Confidential

Test&Measurement

Рефлектометр оптический компактный **Yokogawa AQ1000**
Купить и полная информация на сайте **http://www.optik-sk.ru**

AQ1000 OTDR

Engineering Release Guide

Marketing Division
Yokogawa meters & Instruments Corporation





April 4, 2017
KSR-0978-AF025

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Outline

Good things come in small packages

■Compact

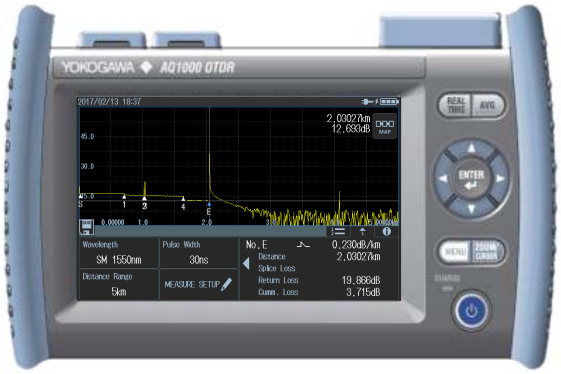
- 185 mm (W) x 116 mm (H) x 56 mm (D)
- Approx. 660 g

■Outstanding operability

- 5.0-inch WVGA Display with Capacitive Touchscreen
- Swift touchscreen operation
- 10+ hours battery operation
- Remote operation with a wireless device (option)

■OTDR functions

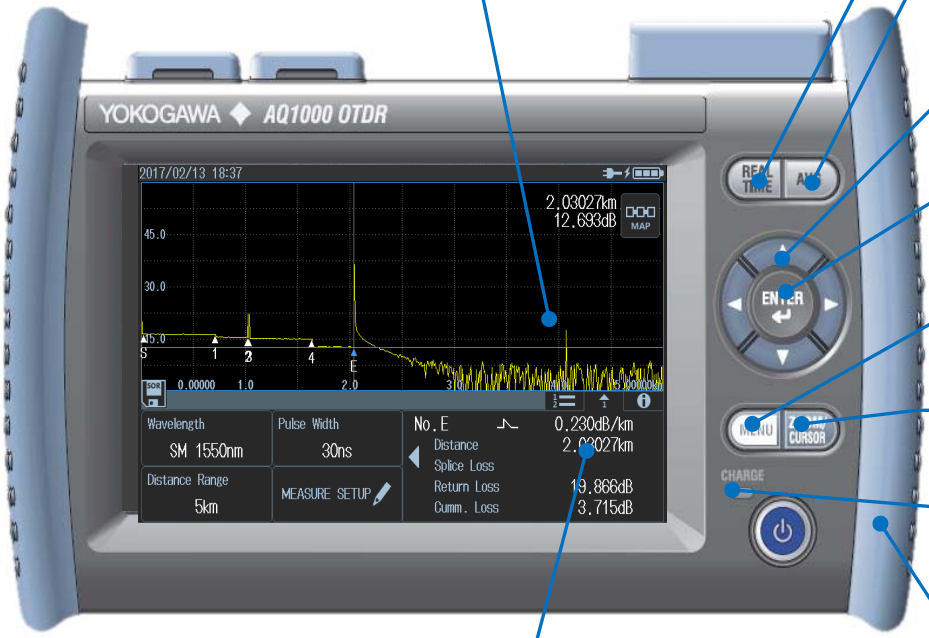
- One-button measurement
- Real-time and Average modes
- Wavelengths: 1310 / 1550 ±20 nm
- Dynamic range: 32 / 30 dB (typ.)



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Outline

Operation interfaces



Display (5inch WVGA)

Touch Screen (capacitive)

Real time key

Average key

Arrow key

Enter key

Menu key

Cursor/Zoom key

Charge lamp

Power switch

・Sleep mode

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Outline

Connection interfaces

USB port Type A

・Host (Memory)

USB port Type micro B

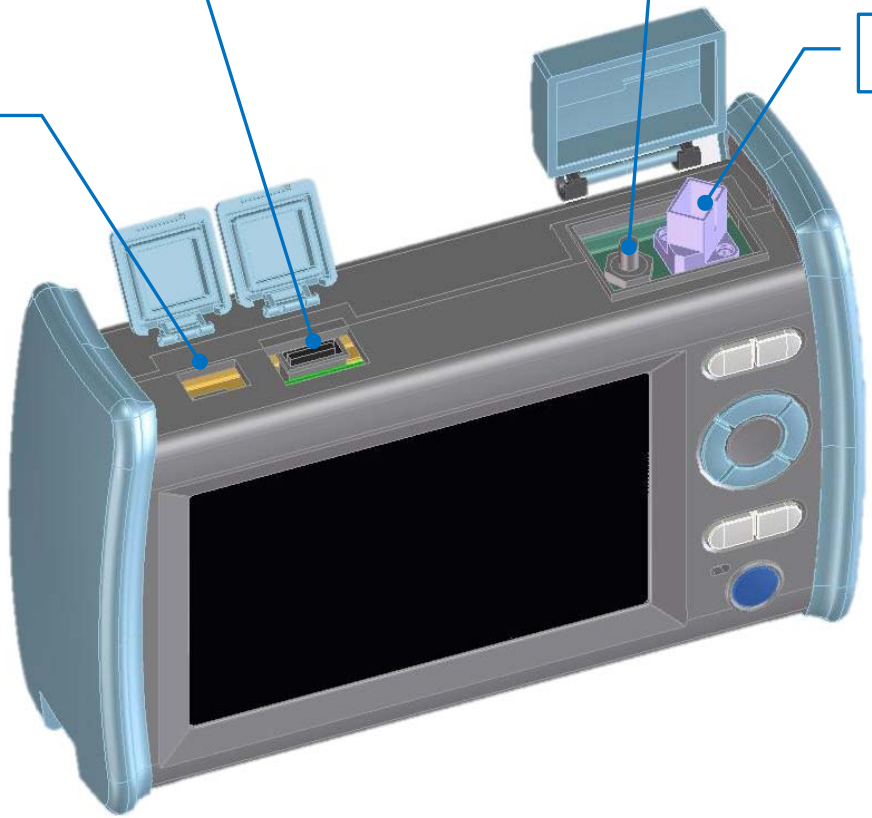
・USB mass storage devices
・DC power supply

VLS port (option)

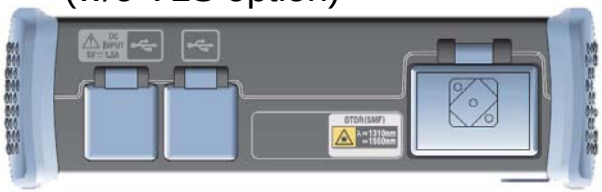
・Visible Light source

OTDR port

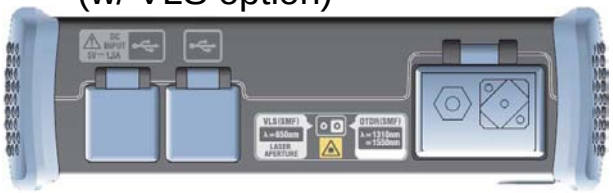
・OTDR
・Power checker
・Light source
・Universal connector (FC, SC)



(w/o VLS option)



(w/ VLS option)



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Benefits of AQ1000 OTDR

- **Smallest and Lightest (660 g)**
  in Yokogawa's OTDR history

- **Quality and Trust**
  backed by the brand YOKOGAWA

- **Good Operability (Direct, Quick and Easy)**
  with a new GUI and Multi Touchscreen

- **Usability not care for power supply environment**
  by USB power supply and Long Life Battery

- **Necessary Basic Measurement Functions**
  which were Standard installed in small Body

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Key Features

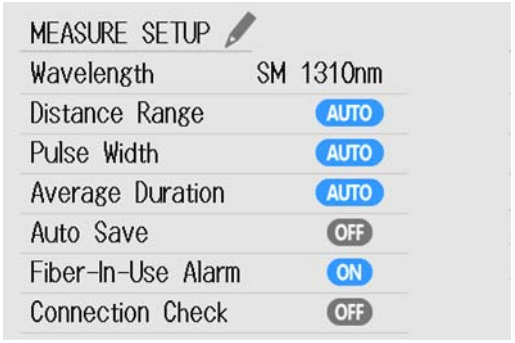
- Multi-touch touchscreen
- One-button measurement
- OTDR view modes (Trace and Map)
- Built-in power checker and light source, and VLS option
- Long battery operation time (over 10 hours)
- Instant boot-up (under 10 seconds)
- USB power feeding
- Multi-language
- Various data storage features
- Wireless and remote control function (option)

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Key Features

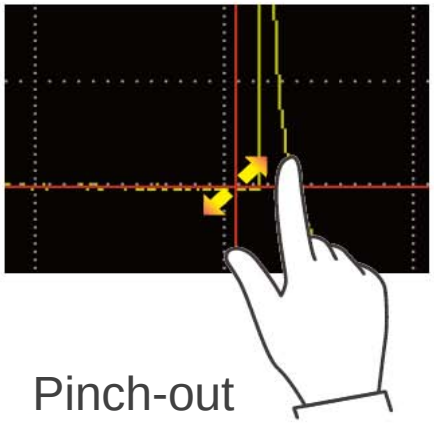
Multi-touch touchscreen

■ Intuitive and responsive

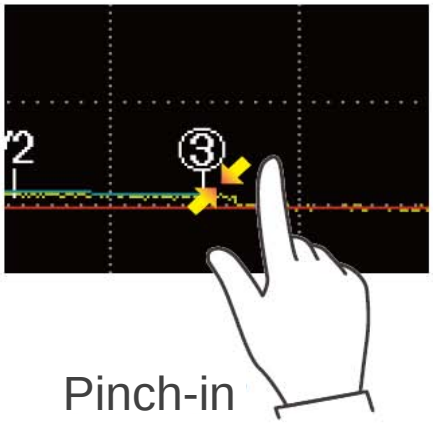




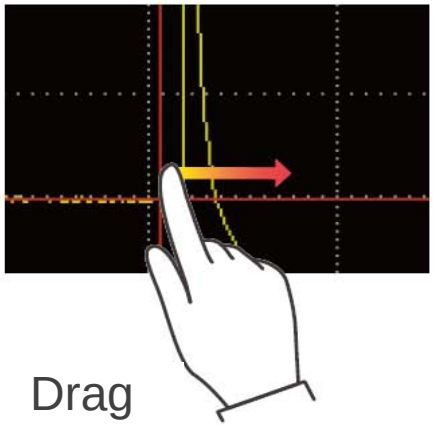
Tap



Pinch-out



Pinch-in



Drag

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Key Features

One-button measurement

FULL-AUTO



Opening

Power ON

AVG



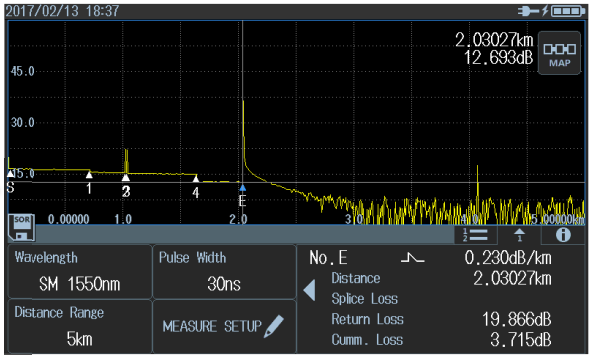
Top Menu (ex. Setup information)

Measurement

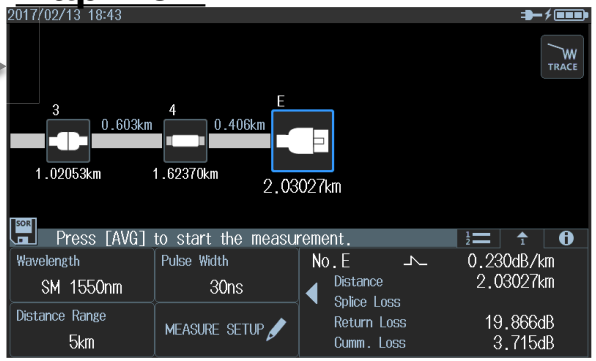
Event Analysis

Result

Trace view



Map view



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Key Features

One-button measurement

■ REAL-TIME



Opening

Power ON

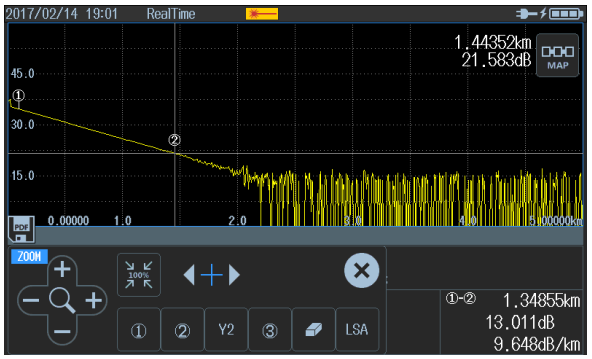
REAL-TIME



Top Menu (ex. Setup information)

Real-time Measurement

Trace



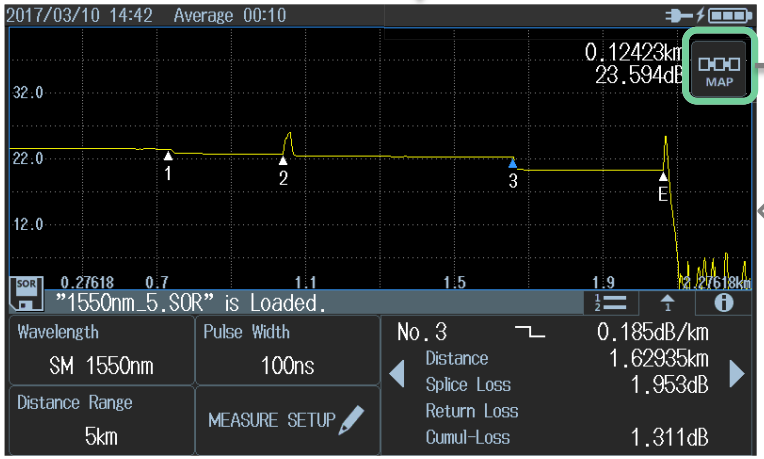
- ✓ Cursor and Marker functions
- ✓ Trace Zoom

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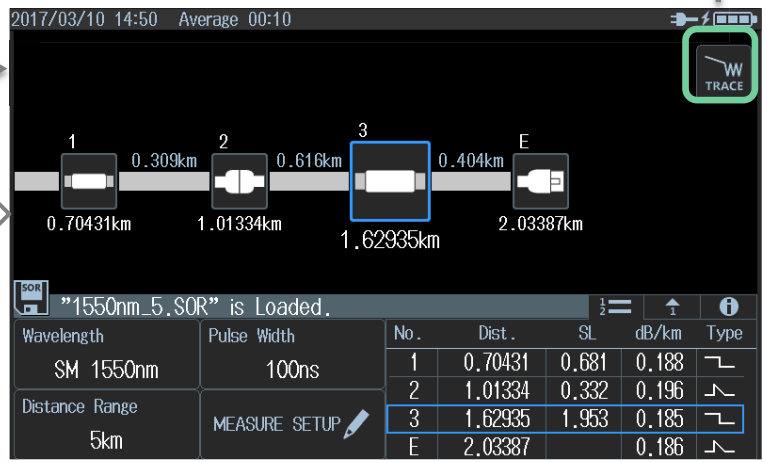
Key Features

OTDR view modes (Trace and Map)

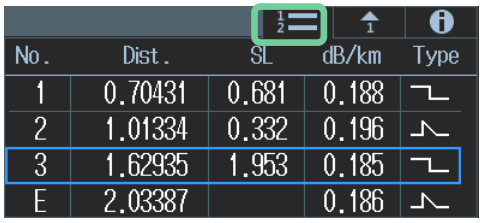
OTDR Trace



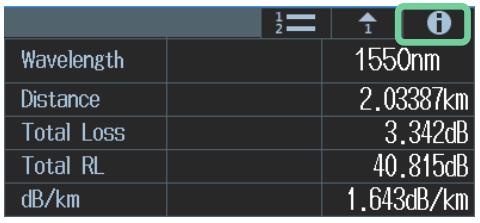
Event Map



Event Information



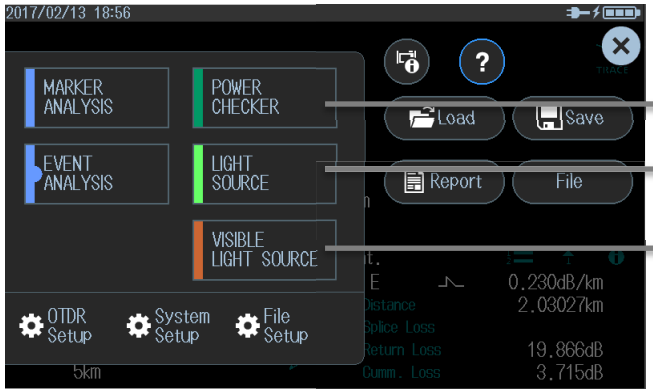


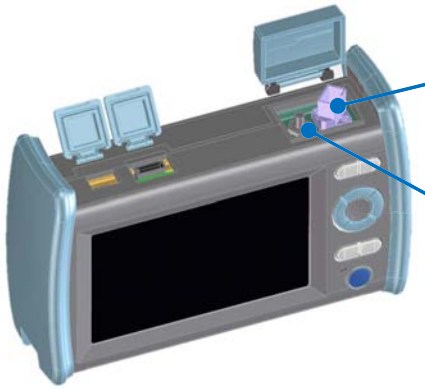


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Key Features

Built-in PC and LS, and VLS options





Power Checker
Light source

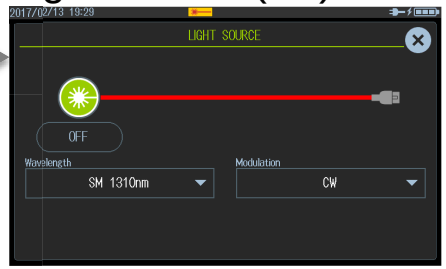
VLS

Power checker (PC)



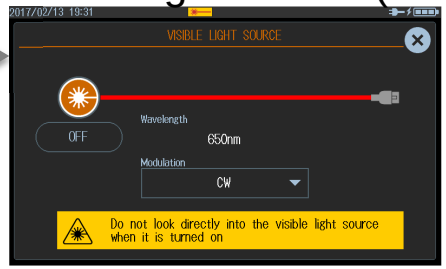
-50 to -5 dBm

Light source (LS)



1310/1550nm
-3dBm±1dB
CW/CHOP

Visible light source (VLS)



650nm
CW / 2Hz

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Key Features

Long battery operation time

- **Over 10 hours!**
  - according to Telcordia GR-196-CORE Issue 2, 2010
- **New Sleep function**
  - Extends the operation time further

Instant boot-up

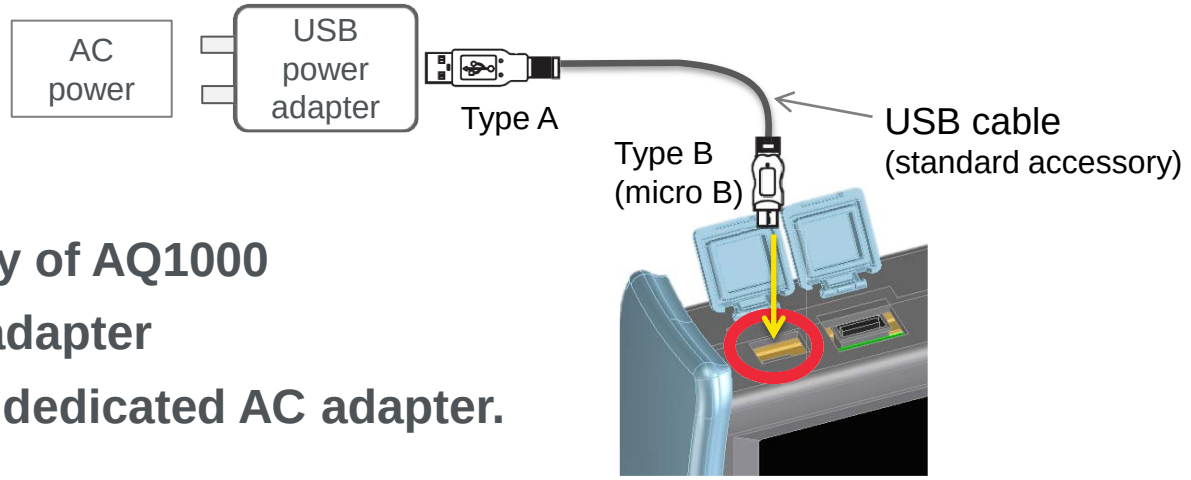
- **Under 10 seconds!**

  From completely OFF to measurement ready

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Key Features

USB power feeding



- **USB to charge the battery of AQ1000**
- **Use a small USB power adapter**
- **No need to carry a bulky dedicated AC adapter.**

USB power adapter

AQ1000 does not come with a USB power adapter, because it is subject to local safety regulations.

Please supply an YMI approved adapter locally .

◆**Recommended models (for China, for example)**

- **Artesyn: DA10-050CH**
- **Xiaomi: MDY-03-EB**
- **Pisen: TS-UC038**

Technical requirements:

1. Output: DC 5V, 1.5A or more
2. CCC marking (for China)
3. Double insulation



Please consult with YMI for approval.

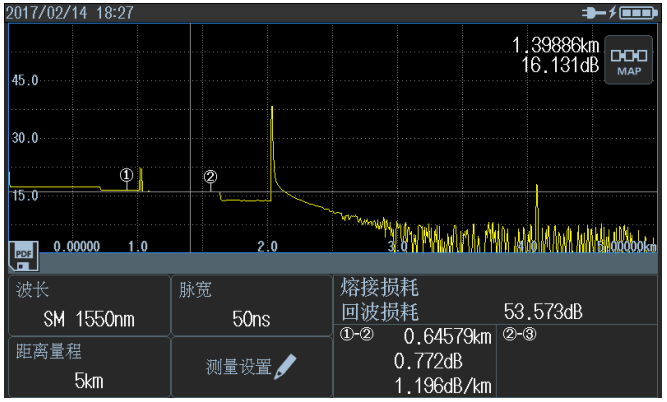
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Key Features

Multi language

- English
- Chinese
- Portugal BR
- Spanish
- Korean





Screen software keyboard

- ✓ English
- ✓ Chinese



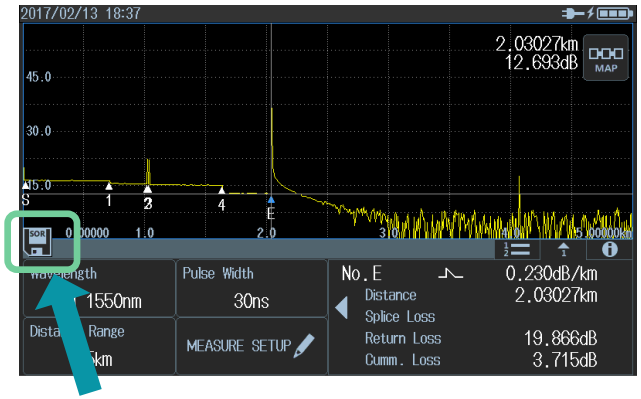
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Key Features

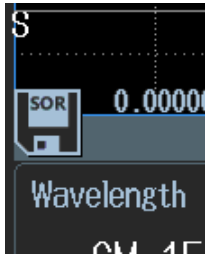
Various data storage features

Direct data saving, PDF reporting, and Data Transfer

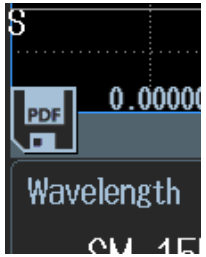
Direct data saving



Direct save button

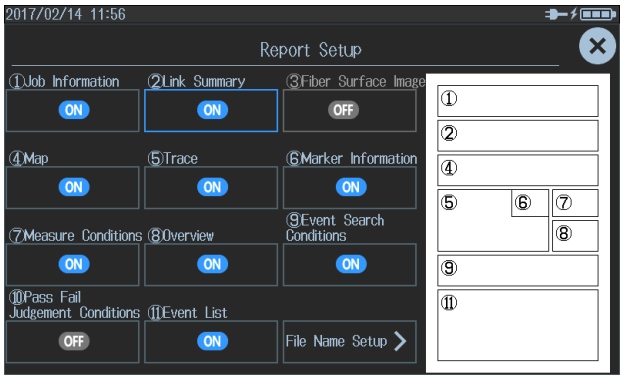


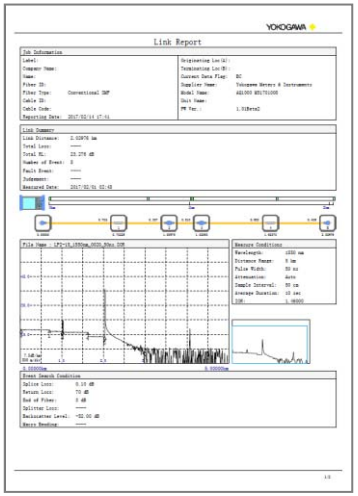
SOR



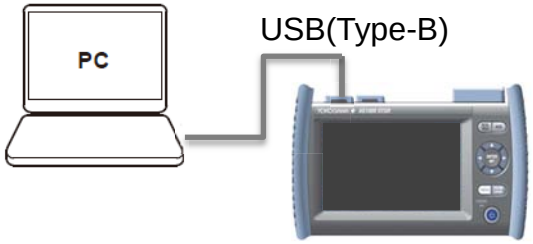
PDF report

PDF reporting





Data Transport



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Key Features

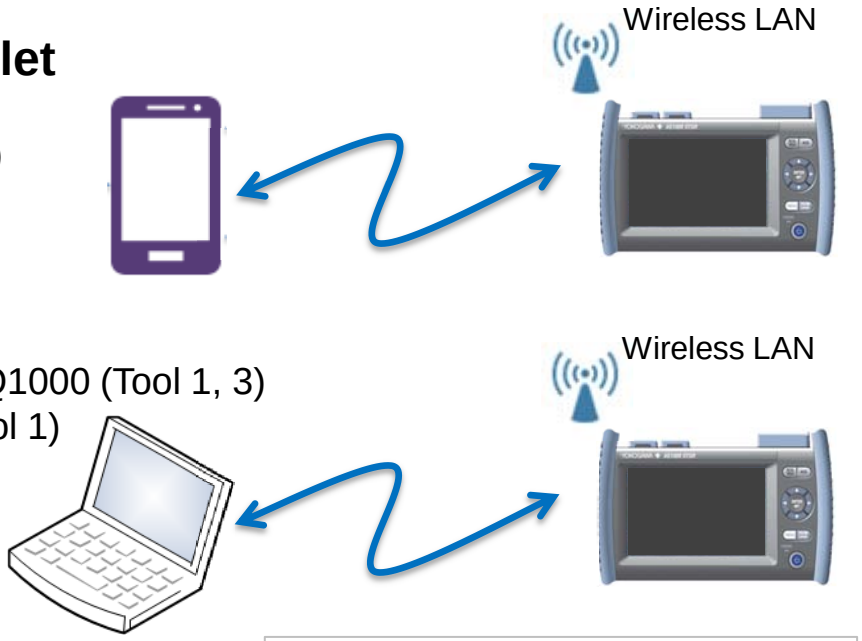
Wireless LAN function (option)

To be released separately

File Transfer and Remote control by point-to-point connection

Smart Phone or Tablet
- ✓ Data transfer (Tool 2)
- ✓ Remote Control (Tool 3)

PC
- ✓ Remote Control like AQ1000 (Tool 1, 3)
- ✓ Data transfer to PC (Tool 1)





Tool 2

Tool 1 : OTDR Remote Controller
Tool 2 : OTDR Data Transporter
Tool 3 : Web browser

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Major Specifications

OTDR

Items	Specifications
Wavelength (nm) (typ.)	1310±20/1550±20
Applicable fiber	SM (ITU-T G.652)
Distance range (km)	0.2, 0.5, 1, 2, 5, 10, 20, 30, 50, 100, 200, 256
Pulse width (ns)	3, 10, 20, 30, 50, 100, 200, 300, 500, 1000, 2000, 5000, 10000, 20000
Sampling resolution	min. 5 cm
Number of sample points	max. 256000
Distance measurement accuracy (m)	±(1 m + Measurement distance × 2 × 10^{-5} +1 sampling resolution)
Event dead zone (m)*1	≤ 0.8
Attenuation dead zone (m) (typ.)*2	4/5
Dynamic range (dB) (typ.)*3	32/30
Loss measurement accuracy	±0.03 dB/dB
Reflection accuracy	±2 dB
Laser class	Class 1M

*1: Pulse width = 3 ns, Return loss ≥ 55 dB, at a 1.5 dB or less point from an unsaturated peak level.
*2: Pulse width = 10 ns, Return loss ≥ 55 dB, at a point where the backscatter level is within ±0.5 dB of the normal level.
*3: Pulse width = 10000 ns, Measurement time = 3 minutes, Sampling resolution = 8 m, SNR = 1.

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Major Specifications

General Specifications

Items		Specifications
Display		5.0 inch color TFT LCD WVGA (Capacitive touchscreen) Resolution: 800×480 pixel
External interfaces		USB2.0 x 2 Type A x1 : Host, Type micro B x 1: USB mass storage devices, DC power supply
		Wireless LAN (/WLN option): IEEE802.11b/g/n
Dimensions		185 mm (W) × 116 mm (H) × 56 mm (D) (excluding projections)
Weight		Approx. 660 g
Environmental conditions	Temperature	Operating: –10°C to 50°C, (10 to 35°C when battery is being charged) (except when USB power adapter is being used) Storage: –20°C to 60°C
	Humidity	5 to 90%RH (No condensation)
	Altitude	4000m or less
Power requirements		DC 5V±10%, max. 1.5A
Battery	Type	Lithium polymer
	Operating time	10 hours or more (Telcordia GR-196-CORE Issue 2, September 2010)
	Recharge time	5 hours

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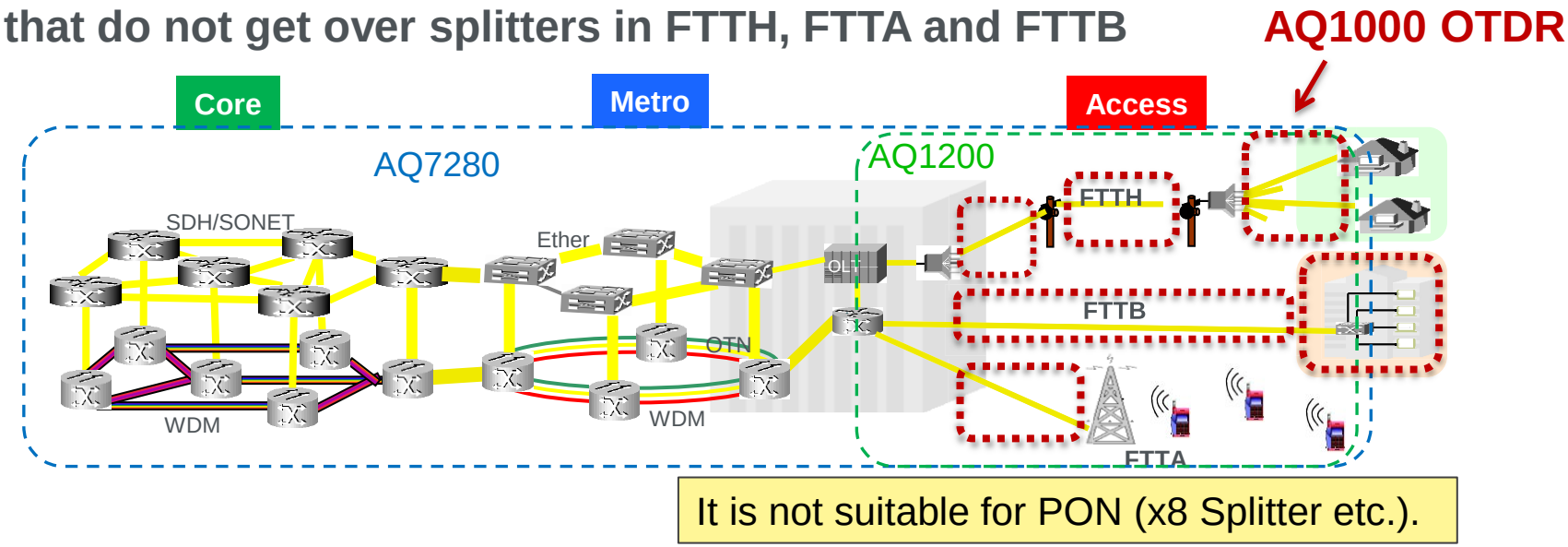
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Target market

- Telecoms
- Network service providers
  - CATV ・Power ・Railways etc.
- Optical fiber network installers and maintenance companies for access networks.

Area to cover

- Relatively short sections that do not get over splitters in FTTH, FTTA and FTTB



It is not suitable for PON (x8 Splitter etc.).

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Comparison with Yokogawa OTDRs

●: Standard ○: Option

Item	AQ1000	AQ1200 series	AQ7280 seroies
Model Number	1	7	12
Model	AQ1000	AQ1200A	AQ7282A
Wavelength (nm)	1310/1550±20	1310/1550±20	1310/1550±25
Dynamic Range	32/30dB	34/32dB	38/36dB
Event dead Zone	0.8m	0.75m	0.6m
Att Dead Zone	4m	4/5m	3.5/4m
Sample point	256000	128000	256000
Linearity	<0.03dB/dB	±0.05dB/dB	±0.03dB/dB
Battery life-time	>10 (Telcordia)	6	>15 (Telcordia)
Display	Multi-touch	Regular	Multi-touch
Display size	5inch	5.7inch	8.4inch
Power supply	USB power adapter	AC adapter	AC adapter
Optical connector	FC, SC	FC, SC, ASC	FC, SC, ASC, LC
Light Source	●	○	○
OPC (OTDR port)	●		○
OPM (OPM port)		○ (Standard, High power ,PON)	○ (Standard, High power)
Loss test		●Auto Loss test, Logging	
VLS	○	○	○
RJ45		○	○
WLAN	○		
Weight	0.66kg	1kg	2.2kg
Measurement result	OTDR trace Map	OTDR trace Map (Event mapper)	OTDR trace Map (Smart mapper (Op))
Trace Analysis	Macro Bending	Multi Trace, 2 way Trace Difference Trace, Section Analysis Macro Bending	Multi Trace, 2 way Trace Difference Trace, Section Analysis Macro Bending
Other function	PDF report	Multi Fiber Measurement	Multi Fiber Project Schedule Measurement (Op) Smart Mapper (Op) PDF report
Video Fiber Inspection Probe		●	● (Pass/Fail (Op))

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Competitive analysis

Good
Not Good

Item	YOKOGAWA	EXFO	Anritsu	Viavi	Viavi	41 Lab	AFL
Model	AQ1000	MAX-715B-M1	909014B	MTS2000 (E4126LA)	E126A	AV6416	FS200-100
Wavelength (nm)	1310/1550±20	1310/1550±30	1310/1550±20	1310/1550±20	1310/1550±20	1310/1550±15	1310/1550±20
Dynamic Range	32/30dB	30/28dB	32.5/31dB	35/33dB	37/35dB	28/26dB	32/30dB
Event dead Zone	0.8m	1m	1m	1.5m	1.35m	1.6m	0.8m
Att Dead Zone	4m	4m	5m	6m	4m	–	3.6m
Sample point	256000	256000	125001	128,000	256,000	65535	300000
Linearity	<0.03dB/dB	0.05dB/dB	0.05dB/dB	0.05dB/dB	0.04dB/dB	0.02dB/km(?)	0.05dB/dB
Battery life-time	>10 (Telcordia)	12 (Telcordia)	8 (idle)	8	20	10 (idle)	>12 (Telcordia)
Display	Multi-touch	Touch	Regular	Touch	Multi-touch	Touch	Touch
Display size	5inch	7inch	4.3inch	5inch	5inch		4.3inch
Battery	Lithium ion polymer	Lithium polymer	NiH or Dry Battery	Lithium polymer	Lithium-polymer	Lithium	Lithium polymer
Power supply	USB power adapter	AC adapter	AC adapter	AC adapter	AC adapter	AC adapter	AC adapter
Optical connector	FC, SC	DIN, FC, SC, E-2000, LC (all APC)	FC, SC, DIN	FC, SC	FC, SC, LC	FC	FC, SC, LC, ST,ASC, AFC, ALC
Light Source	●	●		●	●		○
OPC / OPM	●	○	○	○	○		
VLS	○	○	○		○	●	●
Weight	0.66kg	1.29kg	0.7kg	1.21kg	0.9kg	1kg	0.4kg

●: Standard ○ : Option

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How to beat competitors

■EXFO (Max Tester)

- The operation is slow and difficult to use.
- Startup is also slow.
- Combination with iOLM function could be better, but it is too expensive (1500USD extra) .

■Anritsu (MT9090)

- Small body, but the screen is too small to use.
- The trace quality is O.K..

■Viavi (MTS2000, E126A)

- The operation is slow and it is hard to use.
- The Dead Zone performance is excellent.

■AFL (FS200)

- Small screen, difficult to use.

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Model and Suffix Codes

Model	Suffix codes	Descriptions
AQ1000		AQ1000 OTDR
Optical Connector	-USC	Universal Adapter (SC)
	-UFC	Universal Adapter (FC)
Visible Light Source	/VLS	Visible Light Source
Wireless LAN*	/WLN	Wireless LAN (to be released separately)

* The use of wireless LAN is subject to the regulation of each country. For more detail, please consult with our sales representatives.

■ Simple Suffix code

- **No Language suffix code …. Multi-Language**
- **No Power cord suffix code …. DC Power is supplied by USB power adapter (supplied locally)**

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Schedule and Price (planned)

Schedule

- Sales Release : April 13, 2017
- First Delivery : May 17, 2017
- Promotion Materials:
  - Brochure : April 7, 2017
  - Demo units : April 7, 2017 (limited qty.)

Note. The release of Wireless LAN (/WLN) option is scheduled for June 2017.

Price

Model	Suffix codes	Descriptions	SP
AQ1000		AQ1000 OTDR	$ 1,900
Optical Connector	-USC	Universal Adapter (SC)	$ 0
	-UFC	Universal Adapter (FC)	$ 0
Visible Light Source	/VLS	Visible Light Source	$ 200
Wireless LAN	/WLN	Wireless LAN (to be released separately)	$ 100

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