

# ONT-800 Optical Network Testers

**Simplify and Accelerate  
High Speed Network Test in  
Lab and Production**



The ONT-800 mainframe is a highly-configurable, multi-protocol, multi-port test platform for R&D and system verification of optical transport ICs, modules, and systems. The ONT-800 builds on its predecessor, the industry reference ONT-600, to deliver the bandwidth, power and cooling requirements for testing at 600G per lambda and beyond. The ONT family features multiple mainframe options and compatible application modules, ranging from "singleslot" point tools up to a full rack-mounted multi-slot, multi-port and multi-user solution that satisfies sophisticated R&D SVT and manufacturing needs. All application modules share the same GUI, automation and scripting, for ease of use and versatility throughout product development cycles.

## ONT-800 Use Cases

R&D Design Testing  
System Development  
System Verification Testing  
Manufacturing Testing

## ONT-800 Mainframe Features

- Designed to meet power and cooling for 800G optics
- Highest port density in the ONT family
- Compatible for ONT-600 modules
- One common architecture for SW Scripts on ONT family
- High accuracy clock module to synchronize modules and test ports
- ONT-804D with built in touchscreen
- Linux operating system
- Modules are hot swappable
- Rack mountable

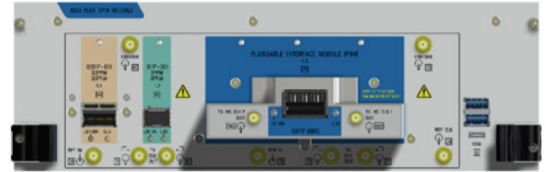
## ONT-800 Key Benefits

- Ensures eco-system interoperability
- Enables reliable performance
- Accelerates product validation

## Available Modules for the ONT-800 Platform

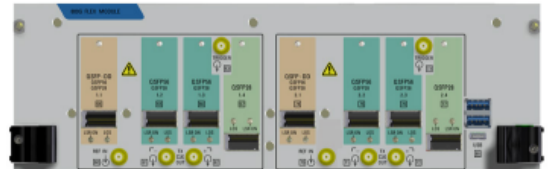
### 800G FLEX XPM Module

- 800G Transponder Test and Validation including OSFP 800G and QSFP-DD800
- Native QSFP-DD and SFP-DD
- Hardware Validation
- FEC Stress Testing
- 800G Unframed BERT
- 2 x 400GE, 8 x 100GE and 4 x 200GE



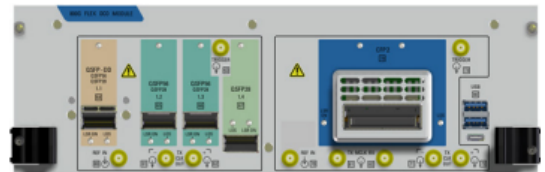
### 800G FLEX V2 Module

- Support for 2 x QSFP-DD / 6 x QSFP-56 / 8 x QSFP-28
- Unframed testing
- Ethernet 400GE and 200GE
- 4 x 100GE, 2 x 200GE and 8 x 50GE breakout
- Hardware Validation
- FEC Validation including FEC Stress Testing
- FOIC, OTUCn - OTUC1/ODUC1 to OTUC8/ODUC8
- ODUFlex with 400GE, 200GE and Bulk, ODU4 with 100GE
- OTL4.2/4.4 with ODU4 Bulk
- FlexE up to 400G via 100G or 200G PHY



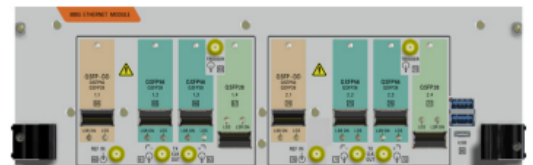
### 800G FLEX DCO Module

- Support for QSFP-DD, QSFP-56/28 and 400G CFP2-DCO
- Unframed testing
- Ethernet 400GE and 200GE, native and OTN client
- 4 x 100GE, 2 x 200GE and 8 x 50GE breakout
- Hardware Validation
- Support for QSFP-DD, QSFP-56/28 and 400G CFP2-DCO
- Unframed testing
- Ethernet 400GE and 200GE, native and OTN client
- 4 x 100GE, 2 x 200GE and 8 x 50GE breakout
- Hardware Validation



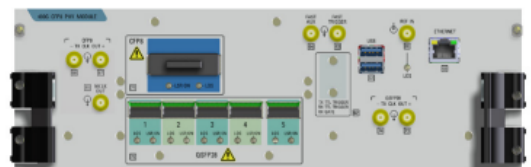
### 800G ETHERNET V2 Module

- Support for 2 x QSFP-DD / 6 x QSFP-56 / 8 x QSFP-28
- Unframed testing
- Ethernet 400GE and 200GE
- 4 x 100GE, 2 x 200GE and 8 x 50GE breakout
- Hardware Validation
- FEC Validation including FEC Stress Testing



### 400G CFP8 and QFLEX Modules

- CFP8-based 400GE testing
- Unframed, PCS, Ethernet IP, OTUCn, FlexE and FlexO testing up to 400G via QSFP28 or CFP8
- Static and dynamic (NRZ) skew insertion
- PAM-4 and NRZ electrical adapters
- Support for QSFP-DD and OSFP via adapters



### N-PORT Module

- Native support for 4 x SFP28 / 4 x QSFP28
- Ethernet including 1GE, 10GE, 25GE, 40GE, 50GE and 100GE
- eCPRI over 10GE, 25GE, 40GE, 50GE and 100GE
- OTN OTU-4, OTU-3, OTU2, OTU1, OTLC1, ODU Multi Channel
- Fibre Channel 1/2/4/8G, 10G, 16G, 32G
- SDH/SONET 10G/2.5G



### N-PORT ETHERNET Module

- Native support for 4 x SFP28 / 4 x QSFP28
- Ethernet including 1GE, 10GE, 25GE, 40GE, 50GE and 100GE
- eCPRI over 10GE, 25GE, 40GE, 50GE and 100GE



### Mainframe Controller and Clock Module

- HDMI for external monitor connection
- 4 x USB for external keyboard/mouse and data transfer
- BNC, Bantam and Time of Day (ToD) inputs for external synchronization
- Optional Rb and GNSS synchronization



## ONT-800 Mainframes

### ONT-804D

- 4 slots for application modules
- 15" TFT touch screen
- LINUX OS with support for VNC-based remote operation
- Runs stand-alone software like Wireshark
- Ideal for stand-alone lab use



### ONT-804, ONT-812 and ONT-812A

- 4 or 12 slots for application modules
- LINUX OS with support for VNC-based remote operation
- Runs stand-alone software like Wireshark
- Connectors for external keyboard, mouse, and display
- Ideal for cost-sensitive and scripted applications in SVT and manufacturing



## Mainframe Specifications

| Power supply (nominal range of use)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                                                                                                   |                       |                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------|-----------------------|-----------------------|
| AC Line                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ONT-804            | ONT-804D                                                                                          | ONT-812               | ONT-812A              |
| Nominal voltage range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 100 to 240 V       |                                                                                                   | 200 to 240 V          | 100 to 240 V          |
| Operating voltage range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 85 to 265 V        |                                                                                                   | 170 to 265 V          | 85 to 265 V           |
| Operating frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    | 50/60 Hz                                                                                          |                       |                       |
| Max AC power (fully loaded mainframe)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1600 VA            | 1600 VA                                                                                           | 4400 VA (2 x 2200 VA) | 3200 VA (2 x 1600 VA) |
| Max DC Power to Application Modules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1200 W             | 1200 W                                                                                            | 3600 W                | 2400 W                |
| Dimensions and weight (w/o modules)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                                                                                                   |                       |                       |
| Dimensions, including handle/bumpers (w x h x d)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 400 x 200 x 495 mm | 400 x 495 x 215 mm                                                                                | 483 x 666 x 460 mm    | 483 x 666 x 460 mm    |
| Weight                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 11.7 kg            | 14.2 kg                                                                                           | 24 kg                 | 24 kg                 |
| Touch screen display (ONT-804D only)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                                                                                                   |                       |                       |
| Color TFT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    | 15 inches                                                                                         |                       |                       |
| Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    | 1024 x 768 (XGA)                                                                                  |                       |                       |
| Interfaces, storage, data transfer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                                                                                   |                       |                       |
| Interfaces                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    | Ethernet (Rj45), 4 x USB, external keyboard, mouse, HDMI                                          |                       |                       |
| Processor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    | Intel, 16GB RAM                                                                                   |                       |                       |
| Hard drive for data/setup storage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    | ≥ 64 GB                                                                                           |                       |                       |
| Instrument operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                                                                                                   |                       |                       |
| The ONT-800 uses the Linux operating system<br>Local GUI via built-in touch screen and by connecting screen/mouse/keyboard. Remote operation is provided via Java Web Start or VNC. Individual user programs may run on the controller board, for example Wireshark or similar tools used to analyze captured data.                                                                                                                                                                                                                             |                    |                                                                                                   |                       |                       |
| Instrument operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                                                                                                   |                       |                       |
| The ONT-800 can be controlled remotely via SCPI commands sent by the customer’s program using the LAN port. Modules are addressed independently and in parallel and may be shared among multiple users and across multiple mainframes network-wide. Universal driver libraries facilitate automation with specific support for individual applications. Scripting support is provided for Tcl/Tk, Python, C libraries, and LabView. The interactive GUI also works in parallel with remote control making it easy to develop automated scripts. |                    |                                                                                                   |                       |                       |
| Instrument operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                                                                                                   |                       |                       |
| Nominal range of use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    | +5 to +35°C                                                                                       |                       |                       |
| Storage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    | –20 to +65°C                                                                                      |                       |                       |
| Transport                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    | –20 to +65°C                                                                                      |                       |                       |
| Local Mini LCD display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                                                                                                   |                       |                       |
| Display type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    | Graphic LCD display 128 x 32 pixels                                                               |                       |                       |
| 2 push buttons                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    | Display and control: IP address, mainframe reference clock settings and module connectivity check |                       |                       |
| Clock and synchronization                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                                                                                                   |                       |                       |
| nternal master clock module accuracy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    | ±1.0 ppm<br>(Exceeds T1.101 stratum 3/3E accuracy)                                                |                       |                       |
| External synchronization input / output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                                                                                                   |                       |                       |
| Clock and time of day synchronization                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    | NTP, PTP, external GPS, 1PPS, Time of Day                                                         |                       |                       |
| Connector, unbalanced                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    | 50 Ω, BNC jack                                                                                    |                       |                       |
| Clock source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    | Ds1, E1; 1544, 2048 kHz, 1, 5, 10 MHz, 6312 kHz                                                   |                       |                       |
| Connector, balanced                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    | 110 Ω, Bantam jack                                                                                |                       |                       |
| Clock source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    | Ds1, E1; 1544, 2048 kHz, 1 MHz                                                                    |                       |                       |

| Clock output                                                                                            |                            |
|---------------------------------------------------------------------------------------------------------|----------------------------|
| Connector, unbalanced                                                                                   | 50 $\Omega$ , BNC jac      |
| Connector, balanced                                                                                     | 110 $\Omega$ , Bantam jack |
| Clock frequencies                                                                                       |                            |
| E1, DS1, 2048 kHz, 1544 MHz<br>RJ45 Clock in/out 1 pps and time of day, ITU and YD/T 2375-2011, cascade |                            |

## GNSS synchronization and Rubidium oscillator (optional)

| GNSS synchronization                  |                                                                                                                                                                          |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Antenna input [10]                    | Connector type: SMA 1.6/5.6, 50 $\Omega$<br>RF input power max. +10 dBm<br>3.0 V / 50 mA max                                                                             |
| Supported satellite systems           | GPS, Glonass, Beidou, Galileo                                                                                                                                            |
| Time to first fix                     | < 30 s                                                                                                                                                                   |
| Warm up time Rb oscillator            | < 8 min to reach frequency accuracy better than $\pm 1\text{E-}9$<br>at ambient temperature 25°C                                                                         |
| Overall synchronization time typical: | < 30 min<br>depends on satellite constellation and received signal quality                                                                                               |
| Time accuracy                         | < $\pm 2$ ns (clear sky, good signal quality)                                                                                                                            |
| Frequency accuracy                    | < $\pm 1\text{E-}10$ without receiving satellites (Rb oscillator)<br>< $\pm 2\text{E-}8$ during synchronization<br>synchronized: long time stability of satellite system |

## Available ONT-800 Modules and their Capabilities

This table provides a portfolio overview to help you making the right module selection. Additional applications will be added over time, especially for the N-PORT and 800G FLEX Modules.

|                                                                                           | N-PORT | 400G CFP8 | 800G FLEX     |
|-------------------------------------------------------------------------------------------|--------|-----------|---------------|
| Transponder Validation                                                                    | Yes    | Yes       | Yes           |
| PHY – Advanced Error Analysis                                                             |        | Yes       | Yes           |
| Dynamic Skew Insertion                                                                    |        | Yes       | Yes           |
| Electrical Adapter                                                                        |        | Yes       | Yes           |
| 400GE                                                                                     |        | Yes       | Yes           |
| 200GE                                                                                     |        | Yes       | Yes           |
| 100GE NRZ                                                                                 | Yes    |           | Yes           |
| 100GE PAM-4                                                                               |        |           | Yes           |
| 50GE                                                                                      | Yes    |           | Breakout 50GE |
| 40GE                                                                                      | Yes    |           |               |
| 25GE                                                                                      | Yes    |           |               |
| 10GE                                                                                      | Yes    |           |               |
| 1GE                                                                                       | Yes    |           |               |
| 2 x 200GE, 4 x 100GE,<br>8 x 50GE breakout<br>8 x 100GE, 4 x 200GE,<br>2 x 400GE breakout |        |           | Yes           |
| FlexE                                                                                     |        | Yes       | Yes           |
| FOIC-OTUCn                                                                                |        | Yes       | Yes           |
| OTN OTU 1/2                                                                               | Yes    |           |               |
| OTN OTU 3/4                                                                               | Yes    |           |               |
| MultiChannel OTN                                                                          | Yes    |           |               |
| Fibre Channel up to 10G                                                                   | Yes    |           |               |

|                                       | N-PORT | 400G CFP8 | 800G FLEX |
|---------------------------------------|--------|-----------|-----------|
| Fibre Channel 16G / 32G               | Yes    | Yes       | Yes       |
| eCPRI                                 | Yes    |           |           |
| SONET/SDH                             | Yes    |           |           |
| <b>Configuration Details</b>          |        |           |           |
| Number of ports                       | 4      | 1 - 4     | 2 - 8     |
| Number of slots occupied in mainframe | 1      | 3         | 3         |
| DC Power Consumption (max)            | 250 W  | 450 W     | 700 W     |

## ONT-800 Mainframes and Accessories

|                                                             |                                                                                               |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 3078/04 ONT-804D                                            | Mainframe with touchscreen display                                                            |
| 3078/05 ONT-804                                             | Mainframe without display, 19" / 21" rack mount included                                      |
| 3078/07 ONT-812                                             | Mainframe 12 slot rack mount version                                                          |
| 3078/08 ONT-812A                                            | Mainframe 12 slot rack mount version for 110V AC with reduced power profile                   |
| 3078/92.05                                                  | Rack Mount Kit 19" and 21" for ONT-804D                                                       |
| 3078/92.02                                                  | ONT-800 Ultra High Accuracy GNSS Rb Clock. Hardware option, can only be fitted in the factory |
| <b>Power Cables (1 for ONT-804, 2 for ONT-812 included)</b> |                                                                                               |
| K 810                                                       | European IEC C19 Schuko 250 V 16 A                                                            |
| K 811                                                       | UK C19 250 V 13 A                                                                             |
| K 812                                                       | Australia 250 V 15 A                                                                          |
| K 814                                                       | US NEMA 5-20 125 V 20 A                                                                       |
| K 815                                                       | US NEMA 6L-20 250 V 20 A                                                                      |