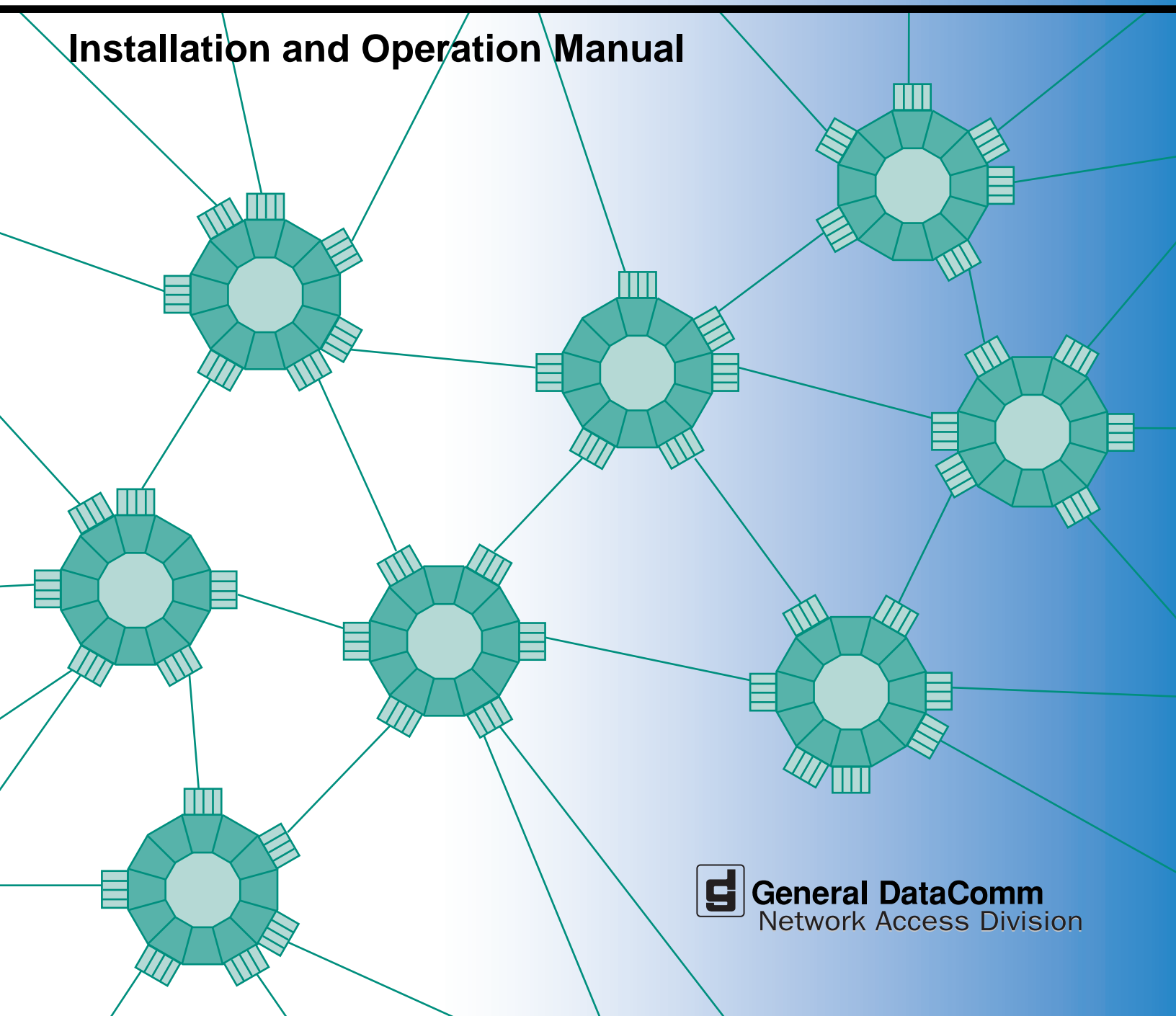


GT 1033 Multi-Rate[®]

Installation and Operation Manual



073R503-000
Issue 1
December 2000

GT 1033 Multi-Rate[®]

Installation and Operation Manual

Copyright

©2000 General DataComm, Inc. ALL RIGHTS RESERVED.

This publication and the software it describes contain proprietary and confidential information. No part of this document may be copied, photocopied, reproduced, translated or reduced to any electronic or machine-readable format without prior written permission of General DataComm, Inc. The information in this document is subject to change without notice. General DataComm assumes no responsibility for any damages arising from the use of this document, including but not limited to, lost revenue, lost data, claims by third parties, or other damages.

If you have comments or suggestions concerning this manual, please contact:

General DataComm, Inc.
Network Access Division
Technical Publications Department
Park Road Extension
Middlebury, Connecticut USA 06762-1299

Telephone: 1 203 758 1811

Trademarks

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

Documentation

Revision History

Issue Number	Date	Description of Change
1	Dec 2000	Initial issue

Related Publications

A listing of related user manuals is provided below. In addition to the hardware and software manuals, always read the software System Release Notes supplied with your product.

Publication Name	Publication Number*
TEAM 700 Operation Manual	058R707-VREF
TEAMCore Operation Manual	058R720-VREF

* For publications numbers, **REV** is the hardware manual revision (for example, -000, -001, etc.) **VREF** (if listed) is the software revision (for example, -V120 would read, Version 1.2) and corresponds to the most current revision.

Preface

Scope

This manual describes how to install and operate the GT 1033 Multi-Rate modem. The information contained in this manual has been carefully checked and is believed to be entirely reliable. However, as General DataComm improves the reliability, function, and design of their products, it is possible that information may not be current. Contact General DataComm for updated information on this or other General DataComm products.

General DataComm, Inc.
Network Access Division
Technical Publications Department
Park Road Extension
Middlebury, Connecticut, USA 06762-1299
Tel: 1 203 758 1811 Toll Free: 1 800 794 8246

Manual Organization

This manual is divided into the following chapters:

[*Chapter 1, System Description*](#)

[*Chapter 2, Installation*](#)

[*Chapter 3, Operation*](#)

[*Chapter 4, Tests*](#)

[*Chapter 5, Application Guide*](#)

Safety Information

This manual should be read in its entirety and all procedures completely understood before installing or operating the unit. The notes that appear throughout this manual must be read prior to any installation or operating procedure. Examples of notes used in this manual are shown below.

Note *A note provides essential operating information not readily apparent which you should be particularly aware of. A note is typically used as a suggestion.*

Important *Indicates an emphasized note. It is something you should be particularly aware of; something not readily apparent. Important is typically used to prevent equipment damage.*

The CAUTION, WARNING, and DANGER statements that appear throughout this manual are intended to provide critical information for the safety of both the service engineer and operator. These statements also enhance equipment reliability. The following definitions and symbols for CAUTION, WARNING, and DANGER as they are used in this manual comply with ANSI Z535.2, American National Standard for Environmental and Facility Safety Signs, and ANSI Z535.4, Product Safety Signs and Labels, issued by the American National Standards Institute.



CAUTION *Indicates a potentially hazardous situation which, if not avoided, may result in minor to moderate injury. It may also be used to alert against unsafe practices.*



WARNING *indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.*



DANGER *indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.*

Safety Guidelines

Always use the following guidelines when unsafe conditions exist or when potentially hazardous voltages are present:

- Always use caution and common sense.
- Repairs must be performed by qualified service personnel only.
- To reduce the risk of electrical shock, do not operate equipment with the cover removed.
- Never install telephone jacks in a wet location unless the jack is designed for that location.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- Never install telephone wiring during an electrical storm.

Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. Electrostatic discharge occurs when a person whose body contains a static buildup touches a computer component. This product may contain static-sensitive devices that are easily damaged. Proper handling, grounding and precautionary ESD measures are essential when installing parts or cards. Keep parts and cards in antistatic packaging when not in use or during transport. If possible, use antistatic floorpads and workbench pads.

When handling components, always use an antistatic wrist strap connected to a grounded equipment frame or chassis. *If a wrist strap is not available, periodically touch an unpainted metal surface on the equipment.* Never use a conductive tool, like a screwdriver or a paper clip, to set switches.

Deutschland

Überblick Sicherheit

Bitte lesen sie dieses Handbuch komplett durch und stellen sie sicher, daß sie alle Vorschriften verstehen, bevor sie das Gerät installieren oder betreiben. Die Hinweise in diesem Handbuch müssen vor Installation oder Betrieb gelesen werden. Beispiele für Hinweise sehen sie hier.

Hinweis *Ein Hinweis enthält wichtige Informationen zum Betrieb, die nicht auf den ersten Blick ersichtlichsind, und die zu beachten sind. Ein Hinweis dient als Vorschlag.*

Wichtig *Bedeutet einen besonders wichtigen Hinweis. Darauf sollten sie besonders achten, da dies nicht offensichtlich ist. Wichtige Hinweise dienen im Allgemeinen dazu, Schäden am Gerät zu vermeiden.*

Die Hinweise CAUTION (VORSICHT), WARNING (WARNUNG) und DANGER (GEFAHR), welche im Handbuch erscheinen, enthalten entscheidende Informationen für die Sicherheit sowohl des Servicepersonals als auch der Bediener. Diese Hinweise erhöhen die Zuverlässigkeit der Anlage. Die folgenden Definitionen und Symbole für VORSICHT, WARNUNG und GEFAHR, wie sie in diesem Handbuch auftreten, sind gemäß ANSI Z535.2, Amerikanischer Nationaler Standard für Sicherheitszeichen für Umwelt und Anlagen, und ANSI Z535.4, Produkt-Sicherheits-Zeichen und Beschriftungen, ausgegeben vom American National Standards Institute.



VORSICHT *bedeutet eine potentiell gefährliche Situation, die wenn sie nicht vermieden wird, zu leichten oder mittelschweren Verletzungen führen kann.*



WARNUNG *bedeutet eine drohende gefährliche Situation, die wenn sie nicht vermieden wird, zu schweren Verletzungen oder zum Tode führen kann.*



GEFAHR *bedeutet eine drohende gefährliche Situation, die wenn sie nicht vermieden wird, zwangsläufig zu schweren Verletzungen oder zum Tode führt.*

Sicherheitsrichtlinien

Unter normalen Umständen arbeitet die Anlage sicher und zuverlässig in ihrem Netzwerk. Falsche Handhabung oder Installation von Bestandteilen kann zu Ausfällen oder Gefahren für den Bediener führen. Seien sie vorsichtig und beachten sie die allgemeinen Regeln bei der Installation der Netzwerkkabel. Beachten sie die folgenden Hinweise, besonders bei unsicheren Umständen oder potentiell gefährlichen Spannungen:

- Reparaturen dürfen nur von qualifiziertem Servicepersonal ausgeführt werden.
- Zur Vermeidung elektrischer Schläge darf die Anlage nicht mit geöffneter Abdeckung betrieben werden.
- Niemals Netzwerkstecker in feuchter Umgebung installieren, es sei denn der Stecker ist dafür ausgelegt.
- Niemals unisolierte Netzwerkdrähte oder Klemmen berühren, es sei denn das Netzwerk ist am Interface abgeschaltet.
- Niemals Netzwerk bei elektrischem Gewitter verdrahten.

EC Declaration of Conformity

We: General DataComm Limited
Molly Millars Lane
Wokingham, Berkshire RG41 2QF, United Kingdom

On behalf of: General DataComm Inc.
1579 Straits Turnpike
Middlebury, CT 06762-1299, U.S.A.

The products to which this declaration relates are in conformity with the following relevant harmonized standards, the reference numbers of which have been published in the Official Journal of the European Communities.

Electromagnetic Compatibility

EN 55022: 1994

Specification for limits and methods of measurement of radio interference characteristics of information technology equipment.

EN 50082-1: 1992

Generic immunity standard Part 1 Residential, Commercial, and Light Industry.

Safety

EN 60950: 1997 A1 through A11

Low Voltage Directive relating to electrical equipment designed for use within certain voltage limits.

Service Support and Training

VITAL Network Services, a General DataComm company, is committed to providing the service support and training needed to install, manage, and maintain your GDC equipment. VITAL Network Services provides hands-on training courses through **VITAL Network Services Global Technology Training Services**. Courses range from basic data communications, modems and multiplexers, to complex network and ATM systems. Training courses are available at our centers in the US, UK, France, Singapore and Mexico, as well as at a customer's site.

For more information on VITAL Network Services or for technical support assistance, contact VITAL Network Services at:

VITAL Network Services World Headquarters

6 Rubber Avenue
 Naugatuck, Connecticut 06770 USA

<http://www.vitalnetsvc.com>

Telephones:	Faxes:
1 800 243 1030	1 203 723 5012
1 888 248 4825	1 203 729 7611
1 203 729 2461	

VITAL Network Services Regional Sales and Service Offices:	
<p>North American Region Office 6 Rubber Avenue Naugatuck, Connecticut 06770 USA Telephones: 1 800 243 1030 1 888 248 4825 1 203 729 2461 1 800 361 2552 (French Canadian) Training: 1 203 729 2461 Faxes: 1 203 723 5012 1 203 729 7611</p>	<p>Central America, Latin America VITAL Network Services Periferico Sur 4225, Desp. 306 C.P. 14210, Mexico D.F., Mexico Telephone: 52 5 645 2238 Training: 52 5 645 2238 Fax: 52 5 645 5976</p>
<p>Europe, Middle East, Africa VITAL Network Services Molly Millars Close Molly Millars Lane Wokingham, Berkshire RG41 2QF UK Telephone: 44 1189 657200 Training: 44 1189 657240 Fax: 44 1189 657279</p>	<p>Asia Pacific VITAL Network Services 501 Orchard Road 05-05 Wheelock Place, Singapore 238880 Telephone: 65 735 2123 Training: 65 735 2123 Fax: 65 735 6889</p>

Table of Contents

Preface

Service Support and Training	vii
--	-----

Chapter 1: System Description

Features	1-1
Applications	1-1
Point-to-Point	1-1
Data Grooming and Concentration	1-1
Diagnostics/Network Management	1-3
The GT 1033 Multi-Rate Unit	1-3

Chapter 2: Installation

Unpacking and Handling	2-1
Installation Requirements	2-1
Setting Hard Options	2-2
DTE Interface Selection	2-4
Electrical Connections	2-4
Power	2-5
Business Equipment Connections	2-5
SDSL Line Connections	2-6
Performance Rates and Maximum Distance	2-7
Preoperational Configuration Setup	2-7
Hard	2-7
Soft	2-7

Chapter 3: Operation

Front Panel Description	3-1
Soft Option Selection	3-2
Terminal Requirements	3-2
Control Port Characteristics	3-2
Startup Procedure	3-3
Screen Organization	3-3
Operating Procedures	3-4
Menu Selection	3-4
Field Navigation	3-4
Field Editing	3-4

Table of Contents

Restoring Default Values	3-4
Saving Values	3-4
Quitting Without Saving	3-4
Refresh	3-4
Main Menu	3-5
Diagnostics Menu	3-6
SDSL Monitoring	3-7
SDSL Status	3-8
Configuration Menu	3-9
Unit Configuration Screen	3-10
Interface Configuration Screen	3-11
View H/S Configuration	3-12
Maintenance Menu	3-13
Network Management	3-13

Chapter 4: Tests

Maintenance Menu	4-1
Loopback Testing	4-2
Loopback Testing (Hard)	4-3
Loopback Testing (Soft)	4-3
Considerations in the Use of Test Loopbacks	4-4
BER Test	4-4
Troubleshooting Procedures	4-7

Chapter 5: Application Guide

Timing Options	5-1
High Channel Data Rate Application	5-1
Typical Applications	5-2

Index

Chapter 1: System Description

Overview

This manual describes the installation and operation of GT 1033 Multi-Rate (GT 1033 MR) unit manufactured by General DataComm Industries, Inc. The GT 1033 MR supports one SDSL loop and provides selectable data rates from 128 kbps to 1536 kbps in 64 kbps increments.

The unit's interface is selectable, ITU-T V.35 or X.21. These interfaces provide the transmit timing for the user's DTE equipment connected to the interface.

Part numbers for standard and optional equipment for the GT 1033 MR appear in [Table 1-1](#). Operating parameters appear in [Table 1-2](#).

Features

The GT 1033 MR is a customer-side interface for an SDSL system. It provides the following features:

- Configurable as either a Line Terminating Unit (LTU) or a Network Terminating Unit (NTU).
- Software configurable through an optional ASCII terminal or hardware configurable via on-board switches.
- May be used as a Network Managed Element within a GDC Network Management System.
- Supports either ITU-T V.35 or X.21 customer interface.
- Provides internal BERT capability.
- Provides Local Loopback and Remote Digital Loopback capabilities.

Applications

Point-to-Point

The GT 1033 MR can operate in two configurations which are shown in [Figure 1-1](#). This application provides bandwidth of $N \times 64$ kbps for $N=2$ to $N=24$.

Data Grooming and Concentration

This application accomplishes E1 concentration grooming of bandwidth from each remote GT 1033 MR. The total bandwidth of the remote E1 is determined by the UAS 7000 system configuration.

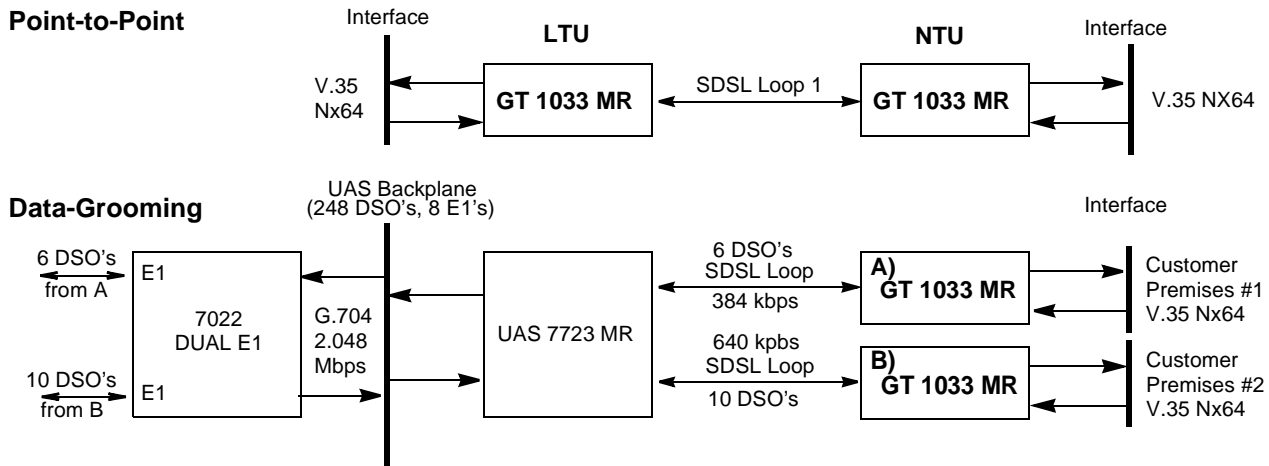


Figure 1-1 Typical GT1033 Multi-Rate Applications

Note Other applications may be found in [Chapter 5, Application Guide](#) of this manual.

Diagnostics/Network Management

Operation and parameters are controlled by switches mounted on the printed circuit card. A back panel terminal interface jack labeled CONTROL is also provided. This terminal interface enables access to a full set of menu-driven diagnostic and configuration controls via a standard terminal interface. These include loopback and test pattern control, access to performance monitoring, and configuration control. Instructions for using the terminal feature are in [Chapter 2, Installation](#).

A GT 1033 MR standalone unit may be used as part of a Universal Access System (UAS). The UAS is a family of network managed metallic loop transmission products. A shelf mounted UAS family member is linked by the access loop to a standalone unit located at the far end. Full network management capabilities are achieved by using a SpectraComm Manager (SCM), installed in the UAS shelf, as the interface to an SNMP controller. Refer to [Figure 1-1](#).

The GT 1033 Multi-Rate Unit

Technical Characteristics

[Table 1-1](#) outlines the Equipment List for the GT 1033 MR.

Table 1-1 Equipment List

Description	GDC Part No.
GT 1033 MR - 100 to 240 VAC, 50/60 Hz	073A510-001
GT 1033 MR - pc board only	073P510-001
Cables	
DB-25 Male to V.35 Male (ISO 2593) adapter cable	027H579-005, -015, -025, -050
Cable assembly DB-25M to V.35F adapter cable	027H572-001
Cable assembly DB-25M to DB-15F X.21 adapter	027H448-0XX
Line cable	022H024-0XX
Power Cords (IEC320)	
Domestic	830-024-003
Europe	830-061-002
Italy	830-002-008
Japan	830-002-009
Australia	830-002-010
Taiwan	830-002-011
U.K.	830-060-102
Switzerland	830-061-003

[Table 1-2](#) contains the Technical Specifications of the GT 1033 MR.

Table 1-2 Technical Specifications

DTE Side	
Data Rates	128 kbps to 1536 kbps (24 x 64k)
Interface	V.35 or X.21
Connector	DB-25
Transmission Line	
Metallic twisted-pair	No loading coils; no additional shielding Only twisted pair or quad cable When Bridged-Taps (BTs) are present, the following rules apply: Maximum number of bridged-taps = 2 Each tap length - 500 meters max. Meets the performance specification of ETSI DTR/TM-3017
Line Bit Rates	128 kbps to 1536 kbps in 64 kbps increments
Data Encoding	2B1Q
Test Features	
Local Loopback	Front panel switch or terminal screen selectable.
Remote Loopback	Front panel switch or terminal screen selectable.
BER Test	Front panel switch or terminal screen selectable.
Dimensions	
Height	56 mm (2.2 in.)
Width	206 mm (8.1 in.)
Depth	163 mm (6.4 in.)
Weight	0.7 kg (1.5 lbs.)
Shipping Weight	3.6 kg (8.1 lbs.)
Electrical	
Input Power	7 watts at the AC main
Environmental	
Temperature Card Assembly Operation	0 to 40 degrees Celsius
Card Assembly Storage/ Non-Operating	-40 to +70 degrees Celsius
Humidity	5 to 95% non-condensing
Altitude Operating	0 to 10,000 feet
Non-Operating	0 to 40,000 feet

Chapter 2: Installation

Overview

This chapter guides you through the process of installing and using the GT 1033 MR in your communications network. If this is your first experience using these units you may wish to review [Chapter 1, System Description](#) to ensure that you understand the key features and the process of installing and using the unit in your network.

Unpacking and Handling

Inspect the unit for damage. If any is observed, notify the shipper immediately. Save the box and packing material for storage or shipping, if necessary.

Installation Requirements

The GT 1033 MR basecard occupies a standalone enclosure. Place the unit in a ventilated area where the ambient temperature does not exceed 104°F (40°C). Do not install it directly above equipment that generates a large amount of heat (such as power supplies).

Important *Observe ESD precautions during the procedure. Be sure to wear a properly grounded antistatic wrist strap.*



CAUTION

1. Make sure that the unit's power cord is disconnected.
2. Remove the two screws from the bottom of the unit.
3. Place the unit right side up on a flat surface and carefully remove the top cover.

Note *The component card and rear panel are fixed to the bottom. The front panel, however, is floating.*

4. Perform the switch and jumper adjustments.
5. Replace the top cover, positioning it with the grille at the rear, and carefully align the front panel so that it fits into the grooves in the top and bottom covers.
6. Replace the two screws in the bottom of the unit.

Setting Hard Options

Option selections match the GT 1033 MR's functional characteristics with the network in which it is installed. The unit's pc card has two switchbanks for option selection. Normally, the settings controlled by the switches can also be performed by means of software (terminal interface or SNMP network controller), but there is a hardware switch setting (switch S4-1) to lock out software optioning. Switches settings to control the data rates are outlined in [Table 2-1](#), and [Table 2-2](#) outlines all the other switch options. [Table 2-3](#) explains the jumper options. [Figure 2-1](#) shows the locations.

Note

The microprocessor in the GT 1033 MR only reads the hardware option switch settings during the unit's power-up sequence. If you change hardware settings while the power is On, you must turn the power Off and then On again in order for the new settings to take effect. Software option settings take effect immediately without need for a power cycle. Software option settings are stored in non-volatile memory, so they do not need to be reset after power interruption.

You need to make these adjustments only once, when first installing the unit. You don't have to repeat the procedure, unless you change your network or connect a different device to a data channel.

Table 2-1 Data Rate: Option Selections

Data Rate	S1-6	S1-5	S1-4	S1-3	S1-2	S1-1
128 kbps	OFF	OFF	OFF	OFF	OFF	OFF
192 kbps	OFF	OFF	OFF	OFF	OFF	ON
256 kbps	OFF	OFF	OFF	OFF	ON	OFF
320 kbps	OFF	OFF	OFF	OFF	ON	ON
384 kbps	OFF	OFF	OFF	ON	OFF	OFF
448 kbps	OFF	OFF	OFF	ON	OFF	ON
512 kbps	OFF	OFF	OFF	ON	ON	OFF
576 kbps	OFF	OFF	OFF	ON	ON	ON
640 kbps	OFF	OFF	ON	OFF	OFF	OFF
704 kbps	OFF	OFF	ON	OFF	OFF	ON
768 kbps	OFF	OFF	ON	OFF	ON	OFF
832 kbps	OFF	OFF	ON	OFF	ON	ON
896 kbps	OFF	OFF	ON	ON	OFF	OFF
960 kbps	OFF	OFF	ON	ON	OFF	ON
1024 kbps	OFF	OFF	ON	ON	ON	OFF
1088 kbps	OFF	OFF	ON	ON	ON	ON
1152 kbps	OFF	ON	OFF	OFF	OFF	OFF
1216 kbps	OFF	ON	OFF	OFF	OFF	ON
1280 kbps	OFF	ON	OFF	OFF	ON	OFF
1344 kbps	OFF	ON	OFF	OFF	ON	ON
1408 kbps	OFF	ON	OFF	ON	OFF	OFF
1472 kbps	OFF	ON	OFF	ON	OFF	ON
1536 kbps	OFF	ON	OFF	ON	ON	OFF

Table 2-2 Switchbank Functions: Option Selection

Switch(es)	Label	Setting	Description
S1-7	CTS-ON	On	CTS follows RTS
S1-8	FP/DIS	On	Front panel switches disabled
S4-1	SFT/HRD	On	Configuration can only be changed by means of hardware switches
		Off	Configuration can be changed by means of terminal interface or SNMP control as well as by hardware switches.
S4-2	NTU/LTU	On	Unit functions as a Line Terminating Unit (LTU), located on the central office side. LTU acts as a master unit in relation to a NTU for timing and supervision.
		Off	Unit functions as a Network Terminating Unit (NTU), located on the user side.
S4-3/S4-4	INT/EXT	Off/Off	Looped
		On/Off	Internal Timing
		Off/On	External Timing
		On/On	Looped
S4-5	SPARE		
S4-6	SPARE		
S4-7	SPARE		
S4-8	SPARE		

Table 2-3 Jumper Options

Jumper	Description
X1	Factory use - no jumper installed
X2, X3	Sets DTE interface for X.21 or V.35
X4	Enables/disables External RL
X5	Enables/disables External LL

DTE Interface Selection

The DB25 back panel connector labeled Business Equipment is jumper-selectable for V.35 or X.21 compatibility. The X2 and X3 jumpers, located adjacent to the connector on the pc board, control the selection.

Place the jumpers ON the center and right rows of pins for V.35 operation, or on the center and left rows for X.21 operation. The positions are labeled on the board. Refer to [Figure 2-1](#).

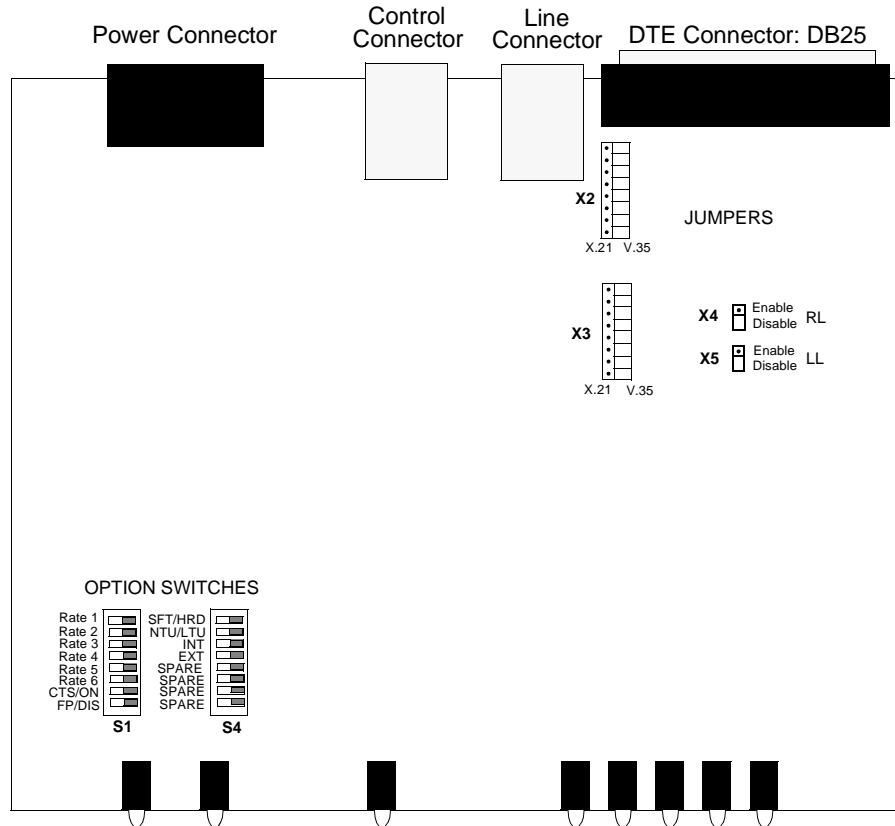


Figure 2-1 PC Board: Options and Connectors

Electrical Connections

The following paragraphs describe the power and line connections to the GT 1033 MR.

Note Before you power up the unit, refer to the *Preoperational Hard/Soft Configuration Setup* later in this chapter.

Power

Attach the appropriate power cord to the rear panel IEC 320 connector and to the wall receptacle. The unit should be powered by the same AC source as the equipment interfaced with the unit to prevent large circulating currents caused by differences in ground potential. If you cannot determine whether the equipment is powered by the same AC source, verify that a potential difference of less than 0.25 V rms exists between the grounding circuits of the respective power outlets.

Business Equipment Connections

The rear panel universal DTE DB-25 connector, labeled Business Equipment (see [Figure 2-2](#)), supports either X.21 or V.35 interface connection as selected by the X2 and X3 jumpers. The connector pinouts for the two applications are detailed in [Table 2-4](#) and [Table 2-5](#) below.

Table 2-4 Business Equipment (DTE) Interface Signals (ITU-T V.35)

J1 (DB-25) Pin (See Note 1)	V.35 (ISO 2593) Pin (See Note 2)	ITU-T (See Note 3)	NTU	Signal	Description
1	A	101		No Connection	
7	B	102		Signal ground	Establishes a common ground reference for all interface circuits.
4	C	105	RS	Request-to-send	Indicates to GT 1033 MR that DTE is prepared to transmit.
5	D	106	CS	Clear-to-send	Indicates to DTE that GT 1033 MR is prepared to transmit.
6	E	107	DM	Data Set Ready	Indicates to DTE that GT 1033 MR is operational.
8	F	109	CO	Received line signal detector (Carrier On)	Indicates to DTE that GT 1033 MR is receiving data (not idle or OOS codes).
25	NN	142	TM	Test mode	Indicates to DTE that GT 1033 MR is in a test mode.
2 14	P S	103 103	SD-A SD-B	Transmitted data	Transfers data signals from DTE to GT 1033 MR for transmission over communications line.
3 16	R T	104 104	RD-A RD-B	Received data	Transfers data signals received over communication line by GT 1033 MR to DTE.
17 9	V X	115 115	RT-A RT-B	Receiver timing	Transfers receiver signal timing information from GT 1033 MR to DTE.
15 12	Y AA/a	114 114	ST-A ST-B	Transmitter timing	Transfers transmitter signal timing information from GT 1033 MR to DTE.
18	L	141	LL	Local Loopback	Loops data back to DTE at DSL interface
21	N	140	RL	Remote Loopback	Sends loopback signal to remote to loop data back to local unit
20	H	108/2	TR	Data Terminal Ready	Indicates to GT 1033 MR that DTE is prepared for data communication.

Note 1: Unlisted DB-25 pins are not used
 Note 2: V.35 interface requires use of adapter cable 027H579 or 027H572
 Note 3: ITU-T designations are shown for reference only.

Table 2-5 Business Equipment (DTE) Interface Signals (X.21)

J1 DB-25 Pin	15-Pin X.21 Connector *	ITU-T Circuit Designation	Signal	Description
2 14	2 9	T(A) T(B)	Transmitted data	Data from DTE.
3 16	4 11	R(A) R(B)	Received data	Data to DTE.
4 20	3 10	C(A) C(B)	Control	Indicates to GT 1033 MR that DTE is prepared to transmit.
5 6	5 12	I(A) I(B)	Indication	Indicates to DTE that GT 1033 MR is receiving data.
15 12	6 13	S(A) S(B)	Signal element timing	Transmit and receive signal timing information from GT 1033 MR to DTE.
7	8	G	Ground	Common electrical reference

* DB25 to DB15 adapter cable, part # 027H448-005, -010, or -025 needed for X.21 compatibility.

SDSL Line Connections

You make SDSL line connections to the GT 1033 MR standalone using the Line connector on the rear panel. Refer to [Figure 2-2](#).

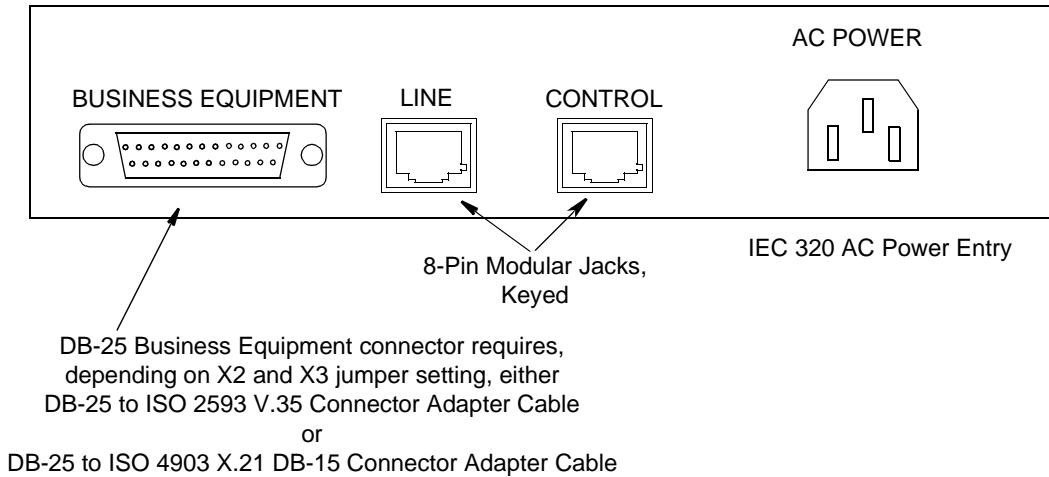


Figure 2-2 Rear Panel

Performance Rates and Maximum Distance

GDC has rigorously tested the performance of the GT 1033MR, with the results detailed in [Table 2-6](#).

Table 2-6 Cable Reach (26 AWG - no noise)

Rate (kbps)	Feet	Meters
128	16,200	4,938
192	15,700	4,785
256	15,400	4,694
384	15,100	4,602
512	14,600	4,450
768	12,900	3,932
1024	12,300	3,749
1536	11,600	3,536

Preoperational Configuration Setup

Hard

Configure the unit as follows:

1. Set the switches and jumpers according to [Table 2-2](#) and [Table 2-4](#). Verify LTU/NTU configuration. If S4-1 is placed in the SOFT configuration position, all other switch settings are ignored, and the unit must be configured via the optional terminal screen. Refer to Setup (Soft).
2. Connect the DTE interface and SDSL loops to the rear panel connectors.
3. Apply power to the unit.
4. The card automatically performs internal self-tests. If one of these tests fails, the front panel ALM LED blinks.
5. Follow step 5 under Setup (Soft).

Soft

1. Follow steps 1 through 5 above.
2. Connect a terminal to the CONTROL connector on the back panel.
3. To view the internal self-test results on the terminal, go to the View H/S Config Screen on the terminal. Refer to [Chapter 3, Operation](#) paragraph - "Setting Soft Options".

4. After performing the self-test, the SDSL loop (LTU and NTU) initiates start-up, and the green LEDs should blink. The start-up should last less than three minutes. When complete, the NORM LED should be ON and the ES LED should be OFF. If not, the start-up failed. The card automatically initiates a new start-up procedure. During this time, the ALM LED will blink until the LOOP status indicators clear.
5. Data transfer should occur, DTE indicators RD and SD should be ON. The NORM LED should be ON, and the ES LED should be OFF. If not, refer to the troubleshooting procedure in [Chapter 4, Tests](#).

[Table 2-7](#) shows the SDSL Connector Pin Assignments and [Table 2-8](#) shows the Control Line Connector Pin Assignments.

Table 2-7 SDSL Connector Pin Assignments

Pin No.	Function	Description
1	No Connection	
2	No Connection	
3	No Connection	
4	SDSL-LP1-RING	Loop 1 Ring
5	SDSL-LP1-TIP	Loop 1 Tip
6, 7, 8	No Connection	

Table 2-8 Control Line Connector, Pin Assignments

Pin No.	Function	Description
1, 3, 7, 8	No connection	
2	DCD	Data Carrier Detect - constant On
4	Ground	
5	RXD	Receive Data - from unit to terminal
6	TXD	Transmit Data - from terminal to unit

Chapter 3: Operation

Overview

The GT 1033 MR front panel is illustrated and the function of each control and indicator are explained. You may check the operation of the unit by monitoring the front panel indicators and using the test procedures provided in [Chapter 4, Tests](#). Unit configurations for typical applications are provided in [Chapter 5, Application Guide](#).

Once the options are set and the communication line is properly connected, the unit needs no additional operator commands. The unit is transparent to your network and communicates automatically with each other and with your connected network devices.

Front Panel Description

[Figure 3-1](#) illustrates the front-panel LED indicators and push buttons. Red LEDs indicate unit under test, critical or major failures and errors. Green LEDs indicate satisfactory operation or completion of a process. [Table 3-1](#) explains the function of each indicator and button.

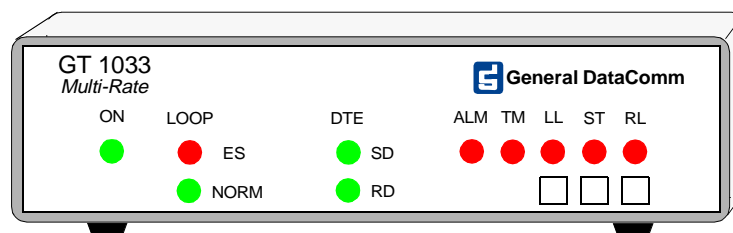


Figure 3-1 GT 1033 Multi-Rate Front Panel

Table 3-1 DTE Configuration Table

Label	Function
ON	Lit while +5V is applied to the unit
LOOP ES	Errored Second - indicates loop status in conjunction with the NORM indicator; see Table 3-2 .
LOOP NORM	Normal Operation - indicates loop status in conjunction with the ES indicator; see Table 3-2 .
DTE SD	Send Data - indicates presence of transmit data at the DTE interface
DTE RD	Receive Data - indicates presence of received data at the DTE interface
ALM	Lights to indicate the presence of a major alarm. Blinks to indicate failure during self-test. Also blinks to indicate detection of LOS, LOSW, or UAS on an SDSL loop.
TM	Test Mode - lit during any loopback and/or self-test; blinks during self-test with bit errors.
LL	Local Loopback, indicator and push button. Indicator is lit during Local Loopback test mode, when initiated by the pushbutton, but not by software control. TM is also lit when this indicator is On.
ST	Self Test, indicator and push button. Pushing the ST button activates a 2^{15} pseudo-random test pattern and enables detection of an incoming 2^{15} pattern. Indicator is lit during self test mode, when initiated by the pushbutton, but not by software control. TM is also lit when this indicator is On.
RL	Remote Loopback, indicator and push button. Indicator is lit during Remote Loopback test mode, when initiated by the pushbutton, but not by software control. For this loopback to be functional, the unit must be configured as a LTU. TM is lit when this indicator is On.

The Loop and DTE data path indicators enable visual monitoring of the SDSL Loop input and the DTE Interface.

The status of each SDSL loop is represented by two indicators:

- NORM - system status.
- ES - transport status.

Each of those LEDs can be in one of three states: ON, blinking (at a 2 Hz rate), or OFF. [Table 3-2](#) summarizes how to interpret the loop indicators.

Table 3-2 Loop Status Indicators

Loop Indicators		
ES	NORM	Indicates...
OFF	ON	Normal operation
ON	OFF	LOS/LOSW - Loss of input signal/Loss of synchronization word on loop
ON (for .5 sec.)	ON	ES - Errored second
ON	Blink	Start-up tests, No response from mating unit
OFF	Blink	Start-up in progress

Soft Option Selection

You can use an optional terminal (a standard ASCII terminal equipped with an EIA/TIA-232-E communication interface) connected to the CONTROL interface on the back panel for configuration and control of the unit.

Terminal Requirements

The software necessary to run the supervision program for a GT 1033 MR unit is contained in the unit itself. You can use any standard ASCII terminal (VT100 or ANSI terminal, or personal computer emulating an ASCII terminal) equipped with an EIA/TIA-232-E communication interface to control operation. The following screens were derived by plugging the COMM port of a PC (using Microsoft Windows™ terminal emulator program) into the back panel CONTROL jack. Set the terminal communications parameters as follows:

- Data Rate = 9600 bps
- Character Format = 1 start bit, 8 data bits, no parity, one 1 stop bit

Control Port Characteristics

The control port has an EIA/TIA-232-E asynchronous DCE interface, terminated in an RJ-45 connector on the back panel designated CONTROL. The connector is wired as shown below:

Pin	Function
1, 2, 3	Not connected
4	Ground
5	Transmit output (RXD of terminal)
6	Receive input (TXD of terminal)
7, 8	Shorted internally

Startup Procedure

A management session starts automatically as soon as the terminal cable is connected to the CONTROL port of an operating unit. To end an ongoing management session, disconnect the terminal from the unit. Upon power-up, the unit sends the opening screen, shown in [Figure 3-2](#). Advance to the main menu by pressing any key.

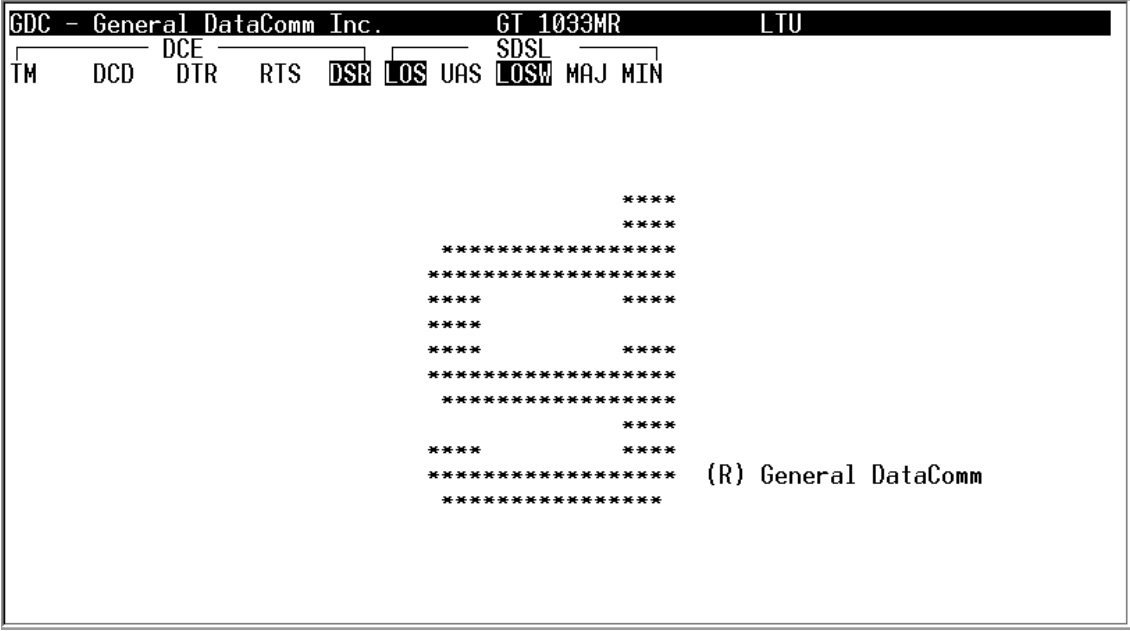


Figure 3-2 Opening Screen

Screen Organization

Areas of the screen are described in [Table 3-3](#).

Table 3-3 Terminal Screen Organization

Area	Description
Header	Located at the top of the screen, the header displays GDC name and equipment model, followed by the current operating mode (LTU or NTU).
Status Line	Located below the header, the status line includes two main fields, which display the status of the various alarms and status signals. An active alarm and status indicators are displayed in reverse video.
DCE Field	Includes the following indications: TM, DCD, DTR, RTS, DSR
Loop Alarms Field	Loop alarms field is divided into several sub fields and includes the following indications: LOS - Loss of input signal. UAS - Unavailable seconds threshold being exceeded. LOSW - Loss of synchronization word.
Work Area	Displays the menu and dialog boxes.
Active Keys Area	The active keys are constantly updated to show the keys and key combinations you can use on the current screen.

Operating Procedures

The following procedures apply to all the operations that you perform on the optional terminal.

Menu Selection

Menu items are selected in one of two ways:

- Move the selected block to the desired item by means of the arrows, then press the Enter key, or
- Type the number appearing to the side of the menu item.

Either action opens the sub menu or dialog box used to perform the selected operation.

Field Navigation

To move forward among the fields of a dialog box, press the Down arrow key. To move backward, press the Up arrow key.

Field Editing

The values displayed in the screen fields can be modified as follows:

- Bring the cursor to the desired field, and then press Enter to display an option menu with the available values, or
- Highlight the desired value then press Enter to select the new value and close the option menu.

Restoring Default Values

When the unit stores default values for parameters displayed in a dialog box, you can replace the current values with the default values by pressing Ctrl D (Ctrl D means hold down the Ctrl (control) key and press D).

Saving Values

To save new parameter values entered in dialog boxes, press Ctrl W. The new settings will be stored in the non-volatile memory.

Quitting Without Saving

To quit without saving the new parameter values entered in a dialog box, press Esc. You can also press Esc as necessary to close any open submenus and to return to the main menu.

Refresh

You may refresh the screen at any time by typing Ctrl-R.

Main Menu

The Main Menu is displayed in [Figure 3-3](#) and described in [Table 3-4](#).

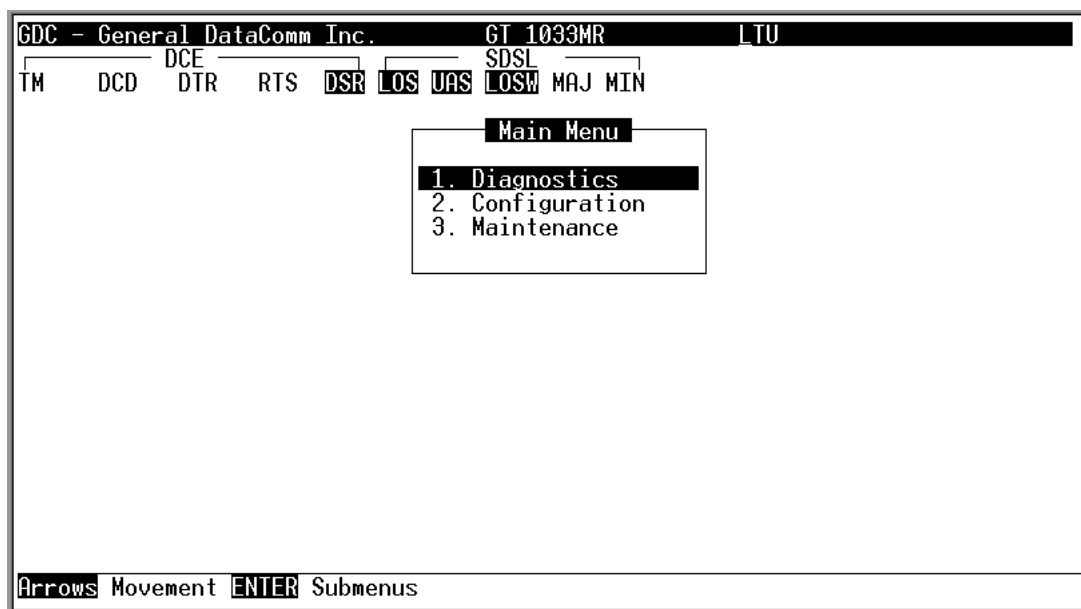


Figure 3-3 Main Menu.

Table 3-4 Main Menu Screen Options

Option	Purpose	Functions
1. Diagnostics	To display diagnostic information and to activate or control diagnostic functions	Display of performance statistics collected on the SDSL loop.
		Display SDSL loop status information, technical data on Tip/ring reversal, noise margin, and pulse attenuation.
2. Configuration	To configure the data interface and SDSL loop parameters	Display and modify unit configuration operating mode (NTU or LTU), front panel enable, major and minor alarm thresholds.
		Display and modify the interface configuration, TX clock mode, CTS mode, and data rate.
		Display system hardware and software data, and self-test results.
3. Maintenance	To perform maintenance activities	Enable both local and remote system loopbacks.
		Test system performance using the internal BER meter.
		Reset the statistics counters.
		Reset the unit. (Simulate a power-up.)

Maintenance Options are discussed further in [Chapter 4, Tests](#) under Maintenance Menu.

Diagnostics Menu

To open the diagnostics menu, select item 1 on the main menu. [Figure 3-4](#) shows the screen and [Table 3-5](#) explains the options.

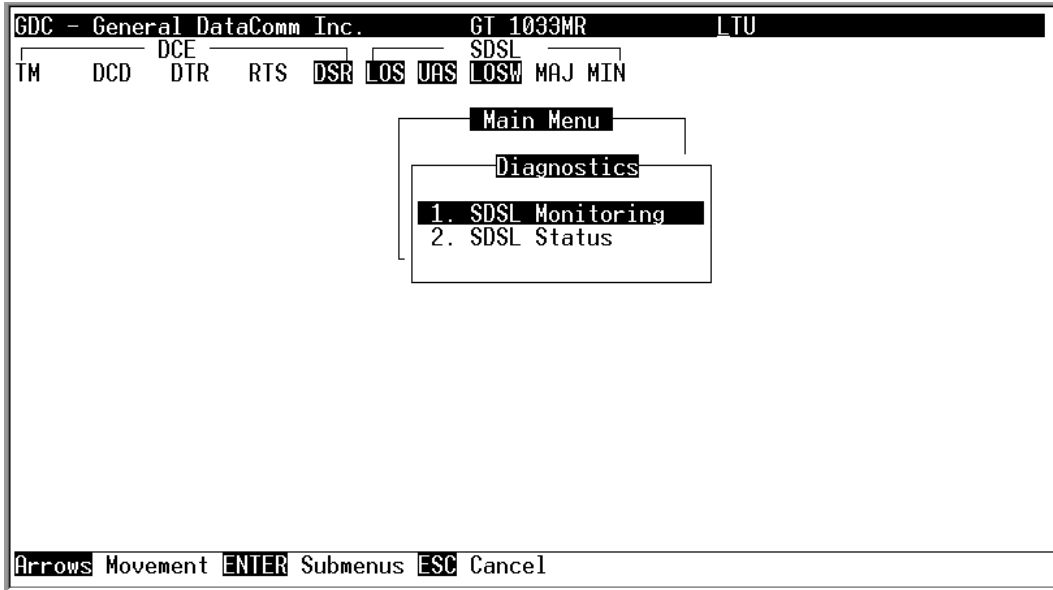


Figure 3-4 Diagnostics Menu

Table 3-5 Diagnostics Menu Options

Option	Function
1. SDSL Monitoring	Displays 24-hour performance statistics on the SDSL loop
2. SDSL Status	Shows you diagnostic information and technical data on SDSL loop performance

SDSL Monitoring

The SDSL Monitoring screen displays 24-hour performance statistics on the SDSL loop. To display the SDSL monitoring screen, select item 1 on the diagnostic menu. [Figure 3-5](#) shows the SDSL Monitoring screen and [Table 3-6](#) explains the fields.

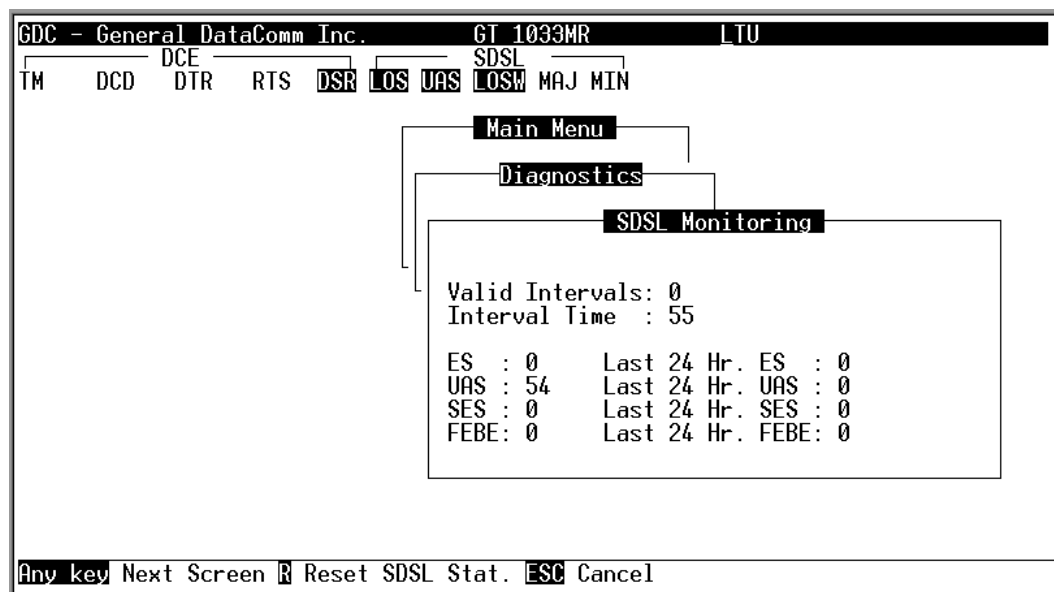


Figure 3-5 SDSL Monitoring Screen

Table 3-6 SDSL Monitoring Fields

Field	Function
Interval Time	Displays the elapsed time in seconds from the beginning of the current 15-minute interval. The range is 0 to 900.
ES	Displays the number of errored seconds in the current 15-minute interval.
Last 24 Hr ES	Displays the number of errored seconds in the last 24-hour interval.
UAS	Displays the number of unavailable seconds in the current 15-minute interval.
Last 24 Hr UAS	Displays the number of unavailable seconds in the last 24-hour interval.
SES	Displays the number of severely errored seconds in the current 15-minute interval.
Last 24 Hr SES	Displays the number of severely errored seconds in the last 24-hour interval.
FEBE	Displays the number of Far-End-Block-Errors reported by the remote equipment in the current 15-minute interval.
Last 24 Hr FEBE	Displays the number of Far-End-Block-Errors reported in the last 24-hour interval.

Note Powering up the GT 1033 MR unit resets the 24 hour performance statistics on the SDSL loop.

After viewing the data collected for the loop in the current 15-minute interval, you can display the other 95 intervals within the current 24-hour interval by pressing any key, except R, and Esc keys. The display is cyclic, that is, the current interval is displayed again after the 95th interval.

To reset the SDSL statistics counters, type **R**. All the displayed values are reset to 0. To exit and return to the Diagnostics menu, press the Esc.

SDSL Status

The SDSL Status option displays the SDSL Status screen (see [Figure 3-6](#)), which shows you diagnostic information and technical data on SDSL loop performance. [Table 3-7](#) explains the details of each field displayed. To display the SDSL Status screen, select item 2 on the Diagnostics menu. After viewing the data, press Esc to exit and return to the Diagnostic menu.

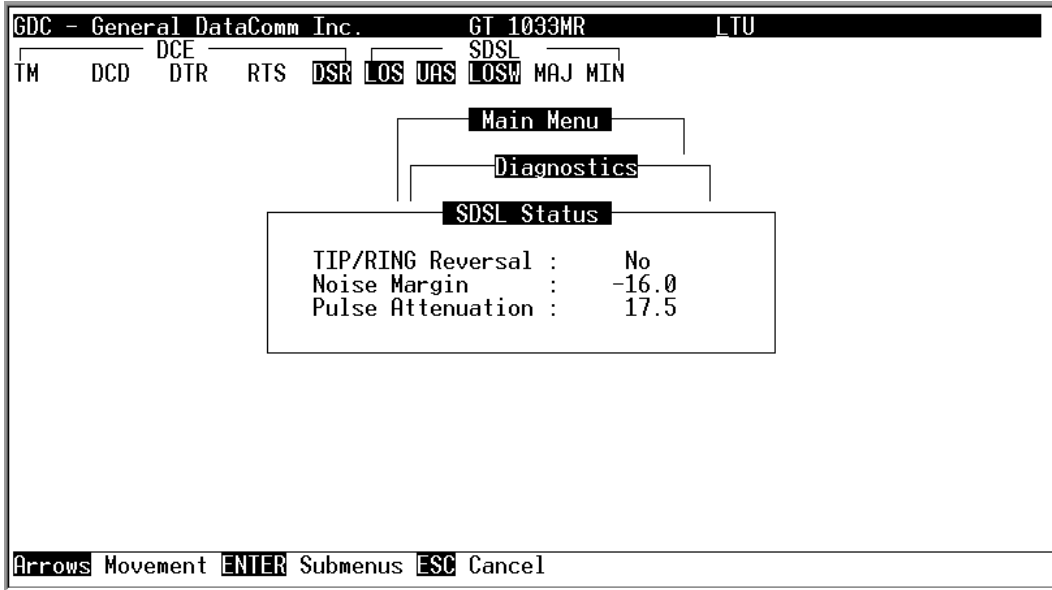


Figure 3-6 SDSL Status Screen

Table 3-7 SDSL Status Fields

Field	Function
TIP/RING Reversal	Indicates whether the two conductors of the SDSL loop are correctly connected or have been interchanged by error. This information is available only when the unit connected in a link can exchange information with the remote unit. Not applicable if unit is configured as an LTU.
Noise Margin	Displays amount of additional noise in dB which can be tolerated before exceeding 5×10^{-8} bit error ratio.
Pulse Attenuation	Displays the pulse attenuation, in dB, measured by the signal processing circuits of the unit.

Configuration Menu

Use the Configuration menu to configure the data interface and the SDSL loop parameters.

To open the Configuration menu (see [Figure 3-7](#)), select item 2 on the Main Menu. The configuration options are explained in [Table 3-8](#).

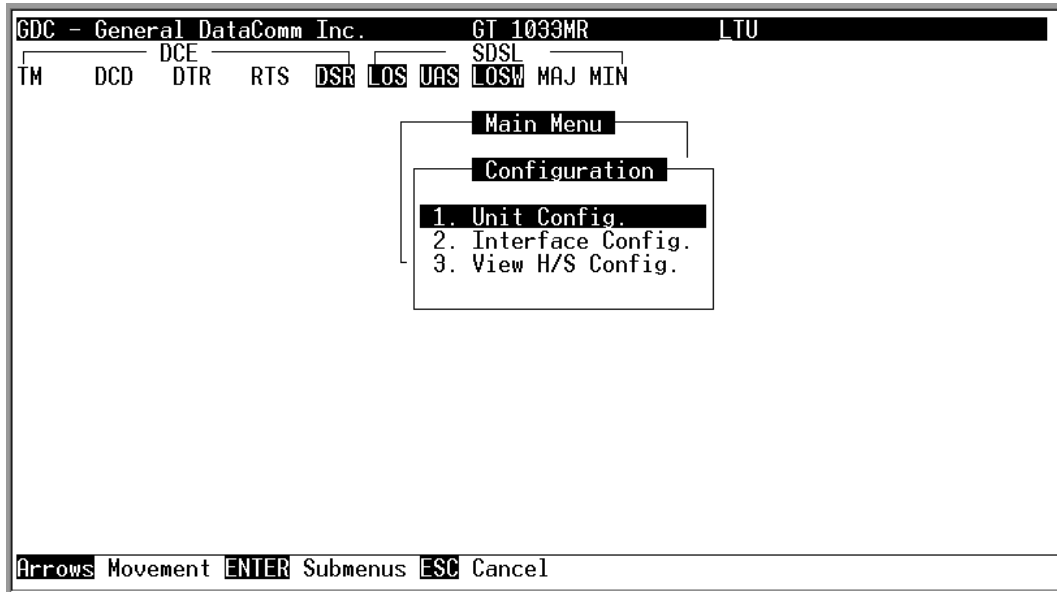


Figure 3-7 Configuration Screen

Table 3-8 Configuration Menu Options

Option	Function
1. Unit Config.	Displays the SDSL configuration parameters
2. Interface Config.	Displays the DCE Interface Configuration parameters
3. View H/S Config.	Shows hardware and software configuration data and the results of the last power-up self-test

Unit Configuration Screen

The Unit Configuration option displays the Unit Configuration screen, showing the SDSL configuration parameters of the unit. The screen includes three fields that are used to select the operating mode of the unit on the SDSL loop side, and the network application.

To display the Unit Configuration screen (refer to [Figure 3-8](#)), select item 1 on the Configuration menu. [Table 3-9](#) describes the options available.

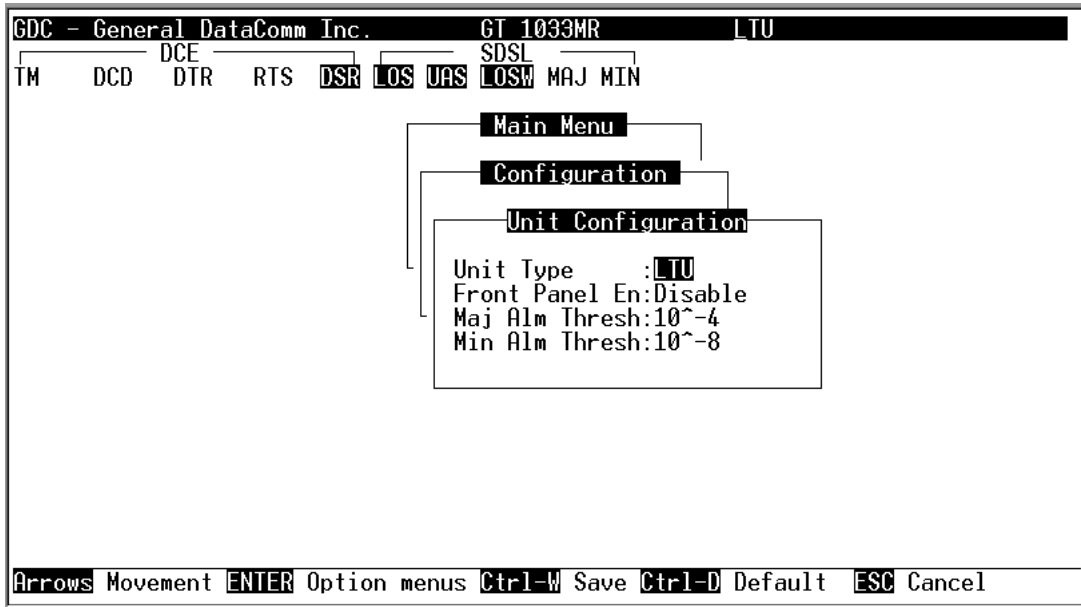


Figure 3-8 Unit Configuration Screen

Table 3-9 Unit Configuration Options (defaults in bold)

Selections	Options
Unit Type	LTU
	NTU
Front Panel Enable	Enable
	Disable
Maj Alm Thres	10^ 4-8 (default 10^4)
Min Alm Thres	10^4-8 (default 10^6)

Once you select your option, the option menu will close and the new selection appears in the screen. After making the desired changes, you have the choice to either save the options or Esc to quit.

Interface Configuration Screen

The Interface Configuration option displays the DCE Configuration parameters of the unit. To display the interface configuration screen, select item 2 on the configuration menu. A typical screen is shown in [Figure 3-9](#) and [Table 3-10](#) outlines the options..

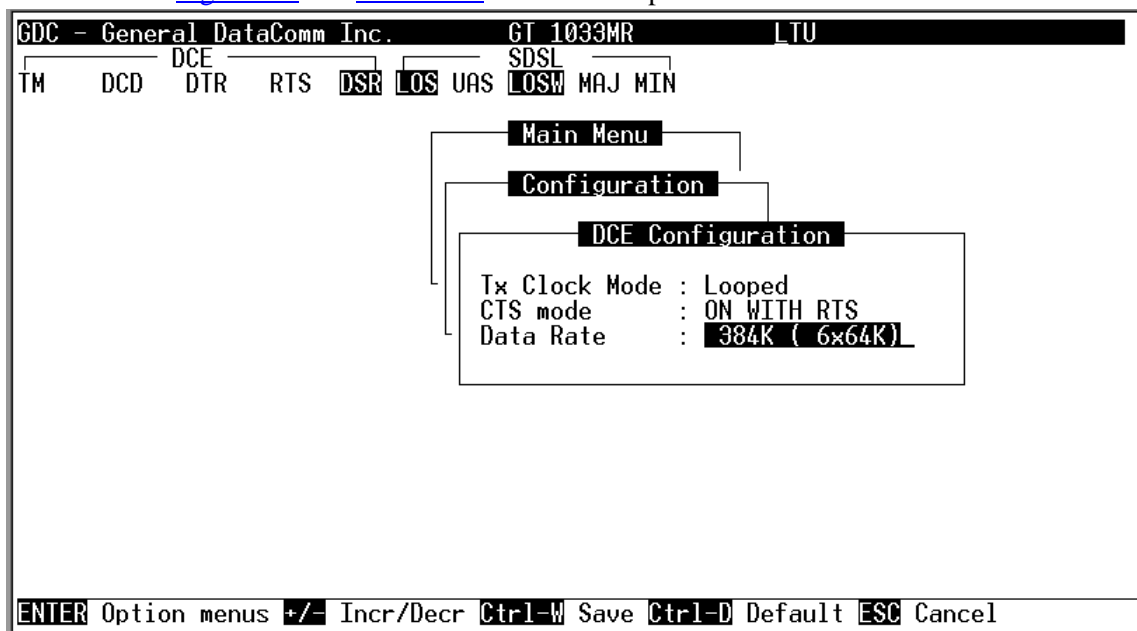


Figure 3-9 Interface Configuration Screen

Table 3-10 Interface Configuration Options (defaults in bold)

Option	Function
TX Clock Mode	Displays the DCE interface transmit timing selection: Looped - The transmit clock is locked to the receive clock and is developed from the incoming remote end timing. External - The DCE interface uses an external clock provided by the customer's DTE. Internal - The transmit clock is derived from the internal clock oscillator of the SDSL module.
CTS Mode	Forced ON: CTS is on as long as the SDSL module is powered and operating normally. ON with RTS : The CTS line tracks the state of the RTS line.
Data Rate	Press the space bar to increment the data rate, press the minus key to decrement the data rate. Select from 128 kbps to 1536 kbps (default 384k (6x64k)).

View H/S Configuration

The View H/S Configuration option displays the Configuration and Selftest Results screen, showing hardware and software configuration data and the results of the last power-up self-test. The information displayed on this screen is intended for maintenance and technical support groups. The upper area of the screen presents configuration data. The lower area presents the results of the last power-on self-test. A typical screen is shown in [Figure 3-10](#) and fields are described in [Table 3-11](#).

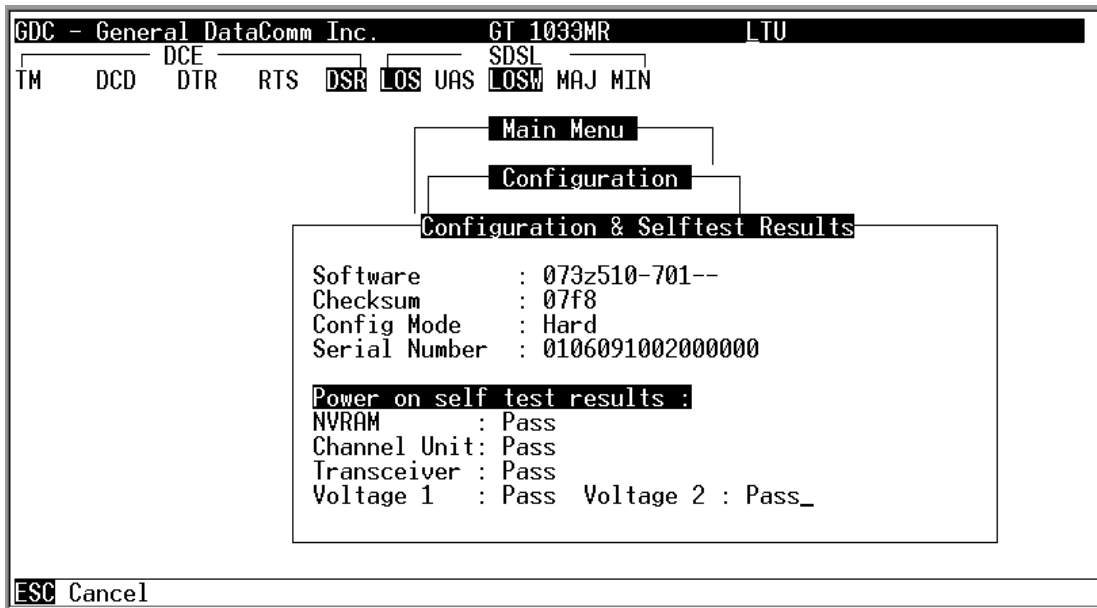


Figure 3-10 View H/S Configuration Screen

Table 3-11 View H/S Configuration Fields

Field	Function
Software	Displays the software part number and version of the unit.
Checksum	Firmware checksum.
Config Mode	Displays the current configuration mode of the unit: Soft - The unit is configured under software control. Hard - The unit is configured by means of the internal dip switches and jumpers.
Serial Number	Displays the serial number of the unit.

The last power-on self-test results area lists each subsystem tested during the self-test, and the result: Pass or Fail.

Maintenance Menu

Refer to [Chapter 4, Tests](#) to perform maintenance and troubleshooting.

Network Management

GT 1033 MRs can be used as a Network Managed element when used within a GDC Network Management System. The management software conforms to the MIB (Management Information Base) II standards set out for SNMP Version 1.0. Refer to the related SCM Manager Card publication listed in the front of this manual.

Chapter 4: Tests

Overview

This chapter is divided into the following main paragraphs: the Maintenance Menu screens and descriptions, Loopback testing (hard and soft), and troubleshooting procedures,

Important The activation of any loopback disrupts the flow of user data traffic.

The unit displays the status of these tests through the indicators on the front panel. You may also use the optional terminal connected to the CONTROL port on the back panel. Doing so provides a comprehensive set of features for testing operation and identifying trouble areas. This chapter provides instructions for managing the system by means of a terminal, and tells you how to enable and disable various loopbacks.

Maintenance Menu

The Maintenance Menu is used to perform maintenance and troubleshooting activities. To open the Maintenance Menu, select item 3 on the Main Menu. [Figure 4-1](#) illustrates the Maintenance Menu.

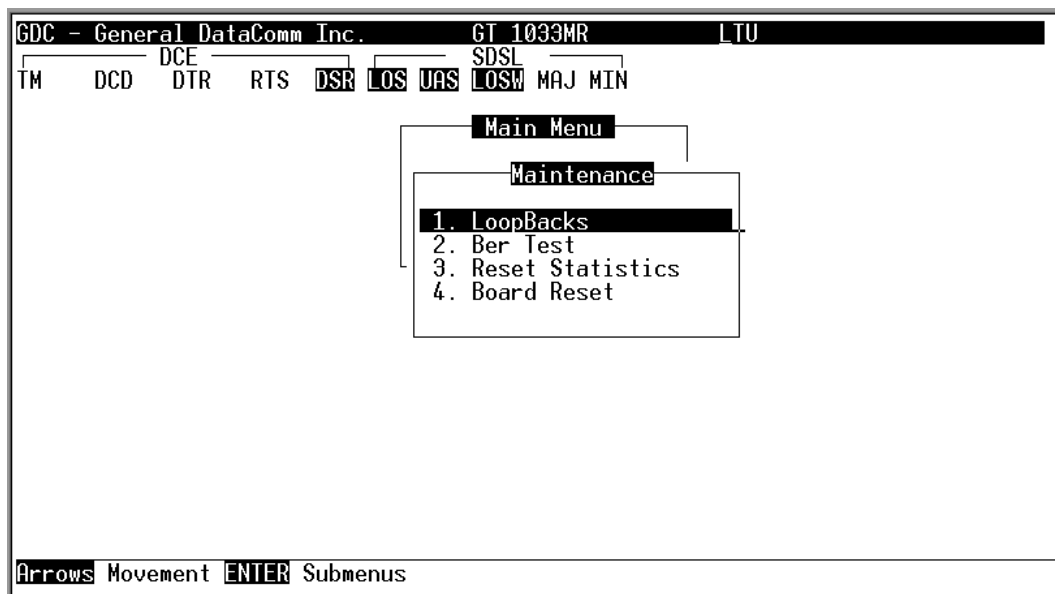


Figure 4-1 Maintenance Menu

Table 4-1 Maintenance Options

Option	Function
1. Loopbacks	enable/disable loopbacks on the user's equipment interface and on the SDSL loop for maintenance purposes
2. BER Test	performs bit error measurements on an SDSL system module
3. Reset Statistics	resets all the performance statistics entries of the unit
4. Board Reset	resets the unit

Loopback Testing

This function is used to enable/disable loopbacks on the user's equipment interface and on the SDSL loop for maintenance purposes. The SDSL systems offered by GDC provide two types of test loopbacks. [Figure 4-2](#) shows the simplified signal paths when the loopbacks are connected. To access the Loopbacks function, select item 1 on the Maintenance Menu.

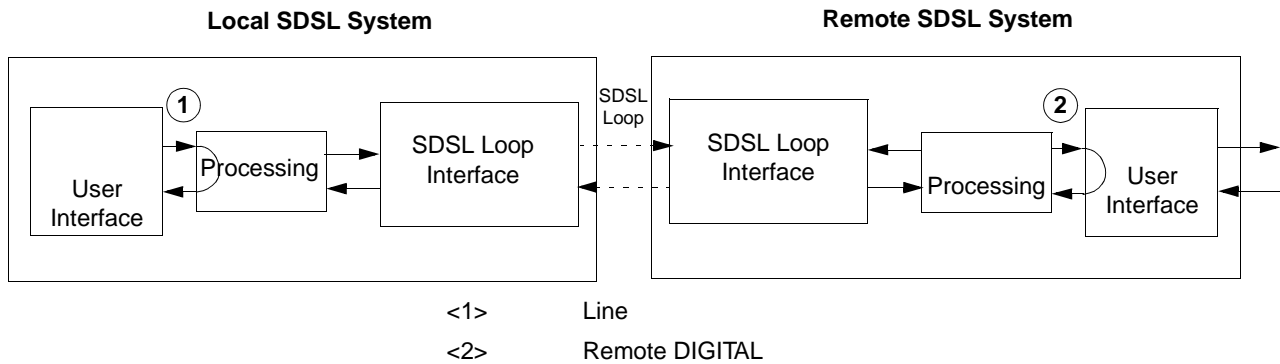


Figure 4-2 Loopbacks Signal Paths

[Figure 4-3](#) shows a typical loopback setting screen for a SDSL system using a terminal interface.

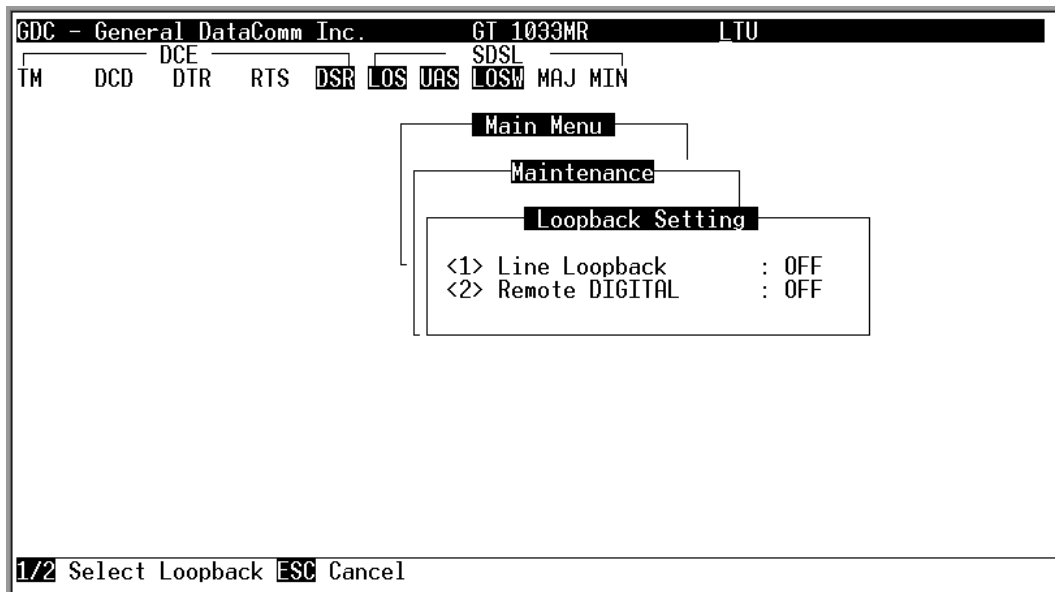


Figure 4-3 Loopback Screen

[Table 4-2](#) shows the options available from the loopback screen.

Table 4-2 Loopback Options

Option	Function
<1> Line Loopback	Toggles the Line Loopback ON and OFF
<2> Remote DIGITAL	Toggles the Remote DIGITAL Loopback ON and OFF

To change the state of a loopback, use the following procedure:

1. Type the number of the line for the desired loopback. This toggles the selected loopback ON and OFF.
2. To exit and return to the Maintenance Menu, press the Esc.

Loopback Testing (Hard)

The GT 1033 MR supports two types of loopbacks at the front panel:

LL - Line Loopback loops the data back towards the user's equipment interface.

RL - Remote Loopback signals the remote unit to loopback the data at it's user's equipment interface.

The forward signal for both of these loopbacks is transparent.

Loopback Testing (Soft)

You may also use the optional terminal connected to the CONTROL port on the back panel which provides a comprehensive set of features for testing operation and identifying trouble areas. You may use loopbacks to enable/disable loopbacks on the user's equipment interface and on the SDSL loop, for maintenance purposes.

The SDSL systems offered by GDC provide two types of test loopbacks available from the optional terminal. [Figure 4-2](#) shows the simplified signal paths when the loopbacks are connected.

Line Loopback

The line loopback is generally used to test the connections between the local user's equipment and the SDSL system module.

When the local line loopback is connected <1> Line (ON), the data signal received from the local user via the transmit line of the user's equipment interface is returned by the SDSL system module on the receive line of that interface. Therefore, during normal operation the local user's equipment should receive its own signal without errors.

The local user transmit signal is transparent and therefore is sent to the remote SDSL system, however the signal received from the remote SDSL system is lost.

Remote DIGITAL Local Loopback

The Remote DIGITAL is generally used to test end-to-end operation of the SDSL link. It can be initiated by either the LTU or NTU and used once normal operation is obtained. Although the Remote DIGITAL can be initiated by either LTU or NTU, it is recommended initiation be performed by the LTU in order to follow the path of the signal.

When the EOC Remote DIGITAL is connected <2> Remote DIGITAL (ON), the data received by the remote module from the local user is returned by the SDSL system module on the receive path, within the remote user's equipment interface. Therefore, during normal operation the local user's equipment should receive its own signal without errors.

The local user transmit signal is also passed to the remote user's equipment connected to the SDSL system, however the signal transmitted by the remote user is lost.

Considerations in the Use of Test Loopbacks

The test loopbacks are designed to allow systematic testing of the signal paths along the link, starting from one end of the link (the "local" SDSL module). In most situations, it is recommended to initiate the loopbacks from the side serving as the LTU, because this would allow you to follow the signal path starting from the office and continue toward the end user in addition to maintaining system timing. All of the test loopbacks are transparent.

The recommended order of test activation is as follows:

1. Line loopback.
2. Remote DIGITAL.

This is also the order in which the loopbacks are listed on the LOOPBACKS screen.

BER Test

This screen is used to perform bit error measurements on an SDSL system module.

Testing Method

BER testing is performed by repeatedly transmitting a pseudo test sequence having a length of $2^{15}-1$ bits, and comparing by means of an error detector the received sequence. Any difference is assumed to be an error and is counted. To perform a meaningful comparison, the error counting is inhibited until the error detector becomes synchronized to the incoming sequence. During this synchronization, it is possible to see a burst of 255 errors.

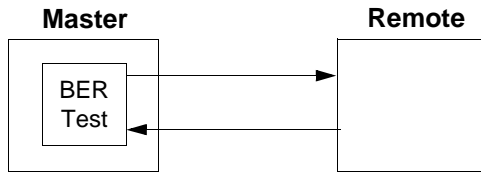
During this testing, your traffic is disconnected. BER Tests may be performed in an end-to-end mode that requires both LTU and NTU BER testers to be on. If testing is initiated at one end, a loopback along the signal path needs to be connected. The loopback can be a physical connection made somewhere along the signal path or a test loopback activated at the desired location as described in the Loopbacks paragraphs of this manual. Alternatively, an external BERT may be connected to the remote unit to facilitate testing.

The measurement is carried out over discrete intervals (an interval corresponds to the time required for a transmission block of 2^{24} bits). The number of errors that are counted in each interval can be up to 255. If the actual number of errors in a given interval is higher, this maximum count is considered in the calculation of the BER. The calculated BER is updated at the end of each interval.

The bit error rate test is performed over the entire SDSL bandwidth.

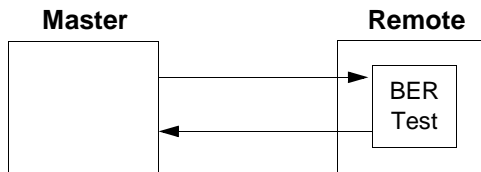
BER testing can be performed through the GDC UAS Controller, supervisory terminal port or front panel switch. The front panel LED TM is on when the BER Test is initiated. When the error detection is in sync and detects no errors, the TM LED is solid on. However, when the error detector is not in sync or detects some errors, the TM LED blinks.

Test Configuration



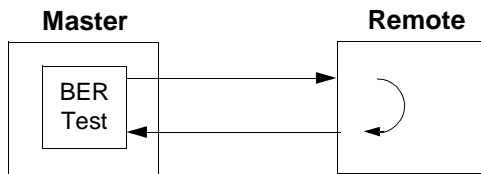
Master Self-Test:

Enable Master BER Test. Be sure you have an external loopback or test equipment at the remote unit to facilitate this test.



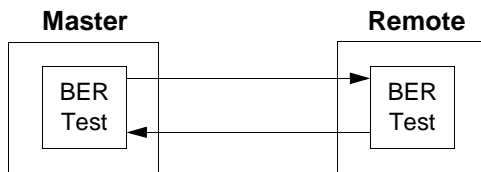
Remote Self-Test:

Enable BER Test on remote unit. Be sure you have an external loopback or test equipment at the master unit to facilitate this test.



Self-Test with Remote Loopback:

From Master unit, assert Remote Loopback (RL) and enable BER Test.



Master to Remote Self-Test:

Enable BER Test on both Master and Remote unit.

Figure 4-4 BER Test Configurations and Notes

BER Screen Description

To display the BER Test screen, select item 2 on the Maintenance Menu. The dialog box used to control BER testing has two areas:

- The top area is used to display BER Test results.
- The bottom area is used to start/stop BER Test measurement.

A typical screen for BER testing is shown in [Figure 4-5](#) with options detailed in [Table 4-3](#).

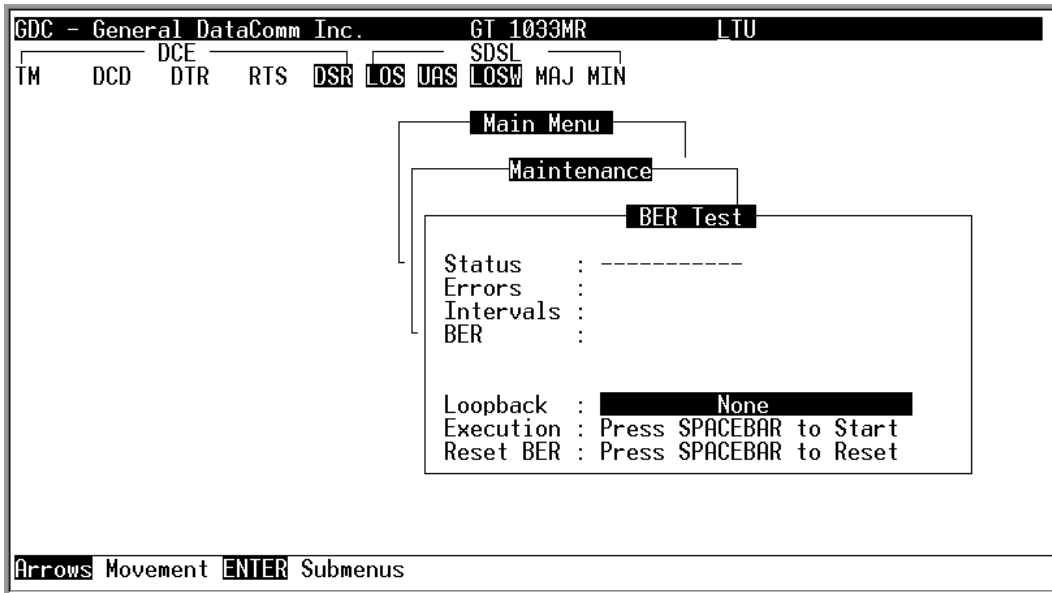


Figure 4-5 BER Test Screen

Table 4-3 BER Test Fields

Field	Function
Status	Displays the current status of the error detector: Sync - The error detector is synchronized, and the BER measurement is possible. Out-of-Sync - The error detector is not synchronized, and BER measurement is inhibited.
Errors	Displays the number of bit errors since test started
Intervals	Displays the number of measurement intervals up to this point.
BER	Displays the BER calculated up to this point.
Loopback	Displays the current state of the loopback activated for the purpose of the BER test: No loopback has been activated. In this case, an external loopback, e.g., a physical loopback connection, must be connected before starting the BER test. Remote Local - Remote line loopback is activated for the BER test.
Execution	Displays the next state of BER measurement: Press SPACEBAR to start - BER Test measurement disabled. Press SPACEBAR to stop - BER measurement enabled.
Reset BER	Resets the bit error count to zero

Make sure a loopback is activated. If the Loopback field displays None and no external loopback is currently connected, change the state of the loopback used for BER measurement. Move the selection block to the Loopback line and press the spacebar.

To enable/disable BER testing:

1. To start the BER measurement, move the selection block to the Execution field and press the space bar. The Execution field now shows Stop.
2. To stop the BER measurement, move the selection block to the Execution line and press the space bar. The Execution field now shows Press SPACEBAR to start.

To exit and return to the maintenance menu, make sure that BER testing has been disabled, and press the Esc key.

Note

You cannot exit the BER Test screen while a BER Test is running.

The BER test detector will synchronize and show error-free for all 1s and all 0s pattern.

Reset Statistics

The Reset Statistics option resets all the performance statistics entries of the unit.

To instruct the unit to reset all the performance statistics counters:

1. Select item 3 on the Maintenance Menu. A dialog box will appear:


```
Reset Statistics?
  No
  Yes
```
2. To reset the statistics, move the selection block to Yes, and press Enter.
3. To exit without resetting press Esc, or move the selection block to No, and press Enter.

Board Reset

This option is used to reset the unit.

To reset the unit, select item 4 on the Maintenance Menu. A dialog box will appear:

```
Reset Board?
  No
  Yes
```

After a few seconds, the opening screen will appear. The unit performs the start-up process, and displays the Main Menu screen.

Troubleshooting Procedures

LEDs are OFF

1. If all the LEDs are OFF, verify that there is power to the unit.
2. If the terminal is working, check the status of voltage 1, voltage 2 on the terminal's View H/S Config screen. If there is a problem send for repair.

Start Up Continuously Fails

1. If an SDSL red ES LED is continuously ON during start-up, the card is not receiving a signal from the far end of its channel. Check the loop connections between the two cards (LTU and NTU).

2. Verify that one card is configured as LTU and the other as NTU.
3. Check the status of the card in the View H/S Config screen.

Chapter 5: Application Guide

Overview

This chapter includes timing notes and typical applications to assist you in configuring your system.

Timing Options

High Channel Data Rate Application

The length of the cable connecting the customer equipment (the DTE) to the GT 1033 MR is an important factor when using DCE timing in a high channel data rate application. (With DCE timing, the GT 1033 MR provides timing to the DTE. The DCE timing options in the GT 1033 MR include Looped Timing and Internal Timing.) The cable creates a delay between the unit's clock and data arriving from the DTE. When this delay is too great (because the cable is too long or the rate is too high), it can cause errors.

If errors occur with DCE timing, you can use External Timing for the GT 1033 MR and loop timing for the DTE. This permits operation at any data rate, regardless of cable length. (Note that the ITU-T V.35 recommendation limits cable length to about 30 m.) Refer to [Figure 5-1](#) and the [Chapter 3, Operation](#) for configuring timing options.

Note Select the appropriate timing option for the DTE: The DTE must loop timing from the Chnl Rcv Clk lead to the Chnl Ext Clk lead.

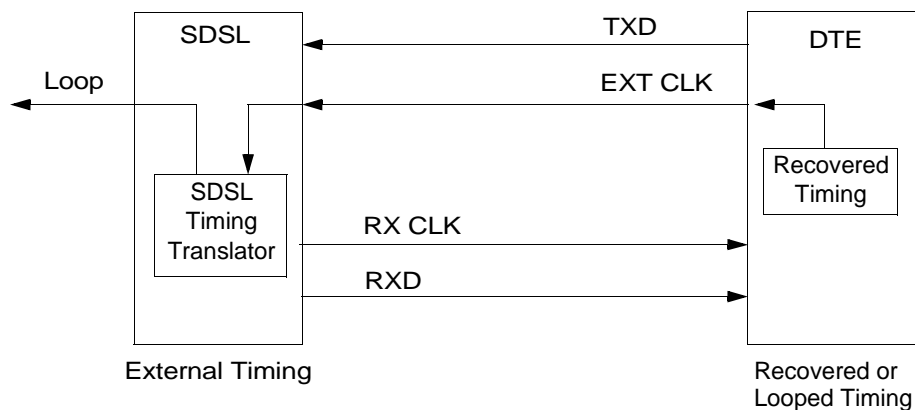


Figure 5-1 High Channel Data Rate Application

Typical Applications

[Figure 5-2](#) and [Figure 5-3](#) show typical applications and option settings for configuring your system.

Unit Type:	LTU (1033MR)	NTU (1033MR)
Enabled Loops:	1	1
Application:	P2P	P2P
FP Enable:	Enabled	Enabled
Tx Clock Mode:	External	Looped
CTS Mode:	ON with RTS	ON with RTS
Data Rate:	768k (12x64k)	768k (12x64k)

Figure 5-2 Single Loop Point-To-Point Application

Unit Type:	LTU (7723MR)	Unit Type:	NTU(1033MR)
FP Enable	N/A	Application:	P2P
Line Unit:	TLU	FP Enable:	Enabled
Line Code:	HDB3	Tx Clock Mode:	Looped
Frame Mode:	Framed	CTS Mode:	ON with RTS
		Data Rate:	256k (4x64k)
Network Configuration			
Application:	P2P		
Loop 1 Start DS0:	1		
Loop 1 Consecutive DS0:	4		

Figure 5-3 Fractional G.704 Service Application

-
- A**
- Antistatic Precautions v
 - Applications
 - Data Grooming and Concentration 1-1
 - Point-to-Point 1-1
- B**
- BER
 - Screen Description 4-6
 - Test Configuration 4-5
- C**
- Configuration Menu 3-9
 - Control Port Characteristics 3-2
- D**
- Diagnostics Menu 3-6
 - Diagnostics/Network Management 1-3
 - DTE
 - Configuration Table 3-1
 - Interface Selection 2-4
- F**
- Features 1-1
 - Front Panel Description 3-1
- H**
- High Channel Data Rate Application 5-1
- I**
- Installation Requirements 2-1
 - Interface Configuration Screen 3-11
- L**
- Line Loopback 4-3
 - Loop Status Indicators 3-2
 - Loopback
 - Testing 4-2
 - Testing-Hard 4-3
 - Testing-Soft 4-3
- M**
- Main Menu 3-5
 - Maintenance Menu 3-13, 4-1
 - Menu
 - Configuration 3-9
 - Diagnostics 3-6
 - Main 3-5
 - Maintenance 3-13, 4-1
- N**
- Network Management 3-13
- O**
- Operating Procedures
 - Field Editing 3-4
 - Field Navigation 3-4
 - Menu Selection 3-4
 - Quitting Without Saving 3-4
 - Refresh 3-4
 - Restoring Default Values 3-4
 - Saving Values 3-4
- P**
- Pin Assignments
 - Control Line Connector 2-8
 - SDSL Connector 2-8
 - Preoperational Configuration Setup
 - Hard 2-7
 - Soft 2-7
- R**
- Remote DIGITAL Local Loopback 4-3
- S**
- Safety
 - Guidelines iv
 - Information iv
 - Screen
 - Main Menu 3-5
 - Organization 3-3

Index

- SDSL Monitoring 3-7
- SDSL Status 3-8
- SDSL
 - Monitoring 3-7
 - Status 3-8
- Service Support and Training vii
- Setting Hard Options 2-2
- Soft Option Selection 3-2
- Startup Procedure 3-3

T

- Technical Characteristics 1-3
- Technical Specifications 1-4
- Terminal Requirements 3-2
- Testing Method 4-4
- Timing Options 5-1
- Troubleshooting Procedures 4-7
- Typical Applications
 - Fractional G.704 Service 5-2
 - Single Loop Point-To-Point 5-2

U

- Unit Configuration Screen 3-10
- Unpacking and Handling 2-1

V

- View H/S Configuration 3-12

