN STIB2 & STIB (S/T Interface Board) Installation**

It should be noted that the STIB2 & STIB board should be installed on the SLOT1 of the MBU.  
 The STIB2 provides 1 port of BRI(Basic Rate Interface-'T' mode only) and 1port of 'S' and 'T' mode Switchable interface and STIB provides 1 port of 'S' and 'T' mode Switchable interface.  
 Select the jumpers and DIP switches for S0 or T0 interface. Be sure to connect ISDN trunk to T0 interface port and ISDN extension to S0 interface port. Check if ISDN trunk is not connected to S0 interface port and ISDN extension is not connected to T0 interface port.  
 The mode selection method is shown in table 3.4.3.



Jumper/ Switch	Manufacture Setting (T mode)	Description	Remark
<b>SW1 &amp; CN2</b>	<b>SW1 :OFF CN2 : T position</b>	S0 or T0 interface mode selection for the port and PEB2086 device respectively.	
<b>SW2</b>	<b>Pin1-2 : OFF Pin3-4 : ON</b>	#1 and #2 : External Power feeding ON/OFF. #3 and #4 : Termination Resistor ON/OFF	
<b>SW3</b>	<b>ON</b>	Termination Resistor ON/OFF	Only for T0 interface.

LINE	Connector & Switch	Mode	Selection Method
So/To(CO5-6 or 2So station 112-113)	SW1 SW2 CN2	T	Move short pins to CN2's 'T' position Move SW1, SW2 to 'T' position(OFF)
		S	Move short pins to CN2's 'S' position Move SW1, SW2 to 'S' position(ON)
To (CO3-4)	SW3	T only	Move SW3 to ON position

[Table 3.4.3] S/T Mode Selection Method

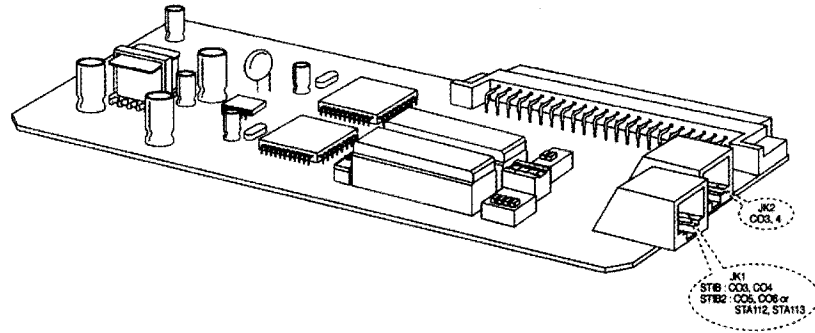


Figure 3.4.7 STIB2

**It is noted that the 'PWR' and the 'R' markings on the STIB2 & STIB board are switched with above figure.**

**DTIB (Digital Terminal Interface Board) Installation**

The DTIB provides 4 ports of normal type or 2B type digital terminal interfaces. All the ports can support 2B format of digitized voice data. The connection between the DTIB and digital terminals are performed through TERMINAL BLOCK(CN2). The exterior of the board is shown in Figure 3.4.8.

**It should be noted that the DTIB board could be installed on the SLOT3 and SLOT4.**

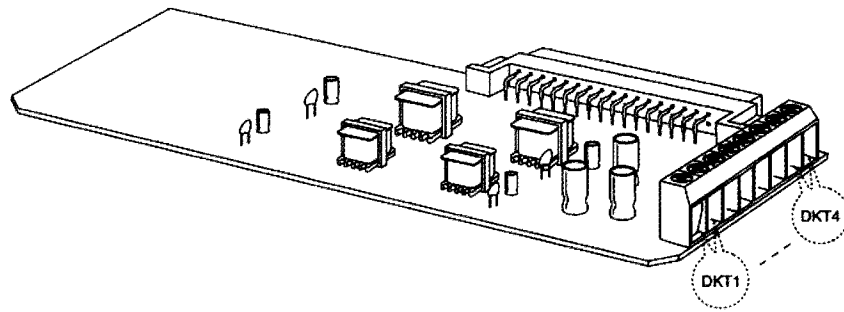


Figure 3.4.8 DTIB

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### Single Line Telephone Interface Board(SLIB) Installation

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The SLIB board provides four(4) ports of SLT interface. The connection between the SLIB and Single Line Telephone are performed through TERMINAL BLOCK(CN2). The exterior of them are shown in Figure 3.4.9

**It should be noted that the SLIB board could be installed on the SLOT3 and SLOT4.**

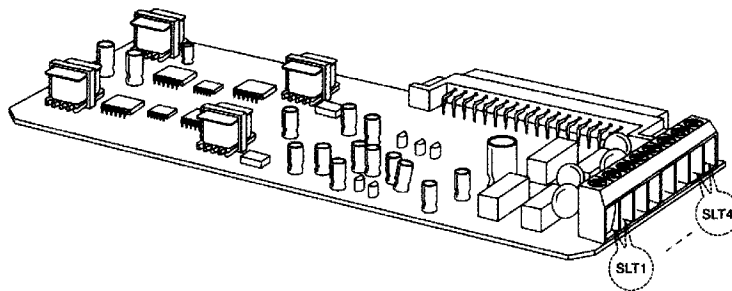


Figure 3.4.9 Exterior of the SLIB

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### DKT & SLT Interface Board(DSIB) Installation

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The DSIB provides 4 ports of normal type or 2B type digital terminal interfaces and 4 ports of SLT interfaces at the same time.

Note that you should consider the same condition mentioned above Single Line Interface Board and Digital Terminal Interface Board installation.

**The DSIB should be installed on the SLOT3 and the SLOT4.**

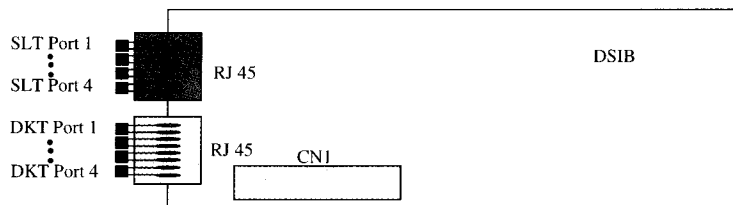


Figure 3.4.10 Exterior of the DSIB

**DVIB (Digitized Voice Interface Board) Installation**

The DVIB provides 2 voice channels. The maximum record time of a DVIB without DVEU(Digitized Voice Expansion Unit) is 68 minutes and if a DVEU is installed, additional 70 minutes is added to the maximum record time. And the protection of recorded messages is controlled by MBU SW7-1.

MBU	Description	System message	User message
SW7-1	OFF : for system default	Not deleted	Deleted
	ON : for database protection	Not deleted	Not deleted

[Table 3.4.4] Protection of recorded messages

**The DVIB should be installed on the SLOT2 of MBU. And the DVEU board should be installed correctly on the CN4 and CN5 of DVIB. If the boards are incorrectly installed, DVIB or DVEU may be operated abnormally or damaged.**

The connectors of a DVIB is shown in figure 3.4.10. CN2 is used for the trace of a DVIB board using a trace data monitor tool(GDK-TRC1). CN4 and CN5 are used for a DVEU installation. CN1 is inserted on SLOT2 of MBU and CN3 is used for a test.

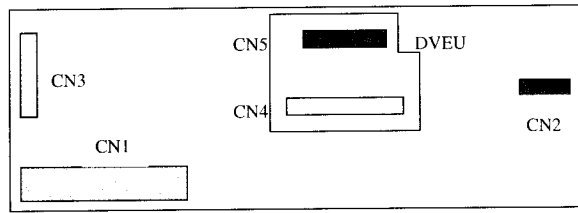


Figure 3.4.11 Connectors of the DVIB

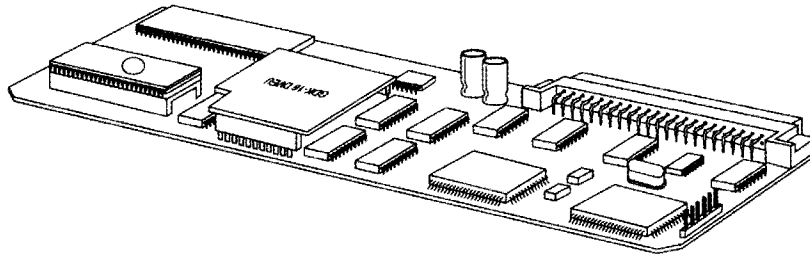


Figure 3.4.12 DVIB

**MOHU (Music On Hold Unit)**

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The MOHU provides External Music Source to the system through any kind of Single Line Interface including 2B-SLIU30 in other GDK System. But in the GDK-16 System, MOHU is used for external paging not for MOH.

The external paging source provided through single line interface. A MOHU has two interface circuits to connect 2 external sources with 2 single line interface. In the GDK-16 system, just one external source of them is used. The single line interfaces connected to MOHU should be selected by Admin programming.

The characteristics of MOHU interface are followings,

Impedance: 600 ohm

Transmission loss: 1 dB +/- 1dB at 1020Hz

Maximum output level: Max. 0 dBm @ 600 ohms

The MOHU can be connected to any kind of single line interface including 2B-SLIU30.

***Caution ; In the GDK-16, MOHU is used for External paging(1 port) not for MOH***

### 3.5 SYSTEM WIRING

#### Battery Back-Up Wiring Installation

The system can be equipped with external batteries for proper operation when local AC power fails. The Back-Up batteries are connected to the connector(CN3) of the MFB.

The External batteries must provide 24 Volts DC. This is generally accomplished by connecting two 12 volts batteries in a series arrangement. Battery operation is controlled by the MFB. The MFB will provide charging current(maximum 0.1A(India : max 0.35A)) to the batteries during normal AC power operation. The MFB will automatically stop the battery operation when AC power re-applied or low battery voltage detected.

The system operating time by external batteries is depend on several elements as follows, battery charge state, condition of the batteries, capacity of the batteries, and the system configuration(number of station ports).

The MFB has one industry standard 9 pin RS-232C connector. The RS-232C ports are connected by 9-pin connectors as shown 3.5.2. Note that the communication settings are 9600bps(Max. 38400bps), 8 bit data, no parity bit and 1 stop bit.

The RS-232C port only provides three(3) control signals such as TXD, RXD and ground.

Batteries are connected to the connector(CN3) of the MFB, as shown in Figure 3.5.1.

**Warning :**

- Carefully check the battery polarity with cable colors(RED and BLUE) when connecting the battery to system.
- It is recommended to use a fuse(5A @250V) between battery and system.
- Recommended battery capacity is 24V/10AH MF battery. The system will operate more than 5 hours with this battery.

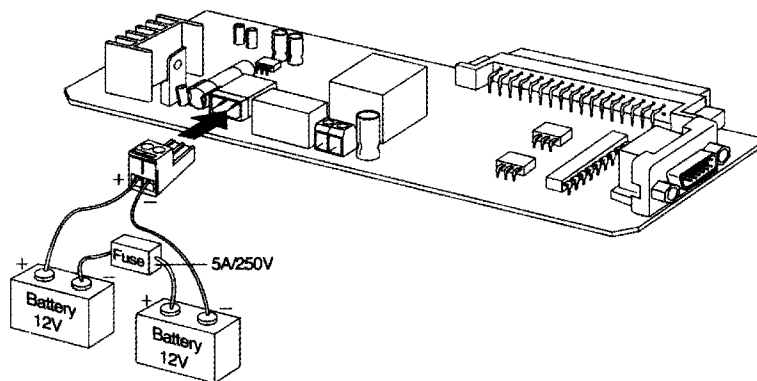


Figure 3.5.1 Battery Back-Up Wiring

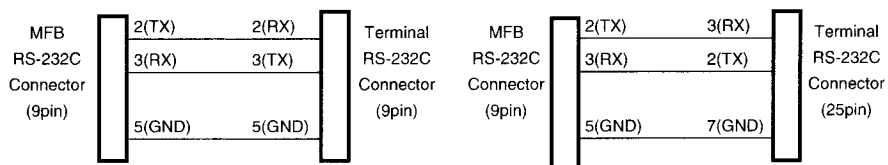


Figure 3.5.2 RS-232C 9-pin Connector Wiring

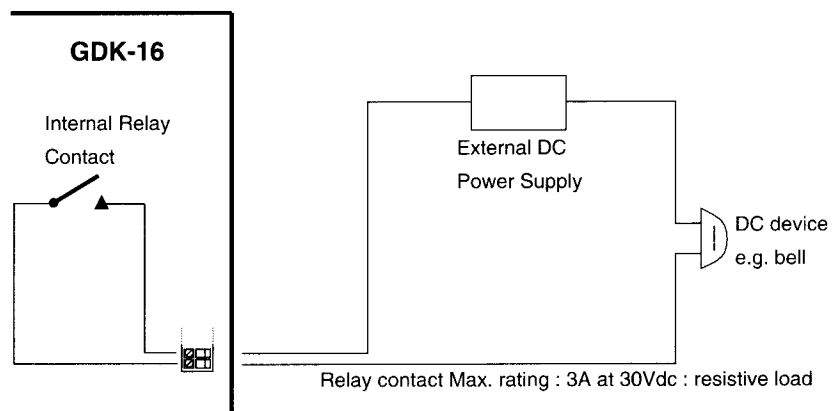
### Music on Hold (MOH) Wiring

The GDK-16 System sends internal or external music signal to CO lines that are in hold state. The default music source input is assigned to internal source. And the external music source can be used by changing the system database and connect a external music source to the blue colored TERMINAL BLOCK(CN22 pin#5,6) of the MBU.

### General Purpose Relays Wiring

There is a general purpose relays in the MBU and these contacts are connected through CN22 pin#1,2 (RELAY1) of the MBU. The control of these relays are done by system programming..

Also, this dry relay contact can be used to Loud Bell Control function, Door Open function, etc. under the software control. Note that the maximum rating of the relay contact is 30Volt/3A, so, do not use over this rating.



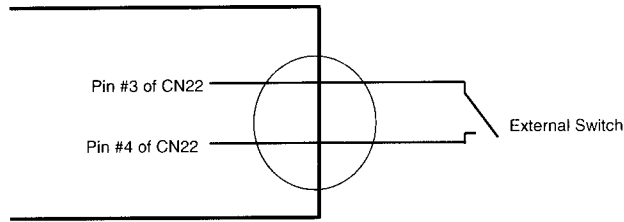
**CAUTION**

- It is possible to cause danger of high voltage and electric shock.
- "From external source - take all appropriate safety precaution if over 50V AC"



**Alarm Detect Port Wiring**

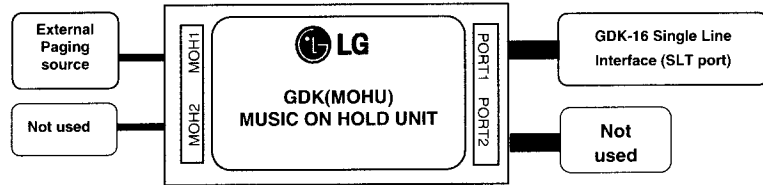
One external alarm detect input port is provided from the TERMINAL BLOCK CN22(pin#3,4) of the MBU. This port is used for notify to extensions when the external switch on/off. The connection example is shown in figure 3.5.3.  
Close or open detection is programmable by administration programming.



**Figure 3.5.3 External Switch Wiring Example**

**MOHU installation**

The maximum distance of the installation is 1 Km (3.2K feet) from the system. GDK-16 system is capable of accommodating just one external paging source through single line interfaces, which are limited by the main program. This function has been supported since the main program V2.0 or later version.  
To use the external paging sources through the desired SLT ports, assign the desired SLT ports in the Admin program(Refer to the Programming Manual).



- **Note :**  
It is recommended that the MOHU should be installed in the safe place from the humid and ESD (Electrostatic Discharge).

**Figure 3.5.4 Connection method of MOHU**

## SECTION 4. ISDN DESCRIPTION

### 4.1 ISDN Boards in GDK-16

1. There are two kinds of ISDN Boards on GDK-16 system, as follows.

Board Type	MBU	STIB	STIB 2	Remark
Basic	1 Port			1 Port = 2B + D
Option		1 Port	2 Ports	
Interface	T	S/T	Up: S/T Down: T	S/T Interface in STIB can selected by changing the Jump Switch on the STIB Board.
Maximum number of boards on GDK-16.		1 Board	1 Board	

2. You can install STIB within the station and CO line capacity of the system.

MODEL	Max. Stations	Max. CO Lines
GDK-16	16, 20(only GDK-16E, 16EA)	6

3. The maximum 8 ISDN devices can be connected to the single S-Interface port, and any kind of ISDN devices, which are compatible with ETSI ISDN specification, can be connected to the S-Interface. For example, ISDN phone, G4 Fax, video terminal, ISDN PC board, etc. can be connected.

#### 4.2 Station/CO Line Number Assignments on ISDN Board

1. As same as any other station/CO boards, the station/CO line number on ISDN board is assigned by automatically.
2. In STIB board with T-Interface, the 2 continuous CO line numbers are assigned automatically. Two continuous CO line numbers are assigned per a port (2B+D).
3. In STIB board with S-Interface, the 2 continuous station numbers are assigned automatically. Two continuous station numbers are assigned per a port (2B+D).

MBU	Port 1	T-Interface	CO Line 1 - 2
STIB 1	Port 1	S-Interface	Station 112 - 113
		T-Interface	CO Line 3 - 4
STIB 2	Port 1	T-Interface	CO Line 3 - 4
	Port 2	S-Interface	Station 112 - 113
		T-Interface	CO Line 5 - 6

4. Two continuous station numbers assigned a single S-Interface act as the same station number. For example, calling to station 112 is same as calling to station 113.

### **4.3 The Basic Features of ISDN Device (S-Interface)**

#### **1. ISDN Devices**

- 1) There are many ISDN Devices. ( ex. ISDN Phone, Video-Phone, G4 Fax, PC-Board, etc. ) GDK-16 supports all ISDN Devices which is compatible with Euro-ISDN (ETSI ISDN Specification) till now on.
- 2) ISDN Devices can call another station on the GDK-16 and access ISDN CO Lines.
- 3) Current LCD Display on ISDN Device is its own Device Feature, not GDK-16 System's Feature.

#### **2. Supplementary Service for ISDN Device**

- 1) In GDK-16, ISDN Station can access the following features,
  - A. ISDN Sub Addressing
  - B. MSN
  - C. Intercom Call
  - D. CO Line Access
  - E. CO Line Hold.
  - F. CO Line Transfer.
  - G. Etc.

- 2) ISDN Sub Addressing.

Sub Addressing can be programmed by Station Base Program(Main Menu2) - ISDN Station Attribute(Sub Menu2) - Sub Address(Terminal Menu1), its range is YES/NO(Default: NO).

If ISDN Station is allowed sub addressing by admin. program, in any station user who wants to call to ISDN station has to dial the station No and sub address for that ISDN station.

For using ISDN Station's Sub Address, there is further program on the ISDN Devices. Please consult your ISDN Devices manual for programming ISDN Device's Sub Address.

Sub Address is useful to the following Features for decoding the single ISDN Device from ISDN Devices on the same S-Interface ( bus ),

- (1) Intercom Call to ISDN Station
- (2) DID Call to ISDN Station
- (3) DISA Call to ISDN Station

On the other features, Sub Addressing does not effect ISDN Station's behavior.

- 3) ISDN MSN Addressing.

MSN Addressing can be programmed by Station Base Program (Main Menu2) - ISDN Station Attribute(Sub Menu2) - MSN (Terminal Menu3), its range is YES/NO(Default: NO).

If ISDN station is allowed MSN addressing by admin. program, in any station user who wants to call to ISDN station has to dial the station No and MSN address for that ISDN station.

For using ISDN Station's MSN Address, there is further program on the ISDN Devices. Please consult your ISDN Devices manual for programming ISDN Device's MSN Address.

MSN Address is useful to the following Features for decoding the single ISDN Device from ISDN Devices on the same S-Interface ( bus ),

- (1) Intercom Call to ISDN Station
- (2) DID Call to ISDN Station
- (3) DISA Call to ISDN Station

On the other features, MSN Addressing does not effect ISDN Station's behavior.

- 4) ISDN Intercom Call.  
Any station can call ISDN Devices by dialing station no. S-Interface has two stations no. So, user can call ISDN Devices by dialing one of two pre-assigned stations no. There is no difference between calling ISDN Devices with the two stations no which is assigned the same S-Interface.  
  
If ISDN Device is set to Sub Addressable ISDN, it needs further one digit for calling that ISDN Device.
- 5) ISDN CO Line Access.  
CO Line Access of ISDN Device is the same as that of Single Line Telephone ( SLT )
- 6) CO Line Hold.  
In GDK-16, system does not use DTMF Receiver for recognizing user's dialing digit. So if user want to use Hold/Transfer Feature on ISDN Device, ISDN Device has the capability of sending Keypad Facility Information on the Information Message.  
  
If possible, holding CO Line Call, send "\*" # ( Keypad Facility ), then connected CO Line Call is held and user can hear Intercom Dial Tone.  
  
Retrieving Held CO Line, send "\*" # ( Keypad Facility ), then the held CO Line Call is retrieved.  
  
Please consult your ISDN Device's Manual for sending "Keypad Facility" after connection.
- 7) CO Line Transfer.  
In GDK-16, system does not use DTMF Receiver for recognizing user's dialing digit. So if user want to use Hold/Transfer Feature on ISDN Device, ISDN Device has the capability of sending Keypad Facility Information on the Information Message.  
  
If possible, holding CO Line Call, send "\*" # ( Keypad Facility ) and dial the station No to transfer the call, then connected CO Line Call is held and user can hear Intercom Dial Tone.  
  
Retrieving Held CO Line, send "\*" # ( Keypad Facility ), then the unanswered CO Line Transfer Call is retrieved.  
  
Please consult your ISDN Device's Manual for sending "Keypad Facility" after connection.
- 8) Etc.
  - ISDN station accesses the above features. Other features are not supported currently.
  - ISDN station cannot accept additional ring when it is used whether the ring is external or internal.
  - It is recommended to use ISDN S port with DATA terminal instead of pure voice terminal.
  - If the GDK-16 is set with Extension Numbering Plan, user can not make a call because of all digit are reported with keypad facility when dialing CO access code (e.g., \* 8 8 1) and telephone number in ISDN station.

#### 4.4 The Features of ISDN CO Line ( T-Interface )

1. Normal CO Line Features

Normal CO Line Features of STIB/BRI is the same as Analog CO Line. Normal CO Line Features are described GDK-16 Manual. Consult your GDK-16 for normal CO Line Features.

2. MSN

GDK-16 will receive some called party number from PX via DID line, then looks up the MSN address TABLE, ISDN Program (Main Menu 4) - MSN Table (Sub Menu 9) to provide ring signal to an ISDN internal port.

GDK-16 will send the information including the called party number to the ISDN station that is ringing.

- (1) Maximum table entry : 24.
- (2) The CO line should be programmed as DID Line, CO Base Program (Main Menu 3) – ISDN Attribute(Sub Menu 2) - DID Use(Terminal Menu 4).
- (3) If the called party number is not matched with MSN table then GDK-16 will treat the call like as DID.
- (4) If the called CO line number is not programmed then search all tables.
- (5) If there is matched CO line number in MSN address table then search only matched entry of the table.
- (6) Maximum 8 device can be connected to a S0 port.
- (7) MSN Table. ISDN Program (Main Menu 4) - MSN Table (Sub Menu 9)

Item	CO Line Number	Telephone Number	Station Number	MSN Number
Flex	1	4	2	3
Range	1-6	Max 20 Digits	2 or 3 Digit Station Number	1-8
Default	None	None	None	None

3. D.I.D. ( Direct Inward Dialing )

The system operates DID CO, if ISDN CO assigns DID CO through CO Base Program (Main Menu3) – ISDN Attribute (Sub Menu2) – DID Use (Terminal Menu 4). If you want to call to a ISDN station which assigns sub-addressing of DID or DISA, you should dial station numbers and sub-address or MSN number (1-8).

If your PX send full called party number(area code + prefix number of DID, real DID number(for station number)) and then please set CO Base Program (Main Menu3) - ISDN CO Attribute (Sub Menu2) - DID\_RN(Terminal Menu2) to length of (area code + prefix did number).

4. CLIP (Calling Line Identification Presentation)

When a call exists through DISA or DI D, Calling line identification(CLI) of the incoming call will be displayed on the internal called station's keyset if PX provide CLI information.

- . Calling line identification (CLI) or name which is matched with the speed dial list is displayed to original called party extension.
- . First, The system search station speed dial buffer to find out the programmed name, and if there is not matched then search system speed dial buffer.(Not implemented Yet)
- . CLI information will be printed in SMDR record through RS-232 port.

## 5. COLP (Connected Line Identification Presentation)

Each station user can send CLI information to called party through ISDN line if PX service this supplementary service.

There are 8 type of calling party number, But at this moment GDK only support four kinds of type.  
(UNKNOWN / NATIONAL TYPE / INTERNATIONAL / SUBSCRIBER)

- COLP field determines what is used to generate my CLI information in setup message, it indicate entry of CO Base Program (Main Menu3) - ISDN Line Attribute(Sub Menu2) - OLP(00)(Terminal Menu1).

- When a internal user seize a ISDN(DID) line which is programmed for COLP, GDK system will make calling party number using ISDN COLP TABLE and extension number in setup message.

- UNKNOWN TYPE :

Insert the calling station number at calling party number information field in setup message.

- NATIONAL TYPE :

① Insert my area code if exist. ISDN Program (Main Menu4) - My Area Code (Sub Menu6)

② Insert prefix of COLP number. ISDN Program(Main Menu4) - COLP Table(Sub Menu8)

③ Insert the calling station number.

Ex) The calling station(100) seize a ISDN line 01 which is programmed as COLP(01), COLP Table(Main Menu4 - Sub Menu 8) (01 : "5001", prefix of COLP number) and MY AREA CODE(0343).

CLI in setup message : "03435001100"

- INTERNATIONAL TYPE :

① Insert my nation code if exist. ISDN Program (Main Menu4) - My Nation Code (Sub Menu7)

② Insert my area code if exist. ISDN Program (Main Menu4) - My Area Code (Sub Menu6)

③ Insert prefix of COLP number. ISDN Program(Main Menu4) - COLP Table(Sub Menu8)

④ Insert the calling station number.

Ex) The calling station(100) seize a ISDN line 01 which is programmed as COLP(01), COLP Table(Main Menu4 - Sub Menu 8) (01 : "5001", prefix of COLP number) ,MY AREA CODE(0343) and MY Nation Code(82).

CLI in setup message : "8203435001100"

- SUBSCRIBER TYPE :

① Insert prefix of COLP number. ISDN Program(Main Menu4) - COLP Table(Sub Menu8)

② Insert the calling station number.

Ex) The calling station(100) seize a ISDN line 01 which is programmed as COLP(01), COLP Table(Main Menu4 - Sub Menu 8) (01 : "5001", prefix of COLP number) ,MY AREA CODE(0343) and MY Nation Code(82).

CLI in setup message : "5001100"

## 6. Multi-point Working

- The GDK-16 and other devices can be connected to the same CO NT S-bus side.

- Incoming calls to the other ISDN devices with different MSN numbers are treated as an error case in GDK-16. If Error Destination (5-6-2) is Tone, then DISCONNECT message is sent to the network. And, if Error Destination is ATD, then CALL PROCEEDING and ALERTING messages are sent to the network.

- For outgoing call, GDK-16 requests a B-channel as channel base (in case of basic BRI port, B1 for CO 1, B2 for CO 2). And before GDK-16 tries to request B-channel, it does not know if the B-channel is used by other ISDN device or not.

## SECTION 5. SYSTEM CAPACITIES & FEATURE CODES

### 5.1 SYSTEM CAPACITIES

This chapter describes the capacities of GDK-16 system.

ITEM	GDK- FPII	GDK-16	REMARK
Max Number of Stations	67	16	22 in 16E and 16EA
Max Number of CO Lines	34	6	
Max DSS/DLS Console per station	2	0	
Number of CO Line Groups	9	4	
Number of Attendants	5	1	
Number of Internal Page Zones	5	2	
Number of System Speed Dial Bins	200	79	
Number of Station Speed Dial Bins	20	20	Station Base
Number of SMDR Records	100 (Option 1900)	500	
Number of External Relays	2	2	
Number of Power Failure Circuit	2	0	
Number of Automatic Fax Transfer	-	1	
Number of DVIB	2	1	
Number of Channel / DVIB	8	2	
Max Record Time	System : 3 Minutes User : 17 Minutes 30 Seconds	68 Minutes	With option, Additional 70 Minutes
Number of User Voice Messages	250 ea	400 ea	Without option for DVIB, total 200 messages
Default Voice Data	Prompts	Prompts	Date/Time stamp is available.
Battery Backup Voice Messages	System Announcements	All the messages	With Backup SW ON. When backup switch is set OFF, only system greetings and prompts are saved. User messages are deleted.
Number of Station Group	8	4	
Max Number of Member in Group	32 Stations	6 Stations	

**Note:** To use DSIB, the software "XX75P-version" for GDK-16E, 16EA should be used.  
The DSIB in GDK-16 can't be used in GDK-16E.



**5.2 FEATURE CODES****5.2.1 NUMBERING PLAN<sup>1</sup>**

FEATURES	CODES	REMARKS
Station Intercom Number	100 - 115 (100-121 in 16E, 16EA)	Programmable 100 - 499
CO Line Access ,Group	81-84	
CO Line Access ,Individual	881-886	
Retrieve a Held CO Line - Individual	8#1 - 8#6	SLT
Retrieve a Held CO Line	8##	SLT
Attendant	0	
CO Line Access, First Accessible Group	9	
Call Waiting (Camp-on)	*	ICM Busy Tone
Page, All Call	#0	B (NOTE 2, 3)
Page, Internal Zone	#1 - #2	B
Page, Meet Me	#6, [HOLD/SAVE]	B (#6)
SLT, Last Number Redial (LNR)	52	SLT
SLT, DND	53	SLT
SLT, Call Forward	54	SLT
SLT, Speed Dial, Program	55	SLT
SLT, Speed Dial, Access	58	SLT
Alarm Reset	65	B
Pick-Up	66	B
UNA	69	B
2/8 Btn, Message Wait / Call Back - Request	[PGM]+56	2/8 Button
2/8 Btn, Message Wait - Answer	57	2/8 Button
SLT, CO Flash	Hook Flash + 51	SLT
SLT, Call Waiting (Camp-on)	Hook Flash + *	SLT, ICM Busy Tone
SLT, Message Wait / Call Back	Hook Flash + 56	SLT
SLT, CO Hold	Hook Flash + 59	SLT
Station Pilot Number	61-64	
Door Open	#*1-2	
Attendant, Clock Set	[TRANS/PGM]+#1	Attendant
Admin Program Start	[TRANS/PGM]+*#	100
Attendant, Date Format Change	[TRANS/PGM]+*5	Attendant
Attendant, Time Format Change	[TRANS/PGM]+*6	Attendant
Version Display	[TRANS/PGM]+40	
Wake-Up Program	[TRANS/PGM]+41	Station, Attendant
Wake-Up Cancel	[TRANS/PGM]+42	Station, Attendant
ICM Signal Mode - HF/TN/PV	[TRANS/PGM]+49 + 1/2/3	
Differential Ring	[TRANS/PGM]+50 + 1/2/3/4	
COLR/CLIP Key	[TRANS/PGM]+58	Note 8)
BGM	[TRANS/PGM]+73	B
Loop Key	[TRANS/PGM]+84	B Only
Call Wait Key	[TRANS/PGM]+85	B Only
SPEED Key	[TRANS/PGM]+90	B Only, 2/8 Button Only
CONF Key	[TRANS/PGM]+91	B Only, 2/8 Button Only
CALL BK Key	[TRANS/PGM]+92	B Only, 2/8 Button Only
DND Key	[TRANS/PGM]+93	B Only, 2/8 Button Only
MUTE Key	[TRANS/PGM]+95	B Only, 2/8 Button Only
REDIAL Key	[TRANS/PGM]+97	B Only, 2/8 Button Only
Last Number Redial (LNR)	[SPEED]+*, [REDIAL]	

GDK-16, 16A, 16E, 16EA DIGITAL KEY TELEPHONE SYSTEM

FEATURES	CODES	REMARKS
Call Park	601-606	
Direct Call Pick Up	7	B
Station Language Code Change	[PGM]+51	B
Speaker/Headset Button	[PGM]+57	B only
SMDR PRINT	[PGM]+*81	
SMDR DELETE	[PGM]+*82	
ABORT PRINTING	[PGM]+*83	
DVIB- Date & Time Order	[PGM] + *71	
DVIB- Retrieval Order	[PGM] + *72	
DVIB- Check Time Status	[PGM] + *73	
DVIB- Check Number Status	[PGM] + *74	
DVIB- Delete Station Message	[PGM] + *76	
DVIB – Recording System Announcements Two Way Recording	[TRANS/PGM]+#4	Attendant For Two Way Recording : B only
DVIB – Recording User Greeting (Call Forward, DVIB)	[MON]+[DND/FOR]+7+#	Note 4)
Call Forward, DVIB	[MON]+[DND/FOR]+7	Note 5)
DVIB – Deleting User Greeting	[MON]+[DND/FOR]+7+*	Note 6)
Call Forward – Cancel	[MON]+[DND/FOR]+#	Note 7)
To Set Current Time - 1 Hour early	[TRANS/PGM]+*1	Attendant, B
To Set Current Time - 1 Hour late	[TRANS/PGM]+*2	Attendant, B
VM MSG Wait Enable	*8	
VM MSG Wait Disable	*9	
ISDN Supplementary HOLD	[TRANS/PGM]+*75#	Button Only
ISDN Supplementary CONF	[TRANS/PGM]+*77#	Button Only

Note 1) Numbering Plan can be changed according to nation.

Note 2) B - Button program is available.

Note 3) If a flexible button is programmed as a certain function, and if there is another flexible button as the same function, then the old one is cleared. But only in case of LOOP key, multiple LOOP keys are available.

Note 4) Call Forward to DVIB is activated after recording User Greeting. When user dials forward type "7" and if there is recorded User Greeting already, then user may not record User Greeting again and recorded User Greeting is used.

Note 5) User Greeting should be recorded before Call Forward to DVIB port. When user hangs up after the forward type "7" and if there is no recorded User Greeting, then forward is not activated.

Note 6) If a station is forwarded to DVIB port, Call Forward is canceled after deleting User Greeting.

Note 7) Only Call Forward to DVIB port is canceled and recorded User Greeting is not deleted. User can delete User Greeting by [MON]+[DND/FOR]+7+\*.

Note 8) "COLR/CLIR" has a double function. It is used to restrict both for the CLI for outgoing call and Connected Line number for incoming call.

Note 9) To use DSIB the software "XX75P-version" for GDK-16E, 16EA should be used.

Note 10) The Database in GDK-16 can't be used in GDK-16E, 16EA.

5.2.2 BASIC AND EXTENDED NUMBERING PLANS<sup>1</sup>

FEATURES	BASIC	EXTENSION	REMARKS
Station Intercom Number	10-49 or 100 - 499	10-99 or 100-999	2 or 3 digit station numbers by Admin
CO Line Access, Group	81-84	*81-*84	
CO Line Access, Loop	85	*85	
CO Line Access, Individual	881-886	*881-*886	
Retrieve a Held CO Line - Individual	8#1 - 8#6	*8#1 - *8#6	SLT
Retrieve a Held CO Line	8##	*8##	SLT
Attendant	0	0	
CO Line Access, First Accessible Group	9	*9	
Call Waiting (Camp-on)	*	*	ICM Busy Tone, B
Page, All Call	#0	#0	B
Page, Internal Zone	#1 - #2	#1 - #2	B
Page, Meet Me	#6, [HOLD/SAVE]	#6, [HOLD/SAVE]	B (#6)
SLT, Last Number Redial (LNR)	52	*52	SLT
SLT, DND	53	*53	SLT
SLT, Call Forward	54	*54	SLT
SLT, Speed Dial, Program	55	*55	SLT
SLT, Speed Dial, Access	58	*58	SLT
Alarm Reset	65	*65	B <sup>2</sup>
Pick-Up	66	*66	B
UNA	69	*69	B
2/8 BTN, Message Wait / Call Back - Request	[PGM] + 56	[PGM] + #56	2/8 Button
2/8 BTN, Message Wait - Answer	57	*57	2/8 Button
SLT, CO Flash	Hook Flash + 51	Hook Flash + #51	SLT
SLT, Call Waiting (Camp-on)	Hook Flash + *	Hook Flash + *	SLT, ICM Busy Tone
SLT, Message Wait / Call Back	Hook Flash + 56	Hook Flash + #56	SLT
SLT, CO Hold	Hook Flash + 59	Hook Flash + #59	SLT
Station Pilot Number	61-64	*61 - *64	
Door Open	#*1-2	#*1 - #*2	

\*1: Numbering Plan can be changed according to nation.

\*2: B - Button program is available.

**Note:** Extension Numbering Plan will be selected by Admin Program.

**5.2.3 LCD MONTHS**

	1	2	3	4	5	6	7	8	9	10	11	12
English	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Italian	GEN	FEB	MAR	APR	MAG	GIU	LUG	AGO	SET	OTT	NOV	DIC
Finish	01	02	03	04	05	06	07	08	09	10	11	12
Dutch	JAN	FEB	MRT	APR	MEI	JUN	JUL	AUG	SEP	OKT	NOV	DEC
Swedish	JAN	FEB	MAR	APR	MAJ	JUN	JUL	AUG	SEP	OKT	NOV	DEC
Norwegian	JAN	FEB	MAR	APR	MAI	JUN	JUL	AUG	SEP	OKT	NOV	DES
German	JAN	FEB	MAR	APR	MAI	JUN	JUL	AUG	SEP	OKT	NOV	DEZ
Spanish	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC

\* Finish example of date:

- . 30-07-99 (In case of DDMMYY order, System Base Program (Main Menu 5) - LCD Display (Sub Menu 4))

**5.2.4 AUDIBLE SIGNALS**

TONE / RING	CADENCE	
Alarm Ring, Continuous	0.2 sec ON / 0.2 sec OFF Repeat	
Alarm Ring, Single	1 sec ON	
All Call Page Tone	1 sec ON	
Busy Tone	Australia	0.35 sec ON / 0.35 sec OFF Repeat
	Finland EU / CIS	0.3 sec ON / 0.3 sec OFF Repeat
	Spain	0.2 sec ON / 0.2 sec OFF Repeat
	Sweden Denmark	0.25 sec ON / 0.25 sec OFF Repeat
	Others	0.5 sec ON / 0.5 sec OFF Repeat
CO Ring	Finland Italy	1 sec ON / 4 sec OFF Repeat
	Others	0.4 sec ON / 0.4 sec OFF / 0.4 sec ON / 2 sec OFF Repeat
LCR Dummy CO Dial Tone	Continuous	
Confirm Tone	1.2 sec ON	
DND Tone	0.2 sec ON / 0.2 sec OFF / 0.2 sec ON / 0.2 sec OFF / 0.2 sec ON / 0.5 sec OFF Repeat	
Dial Tone	Finland	0.2 sec ON / 0.3 sec OFF / 0.2 sec ON / 0.3 sec OFF / 0.2 sec ON / 0.8 sec OFF Repeat
	Others	Continuous
Error Tone	Australia	2.5 sec ON / 0.5 sec OFF Repeat
	Finland Italy	0.2 sec ON / 0.2 sec OFF Repeat
	Sweden	0.25 sec ON / 0.75 sec OFF Repeat
	Others	0.25 sec ON / 0.25 sec OFF Repeat

TONE / RING	CADENCE		
HFTB Warning Tone		0.2 sec ON / 0.2 sec OFF 3 Times	
Intercom Ring	Finland	0.6 sec ON / 0.2 sec OFF / 0.6 sec ON / 4 sec OFF Repeat	
	Italy	0.6 sec ON / 0.2 sec OFF / 0.2 sec ON / 4 sec OFF Repeat	
	Others	0.8 sec ON / 2.4 sec OFF Repeat	
Reminder Tone		0.5 sec ON / 0.5 sec OFF 3 Times	
Ring Back Tone (CO Ring Back Tone)	Australia New Zealand	0.4 sec ON / 0.2 sec OFF / 0.4 sec ON / 2 sec OFF Repeat	
	Denmark Finland EU, CE CIS Italy Netherlands Norway	1 sec ON / 4 sec OFF Repeat	
	Spain	1.5 sec ON / 3 sec OFF Repeat	
	Sweden	1 sec ON / 5 sec OFF Repeat	
	Others	1 sec ON / 2 sec OFF Repeat	

-. SLT

SLT RING	CADENCE	
SLT CO Ring	Finland Italy	1 sec ON / 4 sec OFF Repeat
	New Zealand	0.4 sec ON / 0.2 sec OFF / 0.4 sec ON / 2 sec OFF Repeat
	Spain	1 sec ON / 3 sec OFF Repeat
	Others	0.4 sec ON / 0.2 sec OFF / 0.4 sec ON / 4 sec OFF Repeat
SLT Intercom Ring	Finland	0.4 sec ON / 0.2 sec OFF / 0.4 sec ON / 4 sec OFF Repeat
	Italy	0.6 sec ON / 0.2 sec OFF / 0.2 sec ON / 4 sec OFF Repeat
	New Zealand	1 sec ON / 2 sec OFF Repeat
	Spain	0.4 sec ON / 0.2 sec OFF / 0.4 sec ON / 3 sec OFF Repeat
	Others	1 sec ON / 4 sec OFF Repeat

5.2.5 FREQUENCIES AND TONES

NO	TONERING	DEFAULT	FINLAND	ITALY	NETHERLANDS	NEW ZEALAND	SWEDEN	UK
1	DIFFERENTIAL RING - 1 REMINDER TONE (4) CO RING (19) INTERCOM RING (20) ALARM RING (21) CALL WAIT BURST RING (22) QUEUE RING (23) SINGLE ALARM RING (24)	1000Hz 1020Hz					480Hz	
2	DIAL TONE (11)	425Hz		425Hz		400Hz		350Hz
3	DIAL WARNING TONE (12)							440Hz
4	COL RING BACK TONE (17)	425Hz				400Hz		440Hz
5	RING BACK TONE (5)	425Hz				400Hz		440Hz
6	BUSY TONE (1)	425Hz				400Hz		480Hz
7	ERROR TONE (2)	620Hz		425Hz				620Hz
8	DND TONE (3)							
9	CONF TIMEOUT TONE (13) DISSUASION TONE (15) Reserved	425Hz						1400Hz
10	COL HOLD TONE (15)	425Hz			1000Hz			
11	ALL CALL PAGE TONE (6)	950Hz	425Hz	425Hz				
12	ICM PAGE TONE (7)							
13	HFTB WARNING TONE (8) OHVA TONE (14)							
14	CONFIRMATION TONE (9)	1400Hz		425Hz				
15	SINGLE ERROR TONE (10)							
16	ADMIN ERROR TONE (18)							
17	LCP Dummy/CO Dial Tone	425Hz	425Hz	350Hz			425Hz	
18	Reserved	1260Hz		425Hz				
19	(DUAL HOWLING TONE)	1633Hz						
20	DIFFERENTIAL RING - 2	890Hz						
21	DIFFERENTIAL RING - 3	1260Hz						
22	DIFFERENTIAL RING - 4	800Hz					400Hz	
23	Reserved	820Hz					620Hz	
24	Reserved	480Hz					770Hz	
25	Reserved	400Hz						
26	Reserved	620Hz						
27	Reserved	770Hz						

NO	ZONE/RING	DEFAULT	SPAIN	EU / CE	CIS
1	DIFFERENTIAL RING - 1 REMINDER TONE (4) CO RING (19) INTERCOM RING (20) ALARM RING (21) CALL WAIT BURST RING (22) QUEUE RING (23) SINGLE ALARM RING (24)	1000Hz 1020Hz			
2	DIAL TONE (11)	425Hz			
3	DIAL WARNING TONE (12) RING BACK TONE (5) COL RING BACK TONE (17)	425Hz			
4	BUSY TONE (1)	425Hz			
5	ERROR TONE (2) DND TONE (3) CONF TIMEOUT TONE (13) DISSUATION TONE (16)	620Hz	425Hz		
6	Reserved	425Hz			
7	COL HOLD TONE (15)	425Hz			
8	ALL CALL PAGE TONE (6) ICM PAGE TONE (7) HFTB WARNING TONE (8) OHVA TONE (14)	950Hz			
9	CONFIRMATION TONE (9) SINGLE ERROR TONE (10) ADMIN ERROR TONE (18) LCR Dummy CO DialTone	1400Hz			
10	Reserved	425Hz			
11	(DUAL HOWLING TONE)	1260Hz			
12	DIFFERENTIAL RING - 2	890Hz			
13	DIFFERENTIAL RING - 3	1260Hz			
14	DIFFERENTIAL RING - 4	800Hz			
15	Reserved	480Hz			
16	Reserved	400Hz			
17	Reserved	620Hz			
18	Reserved	770Hz			

**5.2.6 CONFIGURATION**

5.2.6.1 GDK-16

BASIC STA	BASIC T0	MBU SLOT 3	MBU SLOT 4	CO SLOT			TOTAL		
				LCO	T0	S0	STA	CO	DEFAULT
2 key + 2 slt	1 T0						4	2	100-103, CO1-2
2 key + 2 slt	1 T0	4 key OR 4 slt					8	2	100-107, CO1-2
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt				12	2	100-111, CO1-2
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt	2 LCO			12	4	100-111, CO1-4
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt	4 LCO			12	6	100-111, CO1-6
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt		2 T0		12	6	100-111, CO1-6
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt		1 T0	1 S0	14	4	100-111, CO1-4 112-113 for S0

5.2.6.2 GDK-16A

BASIC STA	BASIC T0	MBU SLOT 3	MBU SLOT 4	CO SLOT			TOTAL		
				LCO	T0	S0	STA	CO	DEFAULT
2 key + 2 slt	None						4		100-103
2 key + 2 slt	None	4 key OR 4 slt					8		100-107
2 key + 2 slt	None	4 key OR 4 slt	4 key OR 4 slt				12		100-111
2 key + 2 slt	None	4 key OR 4 slt	4 key OR 4 slt	2 LCO			12	2	100-111, CO1-2
2 key + 2 slt	None	4 key OR 4 slt	4 key OR 4 slt	4 LCO			12	4	100-111, CO1-4
2 key + 2 slt	None	4 key OR 4 slt	4 key OR 4 slt	6 LCO			12	6	100-111, CO1-6
2 key + 2 slt	None	4 key OR 4 slt	4 key OR 4 slt		1 T0	1 S0	14	2	100-111, CO1-2 112-113 for S0
2 key + 2 slt	None	4 key OR 4 slt	4 key OR 4 slt		2 T0		12	4	100-111, CO1-4

5.2.6.3 GDK-16E

BASIC STA	BASIC T0	MBU SLOT 3	MBU SLOT 4	CO SLOT			TOTAL		
				LCO	T0	S0	STA	CO	DEFAULT
2 key + 2 slt	1 T0						4	2	100-103, CO1-2
2 key + 2 slt	1 T0	4 key OR 4 slt					8	2	100-107, CO1-2
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt				12	2	100-111, CO1-2
2 key + 2 slt	1 T0	DSIB	4 key OR 4 slt				16	2	100-115, CO1-2
2 key + 2 slt	1 T0	DSIB	DSIB				20	2	100-119, CO1-2
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt	2 LCO			12	4	100-111, CO1-4
2 key + 2 slt	1 T0	DSIB	4 key OR 4 slt	2 LCO			16	4	100-115, CO1-4
2 key + 2 slt	1 T0	DSIB	DSIB	2 LCO			20	4	100-119, CO1-4
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt	4 LCO			12	6	100-111, CO1-6
2 key + 2 slt	1 T0	DSIB	4 key OR 4 slt	4 LCO			16	6	100-115, CO1-6
2 key + 2 slt	1 T0	DSIB	DSIB	4 LCO			20	6	100-119, CO1-6
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt		2 T0		12	6	100-111, CO1-6
2 key + 2 slt	1 T0	DSIB	4 key OR 4 slt		2 T0		16	6	100-115, CO1-6
2 key + 2 slt	1 T0	DSIB	DSIB		2 T0		20	6	100-119, CO1-6
2 key + 2 slt	1 T0	4 key OR 4 slt	4 key OR 4 slt		1 T0	1 S0	14	4	100-111, CO1-4 120-121 for S0
2 key + 2 slt	1 T0	DSIB	4 key OR 4 slt		1 T0	1 S0	18	4	100-115, CO1-4 120-121 for S0
2 key + 2 slt	1 T0	DSIB	DSIB		1 T0	1 S0	22	4	100-119, CO1-4 120-121 for S0

**Note:** To use DSIB the software "XX75P-version" for GDK-16E should be used.



## 5.2.6.4 GDK-16EA

BASIC STA	BASIC TO	MBU SLOT 3	MBU SLOT 4	CO SLOT			TOTAL		
				LCO	T0	S0	STA	CO	DEFAULT
2 key + 2 slit	None						4		100-103, CO1-2
2 key + 2 slit	None	4 key OR 4 slit					8		100-107, CO1-2
2 key + 2 slit	None	4 key OR 4 slit	4 key OR 4 slit				12		100-111, CO1-2
2 key + 2 slit	None	DSIB	4 key OR 4 slit				16		100-115, CO1-2
2 key + 2 slit	None	DSIB	DSIB				20		100-119, CO1-2
2 key + 2 slit	None	4 key OR 4 slit	4 key OR 4 slit	2 LCO			12	2	100-111, CO1-4
2 key + 2 slit	None	DSIB	4 key OR 4 slit	2 LCO			16	2	100-115, CO1-4
2 key + 2 slit	None	DSIB	DSIB	2 LCO			20	2	100-119, CO1-4
2 key + 2 slit	None	4 key OR 4 slit	4 key OR 4 slit	4 LCO			12	4	100-111, CO1-6
2 key + 2 slit	None	DSIB	4 key OR 4 slit	4 LCO			16	4	100-115, CO1-6
2 key + 2 slit	None	DSIB	DSIB	4 LCO			20	4	100-119, CO1-6
2 key + 2 slit	None	4 key OR 4 slit	4 key OR 4 slit		2 T0		12	4	100-111, CO1-6
2 key + 2 slit	None	DSIB	4 key OR 4 slit		2 T0		16	4	100-115, CO1-6
2 key + 2 slit	None	DSIB	DSIB		2 T0		20	4	100-119, CO1-6
2 key + 2 slit	None	4 key OR 4 slit	4 key OR 4 slit	6LCO			12	6	100-111, CO1-6
2 key + 2 slit	None	DSIB	4 key OR 4 slit	6LCO			16	6	100-115, CO1-6
2 key + 2 slit	None	DSIB	DSIB	6LCO			20	6	100-119, CO1-6

**Note:** To use DSIB the software "XX75P-version" for GDK-16EA should be used.

## 5.2.7 STATION CONFIGURATION WITH LKD 2B

## 5.2.7.1 GDK-16

BASIC	MBU SLOT 3	MBU SLOT 4	DEFAULT STA NUMBER
2 LKD 2B + 2 slit			100-103 : 2 LKD 2B Primary devices and 2 slts 114 : Secondary device of 100 115 : Secondary device of 101
2 LKD 2B + 2 slit	4 LKD 2B		100-103 : 2 LKD 2B Primary devices and 2 slts 104-107 : 4 LKD 2B Primary devices in slot 1 <b>108-111 : 4 Secondary devices for the above 104-107 respectively.</b>

- LKD 2B :

- LKD 2B occupies 2 station numbers, one for the Primary device and the other for the Secondary device. **It can be connected to Basic 2 DKT ports and to 4 DKT ports in MBU Slot 3.**
- If LKD 2B is connected to any 4 DKT port in MBU Slot 4, it occupies only 1 station number, for the Primary device. It means that the station can not have any Secondary device even if there is DTIU or SLIU for the Secondary device in it.  
**LKD 2B is not available for SLOT4.**
- LKD 2B without either DTIU or SLIU (Basic LKD 2B) occupies 1 station number, for the Primary device. It can be connected to any DKT ports, Basic 2 DKT ports and 8 DKT ports in MBU slot 3 and 4.

**Note:** DTIU, SLIU are the sub-boards in LKD 2B for the secondary device of DKTU or SLT.

5.2.7.2 GDK-16E / GDK-16 EA

BASIC	MBU SLOT 3	MBU SLOT 4	DEFAULT STA NUMBER
	4 LKD 2B (DSIB)	4Key OR 4Slit	104-107 : 4 LKD 2B Primary devices in slot 3 112-115 : 4 Secondary devices for the above 104-107 respectively. And in this case, key set in slot 4 don't operate because the ports of slot 4 is used as 2B secondary devices.
	4 LKD 2B (DSIB)	DSIB	104-107 : 4 LKD 2B Primary devices in slot 3 112-115 : 4 Secondary devices for the above 104-107 respectively. And in this case, key set in slot 4 don't operate because the ports of slot 4 is used as 2B secondary devices

● LKD 2B :

- 1) If LKD 2B is connected to any 4 DKT port in MBU Slot 3, that port in MBU Slot 4 don't be operated because it is used as 2B secondary device.

**Note:** To use DSIB the software "XX75P-version" for GDK-16E, 16EA should be used.

5.2.8 MAXIMUM NUMBER OF STATIONS

5.2.8.1 GDK-16 / GDK-16A : 16 PORTS

NUMBER OF PORTS	DEFAULT STATION NUMBER	DESCRIPTION
4	100-103	2 Basic DKT ports and 2 Basic SLT ports
4	104-107	4 DKT ports or 4 SLT ports
4	108-111	4 DKT ports or 4 SLT ports
2	112-113	2 S0 stations in STIB second S0
2	114-115	2 Secondary devices for 2 basic DKT ports

5.2.8.2 GDK-16E / GDK-16EA : 22 PORTS

NUMBER OF PORTS	DEFAULT STATION NUMBER	DESCRIPTION
4	100-103	2 Basic DKT ports and 2 Basic SLT ports
8	104-111	4 DKT ports and 4 SLT ports (DSIB)
8	112-119	4 DKT ports and 4 SLT ports (DSIB)
2	120-121	2 S0 stations in STIB second S0

5.2.9 MAXIMUM NUMBER OF CO LINES : 6 PORTS

5.2.9.1 GDK-16 / GDK-16E

NUMBER OF PORTS	DEFAULT CO NUMBER	DESCRIPTION
2	CO 1-2	2 Basic BRI
4	CO 3-6	4 BRI in STIB 2T0 or 4LCO in LCOB-2

5.2.9.2 GDK-16A / GDK-16EA

NUMBER OF PORTS	DEFAULT CO NUMBER	DESCRIPTION
6	CO 1-6	6LCO in LCOB6

**5.2.10 MAXIMUM NUMBER OF PORTS (STATION / CO)****5.2.10.1 GDK-16 : 20 PORTS**

NUMBER OF PORTS	DEFAULT NUMBER	DESCRIPTION
6	100-103, CO 1-2	2 Basic DKT ports and 2 Basic slt ports. Basic 2 BRI.
4	104-107	4 DKT ports or 4 slt ports in MBU slot 3
4	108-111	4 DKT ports or 4 slt ports in MBU slot 4
2	CO 3-4	2 BRI in STIB (First T0) or 2 LCO in LCOB
2	CO 5-6 or 112-113	2 BRI in STIB / 2 LCO in LCOB2 or 2 S0 stations in STIB (Second T0 or 1 S0)
2	114-115	Secondary devices for 2 basic DKT ports

**5.2.10.2 GDK-16A : 20 PORTS**

NUMBER OF PORTS	DEFAULT NUMBER	DESCRIPTION
4	100-103	2 Basic DKT ports and 2 Basic slt ports.
4	104-107	4 DKT ports or 4 slt ports in MBU slot 3
4	108-111	4 DKT ports or 4 slt ports in MBU slot 4
6	CO 1-6	6 LCO in LCOB6
2	114-115	Secondary devices for 2 basic DKT ports

**5.2.10.3 GDK-16E / GDK-16EA : 26 PORTS**

NUMBER OF PORTS	DEFAULT NUMBER	DESCRIPTION
6	100-103, CO 1-2	2 Basic DKT ports and 2 Basic slt ports. Basic 2 BRI.
8	104-111	4 DKT ports and 4 slt ports in MBU slot 3 (DSIB)
8	112-119	4 DKT ports and 4 slt ports in MBU slot 4 (DSIB)
2	CO 3-4	2 BRI in STIB (First T0) or 2 LCO in LCOB
2	CO 5-6 or 120-121	2 BRI in STIB / 2 LCO in LCOB2 or 2 S0 stations in STIB (Second T0 or 1 S0)

**Note.** To use DSIB the software "XX75P-version" for GDK-16E, 16EA should be used.

**5.2.11 GAIN CONTROL (SYSTEM BASE (MAIN MENU 5 - SUB MENU 14))**

- Digital Keypad RX Gain

Country	DKTU	SLT	CO	DCO	DTMF	Tone	DVU	Int Music	Ext Music
Australia	22	19	14	30	8	32	20	22	22
Belgium	33	27	21	21	8	33	20	33	33
Denmark	17	13	16	26	8	33	32	10	10
Finland	25	27	30	29	8	32	32	29	29
Germany	25	35	29	29	8	15	32	26	26
India	25	24	17	32	8	32	20	29	29
Italy	17	13	16	26	8	33	20	26	26
Netherlands	32	24	10	21	8	33	32	33	33
New Zealand	10	12	16	32	8	32	20	32	32
Norway	30	24	38	32	8	33	32	26	26
Spain	26	28	28	33	8	32	32	29	29
Sweden	26	21	31	26	8	33	32	25	25
UK	25	35	29	15	8	15	32	26	26
EU, CE, Israel	25	24	29	32	8	32	32	29	29
CIS	25	24	29	32	8	32	32	29	29
Korea	21	24	24	32	8	32	32	29	29
Others	21	36	33	33	8	32	32	29	29

GDK-16, 16A, 16E, 16EA DIGITAL KEY TELEPHONE SYSTEM

- SLT Rx Gain

Country	DKTU	SLT	CO	DCO	DTMF	Tone	DVU	Int Music	Ext Music
Australia	36	32	32	32	4	46	32	36	36
Belgium	27	21	26	26	4	36	32	29	29
Denmark	27	32	32	32	4	30	32	10	10
Finland	26	16	32	23	4	32	32	29	29
Germany	36	38	32	23	4	27	32	29	29
India	32	32	32	32	4	30	32	32	32
Israel	32	36	32	32	4	49	32	32	32
Italy	27	32	32	32	4	30	32	37	37
Netherlands	39	32	32	26	4	38	32	32	32
New Zealand	28	32	32	29	4	50	32	50	50
Norway	15	32	36	32	4	45	32	18	18
Spain	26	32	32	24	4	32	32	32	32
Sweden	28	32	32	28	4	39	32	31	31
UK	36	38	32	23	4	27	32	29	29
EU, CE	32	32	32	32	4	32	32	32	32
CIS	32	32	32	32	4	53	32	32	32
Korea	32	32	32	32	4	32	32	32	32
Others	10	30	21	24	4	32	32	20	20

- CO Line Rx Gain

Country	DKTU	SLT	CO	DCO	DTMF	Tone	DVU	Int Music	Ext Music
Australia	34	32	24	32	31	29	32	32	32
Belgium	21	29	26	26	38	36	32	37	37
Denmark	34	32	16	20	32	39	32	10	10
Finland	23	32	28	32	32	32	32	32	32
Germany	35	31	32	32	19	29	32	29	29
India	24	32	20	32	35	32	32	32	32
Italy	34	32	26	30	38	39	32	32	32
Netherlands	28	32	24	26	31	43	32	32	32
New Zealand	33	32	24	31	27	33	32	50	50
Norway	38	32	24	32	38	37	32	27	27
Spain	30	28	28	24	36	32	32	32	32
Sweden	31	32	32	32	34	41	32	27	27
UK	35	32	32	32	23	37	32	29	29
EU, CE, Israel	35	32	24	32	30	32	32	32	32
CIS	35	32	24	32	43	32	32	32	32
Korea	29	32	24	32	35	12	32	32	32
Others	19	36	24	24	28	32	32	32	32

\* Note : In Italy, all tones provided during conversation should be decreased by 5db.

- DCO Gain Table

Country	DKTU	SLT	CO	DCO	DTMF	Tone	DVU	Int Music	Ext Music
Australia	31	32	26	32	28	32	32	32	32
Belgium	21	29	26	32	38	36	32	37	37
Denmark	32	32	20	32	32	37	32	10	10
Finland	35	32	32	32	25	37	32	29	29
Germany	35	32	32	32	25	37	32	29	29
India	24	32	26	32	32	32	32	32	32
Italy	32	32	28	32	32	37	32	38	38
Netherlands	21	29	26	32	26	36	32	37	37
New Zealand	32	27	26	32	28	32	32	50	50
Norway	36	32	26	32	32	37	32	27	27
Spain	26	37	30	32	32	32	32	32	32
Sweden	30	37	32	32	32	40	32	26	26
UK	30	32	32	29	25	37	32	29	29
EU, CE, Israel	32	32	26	32	25	32	32	32	32
CIS	32	32	26	32	25	32	32	32	32
Korea	26	32	26	32	32	12	32	32	32
Others	26	37	24	32	32	32	32	32	32

- DVU Rx Gain

Country	DKTU	SLT	CO	DCO	External Music
Australia	26	32	32	32	32
Belgium	26	32	32	32	32
Denmark	26	32	32	32	10
Finland	26	32	32	32	32
Germany	26	32	32	32	32
India	26	32	32	32	32
Italy	26	32	32	32	32
Netherlands	26	32	32	32	32
New Zealand	26	32	32	32	32
Norway	26	32	32	32	32
Spain	26	32	32	32	32
Sweden	26	32	32	32	32
UK	26	32	32	32	32
EU, CE, Israel	26	32	32	32	32
CIS	26	32	32	32	32
Korea	26	32	32	32	32
Others	26	32	32	32	32

GDK-16, 16A, 16E, 16EA DIGITAL KEY TELEPHONE SYSTEM

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- DTMF RECEIVER Rx Gain

Country	SLT	CO	DCO
Australia	32	16	32
Belgium	24	24	24
Denmark	35	24	34
Finland	26	24	32
Germany	32	32	32
India	32	24	32
Italy	35	24	34
Netherlands	21	11	24
New Zealand	34	16	32
Norway	32	32	32
Spain	20	24	24
Sweden	36	34	18
UK	32	32	32
EU, CE, Israel	20	24	24
CIS	20	24	24
Korea	20	24	24
Others	37	24	24

- Conversion detected pulse to digit

Country / # of Pulse	1	2	3	4	5	6	7	8	9	10
New Zealand	9	8	7	6	5	4	3	2	1	0
Sweden	0	1	2	3	4	5	6	7	8	9
Others	1	2	3	4	5	6	7	8	9	0

- Conversion dialed digit to pulse

Country \ Digit	1	2	3	4	5	6	7	8	9	0
New Zealand	9	8	7	6	5	4	3	2	1	10
Sweden	2	3	4	5	6	7	8	9	10	1
Others	1	2	3	4	5	6	7	8	9	10

## SECTION 6. ADMIN PROGRAMMING

### 6.1 GENERAL DESCRIPTION

#### 6.1.1 INTRODUCTION

The GDK-16 Key Telephone System can be programmed to meet each customer's individual need. All programming is done at station 100 (DKT 1) using KD-24D, KD-36D or LKD-30D digital key telephone.

Upon entering the program mode, the key telephone at station 100 cannot operate as a normal telephone but as a programming instrument with all of the buttons redefined. The keys of the dial pad are used to enter the various data fields and to enter numerical information. The 24 buttons located at the top of the phone (Flex Buttons) are used to indicate the specific data field and to enter information. Sometimes **[SPEED]** button is used to delete the data.

See **TABLE 6.2.2.1 – 6.2.2.10** for default data. If this pre-programming suits the customer, additional Admin program is not necessary. To change admin data, the user enter the admin programming mode and select program code. During Admin programming, other keysets in the system operate normally.

When Admin programming, LCD and LED's indicate current programmed data and status. If the programmer enters correct data, then LCD and LED's show the entered data and the data is stored in the temporary buffer area. Real system database is not changed and has no effect on telephone operation unless permanent updating procedure is executed. Pressing **[HOLD/SAVE]** button, all data in the temporary buffer (same as LCD and LED's show their status) is saved into permanent memory. Tones are provided to let the programmer know whether data entry is correct (confirmation tone) or not (error tone).

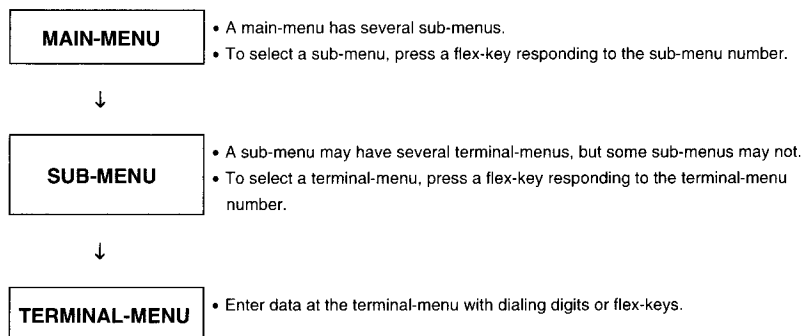
#### 6.1.2 TO ENTER THE PROGRAMMING MODE

1. Lift handset or press the **[MON]** button on the admin station, and hear ICM dial tone (optional),
2. Press **[TRANS/PGM]** button and dial \* # (confirmation tone heard),
3. This procedure places the station into the Admin. Programming mode (confirmation tone heard). And LCD will display the first step of Admin. Programming (Refer to the below LCD).

ADMIN PROGRAM START  
PRESS FLEX KEY(1-11)

### 6.1.3 HOW TO PROGRAM

1. There are 12 main-menus in the Admin. Programming mode.
2. Each main program has several sub-menus and each sub-menu can have several terminal menus (sub-menus of a sub-menu), but some sub-menus don't have any terminal-menus (It means that sub-menus are terminal-menus.). Refer to the followings;



#### 6.1.3.1 Example of Admin. Program

##### PROCEDURE

---

- |  |   |
|--|---|
| <b>ADMIN PROGRAM START</b><br><b>PRESS FLEX KEY(1-12)</b>      | <p>(1) When the user enters Admin. Programming mode, the first message will be displayed on the LCD.<br/>Press a flex-key to select a main-menu among 12 main-menus.</p>  |
| <b>STA PGM</b><br><b>ENTER STA RANGE</b>                       | <p>(2) Select the 2<sup>nd</sup> main-menu, "STATION BASE PROGRAM", by pressing the 2<sup>nd</sup> flex-key in step 1.<br/>Dial station range. (The second station number must be more than or equal to the first station number)</p>   |
| <b>STA PGM,100-100</b><br><b>PRESS FLEX KEY(1-9)</b>           | <p>(3) And then, press a flex key (1-9) or ▲ /▼ .<br/>                 ① Flex key (1-9): Select a sub-menu of <b>STA BASE PROGRAM</b>.<br/>                 ② ▲ : Move to the next main-menu, <b>CO LINE BASE PROGRAM</b>.<br/>                 ▼ : Move to the previous main-menu, <b>INITIALIZATION</b>.</p>  |
| <b>STA PGM,100-115,ATTRIBUT</b><br><b>PRESS FLEX KEY(1-13)</b> | <p>(4) Pressing a flex key 1, the LCD displays as the left side.</p>  |
| <b>STA PGM,100-115, DND</b><br><b>YES</b>                      | <p>(5) Pressing a flex key 1, the LCD displays as the left side. And then press a flex key 1 to change the current value. Press <b>[HOLD/SAVE]</b> button to update the database permanently.<br/>                 - ▲ /▼ : Go to the other same level menu.<br/>                 - <b>[TRANS/PGM]</b>: Go to the Admin. starting menu.<br/>                 - <b>[REDIAL]</b>: Go to the 1 level upper menu.</p> |
-



#### 6.1.4 BUTTON DEFINITION

Buttons are used for the following purposes in the Admin. Programming mode.

- (1) [HOLD/SAVE]: Update the system database permanently.
- (2) [TRANS/PGM]: Move to the start of admin program menu.
- (3) [REDIAL]: Move to the upper level menu.  
(SUB-MENU - MAIN-MENU or TERMINAL-MENU - SUB-MENU)
- (4) ▲ : Move to the next menu in the same level. (Round-robin)  
(Ex: DND (1<sup>st</sup> terminal-menu of STATION ATTRIBUTE) - SPEED DIAL ACCESS (2<sup>nd</sup> terminal- menu of STATION ATTRIBUTE)  
▼ : Move to the previous menu in the same level. (Round-robin)  
(Ex 1: INITIALIZATION (1<sup>st</sup> main-menu) - PRINT DATABASE (last main-menu)  
Ex 2: STATION CLASS OF SERVICE (3<sup>rd</sup> sub-menu of 2<sup>nd</sup> main-menu) -  
ISDN STATION ATTRIBUTE (2<sup>nd</sup> sub-menu of 2<sup>nd</sup> main-menu))
- (5) [SPEED]: Clear database of the current terminal menu.
- (6) FLEX-KEY: 1. Used for selecting a menu (main/sub/terminal) responding to the number.  
2. Also used as toggle key for entering data, if entered value has only 2 cases number (i.e. Yes/No, Enable/Disable)
- (7) DIGIT: Used for entering data by dialing.

## 6.2 ADMIN PROGRAMMING

### 6.2.1 ADMIN PROGRAMMING INDEX

FLEX KEY	MAIN MENU	FLEX KEY	SUB MENU
1	Initialization (DB INIT)	1 2 3 4 5 6 7 8 9 10 11 12	Station Database Initialization CO Line Database Initialization Database Initialization (ISDN Table) System Feature Database Initialization Database Initialization (System Timer) Database Initialization (Toll Table) Authorization Code Table Database Initialization Flexible Station Number Initialization Flexible Button Program Initialization LCR Database Initialization (LCR package only-MENU) Hunt Group/Voice Mail Table initialization All Database Initialization
2	Station Base Program (STA PGM)	1 2 3 4 5 6 7 8 9	Station Attribute ISDN Station Attribute Station Class-Of-Service CO Line Group Access Preset Call Forward Flex Buttons Assignment Warm Line Selection Page Zone Language Code
3	CO Line Base Program (CO PGM)	1 2 3 4 5 6 7	CO Line Attribute ISDN CO Line Attribute Group Assignment DISA Type CO Flash Timer CO Loop Supervision Timer CO Line Ring Assignment
4	ISDN Program (ISDN PGM)	1 2 3 4 5 6 7 8 9 10 11 12 13 14	TEI Type Calling Sub-Address Incoming Zero Insertion Outgoing Zero Insertion Outgoing Check Digit My Area Code My Nation Code International Code COLP Table (Entry no:01-10) MSN Table (Entry no:01-24) DID Digit Conversion Table ISDN Transfer Code ISDN Supplementary Service Loopback

FLEX KEY	MAIN MENU	FLEX KEY	SUB MENU
5	System Base Program (SYS PGM)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	System Attribute Attendant Assignment Setting System Date/Time LCD Date/Time Display Mode PBX Access Code DID/DISA Destination DISA Retry Counter SMDR Attributes Pulse Dial / Speed Ratio Alarm Attributes External Control Contact BGM(Background Music) Type MOH(Music On Hold) Type System Gain Control Fax Transfer CO Line External Page Station DID/DISA Forward to DVU CCR Table Admin Password DVU Setting Weekly Time Table ACNR Tone Cadence
6	System Timers (SYS TMR)	Timer - 1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	Exclusive Hold Recall Timer System Hold Recall Timer Transfer Hold Recall Timer I-Recall Timer Attendant Recall Timer CO Ring Detect Timer CO Ring Stop Detect Timer Pause Timer CO Release Guard Timer CO Dial Delay Timer Preset Forward Timer Call Forward Busy/No Answer Timer DID/DISA No Answer Timer Unsupervised Conference Timer MSG Wait Reminder Tone Timer Hook Switch Flash Timer Door Open Timer(Enhanced) Inter Digit Timer Warm Line Timer SMDR Timer Wake-up Fail Ring Timer Fax Tone Detect Timer Fax CO Call Timer DVU User Record Timer

GDK-16, 16A, 16E, 16EA DIGITAL KEY TELEPHONE SYSTEM

FLEX KEY	MAIN MENU	FLEX KEY	SUB MENU
6	System Timers (SYS TMR)	Timer - 2	1 DVU Forward Answer Timer 2 Valid User Message Timer 3 Hunt Disconnect Timer 4 Call Park Recall Timer 5 Normal Ring To DVIB Timer 6 CCR Inter Digit Timer 7 DISA Delay Timer 8 ACNR Pause Timer 9 ACNR Delay Timer 10 ACNR Tone Detect Timer 11 ACNR No Answer Timer 12 ACNR Retry Counter 13 ACNR Retry No Tone
7	Toll Table	1 2 3 4 5	Toll Exception Table – Allow A (Entry no:01-20) Toll Exception Table – Deny A (Entry no:01-10) Toll Exception Table – Allow B (Entry no:01-20) Toll Exception Table – Deny B (Entry no:01-10) 1. Canned Toll Table –Allow (Entry no:01-10) 2. Canned Toll Table –Deny (Entry no:01-10)
8	Authorization Code Table (Author Code Table)	-	Authorization Code Table (Entry no:01-30)
9	Flexible Numbering Plan	1 2 3	Numbering Plan Type(Extension / Basic) Station Number Digit Size (3 / 2) Flexible Station Number Assignment
10	LCR Program - MEMU needed	1 2 3 4 5	LCR Access Mode Day Zone Time Zone of Day Zone LDT Table DMT Table
11	Hunt Group/Voice Mail Table	Hunt Group	1 Group Type 2 Group Member 3 Group Attribute
		VM Table	1 Put Mail 2 Get Mail 3 Busy Table 4 No Answer Table 5 Error Table 6 DND Table 7 Disconnect Table
12	Print Database	1 2 3 4 5 6 7 8 9 10 11	Station Database Print CO Line Database Print ISDN Database Print System Feature Database Print System Timer Database Print Toll Table Print Authorization Code Table Print Flexible Station Number Print LCR Database Print Hunt Group/Voice Mail Table Print All Database Print

## 6.2.2 DEFAULT VALUES

TABLE 6.2.2.1 STATION BASE PROGRAM (MAIN MENU 2)

NO	SUB MENU	FLEX KEY	TERMINAL MENU	RANGE	DEFAULT	REMARK
1	Station Attribute	1	DND (Do-Not-Disturb)	YES/NO	YES	
		2	Speed Dial Access	YES/NO	YES	
		3	Page Access	YES/NO	YES	
		4	Call Forward Access	YES/NO	YES	
		5	PLA (Preferred Line Answer)	YES/NO	YES	
		6	Speaker-Phone/Headset	SP/HEAD	Speaker-Phone	
		7	Auto Speaker Selection	YES/NO	YES	
		8	ICM Box Signaling	YES/NO	YES	
		9	Automatic Hold	YES/NO	Station1:YES Station2-16:NO	
		10	Data Line Security	YES/NO	NO	
		11	DVIB Access	YES/NO	YES	
		12	Two-way Recording	YES/NO	NO	
			13	DID Ring	YES/NO	NO
2	ISDN Station Attribute	1	Sub Address	YES/NO	NO	If this field is set to YES, then GDK sends the called extension number in called party sub-address information of setup message to ISDN extension.
		2	Long/Short	Long/Short	Short	
		3	MSN	YES/NO	NO	If this field is set to YES, then GDK sends the called extension number in called party number information of setup message to ISDN extension.

GDK-16, 16A, 16E, 16EA DIGITAL KEY TELEPHONE SYSTEM

NO	SUB MENU	FLEX KEY	TERMINAL MENU	RANGE	DEFAULT	REMARK
2	ISDN Station Attribute	4	COLR/CLIR	YES/NO	NO	
		5	COLP	YES/NO	NO	
		6	CLIP	YES/NO	NO	
		7	CLIS	YES/NO	NO	
		8	CLI NAME Display	YES/NO	NO	If this field is ON, the system check whether the received CLI is matched with the speed dial data or not. If they are matched, the speed dial name is displayed.
	9	KEYPAD FACILITY	KEYPAD /DTMF	DTMF	This field determines that ISDN station sends digit in DTMF or keypad facility after connected.	
3	Station COS	-	Day COS/Night COS	11 - 77	11	2 Digit 1 <sup>st</sup> Digit-Day COS 2 <sup>nd</sup> Digit-Night COS
4	CO Group Access	1- 4	CO Line Group	1-4	1-4	1 <sup>st</sup> Flex : CO GRP 1 : 4 <sup>th</sup> Flex : CO GRP 4
5	Preset Call Forward	-		Station No	Not Assigned	The ISDN station or ICM box cannot be assigned as preset call forward station.
6	Flex Buttons Assignment			1-6		Type
				--		1: User Button
				1-6		2: CO x
				1-4	Not Available	3: CO Group x
				-		4: LOOP
				STA No. SPD Bin No. (01-99)		5: STA xxx 6: SPD xx
7	Warm Line Selection	-		1-4	Not Assigned	1:Flex Button <sup>1)</sup> 2:CO Line 3:CO Group 4:Station
8	Page Zone	-		1-2	1	1:Page Zone 1 2:Page Zone 2
9	Language Code	-		1-2	Each Nation's Language	

- 1) Under following conditions, flex. button cannot be assigned as warm line.
- If any station among entered range is SLT or 2B-SLT, you cannot save input value.
  - If you entered the bigger flex. button number than stations have, you cannot save input value.

TABLE 6.2.2.2 CO LINE BASE PROGRAM (MAIN MENU 3)

NO	SUB MENU	FLEX KEY	TERMINAL MENU	RANGE	DEFAULT	REMARK	
1	CO Line Attribute	1	CO Line Type	PBX / CO	CO		
		2	CO Line Signal Type	DTMF / Pulse	DTMF		
		3	Universal Night Answer (UNA)	Yes / No	No		
		4	Flash Type	Ground / Loop	Loop	Only "Loop" type is supported	
		5	DISA Account	Yes/No	No		
		6	Loop Supervision	Yes/No	No		
		7	DID/DISA Announcement	Yes/No	Yes		
		8	CPT Tone Detect	YES/NO	NO		
2	ISDN CO Line Attribute	1	COLP	00-10	00	00:Not Assigned 01-10:indicate an entry of Outgoing COLP table	
		2	DID_RN	00-99	00	00:Do not ignore 01-99:indicate an ignored called party number (DID_RN : DID removes number from called party information)	
		3	Type of Calling Number	0-8	2	0:Unknown number 1:International type 2:National number 3:Not used 4:Subscriber number 5:Not used 6:Not used 7:Not used 8:No send COLP	
		4	DID Line Use	Yes/No	No		
3	CO Line Group Assign	-		1 - 4	1		
4	DISA Type	-		U/Day/Night/Both	U	0/1/2/3	
5	CO Flash Timer	-		000 - 300	050	10msec base	
6	CO Loop Supervision Timer	-		0 - 20	0	100msec base	
7	CO Line Ring Assignment For XX70P-version (GDK-16)	-		No/Day/Night/Both	Station 1:All ring Station 2-16: No ring	Flex key : Round-robin	
	CO Line Ring Assignment For XX75P-version (GDK-16E, 16EA)	1	Ring to station	No/Day/Night/Both	Station 1 : All ring Station 2-22 : No ring		
		2	1		Ring to Hunt Group 1		No Ring
			2		Ring to Hunt Group 2		
			3		Ring to Hunt Group 3		
4	Ring to Hunt Group 4						

TABLE 6.2.2.3 ISDN PROGRAM (MAIN MENU 4)

FLEX KEY	SUB MENU	TERMINAL MENU	RANGE	DEFAULT	REMARK
1	TEI Type	-	Auto/Fixed	Auto (3 Ports)	After changing TEI, press RESET button on MBU to operate with the new TEI type.
2	Calling Sub-Address	-	Yes/No	No	If this field is set to YES, then GDK sends the calling extension number in calling party sub address information of setup message.
3	Incoming Zero Insertion	-	Yes/No	No	This feature will be implemented in the next upgrade version.
4	Outgoing Zero Insertion	-	Yes/No	Yes	
5	Outgoing Check Digit	-	0 - 9	0	
6	My Area Code	-	-	Not Assigned	
7	My Nation Code	-	-	Not Assigned	
9	COLP Table	-	Entry No (01-10)	Not Assigned	Max : 10 digits
10	MSN Table	-	Entry No (01-24)	Not Assigned	Flex key 2: Day destination STA #(2digit/3digit)/HUNT #(61-64) /DVU Flex key 4: Night destination STA #(2digit/3digit)/HUNT #(61-64) /DVU
11	DID Digits Conversion	1. DID Received Digit from PX	2 - 4	3	
		2. DID First Two Digits Conversion	DID Received Digit No	***	0 - 9 # : Ignore digit * : using received digit
		3. DID Second Digit Conversion	10 Digits	1234567890	
12	ISDN Transfer Code	-	-	* #	
13	ISDN Supplementary Service	1. Service Type	1. Hold/Retrieve 2. 3-party Conf.	Func/ Keypad	Keypad
		2. Hold Code		10 digits	Not Assigned
		3. Retrieve Code		10 digits	Not Assigned
		4. 3-Party Conference Code		10 digits	Not Assigned
14	Loop Back	-	On/Off	Off	Note 2)

Note 1) In Basic II version, **MSN destination** can be either a **station** or a **station group**. So, it is possible to program MSN destination as a group number (61-64).

Note 2) The switch SW7-2 must be turned on to enable Loop-Back feature. Otherwise, it is no use setting Loop-Back ON in Admin. Program.



TABLE 6.2.2.4 SYSTEM BASE PROGRAM (MAIN MENU 5)

NO	SUB MENU	FLEX KEY	TERMINAL MENU	RANGE	DEFAULT	REMARK	
1	System Attributes	1	Hold Preference	SYS / EXC	SYS		
		2	Privacy	YES / NO	YES		
		3	External Night Ring	YES / NO	NO		
		4	Multi-line Conference	YES / NO	NO		
		5	CO Line Choice	Last Choice / Round-robin	Last Choice		
		6	Override 1 <sup>st</sup> CO Group	YES / NO	NO		
		7	Night DVU	YES / NO	NO		
		8	Music on Camp-on	YES / NO	NO		
2	Attendant Assignment	-		Station No.	100 (1 <sup>st</sup> Station)	ICM box cannot be assigned as attendant station.	
3	Set System Date/Time	-					
4	LCD Display Mode	-		1-4	3 (12-DD/MM/YY)	1:24- DD/MM/YY 2:24- MM/DD/YY 3:12- DD/MM/YY 4:12- MM/DD/YY	
5	PBX Access Code	-		Max 2 Digits	Not Assigned	Max 4 PBX Access Codes	
6	DID/DISA Destination	1	Busy Destination	Tone / ATD	Tone		
		2	Error Destination	Tone / ATD	Tone		
7	DISA Retry Counter		DISA Retry Counter	1-9	3		
8	SMDR Attributes	1	SMDR Print Enable	YES / NO	NO		
		2	SMDR Recording Call Type	All Call / Long Distance	All Call		
		3	Print Incoming Call	YES / NO	NO		
		4	SMDR Print Baud Rate (RS-232C)	1-8	6		1:300Bps 2:600Bps 3:1200Bps 4:2400Bps 5:4800Bps 6:9600Bps 7:19200Bps 8:38400Bps
		5	SMDR Save	NO	YES/NO		The system can be set to record either all outgoing calls (ALL) or only limit set by timer in Btn12 (SMDR Start Timer)

GDK-16, 16A, 16E, 16EA DIGITAL KEY TELEPHONE SYSTEM

NO	SUB MENU	FLEX KEY	TERMINAL MENU	RANGE	DEFAULT	REMARK		
8	SMDR Attributes	6	Records In Detail	YES	YES/NO	If this field is set as 'NO', the customer can see not the detailed call information but information of total call( total metering count and total cost for individual station) for SMDR Save Record. Otherwise, the customer can see		
9	Attributes	-		60/40 or 66/33	66/33 (10 PPS Only)			
10	Alarm Attribute	1	Alarm Enable	YES / NO	NO			
		2	Alarm Contact Type	Close / Open	Close			
		3	Alarm Signal Mode	Repeat / Once	Repeat			
11	External Control Contact	1	First Contact	1-3	None			
		2	Second Contact	(Loud Bell /Door/ Ext page)	None			
12	BGM Type	-	-	1-3	1	1:Internal 2:External 3:Both		
13	MOH Type	-	-	1-3	1	1:Internal 2:External <b>3:DVIB MOH</b>		
14	System Gain Control	1	Digital Keypad Rx Gain	00-60		1.DKTU		
						2.SLT		
						3.CO		
								4.DCO
								5.DTMF RX
								6.TONE
								7.DVU
								8.MUSIC1
								9.MUSIC2
		2	SLT Rx Gain	00-60		1.DKTU		
	2.SLT							
	3.CO							
						4.DCO		
						5.DTMF RX		
						6.TONE		
						7.DVU		
						8.MUSIC1		
						9.MUSIC2		
		3	CO Line Rx Gain	00-60		1.DKTU		
	2.SLT							
	3.CO							
						4.DCO		
						5.DTMF RX		
						6.TONE		
						7.DVU		
						8.MUSIC1		
						9.MUSIC2		

NO	SUB MENU	FLEX KEY	TERMINAL MENU	RANGE	DEFAULT	REMARK	
14	System Gain Control	4	Digital CO Line (DCO)	00-60		1.DKTU	
			Rx Gain			2.SLT	
						3.CO	
							4.DCO
							5.DTMF RX
							6.TONE
							7.DVU
							8.MUSIC1
							9.MUSIC2
		5	DVU Rx Gain	00-60		1.DKTU	
						2.SLT	
						3.CO	
						4.DCO	
						5.MUSIC2	
		6	DTMF Rx Gain	00-60		1.SLT	
						2.CO	
						3.DCO	
15	Fax Transfer CO Line	-		3-6	None		
16	External Page Port Assignment	-	-	Station No.	None	Only SLT port	
17	DID/DISA Forward To DVIB	1	Fwd to DVU : Busy	YES/NO	NO		
		2	Fwd to DVU : No Answer	YES/NO	NO		
		3	Fwd to DVU : Attendant No Answer	YES/NO	NO		
18	CCR Table	1	Day/Night CCR Table		1-2	Input Type	
		2	Other CCR Table		1-9	1. Station 2. Hunt Group 3. DVU 4. DVU DROP 5. System Speed 6. Internal Page 7. External Page 8. All Call Page	
19	Admin Password	-	-	Not Assigned	4 Digits	Admin Password can be assigned to enter Admin Programming mode for only Administrator who knows the Admin Password.	

GDK-16, 16A, 16E, 16EA DIGITAL KEY TELEPHONE SYSTEM

NO	SUB MENU	FLEX KEY	TERMINAL MENU	RANGE	DEFAULT	REMARK
20	DVU Setting	1	DATE/TIME Prompt Order	DATE/TIME	DATE/TIME TIME/DATE	The system attendant can change the date & time prompt order so that the date & time is played as date & time or time & date order when a DVIB message is retrieved with the recorded date & time.
		2	DVU Message Retrieve Order	FIFO	FIFO/LIFO	DVIB message retrieve order is settable so that station users are able to retrieve latest message or oldest message first when multiple messages are stored in their stations.
		3	Auto Delete of Retrieved Saved Messages	Not Assigned	000-300 days	The recorded DVIB messages in the all stations may be deleted after assigned term with admin programming. The retrieved and saved messages will be deleted after assigned term. When it is set to 000, the DVIB message will not be deleted automatically.
21	Weekly Time Table	-	-	-	1-7	Day of Week 1. Day Start Time : 0000-2359 (Default: 0900) 2. Night Start Time: 0000-2359 (Default: 1800)
22	ACNR Tone Cadence	1	Ring-Back Tone	ON:050 OFF:100	000-255 (20 msec)	
		2	Busy Tone	ON:025 OFF:025	000-255 (20 msec)	
		3	Error Tone	ON:012 OFF:012	000-255 (20 msec)	
		4	Second Dial Tone	ON:070 OFF:000	000-255 (20 msec)	

TABLE 6.2.2.5 SYSTEM TIMER PROGRAM (MAIN MENU 6)

NO	SUB MENU	FLEX KEY	SUB MENU	RANGE	DEFAULT	REMARK
1	TIMER 1	1	Exclusive Hold Recall Timer	000 - 300	060	1 sec base
		2	System Hold Recall Timer	000 - 300	030	1 sec base
		3	Transfer Recall Timer	000 - 300	030	1 sec base
		4	I-Hold Recall Timer	000 - 300	030	1 sec base
		5	Attendant Recall Timer	00 - 60	01	1 min base
		6	CO Ring Detect Timer	1 - 9	2	100 msec base
		7	CO Ring Stop Detect Timer	1 - 15	6	1 sec base
		8	Pause Timer	1 - 9	1	1 sec base
		9	CO Release Guard Timer	01 - 15	01	1 sec base
		10	CO Dial Delay Timer	00 - 99	05	100 msec base
		11	Preset Call Forward Timer	00 - 99	10	1 sec base
		12	Call Forward Busy/No Answer Timer	00 - 99	10	1 sec base
		13	DID/DISA No answer Timer	00 - 99	20	1 sec base
		14	Unsupervised Conference Timer	00 - 99	10	1 min base
		15	Message Reminder Tone Timer	00 - 60	00	1 min base
		16	Hook Switch Flash Timer	001 - 250	050	10 msec base
		17	Door Open Timer	05 - 99	20	100 msec base
		18	Inter-Digit Timer	01 - 20	05	1 sec base
		19	Warm Line Timer	01 - 20	05	1 sec base
		20	SMDR Start Timer	000 - 250	000	1 sec base
		21	Wake-up Fail Ring Timer	00 - 99	20	1 sec base
		22	FAX Tone Detect Timer	01 - 10	05	1 sec base
		23	FAX CO Call Timer	1 - 5	1	1 min base
		24	DVU User Record Timer	010 - 255	20	1 sec base
2	TIMER 2	1	DVU Station Forward Answer Timer	04 - 40	04	1 sec base (NW: 10)
		2	DVU Valid User Message Timer	0 - 10	04	1 sec base
		3	Hunt Disconnect Timer	01 - 10	03	1 min base
		4	Call Park Recall Timer	0-600 (3 Digits)	120 (sec)	Determines the amount of time before a call placed in a call park location will recall the station placing the park.
		5	Normal Ring To DVIB Timer	0-300 (3 Digits)	4 (sec)	When Normal CO ring comes, all ring assigned station will ring during "Normal Ring to DVIB Timer" and the call will be routed to DVIB.
		6	CCR Inter Digit Timer	000 - 300 (3 Digits)	030	This field is used for the CCR inter-digit timer in the DISA/DID CO line. (100ms base).
		7	DISA Delay Timer	00-99 (3 Digits)	00	When this timer is expired, DISA is activated (1 sec base)

GDK-16, 16A, 16E, 16EA DIGITAL KEY TELEPHONE SYSTEM

NO	SUB MENU	FLEX KEY	SUB MENU	RANGE	DEFAULT	REMARK
2	TIMER 2	6	CCR Inter Digit Timer	000 – 300 (3 Digits)	030	This field is used for the CCR inter-digit timer in the DISA/DID CO line. (100ms base).
		7	DISA Delay Timer	00-99 (3 Digits)	00	When this timer is expired, DISA is activated (1 sec base)
		8	ACNR Pause Timer	005 - 300 (3 Digits)	030	When expired, ACNR is activated. (1 sec base)
		9	ACNR Delay Timer	000 – 300 (3 Digits)	030	When ACNR Pause Timer expires and there is no available CO Line in the group, this timer is invoked.
		10	ACNR Tone Detect Timer	000 –300 (3 Digits)	030	This timer is invoked upon completion of dialing and system considers the CO party as busy in the case that CPTU cannot detect the valid tone type until this timer expires. (1 sec base)
		11	ACNR No Answer Timer	10 – 50 (2 Digits)	30	This Timer is invoked after system detects CO ring back tone or voice from CO party. After this timer, system retries ACNR. (1 sec base)
		12	ACNR Retry Counter	1 – 30 (1 Digit)	03	This is decreased every time station retries ACNR, ACNR is canceled if set to 0.
		13	ACNR Retry No Tone	1 – 9 (5sec)	1	1 means 5 seconds, GDK-16 will wait this value to decide NO TONE. 3 means 15 seconds. (Only for CIS)

TABLE 6.2.2.6 TOLL TABLE (MAIN MENU 7)

FLEX KEY	SUB MENU	TERMINAL MENU	DEFAULT	REMARK
1	Allowed Table A	Entry No (01 – 20)	Not Assigned	Max : 8 digits
2	Denied Table A	Entry No (01 – 10)		
3	Allowed Table B	Entry No (01 – 20)		
4	Denied Table B	Entry No (01 – 10)		
5	Canned Toll Table : Allow	Entry No (01 – 10)		
	Canned Toll Table : Deny	Entry No (01 – 10)		

**TABLE 6.2.2.7 AUTHORIZATION CODE TABLE (MAIN MENU 8)**

SUB MENU	FLEX KEY	TERMINAL MENU	RANGE	DEFAULT	REMARK
Authorization Code Table	-	Entry No. (01-30)	5 Digits	Not Assigned	

**TABLE 6.2.2.8 FLEXIBLE STATION NUMBERING PLAN (MAIN MENU 9)**

FLEX KEY	SUB MENU	RANGE	DEFAULT	REMARK
1	Numbering Plan Type	Extension / Basic	Basic	
2	STA Number Digit Size	3 / 2	3	
3	Flexible Station Number	For 70P-X.x version (GDK-16) FLEX KEY 1-16	100-115	Each flex key denotes corresponding station.
		For 75P-X.x version (GDK-16E, 16EA) FLEX KEY 1-22	100-121	

**TABLE 6.2.2.9 LCR PROGRAM (MAIN MENU 10)**

FLEX KEY	SUB MENU	RANGE	DEFAULT	REMARK
1	LCR Access	3-way toggle - DISABLE - OVERRIDE - ALWAYS	Disable	
2	Day Zone	F1: Zone 1. Day : 1 - 7	1-7	Each day belongs to only one-day zone.
		F2: Zone 2. Day : 1 - 7	-	
		F3: Zone 3. Day : 1 - 7	-	
3	Time Zone	F1: Zone 1. Time : 00 - 24	00-24	Each hour belongs to only one time zone.
		F2: Zone 2. Time : 00 - 24	-	
		F3: Zone 3. Time : 00 - 24	-	
4	LDT (Leading Digit Table)	00 - 99 (total:100)	None	F1: LCR type, BOTH / INT / COL. F2: CD 12 digits F3: DMT index. 6 digits. Total three DMT indices for each time zone1/2/3 • F1 - Day zone 1 index to the DMT. • F2 - Day zone 2 index to the DMT. • F3 - Day zone 3 index to the DMT.
5	DMT (Digit Modification Table)	00 - 99 (total:100)	None	F1: A (Added digit stream). 25digits F2: RP (Removal Position). 2digits F3: RN (Removal Number of digits of CODE in each table) 2 digits F4: AP (Add Position). 2digits F5: CG (CO group). 1digit F6: ALT (Alternative DMT index). 2digits

**TABLE 6.2.2.10 HUNT GROUP/VOICE MAIL PROGRAM (MAIN MENU 11)**

NO	SUB MENU	FLEX KEY	TERMINAL MENU	RANGE	DEFAULT	REMARK
1	Hunt Group Program	1	Type	Cir/Term/UCD /VM/Ring/None	None	
		2	Group Member	Station No.	None	Max 6 stations
		3	Attribute		None	
		Cir/ Term	1.No Answer Timer	0-99	15	1 second
			2.Ring Timer	0-99	60	1 second
			3.Overflow Destination	STA#,HUNT#, DVU, SYS SPD#		Destination Type 1. STA 2. HUNT 3. DVU 4. SYS SPD
			4.Overflow Timer	000-600	180	1 second
			UCD	1.First Announcement Timer	0-99	15
		2.Second Announcement Timer		0-99	15	1 second
		3.Announcement Repeat Timer		0-99	15	1 second
		4.Overflow Destination		STA#,HUNT#, DVU, SYS SPD#		Destination Type 1. STA 2. HUNT 3. DVU 4. SYS SPD
		5.Overflow Timer		000-600	180	1 second
		VM	1.Ring Timer	0-99	99	1 second
			2.Put Mail Index	1-4	1	
			3.Get Mail Index	1-4	2	
			4.Overflow Destination	STA#,HUNT#, DVU, SYS SPD#		Destination Type 1. STA 2. HUNT 3. DVU 4. SYS SPD
			5.Overflow Timer	000-600	180	1 second
		Ring	1. Ring Announce Timer	0-99	99	1 second
			2.Overflow Destination	STA#,HUNT#, DVU, SYS SPD#		Destination Type 1. STA 2. HUNT 3. DVU 4. SYS SPD
			3.Overflow Timer	000-600	180	1 second
2	VM Dialing Table	1	Put Mail	1-2	Prefix : P# Suffix : -	Flex 1 for Prefix, 2 for Suffix. Max 12 digits
		2	Get Mail	1-2	Prefix : P## Suffix : -	
		3	Busy	1-2	Prefix : P#*3P Suffix : -	
		4	No Answer	1-2	Prefix : P#*4P Suffix : -	
		5	Error	1-2	Prefix : P#*5P Suffix : -	
		6	DND	1-2	Prefix : P#*6P Suffix : -	
		7	Disconnect	-	*****	



# DECLARATION OF CONFORMITY

according to ISO / IEC Guide 22 and EN45014

**Application of Council Directive(s)**

1999 / 5 / EC

Date : 2002. 04. 19.

**Manufacturer's Name**

LG Electronics Inc.

**Manufacturer's Address**

Enterprise Communication Company  
73, Hyangjeong Dong, Hungduck Gu  
Cheongju, 361-726, Korea

**Declares that the Products :**

Product Type / Environment

Digital Hybrid Key Telephone System

Model Name

GDK-16

Product Options

Covers all Option of the above Product.

**Conformance to**

EN 55022 : 1994/ A2:1997  
EN 55024 : 1998  
EN 61000-3-2 : 1995/A1, A2 : 1998  
EN 61000-3-3 : 1995  
EN 60950 / A3 : 1995  
TBR15(1997)  
TBR21(1996), EG201121(1998)

'CE' affixed Date : From 2001. 11. ( R&TTE )

**Supplementary Information :**

The above products comply with the requirements of the R&TTE Directive 1999/5/EC.  
The conformity to above standards is verified by TUV Product Service GMBH ( Competent Body )  
with Ref. No. E8 01 11 27114 123 for EMC and with Ref. No. N8 01 10 27114 121 for LVD.  
And by TUV Rheinland Product Safety GmbH with Ref. No. QT 2137586 for TBR15, TBR 21 and EG201121.

Anyang City, Kyongki-do

April 19, 2002

/ David Song

Location

Date

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