

Opti Max™ Optical Node Series

1x2 Remote PHY Device (RPD)
for OM6000™ 1.2 GHz HFC Nodes

FEATURES

- Industry leading RF output capability of 57 dBmV at 1.2 GHz
- Supports 1.2 GHz Downstream and 204 MHz Upstream bandpass for DOCSIS® 3.1 migration
- Seamlessly upgrade from traditional optics to distributed access architectures (DAA)
- Monitoring options available with ingress control switch remote functionality
- Enhances plant performance
- Maximizes fiber utilization and reach
- Improves headend density and power efficiency
- Simplifies plant maintenance via digital optics

The Remote PHY Device (RPD) is a key component in CommScope's Distributed Access Architecture (DAA) portfolio, which can provide significant operational benefits—including increased bandwidth capacity, improved fiber efficiencies (wavelengths and distance), simplified plant operations with digital optics, and decreased loads on facility space and power systems—by extending the digital portion of the headend or hub to the node and placing the digital/RF interface at the optical/coax boundary. The RPD works in conjunction with the CCAP Core to extend the PHY layer from the CCAP into an Opti Max™ OM6000™ HFC node. MAC processing, provisioning, and monitoring functions remain in the headend. The RPD provides full spectrum support for digital broadcast TV, VoD, and DOCSIS 3.0 and DOCSIS 3.1, as well as strategic alignment with future NFV/SDN/FTTx systems.



RPD Module Operation

The RPD takes the place of traditional optics modules, such as downstream receivers and upstream transmitters, inside the node. The RPD module operates with a standard output level and tilt that can be attenuated by installing RF attenuator pads and equalizers, respectively, in the node's RF modules. The RPD module's channel configuration is received from the CCAP Core in the headend; no manual configuration of the module is necessary after it is optically linked to the headend. The CommScope RPD module supports RPD modules 1x1 or a 1x2 configuration with one downstream segment and one or two upstream segments for HFC applications. The node's forward and return segmentation modules can be configured to support both configurations.

Network Flexibility

Today's technologies are developing at a rapid pace, which is why it is more important than ever for products to be flexible enough to support next-generation technologies, such as DAA, without major forklift. Keeping these concerns in mind, the OM6000 node allows operators to transition seamlessly from traditional node-based analog/digital optical delivery to a DAA architecture by using the OM6000 chassis as a base and leveraging current network assets. When operators are ready to transition to DAA, the node's modular design allows them to upgrade previously deployed OM6000 nodes to support R-PHY delivery by simply removing the node's existing receivers and transmitters and replacing them with the appropriate RPD module. The ease and simplicity of transitioning the OM6000 to support DAA operation provides operators with several benefits, including a cost-effective roadmap for upgrading their current network assets and the ability to future-proof today's purchases for long term use.

Flexible Powering Options

The need to utilize all RF outputs may not fit every node placement requirement. With this in mind, the OM6000's modular RF base design allows operators to target and remove one or more of the node's four RF modules to save power while operating the node. If necessary, operators can easily reintroduce these same modules to support future service group requirements.

Additionally, the OM6000 node features optional fully redundant powering via a second power supply module, which can be added to provide backup to the main power supply module. This redundancy is fully load sharing during normal operation. Each power supply has the ability to support the entire node in case the other fails.

Small Form-Factor Pluggable (SFPs)

CommScope offers temperature-hardened, high-speed 10 Gbps SFP+ modules for the RPD application. These SFP modules are carefully chosen by our design teams to ensure end-to-end performance and stability. Available in CWDM and DWDM 40 ITU wavelengths, CommScope SFP+ modules support lengths of up to 80 km. Rigorously tested, SFP+ modules are designed to withstand the increased thermal profile of the OM6000 while providing long-term performance in the field. The modules provide both design flexibility and the ability to maximize wavelength aggregation, making them the ideal choice to guarantee the RPD's link performance across a wide range of outdoor temperatures.



SPECIFICATIONS

Characteristics	Specification
Physical	
Dimensions	23.6 in L x 11.0 in W x 12.2 in H
Weight	< 50 lb
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%–95% non-condensing
General	
Service Group Configurations	1 DS-SG x 1 US-SG 1 DS-SG x 2 US-SG
CIN Connectivity	Dual 10 GbE SFP+ Daisy Chain (future) Path Redundancy (future)
Channel Capacity	
Downstream	Up to 2 OFDM channels (up to 192 MHz wide each) and 72 Annex A channels (96 Annex A channels future) Up to 2 OFDM channels (up to 192 MHz wide each) and 128 Annex B channels
Upstream	Up to 2 OFDMA (up to 95 MHz each) and 12 SC-QAM channels (per upstream port)
Set Top Box Out-of-Band (OOB)	SCTE 55-1 SCTE 55-2
Out of Band	Narrowband Digital Forward (1.28, 2.56, and 5.12 MHz channel widths) Narrowband Digital Return (1.28, 2.56, and 5.12 MHz channel widths)
CW Tone Generation	AGC, Alignment, Leakage Detection (up to 12 leakage tones—10 dedicated AGC and Leakage Detection, 2 non-dedicated Alignment)
High Speed Data	DOCSIS 3.0, DOCSIS 3.1
Video	Broadcast Video, Narrowcast Video
Designed for Compliance to CableLabs® MHA v2 Standards	CM-SP-R-PHY Remote PHY Specification CM-SP-R-DEPI Remote Downstream External PHY Interface Specification CM-SP-R-UEPI Remote Upstream External PHY Interface Specification CM-SP-GCP Generic Control Plane Specification CM-SP-R-DTI Remote DOCSIS Timing Interface Specification CM-SP-R-OOB Remote Out-of-Band Specification CM-SP-R-OSSI Remote PHY OSS Interface Specification CM-SP-DRFI Appendix D
RF (Node with RPD)	
Downstream Operational Bandwidth	54–1218 MHz/85–1218 MHz/102–1218 MHz/258–1218 MHz
Upstream Operational Bandwidth	5–42 MHz/5–65 MHz/5–85 MHz/5–204 MHz
Output Level	51/33 dBmV @ 1218 MHz (actual) 57/39 dBmV @ 1218 MHz (virtual)
Output Linear Tilt	18 dB (54 to 1218 MHz)
RF Port Impedance	75 Ω
RF Return Loss	16 dB Typical
Test Points	-20 dB
Powering (Node with RPD)	
Power	< 140 W AC
AC Input Voltage	44–90 V AC (dual redundant power supplies)
Power Supply Spurious	-60 dBc
Hum Modulation	-60 dBc
AC Bypass Current	15 A

RELATED PRODUCTS

E6000® CCAP Core	CHP Max5000® Optics
OM6000 Fiber Deep Node	Headend and Field Passives
1310/CWDM/DWDM SFP+	Installation Services

ORDERING INFORMATION

Model Number	Description
Factory Configured RPD Node Options	
OM6H42YSN-1XR2XC112M	1.2 GHz HFC OM6000 node with Remote PHY Device (RPD), 1 DS-SG x 2 US-SG, 42/54 MHz Split, no console port
OM6H42YSN-1X02X0000M	1.2 GHz HFC OM6000 node, 42/54 MHz Split, I ² C EMS Mux card, without RPD module (RPD ready)
RPD Modules	
1001420	Remote PHY Device (RPD), 1 DS-SG x 2 US-SG, with Console Port
1001421	Remote PHY Device (RPD), 1 DS-SG x 2 US-SG, no Console Port
Power Supply Modules	
1510056-001	OM6 24 V HFC Power Supply Module
OM6-PS-HOLD	OM6 Power Hold-up Module
RF Modules	
1510055-020	OM6 1.2 GHz, 42/54 MHz Split, 24 V, with Return EQ Support and Ingress Control Switch
1510055-024	OM6 1.2 GHz, 65/85 MHz Split, 24 V, with Return EQ Support and Ingress Control Switch
1510055-028	OM6 1.2 GHz, 85/102 MHz Split, 24 V, with Return EQ Support and Ingress Control Switch
1510055-032	OM6 1.2 GHz, 204/258 MHz Split, 24 V, with Return EQ Support and Ingress Control Switch
SFP+ Optics	
TTA1310-TL10	10 Gbps 10 km 1310 nm Transceiver, -40° to +95°C (-40° to +203°F) operating temperature range
TTB1550-TLxx (xx = 40 or 80)	10 Gbps 1550 nm Transceiver, Fiber Distances of 40 km or 80 km Supported, -40° to +95°C (-40° to +203°F) operating temperature range
TTC-xxxx-TL40 (xxxx = wavelength)	10 Gbps 40 km CWDM Transceiver, 8 Wavelengths Supported (1470 nm to 1610 nm), -40° to +95°C (-40° to +203°F) operating temperature range
TTCxxxx-TL80 (xxxx = wavelength)	10 Gbps 80 km CWDM Transceiver, 8 Wavelengths Supported (1470 nm to 1610 nm) -40° to +95°C (-40° to +203°F) operating temperature range
TTD4540-xx-PI (xx = 20–59)	10 Gbps 40 km DWDM Transceiver, 40 Wavelengths Supported (ITU Channels 20–59) -40° to +95°C (-40° to +203°F) operating temperature range
TTD4580-xx-PI (xx = 20–59)	10 Gbps 80 km DWDM Transceiver, 40 Wavelengths Supported (ITU Channels 20–59) -40° to +95°C (-40° to +203°F) operating temperature range
PADs/Equalizers	
1510053-0xx (xx = 01–12)	1.4" Linear Equalizer, 1.2 GHz, 01 dB through 12 dB
NPB-xx0 (xx = 00–20)	1.4" Attenuator, 00 dB through 20 dB
REQC-42-xx (xx = 02–11)	1.4" Cable Equalizer, 42 MHz, 02 dB through 11 dB
REQC-65-xx (xx = 02–11)	1.4" Cable Equalizer, 65 MHz, 02 dB through 11 dB
REQC-85-xx (xx = 02–11)	1.4" Cable Equalizer, 85 MHz, 02 dB through 11 dB
REQC-204-xx (xx = 02–11)	1.4" Cable Equalizer, 204 MHz, 02 dB through 11 dB

Contact Customer Care for product information and sales:

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Note: Specifications are subject to change without notice.

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1513968_1x2 RPD Module for OM6 HFC Nodes_RevA