HDSL4 for E220, DDM+, 3192

H4TU-C for E220, DDM+, and 3192 Form Factors

Product Features

- Standards-based technology for industry-required interoperability
- Spectral compatibility with ADSL
- Improved operating margins in the CSA
- DS1 payload over two copper pairs, with added coding gain, for reduced signaling bandwidth
- Extended range T1 deployment for areas just beyond the CSA eliminating the need for repeaters
- Industry-leading, 10-year warranty

T1 line deployments remain a staple in service portfolios of most telecom carriers. However, numerous legacy T1 lines, relying on older Alternate Mark Inversion modulation techniques, have been replaced by HDSLx technology. ADTRAN® offers end-to-end HDSL4 card solutions for the most frequently found legacy form factors in telecom networks — E220, DDM+, and 3192.

Issue 2 of ANSI T1.418 standard for HDSL2 includes a 4-wire TC PAM T1 transport technology called HDSL4. This technology is a 4-wire (2-pair) implementation of the High Bit Rate Digital Subscriber Line - 2nd Generation (HDSL2) technology. HDSL4 combines two well-known approaches to DS1 transport, HDSL and HDSL2. HDSL4 provides a standards-based repeatered T1 transport technology that remains spectrally compatible with ADSL per ANSI T1.418.

HDSL4 offers improved operating margins, a good price/performance value, and spectral compatibility with ADSL in the same binder group. It allows deployment ranges (without repeaters) beyond HDSL and HDSL2. Carriers can avoid replacement of costly repeaters in areas just beyond the CSA. In fact, HDSL4 is the only extended reach T1 transport technology that is spectrally compatible with ADSL (per ANSI T1.418) when deployed with repeaters.

The ADTRAN HDSL4 solutions include central office, repeater, and remote cards for legacy form factors commonly found in networks.

HDSL4 products provide span powering voltage (negative only with respect to ground, –190 VDC nominal, GFI protection less than 5 mA) and meets all requirements of Bellcore GR-1089-CORE (Class A2), ANSI T1. 418-2002. The products are NRTL listed to the applicable UL standards.

ADTRAN's HDSL4 repeaters feature in-band loopback control, remote provisioning, and pass-through control. They are available in standard T200 and 239 mechanics.

ADTRAN's HDSL4 units are equipped with troubleshooting-at-a-glance LEDs that provide customers with a simple means of identifying the location of certain faults. Several new screens have been added to the craft interface to simplify the trouble isolation process.

These HDSL4 units are equipped to support the ADTRAN TScan™ feature. TScan allows the remote retrieval of circuit diagnostics and performs advanced fault location. For implementation of TScan, please contact your local ADTRAN sales representative.

ADTRAN®

ADTRAN, Inc.
901 Explorer Boulevard
Huntsville, AL 35806

P.O. Box 140000
Huntsville, AL 35814-4000

256 963 8000 voice
256 963 8030 fax
877 457 5007 fax back

General Information
800 9ADTRAN
info@adtran.com
www.adtran.com

Pre-Sales Technical Support
888 5ADTRAN
support@adtran.com
www.adtran.com/support

Where to Buy
800 827 0807
www.adtran.com/where2buy

Post-Sales Technical Support
800 726 8663
support@adtran.com
www.adtran.com/support

Regional Offices
Dallas, TX
972 830 9070
Denver, CO
303 471 9150
Irvine, CA
949 260 3500
Kansas City, KS
800 471 8649
Newark, NJ
800 471 8656
Ontario, Canada
416 290 0585
Quebec, Canada
877 923 8726
San Antonio, TX
888 223 7671

International Inquiries
+1 256 963 8716 voice
+1 256 963 6300 fax
international@adtran.com
www.adtran.com/international

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Product Specifications

Technical Specifications

- **Modulation type:** 16 TC PAM
- **Mode:** Full duplex, partially overlapped echo canceling
- **Number of pairs:** 2
- **Line rate:** 1.552 Mbps
- **Baud rate:** 261.333 kbaud
- **Bridged taps:** Single taps less than 2000 ft, total taps less than 2500 ft
- **Performance:** Compliant with T1.418-2000 (HDSL2 Standard, issue 2)
- **H4TU-C transmit power (data) level:** 14.1 ±0.5 dBm (0 to 400 kHz)
- **H4TU-C transmit power (activation) level:** 14.1 ±0.5 dBm (0 to 307 kHz)
- **Input impedance:** 135 ohms
- **Maximum loop resistance:** 1150 ohms (nonrepeatered circuit)

Interfaces

- **Network:** DS3, OC-3
- **Subscriber:** HDSL4

Electrical

- **H4TU-C total power:** –48 VDC at 200 mA with H4TU-R, –48 VDC at 330 mA with H4TU-R and one H4R
- **Span power:** –190 VDC (internally generated) Class A2 compliant, GFI current at less than 5 mA, loop current limited at 150 mA
- **Fusing:** 1.00 A (not field replaceable)

Regulatory Standards

- NEBS Level 3
- GR-1089-CORE, Issue 3
- GR-63-CORE, Issue 2
- NRTL Safety Listed

Clock

- **Clock sources:** internal, DSX-1 derived (with HDSL4 fram bit stuffing)
- **Internal clock accuracy:** ±25 ppm (exceeds Stratum 4), meets T1.101 timing requirements

Environmental

- **Operating temperature:** –40°C to +70°C
- **Storage temperature:** –40°C to +85°C

Ordering Information

Equipment	Part #
Central Office Form Factors	
E220 H4TU-C	1223401L2
DDM+ H4TU-C	1223403L2
3192 H4TU-C	1223404L2
Repeaters	
T200 H4R	1223441L1
239 H4R	1223445L1
Remote Units	
T200 Local Power H4TU-R	1223424L2
T200 Span Power H4TU-R	1223426L2