Designed for modernized metro applications, the 1+8 Optical Transport Network (OTN) Flex MOTR module acts as a service aggregation and grooming interface for a wide range of multi-protocol services. The 1+8 OTN Flex MOTR module leverages standards-based OTU1/OTU2 encapsulation to cost-effectively extend the OTN infrastructure to the access.

The 1+8 OTN Flex MOTR (also called OTN Flex MOTR 1xXFP, 8xSFP) is a single-slot module comprising eight SFP ports that support a wide range of service client protocols, including Fast/Gigabit Ethernet (FE/GbE), SONET/SDH, Fibre Channel, ESCON®, IBM ISC-3, Common Public Radio Interface (CPRI), and DVB-ASI. Each SFP port can be provisioned individually for maximum flexibility, and up to four of the ports can also be configured as OTU1 line ports enabling OTU1 transport across the network. The card also provides one line-side XFP port that supports a 10G OTU2 networking interface in a pluggable form factor that uses WDM optics to easily connect to a next-generation OTN network. The card's XFP port also supports gray optics for low-cost interconnect to higher-speed interfaces to be transported over 40G or 100G wavelengths.

Features and Benefits
- Aggregates any mix of 125 Mb/s to 4.25 Gb/s rate client services onto an OTU1 or OTU2 stream in a compact footprint
- Addresses multiple applications with support of a wide range of client protocols, including SONET/SDH, FE, GbE, Fibre Channel, CPRI, ESCON, IBM ISC-3, and DVB-ASI
- Provides flexible configuration options for enhanced networking capabilities including transponder, muxponder, add-drop-mux, and OTU1 line regeneration
- Simplifies operations with pluggable client and line optics
- Offers enhanced operational benefits such as OTN Tandem Connection Monitoring (TCM) and end-to-end G.709 delay measurements
- Enables a differentiated service offering through flexible protection schemes, including A-SNCP path, as well as line/equipment protection options
- Interworks with higher-speed modules for 40G/100G transport

The 1+8 OTN Flex MOTR operates flexibly in all 6500 D-Series and S-Series shelf configurations (6500-D2, -D7, -S8, -S14, -S32) to meet site-specific capacity, footprint, and power requirements. The module is designed to interwork with higher-speed modules for 40G/100G transport.
with the latest OTN standards and supports ODU-based encapsulation and switching for the most efficient use of network bandwidth. The circuit pack supports OTN Tandem Connection Monitoring (TCM) for improved service assurance, giving service providers better service fault correlation and troubleshooting capability when handling third-party traffic.

Additional operational advantages include G.709 end-to-end delay measurements and flexible path, client, and line protection options. For example, backplane connectivity enables two adjacent 1+8 OTN Flex MOTRs to operate as a mated pair that provides protection as well as ADM functions.

The circuit pack provides OTN networking flexibility at the edge through a variety of operating modes, including: transponder (single client to single OTU1 line); muxponder (up to 4/8 clients to a single OTU1/OTU2 line); ADM OTU1 line on a single card or OTU2 line using two cards; and OTU1 line regenerator.

As the demand for increased data capacity in networks grows, mobile operators are looking for ways to reduce the OPEX attributed to cell sites where costs related to lease fees, power consumption and maintenance are significant. The 1+8 OTN Flex MOTR can be deployed within the wireless fronthaul network to create a Distributed Radio Access Network (D-RAN). The wireless fronthaul network refers to the interconnection of the two main parts of a cellular base station: the Baseband Unit (BBU) and Remote Radio head (RRH). D-RAN architectures alleviate these costs by using dedicated fiber, CWDM or DWDM.
connectivity in their fronthaul networks, running the CPRI protocol, in place of the traditional copper connections to the antennas. The 1+8 OTN Flex MOTR supports CPRI, adhering to strict transport requirements for mobile fronthaul applications. This solution reduces the power consumption and space requirements at cell sites, and allows for future growth by freeing up space to add additional antennas. Additionally, the Wavelength Division Multiplexing (WDM) and OTN capabilities of the 6500 platform can be used to connect a larger number of RRHs by sharing fiber with other services in access/aggregation networks.

Overall, the comprehensive capabilities of the 1+8 OTN Flex MOTR allow the network operator to offer a complete catalog of services with multiple Service Level Agreement (SLA) options for efficient transparent transport across the network.

### Technical Information

<table>
<thead>
<tr>
<th>System Requirements</th>
<th>The 1+8 OTN Flex MOTR module can operate in any of the 6500-S32, 6500-D14/S14, 6500-D7/S8 or 6500-D2 chassis.</th>
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</thead>
<tbody>
<tr>
<td>Port Format</td>
<td>Fast Ethernet, Gigabit Ethernet</td>
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</tbody>
</table>
| Line-side supported interfaces | OC-3/STM-1, OC-12/STM-4, OC-48/STM-16  
ESCON, IBM ISC-3 (1 Gb/s), IBM ISC-3 (2 Gb/s)  
FC100/FICON®, FC200/FICON Express, FC400/FICON 4G Express  
CPRI Option 1 (614.40 Mbps), CPRI Option 2 (1228.80 Mbps), CPRI Option 3 (2457.60 Mbps)  
DVB-ASI |
| Supported XFP modules | OTU1 (SFP) – 2.7 Gb/s  
OTU2 (XFP) – 10.71 Gb/s  
Gray optics: 850 nm (300 m), 1310 nm (SR/LR), 1550 nm (40 km, 80 km)  
CWDM  
DWDM: fixed (40 km), tunable (80 km), narrowband tunable (175 km) |
| Power Requirements | 36W |
| Protection Options  | Unprotected  
A-SNCP per port path protection (single card or dual card)  
Single card 1+1 OTU1 line protection  
1+1 per port client and equipment protection via Transponder Protection Tray (TPT) |
| FEC Modes           | G.709 compliant RS-8 FEC and OFF |
| Environmental Characteristics | Operating Temperature  
+41°F to +104°F (+5°C to +40°C)  
+23°F to +131°F (-5°C to +55°C) short term – 6500-D14/S14, 6500-D7/S8, 6500-D2  
+23°F to +122°F (-5°C to +50°C) short term – 6500-S32  
-40°F to +149°F (-40°C to +65°C) uncontrolled OSP Class 2 GR-3108-CORE on 6500-D2 |
| Relative Humidity   | 5% to 85% (non-condensing) |
| Altitude            | 13,000 ft; 4000 m |
| Physical Characteristics | 11.34 in (H) x 0.99 in (W) x 9.34 in (D)  
288 mm (H) x 25 mm (W) x 237 mm (D) |