HXU-360-L2 DS3 Multiplexer Unit
Quick Installation Guide

Overview

The ADC® HXU-360-L2 asynchronous multiplexer card is the multiplexing component of the Wideband System 3190 and ThinMux chassis. The HXU-360 multiplexes 28 T1 lines or 21 E1 lines (or a mixed combination of T1 or E1 line groups) into a single DS3 data channel using 6.747 standards.

When two HXU-360s reside in a Wideband System 3190 (HMS-358) or ThinMux (ACE-COM or THMX-DS3) chassis, one board functions as the active board, and the other is a standby in the event of failure.

Features

- **Front-panel status indicators**, including office alarms (Major, Minor, Far-End, and Critical)
- **Front-panel RS-232 Craft port** for direct connection to a maintenance terminal
- Front-panel test jacks
- Backplane test interface
- **Digital Access Cross-Connect Switching (DACS)** at the DS1 level
- Complete software provisioning
- **Support for T1 and E1** line interfaces
- **Advanced management** and TL1 support in Wideband System 3190 via the HMU-319
- Password protection

Specifications

Table 1. HXU-360 List 1 Specifications

Operating Temperature	-40°F to +149°F (-40°C to +65°C)
Operating Humidity	5% to 95%, non-condensing
Input Voltage Range	-42.5 Vdc to -57.5 Vdc
Power Consumption	12W typical, 15W maximum
Power Input Source	Redundant Battery A/Battery B sources in the Wideband System 3190 or ThinMux
DS3 Input Level	35mV (peak) and 1V (peak)
DS3 Output Level	0.36V to 0.85V (meets TR-TSY-000499 requirements)
DS3 Interface Line Rate	44.736 Mbps ±20 ppm
DS3 Interface Line Coding	Bipolar with 3 Zero Substitution (B3ZS)
DS1 Input Level	+1.5 to -7.5dB DSX
DS1 Output Level	3.0V ±0.6V
T1 Interface Line Rate	1.544 Mb/s ±50 ppm output
T1 Interface Line Coding	Alternate Mark Inversion (AMI) or Bipolar with 8 Zero Substitution (B8ZS)

Step 1: Installation

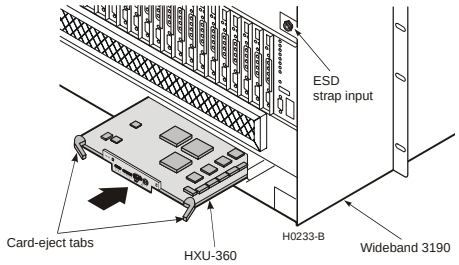


Figure 1. Installing an HXU-360 Card (Wideband System 3190 Shown)

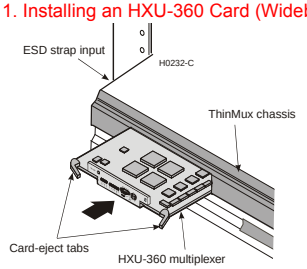


Figure 2. Installing an HXU-360 Card (ThinMux Chassis Shown)

IMPORTANT

Do not mix different multiplexer types (357/358/360) in a system. If you are installing an HXU-360 in a Wideband System 3190 (Figure 1) or ThinMux chassis(Figure 2) that has a different HXU-360 multiplexer List number or Software version, contact Customer Service for further instructions.

HXU-360 multiplexer cards are installed in the front of the Wideband System 3190 or ThinMux as shown in Figure 1.

Step	Action
1	Unscrew the two hold-down lugs on each side of the chassis front cover. The cover folds down.
2	Connect an ESD wrist strap to the ESD strap input, left of the chassis on the ThinMux and right of the chassis on the Wideband System 3190.
3	Align the edges of the replacement card with the slot guides in the multiplexer tray.
4	Grasping the card, eject tabs and gently push the card into the bay.
5	Firmly press in on the tabs until the card snaps into place.

Note: The LEDs flash momentarily when the multiplexer card is installed. The power LED and active LED on the active multiplexer remain illuminated. The LEDs on the inactive (standby) multiplexer should be off, except for the PWR LED.

When installed in a working system that already has an HXU-360, the second HXU-360 is automatically configured for that system by the active HXU-360 in the shelf. If the software version or List Number are different, refer to the HXU-360 User Manual (LTPH-UM-1089).

Step 2: Accessing the Management Interface

Depending on the type of hardware used (Wideband System 3190 or ThinMux), refer to one of the following sections:

- "Wideband System 3190 Installations" below
- "ThinMux Chassis Installations" on page 2

Wideband System 3190 Installations

Connect a maintenance terminal to the Craft port of the HMU. (The HXU-360 craft port is disabled when there is an HMU in the Wideband System 3190.) The modem settings are 9600 baud, 8 data bits, no parity, 1 stop bit, and VT100 terminal emulation.

For more information about the HMU-319 management interface, refer to the HMU-319 User Manuals (LTPH-UM-1028-TL1 commands and LTPH-UM-1142-UM).

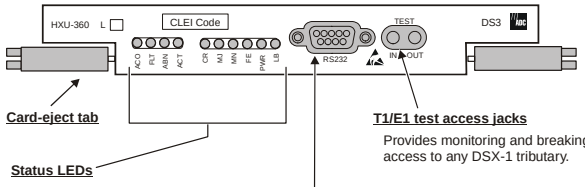
To log on to the HXU screens through the HMU interface:

Step	Action

1	Upon connecting to the HMU-319, the TL1 prompt (<) appears. Type **TAO**, then press **ENTER** to invoke TAO. The following password prompt appears.
	`Please enter password for Terminal Access Option:`
	`Password:`

2	Type **public** (default password), then press **ENTER**.
3	Type **TAO** at the prompt, then press **ENTER**. This opens the Terminal Access Option (TAO) interface.
4	From the Network Status screen (for multishelf configurations), type the number of the desired shelf ID (1 through 32), then press **ENTER**.
5	From the Shelf Status screen, select the Shelf Options, then select Mux Type and the type of multiplexer (**HXU-360**).
6	Proceed to "Step 3: Configuration (Wideband System 3190 and ThinMux)" on page 3.

Note: The logon screen can also be accessed by a Telnet session or through connection to the OS port. See the HMU user manual for more information.



Name		Color
CR	Critical Error	Red
MJ	Major Error	Red
MN	Minor Error	Yellow
FE	Far End Error	Yellow
PWR	Power On	Green
LB	Loopback	Red
ACO	Alarm Cutoff	Green
FLT	Fault	Red
ABN	Abnormal	Yellow
ACT	Active	Green

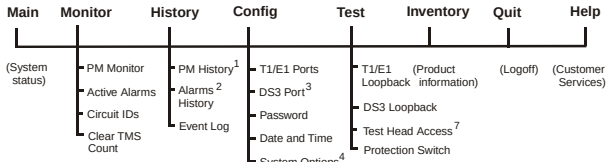
Craft port

Connect a standard 9-pin terminal cable between the serial port on a PC and the HXU craft port. The craft port on the HXU is disabled if an HMU is present in the Wideband 3190.

The HXU-360 screens can be navigated by using the following keys:
Arrow keys - make a selection.
SPACEBAR - scroll through options.

ENTER - execute a choice.
ESC - return to the previous screen or selection.
Follow the onscreen navigational aids.

Logon Menu Tree for the HXU-360 Interface



Note 1: Provides three kinds of PM History screens - PM History, Alarms History, and Event Log

Note 2: Provides four kinds of Alarm History screens - T1/T1 Ports, DS3 Port, System, and Clear All Hist

Note 3: Provides eight kinds of options - Service Mode, Protection Mode, DS3 Mode, Line Buildout, Transmit Timing, BER Threshold, RAI upon DS1 Loopback, and Remote DS1 LPBK in M13

Note 4: Provides five kinds of screens - Card ID, System ID, IP Address, IP Mask, and IP Gateway

Note 5: Provides four kinds of screens - TFTP Transfer, XMODEM Transfer, Synchronize Images, Activate Image

Note 6: Provides five kinds of screens - T1/E1 ports timing mode, Primary reference, Secondary reference, Timing ref. switching, Current active reference

Note 7: Provides two kinds of test screens - Internal Test Head Access and External Test Head Access

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Figure 3. Logon Menu Tree for the HXU-360 Interface

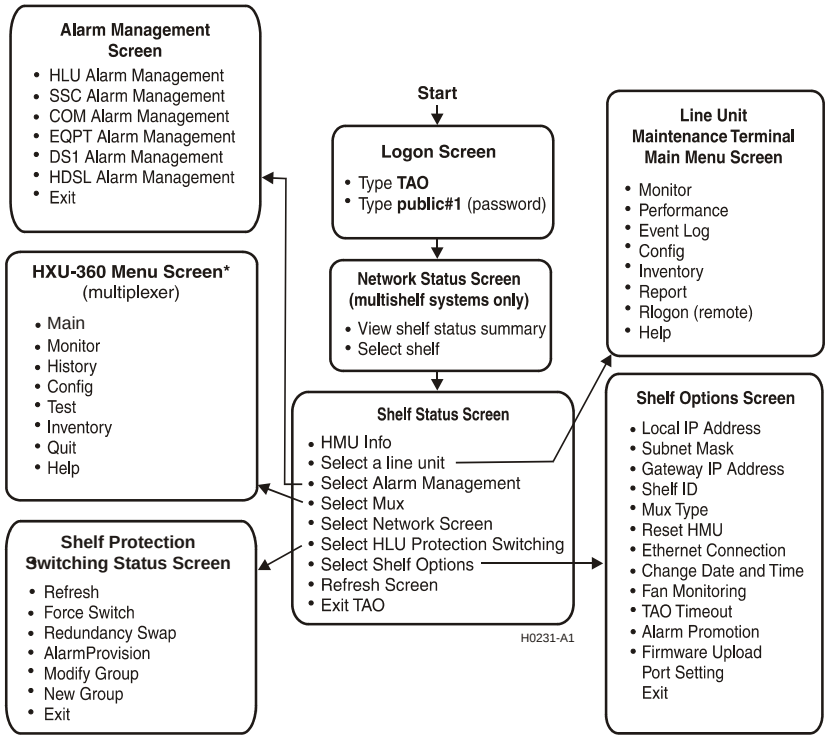

Figure 4. HXU-360 Screen Summary

STEP 2: ACCESSING THE MANAGEMENT INTERFACE (CONTINUED)

ThinMux Chassis Installations

HXU-360 Craft screens can be accessed by connecting a management terminal to the Craft port on the HXU-360 front panel, the rear Craft port, or the 10BaseT port on the ThinMux backplane, which can then access both HXU-360s.

For more information about the ThinMux management interface, refer to the ThinMux User Manuals (LTPH-RG-1141-TL1 Commands and LTPH-UM-1126-UM).

Step	Action
1	Type **`public`** (default password), then press **ENTER**. The HXU-360 main menu appears.
2	Select the **Config** menu, choose **System Options**, and then press **ENTER**.
3	At the Card ID prompt, type the Card ID, then press **ENTER**. Type the System ID, IP Address, IP Mask, IP Gateway, then press **ENTER**. Within **Config** menu, choose **Date and Time**, enter the correct information, and press **ENTER**.
4	Proceed to "Step 3: Configuration (Wideband System 3190 and ThinMux)" on page 3.

Note: When accessing the Craft port located on the front on the HXU-360, be sure to select the active multiplexer. Accessing the Craft port located on the rear on the ThinMux chassis automatically selects the active multiplexer.

Step 3: Configuration (Wideband System 3190 and ThinMux)

The HXU-360 menus can be navigated by using the onscreen navigational aids and the keys shown in Figure 3 on page 2.

Configure System Options

Select the **Config** menu, choose **System Options**, and then perform the following setup tasks:

Step	Action
1	Choose **DS3 Port** and type a name for the card; then press **ENTER**.
2	Select **Service Mode**, press **SPACEBAR** to select **MEM-ADMIN**, then press **ENTER**. No configuration changes can be made unless the Service Mode is configured as MEM-ADMIN. Changing operating modes resets all multiplexers installed in a chassis. **Line Buildout** is automatically set.
3	Set **Transmit Timing** to LOCAL.
4	Set the **BER Threshold** to E-03, E-06, or E-09. (Default is E-03.)
5	Set **RAI upon DS1 Loopback** to ENABLE or DISABLE.
6	When you are finished configuring the DS3 Port, select **Service Mode** and change it to IN SERVICE.

Configure Ports

Choose **T1/E1 Ports**, press **ENTER**, and then set the **Srvc Mode** to MEM-ADMIN to reconfigure port; then press **ENTER**.

Step	Action
1	Choose the type of service (E1 or T1). T1 is the default.
2	Choose the type of line code (B8ZS or AMI).
3	Choose the line code for E1 (Code).
4	Choose the Line Buildout (LBO) for the channel (133, 266, 399, 533, or 655 feet).
5	When finished configuring, reset the port to **IS** to place it in service; then press **ENTER**.

Configure Bits Timing

Confirm your chassis is connected to the BITS timing wire-wrap pins, as specified in the chassis User Manual (LTPH-SM-1052 for Wideband System 3190 (HMS-358) or LTPH-UM-1126-UM for ThinMux). After the chassis is wire-wrapped, select **BITS Timing** from the Config Menu; then press **ENTER**.

Step	Action
1	At the T1/E1 Ports Timing mode prompt, use **SPACEBAR** to select Through (default), Internal (Local), or External (BITS).
2	At the Primary reference and Secondary reference prompts, use **SPACEBAR** to select either BITS A DS1 SPEED or BITS B DS1 SPEED.
3	At the Timing reference switching prompt, use **SPACEBAR** to select from Non Revertive or Revertive.
The Current Active Reference prompt will show the current clock status.	

How to Obtain ADC Documentation

Copies of this publication or the *HXU-360 User Manual* (LTPH-UM-1089) can be downloaded from the ADC website at www.adc.com. To order a hard copy, please contact your sales representative.

FCC Class A Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Limited Warranty

Product warranty is determined by your service agreement. Refer to the ADC Warranty/Software Handbook for additional information, or contact your sales representative or Customer Service for details.

Modifications

Any changes or modifications made to this device that are not expressly approved by ADC Telecommunications, Inc. voids the user's warranty. All wiring external to the products should follow the provisions of the current edition of the National Electrical Code.

Standards Compliance

This equipment has been tested and verified to comply with the applicable sections of the following safety standards:

- GR 63-CORE - Network Equipment-Building System (NEBS) Requirements
- GR 1089-CORE - Electromagnetic Compatibility and Electrical Safety
- Binational standard, UL-60950/CSA C22.2 No. 60950-00: Safety of Information Technology Equipment.

World Headquarters

To contact ADC by mail:

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Technical Support

Technical assistance is available 24 hours a day, 7 days a week by contacting the ADC Technical Assistance Center (TAC) at:

Telephone:	800.366.3891 (toll-free in the U.S. and Canada)
E-mail:	wsd.support@adc.com
Knowledge Base:	www.adc.com/Knowledge_Base/index.jsp
Web:	www.adc.com

HXU-360 List 2

Quick Installation Guide

Product Catalog: HXU-360-L2
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Revision History

Rev	Date	Revisions
01	3/20/2002	Initial release
02	12/1/2002	Miscellaneous manual updates
03	4/13/2005	Upgrade to List 2