Optimux-XLT1

Multiple T1 and Ethernet Multiplexer
Installation and Operation Manual

Notice

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Warranty

This RAD product is warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period, RAD will, at its option, either repair or replace products which prove to be defective. For warranty service or repair, this product must be returned to a service facility designated by RAD. Buyer shall prepay shipping charges to RAD and RAD shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties and taxes for products returned to RAD from another country.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied firmware or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

Exclusive Remedies

The remedies provided herein are the Buyer's sole and exclusive remedies. RAD shall not be liable for any direct, indirect special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

Safety Warnings

The exclamation point within a triangle is intended to warn the operator or service personnel of operation and maintenance factors relating to the product and its operating environment which could pose a safety hazard.

Always observe standard safety precautions during installation, operation and maintenance of this product. Only a qualified and authorized service personnel should carry out adjustment, maintenance or repairs to this instrument. No adjustment, maintenance or repairs should be performed by either the operator or the user.

Laser Warnings

This product may be equipped with a laser diode. In such a case, this laser warning symbol label will be attached near the optical transmitter. Please observe the following precautions:

- Do not attempt to adjust the laser drive current.
- Do not use broken or unterminated fiber-optic cables/connectors or stare at the laser beam.
- The use of optical equipment with this product will increase eye hazard.
- Use of controls, adjustments or performing procedures other than those specified herein, may result in hazardous radiation exposure.

Telecommunication Safety

The safety status of each of the ports on the Optimux-XLT1 is declared according to EN 41003 and is detailed in the table below:

Ports	**Safety Status**	
LAN, ALARM	SELV	Circuit operating with Safety Extra-Low Voltage
T1	TNV-1	Circuit whose normal operating voltage is within the limits of SELV, on which overvoltages from Telecommunications Networks *are* possible.

Note *The T1 ports are not intended for connection to exposed plant.*

Regulatory Information

FCC-15 User Information

This equipment has been tested and found to comply with the limits of the Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to the radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning per EN 55022

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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Chapter 1
Introduction

1.1 Overview

The Optimux-XLT1 is a multiplexer that combines Ethernet, Fast Ethernet, High Speed (HS) and T1 channels into a data stream transmitted over fiber optic cables. A pair of Optimux-XLT1 units offers simple low-cost connectivity for Ethernet, Fast Ethernet, High Speed (HS) and T1 channels at distances up to 60 Km (37.28 miles).

Versions

Link Interface Options

Optimux-XLT1 is available with a variety of fiber optic link options in addition to the built-in Ethernet port (see *Table 1-1* for details). The unit can also be ordered with a second redundant link (same as the first link).

Power Supply Options

Optimux-XLT1 is available with one or two of the following power supplies:

- 100–230 VAC power supply
- -48 VDC power supply
- 24 VDC power supply.

In addition, the unit can be ordered with a second redundant power supply (same as the first power supply).

Channel Module Options

Optimux-XLT1 supports various channel module options as detailed in *Table 1-2*.

Applications

The Optimux-XLT1 unit permits improved utilization of fiber optic links, due to its capability to multiplex channels connected to different transmission environments, Ethernet LAN and T1 channels. A frequently used application is depicted in *Figure 1-1*.

Point-to-point Application

In *Figure 1-1*, a company campus line or a line leased from the local operator is used to link two Optimux-XLT1 units situated at a distance ranging from several hundreds of meters to several tens of kilometers. A backup link is optionally used to ensure uninterrupted data flow between the two sites. The Optimux-XLT1 at each site is connected to Ethernet LANs and T1 access equipment like PBXs and T1 multiplexers. The distance limitations on the LAN deployment area are efficiently removed while maintaining the full and half-duplex transmission modes.

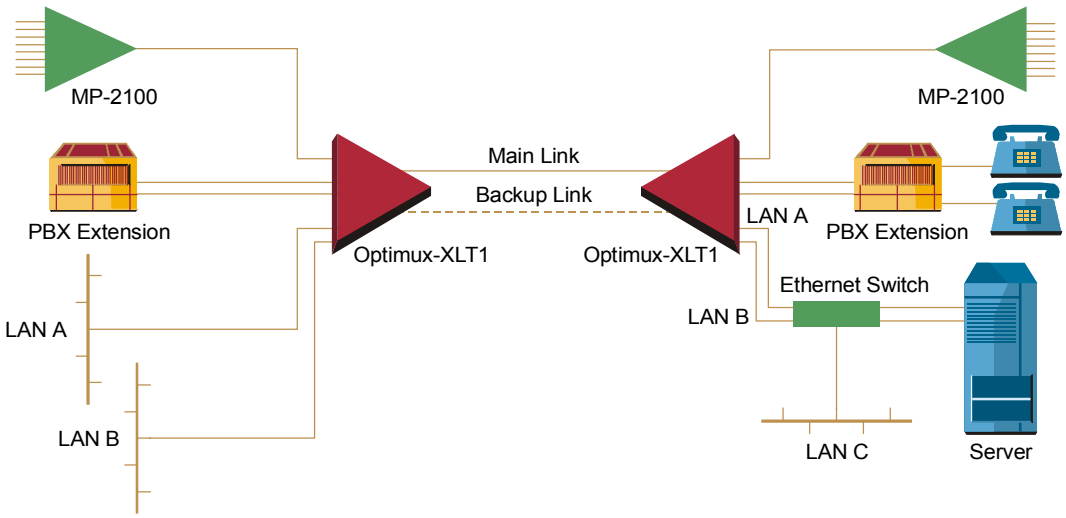

Figure 1-1. Optimux-XLT1 Point-to-point Link Application

Features

Optimux-XLT1 is a compact 44 mm (1U) high unit intended for 19-inch rack installations using an adapter kit. A combination of up to four 10BaseT Ethernet channels or one 10BaseT Ethernet channel and Fast Ethernet, HS data and T1 channels can be combined into a single fiber optic link. Optimux-XLT1 is suitable for various modes of fiber optic transmission.

Optimux-XLT1 features link redundancy (an optional backup link), which enables coupling of any combination of fiber modules to the link. In addition, Optimux-XLT1 can accommodate up to two (one redundant power supply in case of power failure or disconnection) built-in AC to DC and DC to DC power supplies for a wide range of power sources.

Optimux-XLT1 offers the options of working in loopback timing.

Setup, monitoring and diagnostics can be configured using an ASCII terminal, Telnet or an SNMP management station. System diagnostics are monitored and managed using status and alarm panel indications, alarm dry contacts and external management tools.

1.2 Physical Description

Optimux-XLT1 is a compact 44 mm (1U) high unit intended for 19-inch rack installations using an adapter kit. For rack installation instructions refer to the *Rack Mounting Kit for 19-inch Racks* guide that comes with the RM kit.

Figure 1-2 shows a 3D view of Optimux-XLT1.

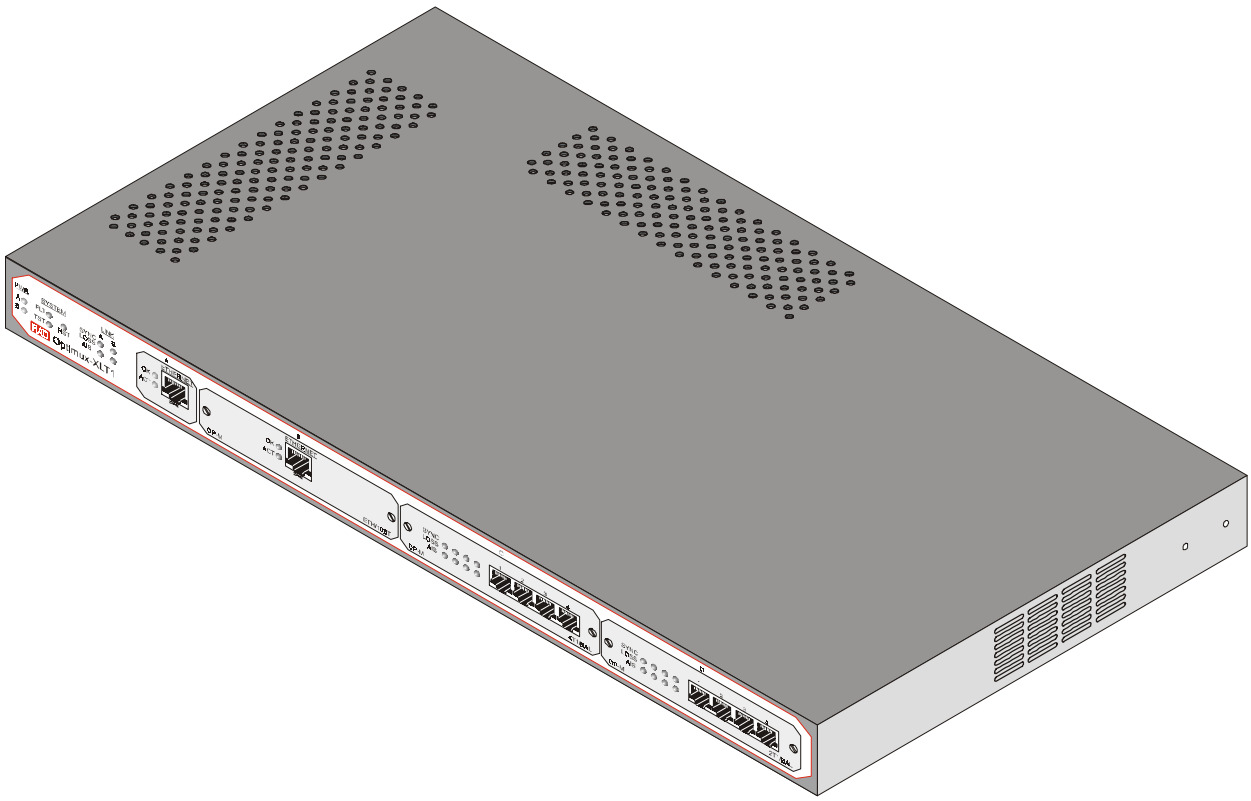

Figure 1-2. Optimux-XLT1 3D View

Front Panel

T1 and Ethernet connectors are located on the unit's front panel. Front panel LEDs indicate system and link status. For details on the front panel, its connectors and LEDs, see the *Installation and Setup* chapter.

Rear Panel

The rear panel of Optimux-XLT1 contains the power, management, alarm and fiber optic connectors. For details refer to the *Installation and Setup* chapter.

1.3 Functional Description

Fiber Optic Link Interface

The Optimux-XLT1 can be ordered with a fiber optic link interface. The optical interface is used to extend the transmission range to 60 km (37.28 miles), enhance the transmission security and achieve immunity against electrical interference.

The fiber optic interface complies with the ITU-T Rec. G.956, while applying a proprietary signaling format to the NRZ 34 Mbps data stream. In the upstream direction, the data stream modulates the beam emitted by the optical device, which is either a LED or a Laser diode. In the downstream direction, the data stream is recovered from the current changes in a diode sensitive to the received optical beam.

Various optical interfaces meet a range of customer and infrastructure needs. *Table 1-1* shows the Optimux-XLT1 options in terms of transceiver, fiber optic and maximum transmission range. The maximum transmission range is a function of the optical budget (transmitter power minus receiver sensitivity), the fiber optic attenuation per kilometer and the necessary margin due to CO connections, aging, etc. A typical 3 dB margin has been assumed to calculate the maximum range in *Table 1-1*. Front panel LEDs indicate loss-of-signal frame and AIS on the link.

It is possible to add a redundant fiber optic link to an existing unit or to replace the link module by the 850 nm multimode AMC-101 module or any of the single mode AMC-101 modules.

Table 1-1. Fiber optic Interface Options

Wavelength (nm)	Fiber Type (µm)	Transmitter Type	Power (dBm)	Receiver Sensitivity (dBm)	Typical Max. Range (km / miles)
850	62.5/125 multimode	LED	-18	-28	2.5/1.55
1300	62.5/125 multimode	LED	-18	-31	5.5/3.4
1300	9/125 single mode	LED	-15	-31	32/20
1300	9/125 single mode	Laser	-12	-31	38/23.6
1300	9/125 single mode	Laser (long haul)	-2	-34	70/43.4
1550	9/125 single mode	Laser	-12	-31	68/42.2
1550	9/125 single mode	Laser (long haul)	-1	-34	110/68.35
1300/1550	9/125 single mode	Laser (WDM)	-12	-30	40/24.8

Link Redundancy

An additional link interface can be ordered for backup. The two link interfaces are both identical. The link interfaces are implemented by interchangeable link modules plugged into two dedicated slots at the rear of the Optimux-XLT1 unit designated LINK A (MAIN) and LINK B (BACKUP). Front panel LEDs provide AIS and signal loss (SYNC LOSS) indications on the link.

When two link modules are installed, the redundancy mechanism of the Optimux-XLT1 is used to:

- Automatically switch to the back-up link interface in case of signal or sync loss on the main link. If the redundancy mode is set to AUTOMATIC, under signal loss, the main link (equipment and/or line) resumes transmission after it has recovered. Under sync loss, the backup link continues transmission until it receives a sync loss/signal loss.
- Force transmission via the MAIN link using a software management tool for maintenance purposes if the redundancy mode is OFF.

When the redundancy mode is MANUAL and the main link is disconnected or fails, the backup link is forced into the active state. The main link will not resume transmission as long as the redundancy mode is MANUAL.

Tributary Interface Characteristics

The modular design of the Optimux-XLT1 supports one fixed 10BaseT Ethernet port and up to three additional plug-in channel modules. The additional channel module types are specified in *Table 1-2*.

Table 1-2. Channel Module Options

Channel Module	Port Type	Bandwidth	No. of Ports	Port Connector
OP-XL-M/ETH	10BaseT Ethernet	6.639 MHz	1	RJ-45
OP-XL-M/FETH	10/100BaseT Fast Ethernet	6.639 MHz	1	RJ-45
OP-XL-M/2T1/BAL	T1 Balanced (twisted pairs)	1.544 Mbps	2	RJ-45
OP-XL-M/4T1/BAL	T1 Balanced (twisted pairs)	1.544 Mbps	4	RJ-45
OP-XL-M/4HS/1.5M/V35	V.35	1.544 Mbps	4	SCSI 26-pin
OP-XL-M/4HS/1.5M/RS530	RS-530	1.544 Mbps	4	SCSI 26-pin
OP-XL-M/4HS/1.5M/X21	X.21	1.544 Mbps	4	SCSI 26-pin

A selection of Ethernet, Fast Ethernet, T1 and high-speed channel modules permits a variety of multiplexing schemes for LAN and CO sites. The Ethernet or Fast Ethernet ports are connected directly to the local network or to an Ethernet LAN. The port activity and the link integrity are monitored either by front panel LEDs or by an external terminal. The transmission of the Ethernet or Fast Ethernet channel is implemented by a built-in bridging function operating at the 6.639 Mbps, "almost wire-speed", rate and supports up to 10,000 (Ethernet) or 16,0000 (Fast Ethernet) addresses.

The T1 interface complies with the ITU-T Rec. G.703. Line coding is B8ZS. A pair of LEDs monitor loss-of-signal and AIS on each T1 receive line.

For the high-speed modules (V.35, RS-530 and X.21), the desired physical port connector is achieved by the use of an appropriate adapter cable, which is supplied with the product.

Management Requirements

Optimux-XLT1 operates locally using on-board switches and jumpers to configure the operation modes and front panel LEDs to monitor system failure and tests (loop connections). Alarms are monitored using the dry contacts of the Optimux-XLT1 alarm relays on a dedicated D-type connector.

An ITU-T V.24/EIA RS-232 port enables monitoring and tests using an ASCII supervision terminal.

The management interface also includes an SNMP agent that enables SNMP management of the Optimux-XLT1, using the Ethernet protocol. The SNMP management capability enables fully graphical, user-friendly management using the RADview network management stations offered by RAD, as well as management by other SNMP-based management systems.

Remote management is also possible using the Telnet communication protocol, which uses TCP/IP communication, without the SNMP service. Telnet support enables a remote IP host to control the operation of Optimux-XLT1 using functions identical to those provided by a supervision terminal. The Telnet management function can be protected by the manager password feature.

Note *When using Telnet for management, the Software Downloading option is not operational.*

Timing

Optimux-XLT1

Optimux-XLT1 can work with an internally generated clock (internal oscillator).

Loopback timing can be used in those systems that require a one-source clock.

High Speed Interface

The high-speed (HS) modules support the following timing modes:

- 4HSx1.5M – Internal, external and loopback timing

Figure 1-3 through *Figure 1-7* show the different timing modes supported by the HS modules.

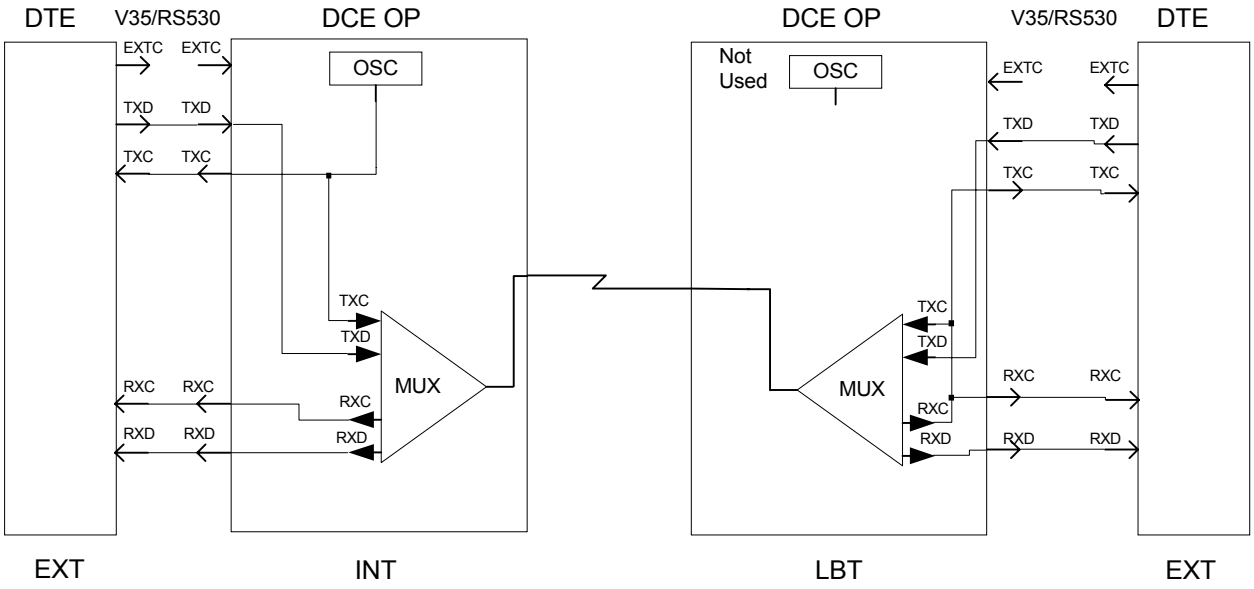

Figure 1-3. Internal and Loopback Timing with V35/RS530 Module

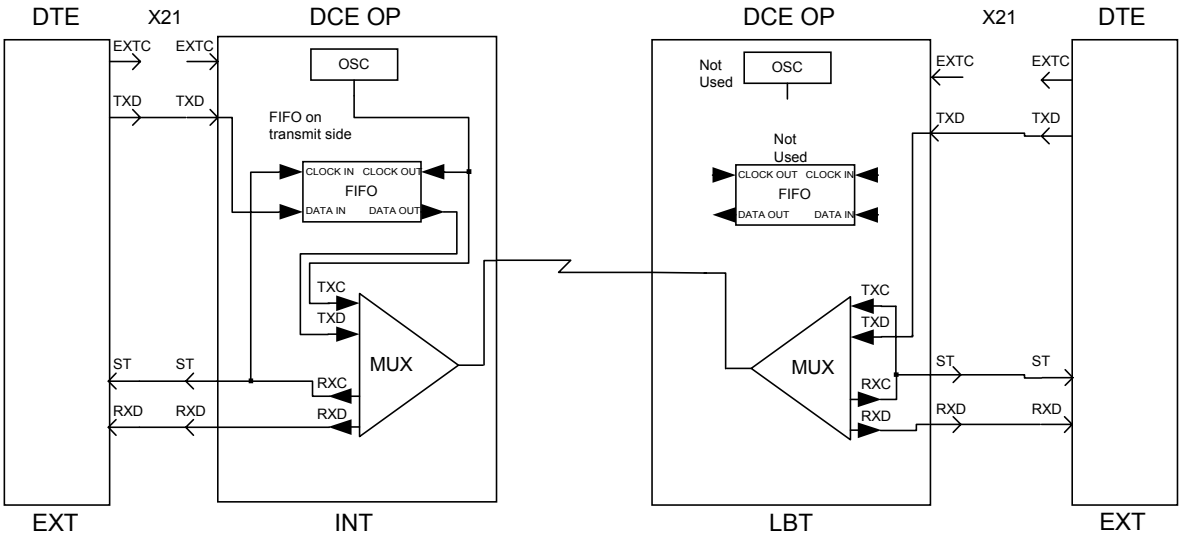

Figure 1-4. Internal and Loopback Timing with X21 Module

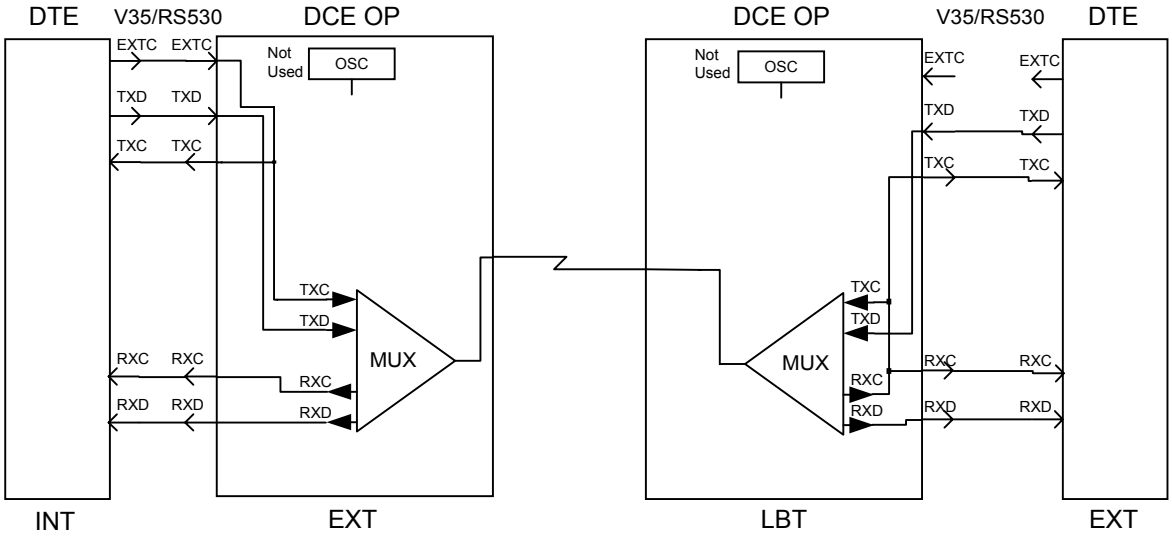

Figure 1-5. External with V35/RS530 Module

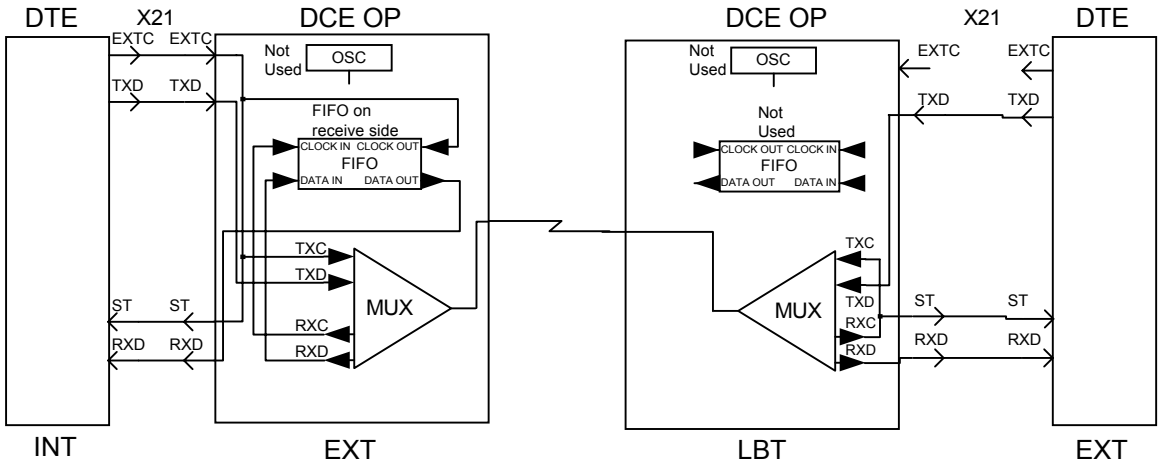

Figure 1-6. External with X21 Module

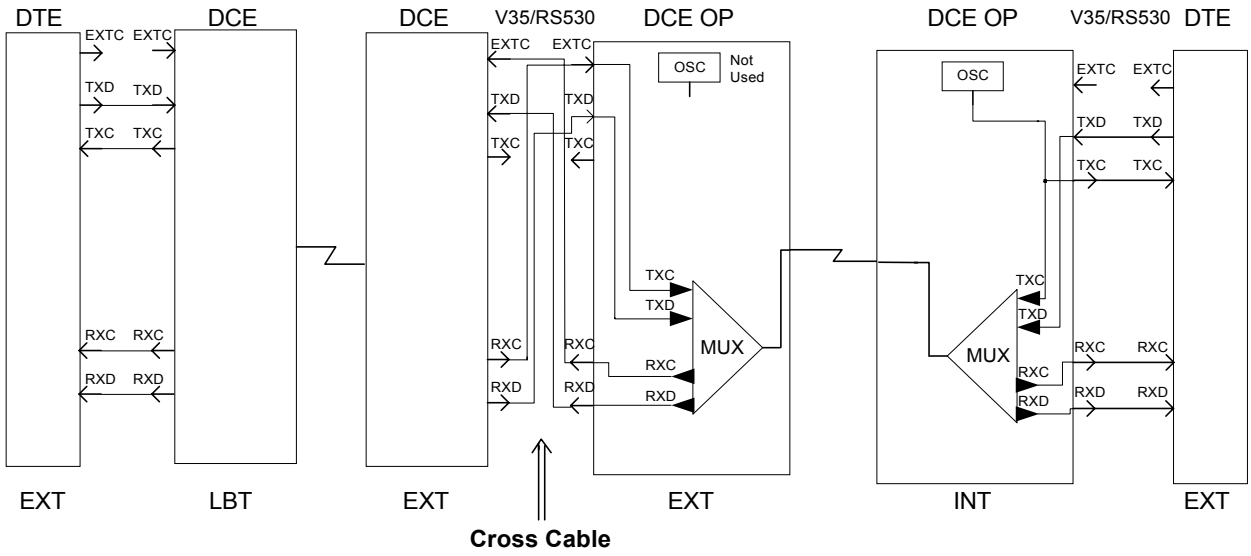

Figure 1-7. Timing Description for Tail End Application with V35/RS530 Module

Power Requirements

Optimux-XLT1 can be connected to 115 VAC or 220 VAC mains, or to a battery source supplying -48 VDC or 24 VDC.

A second power supply is optionally installed in the Optimux-XLT1 to assure continuous operation in case of supply failure. When the two supplies are turned ON, they share the power consumption of the unit. If one of the power supplies fails, the other provides full power consumption.

A limitation in the combination of interface installation exists due to the power supply currently installed in Optimux-XLE1. *Table 1-3* shows the feasible combinations that can be ordered or installed.

Table 1-3. Interface Installation Combinations

Port A	Port B	Port C	Port D
Ethernet (10BaseT)	4HS/V35	4T1 or 2T1 or 10BaseT	4T1 or 2T1 or 10BaseT
Ethernet (10BaseT)	4HS/RS530 or 4HS/X21	4HS/RS530 or 4HS/X21	4HS/RS530 or 4HS/X21
Ethernet (10BaseT)	4T1 or 2T1 or 10BaseT	4T1 or 2T1 or 10BaseT	4T1 or 2T1 or 10BaseT
Ethernet (10BaseT)	Fast Ethernet	4T1 or 2T1 or 10BaseT	4T1 or 2T1 or 10BaseT
Ethernet (10BaseT)	Fast Ethernet	Fast Ethernet	4T1 or 2T1 or 10BaseT

1.4 Technical Specifications

Link Interfaces

Fiber Optic Link

Applicable Standard	ITU-T Rec. G.955
Line Code	CDP
Performance	Refer to *Table 1-1*
Connectors	ST, SC, FC/PC
Redundancy	Additional link is optional

Channel Interfaces

Ethernet Ports

Physical Interface	10BaseT, 10/100BaseT
Channel Slots (Ports)	• Fixed: A (one 10BaseT) • Interchangeable with FETH/HS/T1: B, C and D (three)
Data Rate	• 10 Mbps for 10BaseT interface • 10/100 Mbps for 10/100BaseT interface
Transmission Mode	Full/half-duplex or auto negotiation enable/disable selectable on Ethernet channel module
Bridge Parameters	• Data transfer rate: 6.639 Mbps maximum • No. of Supported Addresses: ▪ 10,000 for 10BaseT ▪ 16,000 for 10/100BaseT • Connector: RJ-45

T1 Interface

Electrical Interface	According to ITU-T Rec. G.703
Jitter	According to ITU-T Rec. G.824
Data Rate	1.544 Mbps
Line Code	B8ZS or AMI
Range	According to ITU-T G.703
Slots (Ports)	B, C and D interchangeable with three FETH/HS Ethernet ports

	Port Type	Balanced (100Ω)
	No. of channels per slot	2 or 4
	Maximum no. of channels per unit	12
	Connector	RJ-45
High Speed Interfaces	*Physical Interface*	V.35, RS-530 or X.21
	Data Rate	1.544 Mbps
	Slots/Ports	B, C and D (interchangeable)
	Timing	Internal, external and loopback
	Number of Channels	4
	Connector	SCSI 26-pin (with adapter cable)
	Control Signals	RTS, CTS, DTR, DSR and DCD
Power	*Number of Supplies*	One or two (power sharing)
	AC Power	90 VAC to 260 VAC, 47 Hz to 63 Hz
	DC Power	• -48 VDC: -36 VDC to -72 VDC • 24 VDC: 24 VDC ±10%
	Source Power Consumption	40 Watt maximum (from one or two supplies)
Unit Indications and Alarms	*Unit Indications*	See *Table 3-1*
	Dry Contacts	• Maximum Ratings: 1A, 60 VDC, 30 VAC • Major alarm: Power is OFF, in redundant power supply: One power supply is faulty, E3 signal loss of frame, T1 loss of signal • Minor alarm: AIS on T1 input line, AIS on link input • Connector: 9-pin D-type female

Control Ports	*CONTROL/MNG*	ITU-T V.24/EIA RS-232 ASCII terminal port
	Rate	9600 bps to 115200 bps
	Connector	25-pin D-type female
	MNG-ETH	10BaseT
	Connector	RJ-45
Physical Characteristics	*Height*	4.4 cm / 1.7 in
	Width	43.2 cm / 17.0 in
	Depth	26.8 cm / 10.5 in
	Weight	2 kg / 5 lb
Environmental Characteristics	*Temperature*	0–45°C (32–113°F)
	Humidity	Up to 90% non-condensing

Chapter 2
Installation and Setup

2.1 Introduction

Optimux-XLT1 is delivered completely assembled. It is designed for installation as a desktop unit or for mounting in a 19-inch rack. For rack installation instructions, refer to the *Rack Mounting Kit for 19-inch Racks* guide that comes with the RM kit.

After installing the unit, refer to the Operation chapter for system operating instructions. In case a problem arises, refer to the *Troubleshooting & Diagnostics* chapter for test and diagnostics instructions.

Warning

No settings of switches and jumpers, replacement of cards and cables or other repairs may be performed by either the operator or the user. Such activities may be performed only by a skilled technician who is aware of the hazards involved.

Always observe standard safety precautions during installation, operation, and maintenance of this product.

2.2 Site Requirements & Prerequisites

AC-powered Optimux-XLT1 units should be installed within 1.5m (5 ft) of an easily accessible grounded AC outlet capable of furnishing a supply voltage in the range of 90 to 260 VAC.

DC-powered Optimux-XLT1 units require -36 VDC to -72 VDC or 21.4 VDC to 26.4 VDC power source according to order. Verify that the input voltage at the end of the power cable is within the above limits

Allow at least 90 cm (36 in) of frontal clearance for operator access. Allow at least 10 cm (4 in) rear clearance for interface cable connections.

When planning the routing of fiber optic cables, avoid sharp bends. The bending radius should exceed 30 mm (1.2 in).

The ambient operating temperature of Optimux-XLT1 should be 0°C to 45°C (32°F to 113°F) at a relative humidity of up to 90%, non-condensing.

2.3 Package Contents

A preliminary inspection of the equipment contained in the shipping box should be made before unpacking. Evidence of damage should be noted and reported immediately. The Optimux-XLT1 package includes the following items:

- Optimux-XLT1 unit
- Optimux-XLT1 Installation and Operation Manual
- Power cable – 110 or 220 depending on your order
- Interface adapter cable – High speed modules depending on your order
- If –48 VDC version is ordered, 48V plug is supplied
- If 24 VDC version is ordered, 24V plug is supplied.

2.4 Installation and Setup

This section details the functions and positions of the internal switches and jumpers used to configure the Optimux-XLT1 unit for your particular application. A common configuration procedure is provided. Then, the configuration options and the default settings for each module are detailed.

Identifying Optimux-XLT1 Modules

Figure 2-1 and shows the modular construction of the Optimux-XLT1 unit. Use this figure to identify the modules supplied.

➤ **To remove the unit from its case:**

1. Unscrew three captive screws on each side of the unit and eight captive screws on the top.
2. Remove the Optimux-XLT1 top cover.
3. Check that the optional modules ordered are installed in the unit case. Refer to *Table 2-1* and verify the designation of the modules/cards in capital letters.

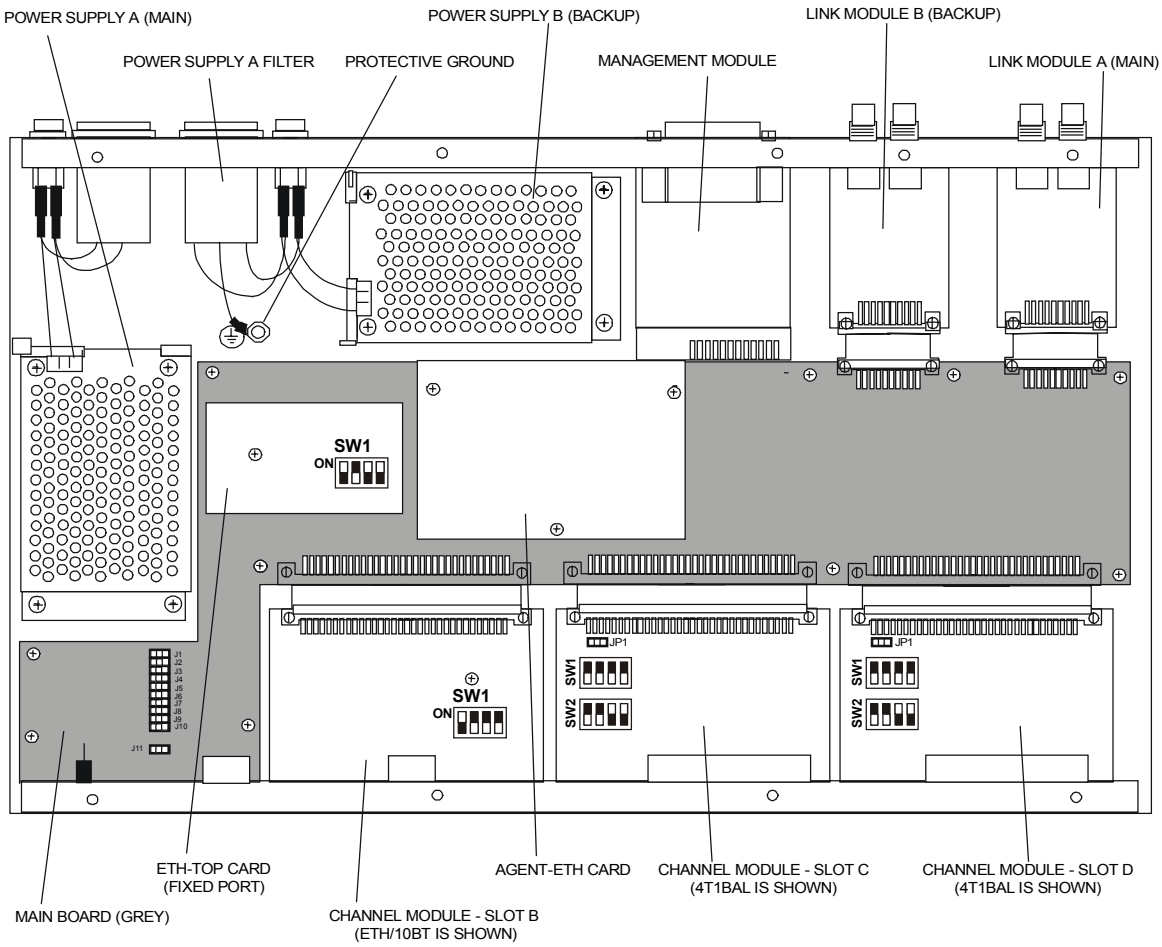

Figure 2-1. Location of Modules in the Optimux-XLT1 Case

Table 2-1. List of Optimux-XLT1 Modules

Module Designation	Fixed/ Optional	Location	Used to provide
Main Board/ OPTI-T1/LAN	Fixed	Along the width of the unit	Optimux-XLT1 unit control functions. Fixed Ethernet port (section A on the front panel). Operation modes of the fixed Ethernet port (see ETH-TOP card). Ethernet agent functionality (see AGENT-ETH card).
ETH	Fixed/ Optional	Front fixed A Front slots B, C, D	Ethernet port connection
FETH	Optional	Front slots B, C, D	Fast Ethernet port connection
4 T1 balanced– 4T1 BAL	Optional	Front slots B, C, D	ITU-T G.703 interface for four T1 balanced ports
fiber optic Link–FO	Fixed/ Optional	Rear slots LINK A/B	Fiber optic interface to the link. A is the main link and B is the optional backup link.
H.S.	Optional	Front slots B, C, D	V35/RS530/X21 Interface ports
Power supply– PWR-A	Fixed	On the rear side	Optimux-XLT1 supply voltages
Power supply– PWR-B	Optional	On the rear side	Power supply redundancy - power consumption sharing or full consumption in case of power supply A failure.

Setting Internal Jumpers and Switches

Initializing the Unit

Before setting the switches and jumpers, the unit must be initialized.

➤ **To initialize the unit after power up:**

- Press the reset switch.

  The switch can be reached from the front (see *Figure 3-1*) with a screwdriver (to prevent unauthorized personnel from resetting the unit).

The Optimux-XLT1 internal jumpers and switches are located on its board. The internal jumpers and switches of the modules are located on the board of each module. *Figure 2-2* shows the settings of the Optimux-XLT1 and its modules' switches and jumpers. *Figure 2-3* shows the settings of the high-speed module jumpers. The internal settings are listed in *Table 2-2*.

➤ **To reach the internal switches and jumpers:**

1. Disconnect all the cables connected to the Optimux-XLT1.
2. Unscrew two captive screws on each side of the unit and eight captive screws on the top.
3. Remove the unit cover.
4. Set switches and jumpers of the installed modules as specified below.

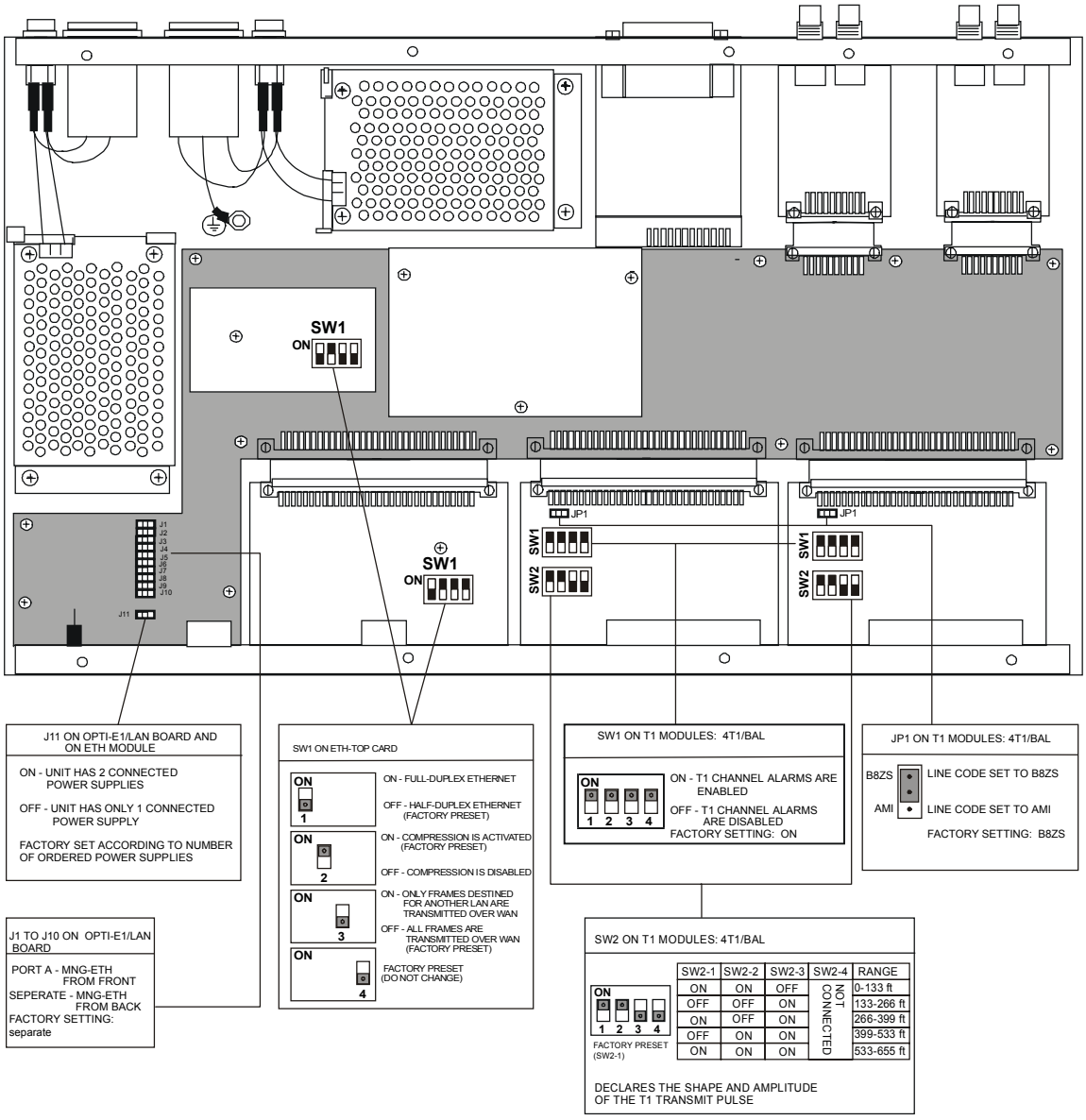

Figure 2-2. Setting the Optimux-XLT1 Switches and Jumpers

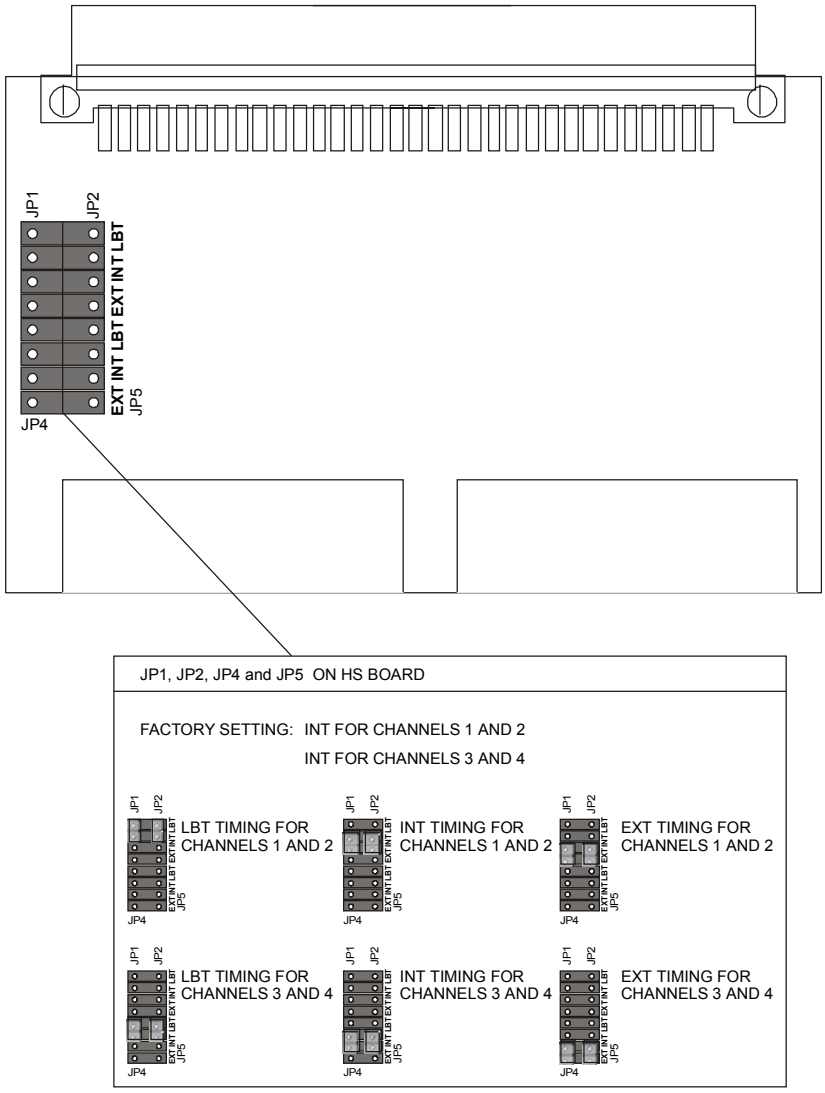

Figure 2-3. Setting the High Speed Module Jumpers

Table 2-2. Internal Settings

Identification of Internal Setting	Function	Settings	Factory Setting
Main Board			
J1 through J10	MNG-ETH port is available from front or rear panel	**Port A** – The MNG-ETH port is only available from the front panel in half-duplex only and operates as an Ethernet port. **Separate** – The MNG-ETH port is available from the rear panel in half-duplex. The MNG-ETH port on the front panel operates as an Ethernet port, is combined into a fiber optic link and is available in half or full duplex.	Separate
J11	Setting unit to work with one or two power supplies	**ON** – When the unit uses two power supplies. **OFF** – When the unit uses only one power supply.	To match numbered order of power supplies
JP5	To facilitate clock from the T1 module to the station clock module	Jumper connected Jumper disconnected	Jumper disconnected
ETH–TOP card			
SW1	The ETH-TOP card mounted on the main board supports the fixed Ethernet port of the Optimux-XLT1 unit. A similar switch mounted on the Ethernet module installed in slots B, C and D supports the optional Ethernet ports (up to three).		
Section 1	Determines the transmission mode of the Ethernet ports in slots B, C and D, and in the fixed Ethernet port, either full or half duplex (if J1 through J10 are set to Port A, the working mode of the fixed Ethernet port must be half-duplex only).	**ON** – Full duplex **OFF** – Half duplex	OFF
Section 2	Enables and disables data throughput compression	**ON** – Enable **OFF** – Disable	ON
Section 3	Determines whether all frames are transmitted over the WAN or only those that are destined for another LAN. If this section is set to OFF, the software selects the filtering mode.	**ON** – Filtered **OFF** – Not filtered	OFF
Section 4	Not used in the Optimux-XLT1 current version and should be set to the default position specified in *Figure 2-2*.	**ON** **OFF**	OFF

Table 2-2. Internal Settings (Cont.)

Identification of Internal Setting	Function	Settings	Factory Setting
T1 Channel Modules			
SW1			
Sections 1–4	On the T1 modules are used to enable T1 interface alarms to the Optimux-XLT1 system control Sections 3–4 are not used in the 2T1/BAL channel modules	**ON** – Alarms enabled **OFF** – Alarms disabled	ON
SW2			
Sections 1–3	On the T1 modules are used to set the line length equalizer that determines the shape and amplitude of the transmit pulse. Sections 4 are not used and always set to OFF.	**ON, ON, OFF** – 0–133 ft **OFF, OFF, ON** – 133–266 ft **ON, OFF, ON** – 266–399 ft **OFF, ON, ON** – 399–533 ft **ON, ON, ON** – 533–655 ft	ON, ON, OFF
JP1	Determines the line code implemented by the T1 interface	**B8ZS** – Line code set to B8ZS **AMI** – Line code set to AMI	B8ZS
High Speed Module			
JP1, JP2	Select timing mode for channels 1 and 2	**LBT** – Loopback timing **INT** – Internal timing **EXT** – External timing	INT
JP4, JP5	Select timing mode for channels 3 and 4	**LBT** – Loopback timing **INT** – Internal timing **EXT** – External timing	INT

2.5 Interfaces and Connections

The T1, Ethernet, Fast Ethernet or High Speed channel connectors are located on the unit front panel, sections A to D. Section A is dedicated to the fixed Ethernet port. Sections (slots) B through D are allocated to T1, Ethernet, Fast Ethernet or High Speed ports (see *Figure 2-4*, *Figure 2-5* and *Figure 2-6*). Except for the fixed Ethernet port, the front panel connections depend on the type of channel module installed as indicated in *Table 2-3*.

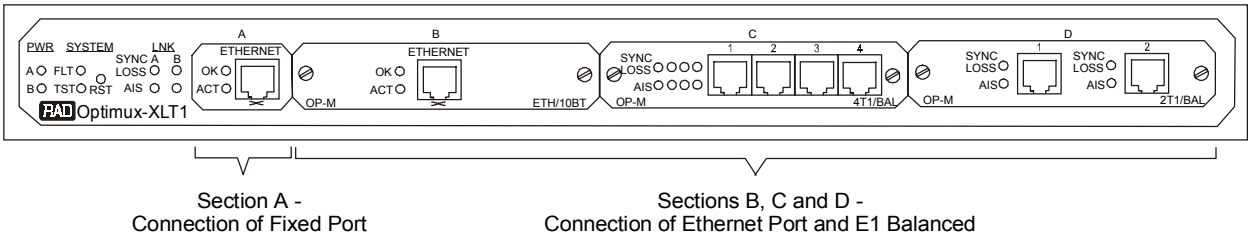

Figure 2-4. Front Panel Connections of Ethernet Port and T1 Balanced Channels

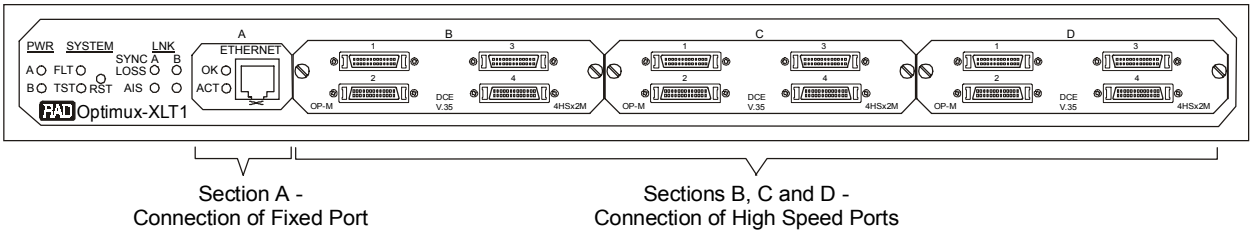

Figure 2-5. Front Panel Connections of Ethernet Port and High Speed Channels

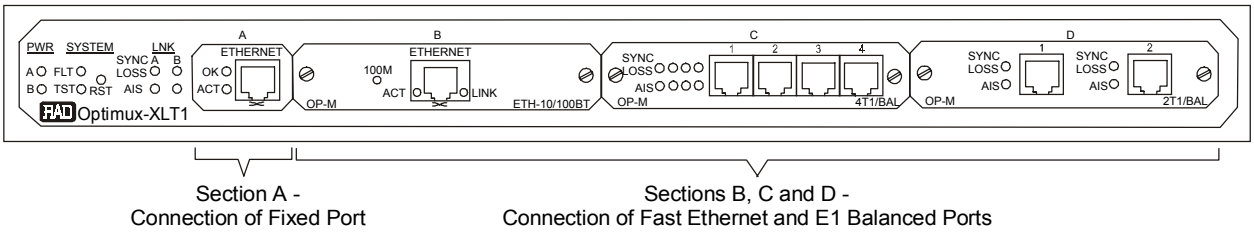

Figure 2-6. Front Panel Connections of Fast Ethernet Port and T1 Balanced Channels

Warning

ELECTRICAL SHOCK HAZARD: Access to the inside of the equipment is permitted only to qualified and authorized service personnel.

Before disconnecting the unit from its cables, verify that the remote unit is turned OFF. Disconnect the unit from the power line and from all the cables before removing the cover.

Dangerous high voltages are present inside the Optimux-XLT1 when it is connected to power. Moreover, under external fault conditions, dangerous high voltages may appear on the lines connected to the Optimux-XLT1.

Capacitors inside the instruments may still be charged even after the unit has been disconnected from the supply source.

Any setting, or repair of the open unit under voltage should be avoided as much as possible and, when inevitable, would be carried out only by a skilled technician who is aware of the hazard involved.

Caution The Optimux-XLT1 contains components sensitive to electrostatic discharge (ESD). To prevent ESD damage, avoid touching the internal components. Before moving jumpers, touch the Optimux-XLT1 frame.

Table 2-3. Connectors

Section	Channel Module	Connector	Used to connect
A	None	RJ-45	The fixed Ethernet port to a LAN
B, C, D	ETH/10BaseT	RJ-45	Up to three additional Ethernet ports to LANs
B, C, D	FETH/10/100BaseT	RJ-45	Up to three additional Ethernet ports to LANs
B, C, D	4T1/BAL	RJ-45x4	Four T1 balanced channels
B, C, D	2T1/BAL	RJ-45x2	Two T1 balanced channels
B, C, D	4 HS	SCSI 26-pin	Four DTE channels

The rear panel of the Optimux-XLT1 unit (see *Figure 2-7*), contains the power, management, alarm and link connectors as indicated in *Table 2-4*.

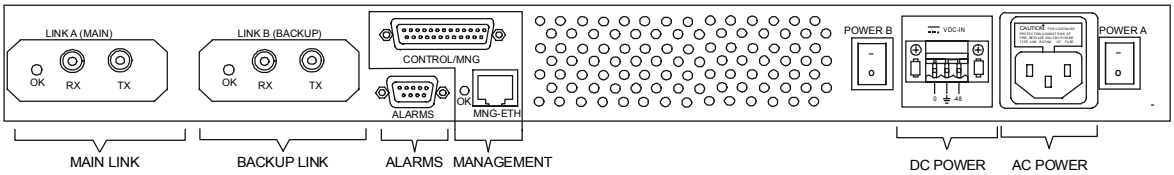

Figure 2-7. Rear Panel Connections Optimux-XLT1 with Dual Link and Dual Power Supply

Table 2-4. Management, Alarm and Link Connectors

Connector	Type	Used to connect
POWER B	Standard 3-pin plug	Redundant power source (DC or AC plug), when the redundant power supply option is selected
POWER A	Standard 3-prong plug	Main power source (DC or AC plug)
CONTROL/MNG	25-pin D-type female	RS-232 ASCII terminal
MNG-ETH	RJ-45	MNG-ETH entrance
ALARMS	9-pin D-type female	Optimux-XLT1 dry contacts of two alarm relays (major and minor) to a remote monitoring site
LINK A, TX/RX	ST, SC or FC/PC	Main fiber-optic link
LINK B, TX/RX	ST, SC or FC/PC	Redundant (backup) fiber-optic link

For the pin assignment of the connectors, refer to the *Interface Specification* appendix.

Channel Connections

The Optimux-XLT1 has four groups of interface ports designated A to D on the front panel of the unit.

Channel A is a fixed 10BaseT Ethernet port with an RJ-45 connector. The other groups of interface ports should be prepared according to the ordered channel modules (see the *Channel Module Options* table). Any combination of 10BaseT Ethernet, T1 balanced, Fast Ethernet and High Speed modules can be installed in Optimux-XLT1 slots B to D (see *Figure 2-1*). A vacant slot should be closed up using a blank panel.

For T1 lines, the maximum allowable line length between the T1 ports and the user's equipment is 655 ft (200m) according to ANSI T1.102. The cable type and length should be selected accordingly. The length of a standard UTP cable to a 10BaseT Ethernet or 10/100BaseT station is 100 meters (330 ft).

The *Interface Specification* appendix provides the pin allocation for all the connectors.

Connect the channel cables to connectors corresponding to the interface in use (see *Figure 2-4*, *Figure 2-5* and *Figure 2-6*) as indicated in *Table 2-5*.

Table 2-5. Cable to Interface Connections

Interface	Connector Type	Note
G.703 balanced	RJ-45	Channel numbers 1 to 4 for the 4T1/BAL modules, 1 and 2 for the 2T1/BAL module
Ethernet, Fast Ethernet	RJ-45	Physical connection ⨯
HS	SCSI 26-pin	To achieve the desired connector type, use the supplied adapter cable

Fiber Optic Link Connections

Laser Warning

Eye damage may be caused by a broken or non-terminated fiber-optic or connector if the laser beam is viewed directly or with improper optical instruments.

One or two (main and backup) link interfaces are provided according to order. The fiber optic interfaces can be of optical type only.

In normal operation a module must be installed in the main link.

For the properties and specifications of the optical link interfaces, refer to the *Fiber Optic Interface Options* table.

When working with WDM modules, the two types SF1 and SF2 must work one opposite the other. SF1 does not work opposite SF1 and SF2 does not work opposite SF2.

Note *While link redundancy is OFF, it is recommended not to install the backup link so as not to receive a major alarm indication (while the backup link is in sync loss).*

Connect each fiber optic link interface (main and backup), in accordance with the type of interface installed for that link as indicated in *Table 2-6*.

Table 2-6. Fiber Optic Link Connections

Interface	Connector Type	Note
Optical	ST, SC or FC/PC	Avoid sharp bends of the optical cables. The minimum bending radius should be 30 mm (1.2 in).
		Cleanliness of the optical connectors: use an approved solvent, and dry thoroughly using optical tissue.
		Connection of the receive cable to the optical connector designated RX and the transmit cable to the optical connector designated TX.

Alarm Connection

The alarm cable is terminated with a 9-pin D-type male connector on the unit side. The maximum rating of the alarm relay contacts for planning the monitoring means and cabling is 1 Amp, 60 VDC and 30 VAC.

The dry contacts of the Optimux-XLT1 alarm relays (major and minor) are connected to a remote monitoring site via the rear panel ALARM connector (see *Figure 2-7*).

Management Connections

The Optimux-XLT1 can be managed via:

- V.24/RS-232 terminal. The connection cable to the V.24/RS-232 interface on the unit's rear panel should be terminated with a 25-pin D-type male connector. The nominal length of the cable for a data rate of 19.2 kbps is 16m (50 ft).
- Ethernet port. The connection cable to the MNG-ETH interface on the unit's front and rear panels should be terminated with an RJ-45 connector.

Connect the management cable to the required management port. The options available are indicated in *Table 2-7*.

Table 2-7. Management Port Options

Interface	Connector Type	Note maximum cable length
RS-232	25-pin D-type	16m (50 ft) for a 19.2 kbps data rate
Ethernet, Port A	RJ-45	100m for a UTP cable, type 3
MNG-ETH	RJ-45	100m for a UTP cable, type 3

Power Connection

The Optimux-XLT1 chassis ground is connected to the protective ground (middle) pin of the power connectors, both for the AC and DC versions of the unit.

Intentional disconnection of the protective ground is prohibited since such an action may expose personnel to electrical shock hazards.

Warning

Before switching on or connecting any cable, the protective ground terminal (see Figure 2-1) must be connected to the protective ground connector of the power cord. The power plug shall only be inserted in a socket outlet provided with a protective ground contact. The protective action must not be negated by use of an extension cord (power cable) without a protective conductor (grounding).

For AC or DC power connections, refer to *Site Requirements & Prerequisites* on page 2-1.

Chapter 3
Operation

3.1 Optimux-XLT1 Controls

This chapter presents information and description of the Optimux-XLT1 front panel and rear panel controls and the operating procedure for turn ON.

Front Panel Controls

The Optimux-XLT1 front panel provides the LED indications and the connections to the Ethernet LAN and to the T1 channels as shown in *Figure 3-1*. *Table 3-1*lists the functions of the LEDs, switch and connectors located on the Optimux-XLT1 front panel. *Figure 3-2*and *Figure 3-3* show the High Speed and Fast Ethernet modules front panel. The index numbers in *Table 3-1*correspond to the balloon numbers in *Figure 3-1*, *Figure 3-2*and *Figure 3-3*.

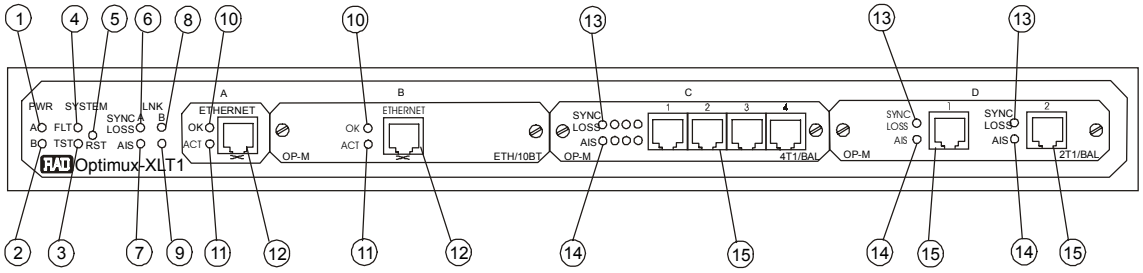

Figure 3-1. Optimux-XLT1 Front Panel

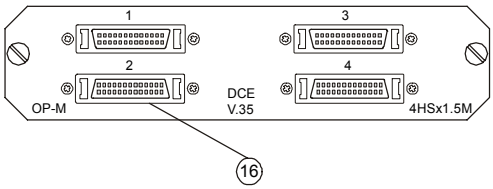

Figure 3-2. High Speed Module Panels

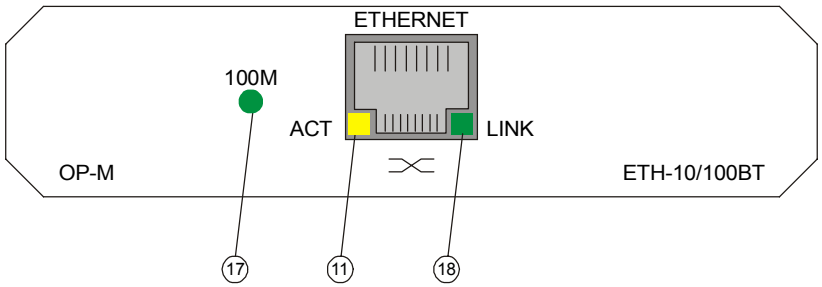

Figure 3-3. Fast Ethernet Module Panel

Table 3-1. Optimux-XLT1 Front Panel Controls and Indicators

No.	Name	Control	State	Function
1	PWR A	Indicator	OFF	Indicates that the main power supply is not powered
			ON (green)	Indicates that the main power supply is ON and operates normally
			ON (red)	Indicates that a malfunction has been detected in the main power supply or it is not powered. If the backup power supply is installed, the Optimux-XLT1 may continue operating normally.
2	PWR B	Indicator	OFF	Indicates that the backup power supply is not installed
			ON (green)	Indicates that the backup power supply is ON and operates normally
			ON (red)	Indicates that a malfunction has been detected in the backup power supply or it is not powered. In this case, the Optimux XLT1 may continue operating normally using the main power supply.
3	SYSTEM TST	Indicator	ON (yellow)	Indicates that the system is on TEST, turn ON self test or loop test.
4	SYSTEM FLT	Indicator	ON (red)	Indicates a control system fault or a failure detected during the turn ON self test.
5	SYSTEM RST	Push-button	Pressed	Resets the Optimux-XLT1 unit using a screwdriver
6	LINK A SYNC LOSS	Indicator	ON (red)	Indicates that a loss-of-signal or loss-of-frame has been detected on the main link.
			Flashing (red)	Indicates that the link is not active (the signal is received from link B)
7	LINK A AIS	Indicator	ON (yellow)	Indicates that an alarm indication signaling has been detected on the link
8	LINK B SYNC LOSS	Indicator	ON (red)	Indicates that a loss-of-signal has been detected on the backup link
9	LINK B AIS	Indicator	ON (yellow)	Indicates that an alarm indication signaling has been detected on the backup link
10	A/B/C/D OK	Indicator	ON (green)	Indicates link integrity on the Ethernet port
11	A/B/C/D ACT	Indicator	Flashing (yellow)	Indicates LAN traffic on the Ethernet/Fast Ethernet port
12	A/B/C/D ETHERNET	Connector	–	Connects the Optimux-XLT1 Ethernet port to a LAN
13	B/C/D SYNC LOSS i	Indicator	ON (red)	Indicates that a loss-of-signal has been detected on channel i of the T1 interface module installed in slot B/C/D.

Note: i is 1 to 4 for the 4T1/BAL module installed in slot B, C or D of the Optimux-XLT1 unit. i is 1 or 2 when 2T1/BAL is installed.

Table 3-1. Optimux-XLT1 Front Panel Controls and Indicators (Cont.)

No.	Name	Control	State	Function
14	B/C/D AIS i	Indicator	ON (yellow)	Indicates that an alarm indication signaling has been detected on T1 port i
15	B/C/D i	Connector	–	Connects T1 port i of the T1 module installed in slot B/C/D to the T1 network
16	B/C/D i	Connector	–	Connects HS DTE to the module installed in slot B, C or D
17	B/C/D 100M	Indicator	ON (green)	Indicates speed of 100 Mbps on the Fast Ethernet port
18	B/C/D LINK	Indicator	ON (green)	Indicates link integrity on the Fast Ethernet port

Rear Panel Controls

The Optimux-XLT1 rear panel provides the link, alarm, management and power connections and the status indications associated with these connections as shown in *Figure 3-4*. *Table 3-2* lists the functions of the connectors and switches located on the Optimux-XLT1 rear panel. The index numbers in *Table 3-2* correspond to the balloon numbers in *Figure 3-4*.

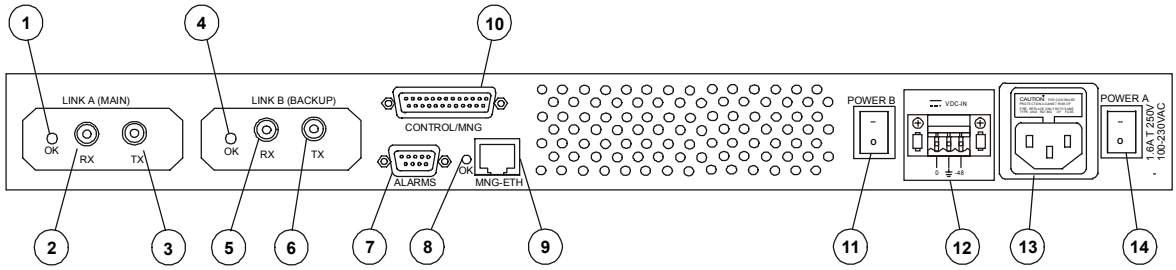

Figure 3-4. Optimux-XLT1 Rear Panel

Table 3-2. Optimux-XLT1 Rear Panel Controls

No.	Name	Control	State	Function
1	LINK A OK	Indicator	ON (green)	Indicates that the received signal from link A is detected
2	LINK A (MAIN) RX	Connector	–	Connects the input cable of the main link to the main link module
3	LINK A (MAIN) TX	Connector	–	Connects the output cable of the main link to the main link module
4	LINK B OK	Indicator	ON (green)	Indicates that the received signal from link B is detected
5	LINK B (BACKUP) RX	Connector	–	Connects the input cable of the backup link to the backup link module□Station Clock Module: Input 2.048 MHz signal
6	LINK B (BACKUP) TX	Connector	–	Connects the output cable of the backup link to the backup link module□Station Clock Module: Output 2.048 MHz signal
7	ALARMS	Connector	–	Connects the dry contacts of the major and minor alarm relays to a remote monitoring site
8	MNG-ETH OK	Indicator	ON (green)	Indicates link integrity on the Ethernet port
9	MNG-ETH	Connector	–	Connects the Ethernet port to the Management port
10	CONTROL / MNG	Connector	–	Connects the V.24/RS-232 management port to an ASCII terminal
11	POWER B	Switch	0	Turns OFF the backup power supply. The Optimux-XLT1 is powered by the main power supply only.
			1	Turns ON the Optimux-XLT1 backup power supply; when set to this position, the switch lights in red.
12	POWER B	Connector	–	Connects the Optimux-XLT1 to the AC mains or to the backup DC power source
13	POWER A	Connector	–	Connects the Optimux-XLT1 to the AC mains or to the main DC power source
14	POWER A	Switch	0	Turns OFF the main power supply. The Optimux-XLT1 is powered by the backup power supply only.
			1	Turns ON the Optimux-XLT1 main power supply ; when set to this position, the switch lights in red.

3.2 Operating Instructions

Turn ON

➤ **To turn ON a unit with a single power supply module:**

Set POWER A switch to ON.

The PWR A indicator on the front panel must light in green.

➤ **To turn ON a unit with two power supply modules:**

1. Set at least one of the two rear POWER switches to ON.
2. To achieve power supply redundancy, turn ON both POWER switches.
3. The PWR A and PWR B indicator(s) on the front panel must light in green indicating that the power consumption of the unit is shared between the two supplies.

Note *For the first operation and before synchronization of two units, declare the link redundancy in the same configuration for both units. In addition, declare the timing for both units in a valid configuration (i.e. not both units on Loop Back Timing – LBT).*

Normal Indications

During normal operation, the LED indications shown in *Table 3-3* should appear:

Table 3-3. LED Indications

LED	State	Indicates
PWR	ON, green	Power supplies of the OPTIMUX-XLT1 unit active
FLT	OFF	Self test passes
TST	OFF	No diagnostic test is performed
OK	ON, green	Link integrity of the Ethernet ports
ACT	Flashing, yellow	Ethernet port traffic
SYNC LOSS	OFF	No loss of receive signal on T1 ports
AIS	OFF	No AIS received on T1 ports

Redundancy Functions

The redundant power supply and the redundant link module ensure the Optimux-XLT1 operation even when one of these critical modules fails.

Link Redundancy

When the redundant link is installed (backup module and link A) and the link-redundancy is set to AUTOMATIC from the terminal or SNMP, the Optimux-XLT1 starts using the main link. It will automatically switch to the backup link when the main link fails (signal loss/sync loss). The LINK A/B SYNC LOSS LED on the front panel indicates the deactivated link. If the failure is due to signal loss, the Optimux-XLT1 will switch back to the main link, when the signal is recovered in the main link. If the failure is due to sync loss, the backup link becomes the active link until signal loss/sync loss occurs on the backup link.

When the redundant link is installed and the management link-redundancy is MANUAL, the Optimux-XLT1 starts using the main link. It will automatically switch to the backup link when the main link fails (signal loss/sync loss). The LINK A/B SYNC LOSS LED on the front panel indicates the deactivated link. The backup link remains active even when the main link recovers. Switching back to the main link is performed by setting the link-redundancy to AUTOMATIC from the terminal or by turning the system OFF and then ON.

When the management link-redundancy is OFF, the redundancy function is not available.

Power Supply Redundancy

In the redundant power supply mode, both supplies share the Optimux-XLT1 power consumption. If one of the power supply modules fails, the entire power consumption of the unit is automatically drawn from a single power supply. In this case, the respective PWR LED on the front panel indicates the active power supply.

Note *All changes made to the terminal or SNMP in link redundancy mode at the local site automatically affect the remote site*.

Turn OFF

Set the Optimux-XLT1 rear power switch (switches) to OFF.

Chapter 4

Supervisory Port Software Configuration

4.1 Introduction

The Optimux-XLT1 parameters can be configured from a supervisory terminal connected to the unit's CONTROL/MNG connector. Remote management is also possible using the Telnet communication protocol through the unit's MNG-ETH connector.

Note *All the example screens shown in this chapter are for different hardware/software situations that are available.*

4.2 Accessing and Exiting the Supervisory Terminal

➤ **To access the supervisory terminal for configuration:**

1. Connect an ASCII ANSI terminal, or a PC capable of emulating an ASCII ANSI terminal, to the 25-pin CONTROL/MNG connector on the rear panel of the Optimux-XLT1 (for the cable wiring diagram, refer to the *Control Cable Wiring* figure).
2. Set the terminal communication parameters to: 19,200 baud, 8 bits/character, one stop bit and no parity bit.

   Optimux-XLT1 automatically detects and adapts itself to terminal baud rates of 9600, 19200, 38400, 57600 and 115200 bps only.
3. Turn the unit on and immediately press <Enter> four or more times. If the correct baud rate was detected, dots will start to appear correctly on the terminal screen.
4. Press the dot <.> key once to set the parity and to complete the detection. This baud setting will be saved in non-volatile RAM.

   If the auto-detection fails, the baud rate of the Optimux-XLT1 management port is the last baud rate that was written in the non-volatile RAM.
5. If a PC is used, run a terminal emulation program.
6. Reset the Optimux-XLT1 or turn it ON.

   The Optimux-XLT1 Main Menu appears.

```
MAIN MENU
          RAD Data Communications Ltd.
          OPTIMUX - XLT1
          ***************************************

          SW version 4.0
          HW Revision H

          1.   Local device
          2.   Remote device

          Enter your choice:
```

7. Type **1** for the Local Device menu or **2** for the Remote Device menu.

   The Optimux-XLT1 Local Device or Remote Device screen appears.

Note *All the following screens for the Local Device and the Remote Device are the same, except Download, SNMP and parts of the interface configuration screens, which are not available for the Remote Device.*

The top left corner of each screen indicates the screen that applies to a Local Device or a Remote Device.

When working with the remote device, all changes take affect within 120 seconds.

```
LOCAL DEVICE
          LOCAL OPTIMUX MENU
          ------------------

          0.   Exit
          1.   Device Information
          2.   Interface
          3.   Software Download (not available in Telnet)
          4.   SNMP Parameters
          5.   Reset
          6.   Change password

          Enter your choice:
```

➤ **To exit the supervisory terminal:**

Type **0** or press **ESC** in any menu screen and in any subsequent screen that may appear.

4.3 Changing Parameter Settings

The configurable parameters can be changed using a series of menus and submenus (see *Figure 4-1*).

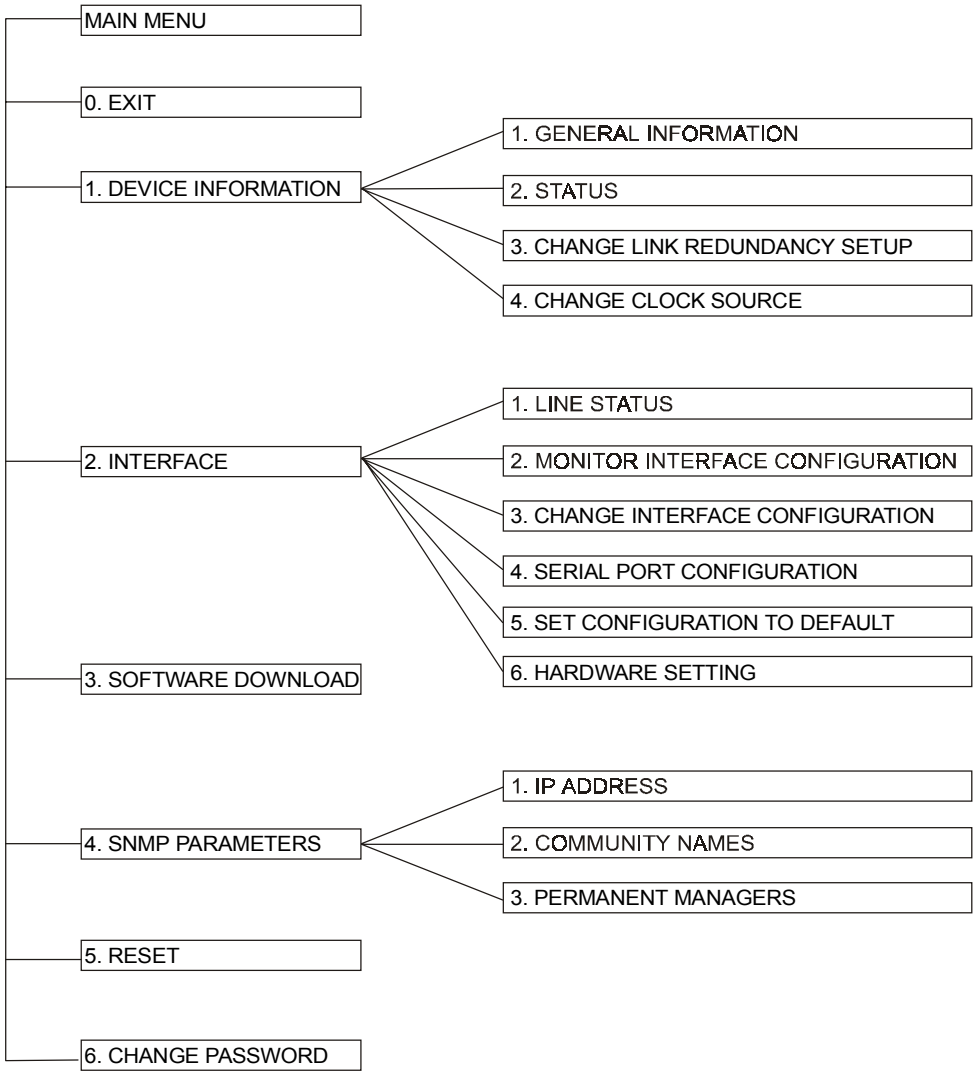

Figure 4-1. Software Configuration Menu Map

➤ **To set a parameter in a menu:**

1. Type the number of the parameter to be changed.
2. Enter the new parameter value according to the prompt message appearing on the screen.
3. If you wish to leave the current value, press ESC.
4. To exit to the previous screen, type 0 in any screen.

Each configuration screen contains the following parameter information: name, current value and when the option is selected, the applicable value(s).

4.4 The Optimux-XLT1 Device Information

➤ **To access the device information:**

Type **1** in the Optimux-XLT1 Local Device screen.

The Device Information Menu screen appears.

```
LOCAL DEVICE
              DEVICE INFORMATION MENU
              ----------------------

          0.   Exit
          1.   General Information
          2.   Status
          3.   Change Link Redundancy Status
          4.   Change Clock Source

          Enter your choice:
```

Viewing the Optimux-XLT1 Versions

➤ **To view the hardware and software revisions:**

Type **1** in the Device Information Menu.

The General Information screen appears.

```
LOCAL DEVICE
              GENERAL INFORMATION
              -------------------

          Hardware revision      H
          Software version       SW Version 4.0
          Management channel     Through module A

          0. Exit

          Enter your choice:
```

The Management channel shows one of the following states:

Through module A indicates MNG-ETH port is set to Port A.

Separate port (back panel) indicates MNG-ETH port is set to Separate.

Viewing the Optimux-XLT1 Component Status

➤ **To view the status of the functional blocks:**

Type **2** in the Device Information Menu screen.

The Status Information screen appears.

```
LOCAL DEVICE
              STATUS INFORMATION
              ------------------

         Power supply 1                                  FAULT
         Power supply 2                                  OK
         Active Link                                     MAIN
         Link Redundancy                                 MANUAL
         Clock Source                                    INTERNAL

         0. Exit

         Enter your choice:
```

The applicable states for power supplies are indicated in *Table 4-1*.

Table 4-1. Power Supply States

State	Indicates
Not present	Power supply is not mounted. This indication applies only to power supply # 2 (backup)
OK	Power supply is ON and functions properly
FAULT	Power supply failure was detected

Setting Link-Redundancy

➤ **To change the link-redundancy setting:**

1. Type **3** in the Device Information Menu screen.

   The Change Link Redundancy screen appears.

```
LOCAL DEVICE

              CHANGE LINK REDUNDANCY
              ----------------------


         0.   Exit.
         1.   Redundancy status       AVAILABLE
         2.   Redundancy setup        MANUAL


         Enter your choice:
```

2. Type **2** to enter the redundancy setup.
3. Type **1** for AUTOMATIC, **2** for MANUAL, **3** for OFF, or press ESC to cancel your choice.
4. To exit to the screen, type **0**.

Notes

1. *Redundancy status is not available for changes, but you can change Redundancy status even if the status is "NOT AVAILABLE". (And in that case your change will take place once the status "AVAILABLE").*
2. *When in normal operation, the link redundancy setting must be changed only after the system has been operating and synchronized for 120 sec on the same link.*
3. *Changes to the link redundancy mode take affect up to 120 seconds after being made.*
4. *Before synchronizing two Optimux-XLT1 units, the link redundancy mode of both units must be the same.*

Changing the Clock Source

➤ **To change the clock source:**

Type **4** in the Device Information Menu screen.

The Clock screen appears.

```
LOCAL DEVICE
               CLOCK
               -----


          0.   Exit
          1.   Change clock source: INTERNAL
          2.   Reset to default configuration


          Enter your choice:
```

➤ **To view and change the clock source:**

1. Type **1** to enter the change clock source option.
2. Type **1** for LoopBackTiming (RCV clk), **2** for Internal (INT clk), or **0** to cancel your choice.

➤ **To reset to the default clock configuration (INT):**

1. Type **2** to perform the reset to default configuration option.
2. Confirm the action.
3. Type **0** to exit the Clock screen.

Note *Option 1 (view and change the clock source) is not available in Hardware Version A. Loop back timing is not available at the Remote Device and at the Local Device at the same time.*

4.5 The Optimux-XLT1 Interface

➤ **To view the interface information:**

Type **2** in the Optimux-XLT1 Local Device screen.

The Interface Menu screen appears.

```
LOCAL DEVICE
               INTERFACE MENU
               --------------

          0.   Exit
          1.   Line Status
          2.   Monitor Interface Configuration
          3.   Change Interface Configuration
          4.   Serial Port Configuration
          5.   Set Configuration to Default
          6.   Hardware Setting
          7.   Interface Status

          Enter your choice:
```

Viewing Status of Transmission Interfaces

➤ **To view the status of the T1, Ethernet, HS, FETH and Fiber Optic interfaces:**

Type **1** in the Interface Menu screen.

The Line Status screen appears.

```
LOCAL DEVICE
                                  LINE STATUS
                                  -----------


-------------------------------------------------------------------------------
|  Port    |  Module A    |  Module B  |  Module C  |  Module D  |  FO link    |
|  number |  ETHERNET    |  NO_MODULE |  NO_MODULE |  NO_MODULE |  F/O-F/O    |
-------------------------------------------------------------------------------
|   1      | Signal loss | No port     | No port     | No port     |Signal loss |
-------------------------------------------------------------------------------
|   2      | No port      | No port     | No port     | No port     |Signal loss |
-------------------------------------------------------------------------------
|   3      | No port      | No port     | No port     | No port     |
-------------------------------------------------------------------------------
|   4      | No port      | No port     | No port     | No port     |
-------------------------------------------------------------------------------
0.Exit

Enter your choice:
```

The interface ports are characterized by the states indicated in *Table 4-2*.

Table 4-2. Interface Ports

State	Indicates
No port	The interface module associated with the specific port is not installed or the port number is irrelevant for a certain type of interface module. For example, only a single port is associated with an Ethernet interface module.
O.K.	The signal is detected at the input of an T1 or fiber optic port or, for an Ethernet port, link integrity pulse is detected on the receive pair.
Signal Loss	No signal is detected at the input of an T1 or fiber optic port or, for an Ethernet port, link integrity pulse is not detected on the receive pair.
AIS	An Alarm Indication Signal was detected at the input of an T1 port or on the fiber optic link.
NA	Not relevant

The first row in the screen table specifies the type of module installed in the Optimux-XLT1 slot. For example, 4T1_UTP in slot B specifies a 4-port balanced T1 module.

For the HS interface, the state is always characterized as NA.

Viewing Configuration of Monitor Interface

➤ **To view the configuration of the monitor interface:**

Type **2** in the Interface Menu screen.

The Monitor Interface Configuration screen appears.

```
LOCAL DEVICE
                        MONITOR INTERFACE CONFIGURATION
                        -------------------------------


-------------------------------------------------------------------------------
|  Port   |  Module A  |  Module B  |  Module C  |  Module D  |  FO link   |
|  number |  ETHERNET  |  NO_MODULE |  NO_MODULE |  NO_MODULE |  F/O-F/O   |
-------------------------------------------------------------------------------
|   1     |  Filter en |  No port   |  No port   |  No port   |  No loop   |
-------------------------------------------------------------------------------
|   2     |  No port   |  No port   |  No port   |  No port   |  No loop   |
-------------------------------------------------------------------------------
|   3     |  No port   |  No port   |  No port   |  No port   |
-------------------------------------------------------------------------------
|   4     |  No port   |  No port   |  No port   |  No port   |
-------------------------------------------------------------------------------

0.Exit

Enter your choice:
```

The tributaries and fiber optic settings can be set from the terminal (see *Changing the Configuration of the Interface* on page 4-10). The applicable tributaries and fiber optic interface states are indicated in *Table 4-3*.

Table 4-3. T1 and Fiber Optic Interface States

State	Indicates
No loop	No loop is set
Local loop	A local loop is set. An T1 local loop applies to all ports of an T1 module (see *Troubleshooting Instructions* on page 5-3 for details)
Remote loop	A remote loop is set. A T1 remote loop applies to a single port of a T1 module (see *Troubleshooting Instructions* on page 5-3 for details). Remote loop on fiber optic link is not available.

The Ethernet port is set from a DIP switch. The applicable settings are:

Table 4-4. Ethernet Setting

Setting	Indicates
Half duplex	Ethernet port operates in half duplex
Full duplex	Ethernet port operates in full duplex

Changing the Configuration of the Interface

➤ **To change the configuration of the monitor interface:**

4. Type **3** in the Interface Menu screen.

   The Change Interface Configuration screen appears.

```
LOCAL DEVICE
          CHANGE INTERFACE CONFIGURATION
          ------------------------------


   NOTE:  To change the configuration of the interface, select it
          in the next format:
          - decimal number from 1 to 5 for modules,
          (1 for module A, 2 for module B,..., 5 for E3 link)
          - decimal number from 1 to 4 for ports
          - for E3 link port=1 selects main link, port=2 selects backup link.


   0.   Exit
   1.   Module                   module A
   2.   Port                     port 1
   3.   Test Configuration       Filter enabled


Enter your choice:
```

5. Type **1** to change a module.
6. Type **1** for module A, **2** for module B, **3** for module C, **4** for module D, or **5** for an E3 link.
7. Type **2** to change ports
8. Type **1** for port 1, **2** for port 2, **3** for port 3, or **4** for port 4.

   For the E3 link, port 1 selects the main link; port 2 selects the backup link.

For an Ethernet module:

9. Type **3**
10. Set the test configuration to **filter enabled** or **disabled**. This change takes effect only if switch SW1-3 on the ETH-TOP card or the ETH module is set to OFF. If the switch is set to ON, the status of the interface remains filter enabled regardless of changes made by the supervisory software.

For a Fast Ethernet module:

11. Type **1** to change a module.
12. Set the module slot to correspond to the slot of the Fast Ethernet module by typing **1** for module slot A, **2** for module slot B, **3** for module slot C, **4** for module slot D or **5** for E3 link.

    The Change Interface Configuration screen changes and appears as follows:

```
LOCAL DEVICE
          CHANGE INTERFACE CONFIGURATION
          ------------------------------


   NOTE:  To change the configuration of the interface, select it
          in the next format:
           -   decimal number from 1 to 5 for modules,
               (1 for module A, 2 for module B,..., 5 for E3 link)


   0.   Exit
   1.   Module                  module B
   2.   Back Pressure           Disable
   3.   Half/Full duplex        N/A
   4.   Auto-negotiation        Enable
   5.   Multicast blocking      Disable
   6.   Broadcast blocking      Disable
   7.   Speed                   N/A
   8.   Reset


   Enter your choice:
```

13. Type **2** to set the back pressure.

The Change Interface Configuration screen changes and appears as follows:

```
LOCAL DEVICE
          CHANGE INTERFACE CONFIGURATION
          ------------------------------


   NOTE:  To change the configuration of the interface, select it
          in the next format:
           -   decimal number from 1 to 5 for modules,
               (1 for module A, 2 for module B,..., 5 for E3 link)


   0.   Exit
   1.   Module                   module B
   2.   Back Pressure            Disable
   3.   Half/Full duplex         N/A
   4.   Auto-negotiation         Enable
   5.   Multicast blocking       Disable
   6.   Broadcast blocking       Disable
   7.   Speed                    N/A
   8.   Reset


   Choose 1-for 'Back pressure Enable' 2-for 'Back pressure Disable',
   ESC to cancel
```

14. Type **1** to enable back pressure or **2** to disable back pressure.

15. Type **3** to set the port operation mode.

The Change Interface Configuration screen changes and appears as follows:

```
LOCAL DEVICE
          CHANGE INTERFACE CONFIGURATION
          ------------------------------


   NOTE:  To change the configuration of the interface, select it
          in the next format:
           -   decimal number from 1 to 5 for modules,
               (1 for module A, 2 for module B,..., 5 for E3 link)


   0.   Exit
   1.   Module                   module B
   2.   Back Pressure            Disable
   3.   Half/Full duplex         N/A
   4.   Auto-negotiation         Enable
   5.   Multicast blocking       Disable
   6.   Broadcast blocking       Disable
   7.   Speed                    N/A
   8.   Reset

   Choose 1-for 'Full duplex' 2-for 'Half duplex', ESC to cancel
```

16. Type **1** to set operation to full duplex or **2** to set operation to half duplex.

17. Type **4** to set the auto-negotiation function.

The Change Interface Configuration screen changes and appears as follows:

```
LOCAL DEVICE
          CHANGE INTERFACE CONFIGURATION
          ------------------------------


   NOTE:  To change the configuration of the interface, select it
          in the next format:
           -   decimal number from 1 to 5 for modules,
               (1 for module A, 2 for module B,..., 5 for E3 link)


   0.   Exit
   1.   Module                   module B
   2.   Back Pressure            Disable
   3.   Half/Full duplex         N/A
   4.   Auto-negotiation         Enable
   5.   Multicast blocking       Disable
   6.   Broadcast blocking       Disable
   7.   Speed                    N/A
   8.   Reset


   Choose 1-for 'Auto-negotiation Disable' 2-for 'Auto-negotiation Enable',
   ESC to cancel
```

18. Type **1** to disable auto-negotiation or **2** to enable auto-negotiation.

19. Type **5** to set multicast blocking.

The Change Interface Configuration screen changes and appears as follows:

```
LOCAL DEVICE
          CHANGE INTERFACE CONFIGURATION
          ------------------------------


   NOTE:  To change the configuration of the interface, select it
          in the next format:
           -   decimal number from 1 to 5 for modules,
               (1 for module A, 2 for module B,..., 5 for E3 link)


   0.   Exit
   1.   Module                   module B
   2.   Back Pressure            Disable
   3.   Half/Full duplex         N/A
   4.   Auto-negotiation         Enable
   5.   Multicast blocking       Disable
   6.   Broadcast blocking       Disable
   7.   Speed                    N/A
   8.   Reset

Choose 1-for 'Multicast blocking Enable' 2-for 'Multicast blocking Disable',
ESC to cancel
```

20. Type **1** to enable multicast blocking or **2** to disable multicast blocking.

21. Type **6** to set broadcast blocking.

The Change Interface Configuration screen changes and appears as follows:

```
LOCAL DEVICE
          CHANGE INTERFACE CONFIGURATION
          ------------------------------


   NOTE:  To change the configuration of the interface, select it
          in the next format:
           -   decimal number from 1 to 5 for modules,
               (1 for module A, 2 for module B,..., 5 for E3 link)


   0.   Exit
   1.   Module                   module B
   2.   Back Pressure            Disable
   3.   Half/Full duplex         N/A
   4.   Auto-negotiation         Enable
   5.   Multicast blocking       Disable
   6.   Broadcast blocking       Disable
   7.   Speed                    N/A
   8.   Reset

Choose 1-for 'Broadcast blocking Enable' 2-for 'Broadcast blocking Disable',
ESC to cancel
```

22. Type **1** to enable broadcast blocking or **2** to disable broadcast blocking.

23. Type **7** to set the speed.

The Change Interface Configuration screen changes and appears as follows:

```
LOCAL DEVICE
          CHANGE INTERFACE CONFIGURATION
          ------------------------------


   NOTE:  To change the configuration of the interface, select it
          in the next format:
           -   decimal number from 1 to 5 for modules,
               (1 for module A, 2 for module B,..., 5 for E3 link)


   0.   Exit
   1.   Module                   module B
   2.   Back Pressure            Disable
   3.   Half/Full duplex         N/A
   4.   Auto-negotiation         Enable
   5.   Multicast blocking       Disable
   6.   Broadcast blocking       Disable
   7.   Speed                    N/A
   8.   Reset


   Choose 1-for 10Mbps, 2-for 100Mbps, ESC- for cancel
```

24. Type **1** to set the module speed to 10 Mbps or **2** to set the module speed to 100 Mbps.

25. Type **8** to reset to default settings.

The Change Interface Configuration screen changes and appears as follows:

```
LOCAL DEVICE
          CHANGE INTERFACE CONFIGURATION
          ------------------------------


   NOTE:  To change the configuration of the interface, select it
          in the next format:
           -   decimal number from 1 to 5 for modules,
               (1 for module A, 2 for module B,..., 5 for E3 link)


   0.   Exit
   1.   Module                   module B
   2.   Back Pressure            Disable
   3.   Half/Full duplex         N/A
   4.   Auto-negotiation         Enable
   5.   Multicast blocking       Disable
   6.   Broadcast blocking       Disable
   7.   Speed                    N/A
   8.   Reset


   Type 'reset' to confirm reset to default setting, ESC- cancel
```

26. Type **reset** to reset the module back to its default settings.

The fields needed in order to configure an interface are indicated in *Table 4-5*.

Table 4-5. Fields in the Change Interface Configuration Screen

Field	Specifies	Modules	Values
Module	Interface module and fiber optic link	All	1 to 5
Port	Interface channel	4T1/BAL	1 to 4
		2T1/BAL FO LINK	1 and 2
		ETH/10BT	1
		HS	1 to 4
Test Configuration	Current port configuration	4T1/BAL, 2T1/BAL,	Normal, Local loop, Remote loop
		FO LINK	Normal, Local loop
		ETH/10BT	Filter enable, Filter disable
		HS	Normal, Local loop, Remote loop (in 2M modules only)
DCD Configuration	Current port configuration	HS	Permanent ON, Control*
CTS Configuration	Current port configuration	HS	Permanent ON, Control**

* ON when the active link is OK (no sync loss, frame loss or AIS)

** ON when RTS is ON

The Ethernet filtering configuration of the fixed Ethernet can be changed from this screen. The factory setting is **filter enable**. The change will take affect only if switch SW1-3 on the ETH-TOP card is set to OFF.

Notes

1. *Under the remote device at the fiber-optic module no loop is available. Under the local device at the fiber-optic module the remote loop is not available.*
2. *Turning the unit OFF and ON or removing and reassembling a changeable ETH module changes back the filtering configuration to 'filter enable'.*

Changing the Configuration of the Serial Port

➤ **To change the configuration of the serial port:**

1. Type **4** in the Interface Menu screen.

   The Serial Port Configuration screen appears.

```
LOCAL DEVICE
              SERIAL PORT CONFIGURATION
              -------------------------

         0.   Exit.
         1.   Baud rate.     38400 baud
         2.   parity.        NO

         Enter your choice:
```

2. Type **1** to set the baud rate
3. Type **4** for 9600, **6** for 19200, **7** for 38400, **8** for 57600, or **9** for 115200 bps.
4. Type **2** to set the parity
5. Type **0** for no parity, **1** for even, or **2** for odd.
6. Confirm the action.
7. Type **0** to exit the Serial Port Configuration screen.

Resetting to the Default Configuration

➤ **To reset all T1 and fiber optic interfaces to "Normal" operation:**

1. Type **5** in the Interface Menu screen.

   The Set Configuration to Default screen appears.

```
LOCAL DEVICE
         SET CONFIGURATION TO DEFAULT
         ----------------------------

   NOTE:  After performing this operation all interfaces
          will be set to NORMAL configuration.

         0.   Exit
         1.   Reset to default configuration

         Enter your choice: 1
         Type 'reset' to confirm reset to default setting, ESC to cancel:
         reset
         All interfaces have been set to default!
```

2. Type **1** to perform the reset to default configuration option.
3. Type **reset** to confirm or press ESC to cancel your choice.
4. Type **0** to exit the Set Configuration to Default screen.

Viewing Hardware Setting

➤ **To view the hardware setting:**

Type **6** in the Interface Menu screen.

The Hardware Setting screen appears.

```
LOCAL DEVICE
                              HARDWARE SETTING
                              ----------------
-------------------------------------------------------------------------------
|   Module   |   Type    |   Coding/Duplex   |          Channel Alarm          |
|            |           |                   |  CH1  |  CH2  |  CH3  |  CH4  |
|------------------------------------------------------------------------------|
|     A      | ETHERNET  |    Half duplex    |   NA  |   NA  |   NA  |   NA  |
|------------------------------------------------------------------------------|
|     B      | NO_MODULE |                   |       |       |       |       |
|------------------------------------------------------------------------------|
|     C      | NO_MODULE |                   |       |       |       |       |
|------------------------------------------------------------------------------|
|     D      | NO_MODULE |                   |       |       |       |       |
|------------------------------------------------------------------------------|
         0.Exit
         Enter your choice:
```

Viewing Interface Status

➤ **To view the interface status:**

Type **7** in the Interface Menu screen.

The Interface Status screen appears.

```
LOCAL DEVICE
                              INTERFACE STATUS
                              ----------------
NOTE:     To change the configuration of the interface, select it
          in the next format:
          -    decimal number from 1 to 4 for modules,
               (1 for module A, 2 for module B, ...
          -    decimal number from 1 to 4 for ports


0.   Exit
1.   Module                    module A
2.   Port                      port 1
3.   Link Integrity            N/A
4.   Speed                     N/A
5.   Hardware Revision         N/A
6.   Timing                    N/A
```

4.6 The Optimux-XLT1 Software Download

➤ **To download software:**

1. Type **3** in the Optimux-XLT1 Local Device screen.
   The Software Downloading screen appears.

```
LOCAL DEVICE
              SOFTWARE DOWNLOADING
              --------------------

         0.   Exit
         1.   Download new software

         Enter your choice:
```

2. Type **1** to download new software.
3. Type **flash** (in lower case only) when asked for the password.
4. Press Enter.
   The Optimux-XLT1 resets itself and erases the flash memory.
5. Start the communication software.
   Depending on the terminal used, the popup screen differs.
6. Select the XMODEM protocol.
7. Enter the name and path of the software distribution file to be downloaded.
8. Press Enter.
   The new software version is loaded to the flash memory.
9. Reset the unit by either turning it OFF and then ON or by pressing the RST push button on the unit's front panel.

Notes

1. *Software download is not available for the remote device.*
2. *The downloading speed is determined by the baud rate set during the serial port configuration stage. To change the baud rate, refer to the 'Changing the Configuration of the Serial Port' section in this chapter.*
3. *When using Telnet for management, the Software Downloading option is not operational.*

4.7 The Optimux-XLT1 SNMP Parameters

➤ **To modify the SNMP parameters:**

Type **4** in the Optimux-XLT1 Local Device screen.

The SNMP Parameters screen appears

```
LOCAL DEVICE
               SNMP PARAMETERS
               ---------------

          0.   Exit
          1.   IP addresses
          2.   Community names
          3.   Permanent managers

          Enter your choice:
```

The SNMP Parameters Menu is not available for the Remote Device.

Viewing IP Addresses

➤ **To view the IP addresses:**

1. Type **1** in the SNMP Parameters screen.

   The IP Addresses screen appears.

```
LOCAL DEVICE
               IP ADDRESSES
               ------------

NOTES:    1. IP address should be typed in the following format: X.X.X.X
             where: X- decimal number from 0 to 255.
          2. Non-contiguous subnet masks are not allowed.
          3. Change will take effect after RESET only.

0.        Exit.
1.        Inband IP address:      192.115.244.135
2.        Subnet mask:            255.255.255.192
3.        Default Gateway:        192.115.244.129

          Enter your choice:
```

2. Type **1** to input an inband IP address.
3. Type **2** to insert a subnet mask.
4. Type **3** to set a default gateway.
5. Type **0** to exit the IP Addresses screen.

Note *For changes to take effect, the unit must be reset.*

Viewing Community Names

➤ **To view the community names:**

1. Type **2** in the SNMP Parameters screen.
   The Community Names screen appears.

```
LOCAL DEVICE
               COMMUNITY NAMES
               ---------------

     NOTE:    Change will take effect after RESET only.
         0.   Exit.
         1.   View & change Trap community name:      public
         2.   View & change Read-only community names:public
         3.   View & change Read-write community names:  1

         Enter your choice:
```

2. Type **1** to view and modify a Trap community name.
3. Type **2** to view and modify a Read-only community name.
4. Type **3** to view and modify a Read-write community name.
5. Type **0** to exit the Community Names screen.

Viewing Permanent Managers

➤ **To specify the permanent managers:**

1. Type **3** in the SNMP Parameters screen.

   The Permanent Managers screen appears.

```
LOCAL DEVICE
              PERMANENT MANAGERS
              ------------------


          Manager Number              IP


          1.                      255.0.0.0
          2.                      192.115.72.35
          3.                      255.255.0.0
          4.                      255.255.255.0
          5.                      192.115.0.0


          0.   Exit
          1.   Choose manager number
          2.   Enter permanent manager IP


          Enter your choice:
```

   Permanent manager IP address should be typed in an X.X.X.X format where X is a decimal number from 0 to 255.

2. Type **1** to select a manager number.
3. Type **2** to enter or change a permanent manager IP address.
4. Confirm the action.
5. Type **0** to exit the Permanent Managers screen.

Note *When choosing a manager number row it will appear as highlighted on the screen.*

4.8 The Optimux-XLT1 Reset

➤ **To restart the system:**

Type **5** in the Optimux-XLT1 Local Device screen.

The Restart Menu screen appears.

```
LOCAL DEVICE

               RESTART MENU
               ------------

          0.   Exit
          1.   Restart system

          Enter your choice:
```

The Restart Menu is not available for the Remote Device.

4.9 Setting the Telnet Password

➤ **To set the Telnet password**

1. Type **6** in the Optimux-XLT1 Local Device screen.

   The Password Management screen appears.

```
                              PASSWORD MANAGEMENT

 0.      Exit
 1.      Set new monitor password

Enter your choice :
```

2. Type **1** to set the password.
3. Type the manager password, "**optimux1**" (not case sensitive).
4. Type the new password.
5. Verify the new password by retyping the password.

   The password has now been set and saved. Connection to Telnet can be established by using this password.

Note *The manager password is always valid in terminal connection but, it cannot be used to connect to Telnet.*

Chapter 5

Troubleshooting & Diagnostics

This chapter includes a description of the Optimux-XLT1 loop connections and troubleshooting procedures.

5.1 Loop Connections

Optimux-XLT1 supports loop connections necessary for isolating a failure to a particular component of the transmission system. The loop connections are set using a management tool connected to one of the management ports at the rear of the unit.

The available Optimux-XLT1 loop connections are shown in *Figure 5-1* and the diagnostic loops in *Table 5-1*.

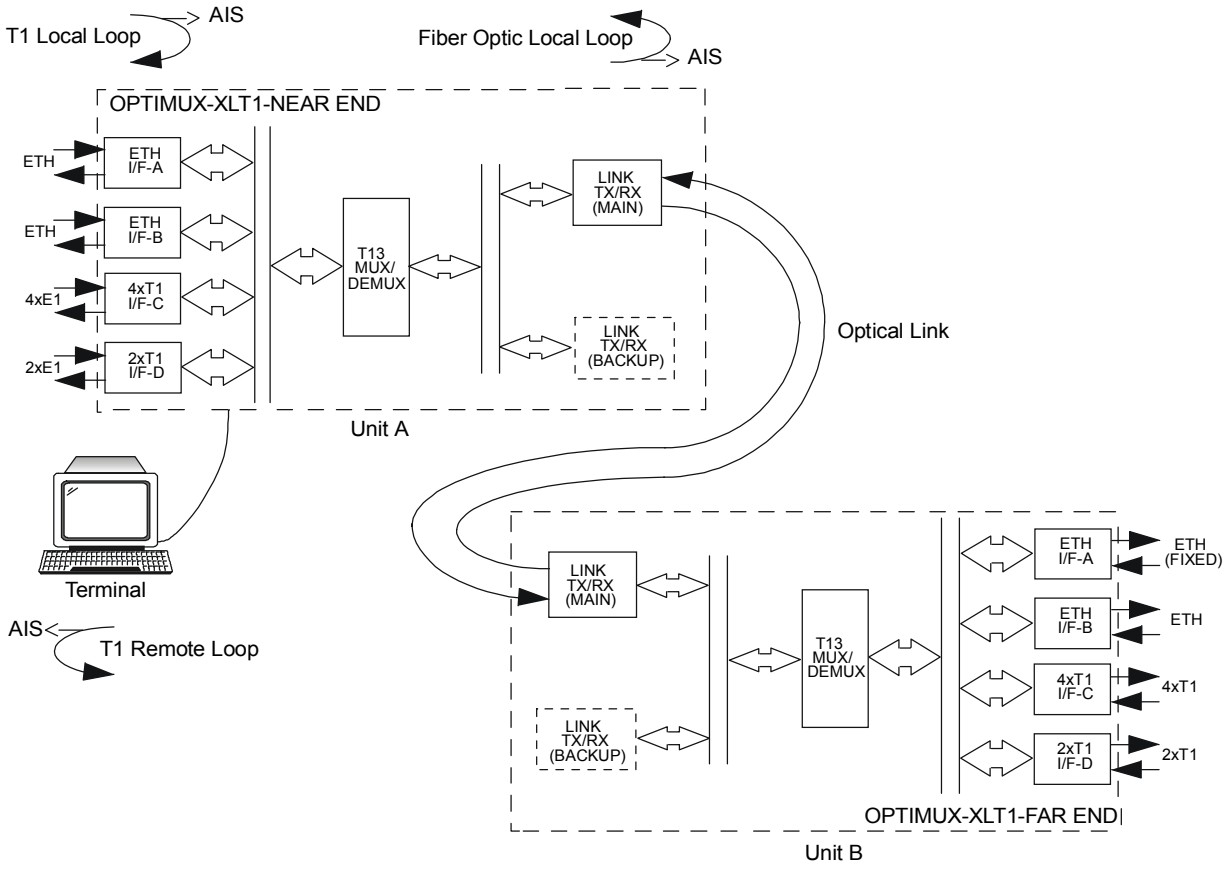

Figure 5-1. Optimux-XLT1 Loops

Table 5-1. Diagnostic Loops

Loop	Function
T1 local	An incoming T1 signal is looped back to the T1 line. AIS is injected towards the T13 MUX. T1 local loop is set for all the ports belonging to a particular T1 channel module. For HS modules, the loop can be set separately for each port belonging to a particular HS channel module.
Fiber optic local	The outgoing fiber optic signal is looped back towards the T1 and Ethernet ports. AIS is injected in the outgoing fiber optic signal towards the link and propagated to the T1 signals in the remote Optimux-XLT1.
T1 remote	The received T1 signal is looped back towards the link. AIS is injected in the T1 signal towards the T1 line. The T1 remote loop is set separately for each port belonging to a particular T1 channel module.

Note *Before setting the fiber optic local loop, set the clock source to INT and set the link redundancy to OFF.*

➤ **To perform a T1 loop on Unit B:**

T1 loops can be made the same way on Unit B, with the terminal connected to Unit A, while choosing the remote option from the Main Menu of the Terminal Main Menu.

5.2 Troubleshooting Instructions

In case a problem arises, check the displayed indications and using this section and the *Optimux-XLT1 Front Panel Controls* table attempt to interpret and solve.

Identify the trouble symptoms and perform the actions listed under "Corrective Measures" in the order given in *Table 5-2*, until the problem is solved.

Table 5-2. Troubleshooting Chart

Trouble Symptoms	Probable Cause	Corrective Measures
Optimux-XLT1 is "dead".	No power	1. Check that both ends of the power cable are properly connected. 2. If the Optimux-XLT1 is powered from DC, check the polarity of the power connections.
	Blown fuse	1. Disconnect the power cable from both ends 2. Replace the fuse with another fuse of the same rating.
	Defective Optimux-XLT1	Replace Optimux-XLT1
One of the PWR LEDs is red.	Power connection	Check the connection of the power cable.
	Blown fuse.	Replace the fuse with another fuse of the same rating.
	Defective power supply	If the PWR LED is still RED, have the Optimux-XLT1 repaired as soon as possible.
The LINK SYNC LOSS LED is ON	Defective Optimux-XLT1	1. Set the clock source to INT. 2. Loop the link connection with a short fiber. 3. If the LED is still ON replace the link. 4. If the LED is still ON have the Optimux-XLT1 repaired.
	External problem	Check the link connections. Use loopback connections to isolate the faulty unit (see *Loop Connections* on page 5-1).
The LINK AIS LED is ON	External problem	The remote equipment connected to the fiber optic link of the Optimux-XLT1 sends an AIS sequence. Check the remote equipment.
	Defective Optimux-XLT1	1. Set the clock source to INT. 2. Loop the link connection with a short fiber/coax. 3. If the LED is still ON have the Optimux-XLT1 repaired.

Table 5-2. Troubleshooting Chart (Cont.)

Trouble Symptoms	Probable Cause	Corrective Measures
All the units connected to a local Optimux-XLT1 do not receive the remote equipment.	External problem	1. Activate the fiber optic local loop on the Optimux-XLT1. 2. Check that all the SYNC LOSS and AIS indicators turn OFF, and that the equipment connected to the local channels receive their own transmissions. 3. If the indicators turn OFF, the problem is external. Troubleshoot the remote unit, and the fiber optic transmission path.
	Defective Optimux-XLT1	Replace Optimux-XLT1
Only one of the units connected to a local Optimux-XLT1 does not receive from the remote equipment.	Connection problem	Check the equipment connected to the local channel
	External problem	1. Activate the port local loop on the Optimux-XLT1. 2. Check that any previously lit alarm indicators related to the channel turn OFF. 3. If the indicators turn OFF, the problem is external. Check the remote equipment.
	Defective Optimux-XLT1	Replace Optimux-XLT1
SYSTEM FLT indicator is ON	Defective Optimux-XLT1.	Replace Optimux-XLT1

Appendix A
Interface Specification

A.1 T1 Connectors

T1 module connectors are of type RJ-45. An RJ-45 connector is mounted on the 4T1/BAL for each T1 channel. The pin assignment of the T1 RJ-45 connector is indicated in *Table A-1*.

Table A-1. T1 RJ-45 Connector Pin Assignment

Pin	Designation	Function	Direction
1	RD(T)	Receive Data (Tip)	Input
2	RD(R)	Receive Data (Ring)	Input
3	FG	Frame Ground	–
4	TD(R)	Transmit Data (Ring)	Output
5	TD(T)	Transmit Data (Tip)	Output
6	FG	Frame Ground	–
7, 8		Not connected	–

A.2 Ethernet and Fast Ethernet Connectors

One Ethernet RJ-45 connector is mounted on each of the modules indicated in *Table A-2*.

Table A-2. RJ-45 Connector Location

Module	Use
Main Board	Fixed Ethernet port at the front
ETH/10BaseT	Modular Ethernet port in front slot B, C or D
FETH/10/100BaseT	Modular Fast Ethernet port in front slot B, C or D
Management	MNG-ETH at the back panel

The pin assignment of the Ethernet RJ-45 connector is depicted in *Table A-3*.

Table A-3. Ethernet RJ-45 Connector Pin Assignment

Pin	Designation	Function	Direction
1	RX+	Receive - positive lead	Input
2	RX-	Receive - negative lead	Input
3	TX+	Transmit - positive lead	Output
6	TX-	Transmit - negative lead	Output
4, 5, 7, 8	–	Not connected	–

A.3 HS DTE Connector

The HS DTE module connectors are of 26-pin SCSI type. Up to four connectors can be mounted on each module. The desired physical connector (V.35, RS-530 or X.21), is achieved using an adapter cable which is supplied with the product. The pin assignment of the HS DTE connector is depicted in *Table A-4*.

Table A-4. HS DTE Connector Pin Assignment

Pin	Designation	Function	Direction
1	GND		–
26	–	Unused	–
2	TD-	Transmit data	Input
14	TD+	Transmit data	Input
3	RD-	Receive data	Output
16	RD+	Receive data	Output
4	RTS-	Request to send	Input
19	RTS+	Request to send	Input
5	CTS-	Clear to send	Output
13	CTS+	Clear to send	Output
6	DSR-	Data set read	Output
22	DSR+	Data set read	Output
8	DCD-	Data carrier detect	Output
10	DCD+	Data carrier detect	Output
17	RXC-	Receive clock	Output
9	RXC+	Receive clock	Output
24	EXTC-	External clock	Input
11	EXTC+	External clock	Input
15	TXC-	Transmit clock	Output
12	TXC+	Transmit clock	Output
20	DTR-	Data terminal ready	Input
23	DTR+	Data terminal ready	Input
18	–	Unused	–
21	–	Unused	–
25	–	Unused	–
7	GND		–

A.4 Alarm Connector

The Optimux-XLT1 ALARM connector is a 9-pin female connector, which includes three contacts for each of the alarm relays. *Figure A-1* shows the pin functions. The relay positions are shown in the non-energized (alarm active) state.

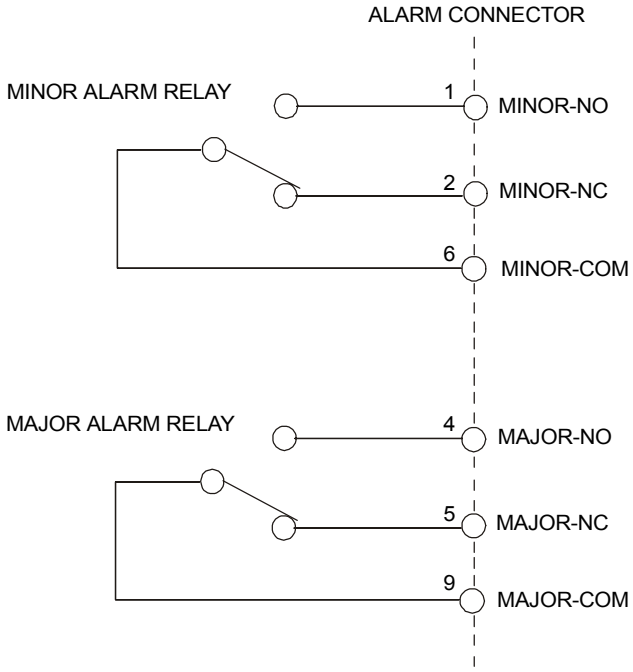

Figure A-1. Alarm Connector Wiring

A.5 Control Connector

Connector Pin Assignment

The optional RS-232 control port has a standard ITU-T V.24 DTE interface. The physical interface is a 25-pin female connector, designated CONTROL/MNG. The pin assignment of the CONTROL/MNG connector is indicated in *Table A-5*.

Table A-5. ITU-T V.24 CONTROL/MNG Connector Pin Assignment

Pin	Designation	Function	V.24 Circuit	Direction
1	CHAS	Frame Ground	112	–
2	TD	Transmit Data	103	Output
3	RD	Receive Data	104	Input
4	RTS	Request-to-send	105	Output
5	CTS	Clear-to-send (not connected)	106	Input
6, 9–19, 21–25	–	Not connected	–	–
7	SG	Signal Ground	102	–
8	CD	Carrier Detect (not connected)	109	Input
20	DTR	Data Terminal Ready	108.1	Output

Cable Connection

If you do not wish to connect the Optimux-XLT1 to an ASCII terminal through a modem, use a standard null-modem cable (EYN-251), or prepare a cable according to the diagram shown in *Figure A-2*.

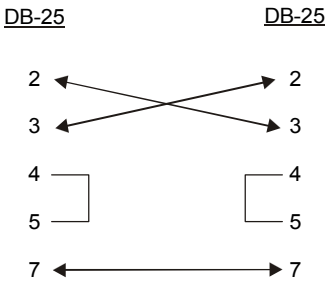

Figure A-2. Control Cable Wiring

A.6 Power Connectors

The power connector used for AC powering is a standard square 3-prong female connector.

The power connector used for DC powering is a terminal block connector (see *Figure A-3*).

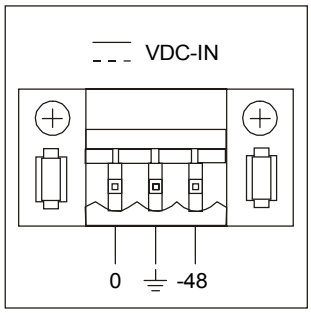

Figure A-3. DC Connections

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