

Nokia 1830 Global Express (GX) Open Line System

Flexible multi-haul open OLS for any transport application, including $\mbox{\sc OpenROADM}$

Optical network disaggregation, the decoupling of transponders/muxponders from the optical line system, is being embraced by a wide range of network operators thanks to benefits like more choice, faster innovation, and improved economics. Nokia's 1830 Global Express (GX) compact modular transport platforms support both Layer 1 and Layer 0 functionality within one chassis or on separate ones and can evolve between technology generations within a common platform. With the 1830 GX, operators have the choice to disaggregate or aggregate their networks. The brand-new update of the 1830 GX OLS technology includes 600-mm and 300-mm chassis options, new compact ROADM-on-a-blade, new add/drop modules, and advanced amplification options, enabling network operators to address all transport network domains, from small to large and from metro and core to ultra-long-haul and subsea, delivering a holistic end-to-end OLS solution with a single multi-haul line system and saving cost, space, and power. It collapses network domains with metro and ultra-long-haul in a single platform and a single line system.



Flexible Compact Modular Platform for Network Disaggregation

Nokia's 1RU 1830 GX G31 and 2RU 1830 GX G32 compact modular platforms support installations in 19", 21", and 23" racks/cabinets with depth of 600 mm or greater. The 1830 GX G34c is a 4RU compact modular platform that supports installation in 300-mm ETSI-compliant installation environments. All support redundant AC or DC power supplies, redundant fans with front-to-back airflow, and field-replaceable controllers. The 1830 GX G32 and 1830 GX G34c support redundant field-replaceable controller cards.

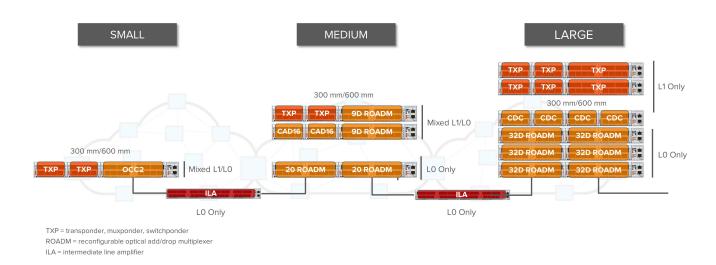
Benefits of the Nokia 1830 Global Express (GX) OLS

- Enable any transport network infrastructure with modular open line system functionalities
- Leverage flexibility, with many different add/drop architectures supporting colorless, directionless, and contentionless architectures
- Open your network with open APIs, OpenROADM compliance, and support for any transponder technology, including third-party transponders/ muxponders
- Save on CapEx with the ability to select only the functionality needed
- Reduce operational costs, improve analytics, and speed up service delivery with YANG RESTCONF/NETCONF open APIs and gNMI/gRPC streaming telemetry
- Simplify turn-up and lifecycle management with easy installation, quick service turn-up, and intuitive management
- Optimize your line system with dynamic gain equalization (DGE) and Layer 0 analytics with OCM and OTDR
- Minimize footprint with two ROADM degrees in a single rack unit
- Scale with multi-chassis pairing
- Future-proof your line system investments with the ability to add functionality with new pluggables as your needs evolve
- Reduce power consumption and carbon footprint with ROADM technology and power-efficient optical layer components

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The 1830 GX OLS supports a wide range of optical layer functions, including FOADMs; ROADMs; C, CD, and CDC add/drops; variable-gain EDFA amplifiers; Raman amplifiers; optical time-domain reflectometer (OTDR); optical protection switching (OPS); optical channel monitoring (OCM); optical supervisory channel (OSC); and a variety of fixed mux/demux DWDM filters. Further, the 1830 GX OLS operates GOSNR-based link control, enabling automated per-wavelength power balancing and high-performance optical transmission regardless of wavelength data rate, channel baud rate, and modulation, designed to seamlessly support any wavelength, including third-party wavelengths.



Leverage the Same Platform for Transponder/Muxponder/Switchponder Functions

The 1830 GX supports a wide range of transponder/muxponder/switchponder sleds within the same or multiple chassis and can be combined in a multi-chassis configuration with a single TID.

Open Line System Sleds

Nine-degree ROADM Sled

Supported in the 600-mm 1830 GX G31/G32 chassis, the dual-slot RD09SM is a cost-effective and fully integrated nine-degree broadcast-and-select ROADM-on-a-sled with a single 1 x 9 wavelength-selective switch (WSS). In addition to the WSS, it includes a two-port OCM, OTDR and monitor ports, a 1510-nm OSC with pluggable SFP, a variable-gain pre-amplifier, and booster amplifiers. It supports an OpenROADM-compliant mode and fixed- and flexible-grid operation within the extended C-band. Supported add/drop structures are fixed DWDM filter and colorless-directionless add/drop, as well as direct transponder connect.

20-degree ROADM Sled

Supported in the 600-mm 1830 GX G31/G32 chassis, the dual-slot RD20TM is a fully integrated 20-degree route-and-select ROADM-on-a-sled with a twin 1 x 20 WSS. In addition to the WSS, it includes a three-port OCM, OTDR and monitor ports, a 1510-nm OSC with pluggable SFP, a variable-gain pre-amplifier, and booster amplifiers, and it supports hardware cable ID to validate fiber connectivity. It supports fixed-grid and flexible-grid operation within the extended C-band. Supported add/drop structures are fixed DWDM filter, colorless, and colorless-directionless-contentionless, as well as direct transponder connect.

12-degree ROADM Sled

Supported in the 300-mm 1830 GX G34c chassis, the dual-slot RD12TI is a fully integrated 12-degree route-and-select ROADM-on-a-sled with a twin 1 x 12 WSS. In addition to the WSS, it includes mid-stage access, a three-port OCM, OTDR and monitor ports, a 1510-nm OSC with pluggable SFP, a variable-gain pre-amplifier, and booster amplifiers, and it supports hardware cable ID to validate fiber connectivity. Its support spans fixed-grid and flexible-grid operation and Super C-band. Supported add/drop structures are fixed DWDM filter and colorless-directionless-contentionless, as well as direct transponder connect.

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32-degree ROADM Sled

Supported in the 600-mm 1830 GX G32 chassis, the triple-slot RD32TH is a fully integrated 32-degree route-and-select ROADM-on-a-sled with a twin 1 x 32 WSS. In addition to the WSS, it includes a three-port OCM, OTDR and monitor ports, a 1510-nm OSC with pluggable SFP, a variable-gain pre-amplifier, and booster amplifiers, and it supports hardware cable ID to validate fiber connectivity. It supports fixed-grid and flexible-grid operation within the Super C-band and is upgradeable to Super L-band while in service. Supported add/drop structures are fixed DWDM filter, colorless, and colorless-directionless-contentionless, as well as direct transponder connect.

Raman Amplifier Sled

Supported in the 600-mm 1830 GX G31/G32 chassis, the single-slot RPBM is a fully integrated Raman amplifier sled. It comes in two variants – the Raman Super C-band with four pumps and the Raman Super C+L-band with five pumps. Both support spans of up to 48 dB in combination with the ROADM sleds.

Supported in the 300-mm 1830 GX G34c chassis, the dual-slot RPBM is a fully integrated Raman amplifier sled. It comes in two variants – the Raman Super C-band with two pumps, supporting spans of up to 35 dB, and the Raman Super C+L-band with six pumps, supporting spans of up to 48 dB in combination with the ROADM sleds.

Bidirectional EDFA Sled

Supported in the 300-mm 1830 GX G34c chassis, the dual-slot ILASGH is a fully integrated dual EDFA amplifier designed for both fiber degrees at an intermediate line amplifier (ILA) site. The ILASGH supports Super C-band and provides an upgrade port for seamless Super L-band EDFA upgrade and insertion. Integrated OCM monitoring ports, OTDR ports, pluggable OSC, and DGE ports make the ILASGH a comprehensive amplification module.

Colorless Add/Drop Sled

Supported in the 600-mm 1830 GX G31/G32 chassis, the single-slot CAD10A is a fully integrated colorless add/drop sled with 10 ports for wavelength interfaces. In addition to the colorless splitter/combiner, it includes a pre-amplifier and a booster amplifier. The CAD10A supports channels of +5 dBm to -10 dBm and Super C-band with up to 6.1 THz of total capacity, and it provides optical power monitoring on TX, RX, and common line ports. The CAD10A can also be configured as a terminal node.

Colorless-Directionless-Contentionless Add/Drop Sled

Supported in the 600-mm 1830 GX G31/G32 chassis, the single-slot CDC8D6 is a fully integrated colorless-directionless-contentionless add/drop sled with eight-degree ports and six add/drop ports. The CDC8D6 supports Super C-band and Super L-band channels with input power of +7 dBm to -2 dBm, and it provides optical power monitoring on TX, RX, and common line ports.

OCC2 OFP2 Carrier Card Sled

The dual-slot OCC2T is an optical carrier card sled for up to three OFP2 optical layer pluggables for the 1830 GX G31 and G32 chassis variants and supports BITS input/output and PPS/TOD connectors for future synchronization applications. The dual-slot OCC2E is an optical carrier card sled for up to four OFP2 optical layer pluggables for the 1830 GX G34c chassis variant.

OFP2 Pluggables for the OCC2 Carrier Card Sleds

The OCC2 supports a wide range of compact optical layer pluggables based on the CFP2-like form factor called OFP2, which has a height of 19.5 mm, a width of 50.5 mm, and a depth of 154.4 mm.

OFP2 Variable-gain Amplifiers

Available options include three pre-amplifiers with OSC (O2PAOHIR, O2PAOHER) and one booster amplifier (O2BAX) and are optimized for different span losses and channel counts. These amplifiers support a wide range of applications, including point-to-point, chain, ring, and mesh ROADM topologies and can be utilized for terminal sites, add/drop sites, and intermediate line amplifier sites. The OFP2 amplifiers have a maximum power consumption of between 5 and 11 W.

OFP2 Optical Time-domain Reflectometer (OTDR8)

The O2OTDR8E OFP2 supports both in-service and out-of-service OTDR on up to eight fibers (i.e., four bidirectional degrees). It supports measurements with resolution down to as little as 1 meter and distances of approximately 100 km. In order to support inservice operation, it operates at 1625 nm and supports C+L networks.



OFP2 Optical Channel Monitor (OCM)

The O2OCM provides per-channel power monitoring on four ports (i.e., two degrees in two directions) and can be used to provide optical layer visibility, enabling proactive troubleshooting.

OFP2 Dynamic Gain Equalizer (DGE)

The O2DGE provides cost-effective dynamic optical power channel equalization, performs balancing of all wavelengths with 6.25 GHz resolution, and supports Super C-band. It maximizes end-to-end performance and reach at intermediate line amplifiers and FOADMs. The O2DGE includes two OCMs, simultaneously balancing power for two directions (east and west) of transmission.

OFP2 Optical Protection Switch (OPSM)

The O2OPS OFP2 provides a cost-effective option for supporting a variety of protection schemes, including 1+1 OTS, 1+1 OMS, 1+1 OCh, and 1+1 client. It includes a single protection switch in an OFP2 form factor with protection switching triggered by loss of signal (LOS). The O2OPS1PT adds a pilot tone, enabling it to be used for 1+1 OCh protection with colorless add/drop, where loss of signal cannot be used as a reliable indicator that the channel has failed.

OFP2 Colorless Add/Drop (CAD16A)

The OFP2 form factor CAD16A is a fully integrated colorless add/drop sled supporting 16 add/drop wavelengths. In addition to the colorless splitter/combiner, it includes a pre-amplifier and a booster amplifier. The CAD16A supports operation within the extended C-band with up to 4.8 THz of total capacity and provides two ports for optical channel monitoring.

OFP2 Wavelength-selective Switch (WS04S)

The O2W04S provides a 1 x 4 broadcast-and-select WSS. It includes two integrated OCMs, enabling bidirectional per-channel power monitoring. It supports both fixed-grid and flexible-grid operation. A 1610-nm OSC loopback is provided for port-side laser safety. It enables up to four ROADM degrees in a node and up to two ROADM degrees in a single rack unit. Colored-directional, colorless-directional, and colorless-directionless add/drop options are supported.

OFP2 Colorless-Directionless-Contentionless Switch (CDC4D4)

Supported in the 300-mm 1830 GX G34c chassis, the OFP2 form factor CDC4D4 is a fully integrated colorless-directionless-contentionless add/drop with four-degree ports and four add/drop ports. The CDC4D4 supports Super C-band and Super L-band channels with input power of +7 dBm to -2 dBm, and it provides optical power monitoring on TX, RX, and common line ports.

External Passive Equipment

DWDM Mux/Demux Units

The OMD64 is a 2RU external unit with 64 LC ports for mux/demux, LC ports for the DWDM line, and LC ports for optical power monitoring. It provides a mux/demux filter for 64 x 75 GHz channels, ideal for high-baud-rate wavelengths such as the 600 Gb/s CHM2T muxponder and coherent 400G ZR+/XR wavelengths and supports the extended C-band (4,800 GHz).

The OMD64S is a 2RU external unit with 64 LC ports for mux/demux, LC ports for the DWDM line, and LC ports for optical power monitoring. It provides a mux/demux filter for 64 x 75 GHz channels compliant with the ITU-T grid, designed for 400ZR-OIF standard-grid support and supports the extended C-band (4,800 GHz).

The OMD48E is a 2RU external unit with 48 LC ports for mux/demux, LC ports for the DWDM line, and LC ports for optical power monitoring. It provides a mux/demux filter for 48 x 100 GHz channels, ideal for optical engines with very high baud rates, such as 600G and 800 Gb/s and supports the extended C-band (4.800 GHz).

The OMD48S is a 1RU external unit with 48 LC ports for mux/demux, LC ports for the DWDM line, and LC ports for optical power monitoring. It provides a mux/demux filter for 48 x 75 GHz channels, ideal for optical engines with high baud rates, such as 400G XR/ZR+ and 600 Gb/s and supports the extended C-band (4800GHz).

The OMD40E is a 2RU external unit with 40 LC ports for mux/demux and LC ports for the DWDM line with the support of Super C-band (6,100 GHz). It provides a mux/demux filter for 40 x 150 GHz channels, ideal for optical engines with ultra-high baud rates, such as Nokia's 800 Gb/s Infinite Capacity Engine 6 (ICE6) and 1.2T Infinite Capacity Engine 7 (ICE7) high-performance coherent optics and 800G coherent pluggables.



All these OMD variants have low insertion loss of less than 6 dB and provide an RJ45 port for one-wire inventory management from the USB interfaces on the OCC2 sled.

Additional Passive Equipment

The 1830 GX OLS can optionally leverage a wide range of passive equipment from the Nokia Pluggable Optical Layer portfolio. This portfolio includes an eight-slot, 1RU passive shelf with single- and dual-slot cartridges for a wide range of passive functions, including eight-channel and four-channel DWDM filters, a DWDM band mux, eight-channel and four-channel CWDM filters, an OTDR filter, and dispersion compensation modules.

Optical Timing Channel (OTC2.0)

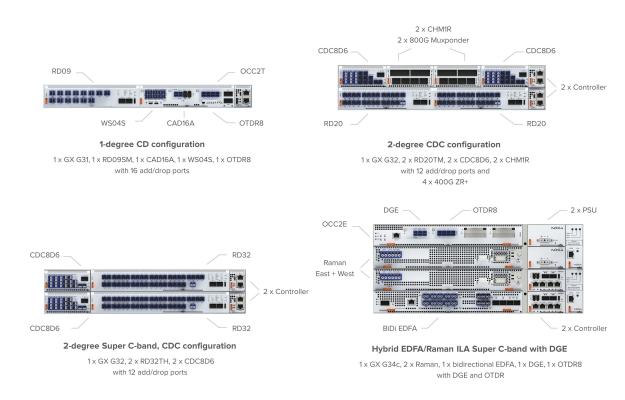
With OTC2.0, the 1830 GX OLS provides an optional dedicated disaggregated optical timing channel that delivers high-performance synchronization and timing distribution over any optical transport network. OTC2.0 enables network operators to enhance the resiliency of their synchronization and timing networks and decouple timing strategies from total reliance on GNSS-based timing at every network node. OTC2.0 enables network operators to build virtual PRTC (vPRTC) timing cloud architectures with sub-100-ns performance to every network node.

Automation Enabled by Open APIs and Streaming Telemetry

The 1830 GX OLS supports management, automation, and streaming telemetry via open interfaces. It supports WebGUI, CLI, SNMP, TACACS+, syslog, and YANG-modeled NETCONF and RESTCONF APIs, as well as gNMI/gRPC streaming telemetry. It is OpenConfig and OpenROADM compliant. An OSPF-based DCN is supported with in-band management via OSC or GCC0 with 1830 GX G30 Series muxponders and out-of-band management via Ethernet interfaces. Additional manageability features include zero-touch commissioning (ZTC) and the management of multiple 1830 GX G30 units as a single entity. The 1830 GX G30 Series is managed under Nokia Transcend Network Management System/Transcend Controller.

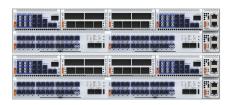
Example Configurations

The following are a few configuration examples. All these configurations can be expanded in service to support more chassis, more fiber degrees, and more add/drop ports. 1830 GX supports multi-chassis configurations with single TID.



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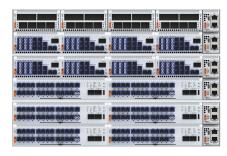
4-degree CDC configuration

2 x GX G32, 4 x RD20TM, 4 x CDC8D6, 4 x CHM1R with 24 add/drop ports and $$8 \times 400G\ ZR+$$



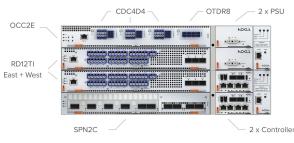
2-degree Super C+L CDC configuration

2 x GX G32, 2 x RD32TH Super C-band, 2 x RD32TH Super L-band, 4 x CDC8D6 with 24 add/drop ports



6-degree CDC configuration

3 x GX G32, 6 x RD20TM, 8 x CDC8D6, 4 x CHM1R with 48 add/drop ports and $8 \times 400 \text{G ZR}+$



2D ROADM Super C-band with CDC and 1.2T OTN switch

1 x GX G34c, 1 x SPN2C, 2 x RD12TI, 3 x CDC4D4, 1 x OTDR8

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Technical Specifications

Environmental

- Operating temperature: 0° to 40° C/32° to 104° F
- Transport and storage: -40° to +70° C/-40° to +158° F/40° C +93% RH
- Humidity: 5% to 90% non-condensing

Management Options

- Management and control platforms:
 - Nokia Transcend Controller
 - Nokia Transcend Network Management System
- Command line interface (CLI)
- Zero-touch commissioning (ZTC)
- Syslog
- TACACS+/RADIUS
- WebGUI
- NETCONF
- RESTCONF
- Native YANG models
- OpenConfig
- OpenROADM
- gNMI/gRPC

- SNMP fault and performance management
- OSPF-based DCN
- Multiple 1830 GX units can be managed as a single entity

OLS Service Modules/Sleds

- Dual-slot ROADM (G2RD09SM) sled
 - 193.5 x 39.6 x 273.3 mm/7.62 x 1.56 x 10.76 in (W x H x D)
 - 2.27 kg/5 lb
 - 85 watts
 - Fully integrated nine-degree broadcast-and-select ROADM-on-a-sled
 - Single 1 x 9 WSS
 - Integrated OCM
 - OTDR and monitoring ports
 - 1510-nm OSC with pluggable SFP
 - Variable-gain pre-amplifier and booster amplifiers
 - Supports spans from 0 to 30 dB
 - OpenROADM compliant

- Fixed-grid and flexible-grid operation
- Extended C-band
- Direct connect, fixed, and colorlessdirectionless add/drop
- Dual-slot ROADM (G2RD20TM) sled
 - 193.5 x 39.6 x 273.3 mm/7.62 x 1.56 x 10.76 in (W x H x D)
 - 3.16 kg/6.97 lb
 - 70 watts
 - Fully integrated 20-degree routeand-select ROADM-on-a-sled
 - Twin 1 x 20 WSS
 - Integrated OCM
 - OTDR and monitoring ports
 - 1510-nm OSC with pluggable SFP
 - Variable-gain pre-amplifier and booster amplifiers
 - Supports spans from 0 to 32 dB
 - Cable ID in and out ports
 - Fixed-grid and flexible-grid operation
 - Extended C-band
 - Direct connect, fixed, colorlessdirectionless, and CDC add/drop



Technical Specifications

- Dual-slot ROADM (C2RD12TI) sled
 - Fully integrated 12-degree routeand-select ROADM-on-a-sled
 - Twin 1 x 12 WSS
 - Integrated OCM
 - OTDR and monitoring ports
 - 1510-nm OSC with pluggable SFP
 - Variable-gain pre-amplifier and booster amplifiers
 - Supports spans from 0 to 29 dB
 - Cable ID in and out ports
 - Fixed-grid and flexible-grid operation
 - Super C-band with 6.1 THz total spectrum
 - Direct connect, fixed, colorlessdirectionless, and CDC add/drop
- Triple-slot ROADM (G3RD32TH) sled
 - Fully integrated 32-degree routeand-select ROADM-on-a-sled
 - Twin 1 x 32 WSS
 - Integrated OCM
 - OTDR and monitoring ports
 - 1510-nm OSC with pluggable SFP
 - Variable-gain pre-amplifier and booster amplifiers
 - Supports spans from 0 to 33 dB
 - Cable ID in and out ports
 - Fixed-grid and flexible-grid operation
 - Super C-band with 6.1 THz total spectrum
 - Upgrade port for Super L-band inservice expansion
 - Direct connect, fixed, colorlessdirectionless, and CDC add/drop
- Single-slot colorless add/drop (G1CAD10A) sled
 - 98.9 x 39.6 x 274.7 mm/3.89 x 1.56 x 10.81 in (W x H x D)
 - 1 kg/2.2 lb
 - 30 watts
 - Fully integrated colorless add/drop sled
 - Supports Super C-band
 - Supported with RD09SM, RD20TM, and RD32TH or standalone
 - Integrated pre-amplifier and booster amplifier
 - Monitoring ports
 - Cable ID in and out ports
 - SFP cage for cable ID SFP

- Single-slot colorless-directionlesscontentionless add/drop (G1CDC8D6) sled
 - 98.9 x 39.6 x 274.7 mm/3.89 x 1.56 x 10.81 in (W x H x D)
 - 1 kg/2.2 lb
 - 12 watts
 - Fully integrated colorlessdirectionless-contentionless add/ drop sled
 - Supports Super C-band and Super L-band
 - Supported with RD20TM and RD32TH
 - Monitoring ports
 - Cable ID in and out ports
 - SFP cage for cable ID SFP
- Dual-slot bidirectional EDFA (C2ILASGH)
 - 303 x 40 x 203.3 mm/11.93 x 1.57 x 8 in (W x H x D)
 - 2.4 kg/5.29 lb
 - 62 watts
 - Fully integrated dual EDFA
 - Dynamic gain range from 0 to 30 dB
 - Supports Super C-band
 - Monitoring ports
 - DGE ports
 - OCM ports
 - Pluggable OSC ports
 - OTDR ports
- Single-slot RAMAN amplifier (G1RPBM) sled
 - 98.9 x 39.6 x 274.7 mm/3.89 x 1.56 x 10.81 in (W x H x D)
 - 1.2 kg/2.6 lb
- 70 watts
- Fully integrated RAMAN sled
- Supports Super C-band
- DWDM monitoring ports
- Raman pump spectrum monitoring
- Dual-slot optical carrier card (OCC2T) sled
 - 199.78 x 41.62 x 337.82 mm/7.8 x 1.6 x 13.3 in (W x H x D)
 - 1.77 kg/3.9 lb
 - Three OFP2 pluggable interfaces
 - Two SFP pluggable interfaces for optical timing channel (OTC)
 - BITS USB type C connector for T1/E1 input/outputs
 - PPS/TOD USB type C connector for local time input (1PPS+ToD)

- Typical power consumption is 20 W for the OCC2T without any interfaces equipped; the total power consumption will depend on the type and quantity of inserted SFP/OFP2 modules
- Dual-slot optical carrier card (OCC2E) sled
 - 307 x 40 x 269 mm/12.1 x 1.57 x 10.6 in (W x H x D)
 - 1.4 kg/3.1 lb
 - Four OFP2 pluggable interfaces
 - Typical power consumption is 20 W for the OCC2E without any interfaces equipped; the total power consumption will depend on the type and quantity of inserted SFP/OFP2 module

EDFA OFP2 Pluggable Common Specifications

- Equipped in OCC2T or OCC2E in the OFP2 slots
- Operating ambient temperature: -5° to +50° C
- Operating relative humidity: 5% to 90% non-condensing
- Storage temperature: -40° to +70° C (GR-63-CORE)
- 19.5 x 50.5 x 154.4 mm/0.77 x 1.99 x 6.08 in (W x H x D)
- Regulatory compliance: GR-468-CORE Generic Reliability Assurance Requirements for Optoelectronic Devices Used in Telecommunications Equipment
- Weight: 6.5 oz (0.185 kg)
- MBTF: 25 years per SR-332 (40° C, 50% electrical stress, 90% confidence interval)
- RoHS: 6/6 compliant assembly

Amplifiers OFP2 Pluggable

- The O2BAX extended gain booster amplifier has a gain range of 10 to 22 dB
- The O2PAOIR intermediate range preamplifier has a gain range of 0 to 18 dB
- The O2PAOLR long-range pre-amplifier has a gain range of 14 to 26 dB
- The O2PAOER extended-range preamplifier has a gain range of 25 to 35 dB



Technical Specifications

OTDR OFP2 Pluggable

- Supports eight OTDR ports
- Each port can be used for onedirection OTDR testing
- Can be used for four degrees with eight fibers for OTDR application
- In-service monitoring and out-ofservice diagnostics
- Resolution of 1 meter and distances of approximately 100 km
- Operates at 1625 nm, supporting C+L networks

OPS/OPS1PT OFP2 Pluggables

- 1+1 OTS protection: single span and multi span (OSC presence)
- 1+1 OMS protection
- 1+1 OCh protection for both colored (OPS) and colorless add/drop (OPS1PT)
- 1+1 client protection

OCM OFP2 Pluggable

- Per-channel optical power monitoring
- Channel frequency channel monitoring

CAD8/CAD8E OFP2 Pluggables

- Eight-channel coherent colorless add/ drop
- Extendable to 16 channels with CAD8E
- Supports Super C-band and Super L-band

CAD16 OFP2 Pluggable

- 16-channel coherent colorless add/ drop
- Amplified
- Supports Super C-band and Super L-band

DGE OFP2 Pluggable

- Dynamic gain equalization
- Up to two directions of equalization
- Two OCMs
- ILA, FOADM, and DCO point-to-point applications
- Supports fixed grid and flexible grid
- Supports Super C-band
- Automated balancing

WSS OFP2 Pluggable

- Up to four-degree ROADM, with additional one degree for add/drop
- Broadcast-and-select architecture with single 1 x 4 WSS
- Supports fixed grid and flexible grid
- Two OCM monitoring ports
- 1610-nm OSC loopback for port-side laser safety

OMD64 2RU External Unit

- Height: 2RU; 482.6 x 88 x 166 mm/19.1 x 3.48 x 6.56 in (W x H x D)
- 2.0 kg/4.44 lb
- Channel number: 64
- Channel spacing: 75 GHz
- Max passband channel (3 dB): 74 GHz
- Operating wavelengths: 191.3625 THz (Channel 1) to 196.0875 THz (Channel 64)
- Insertion loss: ~6 dB
- Connectors: 66 dual LC connectors
- One-wire connector for inventory managementOne-wire connector for inventory management

OMD48E 2RU External Unit

 Height: 2RU; 482.6 x 88 x 166 mm/19.1 x 3.48 x 6.56 in (W x H x D)

- 3.8 kg/8.38 lb
- Channel number: 48
- Channel spacing: 100 GHz
- Max passband per channel (3 dB): 110 GHz
- Operating wavelengths: ITU C-band 191.4 THz (Channel 1) to 196.1 THz (Channel 48)
- Insertion loss: ~6 dB
- Connectors: 50 dual LC connectors
- One-wire connector for inventory management

OMD48S 1RU External Unit

- Height: 1RU; 166 x 44 x 482.6 mm/6.56 x 1.74 x 19.1 in (W x H x D)
- 2.0 kg/4.4 lb
- Channel number: 48
- Channel spacing: 100 GHz
- Max passband per channel (3 dB): 75 GHz
- Operating wavelengths: ITU C-band 191.4 THz (Channel 1) to 196.1 THz (Channel 48)
- Insertion loss: max. 5.7 dB
- Connectors: 50 dual LC connectors
- One-wire connector for inventory management

OMD40E 2RU External unit

- Height: 2RU; 482.6 x 88 x 166 mm/19.1 x 3.48 x 6.56 in (W x H x D)
- Channel number: 40
- Channel spacing: 150 GHz
- Operating wavelengths: 190.625 THz (Channel 1) to 196.725 THz (Channel 40)
- Insertion loss: <6 dB
- Connectors: 41 dual LC connectors

About Nokia

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale. Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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