# ciena®

# 3801

**Ciena's 3801 XGS-PON desktop Optical Network Unit (ONU) is purpose-built for residential, Small and Medium-sized Business and Enterprises (SMB/SMEs) with low-cost metro access in mind. The versatile broadband service delivery desktop ONU is lightning-fast, secure, and capable of meeting or exceeding both immediate and future business needs enabled by flexible, open deployment within Ciena's 10G PON and universal aggregation Routing and Switching platforms.**

The 3801 XGS-PON desktop ONU is fully compliant with ITU-T G.9807.1 (XGS-PON) and supports symmetrical 10 Gb/s downstream and upstream connectivity. This desktop ONU comes with built-in XGS-PON optics and Media Access Control (MAC), an Ethernet switch, and one 1GbE port. With low Total Cost of Ownership (TCO) in mind, the shared fiber desktop ONU reduces edge transport, switching and routing costs, footprint, and power consumption by rightsizing with high-density Optical Line Terminal (OLT) platforms.

## Higher-bandwidth service delivery for SMB/SMEs

SMEs play a major role in most economies and contribute significantly to job creation and global economic development. At the same time, most network operators' environments are very challenging, as they experience surging IP traffic growth in both their wireless and wireline networks in a hyper-competitive environment.

Key to customer retention and continued growth is to offer customers new, higher-bandwidth services. For the past 15 years, Passive Optical Networks (PONs) have become extremely popular by cost-effectively addressing ongoing surges in IP television (IPTV) and high-speed internet access. However, bandwidth demands and intense competition are driving network operators to 10G PON, as 15-year-old asymmetrical Ethernet PON (EPON) and Gigabit PON (GPON) technologies can no longer address network growth expected to increase by a factor of 10 in the next decade.

## Features and benefits

- Compliant with ITU-T G.9807.1 specifications
- Cost-effective symmetric multi-GbE services
- Built in XGS-PON and 1GbE interfaces
- Small desktop, wall, or rack-mountable package
- Operates at commercial temperature range (0°C to +40°C)
- IEEE VLAN bridging and tagging
- PON OAM software for commissioning, fulfillment, and service assurance
- Ciena's Manage, Control and Plan (MCP) domain controller multi-layer support for end-to-end network management, control, and planning
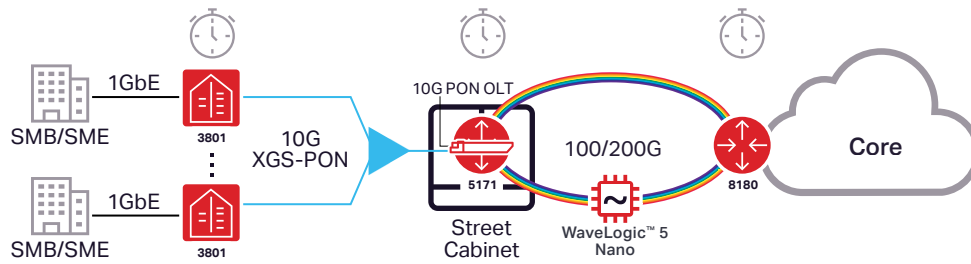
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*Figure 1. 3801 SMB/SME application*

## Customer benefits

Ciena's 3801 XGS-PON desktop ONU provides a single-box solution for access, service delivery, and in-depth management. Positioned at the customer demarcation point, it allows service providers to efficiently create, deploy, manage, and maintain cost-effective services their customers increasingly demand while reducing capital expenditures.

The small, slim desktop design enables the 3801 to be deployed in a variety of indoor environments as determined by end-user circumstances, while delivering the small footprint and low noise characteristics appreciated in today's busy office environments, including Fiber-To-The-Premises (FTTP) for Gigabit broadband SMB/SME services.

As a last-mile technology used between the subscriber and network operator, Ciena's 3801 XGS-PON desktop ONU increases operator competitiveness by doing more with less and allows network operators to turn up new services more quickly.

## Shared fiber 10G PON

Ciena's 3801 XGS-PON desktop ONU transceiver supports 10 Gb/s XGS-PON downstream and upstream. The downstream wavelength operates at 1577nm, while the upstream wavelength operates at 1270nm. While increasing PON data rates to 10 Gb/s symmetrical, G-PON, XGS-PON, and NG-PON2 can operate in the overall PON transmission window of 1260nm to 1650nm window—enabling co-existence of multiple PON services due to each technology using different wavelengths. Operators can seamlessly migrate services to XGS-PON or offer differentiated levels of services (business, residential, etc.).

Ciena's 3801 XGS-PON desktop ONU 10Gb/s PON transceiver meets the N2 class maximum optical link budget in the ITU-T G.9807.1 standard, supporting symmetrical 10 Gb/s data rates up to 1:64 split ratio on 20km links.

| Parameter | Minimum | Typical | Maximum | Unit |
|---|---|---|---|---|
| Tx Operating Wavelength | 1575 | 1577 | 1580 | nm |
| Tx Spectral Width | | | 1 | nm |
| Average (Tx) launch Power | 4.0 | | 9.0 | dBm |
| Rx Operating Wavelength | 1260 | 1270 | 1280 | dBm |
| Rx Sensitivity | -8 | | -28 | dBm |

*Figure 2. 3801 optical transceiver characteristics*

## Universal aggregation

Efficient use of real estate assets is a growing concern for network operators, who either host their own network equipment or lease power and space in collocation facilities. As services multiply, operators have been forced to stack 10G-capable equipment, incurring additional collocation rental and power costs.
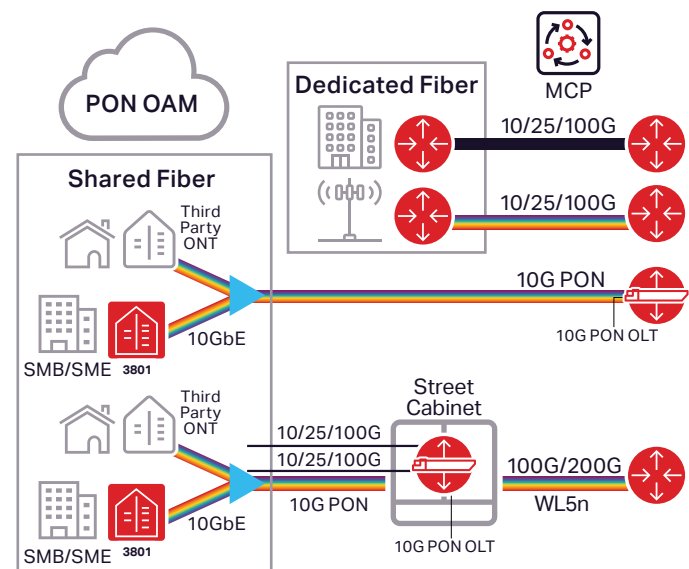


*Figure 3. Universal Edge 10G PON service delivery functions*

Network operators now can bring more value to their networks by supporting concurrent PON, IP, and Ethernet services on the same Ciena aggregation platform, taking advantage of tightly integrated Class of Service (CoS) per-service and per-ONU traffic management and statistics.

### Ethernet switch functions

Ciena's 3801 XGS-PON desktop ONU supports the following Ethernet functions:

- Port or Source Address/Destination Address base frame filtering; 802.1d bridge
- MAC address limiting
- VLAN 802.1d, QinQ 802.1ad tag classification and manipulation
- 802.1p Ethernet Quality of Service (QoS)
    - DSCP-to-802.1p mapping
    - Traffic class forwarding to GEM port and TCONT
- Upstream bandwidth traffic policing

### OAM functions

Ciena's 3801 XGS-PON desktop ONU supports the following Operations, Administration, and Maintenance (OAM) functions:

- Carrier Ethernet Y.1731 OAM, traffic metering, and L2CP tunneling
- Power and port LEDs
- OMCI and local CLI management; OLT remote debug via Telnet and GUI
- Field upgradeable firmware
- Log files

### OAM

PON network planning, infrastructure commissioning, service fulfillment, and service assurance can be complex, as networks have grown to serve the increasing bandwidth-hungry world. From OLTs, to ONUs like Ciena's 3801 XGS-PON desktop ONU, and everything PON in between. Ciena's PON OAM software makes network and service management simpler. PON OAM can be cost-effectively hosted on an external x86-based server or internally on Ciena's universal aggregation platform with Ciena's automated, open, and lean Adaptive IP™ solution.
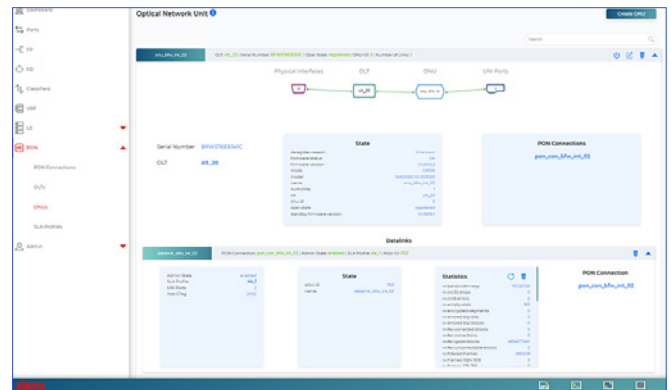


*Figure 4. PON OAM ONU management*

Ciena's 10G PON solution also supports multi-vendor interop or third-party ONU integration and avoids vendor lock-in by supporting both ONU Management Control Interface (OMCI) and Ethernet OAM in-band management. With rich carrier-class OAM&P capabilities, operators can persistently store configurations, provide PM data collection, do fault monitoring, and manage firmware image.

PON OAM's carrier-class management and control supports northbound IP Application Programming Interface (API) for gNMI, NETCONF/YANG, and streaming telemetry over Secure Shell (SSH). Additionally, Ciena's MCP domain controller or embedded WebGUI can be used for configuration and monitoring.

## Technical Information

**Interfaces**
- ITU-T G.9807.1 XGS-PON, SC/APC connector, N2 class
- 1 x 10/100/1000/2500M RJ-45

**Management and support**
- Management via Ciena's Service-Aware Operating System (SAOS)

**OLT compatibility**
- 39xx/51xx with XCVR-SGPL02

**Mechanical**
- Desk, wall, or rackmount

**Physical dimensions (millimeters)**
- Length = 145
- Width = 110
- Height = 30

**Operating temperature (degrees)**
- 0°C to 40°C

**Storage temperature (degrees)**
- -40°C to 85°C

**Humidity**
- 10% to 95%, non-condensing

**Weight (grams)**
- 220

**Maximum Power Consumption (watts)**
- 10

**Wall Adapter**
- 100-240 VAC, 50/60Hz input, 12VDC output

**Ethernet**
- IEEE 802.3 Ethernet
- IEEE 802.ab 1000Base-T
- IEEE 802.1D MAC Bridges
- IEEE 802.1Q VLANs, including .1p Priority
- IEEE 802.1ad Provider Bridging (Q-in-Q) VLAN, tag classification and manipulation
- Jumbo Frames to 9216 bytes
- Layer 2 Control Frame Tunneling
- ITU-T Y.1731 Performance Monitoring

## Ordering information

| Part Number | Description |
|---|---|
| 170-3801-900 | 3801,ONU, (1)XGS-PON SC/APC CONNECTOR, (1)10/100/1000/2500M RJ45, EXTERNAL PWR SUP, INCL. EXT NA AC PSU |
| 170-3801-901 | 3801,ONU, (1)XGS-PON SC/APC CONNECTOR, (1)10/100/1000/2500M RJ45, EXTERNAL PWR SUP, INCL. EXT EU AC PSU |
| 170-3801-902 | 3801,ONU, (1)XGS-PON SC/APC CONNECTOR, (1)10/100/1000/2500M RJ45, EXTERNAL PWR SUP, INCL. EXT UK AC PSU |
| 170-3801-903 | 3801,ONU, (1)XGS-PON SC/APC CONNECTOR, (1)10/100/1000/2500M RJ45, EXTERNAL PWR SUP, INCL. EXT AU AC PSU |

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