

# HiGain® Wideband 3190

Integrated SONET/DS3 Multiplexer for HDSL/HDSL2/HDSL4



The HiGain® Wideband 3190 (WBS-3190) combines an industry-standard STS-1 or DS3 multiplexer with ADC's industry-standard HDSL, HDSL2 or HDSL4 distribution system. The Wideband implementation maintains full compatibility and interoperability with HiGain legacy products. This product compatibility allows you to protect your current investment in HDSL, while benefitting from our latest technology developments.

## Features:

- Versatile, open-system architecture
- Defined migration path from DS3 to STS-1 network interfaces
- Integrated HDSL distribution system with STS-1 or DS3 multiplexing function
- Telcordia TIRKS™ and NMA™ integration for flow-through service provisioning and alarm surveillance
- Extremely low cost per port
- Integrated, open management system
- Optional 1+1 board protection on the DS3 or STS-1 interface
- NEBS Level 3 and UL compliance
- Supports TL1-based remote metallic and electrical test access systems (MLT)
- Hekimian PMI compliant
- Interoperable with Harris 107 Test Set

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## Integrated SONET/DS3 Multiplexer for HDSL/HDSL2/HDSL4

The WBS-3190 multiplexes 28 HDSL lines into a single DS3 or STS-1 line interface. By providing industry-standard interfaces between system components that are independently configured, it maintains a truly open architecture. This architecture allows any industry-standard 3190 card to access the Wideband shelf. Despite its small form factor, the WBS-3190 provides a common architecture that supports all system functions. It houses up to 28 line units (HLU), a management unit (HMU), two multiplexer units (HXU) and an optional fan assembly (HFA). The HXU multiplexer system provides a managed, high-level DS3 or STS-1 trunk interface at the CO. Both TL1 and TAO (craft-VT100) management systems are supported on X.25, 10BASE-T and RS-232 interfaces along with alarm relay contacts and redundant A/B office battery connections. A 7-foot CO rack can support up to six WBS-3190 chassis and meets all NEBS requirements while providing up to 168 DS1 access lines to the field.

### Open System Advantages

The HiGain Wideband 3190 delivers critical advantages through an open-system architecture. This design approach, along with complete backward compatibility with existing HiGain components, results in an extremely low cost per port. Additionally, reliability is greatly enhanced, and long-term operating costs are contained through "single-wire" management capabilities that enable precise, flexible system monitoring.

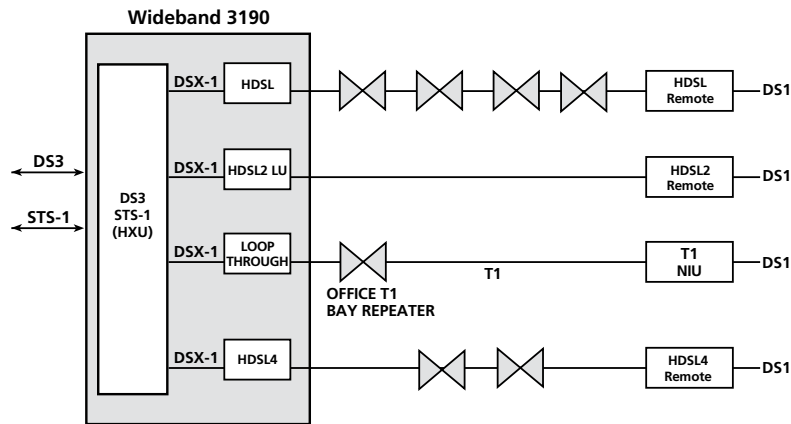


Figure 1: HiGain Wideband3190

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## DS3 Multiplexer Standard Features

- Supports M13 and C-Bit parity frame format
- Supports extensive loopbacks on DS3 and DS1 interfaces
- Flexible Time Slot Assignment (TSA) capabilities
- Both in-band and out-of-band loopback control
- Full 1+1 network services and card protection option
- Front-panel DSX-1 test access
- Non-volatile storage of all configuration data
- Comprehensive Operations, Administration, Maintenance and Provisioning (OAM&P) data
- Front panel LED indicators for power, alarm and fault monitoring



## STS-1 Multiplexer Standard Features

- Supports VT1.5 and VT2 SONET mapping
- Supports extensive loopbacks on STS-1 and DS1 interfaces
- Complete Time Slot Assignment (TSA) flexibility
- Full 1+1 network services and card protection option
- Non-volatile storage of all configuration data
- Comprehensive Operations, Administration, Maintenance and Provisioning (OAM&P) data
- Front panel LED indicators for power, alarm and fault monitoring

## HDSL/HDSL2/HDSL4 Industry-Leading Benefits

- Full-rate T1 over a single copper pair means that you can cost-effectively meet today's demand for voice, data and video services
- Industry-standard interoperability results in cost-effective implementation and network expansion
- Reach up to 12,000 ft on 24 AWG enables service to more customers
- HDSL supports greater distances with a 5-span reach of up to 60 kft on 24 AWG

## Management

- Systems are fully network manageable and support TL1 language
- Supports communications protocols such as Telnet, RS-232 and X.25
- Supports a local craft interface for provisioning and alarm reporting
- Supports dry contact alarm relay monitoring systems

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## Ordering Information

Description	Catalog Number
<b>CO Elements</b>	
Wideband 3190 shelf, Metallic Line Testing (MLT), Digital Test Access (DTA)	HMS-358 L5, L6
HDSL HiGain Line Unit	HLU-319 L5
HDSL2 HiGain Line Unit	H2TU-C-319-L7x
HDSL4 HiGain Line Unit	H4TU-C-319-L5x
HiGain multiplexer unit for STS-1	HXU-359L2V11
HiGain multiplexer unit for DS3	HXU-360-L2
HiGain Fan Assembly	HFA-357 L1
HiGain Management Unit	HMU-319-L81
HiGain Test Card, Test and Loop-through Card	HTC-319 L1
HiGain Cut-through Card	HCC-319 L2
<b>Span Elements</b>	
HDSL HiGain Doubler Unit for "200-400" remote-style mechanics	HDU-404-L2
HDSL HiGain Doubler Unit for "239" mechanics	HDU-409 L2A
HDSL4 HiGain Doubler Unit for "239" mechanics	H4D-409-L2
<b>Remote Elements</b>	
HDSL HiGain Remote Unit for "200-400" mechanics	HRU-402 L1
HDSL2 HiGain Remote Unit for "200-400" mechanics	H2TU-R-402-L7x
HDSL4 HiGain Remote Unit for "200-400" mechanics	H4TU-R-402-L5x
<b>Outdoor Span Element Housing</b>	
Remote Enclosure , Single/Dual Slot, 239 mechanics, vented, above ground, 30" Gel Stub**	HRE-602 L1
HDSL4 Single-Shot™ Enclosure with integrated Repeater (H4D-409-L2)	SPX-HRXP0B7
Radiator II, 8 slot, 239 mechanics, pressurized, below ground, 30' Air Core Stub*	RAD-BA30-8
Radiator II, 8 slot, 239 mechanics, vented, above ground, 30' Gel Core Stub*	RAD-AG30-8T
Radiator II, 16 slot, 239 mechanics, pressurized, below ground, 30' Air Core Stub*	RAD-BA30-16
Radiator II, 16 slot, 239 mechanics, vented, above ground, 30' Gel Core Stub*	RAD-AG30-16T
Encaser® 819, 24 slot, 239 mechanics, pressurized, below ground, 30' Air Core Stub*	ENC-819-CA3P-PA3
Encaser® 819, 24 slot, 239 mechanics, vented, above ground, 30' Gel Core Stub*	ENC-819-CG3P-VA3
<b>Outdoor Remote Element Housing</b>	
Remotes/Doublers, 4 slot, 200/400 mechanics, 30' Gel Stub	HRE-454-L1A
Remotes/Doublers, 4 slot, 200/400 mechanics, 30' Air Stub	HRE-454-L2A
Remotes/Doublers, one slot, 200/400 mechanics, Gel Stub	HRE-450-L2B
Remotes/Doublers, one slot, 200/400 mechanics, Air Stub	HRE-450-L3B
Remotes/Doublers, one slot, 200/400 mechanics, No Stub	HRE-450-L4B

x – refer to customer service or technical support for appropriate list number.



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## Ordering Information

Description	Catalog Number
<b>Indoor Remote Element Housing</b>	
Remote, Single Slot, 200/400 Mechanics, RJ48X, wall mount	HRE-420 L2
Remote, Single Slot, 200/400 Mechanics, DB15/RJ48C, wall mount	HRE-420 L4
Remote, Single Slot, 200/400 Mechanics, WW/RJ48C, wall mount	HWM-T01
Remote, Dual Slot, 200/400 Mechanics, DB15/RJ48C, wall mount	HRE-422 L4
Remote, Dual Slot, 200/400 Mechanics, WW/RJ48C, wall mount	HWM-02B
Remote, Three Slot, 200/400 Mechanics, Wire Wrap, rack mount	HUS-340
Remote, Four Slots, 200 Mechanics, DB15/RJ48C, wall/desk mount	HRE-204 L3A
Remote, Four Slots, 200 Mechanics, RJ48X, wall/desk mount	HRE-204 L3B
Remote, Six Slots, 200 Mechanics, RJ48C, PS wall/desk mount	HRE-206 L1
Remote, Six Slots, 200 Mechanics, RJ48X, PS wall/desk mount	HRE-206 L2
Remote, Twelve Slots, 200/400 Mechanics, Wire Wrap/50pin AMP, wall/desk/rack mount	HRE-425
<b>Indoor Enclosure Accessories</b>	
Wallmount hinge for HRE-204	HRE-204-HMB
HiGain 400 Mechanics Power Supply, 115 VAC to -48 VDC	HPS-448 L1
HiGain Test Card, 200/400 Mechanics	HTC-400 L1
Cable assembly for HRE-425, 12 port, RJ48C to 50pin AMP	CHRE-425-RJ48C
Cable assembly for HRE-425, 12 port, RJ48X to 50pin AMP	CHRE-425-RJ48X

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# HiGain® Wideband 3190

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## Specifications

### DS3 INTERFACE (multiplexer)

<b>Cable:</b>	728A coax
<b>Line Rate:</b>	44.736 Mbps $\pm$ 20 ppm
<b>Line Code:</b>	B3ZS
<b>Line Impedance:</b>	75 $\Omega$ $\pm$ 5 $\Omega$ unbalanced
<b>Pulse Amplitude:</b>	0.36V to 0.85V (meets GR-499 requirements)
<b>Jitter Generation:</b>	<0.3 UI rmf
<b>DS3 Span:</b>	0 to 450 ft (0 to 137m)

### STS-1 INTERFACE (multiplexer)

<b>Cable:</b>	728A coax
<b>Line Rate:</b>	51.84 Mbps $\pm$ 20 ppm
<b>Line Code:</b>	B3ZS
<b>Line Impedance:</b>	75 $\Omega$ $\pm$ 5 $\Omega$ unbalanced
<b>Pulse Amplitude:</b>	0.36V to 0.85V (meets GR-499 requirements)
<b>STS-1 Span:</b>	0 to 450 ft (0 to 137m)

### DSX-1 INTERFACE (CO side)

<b>Output Level:</b>	6 Vpk-pk, pre-equalized for 0–655 ft of ABAM Cable
<b>Input Level:</b>	+1.5 to -7.5 dB DSX
<b>Impedance:</b>	100 $\Omega$
<b>Line Rate:</b>	1.544 Mbps $\pm$ 200 bps
<b>Line Format:</b>	AMI, B8ZS, or ZBTISI
<b>Frame Format:</b>	ESF, SF and unframed

### HDSL TRANSMISSION

<b>Line Code:</b>	784 kbps 2B1Q
<b>Transmission:</b>	Dual-duplex
<b>Media:</b>	Two non-loaded two-wire metallic cable pairs
<b>Output Signal:</b>	+13.5 dBm $\pm$ 0.5 dB into 135 $\Omega$
<b>Impedance:</b>	135 $\Omega$
<b>Maximum Provisioning Loss:</b>	35 dB at 196 kHz, 135 $\Omega$

### HDSL2 TRANSMISSION

<b>Line Code:</b>	1.552 Mbps OPTIS (Overlapped PAM Transmission with Interlocking Spectra)
<b>Transmission:</b>	Full duplex
<b>Media:</b>	One non-loaded two-wire metallic cable pair
<b>Output Signal:</b>	
<b>CO Side:</b>	16.8 dBm $\pm$ 0.5 dB from 0-450 kHz into 135 $\Omega$
<b>RT Side:</b>	16.5 dBm $\pm$ 0.5 dB from 0-350 kHz into 135 $\Omega$
<b>Impedance:</b>	135 $\Omega$
<b>Maximum Provisioning Loss:</b>	35 dB at 196 kHz

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## SYSTEM

**Wander (looped):** 0.3 UI max (1 UI = 648 ns)  
**Narrow Wideband Jitter:** 0.3 UI max  
**Narrowband Jitter (looped):** 0.1 UI max

## TEST ACCESS

**DSX-1:**  
    **"210" Bantam Jacks:** Bridging, splitting/line, splitting/drop; wire wrapped posts on chassis backplane  
    **Metallic:** Wire wrapped posts on chassis backplane (HMS-358 only)

## ALARMS

**ACO and visual alarms:** major, critical, minor,

## LOOPBACKS

Supports all standard in-band and out-of-band loopback modes

## USER INTERFACE

**Craft Port:** RS-232 (DCE) at line unit and remote unit  
**OSS Interface:** RS-232 (DTE) at central office chassis X.25  
**Front Panel:** 4-character display, status LED, system options buttons at line unit, status LEDs

## POWER

**CO Supply:** -48 VDC (nom.) (-42.5 VDC to -56.5 VDC)

## ENVIRONMENTAL

**Each Span:** CSA design rules (e.g. 9 kft @ 26 AWG or 12 kft @ 24 AWG, no load coils, bridged taps per CSA guidelines)

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ADC Telecommunications, Inc., P.O. Box 1101, Minneapolis, Minnesota USA 55440-1101

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