

1830 GX CHMS8 and CHMQ6 800G coherent pluggable muxponders

Lower cost per bit, power and footprint for 100/400/800 GbE services

Leveraging the latest ICE-X 800G coherent pluggable technology

The 1830 Global Express (GX) CHMQ6 and CHMS8 modules, part of Nokia's comprehensive thin transponder offerings, leverage the latest generation of Infinite Capacity Engine - Extensible (ICE-X) 800G ZR/ZR+ coherent pluggables, which include a state-of-the-art 3-nm CMOS process node digital ASIC/DSP. ICE-X 800G multi-haul intelligent coherent pluggables are 800G coherent pluggables with low power consumption, multi-vendor probabilistic constellation shaping (PCS), and multi-haul reach.

Leveraging these new efficiencies, ICE-X 800G pluggables simplify deployment in a wide variety of network scenarios and transport applications while maximizing performance and driving down operating costs.

Features

- Point-to-point data center interconnect (DCI) and metro/long-haul applications
- Supports 800ZR and ZR+
- Supports 800G, 600G, and 400G modes
- Advanced multi-vendor interoperability
- High performance modes
- Support for 800G client splitting

CHMQ6



CHMS8



1830 GX G31 with 4x CHMQ6



1830 GX G31 with 2x CHMS8



Figure 1: The Nokia 1830 GX Suite of Thin Transponder Modules

The images shown are for illustration purposes only and may not be an exact representation of the product.

Benefits

- Utilize the latest 800G coherent pluggables
- Reduce power consumption in your network
- Improve wavelength utilization of your client services with client splitting technology
- Deliver 100/400/800 GbE client services cost effectively
- Protect your services with resiliency mechanisms including SNCP
- Minimize operational costs with integrated PRBS test and loopback, ZTP, and automation tools leveraging RESTCONF/NETCONF open APIs, OpenConfig/YANG data models, and gRPC streaming telemetry

ICE-X 800G ZR/ZR+ pluggables come in both OSFP and QSFP-DD800 form factors. The solution's best-in-class performance is enabled by the DSP's large compensation for chromatic dispersion and high-performance DAC/ADC, as well as the ICTR140 TROSA's indium phosphide-based high-density monolithic integration and low out-of-band noise. ICE-X 800G pluggables can be flexibly tuned to lower bit rates extending reach to unprecedented distances.

ICE-X 800G pluggables meet and exceed 800G ZR and 400G ZR OIF standards and are interoperable with any OIF-compliant ZR transceiver. Moreover, ICE-X 800G pluggables are multi-vendor interoperable through OpenROADM 6.0 for "open probabilistic shaping FEC" and compliant with OIF-800ZR-01.0 and OIF-400ZR-03.0, and OpenZR+ Rev 3.0.

There are two 1830 GX sled architectures that support 800G pluggable technology:

- CHMQ6 – quarter-width coherent module based on QSFP-DD with up to 6x QSFP-DD800 cages
- CHMS8 – half-width coherent module based on OSFP with up to 8x OSFP800 cages

CHMS8 module

Utilizing the ICE-X 800G OSFP form factor, the CHMS8 module supports up to eight OSFP pluggables in a double width sled format for the 1830 GX G31 and 1830 GX G32 chassis. The flexible solution provides up to 6.4 Tb/s of module capacity and 100GbE, 400GbE, 800GbE client interfaces. It can be configured for:

- Transponder functionality e.g., 4x 800GbE to 4x 800G-WDM
- Muxponder functionality e.g., 4x 400GbE to 2x 800G-WDM
- OEO conversion e.g., 4x 800G-WDM to 4x 800G-WDM
- Client splitting e.g., 3x 800GbE to 4x 600G-WDM

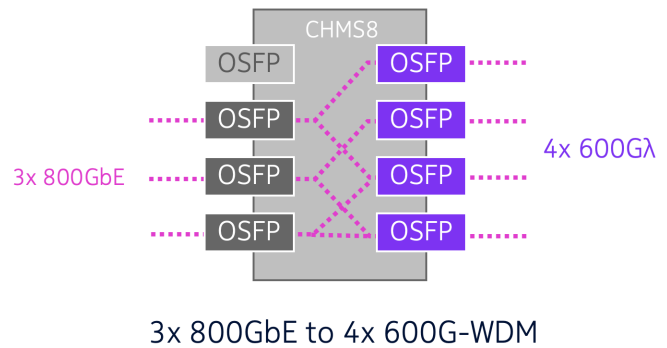


Figure 2: CHMS8 client splitting

CHMQ6 module

Utilizing the ICE-X 800G QSFP-DD form factor, the CHMQ6 module supports up to six pluggables in a single width sled format for the 1830 GX G31 and 1830 GX G32 chassis. The flexible solution provides up to 3.2 Tb/s of module capacity and 100GbE, 400GbE, 800GbE client interfaces. It can be configured for:

- Transponder functionality e.g., 3x 800GbE to 3x 800G-WDM
- Muxponder functionality e.g., 2x 400GbE to 1x 800G-WDM
- OEO conversion e.g., 3x 800G-WDM to 3x 800G-WDM
- Client splitting e.g., 1x 800GbE to 2x 400G-WDM

Reduce cost, power consumption and footprint by 25% and more

ICE-X 800G reduces power per bit by about 25% compared to the 400G coherent pluggable technology. With its reach improvements over the previous generation, ICE-X 800G reduces even further the overall network power consumption as it can operate its wavelengths with significant longer reach. Compared to previous 400G coherent generation, the reach of 400G wavelengths nearly tripled.

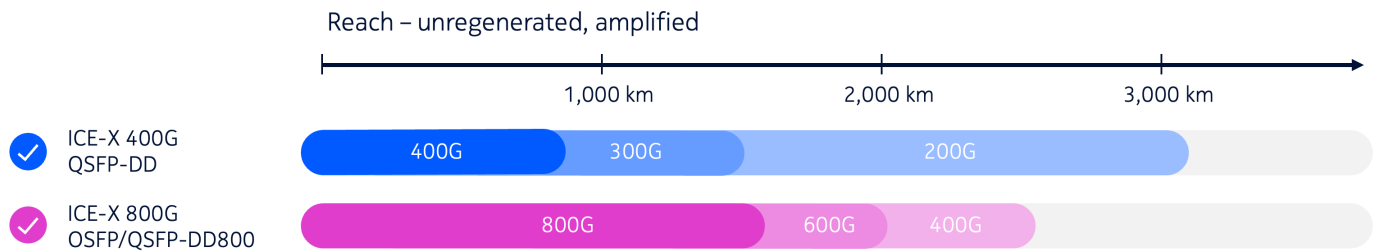


Figure 3: Wavelength-capacity-reach

Technical specifications

Applications	• Transponder • Muxponder • Mix of client services support 100GbE, 400GbE, 800GbE service transport • Client splitting for more effective wavelength utilization • OEO 3R regenerator (including regen without clients)
Key specifications	• OSFP and QSFP-compliant module • Line rates from 200 Gb/s to 800 Gb/s • Fully tunable over C-band or L-band • OIF-800ZR-01.0 Implementation Agreement compliant • OIF-400ZR-03.0 Implementation Agreement compliant • OpenZR+ Rev 3.0 compliant • Open ROADM 6.0 modes • 800G-ETC, 2 x 400 GbE, 4 x 200G, 8 x 100G client support, – OTU4, OTUCn in future releases • Supports upgrade from 400G ZR to 800G ZR • System features – Compatible with brownfield ROADM transport networks and colorless add-drop architectures
Physical interface	• CHMS8: 8 x OSFP pluggable interfaces • CHMQ6: 6 x QSFP-DD800 pluggable interfaces
Line interfaces	• Data rate tunability: 200 Gb/s to 800 Gb/s in 200G increments • TX optical output power: -2 dBm to -4 dBm • Modulation options: – Two Probabilistic constellation shaping (PCS) modes – Interoperable PCS – High Performance PCS – Conventional modulation: 16QAM, QPSK • Interworking with Nokia and third-party line systems

Client interfaces

- CHMS8 OSFP
 - 800GbE: DR8, DR8+, FR4
 - 400G: AOC, FR4, SR8, LR4, DR4, SR4.2, DAC3, XDR4
 - 100G: LR4, LR1, CWD4, DR1, FR1
- CHMQ6: QSFP-DD800
 - 800GbE: DR8, DR8+, FR4
 - 400G: AOC, FR4, SR8, LR4, DR4, SR4.2, DAC3, XDR4
 - 100G: LR4, LR1, CWD4, DR1, FR1

Operational features

- Performance monitoring: line interfaces
 - Chromatic dispersion (CD)
 - Differential group delay (DGD)
 - Polarization-dependent loss (PDL)
 - Q-factor
 - Pre-FEC BER
 - Post-FEC errors
 - Latency
 - SNR
 - OSNR
 - Channel power
 - Wavelength
 - OTU-level PM
- Performance monitoring: client interfaces
 - Physical coding sublayer: errors
 - PHY: FEC, BER, synch
 - MAC: packets, errors, CRC
- PRBS test and loopback (facility and terminal loopbacks)
- LLDP snooping
- RMON and test signal
- TCM

Security

- Secure boot
- MACSec encryption in future release

Management

- Management and control platforms:
 - Transcend Controller
 - Transcend Network Management System
- Command line interface
- Zero-touch commissioning
- Syslog
- SNMP, WebGUI
- NETCONF
- RESTCONF
- Native YANG data models
- OpenConfig
- gNMI/gRPC
- SNMP fault and performance management
- Generic Communication Channel (GCC0) in-band management on the line port OTUk at QSFP-DD variant
- OSPF-based DCN



Environmental

- Power dissipation:
 - CHMS8: 133 Watt excluding pluggables
 - CHMQ6: 73.7 Watt excluding pluggables
- Operating temperature: -5° C to 55° C/23° F to 131° F
- Transport and storage: -40° C to 70° C/-40°F to 158° F/40° C + 93% RH
- Humidity: 5% to 93% maximum

Regulatory and compliance

- RoHS-6 compliant and lead-free per Directive 2002/95/EC
- NEBS level 1/3, GR-1090 and GR63
- Telcordia GR-326-Core Generic Requirements for Single-Mode Optical Connectors and Jumper Assemblies
- Telcordia GR-1435-Core Generic Requirements for Multi-Fiber Optical Connectors
- Emissions: FCC Part 15 Class A, EN55022/CISPR Class A Compliant, CE Laser Safety: ANSI Class 1M, IEC Class 1M, EN 60825-1/2, 21 CFR 1040 US FDA CDR, Class 1
- Electrical safety: UL 60950, CSA22.2 60950 and IEC 60950

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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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