

OTDRs

Agilent N3910AM, N3910AL, N3911AL, N3914AL, N3916AL

Description The Agilent OTDR test engines 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 test engines can be shared between multiple users, without the need for any software changes.



OTDR Test

Features and Benefits

Save time. Make money.

With the N3910AL (1310/1550 nm), and N3911AL (1550/1625 nm) OTDR test engines, long haul fiber links can be tested and qualified faster than ever before, thanks to their 45 dB 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 1310 nm to 1625 nm, Agilent offers a very high performance 3 wavelength test engine N3914AL (1310/1550/1625 nm), 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, insertion and return loss. The new Bending Test will locate both macro and micro bends.

Remote Control

The E6092A Toolkit companion software lets you control your complete OTDR test procedure remotely, via LAN or USB, for optimal comfort and productivity.

Acceptance test done

The E6092A Toolkit companion software can also prepare 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: OTDR Test Engines

Typical values are printed in **BOLD**.

Optical Performance ^a

2λ test engines		Agilent N3910AM		Agilent N3910AL		Agilent N3911AL		
Central wavelength [nm]		1310	1550	1310	1550	1550	1625	
Tolerance [nm]		± 25	± 25	± 25	± 25	± 25	± 20	
Dynamic range (dB) ^b								
Pulse width	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 test engines		Agilent N3914AL						
Central wavelength [nm]					1310	1550	1625	
Tolerance [nm]					± 25	± 25	± 20	
Dynamic range (dB) ^b								
Pulse width	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	
4λ test engines		Agilent N3916AL						
Central wavelength [nm]					1310	1480	1550	1625
Tolerance [nm]					± 25	± 20	± 25	± 20
Dynamic range (dB) ^b								
Pulse width	10 ns				22	19	20	16
	100 ns				27	24	25	22
	1 μs				33	30	31	28
	10 μs				40	37	38	35
	20 μs				43	-	41	38

At any wavelength the following pulse widths are selectable: 10 ns, 30 ns, 100 ns, 300 ns, 1 μ s, 3 μ s, 10 μ s.
 20 μ s can be selected for any wavelength except 1480nm.
 All Agilent OTDR test engines provide a cw-source mode at the selected wavelength.

Resolution	Test Engine			All single-mode test engines
	Event dead zone ^c			3 m
	Attenuation dead zone ^d			10m @ 1310 nm / 12 m @ 1550 nm / 14 m @ 1625 nm
Characteristics	Distance accuracy ^a			
	Offset error	Scale error	Sampling error	
	± 0.3 m	$\pm 5 \times 10^{-5}$	± 0.5 sampling spacing	
Loss/reflectance accuracy^f	Backscatter measurements		Reflectance measurements^g	
	Loss Accuracy		Reflectance Accuracy	
	± 0.03 dB/dB		± 1.0 dB	
Backscatter linearity^h	Backscatter Linearity 1km to 100 km			
	± 0.03 dB			
	Sampling points: up to 64000. Minimum sample spacing: 8 cm. Pulse width: selectable, from 10 ns to 20 μ s.			
CW-Source mode:	Output power level: -3 to -8 dBm (depending on test engine type and wavelength.) Stabilityⁱ: ± 0.1 dB (± 0.15 dB @ 1625 nm) Modulation: 270 Hz, 1 kHz, and 2 kHz square wave.			
Horizontal parameters	Start: 0 km to 400 km. Span: 0.1 km to 400 km. Readout resolution: 0.1 m. Minimum sample spacing: 8 cm. Refractive index: 1.00000 - 2.00000. Length unit: km, ft or miles. Measurement points: User selectable 4000 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 μ s. Auto setup and analysis: provided. Instrument settings: storage and recall of user-selectable instrument settings.			
Optical Interfaces	Output connector: optional FC/PC, DIN 47256, ST, FC/APC, SC, E2000, LC, MU. 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 alphanumeric characters and five comment fields of up to 41 alphanumeric 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. 8 W
Operating Time: typically 5 hours continuous measurement time with a standard OTDR test engine snapped-on to Modular Network Tester mainframe with 50% backlight setting.

-
- [a] *Guaranteed specifications measured at 22 °C ± 3 °C. Bold values are typical specifications.*
[b] *Measured with a standard single-mode fiber at SNR = 1 noise level and with 3 minutes averaging time. Optimize mode: dynamic.*
[c] *Reflectance ≤ -35 dB at a pulse width of 10 ns and with a span of ≤ 4 km. Optimize mode: resolution.*
[d] *Typical specification @ Reflectance ≤ -50 dB at a pulse width of 30 ns, span ≤ 4 km. Guaranteed specification @ Reflectance ≤ -35 dB at a pulse width of 30 ns and with a span of ≤ 4 km. Optimize mode: resolution.*
20m @ 1310 nm: Agilent N3910AM, N3910AL, N3911AL, and N3914AL
25m @ 1550 nm: N3910AM, N3910AL, N3911AL, N3914AL
28m @ 1625 nm: N3911AL, N3914AL
[e] *Distance accuracy: offset error + scale error * distance + sampling error.*
[f] *SNR ≥ 15 dB and with 1 μs, IEC Standard 61746*
[g] *-20 dB to -60 dB at a pulse width of 100ns*
[h] *Displayed OTDR trace and its least square approximation line, pulse width 1 μs, 1550nm, measured with 100 km special reference fiber*
[i] *After 10 minute warm-up (15 min., T = constant).*