
ADTRAN®

# Total Access 3000/3010
# NTU-8 Single Fiber Quad E1
# Installation and Maintenance Practice

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## Revision History

| Revision | Date | Description |
|---|---|---|
| A | January 2008 | Initial release |

## Conventions

The following typographical conventions are used in this document:

This font indicates a cross-reference link.

This font indicates screen menus, fields, and parameters.

THIS FONT indicates keyboard keys (ENTER, ESC, ALT). Keys that are to be pressed simultaneously are shown with a plus sign (ALT+X indicates that the ALT key and X key should be pressed at the same time).

*This font* indicates references to other documentation and is also used for emphasis.

`This font` indicates on-screen messages and prompts.

**`This font`** indicates text to be typed exactly as shown.

**This font** indicates silk-screen labels or other system label items.

**This font** is used for strong emphasis.

**NOTE**

Notes inform the user of additional, but essential, information or features.

**CAUTION**

Cautions inform the user of potential damage, malfunction, or disruption to equipment, software, or environment.

**WARNING**

Warnings inform the user of potential bodily pain, injury, or death.

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# NTU-8 Single Fiber Quad E1

## GENERAL

This document is an installation and maintenance guide for the Total Access® 3000/3010 NTU-8 Single Fiber Quad E1 with Ethernet and Performance Monitoring (NTU-8F). Figure 1 illustrates the NTU-8F (P/N 1182301E1) front panel.


**Figure 1. NTU-8F Front Panel**

## DESCRIPTION

The NTU-8F is a standalone remote network terminal unit that provides for transport four, short-haul E1 (G.703) channels, and a 10Base-T or 100Base-T (10/100) Ethernet interface that can be multiplexed over a single-mode fiber optic cable to a Total Access 3000/3010 LTU-8 Single Fiber Quad E1 with Ethernet and Performance Monitoring (P/N 1182300E1). The LTU-8 is located in the Central Office. The NTU-8F is provisionable remotely from the LTU-8. Provisioning can be viewed locally and flash upgrades can be initiated by using a VT100 craft interface.

### Features

The basic features of the Total Access 3000/3010 NTU-8F include the following:

- E1 Status for all channels
- Loopback Status
- Optical port status

- Operation over extended temperature range of –5°C to +55°C
- Optical interface consisting of a single mode transceiver module comprised of a single fiber transmitter and an SC connector
- Optical interface port support for flat SC-type optical connectors
- Single fiber optical interface
- Operating wavelengths of 1310 nm and 1550 nm for both receiver and transmitter

## Compliance

The NTU-8F is compliant with UL 60950 and IEC-60825 Class 1. The NTU-8F is also compliant with 21CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001. The NTU-8F is intended for use in restricted access locations only. Table 1 shows the compliance codes for the NTU-8F.

**Table 1. Compliance Codes**

| Code | Input | Output |
|---|---|---|
| Power Code (PC) | F | C |
| Telecommunication Code (TC) | – | – |
| Installation Code (IC) | A | – |

The G.703 interfaces for the NTU-8 Single Fiber Quad E1 are to be connected to intra-building wiring only.

The LTU-8 is designed to meet the following environmental classes:

- ETSI EN 300 019-1-1 "Classification of environmental conditions; Storage," Class 019-1-1, Class 1.2
- ETSI EN 300 019-1-2 "Classification of environmental conditions; Transportation," Class 019-1-2, Class 1.3
- ETSI EN 300 019-1-3 "Classification of environmental conditions; Stationary Use at Weather-Protected Locations," Class 019-1-3, Class 3.3

This equipment is designed to function without degradation during exposure to all test severities per Class 019-1-3 or 4, Class 3.3

- ETS 300 753 "Acoustic Noise Emitted by Telecommunications Equipment: Declared noise emissions in accordance with ISO 9296 and ISO 7779:
  - The Operating and Idling Sound Power ($L_{WAd}$) and the Operating and Idling sound pressure ($L_{pAm}$) are not applicable for this equipment, since this equipment does not generate noise.

# INSTALLATION


**CAUTION**

Electrostatic Discharge (ESD) can damage electronic modules. When handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.

After unpacking the NTU-8F, inspect it for damage. If damage has occurred, file a claim with the carrier then contact ADTRAN Customer Service. Refer to "Appendix A, Warranty" for further information. If possible, keep the original shipping container for returning the NTU-8F for repair or for verification of shipping damage.

## Shipping Contents

The contents include the following items:

- NTU-8F
- *Total Access 3000/3010 NTU-8 Single Fiber Quad E1 with Ethernet and Performance Monitoring Compliance Document* (P/N 61182301E1-17)
- *Total Access 3000/3010 NTU-8 Single Fiber Quad E1 with Ethernet and Performance Monitoring Job Aid* (P/N 61182301E1-22)

## Power Interface

The power for the NTU-8F can be supplied through a –48 VDC supply connected to the backplane of the NTU-8F. The NTU-8F operates within a voltage range of –42 VDC to –56 VDC.

## Loop Connections

The E1 loop connections are made through four RJ-45 type connectors. For each connector, transmit tip and ring are on pins 5 and 4, and receive tip and ring are on pins 2 and 1, respectively. Single-mode fiber is connected to the SC connector located on the back panel of the module.

## Physical Installation

To install the NTU-8F, perform the following steps:

1. Place the unit in a location where a DC power source is available. This unit operates within a voltage range of –24 VDC to –48 VDC. If a wall-mount installation is required, attach the supplied hangers to the unit.
2. Connect power to the NTU-8F housing. Power is connected to the NTU-8F by connecting the plus (+), minus (–), and ground wires to a three-position terminal block located at the right of the backplane (see Figure 2).

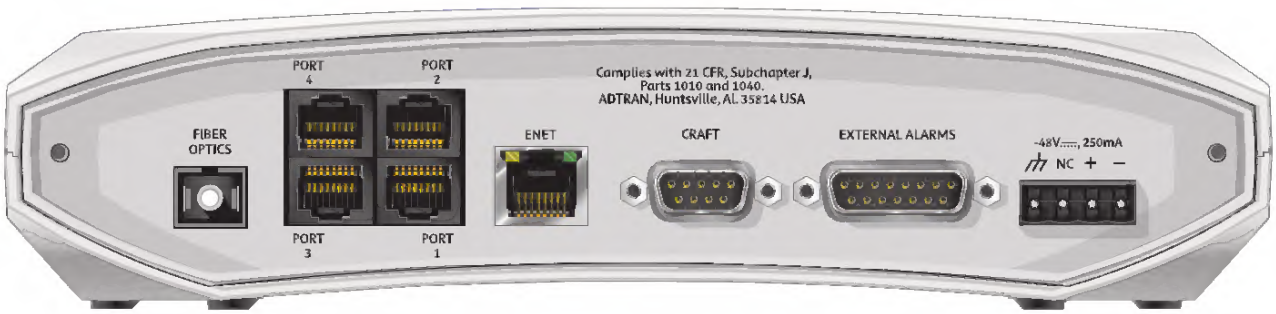


**Figure 2. NTU-8F Rear Panel**

When the NTU-8F first powers up, it runs power up self-tests. Once the power up self-test is complete, the status LEDs will reflect the true state of the hardware.

## Front Panel LEDs

The NTU-8F provides front panel LEDs to display status information. The NTU-8F LEDs and status descriptions are shown in Table 2.

**Table 2. Front Panel LEDs**

| Label | Status | | Description |
|---|---|---|---|
| PWR | ○ | Off | Power supply or fuse failure |
| | ● | Green | In Service |
| | ● | Yellow | Out of Service-Unassigned or Maintenance |
| OPT | ○ | Off | Unit is Out of Service-Unassigned |
| | ● | Green | Unit is active and optical interface is synchronized |
| | ● | Red | Unit is active, but Rx loss on the optical interface |
| PORT 1-4 | ○ | Off | Port is provisioned Out of Service-Unassigned |
| | ● | Green | Port is provisioned and functioning properly |
| | ● | Yellow | Port is in loopback or a BERT is active |
| | ● | Red | Port is active with an active major alarm condition |

**Table 2. Front Panel LEDs (Continued)**

| Label | Status | | Description |
|---|---|---|---|
| LBK | ○ | Off | No loopback on selected channel |
| | ● | Green | Selected G.703 E1 port in local loopback |
| | ● | Yellow | Selected G.703 E1 port in remote loopback (PN127 or V.54) |
| | ● | Red | Selected G.703 E1 port in local or remote loopback (PN127 or V.54), when no port is selected, this becomes an OR'd summation of all loopbacks on all ports |
| BERT | ○ | Off | Selected G.703 E1 port BERT not active |
| | ● | Green | Selected G.703 E1 port BER, with no errors |
| | ● | Yellow | Selected G.703 E1 port BERT active with errors |
| | ● | Red | Selected G.703 E1 port active, but not in sync |

## Rear Panel Connections

Connectors on the rear panel (Table 3) provide for the following connections.

**Table 3. Rear Panel Connectors**

| Connector | Type | Function |
|---|---|---|
| Fiber Optic | SC-type Optical | Connect single-mode fiber (1310 nm transmit, 1510 nm receive) |
| Port 1-4 | RJ-45 | Connect four G.703 E1s |
| ENET | CAT 5 Modular Jack | Connect 10/100 Ethernet |
| Craft | DB-8 (RS-232) | used to view menus and upgrade the NTU-8F; No provisioning or testing can be initiated |
| External Alarms | DB-15 | Connect to six external alarm inputs |
| –48V, 250 mA | 4-pin Terminal Block | Connect to power (NTU-8F has a detachable mating terminal screw block) |

Figure 3 displays the NTU-8F Rear Panel connections.

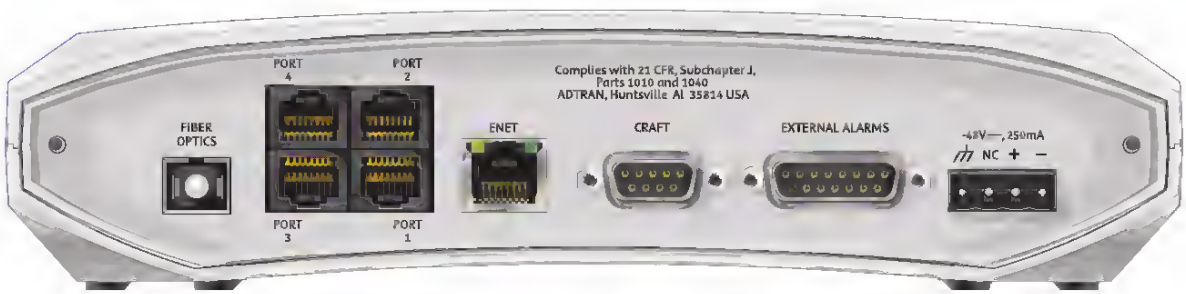


**Figure 3. NTU-8F Rear Panel Connections**

# PROVISIONING

The NTU-8F is automatically configured to match the LTU-8 settings and does not require local provisioning. Provisioning for the LTU-8 is via the Total Access 3000/3010 System Controller Unit (SCU). The SCU initiates and controls the transfer of commands and data to and from the LTU-8. The LTU-8 generates all menu items for both the LTU-8 and the NTU-8F. The LTU-8 retains provisioning data in a nonvolatile memory device in the event of power loss.

Viewing of all provisionable settings, status, and Performance Monitoring menus are supported from the NTU-8F local craft port, labeled **CRAFT**, but changes cannot be made. The craft port is a DB-9 connector that supplies an RS-232 interface for connection to a controlling terminal. The supported terminal type is VT100 or compatible and is set for the following:

- 38400 bps
- 8-data bits
- no parity
- no flow control
- 1-stop bit

Y-Modem flash upgrade is password protected from the NTU-8F. The default password is "password," which can be changed from the NTU-8F.

## Provisioning Defaults

On initial installation, the NTU-8F is set to factory default provisioning options. Table 4 list available options, with the default settings shown in **bold** type.

**Table 4. Provisioning Defaults**

| NTU-8F | Settings | Defaults |
|---|---|---|
| Card Service State | In Service,<br>Out of Service-Maintenance,<br>Out of Service Unassigned | Out of Service-Maintenance |
| NTU Push Buttons | Disabled;<br>Enabled | Disabled |
| External Alarms | Disabled;<br>Enabled | Disabled |
| Change NTU Firmware Upgrade Password | password | password |
| Port Service State | In Service,<br>Out of Service-Maintenance,<br>Out of Service-Unassigned | Out of Service-Maintenance |
| E1 Frame Format | FAS,<br>FAS+CRC4 | FAS |
| E1 Data Rate | 0h - FFh | FFh |
| Timeslot Idle Pattern | 00h - FFh | FFh |

**Table 4. Provisioning Defaults (Continued)**

| NTU-8F | Settings | Defaults |
|---|---|---|
| LT Clock Source | Internal Clock,<br>G.703 Rx Clock,<br>Fiber Rx Clock | G.703 Rx Clock |
| NT Clock Source | Internal Clock,<br>G.703 Rx Clock,<br>Fiber Rx Clock | Fiber Rx Clock |
| ISDN-PRA V3 | Disabled,<br>Enabled | Disabled |
| LTU Ethernet Service State | In Service,<br>Out of Service-Maintenance,<br>Out of Service-Unassigned | Out of Service-Maintenance |
| NTU Ethernet Service State | In Service,<br>Out of Service-Maintenance,<br>Out of Service-Unassigned | Out of Service-Maintenance |
| Ethernet Auto Negotiation | Disabled;<br>Enabled | Enabled |
| Ethernet Duplex Mode | Half Duplex,<br>Full Duplex | Full Duplex |
| Ethernet Speed | 10 Mbps,<br>100 Mbps | 100 Mbps |
| Fiber PM Thresholds | Disabled | Disabled |
| E1 PM Threshold - ES | Disabled | Disabled |

## OPERATION

The NTU-8F provides a platform to exchange data between four G.703 interfaces and an optical fiber interface. The customer data connection is via the RJ-45 connector on the unit. An optical fiber interface is provided for communication with the loop. The NTU-8F operates with an LTU-8 at the other end of the fiber optic cable.

## FRONT PANEL PUSHBUTTON

Pushbuttons on the front panel (Table 5) provide the following functionality (when the option is enabled on the LTU-8).

**Table 5. Front panel Pushbuttons**

| Pushbutton | Function |
|---|---|
| **Port Select** | Press the **PORT SELECT** button to select the active port. Selection choices cycle through the provisioned G.703 E1 ports in following order:<br>No Port, Port 1, Port 2, Port 3, and Port 4 |
| **Local Loop/ERR INJ** | With a port selected, and a Bit Error Rate Test (BERT) is not in progress, press the **LOCAL LOOP/ERR INJ** button to either initiate or terminate a local loop on the selected port.<br>If a BERT is in progress, press the button to inject a single bit error. |
| **Remote Loop** | With a port selected, press the **REMOTE LOOP** button to place or remove a remote loop on the selected port's single data service. This action sends respective inband loop-up or loop-down patterns to the far end (in the associated data service timeslots). |
| **BERT** | With a port selected, and no local loops, press the **BERT** button to start or stop a BERT on the selected port. |

# SPECIFICATIONS

Specifications for the NTU-8F are detailed in Table 6.

**Table 6. NTU-8F Specifications**

| Specification | Description |
|---|---|
| **Environmental** | |
| Operating Temperature: | –5°C to +55°C |
| Storage Temperature: | –40°C to +85°C |
| Relative Humidity: | Up to 95% noncondensing |
| **Physical** | |
| Dimensions: | Height: 1.8 inches<br>Width: 8.0 inches<br>Depth: 9.0 inches |
| Weight: | 2.5 pound |
| **Power** | |
| Input Voltage Range: | –42 VDC to –56 VDC inputs |
| Maximum Current Draw: | 90 mA at –48 VDC |
| Maximum Power Dissipation: | 4.32 watts |
| **Optical** | |
| Fiber Type: | Single Mode |
| Wave length: | 1310 nm receive and 1550 nm transmit |
| Optical Budget: | 17 ±1 dB |
| Transmit Level: | –14 ±1 dB (worst case) |
| Receive Level: | –31 ±1 dB (worst case) |
| Connector: | Single SC connector |
| **Connectors** | |
| E1 Interface: | RJ-45 |
| Fiber: | Flat SC adapter |
| **Part Number** | |
| NTU-8 Single Fiber Quad E1: | 1182301E1 |
| **Compliance** | |
| Agency Approval: | UL 60950 |

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# Appendix A
# Warranty

## WARRANTY AND CUSTOMER SERVICE

ADTRAN will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found at www.adtran.com/warranty.

Refer to the following subsections for sales, support, Customer and Product Service (CAPS) requests, or further information.

### ADTRAN Sales

Pricing/Availability:

800-827-0807

### ADTRAN Technical Support

Pre-Sales Applications/Post-Sales Technical Assistance:

800-726-8663

Standard hours: Monday - Friday, 7 a.m. - 7 p.m. CST
Emergency hours: 7 days/week, 24 hours/day

### ADTRAN Repair/CAPS

Return for Repair/Upgrade:

(256) 963-8722

### Repair and Return Address

Contact CAPS prior to returning equipment to ADTRAN.

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Carrier Networks Division
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