

3131
T1/FT1
CSU/DSU



34-00257
1st Edition

Copyright

©1996 TxPORT. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form by any means without the written permission of TxPORT.

Reorder # 34-00257

1st Edition, September 1996

TxPORT shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material. TxPORT reserves the right to revise this publication from time to time and make changes in content without obligation to notify any person of such revision changes.

Contents of this publication may be preliminary and/or may be changed at any time without notice and shall not be regarded as a warranty.

Documentation Disclaimer

TxPORT makes no representation or warranties of any kind whatsoever with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose.

Table of Contents

General 1-1

Features	1-1
Specifications	1-1
Network Interface.....	1-1
Equipment Interface	1-2
Management Interfaces	1-2
Diagnostics	1-2
Alarms	1-2
Power.....	1-2
Mechanical	1-2
Environmental	1-2
Standards	1-2
Industry Listings.....	1-2
FCC Requirements.....	1-2
Canadian Emissions Requirements.....	1-3
Warranty	1-3
Ordering Information	1-4
TxPORT Customer Service	1-4
Technical Support.....	1-4
Returns/RMA	1-4

Installation 2-1

Unpacking and Inspection.....	2-1
Supplied Materials	2-1
Rack Mounting.....	2-1
Supplied Materials.....	2-1
Rack Mount Installation	2-1
Port Connections.....	2-2
NET	2-2
SUPV.....	2-3
Data Port Connections.....	2-3
Power Connection	2-4
Network Management.....	2-4

Configuration..... 3-1

Hardware Configuration	3-1
Switch S1.....	3-1
Switch S2.....	3-2
Software Configuration.....	3-2
Interface Start-up.....	3-2
Menu Structure	3-3
Alarms Screen	3-3
Performance Screen.....	3-4
Element Maintenance	3-5
Configuration Screens.....	3-6
Line Parameters	3-8
Alarm Configuration.....	3-9
Port Configuration	3-10
Management Ports	3-11
Summary	3-12

Utilities.....	3-12
----------------	------

Testing..... 4-1

Hardware Testing	4-1
Front Panel LEDs.....	4-1
TEST.....	4-1
Loop.....	4-1
NET	4-1
ALARM.....	4-1
POWER	4-1
Front Panel Buttons.....	4-1
TEST.....	4-1
LOOP.....	4-1
Power Failure	4-1
Switch Configuration	4-2
Software Testing.....	4-2

Terminal InterfaceA-1

Interface Start-Up.....	A-1
Screen Components.....	A-1
Cursor Controls.....	A-2
Field Types	A-2
Menu Structure	A-2

Pinout Tables.....B-1

SUPV Port - PC	B-1
SUPV Port - Modem.....	B-1
NET Port.....	B-1
Data Port.....	B-1

1. General

The TxPORT 3100 Series CSU/DSU terminates a broad range of T1/FT1 networking applications. The 3131 is ideal for LAN-to-LAN networking or frame relay.

The 3131 may be provisioned through either switch settings or the terminal interface. The chapters in this manual are arranged as follows:

1. *General* - Describes product features, specifications, FCC and warranty information, in addition to TxPORT ordering numbers and Customer Service telephone numbers.
 2. *Installation* - Describes unit mounting, port connections, and powering.
 3. *Configuration* - Describes hardware DIP switch settings and software configuration options.
 4. *Testing* - Describes the LED indicators, test buttons, and procedures for hardware testing from the front panel and software testing procedures from the unit menu screens.
- A. *Terminal Interface* - Describes all the parts of the unit menus and their functions.
- B. *Pinout Charts* - Describes the pinout assignments of the various ports on the unit.

The 3131 provides the T1 network connection through an advanced integral ESF CSU. Full performance T1 span monitoring allows early detection and correction of problems before they affect critical applications. The unit provides BERT and loopbacks to aid in rapid fault isolation and repair and also responds to inband fractional loop codes to accommodate fractional T1 service testing by the carrier. An internal BERT allows testing of both the network and equipment connections.

The 3131 is compatible with industry standards ensuring access to any T1 provided service and allowing connection of all equipment quickly and correctly. An innovative design eliminates clocking problems on the high speed data ports.

Features

- Single 34-pin, V.35 Winchester interface data port
- Integral ESF/CSU provides full performance monitoring (meets TR62411, TR54016, and T1.403 standards)
- Complete diagnostic capabilities
- Full T1 software management through a VT100 compatible terminal interface
- Programmable alarm thresholds
- Call On Alarm/modem capability
- DIP configuration switches allow easy installation
- D4 or ESF line framing, AMI or B8ZS line coding
- Supports Fractional T1 services with flexible bandwidth allocation

Specifications

Network Interface

Line Rate:	1.544 Mbps (± 50 ppm)
Line Framing:	D4 or ESF
Line Code:	AMI or B8ZS
Input Signal:	0 to -27 dB ALBO
Connection:	RJ-48C jack, 100 Ω ($\pm 5\%$)
Output Signal:	3.0 V ($\pm 10\%$) base-peak into 100 Ω with protection
Line Build Out:	0, -7.5, -15, -22.5 dB attenuation
Transient Voltage:	1000 V protection, fused input/output
Jitter Control:	Per TR62411 and T1.403
Timing Source:	Internal, recovered line clock, external DTE

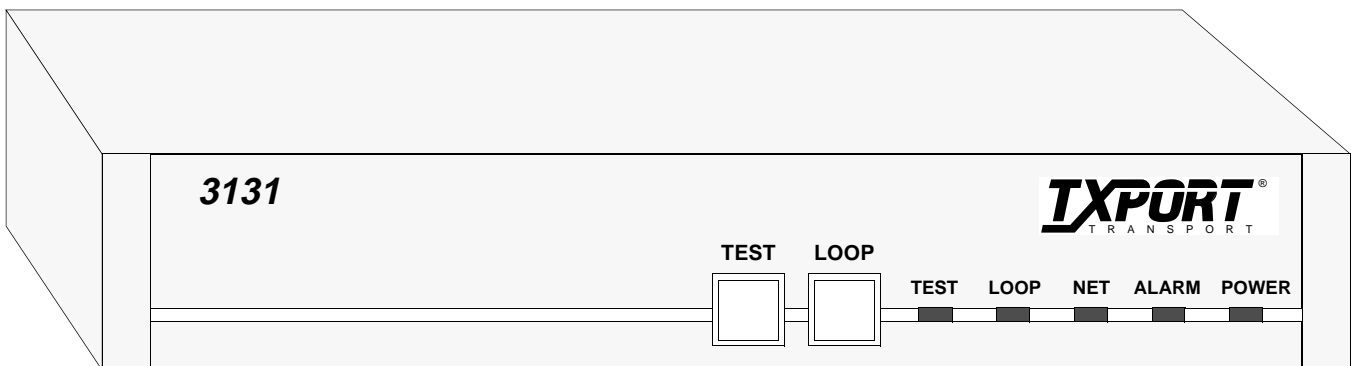


Figure 1-1 3100 Series Product

Ones Density: B8ZS, N x 56 bit stuffing, alternate fill; complies with TR62411

Equipment Interface

DTE Ports: One 34-pin, V.35
Data Rate: Synchronous, N x 56 kbps or N x 64 kbps (where N = 1 to 24); independent selection on each port
Clocking: Internal, External, Oversample
Data Invert: Independent selection

Management Interfaces

Supervisory Port

Connection: 8-pin modular (RS-232)
Data Rates: 1.2, 2.4, 9.6, and 19.2 kbps

Diagnostics

Performance: Monitoring per TR54016 and T1.403
Network Loops: Line loopback or payload loopback
Fractional Loop: Responds to inband V.54 loop code
DTE Port Loops: Bidirectional loop toward DTE and Net
T1 DTE Loops: Local loop toward DTE
Maintenance loop toward network
BERT: 511 and clear test patterns toward network or DTE port

Alarms

Activation: Programmable thresholds
Reporting: Front panel LEDs, call on alarm (COA)

Power

AC: 115 VAC, 0.12 A, 12 W maximum, 41 BTU maximum

Mechanical

Mounting: Desktop or horizontal rack
Dimensions: Width 12 inches (30.48 cm)
Height 1.75 inches (53.34 cm)
Depth 9 inches (22.86 cm)
Weight: 4 pounds (1.814 kg)

Environmental

Operating Temp: 32° to 122°F (0° to 50° C)
Storage Temp: -4° to 185°F (-20° to 85° C)
Humidity: 95% maximum (non-condensing)

Standards

TR62411: December 1990
TR54016: September 1989
ANSI T1.403: 1989
TR54019A: April 1988

Industry Listings

FCC Compliance: Part 15 Subpart B, Class A
FCC Part 68 Cert: FXKUSA-22083-DE-N
NRTL: 1454, 2nd Edition (LR 62298)
IC/CSO3 Cert: 1653 6531 A
CSA Certified: LR 62298 (22.5 NO 22.5-M90)

FCC Requirements

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of 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 is required to correct the interference at his own expense.

Shielded cables must be used to ensure compliance with the Class A FCC limits.



Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Notice to Users of 1.544 Mbps Service: The following instructions are provided to ensure compliance with FCC Rules, Part 68:

1. All direct connections to T1 lines must be made using standard plugs and jacks.
2. The following information may be required by the local telephone company when applying for leased line facilities:

SOC (Service Order Code):	6.0 N
FIC (digital Facility Interface Code):	04DU9-BN 04DU9-DN 04DU9-IKN 04DU9-ISN
USOC jack:	RJ-48C

3. If the unit appears to be malfunctioning, it should be disconnected from the telephone lines until you learn whether the source of trouble is your equipment or the telephone line. If your equipment needs repair, it should not be reconnected until it is repaired.
4. The unit has been designed to prevent harm to the T1 network. If the telephone company finds that the equipment is exceeding tolerable parameters, they can temporarily disconnect service. In this case, the telephone company will give you advance notice, if possible.
5. Under FCC rules, no customer is authorized to repair this equipment. This restriction applies regardless of whether the equipment is in or out of warranty.
6. If the telephone company alters their equipment in a manner that will affect the use of this device, they must give you advance warning so that you can have the opportunity for uninterrupted service. You will be advised of your right to file a complaint with the FCC.
7. The attached affidavit must be completed by the installer.
8. In the event of equipment malfunction, all repairs should be performed by our company or an authorized agent. It is the responsibility of users requiring service to report the need for service to our company or to one of our authorized agents.

Canadian Emissions Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

On 48 VDC units only, end users should use existing 48 VDC battery sources or a CSA-certified power supply.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques (de la class A) prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Warranty

TxPORT warrants each unit against defects in material and workmanship for a period of five years from the date the unit was shipped. If the unit malfunctions at any time during the warranty period, TxPORT will repair, or at TxPORT's option, replace the unit free of charge.

The remedies listed herein are the users sole and exclusive remedies. TxPORT shall not be liable for any indirect, direct, incidental or consequential damages. The owner must return the unit to the factory, shipping prepaid and packaged to the best commercial standard for electronic equipment. TxPORT will pay shipping charges for delivery on return. The customer is responsible for mode and cost of shipment to TxPORT. This warranty does not apply if the unit has been damaged by accident, misuse or as a result of service or modification by other than TxPORT personnel.

Ordering Information

The 3131 is available with a V.35 data port. Ordering options are listed in Table 1-A based on the format *F-3131-001--ABCDE* with F-3131-001-11110 being the default.

Table 1-A Unit Ordering Numbers

Assembly Number	Unit
F-3131-001-11110	Standard unit with V.35port
F-3131-001-12110	Hardened protection with V.35 port

The optional LAN interface cards may be factory or customer installed into a 3131 using a chassis mount kit.

Table 1-B Optional Equipment

Part Number	Optional Equipment
Mounting Kit	
9-3100-002-1	Mounting kit for 19" racks
9-3100-002-2	Mounting kit for 23" racks
Network Cables	
9-1001-004-010	8-pin mod to 8-pin modular (4 twisted pairs)
9-1001-006-1	8-pin mod to 15-pin 'D' type adapter, male
9-1001-006-2	8-pin mod to 15-pin 'D' adapter, female
9-1001-051-1	T1 cross-over kit, 1 foot
Supervisory Cables	
9-1001-015-1	DB-25 pin/8-pin modular adapter
9-1001-073-2	DB-09 female to 8-pin (PC to SUPV)
9-1001-083-5	RS-232 female to 8-pin (Modem to SUPV)
9-1544-619-0xx	8-pin cable
V.35 Cables	
9-1001-001-0xx	V.35 male to male null cable
9-1001-311-0xx	V.35 male to male cable
9-1001-312-0xx	V.35 male to female cable

*xxx denotes cable length in feet: 05, 10, 20.

TxPORT Customer Service

TxPORT office hours are Monday through Friday from 8 a.m. to 5 p.m Central Time. General, sales, and marketing information may be obtained by telephone or e-mail.

Toll Free: 888-4TxPORT or 800-926-0085

Local: (205)772-3770

e-mail: info@txport.com

Technical Support

Technical support is available 24 hours a day, seven days a week. You may contact a support representative by telephone or e-mail. For after-hours emergencies, please call 800-285-2755.

Toll Free: 888-4TxPORT or 800-285-2755

Local: (205) 772-3770

e-mail: support@txport.com

Returns/RMA

If for any reason you need to return a TxPORT unit, you must have a Return Material Authorization (RMA) number marked on the shipping package. You may obtain an RMA number from customer service at 800-926-0085, ext. 2227.

When calling TxPORT for an RMA, please have the following information available.

- Model number and serial number for each unit.
- Reason for return and symptoms of problem.
- Warranty status (if known).
- Purchase order number to cover charges for out-of-warranty items.
- Name and phone number of person we can contact if we have questions about the unit(s).
- Mode of shipment required (second-day air is the normal mode of shipment for all returned material unless otherwise specified).

Units being returned to TxPORT should be sent to the following address:

TxPORT
127 Jetplex Circle
Madison, Alabama 35758

2. Installation

This chapter contains instructions for physically installing the TxPORT 3131 as either a standalone or rack mount unit as well as information concerning the communication ports and power supply on the rear of the unit.

Unpacking and Inspection

Upon receipt of your shipment, inspect the shipping container and contents. If the contents of the shipment are incomplete or, if there is mechanical damage or defect, notify TxPORT Customer Service. If the shipping container or cushioning material is damaged, notify the carrier and TxPORT immediately and make a notation on the delivery receipt that the container was damaged (if possible, obtain the signature and name of the person making delivery). Retain the packaging material until the contents of the shipment have been checked for completeness and the instrument has been checked both mechanically and electrically.

Supplied Materials

Your baseline 3131 shipment contains three items.

- 3131 unit with a captive power supply
- T1 network cable
- Reference manual with configuration guides

For specific applications, you may require additional cables and adapters. Ordering information is located on page 3-4. Contact TxPORT Customer Service for further assistance.

Rack Mounting

The 3131 is housed in a plastic case intended for desktop installation. Kits are available which allow the unit to be mounted into standard 19-inch (33.02 cm) or 23-inch (58.42 cm) racks. This assembly occupies two rack spaces 3.5 inches (8.89 cm).

Supplied Materials

The 3131 rack mount assembly consists of the following items. Refer to the section Ordering Information on page 1-4 for ordering numbers.

- A casing supporting the bottom, sides, and rear of the unit.
- 19" or 23" plate that bolts to rack.
- Set of four bolts and nuts that attach the casing to the plate.
- Four screws that attach the assembly to the 19" or 23" rack.

Rack Mount Installation

1. Insert the 3131 (rear first) into the casing as shown in Figure 2-1.

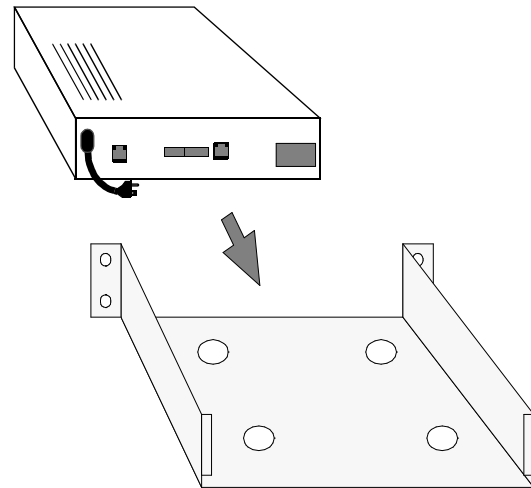


Figure 2-1 Rack Mount Installation

2. Connect this assembly to the 19" or 23" plate using the four nuts and bolts as shown in Figure 2-2. When the mounting plate is attached to the 3131 and the casing, the unit is secure and cannot be pulled out of the assembly from the front.

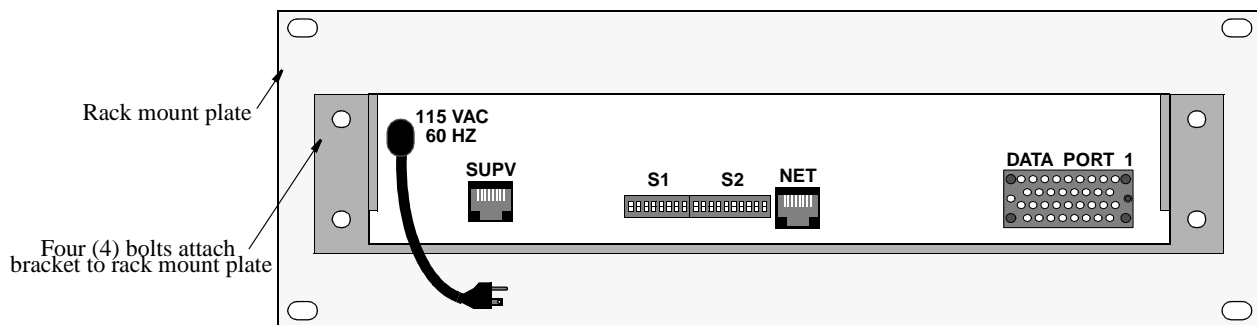


Figure 2-2 Rack Mount Assembly (Rear View)

3. To install the rack mount assembly into a rack, tighten the four sets of nuts and bolts that attach the plate to the

rack as shown in Figure 2-3. The plate may be 19" or 23" wide.

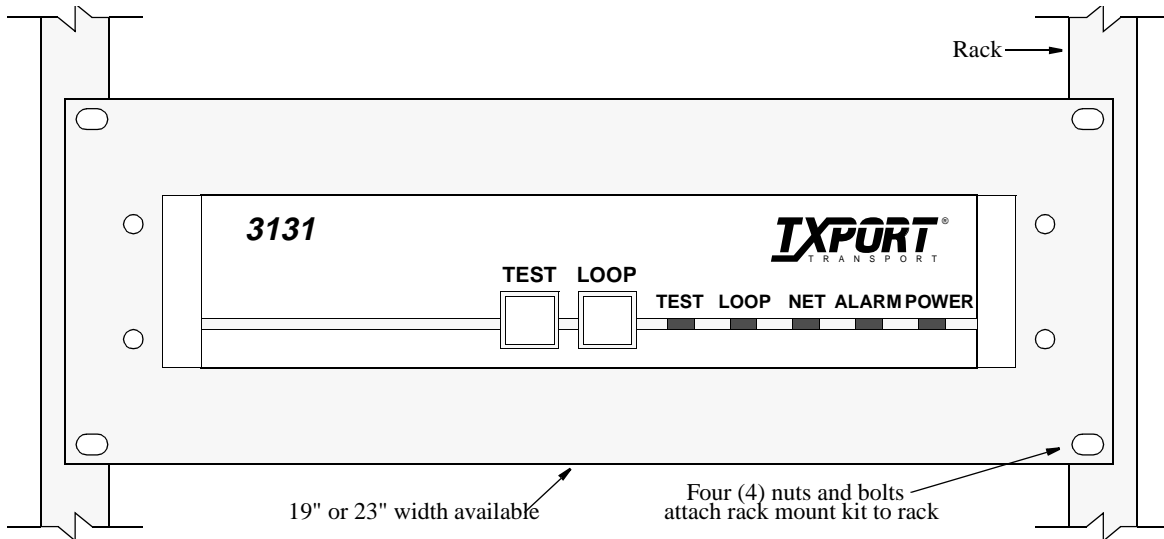


Figure 2-3 Rack Mount Assembly (Front View)

Port Connections

On the rear of the 3131, there are several port connections as shown in Figure 2-4: SUPV, NET, DATA PORT

NET

The Network interface connection contains an automatic line build out (ALBO) allowing the unit to be located a substantial distance away from the telco network interface with a receive signal level down to -27 dB.

The network interface LBO level should be set as instructed in the Line Parameters section on page 2-3. Maximum suggested cable lengths for the connection from the unit to the network are listed in Table 2-A. Calculations are based on a

cable temperature of 70° F, 0.083 uF/mile capacitance, a 27 dB loss, and a 100 Ω, non-loaded, twisted pair cable.

Table 2-A Maximum Cable Lengths

Cable Type	Loss per 1000'	Max Cable Length
26-gauge PIC	6.8 dB	4,400 ft
24-gauge PIC	5.4 dB	5,500 ft
22-gauge PIC	4.2 dB	7,100 ft
19-gauge PIC	3.0 dB	10,000 ft

PIC - Plastic Insulated Cable

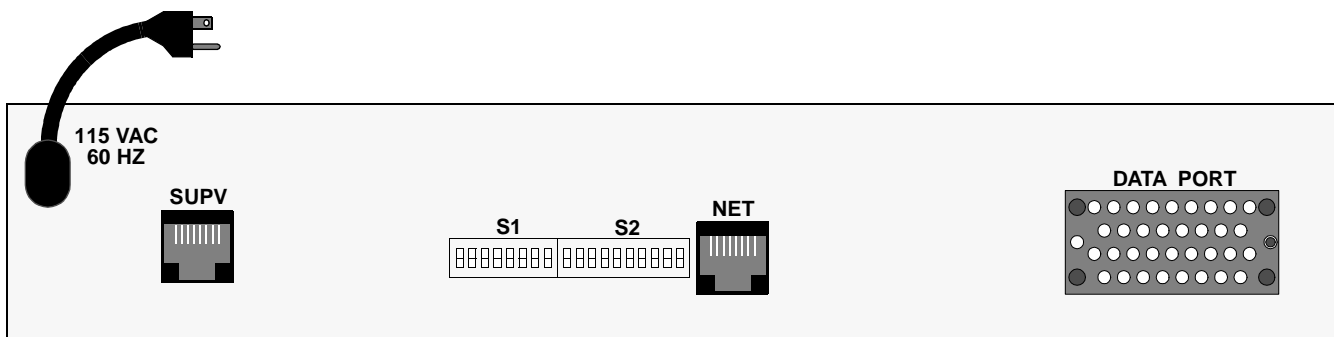


Figure 2-4 3131 Rear Panel

The network physical interface is a standard RJ-48C 8-pin modular jack. Table 2-B displays the pinout assignments.

Table 2-B Network Interface Pinout

Pin	T1 NET Interface
1	Data In
2	Data In
3, 6	Not used
4	Data Out
5	Data Out
7, 8	Chassis Ground

! *In accordance with FCC Rules, Part 68.218(b), you must notify the telephone company prior to disconnecting this product.*

SUPV

The SUPV port bit rates are configured through Switch S2 (page 3-2) and programmed through the Management Ports menu on page 3-11. This port is a DCE port configured for 8 bits, no parity, and 1 stop bit. The physical connections are 8-pin modular jacks (electrically RS-232). Figure 2-5 provides the pinout assignments. Refer to the section Ordering Information on page 1-4 for cable information.

The SUPV port serves several functions. The terminal interface program may be accessed through this port (See the section Software Configuration on page 3-2). A modem supporting an AT command set may be connected to this port for remote access or for the Call On Alarm feature (page 3-11). The modem should be optioned to ignore DTR, enable auto answer, inhibit command echo, and return verbose result codes. Serial bit rates can be set from 1200 bps to 19200 bps.

If you call the unit and send the BREAK command before receiving the CONNECT message, the modem will hang-up.

Data Port Connections

The 3131 is equipped with a V.35 port (on a standard 34-pin connector).

! *When using a V.35 interface, use a non-hooded cable with a V.35 interface.*

Pin functions for both high speed port interfaces are listed in Table 2-C. Default settings route all available DS0s to the DTE port.

! *FCC rules require that interconnecting cables carrying high speed data be shielded appropriately in order to minimize radio frequency interference.*

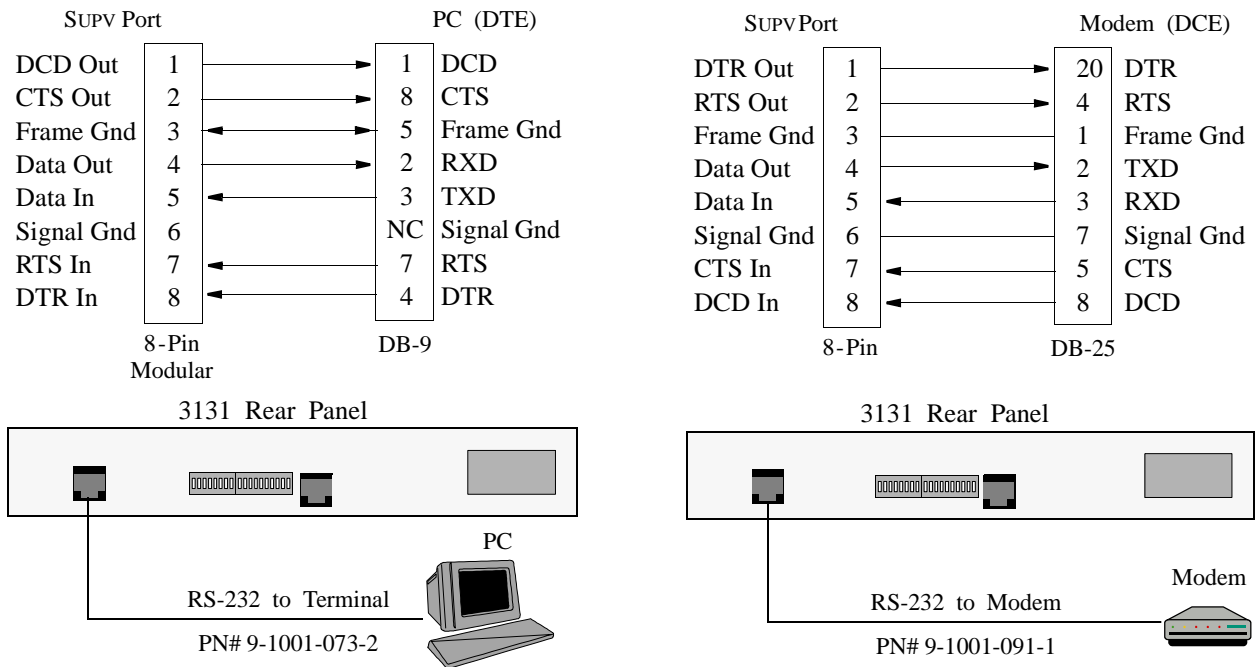


Figure 2-5 SUPV Terminal/Modem Connections

Table 2-C High Speed DTE Interface

Common Name	DB-25 25-pin	V.35 34-pin
Frame Ground	1	A
Signal Ground	7	B
Transmit Data	2, 14	P, S
Receive Data	3, 16	R, T
Request to Send	4, 19	C
Clear to Send	5, 13	D
Data Set Ready	6, 22	E
Data Term Ready	20, 23	H
Data Carrier Detect	8, 10	F
Transmit Clock	15, 12	Y, AA
Receive Clock	17, 9	V, X
Terminal Timing	24, 11	U, W

Power Connection

AC powered units are powered by a 110 VAC captive power supply. There is no power switch.

DC powered units have two terminal block connections labeled positive (+) and negative (-) that accept wire sizes from 12-gauge to 20-gauge. Either polarity (positive or negative) may be referenced to ground.



The unit is protected from reverse power connection but will not operate until power is properly connected according to the marked polarities (positive-positive and negative-negative).

Network Management

The 3131 is compatible with the TxPORT 8100A Site Controller as a remote or far-end element. The 8100A software system can be used to manage TxPORT network access products. Network management is performed through the SUPV port.

3. Configuration

The 3131 can be configured through manual switch settings and/or through a VT100 terminal connection to the supervisory port.

All default options in this manual are underlined.

Hardware Configuration

Hardware configuration is set using two dual in-line package (DIP) switches located on the rear of the unit. These switches allow you to configure simple applications. Refer to Figure 3-1 for switch locations. A removable configuration guide (45-00104) is included in the back of this manual with switch settings and product specifications.

Switch S1

Switch S1 (Figure 3-2) is an eight pin DIP switch that configures Network Framing, Network Coding, Network LBO, Timing Source, Test Button loop Code, and Test Button Mode.

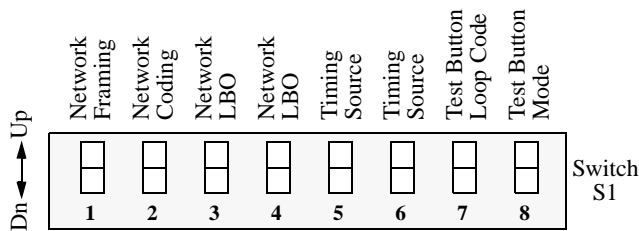


Figure 3-2 Switch S1

Network Framing: Switch S1-1 matches the unit to the network line framing as either ESF (Dn) or D4 (Up).

Network Coding: Switch S1-2 sets the network line coding to either B8ZS (Dn) or AMI (Up).

Network LBO: Switch S1-3 and S1-4 set the line build out signal level of the transmit data (TXD) from the unit to the network. The telephone company can provide the proper set-

ting. If unsure of the exact setting, leave it at the default value. Table 3-A lists the available levels.

Table 3-A Network LBO

S1-3	S1-4	Network LBO
<u>Dn</u>	<u>Dn</u>	<u>0 dB</u>
Up	Dn	-7.5 dB
Dn	Up	-15.0 dB
Up	Up	-22.5 dB

Timing Source: Switch S1-5 and S1-6 determine the unit clocking source. The most common timing source for CSU/DSU applications is the network. The 3131 may also be optioned to time from an internal standard or from the high speed data interface as shown in Table 3-B. The Up/Up setting is not applicable. If the switches are set to Up/Up, the setting defaults to the Network.

Table 3-B Timing Source

S1-5	S1-6	Timing Source
<u>Dn</u>	<u>Dn</u>	Network
Up	Dn	Internal
Dn	Up	Port 1 EXC
Up	Up	N/A

Test Button Loop Code: Switch S1-7 selects either an inband line loopback code (Dn) or an inband V.54 loop code (Up) for use with the front panel test button.

Test Button Mode: Switch S1-8 selects the test button operation mode as either BERT (Dn) or Clear (Up).

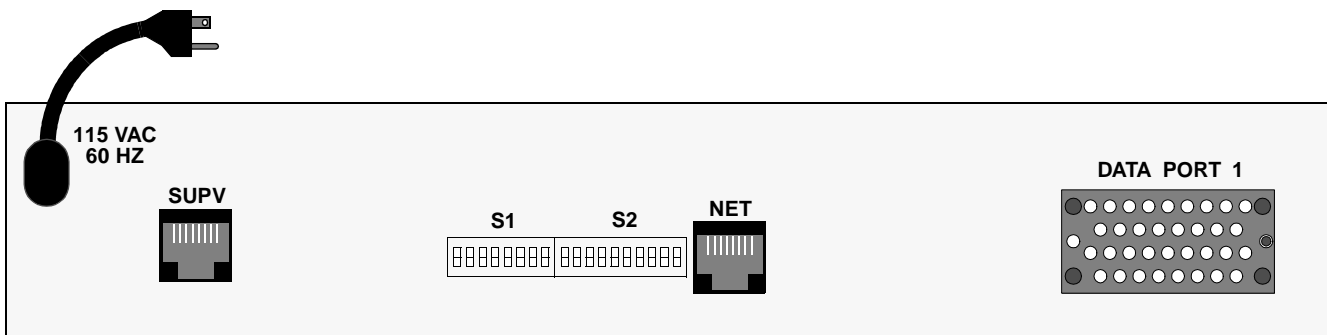


Figure 3-1 3131 Rear Panel

Switch S2

Switch S2 (Figure 3-3) is a ten pin DIP switch that configures the Data Port, Channel Assignment, Multiplier Rate, Boot Mode, and SUPV baud rate.

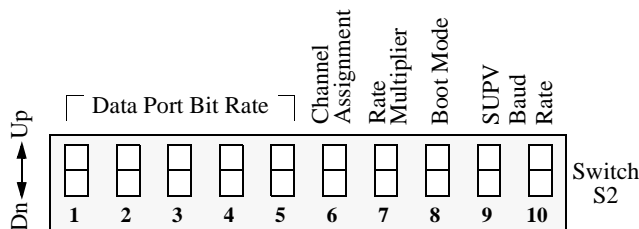


Figure 3-3 Switch S2

Data Port: Positions S2-1 through S2-5 set the 3131 data port bit rate. Table 3-C displays the rates and switch settings.

Table 3-C Data Port Bit Rates

# of DS0s	S2-7		S2-1	S2-2	S2-3	S2-4	S2-5
	Up	Dn					
Disable	Disable		Dn	Dn	Dn	Dn	Dn
1	56 kbps	64 kbps	Up	Dn	Dn	Dn	Dn
2	112	128	Dn	Up	Dn	Dn	Dn
3	168	192	Up	Up	Dn	Dn	Dn
4	224	256	Dn	Dn	Up	Dn	Dn
5	280	320	Up	Dn	Up	Dn	Dn
6	336	384	Dn	Up	Up	Dn	Dn
7	392	448	Up	Up	Up	Dn	Dn
8	448	512	Dn	Dn	Dn	Up	Dn
9	504	576	Up	Dn	Dn	Up	Dn
10	560	640	Dn	Up	Dn	Up	Dn
11	616	704	Up	Up	Dn	Up	Dn
12	672	768	Dn	Dn	Up	Up	Dn
13	728	832	Up	Dn	Up	Up	Dn
14	784	896	Dn	Up	Up	Up	Dn
15	840	960	Up	Up	Up	Up	Dn
16	896	1024	Dn	Dn	Dn	Dn	Up
17	952	1088	Up	Dn	Dn	Dn	Up
18	1008	1152	Dn	Up	Dn	Dn	Up
19	1064	1216	Up	Up	Dn	Dn	Up
20	1120	1280	Dn	Dn	Up	Dn	Up
21	1176	1344	Up	Dn	Up	Dn	Up
22	1232	1408	Dn	Up	Up	Dn	Up
23	1288	1472	Up	Up	Up	Dn	Up
24	1344	1536	Dn	Dn	Dn	Up	Up

Channel Assignment: Switch S2-6 selects the channel assignment mode for network T1 DS0s carrying data to the high speed port. Contiguous channel mode (Dn) assigns the channels as a block beginning at channel one. For example, if the high speed port data rate is to be 256 kbps (as defined by Switch S2), the unit assigns network channels one through four to the high speed port.

Alternate (Up) channel mode assigns an idle channel following each data channel. For example, data are carried on

channels 1, 3, 5, and 7. Channels 2, 4, 6, and 8 are idle (the idle setting is binary code 01111111). The advantage of alternate channel assignment is that T1 ones density requirements are maintained by the idle channels rather than placing any restrictions on the high speed data.

Multiplier Rate: Switch S2-7 sets the multiplier for the Data Port input timing. The unit can operate at any data rate that is a multiple of 56 or 64 kbps. Selecting Nx64K (Dn) provides port bit rates that are multiples of 64 kbps. The ones density requirements of the T1 network line must be ensured in this mode. Refer to the section entitled Line Parameters on page 3-8 for more information. Selecting Nx56K (Up) allows port bit rates that are multiples of 56 kbps. The unit maintains ones density for the selected DS0 channel in this mode.

Boot Mode: Switch S2-8 determines whether the unit configures itself from the DIP switches or from the battery backed RAM. If set to boot from RAM (Up), the switch settings are ignored. If set to boot from switches (Dn), the unit reads the DIP switches on power-up and configures accordingly. Once running, configuration changes can be made through the terminal interface, overriding the switch settings. Only the parameters on switch settings that differ from the current setting are affected.

SUPV Port Bit Rate: Switches S2-9 and S2-10 set the supervisory port bit rate. This is a serial RS-232 DCE port configured for 8 bits, no parity, and 1 stop bit. Table 3-D shows the available speeds and settings.

Table 3-D SUPV Port Bit Rate

S1-2	S1-3	SUPV Port Rate
Up	Up	1.2 kbps
Dn	Up	2.4 kbps
<u>Dn</u>	<u>Dn</u>	<u>9.6 kbps</u>
Up	Dn	19.2 kbps

Software Configuration

The terminal interface is a firmware application program embedded inside the 3131. You can access this information through the SUPV port (page 3-2).

Interface Start-up

Once a compatible terminal is properly connected to the unit, you can start a terminal interface session by sending a BREAK command to the unit (or by pressing <return> four times). The Main Menu screen is displayed if a password has not been specified.

If a password has been previously established, you must enter the correct password to continue the session. The password is case-sensitive. If you have forgotten your password, note the date and time shown on your screen and contact TxPORT Technical Support. You can establish a password through the Utilities screen on page 3-12.

Menu Structure

The terminal interface opens with a main menu allowing five options: Alarms, Performance, Maintenance, Configuration, and Utilities (Figure 3-4). Each menu screen allows you to access the local or far end menu screen.

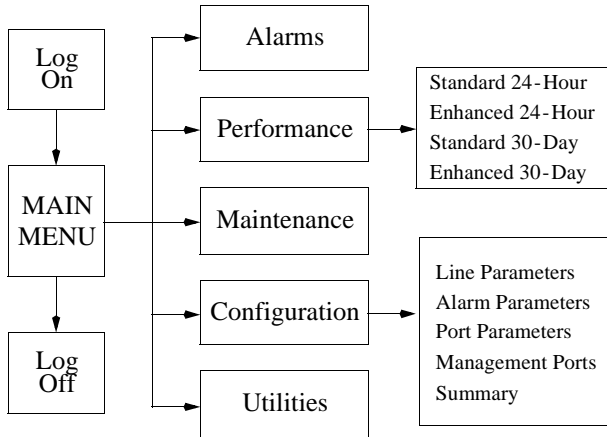


Figure 3-4 Menu Structure

For more information on how to operate the terminal interface refer to Appendix A, Terminal Interface.

⚠ If you do not allow a keystroke for 10 minutes, the terminal interface automatically logs off.

Alarms Screen

The Alarms screen (Figure 3-5) allows you to view the current alarm status of the network and the DTE lines.

NETAlarms: These status lines display the selected element's current network signal alarm state. Alarms are determined by the selectable thresholds in Table 3-E.

Table 3-E Alarm Indicators

Alarm	Description
-----	No status is available
OK	No alarm threshold has been exceeded, although errors may exist which do not exceed thresholds.
ERRS	The Errored Seconds, Severely Errored Seconds, or Bipolar Errored Seconds threshold is exceeded.
LOSS	The Loss Of Signal Seconds threshold is exceeded.
OOFs	The Out Of Frame Seconds threshold is exceeded.
RAIS	The Remote Alarm Seconds threshold is exceeded.
AISS	The Alarm Indication Seconds threshold is exceeded.
UAS	The Unavailable Seconds threshold is exceeded.
PORT 1	DTR Alarm on PORT 1
PORT 2	DTR Alarm on PORT 2

DTEAlarms: These status lines display the selected element's current DTE signal alarm state. Alarms are determined by the selectable thresholds in Table 3-E.

(alarm status): The main body of the Alarms screen shows the current count for parameters that may be used to trigger an alarm.

The Current column displays a total of the preceding 15 one-minute intervals. At the end of each one-minute interval, the oldest minute of the 15-minute interval is discarded.

```

3100 DSU 2.01/2.00          3 1 3 1          Date: 08/19/96
No Far End Response                Time: 09:15:26
----- ALARMS -----

NET Alarms: LOSS
DTE Alarms: NONE

                Current      Threshold
Loss of Signal Seconds (LOSS):      883          5
Errored Seconds (ES):                883          45
Severely Errored Seconds (SES):       0           5
Unavailable Seconds (UAS):           884          0
Out of Frame Seconds (OOFs):         883          5
Remote Alarm Seconds (RAS):          0           0
AIS Seconds (AISS):                  0           0
BPU Seconds (BPUS):                  0           0

Power Loss Seconds (PLS):             0

Reset Alarm Registers:                (RESET)

----- Messages -----
Local Screen
  
```

Figure 3-5 Alarms Screen

The Threshold column displays the values set in the Alarm Configuration screen (page 3-9). Parameters having a current value equal to or greater than its non-zero threshold generates an alarm. Any parameter with a threshold value of zero is disabled from generating alarms.

The parameters shown on the Alarms screen are updated at five second intervals.

Power Loss Seconds: This field displays the number of seconds that the element has been without power since this value was last cleared.

Reset Alarm Registers: Pressing <return> on (RESET) zeros the value of all Current alarm parameters, but does not affect 24-hour or 30-day performance registers.

Performance Screen

The Performance screen (Figure 3-6) display a detailed history of the error parameters that are continuously monitored. The terminal interface provides a display of near end or far end performance data using the facility data link, modems, or a single DS0 channel.

The unit is equipped with a dual set of performance data registers that hold line statistics for both the telco and user. Each register set provides detailed status and performance history for the network interface.

The system has four Performance screens. The STANDARD 24 HOUR and the ENHANCED 24 HOUR screens allow the user to view the 24-hour detailed performance history of the T1 circuit. The only difference in the two screens is in the type of performance data displayed. The STANDARD 24 HOUR screen is shown in Figure 3-6.

The STANDARD 30 DAY and the ENHANCED 30 DAY screens allow the user to view a 30-day history of a particular element's performance. These screens reference intervals by date rather than by time. To reach each of the four screen types, use the <spacebar> to toggle the STANDARD 24 HOUR field. The other fields are described as follows:

Element: Pressing the <spacebar> toggles this field for selection of either the NEAR or FAR unit as the source of performance data or the target of commands. NEAR refers to the unit to which the terminal is connected. FAR refers to the unit at the other end of the network T1 span.

Target: This field selects the display of User or Telco performance registers. Telco registers are for viewing only and may not be changed. The options are:

[USER] [NET] – Display the user performance registers for the network.

[TELCO] [NET] – Display the telco performance registers for the network.

Error Events: This field displays the running total of ESF error events for the circuit selected in the Element field and is applicable only when Target is set to [USER]. This count accumulates until it reaches 65535 or is reset by pressing <return> with the (RESET) field highlighted.

Reset Performance Registers: This field allows the element registers to be reset and may only be used when the Target field is set to [USER]. If <return> is pressed, the following warning appears:

DELETE ALL PERFORMANCE DATA?
(NO!) (YES)

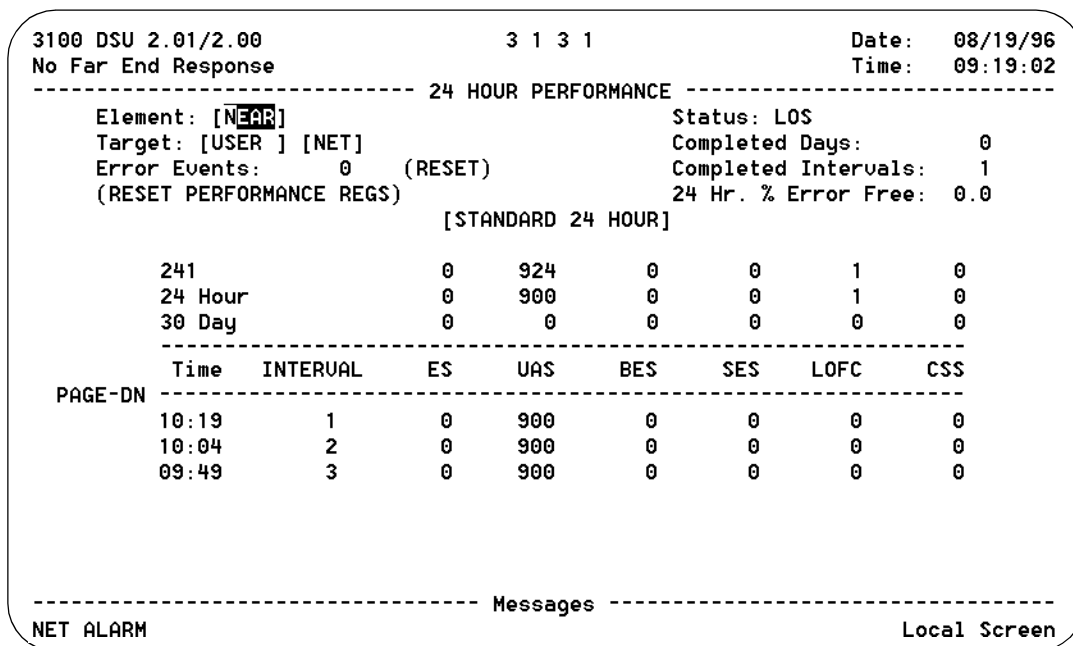


Figure 3-6 Performance Screen

To exit this screen without performing the reset function, press <return> with NO selected. To proceed with the reset function, press <return> on YES. All values for the chosen register set (NET or DTE) are then reset to zero.

Status: Displays the selected T1 line status derived from the type (or absence) of errors in the received data. This status represents the immediate state of the received T1 signal and is not related to the alarm thresholds. This field shows one or more of the signal status conditions listed in Alarm Indicators on page 3-3.

Completed Days: Displays the number of days which are included in the 30-day totals.

Completed Intervals: Displays the number of 15-minute intervals in the last 24-hour period since the registers were last cleared (a 24-hour period may contain up to 96 intervals).

24 Hr.% Error Free: Displays the percentage of error free seconds within the last 24 hours or since the event registers were last cleared (based only on the ES and UAS parameters).

Standard 24 Hour: Toggling this field with the <space-bar> steps through the four available performance screens: STANDARD 24 HOUR, STANDARD 30 DAY, ENHANCED 24 HOUR, and ENHANCED 30 DAY.

(performance data): The main body of display data consists of error events for three different periods: The first display line shows the data accumulated for the current interval (from 0 to 900 seconds). The second line shows the totals for the last 24-hour period (or the last 96 fifteen-minute intervals). The third line shows the 30-day totals.

The remaining lines of this screen show the data for any intervals containing errors. Interval 1 is the most recently

stored 15-minute interval and interval 96 is the oldest in the current 24-hour period. On the 30-day screens, interval 30 is the oldest 1-day interval in the current 30-day period. The real time (or date on 30-day screens) of the interval beginning is shown in the first column.

If more than 5 errored intervals have elapsed, [PAGE-Dn] appears to the left of the performance data. Pressing <return> on this field displays the next five errored intervals. [PAGE-UP] appears once [PAGE-Dn] is used. Pressing <return> on [PAGE-UP] displays the previous five errored intervals. Only intervals containing errors are displayed, eliminating rows of zeroes. If an interval is not displayed, no errors were detected during that time period.

The parameters shown on the Performance screens are updated at 5 second intervals.

Per AT&T TR54016, the Standard 24 Hour and Standard 30 Day performance data consists of Errored Seconds (ES), Unavailable Seconds (UAS), Bursty Errored Seconds (BES), Severely Errored Seconds (SES), Loss of Frame Count (LOFC), and Controlled Slip Seconds (CSS).

The Enhanced 24 Hour and Enhanced 30 Day screens show data for CRC Errored Seconds (CRCES), Out of Frame Seconds (OOFs), Loss of Signal Seconds (LOSS), Alarm Indication Signal Seconds (AISS), Remote Alarm Seconds (RAS), and Bipolar Violation Seconds (BPVS).

For generic 54016 far end devices, only the standard telco 24-hour performance data is displayed. 30-day data is not available.

Element Maintenance

The Element Maintenance screen (Figure 3-7) allows you to perform loop test and/or initiate a 511 BERT. Tests may also

```

3100 DSU 2.01/2.00          3 1 3 1          Date: 08/19/96
No Far End Response          Time: 09:23:04
----- ELEMENT MAINTENANCE -----

(CLEAR TESTS)
(CLEAR ALARMS)

T1 Loop: [FAR PLB]
T1 Unloop: [FAR PLB]

Port Loop: [One NEAR ]
Port Unloop:[One NEAR ]

BERT: [T1 NET ]
Pattern: [511 ]
Test Length: [Cont. ]

Pattern Sync: NO TEST
Elapsed Time: 00:00:00
Bit Errors: 0
Errored Seconds: 100
% EFS: 100

(START TEST)
(RESET ERRORS)

T1 NET Status: LOS

Near Loops:
Far Loops:
----- Messages -----
NET ALARM                                     Local Screen

```

Figure 3-7 Element Maintenance Screen

be activated by the front panel push buttons as described in Hardware Testing on page 4-1.

Clear Tests: Pressing <return> on this field clears all local tests and any line loops that have been initiated.

Clear Alarms: Pressing <return> on this field causes all near end alarms to be cleared.

T1 Loop: The type of T1 loop is chosen by toggling the <spacebar> and is executed by pressing <return>. This unit supports the following types of loops which are graphically represented on page 3-7.

Loop status changes can be made only when the BERT function is not in the active mode.

T1 Unloop: Pressing <return> takes down the specified loop from the currently selected port.

NET PLB (Payload Loopback): The received network signal is looped back toward the network with signal regeneration and framing and CRC regeneration. During the NET PLB, data from the DTE is looped back to the DTE. The NET PLB may be activated by receipt of out of band loop code on the network receive signal or by selection in the user interface maintenance screen.

FAR PLB: You can activate a NET PLB on the remote end unit through this selection.

NET LLB (Line Loopback): The received network signal is looped back toward the network with signal regeneration only (framing and CRC intact). During the NET LLB, data from the DTE is looped back to the DTE. The NET LLB may be activated by receipt of inband or out of band loop code on the network receive signal, by the front panel loop switch, or by selection in the interface maintenance screen.

FAR LLB: You can activate a NET LLB on the remote end unit through this selection or through the front panel TEST switch (if configuration Switch S1-7 is set to Inband LLB).

DTE MLB: The T1 DTE MLB command loops all network data back toward the DTE ports at the network interface. Data is parsed through to the network. Set the T1-NET Timing to Internal when this loop is enabled.

Port Loop: This field is used to loop high speed data port from the network back to the network and data from the DTE back to the DTE. The Port Loop may be activated by receipt of inband V.54 fractional loop code or by this field. Choices are One NEAR and One FAR.

You can activate a Port Loop on the remote end unit through this field or by the front panel test switch. The test switch can be used to activate a remote Port 1 loop if configuration Switch S1-7 is set to Inband V.54. Either method causes the unit to transmit inband V.54 fractional loop code toward the network in the port's bandwidth.

Port Unloop: Pressing <return> takes down the specified loop from the currently selected port.

BERT: This field selects the interface and direction for the test pattern transmission. The choices are: T1_NET, One NET, One DTE, Idle, and channels 1-24. The internal BERT may also be activated through the front panel test switch as specified under Hardware Testing on page 4-1.

Pattern: Specifies the pattern to be transmitted during a test. Modifying this field will not cause the pattern to be transmitted (refer to Start Test). The choices are 511 and [CLEAR].

Test Length: Defines the run-time of test pattern generation and error accumulation. The choices are [15 min], [30 min], [60 min], [24 Hour], and [Continuous].

Start Test: Pressing <return> with the cursor on this field starts the selected test pattern. TEST IN PROGRESS appears once the test has started. To end the test, press <return> on STOP TEST which appears when the test is in progress.

Reset Errors: Pressing <return> with the cursor on this field causes the test error results to be cleared to zero.

Pattern Sync: This field displays the current state of pattern sync during a test. If no test is in progress, NO TEST is displayed. If a test is active, but the receiver is not in pattern sync, NO SYNC is displayed. If the receiver is in pattern sync, IN SYNC is displayed.

Elapsed Time: Displays the amount of time elapsed since a timed test began or, if completed, the total test time.

Bit Errors: Displays the total number of bit errors detected since the test began or since error statistics were cleared (Up to a maximum number of 999,999).

Errored Seconds: This field displays the number of asynchronous errored seconds that have been detected since the test began or since error statistics were last cleared. This parameter includes bit error seconds and sync loss seconds.

% EFS: This ratio is derived from the number of error free seconds divided by the number of seconds accumulated in Elapsed Time.

T1-NET Status:

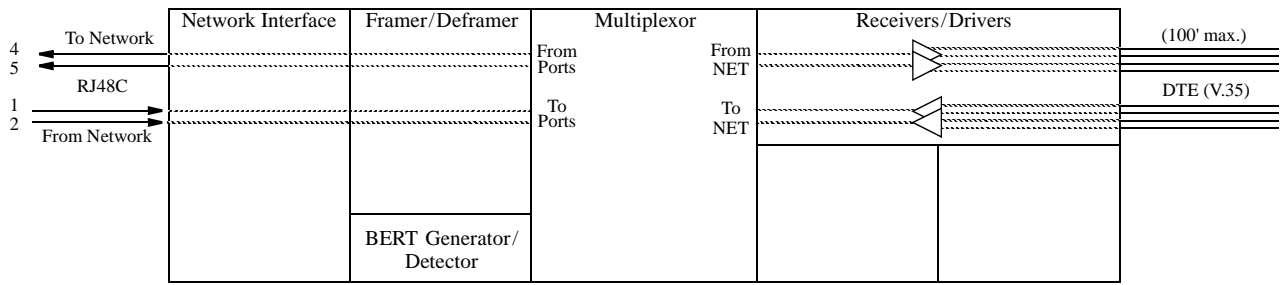
Near Loops: Displays the loop status of the near element.

Far Loops: Displays the loop status of the far element.

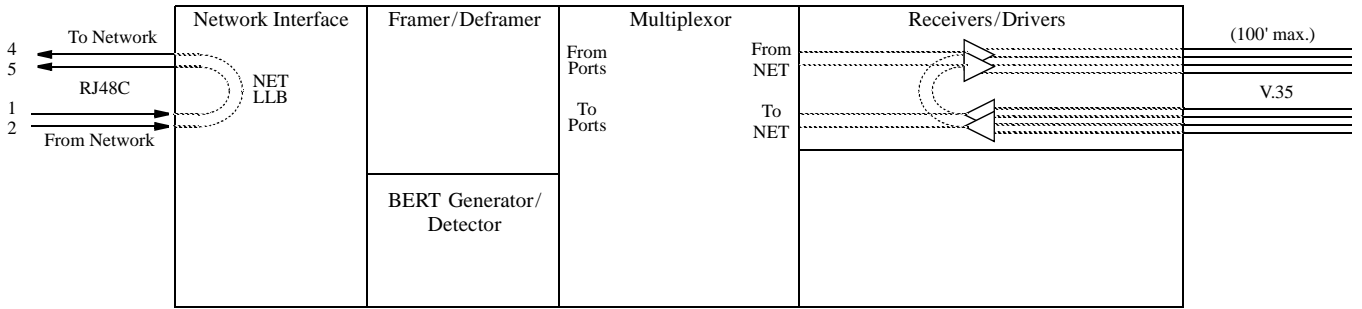
Configuration Screens

The Configuration screens allow you to view and set configuration parameters for the network elements.

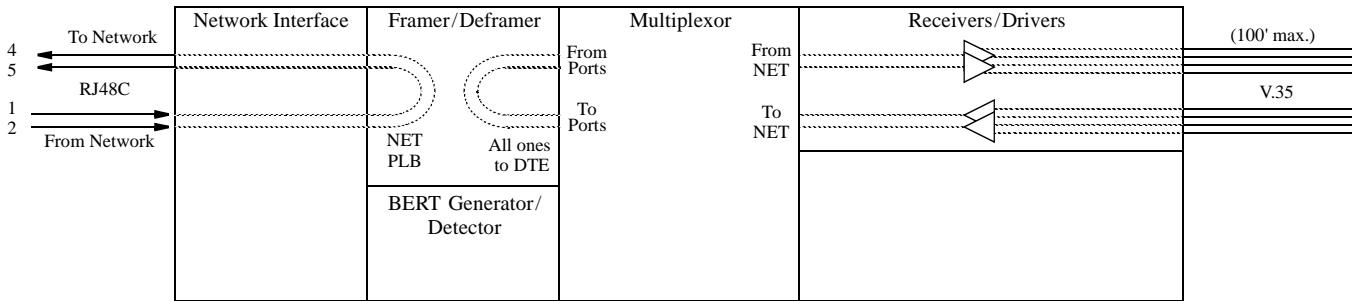
To send a new configuration to the unit, you must press <return> on one of the fields or exit



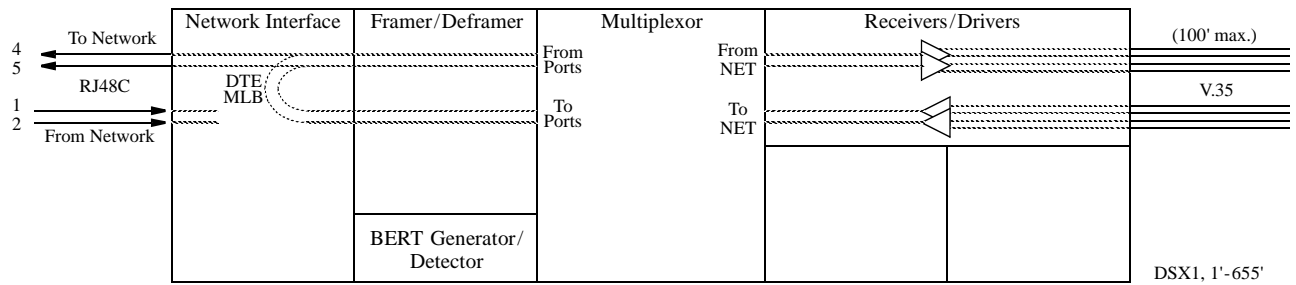
Normal Operation



Network LLB

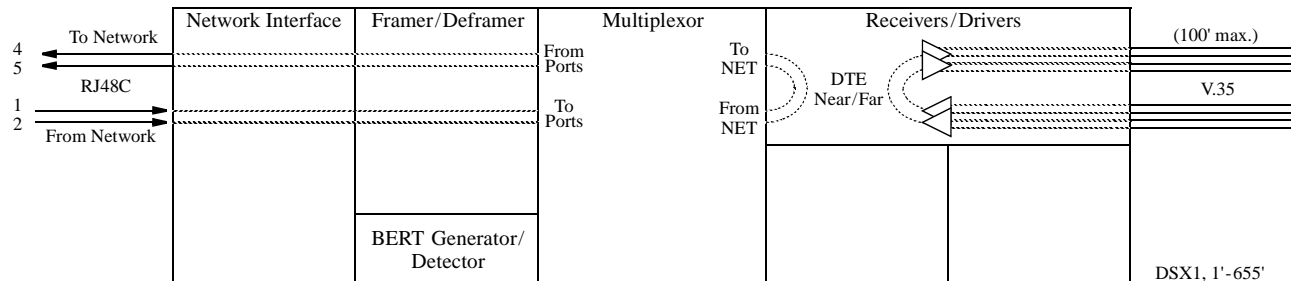


Network PLB



DTE MLB

DSX1, 1'-655' to cross-connect



Port Loop (bidirectional)

DSX1, 1'-655' to cross-connect

the screen. The underlined values are the factory default parameters stored in ROM.

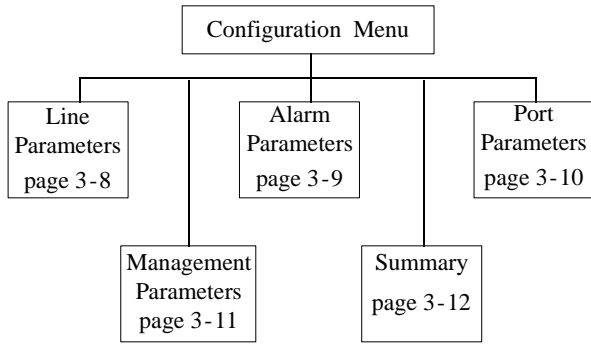


Figure 3-8 Configuration Menu

LINE PARAMETERS

The Line Parameters screen (Figure 3-9) allows you to review and set line parameters for the selected element on the T1 circuit. This screen has the following fields, most of which have user selectable options. To send the new line configuration to the unit, either press <return> on one of the fields, change the Element selection, or exit the screen.

T1-NET Framing: Selects the type of framing for the network side of the element as either [ESF] and [D4].

T1-NET Line Code: Sets the network side line coding as either [AMI] and [B8ZS].

T1-NET LBO: Sets the line build out for the network interface as either [0 dB], [-7.5 dB], [-15 dB], or [-22.5 dB].

PRM Enable: This field allows the T1.403 Performance Report Message, which is sent once a second, to be turned on or off. The choices are [ENABLE] and [DISABLE].

Zero Suppression: This field determines whether ones density insertion is activated after 15 zeros. The choices are [ENABLE] and [DISABLE].

T1-NET Timing: Sets the timing source to synchronize the unit's internal timing generators. Slips are controlled to occur on frame boundaries at the network and/or DSX1 ports when timing synchronization is lost.

Internal: The unit's internal frequency standard is used for all timing.

Port 1: Timing is synchronized to the external terminal timing clock supplied from the DTE and connected to the selected port.

Verify that the external DTE clock is operating at the data rate selected for Port 1.

Network: Timing is derived from the network recovered clock (most applications use this selection).

Remote Comm Channel: This field selects a communication link to the far end unit. You can either assign a DS0 channel (1 through 24) or use an ESF facility data link (0). If '0' is selected, communication is established over the ESF facility data link (valid only when the network interface is configured for ESF and the FDL has end-to-end integrity). For example, the entire T1 bandwidth must be available to the user with no intervening multiplexors in the signal path blocking the FDL.

As an alternative, the communication link may be assigned to an unused idle channel. This option may be used whether the network is operating in D4 or ESF modes.

When the remote communication is programmed to operate over a spare network channel, test conditions such as a

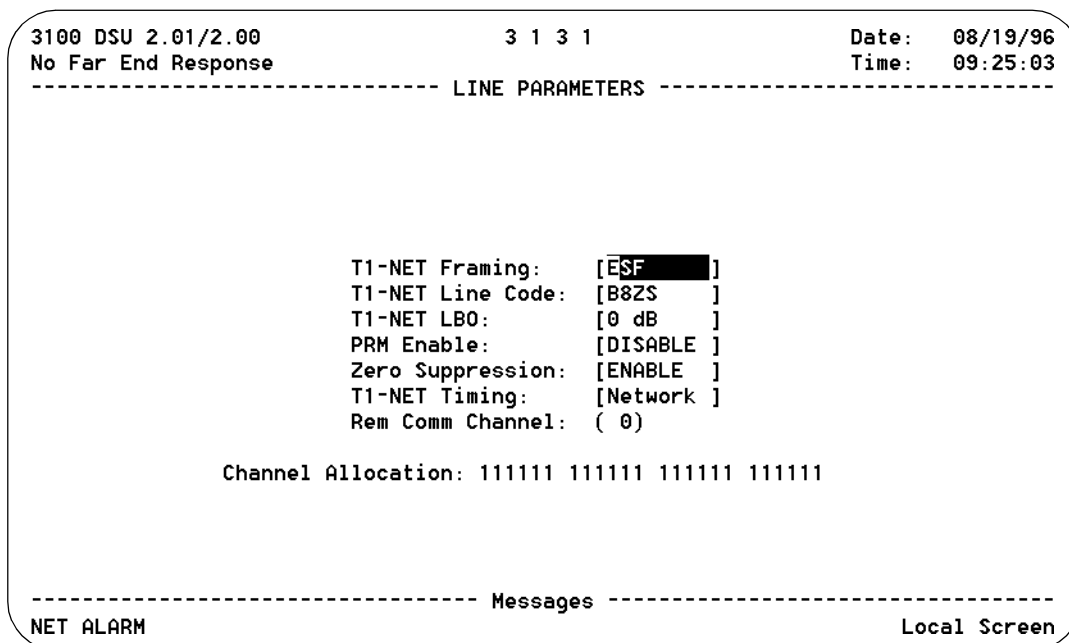


Figure 3-9 Line Parameters Screen

remote network LLB or PLB or a local network LLB will interrupt access to the far end unit.

When the remote communication is programmed to operate over the facility data link (FDL), test conditions such as a remote network LLB or a local LLB on the near end will interrupt access to the far end unit.

If far end communication is interrupted for any reason while accessing the remote unit, you should exit and then reenter this screen to ensure that all the parameters have been updated.

Channel Allocation: This display-only field indicates the network channel assignments with Channel 1 on the left and Channel 24 on the right. Channels assigned to a port are identified with a port number (1 or 2). Non-assigned idle channels are marked with a dash (-). Remote communication channels are marked with an R.

ALARM CONFIGURATION

The Alarm Configuration screen (Figure 3-10) allows you to review and set alarm related thresholds for the selected element. These thresholds are the minimum acceptable performance levels. To modify the parameters, highlight the desired statistic, type in the new value (any number from 0 to 900) and press <return>. If this value is later surpassed, an alarm indication will appear. A field set to (0) will cause the element not to alarm on that statistic.

Errored Seconds: A one second period in which at least one logic error occurred.

Severely Errored Seconds: A one second period in which at least 320 CRC errors or 1 OOF (out-of-frame) occurred.

Loss of Signal Seconds: A one second period in which the T1 received signal is interrupted.

Unavailable Seconds: A one second period in which consecutive severely errored seconds cause an unavailable state.

Remote Alarm Seconds: Generated by the terminal equipment when an improper signal is received from the facility (or upon receipt of unframed all ones).

AIS Seconds: One second period when all ones are received.

Out of Frame Seconds: A one second period in which a frame sync loss occurred.

BPV Seconds: A one second period in which at least one bipolar violation occurred.

Alarm Reset Timer: Determines the number of seconds after alarm conditions clear before indications are removed.

```
3100 DSU 2.01/2.00          3 1 3 1          Date: 08/19/96
No Far End Response          Time: 09:26:26
----- ALARM CONFIGURATION -----

Errored Seconds (ES):      (45)
Severely Errored Seconds (SES): ( 5)
Loss of Signal Seconds (LOSS): ( 5)
Unavailable Seconds (UAS):  ( 0)
Remote Alarm Seconds (RAS): ( 0)
AIS Seconds (AISS):       ( 0)
Out of Frame Seconds (OOFs): ( 5)
BPU Seconds (BPUS):       ( 0)
Alarm Reset Timer (seconds): ( 30)

----- Messages -----
NET ALARM                                     Local Screen
```

Figure 3-10 Alarm Configuration Screen

PORT CONFIGURATION

The Port Configuration screen (Figure 3-11) sets the operating parameters for the high speed port. When channel assignment changes are made to the high speed port or to the remote communication link, the 3131 reestablishes the mapping of all channels. This interruption to traffic will normally result in a brief burst of data errors on other ports.

Channel Allocation: This display-only field indicates the network channel assignments with Channel 1 on the left and Channel 24 on the right. Channels assigned to a port are identified with a port number (1). Non-assigned idle channels are marked with a dash (-). Remote communication channels are marked with an 'R'. When channels are assigned to a port in the Alternate assignment mode, each data channel is followed by an idle channel that is not assignable for other ports and is marked with an X.

Port #: Selects the port to be configured. For the 3131, only one port is available.

Rate Multiplier: The unit can operate at any data rate that is a multiple of 56 or 64 kbps. When **Nx64K** is selected, the ones density requirements of the T1 network line must be ensured. When **Nx56K** is selected, the unit maintains ones density for the selected DS0 channel.

DS0 Channel Assignment: Selects whether the DTE channel assignment will be made as a Contiguous group or as Alternate channels. Selecting Alternate will assure ones density but reduce the available bandwidth from 1.536 kbps to 768 kbps.

Start Channel #: The starting channel in the 24-channel DS1 bit stream must be selected in this field. The unit then assigns the following channels automatically according to

the bit rate multiplier and the mode selected in DS0 Channel Assignment. The choices are 1 through 24.

Port Rate: Pressing the <spacebar> increases the required port bit rate in increments of 56 or 64 kbps, depending on the Rate Multiplier setting. The N multiplier ranges in value from 0 to 24.

of Channels: This field displays the number of channels to be passed through to the DTE. The number is determined by the Port Rate value divided by the Rate Multiplier.

Tx Clock: This field is used to select the clock that the unit will use to sample the data transmitted from the DTE. When set to Internal, the data is sampled directly with the transmit data clock that is also supplied to the DTE as Transmit Clock. The External option uses the external clock supplied by DTE. The Oversample option is used to operate the port as a low speed asynchronous port. In this mode, the port rate should be set to at least 4 times the asynchronous data rate (depending on the degree of allowable distortion for the particular DTE equipment used).

LL (Local Loop) Detect: Allows you to Enable or Disable pin J (V.35) to loop-up the near (local) unit.

RL (Remote Loop) Detect: Allows you to Enable or Disable the monitoring of pin BB (V.35) to loop-up the far unit.

V.54 Loop: Selecting Enable allows the unit to respond to inband V.54 loop commands. If you select Disable, the unit ignores these commands.

Invert Data: In the invert mode (Yes), transmit and receive data are inverted at the port interface. This function may be used as a means of guaranteeing ones density when the data is composed of SDLC type protocols. The choices are Yes and No.

```

3100 DSU 2.01/2.00          3 1 3 1          Date: 08/19/96
No Far End Response          Time: 09:27:38
----- Port Configuration -----

          Channel Allocation: 111111 111111 111111 111111

Port #          [ONE ]
Rate Mult:      [N x 64k]
DS0 Ch. Assign: [Contiguous]

Start Ch. #:    ( 1)
Port Rate:      [1.536 MHz]
# of Channels:  24

Tx Clock:       [Internal ]

LL Detect : [Disable]
RL Detect : [Disable]
U.54 Loop : [Enable ]
Invert Data: [No ]
CTS Control: [Force True ]
DSR Control: [Force True ]
DCD Control: [Force True ]

Alarm On DTR Loss: [Disable]

----- Messages -----
NET ALARM                                          Local Screen

```

Figure 3-11 Port Configuration Screen

CTS/DSR/DCD Control: Setting any of these three fields to Force True or Force False allows the forcing of the port control lead output state. Internal allows for normal operation.

Alarm on DTR Loss: Selecting Enable allows the unit to go into alarm on loss of DTR. The default setting is Disable.

MANAGEMENT PORTS

The Management Ports screen (Figure 3-12) sets the following parameters for the Call On Alarm (COA) connection on the SUPV port.

Element ID: This field allows the entry of an ASCII string (29 characters in length) which identifies the unit to the device receiving the alarm notification messages.

Call on alarm messages are reported in the following format in the DIAL or DIRECT modes only:

Element ID MM/DD/YY HH:MM:SS <CR> <LF>

NET Alarms: alarms <CR> <LF>

DTE Alarms: alarms <CR> <LF>

where (alarms) is a string consisting of some or all of the identifiers LOS, OOF, RAS, AIS, UAS, ERRS, or NONE. The following is an example:

Joesunit 08/04/96 17:24:55

NET Alarms: LOS AIS ERRS

DTE Alarms: LOS

The user programmable Element ID string is transmitted first to allow the COA function to send a message with a specific meaning to some host (such as a log on message).

The identifier ERRS represents an alarm that is caused by ES, SES, and/or BPV errors.

COA Connection: This field controls the remote alarm reporting. The ASCII alarm report type is set by the following choices:

DISABLED - Alarm reporting is disabled.

DIAL - Sends reports through an attached AT command set compatible modem connected to the SUPV serial port, which must dial out to a remote modem. The message format is described in the Element ID field.

DIRECT - Sends reports to a printer or terminal connected directly to the supervisory port.

Primary Dial String, Secondary Dial String: These fields are ASCII strings for the primary and secondary call on alarm phone numbers used in the DIAL mode.

The unit attempts 3 times to connect using the primary number. If all 3 attempts fail, it will attempt 3 times to connect using the secondary number (if it is not blank). If the secondary number fails, the unit waits 5 minutes and then attempts to communicate with the primary number again. When a connection is detected, the unit outputs the notification message (as described in the Element ID field) and then disconnects.

Initialization String: The modem initialization string is entered in this field. Refer to the modem's documentation for further information. The default setting is ATEQ0V1.

Disconnect String: This field identifies the character string to be output when the modem session is terminated. The default setting is ATH.

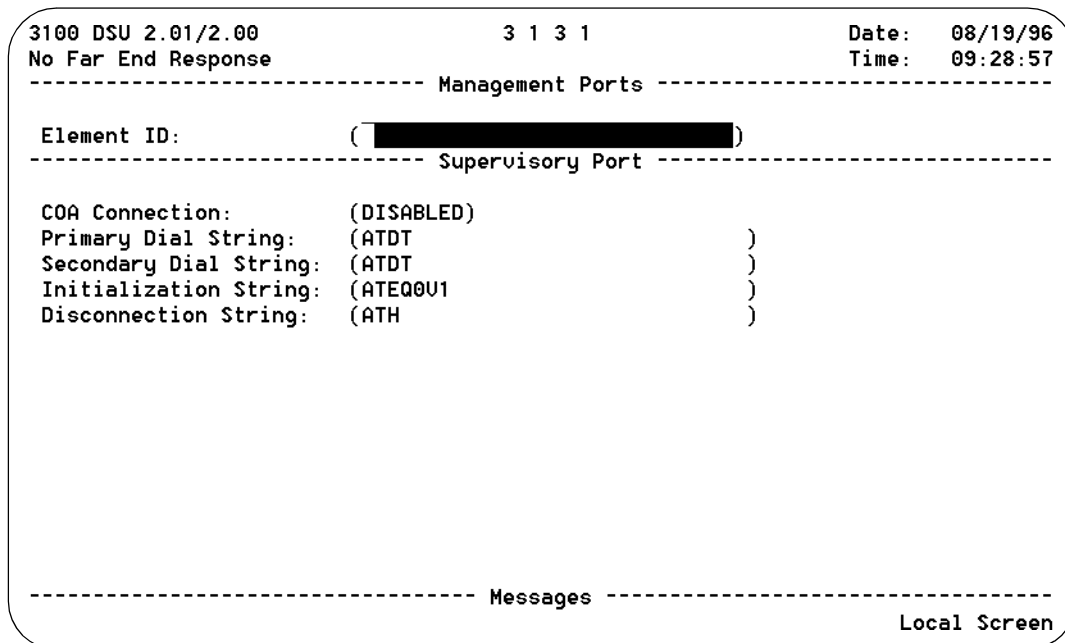


Figure 3-12 Management Ports Screen

SUMMARY

The Summary screen (Figure 3-13) is a *display-only* screen which summarizes all the configuration switch settings in the left column. Other pertinent information is shown in the right column.

Utilities

The Utilities screen (Figure 4-23) handles the functions described in the following paragraphs.

Set Time: The current time may be entered in this field using the 24-hour HH:MM:SS format. For example, 3:45 AM is entered as 0345 and 3:45 PM is entered as 1545.

Set Date: The current date may be entered in this field using the MM:DD:YY format. For example, July 4, 1993 is entered as 070493.

The time and date for the far end can be set from the local unit, however, the values are not displayed on the local screen.

```
3100 DSU 0.99/2.00          P R I S M  3 1 0 0          Date:  05/23/96
No Far End Response          Time:  10:49:22
----- SUMMARY -----
($1:1)  Boot Mode:          Switches          Serial Num: 000001
($1:2-3) Supv Port Rate:    19200              LAN Conn:  SLIP
($1:4-5) Slip Port Rate:    9600                HW Address: N/A
($1:6)   DS0 Ch. Assign:    Contiguous         IP Address: 198.198.198.002
($1:7)   Port 1 Mult:       Nx64
($1:8)   Port 2 Mult:       Nx64
($2:1)   Net Framing:       ESF
($2:2)   Net Coding:        B8ZS
($2:3-4) Net LBO:           0 dB
($2:5-6) Timing Source:     Network
($2:7)   Test Loop:         Inband LLB
($2:8)   Test Mode:         BERT
($3:1-5) Port 1 Rate:       1.536 MHz
($3:6-10) Port 2 Rate:      0 kHz
($4:1)   T1-DTE Framing:    ESF
($4:2)   T1-DTE LineCode:   B8ZS
($4:3-5) T1-DTE DSX Level:  0-110 FEET
----- Unit Options -----
Port 1: U.35
Port 2: U.35
T1-DTE Option Card
----- Messages -----
NET ALARM                                     Local Screen
```

Figure 3-13 Summary Screen

```
3100 DSU 0.99/2.00          P R I S M  3 1 0 0          Date:  05/23/96
No Far End Response          Time:  10:50:24
----- UTILITIES -----
Set Time: (10:50:21)
Set Date: (05/23/96)

New Password: (      )

(MAINTENANCE RESET)
(FACTORY RESET)
----- Messages -----
NET ALARM                                     Local Screen
```

Figure 3-14 Utilities Screen

New Password: This field allows entry of a password of up to 10 characters. An empty string (carriage return only) may be entered to disable the password feature. After <return> is pressed, the new password is activated and is no longer visible. Therefore, type carefully when entering a new password and verify before pressing <return>. When the terminal interface is exited and later reactivated, this password must be entered exactly to gain access. If the wrong password is entered, the following message will appear:

Incorrect Password; Please Enter Again.



Do not exit the terminal interface program until the password procedure is fully understood. If a password has been specified, it must be typed exactly to reenter the program.

If you program a password and later forget it, contact TxPORT Technical support for a one-time backdoor password.

The reset operation sets all parameters to the factory default settings and zeros all performance registers.

Factory Reset: Resets all memory to the factory default settings.

To exit this screen without performing the reset function, press <return> with NO selected. To proceed with the reset function, move the cursor to YES and press <return>.

4. Testing

This chapter describes hardware and software testing procedures and responses for the 3131.

Hardware Testing

The 3131 front panel (Figure 4-1) has five LED indicators and two control buttons from which you can perform basic unit testing.

Front Panel LEDs

Five front panel LEDs allow a visual identification of the test results and alarms. These LEDs are: TEST, LOOP, NET, ALARM, and POWER.

TEST

This LED flashes green when the unit is transmitting loop code. It is green continuously when BERT is on with no errors OR the unit is in clear test. It is red when the BERT is on and is receiving errors.

LOOP

Amber LED illuminates when the unit is in a loop condition.

NET

This LED is green when the unit is in frame sync. It is amber when the unit is receiving a yellow alarm from far end. It is red when the unit is out of frame sync and/or Loss of Signal.

ALARM

Red LED lights continuously when the unit is in an active alarm condition. It flashes when an invalid switch configuration has been made.

POWER

Green LED lights continuously when power is applied to the unit.

Front Panel Buttons

Two front panel buttons allow you to perform loopback tests. The two buttons are: TEST and LOOP.

TEST

When this button is pushed once, the unit transmits five seconds of in-band loop code out to the network either LLB or V.54 depending on the setting of configuration Switch S1-7 (page 3-1). The indicator blinks green during transmission of the loop code.

If configuration Switch S1-8 (page 3-1) is set to Clear Loop, a bidirectional loop is created allowing the central office to initiate a BERT.

If Switch S1-8 is set to BERT, the test pattern last selected in the terminal interface is transmitted toward the network. The received pattern is compared and if the pattern is received error free, the TEST indicator remains green. If pattern errors are detected, the TEST indicator turns red for one second for each errored second. Therefore, if five errored seconds are received, the indicator will remain red for five seconds. The data ports are looped back toward the DTE during the test.

If the TEST button is pushed again, the unit transmits five seconds of in-band loop down code and returns to normal operating mode. The TEST indicator is then turned off.

LOOP

When this momentary push button is pushed once, the unit activates a line loopback, looping the network receive data back to the network, and looping the data from the DTE ports back to the DTE. The LOOP indicator is lit while the unit is in loop. If pushed again, the unit clears the loop and turns off the LOOP indicator.

For additional information concerning test and loop options, refer to the section Software Configuration on page 3-2.

Power Failure

The 3131 provides non-volatile memory retention of the unit configuration in case of a power failure. This feature allows the unit to automatically restore normal service following a power loss. When power is applied to the unit, the front panel indicators flash for approximately five to ten seconds as the unit executes a self-test function.

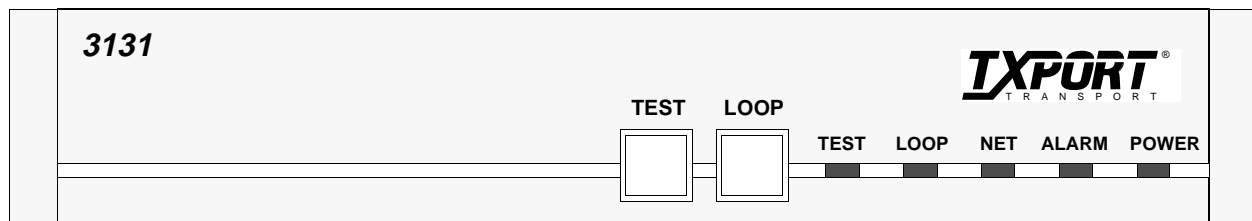


Figure 4-1 Front Panel Controls and Indicators

Switch Configuration

If an ambiguous switch configuration has been programmed, the front panel indicators continue to flash after the self-test is completed. The configuration must then be reviewed in order to correct the error. See Hardware Configuration on page 3-1 for switch setting information.

Software Testing

When indepth testing is necessary, you can perform specific tests from the VT100 interface into the 3131 menu system.

A. Terminal Interface

This chapter describes the screens and menus associated with the TxPORT 3131 terminal interface. The interface is a firmware application program embedded inside the unit.

It requires an ANSI compatible VT100 terminal (ASCII), or a computer running an ANSI terminal emulation program. The terminal interface uses ASCII BREAK and ESCAPE functions, which are implemented differently with the various terminal emulation programs.

Interface Start-Up

Once a compatible terminal is properly connected to the unit, a terminal interface session is started by sending a BREAK to the unit (or by pressing <return> four times). The Main Menu screen (Figure 4-2) is displayed if a password has not been specified. Setting a password is described in the section Utilities on page 3-12.

In the Password screen, enter the correct password to continue the session. *The password is case-sensitive.*

Screen Components

Terminal interface screens have several components common to all screens (Figure 2-2).

Device Type and Revision: The device type (such as 3100) and the revision control numbers are shown in the upper left corner. The first number is the hardware revision and the second number is the software revision. Information is displayed for the near end unit (connected directly to the

terminal) on the top line, and for the far end unit (connected to the network T1 interface) on the second line. Refer to this information when contacting the factory with inquiries.

The far end information is available only for TxPORT products that support a proprietary message set. If the far end does not support these messages but does support the standard 54016 protocol, then the far end information is displayed as GENERIC 54016 FAR END. If the far end does not respond to either proprietary or 54016 messages, then NO FAR END RESPONSE will be displayed. If the far end echoes the FDL messages transmitted by the near end unit, then FAR END LINE LOOP is displayed.

Date/Time: The top right corner of the terminal screen displays the current date and time. The setting of these functions is described in the section entitled Utilities on page 3-12.

Element ID: Below the header (3131), the Element ID is displayed. Refer to the section entitled Management Ports on page 3-11 for information on the Element ID.

Menu Title: The menu title (third line, center) denotes the general classification of functions currently accessible by the user (such as MAIN or PERFORMANCE).

Messages: Diagnostic messages may be displayed at the bottom of the screen.

Local / Remote Screen Indicator: Identifies the visible screen as displaying the local or remote interface.

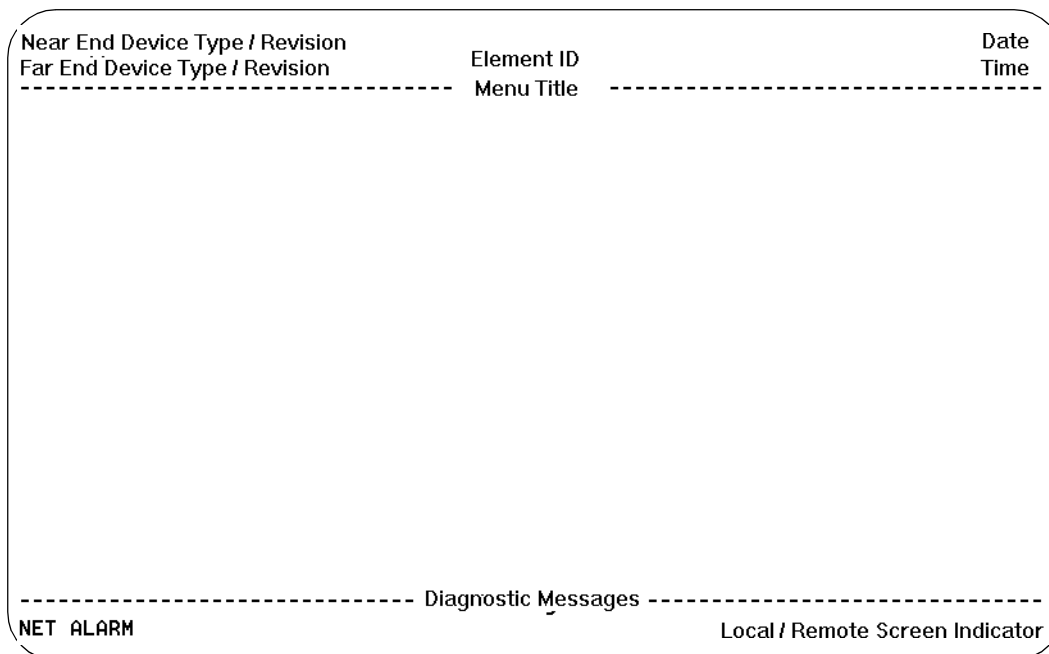


Figure A-1 Terminal Interface Layout

Cursor Controls

The terminal interface utilizes a highlighted cursor to make selections from menus and select fields within screens to be operated on. The cursor is moved in different ways, depending on the terminal emulation program used. Most programs allow use of the <tab> and <shift-tab> keys. Others allow use of the arrow keys. Once a field is highlighted, it is manipulated as described in Section .

For keyboards which do not have these standard keys or have only some of them, an alternate set of cursor control commands is provided. Each command is performed by pressing a letter key while holding down the <Ctrl> key. Alternate commands may be freely mixed with the keyboard commands at your discretion.

Table A-A Keyboard / Alternate Commands

Keyboard Command	Alternate Command
< left arrow >	< Ctrl - S >
< right arrow >	< Ctrl - D >
< up arrow >	< Ctrl - E >
< down arrow >	< Ctrl - X >
< backspace >	< Ctrl - H >
< delete >	< Ctrl - Z >

Field Types

Each screen is made up of fields. The two basic field types are user-selectable and display-only. If the highlighted cursor can be moved to a field, it is a user selectable field. All other fields are for display only. User selectable fields allow for changes to be made or commands to be executed.

Fields without brackets or parenthesis are display-only. They cannot be changed on the screen. Most user selectable fields are enclosed in brackets or parenthesis and are described in the following paragraphs.

Fields enclosed in brackets [] offer the user a list of selections from which to choose. The selections may be toggled by pressing the <spacebar>. Each time it is pressed, a new item appears. When the appropriate choice is displayed, press <return> to select it.

Fields enclosed in parenthesis () are manipulated by one of the following two methods:

1. Pressing <return> on such fields as (Reset) and (Start Test) simply execute the function.
2. The most common type of field in parenthesis accepts typed input in the form of letters and/or numbers. Typing characters when the field is highlighted causes the current entry to be replaced with the new characters. To edit an existing entry rather than replace it, press the <right arrow> key to move the cursor to the point that

needs editing. Characters may then be inserted or deleted. Typed data is always inserted rather than typed over. If the field is full, though, at least one character must be deleted to add another.

Many fields of this type may also be toggled by pressing the <spacebar>. Other fields are range checked, where the user is not allowed to exit with an illegal value set.

Any screen may be redisplayed (or refreshed) by pressing <Ctrl - U>. Any changes to fields on a screen, that have not been activated by pressing <return>, will be discarded.

Menu Structure

The Main Menu screen lists the functional user accessible menus. To activate a menu, highlight the desired selection and press <return>. To exit this or any subsequent menu, press <esc>. If the Main Menu is exited, the terminal interface program terminates. This is a valid way to end a session. If any other menu is exited, the previous screen is returned. The menu structure (Figure A-2) shows all the screens accessible from the Main Menu.

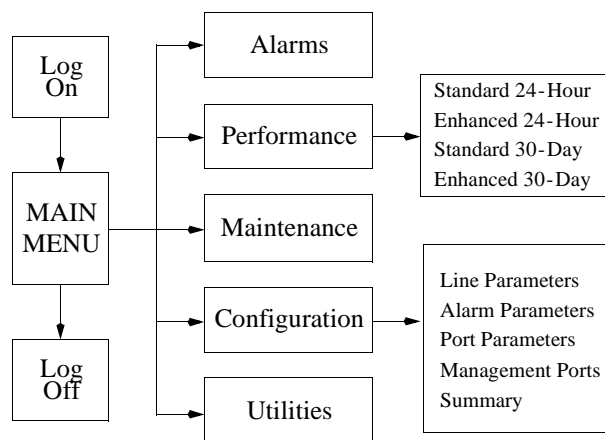


Figure A-2 Terminal Interface Menu Structure

If no key is pressed for 10 minutes, the terminal interface logs off automatically. To manually log off, press <esc> at the Main Menu.

B. Pinout Tables

This appendix displays the pinout assignments for each port and option on the rear of the 3131.

SUPV Port - PC

Pin	Signal Name	DTE
1	DCD Out	DCD
2	CTS Out	CTS
3	Frame Gnd	Frame Gnd
4	Data Out	RXD
5	Data In	TXD
6	Signal Gnd	Signal Gnd
7	RTS In	RTS
8	DTR In	DTR

SUPV Port - Modem

Pin	Signal Name	DCE
1	DTR Out	DTR
2	RTS Out	RTS
3	Frame Gnd	Frame Gnd
4	Data Out	TXD
5	Data In	RXD
6	Signal Gnd	Signal Gnd
7	CTS In	CRTS
8	DCD In	DCD

NET Port

Pin	Signal Name
1	Data In
2	Data In
3,6	Not Used
4	Data Out
5	Data Out
7,8	Chassis Ground

Data Port

Signal Name	DB-25	V.35	Acronym
Frame Ground	1	A	FG
Signal Ground	7	B	SG
Transmit Data	2, 14	P, S	TD
Receive Data	3, 16	R, T	RD
Request to Send	4, 19	C	RTS
Clear to Send	5, 13	D	CTS
Data Set Ready	6, 22	E	DSR
Data Term Ready	20, 23	H	DTR
Data Carrier Detect	8, 10	F	DCD
Transmit Clock	15, 12	Y, AA	TXC
Receive Clock	17, 9	V, X	RXC
Terminal Timing	24, 11	U, W	TT, EXC

