

TAINET

NS-620 E1 HDSDL

High-bit-rate Digital Subscriber Lines
Termination Unit

USER'S MANUAL



ISO *The Professional Partner*

TAINET COMMUNICATION SYSTEM CORP.

Headquarters:

3F, No. 6, Alley 23, Lane 91, Sec. 1, Nei-Hu Rd,
Taipei, Taiwan, R.O.C.
TEL: 886-2-26583000
FAX: 886-2-26583232

Beijing Branch:

Room 409, ZhongDing Building, No.A18,
Bei San Huan West, Beijing, China
TEL: 86-10-6222-6961-5
FAX: 86-10-6222-6967

INFORMATION TO THE USER

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device. Pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and if not installed and used in accordance with the instructions may cause harmful interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

This booklet is available from the US government Printing Office, Washington, DC 20402, Stock NO. 004-000-00345-4.

The shielded RS-232 cable is to be used in order to ensure compliance with FCC Part 15, and it is the responsibility of the user to provide and use shielded RS-232 cable from NTU to personal computer.

CAUTION: Any changes of modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

TABLE OF CONTENTS

1. Introduction
 - 1.1. General Description
 - 1.2. System Modularization
 - 1.3. Specifications
2. Installation
 - 2.1. The Installation of NS-620
 - 2.1.1. LED Description
 - 2.1.2. NS-620 Full-E1 Quick Installation
 - 2.2. The Installation of NS-620R
 - 2.2.1. NS-620R Full-E1 Quick Installation
3. Operating, Administration, Maintenance
 - 3.1. Introduction
 - 3.2. Using the Craft Interface System
 - 3.2.1. Craft User Interface Architecture
 - 3.2.2. System Configuration
 - 3.2.3. System Administration
 - 3.2.4. Display Status
 - 3.2.5. Alarms
 - 3.2.6. HLXE Configuration
 - 3.2.7. Performance Monitoring
 - 3.2.8. System Maintenance
 - 3.3. Using the LCD Menu
 - 3.3.1. The LCD Menu Display Format
 - 3.3.2. The LCD Menu Tree
4. UNIT DESCRIPTIONS
 - 4.1. NS-620 Stand alone
 - 4.2. NS-620R Rack
 - 4.3. NS-620N Line card
 - 4.4. NS-620M Interface Module
 - 4.5. NS-620H Hand-Held Controller
 - 4.6. Ordering Information

CHAPTER 1
Introduction

CONTENT

1.1 General Description

1.2 System Modularization

1.3 Specifications

CHAPTER 1: Introduction

1.1 General Description

- The TAINET NS-620 series are High-bit-rate Digital Subscriber Line (HDSL) system that delivers 2.048Mbps E1 service to the customer on up to 4.5 Km (2.8 miles) length of four 24 AWG lines. NS-620 complies with the relevant ETSI RTR/TM-03036 standard
- Three loops (line interfaces) support 2.048Mbps totally and maximum 1168Kbps per loop, using 2B1Q modulation, support optional Wetting Current and Remote Power Feeding when apply different power supply module.
- Can be applied to the switched E1 or N×64K E1 services such as dial-up video conference, distant learning, and home entertainment. It also delivers new service such as Switched Multi-Megabit Data Services (SMDS) and frame relay with speed and economy.
- Has the ability of N×64Kbps fractional E1 used in Point-to-Multipoint, add-drop applications. It provides several digital interfaces (RS-530, V.35, X.21/V.11 or V.36/RS-449) for DCE selections with up to four channels of data multiplexer applications.

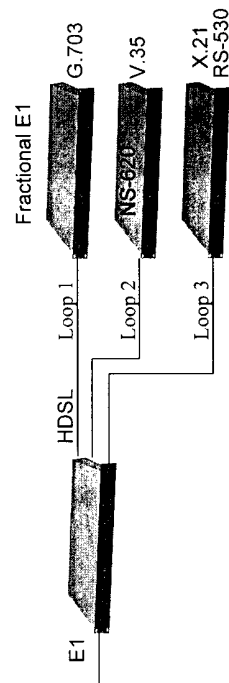


Figure 1-1. Point-to-Multipoint Fractional E1 application

- Full E1 function use two loops for data transmission over 2Mbps G.703 interface support either 120 ohms balanced (terminal block) or 75 ohms unbalanced (BNC). Fractional E1 use one, two or three loops for data transmission over from 64Kbps to 2048Kbps (N x 64K) of V.35, RS-530, V.36(RS-449) or X.21/V.11 interfaces.

- The features of TAINET NS-620 Series:
 - Fully compliant with ETSI RTR/TM-03036
 - Compact desktop and rack mounted
 - Field configurable by front panel menu driven or console port to setup as LRU/CO (Line Termination Unit/ Central Office) or NTU/RT (Network Termination Unit/ Remote side)
 - Communication distance up to 4.5Km on 24AWG without line conditions
 - Three loops (line interfaces) support 1168Kbps per loop.
 - Up to four data ports
 - Utilizes 2B1Q line-code with echo cancellation
 - Full E1 functionality supports G.703 and G.704 2.048Mbps interface
 - N x 64Kbps digital interfaces of V.35, V.36 and X.21 interface
 - Several power supply alternatives, including Remote Power Feeding and Wetting Current
 - Up to 2 bridged taps of each 500 meters maximum length.
 - Extensive self test, internal BER test and loop test
 - Support Point-to-Point, Point-to-Multipoint, Fractional Operation, D2048U, D2048S and E1 add-drop applications
 - Setup, control, monitoring via front panel LCD or control port
 - Support Network Management System and SNNMP MIB II

● The TAINET NS-620 series consist of:

| HDSL STAND-ALONE | |
|------------------|--|
| NS-620 | HDSL Base Unit (Main Board + HDSL Loop Module x 1) |
| NS-620L | HDSL Loop Module (For the second or third loop) |

Table 1-1 HDLS Standalone module list

| USER INTERFACE MODULE | |
|-----------------------|---|
| NS-620M1 | Full/Fractional E1 Balanced (120 Ohm) module, G.703 interface, Terminal Block |
| NS-620M2 | Full/Fractional E1 Unbalanced (75 Ohm) module, G.703 interface, BNC connector |
| NS-620M3 | Full E1, 2Mbps module, RS-530 interface |
| NS-620M4 | Full E1, 2Mbps module, V.35 interface |
| NS-620M5 | Full E1, 2Mbps module, V.36 (RS-449) interface with adapter cable |
| NS-620M6 | Full E1, 2Mbps module, X.21/V.11 interface with adapter cable |
| NS-620M7 | Fractional E1, Nx64Kbps, N=1 to 31, V.35 interface |
| NS-620M8 | Fractional E1, Nx64Kbps, N=1 to 31, V.36 interface with adapter cable |
| NS-620M9 | Fractional E1, Nx64Kbps, N=1 to 31, X.21 interface with adapter cable |
| NS-620M10 | Fractional E1, Nx64Kbps, N=1 to 31, X.21 interface with adapter cable |
| NS-620M11 | Fractional E1, 64Kbps, contra-directional G.703 |

Table 1-2 HDLS User Interface module list

| POWER MODULE | |
|--------------|---|
| NS-620P1 | AC Power Module (support Wetting Current) |
| NS-620P2 | DC Power Module (support Wetting Current) |
| NS-620P3 | DC Power Module (support Remote Power Feeding Source) |
| NS-620P4 | DC Power Module (support Remote Power Feeding Sink) |

Table 1-3 HDLS Power module list

| HDSL RACK MOUNTED LINE CARD | |
|-----------------------------|---|
| NS-620L | Loop Module (For the third loop) |
| NS-620N1 | Line Card (HDSL Loop x 2 + E1 x 1 + Wetting Current) |
| NS-620N2 | Line Card (HDSL Loop x 2 + E1 x 1 + Remote Power Feeding) |

Table 1-4 HDLS Rack Mounted Line Card module list

| HDSL RACK | |
|-----------|---------------------------------|
| NS-620R | Rack Mounted Shelf |
| NS-620M | Main Processing Unit (MPU) Card |
| NS-620H | Hand-Held Controller |

Table 1-5 HDLS Rack module list

1.2 System Modularization

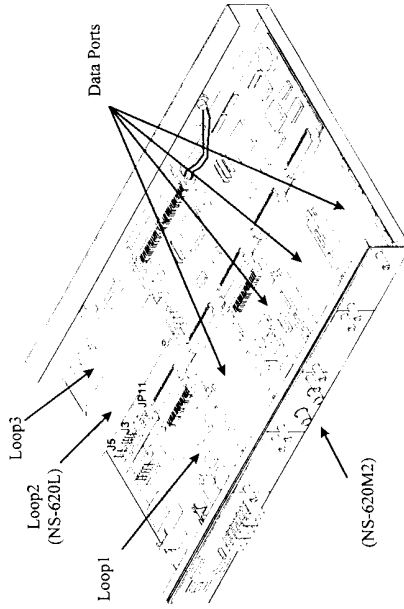


Figure 1-2. NS-620 Modularization (Base Unit + NS-620M2 + NS-620L)

Due to flexible applications are made by different requirements of data transmission speed and terminal interface. All these requirements can be satisfied by combination of different NS-620 module. For example, to transmit data of speed 2048kbps to remote site may use Full-E1 via G.703 balanced (120 ohms) interface. Or trying to use point-to-multipoint application of different speed from 64Kbps, 128Kbps, 192Kbps to 2048Kbps (i.e. N x 64Kbps) may use Fractional-E1 via V.35, RS-530, V.36(RS-449) or X.21/V.11 interface. Some examples of system modularization are listed below:

• Full-E1 System Modularization (Standalone)

Table 1-6 HDLS Full-E1 Modularization Example for Standalone model

| CO site NS-620 modules | | | RT site NS-620 modules | | |
|------------------------|--|-------------|------------------------|-------------|--|
| Data Port | Base Unit | Loop Module | WAN / Link | Loop Module | Data Port |
| E1 | NS-620M1 <NS-620M2> <NS-620M3> <NS-620M4> | NS-620L | Loop 1 + Loop2 | NS-620L | NS-620M1 <NS-620M2> <NS-620M3> <NS-620M4> |

Where the <> parts may replace or add for different applications and requirements. Power unit is an optional but necessary module

- Table 1-6 is useful for Full-E1 data transmission over a pair of NS-620 units. CO site (Central Office) offers 2Mbps data stream pass through balanced G.703 Terminal Block (NS-620M1) interface into NS-620 base unit and connect to RT site (Remote) via two loops (NS-620 base unit + NS-620L).

• Full-E1 System Modularization (Rack)

Table 1-7 HDLS Full-E1 Modularization Example for Rack Mount Model

| CO site NS-620R modules | | | RT site NS-620 modules | | |
|-------------------------|---------------------------------|-------------|------------------------|-------------|--|
| Data Port | Base Unit | Loop Module | WAN / Link | Loop Module | Data Port |
| E1 | NS-620R NS-620M <NS-620H> | <NS-620L> | Loop 1 + Loop2 | <NS-620L> | NS-620N1 <NS-620N2> |
| E1 | NS-620N2 <NS-620N1> | <NS-620L> | Loop 1 + Loop2 | NS-620L | NS-620M1 <NS-620M2> <NS-620M3> <NS-620M4> |

Where the <> parts may replace or add for different applications and requirements. Power unit is an optional but necessary module.

- Table 1-7 show CO site have two line cards, and each line card is useful for Full-E1 data transmission over a pair of NS-620N loop units. One data port transmits 2Mbps data stream pass through balanced G.703 Terminal Block (NS-620R default) interface into NS-620N1 line card and connect with RT site via two loops pair (NS-620N1). Another link is the other line card connect to NS-620 standalone via two loops pair (NS-620 base unit + NS-620L). Which is using power feeding source(NS-620N2) to remote power feeding sink(NS-620P4).

• Fractional-E1 System Modularization (Standalone)

Table 1-8 HDLS Fractional-E1 Modularization Example for Standalone Model

| CO site NS-620 modularization | | | RT site NS-620 modularization | | |
|-------------------------------|--|--|-------------------------------|--|--|
| Data Port | Base Unit | Loop Module | WAN / Link | Loop Module | Data Port |
| Fr E1 | NS-620M1 <NS-620M7> NS-620M8 <NS-620M9> <NS-620M10> <NS-620M11> | NS-620 NS-620P1 <NS-620P2> <NS-620P3> <NS-620P4> | Loop 1 | NS-620 NS-620P1 <NS-620P2> <NS-620P3> <NS-620P4> | NS-620M1 <NS-620M2> <NS-620M7> <NS-620M8> <NS-620M9> <NS-620M10> <NS-620M11> |
| | | NS-620L | Loop 2 | NS-620L | NS-620M8 Fr E1 |
| | | NS-620L | Loop 3 | NS-620L | NS-620M7 Fr E1 |

Where the <> parts may replace or add for different applications and requirements. Power unit is an optional but necessary module.

- Table 1-8 is an application of point-to-multipoint (similar to Fig.1-1), which is useful for Fractional-E1 data transmission over NS-620 base units. CO site offers 2Mbps data stream into G.703, V.35 and RS-530 interface of NS-620 base unit then connect with three RT sites by each one loop pair(NS-620 base unit).
- If using more than two loops, the throughput of CO site data stream may support totally up to 2048Kbps only.

• Fractional-E1 System Modulation (Rack)

Table 1-9 HDLS Fractional-E1 Modularization Example for Rack Mount Model

| CO site NS-620 modularization | | | RT site NS-620 modularization | | |
|-------------------------------|------------------------|---------------------------------|--------------------------------------|----------------------|--|
| Data Port | Base Unit | Loop Module | WAN / Link | Loop Module | Data Port |
| E1 | NS-620N1 <NS-620N2> | NS-620R NS-620M <NS-620H> | Loop 1 + Loop2 + <Loop3> | NS-620L <NS-620L> | NS-620M7 <NS-620M8> <NS-620M9> <NS-620M10> <NS-620M11> |

Where the <> parts may replace or add for different applications and requirements. Power unit is an optional but necessary module.

- Table 1-9 is used for Fractional-E1 data transmission over NS-620N line card. Due to most of CO sites just offer a pass-through transmission for RT to use 64Kbps to 2048Kbps (N x 64Kbps) data stream. Thus the CO sites just have to use Full-E1 to get add-drop data from data switches via G.703 (NS-620N1 default) interface. Then, this batch of data may send into separate loops of NS-620N base unit and transmit to RT site via two loops (NS-620N base unit). These two loops may connect to same or different location of RT site which support Fractional-E1. If using up to three loops, the G.703 interface of CO site still support up to 2048Kbps only.

1.3 SPECIFICATIONS

HDSL interface

- Line Code : 2B1Q
- Mode : full duplex with echo cancellation
- Number of loops : up to three loops (see ordering information)
- Loop rate : 1168Kbps on each loop
- Baud rate : 584 K \pm 32ppm baud
- Frame format : compliant with ETSI RTR/TM-03036 (section 5.4)
- Start up procedure : compliant with ETSI RTR/TM-03036 (section 5.6)
- EOC and O&M function : compliant with ETSI RTR/TM-03036 (section 5.5/5.7)
- Transmit characteristics (pulse peak ,shape ,power) : compliant with ETSI RTR/TM-03036 (section 5.8.4)
- Line impedance : 135 ohms
- Bridge taps : single tap < 500 m , maximum two taps
- Loop length : 3.6 Km on 26 AWG (0.4 mm) and 4.5 Km on 24 AWG (0.5 mm) with line conditions
- Return loss : compliant with ETSI RTR/TM-03036 (section 5.8.2.)
- Performance test (DLL model, BER, bit length ...) : compliant with ETSI RTR/TM-03036 (section 5.9/6.3)
- Jitters tolerance : compliant with ETSI RTR/TM-03036 (section 5.9.3/7)
- Delay difference between pairs : < 60 μ sec
- Shaped noise : compliant with ETSI RTR/TM-03036 (section 6.3.3)
- Impulse noise : compliant with ETSI RTR/TM-03036 (section 6.3.4)
- Common mode rejection : compliant with ETSI RTR/TM-03036 (section 6.3.5)
- Micro interruption : compliant with ETSI RTR/TM-03036 (section 6.3.6)
- Connector : 6-pin wiring pin
- Software configurable for CO (LIU) side or RT (NTU) side

E1 interface

- Line rate : 2.048Mbps \pm 50ppm
- Line code : HDB3
- Frame format : framed or unframed
- Line impedance : 120 ohms (balanced) or 75 ohms (unbalanced)
- Compliance : ITU-T G.703 ,G.704 ,G.706 ,G.732 ,G.826
- Jitters performance : compliant with ITU-T G.823
- Connector : BNC (unbalanced) or 4 pin terminal block (balanced)

Data Port Modules

- Data rate : 1 ~ 31 x 64Kbps (up to 1.984Mbps) or full E1 (2.048Mbps) for RS-530 /V.35 module
- Type : V.35, RS-530, G.703

E1 Clock

- Source : internal, HDSL loopback, E1 derived, system clock (external)
- Internal Clock Accuracy : \pm 32ppm

Control port

- VT-100 or compatible terminal for NMS or NS-620H (Rack-mount Control Unit)
- Interface : V.24/RS-232
- Type : DCE
- Format : 8 character, 1 stop bit, no parity
- Speed : 9600
- Connector : DB-9

Indicators

- NS-620N:
Status, E1 LOS/BER, HDSL SNR, HDSL LOSW/BER (per loop), Loopback test, Remote alarm, Select/Scan
- NS-620:
Status, E1 LOS/BER, HDSL SNR, HDSL LOS/BER (per loop), Data port status (per port), Remote alarm

Maintenance

- Performance monitor :
HDSL : ES, SES, FEBE, BER, SNR, etc. (See chapter 4)
E1 : BER, ES, SES, etc. (See chapter 4)
- Diagnostics : E1 Network Near End Loopback, Far End Loopback, Customer Loopback, Customer Far End Loopback, HDSL Digital Loop Self-test
- Configuration backup and recovery to/from external device
- NS-620N front panel switches and test jacks
- Switches : Display far-end, Loop back test
- Test jack : I+, I-, V+, V-
- NS-620 front panel LCD and Key switches and NS-620H MPU control unit
- LCD : 16 x 2 display
- Key Switch : Up, Down, Left, Right

- > NMS
- > SNMP agent using PPP protocol
- > Form C alarm relay (NS-620R)

Power

- > NS-620R
 - Max power consumption : 320 watts for full NS-620R shelf with power feeding (-36 ~ -72 VDC input on each NS-620N)
 - Power feeding : 100mA \pm 5 % ,140 VDC Max
 - Wetting current : > 15mA
- > NS-620
 - Local power : 85 ~ 260 V AC, 47 ~ 63 Hz or -48 V DC
 - Full E1 power consumption : < 7 watts
 - Fractional E1 power consumption : < 15 watts

Environment

- > Temperature :
 - Operating : 0°C ~ 50°C
 - Storage : -40°C ~ 70°C
- > Humidity :
 - Operating : 10% ~ 90%, non-condensing
 - Storage : 5% ~ 90%, non-condensing

Physical

- > NS-620R
 - Height : 8.2 inch (6U)
 - Width : 19 inch
 - Depth : 12 inch
- > NS-620
 - Height : 1.7 inch (1 U)
 - Width : 19 inch
 - Depth : 12 inch

CONTENT

- 2.1 The Installation of NS-620
 - 2.1.1 LED description
 - 2.1.2 NS-620 Full-E1 Quick Installation
- 2.2 The Installation of NS-620R
 - 2.2.1 NS-620R Full-E1 Quick Installation

CHAPTER 2: INSTALLATIONS

2.1. The Installation of NS-620

The Following items may be needed for installing the NS-620:

- Flat-blade screwdriver
- Cross-blade screwdriver

A. Unpacking

The single NS-620 contains at least one AC or DC power supply and one HDSL Loop module. User Interface Modules are depend on user's order and could be installed from one to four. The interior HDSL Loop modules connections was made by the manufacturer, one shall not open the metal box without permission.

- (2) Unpack equipment carefully; check for completeness against the purchase order
- (3) Inspect equipment for avoided shipping damage, including bent or loose hardware, or broken connectors.
- (4) To prevent electrostatic discharge(ESD) damage, avoid touching the internal components. And before moving jumpers or plugging any user interface module, do turn its power off.

B. Connection

i. AC Power (NS-620P1) and HDSL Loop Connection

The AC power requirement of NS-620 is 85 ~ 260 VAC. An IEC 320 power inlet on the rear panel is used for AC power input. Be sure the power switch is off before connecting the power cord. The screw-down terminal can be connected to the remote unit by using the 24 or 26 AWG twisted wire pairs. **It is strongly recommended that you should connect the PG screw to the earth ground of your power system.**

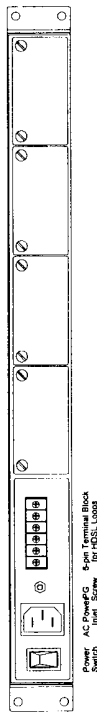


Fig 2-1 NS-620P1 AC power connection

ii. DC Power (NS-620P2, NS-620P3 and NS-620P4) and HDSL Loop Connection

The DC power requirement range of NS-620 is -32 to -72 VDC. Two screw-down terminals on the rear panel are used for DC power input.

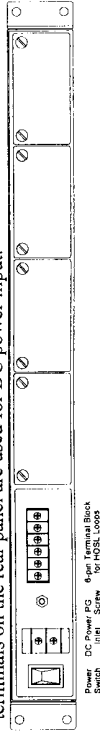


Fig 2-2 NS-620P2 DC power connection



Fig 2-2 NS-620P2 DC power connection

Note : It's strongly recommended that you should connect the PG (protect ground) screw to the earth ground system of you building

The NS-620 provides the following E1 user interface modules for connecting to the E1 equipment.

iii. Balanced E1 Connection (NS-620M1)

For the 120 Ω impedance of the balanced E1 interface, connect the TX+/TX- to the RX+/RX- of the E1 equipment and connect the RX+/RX- to the TX+/TX- of the E1 equipment. This module provides full E1 service or add-drop fractional E1 service.

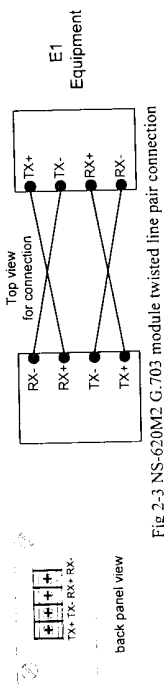


Fig 2-3 NS-620M2 G.703 module twisted line pair connection

The NS-620 also provides the following data port modules for connecting to various DTE interfaces.

iv. Unbalanced E1 Connection (NS-620M2)

The BNC jacks are for the 75 Ω impedance of the unbalanced E1 connection can be used to connect to the E1 equipment. Connect the TX to the RX interface of the E1 equipment and the RX to the TX interface. This module provides full E1 service or add-drop fractional E1 service.

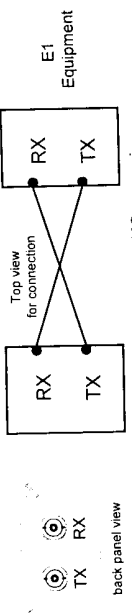


Fig 2-4 NS-620M1 G.703 module BNC connection

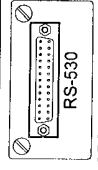


Fig 2-5 RS-530 module back panel view

vi. V.35 Connection (NS-620M4 and NS-620M8)

The NS-620M4 module provides a 2.048Mbps data port for connecting to the DTE equipment using V.35 interface. The NS-620M6 module provides a Nx64Kbps data port for the fractional E1 service (N = 1 to 31).

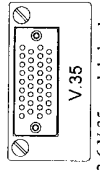


Fig 2-6 V.35 module back panel view

vii. V.36 / RS-449 Connection (NS-620M5 and NS-620M9)

The NS-620M5 module provides a 2.048Mbps data port for connecting to the DTE equipment, which is using an adapter cable to convert RS-530 interface to be V.36 interface. The NS-620M9 module provides a Nx64Kbps data port for the fractional E1 service (N = 1 to 31).

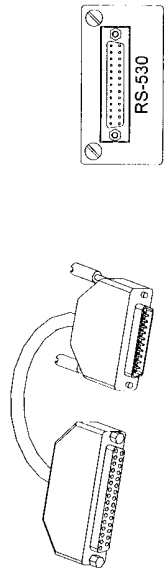


Fig 2-7 The V.36 / RS-449 module interface view

viii. X.21 / V.11 Connection (NS-620M6 and NS-620M10)

The NS-620M6 module provides a 2.048Mbps data port for connecting to the DTE equipment, which is using an adapter cable to convert RS-530 interface to be X.21 / V.11 interface. The NS-620M10 module provides a Nx64Kbps data port for the fractional E1 service (N = 1 to 31).

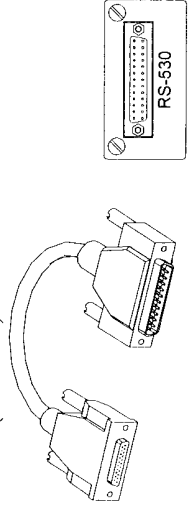


Fig 2-8 The X.21 / V.11 module interface view

iv. Contra-directional G.703 Connection (NS-620M11)

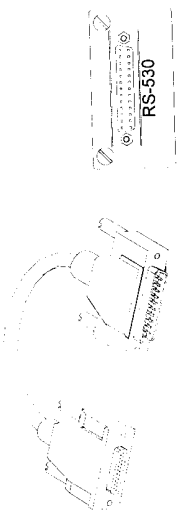


Fig. 2-8 The X.21/V.11 module interface view

iv. Contra-directional G.703 Connection (NS-620M11)

The NS-620M11 module provides 64Kbps, contra-directional G.703 interface. When installing, *each line pairs should be twisted separately.*

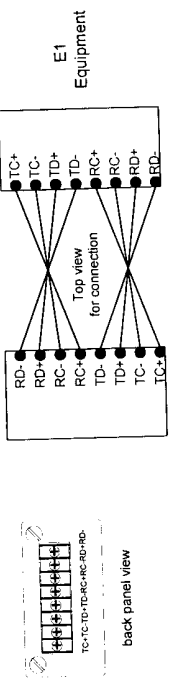


Fig. 2-9 NS-620M11 Contra-directional G.703 module twisted line pair connection

2.1.1. LED Description

| NAME | LED STATUS | DESCRIPTION |
|--------------------------|------------|---|
| STATUS LED | Red | hardware failure or HDSL loopback self-test failure |
| | Yellow | during power-on self-test or HDSL loopback self-test diagnostics |
| | Green | no failure detected on self-test diagnostics |
| E1 LOS/BER LED | Red | indicates E1 LOS (Lost of Signal) condition (LOS condition has higher priority than BER) |
| | Yellow | indicates E1 BER (Bit Error Rate) condition |
| | Off | no LOS/BER condition |
| HDSL CONT/SNR LED | Red | Indicates the DC continuity to the RT side is open. This state is available only at CO side and when remote power feeding is enabled. |
| | Yellow | indicates SNR of any HDSL loop is below a predefined threshold |
| | Off | SNR of all loops are good |
| LOOP 1/2/3 LOSW/BER LEDs | Green | indicates HDSL loop in good condition |
| | Red | indicates HDSL loop LOSW (Lost of Sync Word) condition |
| | Yellow | indicates HDSL loop BER condition |
| DATA PORT 1/2/3/4 | Yellow | the data port is active |
| | Green/Red | the data port is inactive |
| | Off | no data port module is plugged in |
| RMT ALM LED | Yellow | indicates an alarm occurred at the far-end |
| | Off | no alarm |

2.1.2 NS-620 Full-E1 Quick Installation

The Full-E1 modularization should contain two line loops pair as described as Table.1-6. User may connect NS-620 HDSL with Full-E1 module as connection as one of Fig.2-10 to Fig.2-13 below. Where the CO site clock source may provide by E1 terminal (Codirectional), E1 network, System Clock (for example. GPS), or provide by NS-620 internal clock As to the RT site clock source will follow automatically with CO site.

- When clock sources apply independently for CO and RT equipment.

| | | |
|-----------------|---------------|---------------|
| Item | CO Site | RT Site |
| System Type | E1-C | E1-R |
| Frame Format | Unframe | Unframe |
| Set E1 Rx Clock | CODIRECTIONAL | CODIRECTIONAL |

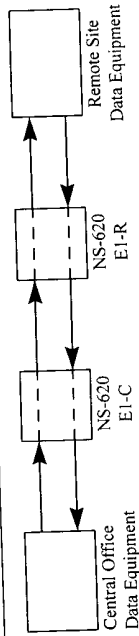


Fig.2-10 NS-620 E1 Codirectional clock supply

- When Clock source apply from E1 Clock of CO site.

| | | |
|-----------------|--------------|--------------|
| Item | CO Site | RT Site |
| System Type | E1-C | E1-R |
| Frame Format | Unframe | Unframe |
| Set E1 Rx Clock | E1-C NETWORK | E1-C NETWORK |

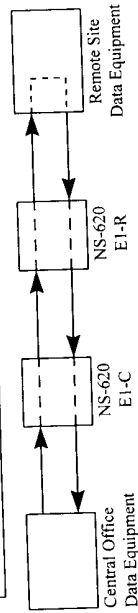


Fig.2-11 NS-620 E1-C Network clock supply

- When Clock source apply from System Clock.

| | | |
|-----------------|--------------|--------------|
| Item | CO Site | RT Site |
| System Type | E1-C | E1-R |
| Frame Format | Unframe | Unframe |
| Set E1 Rx Clock | E1-C SYS CLK | E1-C SYS CLK |

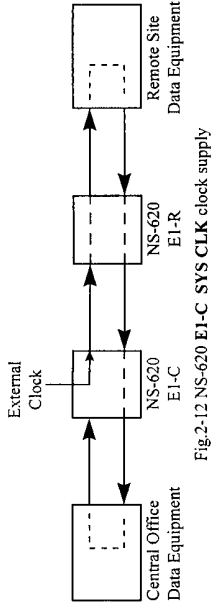


Fig.2-12 NS-620 E1-C SYS CLK clock supply

- When Clock source apply from NS-620 Internal

| | | |
|-----------------|---------------|---------------|
| Item | CO Site | RT Site |
| System Type | E1-C | E1-R |
| Frame Format | Unframe | Unframe |
| Set E1 Rx Clock | E1-C INTERNAL | E1-C INTERNAL |

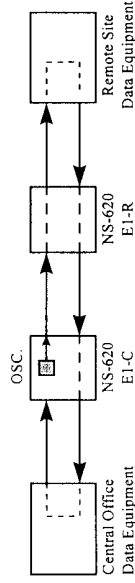
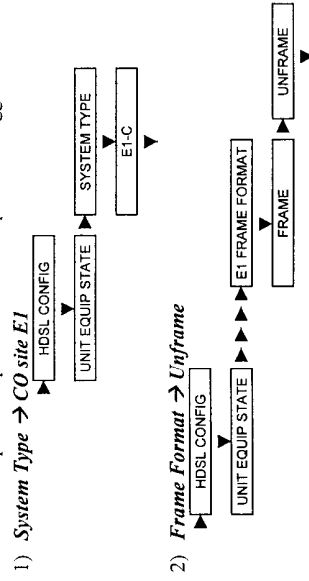


Fig.2-13 NS-620 E1-C INTERNAL clock supply

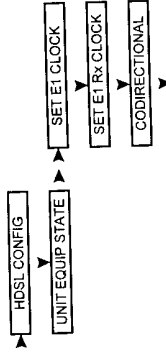
- 1. When clock sources apply independently for CO and RT equipment.

- The CO site quick setup items from front panel are suggested below:



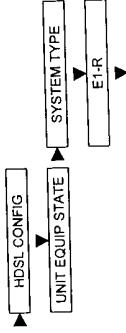
- 2) Frame Format -> Unframe

3) *Clock Source* → *E1 Rx Clocks independently follow data equipment at both CO and RT sites.*

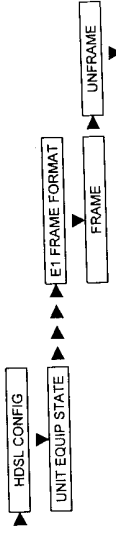


- The **RT site** quick setup items from front panel are almost the same as **CO site**, the system type is the only item to be different in this quick installation example.

4) *System type* → *RT site E1*



5) *Frame Format* → *Uniframe*

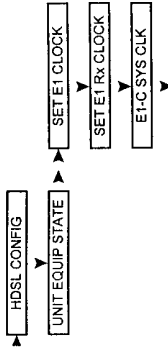


After HDSSL loops connected and changed the necessary items above, the **CO site** will download the configuration to **RT site** include clock source. Then the system will be build up.

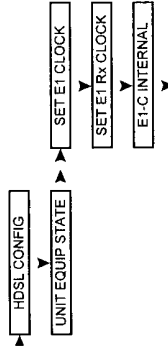
2. Changing CO Site NS-620 to use System clock, Network clock or Internal clock.

The steps 1 can complete the quick installation enough. When trying to use different clock source for HDSSL transmission, the different configuration need to be changed is on "E1 Rx Clock" item only. The operation example of menu tree are listed below:

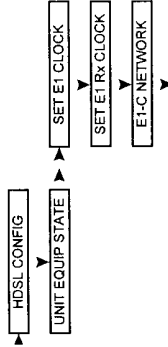
• *Clock Source* → *from SYSTEM clock*



• *Clock Source* → *from NS-620 Internal*



• *Clock Source* → *follow CO site data equipment*



After go through this quick installation example, user may easily transmit the Full-E1 2.048Mbps data pass through NS-620 HDSSL pair. For more detail item and function description, please refer to **Chapter 4. Unit Descriptions**.

2.2 The Installation of NS-620R

The Following items are needed for installing the NS-620R:

- Flat-blade screwdriver
- Phillips screwdriver

A. Shelf Installation

i. Unpacking

Warning: When handling cards, use local office procedures regarding avoid electrostatic discharge (ESD) damage, including but not limited to the following:

- Use grounded wrist straps connected to equipment frame ground when handling cards.
- Store cards only in anti-electrostatic packaging provided by the factory.

ii. Rack Mounting

- The NS-620N is installed in a standard 19-inch rack.
- Mount the shelf on the rack using the screws provided.

B. Card Installation

i. Unpacking

Warning: When handling cards, use local office procedures regarding avoid electrostatic discharge (ESD) damage, including but not limited to the following:

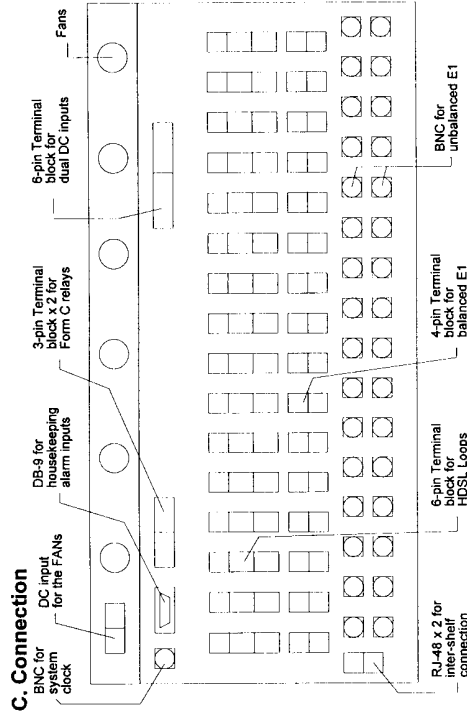
- Use grounded wrist straps connected to equipment frame ground when handling cards.
- Store cards only in anti-electrostatic packaging provided by the factory.

ii. Installation

- Each shelf has a possible 17 slots. A single NS-620M MPU card takes up the first slot. The NS-620N can be installed at any of other 16 slots.
- Use the following instructions whenever installing a card into a slot:
 - (1) Hold the card by the locking lever on the face plate, and carefully align card with the connector on the shelf back plane.

- (2) Secure the card into place by pressing on the locking lever.

Note: The NS-620N may consist of two additional PCBs, one shall not separate them without permission, otherwise the warranty is voided.



i. Dual DC -48V Input Connection

Use the following procedures to connect the office power to the NS-620R.

- 1) Use 16 AWG standard wires to connect office battery supply leads to the terminals -48V/PG/SG on the NS-620R back plane.
- 2) Using a multimeter, verify that the input voltage level is between -36 and -72 VDC.

ii. Alarm Connection

The NS-620R back plane contains two 3-pin (NC, COM and NO) terminal blocks for the external audible alarm system to report the urgent and non-urgent alarm events. The alarm contacts are NC (normally closed) or NO (normally open) connections, with reference to the COM (common).

Note: In an alarm condition or loss of DC power, the system closes the normally open relay contact between the NO and COM terminals, or opens it between the NC and COM terminals.

iii. E1 Connection

Each NS-620R shelf can accommodate up to 16 E1 channels. Either 4-pin terminal block for balanced E1 (120Ω) or the BNC connectors for unbalanced E1 (75Ω) on the shelf back plane can be used to connect the E1 facility. To select the corresponding E1 interface, the DIP switch S3 (75 ohms/120 ohms), the jumper JP10 and JP11 on the NS-620N card must be setup correctly.

Connect the pins named **TXT** (TX, Tip) and **TXR** (TX, Ring) to the receive side of E1 cross connect panel; connect **RXT** (RX, Tip), **RXR** (RX, Ring) to the transmit side of E1 cross connect panel.

iv. HDSL Loops Connection

For each NS-620N in the NETSPAN NS-620R shelf, there is a 6-pin terminal block on the back plane that can be used to connect HDSL loop wires (1, 2, and 3).

Connect the pins named **L1T** (Loop1 Tip) and **L1R** (Loop1 Ring) to the loop 1 terminals at Main Distribution Frame and connect the ones named **L2T** (Loop2 Tip) and **L2R** (Loop2 Ring) to the loop 2 terminals, and so forth.

v. External E1 system clock Connection

NS-620R provides the feature for applications where the E1 timing must be synchronized between E1 equipment in the office. Connect the external E1 system clock to the BNC connector for providing a centralized clock.

vi. External Housekeeping Alarm Input

NS-620R provides the external housekeeping alarm inputs using a DB-9 connector.

2.2.1 NS-620R Full-E1 Quick Installation

To be released on next version of this User's Manual.

CHAPTER3 OPERATING, ADMINISTRATION, MAINTENANCE

CONTENT

- 3.1 Introduction
- 3.2 Using The Craft Terminal
 - 3.2.1 Craft User Interface Architecture
 - 3.2.2 System Configuration
 - 3.2.3 System Administration
 - 3.2.4 Display Status
 - 3.2.5 Alarms
 - 3.2.6 HDSL Configuration
 - 3.2.7 Performance Monitoring
 - 3.2.8 System Maintenance
- 3.3 Using The LCD Menu
 - 3.3.1 The LCD Menu Display Formats
 - 3.3.2 The LCD Menu Tree

CHAPTER 3 : Operating, Administration, Maintenance

3.1 Introduction

Several OA&M (Operating, Administration, and Maintenance) methods are provided for the NS-620 series product. By connecting the NS-620 or NS-620M to a VT-100 compatible terminal, or simply using the LCD panel on the NS-620 or the NS-620H you can easily control and monitor the system by a menu-driven user interface.

3.2 Using the Craft Terminal Interface Mode:

The Craft Terminal is DCE mode, supports **asynchronous protocol, speed 9600bps, and 8 data bits, no parity, 1 stop bit** data format. User can apply any terminal emulation program to setup NS-620 via Craft Terminal port.

- **Keyboard**

The keyboard is used to select menus, view the various screens, and when necessary, to enter alpha and numeric information into system. Keyboard operations make use of the alpha and Numeric keys, Arrow keys, enter or return key, space bar, and control key.

- **Cursor**

In the Craft Interface System, a cursor is used to indicate menu selections, option settings, and data entry fields. The cursor may take the form of a block, a highlighted field, or a flashing line. When selecting a menu, the cursor is moved by pressing either the Numeric keys or the Arrow keys. When selecting an option setting or making a data entry, the cursor is moved by pressing the Arrow keys.

- **Arrow keys**

The Arrow keys are used to move the cursor in order to indicate menu selections, option settings, and data entry fields. In screens that have more than one page, the up and down Arrow keys also moves the screen up or down on line at a time. In the same screens, the left arrow key moves the screen up one page and the right arrow key moves the screen down one page. Each time the screen is moved down one page, the last line from the previous screen is displayed as the first line on the new page. Each time the screen is moved up one page, the first line from the previous screen is displayed as the last line on the new page. (*Note: For Windows 95 Terminal program, the Arrow keys may not operate properly.*)

- **Enter or Return Key**

The Enter or Return key causes the system to act on the data that was entered. Selections may be entered into the system in one of the two ways:

- By pressing the Enter or Return key after making each selection.

- By pressing the Enter or Return key (before leaving the screen) after all selections and entries are made.
- **R Character**
Pressing the "R" character in a selection field changes the selection to previous value.
- **Space Bar**
The space bar is used to change the selection within a highlighted field. When various options may be selected, pressing the space bar brings up the next choice.
- **Control Key**
Various special functions are activated by pressing the Ctrl key while at the same time pressing another key. The following functions are activated by the control keys:
 - **Ctrl-D** : terminates the session and logs out the user.
 - **Ctrl-P** : cancels the current operation and moves the cursor back to the previous menu.
 - **Ctrl-R** : refreshes the current screen with the original values.
 - **Ctrl-T** : cancels the current operation and moves the cursor to the Main Menu.
 - **Ctrl-V** : selects the slave shelf to monitor when you are operation in the master shelf.
- **Pop-Up Boxes**

On some of the Craft Interface screens, error and information notes appear as needed to assist you in operating the system. The information is displayed in a pop-up box that appears over the current screen display.

3.2.1 Craft User Interface Architecture

Before using the user interface, you are asked to enter the user ID and the password. The default User ID is **TAINET** and Password is **NS620** all capital and case sensitive.

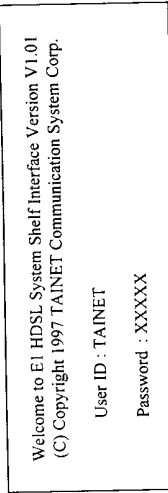


Figure 3-1 Login Menu of Craft User Interface

The contents of main menu (Figure 3-2) described as follows:

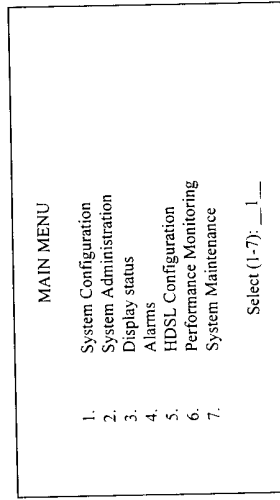


Figure 3-2 Main Menu of Craft User Interface

The sub-menu items are listed as following:

- **System Configuration**
 1. TID/DATE/TIME
 2. Housekeeping Label (*note R*)
- **System Administration**
 1. Edit User Account
 2. Edit Menu Security
- **Display Status**
 1. Display Shelf Status (*note R*)
 2. Display HDSL Status
 3. Display Data Port Status (*note F*)
- **Alarms**
 1. Display Alarm Summary (*note R*)
 2. Display Active Alarms

3. Display Alarm History
 4. Clear Alarm History
 5. Set Alarm Notification Level
- **HDSL Configuration**
 - **Performance Monitoring**
 1. HDSL PM Configuration
 2. HDSL 15-MIN PM Reports
 3. HDSL Daily PM Reports
 4. E1 PM Configuration
 5. E1 15-MIN PM Reports
 6. E1 Daily Reports
 - **System Maintenance**
 1. Reset/LED Test
 2. E1 Loopback Commands/Status
 3. FE1 Loopback Commands/Status (*note F*)
 4. Display Inventory (*note R*)
 5. Display Remote
 6. Digital Loop Self Test
 7. Force Preferred Data Switch
 8. Read Fault Log (*note R*)
 9. Execute ACO
 10. Execute Config Data Upload (*note R*)
 11. Execute Config Data Download (*note R*)
 12. Execute Software Download (*note R*)

note R: for NS-620M rack system only
note F: for fractional E1 applications only

3.2.2 System Configuration

The System Configuration screen is displayed as Figure 3-3.

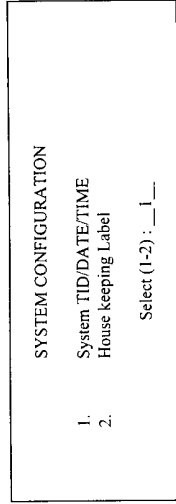


Figure 3-3 Screen of System Configuration

- **System TID/DATE/TIME**

Use this procedure to enter the TID and to set the system internal time and date. Time and date must be set when the system is first installed or if there is a change in the time. Each chassis also requires a unique identification name or number, called the Target Identifier (TID).

Note: Selections may be entered into the database in one of two ways: (1) By pressing the Enter or Return key after making each selection; or (2) By pressing the Enter or Return key (before leaving the menu) after all selections and entries are made in the menu.

1. From the Main Menu, use the Arrow or Numeric keys to select the System Configuration menu. Press the Enter or Return key.
2. Use Arrow or Numeric keys to select the System TID/Date/Time screen. Press the Enter or Return key. The System TID/Date/Time screen should appear (Figure 3-4).
3. Use Arrow keys to move to the TID (Target Identifier) field. At the TID field, type the target Identifier. The TID label can be 1 to 20 characters with no spaces or periods between the characters. Only ASCII alpha, numeric, or hyphen characters are allowed. The first character of the TID must be an alpha character. The last character of the TID may be either an alpha or numerical character. If a TID of more than 20 characters is entered, all characters after the twentieth will be dropped.
4. Use Arrow keys to move to the Date field.
5. At the Date field, enter the two digit number for the month. Enter the two digit number for the date. Enter the four digit numbers for the year.
6. Use Arrow keys to move to the Time field.
7. At the Time field, enter 00 to 23 for the hour. Enter 00 to 59 for the minutes. Enter 00 to 59 for the seconds. The Time field is updated each time the screen is refreshed.
8. Enter the selections by pressing the Enter or Return key.

```

System TID/DATE/TIME

TID      : Machine-1
DATE     : 01/01/1996 (MM/DD/YYYY)
TIME     : 00:00:00 (hr:mm:ss)

Please Input 1-20 Alpha number or -
    
```

Figure 3-4 System TID/Date/Time Screen

• **Shelf Housekeeping Input Alarm Labels (for NS-620M Only)**

Use this selection to assign names to the housekeeping input alarm contacts. When a housekeeping alarm (door ajar, water on the floor, fire alarm, etc.) occurs, the name assigned is displayed in the condition column of the Alarm History and Active Alarms screens.

Note: Selections may be entered into the database in one of two ways: (1) By pressing the Enter or Return key after making each selection; or (2) By pressing the Enter or Return key (before leaving the menu) after all selections and entries are made in the menu.

1. From the Main Menu, use the Arrow or Numeric keys to select the System Configuration menu. Press the Enter or Return key.
2. Use the Arrow or Numeric keys to select Housekeeping Labels and press the Enter or Return key. The Shelf Housekeeping Alarms screen is shown in Figure 3-5.
3. Use Arrow keys to move to the Alarm Condition field.
4. Default alarm condition names are removed by typing over the existing text or using the space bar to erase the text. Alarm Condition names may be 1 to 16 characters in length. The first character must be an alpha character and the middle characters may be alpha or numeric. Enter the Alarm Condition for the number selected.
5. Assign entry by pressing the Enter or Return key.
6. Repeat Steps 3 through 5 for each alarm contact.

```

Shelf Housekeeping Labels

#      Condition Label
-----
1.     Fire-Alarm
2.     HSKP2
3.     HSKP3

Select (1-3) : _1_
    
```

Figure 3-5 Shelf Housekeeping Labels Screen

3.2.3 System Administration

The System Administration Screen is displayed as Figure 3-6.

```

SYSTEM ADMINISTRATION

1      Edit User Account
2      Edit Menu Security

Select (1-2) : _1_
    
```

Figure 3-6 System Administration Screen

• **Edit User Accounts**

Use this menu to create, edit, and view Craft Interface User ID, and Passwords. Each User has an expiration date and a Privilege Level, that is used to control user access to the various menus. The User Accounts data is usually controlled by the System Administrator, who has the highest privilege level (5).

Note: Selections may be entered into the NS-620M database in one of two ways: (1) By pressing the Enter or Return key after making each selection; or (2) By pressing the Enter or Return key (before leaving the menu) after all selections and entries are made in the menu.

1. From the Main Menu, use the Arrow or Numeric keys to select the System Administration menu. Press the Enter or Return key.
2. Use Arrow or Numeric keys to select Edit User Accounts from the System Administration Menu. Press The Enter or Return key. The Edit User Accounts screen is shown in Figure 3-7.
3. Move the cursor to the User Number field. The number one appears. A number from 1 to 5 may be selected. The Craft Interface database of the NS-620M allows up to 25 users to be entered, and the NS-620 standalone unit allows up to 5 users. Use space bar to select the user number, stopping when no user name appears on the screen.
4. Move the cursor to the User Name field. A maximum of ten characters may be entered in this field. A minimum of five characters are required. Only ASCII alpha, numeric, or hyphen characters are allowed. This field is case sensitive. Single word User Names in all upper or lower case are easiest to remember.
5. At the User Name field, type the user name (Logon). If there is already a user name assigned, a new user name may be entered replacing the existing user name.
6. Move the cursor to the Password field. A maximum of ten characters may be entered in this field. A minimum of five characters with one character

being a number are required. Only ASCII alpha, numeric, or hyphen characters are allowed. This field is case sensitive.

7. At the Password field, type the password. If there is already a password assigned, a new password may be entered replacing the existing password.
8. Move the cursor to the Privilege level field. Use space bar to select the privilege level (1 to 5). A privilege level of five allows unlimited access.
9. Use Arrow keys to move to the Expiration Period field.
10. At the Set Password Expiration Period field, type in the time period in days (0 to 999). If 999 is selected, the password has no expiration period.
11. The last row on this menu displays the number of days remaining before the password expires. If the password expiration period is set to zero, this field displays N/A.
12. Assign the selections by pressing the Enter or Return key.

| Edit User Accounts | |
|--|--------|
| User Number : | 1 |
| User Id : | TAINET |
| Password : | NS620 |
| Privilege Level : | 5 |
| Expiration Period : | 990 |
| Number Days Left : | 90 |
| Please Use Space bar to Select User Number | |

Figure 3-7 Edit User Accounts Screen

• **Edit Menu Security**

Use this command to assign access user privilege levels to the menus. Select the System Administration menu from the Main Menu and change the privilege levels as necessary.

Note: Selections may be entered into the database in one of two ways: (1) By pressing the Enter or Return key after making each selection; or (2) By pressing the Enter or Return key (before leaving the menu) after all selections and entries are made in the menu.

1. From the Main Menu, use the Arrow or Numeric keys to select the System Administration menu. Press the Enter or Return key.
2. Select Edit Menu Security from the System Administration Menu. Press the Enter or Return key. The Edit Menu Security screen (with default settings) is shown in Figure 3-8.
3. In the Edit Menu Security move to the desired selection. Use space bar to select a privilege level of 1 to 5. One is the lowest security level and five is the highest level. System users assigned a privilege level of five have

access to all menu selections. Users assigned a privilege level of one have access to only those menus assigned a level of one. A level two is normally assigned to a Local Technician, level three is often assigned to the Operating Technician, and level five is assigned to the System Administrator.

4. Repeat Step 3 for each Main Menu Selection that you wish to change.
5. Assign the selections by pressing the Enter or Return key.

| Menu or Command | Privilege | Edit Menu Security Menu or Command | Privilege |
|--------------------------|-----------|------------------------------------|------------------------------|
| Clear Alarm History | : | 2 | Reset/LED test Commands : 3 |
| HDSL Configuration | : | 2 | Loopback Status/Commands : 3 |
| Data Port Configuration | : | 2 | Self Test Commands : 3 |
| Set Alarm Level | : | 2 | Execute ACO : 3 |
| Edit use Accounts | : | 5 | Upload Config. Data : 3 |
| Edit Menu Security | : | 5 | Download Config. Data : 3 |
| System TTD/Time/Date | : | 3 | Download MPU Software : 3 |
| Housekeeping Alarm Label | : | 3 | EI Perf. Mon. Config. : 3 |
| | | | HDSL Perf. Mon. Config. : 3 |

Figure 3-8 Edit Menu Security Screen (With Defaults)

3.2.4 Display Status

The Display Status screen is displayed as Figure 3-9.

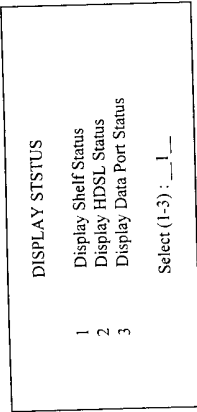


Figure 3-9 Display Status Screen

• **Display Shelf Status (for NS-620M Only)**

- Use this screen to display the status of all line cards installed in the chassis.
- From the Main Menu, use the Arrow or Numeric keys to select the Display Status menu. Press the Enter or Return key.
- Use the Arrow or Numeric keys to select Display Shelf Status from the Display Status Menu. Press the Enter or Return key. The Shelf Status screen is shown in Figure 3-10.

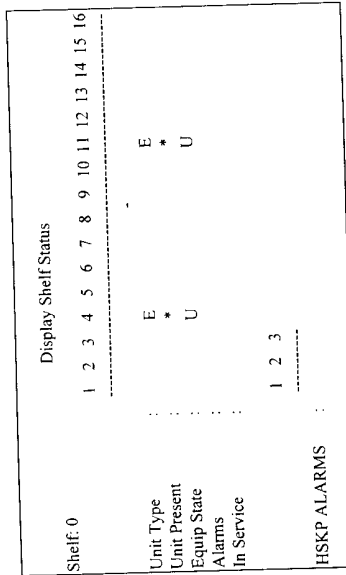


Figure 3-10 Shelf Status Screen

• **Display HDSL Status (for Full E1 Type Configuration)**

- Use this command to display the status of the NS-620 or NS-620N installed in the central office chassis and the associated NS-620/N at the far end of the circuit.
- Use the Arrow keys to select Display Status from the Display Status Menu. Press the Return or Enter key. Figure 3-11 shows a Display Status screen

- 2. Determine the slot number (1-16) for the NS-620N whose status you wish to display. At Slot selection field, select the slot number.

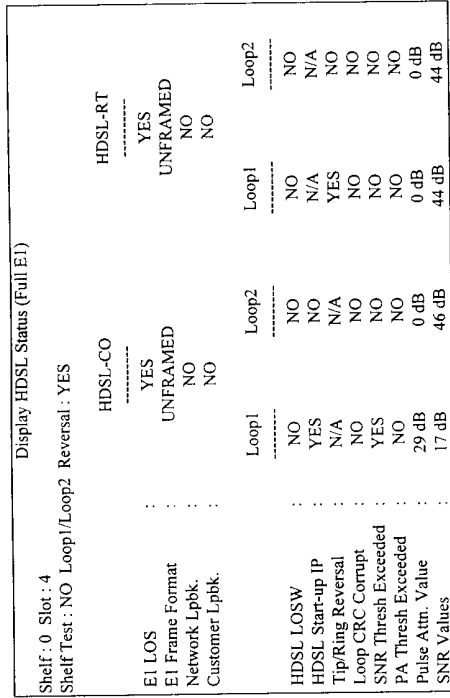


Figure 3-11 Status Screen

• **Display Data Port Status (for Fractional-E1 Type only)**

3.2.5 Alarms

The Alarms screen is displayed as Figure 3-12.

| ALARMS | |
|----------------------|------------------------------|
| 1 | Display Active Alarms |
| 2 | Display Alarm Summary |
| 3 | Display Alarm History |
| 4 | Clear Alarm History |
| 5 | Set Alarm Notification Level |
| Select (1-5) : _ 1 _ | |

Figure 3-12 Alarms Screen

• **Display Active Alarms**

- Use this procedure to display active (current) alarms for all circuits
 - From the Main Menu, use the Arrow or Numeric keys to select the Alarms Menu. Press the Enter or Return key.
 - Use Arrow or Numeric keys to select Display Active Alarms from the Alarms Menu. Press the Enter or Return key. The Display Active Alarms screen is shown in Figure 3-13.
 - A maximum of 160 entries, are displayed in slot order. If the list is too long to fit on one screen, use the Up/Down keys to scroll through the entries one line at a time. Use the right arrow key to move down one screen at a time. Use left arrow key to move up one screen at a time. Pressing Ctrl-R queries the database for all currently active alarms
 - The first column (Access Identifier)(AID) identifies an entity in the system to which the alarm condition pertains. Different alarm conditions result in different types of AIDs
 - The second column (Location) displays either FEND (far-end), NEND (near-end), indicating the location of the alarm.
 - The Third column (Condition) displays the alarm condition present on the circuit. See Table 3-1 for a listing of the possible alarm conditions.
 - The fourth column (Status) displays UA(Urgent Alarm), NU(Non-urgent Alarm), or EV (Event) indicating the degree of the alarm.
 - The fifth column indicates whether the ACO has been activated (YES or NO) for a given alarm.

| Legend: | Access ID | Location | Condition | Status | ACO |
|---------|-----------|----------|-------------|--------|-----|
| | LP-0-4-1 | NEND | T-SNR | NU | YES |
| | E1-0-4 | NEND | SEF DEFECT | NU | YES |
| | E1-0-4 | NEND | LOS DEFECT | UA | NO |
| | E1-0-4 | NEND | LOF FAILURE | UA | NO |
| | E1-0-4 | NEND | LOS FAILURE | UA | NO |
| | LP-0-4-1 | NEND | RECOVER | NU | NO |

Figure 3-13 Display Active Alarms Screen (Sample)

Table 3-1 Alarm Descriptions/Conditions

| DISPLAY | DESCRIPTION |
|------------------------------|--|
| MPU ALARMS, AID =EQPT-MPU# | MPU unable to communicate with NS-620N |
| POWER | Shelf power input (A or B) not connected |
| MPU ALARMS, AID =EQPT-LIU# | |
| DISPLAY | DESCRIPTION |
| COMM FAIL | MPU unable to communicate with NS-620N |
| HDLSL ALARMS, AID =EQPT-LIU# | |
| DISPLAY | DESCRIPTION |
| LOOP REVERSAL | Pairs crossed at RT side |
| TP/RNG REVERSAL | Tip and Ring reversed (either end) |
| PRIMARY POWER | Local power fail indication (1) detected at RT side |
| SECONDARY POWER | Local power fail indication (2) detected at RT side |
| BOARD FAIL | CO or RT Board fail |
| HSKP1 | Housekeeping contact closure (1) detected at RT side |
| HSKP2 | Housekeeping contact closure (2) detected at RT side |
| HDLSL ALARMS, AID = LP | |
| DISPLAY | DESCRIPTION |
| T-BER | HDLSL loop BER threshold crossed |
| T-SNR | HDLSL loop SNR threshold crossed |
| T-PA | HDLSL Pulse Attenuation threshold crossed |
| LOS DEFECT | Loss of Sync Word defect |
| LOS FAILURE | Loss of Sync Word defect |
| COFA | HDLSL Change of Frame Alignment |
| LOS DEFECT | HDLSL Loss of Signal defect |
| LOS FAILURE | HDLSL Loss of Signal Failure |
| RECOVERY | HDLSL loop is performing start-up process |
| T-FCP-15MIN | 15-minute FCP Threshold Cross Alert |
| T-CVP-15MIN | 15-minute CVP Threshold Cross Alert |
| T-ESP-15MIN | 15-minute ESP Threshold Cross Alert |
| T-SESP-15MIN | 15-minute SESP Threshold Cross Alert |
| T-SEFSP-15MIN | 15-minute SEFSP Threshold Cross Alert |
| T-FCP-IDAY | 1-day FCP Threshold Cross Alert |
| T-CVP-IDAY | 1-day CVP Threshold Cross Alert |
| T-ESP-IDAY | 1-day ESP Threshold Cross Alert |
| T-SESP-IDAY | 1-day SESP Threshold Cross Alert |
| T-SEFSP-IDAY | 1-day SEFSP Threshold Cross Alert |

*Note: Please refer to Table 3-2 for HDLSL Performance Monitor Type Descriptions.

| DISPLAY | EI ALARMS, AID = EI | DESCRIPTION |
|---------------|---------------------------------------|-------------|
| T-BER | EI BER threshold crossed | |
| COFA | EI Change of Frame Alignment | |
| SEF DEFECT | EI Severly Errored Framing defect | |
| LOS DEFECT | EI loss of Signal defect | |
| AIS DEFECT | Alarm Indication Signal defect | |
| LOF FAILURE | EI Loss of Frame failure | |
| LOS FAILURE | EI Loss of Signal failure | |
| AIS FAILURE | Alarm Indication Signal failure | |
| RAI FAILURE | Remote Alarm Indication (Yellow) | |
| T-CVL-15MIN | 15-minute CVL Threshold Cross Alert | |
| T-LOSS-15MIN | 15-minute LOSS Threshold Cross Alert | |
| T-ESL-15MIN | 15-minute ESL Threshold Cross Alert | |
| T-SESL-15MIN | 15-minute SESL Threshold Cross Alert | |
| T-FCP-15MIN | 15-minute FCP Threshold Cross Alert | |
| T-CVP-15MIN | 15-minute CVP Threshold Cross Alert | |
| T-AISSP-15MIN | 15-minute AISSP Threshold Cross Alert | |
| T-SASP-15MIN | 15-minute SASP Threshold Cross Alert | |
| T-ESP-15MIN | 15-minute ESP Threshold Cross Alert | |
| T-SEFSP-15MIN | 15-minute SEFSP Threshold Cross Alert | |
| T-ESP-15MIN | 15-minute ESP Threshold Cross Alert | |
| T-CVL-1DAY | 1-day CVL Threshold Cross Alert | |
| T-LOSS-1DAY | 1-day LOSS Threshold Cross Alert | |
| T-ESL-1DAY | 1-day ESL Threshold Cross Alert | |
| T-SESL-1DAY | 1-day SESL Threshold Cross Alert | |
| T-FCP-1DAY | 1-day FCP Threshold Cross Alert | |
| T-CVP-1DAY | 1-day CVP Threshold Cross Alert | |
| T-AISSP-1DAY | 1-day AISSP Threshold Cross Alert | |
| T-SASP-1DAY | 1-day SASP Threshold Cross Alert | |
| T-ESP-1DAY | 1-day ESP Threshold Cross Alert | |
| T-SEFSP-1DAY | 1-day SEFSP Threshold Cross Alert | |
| T-ESP-1DAY | 1-day ESP Threshold Cross Alert | |

*Note: Please refer to Table 3-3 for EI Performance Monitor Type Descriptions.

• **Display Alarm Summary (for NS-620M Only)**

Use this command to display a summary of the currently active alarms for all circuits in the chassis.

1. From the Main Menu, use the Arrow or Numeric keys to select the Alarms menu. Press the Enter or Return key.
2. Use the Arrow or Numeric keys to select Display Alarm Summary from the Alarms Menu. Press the Enter or Return key. The Display Alarm Summary screen is shown in Figure 3-14.
3. Each time the shelf status changes the screen is updated.

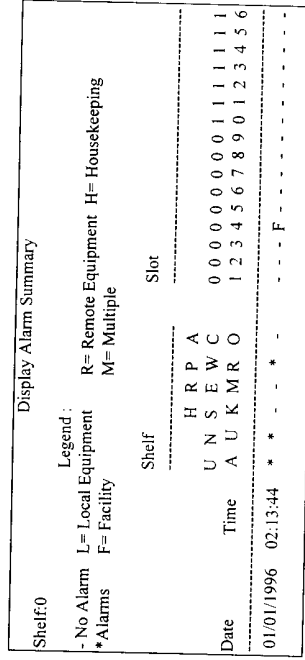


Figure 3-14 Alarm Summary Screen

• **Display Alarm History**

Use this command to display both active and cleared alarms. Each alarm declaration and alarm clearing enters a separate message in the history buffer. (Event level alarms do not show a clearing message.)

1. From the Main Menu, use the Arrow or Numeric keys to select the Alarms Menu. Press the Enter or Return key.
2. Use Arrow or Numeric keys to select Display Alarm history from the Alarms Menu. Press the Enter or Return key. The Alarm History screen is shown in Figure 3-15.
3. At the selection prompt press the Enter or Return key. Both the active and cleared alarms appear. See Figure 3-15. Up to a maximum of 160 messages can be displayed from this history buffer. The messages are displayed in reverse chronological order, starting with the most recent. If the list is too long to fit in one screen, use the Up/Down keys to scroll through the entries one line at a time. Use the right arrow key to move down one screen at a time. Use left arrow key to move up one screen at a time. Press Ctrl-R to refresh screen.

☞ The first (Date) and second (Time) columns on the screen display the date and time respectively of the alarms stored in the history file.

- ☞ The third column (Access ID) identifies an entity in the system to which the alarm condition pertains. Different alarm conditions result in different types of Access IDs.
- ☞ The fourth column (Location) displays either FEND (far-end), NEND (near-end), indicating the location of the alarm.
- ☞ The fifth column (Condition) displays the alarm condition present on the circuit.
- ☞ The sixth column St (Status) displays UA (Urgent Alarm), NU (Non-urgent), EV (Event) or CL (Indicates alarm or event has cleared).

Alarm History

Legend : Access ID = Identifier(-)Shelf-Slot(-)Loop

| Date | Time | Access ID | Location | Condition | St |
|------------|----------|---------------|----------|-----------------|----|
| 01/01/1996 | 02:12:32 | E1-0-4 | NEND | LOS FAILURE | UA |
| 01/01/1996 | 02:12:32 | E1-0-4 | NEND | LOS FAILURE | UA |
| 01/01/1996 | 02:12:32 | E1-0-4 | NEND | LOS DEFECT | NU |
| 01/01/1996 | 02:12:32 | E1-0-4 | NEND | SEF DEFECT | NU |
| 01/01/1996 | 02:12:24 | LP-0-4-1 | NEND | RECOVERY | NU |
| 01/01/1996 | 02:12:23 | LP-0-4-1 | NEND | T-SNR | NU |
| 01/01/1996 | 02:10:51 | EQPT-LTU0-4 | | LOOP REVERSAL | CL |
| 01/01/1996 | 02:10:51 | EQPT-LTU0-4-1 | | TP/RNG REVERSAL | CL |
| 01/01/1996 | 02:10:43 | EQPT-LTU0-4 | | LOOP REVERSAL | EV |
| 01/01/1996 | 02:10:43 | EQPT-LTU0-4-1 | | TP/RNG REVERSAL | EV |

Figure 3-15 Display Alarm History Screen

• **Clear Alarm History**

- Use this command to clear the alarm history.
- From the Main Menu, use the Arrow or Numeric keys to select the Alarms Menu. Press the Enter or Return key.
 - Use the Arrow or Numeric keys to select Clear Alarm history from the Alarms Menu, see Figure 3-16.
 - At the Clear Alarm History selection prompt, press the Enter or Return key. The system displays the query shown in Figure 3-16.
 - Clear all alarm history by pressing Y for yes or cancel clear alarm history by pressing N for no.

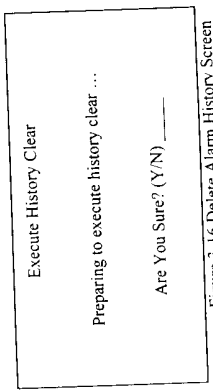


Figure 3-16 Delete Alarm History Screen

• **Set Alarm/Event Notification Level**

The Alarm/Event Notification Level feature is used to filter the alarm notification pop-up based on the criterion of the alarm or event. When this feature is being used, a beep is also heard each time the notification pop-up appears.

- From the Main Menu, use the Arrow or Numeric keys to select the Alarms Menu. Press the Enter or Return key.
- Use the Arrow or Numeric keys to select Alarm/Event Notification Level from the Alarms Menu. Press the Enter or Return key. The Alarm/Event Notification Level screen is shown in Figure 3-17.
- Use space bar to scroll through the options. Stop at the selection you wish to enter. Defaults to Non-Urgent if no selection is made. Allow notification of all Minor, Major, and Critical alarms as they occur.
 - > Urgent Alarm - Allows notification of all Urgent alarms as they occur.
 - > Non-Urgent Alarm - Allows notification of all Non-Urgent alarms and Urgent alarms as they occur.
 - > Event - Allows notification of all alarms and events as they occur.
 - > Disable - Disables the notification of all alarms and events as they occur.
- Assign the selection by pressing the Enter or Return key

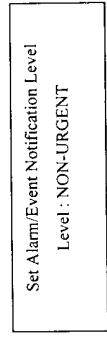


Figure 3-17 Alarm Notification Level

3.2.6 HDSL Configuration (for Full-E1 Type Configuration)

Use this menu to view or edit the configuration for the NS-620 or each NS-620N in the chassis. This menu can also be used to equip, provision, assign thresholds, and assign service state.

Note: Selections can be entered into the database in one of two ways: (1) By pressing the Return or Enter key after making each selection; or (2) By pressing the Return or Enter key (before leaving the menu) after all selections and entries are made in the menu.

1. From the Main Menu, use the arrow keys or number keys to select the HDSL Configuration menu. Press the Return or Enter key. The HDSL Configuration menu appears. See Figure 3-18.
2. Move to the Slot selection field. Select slot number 1-16.
3. Move to the Unit Equip State selection field. Use space bar to select Equipped or Unequipped for the slot selected in Step 2. Module must be equipped before remaining selections are allowed. The default setting is Unequipped.
4. To avoid undesirable reporting of alarms, skip the E1 Service State selection at this time. Place the circuit In-Service after completing the configuration.
5. Move to the E1 Framing Format selection field. Use space bar to select UNFRAMED or G.703. The default setting is G.703.
6. Move to the E1 BER Threshold selection field. E1 BER Threshold can be set between 10^{-3} and 10^{-9} . The default setting is 10^{-7} . Use space bar to select E1 BER Alarm Threshold for the slot selected in Step 2.
7. Move to the HDSL Service State selection field. Use space bar to select IS (In-Service) or OOS (Out-Of-Service) for the slot selected in Step 2.
8. Move to HDSL BER Threshold selection field. The HDSL BER Threshold can be set between 10^{-4} and 10^{-9} . The default setting is 10^{-7} . Use space bar to select HDSL BER Alarm Threshold for slot selected in Step 2.
9. Move to HDSL SNR Threshold selection field. The HDSL SNR Threshold can be set between -128 and +127. The default setting is +24. Enter HDSL SNR Alarm Threshold for the slot selected in Step 2.
10. Move to the HDSL PA Threshold. The HDSL Pulse Attenuation Threshold can be set between -128 and 127. The default setting is +20dB. Enter HDSL Pulse Attenuation Threshold for the slot selected in Step 2.
11. Move to the Preferred Data selection field. Use space bar to select ODD, EVEN (when time slot grouping is ODD/EVEN) or 1-15, 17-31 (when time slot grouping is CONTIGUOUS), SINGLE LOOP or DISABLED for the slot selected in Step 2. The default setting is DISABLED.
12. Move to Loopback Tim-out Period Input field. Input the number of minutes to control the loopback time out. The valid value is from 0 to 240 minutes, where 0 represents no time out.
13. Move to Time Slots grouping selection field. Use space bar to select

CONTIGUOUS or ODD/EVEN.

14. Move to Null Data Selection field. Use space bar to select 0x7F or 0xFF.
15. Move to E1 Rx clock field. Use space bar or "R" Key to select the clock mode.
16. Move to HDSL SYSTEM TYPE field, select the type of the application.

- E1-C: Full-E1 Central office site
- E1-R: Full-E1 Remote user site.
- FE1-C: Fractional-E1 Central office site
- FE1-R: Fractional E1 Remote user site

Note: Once when a different system type is selected the unit will reset automatically for initialization.

17. Assign the selections by pressing the Return or Enter key.
18. Repeat Steps 2 through 15 for each NS-620/N card installed in the chassis.
19. To block the DS0 channel (or E1 time slot), use arrow keys to move to the channel (from 1 to 31). Press the Space bar to block or un-block the channel. (NOTE: Channel 0 is reserved for E1 frame system)

| HDSL Configuration (Full E1) | | | |
|---|-------------|---------------------|---------------|
| Shelf : 0 | Slot : 4 | | |
| Unit Equip State | : EQUIPPED | HDSL SNR Threshold | : 24dB |
| HDSL E1 Type | : E1-C | HDSL PA Threshold | : 20dB |
| E1 Service State | : IS | E1 Rx Clock | : CODIRECTION |
| E1 Frame Format | : G.703 | Prefer Data | : DISABLED |
| E1 BER Threshold | : 10^{-7} | Lpbk Timeout Period | : 240minutes |
| HDSL Server State | : IS | Time Slot Grouping | : ODD/EVEN |
| HDSL BER Threshold | : 10^{-7} | Null Data | : 0xFF |
| DS0 Channel 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 | | | |
| (B= Blocked) S S | | | |

Fig 3-18 HDSL Configuration Menu

System Type Configuration

Use this procedure to setup the following types of the NS-620/N:

1. Full-E1 CO
2. Full-E1 RT
3. Fractional-E1 CO
4. Fractional-E1 RT

3.2.7 Performance Monitoring

The Performance Monitoring screen is displayed as Figure 3-19.

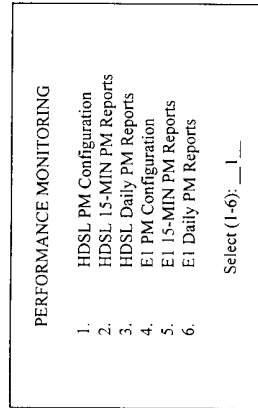


Fig 3-19 Performance Monitoring Screen

- **HDSL PM Configuration**

Use this procedure to assign performance monitoring thresholds for the NS-620 or each NS-620N card in the chassis. You may also view or edit the HDSL Performance Monitoring configuration for each HDSL circuit from this screen.

Note: Selections may be entered into the NS-620/M database in one of two ways: (1) By pressing the Enter or Return key after making each selection; or (2) By pressing the Enter or Return key (before leaving the menu) after all selections and entries are made in the menu.

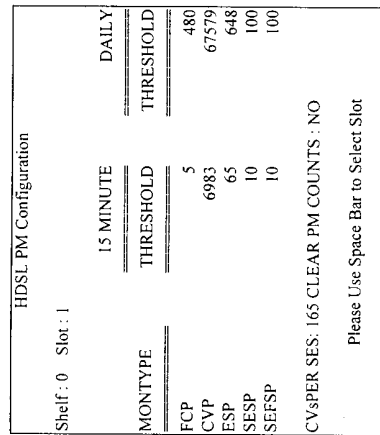


Fig 3-20 HDSL PM Configuration Screen

1. From the Main Menu, use the arrow keys or number keys to select the Performance Monitoring menu. Press the Enter or Return key. A Performance Monitoring menu appears.

2. Use arrow keys or number keys to select HDSL PM Configuration. Press the Enter or Return key. The HDSL PM Configuration screen is shown in Figure 3-20.
3. Move to the Slot selection field. Select slot number 1 to 16.
4. Enter a threshold value for each Mon Type. Ranges and default values for each Mon Type and Internal thresholds are listed in.
5. Assign the selections by pressing the Enter or Return key.
6. Repeat Steps 3 through 6 for each NS-620N card in the chassis.
7. Selecting YES at the Clear PM COUNTS field to removes all threshold values from the database for the slot selected.

- **HDSL PM Reports**

The 15 minute PM, Daily PM, and Summary PM reports are available through the Performance Monitoring selection on the Main Menu as Fig.3-21. Performance Monitoring reports are based on the data stored in the NS-620 or the NS-620M MPU memory.

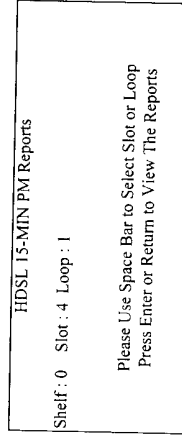


Fig 3-21 HDSL 15-MIN PM Reports (1)

- **15 Minute Performance Monitoring Reports**

This report displays the PM data for the current 15 minute period and the previous thirty-two 15 minute periods.

| Period | FCP | CVP | ESP | SESP | SEFSP | PA-H | SNR-L |
|----------|-----|-----|-----|------|-------|------|-------|
| 02:14:09 | 0 | 0 | 0 | 0 | 0 | 0 | 59 |
| 01:59:09 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:44:09 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 01:29:09 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 01:14:09 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |

Fig 3-22 HDSL 15-MIN PM Reports (2)

• **Daily Performance Monitoring Report**

This report displays the PM data for the current day and the previous seven days. Performance Monitoring Reports are shown in Figure 3-21, Figure 3-22, Figure 3-23, Figure 3-24. Retrieve the Performance Monitoring Report that you wish to view.

```

HDSL Daily PM Reports
Shelf: 0 Slot: 4 Loop: 1

Please Use Space Bar to Select Slot or Loop
Press Enter or Return to View The Reports
Figure 3-23 HDSL Daily PM Reports (1)
    
```

```

HDSL Daily PM Reports
Shelf: 0 Slot: 4 Loop: 1

Period -----
01/01/96      FCP      CVP      ESP      SESP      SEFSP      PA-H      SNR-L
              FCP-FE    CVP-FE    ESP-FE    SESP-FE    SEFSP-FE  PA-H-FE  SNR-L-FE
-----
0              0          0          0          0          0          0          59
0              0          0          0          0          0          0          0
    
```

Please Use Space Bar to Select Slot or Loop
Press Enter or Return to View The Reports
Figure 3-24 HDSL Daily PM Reports (2)

• **Monitor Types**

Once a second the NS-620/M evaluates the current counts and derived parameters for threshold violations. There are 15 minute and daily threshold settings for all counts and derived parameters. These thresholds define the number of errors that constitute a 15 minute or daily threshold violation when exceeded. 15 minute and daily thresholds may be set for any one or all of the Monitor Types. Monitor Types and descriptions are given in Table 4-2.

Table 3-2 HDSL Monitor Type Descriptions

| MON TYPE | LOCATION | DESCRIPTION |
|----------|----------|--|
| FCP | NEND | Failure Count Path : Count of Loss Of Sync Word (LOSW) failures on the HDSL loop. |
| CVP | NEND | Code Violation Path : Count of CRC errors on the HDSL loop. |
| ESP | NEND | Erred Second Path : A second in which one or more CRC errors occurred on the HDSL loop |
| SESP | NEND | Severely Erred Second Path : A second in which the number of CRC errors on the HDSL loop was greater than or equal to some user specified value. |

| SEFSP | NEND | Severely Erred Framing Second Path : A second in which one or more LOSW defects occurred on the HDSL loop. |
|----------|------|---|
| PA-H | NEND | Pulse Attenuation-High Path : Highest Pulse Attenuation value detected on the HDSL loop within the interval. |
| SNR-L | NEND | Signal-to-Noise Ratio-Low Path : Lowest Signal-to-Noise Ratio detected on the HDSL loop within the interval. |
| FCP-FE | FEND | Failure Count Path : Count of Loss Of Sync Word (LOSW) failures on the HDSL loop. |
| CVP-FE | FEND | Code Violation Path : Count of CRC errors on the HDSL loop. |
| ESP-FE | FEND | Erred Second Path : A second in which one or more CRC errors occurred on the HDSL loop. |
| SESP-FE | FEND | Severely Erred Second Path : A second in which the number of CRC errors on the HDSL loop was greater than or equal to some user specified value |
| SEFSP-FE | FEND | Severely Erred Framing Second Path : A second in which one or more LOSW defects occurred on the HDSL loop. |
| PA-H-FE | FEND | Pulse Attenuation-High Path : Highest Pulse Attenuation value detected on the HDSL loop within the interval. |
| SNR-L-FE | FEND | Signal-to-Noise Ratio-Low Path : lowest Signal-to-Noise Ratio detected on the HDSL loop within the interval. |

• **E1 PM Configuration**

Use this procedure to assign thresholds for the NS-620 or each NS-620N card in the chassis. You may also view or edit the E1 Performance Monitoring configuration for each E1 circuit from this screen.

Note: Selections may be entered into the NS620/M database in one of two ways: (1) By pressing the Enter or Return key after making each selection; or (2) By pressing the Enter or Return key (before leaving the menu) after all selections and entries are made in the menu.

1. From the Main Menu, use the arrow keys or number keys to select the Performance Monitoring menu. Press the Enter or Return key. A Performance Monitoring menu appears.
2. Use arrow keys or number keys to select E1 PM Configuration. Press the Enter or Return key. The E1 PM Configuration screen is shown in Figure 3-25.
3. Move to the Slot selection field. Select slot number 1 to 16.
4. Enter a threshold value for each Mon Type. Ranges and default values for each Mon Type and Internal thresholds are listed in.
5. Assign the selections by pressing the Enter or Return key.
6. Repeat Steps 3 through 6 for each NS-620N card in the chassis.
7. Selecting YES at the CLEAR PM COUNTS field to removes all threshold values from the database for the slot selected.

Shelf: 3 Slot: 1

| MONTYPE | 15 MINUTE THRESHOLD | DAILY THRESHOLD | MONTYPE | 15 MINUTE THRESHOLD | DAILY THRESHOLD |
|----------|---------------------|-----------------|----------|---------------------|-----------------|
| CVL-NE | 13340 | 133400 | ESP-NE | 65 | 648 |
| LOSS-NE | 10 | 100 | SESP-NE | 10 | 100 |
| ESL-NE | 65 | 648 | ECP-FE | 48 | 480 |
| SESL-NE | 10 | 100 | ESL-FE | 65 | 640 |
| FCP-NE | 48 | 480 | CVP-FE | 13340 | 133400 |
| CVP-NE | 13340 | 133400 | SEFSP-FE | 10 | 100 |
| AISSP-NE | 10 | 100 | ESP-FE | 65 | 648 |
| SASP-NE | 10 | 100 | SESP-FE | 10 | 100 |

Cvs PER SESL : 1544 Cvs PER SESP-FE : 320
 Cvs PER SESP : 320 CLEAR PM COUNTS : NO

Please Use Space Bar to Select Slot
 Figure 3-25 E1 PM Configuration Screen

• **E1 PM Reports**

The 15 minute PM, Daily PM, and Summary PM reports are available through the Performance Monitoring selection found on the Main Menu. Performance Monitoring reports are based on the data stored in the NS-620 or NS-620M MPU memory.

E1 15-MIN PM Reports

Shelf: 3 Slot: 6

Please Use Space Bar to Select Slot
 Press Enter or Return to View The Reports

Figure 3-26 E1 15-MIN PM Reports (1)

• **15 Minute Performance Monitoring Report**

This report displays the PM data for the current 15 minute period and the previous thirty-two 15 minute periods.

E1 15-MIN PM Reports

Shelf: 3 Slot: 6

| Period | CVL | LOSS | ESL | SESL | FCP | ESP | CVP | SESP |
|----------|-------|------|--------|---------|--------|--------|--------|---------|
| | AISSP | SASP | ESL-FE | SESL-FE | FCP-FE | ESP-FE | CVP-FE | SESP-FE |
| 10:53:13 | 0 | 479 | 0 | 479 | 479 | 0 | 479 | 479 |
| 10:38:12 | 0 | 479 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 900 | 0 | 900 | 899 | 0 | 900 | 900 |
| | 0 | 900 | 0 | 0 | 0 | 0 | 0 | 0 |

Page 1 of 1

Figure 3-27 E1 15-MIN PM Reports (2)

• **Daily Performance Monitoring Reports**

This report displays the PM data for the current day and the previous seven days. Performance Monitoring Reports are shown in Figure 3-26, Figure 3-27, Figure 3-28, Figure 3-29. Retrieve the Performance Monitoring Report that you wish to view.

E1 Daily PM Reports

Shelf: 3 Slot: 6

Please Use Space Bar to Select Slot
 Press Enter or Return to View The Reports

Figure 3-28 E1 1-DAY PM Reports (1)

E1 Daily PM Reports

Shelf: 3 Slot: 6

| Period | CVL | LOSS | ESL | SESL | FCP | ESP | CVP | SESP |
|----------|-------|------|--------|---------|--------|--------|--------|---------|
| | AISSP | SASP | ESL-FE | SESL-FE | FCP-FE | ESP-FE | CVP-FE | SESP-FE |
| 04/18/96 | 0 | 1692 | 0 | 1692 | 1691 | 0 | 1692 | 1692 |
| | 0 | 1692 | 0 | 0 | 0 | 0 | 0 | 0 |

Page 1 of 1

Figure 3-29 E1 1-DAY PM Reports (2)

• **Monitor Types**

Once a second the NS-620/M evaluates the current counts and derived parameters for threshold violations. There are 15 minute and daily threshold settings for all counts and derived parameters. These thresholds define the number of errors that constitute a 15 minute or daily threshold violation when exceeded. 15 minute and daily thresholds may be set for any one or all of the Mon Types. Mon Types and descriptions are given in Table 3-3.

Table 3-3 E1 Monitor Type Descriptions

| MON TYPE | LOCATION | DESCRIPTION |
|----------|----------|---|
| CVL | NEND | Code Violation Line : Count of Bipolar Violations (BPV) in the E1 signal. |
| LOSS | NEND | Loss Of Signal Second : A second in which one or more Loss Of Signal defects occurred. |
| ESL | NEND | Erred Second Line : A second in which there occurred one or more BPVs, or one or more LOS defects. |
| SESL | NEND | Severely Erred Second Line : A second in which more than some user specified value of CVLs or one or more LOS defects occurred. |

| | | |
|----------|------|---|
| FCP | NEND | Failure Count Path : A count of Loss Of Frame (LOF) or Alarm Indication Signal (AIS) failures within the interval. Failure count is independent of the duration (in terms of seconds) of the failure condition. |
| CVP | NEND | Code Violation Path : Count of Frame sync Errors or count of CRC errors. |
| AISSP | NEND | AIS Second Path : A second containing one or more AIS defects. |
| SASPP | NEND | SEF/AIS Second Path : A second containing one or more AISSPs or one or more SEFs (Severely Erred Framing/OOF) defects. |
| ESP | NEND | Erred Second Path : A second containing one or more CVP errors, one or more SEF defects, or one or more AIS defects. |
| SESP | NEND | Severely Erred Second Path : A second in which there occurred more than some user specified value of CVP errors, one or more SEF defects, or one or more AIS defects. |
| FCP-FE | FEND | Failure Count Path-Far end : Count of Remote Alarm Indication (RAI) failures within the interval. This is also called a Yellow alarm. |
| ESL-FE | FEND | Error red Second Line-Far end : A second in which there occurred one or more BPV s., or one or more LOS defects. |
| CVP-FE | FEND | Code Violation path-Far end : Count of (FE) Frame sync Errors or CRC errors. |
| SEFSP-FE | FEND | Severely Erred Framing Second Path-Far end : Derived from Severely Erred Framing Event (SEF Defect). |
| ESP-FE | FEND | Erred Second path-Far end : A second in which there occurred one or more FE events, one or more SEF defects, one or more AIS defects, or the occurrence of an RAI failure. |
| SESP-FE | FEND | Severely Erred Second Path-Far end : A second in which there occurred more than eight FE events, one or more SEF defects, one or more AIS defects, or more than some user specified value of CVP errors. |

3.2.8 System Maintenance

The System Maintenance screen is displayed as Figure 3-30.

| SYSTEM MAINTENANCE | |
|---------------------------------|--|
| 1. Reset/LED Test | 7. Force Preferred Data Switch |
| 2. E1 Loopback Commands/Status | 8. Read Fault Log |
| 3. FE1 Loopback Commands/Status | 9. Execute ACO |
| 4. Display Inventory | A. Execute Configuration Data Upload |
| 5. Display Remote | B. Execute Configuration Data Download |
| 6. Digital Loop Selftest | C. Execute Software Download |
| Select (1-C): <u> 1 </u> | |

Figure 3-30 System Maintenance Screen

• **Reset/LED Test**

Reset and LED Test commands perform software, hard reset initialization, or test the LEDs on selected modules, respectively. Reset of the NS-620 or NS-620M MPU initiates a system restart and logs off all current users. On the CO and RT side, reset leaves the current configuration in place but stops the collection of data for several seconds. The LED Test lights, all LEDs performing a lamp test on the module(s) selected.

Note: Selections may be entered into the NS-620/M database in one of two ways – (1) By pressing the Enter or Return key after making each selection; or (2) By pressing the Enter or Return key (before leaving the menu) after all selections and entries are made in the menu.

Note: Commands may be initiated on more than one module by using the arrow keys to move to each module and pressing the space bar to select each module.

1. From the Main Menu, use arrow keys or number keys to select System Maintenance. Press the Return or Enter key.
2. Use the arrow keys or number keys to select Reset/LED Test Commands from the System Maintenance Menu. Press the Enter or Return key. The Reset/LED Test Commands screen is shown in Figure 3-31.
3. Use the arrow keys to move to the desired module.
4. To perform LED test, use space bar to select L.
5. To perform Soft Reset, use space bar to select R.
6. To perform Hard Reset, use space bar to select H.
7. Assign the selections by pressing the Enter or Return key. A pop-up appears asking **Are You Sure? (y/n)** Press Y for yes or N for no.

Note: A Reset will cause a system restart which eliminates all past data and logs off all current users. The current configuration for the CO

and RT side is left in place. However, the collection of data is stopped for several seconds.

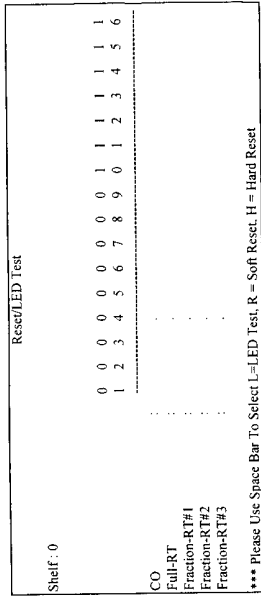


Figure 3-31 Reset/LED Test Menu

• **E1 Loopback Commands/Status (for Full-E1 CO Side Only)**

This menu provides 4 kinds of E1 loopback tests for system maintenance. Refer to Figure 3-32 for the loopback paths. This screen displays the currently active loop-backs for all circuits in the system. Loop-backs are also Enabled and Disabled using this screen.

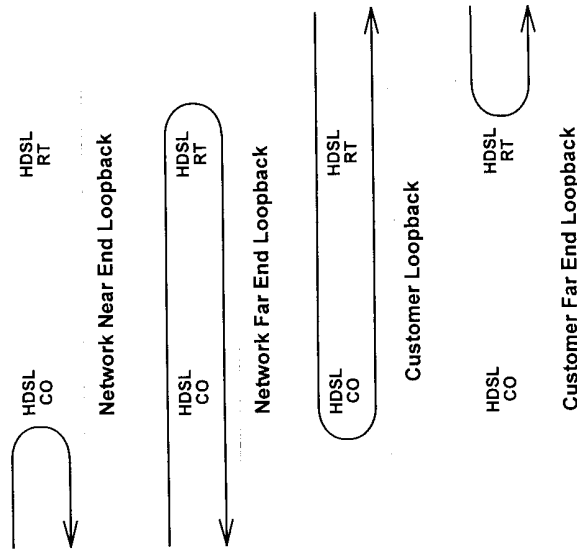


Figure 3-32 E1 Loopback Commands

- Use arrow keys to select System Maintenance from the Main Menu. Press the Return or Enter key.
- Use arrow keys to select E1 Loopback Status/Commands from the System Maintenance Menu. Press the Return or Enter key. E1 Loopback Status/Commands screen appears. (see Figure 3-33)
- Use arrow keys to move to the desired Loopback command field. Use space bar to select Enable, Disable. Press the Return or Enter key.
Note: A blank field indicates no selection.
The following message will appear:
Execute E1 Loopback
Are You Sure? (y/n)
- Enable the loopback selection process by pressing Y for yes or cancel by pressing N for no.

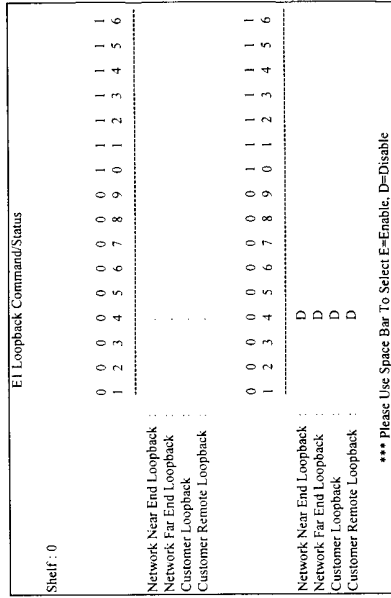


Figure 3-33 E1 Loopback Status/Commands Menu

- **FE1 loopback Command/Status (for Fractional E1 CO site only)**
- **Display Inventory (for NS-620M Only)**

Use this procedure to display the inventory information for the NS-620N cards installed in the chassis and those installed at the remote locations. The inventory display shown is for the point in time at which the request is made. A complete inventory display may not be available for up to a minute after the initial start up.

- From the Main Menu, use arrow keys to select the System Maintenance menu. Press the Return or Enter key.
- Use arrow keys to select Display inventory from the System Maintenance Menu. Press the Enter or Return key. The Inventory Status screen is shown in Figure 3-34.

Display Inventory

| Unit Identifier | Part Number | Catalog Number | Serial Number | Date Code | S/W Version |
|----------------------|-----------------|----------------|---------------|-----------|-------------|
| MPU0 W/BOOT CODE | 00065-202 | NS620M MPU | 00000000 | 971010 | V1.00 |
| MPU0 APPLICATION S/W | | | | 971219 | V1.01 |
| LIU0-1 LOCAL | No Data Present | | | | |
| LIU0-1 REMOTE | No Data Present | | | | |
| LIU0-2 LOCAL | No Data Present | | | | |
| LIU0-2 REMOTE | No Data Present | | | | |
| LIU0-3 LOCAL | 00065-100 | NS620-FullIE1 | 00000000 | 971219 | V1.00 |
| LIU0-3 REMOTE | 00065-200 | NS620n FullIE1 | 00000000 | 971219 | V1.00 |
| LIU0-4 LOCAL | No Data Present | | | | |
| LIU0-4 REMOTE | No Data Present | | | | |
| LIU0-5 LOCAL | No Data Present | | | | |
| LIU0-5 REMOTE | No Data Present | | | | |
| LIU0-6 LOCAL | No Data Present | | | | |
| LIU0-6 REMOTE | No Data Present | | | | |
| LIU0-7 LOCAL | No Data Present | | | | |
| LIU0-7 REMOTE | No Data Present | | | | |

Figure 3-34 Inventory Status Screen

• **Display Remote**

- Use this procedure to display the remote LED status for 5 seconds after the command is executed.
1. From the Main Menu, use arrow keys to select the System Maintenance menu. Press the Return or Enter key.
 2. Use arrow key to select Display Remote from the System Maintenance Menu. Press Return or Enter key. The Display Remote screen will appeared as Figure 3-35.

Display Remote

| | | | | | | | | | | | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shelf: 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| CO | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Full-RT | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Fraction-RT#1 | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Fraction-RT#2 | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Fraction-RT#3 | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |

*** Please Use Space Bar To Select E=Enable, D=Disable

Figure 3-35 Display Remote Screen

• **Digital Loop Self Test (for CO site only)**

Use this command to execute Digital Loop Self-Test. If there is no errors occurred, there is no results recorded. The Digital Loop Self-Test test the board equipment, local loop and Facility. This command is available only when the HDSL startup procedure has been finished successfully.

On executing this command, the CO and RT side will perform a reset. The CO side unit then start the self-test procedure with the STATUS LED being yellow. It starts up the HDSL loop, and sends and receives the QRSS pattern to evaluate the loop performance. The self-test procedure lasts for several minutes. If the HDSL units pass self-test, the STATUS led displays green color, otherwise red color. The HDSL units then automatically return to the normal operation after few seconds. For NS620N card, the test result will be display on the LPBK LED. The LPBK LED lights green color if self-test passed, otherwise it will be red color.

• **Force Preferred Data Switch**

No provided in this version.

• **Read Fault Log**

No provided in this version.

• **Execute ACO**

The ACO command is used to silence active, audible alarms. Any new alarms will cause the audible alarm relay to be reactivated and the ACO state canceled.

1. From the Main Menu, use arrow keys or number keys to select System Maintenance. Press the Return or Enter key.
2. Use arrow keys or number keys to select Execute ACO (Alarm Cut-Off) from the System Maintenance Menu. Screen will display as Figure 3-36.

SYSTEM MAINTENANCE

| | |
|---------------------------------|--------------------------------------|
| 1. Reset/LED Test | 7. Force Preferred Data Switch |
| 2. EI Loopback Commands/Status | 8. Read Fault Log |
| 3. FEI Loopback Commands/Status | 9. Execute ACO |
| 4. Display Inventory | A. Execute Configuration Data Upload |
| 5. Display Remote | Configuration Data Download |
| 6. Digital Loop Selftest | Software Download |

Execute ACO
Press Any Key To Continue

Select (1-C): 1

Figure 3-36 ACO Executed Message

- **Execute Configuration Data Upload (for NS-620M Only)**

Use this procedure to copy the NS-620M MPU configuration data from a MPU to an external device (host computer) for backup the MPU configuration. To perform this procedure, a host computer with VT-100 emulation is required. Use this command to save the current MPU configuration data prior to installing a new MPU in the chassis.

1. From the Main Menu, use arrow keys or number keys to select the System Maintenance menu. Press the Return or Enter key.
2. Use arrow keys or number keys to select Execute Configuration Data Upload from the System Maintenance Menu. Press the Enter or Return key.

3. The following message will appear across the lower part of the screen.

Preparing To Upload Configuration Data From MPU...

Are You Sure? (y/n)

4. Start the program on the host computer that will handle the transfer of data to receive data in a file.

Note: Files must be transferred using ASCII format.

5. Enable the Configuration Data Upload process by pressing Y for yes, or cancel upload by pressing N for no.

6. Enter a name for the file that will contain the MPU configuration data. Record the name assigned to the file and start the file transfer.

Note: The file transfer will take only several seconds. The screen will display the hexadecimal values of the configuration data.

7. When upload is finished, you will see the message:

Upload Completely, Stop Receiving File and Press Ctrl_R to Continue.

- *If the screen stop displaying the hexadecimal value of the configuration data and you do not see the "Upload Completely..." message, stop receiving file and press Ctrl-R to repeat Steps 2 through 6.*

- *If an "Upload Completely..." message appear on the screen bottom, Stop Receiving File and Press Ctrl-R to Continue.*

- **Execute Configuration Data Download (for NS-620M only)**

Use this procedure to transfer the NS-620M MPU configuration data that was saved on an external device (host computer) back to a MPU. To perform this procedure, a host computer with VT-100 emulation is required. Use this command to transfer any saved MPU configuration data to a newly installed MPU.

1. From the Main Menu, use arrow keys or number keys to select the System Maintenance menu. Press the Return or Enter key.

2. Use arrow keys or number keys to select Execute Configuration Data Download from the System Maintenance Menu. Press the Enter or Return key.

3. The following message will appear across the lower part of the screen.

Preparing To Download Configuration Data To MPU...

Are You Sure? (y/n)

Caution: This process will modify configuration that could affect traffic. Be sure of what you are doing.

4. Start the Configuration Data Download process by pressing Y for yes or cancel download by pressing N for no.

5. Start the program on the host computer that will handle the transfer of data.

Note: Files must be transferred using the ASCII format.

6. Enter the name of the file that contains the MPU configuration data and start the file transfer.

Note: This transfer will take only several seconds.

7. After a download is finished, a message will appear to indicate whether the download configuration check-sum correct or error.

8. If download configuration check-sum is correct, you will be asked "Do You Want to Write the Configuration Data to Database (Y/N) ?". If "Y" is pressed, the downloaded configuration data will overwrite the current configuration database.

- *If unsuccessful, you will see a message "Check-sum Error". Repeat Steps 2 through 8.*

- *If unsuccessful and you do not see any message, you can press "Q" to quit configuration download process.*

- **Execute Software Download (for NS-620M Only)**

This procedure is used to download the NS-620M MPU software into a MPU. To speed up software download, you'll be asked to change the terminal speed to 38400bps. And under 38400bps baud rate, the application software require 4-5 minutes to complete data transfer.

1. At the System Maintenance Menu, use arrow keys or number keys to select Execute Software Download. Press the Return or Enter key.

2. The following message will appear on the screen:

Preparing to execute new software download...

Are You Sure? (y/n)

3. Enable the software download process by pressing Y for yes or cancel the download process by pressing N for no.

4. The following message will appear on the screen if Y is pressed:

Set speed to 38400bps, then hit any key to continue ...

```

+-----+
| Welcome to the NS-620 E1 HDSL System |
| LOADER PROGRAM                      |
+-----+

```

Do you want to load MPU software program? (y/n)

5. If Y is pressed, the following message is prompt:
Please use communication package to send MPU software program.
 Start the program that will be used to transfer the MPU application software from the host computer to the MPU.
6. **Note:** Files must be transferred using the Motorola S-record format.
7. During the download, the MPU Status LED will be yellow, when every 10 S-records is transferred, a dot is displayed on screen.
8. After the file is transferred completely, prompts the check sum result and the following message:
Do you want to write the program to flash ROM (y/n)?
9. If Y is pressed, the loader program begin to write the MPU S/W to flash ROM, you will see dots displayed on screen.

Note: Make sure the checksum result is correct after downloaded the new software

10. When the MPU S/W is successfully written to flash ROM, you will be asked to load equalizer, if you select N, you will be asked to start the new software. If you select "Y", the new software will start downloading. If you select "N", you'll be asked to re-load the new software.

11. To start the new User Interface program, remember to change your terminal speed back to 9600 baud rate.

If unsuccessful, repeat step 5 to 10.

3.3 Using the LCD Menu

The LCD menu enables you to easily configure, monitor, and maintain the NS-620 system. It provides the same features as the Craft user interface. Refer section 4.2 for the feature descriptions of each menu item. The operating and display of the LCD menu are described as following.

- **Keyboard**

Four keys are provided on the LCD panel of the NS-620 or NS-620H : **Up**, **Down**, **Left** and **Right**. The keyboard is used to select menus, view the various screens, execute the command, and when necessary, to enter alpha and numeric information into the system.

- **LCD**

The 16x2-char LCD panel is used for displaying menus. The LCD back-light is controlled by the software for power saving.

- **Flashing Char**

In the LCD menu, the flashing char is used to indicate data entry fields. Use the keyboard to enter the alpha or numeric information.

3.3.1 The LCD Menu Display Formats

The following screens shows some examples of the LCD display formats.

- **Model and Version:**

```

NetSPAN-620
Ver 1.00 /304/00

```

When at the top of the LCD menu tree, pressing **UP** key will enable you to see the model name and the version no.

- **Menu Selection:**

```

E1-C MAIN MENU
STATUS

```

Use **RIGHT** or **LEFT** key to see the next or previous item on the same menu tree level. Press **DOWN** key to select the item or **UP** key to go to the upper level of the menu tree. The char "E1-C", "E1-R", "FE1-C" or "FE1-R" indicate the system type of the unit: Full-E1 CO side or RT side, Fractional E1 CO side or RT side.

- **Status Display:**

```
STATUS
EQ LOS (C) : YES
```

This screen shows you the current status of the selected status item. Use **RIGHT** or **LEFT** key to see the next or previous status item.

- **Command Confirm:**

```
LOGOUT
Are You Sure?
```

To confirm executing the command, press **DOWN** key. To quit the execution, press **UP** key.

- **Option Selection:**

```
E1 LOOPBACK
Off <
```

This screen shows you the current setup of the selected menu item. Use **RIGHT** or **LEFT** key to see the next or previous option. Press **DOWN** key to select the option. The "<" char indicates the current selection.

- **Data Entry:**

```
EDIT TIME
1:35:30
```

```
Time Slot : 5
B . . . . . B . . . . . B
```

The flashing char indicates the current location in the data entry field. Use **RIGHT** or **LEFT** key to select the next or previous alpha, numeric digit or option. Press **DOWN** key to confirm the setting and to edit the next location. To quit the editing, press **UP** key.

- **Alarm Display :**

```
EQ-LIU0-1 N
Board-Fail U Y
```

This screen shows an example of an active alarm. The digit "1" indicates the number of the alarm. "EQ-LIU-0-1" is the Access ID (refer 4.2.5). The char

"N" (near-end) shows the location of the alarm. "Board-Fail" is the description. The char "U" (urgent) shows the type of the alarm. The last char "Y" (yes) indicates that this alarm has been confirmed and cut off (refer 3.2.8). Use **RIGHT** or **LEFT** key to see the next or previous alarm.

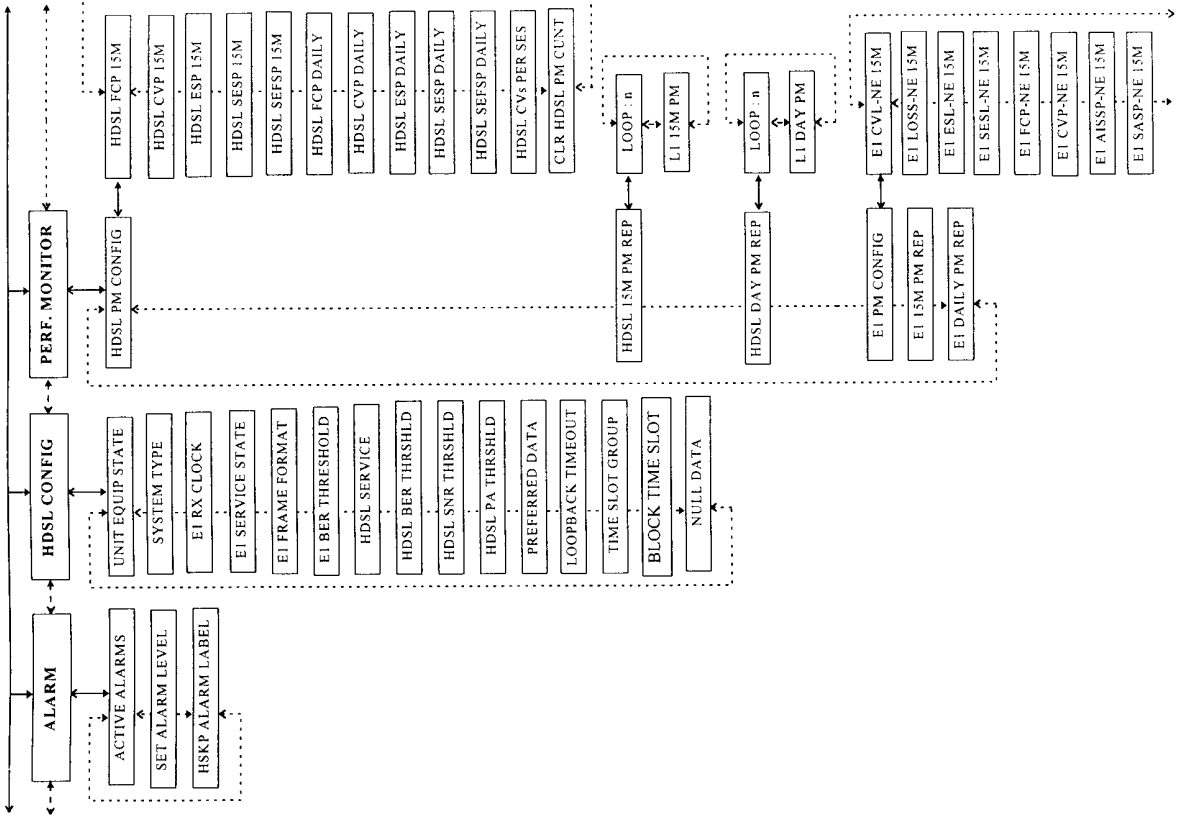
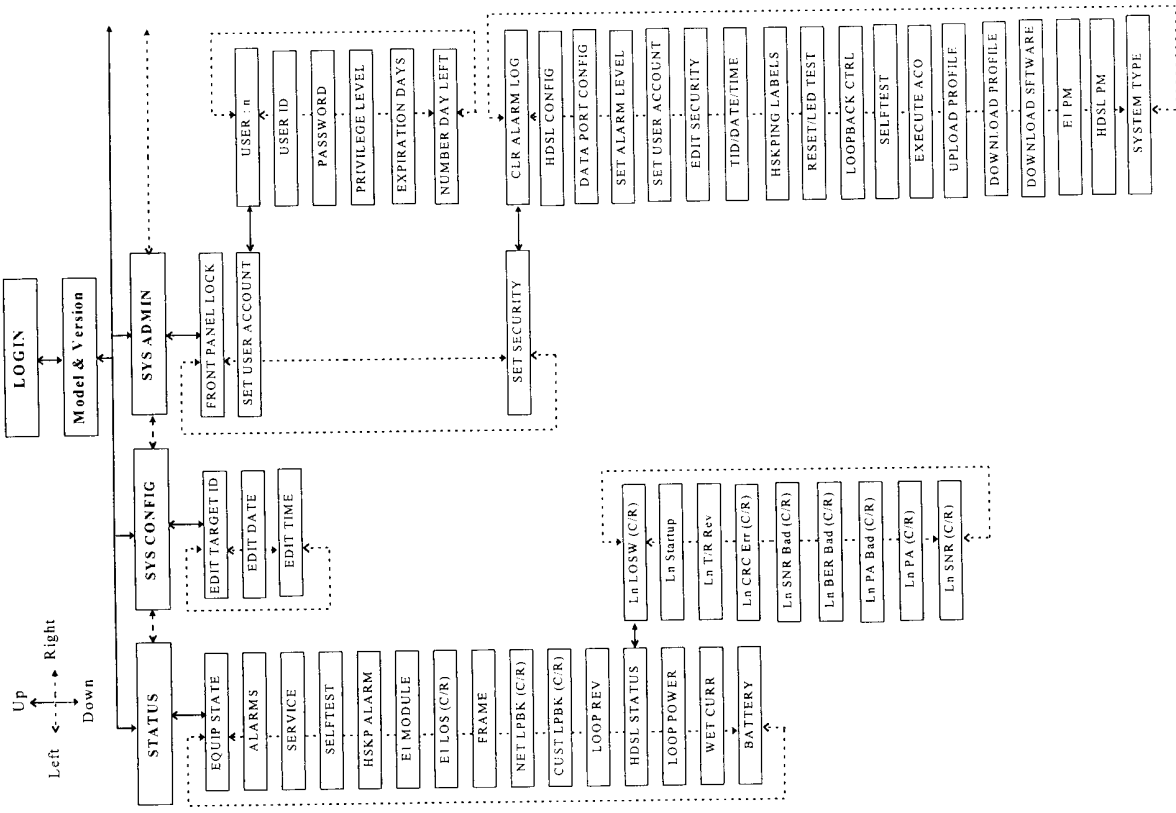
- **Messages:**

```
E1 PM CONFIG
Bad Privilege!
```

Various messages are provided for showing errors, or current situations. Possible messages are listed as following:

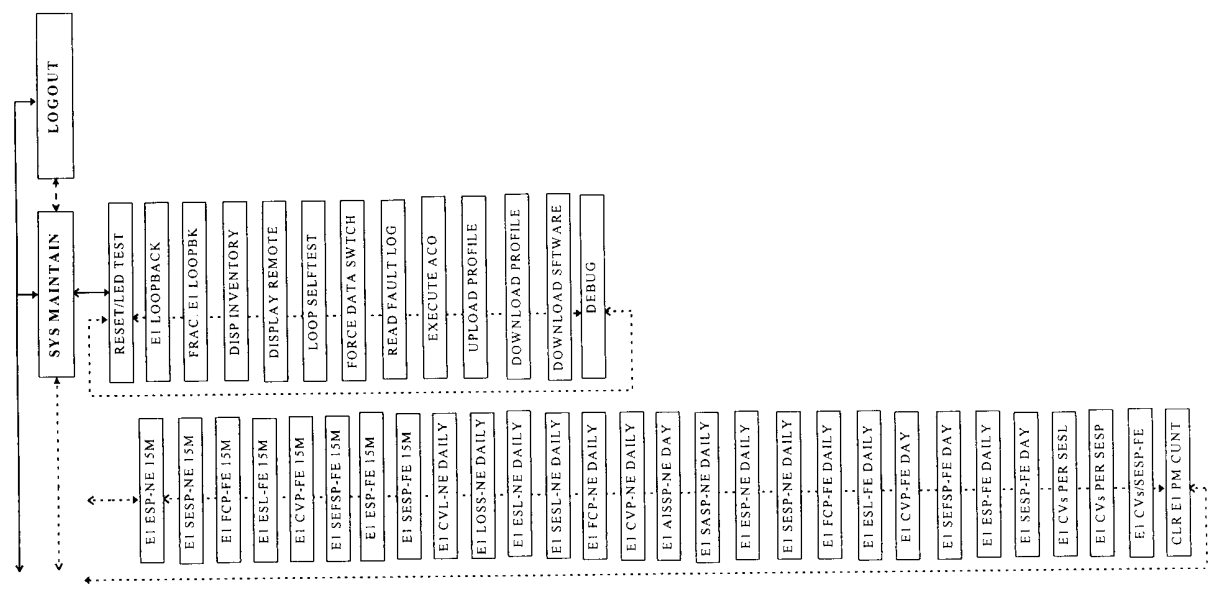
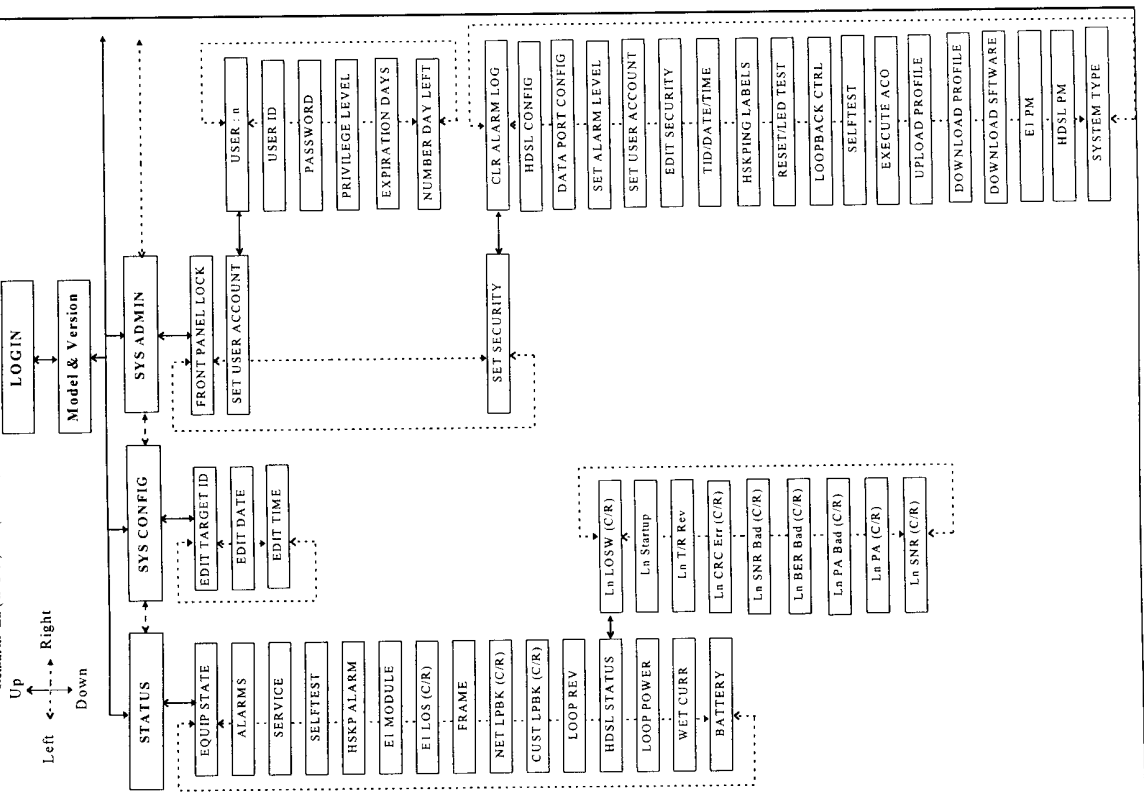
```
Access Denied!
Bad Privilege!
Priv. Expired!
No Carrier!
E1 in Service!
Unit Unequipped!
Has Been Done!
No Alarm.
```

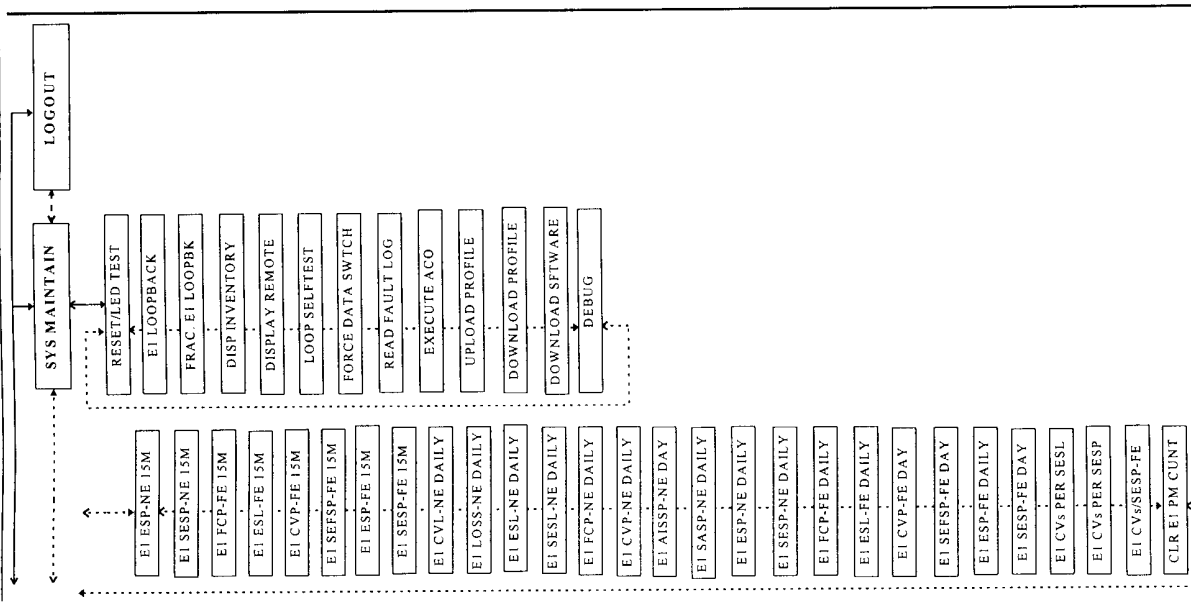
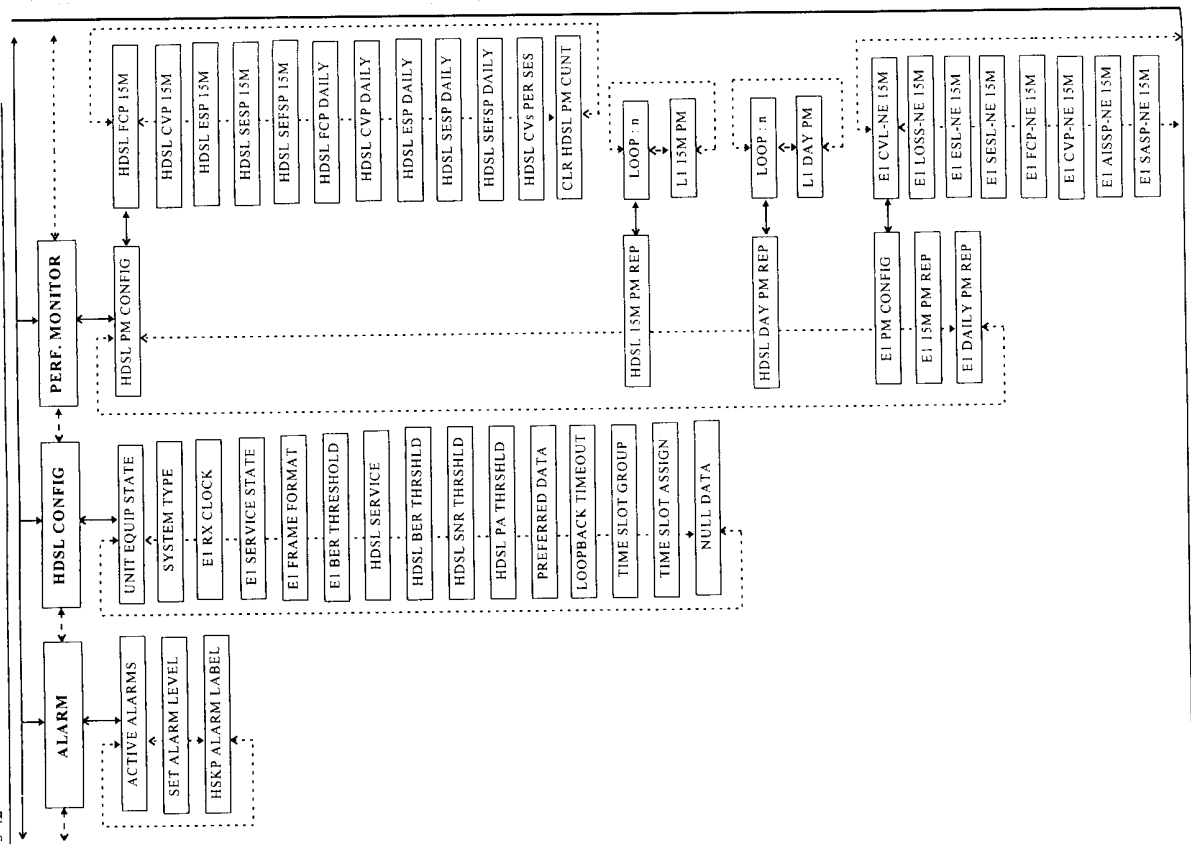
3.3.2 The LCD Menu Tree



3.3.3 The Fractional-E1 LCD Menu Tree (for CO)

Remark: Ln (n=1-3) Rn (n=1-3) DPn (n=1-3) TSn (n=1-31) USERn (n=1-5)





CHAPTER 4
UNIT DESCRIPTIONS

CONTENT

- 4.1 NS-620 Stand Alone
 - 4.2 NS-620R Rack
 - 4.3 NS-620N Line Card
 - 4.4 NS-620M Interface Module
 - 4.5 NS-620H Hand-Held Controller
 - 4.6 Ordering Information
-

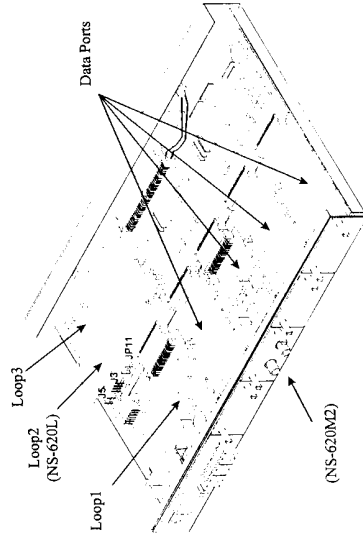
CHAPTER 4 : UNIT DESCRIPTIONS**4.1 NS-620 Stand Alone**

Fig.4-1 NS-620 Base Unit with additional loop module and data port.

- The features of NS-620 :
 - Menu setup for Full-E1 or Fractional-E1 configuration
 - Menu setup for CO (Central Office) side or RT (Remote) side configuration
 - I/P power source : AC 110V-240V or DC -48V power module
 - Remote power feeding option for full-E1 application (when using DC power source)
 - Provides one on-board HDSL transceiver module with option for adding up to 3 HDSL modules
 - Capability of handling 2 independent loops for full E1 service
 - Capability of operating over a single loop by stuffing null information into any time slot normally assigned to the other loop
 - Capability of handling 1, 2, or 3 HDSL loops for fractional E1 service
 - HDSL/E1 line performance monitoring
 - Digital loop self-test and loopback test
 - Alarm report and far-end alarm indicator
 - Communicates between the CO and RT side via the HDSL embedded operation channel (EOC)
 - Loopback test with or without test pattern, for both local and remote units
 - Capability of displaying far-end LED status
 - Provides 6 kinds of E1 interface modules for Full E1 applications: NS-620M1/M2/ M3/M4/M5/M6 (only one E1 module should be installed for full E1 application, and it can be plugged into any data port slot)
 - Provides 5 kinds of user data port modules for fractional E1 applications : NS-620M1/M2/M7/M8/M9/M10/M11 (up to 7 modules can be installed)
 - Provides test points for loop power measurement

| CO | RT |
|-----|----|
| JP1 | •• |
| JP2 | •• |
| JP3 | •• |
| JP4 | •• |
| JP1 | •• |
| JP2 | •• |
| JP3 | •• |
| JP4 | •• |
| JP1 | •• |
| JP2 | •• |
| JP3 | •• |
| JP4 | •• |

| | |
|-----|----|
| JP5 | •• |
| JP6 | •• |
| JP5 | •• |
| JP6 | •• |

| CO | RT |
|-----|----|
| JP1 | •• |
| JP2 | •• |
| JP3 | •• |
| JP4 | •• |
| JP1 | •• |
| JP2 | •• |
| JP3 | •• |
| JP4 | •• |
| JP1 | •• |
| JP2 | •• |
| JP3 | •• |
| JP4 | •• |

Fig.4-2 NS-620, HDSL standard on board loop module (Loop current measurement)

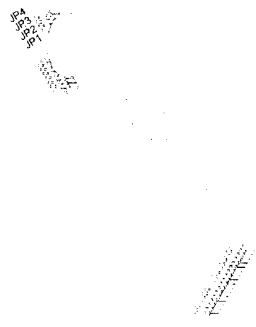


Fig.4-3 NS-620L, HDSL loop module

• The front view of NS-620 (Fig.4-4)

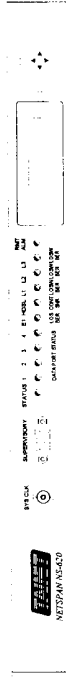


Fig.4-4 NS-620 front view

- **The LCD Panel and Key Switches**
 - provides LCD control menu for system management and configuration
 - operating in the same method as the Hand held Control Unit NS-620H
 - with back light control for power saving

• **SUPERVISOR (The Control Port)**

- 1 DB-9 connector for connecting to the terminal.
- **SYS CLK (The BNC Connector)**
 - external EI system clock
- **The Rear Panel**
 - external system EI clock

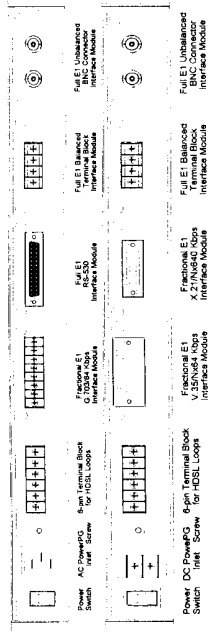


Fig.4-5 NS-620 rear panel view 2.

• **NS-620P1: AC Power Supply Module**

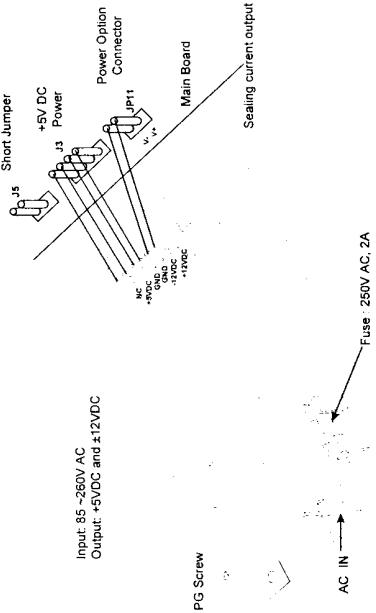


Fig.4-6 NS-620P1, AC Power Module

- Power Switch for AC Power Input On/Off
- DC Power for connecting to AC 85V to 260V power source
- 6-pin Terminal Block for connecting to HDSL main board.
- PG screw for connecting to the earth ground

• **NS-620P2/P3/P4: DC Power Supply Module (Fig.4-7,4-8,4-9)**

UNIT DESCRIPTIONS

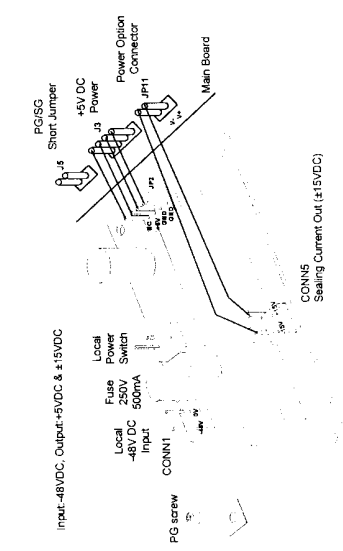


Fig 4-7 NS-620P2, DC power module with sealing current source

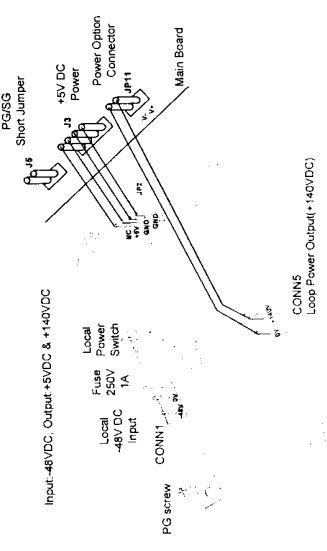


Fig 4-8 NS-620P3, DC Power feeding source module

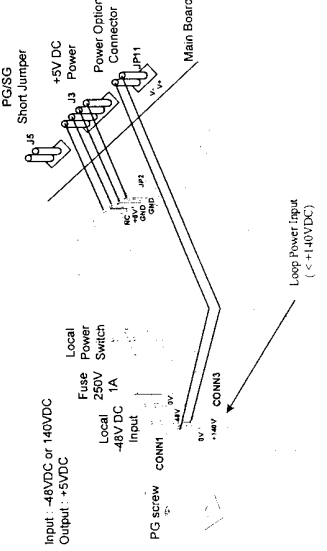


Fig 4-9 NS-620P4, DC power feeding sink module

UNIT DESCRIPTIONS

- Power Switch for DC Power Input On/Off
- DC Power for connecting to DC -48V power source
- 6-pin Terminal Block for connecting to HDSL main board.
- PG screw for connecting to the earth ground
- Full E1 Interface Modules(2,048Kbps)
 - M1: G.703 Balanced Terminal Block interface.(Fig.4-10)
 - M2: G.703 Unbalanced BNC Connector interface. (Fig.4-11)
 - M3: RS-530 Interface (Fig.4-12)
 - M4: V.35 Interface (Fig.4-13)
 - M5: V.36/RS-449 interface.(i.e. M3 + RS530/RS449 Adapter cable) (Fig.4-14)
 - M6: X.21/V.11 Interface (i.e. M3 + RS530/X.21 Adapter cable) (Fig.4-15)

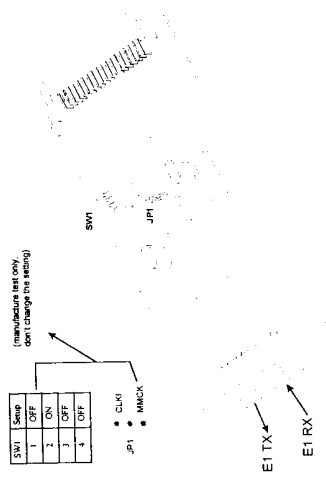


Fig 4-10 NS-620M1, G.703, balanced, 120 Ohm interface module

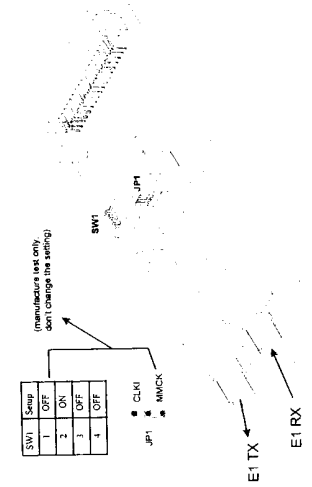


Fig 4-11 NS-620M2, G.703, unbalanced, 75 Ohm interface module



Fig.4-12 NS-620M3, 2.048Mbps, RS 530 Data Interface module

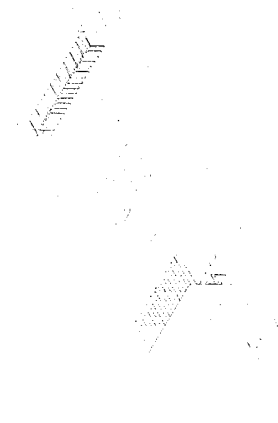


Fig.4-13 NS-620M4, 2.048Mbps, V.35 Data Interface Module



Fig.4-14 RSS50/RS49 Adapting Cable for NS-620M5 and NS-620M9 Fig.4-15 RSS50/ X.21 Adapting Cable for NS-620M6 and NS-620M10

● Fractional E1 Interface Modules

- M1: G.703 Balanced Terminal Block (2,048Kbps, add-drop) Fig.4-10
- M2: G.703 Unbalanced BNC Connector (2,048Kbps, add-drop) Fig.4-11
- M7: RS-530 interface (Nx64Kbps, N = 1 ~ 31), Fig.4-16
- M8: V.35 interface (Nx64Kbps, N = 1 ~ 31), Fig.4-17
- M9: V.36/RS-449 interface (Nx64Kbps, N = 1 ~ 31), Fig.4-14
- M10: X.21/V.11 interface (Nx64Kbps, N = 1 ~ 31), Fig.4-15
- M11: Contra-directional G.703 (64Kbps), Fig.4-18

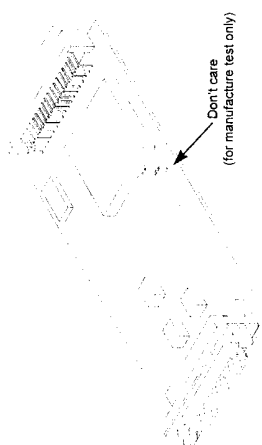


Fig.4-16 NS-620M7, Nx64Kbps, RS 530 Data interface Module

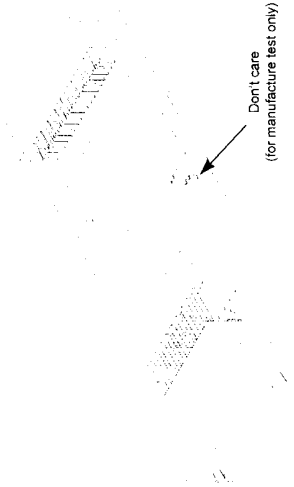


Fig.4-17 NS-620M8, Nx64Kbps, V.35 Data interface Module

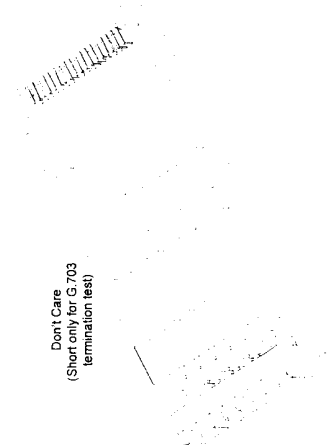


Fig.4-18 NS-620M11, G.703, 64Kbps, Data Interface Module

4.2 Unit Description of NS-620R

- The features of NS-620R
 - > capacity : 16 Line Cards (NS-620N) and 1 MPU (NS-620M)
 - > dimension : 19"(W) x 6U(H) x 12"(D)
 - > power source : dual -48V DC inputs with 6 DC-12V fans (1U height)
 - > NS-620H can be attached onto the rack shelf for instant system management
- The front view of NS-620R

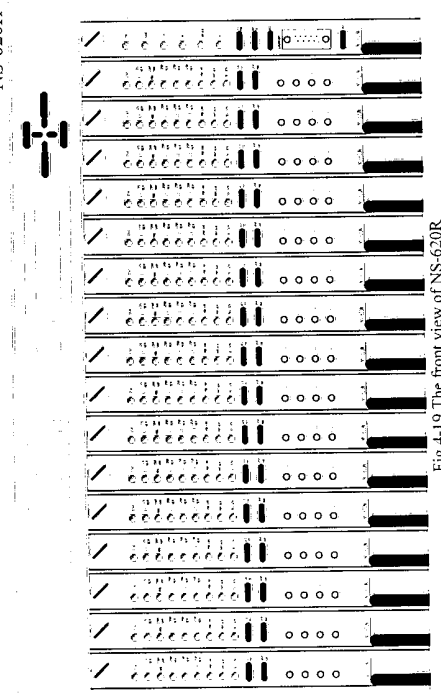


Fig.4-19 The front view of NS-620R

- The rear view of NS-620R

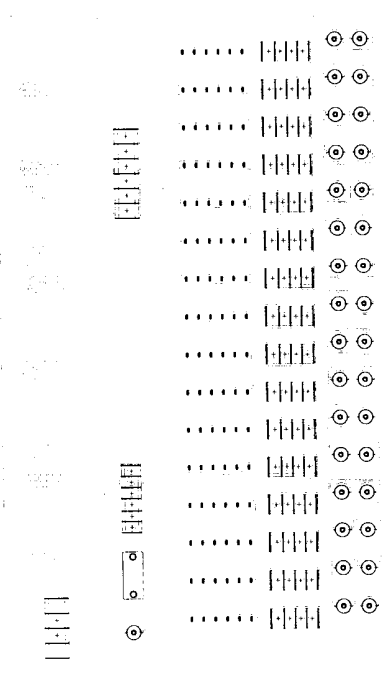


Fig.4-20 The rear view of NS-620R

- The Interface of Back Panel

| INTERFACE | CONNECTOR TYPE | NUMBER |
|---------------------------|----------------------------|--------|
| HDSL Loops (1,2,3) | 6P terminal block (7.62mm) | 16 |
| Balanced E1 | 4P terminal block (7.62mm) | 16 |
| Unbalanced E1 (TX) | BNC | 16 |
| Unbalanced E1 (RX) | BNC | 16 |
| Dual DC-48V/SG/PG | 6P terminal block (10mm) | 1 |
| Form C alarm Relays | 3P terminal block (7.62mm) | 2 |
| House Keeping Alarm | DB-9 | 1 |
| System Clock | BNC | 1 |
| Inter-shelf Communication | RJ-48 | 2 |

Table.4-1 The Interface list of NS-620R back panel.

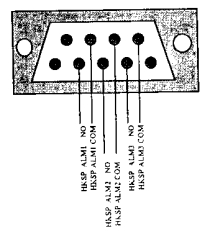


Fig.4-21 House Keeping DB-9 pin assignment

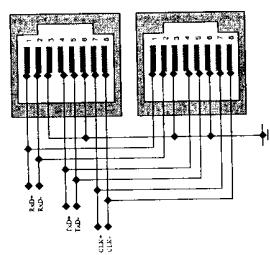


Fig.4-22 Inter Shelf Port RJ-45 pin assignment

4.3 Unit Description of NS-620N

- The features of NS-620N
 - one E1 per card
 - configurable for full-E1 (CO or RT side) or fractional-E1 (CO side only) service
 - power source : DC -48V local power module
 - optional remote power feeding module for full-E1, CO side configuration
 - internal jumper setup for CO or RT side configuration
 - provides 2 on-board HDSL transceiver modules with option for adding the 3rd HDSL transceiver module
 - capability of handling 2 independent loops for full E1 service
 - capability of operating over a single loop by stuffing null information into any timeslot normally assigned to the other loop
 - provides fractional E1 service over 2 HDSL loops with option for the 3rd HDSL loop module
 - HDSL/E1 line performance monitoring
 - digital loop self-test and loopback test
 - alarm report and far-end alarm indicator
 - communicates between the CO and RT side via the HDSL embedded operation channel (EOC)
 - configurable major and minor alarm reports to the NS-620M MPU
 - test access jacks for measuring loop voltage and current
 - loopback test with or without test pattern, for both local and remote units
 - capability of displaying far-end LED status

- The front panel of NS-620N



- The front panel switches

| NAME | DESCRIPTION |
|-----------------------|---------------------------------|
| Display Remote switch | displays the far-end LED status |
| LED Test switch | Test the LEDs |

- The test access jacks

| NAME | DESCRIPTION |
|----------------|---|
| I-, I+, V-, V+ | loop current and voltage measurement points |

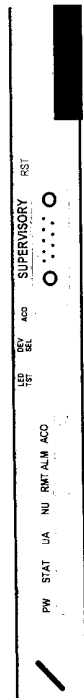
- The LED indicators

| NAME | STATUS | DESCRIPTION |
|---------------------------|------------|---|
| STATUS LED | Red | Hardware failure or HDSL loopback self-test failure detected |
| | Yellow | during power-on self-test or HDSL loopback self-test diagnostics |
| | Green | no failure detected on self-test diagnostics |
| E1 LOS/BER LED | Red | indicates E1 LOS condition (LOS condition has higher priority than BER) |
| | Yellow | indicates E1 BER condition |
| | Off | no LOS/BER condition |
| HDSL CONT/SNR LED | Red | Indicates the DC continuity to the RT side is open. This state is available only at CO side and when remote power feeding is enabled. |
| | Yellow | indicates SNR of any HDSL loop is below a predefined threshold |
| | Off | SNR of all loops are good |
| LOOP 1/2/3 LOSW/BER LED | Green | indicates HDSL loop in good condition |
| | Red | indicates HDSL loop LOSW condition |
| | Yellow | indicates HDSL loop BER condition |
| | Off | no such loop exists |
| LOOPBACK TEST PATTERN LED | Green | HDSL loopback is active |
| | Yellow | HDSL loopback with test pattern is active |
| | Red | E1 loopback with test pattern is active and errors are detected |
| | Off | E1 loopback inactive |
| REMOTE ALARM LED | Yellow | indicates there is an alarm at the remote end |
| | Off | no remote alarm |
| | Red/Yellow | under control by the NS-620M MPU |
| SELECT/SCAN LED | Green | responding to NS-620M regular polling |
| | Off | NS-620M is not online |

4.4 Unit Description of NS-620M

- The features of NS-620M
 - locates in the NS-620R rack mount shelf
 - provides OAM&P (operation, administration, maintenance, and provisioning) for each NS-620N card
 - provides inter-shelf interface to control up to 8 NS-620R shelves
 - provides configurable major/minor/remote alarm indicators
 - provides 2 Form C relay contacts for external audible major/minor alarms
 - provides ACO (Alarm Cut Off) switch and indicator
 - provides housekeeping alarm input contacts
 - provides power status indicator
 - provides system status indicator
 - provides interface port for the control terminal, Handheld Controller NS-620H, or the network management system (NMS)
 - provides backup mechanism to save/restore system configuration
 - provides downloading capability for software upgrading

• The front panel of NS-620M



• The front panel switches

| NAME | DESCRIPTION |
|-----------------------|--|
| LED TST switch | turns on all LEDs in the system for testing |
| DEV SEL switch (lock) | select the interface protocol for the control port (DB-9) when pressed, enable connecting to a control terminal when released, enable connecting to the NS-620H or NMS |
| ACO switch | alarm cut off |
| RST switch | To hold the key pressed for 3 seconds to reset the MPU |

• The Control Interface Port

| NAME | DESCRIPTION |
|-------------|---|
| SUPERVISORY | serial communication port for connecting to a control terminal, the NS-620H, or NMS |

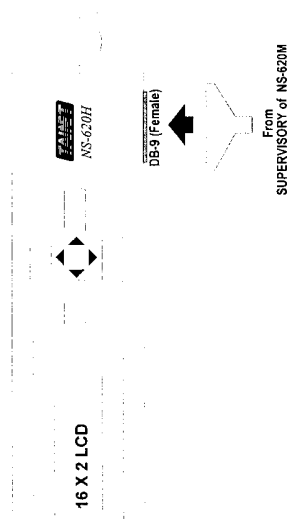
• The LED Indicators

| NAME | STATUS | DESCRIPTION |
|-------------------------|----------------|--|
| PW LED | Green | both -48V DC power inputs are alive |
| | Red | one of the two power inputs has failed |
| | Off | both power inputs have failed |
| STAT LED | Red | hardware failure or self-test failure |
| | Yellow | during self-test diagnostics or software download |
| | Green | no failure detected on self-test diagnostics |
| UA LED | Flash (Red) | the urgent alarm has occurred but not been acknowledged |
| | On (Red) | the urgent alarm has occurred and acknowledged by asserting the ACO switch |
| | Off | the urgent alarm is cleared |
| NU LED | Flash (Yellow) | the non-urgent alarm has occurred but not been acknowledged |
| | On (Yellow) | the non-urgent alarm has occurred and acknowledged by asserting the ACO switch |
| | Off | the non-urgent alarm is cleared |
| RMT ALM LED | Flash (Yellow) | the remote alarm has occurred but not been acknowledged |
| | On (Yellow) | the remote alarm has occurred and acknowledged by asserting the ACO switch |
| | Off | the remote alarm is cleared |
| ACO LED (alarm cut-off) | Green | the audible alarm indication is cut off but the alarm condition still exists |
| | Off | the visual alarm is cleared |

4.5 Unit Description of NS-620H

- The features of NS-620H
 - provides plug-and-play access control to the NS-620M MPU card as a DTE device
 - uses RS-232 interface connecting to the DB-9 port on the front panel of the MPU card
 - transmission mode : asynchronous, 9600 bps
 - data format: 8 data bits, no parity, 1 stop bit
 - power supplied by NS-620M MPU card (at least 0.5W)
 - provides LCD panel and key switches for the menu-driven control

- The front view of NS-620H



- The LCD Panel and Key Switches
 - provides LCD control menu for system management and configuration
 - operating in the same method as the HDLSL standalone Unit : NS-620
 - with back light control for power saving
- Control Port (DB-9) pin assignments :
 - TxD (output), RxD (input), RTS (output)
 - power : dedicated power pin provides +5V DC by NS-620M
 - power consumption : < 0.5w

4.6 Ordering Information

| HDLSL STAND-ALONE | | |
|-------------------|--|-----------|
| Model | Description | Part No. |
| NS-620 | HDLSL Base Unit (Main Board + HDLSL Loop Module x 1) | 00065-100 |
| NS-620L | HDLSL Loop Module (For the second or third loop) | 00065-110 |

Table 4-2 HDLSL Standalone module list

| USER INTERFACE MODULE | | |
|-----------------------|---|-----------|
| Model | Description | Part No. |
| NS-620M1 | Full/Fractional E1 Balanced (120 Ohm) module, G.703 interface (TB) | 00065-121 |
| NS-620M2 | Full/Fractional E1 Unbalanced (75 Ohm) module, G.703 interface (BNC) | 00065-122 |
| NS-620M3 | Full E1, 2Mbps module, RS-530 interface | 00065-132 |
| NS-620M4 | Full E1, 2Mbps module, V.35 interface | 00065-133 |
| NS-620M5 | Full E1, 2Mbps module, V.36 (RS-449) interface with adapter cable | 00065-134 |
| NS-620M6 | Full E1, 2Mbps module, X.21/V.11 interface with adapter cable | 00065-135 |
| NS-620M7 | Fractional E1, Nx64Kbps, N=1 to 31, RS-530 interface | 00065-126 |
| NS-620M8 | Fractional E1, Nx64Kbps, N=1 to 31, V.35 interface | 00065-127 |
| NS-620M9 | Fractional E1, Nx64Kbps, N=1 to 31, V.36 interface with adapter cable | 00065-128 |
| NS-620M10 | Fractional E1, Nx64Kbps, N=1 to 31, X.21 interface with adapter cable | 00065-129 |
| NS-620M11 | Fractional E1, 64Kbps, contra-directional G.703 | 00065-136 |

Table 4-3 HDLSL User Interface module list

| POWER MODULE | | |
|--------------|---|-----------|
| Model | Description | Part No. |
| NS-620P1 | AC Power Module (support Wetting Current) | 00065-101 |
| NS-620P2 | DC Power Module (support Wetting Current) | 00065-104 |
| NS-620P3 | DC Power Module (support Remote Power Feeding Source) | 00065-103 |
| NS-620P4 | DC Power Module (support Remote Power Feeding Sink) | 00065-105 |

Table 4-4 HDLS Power module list

| HDLSL RACK MOUNTED LINE CARD | | |
|------------------------------|--|-----------|
| Model | Description | Part No. |
| NS-620L | Loop Module (For the third loop) | 00065-110 |
| NS-620N1 | Line Card (HDLSL Loop x 2 + E1 x 1) | 00065-200 |
| NS-620N2 | Line Card (HDLSL Loop x 2 + E1 x 1 + Remote Power Feeding) | 00065-204 |

Table 4-5 HDLSL Rack Mounted Line Card module list

| HDLSL RACK | | |
|------------|---------------------------------|-----------|
| Model | Description | Part No. |
| NS-620R | Rack Mounted Shelf | 00065-201 |
| NS-620M | Main Processing Unit (MPU) Card | 00065-202 |
| NS-620H | Hand-Held Controller | 00065-203 |

Table 4-6 HDLSL Rack module list