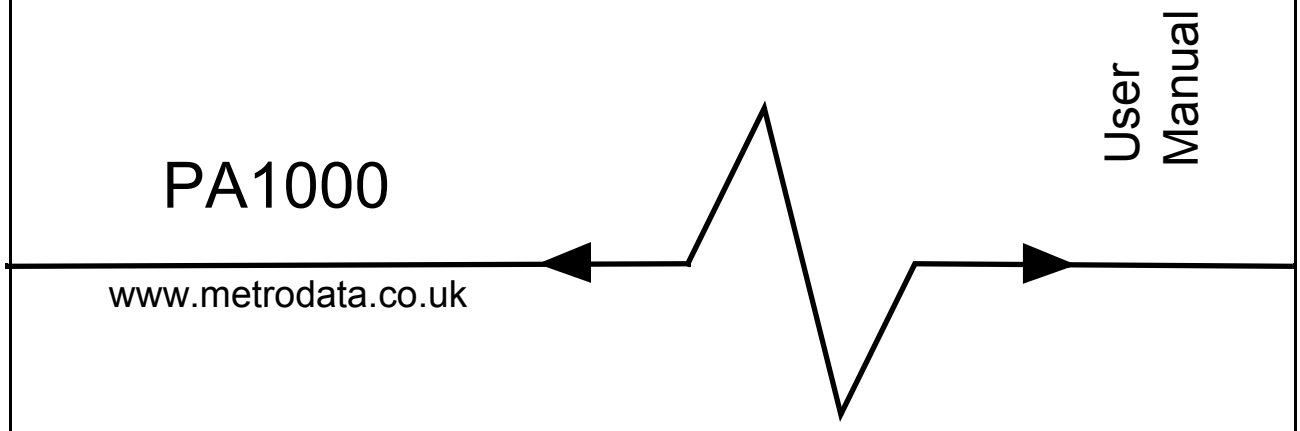

Metrodata PA1000 User Manual

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1 INTRODUCTION

1. 1 About The PA1000

The PA1000 Data Converter is used to connect Packet-over-Sonet (PoS) routers to legacy HSSI routers, and also to connect a PoS router to a satellite modem operating at less than 155Mbps. The PA1000 converts data from byte-oriented HDLC, as used in PoS interfaces, to bit-oriented HDLC as found on HSSI interfaces.

The PA1000 rate-adapts by stripping flags out of the data stream and transporting only the actual packet data. It is transparent to packet payload and may operate with any protocol that both the PoS and HSSI devices support. Note that the PA1000 supports non-standard data rates and asymmetric operation, thus providing significant flexibility for the user.

The PA1000 thus provides a solution for satellite operators wishing to use high performance PoS based routers without the need to use valuable chassis slots for low speed HSSI serial interfaces.

The PA1000 also provides extensive performance monitoring facilities. It can monitor degraded line performance and has extended alarm processing on the connection, giving the network manager extensive visibility and control of the wide-area link. A record of all error conditions, including major and minor alarms and bit errors, is kept for the last 24 hours. Statistics are recorded every 15 minutes and processed into G.821 format. Ninety-six 15 minute periods are kept, which means that 24-hour coverage is maintained on a rolling basis.

Diagnostics are provided to localise a fault condition on the line. These are provided by various types of loopback.

1. 2 Typical PA1000 Installation

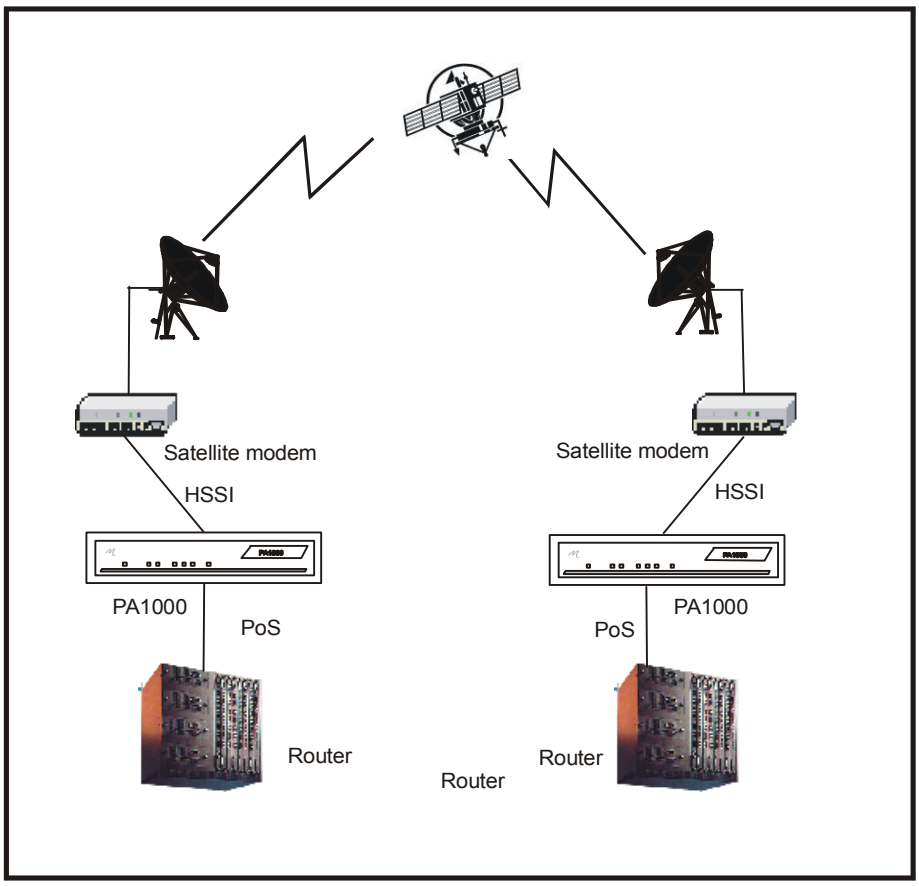

Figure 1. 1 PA1000 typical deployment

1. 3 About This Manual

This user manual describes the installation, commissioning and operation of the Metrodata PA1000 Data Converter. It describes the operational functions of the unit, as well as the extensive performance monitoring facilities.

It is important that you read and understand the performance and operating limitations in Section 2 and specifications in Section 10 of the PA1000 before attempting any connections. Also, familiarise yourself with each of the connectors at the rear of the unit, which are described in Section 4.2.

Section 3 describes the front and rear panels of the PA1000 with details of connectors, connector layouts and alarm lights. It is worthwhile to study the detail of Sections 3 and 4 since this helps in installing and testing the unit.

Section 4, Installing & Setting-up, takes you through the basic steps of connecting the PA1000 to the external devices that you may have.

The structure of the menus is described in Section 5, Configuring the PA1000, as well as each of the options on every menu. Part of this Section describes a typical commissioning procedure, and acts as a checklist for both first-time and experienced users of the PA1000.

Section 6, Analysing Performance, shows you how to monitor the PoS link and change the summary report options for the PA1000.

Section 7 introduces the concept of remote management of the PA1000 using Simple Network Management Protocol with an LM1100 SNMP Enabler. However, this subject is too detailed to be described in this manual, and you should refer to the LM1100 SNMP Enabler User manual.

The extensive diagnostic testing and troubleshooting functions of the PA1000 are described in Section 8, including testing both local and remote connections. The troubleshooting subsection is provided to assist with isolating any errors or faults that may occur. Section 9 lists the various specifications of the PA1000 together with a Glossary of terms, and at the rear of the manual a menu chart is included as an aid to installing the PA1000.

1. 4 Conventions

Notes are used to provide the reader with either statutory information which must be observed for safety reasons, or additional information which may increase the PA1000's effectiveness.

A pair of arrows around a word indicates a key on the keyboard, such as

<space> or **<escape>**

There are two exceptions to this, which appear on some of the menus:

<display> indicates that selecting the option will lead to data being displayed on the screen.

<menu> indicates that the option leads to another menu, from which further options may be chosen.

Screen displays that contain variable information, such as the current date or time, show the variable in italics, surrounded by square brackets, i.e. *[time]*, or *"[nodename]"*. The speechmarks indicate that the field contents can be specified by the user.

Where menu items are referred to in the text, these are shown in italics to help the reader to cross relate to menu information.

Screen examples: the PA1000 allows you to use one of three options for displaying the menus on a terminal - ANSI, VT100/VT220 or TTY.

The screen examples in this manual use VT100/VT220 and are shaded to allow easy identification by the reader.

2 STATUTORY INFORMATION

2. 1 Safety

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

HSSI port
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 PA1000 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 Power Supply

The PA1000 is powered by a mains power supply internal mains-fed power supply. The input voltage is 100-250VAC, 50/400Hz with an input current of 50 mA. An alternative unit fitted with a nominal -48VDC power supply is available, the supply definition being minus 36to minus 72VDC, 200-100mA.

The unit must be connected to safety earth for correct operation. The PA1000 power supply should be connected to a supply socket that is physically located close to the unit and is easily accessible.

Safety Notes:
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 PA1000 must be connected to safety earth for correct operation.

2. 6 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.

2. 7 Laser technology

The user is reminded that the PA1000 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

3 INTRODUCING THE PA1000

The PA1000 is supplied in a metal enclosure for tabletop or 19” rack mounting using the optional rack mounting ears that bolt onto the side of the module.

3. 1 Front panel

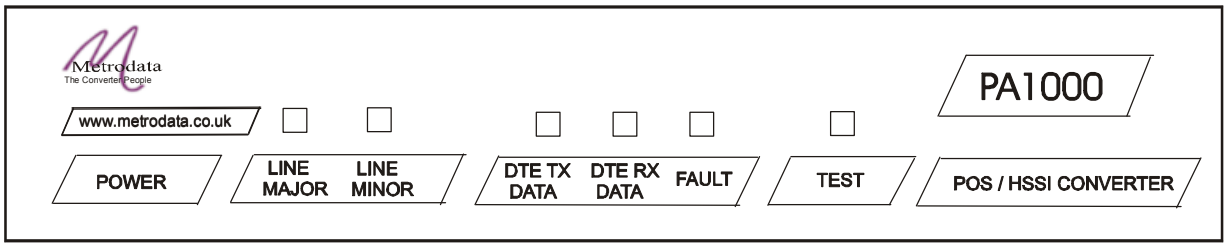

Figure 3. 1 PA1000 front panel

The PA1000 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.

LED	Colour	Meaning
Power	Red	Power is being received.
Line		
Major Minor	Red Yellow	LOS, LOF alarm is present AIS or FERF alarm is present.
DTE		
Fault	Red	The TT clock is out of specification or the PA1000 has a hardware timing fault.
TX Data and RX Data	Red Green Orange	Data being transmitted or received = 1 Data being transmitted or received = 0 The data is switching rapidly between 0 and 1
Test		
	Red	The PoS port is looped locally or remotely
	Unlit	no test in progress

Figure 3. 2 Front panel alarms

3. 2 Rear panel

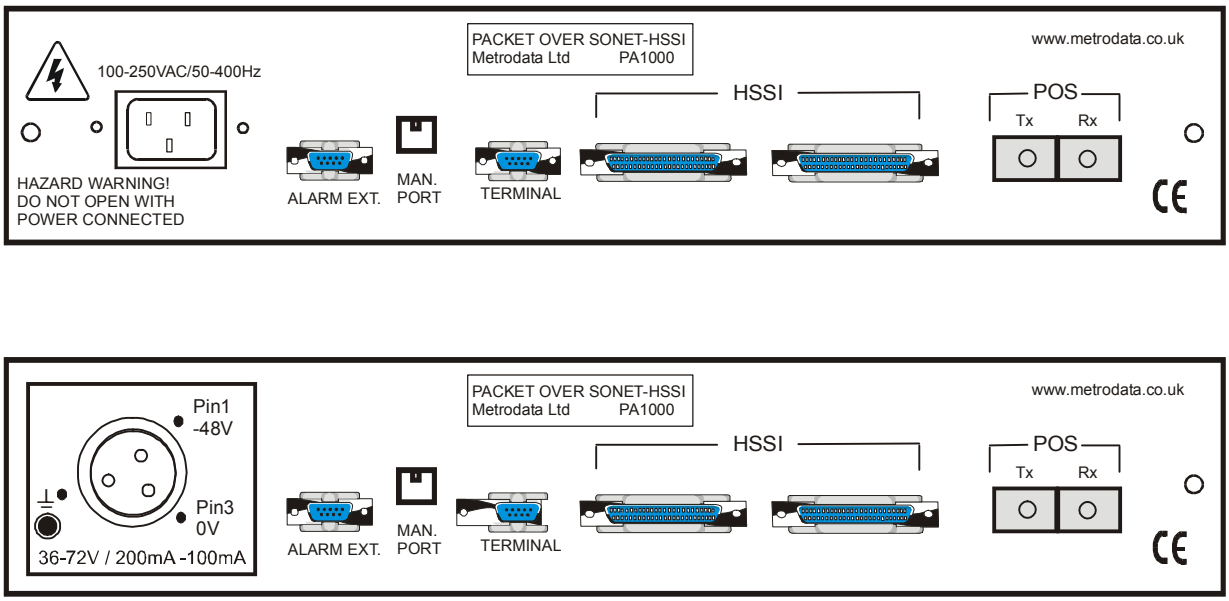

Figure 3. 3 PA1000 Rear panels, AC & DC models

3. 3 Power Supply

The PA1000 is powered by a mains supply with an input voltage of 100-250VAC 50-400Hz and with a maximum input current of 100 mA at 100VAC. The PA1000 is provided ex-factory with a 250mA internal fuse. 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 minus 72 volts DC, 200 - 100mA. 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 PA1000.

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

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

Figure 3. 4 -48VDC connections

Note: The PA1000 must be connected to mains safety earth for correct operation.

3. 4 Remote Management port

If you have chosen the LM1100 SNMP Enabler option this port will contain an RJ45 connector, otherwise it will contain a blanking plug.

This port is labelled *MAN PORT* on the rear panel. The LM1100 SNMP Enabler option gives access to the SNMP network management system via an IEEE 802.3/10BaseT interface on the rear of the unit. The layout of this port's RJ45 connector is shown below:
Note: The Management port is regarded as a SELV port within the scope of EN 41003.

Pin	Signal
1	Tx Data + ve
2	Tx Data - ve
3	Rx Data + ve
4	Not connected
5	Not connected
6	Rx Data - ve
7	Not connected
8	Not connected

Figure 3. 5 Management port layout

3. 5 Alarm Extension

This port contains a 9-pin D-type connector, allowing you to connect the major and minor alarm relay contacts within the PA1000 to a remote indicator, such as a bell or a lamp. The two types of connectors are described below. The Major alarm relay is energised for normal operation, so that major alarm indication is given if the mains power supply to the DSU should fail. The Alarm Relay port is regarded as a SELV port within the scope of EN41003.

Pin	Function
1	Shield
2	Major common
3	Minor N/O
4	Minor N/C
5	Not connected
6	Major N/C
7	Major N/O
8	Minor common
9	Not connected

Figure 3. 6 9-pin D-type connector layout

3. 6 Terminal Port

The terminal port is provided for local management of the PA1000. It is a female 9-pin D-type connector with a full RS232 layout which is shown below.

Note: The Terminal port is regarded as a SELV port within the scope of EN 41003.

Pin	Function
1	DCD
2	Transmit
3	Receive
4	Not connected
5	Ground
6	DSR
7	RTS
8	CTS
9	Not Connected

Figure 3. 7 Terminal port connector layout

If the menu item *VIA MODEM* in the *V.24 SET-UP* menu is set to its default value *YES,* then RTS (pin 7 on the DSU terminal port) needs to be correctly driven, otherwise the user will be permanently logged out of the DSU. To drive the RTS correctly, a fully configured cable can be used together with a terminal that supports hardware handshaking. An alternative approach is to connect the RTS and DSR signals together (pins 6 and 7) at the DSU end of the cable.

3 . 6. 1 Minimum RS232 connection

A cable to connect a local terminal to this port (without a modem) may have the minimum RS232 connection when this is suitable for the terminal being used, as shown below.

9-Way Male (DSU)	Function	25 Way D Female	9 way D
1		Not connected	
3	Transmit	2	3
2	Receive	3	2
4		Not connected	
5	Ground	7	5
6	Loop		
7	Loop		
8		Not connected	
9		9-25 Not connected	

Figure 3. 8 Local terminal cable pinout

3 . 6. 2 V.24 Terminal Connector 9 Way to 9 Way

A connector cable can be used to connect from the 9-way female D-type connector on the rear panel of the DSU to the 9-way D-type connector of a PC compatible COM port. This may be required if a PC is being used as the management terminal. The connections are:

9 Way D Male (DSU)	Function	9 Way D Female (PC)
1	DCD	1
2	Receive	2
3	Transmit	3
4	Not connected	4
5	Ground	5
6	DSR	6
7	RTS	7
8	CTS	8
9	Not connected	9

Figure 3. 9 Terminal port connector cable 9 way to 9 way

Note: To inhibit the modem control function, loop pins 6 and 7 at DSU end of cable, and do not connect PC pin 7, RTS.

3 . 6. 3 V.24 Terminal Converter 9 Way to 25 Way

A converter cable can be used to convert from the 9-way female outlet on the DSU to a 25-way female D-type connector such as is used for many dumb terminals.

9 Way D Male (DSU)	Function	25 Way D Female
1	DCD	8
2	Receive	3
3	Transmit	2
4	Not connected	
5	Ground	7
6	DSR	6
7	RTS	4
8	CTS	5
9	Not connected	1, 9-25

Figure 3. 10 9 way to 25 way converter cable

Note: To inhibit the modem control function , loop pins 6 and 7 at DSU end of cable, and do not connect PC pin 4, RTS

3. 7 HSSI DTE & DCE Ports

HSSI is a co-directionally clocked interface with clock and data travelling in the same direction along the cable; therefore, round trip delays are not an issue.

For the co-directional interface the DCE supplies the Send Timing signal to the DTE. The DTE then uses this clock to return Terminal Timing along with Send Data.

The SCSI-2 50-way connector layouts for this port are shown in the two tables below. The port operates up to a maximum speed of 100Mbit/s at the supplied DCE clock rate. The HSSI port does not support loopbacks.

Pin	Direction	Signal name	Pin	Direction	Signal name
1		Signal Ground	26		Signal Ground
2	Output	Receive Timing(A)	27	Output	Receive Timing(B)
3	Output	DCE Available(A)	28	Output	DCE Available(B)
4	Output	Receive Data(A)	29	Output	Receive Data(B)
5			30		
6	Output	Send Timing(A)	31	Output	Send Timing(B)
7		Signal Ground	32		Signal Ground
8	Input	DTE Available(A)	33	Input	DTE Available(A)
9	Input	Terminal Timing(A)	34	Input	Terminal Timing(A)
10			35		
11	Input	Send Data(A)	36	Input	Send Data(B)
12			37		
13		Signal Ground	38		Signal Ground
14			39		
15			40		
16			41		
17			42		
18			43		
19		Signal Ground	44		Signal Ground
20			45		
21			46		
22			47		
23			48		
24			49		
25		Signal Ground	50		Signal Ground

Figure 3. 11 HSSI DCE connector layout

Pin	Direction	Signal name	Pin	Direction	Signal name
1		Signal Ground	26		Signal Ground
2	Input	Receive Timing(A)	27	Input	Receive Timing(B)
3	Input	DCE Available(A)	28	Input	DCE Available(B)
4	Input	Receive Data(A)	29	Input	Receive Data(B)
5			30		
6	Input	Send Timing(A)	31	Input	Send Timing(B)
7		Signal Ground	32		Signal Ground
8	Output	DTE Available(A)	33	Output	DTE Available(A)
9	Output	Terminal Timing(A)	34	Output	Terminal Timing(A)
10			35		
11	Output	Send Data(A)	36	Output	Send Data(B)
12			37		
13		Signal Ground	38		Signal Ground
14			39		
15			40		
16			41		
17			42		
18			43		
19		Signal Ground	44		Signal Ground
20			45		
21			46		
22			47		
23			48		
24			49		
25		Signal Ground	50		Signal Ground

Figure 3. 12 HSSI DTE connector layout

4 INSTALLING & SETTING-UP

This chapter describes how to set up the PA1000 ready for use. It covers the initial connections, powering on the unit, and how to access the software that controls the operating parameters.

Setting and changing these parameters is covered in Section 5, Configuring PA1000.

Safety Notice: Ports that are identified as SELV in this manual should only be connected to SELV ports on other equipment in accordance with EN 60950 clause 2.3.

4. 1 Connections

Step 1: Mounting
The PA1000 is housed in a convenient 1U table top enclosure. The unit may also be installed in a 19" rack using the 1U rack mounting brackets supplied.

Step 2: DCE / DTE
Connect the PA1000 to the HSSI DCE or DTE, using one of the two 50-way AMP connectors on the rear panel of the unit labelled DCE (TO ROUTER) or DTE (TO MODEM). The choice of which connector to use depends on the type of device to which connection is being made.

Step 3: POS
Connect the POS fibres to the POS Tx and Rx sockets on the rear panel.

Step 4: Terminal
Connect the management terminal (Teletype or VT100/220 or PC) using the 9-way D- type connector labelled *TERMINAL* on the rear panel of the unit.

Step 5: Alarm Extension
If you wish to use an external alarm device, connect this to the alarm extension port.

Step 6: SNMP Management Port
If you have the LM1100 SNMP Enabler option and wish to use it, connect the LAN to the port labelled MAN PORT using an RJ45 connector.

Step 7: Power Supply
Finally, connect the mains power lead (or DC power cable) and re-check all connections for security. See section 2.4 for connection details for the optional -48V DC power supply. Turn on the terminal and external alarm device if used, then turn on the power supply.

Warning: Do not connect the PA1000 to excessive voltages. Read the safety information before continuing.

4. 2 Power-Up Sequence

When the PA1000 is powered up, it performs several system tests. After a few seconds the start-up screen is shown on the terminal. Figure 5.1 below is an example only:

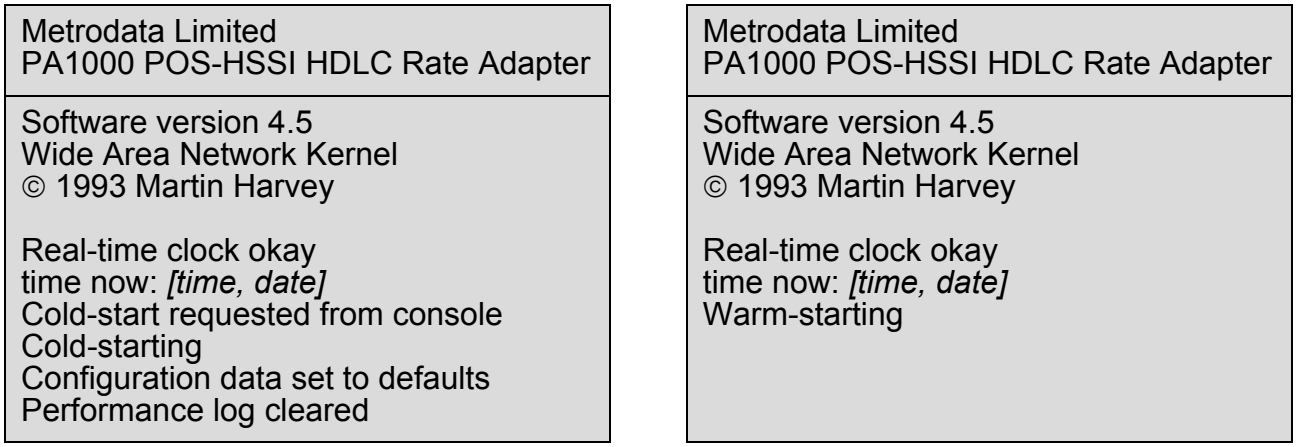

Figure 4. 1 Start-up screens

In order to check or change any of the operating parameters, you will first need to gain access to the PA1000's software by logging in. Press any key, and a logon message will be displayed:

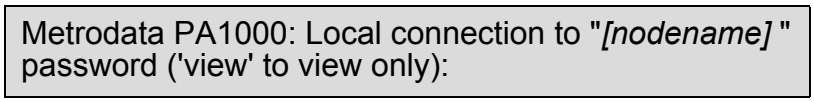

Figure 4. 2 Logon screen

There are two levels of user - Observer, or Operator. If you type *VIEW* as the password, you will only be able to look at the current settings, and will not be able to change any of them. If you enter the correct operator password, you can change any parameters that are not defined as read-only.

The default operator password is the same as the model number, i.e. *PA1000*. When you have entered this once, you will be able to change the password if you wish, as described in Section 6.3. When you enter the appropriate password, you will be presented with the *MAIN SET-UP* menu. All of the PA1000's operating parameters are accessed through this initial menu.

4. 3 User Interface

The display of the menu, and the way you select menu options, will depend on which type of terminal you have connected to the unit, and which version of PA1000 firmware you have. This section describes the differences between the three main types of display - how to change the display set-up is described at the end of this section.

4 . 3. 1 TTY terminal

With a TTY terminal, options are selected by pressing the first capital letter in the name. Generally, this will be the first letter, but where two menu options start with the same letter one of them will have another letter capitalised. An example of a TTY display is shown below:

```
MAIN SET-UP
 alarm eXtension          <menu>
 General set-up           <menu>
 Data port set-up         <menu>
 V.24 set-up              <menu>
 Management               <menu>
 Testing                  <menu>
 Special                  <menu>
 Performance data         <menu>

Select item by using first CAPITAL
letter of name

<escape> - exit menu
```

Figure 4. 3 TTY Main set-up menu

When you press a letter which leads to a further menu, the screen will scroll up and the new menu will be displayed. The item *MANAGEMENT* only appears if the LM1100 SNMP Enabler has been fitted to the PA1000.

Pressing a letter corresponding to a menu option will lead to additional prompts at the bottom of the screen:

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

Figure 4. 4 Prompt screen

The current value of that option will then be shown. Each time you press the space bar, the next value will be displayed, cycling through the available values. When the required value is displayed, simply press the <enter> key to accept the value or press <escape> to cancel your choice. This process is known as toggling.

4 . 3. 2 VT100/VT220 and ANSI terminals

The displays you see on a VT100/VT220 or an ANSI terminal are very similar, and examples are shown below:

MAIN SET-UP	
alarm e**X**tension	<menu>
General set-up	<menu>
Data port set-up	<menu>
V.24 set-up	<menu>
Management	<menu>
Testing	<menu>
Special	<menu>
Performance data	<menu>

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 4. 5 VT/ANSI Main set-up menu

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. 6 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.

Note that if you use a PC with the Windows Hyperterm terminal emulator set to VT100/220, click on ***View/Font*** and activate ***MS Linedraw*** to achieve best picture quality.

4. 4 Default settings

The default settings for the terminal connected to the management port are given in the table below.

The terminal must be set to the PA1000 default values after performing a cold start. Once this is done, the PA1000 V.24 settings can be changed using the *V.24 SET-UP* menu, which is accessed from the *MAIN SET-UP* menu described in the next section.

The default terminal is a Teletype *(TTY),* but the vast majority of users will employ a *VT100/220* or an *ANSI* terminal either directly or on a PC via a terminal emulator. The TTY output screens do not have graphic capability, and are therefore not so easy to read when setting up the system.

After a making change in the PA1000's stored terminal set-up (with the terminal on default settings), select *LOAD NEW CONFIG* on the menu screen. The physical terminal must then be re-set to correspond to the new values stored in the unit.

V.24 Item	Defaults	Options
Terminal type	TTY	TTY, VT100/220, ANSI
Via Modem	Yes	No
Baud rate	9600	2400, 4800, 9600, 19200
Parity	None	Odd, Even
Data bits	8	7 or 8
Stop bits	1	1 or 2
Flow control	Xon/Xoff	

Figure 4. 7 V.24 Terminal set-up defaults and options

5 CONFIGURING THE PA1000

5.1 Menu Structure

When you have completed the installation, and have successfully logged in, you will be presented with the *MAIN SET-UP* menu. In order to view or change a parameter, you need to know which menus or options to display. This section describes how to navigate your way through the menus. In Figure 6.1 below, the shaded boxes represent screens that lead to further menus.

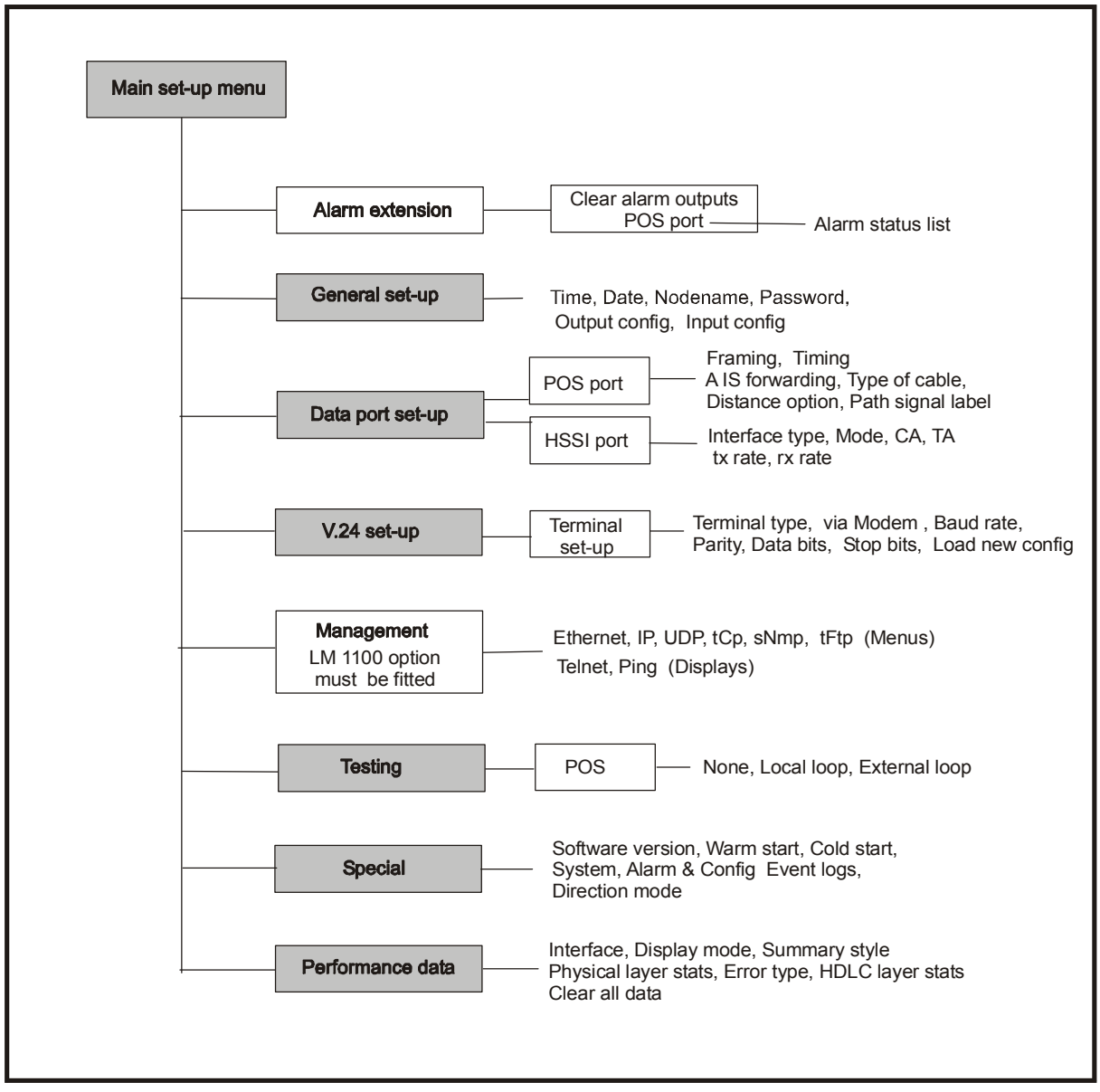

Figure 5.1 PA1000 Menu structure

Note: When interacting with menus, pressing the <escape> key on any screen will return you to the previous screen in the structure.

5.2 Main Set-up Menu

MAIN SET-UP	
alarm e**X**tension	<menu>
General set-up	<menu>
Data port set-up	<menu>
V.24 set-up	<menu>
Management	<menu>
Testing	<menu>
Special	<menu>
Performance data	<menu>

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 5.2 Main set-up menu

The menu item *MANAGEMENT* only appears if the LM1100 SNMP Enabler has been fitted.

5.3 Alarm extension

Selecting the menu item *ALARM EXTENSION* on the *MAIN SET-UP* menu leads to a further menu.

ALARM EXTENSION	
Clear alarm outputs	<display>
POS port	<menu>

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 5.3 Alarm extension screen

5 .3.1 Clear Alarm Outputs

If the PA1000 has detected a major or minor alarm condition the alarm extension is activated. The alarm extension device may be muted by selecting *CLEAR ALARM OUTPUTS*. When this option is selected the alarm extension status (prior to the clear command) is shown below the menu.

```
Alarms cleared
POS Phys: LOS
Press any key to continue
```

Figure 5.4 Alarm status screen

Note: If the alarm extension has been cancelled with the *CLEAR ALARM OUTPUTS* option, the alarm is still indicated on the front panel indicator lights and in the performance statistics.

The *POS PORT* option shown below provides a display of all the alarms which are valid for the PA1000. in each operating mode. The alarms are labelled from 0 to 9 and A to Z in the firmware, and can be selected by their label.

POS PORT	
0 - LOS	Major
1 - LOF	Major
3 - AIS	Minor
4 - FERF	Minor

```
HIGHLIGHTED letter - select item
<escape> - exit menu
```

Figure 5.5 POS Port alarm config

Note: AIS only appears on the alarm listing if it has been *ENABLED* on the *POS PORT SET-UP* menu. Toggling the space bar permits the alarm to be configured by the user to *MAJOR, MINOR or NONE.* This affects which alarm extension relay is affected by an alarm. The configuration rules are:

MAJOR	major relay
MINOR	minor relay
NONE	no relay

Figure 5.6 Alarm relay config

Even if the alarm extension menu item is set to *NONE*, the performance reports described in Section 6 will continue to count alarms.

5.4 General Set-Up Menu

GENERAL SET-UP	
Time	*16:24:32*
Date	*Mon 2/4/01*
Node name	*"[nodename]"*
Password	
Output config	<display>
Input config	

HIGHLIGHTED letter - select item

<escape> - exit menu

Figure 6.7 General set-up menu

5 .4.1 Time

When you select Time, you will be prompted to enter the current time in the format hh:mm:ss. Note that this format uses the 24-hour clock. For example:

```
Enter time (hh:mm:ss)
> 14:30:00
```

Figure 5.7 Time prompt

5 .4.2 Date

Enter the current date in the format dd/mm/yyyyy. For example, April 4th 2001 would be entered as 4/4/2001. The corresponding day of the week is also displayed when you press <enter>. Leading zeros are suppressed by the date display.

```
Enter date "[dd/mm/yyyy]"
> 4/7/2003
```

Figure 5.8 Date prompt

The year is entered as an explicit 4 digit number (e.g. 2004), and processed as such in the firmware. Dates between 01/01/1980 and 31/12/2047 are valid.

5 .4.3 Node name

This is the name of the unit to which you are currently connected. The top of the screen indicates the current node by displaying

```
Local connection to "[nodename]"
```

At the *ENTER NEW NAME* prompt, you can enter the name you wish to give this node. The name may be up to 16 characters with no spaces permitted.

```
Enter new name
>
```

Figure 5.9 Enter new name

5 .4.4 Password

This option is used to change the current password. The supervisory password, which allows you to change settings, is initially set to the model number, i.e. *PA1000*. If you wish to change the password, select this item and then enter the new password.

The password may be up to 16 characters with no spaces permitted.

The password is not case-sensitive, which means that if you enter the password as upper case letters, the unit will accept either upper or lower case, or a mixture of both, when you next log on.

```
Enter new password
Password> ********
Verify>
```

Figure 5.10 Password prompt

For security, the characters you type are displayed on the screen as asterisks. You will also be asked to re-enter the password as a check.

5 .4.5 Output config

This item facilitates the outputting of config information to an intelligent terminal or PC connected to the DSU's terminal port and set up with a terminal emulator such as Hyperterm. When *OUTPUT CONFIG* is selected from the menu screen, the following message appears:

Metrodata LA1000: local connection to *"[nodename]"*
Start capture then press a key
After transfer, stop capture then press another key.

Figure 5.11 Output config screen response

The Hyperterm path *TRANSFER / CAPTURE TEXT* is selected, and when a key is pressed, transfer of configuration data takes place into a nominated file. Note that the file is a .TXT text file. As soon as the transfer is complete, the Hyperterm *DISCONNECT* button should be pressed to avoid capturing unwanted messages. A typical config file is shown below:

	e.0.c=1	e.0.f=1
e.0.t=1	e.0.b=1	e.0.j=1
e.0.o=1	e.0.xa=8652	e.0.xi=49715
e.0.xt=58367	e.0.q=65536	e.1.c=1
e.1.l=1	e.1.f=5	e.1.t=1
e.1.j=1	e.1.xa=8652	e.1.xi=49715
e.1.xt=58367	e.1.q=65536	a.0.m=-1
a.0.a=1	a.0.h=2	a.0.c=1
a.0.p=1	a.0.s=28	a.1.m=-1
a.1.a=1	a.1.h=2	a.1.c=1
a.1.s=28	v.b=3	v.w=LA1000
v.a=31	v.r=2	v.e=1
g.n=egham3k	g.t=60	p.0.e=3
p.0.d=1	p.0.i=5	p.0.v=1
p.1.i=5	p.2.i=5	n.0.a=1
n.0.p=0.192.129.0.1.255	n.0.n=255.255.255.0	n.0.b=1
n.1.n=255.255.255.0	n.1.b=1	n.1.t=1
n.2.b=1	n.2.t=2	n.2.f=255.255.255.255
i.t=32	s.up=161	s.ut=162
s.sc=public	s.sw=public	s.st=public
s.sm=255.255.255.255	s.ts=software	s.tc=config

Figure 5.12 Metrodata DSU Configuration dump file

5 .4.6 Input config

This item facilitates uploading of config information from a stored Text file into a DSU. It also requires the use of a PC as an intelligent Management terminal connected to the DSU's terminal port. When *INPUT CONFIG* is selected from the menu screen, the following message appears:

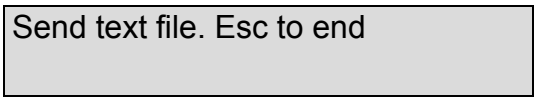

Figure 5.13 Input config message screen

The Hyperterm path *TRANSFER / SEND TEXT FILE* is selected, together with the file containing the config information. When a key is pressed, transfer of configuration data takes place from a nominated file into the DSU's memory.

5.5 Data port set-up

The *DATA PORT SET-UP* menu permits both the POS and the HSSI ports top be set-up. There is an introductory screen as shown below:

DATA PORT SET-UP	
POS port	<menu>
HSSI port	<menu>

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 5.14 Data port introductory screen

5 .5.1 POS port set-up

The POS port has only three set-up options, and the rest of the screen is advisory as shown below.

POS PORT	
Framing	STS-3c
Timing	Internal
AIS forwarding	Always
Type of cable	Single-mode
Distance option	Short-haul
Path signal label	Auto

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 5.15 POS port set-up menu

FRAMING can be set to either *STS-3c* or *STM-1*

TIMING can be set to either *INTERNAL* or *LOOP.*

AIS FORWARDING can be set to *ALWAYS, NEVER* or *UNDER DTE CONTROL*

The *TYPE OF CABLE* and *DISTANCE OPTION* are self explanatory, and are automatically detectwed by the DSU and are for the users information.

The *PATH SIGNAL LABEL* defines the traffic type specifier C2 within the Sonet/SDH frame. It can be set to *AUTO* or to the hex value corresponding to the desired traffic type. *AUTO* will detect the incoming C2 value and use this value. Alternatively, C2 may be manually configured as indicated in the table on the next page:

Hex value	SDH/Sonet payload contents
00	Unequipped
01	Equipped - non-specific payload
13	asynchronous Transfer Mode (ATM) cell mapping
16	IP inside Point-to-Point Protocol (PPP) with scrambling (also: Frame Relay FRF-14)
CF	IP inside PPP without scrambling
FE	Test signal mapping (see ITU Rec. G.707)

Figure 5.16 Common C2 byte hex values

5 .5.2 HSSI port set-up

HSSI is a differential interface which operates up to a maximum guaranteed rate of 51.84Mbit/s. Under favourable conditions the module may exceed this speed with the PA1000 operating at up to 100Mbps. To ensure data integrity, even at high clock speeds, the HSSI interface utilises a co-directional clock and data relationship.

HSSI PORT	
Interface type	HSSI
Mode	DCE
CA	Through
TA	On
tx rate	0kbps
rx rate	0kbps

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 5.17 HSSI menu screen

Interface type is always *HSSI* on this information display item

Mode is either *DCE* or *DTE,* depending on the type of device connected to the interface.

CA and TA
In *DTE* mode, **CA** is fixed and displayed as *ON* or *OFF* as defined by the interface, whilst **TA** can be set to either *ON, THROUGH* or *OFF.*

In *DCE* mode, **TA** is fixed and displayed as *ON* or *OFF* as defined by the interface, whilst **CA** can be set to either *ON, THROUGH* or *OFF.*

Tx Clock Rate: This is the measured clock frequency (ST for DTE, TT for DCE). The clock rate is displayed in KHz (Kb/s).

Rx Clock Rate: This is the measured clock frequency (RT for DTE/DCE). The clock rate is displayed in KHz (Kb/s).

5.6 V.24 set-up menu

This menu may be accessed via a preliminary screen to provide for further options.

V.24 SET-UP	
Terminal set-up	<menu>

Figure 5.18 V.24 preliminary screen

The *TERMINAL SET-UP* screen allows you to set up the communications parameters for the terminal attached to the management port..

TERMINAL SET-UP	
Terminal type	VT100/VT220
via Modem	yes
Baud rate	9600bps
Parity	None
Data bits	8
Stop bits	2
Load new config	

version 4.x

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 5.19 V.24 Terminal set-up menu

5 .6.1 Terminal type

The terminal type can be *ANSI, VT100/VT220 or TTY.*

The *ANSI* and *VT100/VT220* options give you a graphical presentation of the menus, whereas *TTY* is used where a dumb terminal device such as a Teletype is used for configuration and data presentation. Note that ANSI and VT100/220 terminals also highlight the menu select letter.

The screen displays for these terminal types are shown in Section 4.

5 .6.2 Via Modem

This option specifies whether a modem is to be used or not. This option defaults to *YES* and the option is activated immediately without the need to *LOAD NEW CONFIG.* Modem support causes you to be logged-out if the Ready-to-send (RTS) signal is dropped on the terminal port. The menu item *VIA MODEM* is set to *YES* by default, thus enabling modem communication. If the modem goes off-line your current logon session is terminated, preventing unauthorised access to the software.

The RTS line needs to be driven for V.24 operation if modem support is on, so we recommend using a fully configured 25-way cable.

5 .6.3 Baud rate

The baud rates supported are *2400, 4800, 9600* and *19200* baud.

5 .6.4 Parity

Parity may be set to *NONE, ODD or EVEN.*

5 .6.5 Data bits

The number of data bits may be *7* or *8*.

5 .6.6 Stop bits

The number of stop bits may be *1* or *2*.

5 .6.7 Load new config

Except for the terminal type, the changes you make on the V.24 Set-up screen do not take effect until you register the changes in the PA1000 DSU. To do this, select *LOAD NEW CONFIG* after you have made the necessary changes to the other values on this screen. You should then change your terminal settings to match these values.

5.7 Testing menu

This option gives you access to the PA1000's diagnostic functions, which are explained in detail in Section 7, Test. & Troubleshooting.

TESTING	
POS	Local loop

<space> - change value

<enter> - save new value

<escape> - exit without saving

Figure 5.20 Testing menu

5.8 Special

SPECIAL	
Software version	4.5
Warm start	
Cold start	
system **E**vent log	<display>
alar**M** event log	<display.
c**O**nfig event log	<display>
d**I**rection mode	HSSI->POS

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 5.21 Special menu

This menu handles equipment version status and start-up modes, and event logs.

5 .8.1 Software version

This option displays the current version of the software on your PA1000. This is provided for information only.

5 .8.2 Warm start

Selecting *WARM START* simulates turning the mains power off then on again. This may be necessary if a network component hangs up. A warm start does not adversely affect the PA1000's configuration parameters, performance statistics database or event log.

5 .8.3 Cold start (Caution!)

Selecting *COLD START* returns the PA1000's software configuration to the default settings. All configuration parameters will be reset to their defaults, and the performance statistics database and event log will be cleared. The *"[nodename]"* will be erased, but the real-time clock will not be affected.

For security, you will be asked to confirm this request. Pressing *Y* will perform the cold start, pressing any other key will cancel the request.

Note: This option should only be selected when absolutely necessary, since it may cause disruption to the network.

Operational reasons for needing to *COLD START* include real time clock problems when the RTC must be reset; a change of firmware version number in the PA1000 owing to carrying out an upgrade; an invalid configuration, probably caused by corruption of the PA1000 RAM. The management terminal may need to be reset to default settings before you can communicate with the PA1000 after a cold start. Section 5 shows the PA1000's default settings.

5 .8.4 Event Logs

Event logs are intended to provide a long-term history of major occurrences on the system. They can be the first port of call for a network manager when investigating a problem, and serve to confirm the status of the PA1000 at any point in time from the last cold start. If a cold start is performed, this log will be cleared and the first entry in the log will be the date and time of that cold start.

The logs are all accessed from the *SPECIAL* menu. The logs record the most recent events at the top of the screen, with events sorted into backwards order of time. The log is divided into three separate logs on separate screens: *SYSTEM EVENT LOG, ALARM EVENT LOG* and *CONFIG EVENT LOG.*

The *SYSTEM EVENT LOG* records system level events

--- System Event Log ---		
16/8/99	23:27:35	power restored
16/8/99	23:19:07	illegal interrupt
15/8/99	00:09:33	power restored
15/8/99	00:09:28	power-down
Press any key to continue		

Figure 5.22 System event log

Note: If the system event log contains either the message *SPURIOUS RESET* or *ILLEGAL INTERRUPT*, please register this occurrence with your Supplier or Distributor of the product.

The *ALARM EVENT LOG* records alarms that have arisen since the last cold start. They are recorded simply as MAJOR or MINOR alarms with *ON* or *OFF* status.

--- Alarm Event Log ---		
17/2/2001	08:20:23	Major ON POS
16/2/2001	13:21:00	Minor OFF POS
16/2/2001	12:52:38	Minor ON POS
Press any key to continue		

Figure 5.23 Alarm event log

The *CONFIG EVENT LOG* records any configuration changes on the system. This can be very useful since configuration actions may have been taken remotely, without the knowledge of the local user of a node

--- Config Event Log ---		
16/7/2001	08:20:23	Config updated
16/5/2001	13:21:00	Config updated
14/5/2001	11:32:38	Config updated
Press any key to continue		

Figure 5.24 Config event log

5 .8.5 Direction mode

This option specifies the flow direction of the signal stream for DSU set-up purposes. Options are: *POS to HSSI, HSSI to POS, and BI-DIRECTIONAL .*

In unidirectional modes, unusual alarms are masked to prevent them obscuring the real problem, e.g. if there is no fibre attached to the PoS receive port in DTE to PoS mode, PoS LOS will not be raised, and PoS FERF will not be generated.

5.9 Unit Set-up Checklist

PA1000 DSU's may be used in pairs at either end of a satellite link connecting PoS routers, or they may be used alone when interfacing a PoS router to a HSSI router. This section acts as a checklist for setting up each unit before establishing a valid configuration for a particular application. It assumes that you have already connected the unit as required, and logged in with the Operator password. The procedure below should be carried out on **each** unit.

Step 1: Set Terminal
Set your terminal's communication parameters to the PA1000's V.24 default values, then switch on power to the PA1000.

Step 2: V.24 Set-up Menu
Establish the communication parameters so that the PA1000 and the terminal are using the same settings. Set the terminal parameters at first to the default values, which are listed in Section 5.4.

Change the PA1000 *BAUD RATE, PARITY, DATA BITS* and *STOP* bits if necessary, then select *LOAD NEW CONFIG.*

If you have changed any of the default settings, you will now need to update them on the terminal, so that the PA1000 and the terminal are still on identical settings.

Step 3: General Set-up Menu
Check the current time and date, and change them if necessary as already described. Check the "*[nodename]"* of the local PA1000, and change it if necessary. Check the Operator Password, and change it if necessary.

Step 4: POS Set-Up Menu
From the *DATA PORT SET-UP* menu, select the *POS* Set-up option and set the *FRAMING, TIMING,* and *AIS FORWARDING* parameters as appropriate. The AIS detector should always remain enabled under normal datacomms conditions, and should only be disabled when there is a very low zero density in the traffic.

TIMING: We recommend that the PA1000 is set to *INTERNAL* timing and the router is set to *LOOP* timing. The units will operate with both set to *INTERNAL* timing.

Step 5: HSSI Set-Up Menu
From the *DATA PORT SET-UP* menu, select the *HSSI SET-UP* option and set the parameters as appropriate. For connection to a satellite modem, ensure that DTE mode is selected. for connection to a router, ensure that DCE mode is selected.

Also for unidirectional applications, ensure that the *DIRECTION MODE* on the *SPECIAL MENU* is correctly set.

5.10 Performance data

The subject is described in the next section of this manual.

6 ANALYSING PERFORMANCE

6. 1 Introduction

The PA1000 provides you with extensive performance analysis functions, which allow you to monitor and record service information about the POS link.

The first part of this section describes the Errors and Alarms that are valid for the modes of operation of the PA1000. Performance data is displayed in the form of an on-screen report or summary. Information is grouped into periods of 15 minutes. Examples of the screens are shown in later subsections.

6. 2 Errors and Alarms

6 . 2. 1 Error types

The following error types are reported:

B1 BIP Errors	Indicate parity errrors
B2 BIP Errors	Indicate parity errors.
Line FEBE Errors	Line Far End Block Errors

Figure 6.1 PA1000 Error types

6 . 2. 2 POS Port Alarm responses

The default responses in Figure 6.2 below are established in the presence of an alarm condition on the POS port. An alarm or alarms can be cancelled by selecting the *ALARM EXTENSION / CLEAR ALARM OUTPUTS* option from the *MAIN SET-UP* menu. After the alarm has been cancelled as above, it is still indicated on the front panel indicators and in the performance statistics.

Alarm	Response
LOS	MAJOR alarm lamp lights TA/CA cleared if THROUGH POS port transmits FERF
LOF	MAJOR alarm lamp lights TA/CA cleared if THROUGH POS port transmits FERF
AIS (If AIS is enabled)	MINOR alarm lamp lights TA/CA cleared if THROUGH POS port transmits FERF
FERF	MINOR alarm lamp lights.

Figure 6.2 POS Port alarm default responses

6 . 2. 3 HSSI Port responses

If there is an operational problem on the HSSI port, CA or TA is set to *OFF*

Condition	Response
DTE mode: DTE port not responding	DTE Set-up shows TA off
DCE mode: DCE port not responding	DCE Set-up shows CA off

Figure 6.3 DTE/DCE port response

6 . 2. 4 Error and Alarm definitions

The definitions corresponding to Performance reporting are given below:

Errors	Definition
B1, B2 BIPS	Indicate parity errors
Line FEBE	Line Far End Block Error
G.821 Errors	**Definition**
Err. Count	The number of errors in the interval.
Total secs	Valid number of seconds in the interval (less than 900 means that the 15- min. period was incomplete).
EFS	Error-free seconds.
ES	Errored seconds: seconds with an error.
BES	Bursty errored seconds: seconds $\geq$ 2 errors,<1 in 10^3 errors
SES	Severely errored seconds: seconds >1 in 10^3 errors.
UAS	Unavailable seconds: declared after SES for 10 consecutive seconds.
DM	Degraded minutes: >1 in 10^6 errors/minute.
Alarms	**Definition**
LOS	Loss Of Signal: No data and therefore no clocking information. The units are alarm seconds if the summary style is G.821, or events if the style is set to counts.
LOF	Loss of Frame: Clocking information is there but the frame alignment pattern is faulty. The units are alarm seconds if the summary style is G.821, or events if the style is set to counts.
AIS	Alarm Indication Signal: All '1s' being received. The units are alarm seconds if the summary style is G.821, or events if the style is set to counts.
FERF	Far End Receive Failure: the remote PA1000 has detected a problem. The units are seconds if the summary style is G.821, or events if the style is set to counts.

Figure 6.4 Performance data definitions

6. 3 Performance menu

PERFORMANCE DATA	
Interface	POS
Display mode	Static summary
Summary style	G.821
Phys layer stats	<display>
Error type	Line FEBEs
HDLC layer stats	<display>
Clear all data	

HIGHLIGHTED letter – select item <escape> - exit menu

Figure 6.5 Performance data menu

6 . 3. 1 Interface

This field is for the selection of the interface for which statistics are to be displayed. This option is fixed at *POS.*

6 . 3. 2 Display mode

This sets the type of display and the options are:

Full report and Rolling report

Static summary, Updated summary and 15 minute summaries

These modes are described in the subsections below describing reports and summaries. Reports and summaries are dealt with separately since they have different characteristics.

6 . 3. 3 Summary style

The *SUMMARY STYLE* menu option only appears when a Summary has been selected (as opposed to a Report) from the Display mode menu item, and this is therefore described in section 6.5.3.

6 . 3. 4 Physical layer stats

This item leads to the physical layer statas display screen described later in this section.

6 . 3. 5 Error type

The error types available for view are *B1 BIP, B2 BIP* and *LINE FEBEs*

6 . 3. 6 HDLC layer stats

This item leads to the physical layer statas display screen described later in this section.

6. 4 Physical layer stats – Reports

6 . 4. 1 Full Report

This presentation gives six sequential screens of information extending over the previous 24 hours for each type of error. The entries show the performance statistics for each 15-minute interval, referenced from the current real-time clock time.

Note: If the real-time clock is altered then the relative times of this database are also modified.

Metrodata PA1000: Local connection to *"[nodename]"*

POS Interface 1 of 6

	Line FEBEs							Alarmed seconds:				
Period Starting	Count	Valid	EF	ES	BES	SES	UAS	DM	Valid	LOS	LOF	AIS	FERF
	0	900	0	0	0	0	0	0	900	0	0	0	0
14:24:23	0	900	0	0	0	0	0	0	900	0	0	0	0
14:39:23	0	900	0	0	0	0	0	0	900	0	0	0	0
14:54:23	0	900	0	0	0	0	0	0	900	0	0	0	0
15:09:23	0	900	0	0	0	0	0	0	900	0	0	0	0
15:24:23	0	900	0	0	0	0	0	0	900	0	0	0	0
15:39:23	0	900	0	0	0	0	0	0	900	0	0	0	0
15:54:23	0	900	0	0	0	0	0	0	900	0	0	0	0
16:09:23	0	900	0	0	0	0	0	0	900	0	0	0	0
16:24:23	0	900	0	0	0	0	0	0	900	0	0	0	0
16:39:23	0	900	0	0	0	0	0	0	900	0	0	0	0
16:54:23	0	900	0	0	0	0	0	0	900	0	0	0	0
17:09:23	0	900	0	0	0	0	0	0	900	0	0	0	0
17:24:23	0	900	0	0	0	0	0	0	900	0	0	0	0
17:39:23	0	900	0	0	0	0	0	0	900	0	0	0	0
17:54:23	0	900	0	0	0	0	0	0	900	0	0	0	0
18:09:23:	0	900	0	0	0	0	0	0	900	0	0	0	0

<Escape> to exit, any other key to continue

Figure 6.6 Full report screen

6 . 4. 2 Rolling report

The *Rolling report* option gives a single line summary of the statistics at the end of each 15-minute period. This option is a more economic version of the *15-minute summaries* option where a line printer is used, since only one report line is added to the printout every 15 minutes.

Metrodata PA1000: Local connection to *"[nodename]"*

POS Interface 1 of 6

	Line FEBE Errors:							Alarmed seconds:				
Period Starting	Count	Valid	EF	ES	BES	SES	UAS	DM	Valid	LOS	LOF	AIS	FERF
14:09:23	0	900	0	0	0	0	0	0	900	0	0	0	0
14:24:23	0	900	0	0	0	0	0	0	900	0	0	0	0
14:39:23	0	900	0	0	0	0	0	0	900	0	0	0	0
14:54:23	0	900	0	0	0	0	0	0	900	0	0	0	0
15:09:23	0	900	0	0	0	0	0	0	900	0	0	0	0

<Escape> to exit, any other key to continue

Figure 6.7 Rolling report screen

6. 5 Physical layer stats - Summaries

6 . 5. 1 Screen presentation

The summary report screens are designed to give a view of the alarm and error status on a single screen. There is a choice of update frequencies of the data so that the user can choose the optimum presentation at any time.

The type of Alarm or Error being monitored is shown in the left hand column of the screen. Always check this when viewing a screen for the first time. If a diagnostic test is being run, its name appears at the top right of the screen entitled *DIAGS*.

The *Temporary counts* column is used to obtain error counts over a user definable test period, the duration of which need not be time related to anything else, without erasing the entire statistics database. You can reset the *Temporary counts* by pressing *C*. This means that a measurement may be started after a 15 minute interval has partly elapsed. The counts are displayed for the temporary measurement period from its start until you clear it down by pressing *C*.

Pressing any key other than *C* or <esc> will instantly refresh the display. This applies to each of the display styles - *Static, Updated* and *15 minute* displays.

The *Current 15-mins* column gives the error counts for the current partial 15 minute period. Therefore the duration of statistics within this column varies between 0 and 15 minutes in a cyclical fashion as time passes.

The *Previous 15-mins* column gives the error counts for the previous complete 15 minute period, assuming that there has been one.

The *Last 24 hours* column gives the error counts for the previous 24-hour period, as an accumulation of the last 96 complete *Previous 15-mins* periods.

6 . 5. 2 Presentation display modes

The three *DISPLAY MODES* for summaries define the frequency with which the display data is updated.

Static summary
This option presents the data as a single screen display, giving a snapshot of the current status. The information in the display may be updated by pressing any key except <escape>.

Updated summary
This is similar to a static summary except that the screen is refreshed approximately every 5 seconds, and provides a dynamic display of events.

15 minute summaries
This updates the information in a summary at the end of each 15 minute period. This mode is useful where a printer is connected to the terminal port and a detailed log is required.

Once one of these summary types has been selected for display, three styles of display are available for selection, as described below.

6 . 5. 3 Summary style

This option determines the method of presenting the error information in the summaries. These options are not available for the full or rolling reports, which have a fixed style. The *SUMMARY STYLE* option only shows on the menu when a *SUMMARY* has been selected in the *DISPLAY MODE*. The styles available are:

Counts	Errors and alarms accumulate and are quoted as an absolute count.
G.821	Errors and alarms are expressed as G.821 parameters per second.
%G.821	Errors and alarms are shown in terms of normalised percentage G.821 parameters.

Figure 6.8 Summary styles

6 . 5. 4 Summary display - COUNTS style

Metrodata PA1000: Local connection to *"[nodename]"*

13:32:54 Tue 1/7/2003 PERFORMANCE SUMMARY POS

Current Alarms: None ---------- Diag: None

	Temporary Counts	Current 15 mins	Previous 15 mins	Last 24 hours
Alarm counts				
Total Secs	856	510	900	86400
LOS	0	0	0	0
LOF	0	0	0	0
AIS	0	0	0	0
FERF	0	0	0	0
Line FEBEs:	0	0	0	0
Total secs	856	510	900	86400
Err Count	0	0	0	0
Error rate	0	0	0	0

<Escape> - exit, N - next interface, C - clear temp, other key - refresh

Figure 6.9 Performance summary screen - COUNTS style

Note:

If an alarm appears in Counts style, it appears only once as a single event, and is recorded in the Temporary Counts column only. It may be best to confirm an alarm situation by setting the summary screen to G.821 style when an alarm is present.

6 . 5. 5 Summary display - G.821 style

Metrodata PA1000: Local connection to *"[nodename]"*

13:32:54 Tue 1/7/2003 PERFORMANCE SUMMARY POS

Current Alarms: None ---------- Diag: None

	Temporary Counts	Current 15 mins	Previous 15 mins	Last 24 hours
Alarm counts				
Total Secs	856	510	900	86400
LOS	500	500	0	0
LOF	0	0	0	0
AIS	0	0	0	0
FERF	0	0	0	0
Line FEBEs:	0	0	0	0
Total secs	856	510	900	86400
ES	0	0	0	0
BES	0	0	0	0
SES	0	0	0	0
UAS	500	500	0	0
DM	0	0	0	0

<Escape> - exit, N - next interface, C - clear temp, other key - refresh

Figure 6.10 Performance summary screen - G.821 style

Note:
If an alarm appears in G.821 style, it is updated incrementally in the Temporary Counts and other columns as appropriate for its duration. The definition of G.821 as parameters per second gives a different summary layout than that for Counts style. In Counts style, an event is recorded once only.

6 . 5. 6 Summary display - Percent G.821 style

Metrodata PA1000: Local connection to *"[nodename]"*

13:32:54 Tue 1/7/2003 PERFORMANCE SUMMARY POS

Current Alarms:None ---------- Diag: None

	Temporary Counts	Current 15 mins	Previous 15 mins	Last 24 hours
Alarmed time:				
Total secs	856	510	900	86400
%LOS	00.0000%	00.0000%	00.0000%	00.0000%
%LOF	0.0000%	0.0000%	0.0000%	0.0000%
%AIS	0.0000%	0.0000%	0.0000%	0.0000%
%FERF	0.0000%	0.0000%	0.0000%	0.0000%
Line FEBEs:	0.0000%	0.0000%	0.0000%	0.0000%
%EFS	100.0000%	100.0000%	100.0000%	100.0000%
%ES	0.0000%	0.0000%	0.0000%	0.0000%
%BES	0.0000%	0.0000%	0.0000%	0.0000%
%SES	0.0000%	0.0000%	0.0000%	0.0000%
%UAS	0.0000%	0.0000%	0.0000%	0.0000%
%DM	0.0000%	0.0000%	0.0000%	0.0000%

<Escape> - exit, N - next interface, C - clear temp, other key - refresh

Figure 6.11 Performance summary screen - Percent G.821 style

6. 6 HDLC layer statistics

The display for HDLC sdtats ois shown below.

Metrodata PA1000 : Local connection to *"[nodename]"*				
13:32:54 Tues 1/7/2003 HDLC PERFORMANCE SUMMARY POS				
Current Alarms: None ---------- Diag: None				
	Temporary Counts	Current 15 mins	Previous 15 mins	Last 24 hours
Valid Secs	87132	732	900	86400
Tx Packets	0	0	0	0
Tx Bytes	0	0	0	0
B/w usage	0.0000%	0.0000%	0.0000%	0.0000%
Rx Packets	0	0	0	0
Rx Bytes	0	0	0	0
B/w usage	0.0000%	0.0000%	0.0000%	0.0000%
Discards	958584	8184	9900	950400
<Escape> - exit, N - next interface, C - clear temp, other key - refresh				

Figure 6.12 HDLC stats display screen

The screen shows the numbers of packets and bytes transmitted and received over various periods. The Bandwidth usage is calculated as percent of total Bandwidth available.

7 PA1000 REMOTE MANAGEMENT

In addition to using the terminal port, the PA1000 may be managed remotely by using a LAN-based network management system. In order to do this, the LM1100 SNMP Enabler option must be fitted to the PA1000 and a LAN terminal connected to the Management port.

The operating parameters, event log, performance statistics database and diagnostics functions are known collectively as the Management Information Base (MIB). The PA1000 MIB can be accessed remotely by using a Network Management System (NMS) connected to the LAN. The NMS should use SNMP (Simple Network Management Protocol), and could be located on the local LAN or on a remote LAN connected to the local LAN via a LAN bridge or IP router.

The MIB definitions supported have been placed in the public domain by Metrodata and can be parsed in to any NMS supporting an ASN.1 MIB parser. For further information on the management interface and the MIB definition, please refer to the LM1100 SNMP Enabler user manual. The information given in this section is a brief summary to serve as an introduction to the subject.

7.1 Management menu

When the LM1100 SNMP Enabler is fitted to the PA1000, the *MAIN SET-UP* menu contains the option *MANAGEMENT.*

MAIN SET-UP	
alarm e**X**tension	<menu>
General set-up	<menu>
Data port set-up	<menu>
V.24 set-up	<menu>
Management	<menu>
Testing	<menu>
Special	<menu>
Performance data	<menu>

HIGHLIGHTED letter - select item
<escape> - exit menu

Figure 7. 1 Main set-up menu

The *MANAGEMENT* menu leads to a series of menus which permit you to configure the various system management protocols and parameters. Only the utility options are described below.

MANAGEMENT	
Ethernet	<menu>
IP	<menu>
UDP	<menu>
t**C**p	<menu>
s**N**mp	<menu>
Telnet	<display>
t**F**tp	<menu>
Ping	<display>

Figure 7. 2 Management menu

7 .1. 1 Telnet Option

The Telnet option permits a Telnet session to be established between the local PA1000 a remote unit.

```
Metrodata PA1000: Local connection to "[nodename]"
 Telnet>
```

Figure 7. 3 Telnet screen

Note that the PA1000 does not use DNS facilities and therefore that the IP Address of the device to be called must be used. The following Telnet commands are available on PA1000 and are displayed in response to the <help> command

Command	Action
open	Open a connection to an IP address
close	Close a connection
abort	Abandon a connection without waiting for confirmation from the called service
status	Give a status report of the telnet session
quit	Leave telnet
help	Print help screen.
^]	Escape to command mode

Figure 7. 4 Telnet commands

7 .1. 2 TFTP

TFTP is used to upload or download software or config files form the device to or from a server *(CLIENT* mode) or to permit remote devices to acquire files from the device *(SERVER* mode). The remote server or device is identified by its *REMOTE IP* address, which is typed into a menu box after the menu item is selected.

TFTP	
Mode	Server
remote **I**P	192.168.1.10
Software file name	PA1000.45
Config file name	PA1000.cnf

TFTP	
Mode	Client
remote **I**P	192.168.1.10
Get new software	
get **C**onfig	
Put config	

Figure 7. 5 TFTP menu screens

The two modes of TFTP operation are as follows:

a) In *SERVER* mode the device awaits *GET* or *PUT* action from other remote devices. The menu items *SOFTWARE FILE NAME* or *CONFIG FILE NAME* specify the files which can be transferred. Note that Software may only be uploaded into the local device, whilst Config files can be transferred in either direction.

```
Enter file name
>
```

b) In *CLIENT* mode, Config files may be downloaded from the server *(GET),* or may be uploaded to the server *(PUT).* Note that Software may only be uploaded *(GET)* into the local device, whilst Config files can be transferred in either direction. The system requests a file name in response to selection of a *GET* or *PUT* action from the menu.

```
Enter file name, then wait
>
```

7 .1. 3 Ping

PING is used to check that a selected device is responding on the network by sending a *PING* packet to its IP address, and receiving an acknowledgement if the connection is successful. When *PING* is selected form the screen, the following dialogue occurs if the connection is successful. if it is not, the screen message is *no response*.

```
Metrodata PA1000: Local connection to “PA1000“
Destination: [192.168.1.10]
press any key to stop test
okay
okay
okay
```

Figure 7. 6 Ping screen

8 TEST & TROUBLESHOOTING

Several diagnostic tests are supported by the PA1000. The fact that the POS signal is framed is used to identify a faulty or failed connection. In addition loop-backs may be activated to segment the link, and to validate signal flow along the path of the link.

Two types of test loops are available:

POS Local Loop
POS External Loop

Diagrams showing the functioning of these test loops are given in this Section.

8. 1 Testing Menu

When you select the *TESTING* option from the *MAIN SET-UP* menu, the *TESTING* menu is displayed.

TESTING	
POS	Local Loop

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

Figure 8. 1 Testing menu

The type of test to carry out are selected using this screen. Definitions of the menu items are given below.

8. 2 Loop Tests

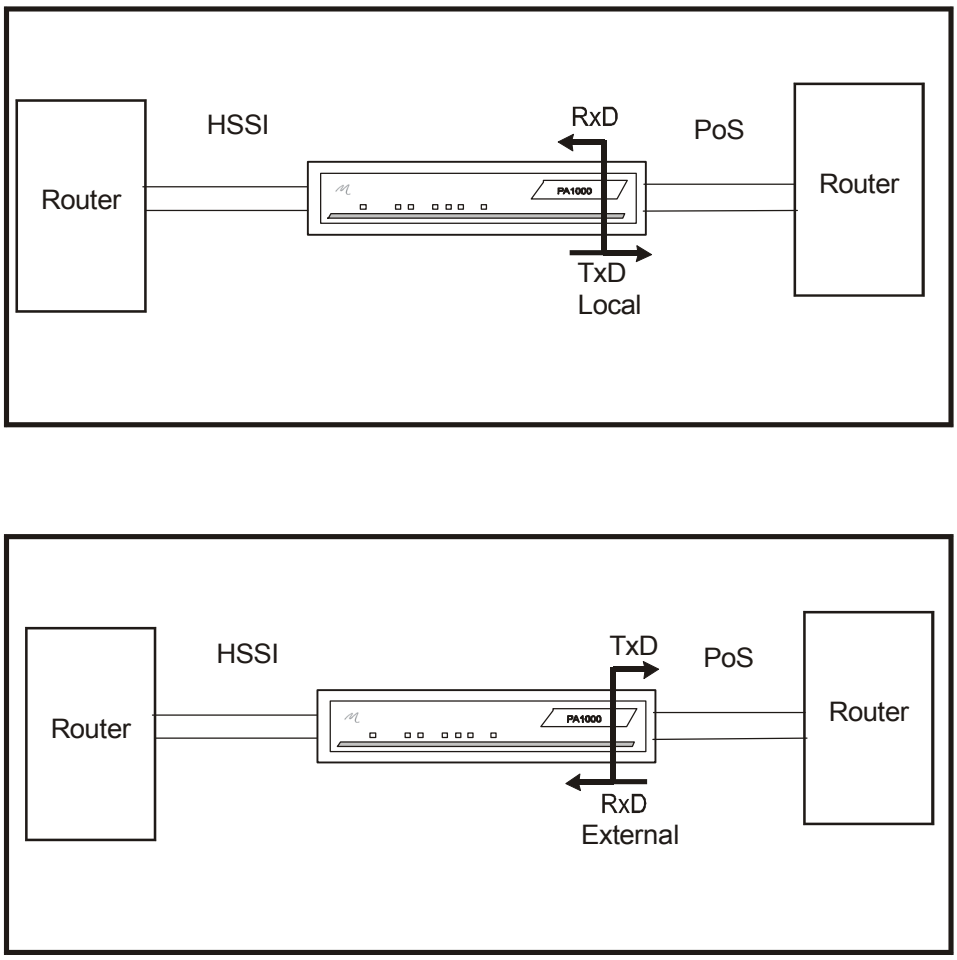

Figure 8. 2 Local & External loop tests

8 . 2. 1 PoS Local Loop

When *LOCAL LOOP* is activated the PoS transmit data is looped back to the PoS receiver and subsequently to the HSSI interface. PoS data is transmitted as normal.

Local loop validates the configuration and operation of the PA1000 HSSI interface.

8 . 2. 2 PoS External Loop

When the *EXTERNAL LOOP* is activated the PoS Receive Data is looped back directly to the PoS transmitter. The PoS data is received as normal.

External loop validates the configuration and operation of the PA1000 PoS interface.

9 PA1000 SPECIFICATIONS

Parameter	Definition
HSSI interface	50-way miniature AMP (SCSI-2) connector
Mode	DCE-DTE
Framing mode	HDLC (bit mode)
Max packet size	4096 bytes
Flags	Supports back to back frames with 1 flag between frames
Data rates	DCE mode: 51.84 Mbps, DTE mode: up to 100Mbps
PoS interface	Fibre with Duplex SC connector
Fibre types	Multi-mode, Single-mode short-haul, Single-mode long haul,
Payload	HDLC (byte mode)
Max packet size	4096 bytes
Flags	Supports back to back frames with 1 flag between frames
Data rate	155 Mbps per G.957
Diagnostics	PoS loop, PoS External loop
Display Style	Counts, G.821, percent G.821
Error type	FAS (G.751 mode), Code errors
Management	V.24 terminal through terminal port. SNMP through management port. Telnet through management port.. Management port can be used for outgoing Telnet sessions Management port complies with IEEE 802.3 / 10 Base T.
Statistics database	Real time statistics time-stamped and logged in a database accumulating over 15 minutes. 96 x 15 minute buckets are stored for rolling 24 hour database.
General	**Definition**
Power supply	100-250 VAC 50-400 Hz 100-200mA, IEC connector or -36 to -72 VDC, 200-100mA , Buccaneer connector
Dimensions	1U x 19": 436 x 213 x 44 mm (w x d x h) with 19" mounting flanges
Environmental	**Range**
Ambient Temp	0degC to +45degC
Storage Temp:	-20degC to +70degC
Relative Humidity:	0% - 95% non condensing
Barometric Pressure	86 KPa - 106 KPa