ONT-506/512

Optical Network Tester

January 2007 edition

Key features

- **Multi-Application support**
  SONET/SDH, NewGen, Ethernet, OTN, Jitter, OSA, DSn/PDH
- **Multi-Port testing**
  All interfaces run simultaneously and independently
- **Multi-Users** to share modules with log-in control
- **Multi-Channel test** checks SONET/SDH channels simultaneously
- Industry first **40/43G SDH/SONET/OTN and unframed BERT** testing with jitter/wander capability
- **High-accurate Jitter/Wander test** according to new ITU-T O.172 Appendix VII + VIII and O.173
- Single and **dual port DSn/PDH** modules
- **High performance OSA modules** ready for 40/43 Gb/s signal analysis with channel drop up to 10.7 Gb/s
- **Automation made easy**
  Linux OS, Tcl/Tk, C- and LabWindows driver libraries
- **ONT-506 Desktop,** 6 slots with 15" TFT screen
- **ONT-512 Rack mount,** 12 slots, 19" rack mount

Testing design and conformance of 40/43G Networks and Line Cards

40 Gb/s is the next natural data rate to become commercially deployed. The drivers are the needs to transport 40 Gb/s IP services generated by routers, and the desire to reduce network costs through lower transport cost and fewer wavelengths to manage. Consequently 43G OTN technology with it robustness and long reach advantages becomes of interest for Network Equipment Manufacturers and Carriers as well.

The ONT-506/512 with its 40/43G SDH/SONET/OTN testing functionality is the first single box solution that enables testing of overheads, alarms and errors, service disruption and pointer operations at these bitrates. With the optional jitter/wander testing capabilities the ONT-506/-512 performs highly accurate and repeatable jitter measurements according to O.172 and O.173.

New level of load and coverage with Multi-Channel and Multi-Port testing

Many actions are performed in parallel in today's network elements. Protection schemes being supported for both line and path level, enhanced restoration capabilities and implementation of large capacity switch fabrics call for testing "under realistic load conditions".

With its 6 slot and 12 slot design ONT-506/ -512 offer true multi-port operation running tests on each of the modules simultaneously and independently. It's Multi-Channel testing with full load analysis of an STS-48/STM-16 signal on up to 1344 VT1.5/1008 VC-12 ensures that all channels are checked in parallel and nothing remains uncovered.

Remote Multi-User access – most efficient use of your test set

Individual log-ins for each user being local or accessing modules through a browser for remote operation allow to share the test set without impacting each others' measurements.

Drivers and test libraries support for Tcl/Tk and LabWindows and the Linux operation system help to minimize efforts to use ONT-506/-512 in an automated environment.

Modules to test OTN, SDH, SONET, NewGen, Ethernet, DSn/PDH and Jitter as well as OSAs complete the **broadest range of applications supported on one platform**. All modules are 'plug-ins'.

Design and conformance testing of NextGeneration transport networks

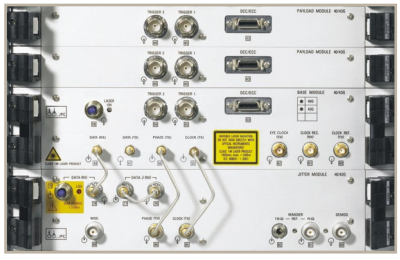
Multi-application and multi-port configuration

40/43G solution

- SONET/SDH, OTN (optional)
- Unframed testing

40/43G jitter/wander solution

- SONET/SDH, OTN (optional)
- High-accurate jitter evaluation according to new O.172 Appendix VII + VIII
- Wander (optional)



2.5G/10G (-B) modules

- SONET/SDH (PoS optional)
- Multi-Channel SONET/SDH (optional)
- Jitter/wander for version -B (optional)

OTN 2.5/2.7G (-B) module

- OTN/SONET/SDH (PoS optional)
- Multi-Channel SONET/SDH (optional)

OTN 10/10.7G (-B) module

- OTN/SONET/SDH (PoS optional)
- Multi-Channel SONET/SDH (optional)
- Jitter/wander for version -B (optional)

Multi-channel extension module

- Adds Multi-Channel SONET/SDH to 2.5/10G, OTN and NewGen modules

10G Ethernet module

- LAN PCS/MAC errors and traffic
- WAN (OC-192c/STM-64c)

Ethernet modules up to 1 Gb/s

- Optical and electrical interfaces
- Ethernet MAC
- Ethernet link

NewGen solution 2.5G (-B)/10G

- Ethernet over SONET/SDH (EoS)
- Ethernet MAC
- LCAS, GFP, differential delay
- SONET/SDH (PoS optional)
- Multi-Channel SONET/SDH (optional)
- GFP-T (optional)

- Jitter/wander for version 2.5G-B (optional)

High performance OSA module

- Optical spectrum analysis
- EDFA test
- DFB, FP, LED tests
- Drop option up to 10.7 Gb/s

DSn/PDH modules

- Unframed, framed and muxed DSn and PDH signals
- Single and dual ports

2.5G-B, 2.5/2.7G-B jitter module (155 Mb/s to 2.7 Gb/s)

- High-accurate jitter evaluation according to new O.172 Appendix VII + VIII
- Adds jitter to 2.5G modules
- Adds jitter to NewGen module 2.5G
- Adds jitter to OTN module 2.5/2.7G
- Wander (optional)

10G-B, 10/ 10.7G-B jitter module

- High-accurate jitter evaluation according to new O.172 Appendix VII + VIII
- Adds jitter to 10G modules
- Adds jitter to OTN module 10/10.7G
- Wander (optional)

Differential interface module

- Differential interfaces for XFP/SFP jitter testing

ONT-506

- 6 slots to take any combination of modules
- 15” TFT display

ONT-512

- 12 slots to take any combination of modules
- Rack mount
- Multi-port load testing with high port count

Configuration guide

ONT-506 mainframe, 6 slots, 15" TFT display		BN 3062/01
ONT-512 mainframe, 12 slots, rack mount		**BN 3061/01**
Modules and options	**Slots required**	
DSn/PDH applications		
DSn/PDH module single port	1	BN 3061/90.61
DSn/PDH module dual port	1	BN 3061/90.62
SONET/SDH/PoS applications		
Module 2.5G, 1310 & 1550 nm/electrical	1	BN 3061/90.18
Module 2.5G, 1310 nm	1	BN 3061/90.80
Module 2.5G-B, 1310 & 1550 nm/electrical	1	BN 3061/90.26
Module 10G, 1310 nm	1	BN 3061/90.15
Module 10G, 1550 nm	1	BN 3061/90.16
Module 10G-B, 1310 nm/electrical	2	BN 3061/90.21
Module 10G-B, 1550 nm/electrical	2	BN 3061/90.19
PoS processing	–	BN 3061/93.03
Multi-Channel SONET/SDH application		
Multi-Channel extension module	1	BN 3061/90.82
Data over SONET/SDH applications		
NewGen solution 2.5G, 1310 & 1550 nm/electrical	1	BN 3061/90.41
NewGen solution 2.5G-B, 1310 & 1550 nm/electrical	1	BN 3061/90.43
NewGen solution 10G, 1550 nm/electrical	2	BN 3061/90.45
GFP-T processing	–	BN 3061/93.08
Ethernet 10/100/1000 M	1	BN 3061/90.71
Mixed Ethernet module – 2 ports 10/100/1000, 2 ports 1G	1	BN 3061/90.72
Ethernet module 1G – 4 ports 1G	1	BN 3061/90.73
10 Gb/s Ethernet		
10G Ethernet solution	2	see separate datasheet
OTN/SONET/SDH applications		
OTN module 2.5/2.7 G, 1310/1550 nm/electrical	1	BN 3061/90.17
OTN module 2.5/2.7G-B, 1310 & 1550 nm/electrical	1	BN 3061/90.27
OTN module 10/10.7G, 1550 nm	2	BN 3061/90.30
OTN module 10/10.7G-B, 1550 nm/electrical	2	BN 3061/90.32
OTN module 10/10.7G-B, 1310 nm/electrical	2	BN 3061/90.33
Jitter/Wander applications		
Jitter module 2.5G-B	1	BN 3061/90.96
Jitter module 2.5/2.7G-B	1	BN 3061/90.92
Wander 2.5/ 2.7G	–	BN 3061/93.92
Jitter module 10G-B	1	BN 3061/90.95
Jitter module 10/10.7G-B	1	BN 3061/90.93
Wander 10/10.7G	–	BN 3061/93.91
Differential interface module	1	BN 3061/90.94
40/43G solution		
40G SDH/SONET	3	BN 3061/91.51
43G OTN	1	BN 3061/91.52
40G SDH/SONET Jitter	5	BN 3061/91.61
43G Jitter	–	BN 3061/91.62
40/43G Wander	–	BN 3061/93.93

Modules and options	Slots required	
Optical applications		
Full-band DWDM analyzer OSA-160	2	BN 3061/91.01
Full-band DWDM analyzer OSA-161	2	BN 3061/91.12
Full-band DWDM analyzer OSA-201	2	BN 3061/91.14
High performance DWDM analyzer OSA-300	3	BN 3061/91.31
High performance DWDM analyzer OSA-301	3	BN 3061/91.32
High performance DWDM analyzer OSA-303	3	BN 3061/91.34

ONT-506 mainframe

Highlights

- 6 slots to cover multiple ports/applications
- Large 15" TFT screen
- Plug-in modules
- Linux operating system
- Driver support

The ONT-506 is a 6-slot mainframe test solution with true multi-port operation for local and remote controlled applications.

'Plug-in' modules allow for easy upgrades in the field and exchange of interfaces among ONT-506 mainframes as well as between the ONT-506 and ONT-512 mainframes.

General specifications

Power supply (nominal range of use)

AC line voltage	100 to 240 V
AC line frequency	50/60 Hz, ± 5%
Power consumption (fully equipped)	max. 650 VA
Safety class to IEC 61010-1	class I

Ambient temperature

Nominal range of use	+5 to +40 °C/41 to 104 °F
Storage	–20 to +45 °C/–4 to +113 °F
Transport	–40 to +70 °C/–40 to 158 °F
Dimensions, including handle/bumpers (w × h × d)	450 × 335 × 435 mm, 17.7 × 13.2 × 17.1 in
Weight (without modules)	approx. 17 kg/ 37.5 lb

Clock and synchronization

Internal master clock accuracy	± 2.0 ppm (exceeds T1.101 stratum 3/3E accuracy)

External synchronization

Connector	75 Ω, unbalanced, BNC jack
Clock source	DS1, E1, 1544 kHz, 2048 kHz, 8 kHz, 1MHz, 5 MHz, 10 MHz
Connector	110 Ω, balanced, bantam jack
Clock source	DS1, E1, 1544 kHz, 2048 kHz

From RX

Each module may use its received signal clock information as reference for its transmitter.

Clock outputs

Connector	75 Ω, unbalanced, BNC jack
Connector	110 Ω, balanced, bantam jack

Instrument operation

The ONT-506, which uses the Linux operating system, supports three types of operation:

- Local GUI via built-in touchscreen
- Remote control, for test automation
- Remote operation via LAN

Touchscreen display

Large color TFT	15"
Resolution	1024 × 768 (XGA)

Interfaces, storage, data transfer

The ONT-506 uses a Pentium PC as internal controller allowing to run Linux applications as well.

Interfaces:	Ethernet (RJ45), USB, external keyboard, mouse, VGA
CD R/W/DVD-ROM drive for data transfer and software update. PC Pentium M, 1.8 GHz, 512 MB RAM	
Hard drive for data/setup storage	≥ 40 GB

Remote control for test automation

The ONT-506 is controlled remotely via SCPI commands sent by the customer's program using an Ethernet TCP/IP connection.
Modules are addressed independently and in parallel and may be shared among multiple users.
Universal driver libraries facilitate automation with specific support for individual applications.
Scripting support via Tcl/Tk and C libraries and LabWindows drivers.
The interactive GUI also works in parallel to remote control, so that it is very easy to develop automated scripts.

ONT-512 mainframe

Highlights

- 12 slots to cover multiple ports/applications
- Rack-mount chassis
- Plug-in modules
- Linux operating system
- Driver support

The ONT-512 is a 12-slot mainframe test solution with true multi-port operation for local and remote control.

'Plug-in' modules allow for easy upgrades in the field and exchange of interfaces among ONT-512 mainframes as well as between the ONT-512 and ONT-506 mainframes.

General specifications

Power supply (nominal range of use)

AC line voltage	100 to 240 V
AC line frequency	50/60 Hz, ± 5%
Power consumption (fully equipped)	max. 1000 VA
Safety class to IEC 61010-1	class I

Ambient temperature

Nominal range of use	+5 to +40 °C/ 41 to 104 °F
Storage	–25 to +45 °C/–13 to +113 °F
Transport	–40 to +70 °C/–40 to 158 °F
Dimensions (w × h × d)	464 × 327 × 523 in mm 18.2 × 12.9 × 20.6 in 7.5 rack unit height is required in a 19" rack for stacking
Weight (without modules)	approx. 17 kg/ 37.5 lb

Clock and synchronization

Internal master clock accuracy	± 2.0 ppm (exceeds T1.101 stratum 3/3E accuracy)

External synchronization

Connector	75 Ω, unbalanced, BNC jack
Clock source	DS1, E1, 1544 kHz, 2048 kHz, 8 kHz, 1MHz, 5 MHz, 10 MHz
Connector	110 Ω, balanced, bantam jack
Clock source	DS1, E1, 1544 kHz, 2048 kHz

From RX

Each module may use its received signal clock information as reference for its transmitter.

Clock outputs

Connector	75 Ω, unbalanced, BNC jack
Connector	110 Ω, balanced, bantam jack

Instrument operation

The ONT-512, which uses the Linux operating system, supports three types of operation:

- Local by connecting screen/ mouse/ keyboard
- Remote control for test automation
- Remote operation via LAN

Interfaces, storage, data transfer

The ONT-512 uses a Pentium PC as internal controller allowing to run Linux applications as well.

Interfaces	Ethernet (RJ45), USB, external keyboard, mouse, VGA
CD R/W/DVD ROM drive for data transfer and software update.	
PC Pentium M, 1.8 GHz, 512 MB RAM	
Hard drive for data/setup storage	≥ 40 GB

Remote control for test automation

The ONT-512 is controlled remotely via SCPI commands sent by the customer's program using an Ethernet TCP/IP connection.
Modules are addressed independently and in parallel and may be shared among multiple users.
Universal driver libraries facilitate automation with specific support for individual applications.
Scripting support via Tcl/Tk and C-libraries and LabWindows drivers.
Remote operation may be used as a parallel monitor, while the ONT-512 is controlled remotely for test automation.

Notes:

Related products

ONT-50 Optical Network Tester

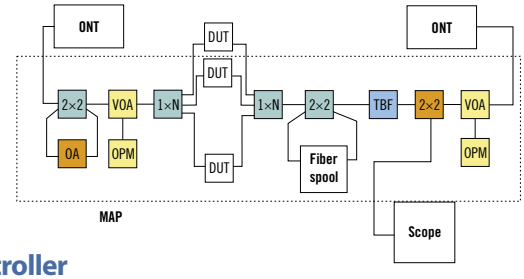
Desktop solution for testing of design and conformance of Next Generation transport networks. SDH, SONET, Multi-channel, OTN, Jitter, NewGen, Ethernet. Multiple users can run multiple applications simultaneously and independently. Linux operating system. High resolution 12" colored touchscreen, 4 slots.

Multiple Application Platform (MAP)

With over 20 unique modules, MAP enables users to manipulate and control optical transmission signals (independent of rate or format) and enables testing of transmission quality as a function of parameters such as Average Power, OSNR and Polarization state. Optical switches and optical splitter modules may be added to enable automation interfaces for multiple devices and/or multiple signal sources.

The modular platform is available in 3 or 8 slot chassis with GPIB or RS-232 interfaces. ActiveX and LabView drivers are also provided. Rack mount kits and a reverse mount system enable clean factory test integration and rear fiber exit when needed.

2×2: optical switch (cross)
OA: optical amplifier
OPM: optical power meter
VOA: variable optical attenuator
1×N: 1:N switch
TBF: tunable bandpass filter



OLC-65 Optical Level Controller

The OLC-65 contains both attenuator and power meter function making test set-up simple and eliminating the need to connect several instruments, cables and couplers.

See OLC-65 data sheet for details.

Handheld Fiber Inspection Microscope OIM-400

Many light transmission problems occur as a result of improper fiber connectors. The Fiber Microscope reflects details of scratches and any contamination of connector end surfaces. The light weight microscope is equipped with universal push-pull adapter.

Magnification	400×
Power supply	3 "AAA" batteries
OIM-400	BN WO-FM-C400

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