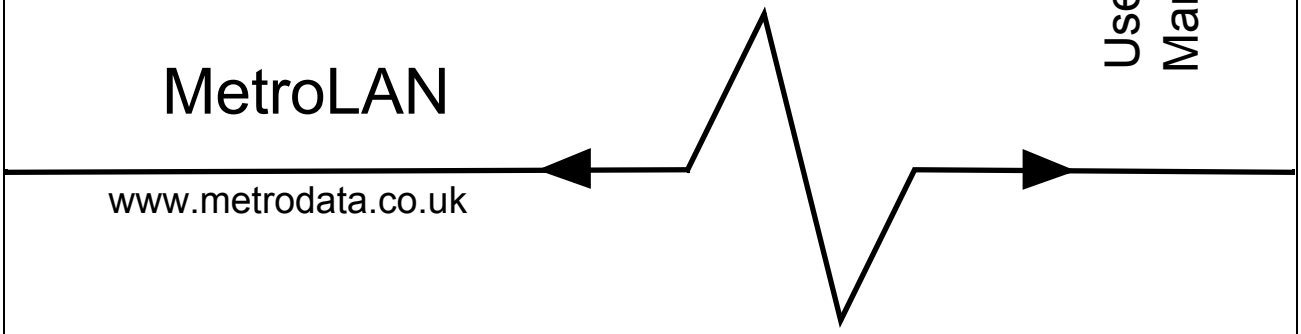
MetroLAN

User Manual



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Metrodata MetroLAN Quick Start Guide

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CONTENTS

1 INTRODUCTION

The Metrodata MetroLAN is a family of products which provide SDH access multiplexer functionality. There are currently two products available:

MetroLAN-1000 which offers SDH STM-1 transport of up to 8 10/100BaseT ports, 8 E1/T1 ports

MetroLAN-2000 which additionally offers the transport of up to 3 E3/DS3 Ports.

The MetroLAN offers a transparent bridged connection over the SDH network. Transport of LAN traffic utilises GFP for encapsulation of the LAN MAC frames and through VCAT enables efficient bandwidth allocation through the use of multiple VC-12 tributaries. When enabled, LCAS provides further flexibility by ensuring that failed VCAT tributaries are seamlessly removed and restarted once the fault has been cleared. Up to 8 10/100BaseT LAN ports may be connected.

Transport of E1/T1 traffic utilises asynchronous mapping of E1 or T1 into a single VC-12 tributary. The MetroLAN treats the E1/T1 as unframed passing the entire circuit transparently. Up to 8 E1/T1 ports may be connected. Each E1/T1 port may be individually selected for E1 or T1 operation.

Transport of E3/DS-3 traffic is available only on the MetroLAN-2000 product, and is achieved through asynchronous mapping into a single VC-3 tributary. The MetroLAN treats the E3/ DS-3 as unframed, passing the entire circuit transparently. Up to 3 E3/DS-3 ports may be connected. Each E3/DS-3 port may be individually selected for E3 or DS-3 operation.

The MetroLAN provides extensive configuration options to ensure inter operability with other vendor equipment, and through comprehensive alarm reporting and performance monitoring enables quick and easy diagnosis of network problems. Management of the MetroLAN may be either local using a VT100 terminal or remotely over the LAN Management port using either Telnet or SNMP. Further management options include the SDH overhead data link management channels.

1. 1 Typical MetroLAN Installation

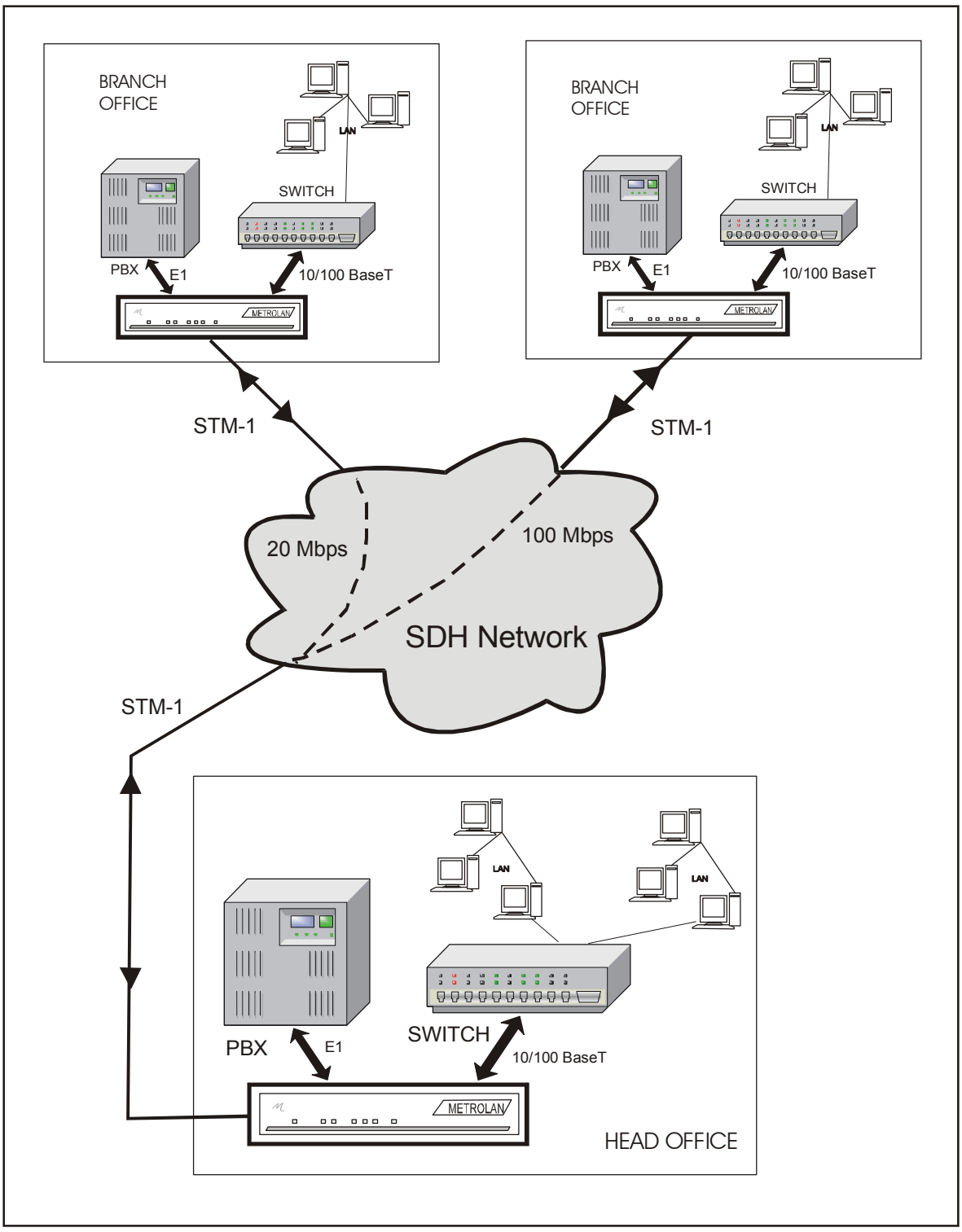


Figure 1.1 MetroLAN typical deployment

2 STATUTORY INFORMATION

2. 1 Safety

The following ports are designated SELV (Safety Extra Low Voltage) within the scope of EN41003:

E1/T1 ports
E3/DS-3 ports
LAN ports
Terminal port
Management port
Alarm extension port

These ports should only be connected to SELV ports on other equipment in accordance with EN60950 clause 2.3.

2. 2 Electromagnetic Compatibility

In order to ensure EMC compliance all signal and data cables and connectors must use a screened connector shell with a screened cable. The cable screen must be terminated to the screened connector shell and not connected to any pins of the connector. Failure to use the correct connector may compromise EMC compliance.

2. 3 EN55022 Declaration

The MetroLAN unit is a Class A product. In a domestic environment it may cause radio interference in which case the user may be required to take adequate measures.

2. 4 FCC Declaration

This equipment has been tested and found to comply with the limits for a 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 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 its own expense.

2. 5 Laser technology

The user is reminded that the MetroLAN employs laser technology. Care must be taken not to expose the eyes to laser beams or radiation since eye tissue damage can result. The rear panels of all models using laser technology are marked with a label as shown below:

Figure 2.1 Laser warning label

2. 6 Power Supply

The MetroLAN is powered by a mains power supply with an input voltage range 100-250 VAC / 50-400 Hz. The maximum operating input current is 400mA rms at 100VAC. Mains power is connected via the IEC inlet on the rear of the unit.

An alternative -48VDC powered unit is available. The input voltage and current ranges are minus 36 to 72 volts DC, 1000 - 500mA. A Buccaneer type socket is fitted to the rear panel, and a plug is provided with the unit for the customer's own wiring. The connections are labelled on the rear panel of the MetroLAN. A schematic of the female -48V DC connector mounted on the rear panel in the place of the AC IEC sockets is shown below.

Pin no	Connection
1	-48VDC
2	Ground
3	0VDC

Figure 2.2 -48VDC connections

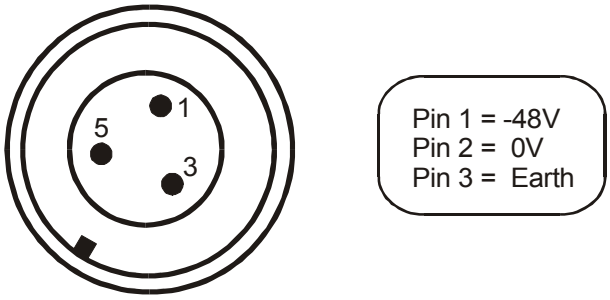


Figure 2. 3 Schematic -48V DC power connector

On some units, an additional Ground stud may be located on the rear panel to permit a separate Ground connection to be made.

Safety Note:
The MetroLAN must be connected to mains safety earth for correct operation.
Excessive voltages are present inside the unit. There are no user serviceable parts inside the unit, and the cover should not be removed by unqualified personnel. The unit must not be exposed to damp or condensing conditions. The MetroLAN must be connected to safety earth for correct operation.

2. 7 On board batteries

The user is reminded that Metrodata motherboards use Lithium/Thionyl Chloride 3.6 volt battery cells for the maintenance of RAM. These batteries must be handled with care. There may be a risk of explosion if a battery is incorrectly replaced. Do not recharge, force open, heat or dispose of by fire. Replace only with the same type of battery.

Disposal must be in accordance with the manufacturer's instructions. If in doubt about any aspect of battery replacement or disposal, please call Metrodata Technical Support Department.

3 METROLAN PHYSICAL

The purpose of this document is to give a user, new to MetroLAN, a simple overview of how to configure the various options to give a basic level of operation. This document should be used in conjunction with the User Manual.

3.1 Front Panel

The front panel of the MetroLAN is shown in schematic form below.

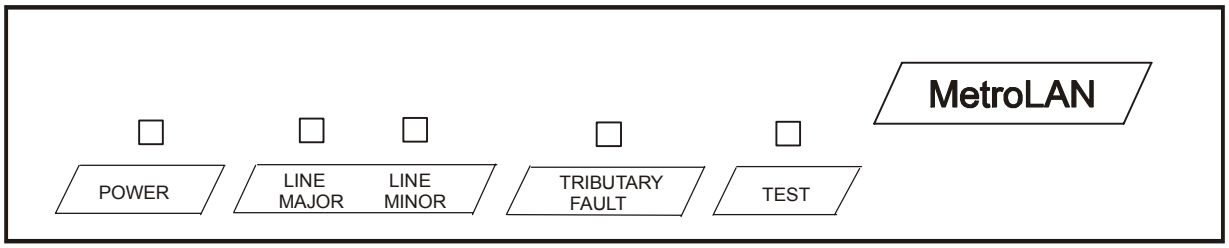


Figure 3.1 MetroLAN front panel

The MetroLAN provides you with essential information through a series of LED's on the front panel. The colour of some of these LED's will depend on the type of data that is being handled at the time, and these are described in Figure 3.2 below. Note that the LINE port label refers to the SDH port, whilst a Tributary fault may relate to any E1/T1 line, E3/DS-3 line, LAN or a VC fault.

LED	Colour	Meaning
Power	Red	Power is being received.
Line SDH		
Line Major	Red	LOS, LOF, LOC, SD or OOF alarm is present
Line Minor	Yellow	AIS, FERF or TIM alarm is present.
Tributary Fault		
Fault	Red	LOS (Major) or AIS (MInor) fault on any E1/T1or E3/DS-3 line LKDN (Link Down) fault on any LAN port VC fault
Test		
	Red	Local loop test in progress on SDH or any E1/T1 or E3/DS3 port
	Unlit	No test in progress

Figure 3.2 Front panel alarms

3.2 Rear panels

The MetroLAN is supplied in a metal enclosure for tabletop or 19” rack mounting using the integral rack mounting ears on the side of the module.The MetroLAN 1000 unit is 1U high, whilst the MetroLAN 2000 which has the additional E3/DS-3 interfaces, is 1.5U high.
The layout of the rear panels with their connections is shown in the figures below.

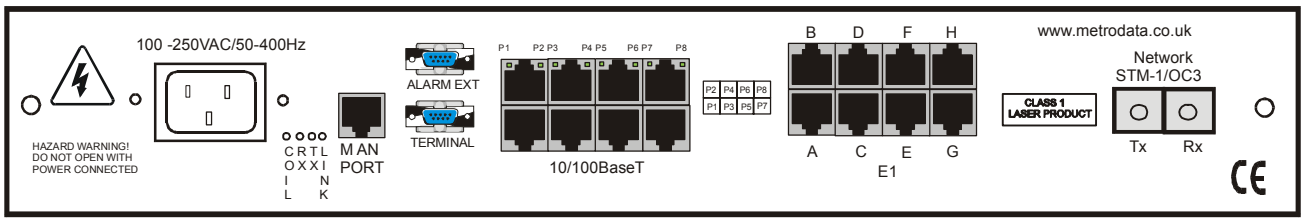


Figure 3.3 MetroLAN 1000 rear panel

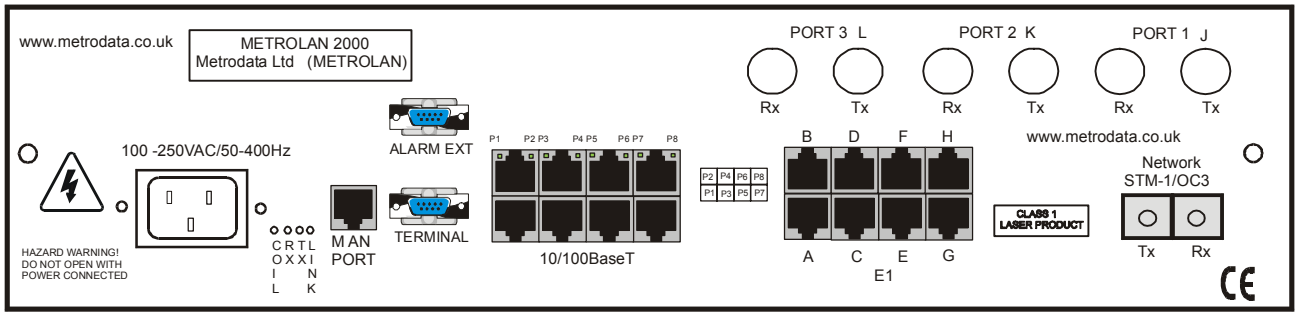
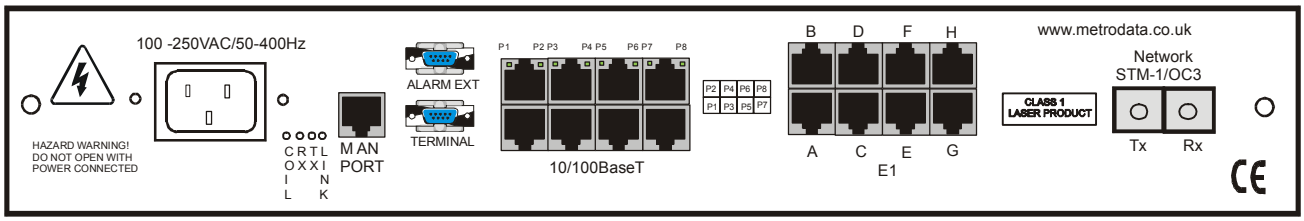


Figure 3.4 MetroLAN 2000 rear panel

3.3 10/100 BaseT LAN ports

There are 8 RJ45 based 10/100 BaseT LAN ports arranged in an array on the rear panel of the MetroLAN.The schematic below shows the rear panels of both types of metroLAN.



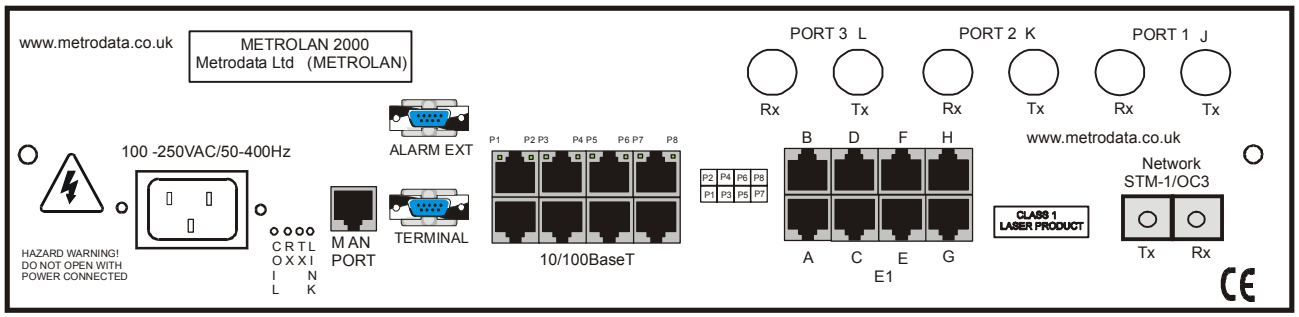


Figure 3.5 MetroLAN rear panels

The 10/100 BaseT LAN ports are the left hand array as shown on the schematics above. The upper array has green indicator LEDs (one for each port). The LEDs show green when the port is active.The LED and port numbering is shown in the table below. This is also engraved in a table on the rear panel.

Port indicator LED	P1 P2	P3 P4	P5 P6	P7 P8
Upper ports	P2	P4	P6	P8
Lower ports	P1	P3	P5	P7

Figure 3.6 LAN port indicator LEDs & port numbers

3 . 3. 1 LAN RJ45 port pinout

Each of the ports in the array has the pinout shown below, but will auto select MDI/MDIX configuration.

RJ45 Pin No	1	2	3	4	5	6	7	8
Function	Rx +	Rx -	Tx +			Tx -		

Figure 3.7 RJ45 LAN port pinout

3.4 E1/T1 RJ45 port layout

In earlier models the E1/T1 ports may not be identified on the rear panel silk screening as given in the figure above. The numeric and alpha port descriptions are given below:
:

E1/T1 Upper ports	B	D	F	H
E1/T1 Lower ports	A	C	E	G

Figure 3.8 E1/T1 Port by letter designations

3.5 E3/DS3 BNC port layout

Each E3/DS-3 port consists of two BNC outlets (Tx and Rx). The numeric and alpha port descriptions which appear on the rear panel are given below:
:

PORT 3 L	PORT 2 K	PORT 1 J

Figure 3.9 E3/DS-3 Ports by number & letter

Note that the port designations read *LKJ* as you face the rear panel, though the screen menus etc list them as *JKL* in the normal left to right manner.

3.6 9-Pin Terminal Port

The Terminal port is presented as a 9 way D-Type Female connector with the standard PC pin configuration as shown below:

The terminal port on the rear panel is presented as a 9-pin D-type female connector with the standard PC pin configuration as shown below

Pin	Signal
1	DCD
2	Receive Data
3	Transmit Data
4	
5	Signal Ground
6	DSR
7	RTS
8	CTS
9	

Figure 3.10 Terminal port layout

When a MetroLAN is first powered up the Terminal port will have the factory default configuration.as below:

Baud Rate: 9200
Parity: None
Character: 8 bits
Stop Bits: 2
Flow Control: XON/XOFF

4 QUICK START CONFIGURATION

4.1 Logging in to MetroLAN

The MetroLAN has a password protected, menu driven user interface. When a terminal is connected to the MetroLAN, press <ENTER> and the welcome banner will be displayed as shown:

```
Metrodata MetroLAN: Local connection to "[nodeame]"
password ('view' to view only):
```

At the prompt, enter the password to gain access to the MetroLAN. The default password is *"metrolan"*. For security, the password is obscured with * being displayed for each character typed. An incorrect password will lead to the welcome banner being redisplayed. A correct password will lead onto the main set up menu . Initially, this will be in the TTY format, but most users will wish to change to the VT100/220 style via the V.24 set-up function and toggling through the item *TERMINAL TYPE* as described immediately below.

```
MAIN SET-UP
Global status                <display>
 alarm eXtension             <menu>
Data port set-up             <menu>
V.24 set-up                  <menu>
Management                   <menu>
System                       <menu>
Testing                      <menu>
Performance data             <menu>

Select item by using first CAPITAL
letter of name

<escape> - exit menu
```

Figure 4.1 TTY style main menu screen

```
MAIN SET-UP
Global status                <display>
 alarm eXtension             <menu>
Data port set-up             <menu>
V.24 set-up                  <menu>
Management                   <menu>
System                       <menu>
Testing                      <menu>
Performance data             <menu>

HIGHLIGHTED letter -  select item

<escape> - exit menu
```

VT100/220 menu style screen

4.2 Navigating the User Interface

The MetroLAN user interface is a simple, menu based interface. In the TTY mode of display, each selectable item may be selected by typing the first capital of the option, e.g. for "Global status" type <G> or <g>. Sometimes, where multiple items have the same starting letter the selection capital will not be the first letter, e.g. "alarm eXtension" which is selected with <x>.

In the VT100/220 mode, the selectable letter is presented in **bold face.** On the right side of the display is a list of what is below each item. This could be:

<menu>This indicates a sub-menu will be entered
<display>This indicates an information screen will be displayed, such as status or statistics.

When you press a letter which leads to a further menu, the screen will be refreshed without scrolling, displaying the new menu.

If you press a letter corresponding to a menu option, the value opposite that option will be highlighted. You will also see the prompts at the bottom of the screen, similar to the TTY display:

```
<space>  - change value
<enter>   - save new value
<escape> - exit without saving
```

Figure 4.2 Prompt screen

Pressing the space bar will cause the next available value to be displayed opposite the option. When the required value is displayed, simply press the **<enter>** key to accept the value or press **<escape>** to leave the existing value unchanged.This process is known as toggling.

4.3 Configuring the System

The system menu provides the basic administrative configuration items for the MetroLAN and should be configured first:

4 . 3. 1 Setting the Time

The time is configured using the hh:mm:ss format in 24 hour notation. It is important to set the time correctly as all event logs are time stamped.

4 . 3. 2 Setting the Date

The date is configured using the dd/mm/yyyy format. It is important to set the date correctly as all event logs are time stamped.

4 . 3. 3 Setting the Node Name

To enable identification of the MetroLAN unit it is useful to enter a meaningful name for the unit. The node name is entered as a string of up to 16 alpha numeric characters, including spaces.

4.4 Configuration of the Data Ports

This section deals with the configuration of each of the user data port types including SDH, LAN, E1/T1 and E3/DS-3. A simple configuration will be shown for each type of port.
The port configuration is accessed from the main setup menu by selecting the data port menu. The data port menu gives the following options

DATA PORT SET-UP	
SDH port	<menu>
LAN port	<menu>
E1/T1 port	<menu>
DS3/E3 port	<menu>

Figure 4.3 Data port menu

4.5 Configuring the SDH Network Port

The SDH port configuration menu is accessed from the data port menu. For basic operation only three parameters must be set, the remaining parameters are optional and in many cases may be left in the default state.

SDH/SONET PORT	
Type of fibre	SM short-haul
Timing	Loop
C1/J0 selection	C1
E1 value	00
s**D** thresholds	10^-6
pa**Y**load	<menu>-
Path signal label	Auto
receiving	02 (TUG structure)
j**1** transmit	“ “
j1 eXpected	“ “
receiving	“ “
RDI type	1 - bit

Figure 4.4 SDH/Sonet set-up menu

4 . 5. 1 Timing

To ensure correct operation the correct timing mode must be configured for the SDH port. The options are:

Internal: SDH Transmit timing derived from the local oscillator and will be accurate to +/-15ppm

Loop: SDH Transmit timing is derived from the SDH receive

4 . 5. 2 Payload

The SDH framing structure is very flexible and can support many operating modes. The payload selection menu is used to determine how the frame is structured. Payload configuration is dependant upon the application. The payload configuration is split into two sections:

The Main Payload offers the following options

AU-4/VC-4	This mode will only support transport of a single LAN port since it utilizes the entire 149Mbps payload
AU-4/TUG-3	This mode will support transport of LAN, E1/T1 and E3/DS-3
	Note that if the main payload mode is **AU-4/TUG-3** then a sub menu is **also** displayed to select the mode of each of the three TUG-3 containers. The options are listed below:
VC-3	This mode is required to transport an E3/DS-3 or can be used for a single LAN port with 45Mbps bandwidth.
VC-12	This mode is required to transport an E1/T1, or can be used to transport LAN traffic.

Figure 4.5 Payload options

4 . 5. 3 Path Signal Label

The path signal label, C2 overhead byte, is used to indicate the type of payload carried on this network. C2 must be set correctly otherwise alarm conditions will be reported by the network. The value to configure depends upon the payload mode selected as below:

Main Payload Mode = VC-4 Path Signal Label = 1B (GFP)
Main Payload Mode = TUG-3 Path Signal Label = 02 (TUG Structure)

4.6 Optional Configuration Items

The following configuration items are not required to get the basic unit operational but will be required for a full deployment:

4 . 6. 1 C1/J0 Operating Mode

In the initial offering of ITU G.707 the C1 overhead byte was used to define the three overhead columns. Later versions of G.707 reassigned C1 as J0 which may be used as an identifier called the "Regenerator Section Trace". When the J0 mode of operation is selected, the user may configure a 15 character string to uniquely identify this interface. The 16th byte is a CRC-7 which is calculated and appended automatically by the MetroLAN.

The user may configure the following:

J0 Transmit: “String of up to 15 alphanumeric characters"
J0 Receive: “String of up to 15 alphanumeric characters"

If an expected J0 receive value is configured, the MetroLAN will declare a TIM alarm when there is a mismatch between the configured expected and actual receive J0 identifiers.
To assist the user in configuration, or fault diagnosis, the actual string being received is also displayed.

4 . 6. 2 Path Overhead, J1 Path Trace Configuration

The J1 Path Trace Identifier is a 16 character string where the user may define up to 15 characters and the MetroLAN will append a CRC-7. The user may configure the following:

J1 Transmit: “String of up to 15 alphanumeric characters"
J1 Receive : “String of up to 15 alphanumeric characters"

If an expected J1 receive value is configured, the MetroLAN will declare a TIM alarm when there is a mismatch between the configured expected and actual receive J1 identifiers.
To assist the user in configuration, or fault diagnosis, the actual string being received is also displayed.

4.7 Configuring LAN ports

The MetroLAN supports up to 8 LAN ports operating simultaneously. Each LAN port is configured independently. Dependant upon the payload mode configured for the SDH port, a reduced number of ports may be supported as below:

Payload Type	Maximum No of LAN ports
AU-4/VC-4	1
AU-4/TUG-3/VC-3	3
AU-4/TUG-3/VC-12	8

Figure 4.6 LAN port configurations

The LAN ports are presented as RJ-45 connectors on the rear panel of the MetroLAN and the port assignment is shown below as the user faces the rear panel:

2	4	6	8
1	3	5	7

4 . 7. 1 LAN Port Configuration

Having selected the LAN port menu option from the data port menu, you will be prompted for the port number, in the range 1 to 8, to configure. Once the required port number is entered, the LAN port configuration menu will be displayed as below:

LAN PORT 2	
State	Down
auto-**N**egotiation	Enabled
Flow control	Enabled
MDI/MDIX	Auto
ma**C** address	0.0.0.0.0.0
fcs **G**eneration	Disabled
ma**X** frame size	1536
gfp payl**O**ad fcs	Disabled
Allocation	-
LCAS	Enabled
max diff dela**Y**	32.000ms
RDI type	1 - bit

LAN PORT 2	
J1/J2 transmit	“ “
l**I**st allocation	<display>
lcas stat**U**s	<display>
coun**T**ers	<menu>

HIGHLIGHTED letter - select item

> - next page

<escape> - exit menu

Figure 4.7 LAN port config menu screens

Note, that the LAN port configuration menu is an extended menu with two screens. Use the less than **"<"** or greater than **">"** keys to switch between the screens.

In order to configure the system for basic operation, only 4 parameters need to be configured the rest may be left in their default state. However, for a more complex installation all parameters may be required.

4.7.1.1 State

To enable any configuration of the selected LAN port it must first be placed in the DOWN state. Once configuration has been completed and all parameters entered, the port state must be changed to UP at which point the port will become operational and start to pass traffic.

4.7.1.2 Allocation

Before any LAN traffic may be transported over SDH it must be allocated to the required tributary containers. Dependant upon the payload type selected for the SDH port the options are as follows:

Payload Type	Allocation Options
AU-4/VC-4	VC-4
AU-4/TUG-3/VC-3	1,2,3
AU-4/TUG-3/VC-12	use ***klm*** notation to define the tributaries See Note1below

Figure 4.8 LAN Allocation options

If more than a single VC-3 or VC-12 bandwidth is required, groups of tributaries may be allocated using either comma or dash notation or combinations as shown below:

For VC-3 groups: 1,2 or 1-2
For VC-12 groups: 111, 112, 113 or 111-133, 211-233

When allocating tributaries, the comma notation 111, 112, 113 means allocate the three tributaries, 111 and 112 and 113. Similarly the dash notation 111-113 means allocate the three tributaries 111 and 112 and 113.

Once the required tributaries have been allocated, the port must be changed to the UP state before traffic will pass.

Note1: ***klm*** notation is a shorthand way of identifying each of the possible 63 VC-12 containers within the STM-1 frame. ***k*** represents the TUG-3 number and has the range 1-3. ***l*** represents the TUG-2 number and has the range 1-7 since there are 7 TUG-2 s in a TUG-3. ***m*** represents the VC-12 within the TUG-2 and has the range 1-3 since each TUG-2 contains 3 VC-12s. Thus 111 is the first, and 373 is the last VC-12 in the STM-1 frame.

4.7.1.3 LCAS

Where tributaries have been grouped LCAS should be enabled to ensure correct operation should a group member fail for any reason. LCAS should be disabled if only a single tributary is used, or the remote equipment does not support LCAS.

4.7.1.4 Auto Negotiation

In most cases, Auto Negotiation may be enabled leaving the port to determine the speed and duplex mode of the attached equipment. However, when connecting to Fast Ethernet ports, which are fixed for 100M, e.g. Cisco equipment. Full Duplex operation, auto negotiation must be disabled and the speed and duplex set manually.

4 . 7. 2 Optional LAN port Configuration Items

The following items are not necessary to enable basic operation but may be configured to give a more reliable and manageable system.

4.7.2.1 Flow Control

The MetroLAN provides IEEE 802.3x pause frame based flow control to prevent buffer overflow when operating with a reduced bandwidth connection. By default this is enabled and is only active when auto negotiation is selected.

4.7.2.2 MDI/MDIX

The MetroLAN LAN ports by default will auto sense the cable type attached and will automatically configure as MDI (End Station e.g. PC for connection to a switch port) or as MDIX (Cross Over, for direct connection to an end station such as a PC). This may be disabled, in which case the MetroLAN will appear as an MDIX or switch port.

4.7.2.3 MAC Address

When Flow Control is enabled, the MetroLAN will output pause frames. These pause frames are formatted according to IEEE 802.3x and will have this MAC address as the source address. The options are 0.0.0.0.0.0 or the unique unit address. Selecting the unit address may help when trying to identify where pause frames are coming from, however since pause frames are not used by switches when building their MAC address tables there is no requirement for a unique source address.

4.7.2.4 FCS Generation

An Ethernet MAC frame has a four byte CRC-32 Frame Check Sequence appended to provide error detection. With FCS Generation disabled the entire MAC frame including FCS is transmitted end to end. However, to save bandwidth the FCS may be stripped on ingress and recalculated and appended on egress at the remote end. In this way bandwidth is reduced since all MAC frames are effectively 4 bytes smaller. It is important that this configuration option matches that of the far end otherwise frames will end up either 4 bytes to small (no FCS) or 4 bytes to large (double FCS).

4.7.2.5 Max Frame Size

For most common LAN protocols 1536 bytes is more than adequate. For some protocols however, larger frame sizes may be required. MetroLAN can support frames up to 4096 bytes in length.

4.7.2.6 GFP Payload FCS

The GFP protocol allows for transmission of frames with or without protection of an FCS. If enabled a 4 byte CRC-32 is appended to GFP payload. Since most SDH networks have very low error rates, errors introduced on the network are rare and will be dealt with by the higher layer protocols, so the bandwidth gains are beneficial. If however, a large number of errors are being detected, the payload FCS should be enabled to allow for the detection of errors in the network.

4.7.2.7 Max Differential Delay Compensation

In most cases the default setting of 32ms is sufficient, however if a large number of VC-12 tributaries have been allocated and they are routed via very diverse routes this may need to be increased to the maximum of 48ms. An alarm will be raised to indicate that the differential delay setting is too low.

4.7.2.8 J1/J2 Strings

Each tributary assigned to a LAN port may have an individual Path Trace Identifier configured. For VC-3 tributaries it is the J1 string, and for VC-12 it is J2. In both cases a 16 byte string made up of 15 user characters and a single CRC-7 byte are used. The user may configure the following on a per tributary basis:

J1/J2 Transmit: “String of up to 15 alphanumeric characters"
J1/J2 Receive: "String of up to 15 alphanumeric characters"

If an expected J1/J2 receive value is configured, the MetroLAN will declare a TIM alarm when there is a mismatch between the configured expected and actual receive J1/J2 identifiers. Since there may be many tributaries assigned to a single LAN port, there is the option of including the tributary number automatically such that the first four characters become ***klm,*** leaving 11 characters for the user string. Similarly once the label has been defined it may be copied to all tributary group members.

4.8 E1/T1 Port Configuration

The MetroLAN supports up to 8 E1/T1 ports operating simultaneously. Each E1/T1 port is configured independently. Dependant upon the payload mode configured for the SDH port, E1/T1 may not be available:

Payload Type	E1/T1 Supported
AU-4/VC-4	No
AU-4/TUG-3/VC-3	No
AU-4/TUG-3/VC-12	Yes

The E1/T1 ports are presented as RJ-45 connectors on the rear panel of the MetroLAN and the port assignment is as follows:

2(B)	4(D)	6(F)	8(H)
1(A)	3(C)	5(E)	7(G)

Please note that the ports may be labelled as 1 to 8 on the rear panel but are referenced as A to H in the user interface. There are three parameters which must be set for every application and to get the basic system up and running. The remaining parameters may be configured but in most cases may be left as default.

E1/T1 PORT B	
State	Down
Interface	E1
rx s**E**nsitivity	Short-haul
Allocation	-
RDI type	1-bit
J2 transmit	
j2 e**X**pected	00
List allocation	<display>
cou**N**ters	<display>

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 4.9 E1/T1 Menu screen

4 . 8. 1 State

In order to configure the E1/T1 port it must first be placed in the DOWN state. Once configuration is completed the state must be changed to UP before normal operation will commence.

4 . 8. 2 Interface

The port operating mode must be selected to be either E1 or T1. This selection is on a per port basis. In each case the E1/T1 circuit is asynchronously mapped into a VC-12 tributary.

4 . 8. 3 Allocation

The E1/T1 port must be allocated to a single VC-12 tributary within the STM-1 frame. The allocation is entered in "klm" format.

4.9 Optional E1/T1 Configuration Parameters

The following parameters are not generally necessary to get the basic system up and running, however their configuration may improve manageability or increase reliability.

4 . 9. 1 Rx Sensitivity/Line Build Out

In most case the E1/T1 end station will be located close to the MetroLAN and thus the default settings will be fine. However, if there is a long cable run to the end station then the Rx Sensitivity and Line Build Out options may need to be changed to reflect the actual deployed equipment.

4 . 9. 2 Path Trace Identifier

In order to identify the VC-12 that is carrying the E1/T1 a label may be attached. This is in the form of a 15 byte user string and an automatically appended CRC7 byte.
The user may configure the following on a per tributary basis:

J2 Transmit String of up to 15 alphanumeric characters
J2 Receive String of up to 15 alphanumeric characters

If an expected J2 receive value is configured, the MetroLAN will declare a TIM alarm when there is a mismatch between the configured expected and actual receive J2 identifiers.

4.10 E3/DS-3 Port Configuration

The MetroLAN supports up to 3 E3/DS-3 ports operating simultaneously. Each E3/DS-3 port is configured independently. Dependant upon the payload mode configured for the SDH port, E3/DS-3 may not be available:

Payload Type	E3/DS-3 Supported
AU-4/VC-4	No
AU-4/TUG-3/VC-3	Yes
AU-4/TUG-3/VC-12	No

The E3/DS-3 ports are presented as 75ohm BNC connector pairs on the rear panel of the MetroLAN. Note, that the ports may be labelled as 1 to 3 on the rear panel but are referenced as J to L in the user interface.
There are three parameters which must be set for every application and to get the basic system up and running. The remaining parameters may be configured but in most cases may be left as default.

4 . 10. 1 State

In order to configure the E3/DS-3 port it must first be placed in the DOWN state. Once configuration is completed the state must be changed to UP before normal operation will commence.

4 . 10. 2 Interface

The port operating mode must be selected to be either E3 or DS-3. This selection is on a per port basis. In each case the E3/DS-3 circuit is asynchronously mapped into a VC-3 tributary.

4 . 10. 3 Allocation

The E3/DS-3 port must be allocated to a single VC-3 tributary within the STM-1 frame. The allocation is entered in the range 1 to 3.

4.11 Optional E1/T1 Configuration Parameters

The following parameters are not generally necessary to get the basic system up and running, however their configuration may improve manageability or increase reliability.

4 . 11. 1 TX Line Build Out

When DS-3 is selected the line build option is available to vary the transmit power. In most case the DS-3 end station will be located close to the MetroLAN and thus the default settings will be fine. However, if there is a long cable run to the end station then the Line Build Out may need to be changed to reflect the actual deployed equipment.

4 . 11. 2 J1 Path Trace Identifier

In order to identify the VC-3 that is carrying the E3/DS-3 a label may be attached. This is in the form of a 15 byte user string and an automatically appended CRC7 byte. The user may configure the following on a per tributary basis:

J1 Transmit : “String of up to 15 alphanumeric characters"
J1 Receive: “String of up to 15 alphanumeric characters"

If an expected J2 receive value is configured, the MetroLAN will declare a TIM alarm when there is a mismatch between the configured expected and actual receive J2 identifiers.

4.12 Remote Management Configuration

To access the MetroLAN remotely via an Ethernet connection a connection is required to the Management Port on the rear panel of the MetroLAN. The Management port supports 10BaseT and is presented MDI on RJ45 for direct connection into a switch. The management port is fixed for operation at 10Mbps, Half Duplex.

4 . 12. 1 Setting the Unit IP Address

From the MAIN SET-UP menu, select the MANAGEMENT menu and then select the ETHERNET menu.

In order to set, or change, the IP address the LAN port state must first be set to *DOWN*.

Configure the IP address using the format AA.BB.CC.DD
Configure the Network Mask, if not Class C

Activate the LAN port by changing the state to *UP*

4 . 12. 2 Setting a default Route

From the MAIN SET-UP menu, select the MANAGEMENT menu and then the IP menu, and then select the ROUTING TABLE. To add a new entry as the default route proceed as follows:

Destination	0.0.0.0
Mask	0.0.0.0
Interface	Select Ethernet interface
Next Hop	IP Address of Next Hop Router

5 FAULT FINDING

Following initial configuration all may be well and all traffic is passing error free. However, in many cases it is possible that there may be problems. This section gives a quick overview of how to go about diagnosing where the problem may lie.

5. 1 Top Level Alarm Summary

To give an immediate indication of the current operational state of the MetroLAN a summary alarm indication is shown in the top right corner of every menu in the user interface.
The top line of the display shows:

Metrodata MetroLAN: Local connection to *"[nodename]"* Alarms: none

If any alarms exist in the system the display will change to show either:

Alarms : Minor
Alarms : Major

If there are either major or minor alarms present, then further investigation is required using either the global status overview, or the performance monitoring screens.

5. 2 Global Status Overview

When the MetroLAN is experiencing problems the first place to look to get an overview of where the problems are is the Global Status Display. This is accessed from the MAIN SET-UP menu and gives an overview of every port and tributary on a single screen. For full details of this screen please refer to the MetroLAN user Manual.

The Global Status shows both current alarms and historical alarms. Current alarms are shown in capitals, e.g. LOS and this means that the alarm is currently active. Historical alarms are shown in lower case, e.g. los, and means that some time in the past an alarm occurred. Historical alarms may be cleared by typing **<C>** to clear the history.

For each port or tributary a single alarm will be displayed and in most cases this is the highest priority alarm for that layer. Often multiple alarms will be active and it will be necessary to view the physical layer statistics for that particular port or tributary to identify all active alarms.

5. 3 Performance Data

The performance data screens provide complete status for each physical port or tributary within the system. The display will maintain a count of errored seconds for each alarm and also provides a display of all currently active alarms.

The temporary count column may be cleared without affecting the main 24 hour performance statistics to make the current network state clearer.