OV-1000 Optical Time Domain Reflectometer (OTDR)

A LANscape® Solutions Product

Corning
Cable Systems

Applications

- Testing and troubleshooting of LAN, telco, CATV and FTTx networks

Description

Corning Cable Systems OV-1000 Optical Time Domain Reflectometer (OTDR) provides testing flexibility by combining a rugged platform with field-interchangeable multimode, single-mode and advanced testing modules. All OTDR modules can be used as continuous wave (CW) light sources. Available as options on the mainframe are a power meter and visual fault locator (VFL). The OV-1000 utilizes Windows® CE technology allowing for a fast power-up time of four seconds. The OV-1000 has an 80 MB internal flash memory that typically stores up to 1500 traces and eliminates the need for a hard drive, which can fail under extreme field conditions. If extra storage capacity is needed, the unit offers USB A/B ports and a compact flash slot.

The OV-1000 OTDR product line offers a wide variety of multimode and single-mode modules. Modules are cross-platform compatible between the OV-1000 and the OptiVisor™ 400 OTDR mainframes. The OV-1000 has the capacity to hold up to two OTDR modules or one OTDR module and one advanced testing module at the same time. Modules can be easily switched out in the field, without the use of tools, in just a matter of seconds.

The OV-1000 has a 6.4-in color touch screen that is resistant to shock, water and most common chemicals used in the field. The screen is large enough to view both the trace and the event table simultaneously, eliminating the need to toggle back and forth between the two.

Along with offering three OTDR test modes — Auto, Advanced and Template Trace — the OV-1000 is future-ready with the ability to accept protocol testing modules, such as Gigabit Ethernet, as they are made available.

Features / Benefits

- Rugged, splash-proof mainframe allows for testing in harsh conditions
- 6.4-in color TFT touch is easily readable when testing indoors under artificial light and outdoors in the sunlight

OV-1000 OTDR | Photo LAN731

OV-1000 OTDR Kit | Photo LAN730

- Dial and keypad make scrolling and selecting faster and easier
- Accommodates up to two field-interchangeable modules, eliminating the need to change modules as often
- Windows CE-based technology with four second power-up time allows the user to begin testing immediately
- Instantaneous AutoSync USB makes it easier and faster to transfer files and perform software upgrades

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Specifications

OV-1000 OTDR Mainframe[1]

Parameter	Specification
Display	Color touchscreen, 640 x 480 TFT 163 mm (6.4 in)
Interfaces	USB A main; USB B remote; RJ-45 LAN 10/100 Mb/s; compact flash; fiber inspection probe connector port (video)
Storage	Internal 80 MB (flash); USB sticks 1 GB and 2 GB (optional); compact flash cards (optional)
Batteries[2]	Rechargeable lithium ion
Battery Operating Time	8 h as per Bellcore TR-NWT-001138
Power Supply	AC/DC adapter, input: 100 to 240 V, 50 to 60 Hz, 2 A max, output; 24 V DC, 90 watts
Operating Temperature	-5° to 50°C (23° to 122°F)
Storage Temperature[3]	-40° to 70°C (-40° to 158°F)
Relative Humidity	0% to 95% max, non-condensing
Size (H x W x D)	32.2 x 19.7 x 10.9 cm (12.6875 x 7.75 x 4.3125 in)
Weight	2.5 kg (5.4 lb)
Vibration	< 1.5 g at 10 to 500 Hz (on three main axes)
Mechanical Shock	< 760 mm on six sides and eight main edges (according to GR-196-CORE)

Power Meter[4]

Calibrated Wavelengths (nm)	850, 1300, 1310, 1490, 1550, 1625, 1650
Detector	InGaAs
Power Range (dBm)	10 to -86
Uncertainty[5]	± 5% ± 3 pW (InGaAs)
Display Resolution (dB)	0.01 = max to -76 dBm; 0.1 = -76 dBm to -86 dBm; 1 = -86 dBm to min
Automatic Offset Nulling Range[6]	Max to -63 dBm for InGaAs

Tone Detection (Hz)	270/1000/2000

Visual Fault Locator (VFL)

	Laser, 650 nm ± 10 nm
	Continuous wave (CW)
	Typical P_{out} in 62.5/125 µm; 3 dBm (2 mW)

Notes:
[1] *All specifications valid at 23°C (73°F).*
[2] *Standard recharge time is 3 h. Recharge temperature: 0° to 35°C (32° to 95°F).*
[3] *Not including internal batteries. Battery maximum storage temperature: 60°C (140°F).*
[4] *At 23°C ± 1°C, 1550 nm and FC connector. With modules in idle mode. Battery operated.*
[5] *Up to 5 dBm.*
[6] *For ± 0.05 dB, from 18° to 28°C.*

(continued)

Specifications *(continued)*

Multimode Module[1]

Model	Wavelength (nm)	Dynamic Range[2,3] (dB)	Event Dead Zone[4] (m)	Attenuation Dead Zone[4] (m)
400-MD26	850 ± 20/1300 ± 20	27/26	1/1	3/4

Single-mode Modules[1]

Model	Wavelength (nm)	Dynamic Range[5] at 10 µs (dB)	Dynamic Range[5] at 20 µs (dB)	Event Dead Zone[6] (m)	Attenuation Dead Zone[6] (m)
400-SD34	1310 ± 20/1550 ± 20	35/34	37/35	1/1	4.5/5
400-SD37	1310 ± 20/1550 ± 20	38/37	39/38	1/1	5/6 (4/4)
400-SD135	1550 ± 20/1625 ± 10	37/35	38/36	1/1	6/6 (4/5)
400-ST37	1310 ± 20/1550 ± 20/1625 ± 10	38/37/35	39/38/36	1/1/1	5/6/6 (4/4/5)
400-ST137	1310 ± 20/1490 ± 10/1550 ± 20	38/34/37	39/35/38	1/1/1	5/6/6 (4/4/4)
400-SD40	1310 ± 20/1550 ± 20	40/40[8]	41.5/40.5[8]	3/3	10/15
400-SD140	1550 ± 20/1625 ± 10	40[8]/38	40.5[8]/39	3/3	15/16
400-SD45[7]	1310 ± 20/1550 ± 20	43.5/43.5[9]	45/45[9]	3/3	10/15
400-SD142[7]	1550 ± 20/1625 ± 10	43.5[9]/41.5	45[9]/43	3/3	15/16
400-ST41	1310 ± 20/1550 ± 20/1625 ± 10	41/40/38	42.5/41.5/39.5	3/3/3	8/10/10

Quad Module[1]

Model	Wavelength (nm)	Dynamic Range[2,3] at 10 µs (dB)	Event Dead Zone[4] (m)	Attenuation Dead Zone[4] (m)
400-MDSD	850 ± 20/1300 ± 20 1310 ± 20/1550 ± 20	27/26 37/35	1/1 1/1	3/4 4.5/5

General Specifications	400-MD26	400-SD34/SD37/ SD135/ST37/ST137	400-SD40/SD140/ SD45/ SD142/ST41	400-MDSD
Distance Range (km)	0.1, 0.3, 0.5, 1.3, 2.5, 5, 10, 20, 40	1.25, 2.5, 5, 10, 20, 40, 80, 160, 260	1.25, 2.5, 5, 10, 20, 40, 80, 160, 260	MM: 0.1, 0.3, 0.5, 1.3, 2.5, 5, 10, 20, 40 SM: 1.25, 2.5, 5, 10, 20, 40, 80, 160, 260
Pulse Width (ns)	5, 10, 30, 100, 275, 1000	5, 10, 30, 100, 275, 1000, 2500, 10,000, 20,000	10, 30, 100, 275, 1000, 2500, 10,000, 20,000	MM: 5, 10, 30, 100, 275, 1000 SM: 5, 10, 30, 100, 275, 1000, 2500, 10,000, 20,000
Multimode Launch Conditions[10]	Class CPR 1 or 2	N/A	N/A	Class CPR 1 or 2
Linearity (dB/dB)	± 0.03	± 0.03	± 0.05	± 0.03

Notes:

1 *All specifications valid at 23°C ± 2°C (73.4°F ± 3.6°F) with an FC/PC connector, unless otherwise specified.*

2 *Typical dynamic range with longest pulse and three-minute averaging at SNR = 1.*

3 *Multimode dynamic range is specified for 62.5 µm fiber; a 3 dB reduction is seen when testing 50 µm fiber.*

4 *Typical dead zone of multimode reflectance below -35 dB and single-mode reflectance below -45 dB, using a 5 ns pulse.*

5 *Typical dynamic range with three-minute averaging at SNR = 1.*

6 *Typical dead zone of single-mode modules for reflectance below -45 dB, using a 10 ns pulse (5 ns pulse for 400-SD34/SD37/SD135/ST37/ST137).*

7 *Typical dynamic range on NZDS fiber with a three-minute average at SNR = 1.*

8 *Typical dynamic range at 1550 nm is 2 dB lower at 10 µs and 1 dB lower at 20 µs.*

9 *Typical dynamic range at 1550 nm is 2 dB lower.*

10 *Controlled launch conditions allow 50 µm and 62.5 µm multimode fiber testing.*

(continued)

Specifications *(continued)*

General Specifications	400-MD26	400-SD34/SD37/ SD135/ST37/ST137	400-SD40/SD140/ SD45/ SD142/ST41	400-MDSD
Loss Threshold (dB)	0.01	0.01	0.01	0.01
Loss Resolution (dB)	0.001	0.001	0.001	0.001
Sampling Resolution (m)	0.04 to 2.5	0.04 to 5	0.08 to 5	MM: 0.04 to 2.5 SM: 0.04 to 5
Sampling Points	Up to 128,000	Up to 128,000	Up to 52,000	Up to 128,000
Distance Uncertainty[11] (m)	± (0.75 + 0.0025% x distance)	± (0.75 + 0.0025% x distance)	± (1 + 0.0025% x distance)	± (0.75 + 0.0025% x distance)
Measurement Time	User-defined (60 min. maximum)	User-defined (60 min. maximum)	User-defined (60 min. maximum)	User-defined (60 min. maximum)
Real-time Refresh (s)	Guaranteed: ≤ 0.4	Guaranteed: ≤ 0.4 Typical: ≤ 0.3	≤ 1	Guaranteed: ≤ 0.4
Stable Source Output Power[12] (dBm)	-1.5 (1300 nm)	-8 (400-SD34), -4.5 (all others)	-5	-1.5 (1300 nm), -7 (1550 nm)
Visual Fault Locator (optional)	Laser, 650 nm ± 10 nm CW, typical P_{out} in 62.5/125 µm: 3 dBm	Laser, 650 nm ± 10 nm CW, typical P_{out} in 62.5/125 µm: 3 dBm	Laser, 650 nm ± 10 nm CW, P_{out} maximum: ≤ 800 µW	Laser, 650 nm ± 10 nm CW, typical P_{out} in 62.5/125 µm: 3 dBm

Notes:

[11] Does not include uncertainty due to fiber index and sampling resolution.

[12] Typical output power is given at 1300 nm for multimode and 1550 nm for single-mode.

Ordering Information

Part Number	Description
Basic Kits	
Basic Kits include OV-1000 Mainframe, single-mode and/or multimode module, power supply, battery, appropriate OTDR port adapter(s), CD with OTSView PC emulation software and user's manual, cleaning supplies, Quick Reference guide and hard-shell transit case.	
1000BK-SD34	Short-Range Dual Single-Mode (35/34 dB) with SC and FC OTDR port adapters
1000BK-SD37	Mid-Range Dual Single-Mode (38/37 dB) with SC and FC OTDR port adapters
1000BK-ST37	Mid-Range Triple Single-Mode 1310/1550/1625 nm (38/37/35 dB) with SC and FC OTDR port adapters
1000BK-ST137	FTTx Single-Mode 1310/1490/1550 nm (38/34/37 dB) with SC and FC OTDR port adapters
1000BK-SD40	Long-Range Dual Single-Mode (40/40 dB) with SC and FC OTDR port adapters
1000BK-SD45	Extended-Range Dual Single-Mode (43.5/43.5 dB) with SC and FC OTDR port adapters
1000BK-MD25	Dual Multimode (26/25 dB) with SC and ST® Compatible Connector OTDR port adapters
1000BK-MDSD	Dual Multimode (26/25 dB) and Single-Mode (35/34 dB) with SC and ST Compatible Connector OTDR port adapters
Deluxe Kits	
Deluxe Kits include OV-1000 Mainframe with power meter and VFL, single-mode and/or multimode module(s), power supply, battery, appropriate OTDR port adapters, CD with OTSView PC emulation software and user's manual, OTSBatch PC batch processing software, cleaning supplies, Quick Reference guide and hard-shell transit case.	
1000DK-SD34	Short-Range Dual Single-Mode (35/34 dB) with SC and FC OTDR port and power meter adapters
1000DK-SD37	Mid-Range Dual Single-Mode (38/37 dB) with SC and FC OTDR port and power meter adapters
1000DK-ST37	Mid-Range Triple Single-Mode 1310/1550/1625 nm (38/37/35 dB) with SC and FC OTDR port and power meter adapters
1000DK-ST137	FTTx Single-Mode 1310/1490/1550 nm (38/34/37 dB) with SC and FC OTDR port and power meter adapters
1000DK-SD40	Long-Range Dual Single-Mode (40/40 dB) with SC and FC OTDR port and power meter adapters
1000DK-SD45	Extended-Range Dual Single-Mode (43.5/43.5 dB) with SC and FC OTDR port and power meter adapters
1000DK-MD25	Dual Multimode (26/25 dB) with SC and ST® Compatible Connector OTDR port and power meter adapters
1000DK-MDSD	Dual Multimode (26/25 dB) and Single-Mode (35/34 dB) with SC and ST Compatible Connector OTDR port and power meter adapters

(continued)

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Ordering Information *(continued)*

Part Number	Description
Mainframes	
Standard components on mainframes include 6.4-in color touch screen, USB A/B ports, RJ-45 port and Compact Flash slot.	
1000-MAINF	OTDR Controller
1000-MAINF-VPM	OTDR Controller with power meter and VFL
OV-1000 Modules	
Includes SC OTDR port adapter(s).	
400-MD26	Multimode OTDR Module, 850/1300 nm (26/25 dB)
400-SD34	Single-Mode Short-Range OTDR Module, 1310/1550 nm (35/34 dB)
400-SD37	Single-Mode Mid-Range OTDR Module, 1310/1550 nm (38/37 dB)
400-SD135	Single-Mode Mid-Range OTDR Module, 1550/1625 nm (37/35 dB)
400-ST37	Single-Mode Mid-Range OTDR Module, 1310/1550/1625 nm (38/37/35 dB)
400-ST137	Single-Mode Mid-Range OTDR Module, 1310/1490/1550 nm (38/34/37 dB)
400-SD40	Single-Mode Long-Range OTDR Module, 1310/1550 nm (40/40 dB)
400-SD140	Single-Mode Long-Range OTDR Module, 1550/1625 nm (40/38 dB)
400-SD45	Single-Mode Extended-Range OTDR Module, 1310/1550 nm (43.5/43.5 dB)
400-SD142	Single-Mode Extended-Range OTDR Module, 1550/1625 nm (43.5/41.5 dB)
400-ST41	Single-Mode Long-Range OTDR Module, 1310/1550/1625 nm (41/40/38 dB)
400-MDSD	Multimode/Single-Mode Quad OTDR Module, 850/1300/1310/1550 nm (26/25/35/34 dB)
Accessories	
UI-SC	Universal Interface Source Connector Adapter, SC
UI-ST	Universal Interface Source Connector Adapter, ST® Compatible
UI-FC	Universal Interface Source Connector Adapter, FC
OA-SC	Power Meter Connector Adapter, SC
OA-ST	Power Meter Connector Adapter, ST Compatible
OA-FC	Power Meter Connector Adapter, FC
OA-LC	Power Meter Connector Adapter, LC
OTSBATCH	PC Batch Processing Software
CASE-OV-1000	Hard-Shell Transit Case with wheels
PS-OV-1000	Power Supply for 100-240 V AC with US line cord

Notes:
1) Various test fiber box configurations available for use as OTDR launch cables. Please contact Customer Service for part numbers and pricing.
2) OV-1000 products are available with options not listed above such as an enhanced screen for outdoor use, extended range GeX power meter on mainframe, protocol testing modules, multitest module for optical power and return loss measurement, and various other OTDR modules. Contact Corning Cable Systems Customer Service for more information.

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