



HIGHLIGHTS

- NEBS Level 3 Approved
- Supports the most service types in industry including video, data and telephony
- Unique add/drop and cross-connect capability at 27Mb/s granularity
- Flexibility in applications for cable MSOs, enterprises and security/traffic surveillance
- Easy installation and maintenance, via an integrated craft LCD front panel
- OC-48C/STM-16 links for compatibility with public networks

General

The IPITEK HBR-2502 is an OC-48c/STM-16c-based optical networking platform designed to Time-division multiplex and transport mixed services over a single optical link or wavelength. These services include a wide variety of video services: baseband video and audio, TV-IF, 64/256-QAM, MPEG-2 video, DVB-ASI, and SDI video (SMPTE 259M level c). The system also supports TELCO standard services such as T1/E1, T3/E3, OC-3/STM-1, Ethernet and Fast Ethernet, and RS-232/422/485, making it an ideal solution for building a multimedia super highway.

An HBR-2502 node can multiplex up to 2.38 Gb/s of digitized video payload over a single 2.48 Gb/s SONET transport layer compliant link. Integral VCX-based cross-connect core modules provide 50 msec protection switching time to also support an overlay of TELCO standard digital voice into this payload. Redundancy of the core system can include dual plug-in hot-swappable PSUs, cross-connect (VCX) and optical link (HSI) modules. Up to 16 plug-in service modules (PIMS) provide the user interfaces and conversion into the cross-connect switching core of the system.

Features/Benefits

Summary of main features and benefits:

- 10-bit PCM coded Broadcast-quality baseband or IF Video Transport -up to 16 ch/node
- adjustable rate DVB-ASI compressed video transparently muxed - up to 64 ch/node
- 270 mb/s SDI - up to 8 ch/node
- adjustable rate 10/100-BASE-T Ethernet transport - up to 16 bi-directional ch/node
- Diverse Network Configurations: point to point, linear add/drop and folded or counter-rotating ring protection
- totally modular and Hot-swappable
- Dual redundancy for all common modules including VCX, HSI and AC or DC Power Supply.
- Network Management via integrated Node Controller and "NodeWizard" NMS
- Overlay T1/E1, T3/E3, OC-3/STM-1 channels

- Equipment protected OC-3/STM-1 support
- RS-232 async 16 ch/PIM slot
- 1310nm, 1550nm or 200 GHZ DWDM link optics
- External "BITS" timing support

System Description/Basic Architecture

A typical HBR-2502 system is comprised of a chassis, equipped with either one or two VCX (virtual cross-connect) modules, one or two HSI (High Speed Interface) modules, and one or two power supply modules.

The VCX module performs the multiplexing, demultiplexing, digital cross-connect and timing functions of the system. Input/output to the outside world at 2.48 Gb/s is handled through an HSI module. The HSI module provides transmitter options ranging from 1310 nm, 1550 nm or ITU grid laser, depending upon the distance and if DWDM systems will be deployed.

Applications

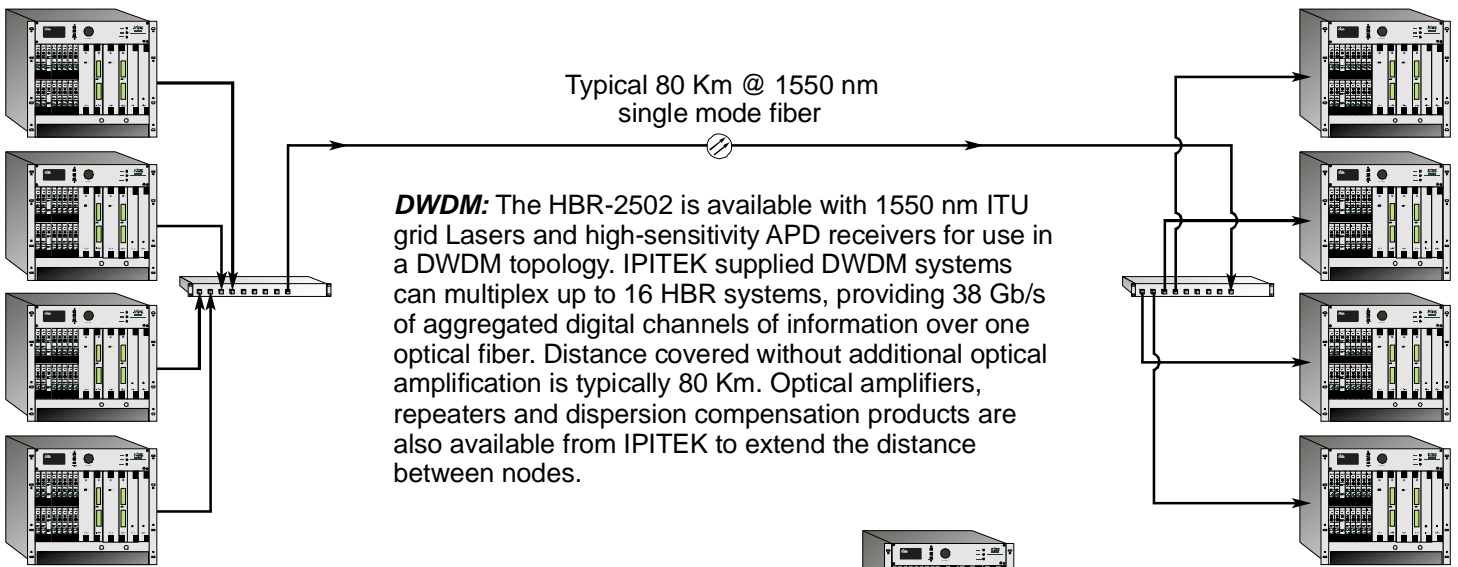
The HBR-2502 can provide a metro media services backbone or private media network. it also functions as an edge aggregation device for SONET/SDH compatible transponders or muxponders of a higher capacity Optical Network.

As shown in figure 1, it supports a large variety of configurations to suit customers' specific networking applications:

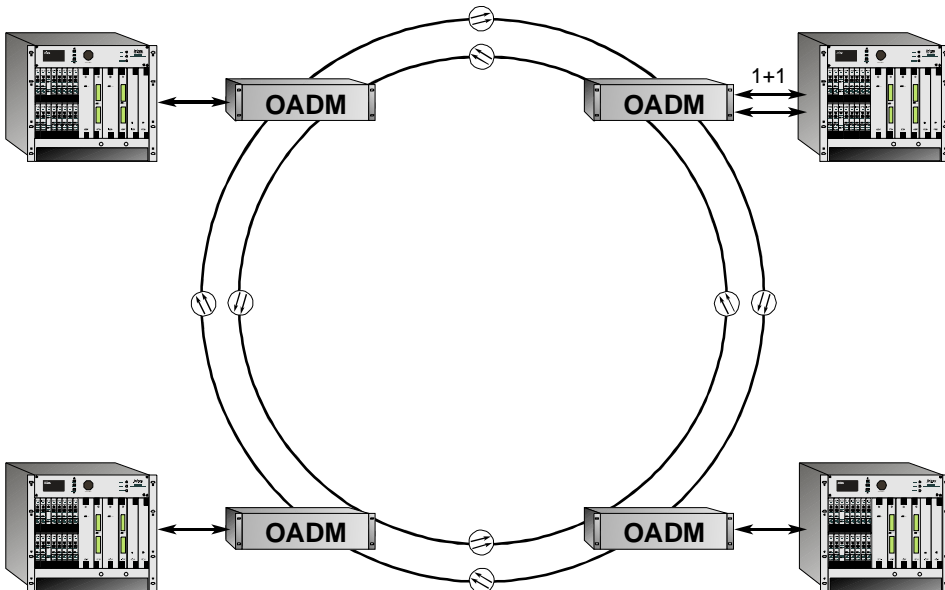
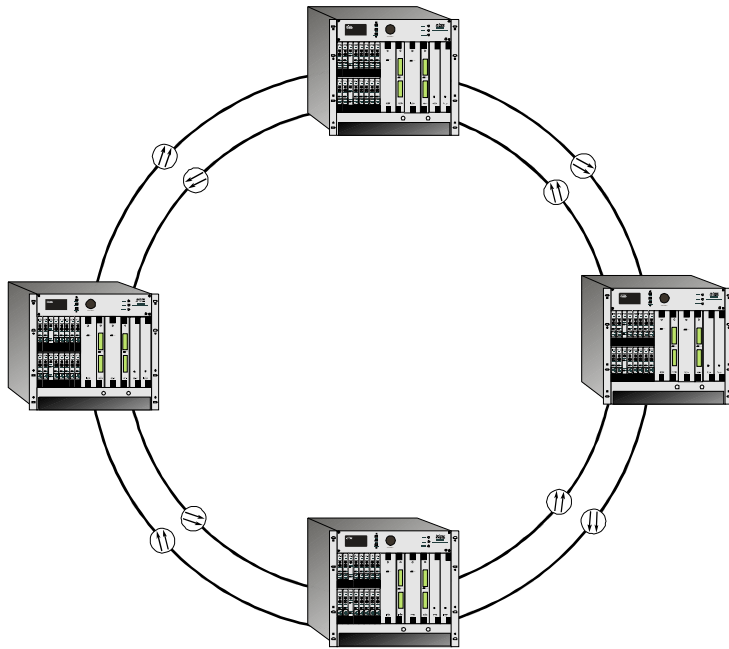
- Uni-directional or bi-directional point-to-point
- Star, typical of CATV distribution
- Unprotected or protected linear add/drop/pass
- Protected optically branched add/drop/pass
- Unprotected electrically branched add/drop/pass
- Unprotected or protected unidirectional ring
- Counter-rotating ring
- Unprotected collapsed ring
- Interop with OC-192/STM-64 ring
- Work with DWDM equipment

TOPOLOGIES

The HBR-2502 supports a variety of network topologies including point-to-point, point-to-multipoint, linear add/drop/pass and protected rings.



Protected Ring: HBR-2502 is most flexible and resilient when operated in a ring topology. The ring may be uni-directional or bi-directional for protected operation. Operating in a ring topology, HBR-2500 offers the ability to insert signals at any point in the ring and drop them at any other point or drop and continue for multi-point services. HBR ring topology may be used for any combination of uni-directional, asymmetric or bi-directional services. Pt-Pt configurations are named a folded ring (unprotected) or a counter-rotating



SONET/SDH Terminal Application: Operating at OC-48c/STM-16c data rate enables the HBR-2502 to integrate its signals into a synchronous higher capacity network. The HBR enters the network through either an optical 2.48 Gb/s regenerating transponder, a 10G muxponder or SONET/SDH mux provisioned for OC-48c/STM-16c transport. This wide-area network provides the connectivity to any other HBR location served by that network.

SPECIFICATIONS

Interface Modules

HBR-VCX-T1	Virtual cross-connect with SONET/SDH framing module with T1/E1 external timing
HBR-HSI	High speed interface modules (1310nm, 1550nm and 200GHZ-spaced DWDM ch21-51 odd)
HBR-PS2 (AC or DC)	Power supply module

Video Interface Modules

HBR-SV	NTSC and PAL Baseband Video with up to 4 audio channels
HBR-IF	NTSC, PAL IF module and 64/256-QAM module
HBR-SD	SMPTE 259M level c transparent including DVB-ASI at any rate
HBR-DVB	Quad DVB-ASI encoder and decoder adjustable BW link and ports

Data Interface Modules

HBR-ETH	10/100 Mbps Ethernet w/integral 3 port hub
HBR-SCM	RS-232/422/485 module, 16 ch

Telco Interface Modules

HBR-D1	T1 module w/ DSX cable build-out
HBR-E1	E1 module
HBR-DS3E3	T3/E3 module
HBR-OC3	OC-3/STM-1 module w/ MMF, 1310nm and 1550nm client-side optics

Network Management

NMS-NW	NodeWizard Element Management System (EMS): Web-based, Client/server system for WIN2k, XP
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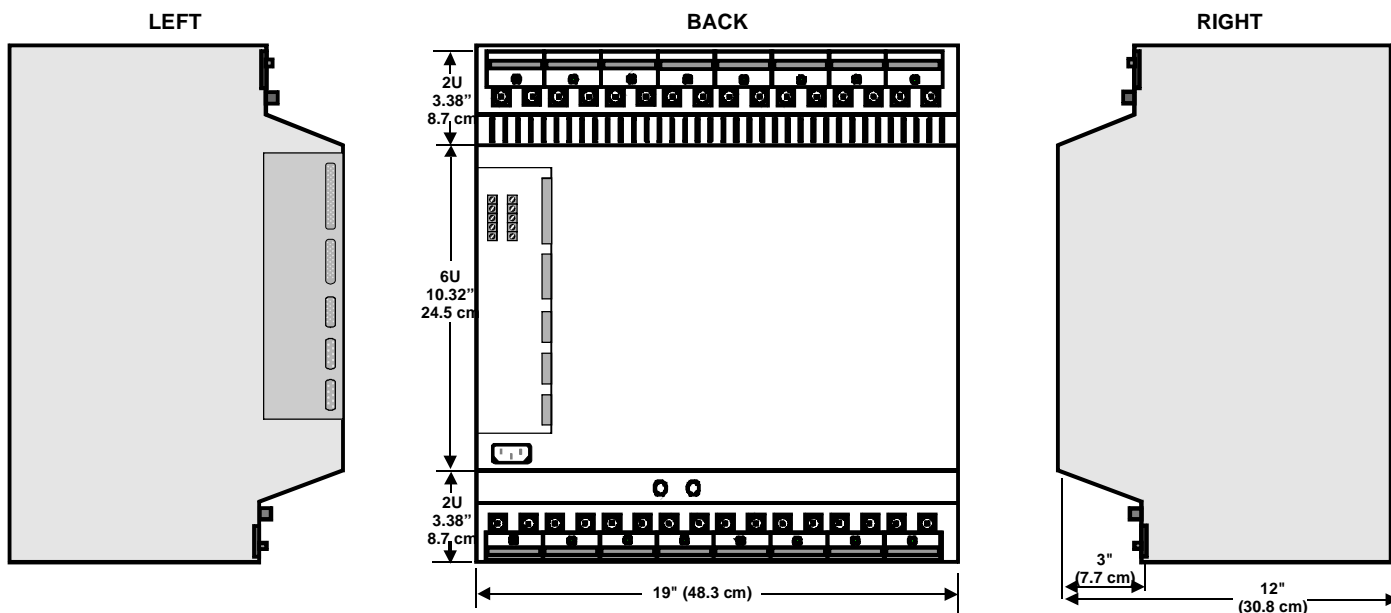
Physical

Dimensions	17.5" high X 19" wide X 12" deep
Mounting options	19" rack or 23" rack with adapter

Environmental

Operating Temperature:	NEBS 3 Certified 0° to 50° deg C
Operating Humidity:	to 90%, non-condensing
Storage Temperature:	-55° to 75°C, 24 hours
Power:	105/240 VAC or -48 VDC, dual-redundant

MECHANICAL



ORDERING INFORMATION

(Please specify chassis type, power supplies, VCX, and node controller for each HBR system)

HBR-CH-2502 (AC chassis + fan bay)

HBR-CH-2502-DC (DC chassis + fan bay)

HBR-PS2-AC (500 watt AC PSU module)

HBR-PS2-DC (400 watt DC PSU module)

HBR-NC-2502 (node controller module)

HBR-VCX-T1 (North American switch module)

Each terminal requires **at least** one power supply module (HBR-PS2) per chassis; an additional power supply may be added for redundancy. See the HBR-PS2 data sheet for power supply specifications.

Each chassis also requires **at least** one optics module (HBR-HSI). Please refer to the data sheet or contact your sales representative for more information about the optics module. See the HBR-OPT data sheet for module specifications.

Refer to specific HBR Module data sheets for other module ordering information and specifications.



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