

Opti Max™ Optical Node Series

OM6000-A Aggregator, OM6000-T Terminating Nodes

DAA Aggregator Solution

FEATURES

- Features an industry-leading R-PHY solution for “pay as you grow” options to support future capacity demands
- Supports high output level capability for maximum service group size
- Drives fiber deeper into the network
- Supports upgrades to R-PHY configurations for additional capacity requirements without having to forklift
- Reduces deployment costs in low to medium density areas, expanding the homes passed per node area
- Pre-configured in the factory to support upstream and downstream operational requirements out of the box

As a complement to traditional DAA solutions, the CommScope OM6000™ DAA Aggregator node platform is a cost-effective solution designed for low to medium density fiber deep deployments that allows operators to “pay as you grow” when customer demands require it. By deploying the OM6000 DAA Aggregator solution, operators can now realize the benefits of DAA and Fiber Deep operation by driving fiber deeper into the network and expanding the homes passed per node area, all while reducing deployment costs.



OM6000-A Aggregator Node



OM6000-T Terminating Node

OM6000 DAA Aggregator Solution Overview

A standard Remote PHY network architecture requires each node to be equipped with an individual RPD, dedicated 10G fiber links, and vCore resources to support R-PHY operation. The OM6000 DAA Aggregator solution's aggregator-based network design, on the other hand, requires only the OM6000-A Aggregator Node to be configured for R-PHY operation, rather than each node in the network. Once deployed, an OM6000-A Aggregator Node can support up to eight sub-tended OM6000-T Terminating Nodes. As a result, only a single R-PHY configured fiber deep node is needed in the OM6000 DAA Aggregator network to expand the homes passed per node area and provide adequate network coverage. Instead of nine R-PHY configured fiber deep nodes servicing 30 homes each, for example, the same coverage can now be provided with one OM6000-A Aggregator Node and up to eight OM6000-T Terminating Nodes. OM6000-T Terminating Nodes can be upgraded to direct RPD nodes as dictated by capacity needs, offering a futureproof solution for expanding and upgrading bandwidth. This flexibility provides operators with a pathway to bandwidth expansion without the need for solution forklift.

OM6000-A Aggregator Nodes

Aggregator and terminating nodes are based on CommScope's current Opti Max OM6000 fiber deep node. The OM6000-A Aggregator Node is equipped with an RPD device, a downstream analog transmitter, and two quad digital return receivers. The RPD will be serviced by a dedicated 10G fiber link for maximum digital performance. The downstream analog transmitter picks off RF signals immediately from the RPD output, which are optically split for transmission to each individual GOT node. The quad digital return receiver receives individual digital return signals from each OM6000-T Terminating Node and feeds the RPD combined RF signals from the OM6000-T Terminating Nodes and the OM6000-A Aggregator Node's RF modules. Additionally, the OM6000-A Aggregator Node provides up to two optional, high-level coaxial RF outputs to support homes near the OM6000-A, which eliminates both the need to place additional nodes near the OM6000-A to service those homes and the need for multiple, close-coupled enclosures.

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.

To further simplify deployment, OM6000-A Aggregator Nodes are pre-configured in the factory to support ease of installation. The modules, pluggable optics, pads, and equalizers included with each node support the network design's upstream and downstream performance requirements out of the box. Additional configuration is not typically required during the deployment process.

OM6000-T Terminating Nodes

Each OM6000-T Terminating Node closely mirrors the traditional analog OM6000 nodes currently deployed in fiber deep networks. OM6000-T Terminating Nodes are factory-configured for 1x1 Fiber Deep operation and include a 1.2 GHz optical receiver and 1-fer DT7030N digital return transmitter with a 4.2G 10 km SFP module. The OM6000-T Terminating Node provides four, high-level coaxial RF outputs to provide maximum RF coverage in the service area. Because OM6000-T Terminating Nodes leverage existing CommScope fiber deep modules and form factors, they provide seamless, plug-and-play upgrade capability for stand-alone R-PHY node configurations. This modular design also allows operators to easily convert an existing OM6000 node to either an Aggregator or Terminating configuration, or convert an OM6000-T Terminating Node to an RPD node. As the network grows, the CommScope solution remains simplistic because of the flexibility of the solution's core modules.

Like OM6000-A Aggregator Nodes, OM6000-T Terminating Nodes are pre-configured in the factory to support ease of installation. The modules, pluggable optics, pads, and equalizers included with each node support the network design's upstream and downstream performance requirements out of the box. Additional configuration is not typically required during the deployment process.

SPECIFICATIONS OM6000-A AGGREGATOR NODE

Characteristics	Specification
Physical	
Dimensions	23.6 L x 11.0 W x 12.2 D
Weight	< 50 lbs
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	
Node Configuration	Two RF Amplifier Modules, one Power Supply, one Downstream Transmitter Module, two Quad Digital Return Receiver Modules, one OM6000-A Downstream Configuration Module, one OM6000-A Upstream Configuration Module, one I2C Multiplexer Card
Forward Path	
RF	
Operational Bandwidth	102–1218 MHz
Flatness ¹	± 1.5 dB
Output Level	+58 dBmV @ 1218 MHz (typical)
Operational Tilt	21.0 ± 1.0 dB (102–1218 MHz) (typical)
Downstream Level Stability Over Temperature ²	± 1.0 dB
RF Output Test Points ³	-20 ± 1.0 dB
RF Output Return Loss ⁴	16 dB
Performance Specifications	
Channel Loading	148 ITU-T J.83 Annex B SC-QAM 256 + 1, 192 MHz OFDM Channel, SC-QAM from 108–1002 MHz, OFDM from 1026 to 1218 MHz
MER	41 dB (typical)
BER (Pre-FEC)	< 1E-06 (ITU-T J.83 Annex B SC-QAM 256)
Return Path	
RF	
Operational Bandwidth	5–85 MHz
Flatness ¹	± 1.0 dB
Gain Slope	0 ± 1.0 dB
Upstream Level Stability Over Temperature ⁵	± 1.0 dB
RF Test Points ²	-20 ± 1.0 dB
RF Return Loss ^{4, 6}	16 dB
RF Path Loss ⁷	0 ± 1.0 dB
With ICS (-6 dB)	6 ± 1.0 dB
Without ICS (Off)	> 30 dB
Node Powering	
Power Consumption	< 160 WAC
AC Input Voltage	44–90 VAC
AC Input Frequency Range	50/60 Hz
Hum Modulation ^{8, 9}	-60 dBc
AC Bypass Current ¹⁰	15 A
Required Accessories	
RF Pads NPB-xx0*	Factory Installed in two RF modules. Not required for digital return setup. Customer can modify in 0.5 dB steps from 0–5 dB, and 1.0 dB steps from 5–20 dB, as required when purchased as an accessory item.
*xx = 00–20 (0–20 dB)	
Linear Equalizers EQ1220MHZ-**	Factory Installed in two locations. Customer can modify in 1 dB steps as required when purchased as an accessory items.
**xx = 00–12 (0–12 dB)	

SPECIFICATIONS OM6000-A AGGREGATOR NODE MODULES

Characteristics	Specification
E6000n Remote PHY Device (RPD) Module	
OM6000-A Node Location	Lid Slots 3–10
RF Port Configuration	1 DS-SG x 1 US-SG
CIN Connectivity ¹¹	Dual 10 GbE SFP+
Downstream Bandwidth	108–1218 MHz
Upstream Bandwidth	5–85 MHz
Operating Tilt (1218/108 typical)	9.5 dB
RF Test Points (Upstream/Downstream)	-20 ± 1.0 dB
Downstream RF Output Level @ 1218 MHz	49.5 dBmV (typical)
Nominal RF Upstream Input Level	8 dBmV/6 MHz
Downstream Transmitter	
OM6000-A Node Location	Lid Slot 1
Optical	
Optical Output Power	10 (typical) dBm
Optical Wavelength Range	1545–1562 nm
Optical Connector	SC/APC 8 degree
RF	
Bandwidth Operational Range	52–1218 MHz
Response Flatness, P-V, min/max	-1.0/1.0 dB (52 to 1218 MHz, typical)
Input Return Loss	16 dB
RF Input Test Point ¹²	-20 ± 1.0 dB
Performance	
Channel Loading	148 ITU-T J.83 Annex B SC-QAM 256 + 1, 192 MHz OFDM Channel, SC-QAM from 108–1002 MHz, OFDM from 1026 to 1218 MHz
Nominal RF Input Power	26 dBmV/channel
Typical Link Performance ¹³	2 km fiber link + passive loss @ 0 dBm Rx power
MER ¹⁴	46 dB (typical)
BER (Pre-FEC)	1E-06 (ITU-T J.83 Annex B SC-QAM 256)
Power Consumption	
Quad Digital Return Receiver	
OM6000-A Node Location(s)	Lid Slot 11, Lid Slot 12
Optical	
Optical Input Power Range	0 to -16 dBm (with RR4000-00-PI installed)
Number of Optical Interfaces	Four with two RR4000-00-PI pluggable receiver modules installed
Operating Wavelength Range	1263.5–1617.5 nm (with RR4000-00-PI installed)
Optical Connector	LC/UPC
Optical Line Rate ¹⁵	4.25 Gbps
RF	
Bandwidth Operational Range	5–85 MHz
Response Flatness ¹⁵	± 0.5 dB
Link Gain ¹⁶	10 ± 1.0 dB
Output Return Loss	18 dB
RF Input Test Point ¹⁷	-20 ± 1.0 dB
RF Output Attenuator Range	0–20, 0.5 dB increments dB
Ingress Control ¹⁸	0, -6, Off dB
Link Performance ¹⁵	
Nominal Loading	12, 6.4 MHz 64 SC-QAM Channels or 5–85 MHz Noise Loading
Nominal RF Input Level ¹⁹	8 dBmV/6 MHz
NPR Dynamic Range @ 40 dB ¹⁵	17 dB
Pre-FEC BER Dynamic Range @ 1E-6 dB ¹⁵	29 dB
Local Monitoring Interface	micro-USB; Supports local status monitoring and control via Opti-Trace [®] CMS
Power Consumption	< 12 WDC, with two RR4000-00-PI pluggable receiver modules installed

SPECIFICATIONS OM6000-A AGGREGATOR NODE MODULES

Characteristics	Specification
Quad Digital Return Receiver Continued	
OM6000-A Node Location(s)	Lid Slot 11, Lid Slot 12
Optical	
Optical Input Power Range	0 to -16 dBm (with RR4000-00-PI installed)
Number of Optical Interfaces	Four with two RR4000-00-PI pluggable receiver modules installed
Operating Wavelength Range	1263.5–1617.5 nm (with RR4000-00-PI installed)
Optical Connector	LC/UPC
Optical Line Rate ¹⁵	4.25 Gbps
RF	
Bandwidth Operational Range	5–85 MHz
Response Flatness ¹⁵	± 0.5 dB
Link Gain ¹⁶	10 ± 1.0 dB
Output Return Loss	18 dB
RF Input Test Point ¹⁷	-20 ± 1.0 dB
RF Output Attenuator Range	0–20, 0.5 dB increments dB
Ingress Control ¹⁸	0, -6, Off dB
Link Performance¹⁵	
Nominal Loading	12, 6.4 MHz 64 SC-QAM Channels or 5–85 MHz Noise Loading
Nominal RF Input Level ¹⁹	8 dBmV/6 MHz
NPR Dynamic Range @ 40 dB ¹⁵	17 dB
Pre-FEC BER Dynamic Range @ 1E-6 dB ¹⁵	29 dB
Local Monitoring Interface	micro-USB; Supports local status monitoring and control via Opti-Trace CMS
Power Consumption	< 12 WDC, with two RR4000-00-PI pluggable receiver modules installed

NOTES OM6000-A Aggregator Node and Modules:

- Measured with respect to tilt over the operating band of the node.
 - Measured to 23°C operational levels.
 - Measured with respect to the associated node port.
 - Measured at the node RF input and output port over the specified passband.
 - Measured from GOA node upstream input port to RPD RF input.
 - Return loss is 15 dB from 5–15 MHz when ICS is installed in the node.
 - At 25°C. Gain measured across bandwidth.
 - Over the operating temperature range.
 - Measured from 0–15A, de-rate to 55 dBc from 5 to 10 MHz.
 - Maximum total current applied.
 - Requires 95°C SFP+ operating temperature. TTD45xx series SFP+ modules are recommended.
 - RF Input test point -20 ± 1.5 dB over full temperature range; RF input attenuator set to 0 dB.
 - Link performance specified with GOT Forward Path Receiver.
 - MER corrected for source contribution. Measured with a signal source with MER greater than 44 dB and a signal analyzer with MER measurement capability greater than 46 dB MER.
 - When using the DT7030N 1-fer 85 MHz digital return transmitter in a single wavelength configuration.
 - From DT7030N input to DR4485N RF Output with 0 dB Attenuation.
 - With output attenuator set to 0 dB; RF input test point switchable via rotary switch positions RX1, RX2, RX3, RX4.
 - Selectable for individual upstream RF paths via Opti-Trace CMS or RPD module.
 - References the nominal RF input level for the DT7030N 1-fer 85 MHz digital return transmitter.
- Specifications are compliant with the applicable, recommended ANSI/SCTE test methods.
All specifications are stated as worst-case over temperature unless otherwise noted.

SPECIFICATIONS OM6000-T TERMINATING NODE

Characteristics	Specification
Physical	
Dimensions	23.6 L x 11.0 W x 12.2 D
Weight	< 50 lbs
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	
Node Configuration	Four RF Amplifier Modules, one Power Supply, one 1.2 GHz receiver module, one digital return transmitter with 10 km SFP+ module, one OM6000-T Downstream Configuration Module, one OM6000-T Upstream Configuration Module
Forward Path	
RF	
Operational Bandwidth	102–1218 MHz
Flatness ¹	± 1.0 dB
Output Level	+58 dBmV @ 1218 MHz (typical)
Operational Tilt	21.0 ± 1.0 dB (102–1218 MHz) (typical)
Downstream Level Stability Over Temperature ²	± 1.5 dB
RF Test Points ³	-20 ± 1.0 dB
RF Output Return Loss ⁴	16 dB
Performance Specifications ⁵	
Channel Loading	148 ITU-T J.83 Annex B SC-QAM 256 + 1, 192 MHz OFDM Channel, SC-QAM from 108–1002 MHz, OFDM from 1026 to 1218 MHz
MER	39.0 dB (typical)
BER (Pre-FEC)	< 1E-06 (ITU-T J.83 Annex B SC-QAM 256)
Return Path	
RF	
Operational Bandwidth	5–85 MHz
Flatness ¹	± 1.0 dB
Gain Slope	0 ± 1.0 dB
Upstream Level Stability Over Temperature ⁶	± 1.5 dB
RF Test Points ³	-20 ± 1.0 dB
RF Output Return Loss ^{3, 7}	16 dB
RF Path Loss ⁸	0 ± 1.0 dB
Nominal Return Input Level ⁹	8 dBmV/6 MHz; 5–85 MHz
Without ICS (Off)	> 30 dB
Node Powering	
Power Consumption	< 135 WAC
AC Input Voltage	44–90 VAC
AC Input Frequency Range	50/60 Hz
Hum Modulation ^{10, 11}	-60 dBc
AC Bypass Current ¹²	15 A
Required Accessories	
RF Pads NPB-xx0* *xx = 00–20 (0–20 dB)	Factory Installed in four RF modules. Not required for digital return setup. Customer can modify in 0.5 dB steps from 0–5 dB, and 1.0 dB steps from 5–20 dB, as required when purchased as an accessory item.
Linear Equalizers EQ1220MHZ.** **xx = 00–12 (0–12 dB)	Factory Installed in two locations. Customer can modify in 1 dB steps as required when purchased as an accessory items.

RELATED PRODUCTS

E6000® CCAP Core	Optical Passives
CHP Max5000®/CH3000 Headend Optics	Indoor and Outdoor 10G SFP+ Options
Digital Return	R-PHY

SPECIFICATIONS OM6000-T TERMINATING NODE MODULES

Characteristics	Specification
Optical Receiver	
OM6000-T Node Location	Lid Slot 4
Optical Wavelength	1260 to 1620 nm
Optical Input Power Range, continuous	-4.0 to +3.0 dBm
Optical Connector Type	SC/APC
Optical Test Point	1 ± 10% Volt/mW
Operating Tilt (1218/108 typical)	9.5 dB
RF Test Points (Upstream/Downstream)	-20 ± 1.0 dB
Downstream RF Output Level @ 1218 MHz	49.5 dBmV (typical)
Nominal RF Upstream Input Level	8 dBmV/6 MHz
Digital Return Transmitter	
OM6000-A Node Location	Lid Slot 9
General	
Pluggable Optics	TKA1310-TL10 (one module installed in factory)
Optical Interface Connectors	LC duplex on SFP
Optical Transmission Bit Rates	4.25 Gbps
Number of RF Channels	1-fer, 1x85 MHz
RF	
Operational Bandwidth	5–85 MHz
Input Return Loss	16 dB (minimum)
System Full Gain	10 ± 1.0 dB (to DR4485 quad digital return receiver)
Input Test Point	-20 ± 1.0 dB
Frequency Response	± 0.5 dB
Distortion¹³	
Nominal Loading	5–85 MHz
Nominal Input	8 dBmV/6 MHz
NPR Dynamic Range @ 40	17 dB
BER Dynamic Range @ 1.E-06	29 dB
BER (Pre-FEC)	1E-06 (ITU-T J.83 Annex B SC-QAM 256)

NOTES OM6000-T Aggregator Node and Modules:

1. Measured with respect to tilt over the operating band of the node.
2. Referenced to 23°C operating levels when connected to a GOA node.
3. Measured with respect to the associated node port.
4. Measured at the node RF input and output port over the specified passband.
5. Measured when connected via 2 km fiber to a GOA node operating with a -1 dBm Rx.
6. Measured from GOT node upstream input port to GOA RPD RF input.
7. Return loss is 15 dB from 5–15 MHz when ICS is installed in the node.
8. At 25°C. Gain measured across bandwidth.
9. Loading at node port and digital return module.
10. Over the operating temperature range.
11. Measured from 0–15 A, de-rate to 55 dBc from 5 to 10 MHz.
12. Maximum total current applied.
13. Tested with DR4485 quad digital return receiver. Single wavelength performance (one DT7030N-85 to the DR4485).

Specifications are compliant with the applicable, recommended ANSI/SCTE test methods.

All specifications are stated as worst-case over temperature unless otherwise noted.

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Note: Specifications are subject to change without notice.

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