DIGITAL KEY TELEPHONE SYSTEM INSTALLATION MANUAL

MODEL : GDK-FPII

REVISION HISTORY

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ISSUE 1.0	1997.05	1. Initial Release
ISSUE 1.1	1997.09	1. Add the description of ISDN 2BRI installation.
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		2. Power Installation.
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Alpha-Numeric		

SECTION 1. INTRODUCTION

1.1 PURPOSE

This manual provides the information necessary to install, operate, and maintain the LG Digital Key Telephone System (GDK-FPII, GDK-34I and GDK-34e). For the system Administration Programming, see the PROGRAMMING MANUAL, which is separately supplied.

 <u>Note: The model name of GDK-FPII may be called as GDK-34i, GDK-34e in some special</u> <u>countries, but the system is the same. In this manual, GDK-FPII will be mainly</u> <u>described as a model name.</u>

1.2 REGULATORY INFORMATION

1.2.1 Telephone Company Notification

Before connecting the GDK-FPII 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 of GDK-FPII (GDK-34i, GDK-34e)
- Local regulatory agency registration number
- Ringer equivalence
- Registered jack

The necessary information is available from your local representative of LGE.

1.2.2 Incidence Of Harm

If the telephone company determines that the customer provided equipment is faulty due to 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.

1.2.3 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 using the GDK-FPII 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.

1.2.4 Maintenance Limitations

Maintenance on the GDK-FPII Digital Key Telephone System should be only performed by LGE. 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.

1.2.5 Notice Of Radiated Emissions

The GDK-FPII 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."

1.2.6 Hearing Aid Compatibility

The GDK-FPII 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.

1.2.7 Notice Of Replacement with Lithium Battery

This product is also designed for IT power system with Phase to Phase voltage 230V.

CAUTION

- Danger of explosion if the 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.

SECTION 2. GENERAL DESCRIPTION

2.1 INTRODUCTION

The GDK-FPII Digital Key Telephone System is a fully digital hybrid Key Telephone System, designed to meet the telecommunication needs of small/medium sized business offices.

The GDK-FPII system incorporates state of the art digital technology for command processing and voice switching, utilizing a Pulse Code Modulation/Time Division Multiplexing (PCM/TDM, "A" law) distributed switching matrix.

The GDK-FPII system achieves a high level of flexibility by 1) employing a Universal Card Slot architecture with a cabinet to house plug-in Printed Circuit Boards, and 2) providing support for different types of instrumentation.

The KSU of the GDK-FPII is a wall-mounted cabinet that houses the MBU (Main Board Unit) and contains card slots for the CO line/Key Station/SLT/ISDN/DECT interface boards, and other useful PCBs. There are 7 slots in the system, four (slot #4~7) of them are universal slots and others(slot #1~3) are fixed slots for specific cards. The 1st fixed slot (slot #1) is used to install only one of the DVIB, STIB or WTIB, the 2nd fixed slot(slot #2) is used to install the 4SLI(SLT interface card) card only and the 3rd fixed slot(slot #3) is used to install one of the 4LCO, 2BRI or PRI card.

There are four universal slots (slot #4~7) in the system. Station, CO line, SLT, and another option board can be installed to the system universal card slots up to the system's maximum configuration. Thus, the system capacity is established by the number of installed interface boards and is not limited by an artificially fixed station to CO line ratio.

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, Auto Route Selection, ACD, etc.

The GDK-FPII system supports a combination of Digital Keysets (KD, KD/E, KD/S, KD/C, LKD series), Electronic Keysets(GSX, GSX/E series), various kinds of ISDN terminals, and wireless 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 DSS/DLS Console, Intercom/Door Box.

With the flexibility of the GDK-FPII extensive feature content, and the capability to use an array of instruments, the GDK-FPII 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 displays the configuration flexibility of the system.

2.2.1 System Capacity

Description	Basic & Expansion	Total
Time Slots		96
CO Line Ports		Max. 20 (with analog CO)1)Max. 24 (with ISDN BRI)1)Max. 34 (with ISDN PRI)1)
Station Ports (Digital/Electronic/SLT/DECT)		Max. 48 (without GAP-DECT) 1) Max. 64 (with GAP-DECT) 1)
DSS/DLS Consoles		3/Keyset
Attendant Positions	1 System, 5 N	Main, 5Group Attendants
Intercom Links		Non-blocking
Paging All Call External Internal		1 zone 1 zone 5 zones
Station Speed Dial	20/station, 24 digits each	200
System Speed Dial	24 digits each	200
Last Number Redial		48 digits
Save Number Redial		48 digits
Memo Dial		48 digits
SMDR	100 (without MEME/SMEMU) 2,000 (with MEMU/SMEMU)	2,000
Music Source Inputs	1 internal / MBU 1 external / MBU	2
External Control Contacts	Flexibly assigned	2 / MBU
Alarm/Door Bell Input		1 / MBU
Power Fail Circuits	6 lines / PFTU 2 lines / PFTU-I	20
RS 232C Ports	1 / SIU 2)	2
DTMF Receivers	2 / MBU 3) 2 / DTRU	14
CO Line Groups		9
Intercom Groups		5
Hunt/UCD Groups		8
DISA Lines		All CO ports
Conference	3-party 4-party 5-party	no limit 13 5

Table 2.2.1	System Capa	cities

- Note:
 - Not all maximum capacities may be achieved simultaneously.
 For the maximum number of boards in a system, see APPEDIX A.

The 2B-modules are limited by the power capacity. The maximum extensions with PSU(Linear) are limited by 34 without WTIB and 48 with WTIB, because of its power capacity.

The maximum extensions with PSU2(SMPS) are limited by 48 without WTIB and 64 with WTIB.

- 2) The SIU has one channel of RS-232. Normally, one SIU can be installed in the position of SIU(1) on MBU. However, in case that MODU is not installed, one more SIU can be installed in the position of SIU(2) on MBU. The purpose of each SIU can be programmable in Admin Programming.
- 3) A DTRU contains two DTMF receiver circuits, and can be installed on 4LCO, LCOB, 4SLI and SLIB as a optional.

MBU contains two DTMF receiver circuits.

2.2.2 System Configuration Chart

2.2.2.1 Overview

This typical Configuration Chart is made up according to the physical capacity of system, without 2B-module and Wireless Terminal(GAP-DECT).

Maximum capacity can be limited by software version and the type of PSU.

- a) With relation to the type of PSU, refer to note 1 on table 2.2.1.
 - Manufacturing GDK-FPII PSU(linear) has been officially stopped after launching PSU2(SMPS) in 1st half of 1999.
- b) At the main program version 1.2Xx or earlier, The number of stations should not be over 34 even though 2B-modules are connected.
- c) At the main program version 1.4Xx or later,
 - If the WTIB is not installed, the number of stations should not be over 48.
 - If the WTIB is installed, the number of stations except Wireless Terminal should not be over 32 and the number of stations including Wireless Terminal should not be over 64.

The following configuration charts, figures 2.2.2 to 2.2.5 can be made up in the system installed the software version 1.4Xx or later, and PSU2(SMPS).

2.2.2.2 Typical System Configuration Chart





- Note
 - 1) This typical Configuration Chart is made up according to the physical capacity of system, without 2B-module and Wireless Terminal (GAP-DECT).

2.2.2.3 System Configuration Chart without PRI Line



FIGURE 2.2.2.3.a GDK-FPII System Configuration Chart without WTIB



FIGURE 2.2.2.3.b GDK-FPII System Configuration Chart with WTIB

- Note
 - 1) Figure 2.2.2.3.b is only the configuration chart when a customer uses the maximum wireless terminals with RMWT 32. If RMWT is set by another value, above will be different configuration chart according to the RMWT.

RMWT can set by multiple of 8 in the range of 8 to 32. A customer can program this RMWT (default 8) in Admin field 02, Flexible button 3.

- RMWT: Registrable Maximum number of Wireless Terminal. For more details, refer to Installation and Maintenance Manual of GDK-162/100/FPII WOTS (Wireless Office Telephone System)
- 2) In above figures, the total extensions are the sum of the quantity of Stations and the number of 2B stations in station axis. With respect to 2B module, see the clause 2B module in Section 2.

2.2.2.4 System Configuration Chart with PRI Line



FIGURE 2.2.2.4.a GDK-FPII System Configuration Chart without WTIB



FIGURE 2.2.2.4.b GDK-FPII System Configuration Chart with WTIB

- Note
 - 3) Figure 2.2.2.4.b is only the configuration chart when a customer uses the maximum wireless terminals with RMWT 32. If RMWT is set by another value, above will be different configuration chart according to the RMWT.

RMWT can set by multiple of 8 in the range of 8 to 32. A customer can program this RMWT (default 8) in Admin field 02, Flexible button 3.

- RMWT: Registrable Maximum number of Wireless Terminal. For more details, refer to Installation and Maintenance Manual of GDK-162/100/FPII WOTS (Wireless Office Telephone System)
- 4) In above figures, the total extensions are the sum of the quantity of Stations and the number of 2B stations in station axis. With respect to 2B module, see the clause 2B module in Section 2.

2.3 SYSTEM SPECIFICATIONS

The following Tables provide general system specifications.

Items	Height	Width	Depth	Weight
Key Service Unit	463mm	403mm	160mm	15 Kg
	18.2in	15.9in	6.3in	31.1 lbs
Digital Keyset	236mm	192mm	84mm	1.5 Kg
Digital Reyset	9.3in	7.6in	3.3in	3.3 lbs
Electronic Keyset	220mm	245mm	70mm	1.6 Kg
Liectionic Reyset	8.6in	9.6in	2.8in	3.5 lbs
Digital DSS/DLS Console	236mm	125mm	62mm	0.9 Kg
	9.3in	4.9in	2.4in	2.0 1bs
Electronic DSS/DLS Consolo	236mm	125mm	62mm	0.9 Kg
	9.3in	4.9in	2.4in	2.0 1bs
Digital ICM/Door Box	45mm	140mm	100mm	0.5 Kg
	1.8in	5.5in	3.9in	1.1 1bs
Electronic ICM/Door Box	45mm	140mm	100mm	0.5 Kg
	1.8in	5.5in	3.9in	1.1 1bs

Table 2.3.1 Dimensions & Weights

Table 2.3.2	Environmental	Specifications
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	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	

Power Supply (PSU – linear): 1)	
AC Voltage Input	AC 110-127V / AC 220-240V @ 47~63Hz
AC Power	100W
AC Input Fuse	T 1.6A H250V (220-240V)
	T 3.15A L250V (110-127V)
DC Output Voltages	+5, -5, +28Volts
Power Supply (PSU2 – SMPS):	
AC Voltage Input	AC 88V~132V, AC 176V~264V @ 47~63Hz
AC Power	170W
AC Input Fuse	T 3.15A H250V
DC Output Voltages	+5, -5, +28Volts
Back-up Battery :	
PSU Input Voltage	24 Volt DC
PSU Battery Fuse	250 Volt/5A
Charging Current	Max. 500mA
Ext. Relay Contacts	1 amp @ 24 Volt DC
Music Source Input	Max. 0 dBm @ 600 ohms
External Page Port	Max. 0 dBm @ 600 ohms
	1 milli-watt max. input

Table 2.3.3 Electrical Specifications

• Note:

1. Manufacturing GDK-FPII PSU(linear) has been officially stopped after launching PSU2(SMPS) in 1st half of 1999.

	22 AWG Wire	24 AWG Wire
Digital Keyset		
2-wire loop	500 m (1.6 Kft)	330 m (1 Kft)
2B modules(with Power Adapter, 24Vdc/200 mA)		
System – Primary Keyset		300 m
Primary Keyset – Secondary Keyset		300 m
Primary Keyset – Secondary SLT		1000 m
2B modules(without Power Adapter)		
System – Secondary Keyset		10 m
System – Secondary SLT		100 m
Electronic Keyset		
4-wire loop	500 m (1.6 Kft)	330 m (1 Kft)
Single Line Telephone		
2-wire loop	2,500 m (8.2 Kft)	1,600 m (5.2 Kft: 490 ohm)

Table 2.3.4	Electrical Sp	ecifications

• Note: The distance between KSU and SLT may differ from above in some countries, because of the relevant special national specification.

Ring Detect Sensitivity	16-30 Hz, 40 Vrms
	30-60 Hz, 30 Vrms
DTMF Dialing	
Frequency Deviation	less than ±1%
Signal Rise time	3 msec, maximum
Tone Duration, on-time	75 mesc, minimum
Inter digit time	75 mesc, minimum
Pulse Dialing	
Pulse Rate	10 pps or 20 pps
Break/Make Ratio	60/40% or 67/33%

Table 2.3.5CO Loop Specifications

• Note: Ring Detection sensitivity and Pulse Ratio may differ from above in some countries, because of the relevant special national specification.

Main System Memory	Memory size
Read-Only-Memory, EPROM	basic = 2 Megabytes
Random Access Memory, RAM	basic = 256 Kbytes expansion = 256 Kbytes (MEMU / SMEMU)
Account Codes	Number
Number of codes	no limit
Digits per code	12
Authorization of codes	Number
Number of codes	110
Digits per code	5

Table 2.3.6 Miscellaneous Specifications

2.4 SYSTEM COMPONENTS

2.4.1 KSU (Key Service Unit)

The KSU is a metal frame cabinet designed for wall mounting. It contains a MBU(Main Board Unit), a PSU(Power Supply Unit) and an optional RGU(Ring Generator Unit).

The connecting cables for the extensions and CO lines exit through the outlet in the left bottom side of the KSU using the CHAMP cable. And this cable can be connected to a user installed termination point.

2.4.2 PSU (Power Supply Unit)

A Power Supply Unit, PSU, is fitted in the Key Service Units when delivering the system. The PSU converts commercial AC power (PSU-linear: $110 \sim 127 / 220 \sim 240$ VAC @ 50-60 Hz, PSU2-SMPS: $110 \sim 240$ VAC @ 50-60 Hz) to DC voltages, regulates the voltages, and provides the appropriate DC voltages to the back plane for distribution to other system components. Three DC outputs are provided : ± 5 VDC, ± 28 VDC. LEDs in the PSU front panel indicate valid outputs as well as the presence of AC input power.

The PSU includes circuitry to float charge externally connected 24 volt batteries and control operation of the battery back-up circuits. And the PSU will provide system operating voltages from the batteries if commercial AC power fails. In addition, battery back-up control circuitry is incorporated in the PSU to disconnect the batteries prior to a deep discharge and over charged.

The PSU is fitted in the Key Service Units when delivering the system. There are two kinds of PSUs; PSU and PSU2. See the clause; table 2.3.3 and the clause 3.3.5.

* Note : Refer to Appendix D about GDK-PHU installation.

2.4.3 MBU (Main Board Unit)

The MBU incorporates the system's memory, master clock, one internal and one external MOH ports, two DTMF receivers, one alarm detection circuit, one external paging port, two general purpose relays, watchdog circuitry and 6 ports digital terminal interface 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 256 Kbytes of RAM with battery back-up and can be expanded up to 512 Kbytes with an optional MEMU or SMEMU. RAM is associated with the system database and the real-time-clock is protected from power loss by a long life high energy lithium battery. For digital voice processing, two ROMs contain PCM tone, gain table, etc.

Four(4) EPROMs(2 Mbytes : U1-U4, 27C040) contain the basic system operating software.

There are three fixed slots and four universal slots for extending the system capacity. And four different types of option boards can be installed on the MBU such as PLLU2 for ISDN clock recovery, MEMU for RAM expansion, SMEMU for the functions of QSIG, TAPI and/or PC-ATTENDANT, MODU for modem interface and SIU for serial interface.

There are 3 CHAMP connectors on the MBU's left most side. The upper one is used to connect 6 digital terminal interface circuits of the MBU, 4 single line interface circuits with 4SLI board that installed on the slot #2, and two dry contacts of general purpose relays. The middle one is used to connect CO lines with CO interface board(s) that installed on slot #3~7. The last one is used to connect extension lines (digital terminals or SLTs) with DTIB or SLIB that installed on universal slots (slot #4~7).

It should be noted that the analog keysets can be connected to the ETIB directly through modular type connectors –RJ11 on the ETIB.

The PSU is fitted in the KSU when delivering the system.

MBU contains 1 internal and 1 external MOH sources, one external paging port, one alarm detection circuit, 2 general purpose relays, 2 DTMF receivers, and 6 digital terminal interface ports on itself. Add-on boards: MEMU, SMEMU, PLLU2, MODU, SIU

2.4.4 RGU (Ring Generator Unit)

The Ring Generator Unit provides the 25Hz sinusoidal ring voltage to the 4SLI/SLIB circuits for ringing the SLT. The output of the RGU is 90Vac, 25Hz with RGU-EX and can support simultaneous ringing for five(5) SLTs at a time, so up to 25 SLTs can be ringing by using time sharing technique.

The RGU is installed on the right bottom side of the KSU. And the RGU is electrically connected to the MBU.

2.4.5 PFTU/PFTU-I (Power Failure Transfer Unit)

<u>PFTU</u>

The PFTU provides the relay contacts for transfer of 6 CO Lines to 6 SLTs in the event of a power or processor failure. The PFTU is installed outside of the KSU and up to 3 PFTU modules can be connected to the KSU with the cascade connection of control wire. The PFTU is equipped with a manual switch that activates the Power Failure Transfer mode for testing purpose.

A 2-pin connector with screws is fitted for the control signal. And a RJ21 type male connector is fitted for the connection between CO line, CO interface circuit, SLT interface circuit and SLT.

<u>PFTU-I</u>

The PFTU-I provides relay contacts for transferring the first 2 CO lines of the 4LCO boards to SLT in the event of a power or processor failure. The PFTU-I can be installed on the 4LCO board only.

2.4.6 DVIB (Digitized Voice Interface Board)

The Digitized Voice Interface Board (DVIB) provides announcements for the system's ACD/UCD features as well as the System Voice Prompts and Recorded User Greetings. Following table shows the capacity of memory, ADPCM channel of DVIB, and its optional board.

Item	Basic	Option(for expansion)	Maximum Capacity	
			a board	a system
ADPCM channel	4 channels	ADPU; 4channels	8 channels	16 channels
System Voice Prompt	2 EPROMs	none	1 Mbyte	1 Mbyte
	1 Mbytes		4 min.	4 min.
	240 seconds			
ACD/UCD	6 SRAMs	none	768 Kbytes	768 Kbytes
Announcement	768 Kbytes		180 sec.	180 sec.
	180 seconds		(3 min)	(3 min)
User Greeting	8 DRAMs	DMEU:2 Mbytes(512 seconds)	8Mbytes	16 Mbytes
	4 MBytes	or	2048 sec.	4096 sec.
	1024seconds	DMEU4:4 Mbytes(1024 seconds)	(34 min.)	(68 min.)

Table 2.4.6The capacity of DVIB

- DVIB allows a DMEU or a DMEU4 to be expanded.
- GDK-FPII allows up to 2 DVIB board to be installed.
- ACD/UCD Announcements are protected from power loss by a long life lithium battery, but User Greetings are not.
- The capacity of ACD/UCD announcements will not be expanded even though 2 boards are installed in a system.

DVIB employs ADPCM channel to store and play System Voice Prompts, ACD/UCD announcements, and Recorded User Greetings. All voice data will be stored and reproduced by using ADPCM technique that compresses the 64Kbps to the 32Kbps in record mode and expands the 32Kbps to the 64Kbps in play mode.

Note that each channel can operate as either record or play mode at a time.

The System Voice Prompts for the standard version of the DVIB are recorded in English. However, customized recordings can be made available for local market requirements.

There are three option board, one is ADPU for ADPCM channel expansion and the others are DMEU and DMEU4 for DRAM expansion.

DVIB can be installed in any of slot No. 1 or slot No. 4~7. And maximum two boards can be installed in a system. Add-on boards: ADPU, DMEU, DMEU4

2.4.7 Extension Boards

The various types of GDK-FPII Extension Boards have capable of supporting various types of terminals as followings,

Board Name	Function	Remark
DTIB	Provides 6 Digital Terminal interfaces	2 wire
ETIB	Provides 6 Electronic Terminal interfaces	4 wire
4SLI	Provides 4 SLT interfaces with a line voltage of 24V.	2 wire
SLIB	Provides 6 SLT interfaces with a line voltage of 24V.	2 wire
WTIB/WTIU	Be capable of accommodating up to 8 Base Stations.	4 wire
	(up to 64 wireless terminals)	
STIB	Be capable of accommodating up to 2 ISDB BRI S interfaces, 4 B	4 wire
	channels. (Each interface is T/S switchable)	

Note:

1. 4SLI can be only installed in slot No. 2. SLIB can be installed in the universal slots (slot No. 4~7).

2.4.7.1 DTIB (Digital Terminal Interface Board)

The DTIB provides 6 circuits of the LGE proprietary digital interface for the system. It provides 2-wire interface to digital terminals. The DTIB functions as a MUX/DEMUX for the digitized voice and data signals to and from the digital keysets by using the CHAMP connector (CN16) on the MBU. In addition, one LED is mounted on the PCB to indicate the state of connected keysets. LED will turn on when one or more ports are busy. 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.

DTIB can be installed in any of four universal slots. (slot #4~7) The maximum 4 boards can be installed in a system. See the clause 2.2 SYSTEM CAPACITY.

2.4.7.2 ETIB (Electronic Terminal Interface Board)

The ETIB allows GSX series of Electronic Keysets to be connected to the system. The PCB provides for 6 interface circuits and incorporates circuitry for A/D and D/A conversion of voice signals, and interprets and sends signaling data to and from the keysets. The ETIB has an industry standard modular jack connector per interface and mounted on the front edge for connecting to the station termination port. In addition, a LED is mounted on the PCB to indicate the status of ports connected to the ETIB, LED will turn on when one or more ports are busy.

This board can be installed in any one of four universal slots. (slot #4~7) The maximum 4 boards can be installed in a system. See the clause 2.2 SYSTEM CAPACITY

2.4.7.3 SLIB/4SLI (Single Line Interface Board)

Board Name	Interface circuit	Feed voltage	Remark
4 SLI	4 cct	24VDC battery feed	In slot No. 2
SLIB	6 cct	24VDC battery feed	In universal slots

SLIB allows single line analog devices to be connected. Two kinds of SLIB boards are available in GDK-FPII system;

There are two kinds of Single Line Interface boards, one is 4SLI and the other is SLIB. The major difference is the 4SLI board should be installed on slot #2 only and the SLIB can be installed on any one of four universal slots (slot #4~7). The 4SLI provides the capability to connect 4 SLTs to the system, but the SLIB provides the capability to connect 6 SLTs to the system with appropriate A/D and D/A conversion. The 4SLI/SLIB allow SLT 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 via a 25-pair CHAMP connectors on the MBU. To connect SLTs to the GDK-FPII system, the 4SLI board on slot #2 uses upper most CHAMP connector(CN14) and the SLIB(s) on the universal slot(s) uses lower most CHAMP connector(CN16) of the MBU. The 4SLI/SLIB can be equipped with a Message Wait source(optional MSGU), which activates a lamp in the SLT, if so equipped. The Message Wait source sends a 90Vdc signal to the SLT illuminating the message waiting lamp. And an optional DTMF receiver unit(DTRU) can be installed on the 4SLI/SLIB. A Ring Generator Unit is required in cabinet if a 4SLI/SLIB is installed. The 4SLI/SLIB allows a single line telephone to be connected up to 2.5 Kilometers (8,200 feet, loop resistance: 490 ohm) from the system by using 22 AWG wire. In addition, a LED is mounted on the PCB to indicate the status of interface circuits connected to 4LSI/SLIB, LED will turn on when one or more ports are busy.

4SLI can be only installed in slot No. 2.

SLIB can be installed in the universal slots (slot No. 4~7)

The maximum 4 SLIBs can be installed in a system. See the clause 2.2 SYSTEM CAPACITY Add-on boards: DTRU, MSGU

2.4.7.4 WTIB /WTIU (Wireless Terminal Interface Board / Unit)

The WTIB provides standard interface between the GDK-FPII digital Key Telephone system and DECT (Digital Enhanced Cordless Telecommunications) Network. The system can accommodate one WTIB, which is capable of supporting up to 4 Base Stations. The WTIB can be optionally equipped with WTIU to expand Base Stations, which can support up to additional 4 base stations. So the system allows maximum 8 Base Stations to be connected. Following table shows the capacity of WTIB and its expansion board.

Items	WTIB	Max. Capacity with WTIU(expansion)
Maximum Cell Number	4	8
(Base Station Number)		
Voice channels / Cell	5	5
Registrable Maximum	8 – 32	8 – 32
Terminal Number	by step 8	by step 8
Max. Simultaneous	16	16
Wireless calls		

Note

- 1. Registrable Maximum Wireless Terminal numbers are programmable in Admin field 02.
- 2. WTIB/WTIU contains RJ11 type connectors for the connection to Base Stations.

A WTIB should be installed in any of slot No. 1 or the universal slots (slot No. 4~7). MEMU(or SMEMU) should be installed on the MBU for proper operation.

For more details, see INSTALLATION and MAINTENANCE MANUAL (GAP) of GDK-162/100/FII WOTS(Wireless Office Telephone System).

2.4.8 Analog CO Line Boards

GDK-FPII Analog CO line Boards have capable of supporting various types of analog CO line as followings,

Board	Function	connection
LCOB	Provides Loop Start CO interfaces, 4 interfaces	2 wire
AC15	Provides AC15a signaling interfaces, 2 interfaces; UK	4 wire
TLIB	Provides 2-wire E&M interfaces, 2 interfaces; Korea	4 wire
BWDIDB	Provides Both-way DID interfaces, 4 interfaces; New Zealand	2 wire

Note

Analog CO line Boards except LCOB are designed to comply with special national specification and application, so it may not suitable for the other national specification and/or application.

2.4.8.1 LCOB/4LCO (Loop Start CO Line Interface Board)

There are two kinds of Loop-start CO line boards. One is 4LCO and the other is LCOB. The major difference is the 4LCO board should be installed on slot #3 only, but the LCOB can be installed on any one of four universal slots.(slot #4~7)

All these two boards have 4 Loop Start CO lines with ring and loop current detection, A/D and D/A conversions, and pulse signaling. An optional Call Metering Unit(CMU) and a Call Progress Tone detection Unit(CPTU) and a DTMF Receiver Unit(DTRU) can be installed on the 4LCO/LCOB.

An optional Power Failure Transfer Unit-I (PFTU-I) board can be installed on the 4LCO only. This PFTU-I supports power failure transfer function for the first two ports (CO1 & CO2) of the 4LCO boards.

For power failure transfer from LCOB, you have to use external PFTU module.

4LCO and LCOB contain four LEDs, one for each port, to indicate the status of each CO line.

4LCO can be only installed in slot No. 4.

LCOB can be installed in any of universal slots (slot No.4~7).

The maximum four LCOB can be installed in a system. See the clause 2.2 SYSTEM CAPACITY. Add-on boards: DTRU, CPTU/A, CPTU/B, CMUPR/CMU50/CMU12/CMU16/CMU12PR/CMU50PR

2.4.8.2 AC15 Board (AC15 Private Line Interface Board) - UK

The AC15 board provides an analog interface between outside tone controlled private lines and the system. An AC15 board has 2 interface circuits and each AC15 private line interface circuit provides two-pair(transmitting and receiving) audio interface circuit and is designed to comply with the tone signaling requirements of UK. There are two private line interface circuits per one board and each AC15 private line interface circuit provides the A/D and D/A conversions for audio and signaling to and from the system and AC15 private line. The AC15 board contains two LEDs to indicate the status of each line.

It is designed to comply with the UK specification and application, so it may not suitable for the other national specification and/or application.

This board can be installed in any one of four universal slots (slot #4~7).

The maximum four AC15 boards can be installed in a system. See the clause 2.2 SYSTEM CAPACITY in section 2.

2.4.8.3 TLIB (Tie Line Board) -Korea

TLIB provides 2 interface circuits that can support 2-wire E&M or Ring Down according to the administration. Each line supports E&M type V of E&M line.

The TLIB board contains two LEDs to indicate the status of each line.

It is designed to comply with the Korean specification and application, so it may not suitable for the other national specification and/or application.

This board can be installed in any one of four universal slots (slot #4~7). The maximum four TLIBs can be installed in a system. See the clause 2.2 SYSTEM CAPACITY.

Add-on board: DTRU

2.4.8.4 BWDIDB (Both-way Direct Inward Dialing Board) - New Zealand

BWDIDB provides 4 both-way DID interfaces, which support DTMF or Pulse dialing. It supports both Incoming and Outgoing calls with pulse or DTMF.

Each interface consists of polarity reversal, pulse dialing, call direction control, open loop control, loop detection and polarity detection circuit.

The BWDIDB contains four LEDs to indicate the status of each line. DTMF Receiver Unit (DTRU), Call Progress Tone detection units (CPTU/A) can be installed optionally on the BWDIDB.

It is designed to comply with the New Zealand specification and application, so it may not suitable for the other national specification and/or application.

This board can be installed in any one of four universal slots (slot #4~7).

The maximum four BWDIDBs can be installed in a system. See the clause 2.2 SYSTEM CAPACITY.

Add-on boards: DTRU, CPTU/A

2.4.9 ISDN Boards

GDK-FPII ISDN Boards are capable of supporting various types of ISDN as followings,

Board	Function	connection
PRI	Provides ISDN Primary Rate interfaces,	4 wire
	1 interface /30 B channels	
2BRI	Provides ISDN Basic Rate interfaces(T),	4 wire
	2 interfaces /4 B channels	
STIB	Provides ISDN Basic Rate interfaces(T/S switchable),	4 wire
	2 interfaces /4 B channels	

2.4.9.1 ISDN PRI (Primary Rate Interface Board)

PRI (Primary Rate Interface) board has capability of one(1) PRI line, which has a interface circuit for 30 channel time slots with 2.048Mbps data rate speed. PRI will be positioned at reference point Ia(T) on ETS 300. 001, that is TE slave without power feeding. And, Data & bit clock are transmitted by the NT master and extracted by the TE slave.

PRI contains reset circuit, address decoder and DBID, and the board line's specific circuitry with PEB2254. The PRI has no local micro-processor and the micro-processor on the MBU controls PRI card directly.

The PRI board can be installed only in the slot No. 3.

The PLLU2 MUST be installed for proper operation.

The MEMU(or SMEMU) should be installed on the MBU for proper operation.

Only 1 PRI board can be installed in a system, and total CO lines should not be more than 34 lines(channels) including PRI and Analog lines..

QSIG function can be supported through PRI (software version 99A), and SMEMU MUST be used for this function.

2.4.9.2 ISDN 2BRI (Basic Rate Interface Board: T interface only)

2BRI has specified to support two interface circuits that allow interfacing the ISDN BRI. Data and bit clock are transmitted by the NT master and extracted by this board. The GDK-FPII system will be positioned at reference point Ia on ETS 300. 012, that is TE slave without power feeding.

2BRI contains reset circuit, address decoder, the circuitry to control the highway interface (DBID), and the board line's specific circuitry with PEB2086 for physical layer and data link layer. The 2BRI has no local micro-processor and the micro-processor on the MBU controls 2BRI card directly.

The 2BRI board can be installed only in the slot No. 3.

The PLLU2 MUST be installed for proper operation.

QSIG function can be supported through 2BRI (software version 99A), and SMEMU MUST be used for this function.

2.4.9.3 ISDN STIB (Basic Rate Interface Board: switchable S/T interface)

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 transmitting capability to support 192Kbps(2B+D). Data & bit clock are transmitted by the NT master and extracted by TE slave. The GDK-FPII system can be positioned at reference point Ia(T) or Ib(S) on ETS 300. 012, that is TE-slave without power feeding or NT-master with power feeding. By selecting the jumper position and DIP switch on each line interface, the STIB can support either S-interface (Line card function) or T-interface (Trunk function).

SCC1 of CPU(MC68LC302) is assigned as 512Kbps HDLC communication to main processor on MBU. SCC2 of CPU is assigned as 38400bps RS-232C channel. This RS-232C channel will be used only in development stage for software and hardware debugging.

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

STIB should be installed in the slot #1 and/or in any one of universal slots (slot #4~7).

The PLLU2 MUST be installed for proper operation.

The maximum 5 STIB boards can be installed in a system. But with respect to total CO lines and extensions, See the clause 2.2 SYSTEM CAPACITY.

QSIG function can be supported through STIB T-interface only (software version 99A), and SMEMU MUST be used for this function.

2.4.10 Add-on boards

This chapter describes add-on boards, which can be installed on various types of boards to support the proper function

Board Name	Function	position
MEMU	Expands SRAM size.	MBU
SMEMU	Expands SRAM size and provides QSIG,CTI, and PCATTN.	MBU
MODU	Provides a 1200/2400 baud modem for local access	MBU
PLLU2	Provides the synchronized system clock when ISDN installed.	MBU
SIU	Provides additional an RS232 serial interface.	MBU
DTRU	Provides further 2 DTMF receivers	1)
MSGU	Provides Message Waiting signals to 6 SLT ports	2)
CPTU/A,CPTU/B	Provides Call progress detection function	3)
CMU	Provides Call Metering signal detection	4)
DMEU/DMEU4	Expands DRAM size for User Greetings(2M/4M)	DVIB
ADPU	Expands 4 ADPCM channels	DVIB

Note:

- 1. DTRU can be installed on 4SLI, SLIB, LCOB, BWDIDB, and TLIB.
- 2. MSGU can be installed on 4SLI and SLIB.
- 3. CPTU/A, CPTU/B can be installed on LCOB, BWDIDB.
- 4. Each type of CMU can be installed on the LCOB according to the local market condition and regulatory requirements.
- MODU, PLLU2 (issue3 or later), DTRU, MSGU, CPTU/A, CPTU/B and ADPU can be commonly used in both GDK-100 and GDK-FPII systems. But PLLU2 issue 2 or earlier can be only used in GDK-FPII system.
- 6. CMU and DMEU/DMEU4 can be commonly used in GDK-162, GDK-100, and GDK-FPII systems.

2.4.10.1 MEMU (Memory Expansion Module)

The MBU contains the basic system RAM memory. The RAM provides the memory for the system database, speed dial numbers, SMDR buffer, etc. The basic RAM is 256 Kbytes and can be expanded up to 512 Kbytes with the MEMU.

MEMU is required for following function.

- Increase the SMDR record buffer from 100 to 2,000
- On-demand Ring
- ISDN CLIP and CO Message Wait: up to 1000
- ISDN Flexible DID table: 000~999 (* User programmable bins: 000~299)
- MSN
- ACD Statistics
- Expanded LCR Table
- WTIB (DECT GAP)
- Enhanced CCR 1)
 - Note:
 - 1) Above features are supported by the software 98FEB or later version. But the Enhanced CCR is only supported by the software 99A or later version.

MEMU is optionally installed on the MBU.

MEMU or SMEMU MUST be installed for the operation of PRI and/or WTIB.

2.4.10.2 SMEMU (Security Memory Expansion Unit)

The SMEMU is an enhanced version of existing MEMU. So it provides all the function of MEMU. In addition, the SMEMU allows QSIG, TAPI and/or PC-ATTENDANT to be operated in GDK-FPII system. The memory size is 256 Kbytes.

SMEMU is required for following features.

- Increase the SMDR record buffer from 100 to 2,000
- On-demand Ring
- ISDN CLIP and CO Message Wait: up to 1000
- ISDN Flexible DID table: 000~999 (* User programmable bins: 000~299)

1)

- MSN
- ACD Statistics
- Expanded LCR Table
- WTIB (DECT GAP)
- Enhanced CCR

	•,
- QSIG	1), 2)
- PC-Attendant	1), 2)
- GDKSP based on TAPI 2.1	1), 2)

- Note:
 - 1) Above features are supported by the software 98FEB or later version. But the features marked 1) are only supported by the software 99A or later version.
 - 2) SMEMU should be required for the features marked 2).

The SMEMU can be optionally installed on the position of MEMU of MBU.

SMEMU MUST be installed on the MBU for the proper operation of QSIG, TAPI and/or PC-ATTENDANT in the system.

SMEMU or MEMU MUST be installed for the operation of PRI and/or WTIB.

2.4.10.3 MODU (Modem Unit)

The Modem Unit provides an asynchronous modem for access to the system database and fault reporting features from a remote site. The module is optionally installed on the MBU and incorporates a 1200/2400 baud modem. The modem may be connected to a pre-selected CO line through the system switching matrix. The remote side which contains an external modem port, may be connected to the system through this MODU with pre-selected CO line. The MODU port is independent with the SIU standard RS-232C port, allowing system database access, etc. without the need to interrupt the SMDR output.

Basically, the system can support two(2) serial channels at a time. One is SIU(1) for serial RS-232C interface and the other is one of SIUs(2) for serial RS-232C interface or MODU for modem function.

So, it should be noted that if the MODU is installed, the system supports one SIU(1) module.

2.4.10.4 PLLU2 (Phase Locked Loop Unit)

PLLU2(PLL Unit 2) is an option board of MBU and generates 32.768MHz clock which is synchronized to ISDN line. The 32.768MHz clock is provided to GSXD on the MBU. It consists PLL circuit and clock (from Digital Trunk interface board) monitoring circuit.

For the system synchronization, the clock should be extracted from 2BRI, PRI or STIB. But, if clock is not generated from 2BRI, PRI or STIB(clock from ISDN card is not present), this unit generates master clock(32.768MHz) when ISDN card is absent, this unit generates master clock(32.768MHz) using internal clock.

The PLLU should be installed on MBU when any ISDN card is installed in the system.

2.4.10.5 SIU (Serial Interface Unit)

The Serial Interface Unit provides a RS-232C interface port with 9-pin connector. The maximum baud rate is 9600bps(default). The SIU is useful for system maintenance, PC based admin., SMDR print out and SMDI for PC based voice mail system. And two SIU boards can be installed on the position of SIU(1) and SIU(2) of the MBU when the MODU is not installed. Followings are the list of the system's output;

- Administration database
- Off-line SMDR (on-demand)
- On-line SMDR
- Statistical Information
- SMDI (voice mail)
- System trace data

The purpose of each SIU(1 & 2) can be defined by admin. programming.

2.4.10.6 DTRU (DTMF Receiver Unit)

One DTMF Receiver Unit contains 2 DTMF receiver circuits. The DTRU can be optionally installed on the 4LCO/LCOB and 4SLI/SLIB and each receiver is time-shared under the control of the system software.

The DTRU can be optionally installed on 4SLI, SLIB, LCOB, BWDIDB, and TLIB. The maximum DTMF receivers including DTMF receivers on MBU are 14 in a system.

2.4.10.7 MSGU (Message Wait Unit)

The Message Wait Unit sends a 90Vdc signal to the SLT for illuminating the Message Wait lamp. The Message Wait Unit contains 6 circuits to support 6 SLTs.

The MSGU can be installed on 4SLI/SLIB.

2.4.10.8 CPTU (Call Progress Tone Detection Unit; CPTU/A, CPTU/B)

The Call Progress Tone Detection Unit is used to detect specific call progress tones which are supplied from the CO or PABX. Tone detection is employed to support features such as ACNR(Automatic Called Number Redial).

CPTU provides 2 tone detection circuits that are time-shared under the control of the system software, as a system resource regardless its position.

CPTU have two versions; CPTU/A and CPTU/B. CPTU/A has wide tone detection range (305Hz - 640Hz), and CPTU/B has narrow tone detection range (350Hz, 620Hz, 440Hz, 480Hz \pm 1%).

Any Kind of CPTU can be optionally installed on the LCOB and BWDIDB.

It is important to check the local specification regarding call progress tone to use CPTU/B.

2.4.10.9 CMU (Call Metering Unit)

The Call Metering Unit detects call metering signals from the CO or PABX to monitor call duration/charges. There are six kinds of CMUs as followings,

- 12KHz
- 12KHz and Polarity Reversal
- 16KHz
- 50Hz Longitudinal
- 50Hz Longitudinal and Polarity Reversal
- Polarity Reversal

The CMU can be optionally installed on the 4LCO/LCOB and each CMU supports one CO line. Each type of CMU can be installed on the LCOB according to the local market condition and national regulatory requirements.

2.4.10.10 DMEU/DMEU4 (DRAM Memory Expansion Unit)

The DMEU or DMEU4 allows for expansion of the DRAM memory on the DVIB. The DMEU expands to 512 seconds for Recorded User Greetings time. And the DMEU4 expands to 1024 seconds for Recorded User Greetings time.

DMEU or DMEU4 can be optionally installed on the DVIB. See clause 2.4.8 DVIB.

2.4.10.11 ADPU (ADPCM Unit)

The ADPU allows for expansion of ADPCM channels on DVIB. The ADPU expands to 4 channels for ADPCM.

ADPU can be optionally installed on DVIB,

2.4.11 Keyset& Terminals

In addition to supporting analogue Single Line devices, by selecting appropriate interface boards, the system will support either or both the LG Digital Keysets /Terminals or the LG Electronic Keysets /Terminals.

2.4.11.1 Digital Keysets and Terminals

		, ,	
Model	Description	Model	Description
KD-36EXE	24 Flexible Button Display	KD/E-36EXE	24 Flexible Button Display
KD-36ENH	24 Flexible Button Normal	KD/E-36ENH	24 Flexible Button Normal
KD-24EXE	12 Flexible Button Display	KD/E-24EXE	12 Flexible Button Display
KD-24ENH	12 Flexible Button Normal	KD/E-24ENH	12 Flexible Button Normal
KD-33LD	8 Flexible Button Large Display	KD/E-8BTN	8 Flexible Button Normal
KD-DSS	48 Button DSS/DLS Console	KD/E-36LD	24 Flexible Button Large Display
		KD/E DSS	48 Button DSS/DLS Console
LKD-30DS	30 Flexible Button Display	KD-Digital Phone Box	Digital Intercom Box
LKD-8DS	8 Flexible Button Display	CTI module 1)	CTI module
LKD-2NS	2 Flexible Button Normal		
LKD-30LD	30 Flexible Button Large Display		
LKD-48DSS	48 Button DSS/DLS Console		

Various types of digital terminals are used with GDK-FPII MBU,DTIB as below:

Note:

- This type of terminal and KD/C and KD/EC series Keysets will not be supplied any more, but CTIU8/CTIU30 which are inserted on the bottom side of LKD Keysets, are supplied for CTI operation. See GDK-PC PHONE (CTI) in this section.
- 2) Minimum software requirements for LKD operation: 1.2 or later version (except 1.4 version)

<u>Digital Keysets</u>

General Description

Each Digital Keyset has a standard 12 button dial-pad, color coordinated handset, an integral Wall Mount kit, a slide-out Directory Tray, an array of "Flexible Buttons", and 12 Fixed Feature Access keys. All of the Flexible and Fixed Buttons, except Volume, incorporate a long-life, super-bright LED to indicate the feature or circuit status. The number of "Flexible Buttons" differ from mdes in above table . The fixed feature access keys are the same for each keyset 8/2 button Keyset. Each Digital Keyset includes a RJ-11 type jack for connection to the system. See Figures 2.4.1 to 2.4.3.

<u>Speaker Phone</u>

Each Digital Keyset except LDK-2NS is equipped with circuitry that enables the telephone to be used hands-free in two way conversations. This circuitry provides voice-switched speaker phone operation which gives channel control to the party with the highest energy level. The speaker phone circuit is controlled by the user with the MON button at KD, KD/E and the ON/OFF button at LKD Keyset.

Volume Control

The volume control is a rocker arm button. Pressing the right side increases volume, the left decreases volume. The volume button controls the volume level of voice and ring signals received at the speaker in the keyset. Also, in the Dial-By-Name (Directory Dial) mode, the volume button scrolls the name display up and down, scrolling display information to find a telephone number in the directory.

<u>LCD Display</u>

The Display Keysets with EXE suffix in model name incorporate a 2-line, 48-character Liquid Crystal Display (LCD). The LCD provides alpha-numeric display of various information to assist the user in operation of features. In the idle mode, the display will show the station name or number on the top line and the time and date on the second line.

And The Large Display Keysets with LD suffix also incorporate a 7-line, 112-character large Liquid Crystal Display (LCD)

<u>Digital DSS</u>

The Digital Direct Station Selection/Direct Line Selection (DSS/DLS) Consoles can be connected to any port of a DTIB in place of a Keyset. Up to 6 DSS/DLS Consoles can be associated with a Keyset in the system database. Each console incorporates a 4 by 12 matrix of "Flexible Buttons", a total of 48 Buttons, each with an associated LED for status indications. The DSS/DLS Console includes a RJ-11 type jack for connection to the system.

Digital Phone Box

The Digital Phone Box provides hands-free intercom conversation from any location that generally does not require a fully functional Key Telephone. The Digital Phone Box is connected to any port of a DTIB in place of a Keyset. The Digital Phone Box includes a volume control slide switch and has 2 feature buttons with LEDs; one to call preprogrammed stations CALL and the second to block incoming calls DND.

2.4.11.2 Electronic Keysets and Terminals

Electronic terminal means the Keysets that can be connected to the LG Analog Key Telephone System such as GHX system.

Model	Description	Model	Description
GSX 8	8 Button Keyset	GSX/E 8	8 Button Keyset
GSX 21 ENH	21 Button Enhanced Keyset	GSX/E 21 ENH	21 Button Enhanced Keyset
GSX 21 EXE	21 Button Executive Keyset	GSX/E 21 EXE	21 Button Executive Keyset
GSX 33 ENH	33 Button Enhanced Keyset	GSX/E 33 ENH	33 Button Enhanced Keyset
GSX 33 EXE	33 Button Executive Keyset	GSX/E 33 EXE	33 Button Executive Keyset
GSX 48DSS	48 Button DSS/DLS Console		
KD-ICMB	Electronic Intercom/Door Box 1)		

Various types of electronic terminals are used with GDK-FPII ETIB as below:

Note:

All the types of electronic terminals can be connected to the GDK-FPII ETIB. Almost every terminal can be also connected to the LG analog KTS, but KD-ICMB can be connected only to the LG Digital KTS, not to the LG analog KTS. On the contrary, GSX Phone Box can be connected only to the LG Analog KTS, not to the LG Digital KTS

Model	Digital KTS		Analog KTS
	The DTIB of Digital KTS	The ETIB of Digital KTS	
KD-Digital Phone Box	Yes	Х	Х
KD-ICM Box	Х	Yes	Х
GSX Phone Box	Х	Х	Yes

Following table shows three types of Phone Boxes and the system to which they can be connected.

Electronic Keysets

General Description

Each Electronic Keyset has a standard 12 button dial-pad, color coordinated handset, an integral Wall Mount kit, a slide-out Directory Tray, volume control slide switches, an ICM control switch, an array of "Flexible Buttons", and 5 or 11 Fixed Feature Access keys. All of the Flexible and Fixed Buttons, incorporate a long-life LED, indicating the feature or circuit status. Each Electronic Keyset includes a RJ-11 type jack for connection to the system. See Figure 2.4.4.

Speaker Phone

Each Electronic Keyset is equipped with circuitry that enables the telephone to be used hands-free in two way conversations. This circuitry provides voice-switched speaker phone operation which gives channel control to the party with the highest energy level. The speaker phone circuit is controlled by the user with the MON button.

Volume Control

The Electronic Keysets have a volume control slide switch RING VOL, which controls the volume of all tone signals sent to the speaker of the Keyset including muted ring. In addition, each 21 and 33 Button Electronic Keyset includes a second volume control slid switch SPKR VOL to control the level of all voice signals sent to the speaker of the Keyset. Moving the control to the right increase volume, to the left decrease volume.

<u>H-T-P switch</u>

The Electronic Keysets are equipped with a three position slide switch which determines the signaling mode for incoming intercom calls.

Position	Function
"HF" position	Intercom call announce w/hands free reply
"TN" position	Intercom tone ring
"PV" position	Intercom call announce w/Privacy

<u>LCD Display</u>

The 21 33 Button Executive Keysets incorporate a 2-line, 48-character Liquid Crystal Display (LCD). The LCD provides alpha-numeric display of various information to assist the user in operation of features. In the idle mode, the display will show the station name or number on the top line and the time and date on the second line.

Electronic DSS

The Electronic Direct Station Selection/Direct Line Selection(DSS/DLS) Consoles can be connected to any port of an ETIB in place of a Keyset. Up to 6 DSS/DLS Consoles can be associated with a Keyset in the system database. Each console incorporates a 4 by 12 matrix of "Flexible Buttons", a total of 48 Buttons, each with an associated LED for status indications. The DSS/DLS Console includes a RJ-11 type jack for connection to the system.

Electronic Phone Box

The Intercom/Door Box, KD-ICM Box, provides hands-free intercom conversation from any location that generally does not require a fully functional Key Telephone. The ICM/Door Box is also used to monitor areas such as a door or entry-way. The ICM/Door Box is connected to any port of an ETIB in place of a Keyset. The ICM/Door Box incorporates a volume control slide switch and has 2 feature buttons with LEDs; one for calling preprogrammed stations CALL and The second to block incoming calls DND.

2.4.11.3 2B-module

The 2B-module allows another terminal, DKTU (Digital Key Telephone Unit) or SLT (Single line Telephone) behind LKD-30DS to be connected. There are 2 kinds of 2B-modules; 2B-DTIU30 for the connection to another DKTU behind LKD-30DS, and 2B-SLIU30 for the connection to another SLT behind LKD-30DS. These 2B-modules can be only installed in LKD-30DS. See Figure 2.4.5 2B modules.

In GDK-FPII system, LDK-30DS with 2B-module can be connected to any port of Digital terminal Interfaces.

The advantage of 2B module in GDK-FPII system;

- 1. Increase the system capacity. See the SYSTEM CAPACITY in section 2.
- 2. Simple wiring with two terminals.
- 3. DTIB is capable of connecting to single line device such as Fax/Modem without any SLIB board.

2B modules are supported in the following condition

- Software: 1.2 or later version (except 1.4 version)
- Hardware: Digital Terminal Interface only, LKD-30DS, 2B-DTIU30 or 2B-SLIU30
- Line length. See Table 2.3.4 Electrical Specifications
 - Note:
 - 1. In case of using 2B-DTIU30 and the secondary digital keyset, it is recommended to use the separate mains adapter, which confirms to the appropriate national or local electrical adapter for the secondary DKTU.
 - 2. The separate mains adapter can be get in local market, the recommended specification is;
 - Output capacity: 24 to 30Vdc, more than 200 mA
 - Size of output plug: the inside diameter 2.1mm, the outside diameter: 5.5mm

The following table shows LKD series which the 2B module can be installed.

DKTU	2B-DTIU30	2B-DTIU30
LKD 30DS	Yes	Yes
LKD 30LDS	х	Х
LKD 8DS	Х	Х
LKD 2NS	Х	Х

• Note: 2B-modules and extensions are limited as followings,

Classification	Capacity		
	1.2 or earlier S/W version	1.4 or later S/W version	
CO lines	34	34	
Max. Extensions	34	48 without WTIB	
		64 with WTIB	
Max. 2B-modules	16	24	
2B module numbering	38	48 or (the last number of 1B + 1)	

- 1. At the program 1.2 or earlier version,
 - the number of 2B modules should not be over 16,
 - the number of stations should not be over 34 even though the 2B-modules are connected.
- 2. At the program version 1.4 or later version,
 - the number of 2B modules should not be over 16,
 - if the WTIB is not installed, the number of stations should not be over 48 even though the 2B-modules are connected,
 - if the WTIB is installed, the number of stations except wireless terminals should not be over 32 even though the 2B-modules are connected,
- 3. Above table is subject to use PSU2 extended capacity.
 - The maximum extensions with PSU(Linear) are limited by 34 without WTIB/ 48 with WTIB, because of its power capacity.
 - The maximum extensions with PSU2(SMPS) are limited by 48 without WTIB/ 64 with WTIB.

2.4.11.4 GDK-PC PHONE (CTI)

GDK-PC PHONE is based on Microsoft TAPI (Telephony Application Programming Interface) Standard Specification and Windows 3.1 or Windows 95 environment. With Computer Telephony, a customer can use computer to take an advantage of a wide range of sophisticated communication features and services over a telephone line. GDK-PC PHONE includes the various value added features to integrate Computer and Telephone, to manage all the details associated with telephone business.

There are 2 kinds of hardware configurations, one is an external CTI module with KD/C or KD/EC series DKTU, the other is an internal CTI module with LKD series DKTU. See Figure 2.4.6 CTI module.

External CTI module package

An external CTI module contains three connectors, 2 RJ-11 type jacks and a RS-232C. One of RJ-11 type jack is used for the connection to Digital Terminal Interface port of the system through 2-wire telephone line, and the other is for the connection to KD/C or KD/EC series through 6-wire telephone line. And RS-232C, comprised of 9-pin connector, is for the connection to a computer. All the line cords and RS-232 cable are provided in the same package.

External CTI module allows only KD/C or KD/EC series to be connected, but not another type of DKTU.

Internal CTI module package

An internal CTI module can be installed on the bottom side of LKD series DKTU. And the cable with RS-232C 9-pin connector and RJ11 type plug is provided for the connection to a computer in the package.

There are two kinds of internal CTI modules, CTIU30 and CTIU8. CTIU30 can be installed in LKD-30DS, and CTIU8 in LKD-8DS and LKD-2NS, but not possible in LKD-30LDS with Large Display.

DKTU	CTIU30	CTIU8
LKD 30DS	Yes	Х
LKD 30LDS	Х	Х
LKD 8DS	Х	Yes
LKD 2NS	Х	Yes

For more details, see "Installation And User's Guide for GDK-PC PHONE".

2.4.12 Cables (5MC1, 5MC2)

There are two kinds of line connection cables, one **5MC1: 6851NF0023A**) is for the connection to analog CO lines or PFTU, and the other **(5MC2: 6851NF0028A)** is for the connection to the terminals or miscellaneous devices. 5MC1 consists of the 25-pair cable with 5 meter line length and a RJ21 type female connector, and 5MC2 consists of the 25-pair cable with 5 meter line length and a RJ21 type male connector. One end of the cable is connected to a RJ21 type connector, and the other is open.

So the RJ21 type connector of the cable can be connected to another RJ21 type connector on the function boards according to the type of connector described above. And open wires of the cable can be connected to a user connection point, e.g. the MDF which a supplier provides.

MDF, which is in wide use in the countries, can be locally used according to the requirements of local regulation.

If necessary, above cables can be supplied from a supplier on the order.

2.4.13 BRI Line Terminating Board (GDK-162/100 TERM: 2923NP1656A)

GDK-162/100 TERM unit provides four pairs of 100 ohm terminating resistors. The unit is capable of accommodating 4 BRA lines with RJ45 type jacks. It has metal case.

This can be connected at outside of the system. If a customer use Basic Rate (S or T) interface but the 100 ohm terminating resistors are not introduced on the interface circuit, this board will be useful.

See the parts of 2BRIB Installation and Terminating Resistors on Basic Rate Interfaces in section 3.

2.4.14 Trace Tool (GDK-TRC1)

GDK-TRC1, Figure 2.4.7, provides a RS-232 Serial Interface for the maintenance of special cards of GDK-FPII system. It provides 4-wire interface to connect to GDK-FPII boards and RS-232 interface to connect to the serial port of PC. All two cables are offered in the GDK-TRC1 package.

GDK-TRC1 can be connected to the following board for access..

System Name	Board Name
GDK-FPII	STIB, WTIB, DVIB

Caution: This tool should be only used by LGE. and its agent for the purpose of the maintenance of GDK-FPII system, but not by an end user.

2.4.15 Accessories For The Purpose Of Test.

These boards are useful to test GDK-FPII system and functional boards for the purpose of investigation. These are not required for an end customer.

Extension Board

These are dummy boards so that the required function board may be positioned at outside of the system cabinet. They are directly installed on the card slot, and then the function cards are connected to the other side of them.
These boards are used when an engineer or a service man wants to investigate the function boards in state of operation.

Board Name	Function Board Name	Remark
BEXT of GDK-FPII	GDK-FPII 4SLI, 4LCO, 2BRI, PRI (slot2,3)	2923NP1431A
UEXT of GDK-FPII	All GDK-FPII boards except above	2923NP1432A

Modular connector board

These are the boards for line connection, which contain a RJ21 type connector and RJ-11 type jacks. A RJ21 type connector of the board is connected to the opposite type of RJ21 type connector on the function boards or the system, and RJ-11 type jacks of the board are connected to CO lines or terminals through line cord. It is easy to connect CO line and terminals for the purpose of testing system and terminals.

These boards are used when an engineer or a service man wants to investigate the operation of the system and terminals.

Board Name	Function Board Name	Remark
EXT-BLOCK of GDK-FPII	All GDK-FPII extension board except ETIB,WTIB	2923NP2168A
CO-BLOCK of GDK-FPII	GDK-FPII Analog CO boards	2923NP2169A



KD-36EXE



KD-33LD



KD Digital Keysets



KD/E-8BTN



KD/E-36EXE



KD/E-36LD





LKD-2NS



LKD-8DS



LKD-30DS



LKD-30LD

Figure 2.4.3

LKD Digital Keysets



GSX-8BTN



GSX-33 EXE

Figure 2.4.4

GSX Electronic Keysets



Note:

- 1. For the connection to any digital keyset behind LKD-30DS, 2B-DTIU30 should be inserted in the bottom side of LKD-30DS.
- 2. In case of using 2B-DTIU30 and Secondary digital Keyset, It is recommended to use optional mains adapter, which confirms to the appropriate national or local electrical adapter.





Note:

For the connection to SLT device (SLT, FAX, Modem etc) behind LKD-30DS, 2B-SLIU30 should be inserted in the bottom side of LKD-30DS.

b. 2B-SLIU30 Connection

Figure 2.4.5 2B-Modules



Note:

- 1. For this type of the connection using the external CTI module (GDK-PC PHONE unit), KD/C or KD/EC keyset should be required.
- 2. All the line cords and RS232C cable are provided with GDK-PC PHONE unit in the same package.

a. The connection method of the external CTI module



- 1. For this type of connection using the internal CTI module (CTIU30/CTIU8), LKD Keyset should be required.
- 2. The cable with RS232C and RJ11 type plug is provided with CTIU30/CTIU8 in the same package.

b. The connection method of the internal CTI module

Figure 2.4.6 **CTI modules**



Note:

- 1. A 4-wire and a RS232C cables are provided with GDK-TRC1 unit in the same package.
- 2. Caution: This tool should be only used by LGE. and its agent for the purpose of the maintenance of GDK-FPII system, but not by a end user.

Figure 2.4.7 The connection method of the GDK-TRC1

SECTION 3. INSTALLATION

3.1 INTRODUCTION

As with any sophisticated communications device, installation of the GDK-FPII System requires the care and fore-thought of a competent technician. Installation proceeds in 5 major steps;

- Site Preparation
- KSU and PSU Installation
- PCB Installation
- System Wiring
- System Programming and Verification

By utilizing the instructions that follow, the installation is quick and efficient. Directions for System Programming are briefly given in **SECTION 5. CUSTOMER DATABASE PROGRAMMING**

3.2 SITE PREPARATION

3.2.1 General Site Consideration

The first step is to locate an acceptable site for the common equipment. (KSUs, boards, etc.) When locating a mounting site for the KSUs, the following points should 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 $\frac{1}{2}$ inch thickness plywood back-board be firmly mounted to the wall at first and then the KSU.
- The location must have access to a dedicated 110~127 Volt AC or 220~240 Volt AC, 50-60Hz with a circuit breaker or fuse rated at 15amps. A 3-wire parallel blade grounded outlet should be within approximately 2 meters (6 feets).
- 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 5~90 % (non-condensing).
- 5. The system should be located within 8 meters (25 feets) 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.

3.2.2 Back-Board Installation

A wooden back-board is recommended for all installations and should be installed when the location has masonry or plaster-board walls. A ¹/₂ inch plywood material is sufficient for most installations. The back-board should be mounted at a convenient height, about 1 meter above the floor, and be bolted in a number of places to distribute the weight of the system..

Space should be available on the bottom and left side of the back-board for another MDF and for optional equipment such as a music source and PFTU, etc.

3.2.3 Verify On-Site Equipment

Once the equipment installation site has been identified and a dedicated AC outlet, earth ground, and lighting and ventilation are available, verify that all required equipment are on-site and have not been damaged during shipment. Unpack the KSU and 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 received boards are correct and optional equipment are on-site. Note that the individual boards should not be unpacked at this time.

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

3.3 KSU INSTALLATION

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





Exterior View of GDK-FPII

3.3.1 Mounting KSU

The KSU is a metal frame cabinet designed for wall-mounting. Employing the KSU mounting template provided with the KSU, mark the location of the four screws to mount the KSU. Again, the KSU must <u>not</u> be mounted on a masonry or dry-wall surface, in this case a wooden back-board is required, refer to paragraph **[Back-Board Installation]**. The distance between mounting holes and the position of mounting holes is shown in Figure 3.3.1.

The KSU is mounted with four #10 or larger, 1.5 inch or longer screws. At first, drill pilot holes in the four locations marked, insert the screws and tighten leaving about 0.5 inch exposed. Mount the KSU on the screws and tighten the screws securely.





3.3.2 RGU Installation

The Ring Generator Unit is needed in KSU if 4SLI or SLIB is installed for using single line telephone, to provide ringing power and Message Wait Source power. The RGU-EX is mounted on the right bottom side of the KSU with two screws and is connected to the Main Board Unit(MBU) with a CN5(PCB lettering) connector. (See Figure 3.3.2)

A cable for connecting between RGU and MBU is provided with RGU in the same package.



Figure 3.3.2 Ring Generator Unit Installation

3.3.3 PFTU Installation

The major function of PFTU is to achieve an alternate connection to the system's CO line ports when the AC power is failed. There are two different types of PFTU. One (PFTU-I) is installed on the 4LCO board and two CO lines on this board can be switched. The other PFTU is connected to MBU to select any CO lines that user requires and the PFTU is installed outside of the system.

<u>PFTU-I</u>

The optional board is installed on the 4LCO board and switches the first two CO lines to single line telephones directly during AC power failure. Single line telephones are connected to the connector CN2 and CN4 on this board. If a SLT is connected to CN2, the SLT can be used to one of the system's extensions during normal state(means AC power on state) by connecting the connector CN1 to any ports of the 4SLI or SLIB. This situation is also true for the connector CN3 and CN4.

Refer to Figure 3.3.3.a



Figure 3.3.3.a PFTU-I INSTALLATION

<u>PFTU</u>

Figure 3.3.3.b shows the exterior of the PFTU module and how to connect this optional module to the MBU. The module switches six CO lines to single line telephones directly via CHAMP connector during AC power failure. The test/normal selection slide switch should be on the '**Normal**' position for proper operation. If it is switched to 'Test' position, the PFTU module works as AC power failure situation. Up to three(3) PFTUs can be connected to the MBU. The detailed connection method is described in **[Power Failure Transfer Unit Wiring]** of section 3.5.

To connect PFTU control signal,

- Connect a pair of wires between connector(U41) of the MBU and terminal of PFTU. Also it is possible to connect a pair of wires from pin#7 and #32 of the basic CHAMP connector(CN14), because these two signals are tied together in the MBU.
- PFTU is not sensitive to polarity of control signal.

Connecting Wire;

- AWG #22 ~ AWG #26 (diameter : about 0.6mm ~ 0.4mm)
- Length : Max. 10 meters ~ 1 m ~ 1.5 m (recommended)

Note : The installer can adjust the diameter and length of above wires depending on the site condition.



Figure 3.3.3.b PFTU Installation

3.3.4 KSU Grounding

Before connection to the mains supply, the GDK system must be earthed in conformance with the appropriate IEE requirements. Earthing is required for user safety and also to minimize EMC interference.

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 should be used or, if allowed, the joints may be bridged.

A separate conductor should be used between the ground source and the KSU, which confirms to the appropriate national or local electrical codes. AGW #14 or larger copper wire is recommended. The wire should be kept as short as possible, it is recommended that the wire be no longer than 8 meters (about 25 feet).

3.3.5 PSU Installation

The Power Supply Unit(PSU) provides the power for the system boards and telephones, converting the AC voltage input to appropriate DC voltages.

The PSU is basically installed when delivering the system. But if PSU is replaced with new one, assure that the AC power cord is **NOT** plugged into the AC outlet before installing new one.

Note:

- 1. There are 2 kinds of PSUs, PSU which is a linear type of Power supply Unit, and PSU2 which is a SMPS. The production of PSU (linear) has been officially stopped after replacing with PSU2(SMPS) in the 1st half of 1999.
- 2. Following Figure 3.3.3.a shows PSU2 (SMPS).
- 3. Refer to the APPEDIX C for the installation of PSU (linear).

4.



Figure 3.3.5.a PSU2 without PSU cover

After the PSU installation, assemble the cover with three(3) screws. The cover assembling method is shown in Figure 3.3.5.b.



Figure 3.3.5.b PSU2 Cover Assembly

3.4 PCB INSTALLATION

3.4.1 PCB Handling & General Installation

All boards should not be installed or removed with power applied.

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

The system PCBs contain digital circuitry which, while extremely reliable, 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 on the mounting knobs and, with components side facing up, insert the card into the system's card edge connector firmly and tighten with screw(s). To remove a PCB, reverse the procedure. Installation method of PCB is shown in Figure 3.4.1.a.



Figure 3.4.1.a PCB Installation

There are 7 slots in the GDK-FPII system to extend or modify the system configuration. But, there are some restrictions for optional board installation. Note that the system can not operate properly with wrong installation. The most upper slot (slot #1) is reserved for DVIB, STIB or WTIB, the next slot(slot #2) is reserved only for 4SLI board, the next slot(slot #3) is reserved for one of 4SLI, 2BRI, or PRI boards and the next four(4) slots(slot #4~7) are universal slots.

Slot No.	Cards	Remarks
SLOT 1	DVIB, STIB, WTIB	Option cards with own CPU
SLOT 2	4SLI	Fixed slot for 4SLI board
SLOT 3	4LCO, 2BRI, PRI	Fixed slot for 4LCO or 2BRI or PRI
SLOT 4		Universal Slot
SLOT 5	LCOB, AC15, BWDIDB, STIB,	<u>*Not allow PRI, 2BRI, 4LCO, 4SLI</u>
SLOT 6	SLIB, DTIB, ETIB, DVIB, WTIB,	
SLOT 7	TLIB	

To summarize, see the following Table 3.4.1.a and Figure 3.4.1.b.





Figure 3.4.1.b Slot Assignments

When the system power is on, the default slot assignment is automatically redefined according to board installation status. (For this, the switch pin #1 and #4 of the SW1 in MBU should be set to ON position.) And it can be modified by user's needs.

3.4.2 MBU Installation

The MBU is installed in the KSU in default. It is comprised of main processor, six(6) digital terminal interface circuits, seven(7) card slots for optional boards, memory, real-time clock circuit and data communication circuit which transmits and receives to/from other cards. The MBU may be equipped with four daughter boards; a MEMU for RAM expansion, a SMEMU for the function of QSIG, TAPI and/or PC-Attendant, a MODU for remote access to the system, a PLLU2 for system synchronization and a SIU for serial data transmission. Refer to Figure 3.4.2.a

It should be noted that two SIU boards can be installed when the MODU is NOT installed, and to install a SIU in the position of SIU(2), an option jumper pin contained in the SIU package should be inserted between pin #1 and pin #2 of MODU connector (CN21) as shown in Figure 3.4.1.b and 3.4.2.5.



Figure 3.4.2.a MBU, MODU, MEMU, SIU, and PLLU2 installation

Lithium Battery

The MBU contains a lithium dry-cell to keep the memory contents and real-time clock functions during power failure. 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 installing MBU. Refer to Figure 3.4.2.b.

" 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 manufacturers instruction."



Figure 3.4.2.b Memory Back-Up switch setting

System Clock Connection without PLLU2

It is important that a shorting trap (option pin) should be inserted to connect the pin #12 and #13 of the connector CN18(See Figure 3.4.1.b and 3.4.2.c) in the MBU for proper operation when the PLLU2 is NOT installed. Refer to the clause of PLLU2 Installation.



Figure 3.4.2.c System Clock connection without PLLU2

Function of SW1

The MBU also has an four-position DIP switch, SW1. The function of each switch position is as followings:

Default setting: All ON position

Switch	Function	ON	OFF
1	Administration Programming Access	Enable	Disable
2	Trace Control (The purpose of testing software)	Disable	Enable
3	SMDI (Simplified Message Desk Control –Voice Mail)	SMDI OFF	SMDI ON
4	Database default on power up	Enable	Disable

Table 3.4.2	The function of each pole of SW2
-------------	----------------------------------

Once the database has been initialized, switch 4 should be placed in the **OFF** position to protect the database in the memory. Before programming the system, switch 4 should be placed in **ON** position. Then, the system program initializes the system database to default value when the system power is on. Refer to Figure 3.4.2.b.

Switch/Connector	Functions	Remark	
SW2	CPU Reset		
SW3	Lithium Battery ON/OFF switch		
CN5	RGU connection		
CN6	DC Power connection		
CN7~CN13	Function Board Connection for slots 1~7		
CN14	Basic Port Connection including Relay contacts	For MBU, Slot No. 2	
CN15	Analog CO line Connection		
CN16	Expansion Port Connection	For Slot No. 3~7	
CN17,CN18	PLLU2 connection	ISDN	1)
CN19	SIU(2) connection	System Access	2)
CN24	SIU(1) connection	System Access	
CN20, CN21	MODU connection	2)	
CN22,23	MEMU or SMEMU connection		
CN41	PFTU control signal connection		
PJ1	RCA Jack for the external paging		
PJ2	RCA Jack for the external music source		

Function of various switches and connectors

Note

 When ISDN board is installed, PLLU2 should be installed. Otherwise there is no necessity for installing PLLU. If PLLU is not installed, the shorting trap (short pin) should be located between contacts 12 and 13 of CN18.

The shorting trap (short pin) is installed on above position when the board delivered.

It is possible to use one of both MODU and SIU(2). If the SIU is installed on SIU(2) position, contacts 1 and 2 of CN21(connector for MODU) should be short.
The shorting trap (short pin) is installed on above position when the board delivered.

Function of LED

LED	Function	Status	Remark
LED1	Display system software operation	Turn ON/OFF at every 100 msec	
LED2	Display event processing	Turn ON during event processing	
LED3	Display task changing	Turn ON/OFF in toggle when the	
	(software testing purpose)	software task is chaging.	
LED4	Basic Digital Keyset In-use LED	ON: At least one port is busy.	
		OFF: all ports are idle	

Check Points

- The DIP switch, SW3 should be turned ON position to protect system data in the case of a power fail.
- The 4th pole of SW1 should be OFF to protect the variety features by Admin programming after the system power up and initialization. See Table 3.4.2 When the system power is on, the boards in slots will be automatically detected if the 4th pole of
- The pin #12 and #13 of the connector CN18 in the MBU should be shorted with a shorting trap (short pin) for proper operation when the PLLU2 is NOT installed. Refer to the clause 3.4.2.3 PLLU Installation.
- Add-on boards: MEMU, SMEMU, PLLU, MODU. SIU

3.4.2.1 MEMU Installation

SW1 is set to ON position.

The MBU may be equipped with MEMU for memory expansion. Before power on, install MEMU as required, refer to Figure 3.4.2.a. The MEMU has a lithium dry-cell and SW1 must be set to ON position to protect the database in the memory, before power on.

- Note:
 - If MEMU is newly installed during operation, then the SMDR recorded in the basic memory of MBU before MEMU installation will be lost.
 - If MEMU is replaced with SMEMU during operation, the database will be lost. So it is recommended that the database is downloaded to PC before replacement, and unloaded after replacement.

The MEMU should be installed on MPB through the dual line connectors, CN22 and CN23 of MBU, so recommend visual inspection of the connecting state between MBU and MEMU after installing it on MBU.

3.4.2.2 SMEMU Installation

The MBU may be equipped with SMEMU for the memory expansion and the QSIG, CTI, PC-ATTN features. Before installing the GDK-FPII, install SMEMU if required, refer to Figure 3.4.2.a. The SMEMU has a lithium dry-cell and SW1 must be set to ON position to protect the database in the memory, before power on.

The SMEMU should be installed on the position of MEMU on MBU.

• Note:

- If SMEMU is newly installed during operation, then the SMDR recorded in the basic memory of MBU before SMEMU installation will be lost.
- If MEMU is replaced with SMEMU during operation, some database will be lost. So it is recommended that the database is downloaded to PC before replacement and unloaded after replacement.
- If you want to use the QSIG, CTI, PC-ATTN features, the software package 99A version should be required.(See the SMEMU in section 2)

The SMEMU should be installed on MBU through the dual line connectors, CN22 and CN23 of MBU, so recommend visual inspection of the connecting state between MBU and MEMU after installing it on MBU.

3.4.2.3 PLLU2 Installation

The PLLU2 board should be installed on the MBU to use the ISDN interface board such as 2BRI, PRI and STIB. If PLLU2 is not installed, a short pin should be used to connect the pin #12 and #13 of the connector CN18 (See Figure 3.4.2.c) in the MBU for proper operation.

3.4.2.4 MODU Installation

The MODU is used for remote access the system for system maintenance and PC based administration function. Refer to Figure 3.4.2.a.

If MODU is installed, SIU(2) should be removed from the system.

3.4.2.5 SIU Installation

The SIU board is used for system maintenance, PC based Admin, SMDR print and SMDI. The system supports up to two SIU boards when the MODU is not installed. The installation method is shown in Figure 3.4.2.5.

It should be noted that two SIU boards can be installed when the MODU is NOT installed, and an option jumper pin packed with the SIU should be inserted between pin#1 and pin#2 of MODU connector(CN21) of the MBU.



a) When 1 SIU is installed



b) When 2 SIUs are installed

Figure 3.4.2.5 SIU Installation

3.4.3 Extension Board Installation

The system can be equipped with any combination of the extension boards; DTIB, ETIB, 4SLI, SLIB, and WTIB. The WTIB can be installed in the most upper slot (slot #1) and the universal slots(slot #4~7), the 4SLI board can be only installed in the next slot(slot #2), DTIB, ETIB, SLIB, and WTIB can be in the universal slots (slot #4~7). See the clause 3.4.1.

3.4.3.1 DTIB Installation

The DTIB provides 6 interface circuits for normal type or 2B type digital terminals. All the interface circuits can support 2B format of digitized voice data. The connection between DTIB and digital terminals are performed through RJ21 type connector (CN16) on the MBU. The exterior of the board is shown in Figure 3.4.3.1.

Function of LEDs

LED	Function	Remark
LD1	The status of ports. (ON: in use, OFF: idle)	

In GDK-FPII system, all Digital Terminal Interfaces are capable of accommodating 2B-channel operation. LDK-30DS with 2B-module and secondary terminal can be connected to every port of DTIB or MBU. See clause 2.4.13.3 2B-module and clause 2.4.13.4 GDK-PC PHONE in section 2 for more details regarding 2B-module and CTI module.



Figure 3.4.3.1 DTIB layout

The DTIB board can be installed on any slot of universal slots (slot #4~7). The Maximum 4 boards can be installed in a system.

3.4.3.2 ETIB Installation

The ETIB provides 6 interface circuits for analog type electronic key telephones. The connection between ETIB and electronic terminals are performed through RJ11 type jacks on the board. The exterior of the board is shown in Figure 3.4.3.1.

Function of LED

LED	Function	Remark
LED1	The status of ports. (ON: in use, OFF: idle)	

Function connector

Connector	Function	Remark
MJ1~MJ6	RJ11 type jack for terminal connection.	See clause 3.4.5





The ETIB board can be installed on any slot of universal slots (slot #4~7). The Maximum 4 boards can be installed in a system.

3.4.3.3 SLIB/4SLI Installation

There are two kinds of single line telephone interface boards, one is 4SLI and the other is SLIB. The 4SLI card provides four(4) interface circuits for SLT and the SLIB card provides six(6) interface circuits for SLT. The 4SLI/SLIB can be optionally equipped with a DTRU for DTMF detect and a MSGU for control the message wait lamp of the SLT. And an RGU is required for ringing SLTs.

The exterior of them are shown in Figure 3.4.3.3.

The major difference is shown in below Table 3.4.3.3.

The 4SLI board can be installed on slot #2 only, but the SLIB can be installed any one of universal slots (slot #4~7).

Board	Slot	Interfaces circuits	Add-on Boards
4SLI	Slot # 2	4	DTRU, MSGU
SLIB	Slot # 4~7	6	DTRU, MSGU

Table 3.4.3.3 Difference between 4SLI and SLIB

Function of LED

LED	Function	Remark
LED1	The status of ports. (ON: in use, OFF: idle)	

Function of various connectors

Connector	Function	Remark
CN1 and CN2	DTRU connection	1)
CN3 and CN4	MSGU connection	1)

•Note:

- 1) If you want Message Waiting function on 4SLIB or SLIB, GDK-100 MSGU should be installed on 4SLI and SLIB.
- 2) The distance between SLIB and SLT: see Table 2.3.4



a) 4SLI Card



b) SLIB Card

Figure 3.4.3.3 Exterior of the 4SLI/SLIB

3.4.3.4 DTRU Installation

A DTRU contains 2 DTMF receiver circuits. Each receiver of DTRU is time-shared under the control of the system software, as a system resource regardless its position.

Board	The position of Installation	The quantity of receivers	Marking on PCB
DTRU	4SLI, SLIB, 4LCO, LCOB, TLIB,	2 DTMF receivers	DTRU of GDK-34/36
	BWDIDB		

The System is capable of supporting DTMF receivers up to 14.

2 DTMF receivers are basically laid out on MBU.

Take a cautious attitude in installing DTRU on the boards because DTRU contains the connectors without the connection guide, otherwise DTRU may be damaged by wrong connection.

3.4.3.5 MSGU Installation

A message waiting unit can be optionally installed on a SLT interface board to light a message waiting lamp in the SLT connected.

Board	The position of Installation	The quantity of circuits	The line voltage
MSGU	4SLI, SLIB	6 circuits	+24Vdc

• Signal voltage: 90~100Vdc

3.4.4 Analog CO Line Board Installation

There are several types of analog CO line boards available. These boards include the 4LCO and LCOB. Additional CO interface boards such as AC15, TLIB and BWDIDB may be available for support of local market conditions and regulatory requirements.

The slot No.3 to No. 7 in the system, which are available for use as a CO Line board, are wired to 4 or 2 CO Lines at the CN15 connector through the MBU. The connection matrix is shown in section 3.5. Analog CO line wiring; contact assignments of RJ21 type male connector (CN15).

3.4.4.1 LCOB/4LCO Installation

There are two kinds of available analog CO line interface (Loop-start technology) boards. One is 4LCO and the other is LCOB. The exteriors of them are shown in Figure 3.4.4.1.

The major difference is shown in below Table 3.4.2. The 4LCO board can be installed on slot #3 only and the LCOB can be installed on slot #4~7(universal slot).

All these two boards provide four(4) Loop Start lines, can be optionally equipped with Call Metering Unit(CMU) for monitoring call charge and a Call Progress Tone Unit(CPTU) for monitoring call progress signals and a DTMF Receiver Unit(DTRU) for detecting DTMF for single line devices. A CMU should be provided for each Loop Start CO line which requires call metering function. In addition, the appropriate type of CMU should be employed. Each CPTU contains two tone detection circuits that are time shared under software control. These detectors are used to support several features including ACNR. If such features are to be used, it is recommended that CPTU be installed for every 4LCO/LCOB. According to sensitivity of tone detector, two types of CPTUs(CPTU/A, CPTU/B) are available. CPTU/A has wide tone detection range(305Hz-640Hz) and CPTU/B has narrow tone detection range (350Hz, 620Hz, 440Hz, $480Hz \pm 1\%$). If required, install the CMUs, a CPTU and a DTRU, on the 4LCO/LCOB.

And an optional PFTU-I can be installed on the 4LCO only. This module supports power failure transfer function of the first 2 CO lines of the 4LCO board.

Board	Slot	Interface Circuits.	Option Boards
4LCO	SLOT #3	4	CPTU, CMU, DTRU, PFTU-I
LCOB	SLOT #4~7	4	CPTU, CMU, DTRU

Table 3.4.2 Differences between 4LCO and LCOB

LED	Function	Remark
LD1	The status of line 1, ON: in use, Green	
LD2	The status of line 2, ON: in use, Green	
LD3	The status of line 3, ON: in use, Green	
LD4	The status of line 4, ON: in use, Green	

Function of LED

Function of various connectors

Connector	Function	Remark
CN1 and CN2	DTRU connection	
CN3 and CN4	CPTU connection	
CN5 and CN6	PFTU-I connection	4LCO only
CN100 and CN104	The connectors for a CMU on line 1	See Note
CN101 and CN105	The connectors for a CMU on line 2	See Note
CN102 and CN106	The connectors for a CMU on line 3	See Note
CN103 and CN107	The connectors for a CMU on line 4	See Note

Note:

 The pin #6 and #7 of CN104, CN105, CN106 and/or CN107 should be shorted by shorting traps (short pin) when CMU12(12 KHz meter pulse) including CMU12PR or CMU16(16 KHz meter pulse) is not installed on the interface circuit(s). Otherwise the receiving voice path of the related line will be open.

- 2. The 0 ohm resistors are usually mounted on R168-R171 of LCOB for the countries using only CMU PR(Polarity Reversal) and/or 50L(50 Hz longitudinal). If these CMUPR, CMU50L or CMU50PR are not installed on any CO interface circuit neither R168-R171 are mounted on LCOB, the pin #6 and #7 of CN104, CN105, CN106 and/or CN107 should be also shorted by shorting traps (short pin) on the related interface circuit.
- 3. CN104/R168 are on the 1st interface circuit, CN105/R169 on the 2nd interface circuit, CN106/R170 on the 3rd interface circuit and CN107/R171 on 4th interface circuit.

4LCO can be only installed in slot No. 3.

LCOB can be only installed in the universal slots (No. 4 to 7), and the maximum four LCOBs can be installed in a system.

Add-on boards: DTRU, CPTU/A, CPTU/B, CMU, PFTU-I (4CLO only).

CMU CPTU CMI PETIL SLT

a) 4LCO Card



b) LCOB Card



3.4.4.2 AC15 Board Installation - UK

The AC15 board provides 2 Tie interface circuits, each line supports AC15a signaling.

It is designed to comply with the UK specification and application, so it may not suitable for the other national specification and/or application.

Function of LED

LED	Function	
LD1	The status of line 1, ON: in use	
LD2	The status of line 2, ON: in use	

The AC15 board can be installed in any of slot No. 4~7.

The maximum four AC15 boards can be installed in a system.

3.4.4.3 TLIB Installation - Korea

The TLIB provides 2 analog E&M interfaces. It can support type I and V of 2-wire E&M.

It is designed to comply with the Korean specification and application, so it may not suitable for the other national specification and/or application.

Function of LED

LED Function		Remark
LD1	The status of line 1, ON: in use	
LD2	The status of line 2, ON: in use	

Function of various connectors

Connector	Function	Remark
CN1 and CN2	DTRU connection	

Line mode selection

connectors	E&M		Ring Down
	Type V	Type I	
JP9,CN12	short pin no. 1-2	short pin no. 1-2	short pin no. 2-3
JP10,CN11	short pin no. 2-3	short pin no. 1-2	Don' t care

Note:

TLIB mainly supports 2-wire E&M type V. It is recommended to set 2 wire E&M Type V.

Check point

TLIB can be installed in any of slot No. 4~7.

The maximum four TLIBs can be installed in a system.

When installing E&M line, It is important to check the type of the opposite line and jumper position.

Add-on board: DTRU

3.4.4.4 BWDIDB Installation – New Zealand

The BWDIDB provides 4 analog both-way DID interfaces. Each line supports Outgoing/Incoming call. It is designed to comply with New Zealand specification and application, so it may not suitable for the other national specification and/or application.

Function of LED

LED	Function	Remark
LD1	The status of line 1, ON: in use	
LD2	The status of line 2, ON: in use	
LD3	The status of line 3, ON: in use	
LD4	The status of line 4, ON: in use	

Function of various connectors

Connector/Switch	Function	Remark
CN1 and CN2	DTRU connection	
CN3 and CN4	CPTU/A or CPTU/B connection	

BWDIDB can be installed in any of slot No. 4~7. The maximum four BWDIDBs can be installed in a system. Add-on boards: DTRU, CPTU/A, CPTU/B

3.4.5 ISDN Board Installation

There are 3 kinds of ISDN boards such as PRI, 2BRI, and STIB are available. PRI and 2BRI can be only installed in slot No.3, and STIB in slot No.1, 4~7.

Each ISDN board contains RJ45 type jack on boards themselves.

3.4.5.1 ISDN 2BRI (Basic Rate T interface) Installation

The 2BRI card provides 2 interface circuits of BRI(Basic Rate Interface) format digital CO interface. For using this board, the PLLU2 board should be installed on the MBU. If more than one ISDN board is required, some special cable should be used for clock signal control. CN1 and CN2 are used to control the clock signal when multi-ISDN boards are installed. Refer to **[Clock Control Cable Wiring]** of section 3.5.

Function of LED

LED	Function	Status	Remark
LD1	The status of Line 1	Red: Error, Green: Synchronized	
LD2	The status of Line 2	Red: Error, Green: Synchronized	

<u>Function of SW1</u>; default -all OFF when delivering the board

Pole	Function	ON	OFF	Remark
1	Loop Back Mode (for testing purpose)	Enable	Disable	
2	Not used	-	-	
3	Trace	Enable	Disable	Note 1
4	Trace: for the purpose of Lab. test	Enable	Disable	Note 1

- Note:
 - 1. These two poles are for the purpose of developing, testing and maintaining 2BRI.
 - 2. The TEI mode of 2BRI is set to Fixed TEI as default.
 - 3. All poles should be OFF during normal operation. Especially the pole 1 should be OFF.

Function of various connectors

Connector	Function	Remark
CN1	Clock control OUT	Note 1
CN2	Clock control IN	Note 1

Note:

1. CN1, CN2: They are used to control the reference clock signal when multi-ISDN boards are installed. See [Clock Control Cable Wiring] in section 3.5.

The line connector and terminating resistors

Line No	RJ45 type jack	Terminating Resistors		
		Switch	All ON	All OFF
Line 1	MJ1	CN3	terminating	open
Line 2	MJ2	CN4	terminating	open

Note

1. Two terminating resistors are required on a line, one for TX pair and the other for RX pair, for proper operation. Two connectors of CN3 and CN4 should be set to the ON position to terminate two terminating resistors on a line.



RJ45 type Jack

Figure 3.4.5.1.a The connection of Terminating Resistors on 2BRI issue 2

2. Terminating resistors and selectable switches are introduced only on PCB issue 2 or later, but not on PCB issue 1. So if you use 2BRI issue 1, the external terminating resistors are required. For the external termination, you can get the terminating unit locally or use GDK-162/100 TERM, which is the terminating unit with 4 P-to-P connection provided by LGE.



Figure 3.4.5.1.b 2BRI Board

Check Points

- 1. 2BRI boards can be installed only in the slot No. 3.
- 2. The PLLU2 MUST be installed on MBU.
- 3. The 2BRI supports Fixed TEI.
- 4. The RX and TX pairs of line should be correctly connected to the TX and RX pairs of NT1.
- 5. The clock control cable should be connected to the proper position when multi-ISDN cards are installed in a system. See section 3.5.
- 6. Terminating resistors on the line. (CN3 and CN4)
- 7. SMEMU MUST be required on MBU for QSIG operation. See SMEMU in section 2.

3.4.5.2 ISDN STIB (Basic Rate S/T Interface) Installation

The STIB provides 2 interface circuits of BRI(Basic Rate Interface) format 'S' and 'T' mode interface. The operating mode selection is performed by setting the short pins and DIP switch to associate position. The 'S' mode is used for connecting the ISDN terminal and the 'T' mode is used for connecting the ISDN CO line. For using this board, the PLLU2 board should be installed on the MBU. If more than one ISDN board is required, some special cable should be used for clock signal control. CN1 and CN2 are used to control the clock signal when multi-ISDN boards are installed. Refer to **[Clock Control Cable Wiring]** of section 3.5.

Function of LED

No	Function	Status	Remark
LD1	The status of Line 1	Red: Error, Green: Synchronized	
LD2	The status of Line 2	Red: Error, Green: Synchronized	

Function of SW1: default - all OF	F when delivering the board
-----------------------------------	-----------------------------

Pole	Function	ON	OFF	Remark
1	Not used	-	-	
2	TEI	Fixed TEI	Automatic TEI	Note 1, 2
3	Layer 2 trace	Enable	Disable	Note 3
4	Layer 3 trace	Enable	Disable	Note 3

- Note:
 - 1. The function of 2nd pole has been implemented in firmware version 1.1 or later.
 - 2. This is set to OFF position as default, therefore it is important to note that 2nd pole is set to the proper position after checking the type of TEI in your country.
 - 3. These two poles are for the purpose of developing and maintaining STIB.

Function of various connectors

Connector	Function	Remark
CN1	Clock control OUT	Note 1
CN2	Clock control IN	Note 1
CN104	Serial interface connector	Note2

Note

1. CN1, CN2: They are used to control the reference clock signal when multi-ISDN boards are installed.

See [Clock Control Cable Wiring] on section 3.5.

 CN104: Trace for the purpose of development and maintenance. The external module for RS 232C serial interface should be required for trace. See GDK-TRC1 in section 2.

The line mode selection (S or T interface setting)

Line No	RJ45	S/T mode selection		n Changing the contact assignmer		assignments	
	type Jack	Switch	All to "T"	All to "S"	Connector	All to "T"	All to "S"
Line 1	MJ1	SW2	Т	S	CONN1	Т	S
Line 2	MJ2	SW3	Т	S	CONN2	Т	S

• Note:

1. The setting method of S/T mode selection switches and connectors: default -all T position when delivering the board.

Each line interface can be used for T interface or S interface with different operation interface. If necessary, the S/T selection switch/connector of SW2/CONN1 or SW3/CONN2 can be respectively set to the T or S position.

- 2. Each line can be selected to T or S interface according to the needs.
- After setting all lines respectively, the slot(s) of STIB must be assigned as CO slot(s) and STA slot(s) together in Admin field 02 for the proper operation of STIB. See the clause 4.2 and the Programming Manual.

The line termination / the power feed to TE

Line No	Terminating Resistors			F	Power Feed to	TE
	(Two poles in the right side)			(Two	poles in the le	ft side)
	Connector	Set to ON	Set to OFF	Connector	Set to S	Set to T
Line 1	CONN3	terminating	open	CONN3	Feed	open
Line 2	CONN4	terminating	open	CONN4	Feed	open

• Note:

- 1. Two poles in the right side of CONN3/CONN4 should set to the ON position to terminate two terminating resistors on a line.
- 2. Two poles in the left side of CONN3/CONN4 should set to the S position to the power into ISDN terminal.



If the user want to use on-board terminating resistors, the right two short pins of CONN3(for Line1)/CONN4(for Line 2) should be placed on the 'ON ' position. And If the interface is in "S" mode operation and power feed to external ISDN terminal is not required, the left two short pins of CONN3(or CONN4) should be placed on the "T" position.

On PCB issue 1(6870N01591), the Markings, POWER and TER.RES. may different from above. But the physical tracks are the same as above.

Figure 3.4.5.2.a The setting method for termination and Power feeding

Check Points

- 1. STIB can be installed in any of the slot No. 1, 4~7.
- 2. PLLU2 MUST be installed on MBU.
- 3. Each interface should be set to the correct type, T or S with S/T selection connectors, according to the needs of user. And the RX and TX pairs of line should be correctly connected to the TX and RX pairs of NT1 or TE according to the interface type of each line.
- 4. Terminating resistors on the line.
- 5. The 2nd pole of SW1 should be set to the proper position according to the type of TEI.
- 6. The clock control cable should be connected to the proper position when multi-ISDN cards are installed in a system. See section 3.5.
- 7. SMEMU MUST be required on MBU for QSIG operation. See SMEMU in section 2.



Figure 3.4.5.2.b STIB Installation

3.4.5.3 ISDN PRI (Primary Rate Interface) Installation

The PRI card provides an interface circuit of PRI(Primary Rate Interface) format digital CO interface. For using this board, the PLLU2 board and the MEMU board should be installed on the MBU. If more than one ISDN board is required, some special cables should be used for clock signal control. CN1 is used to control the clock signal when multi-ISDN boards are installed. Refer to **[Clock Control Cable Wiring]** of section 3.5.

Function of LED

LED	Function	Status		Remark
		ON	OFF	
LD1	Loss Of Signal from the Line	LOS	Normal	
LD2	AIS	Alarm error	Normal	
LD3	Frame Alignment Error	Error	Normal	
LD4	Multi-frame Error	Error	Normal	
LD5	CRC Error	Error	Normal	
LD6	The status of the line	In use	All channel idle	

Note

1. All LEDs will be the status of OFF when normal operation, but LD6(green LED) will be lit in use. 2. When PRI line is plugged out, LD 1 and 3 will be ON.

Function of SW1: default - all OFF when delivering the board

Pole	Function	ON	OFF	Remark
1	Test Purpose	-	-	Note 1
2	CRC	Disable	Enable	
3	Not used	-	-	
4	Trace	Enable	Disable	Note 2

Note

- 1. This pole is for the purpose of testing PRI, should be OFF during normal operation.
- 2. This pole are for the purpose of developing and maintaining PRIB.

Function of various connectors

Connector/Switch	Function	Remark
CN1	Clock control OUT	Note 1
MJ1	RJ45 type jack for PRI Line connection	Clause 3.5

Note

1. CN1: They are used to control the clock signal when multi-ISDN boards are installed. See **[Clock Control Cable Wiring]** on section 3.5.



Figure 3.4.5.3 PRI Board

<u>Check Points</u>

- 1. One PRI board can be installed only in the slot No.3.
- 2. PLLU2 MUST be installed on MBU.
- **3. For QSIG operation, SMEMU MUST be required on MBU for QSIG operation.** See SMEMU in section 2.
- 4. The clock control cable should be connected to the proper position when multi-ISDN cards are installed in a system. See section 3.5.

3.4.6 DVIB (Digitized Voice Interface Board) Installation

DVIB provides system announcement, ACD/UCD announcement, and User Greeting. If necessary, the DMEU(DVU Memory Expansion Unit) or DMEU4 can be installed on DVIB for the expansion of User Greetings. And, if necessary, the ADPU(ADPCM Unit) can be installed on DVIB for the expansion of user access channels.

Function of LED

No	Description	Status		Remark
		ON	OFF	
LED1	The status of channel 1	In use	Idle	
LED2	The status of channel 2	In use	Idle	
LED3	The status of channel 3	In use	Idle	
LED4	The status of channel 4	In use	Idle	
LED5	The status of channel 5	In use	Idle	
LED6	The status of channel 6	In use	Idle	
LED7	The status of channel 7	In use	Idle	
LED8	The status of channel 8	In use	Idle	

Function of various connectors

Connector	Function	Remark
CN1	Dummy connector	
CN2	Serial interface connector(4pin) for trace	Note 1
CN3 and CN4	ADPU connection	
CN5 and CN6	DMEU or DMEU4 connection	
CN13	For the purpose of development	
PJ1	RCA jack for Audio Input, DVU MOH input	Blue
PJ2	RCA jack for Audio Output.	Red

Note

- CN2: Trace for the purpose of development and maintenance. The external module for RS 232C serial interface should be required for trace using this connector. See GDK-TRC1 in section 2.
- 2. CN13, PJ2: It is impossible to use them for user access.

These connectors are usually used for the purpose of development and production test. **Especially, all the pins of CN13 should be open for the normal operation.**
Switch	Function	Remark
SW2	SRAM back-up when power interruption or failure	ON
SW5	For the purpose of development	OFF
SW6	Not used	

Function of various switches

Note

1. SW2: This is for the purpose of SRAM back-up for ACD/UCD announcement.

It should be turned ON during installing the DVU/EDVU, to protect announcements in the case of a power fail.

" 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 manufacturers instruction."

Add-on boards: DMEU, DMEU4, ADPU



Figure 3.4.6 Board Layout and ADPU, DMEU/DMEU4 installation

3.5 SYSTEM WIRING

3.5.1 Battery Back-Up Wiring

The system can be equipped with external batteries for proper operation when commercial AC power is failed. The back-up batteries are connected to the connector on the front of the PSU as shown in Figure 3.5.1.



Figure 3.5.1 Battery Back-up Wiring

The external batteries should provide 24 Volts DC. This is generally accomplished by connecting two 12volts batteries in a series arrangement. Battery operation is controlled by the PSU. The PSU will provide charging current(maximum 0.5 amp) to the batteries during normal AC power operation. The PSU will automatically stop the battery operation when AC power is re-applied or low battery voltage is detected.

Carefully check the battery polarity with cable colors(RED and BLUE) when connecting the battery to system. It is recommended to use a fuse(20A @250V) between battery and system.

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

Recommended battery capacity is 24V/20AH MF. The system will operate more than 5 hours with this battery.

3.5.2 RS 232C WIRING on SIU

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

The SIU(1) position of the MBU provides all the serial communication control signals such as TXD, RXD, CTS, RTS, DSR, DTR and ground. But the SIU(2) position does not provide all these signals and only provides three(3) control signals such as TXD, RXD and ground. For the reason, in case of using two SIUs, you have to consider this situation and connect carefully for proper operation.



Figure 3.5.2

Pin assignments and wiring of DB25 and DB9 for RS-232C

- Name Function
- TD Transmitted Data
- RD Received Data
- RTS Request To Send
- CTS Clear To Send
- DTR Data Terminal Ready
- DSR Data Set Ready
- SG Signal Ground

• Note:

1. Protective Ground (Frame Ground) may be used between DTE and DCE(GDK system) for more stable communication. And it is recommended.

In DTEs and DCEs, protective ground (frame ground) is a point which is electrically bonded to the equipment frame. Protective ground (frame ground) is not an interchange circuit in RS232 standard.(EIA/TIA-232-F) If bonding of the equipment frames of the DCE and the DTE is necessary, a separate conductor should be used which confirms to the appropriate national or local electrical codes.

3.5.3 MBU wiring

There are three(3) RJ21 type connectors(CN14 ~ CN16) and 2 RCA jacks on MBU for the external line or devices. There are three(3) RJ21 type connectors(CN14 ~ CN16) in the left most side of the MBU. These connectors are used to connect all ports of the system except ETIB and ISDN line/terminal, such as CO lines, electronic keysets, digital keysets and single line telephones. So, station wiring is performed by these connectors. The method of RJ21 type cable connection is shown in Figure 3.5.3.

The middle one (CN15) is assigned to CO line connection only, and signal lines of this connector are distributed to slot #3 to slot #7. Refer to **[CO Wiring]** section.



The cable with RJ21 type male connector is required to connect with terminal or external devices. It is possible to get the cable locally, or use GDK-162 5MC2 supplied by LGE on the order if necessary.

Figure 3.5.3 Connection Method of RJ21 type connector

And 2 RCA jacks are used to connect the external music source and the external paging device.

You should install a Ferrite Core on the Audio Cable with 2.5 turns in KSU to minimize EMI, when you connect the Audio Cables for MOH(Music On Hold) and/or EXT. PAGE to audio jack(s) on the MBU.

3.5.3.1 External Music Source wiring

The GDK-FPII system sends internal or external music signal to CO lines during 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 audio jack(PJ2) of the MBU.

The level can be adjusted by the administration programming (Program 66) in 0.5 dB steps to \pm 20 dB of the input. Note, if the output of the source is too high or low, it will be necessary to lower or raise the output level control at the source.

Above External Music sources including a Internal Music Source on MPB are selectable by Admin Programming. See Programming Manual.

3.5.3.2 External Paging wiring

One external paging output port is provided from the red colored audio jack(PJ1) of the MBU. The port is used to support the external paging equipment. See Figure 3.5.3.2.



Figure 3.5.3.2 External paging wiring

3.5.3.3 External Paging Port and General Purpose Relays wiring

One external paging output port is provided from the red colored audio jack(PJ1) of the MBU. The port is used to page outside through external amplifier as a system extension.

And there are two general purpose relays in the MBU and these contacts are connected through CHAMP connector(CN14) of the MBU. Detailed pin assignment of these contacts are shown in Table 3.5.3.6. The dry relay contact can be used to power on/off function for external amplifier. The control of these relays are done by system programming.

For example, the following Figure 3.5.3.3 shows how to connect external amplifier with relay and external paging port.



Figure 3.5.3.3 Example of External Paging Wiring

3.5.3.4 Relay contacts for general purpose

GDK-FPII supports up to 2 Relay contacts, which can be used for the functions of Loud Control, Door Open and so on under the software control. These relay contacts are respectively connected with external equipment through 2 pairs of a RJ21 type connector, CN14 on the board.

RLY1: Pin No. 1 and Pin No. 26

RLY2: Pin No. 3 and Pin No. 28



Figure 3.5.3.4 An example of Loud Bell wiring

3.5.3.5 Alarm Detection wiring

GDK-FPII MBU provides an external alarm detection input, which can be used to notify to extensions when the external switch is on/off. This alarm detection input is provided through a pair of a RJ21 type connector, CN14 on the board.

ALARM: Pin No. 12 and Pin No. 37

Close or open detection is programmable by Admin. Programming.



Figure 3.5.3.5 An example of External Switch wiring

3.5.3.6 Contact Assignments of RJ21 type connector for Basic Connection

The upper one(CN14) and lower one(CN16) are assigned to system's extension line such as digital keysets and single line telephones. Basically the upper most connector(CN14) is used to connect basic system resources and basic digital extensions. The upper one's usage is listed as follows and detailed pin mapping table is shown in Table 3.5.3.6.

The usage of CN14 in the left upper side of MBU is as followings,

- 6 ports of digital terminals on the MBU: See the Digital Keyset and Terminal wiring in this section.
- 4 ports of SLTs of the 4SLI board on the slot #2: See the Single Line Telephone wiring in this section.
- 2 ports of general purpose relay dry contacts
- 1 alarm detect port
- 1 external PFTU control port; See the PFTU wiring in this section.

Punch-Down	MB	U Connector CN14				
Block Pin	Pair	Pin	Color-Code	Designation		
1	1	26 1	WH/BL BL/WH	RELAY-R1 RELAY-T1		
3 4	2	27 2	WH/OR OR/WH			
5 6	3	28 3	WH/GN GN/WH	RELAY-R2 RELAY-T2		
7 8	4	29 4	WH/BN BN/WH			
9 10	5	30 5	WH/SL SL/WH			
11 12	6	31 6	RD/BL BL/RD			
13 14	7	32 7	RD/OR OR/RD	PFT-VO PFT-CTL		
15 16	8	33 8	RD/GN GN/RD			
17 18	9	34 9	RD/BN BN/RD			
19 20	10	35 10	RD/SL SL/RD			
21 22	11	36 11	BK/BL BL/BK			
23 24	12	37 12	BK/OR OR/BK	ALARM-T ALARM-R		
25 26	13	38 13	BK/GN GN/BK			
27 28	14	39 14	BK/BN BN/BK			
29 30	15	40 15	BK/SL SL/BK			
31 32	16	41 16	YI /RI BL/YI	VR-4 VT-4	7	
33 34	17	42	YL/OR	VR-3 VT-3	SLT	
35	18	43 18	YL/GN GN/YI	VR-2 VT-2	Port	
37 38	19	44	YL/BN BN/YI	VR-1 VT-1		
39 40	20	45	YL/SL	DR-6		BI BI HE
41	21	46	VI/BL BL A/I	DR-5 DT-5		BK:BLACK
43 44	22	47	VI/OR OR//I	DR-4	Digital	
45	23	48	VI/GN	DR-3	Port	GN:GREEN
40 47	24	23 49	VI/BN	DT-3 DR-2		VI:VIOLET
48 49 50	25	24 50 25	VI/SL SL/VI	DT-2 DR-1 DT-1		KD:KED YL:YELLOW

Table 3.5.3.6 shows the contact assignments of RJ21 type female connector (CN14) on MBU for Basic Connection.

Table 3.5.3.6 Basic Connector (CN14) Wiring

3.5.4 Extension Board wiring

Extension boards consists of DTIB, ETIB, 4SLI, SLIB, and WTIB. DTIB and SLIB are wired to the terminals through CN16, which is the RJ21 type connector on MBU for wiring the extensions to the extension boards installed in the universal slots(Slot No. 4~7). ETIB contains RJ11 type jack for wiring the electronic terminal to each interface circuit on the board itself. But WTIB and WTIU, Wireless Terminal Interface Board/Unit for DECT contains RJ11 type jacks.

But 4SLI is wired to the SLT device through CN14, which is the RJ21 type connector on MBU for Basic Connection. See the Table 3.5.3.6.

The following provides details on the interconnection between each type of Extension Board and the jack on the station.

3.5.4.1 Digital Keyset and Terminal wiring

Wiring from digital terminal interface board such as DTIB and Digital Interfaces on MBU to station jack requires one pair of wire. The power for a station, PCM data and signaling between board and station are transmitted over this pair.

Contact assignments of RJ11 type jack in Digital Terminals

Figure 3.5.4.1.a shows the contact assignments of the miniature 6-position jack (RJ11 type jack) in LG proprietary digital terminals. Two wires from the digital terminal interface of the system are basically connected to the contact numbers 3 (R) and 4(T).

But two additional contacts, R1 and T1 are provided in the digital terminal as shown in Figure 3.5.4.1. The contact number 3 (R) and 2 (R1) are connected together in the digital terminals, and also the contact number 4 (T) and 5 (T1) are connected together. Because there is a country in which the contact number 2 and 5 are used for the 2-wire connection method according to his local regulation. So LGE provide two more contacts, R1 and T1 in the digital terminals so that the special customer can use the line cord, which is in wide use in his country.

But only 2-wire connection should be recommended to get better transmission characteristics between digital terminal interface of the system and digital terminals.



Figure 3.5.4.1.a contact assignments of Digital Terminals

Connection method between the digital interfaces and the digital terminals

The cable with 25-pair male connector is required between Digital Terminal Interface board and MDF. It is possible to get the cable locally, or use GDK-162 5MC2 supplied by LGE on the order if necessary.

The MDF that is in wide use in the country can be locally used according to the requirements of local regulation.



Note:

- 1. Digital terminals operate regardless of line polarity, not with a fixed polarity.
- 2. Each area means the followings,
 A: GDK system, B: between the GDK system and MDF, C: cable in building,
 D: between Terminal connection point, e.g. terminating adapter and Terminal,
 E: digital terminals
- DTIB is capable of connecting to up to 6 digital terminals through CN14 on MBU.
 MBU is capable of connecting to up to 6 digital terminals through CN14 on MBU.

Figure 3.5.4.1.b Basic connection method between digital terminal interface of the system and digital terminal

Connection method with special condition between the digital interfaces and the digital terminals

Only two-wire connection between the digital terminal interface and digital terminals is recommended to reduce the line noise exited from useless wires. Because R and R1/T and T1 are connected together in the terminals for various national conditions, the useless wires can cause the environment noise, which may affect the data transmission, to flow in the digital terminal the 4-wire line cord is used.

In this case, cut or remove the useless wires connected the contact number R1 and T1 (or, R and T) of the terminals at the Terminal connection point, e.g. terminating adapter, so that those are not drawn out any more.



Note:

1. Each area means the followings,

A: GDK system, B: between the GDK system and MDF, C: cable in building,D: between Terminal connection point, e.g. terminating adapter and Terminal,E: digital terminals

2. Only two wires should be connected to digital terminals and Interface Board, so the rest should be removed at MDF or Terminal Connection Point, as X points shown in above figure.

Figure 2.5.4.1.c Connection method when the 4-wire line cord, or special connection method with with contact number 2 and 5.

Pin Assignments of RJ21 type jack on DTIB, MBU(DTI)

See the clause 3.5.3.6 Contact Assignments of RJ21 type connector(CN14) on MBU for Basic Connector wiring.

See the clause 3.5.4.6 Contact Assignments of RJ21 type connector (CN16) on MBU for DTIB wiring

3.5.4.2 Electronic Keyset and Terminal wiring

Contact assignments of RJ11 type jack in ETIB and Eletronic Terminals

Wiring from electronic terminal interface board to station jack requires two pairs of wires. The first pair is for the audible analog signal including voice, and the second one is for signaling and data communication. The pair for data and signaling is polarity sensitive, so electronic terminal will not properly operate when reversed. However the reversal will not harm terminal or system.

Power is delivered by applying DC voltage to the center tap of the coupling transformers of each of 2 pairs.

Figure 3.5.4.2.a shows contact assignments of RJ11 type jack on ETIB and LG proprietary electronic terminals.



Figure 3.5.4.2.a Contact assignments of Electronic Terminals

Connection method between the ETIB and the Electronic terminals

The cable with 25-pair male connector is required between Electronic Terminal Interface board and MDF. It is possible to get the cable locally, or use GDK-162 5MC2 supplied by LGE on the order if necessary.

The MDF that is in wide use in the country can be locally used according to the requirements of local regulation.



Note:

- 1. Each area means the followings,
 - A: GDK system, B: between the GDK system and MDF, C: cable in building,
 - D: between Terminal connection point, e.g. terminating adapter and Terminal,
 - E: Electronic terminals
- 2. A pair for voice signal can be connected regardless of the polarity of its Tip and Ring. But the other for signaling and data transmission should be connected to be suitable for their polarity as above figure.
- 3. ETIB is capable of connecting with up to 6 electronic terminals.

Figure 3.5.4.2.b wiring between board and electronic terminal

3.5.4.3 Single line Telephone wiring

SLT interface boards such as SLIB24, SLIB48, SLIB II and DSIB are wired to SLT or standard analog device with a single pair of wire that provides battery feed, voice and signaling from/to the connected SLT. Typical contact assignments of RJ11 modular connector, a miniature 6-position jack as following figure 3.5.4.3.a. But the contact assignments and connector type may be different from following figure in special countries according to the special national condition. Before wiring, it is important to check them.



Figure 3.5.4.3.a contact assignments of SLT

The cable with 25-pair male connector is required between SLT Interface board and MDF. It is possible to get the cable locally, or use GDK-162 5MC2 supplied by LGE on the order if necessary.

MDF can be locally used according to the requirements of local regulation and/or an usual usage in the field.



Note:

- 1. SLT (TE) typically operates with both polarities, since a fixed polarity is not guaranteed according to most of specification.
- 2. 4SLI is capable of connecting to up to 6 SLT through CN14 on MBU.

SLIB is capable of connecting to up to 12 SLT through CN16 on MBU.

Figure 3.5.4.3.b wiring between board and analog TE including SLT

3.5.4.4 Intercom/Door Phone Box installation

The Intercom/Door Phone Box is intended to be wall mounted. There are two kinds of Intercom/Door Phone Boxes in GDK-FPII system available. KD-Digital Phone Box is can be connected to the digital terminal interface, and KD-ICM Box is can be connected to the electronic terminal interface (ETIB). But another GK or GSX phone box connected to LG Analog Key Telephone System can not be connected to ETIB.

At first, separate the ICM/Door Box from the base plate by inserting a flat thin edged screw driver in the bottom of the product. Press the screw driver inward which will release the retaining tan and twist the screw driver to separate the base plate. Fasten the base plate of the ICM/Door Box to the wall with # 8 screws. Route the cable through the cable entry hole in the base plate and connect the wires to the four screw terminals as shown in the figures 3.5.4.4.a and 3.5.4.4.b. When the wiring is complete, pull any slack wire back through the base plate and push the housing back together.

Connection method between the Digital Interface Board and KD-Digital Phone Box

KD-Digital Phone Box can be only connected to the Digital Interface Board. Wiring from digital terminal interface board to KD-Digital Phone Box requires one pair of wire.





Figure 3.5.4.4.a wiring between the board and KD-Digital Phone Box

Connection method between the ETIB and KD-ICM Box

KD-ICM Box can be only connected to ETIB. Wiring from electronic terminal interface board to KD-ICM Box requires two pairs of wires.



- 1. A pair for voice signal can be connected regardless of the polarity of Tip and Ring. But the other for signaling and data transmission should be connected with a fixed polarity as above figure.
- 2. The GSX or GK Phone Box that can be connected to the LG Analog Key Telephone System, should not be connected to the GDK-FPII ETIB.



3.5.4.5 Contact Assignments of RJ21 Type Connectors for Expansion Connector

Basically the lower most connector (CN16) is used to connect extensions with option board which is installed in universal slots(slot #4~7). So, any kind of extensions(digital keysets or SLTs) can be connected to this connect. It depends on what kind of interface boards are installed.

Punch-Down	MBU connector CN16				
Block Pin	Pair	Pin	Color-Code	Designation	
1 2	1	26 1	WH/BL BL/WH		
3 4	2	27 2	WH/OR OR/WH	slot #7 - R6 slot #7 - T6	
5 6	3	28 3	WH/GN GN/WH	slot #7 - R5 slot #7 - T5	
7 8	4	29 4	WH/BN BN/WH	slot #7 - R4 slot #7 - T4	
9 10	5	30 5	WH/SL SI /WH	slot #7 - R3 slot #7 - T3	
11 12	6	31	RD/BL BL/RD	slot #7 - R2 slot #7 - T2	
13	7	32 7	RD/OR OR/RD	slot #7 - R1 slot #7 - T1	
15 16	8	33	RD/GN GN/RD	slot #6 - R6	
17 18	9	34 9	RD/BN BN/RD	slot #6 - R5 slot #6 - T5	
19 20	10	35 10	RD/SL SL/RD	slot #6 - R4 slot #6 - T4	
21	11	36	BK/BL BL/BK	slot #6 - R3	
23	12	37	BK/OR OR/BK	slot #6 - R2	
25 26	13	38	BK/GN GN/BK	slot #6 - R1 slot #6 - T1	
27 28	14	39 14	BK/BN BN/BK	slot #5 - R6 slot #5 - T6	
29 30	15	40 15	BK/SL SL/BK	slot #5 - R5 slot #5 - T5	
31 32	16	41 16	YL/BL BL/YL	slot #5 - R4 slot #5 - T4	
33 34	17	42 17	YL/OR OR/YL	slot #5 - R3 slot #5 - T3	
35	18	43 18	YL/GN GN/YL	slot #5 - R2 slot #5 - T2	
37 38	19	44	YL/BN BN/YL	slot #5 - R1 slot #5 - T1	
39 40	20	45	YL/SL SL/YI	slot #4 - R6 slot #4 - T6	BI 'BI UF
41	21	46 21	VI/BL BL//I	slot #4 - R5 slot #4 - T5	BK:BLACK
43 44	22	47	VI/OR OR/\/I	slot #4 - R4 slot #4 - T4	OR:ORANGE
45 46	23	48	VI/GN GN//I	slot #4 - R3	GN:GREEN
47	24	49 24	VI/BN BN//I	slot #4 - R2 slot #4 - T2	VI:VIOLET
49 50	25	50 25	VI/SL SL/VI	slot #4 - R1 slot #4 - T1	YL:YELLOW

The lower one's detailed pin mapping is shown in Table 3.5.4.5.

Table 3.5.4.5 EXP. Connector(CN16) Wiring

3.5.5 PFTU Wiring

The PFTU is wired from the RJ21 type male connector on the modue itself to the MDF, cross connected to the CO Line inputs from the telephone company, to the CO Line inputs of the system, and to Power Failure SLTs. The CO lines and SLTs are used as CO line inputs and extensions of GDK-FPII System in normal operation, but each CO line and SLT is directly connected in power failure mode by connecting as shown in figure 3.5.5

The cable with RJ21 type female connector is required between PFTU connector and MDF. It is possible to get the cable locally, or use GDK-162 5MC1 supplied by LGE on the order if necessary.

The MDF that is in wide use in your country can also be locally used according to the requirements of local regulation.



Note:

- 1. A connector block with screws, which is connected to MBU, is supplied in the PFTU package, but control wires are not supplied. It is recommended that 2 wires with AWG22, 24 or 26 be used for the connection of control signal.
- 2. The control wires can be connected regardless of their polarities .
- 3. The control wires can be connected to CN41 on MBU with a connector block or the contact No. 7 and 37 of CN14 on MBU without a connector block. See PFTU installation in section 2.

Figure 3.5.5 PFTU wiring

Punch-Down		PFTU connector		PFTU	PFT	
Block Pin	Pair	Pin	Pin Color-Code		Circuit	
1 2	1	26 1	WH/BL BL/WH	COT1-IN COR1-IN	1 st Circuit	
3 4	2	27 2	WH/OR OR/WH	COT1-OUT COR1-OUT		
5 6	3	28 3	WH/GN GN/WH	TEL1-T TEL1-R		
7 8	4	29 4	WH/BN BN/WH	SLIB1-T SLIB1-R		
9 10	5	30 5	WH/SL SL/WH	COT2-IN COR2-IN	2 nd Circuit	
11 12	6	31 6	RD/BL BL/RD	COT2-OUT COR2-OUT		
13 14	7	32 7	RD/OR OR/RD	TEL2-T TEL2-R		
15 16	8	33 8	RD/GN GN/RD	SLIB2-T SLIB2-R		
17 18	9	34 9	RD/BN BN/RD	COT3-IN COR3-IN	3 rd Circuit	
19 20	10	35 10	RD/SL SL/RD	COT3-OUT COR3-OUT		
21 22	11	36 11	BK/BL BL/BK	TEL3-T TEL3-R		
23 24	12	37 12	BK/OR OR/BK	SLIB3-T SLIB3-R		
25 26	13	38 13	BK/GN GN/BK	COT4-IN COR4-IN	4 th Circuit	
27 28	14	39 14	BK/BN BN/BK	COT4-OUT COR4-OUT		
29 30	15	40 15	BK/SL SL/BK	TEL4-T TEL4-R		
31 32	16	41 16	YL/BL BL/YL	SLIB4-T SLIB4-R		
33 34	17	42 17	YL/OR OR/YL	COT5-IN COR5-IN	5 th Circuit	
35 36	18	43 18	YL/GN GN/YL	COT5-OUT COR5-OUT		
37 38	19	44 19	YL/BN BN/YL	TEL5-T TEL5-R		
39 40	20	45 20	YL/SL SL/YL	SLIB5-T SLIB5-R		BL:BLUE
41 42	21	46 21	VI/BL BL/VI	COT6-IN COR6-IN	6 th Circuit	BK:BLACK BN:BROWN
43 44	22	47 22	VI/OR OR/VI	COT6-OUT COR6-OUT		OR:ORANGE WH:WHITE
45 46	23	48 23	VI/GN GN/VI	TEL6-T TEL6-R		GN:GREEN SL: SLIVER
47 48	24	49 24	VI/BN BN/VI	SLIB6-T SLIB6-R		VI:VIOLET RD:RED
49 50	25	50 25	VI/SL SL/VI	-	-	YL:YELLOW

Table 3.5.5. shows the contact assignments of RJ21 type connector on PFTU.

Table 3.5.5

PFTU Wiring

3.5.6 Analog CO Line wiring

Analog CO boards such as 4LCO, LCOB, AC15, BWDID, TLIB are wired to the CO lines from the telephone company through CN15, which is a RJ21 type male connector on MBU. Table 3.5.6.5 gives the contact assignments of an RJ21 type male connector, CN15. If using the AC15 or TLIB, the contact assignments of this connector are different to normal CO lines. See AC15 wiring and TLIB wiring in this section; sub-clauses.

The following provides details on the connection of each type of analog CO line Board.

The cable with RJ21 type female connector is required between CN15 connector and MDF. It is possible to get the cable locally, or use GDK-162 5MC1 supplied by LGE on the order if necessary.

The MDF or terminating points that is in wide use in your country can be locally used according to the requirements of local regulation.

3.5.6.1 LCOB/4LCO wiring

4LCO, LCOB are respectively capable of connecting 4 loop start CO lines through an RJ21 type male connector on the MBU.

The following Figure 3.5.6.1 is an example connection in case that 4LCO is installed in slot 3. The relation between the contact assignments of CN15 on MBU and the slots is given in Tables 3.5.6.5.



- 1. CO lines of 4LCO/LCOB can operate regardless of line polarity.
- 2. Connect TRC (Telecommunication reference cable) to 25th pair of RJ21 type connector if it is supplied from Network.
- 3. Both 4LCO/LCOB are respectively capable of connecting to up to 4 lines.

Figure 3.5.6.1 loop start CO line wiring

3.5.6.2 AC15 Board wiring -UK

AC15 is capable of connecting 2 Private lines through an RJ21 type male connector on the MBU.

The following Figure 3.5.6.2 is an example connection in case that the AC15 board is installed in slot 4. The relation between the contact assignments of CN15 on MBU and the slots is given in Tables 3.5.6.5.



- 1. Above figure is an example connection in case that AC15 board is installed in slot No. 4.
- 2. A pair of a line is for RX signal, and the other is for TX signal. So, 2 pairs of wires are required for the connection of 1 line.
- 3. Each pair can be connected regardless of the polarity of Tip and Ring.
- 4. AC15 board is capable of connecting to up to 2 lines.



MBU connector CN15 (for slot #4~7)		Direct mapping to AC15 line	Remark
SLOT #N - CO1-T		RX-T1	
SLOT #N - CO1-R		RX-R1	
SLOT #N - CO2-T		TX-T1	Port 1
SLOT #N - CO2-R		TX-R1	
SLOT #N - CO3-T		RX-T2	
SLOT #N - CO3-R	V	RX-R2	
SLOT #N - CO4-T		TX-T2	Port 2
SLOT #N - CO4-R		TX-R2	

Table 3.5.6.2 Direct Mapping Table for AC15

3.5.6.3 BWDIDB wiring -New Zealand

BWDIDB is capable of connecting 4 both-way DID lines through an RJ21 type male connector on the MBU.

The following Figure 3.5.6.3 is an example connection in case that the BWDIDB is installed in slot 4. The relation between the contact assignments of CN15 on MBU and the slots is given in Tables 3.5.6.5.



- 1. Above figure is an example connection in case that BWDIDB is installed in slot # 8.
- 2. BWDIDB is polarity-sensitive, so it is important to check the polarity of wires when wiring. In idle state, -48V is fed on Ring wire, and Reference is on Tip wire in GDK-FPII system.
- 3. BWDIDB board is capable of connecting with up to 4 lines.

Figure 3.5.6.3	Both-way DID line wiring
----------------	--------------------------

MBU connector CN15 (for slot #4~7)	Direct mapping to both-way DID line	Remark
SLOT #N - CO1-T	T1	Port 1
SLOT #N - CO1-R	R1	
SLOT #N - CO2-T	T2	Port 2
SLOT #N - CO2-R	R2	
SLOT #N - CO3-T	Т3	Port 3
SLOT #N - CO3-R	R3	
SLOT #N - CO4-T	T4	Port 4
SLOT #N - CO4-R	R4	

Table 3.5.6.3 Direct Mapping Table for BWDIDB

3.5.6.4 TLIB wiring - Korea

TLIB is capable of connecting 2 E&M lines through a RJ21 type male connector on the MBU.

The following Figure 3.5.6.4 is an example connection in case that the TLIB is installed in slot 4. The relation between the contact assignments of CN15 on MBU and the slots is given in Tables 3.5.6.5.



Note:

- 1. A pair of wire is for audio signal, and this can be connected regardless of line polarity of Tip and Ring.
- 2. The other is for signaling, and this is polarity-sensitive. EAR wire of EMIB is connected to MOUTH wire of Network/PBX and vice versa.

It is important to check EAR and MOUTH of Network before wiring, because some network equipment may describe ' opposite marks'.

3. TLIB board is capable of connecting with up to 4 lines.

MBU connector CN15 (for slot #4~7)		Direct mapping to TIE line	Remark
SLOT #N - CO1-T		VT - 1	
SLOT #N - CO1-R		VR - 1	
SLOT #N - CO2-T		E-1	Port 1
SLOT #N - CO2-R		M-1	
SLOT #N - CO3-T		VT - 2	
SLOT #N - CO3-R	V	VR - 2	
SLOT #N - CO4-T		E-2	Port 2
SLOT #N - CO4-R		M-2	

Figure 3.5.6.4 wiring E&M tie line

Table 3.5.6.4 Direct Mapping Table for TLIB

3.5.6.5 Contact Assignments of RJ21 type Connectors on Analog CO Boards.

Punch-Down	MB	U Connector C	N15		
Block Pin	Pair	Pin	Color-Code	Designation	
1	1	26	WH/BL	CO1-R	7
2	_	1	BL/WH	CO1-T	
3 4	2	27 2	WH/OR OR/WH	CO2-R CO2-T	Slot #3
5	3	28	WH/GN	CO3-R	
6	_	3	GN/WH	CO3-T	
7	4	29	WH/BN	CO4-R	
8		4	BN/WH	CO4-T	
9 10	5	30 5	WH/SL SL/WH	CO5-R CO5-T	7
11	6	31	RD/BL	CO6-R	
12	Ū	6	BL/RD	CO6-T	Slot #4
13	7	32	RD/OR	CO7-R	
14		7	OR/RD	CO7-T	
15 16	8	33 8	RD/GN GN/RD	CO8-R CO8-T	
17	9	34	RD/BN	CO9-R	_
18	U	9	BN/RD	CO9-T	
19	10	35	RD/SL	CO10-R	
20		10	SL/RD	CO10-T	Slot #5
21 22	11	36 11	BK/BL BL/BK	CO11-R CO11-T	
23	12	37	BK/OR	CO12-R	
24	.=	12	OR/BK	CO12-T	
25 26	13	38 13	BK/GN GN/BK	CO13-R	7
20	14	39	BK/BN	CO14-R	
28		14	BN/BK	CO14-T	Slot #6
29	15	40	BK/SL	CO15-R	
30		15	SL/BK	CO15-T	
31	16	41	YL/BL	CO16-R	
32	47	16	BL/YL	CO16-1	
.3.3 34	17	42 17	OR/YI	CO17-R CO17-T	Г
35	18	43	YL/GN	CO18-R	
36		18	GN/YL	CO18-T	Slot #7
37	19	44	YL/BN	CO19-R	
38		19	BN/YL	CO19-1	
39 40	20	45 20	SL/YL	CO20-R CO20-T	
41	21	46	VI/BL	-	BL:BLUE
42	22	21		-	BK:BLACK
43 44	22	47 22	OR/VI	-	OR:ORANGE
45	23	48	VI/GN	-	WH:WHITE
46		23	GN/VI	-	GN:GREEN
47 49	24	49 24	VI/BN BN/A/I	-	SL:SLIVER
40 40	25	<u>24</u> 50		-	
50	20	25	SL/VI	-	YL:YELLOW

Table 3.5.6.5 shows the contact assignments of RJ21 type connector(CN15) on MBU.

Table 3.5.6.5 CO Connector (CN15) Wiring

3.5.7 ISDN wiring

ISDN boards such as 2BRI, STIB and PRI contain RJ45 type jacks on each board, to connect to ISDN. Following figure shows ISND reference point and Functional group,



Figure 3.5.7.a ISDN Reference Points and Functional Group

Reference point: Theoretical point to classify the functional unit

- 1. V-point: PX line
- 2. U-point: Subscriber line

Subscriber line between public exchange and NT1 (Network termination), 2wire and 4-5Km distance

3. T-point: ISDN Trunk line

Trunk line for PBX between NT1 and PBX system, 4wire and 1Km max distance.

4. S-point: ISDN standard user interface

Standard point for ISDN terminal connection, physically same as T-point, multiple connection possible.

5. R-point: X or V series terminal interface.

Reference point between Terminal adapter and non-ISDN terminal connection

Functional Units

- 1. NT1: Network Termination
- 2. NT2: Protocol Handle, PBX
- 3. TE1: Standard ISDN interface TE
- 4. TE2: Non-Standard ISDN interface TE
- 5. TA: Adapter for non-standard ISDN interface

ISDN trunk connection (Basic Rate)





ISDN Terminal Connection(Basic Rate)





ISDN Trunk connection (Primary Rate)





- 2. Without power feed.
- 3. Line Impedance: 120 ohm



Physical Connectors

Basic Rate User network Interface

ISO 8877 ITU-T Rec. I.430



Contact	TE	NT	Polarity
1	Power Source 3	Power Source 3	+
2	Power Source 3	Power Source 3	-
3	Transmit	Receive	+
4	Receive	Transmit	+
5	Receive	Transmit	-
6	Transmit	Receive	-
7	Power Source 2	Power Source 2	-
8	Power Source 2	Power Source 2	+

Figure 3.5.7.e **RJ-45 Type Jack**

Table 3.5.7.a **Contact assignments**

Primary Rate User network Interface (E1/T1)

ISO 10173 ANSI T1.408



Contact TE NT Polarity Transmit Receive 1 2 Receive Transmit 3 Shield(R) * Shield(T) * 4 Transmit Receive Receive 5 Transmit Shield(T) * Shield(R) * 6 Power Source * Power Source * 7 Power Source * 8 Power Source * + Optional

Figure 3.5.7.f **RJ-45 Type Jack**

Table 3.5.7.b

Contact assignments

3.5.7.1 ISDN 2BRI wiring

BRIB is capable of connecting 2 Basic Rate Trunk lines through RJ45 type jacks. The contact assignments of RJ45 type jack on BRIB show in figure 3.5.7.1.a.



Figure 3.5.7.1.a contact assignments of RJ-45 type jack of 2BRI board

The TX pair of RJ45 type jack on BRIB is connected to the RX pair of NT1, and the RX one on BRIB is to the TX one of NT1 as Figure 3.5.7.1.b.

Terminating resistors should be required on each line to match line impedance. See clause 3.5.7.4.



Note:

- 1. Connect the TX pair of an RJ45 type jack on BRIB to the RX pair of NT1 and vice versa.
- 2. Check terminating resistors. See clause 3.5.7.4.
- 1. 2BRI is capable of connecting to up to 2 lines.

Figure 3.5.7.1.b BRI trunk line wiring

3.5.7.2 ISDN STIB wiring

STIB is capable of connecting to 2 Basic Rate Trunk lines or Terminals through RJ45 type jacks. Each line is switchable by hardware and software setting. (see clause 3.4.6.2)

The contact assignments of RJ45 type jack on STIB show in figure 3.5.7.2.a.





a. When a line is set to T interface

a. When a line is set to S interface

Figure 3.5.7.2.a contact assignments of RJ-45 Connectors of STIB

The TX pair of RJ45 type jack on STIB/STIU is connected to the RX pair of NT1 or Terminal, and the RX one on STIB/STIU is to the TX one of NT1 or terminal as Figure 3.5.7.2.b.

Terminating resistors should be required on each line to match line impedance. See clause 3.5.7.4.



- 1. Connect the TX pair of RJ45 type jack on STIB to the RX pair of NT1 and *vice versa*. And connect the TX pair of RJ45 type jack on STIB to an RX pair of ISDN terminal and *vice versa*.
- 2. Check terminating resistors. See clause 3.5.7.4.
- 3. STIB is capable of connecting to up to 2 lines/terminals.



3.5.7.3 ISDN PRI wiring

PRI board is capable of connecting to 1 Primary Rate Trunk lines through an RJ45 type jack. The contact assignments of RJ45 type jack on PRI board show in figure 3.5.7.3.a.



Note: Only two pairs of RX and TX are typically connected with RRI line.

Figure 3.5.7.3.a Contact assignments of RJ-45 type jack of PRI board

The TX pair of RJ45 type jack on PRI board is connected to the RX pair of DSU, and the RX one on PRI board is to the TX one of DSU as Figure 3.5.7.3.b.



Note:

- 2. Connect the TX pair of RJ45 type jack on PRI board to the RX pair of DSU and vice versa.
- 3. PRI board is capable of connecting with 1 PRI line.

Figure 3.5.7.3.b PRI trunk line (TE connection) wiring

GDK-FPII PRI board is only used as TE. So the PRI board can not be used as TE even though used for QSIG function with another GDK PRIBs directly.

The contact assignments of RJ45 type jack on GDK-162/100 PRIB are not changed even though the board is set to NT mode. See Table 3.5.7.b and Figure 3.5.7.3. So it is important that the wiring with contact assignments of RJ45 type connector should be checked, when PRIB of another system is set to master mode (NT) during installation. The TX pair of RJ45 connector on PRIB in master mode is connected to the RX pair of PRIB of another system and vice versa as following figure 3.5.7.3.c.





3.5.7.4 Terminating Resistors on Basic Rate interface(2BRI/STIB)

Terminating resistors are required on each line of BRIB/STIB for the proper operation. Switchable terminating resistors are introduced on 2BRIB issue 2 or later version and all STIB version. So the contacts of connectors on each line of the board should be short at ON position to terminate them when installing line.



Note:

- 1. R is 100 ohm terminating resistor, and the line is terminated at 100 ohm when switches are ON.
- 2. Terminating connectors and shorting traps on each interface of 2BRI/STIB. See clause 3.4.5.1 and 3.4.5.2.

Figure 3.5.7.4.a Terminating method of BRIB/STIB with switchable terminating resistors

But terminating resistors are not introduced on 2BRI board issue 1, which is very old version and not supplied now. So the external terminating unit should be required to terminate if 2BRI issue1. The external terminating unit can be locally got, otherwise 2923NP1656, which is the terminating unit provided by LGE, can be used.



Note:

1. R is 100 ohm terminating resistors.

2. 2BRI issue 1 is verv old version of 2BRI. Now LGE stopped to produce 2BRI issue1.

Figure 3.5.7.4.b Terminating method of BRIB/STIB without switchable terminating resistors

3.5.7.5 Clock Control Cable wiring- Multi ISDN board installation

GDK-FPII system allows Multi-ISDN boards to be installed. When Multi-ISDN board installation, clock control cable should be connected according to the priority of the cards. Then, in case that the ISDN line of the board with the higher priority is in the state of Loss of signal or clock failed, the synchronized clock for system will be supplied from next daisy chained ISDN board. Every ISDN card in TE mode generates the reference clock synchronized with ISDN line and transmits the clock to PLLU2 on MBU according to the clock control signal.

	High(1) state	Low(0) state
IN	Enable the reference clock circuit	Disable the reference clock out circuit
OUT	Enable next clock circuit	Disable next clock circuit



Figure 3.5.7.5.a Example of multi-ISDN board installation when PRI is the highest priority.

Note:

1. The Clock control cables in the STIB package should be connected between ISDN boards according to the priority of them when multi-ISDN board installation.



Note:

1. The Clock control cables in the STIB package should be connected between ISDN boards according to the priority of them when multi-ISDN board installation.

Figure 3.5.7.5.b Example of multi-ISDN board installation when a 2BRI has the highest priority.



Note:

- 1. The Clock control cables in the STIB package should be connected between ISDN boards according to the priority of them when multi-ISDN board installation.
- 2. If all the lines of ISDN board are set to NT mode (S interface), clock control cable should be not connected to the board.

Figure 3.5.7.5.c Example of multi-ISDN board installation when a STIB is the highest priority and all the interface of another STIB are set to S interfaces.

Cabling Examples

For ISDN line connection, it is done by using the RJ45 type connector on the ISDN interface cards (2BRI, PRI, STIB), not the CHAMP connector on the MBU. So Figure 3.5.7.5 gives an example of the arranging the cables from ISDN cards.



Figure 3.5.7.5.d the arrangement of ISDN cables



Various Examples of Clock control cable wiring

a) 2BRI or PRI card is installed on slot 3 and one or more STIB is(are) installed on universal slot(s).



b) 2BRI or PRI card is installed on slot 3, and one or more STIB is(are) installed on slot 1 and universal slot(s).



c) STIBs are installed on universal slots.

Figure 3.5.7.5.e Clock Control Cable Wiring

3.5.7.6 QSIG connection

GDK-FPII system supports QSIG function using ISDN boards. There are two kinds of connection for supporting QSIG function. One is the direct connection between GDK systems with PRI line, the other is the connection through Public Network with PRI or BRI lines.

For QSIG function, the SMEMU should be required.

Direct connection

Only GDK PRI boards can be used for the direct connection. For more details, see the manual for GDK186/100/FPII Q-signaling Interface.



Note:

1. GDK-FPII PRI board could not be set to master (NT) mode.



The connection through Public Network

GDK-PRIB/BRIB/STIB can be used for this connection.

For more details, see the manual for GDK186/100/FPII Q-signaling Interface.



Figure 3.5.7.6.b

The connection through the Public Network for QSIG feature

3.5.8 Contact Assignments of various types of connectors

The contact assignments of various types of connectors are described in this clause.

3.5.8.1 RJ21 type connectors

The contact assignments of RJ21 type (25-pair Amphenol) connectors on MBU



Figure 3.5.8.1 Contact assignments of RJ21 type connectors

3.5.8.2 Miniature 6-position jack

The contact assignments of miniature 6-position jack registered in FCC.



Figure 3.5.8.2 Contact assignments of miniature 6-position jack
3.5.8.3 Miniature 8-position jack for ISDN connection

The contact assignments of miniature 8-position jack used for ISDN connection.

a. Basic Rate User network Interface

ISO 8877 ITU-T Rec. I.430



Contact	TE	NT	Polarity
1	Power Source 3	Power Source 3	+
2	Power Source 3	Power Source 3	-
3	Transmit	Receive	+
4	Receive	Transmit	+
5	Receive	Transmit	-
6	Transmit	Receive	-
7	Power Source 2	Power Source 2	-
8	Power Source 2	Power Source 2	+

Figure 3.5.8.3.a RJ-45 Connector

Table 3.5.8.3.a Contact

Contact assignments

D. FIIIIIALY RALE USEL HELWOIK IIILEHALE (E 1/11	b.	Primary	Rate	User	network	Interface	(E1/	Τ1
--	----	---------	------	------	---------	-----------	------	----

ISO 10173 ANSI T1.408



Figure 3.5.8.3.b RJ-45 Connector

Contact	TE	NT	Polarity	
1 2 3 4 5 6 7 8	Receive Receive Shield(R) * Transmit Transmit Shield(T) * Power Source * Power Source *	Transmit Transmit Shield(T) * Receive Receive Shield(R) * Power Source * Power Source *	-+	
* Optional				

Table 3.5.8.3.b Contact assignments

SECTION 4. ISDN BOARDS

This section briefly introduces ISDN boards, Number Assignment, and the other information.

For more details for installation, see the ISDN part of clauses 2.4.9 System components, 3.4.6 PCB Installation, and 3.5.7 ISDN wiring.

Otherwise, for more details for the features and Admin programming related to ISDN, see Programming Manual.

4.1 Basic Information

1)	Thoro are th	roo difforent ISDN	Leards on CDK-EPIL	evetore as follows:
I)	mere are un	ree unierent iSDr	N Calus on GDR-FPILS	system as tonows,

Board Type	2BRI	PRI	STIB
Channels	4B Ch. (2 BRI)	30B Ch. (1 PRI)	4B Ch. (2 BRI)
Interface	T-Interface	T-Interface	S/T-Interface
Max No. of Cards on the	1 Card	1 Card	5 Cards
system			

- *) In case of 2BRI & STIB, 1 port is configured with 2B+D structure, so each board can support 4B channel connection.
- *) In case of STIB, it can be operated with S or T interface mode according to DIP switch position on it and max. 5 STIB cards can be installed in GDK-FP II.
- *) In case of 2BRI & PRI, it can be installed only in the Slot No. 3 of GDK-FP II. So, both of them cannot be installed at the same time to the system.
- *) In case of PRI, MEMU or SMEMU should be installed in the system.
- 2) GDK-FP II system, you can install 2BRI/PRI/STIB within the station and CO line capacity of the system.

No. of Max. Stations	No. of Max. CO Lines
34	34

- Not achieved the simultaneously. See the system capacity.
- 3) Max. 8 ISDN TEs (Terminal Equipments) can be connected to the single S-Interface port (But, only when STIB can support enough power for all 8 ISDN terminals within its capacity or when some or all of them have self-power within STIB's power capacity), and any kind of ISDN TEs, which are compatible with ETSI ISDN specification, can be connected to the S-Interface. For example, ISDN Phone, G4 Fax, Video Terminal, ISDN PC Card, etc. can be connected.

4.2 Station/CO Line Number Assignments

- (1) As same as any other station/CO cards, the station/CO line number on ISDN card is assigned by PGM 02 in Admin. Programming.
- (2) In PRI board, the 30 continuous CO line numbers are assigned by PGM 02.
- (3) In 2BRI board, the 4 continuous CO line numbers are assigned by PGM 02. Two continuous CO line numbers are assigned per each port (2B+D).
- (4) In STIB with all T-Interface, as same as 2BRI, the 4 continuous CO line numbers are assigned by PGM 02. Two continuous CO line numbers are assigned per each port (2B+D).
- (5) In STIB with all S-Interface, the 4 continuous station numbers are assigned by PGM 02. Two continuous station numbers are assigned per each port (2B+D).
- (6) If STIB is used for S-Interface and T-interface, then system assigns the continuous CO line No. on each T-Interface, and the continuous station No. on each S-Interface as follows;

	•		(If the first Sta. No. is 120 and the first CO No. is 24)
STIB Board	Port 1	S-Interface	Station 120~121
	Port 2	T-Interface	CO Line 24 ~25

(7) Two continuous station numbers assigned to a single S-Interface act as the same station No. For example, calling to station 120 is the same as calling to station 121.

- (8) If you want to change S-Interface to T-Interface, or vise versa, on STIB board, you have to reprogram Slot Assignment (PGM 02) even if the slot assignment is not changed and reset the GDK system. After that, system works as required.
- (9) In STIB,

To use 'T' interface only - Slot Assignment (PGM 02) at COL only To use 'T' & 'S' interface - Slot Assignment (PGM 02) at COL & STA To use 'S' interface only - Slot Assignment (PGM 02) at COL & STA

Other Information 4.3

ISDN TEs (Terminal Equipment)

- (1) There are many ISDN TEs(ex. ISDN Phone, Video-Phone, G4 Fax, PC-Card, etc.). The GDK-FP II supports all ISDN TEs, which are compatible with Euro-ISDN (ETSI ISDN Specification) till now on.
- (2) ISDN phone can call another station (DKTU,EKTU,SLT) connected to the GDK-FPII and access analog/ISDN CO lines.
- (3) The LCD display on ISDN TE is depending on its own feature, not GDK-FP II system's feature.
- 1) **Etc.**
 - ISDN station cannot be the master of conference and a member of conference.
 - □ ISDN station cannot call station which is activated to Off-net Call Forward.
 - □ ISDN station cannot be an attendant station.
 - ISDN station cannot belong to Hunt Group.

SECTION 5. CUSTOMER DATABASE PROGRAMMING

5.1 INTRODUCTION

The GDK Key Telephone System can be programmed to meet each customer's individual need. All programming is done at station 100 (station port # 00) using KD-36D digital key telephone. (You cannot program with Large LCD keyset.). Additional programming stations can be assigned (PGM 21-BTN 4), but only 1 keyset can be active in programming mode at any one time. (While activating GDK PC Admin, no keyset can be active and the reverse also.)

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 (Flexible Buttons) are used to indicate the specific data field and to enter information. Sometimes the **[SPEED]** button and '* of the dial pad is used to delete the data or to indicate end of data input.

See TABLE 5.6.1 - 5.6.20 for default data. If this pre-programming suits the customer, additional admin program is not necessary. To change admin data, the user enters the admin. programming mode and select program code. During admin programming other keysets operate normally.

When Admin programming, LCD and LEDs indicate the current programmed data and status. If the programmer enters correct data, then LCD and LEDs show the entered data and the data is stored in the temporary buffer area. Real system databases 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 LEDs show their status) is saved into permanent memory. Tones are provided to let the programmer know data entry is correct (confirmation tone) or not (error tone).

5.2 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 the **[TRANS/PGM]** button and dial * # (Confirmation tone is heard).
- 3. Enter Admin password if the password has been set. This places the station into the admin programming mode (confirmation tone heard).

Each program is accessed by pressing the **[TRANS/PGM]** button and dialing the two-digit program number. If an error is made while entering data, the **[▲]** or the **[TRANS/PGM]** button can go the previous status. When the **[TRANS/PGM]** button is pressed, the LCD will display;

ENTER PROGRAM CODE

5.3 PERMANENT UPDATE PROCEDURE

When the data has been entered, the **[HOLD/SAVE]** button is used to store the data permanently. If all data was entered correctly, confirmation tone is heard when pressing the **[HOLD/SAVE]** button. If there were any errors in the entry, then an error tone is presented and data is not stored in the permanent memory.

5.4 NUMBERING PLAN

The following numbering plan can be changed by Admin Programming 01 depending on the user's needs.

NUMBER		ITEM	REMARK
162	100–291		
100	100–235	Station Number	
FPII	100–177		
162	620–649		
100	620–634	Station Group Number	
FPII	620-627		
	3	PGM Enter Code	SLT
162	401-420		
100	401-415	Internal Page Zones	
FPII	401-405		
	43	Internal All Call Paging	
	44	Meet Me Page	
	46	External Page Zone -1	
	47	External Page Zone -2	
	48	External All Call Paging	
	49	All Call Paging	
	50	Enter SMDR Account Code	4/8 BTN Keyset, SLT
	51	Flash Command to CO Line	
	52	Last Number Redial (LNR)	
	53	Do Not Disturb	
	54	Call Forward	
	55	Station Speed Dial	
	56	Message Wait Enable	
	57	Message Wait Answer	
58		Speed Dial Access	
59		Cancel DND/Call Forward/Pre-selected MSG	
162	601-619		
100 601-610		Call Park Location	
FPII	601-605		
	65	Alarm Reset	
66		Group Call Pick-up	

NUMBER		ITEM	REMARK
	67#	DVU – Record User Greeting for Busy Forwarding	
67*		DVU – Delete User Greeting for Busy Forwarding	
	670	DVU – Play User Greeting for Busy Forwarding	
	671	DVU – Time Announcement	
	672	DVU – Date Announcement	
	673	DVU – Station Number Announcement	
	674	DVU – Record User Greeting for No Answer Forwarding	
	675	DVU – Delete User Greeting for No Answer Forwarding	
	676	DVU – Play User Greeting for No Answer Forwarding	
	677	DVU – Station Statue Announcement	
	678	DVU – Record Page Announcement	
	679	DVU – Retrieve Page Announcement	
	69	Universal Night Answer (UNA)	
	7XXX	Direct Call Pick-up (XXX = Station Number)	
162	801-848		
100	801-824	CO Group Access	
FPII	801-809		
162	8801-8896		
100	8801-8848	CO Line Access	
FPII	8801-8834		
	89	Tie Routing Access	
	8##	Retrieve Holding CO Group	Keyset
162	8#01-8#96		
100	8#01-8#48	Retrieve Holding CO Line	Keyset
FPII	8#01-8#34		
	9	Access the first CO line	
	0	Attendant Call	A
	*0	Print SMDR (Station Base)	Attendant
	*0	Print SMDR (Account Group Base)	Attendant
	*2	Delete SMDR (Station Base)	Attendant
	<u> </u>	Display Call Charge on LCD	Attendant
	**	Abort SMDR Printing	Attendant
	#*1	Door Open 1	Allendant
	#*2	Door Open 2	
	#*3	Door Open 3	
# 5		Door Open 4	
*8		VM Message Wait Enable	
*0		VM Message Wait Cancel	
[2]	 PFFD1 + *	Last Number Redial	
101	>FFD] + #	Save Number Redial	Kevset
	ED] + 00-10	Station Speed Dial Access	Keyset
	<u>-0</u> 1,00-19	System Speed Dial Access	XXX (Bin No. of System
			Speed Dial)
[SPI	EED] + XXX		162: 200-999
			100/FPII: 200-399

- To enter user programming mode, press the [TRANS/PGM] button in a keyset or dial 3 (Programming enter code) in a SLT.
- The following numbering plan is fixed, cannot be changed by Admin. Programming.

NUMBER	ITEM	REMARK
18	Walking COS	Keyset
30	Station User Name Registration	4/8 BTN Keyset, SLT
25	Receive Station Number from KSU	WHTU only
29	Erase Subscription Data	ATD only
2*	Display Date / Time	WHTU only
40	MPB Version Display	Keyset
41#	Wake-up Time Registration (Continuous)	
41	Wake-up Time Registration (One-time)	
42	Wake-up Time Cancel	
43	SMEMU Serial Number Display	Keyset with LCD
44	Authorization Code Registration	
45	Authorization Code Change	
46	Station COS Change	
47	Station COS Restore	
48	Custom Message Display (Message 00)	
49	Intercom Answer Mode (1 HF / 2 TONE / 3 PV)	Digital Keyset
50	Differential Ring	
51	LCD Display Mode (English/Korean)	Keyset
52	Set World Time	"
54	[RECORD] BTN Assignment – With Voice Mail	Keyset
55	Restrict DID Ring	System Attendant
56	Restore DID Ring	System Attendant
57	Headset/Speakerphone Mode	Keyset
58	[COLR] BTN Assignment	"
59	Erase All CO Message Wait	"
61	Enable/Disable DID Call Wait	"
62	Enable/Disable Send Keypad Facility IE	"
73	Background Music	n
77XX	Custom Message Display (XX = 00-20)	"
80	[Dial Memo] BTN Assignment	n
81	[Account Code] BTN Assignment	"
83	[ICM Hold] BTN Assignment	"
84	[LOOP] BTN Assignment	u
85	[Camp-on] BTN Assignment	n
86	[ATD Override] BTN Assignment	"
87	[UCD DND] BTN Assignment	"
88	[ACNR] BTN Assignment	"
89	[Stop Watch] BTN Assignment	- 11
8*	[ACD] BTN Assignment	Digital Keyset
8#	[Data Module] BTN Assignment	Digital Keyset

NUMBER	ITEM	REMARK
90	[SPEED] BTN Assignment	4/8 BTN Keyset
91	[CONF] BTN Assignment	п
92	[CALLBK] BTN Assignment	н
93	[DND/FWD] BTN Assignment	"
94	[FLASH] BTN Assignment	11
95	[MUTE] BTN Assignment	н
96	[MON] BTN Assignment	н
97	[CLIR] BTN Assignment	Keyset
41#	Wake-up Time Registration (Continuous)	Attendant
41	Wake-up Time Registration (One-time)	н
42	Wake-up Time Cancel	11
*4	Authorization Code Cancel	System Attendant
*5	LCD Date Mode Change	II
*6	LCD Time Mode Change	11
*7	Custom Display Message Program (11-20)	н
*8	CO Line Access	Attendant
*9	DND/Call Forward/Pre-selected MSG Cancel	"
*0	Door Phone Music Selection	n
#1	System Date/Time Setting	н
#2	Station COS Change (COS 7)	11
#3	Station COS Restore	n
#4	DVU - Record System Greeting	System Attendant
#5	External Page Music -1 Assignment/Cancel	Attendant
#6	External Page Music -2 Assignment/Cancel	Attendant
#71	Start Traffic Analysis	System Attendant
#72	Disable Traffic Analysis	n
#73	Print Traffic Analysis	н
#74	Abort Traffic Analysis	"
#8	Dial By Name	"
#9	Automatic Day/Night Mode Program	Attendant
##	Subscribe WHTU	ATD only
*#	Admin Programming Code	

5.5 ADMIN PROGRAMMING INDEX

INITIALIZATION	PGM 00	Database Initialization
FLEXIBLE NUMBERING PLAN	PGM 01	Flexible Numbering Plan
SLOT ASSIGNMENT	PGM 02	Slot Assignment
MSN/SUB ADDRESS ASSIGNMENT	PGM 03	MSN/Sub-address Assignment (GDK-162)
	PGM 03	PTRP Gain Table Program (GDK-100/FPII)
	PGM 04	PTRP Gain Table Program (GDK-162)
FLEXIBLE DID TABLE	PGM 05	Flexible DID Table
EMERGENCY SERVICE CALL TABLE	PGM 06	Emergency Call
LCR(LEAST COST ROUTING)	PGM 07	LCR
SYSTEM ATTRIBUTE – IV	PGM 08	System Attribute - IV
ISDN COLP TABLE	PGM 09	ISDN COLP TABLE
STATION BASE PROGRAM	PGM 10	Station Attribute - I
	PGM 11	Station Attribute - II
	PGM 12	Station Attribute - III
	PGM 13	Station ID Assignment
	PGM 14	Station Class-Of-Service
	PGM 15	CO Line Group Access
	PGM 16	ICM Tenancy Group
	PGM 17	Internal Page Zone
	PGM 18	Preset Call Forward
	PGM 19	Hot Line/Warm Line
	PGM 20	SMDR Account Group
	PGM 21	Station Attribute - IV
	PGM 22	CTI Attribute
	PGM 23	ISDN Station Attributes - V
	PGM 24	Station Attribute - VI
	PGM 28	Linked Pairs
	PGM 29	Flex Buttons Assignment
CO LINE BASE PROGRAM	PGM 30	CO Line Attribute – I
	PGM 31	CO Line Attribute - II
	PGM 32	CO Line Ring Assignment
	PGM 33	CO Flash Timer
	PGM 34	Open Loop Detect Timer
	PGM 35	TIE Line Assignment
	PGM 36	DID Line Assignment
	PGM 37	CO Line Attribute – III
	PGM 38	CO Line Attribute – IV
	PGM 39	R2 DCOB CO Line Attribute
SYSTEM BASE PROGRAM	PGM 40	System Attribute - I
	PGM 41	System Attribute - II
	PGM 42	System Attribute - III
	PGM 43	System Timer - I
	PGM 44	System Timer - II
	PGM 45	Admin Password

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PGM 55 DID Digit Conversion	
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PGM 57 Pulse Dial Speed Ratio	
PGM 58 Modern Assignment	
PGM 59 Setting System Date/Time	
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PCM 65 TIE Pouting Tables	
PGM 66 System Cain Control	
PGM 66 System Gain Control	
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PGM 68 ACINR Tone Cadence	
PGM 69 System Tone Frequency	
PGM 71 World Time Attribute	
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PGM 73 Voice Mail Dialing Codes	
PGM 74 CO Line Name Assignment	
PGM 75 Ring Frequency (Called Station base)	
PGM 76 Ring Frequency (Calling Station base)	
PGM 77 DCO TX Gain Control	
PGM 78 Digit Insert Table	
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PGM 92 Nation Specific Attribute - I (For Australia)	
PGM #1 System Attributes - V	
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PGM 64 Canned Toll Exception Table	
PRINT DATABASE PGM 80 Database Print	
HOTEL PROGRAMMING PGM 81 Hotel Attribute Setting	
(See Hotel Programming Manual for detail) PGM 82 Hotel Room Attribute	
PGM 83 Hotel Service Station	
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PGM 85 Room Rate Attribute	
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PGM 88 Tax Rate	
PGM 89 Fee for Part Time	
QSIG TABLE PGM *1 QSIG Basic Attribute	
PGM *2 QSIG Routing Table	

5.6 DEFAULT VALUES

The default values may be different by country adaptation.

TABLE 5.6.1 INITIALIZATION

PGM	BTN	ITEM	DEFAULT	REMARK
00	1	Station Data Initialization	-	
	2	CO Line Data Initialization	-	
	3	System Data Initialization	-	
	4	Flex. Buttons Data Initialization	-	
	5	Toll Table Initialization	-	
	6	Flexible Numbering Plan Initialization	-	
	7	Slot Assignment Initialization	-	
	8 All Data Initialization		-	
	9	Nation / Extend Initialization	KOREA/BASIC	
	10	System S/W Reset	-	

TABLE 5.6.2FLEXIBLE NUMBERING PLAN – GDK-162

PGM	BTN	ITEM	BASIC	EXTEND	REMARK
01		First 24 Flexible Number			
	1	Station Number	100-291	100-699	
	2	Station Group Number	620-649	*620-*649	
	3	Station PGM Enter Code	3	*3	SLT
	4	Internal Page Zones	401-420	*401-*420	
	5	Internal All Call Page	43	*43	
	6	Meet Me Page	44	*44	
	7	External Page Zone - 1	46	*46	
	8	External Page Zone - 2	47	*47	
	9	External All Call Page	48	*48	
	10	All Call Page (EXT/INT)	49	*49	
	11	Enter SMDR Account Code	50	*50	
	12	Flash Command to CO line	51	*51	
	13	Last Number Redial (LNR)	52	*52	
	14	Do-Not-Disturb	53	*53	
	15	Call Forward	54	*54	
	16	Speed Dial Programming	55	*55	
	17	MSG Wait/Call-Back Enable	56	*56	
	18	MSG Wait/Call-Back Answer	57	*57	
	19	Speed Dial Access	58	*58	
	20	Cancel DND/CFW / Pre-selected MSG	59	*59	
	21	Call Park Locations	601-619	*601-*619	
	22	Alarm Reset	65	*65	
	23	Group Call Pick-Up	66	*66	
	24	Station DVU Access	67	*67	

PGM	BTN	ITEM	BASIC	EXTEND	REMARK
01		Second 24 Flexible Number			
	1	Night Answer	69	*69	
	2	Direct Call Pick-Up	7	*7	
	3	CO Group Access	801-848	801-848	
	4	CO Line Access	8801-8896	8801-8896	
	5	Tie Routing Access	89	89	
	6	Retrieve Held CO Group	8##	8##	
	7	Retrieve Held CO Line	8#01-8#96	8#01-8#96	
	8	Access to CO Line in the 1st available CO Group	9	9	
	9 Attendant Call		0	0	
	10	Print SMDR (Station Base)	*0	**0	
	11	Print SMDR (Account Group Base)	*1	**1	
	12	Delete SMDR (Station Base)	*2	**2	
	13	Delete SMDR (Account Group Base)	*3	**3	
	14	Display Call Charge On LCD	*4	**4	
	15	Abort SMDR Printing	**	***	
	16	Door Open – 1	#*1	#*1	
	17	Door Open-2	#*2	#*2	
	18	Door Open-3	#*3	#*3	
	19	Door Open-4	#*4	#*4	
	20	VM MSG Wait Enable	*8	*8	
	21	VM MSG Wait Cancel	*9	*9	
	22	UCD DND	68	*68	

TABLE 5.6.3FLEXIBLE NUMBERING PLAN – GDK-100

PGM	BTN	ITEM	NUM	NUM	NUM	NUM	NUM	NUM	REMARK
			SET 2	SET 3	SET 4	SET 5	SET 6	SET 7	
01		First 24 Flexible Number							
	1	Station Number	100-	100-	100-	700-	200-	10-79	
			235	235	235	835	335		
	2	Station Group Number	620-	*620-	620-	9700-	620-	*620-	
			634	*634	634	9714	634	*634	
	3	Station PGM Enter Code	3	*3	*3	*3	1	*3	SLT
	4	Internal Page Zones	401-	*401-	#01-	#01-	401-	*401-	
			415	*415	#15	#15	415	*415	
	5	Internal All Call Page	43	*43	#5	#3	43	*43	
	6	Meet Me Page	44	*44	##	##	44	*44	
	7	External Page Zone - 1	46	*46	#6	#41	46	*46	
	8	External Page Zone - 2	47	*47	#7	#42	47	*47	
	9	External All Call Page	48	*48	#8	#5	48	*48	

PGM	BTN	ITEM	NUM	NUM	NUM	NUM	NUM	NUM	REMARK
			SET 2	SET 3	SET 4	SET 5	SET 6	SET 7	
	10	All Call Page (EXT/INT)	49	*49	#00	#6	49	*49	
	11	Enter SMDR Account Code	50	*50	50	91	50	*50	
	12	Flash Command to CO line	51	*51	51	51	51	*51	
	13 Last Number Redial (LNR)		52	*52	52	52	52	*52	
	14	Do-Not-Disturb	53	*53	53	53	53	*53	
	15	Call Forward	54	*54	54	49	54	*54	
	16	Speed Dial Programming	55	*55	55	*40	55	*55	
	17	MSG Wait/Call-Back Enable	56	*56	56	*66	56	*56	
	18	MSG Wait/Call-Back Answer	57	*57	57	*67	57	*57	
	19	Speed Dial Access	58	*58	58	*9	58	*58	
	20	Cancel DND/CFW / Pre-selected MSG	59	*59	59	59	59	*59	
	21	Call Park Locations	601-	*601-	601-	950-	601-	*601-	
			610	*610	610	959	610	*610	
	22	Alarm Reset	65	*65	65	*65	65	*65	
	23	Group Call Pick-Up	66	*66	**	*1	66	*66	
	24	Station DVU Access	67	*67	40	*22	67	*67	
01		Second 24 Flexible Number							
	1	Night Answer	69	*69	77	2	69	*69	
	2	Direct Call Pick-Up	7	*7	*7	*42	7	*7	
	3	CO Group Access	801-	801-	801-	401-	801-	801-	SLT
			824	824	824	424	824	824	
	4	CO Line Access	8801-	8801-	8801-	4801-	8801-	8801-	
			8848	8848	8848	4848	8848	8848	
	5	Tie Routing Access	89	89	89	47	89	89	
	6	Retrieve Held CO Group	8##	8##	8##	4*	8##	8##	
	7	Retrieve Held CO Line	8#01-	8#01-	8#01-	4#01-	8#01-	8#01-	
			8#48	8#48	8#48	4#48	8#48	8#48	
	8	Access to CO Line in the 1st available CO Group	9	9	9	1	0	9	
	9	Attendant Call	0	0	0	0	9	0	
	10	Print SMDR (Station Base)	*0	**0	661	671	*0	**0	
	11	Print SMDR (Account Group Base)	*1	**1	662	672	*1	**1	
	12	Delete SMDR (Station Base)	*2	**2	663	673	*2	**2	
	13	Delete SMDR (Account Group Base)	*3	**3	664	674	*3	**3	
	14	Display Call Charge On LCD	*4	**4	665	**4	*4	**4	
	15	Abort SMDR Printing	**	***	666	***	**	***	
	16	Door Open – 1	#*1	#*1	#*1	#*1	#*1	#*1	
	17	Door Open – 2	#*2	#*2	#*2	#*2	#*2	#*2	
	18	Door Open – 3	#*3	#*3	#*3	#*3	#*3	#*3	
	19	Door Open-4	#*4	#*4	#*4	#*4	#*4	#*4	
	20	VM MSG Wait Enable	*8	*8	*8	*8	*8	*8	
	21	VM MSG Wait Cancel	*9	*9	*9	**9	*9	*9	
	22	UCD DND	68	*68	68	68	68	*68	

TABLE 5.6.4 FLEXIBLE NUMBERING PLAN – GDK-FPII

PGM	BTN	ITEM	NUM	NUM	NUM	NUM	NUM	NUM	REMARK
			SET 2	SET 3	SET 4	SET 5	SET 6	SET 7	
01		First 24 Flexible Number							
	1	Station Number	100-	100-	100-	700-	200-	10-79	
			177	177	177	777	277		
	2	Station Group Number	620-	*620-	620-	9700-	620-	*620-	
				*627	627	9707	627	*627	
	3	Station PGM Enter Code	3	*3	*3	*3	1	*3	SLT
	4	Internal Page Zones	401-	*401-	#01-	#01-	401-	*401-	
			405	*405	#05	#05	405	*405	
	5	Internal All Call Page	43	*43	#5	#3	43	*43	
	6	Meet Me Page	44	*44	##	##	44	*44	
	7	External Page Zone - 1	46	*46	#6	#41	46	*46	
	8	External Page Zone - 2							
	9	External All Call Page	48	*48	#8	#5	48	*48	
	10	All Call Page (EXT/INT)	49	*49	#00	#6	49	*49	
	11	Enter SMDR Account Code	50	*50	50	91	50	*50	
	12	Flash Command to CO line	51	*51	51	51	51	*51	
	13	Last Number Redial (LNR)	52	*52	52	52	52	*52	
	14	Do-Not-Disturb	53	*53	53	53	53	*53	
	15	Call Forward	54	*54	54	49	54	*54	
	16	Speed Dial Programming	55	*55	55	*40	55	*55	
	17	MSG Wait/Call-Back Enable	56	*56	56	*66	56	*56	
	18	MSG Wait/Call-Back Answer	57	*57	57	*67	57	*57	
	19	Speed Dial Access	58	*58	58	*9	58	*58	
	20	Cancel DND/CFW	59	*59	59	59	59	*59	
		/ Pre-selected MSG							
	21	Call Park Locations	601-	*601-	601-	950-	601-	*601-	
			605	*605	605	954	605	*605	
	22	Alarm Reset	65	*65	65	*65	65	*65	
	23	Group Call Pick-Up	66	*66	**	*1	66	*66	
	24	Station DVU Access	67	*67	40	*22	67	*67	
01		Second 24 Flexible Number							
	1	Night Answer	69	*69	77	2	69	*69	
	2	Direct Call Pick-Up	7	*7	*7	*42	7	*7	
	3	CO Group Access	801-	801-	801-	401-	801-	801-	SLT
			809	809	809	409	809	809	
	4	CO Line Access	8801-	8801-	8801-	4801-	8801-	8801-	
	L		8834	8834	8834	4834	8834	8834	
	5	5 Tie Routing Access		89	89	47	89	89	
	6	Retrieve Held CO Group	8##	8##	8##	4*	8##	8##	
	7	Retrieve Held CO Line	8#01-	8#01-	8#01-	4#01-	8#01-	8#01-	
			8#34	8#34	8#34	4#34	8#34	8#34	

PGM	BTN	ITEM	NUM	NUM	NUM	NUM	NUM	NUM	REMARK
			SET 2	SET 3	SET 4	SET 5	SET 6	SET 7	
	8	Access to CO Line in the 1st	9	9	9	1	0	9	
		available CO Group							
	9	Attendant Call	0	0	0	0	9	0	
	10	Print SMDR (Station Base)	*0	**0	661	671	*0	**0	
	11	Print SMDR	*1	**1	662	672	*1	**1	
		(Account Group Base)							
	12 Delete SMDR (Station Base)		*2	**2	663	673	*2	**2	
	13	Delete SMDR	*3	**3	664	674	*3	**3	
		(Account Group Base)							
	14	Display Call Charge On LCD	*4	**4	665	**4	*4	**4	
	15	Abort SMDR Printing	**	***	666	***	**	***	
	16	Door Open – 1	#*1	#*1	#*1	#*1	#*1	#*1	
	17 Door Open – 2		#*2	#*2	#*2	#*2	#*2	#*2	
	18	Door Open – 3							
	19	Door Open-4							
	20	VM MSG Wait Enable	*8	*8	*8	*8	*8	*8	
	21	VM MSG Wait Cancel	*9	*9	*9	**9	*9	*9	
	22	UCD DND	68	*68	68	68	68	*68	

TABLE 5.6.5 SLOT ASSIGNMENT

PGM	SYS	BTN	DEFAULT	REMARK	
02	GDK-FP II	1	03	CO Line Slot Assignment	
				Max 34 CO lines or Max. 6 slots	
		2	02	Station Slot Assignment	
				Max 78 stations or Max. 7 slots	
		3	08	WTIB Port Number	
		4	30	No. of Basic Primary Dev. (PRIB, DCOB, R2)	
	GDK-100	1	08 07 06 12 11	CO Line Slot Assignment	
				Max 48 CO lines or Max. 8 slots	
		2	01 02 03 04 05 09 10 11	Station Slot Assignment	
				Max 136 stations	
		3	08	WTIB Port Number	
		4	30	No. of Basic Primary Dev. (PRIB, DCOB, R2)	
	GDK-162	1	06 07 08 14 15 16 17	CO Line Slot Assignment	
				Max 96 CO lines	
		2	02 03 04 05 09 10 11 12 13	Station Slot Assignment	
				Max 186 stations	
		3	08	WTIB Port Number	
		4	30	No. of Basic Primary Dev. (PRIB, DCOB, R2)	
		5	30	No. of Option Primary Dev. (PRIU)	

TABLE 5.6.6 MSN/SUB-ADDRESS ASSIGNMENT

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
03	1	CO Line Number	01-96/48/34		
	2	Flex DID Table(PGM 05) Index			
	3	MSN/Sub-address Number	0-9		
	4	Telephone Number	20 digits		

TABLE 5.6.7 FLEXIBLE DID TABLE PROGRAM

PGM	BTN	SUB- BTN	ITEM	RANGE	DEFAULT	REMARK
05	1	1	Bin Number	000-999		
		2	CO Name (DID Name)	11 digits		
		3	Day Destination Bin	STA/STA Grp/DVU/DVU CO		
			Number	Drop/Speed Dial/CO Page Code		
		4	Night Destination Bin	STA/STA Grp/DVU/DVU CO		
			Number	Drop/Speed Dial/CO Page Code		
	2		Restore default			
	3		Clear table			

TABLE 5.6.8 EMERGENCY SERVICE CALL

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
06	1~10	Emergency Service Call Table	5 digits		

TABLE 5.6.9 LCR TABLE ASSIGNMENT

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
07	1	LCR Access Mode	M00/M01/M02/M11/M12/M13	M00	
	2	Set the Day of week zone	1~7	1234567	
	3	Set the Time of week zone	00~24	0024	
	4	LCR Leading Digit Table			
	5	Digit Modification Table			
	6	Initialization of LCR Database			

TABLE 5.6.10 SYSTEM ATTRIBUTE - IV

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
08	1	In Prefix Code Insertion	1/0	0 (OFF)	
	2	My area code	5 digits		
	3	CO ATD Code	2 digits		
	4	DID Conversion Table	0/1/2	0	
	5	Calling Sub Address	1/0	0 (OFF)	
	6	Type of Calling Number	0~4	2 (National No.)	
	7	Advice of Charge	0~5	0	
	8	Out Prefix Code Insertion	1/0	1 (ON)	
	9	Paging Conference Index	Internal Page Group		
	10	U-A Law Line Installed	1/0	0 (OFF)	
	11	ISDN Sending Mode	1/0	0 (Overlap)	For Israel
	12	Enblock Inter-digit Timer		15	For Israel
	13	Prefix Code	2 digits	0	
	14	International Access Code	4 digits		
	15	LCR Display/Print Mode	0/1	1	

TABLE 5.6.11 ISDN COLP TABLE ASSIGNMENT

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
09	1-10	ISDN COLP Table	10 digits		

TABLE 5.6.12 STATION BASE PROGRAM

PGM	BTN	ITEM	RANGE		DEFAULT		REMARK
				FP II	100	162	
10	1	DND (Do-Not-Disturb)	YES / NO		NO		
	2	Speed Dial Access	YES / NO		YES		
	3	Page Access	YES / NO		NO		
	4	Call Forward Access	YES / NO		NO		
	5	PLA (Preferred Line Answer)	YES / NO		YES		
	6	Auto Speaker Select	YES / NO		YES		
	7	Warm Line	YES / NO		NO		
	8	SMDR Dial Digit Hidden Display	YES / NO		NO		
11	1	CO Line Queuing	YES / NO		YES		
	2	3-Minute Warning Tone	YES / NO		NO		
	3	Override Privilege	YES / NO		NO		
	4	Automatic CO Hold	YES / NO				
		YES-For Attendant, NO-For Others					
	5	Data Line Security	YES / NO		NO		
	6	Group Listening	YES / NO		NO		
	7	Speaker-Phone/Headset	SP / HEAD	S	peakerphone	Э	
	8	Howling Tone To SLT	YES / NO		YES		
	9	DID Call Waiting on busy station	YES / NO		NO		

PGM	BTN	ITEM	RANGE		DEFAULT		REMARK
				FP II	100	162	
12	1	Alarm/Door Bell Signaling	YES / NO		YES		
	2	ICM Box Signaling	YES / NO		YES		
	3	CO Line Access with dialing	YES / NO		YES		
	4	No Touch Answer	YES / NO		NO		
	5	DVU Access	YES / NO		NO		
	6	Voice Over	YES / NO		NO		
	7	Suppress RX Data connected DM	YES / NO		NO		
	8	Prepaid Call	YES / NO		NO		
13		Station ID Assignment	1-12		Keyset		
	1	Keyset					
	2	DSS MAP 1					
	3	DSS MAP 2		N/A	-	-	
	4	DSS MAP 3		N/A	-	-	
	5	DSS MAP 4		N/A	N/A	-	
	6	DLS MAP 1			-		
	7	DLS MAP 2		N/A	N/A	-	
	8	ICM Box			-		
	9	SLT (DTMF)			-		
	10	SLT (Pulse)			-		
	11	SLT with Msg Wait (DTMF)			-		
	12	SLT with Msg Wait (Pulse)			-		
	13	Station ID Display			-		
14	1	Station COS : Day	1 - 7		1		
	2	Station COS : Night	1 - 7		1		
15		CO Group Access					
	1-24	CO Line Group 01~24		01-09	01-24	01-24	
		CO Line Group 25~48		N/A	N/A	25-48	
16	1	ICM Tenancy Group Assign	01 - 05/10		01	-	
	2	ICM Tenancy Group Attendant	STA No.		-		
	3	ICM Tenancy Access Group	01 - 05/10		01		
17	1-xx	Internal Page Zone Access	01 - 05/20		GRP 01		
18		Preset Call Forward			-		
19		Hot Line / Warm Line			-		
	1	Flex Button	01 - 24		-		
	2		01-34/48/96		-		
	3	CO Group	01-09/24/48		-		
	4	Station	STA No.		-		
20	-	SMDR Account Group Assign	01 - 24/99		-		
21	1	DID Ring	YES / NO		YES		
	2	ACD Warning Tone	YES / NO		YES		
	<u>-</u> २	CO Button Program Enable	YES / NO		NO		
	4	ADMIN Program Enable	YES / NO		NO		
	5	UCD Service	YES / NO		NO		
	6	Differential Ring	0-4		0		
	7	CO Call Drop Timer Enable	YES / NO		NO		
	1	CO Call Drop Timer Enable	IES/INU		UN		

PGM	BTN	ITEM	RANGE		DEFAULT		REMARK
				FP II	100	162	
22	1	CTI Mode	1 - 3		2		
	2	CTI Baud Rate	1 - 3		1		
23	1	ISDN Sub Address	YES / NO		NO		
	2	ISDN Long	YES / NO		NO		
	3	MSN	1/0		0 (NO)		
	4	EXT or CO ATD	1/0		1 (EXT)		
	5	Progress IND	1/0		0 (NO)		
	6	CO Message Wait	1/0		0 (NO)		
	7	Station Base CLIP	1/0		0 (NO)		
	8	Station Base COLP	1/0		0 (NO)		
	9	Station Base CPN	1/0		0 (NO)		
	10	Station Base CLIR	1/0		0 (NO)		
	11	STA CLI NAME DISP	1/0		1(ON)		
24	1	CO Name Bin	00 - 10		00		
	2	COLR	YES / NO		NO		
	3	HSR (Headset Ring)	ON / OFF		OFF		UK: ON
	4	CO Group Access with dialing	YES/NO		YES		
	5	Keypad Facility	YES/NO		NO		

TABLE 5.6.13 STATION LINK PROGRAM

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
28	1	Linked Station Pairs View	-	-	

TABLE 5.6.14 FLEXIBLE BUTTONS PROGRAM

PGM	BTN	ITEM		RANGE		DEFAULT	REMARK
			FP II	100	162		
29	01-48	Flex. Buttons Assignment	В	5TN 01-48			
		1: User Button		-			
		2: {COxx} Button	01 -34	01 -48	01-96		
		3: {CO Group xx} Button	01 -09	01 -24	01-48		
		4: {LOOP} Button		-			
		5: {STA xxx} Button	STA No.				
		6: STA PGM Button		-			
		7: {SPD xxx} Button	SI	PD Bin No	D.		

TABLE 5.6.15 CO LINE BASE PROGRAM

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
30	1	CO Line Group Assign	00 - 10/25/49	01	
	2	CO Line COS	1 – 5	1	
	3	CO Line Group Account	YES / NO	NO	
	4	DISA- xx	U/N/B/S/D, 0 - 9	U0	
	5	DISA Account Code	YES / NO	YES	
	6	CO Line Name	00 - 10	00	
31	1	CO Line Type	CO / PBX	СО	
	2	CO Line Signal Type	DTMF / Pulse	DTMF	
	3	Universal Night Answer (UNA)	YES / NO	NO	
	4	Flash Type	Ground / Loop	Loop	
	5	Metering Type	0-6	0	
	6	Voice/Data For CEPT	VOICE / DATA	VOICE	
	7	Line Drop using CPT	YES / NO	NO	
	8	Night DVU	YES / NO	NO	
32		CO Line Ring Assignment			
	1	Ring Assign to Stations		UO	U : Unassigned (0)
		- Ring Mode	U/D/N/B/O		D : Day Only (1)
		- Delay Ring Counter	0 - 9		N : Night Only (2)
					B : Day/Night (3)
					O :On-demand (4)
	2	Ring Assign to Hunt Group	0 -4 (Ring Mode)		
33		CO Flash Timer	00 -30	05	(100msec base)
34		Open Loop Detect Timer	00 -20	00	(100msec base)
35		TIE Line Assignment	1-7	1	
	1	Normal Ring			
	2	Ring/Down			
	3	Loop/Dial			
	4	Ear/Mouth Continuous			
	5	Polarity Reverse			
	6	Ear/Mouth Discontinuous			
	7	DID Line For Digital CO Line			
36		DID Line Assignment	1-4	1	
	1	Immediate Start			
	2	Wink Start			
	3	Delayed Dial Start			
37		ISDN CO Line Attributes			
	1	COLP	00-11	00	
	2	DID RN	00-99	00	

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
38		CO Line Attributes -IV			
	1	CO Distinct Ring	0-4	0	
	2	CO Line MOH	0-4	0	
	3	CO Line Dial Tone	YES/NO	YES	
	4	Ring Back Cause Handling	1/0 (ON/OFF)	0 (OFF)	For GDK-162
	5	Error Cause Handling	1/0 (ON/OFF)	0 (OFF)	For GDK-162
	6	Busy Cause Handling	1/0 (ON/OFF)	0 (OFF)	For GDK-162
	7	Announce Cause Handling	1/0 (ON/OFF)	0 (OFF)	For GDK-162
	8	Enable/Disable CO Page	1/0 (ON/OFF)	0 (OFF)	
39		R2 DCOB CO Line Attribute			For GDK-162
	1	Incoming Signal	Pulse(0)/DTMF(1)/REC(2)	DTMF (1)	
	2	Outgoing Signal	Pulse(0)/DTMF(1)/REC(2)	DTMF (1)	
	3	B-Signal	1-9	CHARGE (6)	
	4	Grp II Signal	1-9	Grp II-1 (1)	

TABLE 5.6.16 SYSTEM BASE PROGRAM

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
40	1	Hold Preference	SYS / EXC	SYS	
	2	Privacy	YES / NO	YES	
	3	Privacy Warning Tone	YES / NO	YES	
	4	Page Warning Tone	YES / NO	YES	
	5	Off-Hook Ring Signal Type	Mute Ring	Mute Ring	
			/One Burst Ring		
	6	Multi-Line Conference	YES / NO	YES	
	7	Common Speed Toll Check	YES / NO	YES	For GDK-162
	8	Attendant Call Queuing	Ringback/MOH	MOH	
41	1	Background Music Channels	0 - 9	1	
	2	MOH Channel	0 - 9	1	
	3	ICM BOX Music Channel	0 - 9	1	
	4	Music source on Channel 1	Internal / External	Internal	For GDK-162/100
	5	LCD Display Language	0 - 24	1 (KOREAN)	3 : Invalid
	6	Print Caller-ID	YES / NO	NO	
	7	CAMP, MOH/RBT	YES / NO	NO	
	8	SMDR Dial Digit Hidden Display	0 - 4	0	For GDK-100/FPII
42	1	External Night Ring	YES / NO	NO	
	2	CO Line Access mode in CO Grp	Round Robin	Last Choice	
			/Last Choice		
	3	Continuous Dial-Tone	YES / NO	YES	
	4	Ring Exchange on SLT	YES / NO	NO	
	5	Dial-Tone Detect	YES / NO	NO	
	6	Clear ACD Database after printing	YES / NO	NO	
	7	ACD Print Duration	10SEC / 1Hour	1 Hour	

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
43	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	ATD Recall Timer	00 - 60	01	1 min base
	6	CO Ring Detect Timer	1 - 9	2	100 msec base
	7	Pause Timer	3 - 9	3	1 sec base
	8	CO Release Guard Timer	010 - 150	020	100 msec base
	9	CO Warning Tone Timer	060 - 900	180	1 sec base
	10	CO Dial Delay Timer	00 - 99	01	1 sec base
	11	Call Park Timer	000 - 600	120	1 sec base
	12	Preset Call Forward Timer	00 - 99	10	1 sec base
	13	Unsupervised Conference Timer	00 - 99	10	1 min base
	14	ACNR Retrial Pause Timer	030 - 300	030	1 sec base
	15	ACNR Retrial Delay Timer	000 - 300	030	1 sec base
	16	Flexible DID Time-out Timer	000 - 300	030	100 msec base
	17	ACNR No Answer Timer	10 - 50	30	1 sec base
	18	ACNR Retry Counter	1 - 3	3	
	19	Warm Line Timer	01 - 20	05	1 sec base
	20	PBX Code Print	1/0	0	
	21	Prepaid Call Warning Tone Timer	00 - 99	15	1 sec base
	22	DISA Retry Counter	1 - 13	3	
	23	COS when DISA seize CO	1 - 6	6 (UK: 1)	
	24	DVU Forward Answer Timer	04 - 40	04	
	25	R2 Out Manage Timer	01 - 50	14	For GDK-162
	25	ACNR Retry Time Count	1 - 9	3	For GDK-100/FPII
	26	R2 Pulse Timer	01 - 30	7	For GDK-162
	26	Switch Pause Timer	00 -40	00	For GDK-100/FPII
	27	DT Delay Timer	01 - 30	20	For GDK-162
	27	First CO Group OVR	0/1	1	For GDK-100/FPII
	28	ACNR Retry Time Count	1 - 9	3	For GDK-162
	28	CO Call Drop Timer	01 - 99	10	For GDK-100/FPII
	29	Switch Pause Timer	00 - 40	00	For GDK-162
	30	First CO group OVR	0/1	1 (UK : 0)	For GDK-162
	31	R2 Incoming Manage Timer	01 - 50	14	N/A in FPII/100
	32	R2 Disappear Timer	01 - 50	14	N/A in FPII/100
	33	CO Call Drop Timer	01 - 99	10	1 min base

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
44	1	Message Reminder Tone Timer	00 - 60	00	1 min base
	2	Hook Switch Flash Timer	01-25	05	100msec base
	3	Hook Switch Debounce Timer	01 - 25	01	100msec base
	4	DID/DISA No Answer Timer	00 - 99	20	1 sec base
	5	ICM Box Timer	00 - 60	30	1 sec base
	6	Door Open Timer	05 - 99	20	100msec base
	7	Call Forward No Answer Timer	000 - 600	015	1 sec base
	8	ICM Dial-Tone Timer	01 - 20	10	1 sec base
	9	Inter-Digit Timer	01 - 20	05	1 sec base
	10	Automatic Release Timer	000 - 300	030	1 sec base
	11	Page Timer	00 - 60	15	1 sec base
	12	Ring Stop Detection Timer	010 - 150	060	100 msec base
	13	Wink Timer	010 - 200	010	10 msec base
	14	Min Hook-flash Timer	000 - 250	020	10 msec base
	15	SMDR Start Timer	000 - 250	000	1 sec base
	16	DVU Recording Time	10 - 90	20	1 sec base
	17	CO Digit Analysis Counter	0 - 9	3	
	18	ACD Print Timer	000 - 255	000	
	19	SLT Ring Phase Time	2 - 5	5	1 sec base
	20	Camp-On Recall Timer	000 - 200	050	1 sec base
	21	Station Auto Release Timer	000 - 200	060	1 sec base
	22	СЕРТ СО Туре	0-2	2	0:Sweden/Cyprus 1:Italy 2:Korea/Australia
	23	Preparation Signal Timer	000 - 025	007	For GDK-162
	23	Erase Wake Up Fail Ring Timer	00 - 99	20	For GDK-100/FPII
	24	Erase Wake Up Fail Ring Timer	00 - 99	20	
45		ADMIN Password	4 Digits	-	
46	1-5	Main Attendant Assign	STA No.	1 : 101	
47	1-6	Station Groups			
	1	Circular Group			
	2	Terminal Group			
	3	UCD Group			
	4	Voice Mail Group			
	5	Ring Group			
	6	Pick-Up Group			
48		Circular Group Attribute			
	1	No Answer Timer	00 – 99	15	1 sec base
	2	Ring Timer	000 – 999	999	1 sec base
	3	Wrap-Up Timer	002 – 999	002	1 sec base
	4	Overflow Timer	000 - 600	000	1 sec base
	5	Overflow Destination	STA No./STA GRP No.	-	
	6	Announce Location	DVU 1-9	-	
	/	Group Call By Pliot Number	1/U O:Diaphla/4:Enchla	U O (Dischla)	
	0	Service no Duty	U.DISADIE/ I.ENADIE	U (Disable)	

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
48		Terminal Group Attribute			
	1	No Answer Timer	00 – 99	15	1 sec base
	2	Ring Timer	000 – 999	999	1 sec base
	3	Wrap-Up Timer	002 – 999	002	1 sec base
	4	Overflow Timer	000 – 600	180	1 sec base
	5	Overflow Destination	STA No./ STA GRP No.	-	
	6	Announce Location	DVU 1-9		
	7	Group Call By Pilot Number	1/0	0	
	8	Service No Duty	0:Disable/1:Enable	0 (Disable)	
		UCD Group Attribute			
	1	Queuing To DVU Announce 1 Timer	000 – 999	015	1 sec base
	2	Queuing To DVU Announce 2 Timer	000 – 999	000	1 sec base
	3	Supervisor Timer	000 – 999	030	1 sec base
	4	Supervisor Call	00 – 99	00	
	5	Overflow Timer	000 - 600	180	1 sec base
	6	Wrap-Up Timer	002-999	002	1 sec base
	7	Queuing To DVU Announce Timer	000 - 999	000	1 sec base
	8	Overflow Destination	STA No. / STA GRP No.	-	
	9	DVU Announce Location 1	DVU 1 - 9	-	
	10	DVU Announce Location 2	DVU 1 - 9	-	
	11	DVU Announce 2 Repeating	1/0	0	
	12	UCD Station's Priority	0-9	0	
	13	Supervisor	STA No.		
	14	Alternate Destination	STA No. /STA GRP No.		
	15	Music Source	0-9	0	
	16	Max. Queue Call Count	00 - 99	00	
	17	Service No Duty	0:Disable/1:Enable	0 (Disable)	
		VM Group Attribute			
	1	Service No Duty	0.Disable/1.Enable	0 (Disable)	
	2	Ring Timer	000 - 999	999	1 sec base
	2	Wran-un Timer	002 - 999	002	1 sec base
	4	Overflow Timer	000 - 600	180	1 sec base
	5	Overflow Destination	STA No /STA GRP No	-	
	5		GIANO, GIA GRENO.	-	
	7	Put Mail Index	1 1	1	
	0	Cot Mail Index	1 4	2	
	0		1-4	2	
	9				
	4		000 000	400	1
	1			180	1 Sec base
	2		STA NO./STA GRP NO.	-	
	3	Music Source	0-9	0	1.000 5.000
	4		000 - 999	015	1 Sec base
	5	King Group Anne Location	1 - 9	-	
	6	Service No Duty	0:Disable/1:Enable	0 (Disable)	

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
48		Pick-Up Group Attribute			
	1	Auto Pick-Up	YES / NO	NO	
	2	All Ringing	YES / NO	NO	
49	1-xx	Executive/Secretary Pairs	STA No.	-	
50	1	Alarm Enable	YES / NO	NO	
	2	Alarm Mode	Alarm / Door-Bell	Alarm	
	3	Alarm Contact Type	Close / Open	Close	
	4	Alarm Signal Mode	Repeat / Once	Repeat	
51	1 - x	External Contact Assign	1 - 2/4/6	-	
52	1 - 5	PBX Dialing Codes	Max 2 digits	-	
53	1 - 5	SMDR Long Distance Codes	Max 2 digits	1 : "0"	
54		Authorization Codes	5 digits	-	
55	1	DID Received Digit from PX	2 - 4	3	
	2	DID First Two Digits Conversion	4 digits	#***	0 - 9 # : Ignore Digit * : using received digit
	3	DID Second Digit Conversion	10 digits	1234567890	
56		DID/DISA Destination			
	1	Busy Destination	Tone / ATD	Tone	
	2	Error Destination	Tone / ATD	Tone	
57	1 - 4	Pulse Dial Speed Ratio		2	1: 10 PPS 60/40 2: 10 PPS 66/33 3: 20 PPS 60/40 4: 20 PPS 66/33
58	1	Modem Mode	Modem / Bypass	Modem	
	2	Modem Baud Rate	1 - 8	4	
	3	Modem Associated Device	CO No.(0)/ STA No.(1)	STA 167/171/291	
59		System DATE/TIME Setting			
60	1	LCD Time Display Mode	12/24 Hour	12 Hour	
	2	LCD Date Display Mode	MMDDYY /	DDMMYY	
			DDMMYY		
61		S/W Version Display			
62	1	Save SMDR	YES / NO	NO	
	2	Print SMDR	YES / NO	NO	
	3	SMDR Recording Call Type	LD / All	Long Distance Only	
	4	Print Incoming Call	YES / NO	NO	
	5	Record Detailed SMDR	YES / NO	YES	
	6	SMDR Print Baud Rate (RS-232)	1 - 8	6	1: Baud 300 2: Baud 600 3: Baud1200 4: Baud 2400 5: Baud 4800 6: Baud 9600 7: Baud 19200 8: Baud 38400
	7	SMDR Currency	3 English Chars	-	

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
63	1	SMDR Cost Per Unit Pulse	6 digits	-	
	2	SMDR Fraction	0 - 5	0	
65	1 - 6	TIE Routing Table (01 - 30)	CO 01-34/48/96	-	
66	1 -12	System Gain Control	0 - 63		1 dB base
67	1 - 3	System Speed Zone	01 - 10		
68	1 - 4	ACNR Tone Cadence	0 - 255		20 msec base
69	1 - 4	System Tone Frequency	4 digits		
71	1 - 4	World Time Attribute		-	
	1	Display World Time	YES / NO	NO (OFF)	
	2	Celsius/Fahrenheit	C/F	Celsius (ON)	
	3	ISD Code Length	1 - 4	3	
	4	ISD Code	-	00	
72	1 - 4	World Time			
	1	Nation Code	3 digits	-	
	2	Area Code	4 digits	-	
	3	Equation of Time	00-23	00	
	4	Temperature		000	
73	1 - 9	VM dialing Table	Max. 12 digits		
74		CO Line Name (01-10)	Max. 12 ENG. chars	-	
75	1 - 4	Ring Frequency	0000 - 9999		
76	1 - 4	Distinct Ring Frequency	0000 - 9999		
77	1 - 7	DCO TX Gain	00 - 63		1 dB base
78	1 - 3	Digit Insert Table			

TABLE 5.6.17 TOLL TABLE

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
70		Exception Tables			
	1	Allowed Table A	01 - 20	-	
	2	Denied Table A	01 - 10	-	
	3	Allowed Table B	01 - 20	-	
	4	Denied Table B	01 - 10	-	
64		Canned Toll Exception Table			
	1	Allowed Table	01 - 10		
	2	Denied Table	01 - 10		
79		CCR Tables	01 - 09		

TABLE 5.6.18 PRINT DATABASE

PGM	BTN	ITEM	REMARK
80	1	Print Flexible Numbering Plan	
	2	Print Slot Assignment	
	3	Print Station Database	
	4	Print Flex Buttons Assignment	
	5	Print CO Line Database	
	6	Print System Database	
	7	Print Toll Tables	
	8	Print System Speed Dial Bins	
	9	Print All Database	
	10	Print Specific Nation's Database	
	11	Print QSIG Admin Database	

TABLE 5.6.19 NATION SPECIFIC SYSTEM PROGRAM

PGM	BTN	ITEM	RANGE	DEFAULT	REMARK
92	1	CPE CO Connection Program	ction Program For Australia		For Australia
	2	CPE Port Selection Program	0 - 1	-	
	3	CLI TEL No. or Name Display	0 - 1	0	

TABLE 5.6.20 SYSTEM ATTRIBUTE – V

PGM	BTN	SUB- BTN	ITEM	RANGE	DEFAULT	REMARK
#1	1	2	Virtual DIP Switch			For GDK-FPII only
		1	СТЅ	ON/OFF	OFF	
		2	SOFT	ON/OFF	OFF	
		3	ECHO	ON/OFF	OFF	
		4	XONOFF	ON/OFF	OFF	
	2	1-5	Assign MOH via SLT	Station No		
	6	1-8	Print Port Selection	1-2(4)	1	

APPENDIX A. The Maximum Number of Boards in a system

The maximum number of boards is described in this section. Some boards can be limited by the capacity of system power supply, PSU linear.

A.1 The Maximum Number of Cards in a system..

The maximum capacity of boards in a system is given in table A.1 Not all maximum capacities may be achieved simultaneously. The complex configuration can be limited by the system power supply, e.g. PSU(linear). *Especially if you want to make the complex configuration with various extension boards including WTIB and 2B-modules, consult it with its supplier or authorized agent.*

Board Name	The Maximum Number of Cards per a cabinet	Slot Position	Remark
2BRI	1	3	Basic slot
4LCO	1	3	Basic slot
4SLI	1	2	Basic slot
AC15(UK)	4	4~7	
BWDIDB(NZ)	4	4~7	
DTIB	4	4~7	
DVIB	2	1,4~7	
ETIB	4	4~7	
LCOB	4	4~7	
MBU	1	KSU	
PRI	1	3	Basic slot
SLIB	4	4~7	
STIB	5	1,4~7	
TLIB(KOREA)	4	4~7	
WTIB	1	1,4~7	
WTIU	1	on WTIB	
2B-SLIU30 and SLT	24	on LKD30	* Note 1

Table 1.1 The maximum number of cards per a cabinet

Note;

1. The 2B-modules are limited by the power capacity.

The maximum terminals with PSU(Linear) are limited by 34 without WTIB and 48 with WTIB, because of its power capacity.

The maximum terminals with PSU2(SMPS) are limited by 48 without WTIB and 64 with WTIB, because of its power capacity.

A.2 The Capacity of GDK-FPII Power Supply

The capacity of GDK-FPII Power Supplies, PSU(linear) and PSU2(SMPS), is given in table A.2. The capacity of +30Vdc in table A.2 includes the capacity of +5Vdc,-5Vdc. -48Vdc is locally generated on the card that it is required.

PSU	+5Vdc	-5Vdc	+30Vdc	-48Vdc
GDK-FPII PSU (Linear)	2000	500	3000	None
GDK-FPII PSU2(SMPS)	3500	800	4000	None

 Table A.2
 Power Capacity of GDK-FPII PSU and PSU2

Note:

Manufacturing GDK-FPII PSU(linear) will be officially stopped after launching PSU2(SMPS) from the first half of 1999.

APPENDIX B. Power Consumption

Board Name	The Power Consumption/a Card				
(all boards)	+5V	-5V	+30V	-48V	
2BRI	55	0	0	0	
4LCO	85	65	80	0	
4SLI	55	50	135	0	
AC15(UK)	65	55	0	0	
BWDIDB(NZ)	100	60	490	0	
DTIB	50	0	360	0	
DVIB	475	5	0	0	
ETIB	65	55	410	0	
LCOB	100	70	80	0	
MBU	360	15	370	0	
PRI	125	0	0	0	
SLIB	80	65	195	0	
STIB	120	0	150	0	
TLIB(KOREA)	60	35	280	0	
WTIB	680	0	320	0	
WTIU	200	0	320	0	
2B-SLIU30 and SLT	0	0	50	0	
MEMU	3	0	0	0	
SMEMU	5	0	0	0	
PLLU2(issue 1,2)	20	0	0	0	
PLLU2(issue 3)	30	0	0	0	
MODU	15	7	0	0	
SIU(UK)	58	0	0	0	
SIU(ST)	15	0	0	0	
CMU	8	3	0	0	
PFTU(External)	0	0	55	0	
PFTU-I(Internal)	0	0	25	0	
RGU	0	0	110	0	
Charging Battery	0	0	500	0	

APPENDIX C. PSU installation

This is the description of PSU(linear type) for the user who uses it.

Note: There are 2 kinds of PSUs, PSU which is a linear type of Power supply Unit, and PSU2 which is a SMPS. The production of PSU (linear) has been officially stopped after replacing with PSU2(SMPS) in the 1st half of 1999.

The PSU is basically installed when delivering the system. But if PSU is replaced with new one, assure that the AC power cord is **NOT** plugged into the AC outlet before installing new one.

The system contains any one of two linear PSU assemblies; one is PSU with transformer 6170NI0008A, the other is PSU with transformer 6170NI0007A

PSU with Main Transformer 6170NI0008A: for European and Oceanic countries

The linear type PSU can operate from 220VAC~240VAC with transformer 6170NI0008A based on the connection of the cable(2-wired) from transformer to the connector CN1 of the PSU PCB. This type only operate from 220~240VAC, not 110VAC. Fuse: T1.6AH250V

<u>PSU with Main Transformer 6170NI0007A</u>: for the countries except European and Oceanic countries. The linear type PSU can be operate from ether 110VAC or 220VAC with transformer 6170NI0007A based on the connection of the cable(5-wired) from transformer to the connector CN1 or CN2 of the PSU PCB. Generally shipped the PSU with 220VAC. If local AC voltage 110~127VAC volts, move the cable to the CN2 shown as Figure C.1

Input Voltage	Connect to	Fuse
110VAC	CN2	T3.15AL250V
220VAC	CN1	T1.6AH250V



Figure C.1 Connection of PSU linear

After the PSU installation, you have to assemble the cover with three(3) screws. The cover assembling method is shown in Figure C.2



Figure C.2 Power Supply Unit Cover Assembly

APPENDIX D. GDK-PHU Installation

1. Introduction

- -. This manual provides the information necessary to install the PHU of GDK with GDK system. (*The packing of GDK-PHU may be different by country adaptation.*)
- -. This product is the PHU(Power Harmonic filter Unit), Input is AC 90 ~ 260V under single phase.
- -. It used to GDK-FPII KSU for meet to EN61000-3-2. (EN61000-3-2 : Limit for harmonic currents emissions)
- -. The packing of GDK-PHU may be different by country adaptation. But the country listed below is adaptable as follows;

Country Adaptation : Belgium, Denmark, Finland, Ireland, Italy, Netherlands, Norway, Poland, Spain, Sweden, United Kingdom

2. Installation



Put on screw the PHU at side of KSU like figure.



Insert the cord of PHU at the PSU like figure.



Insert power cord of external power source at the PHU like figure.

3. Specification

Item	Specification	Remark
1. Input Voltage	AC 90V ~ 260V	
2. Input Frequency	50/60Hz	
3. Input Current	Max. 4A	
4. Test voltage Between AC	3KV AC	
Mains and Chassis		

APPENDIX E. Declaration of Conformity

DECLARATION OF CONFORMITY according to ISO / IEC Guide 22 and EN45014		
	Date : 2001. 03. 02.	
Application of Council Directive(s)	1999 / 5 / EC	
Manufacturer's Name	LG Electronics Inc.	
Manufacturer's Address	Digital Network Company 73, Hyangjeong Dong, Hungduck Gu Cheongju Shi, 361-726, Korea	
Declares that the Products :		
Product Type / Environment	Digital Hybrid Key Service Unit for commercial environments	
Model Name	GDK-FPII	
Product Options	Covers all Option of the above Product.	
Conformance to 'CE' affixed Date : From 2001, 03. (R& Supplementary Information : The above products comply with the req The conformity to above standards is ve	ETS 300 329 ETS 300 346, ETS 300 047 EN 55022 : 1995 EN 50081-1, EN 50082-1/ 1992 EN 61000-3-2 : 1995 / A14 : 2001, Class A EN 61000-3-3 : 1995 I-CTR3 / I-CTR4 TBR 06 / TBR 10 / TBR 22 EN 60950 / A11 : 1997 EN 41003 TTE)	
with Ref. No. E8 97 06 27114 021/ E8 00 12 27114 105 for EMC and by COMLAB with Ref. No. 95/7796/8/CT-511 for LVD and with Ref. No. 95/7796/3/LT-511 & 95/7796/5/CT-511 & BABT/96/4309. Regarding the DECT Part, G5M200080259-C is verified by BZT-ETS Certification GmbH.		
Cheongju City, Choong Book Mar.02, 2	001 CM / Solomon Sim	
Location Date	Research Engineer, R&D Lab, Digital Network Company	
European Contact : Mr. C. H. Kim / Product Manager LG Electronics Dusseldorf Office Jakoob - Kaiser - Strabe 12 47877 Willich,	Germany (FAX: +49-2154-428799)	
	🕒 LG Electronics Inc	

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