Lucent Technologies
Bell Labs Innovations

SLC® LineReach™ Access System

AUA66 HDSL Line Interface Unit—5SLI160

Features/Functions

- Interfaces HDSL digital line

- Compatible with PairGain* HDSL line units

- ZCS line coding option

- Faceplate FAIL and carrier line failure (CLF) bicolor LED and SETUP RETRIEVE PORT

- Meets TR-1089† standards for lightning and AC power crosses.

- UL‡ Recognized

* Registered trademark of PairGain Technologies, Inc.

† Telcordia Technical Reference TR-NWT-001089 Issue 1, October 1991, and all Revision and Supplements, "Electromagnetic Compatibility and Electrical Safety Generic Criteria for Network Telecommunications Equipment," Telcordia Technologies, Inc.

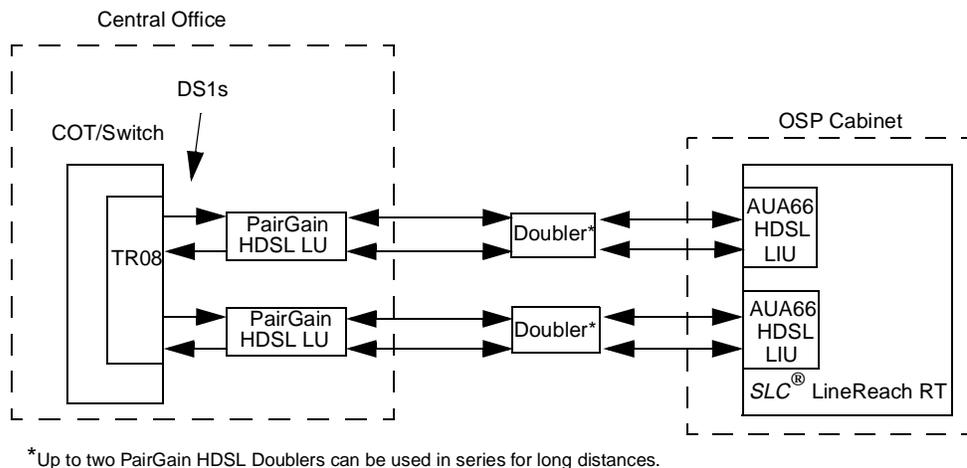‡ Registered trademark of Underwriters Laboratories Inc.

Description

This data sheet describes the AUA66 high-bit-rate digital subscriber line (HDSL) line interface unit (LIU) (COMCODE 108253717) and is intended for the end-user of the unit.

The AUA66 line interface unit is used in the *SLC*® LineReach™ Access System remote terminal (RT) to interface the system directly to an HDSL line.

HDSL provides transport of DS1 rate signals over repeaterless copper pairs that meet carrier service area (CSA) guidelines. Utilizing 2B1Q line coding, adaptive equalization and echo cancelling techniques, data is transmitted bidirectionally

(i.e., full duplex) over two pairs. Figure 1 illustrates how HDSL is utilized in the *SLC* LineReach Access System.

Central Office

DS1s

COT/Switch

OSP Cabinet

TR08

PairGain
HDSL LU

Doubler*

AUA66
HDSL
LIU

PairGain
HDSL LU

Doubler*

AUA66
HDSL
LIU

SLC® LineReach RT

*Up to two PairGain HDSL Doublers can be used in series for long distances.

**Figure 1.   Typical application of the AUA66 HDSL LIU
in *SLC* LineReach System**

The AUA66 HDSL LIU splits the DS1 signal into two data streams of 784 kbps (12 channels at 64 kbps, 8 kbps DS1 framing and 8 kbps HDSL overhead channel). Each data stream is then transmitted and received over its own pair. At the far end, the HDSL receiver combines the signals back into a DS1. The PairGain HTU-C (HDSL Terminal Unit - Central Office) is used as the central office interface.

The AUA66 HDSL LIU is compatible with the PairGain HDSL line units such as follows:

- **HLU-319 HDSL line unit.** This line unit plugs into the Wescom 3192 Span Termination System (STS) shelves or equivalent. The HLU-319 can coexist with 3192-type repeater cards in the same shelf.

- **HLU-338 HDSL line unit.** This line unit plugs into the DDM-Plus Shelf (or equivalent). It can coexist with AEK-type repeater cards in the same shelf.

- **HLU-231 HDSL line unit.** This line unit plugs into the 222-type Office Repeater Bay shelves.

- **HLU-611 HDSL line unit.** This line unit plugs into the 222-type Office Repeater Bay shelves. (This unit will not support doublers.)

The HDSL signal can be transmitted up to 12,000 feet using 24 AWG wire

without regeneration or up to 9,000 feet using 26 AWG wire without regeneration. A special repeater, called a "doubler" can be used to extend the range by a factor of two or three. The maximum allowable number of doublers between the COT and RT are two. The HDSL T1 system provides 10E-7 to 10E-10 bit-error rate (BER) on copper pairs.

The AUA66 HDSL LIU is compatible with the PairGain HDSL doublers such as follows:

- **HDU-437 HDSL HiGain doubler**. This doubler occupies one slot of the original DDS or ISDN repeater case.

- **HDU-439 HDSL HiGain doubler:** This doubler mounts into two compatible adjacent slots of a 239 mini T1 repeater apparatus case.

- **HDU-451 HDSL HiGain doubler:** This doubler mounts in a single slot of any industry standard 400 mechanics shelf or in equivalent enclosures manufactured by PairGain Technologies.

This data sheet is being updated to reflect the change in the color of the FAIL/ CLF LED and to clarify the use of the Z/NZ switch for the AUA66 HDSL LIU.

Figure 1 shows the typical application of the AUA66 HDSL LIU in *SLC* LineReach System. Figure 2 shows the faceplate diagram and switch location for the AUA66 HDSL LIU . Table 1 lists the environmental specifications. Table 2 lists the power drain requirements and Table 3 lists the edge connections for the AUA66 HDSL LIU.

Specifications

This unit is intended for use in *SLC* LineReach Access Systems located in controlled environments that conform to the specifications of Telcordia Technologies GR-63[*]. It may also be used in applicable Lucent Technologies cabinets designed for *SLC* LineReach and intended for applications in non-controlled (outside plant) environments that conform to Telcordia Technologies GR-487[†]. These cabinets, when properly equipped, are designed to maintain internal environmental conditions within appropriate operational limits for *SLC* LineReach equipment such that system performance meets TR-NWT-000057[‡].

The applicable outside plant environment criteria for cabinet enclosures (per GR-487) are summarized in Table 1 Environmental Specifications.

Table 1.   Environmental Specifications

A. Temperature Range (Ambient)
1. Operating, per TR-NWT-000057: in Lucent Technologies cabinets exposed to ambient temperatures of -40° F (-40° C) with no solar load to +115° F (46° C) with maximum solar load and maximum power dissipation. Lucent Technologies cabinets are designed to ensure that the components within do not exceed their rated temperatures for the above conditions.
2. Storage, per TR-NWT-000057: ambient temperatures of -40° to 140° F (-40° to 60° C).
B. Relative Humidity
1. Operating, per TR-NWT-000057. For outside ambient temperature 84° F (29° C) or less, relative humidity of 5% to 95%. For ambient temperatures above 84° F (29° C), the relative humidity is limited to that corresponding to a specific humidity of 0.024 pound of water per pound of dry air.
2. Storage, per TR-NWT-000057: ambient temperatures 84° F (29° C) or less, 10% to 95%. For ambient temperatures above 84° F (29° C), the relative humidity is limited to that corresponding to a specific humidity of 0.024 pound of water per pound of dry air.

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[*]   Telcordia Technologies Generic Reference GR-63, Issue 1, October 1994, and all Revisions and Supplements, "Network Equipment-Building System Requirements: Physical Protection (a module of LSSGR, GR-64; TSGR, FR-440, and NEBS FR, FR-2063)," Telcordia Technologies, Inc.

[†]   Telcordia Technologies General Requirements GR-487, Issue 1, June 1996, and all Revisions and Supplements. "*General Requirements for Electronic Equipment Cabinets*," Telcordia Technologies, Inc.

[‡]   Telcordia Technologies Technical Reference TR-NWT-000057, Issue 2, January 1993, and all Revisions and Supplements, "*Functional Criteria For Digital Loop Carrier Systems*," Telcordia Technologies, Inc.

Table 2.   Power drain for AUA66 LIU

Supply	Maximum Value
+5 Volts DC	2.5 W

Installation and Testing

There are switches to set on this unit. Refer to next section for description of switches and faceplate diagram.

More detailed technical information is given in 363-208-400, *SLC LineReach Access System, Applications, Planning, and Ordering Guide*. Procedures for setting the option switches is given in 363-208-401, *SLC LineReach Access System, User/Service Manual*

The faceplate provides test access through a female DB9 PC connection.

Faceplate Features and Options

The AUA66 HDSL line interface unit faceplate and circuit board switch locations are shown in Figure 2. The LED indicator (FAIL/CLF indicator is a bicolor LED) and jack on the faceplate provide the following functions:

FAIL/CLF is a single bicolor LED which indicates the following conditions:

- **FAIL**: When lit steadily red, indicates that this LIU has failed.

- **CLF**: When lit flashing yellow[*], indicates that a carrier line failure has been sectionalized to the digital facility connected to this LIU.

The LED will light steady red and then flash yellow after the circuit pack is inserted. Once the LIU is synchronized, the LED will turn off.

SETUP RETRIEVE PORT: The faceplate has a female DB9 PC connector, which provides craft access to the ASCII text interface of the HDSL transceiver module on the AUA66 HDSL LIU. This menu-driven interface is compatible with an ASCII terminal or PC operating in VT-100 mode, and is used to monitor performance and alarm history, and to view system settings. Refer to 363-208-401, *SLC LineReach Access System, User/Service Manual* for usage.

The switch options for the AUA66 HDSL line interface unit are as follows:

- **Master/Slave** option: Switch slide 1 (**M**/**S**) selects whether the LIU should operate as a master or a slave. When the unit is used in an RT, the switch should be set to the slave (**S**) position. The master (**M**) position is intended for future applications. For *SLC* LineReach this switch should be in the slave (**S**) position. The factory default setting for switch slide 1 is position **S**.

- **Z/NZ** option: Switch slide 2 (**Z**/**NZ**) selects the line encoding to be used. Position **Z** selects zero code suppression (ZCS). When position **NZ** is selected, the AUA66 LIU operates without zero code suppression. The **NZ** position must be selected in applications requiring 64kb clear channel performance or when using B8ZS line coding. The factory default setting for switch slide 2 is position **Z**.

    - For FP1.1, set **Z/NZ** per the work order (Default setting is **Z** for ZCS line coding).

    - For FP2.0, set **Z/NZ** to **NZ** to support required B8ZS line coding from the associated CO end.

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[*] The flashing color of the CLF LED may be green even though the faceplate marking indicates "Flash Yellow: CLF". Yellow is the standard for series S2:3 and above.
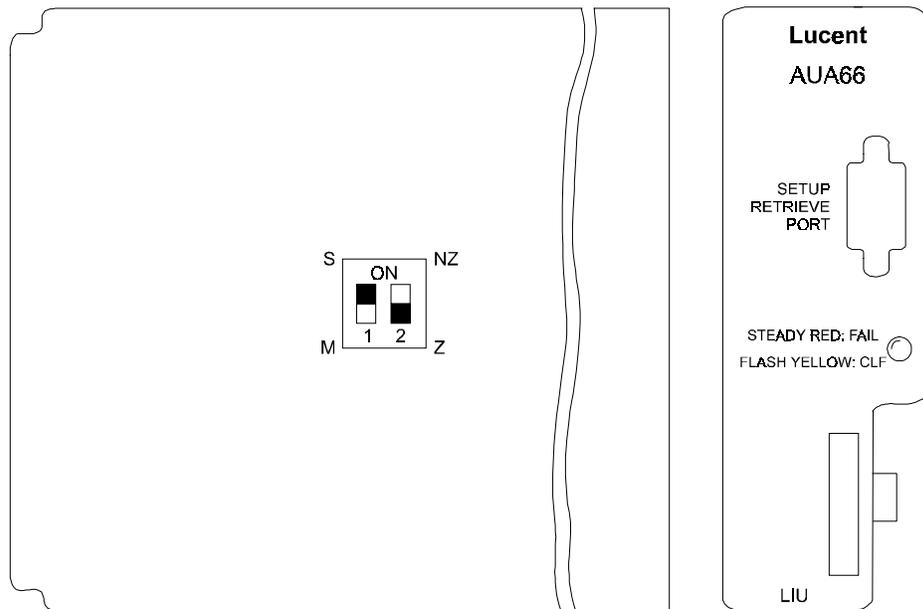
Figure 2.   AUA66 HDSL LIU Faceplate Diagram and Switch Location

Table 3.   Edge Connections For AUA66 Line Interface Unit

Finger	Function
1	Frame Ground
6, 7, 25	Circuit Ground
18	+5 Volts DC
26, 11	R1 (receive)
27, 12	T1 (receive)
29, 13	R (transmit)
30, 14	T (transmit)
31	-48 Volts DC
32	-5 Volts DC

References

The following documents provide additional information about the use of this unit in the *SLC* LineReach Access System:

363-208-400
SLC LineReach Access System
Applications, Planning, and Ordering Guide

363-208-401
SLC LineReach Access System
User/Service Manual

Technical Assistance

Follow local procedures for obtaining technical assistance. Lucent Technologies also provides in-hours or emergency out-of-hours help for the *SLC* LineReach Access System. Call the Lucent Technologies Regional Technical Assistance Center at 1-800-225-RTAC.

Ordering Information

Additional copies of this document (363-005-408) are available from the Customer Information Center — call 1-888-582-3688.

Comments

Comments about this document can be directed to:

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