DATA SHEET

Opti Max™ Optical Node Series

Digital Return System

2x85 MHz Legacy CommScope Protocol Node Transmitter and CHP Receiver

FEATURES

- Digital Return technology for ease of set-up and simplified “plug and play” operation
- 2:1 Time Division Multiplexing solution supporting 5–85 MHz upstream bandwidth
- Improved performance over legacy digital return solutions
- 1310, CWDM, and DWDM Small Form Pluggable (SFP) optics supported for simplified deployment logistics
- Dual Density receiver optimizes valuable headend/hub real estate
- Remote node monitoring with Digital Element Management System (DEMS) eliminates the need for a transponder
- Supports service group aggregation to support optimized scaling of headend/hub infrastructure equipment per service group
- Supports OM6000™, OM41xx, and OM27xx nodes

The CommScope Opti Max series of modular optical nodes offer a variety of options that support both HFC and Fiber Deep network architectures. To complement these nodes, CommScope offers a digital return system with improved link performance in support of DOCSIS® 3.1 deployments with bonded channels and higher orders of modulation.

Digital return solutions offer superior performance that is independent of link distance, which allows the node to be set up easily and does not require detailed optical analysis of individual loss budgets. The CommScope digital return system offers two, 5 to 85 MHz Time Domain Multiplexed (TDM) RF channels, making it easy to manage node segmentation and subscriber growth.

Digital Transmitter Processor Module

The transmitter can be deployed in 42, 65, or 85 MHz return systems, making it an ideal choice for operators looking to expand their return path in the future by reclaiming forward spectrum. The transmitter delivers improved performance over previous digital return versions and is designed to accommodate fiber deep architectures that may require lower return input levels by accepting an RF input level of 8 dBmV per 6 MHz channel.

The transmitter supports Service Group Aggregation (SGA), or Daisy Chaining, with improved Noise Power Ratio performance due to advancements in A/D technology. In this process, signals from service groups—up to four nodes—are digitally multiplexed at each node and fed upstream to the master node. SGA preserves CMTS ports and RX slots in the hub or headend, providing the flexibility to expand the service group later in response to increased bandwidth demands.

Two transmitter options are available. The OM6DTX-SFP-285-5A8 is the standard model that allows service group aggregation utilizing both RF channels. OM6DTX-SFP-285-5B8 is a premium model that enables the operator to switch to a mode that utilizes a single RF channel, maintaining NPR performance that is equivalent to a single link.

SFP OPTICS/TRANSMITTER SPECIFICATIONS

Characteristics	Specification
Physical	
Dimensions	6.0 in L x 1.25 in W x 4.3 in H (15.24 cm x 3.17 cm x 10.92 cm)
Weight	1.0 lb (0.45 kg)
Environmental	
Operating Temperature Range	-40° to +60°C (-40° to +140°F)
Storage Temperature Range	-40° to +85°C (-40° to +185°F)
Humidity	5% to 95% non-condensing
Optical	
Optical Center Wavelength	
1310	-25 ± 35 nm
CWDM	± 6.5 nm
DWDM	± 0.1 nm
SFP Transmitter Optical Output Power	
1310	-8.0 dBm (min), -1.0 dBm (max)
CWDM	0 dBm (min), +5.0 dBm (max)
DWDM	+3.0 dBm (min), +7.0 dBm (max)
SFP Transceiver Optical Input Range	
1310	-18.0 dBm (min), -1.0 dBm (max)
CWDM	-23.0 dBm (min), -7.0 dBm (max)
DWDM	-23.0 dBm (min), -7.0 dBm (max)
Optical Connector Type	LC/UPC
Data Rate Gbps	4.25
RF	
Operational Bandwidth	5–85 MHz
Recommended Total RF Input Power	+8 dBmV per Channel
Number of Input Channels	2
RF Input Return Loss	16 dB min
RF Input Impedance	75 ohms
RF Input Test Point	-20 ± 0.5 dB
Power Requirements	
Power Consumption	9 W (typical), 10 W (max)

CHP Digital Receiver Module

The dual digital return path receiver module contains two independent receiver circuits in a single width CHP module, enabling up to 20 receivers, or 40 RF streams, in a fully-loaded CHP chassis. With four RF outputs, a single DRR module can support a full, 4x4 segmented node, increasing the efficiency of node splits and preserving valuable real estate in the hub or headend. The Receiver is compatible with OM6 2x85 MHz transmitters only.

The receiver utilizes Avalanche Photo Diode (APD) technology, enabling very high sensitivity to extend link reach. The receiver supports an optical input range of -10 dBm to -26 dBm.

An additional benefit of the next-generation digital return system is the integrated Digital Element Management System (DEMS) monitoring provided by the transmitter modules, which eliminates the need for a separate DOCSIS transponder. Key parameters and module status of the node are communicated to the receiver via overhead bits in the digital return data stream.

The CHP Management Module (SMM-2), combined with the CORView™ EMS platform, manages the devices through standard SNMP/CLI interfaces and sophisticated Graphical User Interfaces.

RECEIVER SPECIFICATIONS

Characteristics	Specification
Physical	
Dimensions	3.44 in H x 1.25 in W x 18.5 in D (8.44 cm x 3.18 cm x 46.99 cm)
Weight	3.0 lbs (1.35 kg)
Environmental	
Operating Temperature Range	0° to +50°C (32° to +122°F)
Humidity	5% to 95% non-condensing
Optical	
Input Wavelength Range	1200 to 1620 nm
Optical Input Range	-26 to -10 dBm
Optical Connector Type	SC/APC (8 degrees)
RF	
RF Output Bandpass	5–85 MHz
Output Level	+40 dBmV max
Channel to Channel Isolation	65 dB
Output Return Loss	16 dB min
Output and Test Point Impedance	75 ohms
RF Output Test Point	-20 ± 0.5 dB
RF Connector Types	
Output	F-type
Test Points	F-type
Power Requirements	
Power Consumption	15.7 W (typical), 18.7 W (max)

SFP Optics

Small Form Pluggable, MSA compliant optics are available in a selection of technologies designed to satisfy a wide range of network requirements. These 4.25 Gbps, industrial temperature-rated SFP transceivers ensure the overall link performance is maintained.

For short links less than 10 km, a low-power 1310 nm SFP transceiver is available that delivers a lower-cost solution than analog return transmitters on a per RF stream basis.

To take advantage of longer links up to 50 km, CWDM SFP transceivers are available in 16 wavelengths. With the addition of ruggedized optical passives, wavelengths can be multiplexed for better fiber utilization.

For greater distances up to 80 km, DWDM SFPs are available in 40 ITU wavelengths to maximize wavelength aggregation and design flexibility. In the DWDM series, customers can select transmitter only SFPs or transceiver SFPs if Service Group Aggregation (SGA) is intended.

The complementary optical passive demultiplexer is required at the headend to decouple wavelengths prior to the CHP-D2RRX-85-6Z-S Receiver.

LINK SPECIFICATIONS

Characteristics	Specification
Link Budget	
1310	10 km fiber
CWDM	50 km fiber, 26 dB link budget
DWDM	80 km fiber, 29 dB link budget
Peak Noise-Power Ratio (NPR), typical	53 dB
Dynamic Range, @ ≥ 40 NPR, typical[1,2]	20 dB
BER Dynamic Range, @ ≤ 10^{-6} BER[1,2]	26 dB (256-QAM)
RF Link Gain[3]	32 dB
Link Flatness[3]	± 1.0 dB

NOTES:
1. Typical performance provided for the transmitter installed in the node at 23°C; 6 dB NPR degradation with four nodes in Standard Service Group Aggregation (SGA) mode.
2. With minimum transmitter and receiver attenuation settings.
3. Measured from node input to DRR output.

ORDERING INFORMATION

Model Name	Part Number	Description
		Digital Transmitter Processor Modules
OM6DTX-SFP-285-5A8	OM6DTX-SFP-285-5A8	2x85 MHz Digital Return Transmitter, Standard (2x Service Aggregation Mode Only), OM6000/OM41xx/OM27xx, Digital Element Management System, Service Group Aggregation
OM6DTX-SFP-285-5B8	OM6DTX-SFP-285-5B8	2x85 MHz Digital Return Transmitter, Premium (1x or 2x Service Aggregation Mode Switch), OM6000/OM41xx/OM27xx, Digital Element Management System, Service Group Aggregation
		CHP Digital Receiver Module
CHP-D2RRX-85-6Z-S	CHP-D2RRX-85-6Z-S	Digital Return Receiver, dual optical inputs, four RF outputs, 5–85 MHz
		1310 nm SFP Module, 10 km
OM6-SFP-1310-XCVR-4.25	1509443-001	SFP, 1310 nm Transceiver, 4.25 Gbps LC/UPC
		CWDM SFP Module, 40 km, 16 Wavelengths[1]
OM6-SFP-CWDM-xxxx-XCVR-4.25	1509444-xxx	SFP, Transceiver, 4.25 Gbps, sixteen CWDM wavelengths from 1271 nm to 1611 nm, LC/UPC
		DWDM SFP Module, 80 km, 40 ITU Wavelengths (Transmitter only)[2]
OM6-SFP-DWDM-CHxx-XMTR-4.25	1509445-xx1	SFP, Transmitter, 4.25 Gbps, 40 ITU channels from 20 to 60, LC/UPC

NOTES:
1. xxx = 271–611; xxxx = 1271–1611
2. xx = 20–60

RELATED PRODUCTS

Digital Return Transmitter	Optical Patch Cords
SFPs	Optical Passives
Fiber Service Cable	Installation Services

Contact Customer Care for product information and sales:
- United States: 866-36-ARRIS
- International: +1-678-473-5656

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Note: Specifications are subject to change without notice.

1514594_Opti Max/CHP 5–85 MHz Digital Return_DS_RevA