TAINET

DT-2000 Series HDSL

High-bit-rate Digital Subscriber Lines

Termination Unit

USER'S MANUAL

The Professional Partner

TAINET COMMUNICATION SYSTEM CORP.

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INFORMATION TO THE USER

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device. Pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference 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 MODEM 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.

FCC REQUIREMENTS

This equipment complies with Part 68 of the FCC Rules. On the base unit of this equipment is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. IF REQUESTED, THIS INFORMATION MUST BE GIVEN TO THE TELEPHONE COMPANY.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most, but not all areas, the sum of the REN's of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN you should contact your local telephone company to determine the maximum REN to your calling area.

If your equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But the advance notice isn't practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this telephone equipment, please contact the following address and phone number for information on obtaining service or repairs.

The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

COMPANY: SUMMIT MICRO DESIGN, INC.
ADDRESS: 485 MACARA AVE., SUITE 901 SUNNYVALE, CA 94086 USA

TEL NO: (408)739-6348

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CHAPTER 1
INTRODUCTION

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CHAPTER 1: INTRODUCTION

1.1 General Description

- The TAINET DT-2000 series are High-bit-rate Digital Subscriber Line (HDSL) systems which deliver 2.048Mbps E1 service to the customer up to 4.5 Km (2.8 miles) length over four 24 AWG (0.5 mm) lines.

- DT-2000 series, use 2B1Q modulation and support Wetting Current, Power Feeding fully complies with the ETSI standard ETR 152 provide full and fractional E1, switched E1 or Nx64K E1 service over two pairs of wires.

- Switched E1 or N × 64K E1 service which is used in Point-to-Point, add-drop applications 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.

- The 2B1Q line code is a four-level pulse-amplitude modulation code as shown as Table 1-1. Its power average on a sequence of symbols consist with a frame word in all other positions is between 13.0 dBm and 14.0 dBm, which over the frequency band from 0 Hz to 1168KHz into a 135 ohms termination.

Binary Digits		Quaternary Symbol
First Bit (Sign)	Second Bit (Magnitude)	
1	0	+3
1	1	+1
0	1	-1
0	0	-3

Table 1-1 The 2B1Q Line Coding

- The HDSL system consist of Line Termination Unit(LTU) for Central Office (CO) in the network side, and Network Termination Unit (NTU) for Remote Terminal (RT) in the user side. It will provide an alternation to repeat E1 lines for buyer to support repeaterless 2048Kbps rate access over non-loading copper loop.

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

- Rack mounted model may apply 16 cards to one shelf. TAINET Network Management System work over TCP/IP for Windows 9x/NT platform is available.

- Remote configuration will be matched with central site: for general application, users just need to setup CO and RT to be connected. Once it is connected, the parameters of RT will follow CO automatically. For example, when CO site setup from Full E1 to Fractional E1, the RT site will follow up to Fractional E1 too.

- The features of TAINET DT-2000 Series:

DT-2000 Series	Desktop	Rack Mounted
Full E1 Only	DT-2000	DT-2000N
Full/Fractional E1	DT-2000F, DT-2000FD	DT-2000NF1
Full/Fractional E1 with Loop Power	DT-2000FP (sink)	DT-2000NF2 (source)

  - Fully compliant with ETSI ETR 152
  - Compact desktop and rack mounted
  - Front panel menu driven to serve as LTU/CO (Line Termination Unit/ Central Office) or NTU/RT (Network Termination Unit/ Remote side)
  - Communication range up to 4.5Km on 24AWG without line conditions
  - Operate over loops (line interfaces) at data rate 1168Kbps per loop.
  - Utilizes 2B1Q line-code with echo cancellation
  - Full E1 functionality supports G.703 interface of data speed 2.048Mbps.
  - Fractional E1 supports G.703 interface of data speed N x 64Kbps.
  - Up to 2 bridged taps of each 500 meters maximum length.
  - Extensive self test , internal BER test and loop test
  - Supporting Point-to-Point, Fractional Operation, D2048U, D2048S and E1 add-drop applications
  - Setup, control, monitoring via front panel LCD or NMC controller.
  - Support Network Management System WNMS over TCP/IP.

1.2 Specifications

- HDSL interface

  - Line Code : 2B1Q (Two Binary One Quaternary)
  - Mode : full duplex with echo cancellation
  - Number of loops : two loops
  - Loop rate : 1168Kbps on each loop
  - Baud rate : 584 K ± 32ppm baud
  - Frame format : compliant with ETSI ETR 152 (section 5.4)
  - Start up procedure : compliant with ETSI ETR 152 (section 5.6)
  - EOC and O&M function : compliant with ETSI ETR 152 (section 5.5/5.7)
  - Transmit characteristics (pulse peak ,shape ,power): compliant with ETSI ETR 152 (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) without line conditions
  - Return loss : compliant with ETSI ETR 152 (section 5.8.2)
  - Performance test (DLL model, BER, bit length ...): compliant with ETSI ETR 152 (section 5.9/6.3)
  - Jitters tolerance : compliant with ETSI ETR 152 (section 5.9.3/7)
  - Delay difference between pairs : < 60 μsec
  - Shaped noise : compliant with ETSI ETR 152 (section 6.3.3)
  - Impulse noise : compliant with ETSI ETR 152 (section 6.3.4)
  - Common mode rejection : compliant with ETSI ETR 152 (section 6.3.5)
  - Micro interruption : compliant with ETSI ETR 152 (section 6.3.6)
  - Connector : RJ-45 phone jack.
  - Software configurable for CO (LTU) side or RT (NTU) side

- E1 interface

  - Line rate : 2.048Mbps ± 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 RJ-45 phone jack (balanced)

- E1 Clock
  - Source : E1 Internal, E1-C Network, Codirectional (E1-C only).
  - Internal Clock Accuracy : ± 32ppm
- Indicators
  - DT-2000F Desktop Series:
    PWR, E1, L1, L2, HDSL, TST, BATL, ALM
  - DT-2000NF Rack Mounted Series:
    SEL, STAT, C/R, E1 LOS/BER, HDSL CONT/SNR, L1 LOSW/BER, L2 LOSW/BER, ALM, RMT/ALM, TST, SCAN.
- Maintenance
  - Performance monitor :
  - HDSL : ES, SES, FEBE, BER, SNR, etc. (Refer to Chapter 3)
  - E1 : BER, ES, SES, etc. (Refer to Chapter 3)
  - Diagnostics : E1 Network Near End Loopback, Far End Loopback, Customer near end Loopback. Customer Far End Loopback, Data port loopback, HDSL Digital Loop Self-test
  - Configuration backup and recovery to/from external device
  - Front panel switches: Display far-end, Loop back test
  - DT-2000F Desktop Series: front panel switches: Display far-end, Loop back test
  - DT-2000NF Rack Mounted Series: front panel LCD and Key switches and NMC-32 controller
  - LCD : 16 x 2 display
  - Key Switch : Up, Down, Left, Right, Home
  - WNMS with SNMP platform compatible.
- Power
  - DT-2000F Desktop Series:

    Local power :
    For DT-2000/ DT-2000F : AC Input 85 ~ 260 V, 47 ~ 63 Hz
    For DT-2000FD: DC Input –30 ~ -72 V
    For DT-2000FP: Loop Power sink(from HDSL loop 110V DC)

    Power consumption : Full/Fractional E1< 7.5 watts
    Wetting current : > 15mA

- DT-2000NF Rack Mounted Series:
  Max power consumption : 100 watts for full TRS-32 shelf
  (-24 VDC input on each DT-2000N)
  Wetting current : > 15mA
  Loop Power: 110VDC, <140mA (DC -48V input on each card)

- Environment

  - Temperature:
    Operating : 0°C ~ 50°C
    Storage : -25°C ~ 70°C
  - Humidity :
    Operating : 10% ~ 90%, non-condensing
    Storage : 5% ~ 90%, non-condensing

- Physical

  - DT-2000F Desktop Series:
    Height : 60 mm
    Width : 194 mm
    Depth : 316 mm
    Weight: 1.9 Kg

  - DT-2000NF Rack Mounted Series:
    Height : 8.2 inch (6U)
    Width : 19 inch
    Depth : 12 inch
    Weight: 0.6 Kg
    Full Shelf Equipped: 16 Kg

1.3 Module List

The TAINET DT-2000 series consist of :

HDSL Desktop Series	
Model/Module	**Description**
DT-2000	Full E1 HDSL, balanced/unbalanced (120/75 Ohm) G.703 interface support.
DT-2000F	Full/Fractional E1 HDSL, with a slot for different user interface module.(AC power)
DT-2000FP	Full/Fractional E1 HDSL, with a slot for different user interface module.(Loop power)
DT-2000FD	Full/Fractional E1 HDSL, with a slot for different user interface module.(DC power)

Table 1-2 HDSL Standalone module list

USER INTERFACE MODULE	
Model/Module	**Description**
/G703U-3	Full & Fractional E1, G.703 Unbalanced (75Ω) module, BNC
/G703B-3	Full & Fractional E1, G.703 balanced (120Ω) module, terminal block
/G703B-C	Contra-direction; Fractional E1, G.703 Balance, 64K
/R530-3A	Full/Fractional E1, Nx64Kbps (N=1 to 31), RS-530 Female
/V35-3A	Full/Fractional E1, Nx64Kbps (N=1 to 31), V.35 Female
/V36-3A	Full/Fractional E1, Nx64Kbps (N=1 to 31), V.36 Female with adapter cable
/X21-3A	Full/Fractional E1, Nx64Kbps (N=1 to 31), X.21 Female with adapter cable
/Router	Router Module

Table 1-3 HDSL User Interface module list

RACK POWER MODULE	
Model/Module	**Description**
/PWR-132A	AC Power Module (support Wetting Current) for shelf module
/PWR-132D	DC Power Module (support Wetting Current) for shelf module

Table 1-4 Rack Power module list

HDSL Rack Mounted LINE CARD	
Model/Module	**Description**
DT-2000N	Full E1 HDSL, balanced/unbalanced (120/75 Ohm) G.703 interface support.
DT-2000NF1	Full/Fractional E1 HDSL provide wetting current (sealing current).
DT-2000NF2	Full/Fractional E1 HDSL provide loop power .
/V35-1A	V.35 module for DT-2000NF
/R530-1	RS-530 module for DT-2000NF

Table 1-5 HDSL Rack Mounted Line Card module list

HDSL RACK	
Model/Module	**Description**
TRS-32	Rack Mounted Shelf
/TB-32	TRS-32 rear panel module board (option) Terminal block for line connection
/TB-32LP	TRS-32 rear panel module board (option) Terminal block for line connection and loop power input (DC –48V)
/PJ-32A	TRS 32 rear panel module board (option) RJ45 for line connection
NMC-32	Rack Mounted Controller

Table 1-6 HDSL Rack module list

HDSL REGENERATOR	
Model/Module	**Description**
REG-H	HDSL Loop Regenerator

Table 1-7 HDSL Regenerator module list

CHAPTER2
Unit Description

CONTENT

2.1 General Description

2.1.1 Desktop Units

2.1.2 Rack Mounted Units

CHAPTER 2 : UNIT DESCRIPTIONS

2.1 General Description

DT-2000F HDSL Desktop Unit without DTE interfaces module

Full /Fractional-E1 menu selectable

Optional DTE module V.35 Female
V.36 Female with adapter cable
V.21 Female with adapter cable
G.703 2M balanced/unbalanced

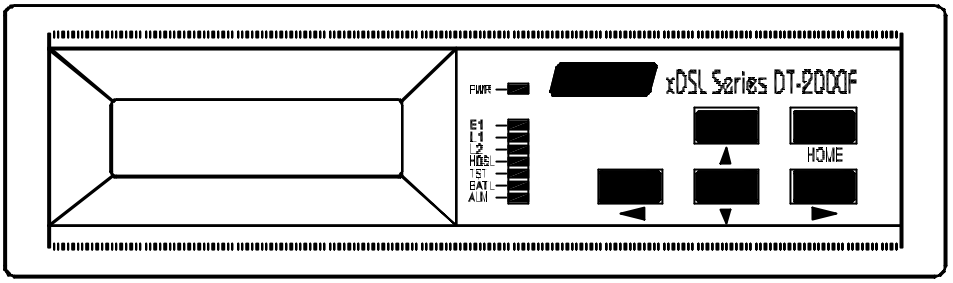


Fig.2-1 The front panel view of DT-2000F

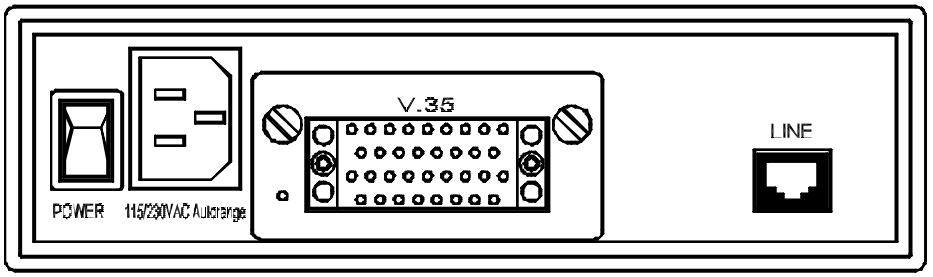


Fig.2-2 The rear view of DT-2000F

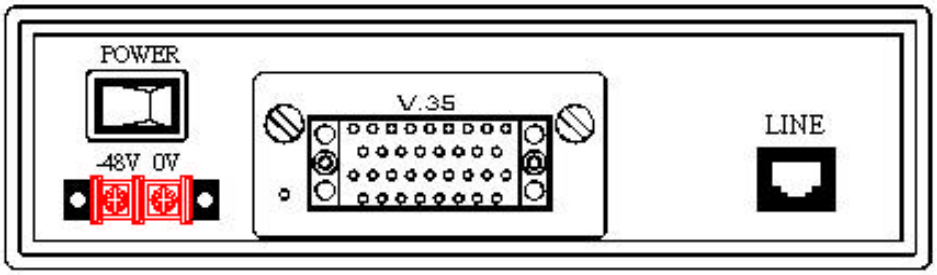


Fig.2-3 The rear view of DT-2000FD

The DT-2000F fractional E1 service model, the real panel has a slot for changeable DTE interface module. Both of DT-2000 and DT-2000F contain an IEC 320 AC Power Inlet Connector. They use AC power source input, but the DT-2000FD use DC -48V power source input.

- The LED Indicators OF **DT-2000F:**

NAME	LED STATUS	DESCRIPTION
PWR	Green	Means POWER ON
E1	Green	Indicates E1 LOS/BER condition
	Off	Means no LOS/BER condition
HDSL LED	Green	Indicates SNR of any HDSL loop is below a predefined threshold
	Off	SNR of all loops are good
LOOP 1/2 LEDs	Green	Indicates HDSL loop in good condition
	Off	Indicates HDSL loop LOSW (Lost of Sync Word) condition Or indicates HDSL loop BER condition
TST LED	Green	The test state is active
	Off	Normal operation
BATL LED	Yellow	Means that Battery Low
	Off	Indicates Battery Good
ALM LED	Yellow	Indicates an alarm occurred at the far-end or near end.
	Off	no alarm

- The LCD Panel and Key Switches
  - ❖ provides LCD control menu for system management and configuration
  - ❖ with back light control for power saving

- AC Power Supply Module
  - ❖ Power Switch for AC Power Input On/Off

- HDSL Interface Module
  - ❖ One RJ-45 Phone Jack for connecting to 2 HDSL Loops

- Full E1 Interface Module (Refer to the following demo diagrams)
  - ❖ One RJ-45 Phone Jack for Balanced Application
  - ❖ One G.703 Unbalanced BNC Connector
  - ❖ V.35 Interface
  - ❖ RS530

- Fractional E1 Interface Module (Refer to the following demo diagrams)
  - ❖ V.35 Interface (N x 64 Kbps, N= 1 ~ 31)
  - ❖ RS-530 interface (N x 64 Kbps, N= 1 ~ 31)
  - ❖ V.35/RS-449 interface (N x 64 Kbps, N = 1 ~ 31)
  - ❖ X.21/V.11 interface (N x 64 Kbps, N = 1 ~ 31)
  - ❖ G.703 Balanced Terminal Block (2.048Mbps)
  - ❖ G.703 Unbalanced BNC Connector (2.048Mbps)

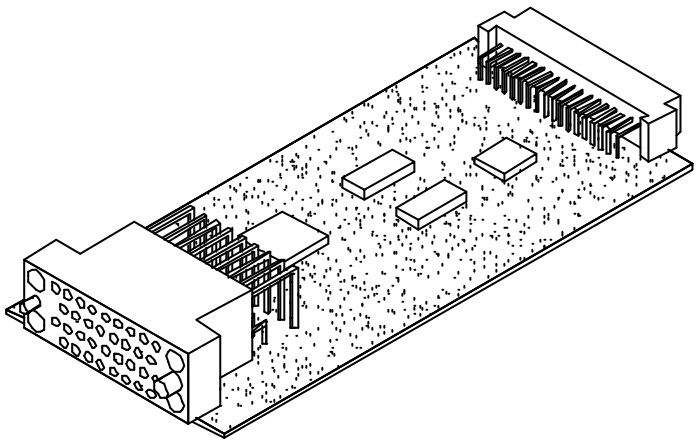


Fig.2-7 V35-3A, 2.048Mbps, V.35 Data Interface Module; Female

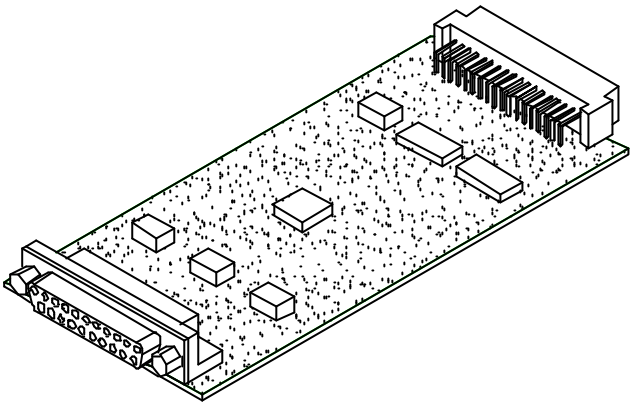


Fig.2-8 R530-3A, 2.048MBps, RS 530 Data Interface module; Female

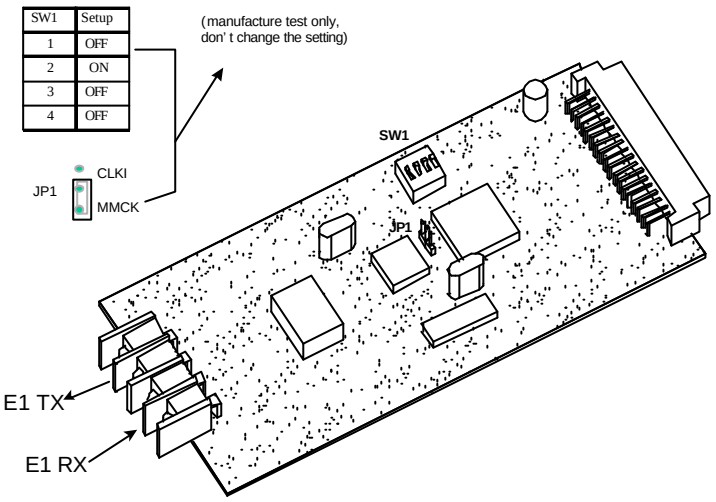


Fig.2-9 G703B-3, 2.048MBps, G.703 Balance 120ohm-interface module

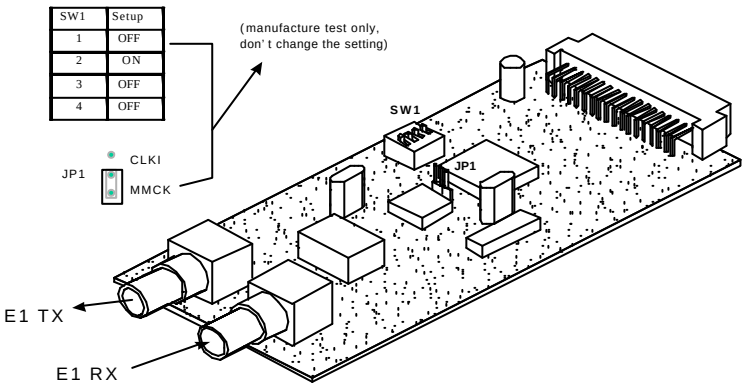


Fig.2-10 G703U-3, 2.048MBps, G.703 Unbalance 75 ohm interface module

2.2 Rack Mounted Units

TRS-32 Rack Shelf, for sixteen HDSL Line Cards to plug in

NMC-32 Rack Controller, for HDSL Line Cards configuration

PWR-132A Rack AC power supply module, using AC power source 85~260V

PWR-132D Rack DC power supply module, using DC power source -30~ -72V

DT-2000N HDSL Line Card for Full-E1 only

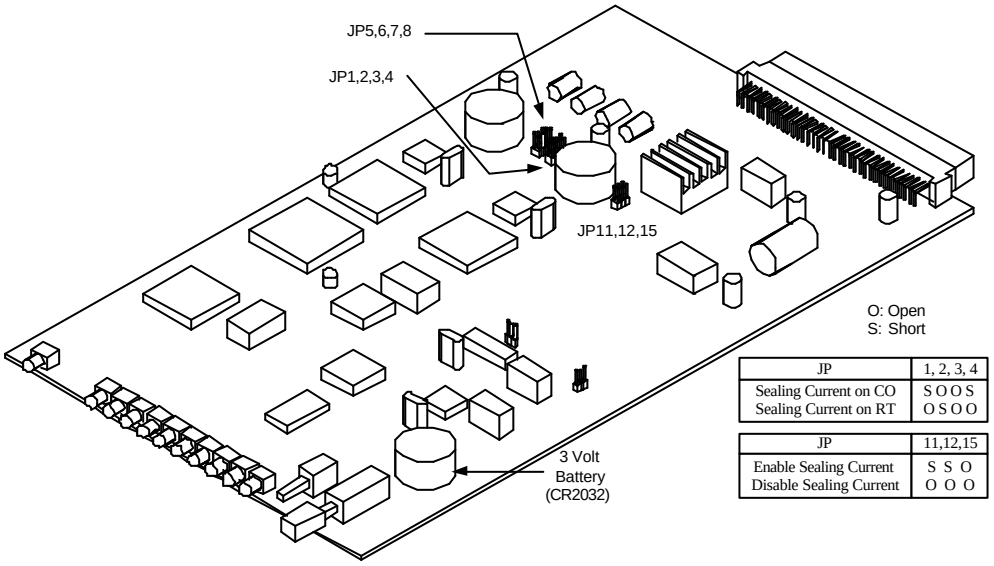
Full-E1, using G.703 balanced and unbalanced adapter only
Two HDSL loops, using Terminal Block on TRS-32 shelf

DT-2000NF1 HDSL Desktop Unit for Full or Fractional E1

E1 interface, using G.703 balanced and unbalanced adapter
Two HDSL loops, using Terminal Block on TRS-32 shelf
Internal power apply from power module for Wetting Current
Optional DTE module V.35 module (with female adapter cable)
RS530 module (female)

DT-2000NF2 HDSL Desktop Unit for Full-E1 only

E1 interface, using G.703 balanced and unbalanced adapter
Two HDSL loops, using Terminal Block on TRS-32 shelf
DC Power -48V input from outside for loop power supply
Optional DTE module V.35 module (with female adapter cable)
RS530 module (female)



JP	1, 2, 3, 4
Sealing Current on CO	S O O S
Sealing Current on RT	O S O O

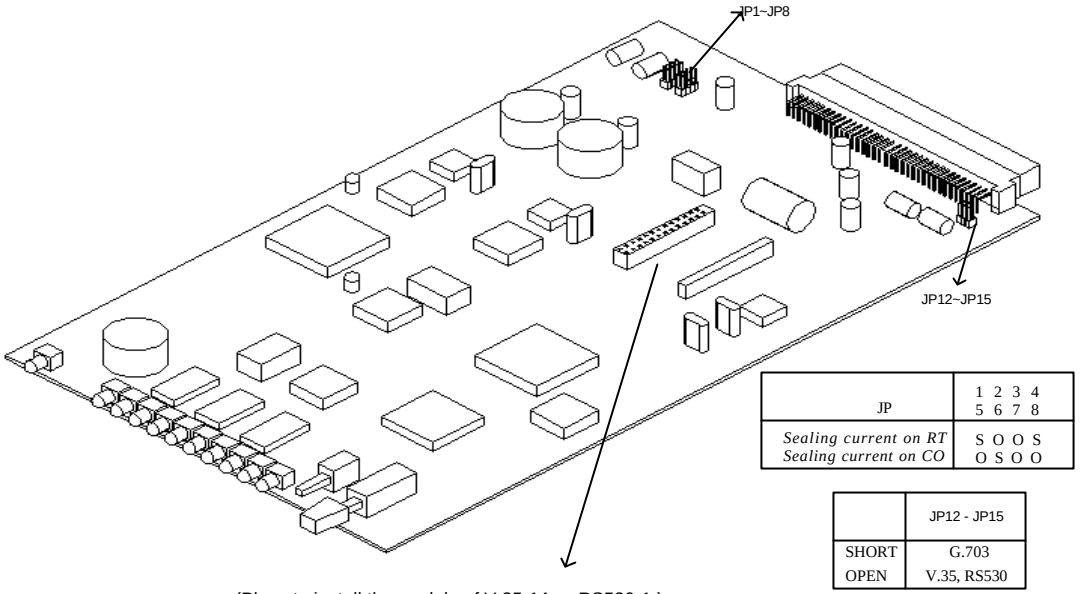
JP	11,12,15
Enable Sealing Current	S S O
Disable Sealing Current	O O O

Fig.2-11 DT-2000N/NF PCB

Caution

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by TAINET.
Dispose of used batteries according to the national instruction of government.



JP	1 2 3 4 5 6 7 8
Sealing current on RT *Sealing current on CO*	S O O S O S O O

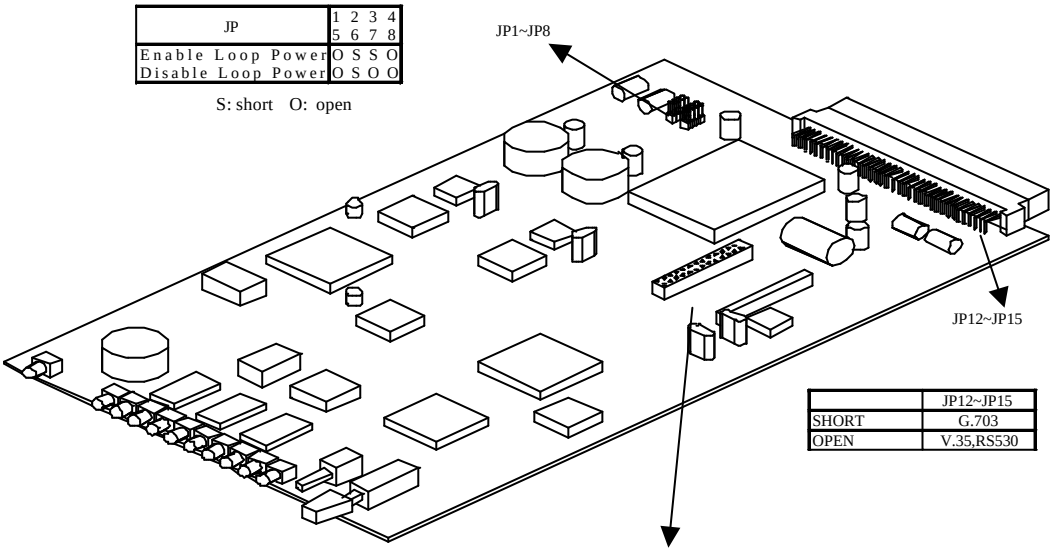
	JP12 - JP15
SHORT	G.703
OPEN	V.35, RS530

(Place to install the module of V.35-1A or RS530-1.)

Fig.2-12 DT-2000NF1 PCB

JP	1 2 3 4 5 6 7 8
Enable Loop Power	O S S O
Disable Loop Power	O S O O

S: short O: open



	JP12~JP15
SHORT	G.703
OPEN	V.35,RS530

(Place to install the modul of V.35-1A or RS530-1)

Fig.2-13 DT-2000NF2 PCB

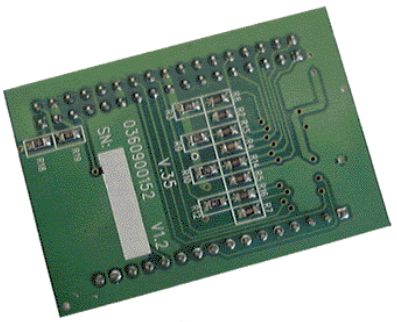
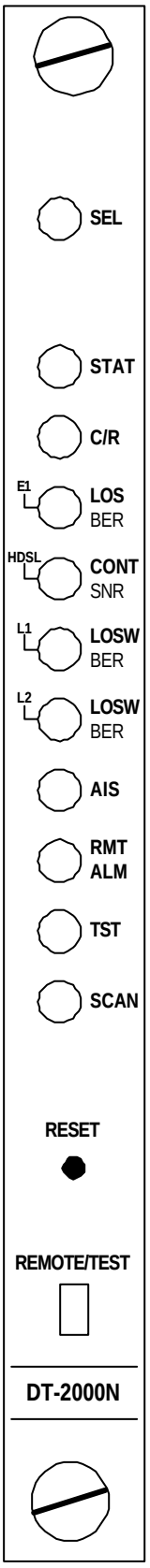
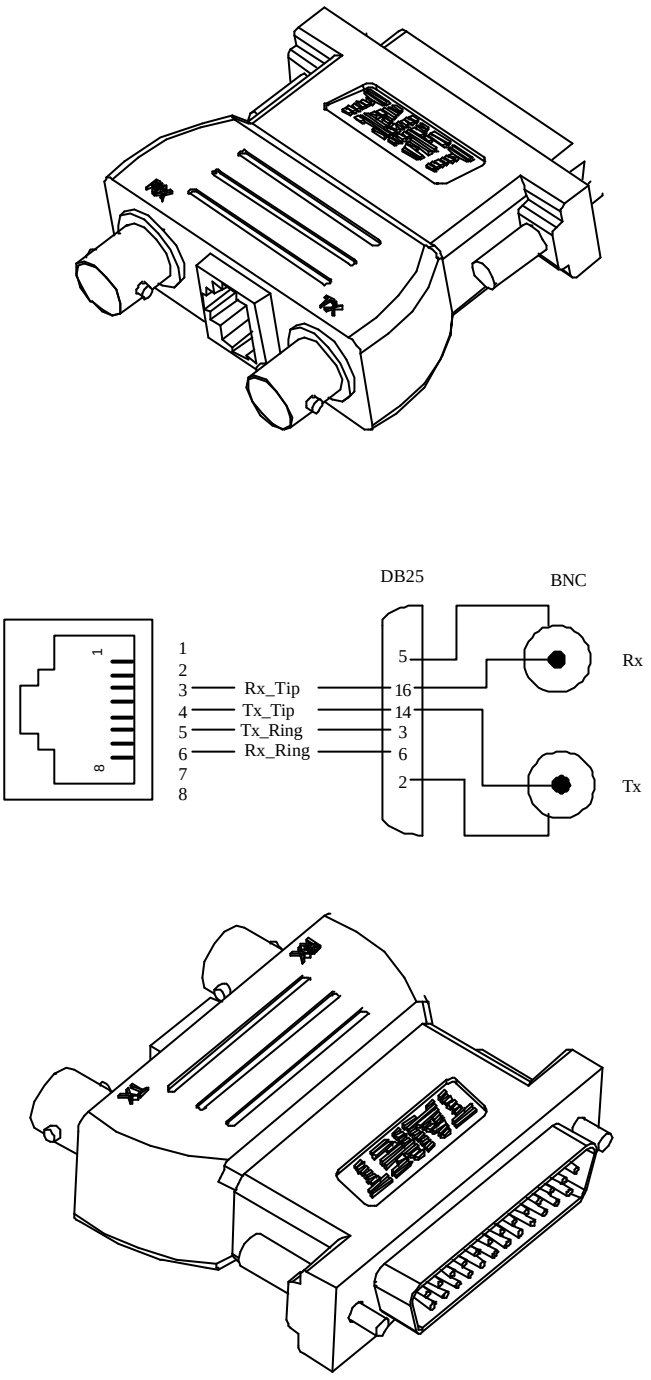


Fig.2-14 V.35-1A module



Front Panel view of DT-2000N



DB-25 to BNC & RJ-45 adapter
(P/N: 035014009A)

Fig.2-15 DT-2000N front view and G703 adapter

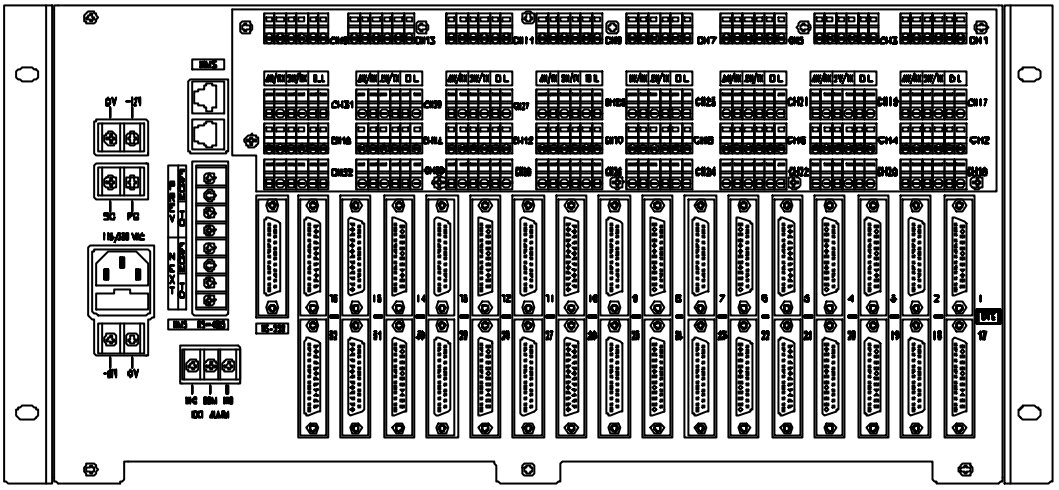


Fig.2-16 The rear panel view of TRS-32.

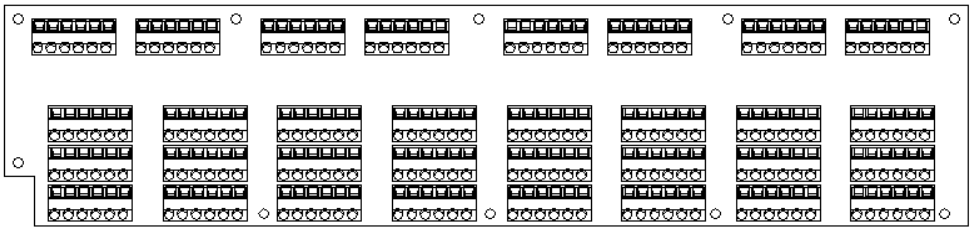


Fig.2-17 The TRS-32 Daughter board (/TB-32)

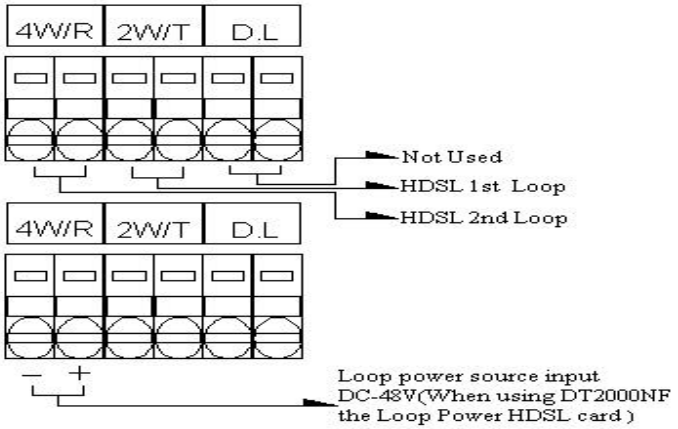


Fig.2-18 Terminal block insertion

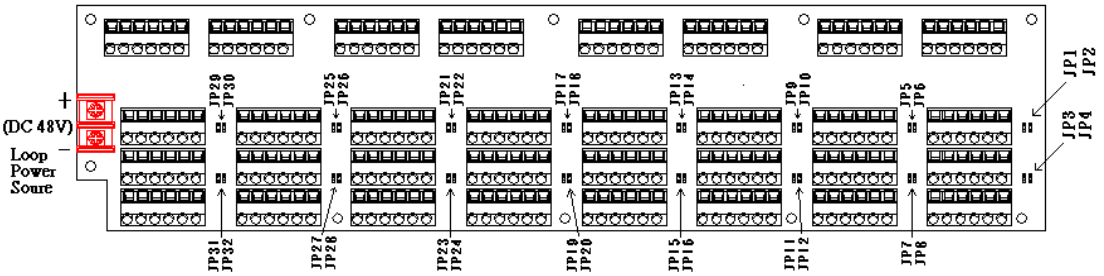


Fig.2-19 The TRS-32 Daughter board (TB-32LP)

SLOT 1	→	JP 1~JP 2	SLOT 9	→	JP17~JP18
SLOT 2	→	JP 3~JP 4	SLOT 10	→	JP19~JP20
SLOT 3	→	JP 5~JP 6	SLOT 11	→	JP21~JP22
SLOT 4	→	JP 7~JP 8	SLOT 12	→	JP23~JP24
SLOT 5	→	JP 9~JP10	SLOT 13	→	JP25~JP26
SLOT 6	→	JP11~JP12	SLOT 14	→	JP27~JP28
SLOT 7	→	JP13~JP14	SLOT 15	→	JP29~JP30
SLOT 8	→	JP15~JP16	SLOT 16	→	JP31~JP32

Loop Power set up (SHORT: enable, OPEN: disable) for DT-2000NF2 card

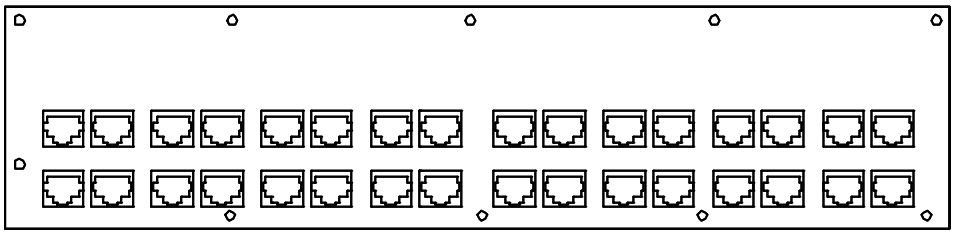


Fig.2-20 The panel view of TRS-32 Daughter board (PJ-32A)

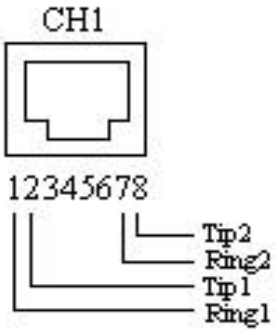


Fig.2-21 The pin assignment of PJ-32A

- The front panel switches

NAME	DESCRIPTION
RESET switch	Active The Hardware RESET of DT-2000N/NF
TEST switch	toggles the LED test and display REMOTE LED --> LED Test --> Remote LED Display

- The LED indicators

NAME	STATUS	DESCRIPTION
SEL LED	Red	Controlling by the NMC-32 Controller
	Off	DT-2000N/NF is not online with NMC-32 Controller
STAT LED	Red	Hardware failure or HDSL loopback, self-tests failure
	Yellow	power-on self-testing or HDSL loopback self-testing
	Green	No failure detected after self-tests
C/R LED	Green	Means “Central Side” setup
	Off	“Remote Side” setup
E1 LOS/BER LED	Red	E1 LOS condition (LOS condition has higher priority than BER)
	Yellow	E1 BER condition
	Off	no LOS/BER condition
HDSL CONT/SNR LED	Red	HDSL Loop Power is inactive (DT-2000NF2 only)
	Yellow	SNR of any HDSL loop is below a predefined threshold
	Off	SNR of all loops are good
LOOP 1/2 LOSW/BER LED	Green	HDSL loop in good condition
	Red	HDSL loop LOSW condition
	Yellow	HDSL loop BER condition
ALM LED	Yellow	there is an alarm condition
	Off	Normal condition
RMT ALM LED	Yellow	Alarm detected on the Remote Side
	Off	No Alarm on the Remote Side.
TEST 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	Loopback Function is inactive
SCAN LED	Yellow	responding to NMC-32 Controller regular polling
	Off	DT-2000N/NF is not online

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CHAPTER3
Installations

CONTENT

CHAPTER 3 : INSTALLATIONS

3.1 General Description

This chapter provides the information needed to install the TAINET DT-2000F HDSL modem and to ensure that it is working properly.

3.1.1 Unpacking

Save the carton and protective packing material in which TAINET DT-2000F HDSL modem was shipped; you might need them for repackaging if you have to store or ship the modem in the future. The following items are shipped with your TAINET DT-2000F modem:

- One User's Manual for DT-2000F HDSL modem.
- One 7-feet (2.13m) twist telephone wires for connection to an RJ11 4-pin jack.
- One 6-pin box for twisted line application.
- One DB-25 to BNC unbalanced E1/RJ-45 balanced E1 adapter (DT-2000N Rack Mounted series only).

Rough handling during shipping causes most early modem failure, after you unpack the modem, check carefully for shipping damage. Contact the shipper if you notice any damage.

Note :	We strongly recommend that you should connect the PG (protect ground) to the earth ground system of your building

3.1.2 System Architecture

Using a pair of DT-2000F/NF, one to set as CO unit and another to set as RT unit. When it applies two signal line loops at the same time, a full E1 (2 Mbps) data can send and receive between them. If user configure the DT-2000F/NF as fractional E1 (n x 64Kbps), the data can hence send and receive by just use one signal line loop to get 16 x 64Kbps (1Mbps) data.

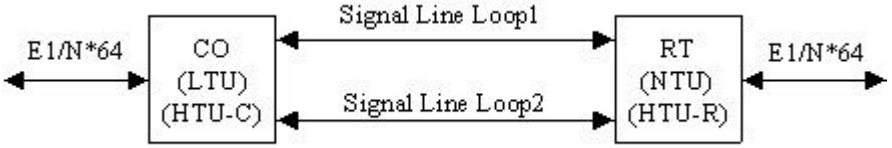

Fig.3-1 A simple application of HDSL

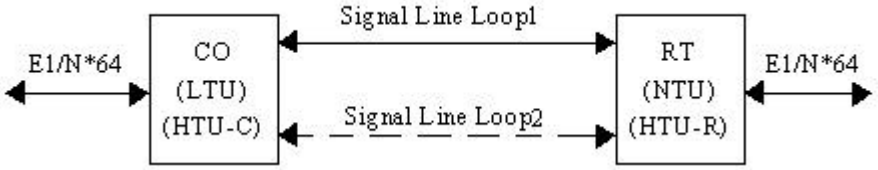

Fig.3-2 A single loop with backup application of HDSL

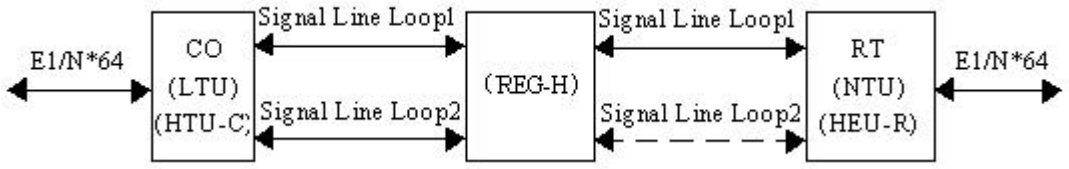

Fig. 3-3 Using HDSL Repeater to double the distance

3.2 Common Installation

3.2.1 The Front Panel Operation

On the front view of DT-2000F/F, there are LCD display, LED indicators and Keypads. The functions of LCD display and LED indicators have described in previous chapter. The operation of keypads are describing here below:

Home: for set-up menu to go back to the home menu.

▲ **:** Exit Key, use it to go back to the upper level menu.

▼ **:** Enter Key, to enter the next lower level menu or confirm selections.

◀ **:** Left Key, to shift to left field of menu item.

▶ **:** Right Key, to shift to right field of menu item.

As it works for menu tree function selection, more information will show on LCD front panel display. Please refer to next chapter for more detail. This chapter will guide the user to have a quick installation at all.

3.2.2 The Rear Panel Connection

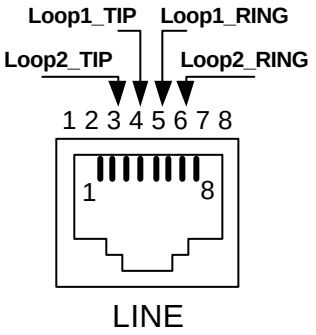

Fig.3-4 The pin assignment of RJ-45 DSL interface

❖ HDSL Loops Connection

For DT-2000F loop connection, there is a RJ-45 phone jack with 8-pin connector on the rear panel that can be used to connect two loop wires together (Tip/Ring). User may connect DT-2000 loops refer to Fig.3-5 and Fig.3-6 previously. The Loop1 uses Loop1_Tip and Loop1_Ring to connect to remote Loop1, and Loop2 uses Loop2_Tip and Loop2_Ring to connect to remote Loop2 via both full-duplex of 2B1Q modulation.

❖ E1 Connection

For all DT-2000 series can accommodate data up to an E1 channels. Either terminal block for balanced E1 (120Ω) or the BNC connectors for unbalanced E1 (75Ω) on the rear panel can be used to connect the E1 facility.

Cross connection on the pins named Tx (Tip/Ring) to the receive side of E1 panel Rx (Tip/Ring), cross connect Rx (Tip/Ring) to the transmit side of E1 panel Tx (Tip/Ring).

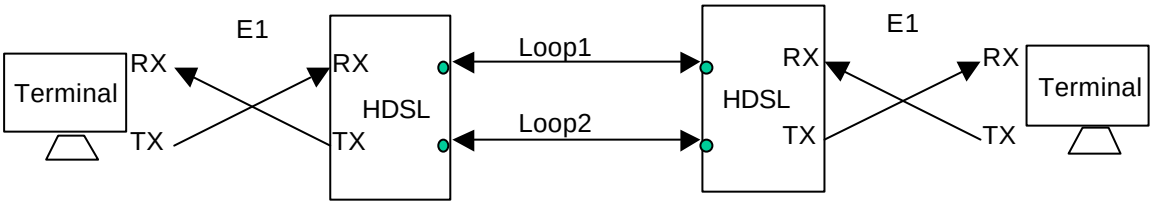

Fig.3-5 An example of Line and E1connection

For some longer connection on real network, the Tip and Ring may reversal connection by field; it works normally but shows as warning messages.

3.2.3 Clock Source Configuration

On synchronous transmission system, whole E1 system should synchronize one and only one clock source. Thus the CO site clock source may set as E1 terminal (Co-directional), E1-C network (loop clock recovery), or provide by DT-2000 internal clock (E1-C Internal) for whole system to follow up. As to the RT site, the 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 Clock	CODIRECTIONAL		CODIRECTIONAL

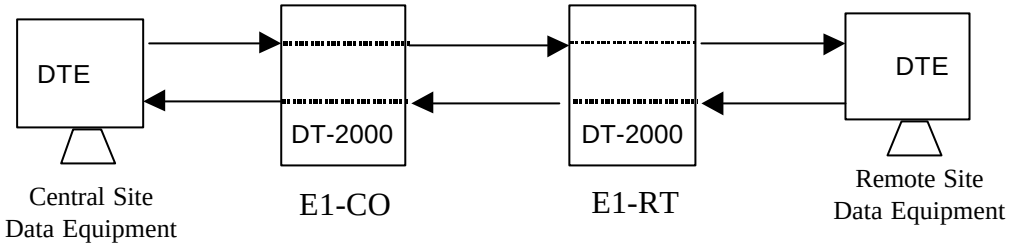

Fig.3-6 DT-2000 E1 **Codirectional** clock supply

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

Item	CO Site		RT Site
System Type	E1-C / E1-CF		E1-R / E1-RF
Frame Format	Unframe / Frame		Unframe / Frame
Set E1 Clock	**E1-C NETWORK**		**E1-C NETWORK**

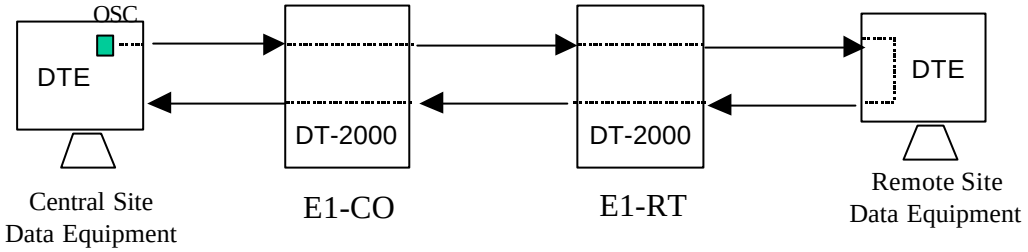

Fig.3-7 DT-2000 **E1-C Network** clock supply

- When Clock source apply from DT-2000 Internal

Item	CO Site		RT Site
System Type	E1-C / E1-CF		E1-R / E1-RF
Frame Format	Unframe / Frame		Unframe / Frame
Set E1 Clock	**E1-C INTERNAL**		**E1-C INTERNAL**

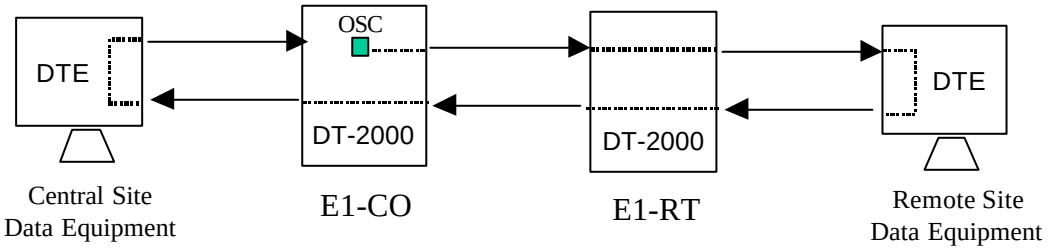

Fig.3-8 DT-2000 **E1-C INTERNAL** clock supply

3.3 DT-2000F/NF Full-E1 Quick Installation

To install the E1 transmission system, one HDSL is set to CO and the other is set to RT mode. At the beginning of installation, the DT-2000F/NF signal line loop interface may connect first. Make sure a connection is established, then connect each E1 data port to its terminal device and setup each DT-2000F/NF HDSL to match configuration.

3.3.1 Setting as Co-directional clock (E1-C only)

When clock sources apply independently for CO and RT equipment.

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

  1. HDSL CONFIG → SYSTEM TYPE → E1-C
  2. HDSL CONFIG → E1 FRAME FORMAT → UNFRAME
  3. HDSL CONFIG → SET E1 CLOCK → CODIRECTIONAL

- 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 from this quick installation example.

  1. HDSL CONFIG → SYSTEM TYPE → E1-R

  After HDSL loops connect and change the necessary items above, the CO site will download the configuration to RT site include clock source, then the system will be built up.

3.3.2 Using different clock source

Changing CO Site' s clock source of DT-2000F to Network clock or internal clocks. The following steps can easily complete quick installation. Step 1. When trying to use different clock source for HDSL transmission, the different configuration that needs to be changed is on "SET E1 Clock" item only. The operation example of menu tree are listed as below:

❖ ***Clock Source → from DT-2000F Internal***

1. HDSL CONFIG → SYSTEM TYPE → E1-C
2. HDSL CONFIG → E1 FRAME FORMAT → UNFRAME
3. HDSL CONFIG → SET E1 CLOCK → INTERNAL

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

1. HDSL CONFIG → SYSTEM TYPE → E1-C
2. HDSL CONFIG → E1 FRAME FORMAT → UNFRAME
3. HDSL CONFIG → SET E1 CLOCK → NETWORK

After went through this quick installation example, user may easily transmit the Full-E1 2.048Mbps data pass through DT-2000F HDSL pair. For more detail items and function descriptions, please refer to chapter 4.

3.4 DT-2000F/NF Fractional E1 Quick installation

Basically, the configuration steps are the same as DT-2000F/NF (E1-C). (User can refer to section 3.3 for configuring of clock source, Co-directional clock source does not support in E1 fractional mode) There is a major different frame type for DT-2000F/NF, user can select the Fractional E1 for Central or Remote sites. When select the E1 frame format to FRAME mode, user may have a choice on different data speed with N x 64kbps (N=1~31) as well as Full E1.

3.4.1 CO site Installation Steps

- Power off all units.
- Make sure the DIP SW1 on G.703 module is set correctly. (2 ON and 1,3,4 OFF)
- Plug in the E1 (G.703) module into the data port slot on CF.
- Connect the E1 cable to the E1 network equipment.
- Connect the DTE cable to the data port unit.
- Connect the copper wires between CF & RF.
- Turn on the power on all units.
- Configure the units using LCD panel or the Craft interface on the CF unit.

1. ***The CO site E1 Fractional mode setup***

   HDSL CONFIG → SYSTEM TYPE → E1-CF
   HDSL CONFIG → E1 FRAME FORMAT → FRAME / FRAME + CRC
   HDSL CONFIG → SET E1 CLOCK → CODIRECTIONAL

2. ***BLOCK the TIME SLOT to reduce the data speed on the HDSL link***

   For example, just use 20 x 64Kbps, we block the time slot from 1 to 11. At the Time Slot Block menu, to use ENTER key may locate the time slot number and use LEFT or RIGHT key may switch the block state to ON or OFF.

   HDSL CONFIG → BLOCK TIME SLOT → SBBBBBBBBBBB.**.....**

3. ***Assign the TIME SLOT to the specify data port interface (DT-2000F —E1-CF)***

   For example, just use 20 x 64Kbps, we block the time slot from 1 to 11, where we will also needs to assign the time slot from 12 to 31 continues for the data port. At the Assign Time Slot menu, to use ENTER key may locate the time slot number and use LEFT or RIGHT key may switch the assign state to ON or OFF.

   HDSL CONFIG → ASSIGN TIME SLOT →
   S.**.....**EEEEEEEEEEEEEEEEEEE

3.4.2 RT site Installation Steps

- Power off all units.
- Connect the E1 cable to the E1 network equipment.
- Plug in the data port unit (V.35 or RS530 module) into the slot on RF.
- Connect the DTE cable to the data port unit.
- Connect the copper wires between CF & RF.
- Turn on the power on all units.
- Configure the units using LCD panel or the Craft interface on the RF unit

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 from this quick installation example.

1. HDSL CONFIG → SYSTEM TYPE → E1-RF

After HDSL loops connect and change the necessary items above, the CO site will download the configuration to RT site include clock source, then the system will be built up.

3.5 The Installation of DT-2000NF Rack Mounted Series

3.5.1 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 and connected to the equipment frame ground when handling cards.
- Store cards only in anti-electrostatic packaging provided by the factory.

3.5.2 Card Installation

- Each shelf has a possible 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.

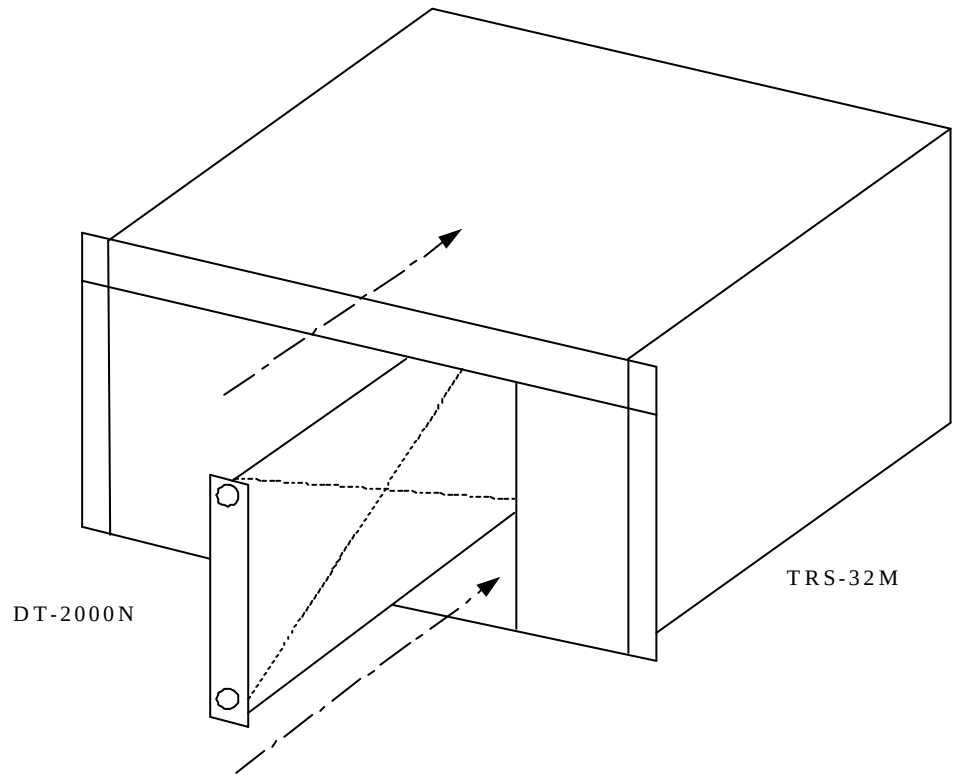

Fig.3-9 Card insertion

3.5.3 E1 and HDSL Loops Connection

Each TRS-32 shelf can accommodate up to 16 DT-2000NF with E1 channels. Either a RJ-45 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. The E1 interface of DT-2000NF card must be setup correctly, please refer to Chapter 4 HDSL CONFIG for the setting. Connect the pins named **TX_Tip** and **TX_Ring** to the receive side of E1 connect panel; Connect **RX_Tip** and **RX_Ring** to the transmit side of E1 connect panel.

For each DT-2000NF in the TRS-32 shelf, there is a 6-pin terminal block on the back plate that can be used to connect HDSL loop wires (2W/Tx for Loop1 and 4W/Rx for Loop2). The same as Fig.2-18, connect the Loop1 (2W/Tx) to the other Loop1 of remote HDSL and connect the Loop2 (4W/Rx) to the other Loop2 of remote HDSL.

The DT-2000NF has the similar operation menu tree as DT-2000/F. User could apply the same procedure as DT-2000/F to quick install DT-2000N/NF.

For DT-2000NF series, there is one built-in G.703 E1 interface and one optional data interface for user to apply. With the additional data port interface, user can select ether G.703, V.35/ R530 or both to connect with data terminals.

Another difference between DT-2000F desktop series with DT-2000NF rack mounted series is the default factory profiles are DT-2000NF series have 19 preset profiles inside. Users can easily load these preset configurations to run the system! After loading one of these profiles, the System Type, Frame Format, and E1 Clock in the system configurations will be changed.

[System Type]-[Frame Format]-[E1 Clock]-[Data Port I/F]	Description
1: C-UFm-CoDir-G	Central Office site, Unframed, Co-directional clock and G.703 data interface.
2: C-UFm-Net-G	Central Office site, Unframed, Network clock and G.703 data interface.
3: C-UFm-Int-G	Central Office site, Unframed, Internal clock and G.703 data interface.
4: C-FmC-CoDir-G	Central Office site, Framed, Co-directional clock and G.703 data interface.
5: C-FmC-Net-G	Central Office site, Framed, Network clock and G.703 data interface.
6: C-FmC-Int-G	Central Office site, Framed, Internal clock and G.703 data interface.
7: R-G703	Remote Terminal site, G.703 data interface and all configurations will follow CO.

[System Type]-[Frame Format]-[E1 Clock]-[Data Port I/F]	Description
8: C-UFm-CoDir-D	Central Office site, Unframed, Co-directional clock and V.35/RS530 data interface.
9: C-UFm-Net-D	Central Office site, Unframed, Network clock and V.35/RS530 data interface.
10: C-UFm-Int-D	Central Office site, Unframed, Internal clock and V.35/RS530 data interface.
11: R-DATA PORT	Remote Terminal site, V.35/RS530 data interface and all configurations will follow CO.
12: CF-FmC-CoD-G	CO site with Fractional E1, Frame mode, Co-directional clock and V.35/RS530 data interface.
13: CF-FmC-NET-G	CO site with Fractional E1, Frame mode Network clock and V.35/RS530 data interface.
14: CF-FmC-Int-G	CO site with Fractional E1, Frame mode Internal clock and V.35/RS530 data interface.
15: RF-G703	RT site with Fractional E1, G.703 data interface and all configurations will follow CO.
16: CF-FmC-CoD-D	CO site with Fractional E1, Frame mode Co-directional clock and V.35/RS530 data interface.
17: CF-FmC-Net-D	CO site with Fractional E1, Frame mode Network clock and V.35/RS530 data interface.
18: CF-FmC-Int-D	CO site with Fractional E1, Frame mode Internal clock and V.35/RS530 data interface.
19: RF-DATA PORT	RT site with Fractional E1, V.35/RS530 data interface and all configurations will follow CO

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CHAPTER4
OPERATING, MAINTENANCE

CONTENT

CHAPTER 4 : OPERATING MAINTENANCE

4.1 Using the LCD Menu

The LCD menu makes you to configure, monitor, and maintain the DT-2000 series system easily. Refer to Chapter 2 for the feature descriptions of each menu item. The operating and display of the LCD menu are described as following.

- **Keyboard**

  Five keys are provided on the LCD panel of the DT-2000, DT-2000F, DT-2000N and DT-2000NF which can be controlled from the NMS controller: **Up (EXIT** on NMS controller**)**, **Down (ENTER** on NMS controller**)**, **Left, Right** and **Home**. The keyboard is used to select menus, view the various screens, execute the command, and when necessary, to select alpha and numeric information into the system.

- **LCD**

  The 16x2-char LCD panel is used for displaying menus and messages. The LCD back-light which is controlled by the software will automatically switch off after 5 minutes for power saving.

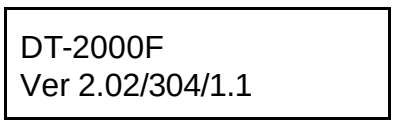
- **Flashing Char**

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

4.1.1 The LCD Menu Display Format

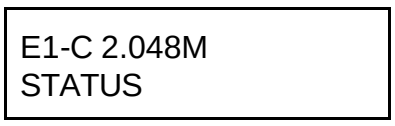
The following screens show some examples of the LCD display formats.

- **Model and Version:**

  When at the top of the LCD menu tree, press **HOME/ UP** key will enable you to see the model name and the version number.

- **Menu Selection:**

  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", "E1-CF"or "E1-RF" indicate the system type of the unit: Full-E1 CO side or RT side, Fractional E1 CO side or RT side.

- **Status Display:**

```
STATUS
E1 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
01:35:30
```

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:**

```
1 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. The char "N"(near-end) shows the location of the alarm. "Board-Fail" is the description of the alarm. 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 3.2.4). Use **RIGHT** or **LEFT** key to see the next or previous alarm.

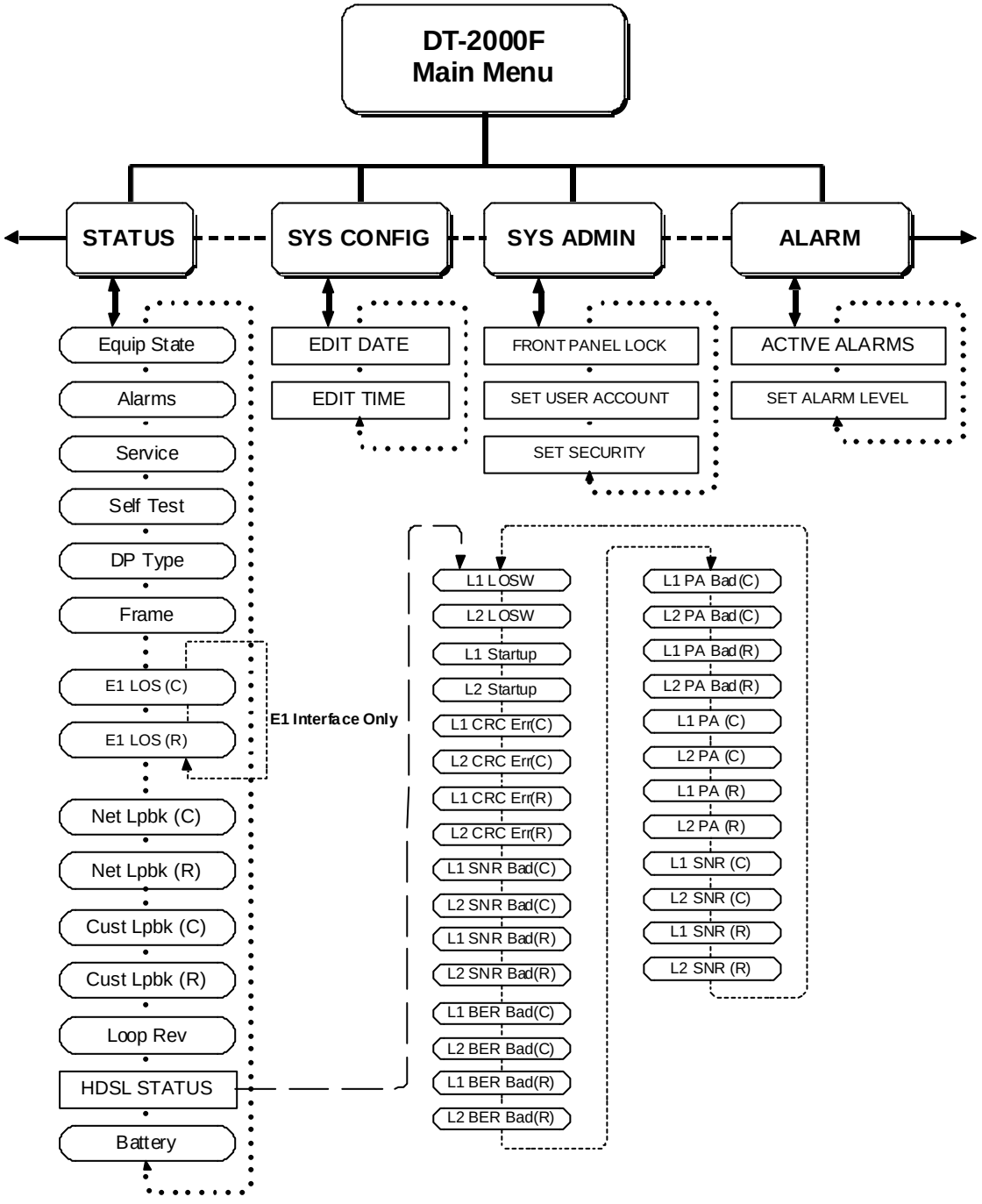
- **Messages:**

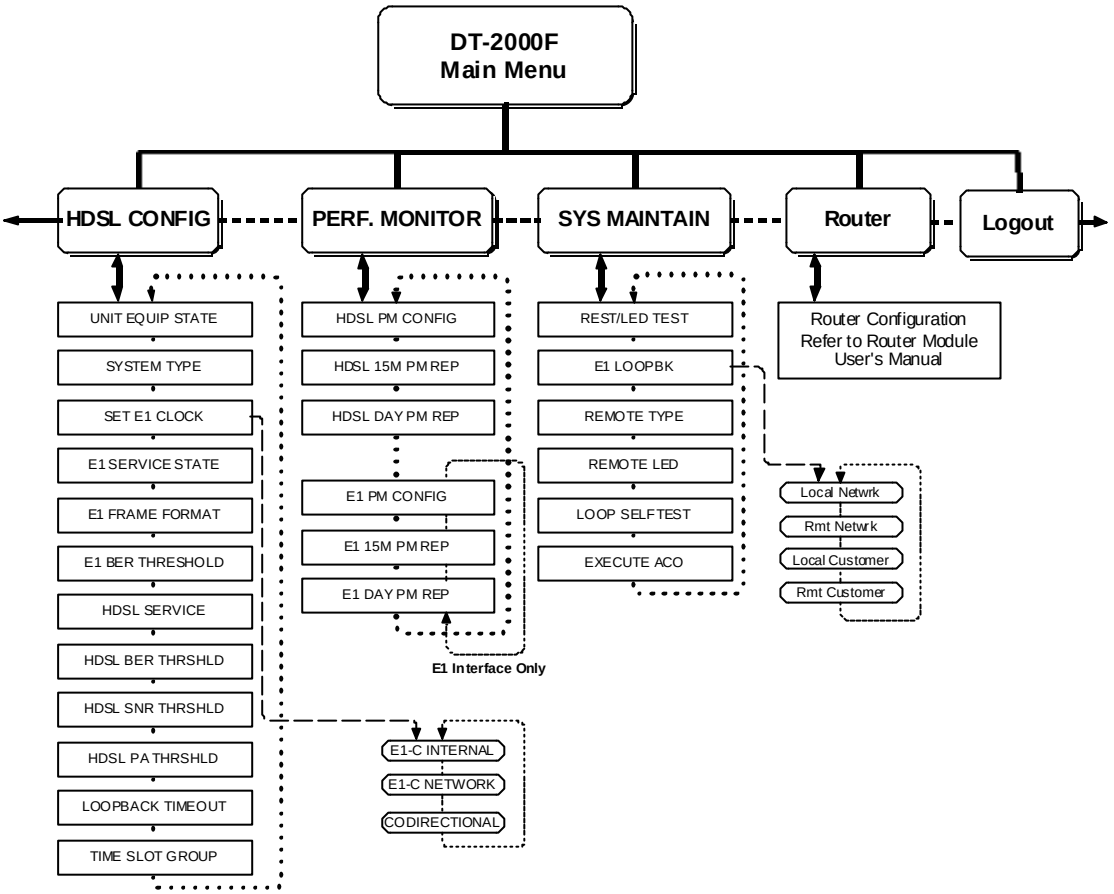
E1 PM CONFIG
Bad Privilege!

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

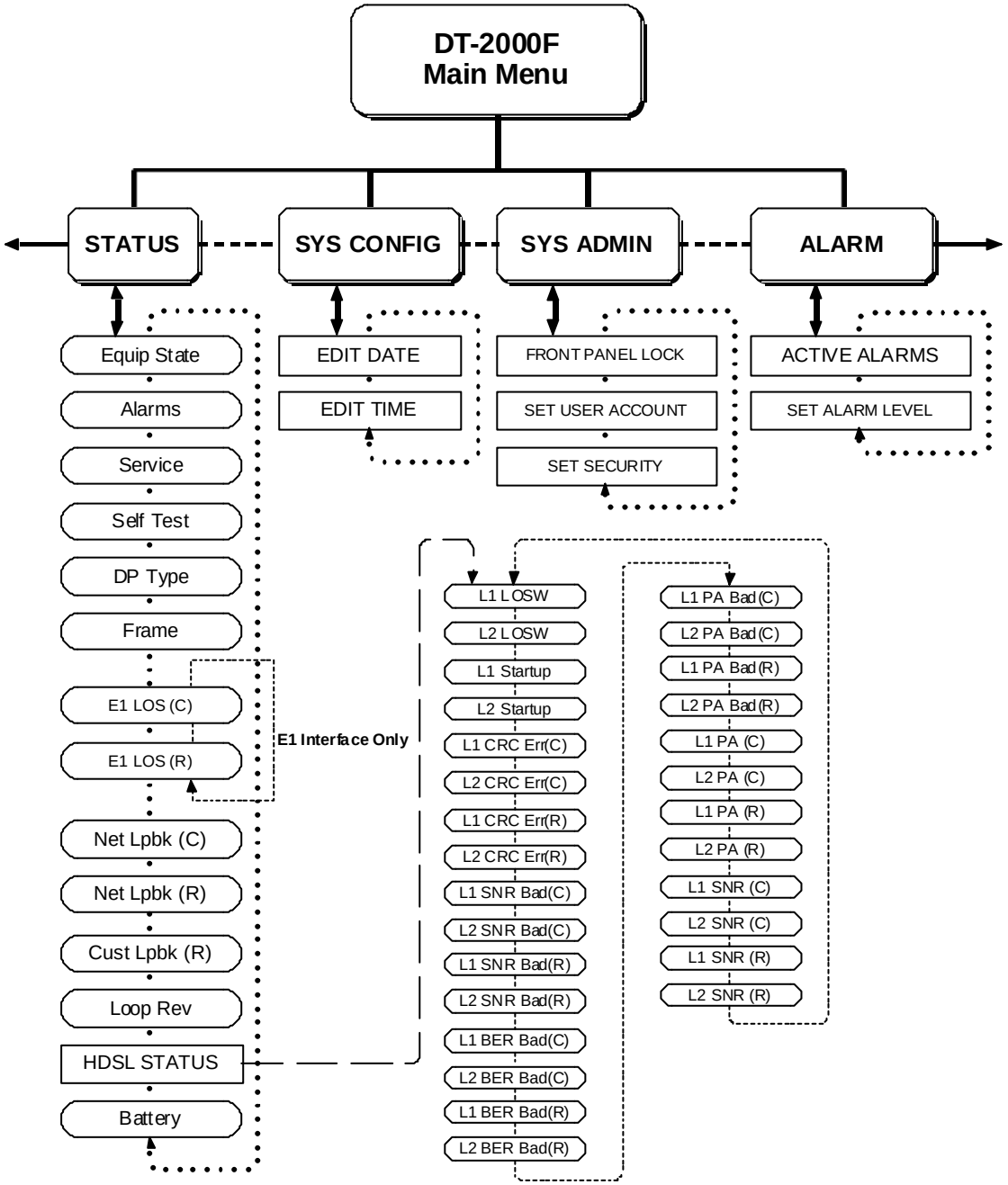
Access Denied!
Bad Privilege!
Privi. Exipred!
No Carrier!
E1 in Service!
Unit Unequipped!
Has Been Done!
No Alarm.

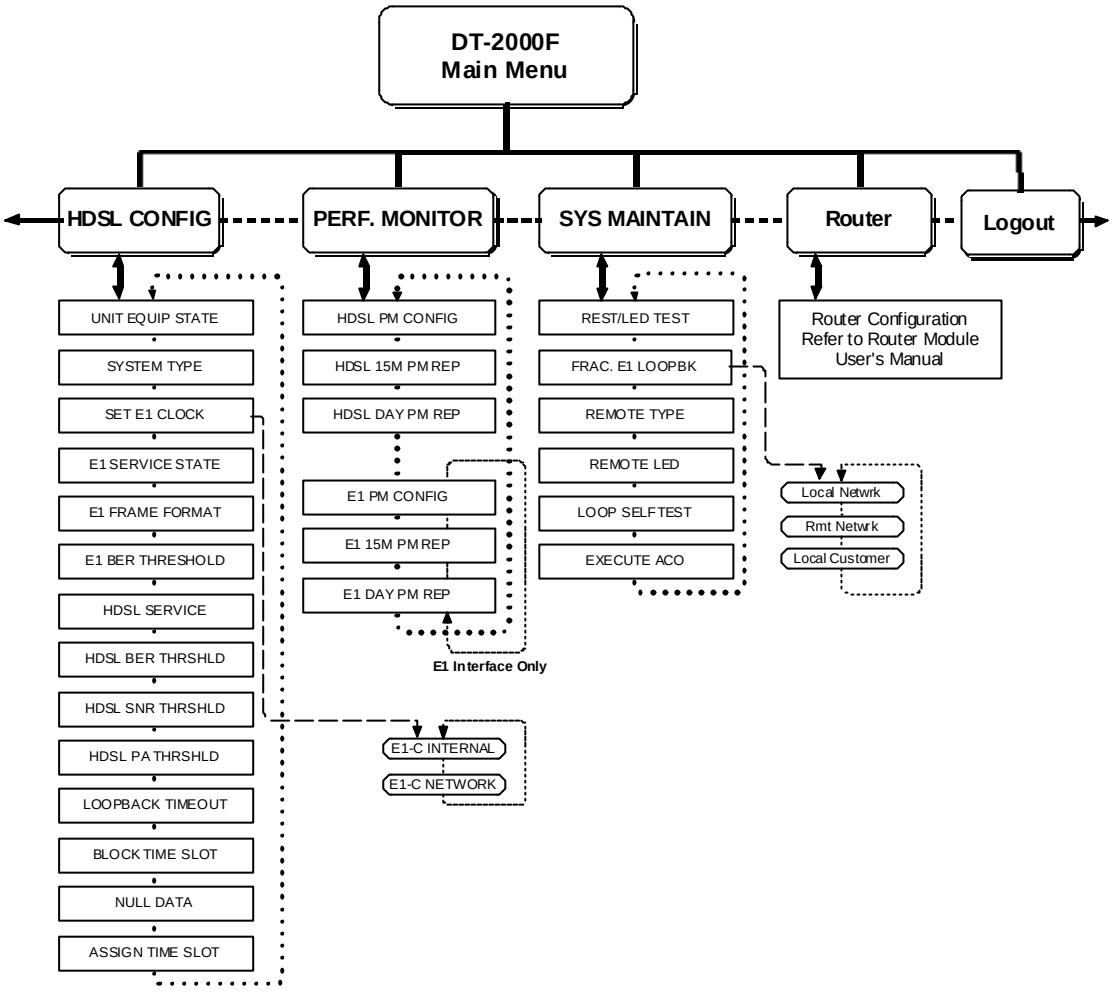
4.1.2 The Full-E1 LCD Menu Tree (E1-C)




DT-2000F
Main Menu
HDSL CONFIG
PERF. MONITOR
SYS MAINTAIN
Router
Logout
UNIT EQUIP STATE
SYSTEM TYPE
SET E1 CLOCK
E1 SERVICE STATE
E1 FRAME FORMAT
E1 BER THRESHOLD
HDSL SERVICE
HDSL BER THRSHLD
HDSL SNR THRSHLD
HDSL PA THRSHLD
LOOPBACK TIMEOUT
TIME SLOT GROUP
E1-C INTERNAL
E1-C NETWORK
CODIRECTIONAL
HDSL PM CONFIG
HDSL 15M PM REP
HDSL DAY PM REP
E1 PM CONFIG
E1 15M PM REP
E1 DAY PM REP
E1 Interface Only
REST/LED TEST
E1 LOOPBK
REMOTE TYPE
REMOTE LED
LOOP SELFTEST
EXECUTE ACO
Local Netwrk
Rmt Netwrk
Local Customer
Rmt Customer
Router Configuration
Refer to Router Module
User's Manual

4.1.3 The Fractional-E1 LCD Menu Tree (E1-CF)




DT-2000F
Main Menu
HDSL CONFIG
PERF. MONITOR
SYS MAINTAIN
Router
Logout
UNIT EQUIP STATE
SYSTEM TYPE
SET E1 CLOCK
E1 SERVICE STATE
E1 FRAME FORMAT
E1 BER THRESHOLD
HDSL SERVICE
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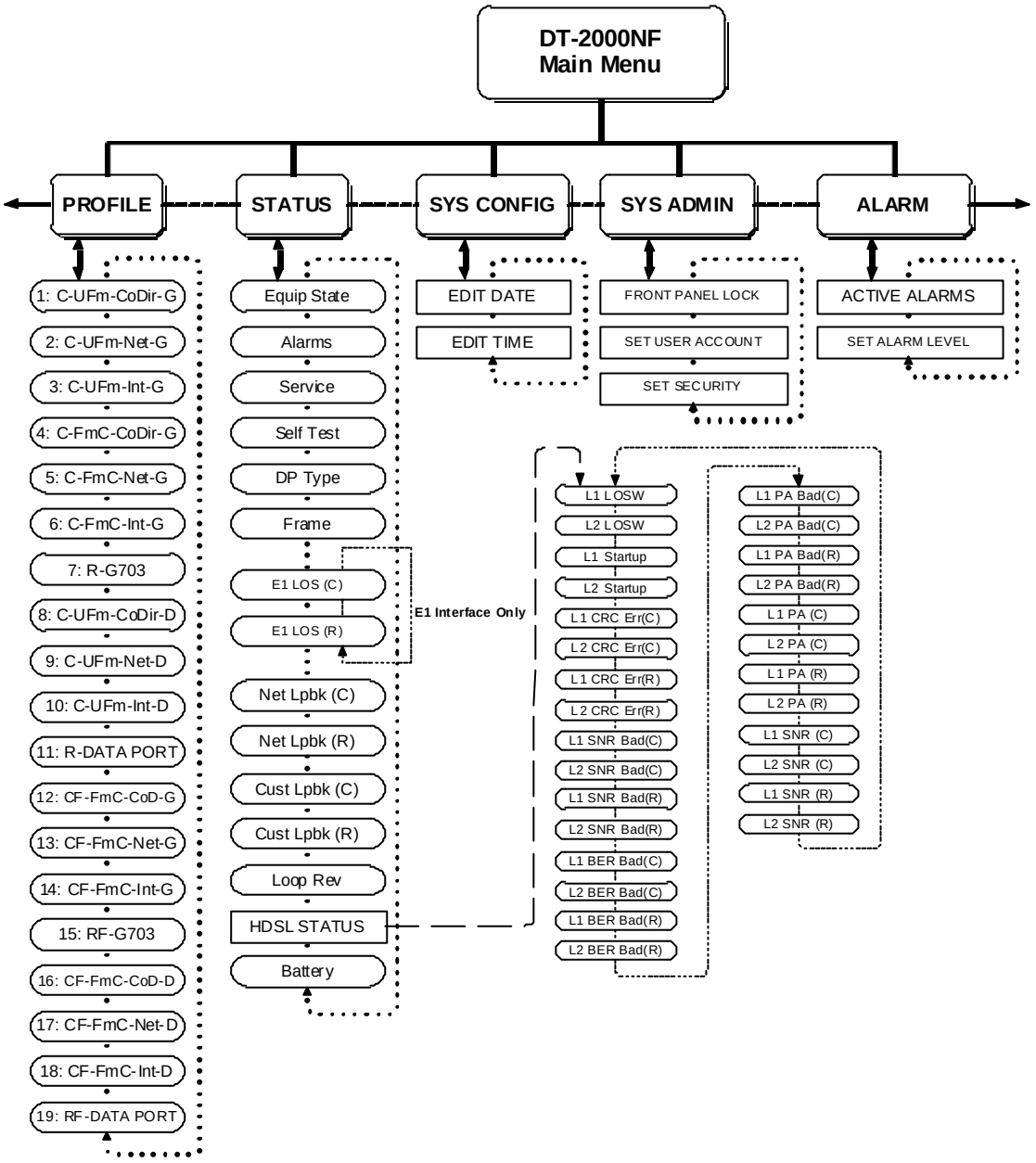
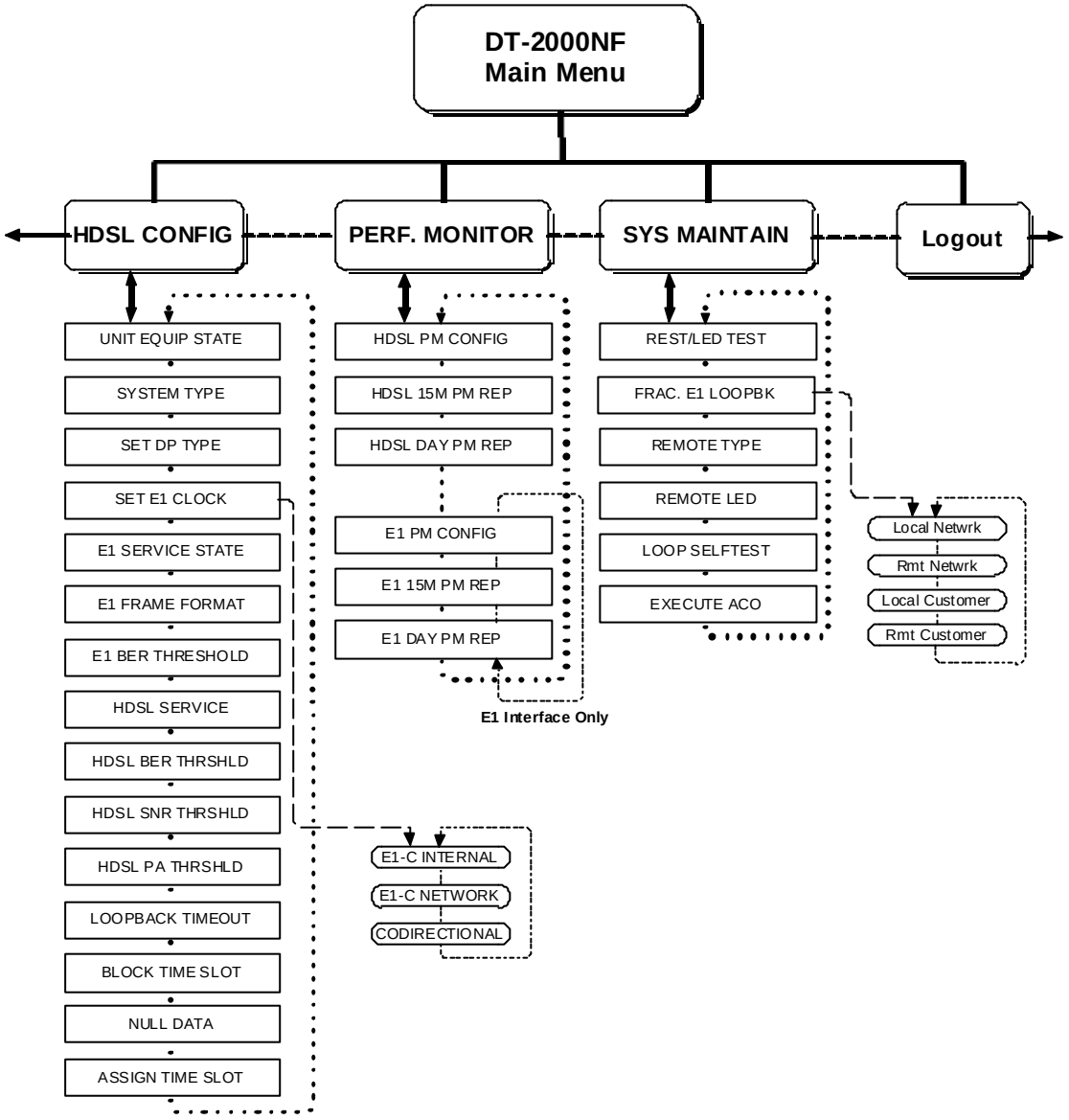
REMOTE TYPE
REMOTE LED
LOOP SELFTEST
EXECUTE ACO
Router Configuration
Refer to Router Module
User's Manual
Local Netwrk
Rmt Netwrk
Local Customer

4.1.4 The DT-2000NF LCD Menu Tree




DT-2000NF
Main Menu
HDSL CONFIG
PERF. MONITOR
SYS MAINTAIN
Logout
UNIT EQUIP STATE
SYSTEM TYPE
SET DP TYPE
SET E1 CLOCK
E1 SERVICE STATE
E1 FRAME FORMAT
E1 BER THRESHOLD
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HDSL BER THRSHLD
HDSL SNR THRSHLD
HDSL PA THRSHLD
LOOPBACK TIMEOUT
BLOCK TIME SLOT
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EXECUTE ACO
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Rmt Netwrk
Local Customer
Rmt Customer

4.2 Operation, Configuration, Administration and Maintenance

All DT-2000F/NF can be easily operated, configured or monitored through the LCD display by using the keyboard. General functions of each key are described as following:

4.2.1. STATUS

The DT-2000F/NF operator can view the contents of the status on the LCD display by pressing "Enter" from STATUS menu followed by →, ← keys to view the status.

Table 4-1 STATUS messages and descriptions

Message	Description
Equip State Equipped Unequipped	Shows the Unit Equip State of HDSL Config
Alarms YES NO	Shows if alarm has been detected
Service OOS IS	Out Of Service In Service
Selftest NO YES	. Shows if HDSL Selftest has been activated
DP TYPE G.703-75 G.703-120 V.35 RS530 Router	Shows the Data Port type. eg. G.703 interface using 75 ohm unbalanced BNC
E1 LOS (C/R) YES NO	(E1 interface only) Shows if there is any Lost Of Signal on both Central and Remote sites
Frame Unframe Frame+CRC Frame	Shows the E1 Frame Format is 2048Kbps unstructured digital leased line.(D2048U) Shows the E1 Frame is 2048Kbps structured digital leased line.(D2048S) with CRC Shows the E1 Frame is 2048Kbps structured digital leased line without CRC.
Net LPBK (C/R) NO YES	Shows that if local network loopback for both central and remote sites have been activated

Message	Description
Cust LPBK (C/R)	
NO	Shows that if customer loopback for both central and remote sites have been activated.
YES	
Loop REV	Shows if Loop1 and Loop2 pairs are crossed.
NO	
YES	
HDSL Status	
Ln LOSW (C/R)	
NO	Shows if any Lost Of Sync. Word in both central and remote sites.
YES	
Ln T/R Rev	.
NO	Shows if Loop(n) Tip and Ring are reverse.
YES	Shows if Loop(n) Tip and Ring are reverse
Ln CRC Err (C/R)	
NO	Shows if the Circular Redundant Check value is correct on both central and remote sites.
YES	
Ln SNR Bad (C/R)	
NO	Shows the condition of Signal-to-Noise
YES	Ratio on both central and remote sites.
Ln BER Bad (C/R)	
NO	Shows the condition of Bit Error Rates on both central and remote sites.
YES	
Ln PA Bad (C/R)	
NO	Shows the condition of Pulse Attenuation on both central and remote sites.
YES	
Ln PA (C/R)	
NO	Shows the value (dB) of Pulse Attenuation on both central and remote sites.
YES	
Ln SNR (C/R)	
NO	Shows the value (dB) of Signal-to-Noise
YES	Ratio on both central and remote sites.
Battery	
GOOD	Shows the condition of the battery on each device.
BAD	

4.2.2. SYSTEM CONFIG

For SYS CONFIG, there are 2 sub-menus, EDIT DATE and EDIT TIME.

- **EDIT DATE**
  Press the "Enter" button to enter the current date. The format is mm/dd/yyyy. Use right→, left ← arrow keys to select the current month, and press "Enter" to go to the day column. Use two arrow keys to select the desirable day and again press "Enter" to edit the current year. Once the year has been selected and pressed "Enter", the LCD display shows "Has Been Done!". Now, press the "Exit" button to complete the setup of the date and go back to the upper menu.

- **EDIT TIME**
  Use right →, left ← arrow keys to select this sub-menu under SYS CONFIG. Once selected, LCD display shows the current time first. Press "Enter" key again to edit the current time. The time format is hh/mm/ss. Use →, ← keys to select the hour in 24-hour mode, then press "Enter" to go to the minute column. Again, use 2 arrow keys to adjust the minute and press "Enter" button to the second column. After these 3 time formats have been correctly edited, press "Enter", the LCD display shows "Has Been Done!", and then the current time starts to run and shows on the LCD display. Press "Exit" button to go back to the upper menu or "HOME" to the top menu.

4.2.3. SYSTEM ADMINISTRATON

FRONT PANEL LOCK

On After “Reset” or “Logout”, user will be asked to select “user ID” and enter the password.

Off for normal operation

SET USER ACCOUNT

- SET USER ACCOUNT
- USER: n (n=1~5)

USER: n

USER ID

PASSWORD

PRIVILEGE LEVEL (from1~5)

(Level 5 has the highest privilege.)

EXPIRATION DAYS (from 001~999 days)

NUMBER DAY LEFT

Display the number of days left for specific user.

SET SECURITY Define the privilege level for each user to have the privilege to access or setup the following events.

- CLR ALARM LOG (Privi Level: 1~5 for all settings)
- HDSL CONFIG
- SET ALARM LEVEL
- SET USER ACCOUNT
- EDIT SECURITY
- TID/DATE/TIME
- RESET/LED TEST
- LOOPBACK CTRL
- SELFTEST
- EXECUTE ACO
- E1 PM
- HDSL PM

4.2.4. ALARM

The alarm function is to set the alarm notification to alert the operator. There are 2 sub-menus under the ALARM mode.

❖ **ACTIVE ALARMS**

If there is no alarm, the LCD display will show "No Alarms". Otherwise, see table for Alarm descriptions.

Table 4-2 ALARM messages and descriptions

HDSL ALARMS, *EQ-LIU#*	
DISPLAY	DESCRIPTION
LOOP-REV	Pairs crossed at RT side
T/R-REVERSAL	Transmitter Tip/Ring or Receiver Tip/Ring reversed
BOARD FAIL	CO or RT Board fail

HDSL ALARMS, *LP*	
DISPLAY	DESCRIPTION
T-BER	loop BER threshold crossed
T-SNR	loop SNR threshold crossed
T-PA	Pulse Attenuation threshold crossed
LOSW DEFECT	Loss of Sync Word defect
LOSW FAILURE	Loss of Sync Word failure
COFA	Change of Frame Alignment
LOS DEFECT	Loss of Signal defect
LOS FAILURE	Loss of Signal Failure
RECOVERY	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-1DAY	1-day FCP Threshold Cross Alert
T-CVP-1DAY	1-day CVP Threshold Cross Alert
T-ESP-1DAY	1-day ESP Threshold Cross Alert
T-SESP-1DAY	1-day SESP Threshold Cross Alert
T-SEFSP-1DAY	1-day SEFSP Threshold Cross Alert

Note: Please refer to **Table 4-4** for HDSL **Performance Monitor Type Descriptions.**

E1 ALARMS, *E1*	
DISPLAY	DESCRIPTION
T-BER	E1 BER threshold crossed
COFA	E1 Change of Frame Alignment
SEF DEFECT	E1 Severely Error Framing defect
LOS DEFECT	E1 loss of Signal defect
AIS DEFECT	Alarm Indication Signal defect
LOF FAILURE	E1 Loss of Frame failure
LOS FAILURE	E1 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-SESP-1DAY	1-day SESP Threshold Cross Alert
T-SEFSP-1DAY	1-day SEFSP Threshold Cross Alert
T-ESP-1DAY	1-day ESP Threshold Cross Alert

Note: Please refers to **Table 4-5** for **E1 Performance Monitor Type Descriptions**.

❖ SET ALARM LEVEL

URGENT	Notify all “Urgent” alarms when they occur.
DISABLE	Disable all alarms notifications.
EVENT	Showing all the events.
NON-URGENT	Notify all alarms when they occur.

4.2.5. HDSL CONFIG

Table 4-3 HDSL CONFIG items and descriptions

UNIT EQUIP STATE	
EQUIPPED	When set to be equipped, users are allowed to set the Configuration.
UNEQUIPPED	When set to be unequipped, users are only allowed to monitor the status.
SYSTEM TYPE	
E1-R	Be Remote site with full E1 function.
E1-C	Be Central Office site with full E1 function.
E1-CF	Fractional E1 central Office site.
E1-RF	Fractional E1 remote site.
SET E1 CLOCK	
CODIRECTIONAL (For E1-C only)	Set the E1 clock to be Codirectional or
E1-C NETWORK	Central Office site Network or
E1-C INTERNAL	Central Office site Internal.
E1 SERVICE STATE	
OOS	Select to Out-Of-Service to de-activate all the E1 alarm detection.
IS	Select to In-Service to activate the E1 alarm detection.
E1 FRAME FORMAT	
UNFRAME	Set the E1 Frame Format to 2048 kbps unstructured digital leased line.(D2048U)
FRAME+CRC	Set the E1 Frame to 2048 kbps structured digital leased line.(D2048S) with CRC.
FRAME	Set the E1 Frame to 2048 kbps structured digital leased line without CRC.
E1 BER THRESHOLD	
10^-3 ~ 10^-9	Set the E1 BER Threshold ranging from 10^-3 ~ 10^-9 Default setting is 10^-7
HDSL SERVICE	
OOS	Select to Out-Of-Service to de-activate the HDSL alarm detection.
IS	Select to In-Service to activate the HDSL alarm detection.

HDSL BER THERSHOLD 10^-4 ~ 10^-9	Set the HDSL BER Threshold ranging from 10^-4 ~ 10^-9 Default setting is 10^-7
HDSL SNR THRSHLD -128 ~ 127 dB	Set the HDSL SNR Threshold ranging from -128dB to +127dB. Default setting is +24dB.
HDSL PA THRSHLD -128 ~ 127 dB	Set the HDSL Pulse Attenuation Threshold ranging from -128dB to +127dB. Default setting is +20dB.
LOOPBACK TIMEOUT FOREVER 1 MIN ~ 240 MIN	Set to no time limitation for loopback timeout. Set the loopback timeout ranging from 1 min to 240 mins.
TIME SLOT GROUP (For E1-C only) ODD/EVEN CONTIGUOUS	Select the type of time slot transmission to be ODD/EVEN in two loops or CONTIGIOUS in one loop.
BLOCK TIME SLOT (For E1-CF only) Time Slot from 1~ 31	Use arrow keys to select for Block.(Prohibit Time Slot) Press Enter to go to next time slot.
NULL DATA (For DT-2000F/NF) 0Xff 0x7F	Selection for inserting data to the blocked time slot as FF or 7F when there is no data presents.
ASSIGN TIME SLOT (For E1-CF only) Time Slot from 1~ 31	Select DS0 priority. Use arrow keys to assign time slot. Enable showing "E" or disable showcing "•"; Press Enter to go to next time slot.

Preferred Data:

- When 1 loop fails, those time slots assigned as preferred data on that loop will switch to the second loop.
- Maximum of 17 time slots can be assigned as preferred data.
- If total time slots on 2 loops are equal or less than 17, then when 1 loop fails, those time slots on that loop will automatically switch to the other loop.

4.2.6. PERFORMANCE MONITOR

HDSL PM CONFIG Use this function to assign the performance monitoring thresholds for DT-2000 series. There are two main types of Performance Monitoring Config, 15 minutes and Daily. Also provides:

CLR HDSL PM Count To clear all HDSL PM report from the database.

HDSL PM REPORT

- 15 Minutes Performance Monitoring Reports
  This report displays the PM data for the current 15-minute period and previous thirty-two 15-minute periods.
  By pressing "Enter" to view the previous period of PM data and "EXIT" to go forward. Using →, ← keys to select the Monitor types.
- Daily Performance Monitoring Report
  This report displays the PM data for the current day and the previous seven days. To view the previous daily reports, press "ENTER" and use →, ← to select the daily PM type.

Table 4-4 HDSL Monitor Type Descriptions

MON TYPE	LOCATION	DESCRIPTION
FCP FCP-FE	Near End Far End	Failure Count Path : Count of Loss Of Sync Word (LOSW) failures on the HDSL loop.
CVP CVP-FE	Near End Far End	Code Violation Path : Count of CRC errors on the HDSL loop.
ESP ESP-FE	Near End Far End	Erred Second Path : A second in which one or more CRC errors occurred on the HDSL loop
SESP SESP-FE	Near End Far End	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 SEFSP-FE	Near End Far End	Severely Erred Framing Second Path : A second in which one or more LOSW defects occurred on the HDSL loop.
PA-H PA-H-FE	Near End Far End	Pulse Attenuation-High Path : Highest Pulse Attenuation value detected on the HDSL loop within the interval.
SNR-L SNR-L-FE	Near End Far End	Signal-to-Noise Ratio-Low Path : Lowest Signal-to-Noise Ratio detected on the HDSL loop within the interval.

*Refer to table 4-2 for monitor type descriptions.

E1 PM CONFIG

Use this function to assign the E1 performance monitoring thresholds for DT-2000N. There are also two main types of E1 Performance Monitoring Config: 15 minutes and Daily.

CLR E1 PM Count To clear all E1 PM report from the database.

E1 PM REPORT

- 15 Minutes Performance Monitoring Reports
  This report displays the PM data for the current 15-minute period and previous thirty-two 15-minute periods.
  By pressing "Enter" to view the previous period of PM data and "EXIT" to go forward. Using →, ← keys to select the Monitor types.
- Daily Performance Monitoring Report
  This report displays the PM data for the current day and the previous seven days.
  To view the previous daily reports, press "ENTER" and use →, ← to select the daily PM type.

Table 4-5 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.
SASP	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.

MON TYPE	LOCATION	DESCRIPTION
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 BPVs., 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.

*Refer to table 4-2 for E1 monitor type descriptions.

4.2.7. SYSTEM MAINTAIN

RESET/LED TEST

RESET and LED TEST commands perform software, hardware reset initialization, and test the LEDs on selected modules, respectively. Reset the device 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, all LEDs perform a lamp test.

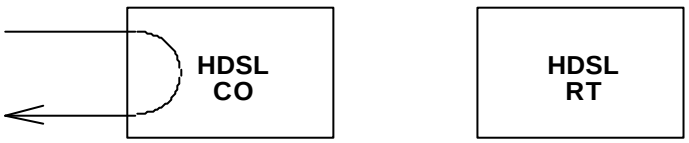
Off	To disable the RESET/LED TEST.
LED Test	To enable the LED test on selected module.
Local Soft Rst	To enable Local Software Reset.
Local Hard Rst	To enable Local Hardware Reset.

E1 LOOPBACK (available at CO site only)

E1 LOOPBACK / FRAC. E1 LOOPBK

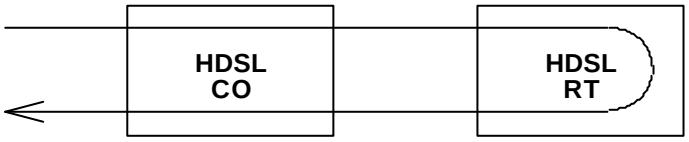
Off — Disable E1 loopback test for system maintenance.
Following are 4 types of E1 loopback test.

Local Network



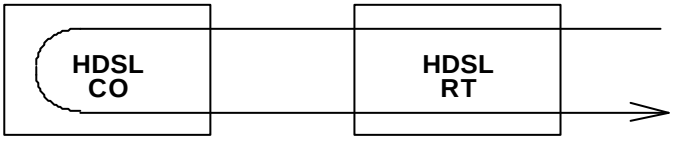
Network Near End Loopback

Rmt Network
/ Rmt Pay Load



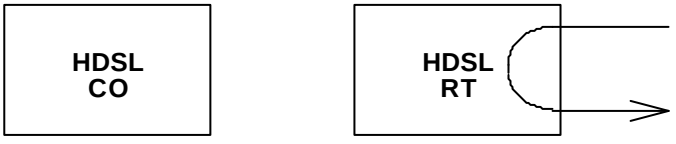
Network Far End Loopback

Local Customer
(E1-C only)



Customer Loopback

Rmt Customer
/ Rmt Data Port



Customer Far End Loopback

DISPLAY REMOTE Select to display the remote LCD status for 5 seconds.

Has Been Done! Once selected, LCD display shows “Has Been Done ! ”.

LOOP SELFTEST Use this command to execute Loop Selftest. If there is no error occurred, there will be no result recorded. This command is available only on the CO unit and when the HDSL startup procedure has been finished successfully. The Loop Selftest examine the board equipment, local loop and facility.

On executing this command, DT-2000NF starts the following procedures:

- Both CO and RT units will perform a reset.
- Both units then start the self-test procedure with the STAT LED on DT-2000NF being yellow color. (For DT-2000F, there is only TST LED being ON)
- It then performs the boot up diagnosis.
- Tests the E1 interface. If the E1 interface pass the test, the E1 LED will show green color, otherwise red.
- Starts up the HDSL loop. During HDSL loop start up procedure, the Loop LEDs (L1 and L2 LED) flashes until the link is active.
- Sends and receives the QRSS pattern to evaluate the loop performance.
- The evaluation lasts about 5 minutes.
- For DT-2000NF card, if the HDSL unit passes all self-test items, the STAT LED displays green color, otherwise red color. And the test result will be display on the LPBK LED: green color if self-test passed, otherwise it will be red color.
- For DT-2000F desktop model, press the Left, Enter and Right keys simultaneously can get into DEBUG mode, the QRSS test and its result is showed in debug mode. (Since software version V2.02 on)
- Both units then automatically switch back to the normal operation after few seconds.

On Select to perform the Loop Self-test.

Off

EXECUTE ACO The ACO command is provided for operator to confirm the detection of an active alarm.

Are You Sure? Once selected, the Alarm-Cut-Off mode will be activated.

Has Been Done! The LCD display shows " Has Been Done ! ".

4.2.8. LOGOUT

When select, you will be asked “Are You Sure?” Press “ENTER” to LOGOUT the current user, the operator will be able to login for another user with different privilege level to monitor or maintain the system.

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APPENDIX

A. Ordering Information

Model/Module	Description	Part No.
DT-2000	HDSL, 2 loops Full E1 HDSL; Standalone Basic Unit with G.703 Interface module	000069-0001
DT-2000F	HDSL, 2 loops Full & Fractional E1 HDSL; Standalone Basic Unit without DTE module; Using AC Power Source	000071-0001
DT-2000FP	Using Loop Power	000071-0004
DT-2000FD	Using DC power source	000071-0003
/R530-3A	RS-530; Female	000065-0126
/V35-3A	V.35, Female	000065-0127
/V36-3A	V.36, Female (R530-3A with V.36 adapter cable)	000065-0128
/X21-3A	V.21, Female (R530-3A with X.21 adapter cable)	000065-0129
/G703B-3	G.703 2M, Balance	000065-0121
/G703U-3	G.703 2M, Unbalance	000065-0122
DT-2000N	HDSL, 2 loops Full E1 HDSL card for Super Shelf (NMC-32), with G.703 Interface module	000069-0002
DT-2000NF1	2Mbps rack mounted modem card with G.703 interface module and optional N x 64Kbps data port interface, provide wetting current(sealing current)	000071-0002
DT-2000NF2	Provide Loop Power	000071-0005
/V35-1A	V.35 module	000046-0033
/R530-1	RS-530 module	000046-0015
/V36-1	R530-1 module with V.36 adapter cable	000046-0022
/X21-1	R530-1 module with X.21 adapter cable	000046-0017
/Router	Router module	000077-0002
TRS-32	16 slot rack mounted shelf	000053-0004
/TB-32	TRS-32 rear panel module board (option) Terminal block for line connection	000053-0002
/TB-32LP	TRS-32 rear panel module board (option) Terminal block for line connection and loop power input (DC –48V)	000053-0012
/PJ-32A	TRS 32 rear panel module board (option) RJ45 for line connection	000053-0007
/CA50	50 pin cable for standard centric connector	000053-0003
NMC-32	Network Management Controller	000055-0002
PW-132A	AC power supply for rack	000057-0001
PW-132D	DC power supply for rack	000057-0002

*For easier configure of DT-2000/F/N, refer to Full E1 configuration section.

For easier configure of DT-2000F/NF, refer to Fractional E1 configuration section.

B. Interface Specifications

ISO 2110 PIN No.	RS-232 (V.24)	EIA 530	V.35	X.21	Electrical Spec.	Signal Direction	Circuit Description
1		-	-	-			Frame Ground
2 TD	103	103a, BA (A)	103a	103a	V.11	DCE ◀ DTE	Transmitted Data A
3 RD	104	104a, BB (A)	104a	104a	V.11	DCE ▶ DTE	Received Data A
4 RTS	105	105a, CA (A)	105	105	V.11	DCE ◀ DTE	Request to Send A
5 CTS	106	106a, CB (A)	106		V.11	DCE ▶ DTE	Clear to Send A
6 DSR	107	107a, CC	107		V.10	DCE ▶ DTE	DCE Ready
7 SG	102	102, AB	102	102			Signal Common
8 DCD	109	109a, CF (A)	109	109a	V.11	DCE ▶ DTE	Received Line Signal Detector A
9		115b, DD (B)	115b		V.11	DCE ▶ DTE	DCE Receiver Signal Element Timing B
10		109b, CF (B)		109b	V.11	DCE ▶ DTE	Received Line Signal Detector B
11		113b, DA (B)	113b		V.11	DCE ◀ DTE	DTE Transmit Signal Element Timing B
12		114b, DB (B)	114b	114b	V.11	DCE ▶ DTE	DCE Transmit Signal Element Timing B
13		106b, CB (B)			V.11	DCE ▶ DTE	Clear to Send B
14		103b, BA (B)	103b	103b	V.11	DCE ◀ DTE	Transmitted Data B
15 TC	114	114a, DB (A)	114a	114a	V.11	DCE ▶ DTE	DCE Transmit Signal Element Timing A
16		104b, BB (B)	104b	104b	V.11	DCE ▶ DTE	Received Data B
17 RC	115	115a, DD (A)	115a		V.11	DCE ▶ DTE	DCE Receiver Signal Element Timing A
18		LL			V.10	DCE ◀ DTE	Local Loop-back
19		105b, CA (B)		105b	V.11	DCE ◀ DTE	Request to Send B
20 DTR	108	108a, CD	108		V.10	DCE ◀ DTE	DTE Ready
21		RL			V.10	DCE ◀ DTE	Remote Loop-back
22		107b, CE			V.10	DCE ▶ DTE	Ring Indicator
23		108b, AC				DCE ◀ DTE	Signal Common
24 EXC	113	113a, DA (A)	113a		V.11	DCE ◀ DTE	DTE Transmit Signal Element Timing A
25		TM			V.10	DCE ▶ DTE	Test Mode