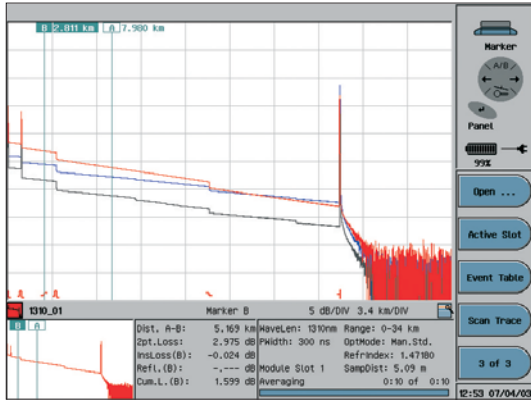


# Agilent portable equipment for testing optical networks

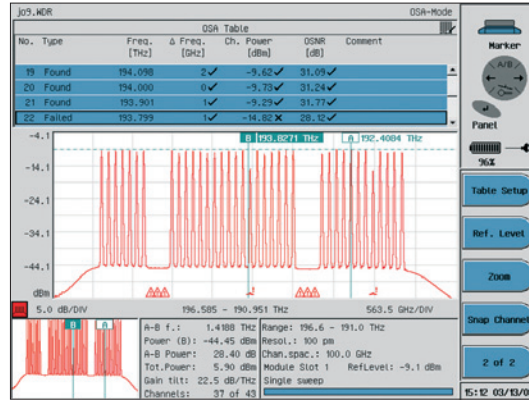


# Agilent Modular Network Tester

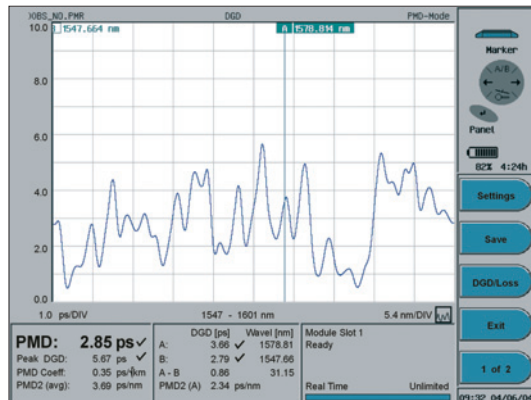
The Agilent Technologies modular network tester was designed and developed according to the requirements we learned from our existing customers and other prospective owners and users. It combines answers for the needs of the field (battery life, brilliant display, lightness and ruggedness) with highest technology advances (speed, connectability, and best in class Agilent measurement accuracy and reliability). This is not our product, this is your solution. If you have an optical network to look after, this is the tool you were looking for.



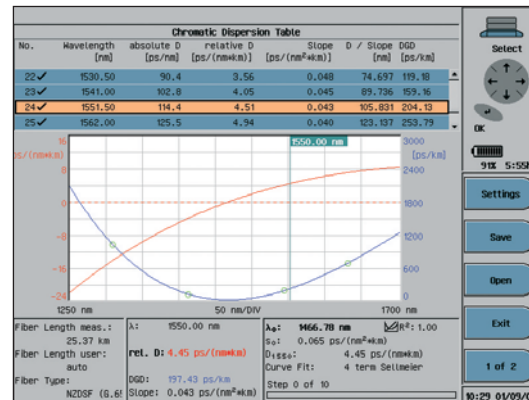
Optical time domain reflectometer



Optical spectrum analyzer



Polarization mode dispersion and differential group delay analyzer



Chromatic dispersion analyzer and 4-λ OTDR

# The Agilent N3900A Modular Network Tester



**Display**

SVGA-LCD 10.4" TFT display 800 x 600 pixels

**Weight**

3.3 kg (including battery pack)

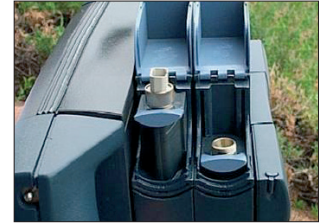
**Battery**

5 hours of continuous measurement  
< 3 hours charging time

- The modular network tester is designed to be a natural extension of your arm: the lightest platform on the market, with a powerful measurement processor, and an adaptable user interface to match the tool to the task.
- A working day of battery life.
- Softkeys and cursor control, or touchscreen, full functionality at your fingertips, however you want it.



**Power on. Snap on.  
Onto the task**



**An exhaustively tested  
pop-up connection**



**Agilent N3988A  
Video Microscope Camera**

- 200 – 500 optical magnification
- One button image capture
- No need for external power supply
- 0.2 kg weight
- Standard PC format for pictures (JPG, BMP)
- Can be directly connected to any PC with USB support

**Available connector tips**

- FC/PC, FC/APC, SC, SC/APC
- 2.5 mm ferrule
- LC, MU, 1.25 mm ferrule



**Agilent N3940AA  
1x 12 optical switch module**

- Snaps onto the Modular Network Tester behind the OTDR modules. The OTDR is connected to the input port of the switch.
- The "Multi-fiber Test Routine" automatically tests 12 fibers in a row.

**Wavelength range**

- 1280-1650 nm

**Insertion Loss**

- 2.7 dB

**Return Loss**

- 40 dB (straight connector), 50 dB (angled connector)

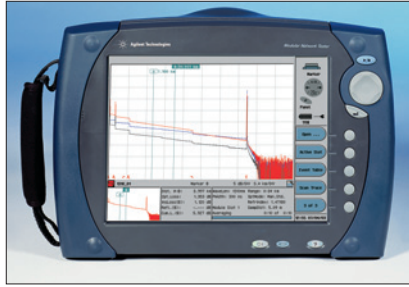


**Agilent N3900A  
connectivity options**

- Universal serial bus (USB 1.1) for Video microscope camera
- USB 1.1 peripheral, transmission up to 12 Mbit/s
- RS232C
- Parallel port
- LAN: RJ-45 jack, Ethernet 10/100
- Keyboard
- Analog monitor output (SVGA)
- Floppy disk

# OTDR test engines

## Agilent N3910AM, N3911AL, N3914AL & N3910AL



- Each OTDR engine has built in RISC processing power for fast and accurate trace acquisition.
- For long haul links, Agilent N3910AL (1310 & 1550 nm) and N3911AL (1550 & 1625 nm).
- For metro links: Agilent N3914AL (1310, 1550 & 1625 nm).

### Built-in applications

- OTDR mode
- Pass/fail test
- Macro bending finder
- Multi-fiber test
- Accumulated optical return loss and end to end loss
- Loop back fiber testing mode
- CW and source mode

### Minimum sample spacing:

4 cm

### Pulse width:

Selectable, from 10 ns to 20  $\mu$ s

### Event dead zone

(For all single mode modules) 3 m

### Attenuation dead zone

10 m @ 1310 nm / 12 m @ 1550 nm

14 m @ 1625 nm

### Linearity

$\pm$  0.03 dB (1-100 nm)

### Modular Network Tester N3900A

Wavelength SM OTDR Modules	40 dB	43 dB	45 dB
1310/1550 nm	N3910AM		N3910AL
1550/1625 nm		N3911AL	
1310/1550/1625 nm		N3914AL	
1310/1480/1550/1625 nm	N3916AL		

# Chromatic dispersion analyzer

## Agilent N3916AL



- Powerful built-in measurement algorithms provide the user with fiber type and accurate chromatic dispersion information.
- Access to just one fiber end is necessary.
- This engine combines the CD analyzer with the capabilities of a 4-Wavelength OTDR.
- Fiber loss test and chromatic dispersion in one go.
- For easy dispersion compensation planning, the user directly gets dispersion values and dispersion slope ratios as a function of the wavelength.

### Zero dispersion wavelength

Repeatability  $\pm$  0.6 nm

### Dispersion coefficient

Accuracy  $\pm$  0.5 ps/nm/km

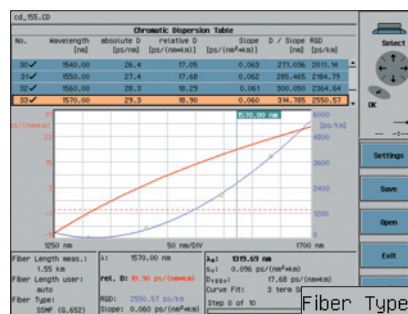
Repeatability  $\pm$  0.05 ps/nm/km

### Dispersion range

$\pm$  2500 ps/nm

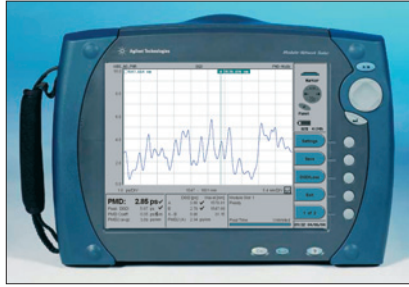
### Wavelength range

1250 nm to 1700 nm



# Polarization mode dispersion analyzer

## Agilent N3909A



- Agilent Technologies is first again to implement state of the art measurement technology: A field PMD analyzer based on the "golden standard" Jones Matrix Eigenanalysis method.
- Minimize effects of PMD using the most robust PMD measurement available with a single button push and optimize revenues through fiber plant capacity and repeater distance optimization.
- DGD distribution over the transmission band enables PMD troubleshooting.
- Femto second resolution and repeatability as well as 2nd-order PMD over wavelength for future proof.
- Link loss over wavelength to enable L-band transmission.

**Wavelength range**  
1525 nm to 1620 nm

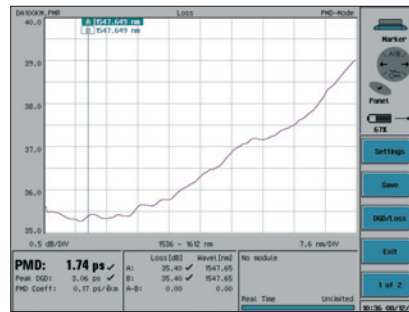
**Wavelength resolution**  
50 pm

**DGD range**  
0 ps to 150 ps

**PMD range**  
0 ps to 50 ps

**PMD accuracy**  
± (0.03 ps + 2% of PMD)

**Link loss accuracy**  
± 0.4 dB



# Optical spectrum analyzer engine

## Agilent N3935A



- Designed for use in systems with channel spacing down to 25 GHz.
- Capable of characterization in the S, C, L bands and beyond. Up to 256 simultaneous channels.
- Like all the modular network test engines, built for the rigors of the outside plant environment, to be shared and above all to be reliable.
- Enough dynamic range to detect any fault.
- One button completion of predefined jobs.

**Dynamic range**  
45 dBc @ 100 GHz and 40 dBc @ 50 GHz

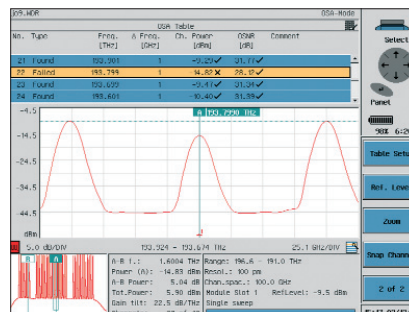
**Resolution Bandwidth (FWHM)**  
< 100 pm

**Scanning Resolution**  
0.005 nm

**PDL**  
± 0.05 dB

**Wavelength accuracy**  
± 40 pm

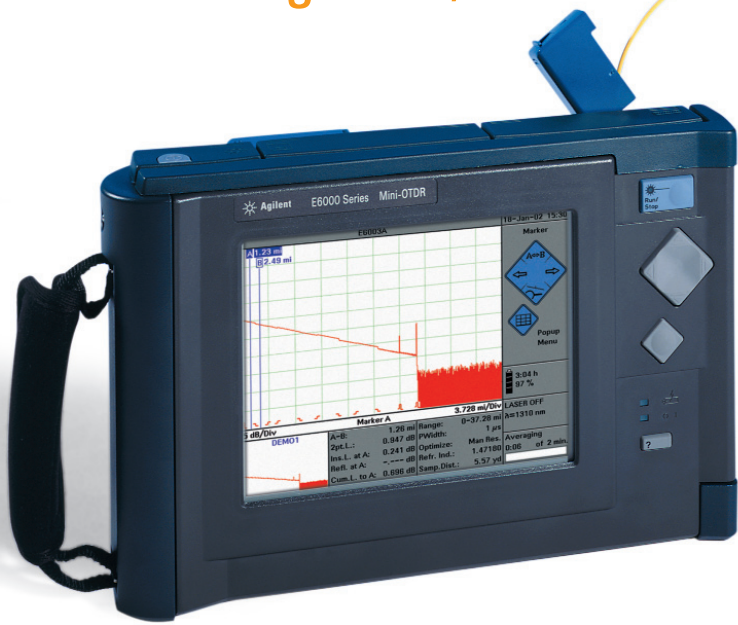
**Power Noise Level**  
- 70 dBm



- Built-in test routines and applications:**
- Channel planning tool.
  - Spectral analysis with real time (continuous) and average measurements.
  - Automatic detection of missing and/or unexpected channels.
  - Pass/fail test for all parameters (OSNR, power, channel frequency and drift, total power).

# The Agilent Mini-OTDR

## The lightest, smartest OTDR on the market



The Agilent Mini OTDR family offers you the most advanced technology for portable equipment: measurements that are simultaneously fast, reliable and accurate, best trace resolution from the connector to the end of the link, 8 hours of battery operation and just 2.9 kg. It makes your work easier before you even switch it on.

### Built-in applications

- OTDR expert mode
- Multi-fiber test
- Pass fail test and event table
- Optical return loss and end to end loss
- Traffic detection
- Fiber break locator
- OTDR wizard and auto-text for novice operators

### Minimum sample space

4 cm

### Pulse width

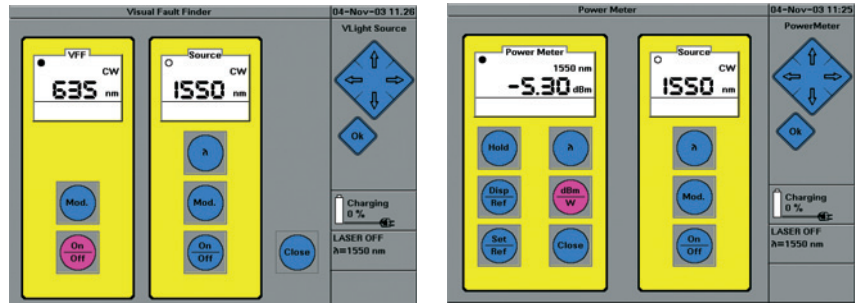
10 ns to 20  $\mu$ s

### Event dead zone

3 m

### Attenuation dead zone

10/12/14 m at 1310/1550/1625 nm



Visual fault finder (red laser) and built-in laser source

Optical power meter and loss test

### Mini OTDR E6000C

Wavelength SM OTDR Modules	Deadzone	30 dB	35 dB	40 dB	43 dB	45 dB
1310/1550 nm	3 m	E6004A	E6003A	E6003B		E6008B
1310/1550 nm	1.5 m				E6003C	
1550/1625 nm	3 m				E6012A	
1310/1550/1625 nm	3 m			E6013A		

### Wavelength MM OTDR Modules

Wavelength	Deadzone	23 dB	35 dB
850/1300 nm	3 m		E6005A
850/1300 nm	3 m	E6009A	

### Wavelength Power Meter Sub module E6006A

Wavelength	Power Range
800 – 1650 nm	- 70 dBm to + 10 dBm

### Visual Fault Locator Sub module E6007A

Wavelength	Distance range
Red Visible Light (635 nm)	up to 5 km

# Hand-held equipment

## High end series



### Optical power meter N3970A

- Dynamic range + 5 to - 70 dBm

### Optical power meter N3971A

- Dynamic range + 27 to - 40 dBm
- Accuracy  $\pm 3\%$  (also N3970A)

### Dual Laser Source N3974A

- Output power - 5 dBm
- Power stability  $\pm 0.15$  dB
- No warm up time

### Optical attenuator N3977A

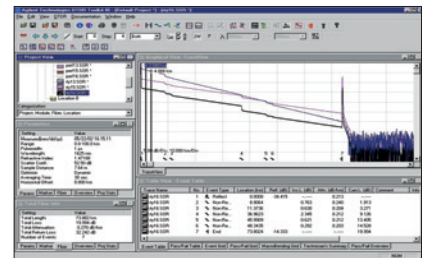
- Attenuation range 2.5 to 60 dB
- High precision (0.05 dB calibration step)

# Trace analysis and documentation software

## Agilent E6092A OTDR toolkit III plus

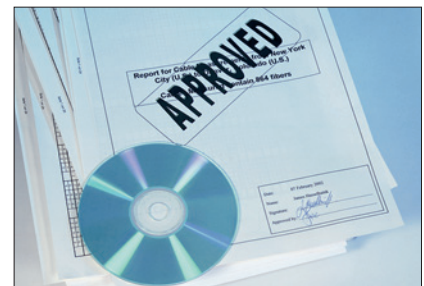
### OTDR trace management

- The Agilent tool kit is a powerful tool to manage, analyze and post-process, organize and store the result of your work with the OTDR engines.
- It can access and process the data to make two-way averages and analyze events such as splices, connectors or fiber attenuation.



### Acceptance test documentation

- Automatic trace labeling, powerful trace loading filters and batch processing.
- Automatically transfers the data information into PC compatible MS EXCEL<sup>®</sup> format.
- Built-in editing and print tools to produce work orders for splice crews and acceptance reports in whatever format you need, including your customer's design.



### Remote Control

#### Monitoring

- Viewer can remotely connect to and control both Mini-OTDR and Modular Network Tester OTDRs.
- Trace Connection can be established via LAN, USB or RS232C (serial port).

#### "On-line assistance"

- There is a problem or a challenging situation at the test site, a more experienced person can take control of the instrument to make sure you finish the work successfully.



### Connector interfaces

Full range of standard connector interfaces (FC/PC, FC/APC, SC, ST, E2000, DIN, LC and MU)

### Calibration Warranty

Agilent offers a standard 2 years calibration for all its optical equipment and 3 years or 5 years calibration warranty options depending on the instrument. Contact your Agilent sales representative for further information.

### Sales and Support

Agilent has offices in the main cities worldwide and offers you 24 hours Online assistance support.

### Related Literature

"Agilent N3900A Modular Network Tester" data sheet  
Part No. 5988-8190EN

### Training Materials

"Agilent Cleaning Procedures for Lightwave Test and Measurement Equipment"  
Part No. N3900-90AJ1

"Agilent OTDR's Pocket Guide"  
Part No. E6000-91017

### Web Based Training

"OTDR Solution User's Course"

Web tutorial (delivered with equipment)

## [www.agilent.com/comms/XPI](http://www.agilent.com/comms/XPI)

You're expected to do more with less – provide results faster with fewer resources, increase network performance, boost ROI, rapidly roll out new services – deliver extreme productivity improvements (XPI). Agilent XPI solutions help you drastically cut the time and cost of installing, testing and maintaining your communications networks. Reduce your operating costs by squeezing cost and time out of testing, increase revenues by rolling out new services more quickly, and, improve your network uptime by troubleshooting network problems faster. Together with Agilent, gain the extreme productivity improvements (XPI) that your business demands!

# XPI

#### Australia

1800 629 485

#### Austria

0820 87 44 11

#### Belgium

+32 (0) 2 404 9340

#### Brazil

+55 11 4197 3600

#### Canada

877 894 4414

#### China

800 810 0189

#### Denmark

+45 70 13 15 15

#### Finland

+358 (0) 10 855 2100

#### France

+33 (0) 825 010 700

#### Germany

+49 (0) 1805 24 6333

#### Hong Kong

800 930 871

#### India

1600 112 929

#### Ireland

+353 (0)1 890 924 204

#### Israel

+972 3 6892 500

#### Italy

+39 (0)2 9260 8484

#### Japan

0120 421 345

#### Luxembourg

+32 (0) 2 404 9340

#### Malaysia

1800 888 848

#### Mexico

+52 55 5081 9469

#### Netherlands

+31 (0) 20 547 2111

#### Philippines

1800 1651 0170

#### Russia

+7 095 797 3963

#### Singapore

1800 375 8100

#### South Korea

080 769 0800

#### Spain

+34 91 631 3300

#### Sweden

0200 88 22 55

#### Switzerland-Italian

0800 80 5353

#### Switzerland-German

0800 80 5353

#### Switzerland-French

0800 80 5353

#### Taiwan

0800 047 866

#### Thailand

1800 226 008

#### United Kingdom

+44 (0) 7004 666666

#### USA

800 452 4844

This information is subject to change without notice.  
© Agilent Technologies, Inc. 2004  
August 2004 (B.O.L.A.Y. GmbH)

**5989-0572EN**



**Agilent Technologies**