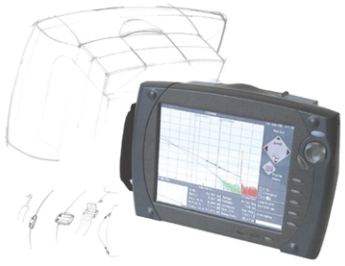
Agilent N3910AM, N3910AL, N3911AL, N3914AL OTDR Test Engines for Modular Network Tester



The Perfect Fit

Technical Specifications

Specifications describe the instrument's warranted performance, measured with typical PC-type connectors. Uncertainties due to the refractive index of the fiber are not considered. Characteristics and typical data provide information about the non-warranted instrument performance.

Agilent OTDRs are produced to the ISO 9001 international quality system standard as part of Agilent's commitment to continually increasing customer satisfaction through improved quality control.

Agilent Technologies

Agilent N3910AM, N3911AL, N3914AL, N3910AL: OTDR Modules for single-mode fibers

Description

The Agilent OTDR Modules N391x work together with the Agilent Modular Network Tester, and are easy to snap on. The OTDR application is uploaded in seconds due to the dynamic software architecture, and allows plug and play operation. Each OTDR test engine has built-in RISC processing power for fast and accurate trace acquisition and data processing. These test engines work in parallel processing mode with other connected test engines, for example, the 1x12 Switch module. All OTDR modules can be shared between multiple users, without the need for any software changes.

Features and Benefits

Save time. Make money.

With the N3910AL (1310/1550nm), and N3911AL (1550/1625nm) OTDR test engines, long haul fiber links can be tested and qualified faster than ever before, thanks to their 45dB ultra high dynamic range technology. For high fiber count cables, where the test time is critical, these OTDR Test engines significantly reduce test times from minutes to seconds.

One connection, 3 wavelengths: Tested all at once

For metro applications, where the transmission wavelength spectrum ranges from 1310nm to 1625nm, Agilent offers a very high performance 3 wavelength module N3914AL (1310/1550/1625nm), which tests fibers at all 3 wavelengths and automatically saves the trace files.

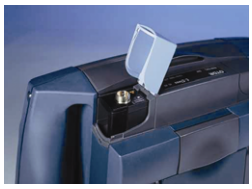
All Done. All Right.

After the measurements have been taken the Pass/Fail Test will automatically check for attenuation and insertion and return loss. The new Bending Test will locate both macro and micro bends.

Easy Connector access and protection

The pop-up connector solves many common problems. For easy access to the optical fiber connection, the pop-up connector is released to the up position, where a fiber can be attached without any obstacles, or the connector cleaned. This also minimizes the risk of scratches to the connector.
In the down position with the dust cover closed, the connector stays protected and clean during transit.

Connector in down position



Connector in up position

Attach the right connector

Agilent's universal connector interface allows a large range of standard fiber optic connectors, such as FC/PC, SC, and LC, to be connected to the OTDR port. The connector interfaces are easy to attach, even when working on site, and once removed, the fiber ferrule is easily accessible for cleaning.

Acceptance Test Done

The companion software, Toolkit III, prepares acceptance reports the way your customers want them, and handles post-processing jobs to free you up for the next task.

Built-in Applications

- OTDR Mode
- Multi Fiber Test
- Automated OTDR measurements using 1x12 optical switch
- Accumulated optical return loss
- Accumulated end to end loss
- Loop Back fiber testing mode
- Build-in continuous wave source (CW)
- Pass/Fail Test

Specifications

Optical Performance [1]

2λ Modules		Agilent N3910AM		Agilent N3910AL		Agilent N3911AL	
Central wavelength [nm] Tolerance [nm]		1310 ± 25	1550 ± 25	1310 ± 25	1550 ± 25	1550 ± 25	1625 ± 20
Dynamic range (dB)[2]							
Pulsewidth	10 ns	19	17	24	22	22	18
	100 ns	24	22	29	27	27	24
	1 µs	30	29	35	34	34	30
	10 µs	38	37	42	41	41	37
	20 µs	**40**	**39**	**45**	**43**	**43**	**39**

3λ Modules		Agilent N3914AL		
Central wavelength [nm] Tolerance [nm]		1310 ± 25	1550 ± 25	1625 ± 20
Dynamic range (dB)[2]				
Pulsewidth	10 ns	22	20	16
	100 ns	27	25	22
	1 µs	33	31	28
	10 µs	40	38	35
	20 µs	**43**	**41**	**38**

At any wavelength the following pulsewidths are selectable: 10 ns, 30 ns, 100 ns, 300 ns, 1 µs, 3 µs, 10 µs, 20 µs.
All Agilent OTDR Test Engines provide a cw-source mode at the selected wavelength.
Typ. values are printed in **BOLD.**

Resolution

Module	all single-mode modules
Event deadzone[3]	3 m
Attenuation deadzone [4]	10m @ 1310nm / 12m @ 1550nm / 14m @1625nm

Characteristics

Distance accuracy [5]

Offset error	Scale error	Sampling error
±1 m	$\pm 10^{-4}$	±0.5 sampling spacing

Loss/reflectance accuracy [6]

Backscatter measurements 1 dB steps	Reflectance measurements[7]
±0.03 dB	±1.0 dB

Sampling points: up to 64000.
Minimum sample spacing: 8cm.
Pulsewidth: selectable, from 10 ns to 20 µs.
CW-Source mode:
Output power level: -3 to -8dBm (depending on module type and wavelength.)
Stability: [8]: ±0.1 dB (±0.15 dB @ 1625 nm)
Modulation: 270 Hz, 1 kHz, and 2 kHz squarewave.

Note:

[1] Guaranteed specifications measured at 22 °C ± 3 °C. Bold values are typical specifications.

[2] Measured with a standard single-mode fiber at SNR = 1 noise level and with 3 minutes averaging time. Optimize mode: dynamic.

[3] Reflectance ≤ -35 dB at a pulsewidth of 10 ns and with a span of ≤ 4 km. Optimize mode: resolution.

[4] Typical specification @ Reflectance≤ -50 dB at a pulsewidth of 30 ns, span ≤ 4 km.

Guaranteed specification @ Reflectance ≤ -35 dB at a pulsewidth of 30 ns and with a span of ≤ 4 km. Optimize mode: resolution.

20m @ 1310 nm: Agilent N3910AM, N3910AL, N3911AL, N3914AL

25m @ 1550 nm: N3910AM, N3910AL, N3911AL, N3914AL

28m @ 1625 nm: N3911AL, N3914AL

[5] Distance accuracy: offset error + scale error * distance + sampling error.

[6] SNR ≥ 15 dB and with 1 µs, averaging time maximum 3 minutes.

[7] -20 dB to -60 dB.

[8] After 10 minute warm-up (15 min., T = constant).

Horizontal parameters

Start: 0 km to 400 km.
Span: 0.1 km to 400 km.
Readout resolution: 0.1 m.
Minimum sample spacing: 8cm.
Refractive index: 1.00000 - 2.00000.
Length unit: km, ft or miles.
Measurement points: up to 64000.

Vertical parameters

Vertical scale: 0.1 - 10.0 dB/Div.
Readout resolution: 0.001 dB.
Reflectance range: -14 dB to -70 dB.
Backscatter coefficient: 10 dB to 70 dB at 1 µs.
Auto setup and analysis: provided.
Instrument settings: storage and recall of user-selectable instrument settings.

Optical Interfaces

Output connector: optional Diamond HMS-10, FC/PC, DIN 47256, ST, FC/APC, Biconic, SC, NEC D4, E2000, LC. All are user-exchangeable.

Scan trace

Type of events: reflective and non-reflective events.
Maximum number of events: 100.
Threshold for non-reflective events: 0.0 to 5.0 dB, selectable in 0.01 dB steps.
Threshold for reflective events: -14.0 to -65.0 dB and 0.00 dB (disabled), selectable in 0.1 dB steps.
Threshold for fiber breaks:
0.1 to 10 dB and 0.00 dB (disabled), selectable in 0.1 dB steps.

Documentation

Trace format: Bellcore/Telcordia compliant according to GR-196-CORE Issue 2 OTDR Data Standard.
–GR 196,Revision 1.0
–GR 196,Revision 1.1
–GR 196,Revision 2.0
Trace information: five comment labels of up to 15 alpha-numeric characters and five comment fields of up to 41 alpha-numeric characters are provided for each trace.

General

Operating temperature: 0°C to +50°C
Storage temperature: -40°C to + 60°C
Humidity: 95% R.H from 0°C to + 40°C.
Dimensions: 217 mm H, 212 mm W, 33 mm D.
(8.6" x 8.4" x 1.3")
Weight: net <1.2 kg (2.5 lbs)
Laser safety class: All laser sources specified by this data sheet are classified as Class 1M according to IEC 60825-1 (2001). All laser sources comply with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2001-July-26
Recommended recalibration period: 2 years.
Power consumption: max. 8W
Operating Time: typ. 5 hours continuous measurement time with a standard OTDR module snapped-on to Modular Network Tester mainframe with 50% back light setting.

Ordering Information

Agilent Product	Description
N3910AM	OTDR Module 1310/1550nm 40/39 dB
N3910AL	OTDR Module 1310/1550nm 45/43 dB
N3911AL	OTDR Module 1550/1625nm 43/39 dB
N3914AL	OTDR Module 1310/1550/1625nm 43/41/38 dB

Localization:

Languages	Options
English localization	ABA
French localization	ABF
German localization	ABD
Simplified Chinese localization	AB2
Spanish localization *	ABE
Portuguese localization *	AB9
Traditional Chinese localization *	ABO
Japanese localization *	ABJ
Italian localization **	ABZ
Korean localization **	AB1
Russian localization **	ACB
Turkish localization **	AB8
Czech localization **	AKB
Polish localization **	AKD

* Planned availability for August 2002
** For availability please contact your Agilent representative

Connector Options:

021 – Straight physical contact
022 – Angled physical contact

Accessories Supplied:

- Each OTDR Module ordered with Option 021 is provided with 81000FI (FC/PC) and 81000 KI (SC) connector Interface
- Each OTDR Module ordered with Option 022 is provided with 81000NI (FC/APC) and 81000 KI (SC) connector Interface
- User's Guide
- Support CD

Connector Interfaces:

Agilent Model No.	Description
81000WI	Biconic
81000SI	DIN
81000HI	E2000
81000NI	FC/APC
81000FI	FC/PC
81000AI	HMS/10
81000GI	D4
81000KI	SC
81000VI	ST
81000LI	LC

Service and Support Options:

- **R1280A** – Return to Agilent Warranty and Service Plan. Available for 36 months (3 years) or 60 months (5 years).
- **R1282A –** Return to Agilent Calibration Plan. Available for 36 months (3 years) or 60 months (5 years).

Software:

Agilent E6092A Toolkit III – OTDR Trace post processing and acceptance test documentation software package

Related Agilent Literature:

Title	Type of Literature	Part Number
N3900A Modular Network Tester	Brochure	5988-5065EN
N3900A Modular Network Tester	Datasheet	5988-5066EN
N3940AA 1 X 12 Optical Switch Module for Modular Network Tester	Datasheet	5988-5068EN
N3988A Video Microscope for Modular Network Tester	Datasheet	5988-5069EN

Training Materials:

Title	Part Number
Agilent Cleaning Procedures for Lightwave Test and Measurement Equipment	N3900-90AJ1
Agilent OTDR 's Pocket Guide	E6000-91017

Web Based Training

OTDR Solution User's Course

To take this training, go to:
http://www.agilent.com/cm/service/education.shtml

Safety Information

All laser sources specified by this data sheet are classified as class 1M or class 2 according to IEC 60825-1 (2001).

All laser sources comply with FDA 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2001-July-26.

The class 1M laser sources (all OTDR test engines) bear the laser label

All modules also bear the CE conformity marking

You **must** return instruments with malfunctioning laser modules to an Agilent Technologies Service Center for repair and calibration, or have the repair and calibration performed on-site by Agilent Technologies personnel.

Agilent Technologies Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

By internet, phone, or fax, get assistance with all your test & measurement needs

Online assistance:
www.agilent.com/comms/otdr

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(tel) 1 800 452 4844

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