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Optical test and Measurement System
AQ8201 Series



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High-speed, high accuracy measurement of WDM optical device specifications

General

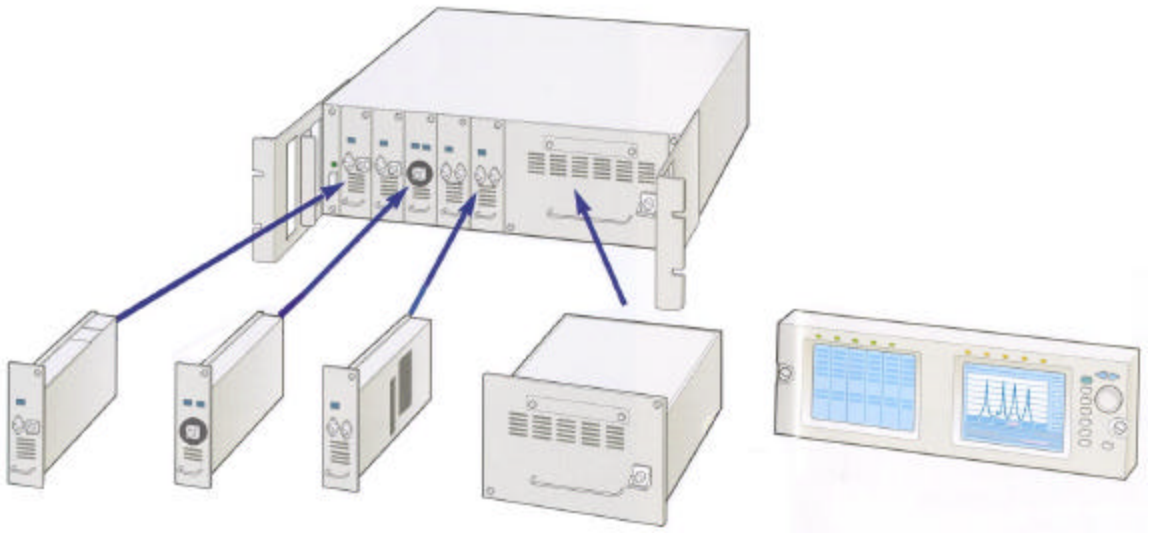
The configuration of measurement systems for evaluation is a major issue in the volume production of optical devices for WDM. The optical Test and Measurement System AQ8201 Series has a wide lineup of modules to meet diverse needs quickly. The 19-inch rack design makes space-efficient, flexible system configuration possible. And it's also effective for specification evaluation of WDM-related parts such as MUX/DEMUX, AWG and EDFA.

Features

- General optical measurement equipment consists of the mainframe and display, and plug-in modules.
- Applies mainframe for 19-inch rack.
- Highly-visible 6.5-inch TFT color LCD
- Wide variety of module lineup
- 1 frame can mount up to 10 modules and save space.
- Support for LabVIEW driver.

Easy to build up system for your application

Rack Mount Mainframe
AQ8201A



WDM DFB-LD Module AQ8201-11,11A,11B

OPM Module AQ8210-21

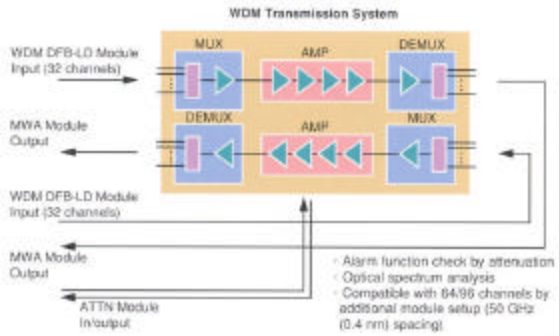
ATTN Module AQ8201-31,32,33

MWA Module AQ8210-61

Display Controller AQ8210-02

System configuration image





Optical Test and Measurement System Components

Display Controller module
AQ8201-03



WDM DFB_LD Module
AQ8201-11, 11A, 11B



Product name	Model	Slot width
Rack mount Mainframe	AQ8201A	—
Display controller	AQ8210-02	—
Display Controller Module	AQ8201-03	2 slots
WDM DFB-LD Module (Light source)	AQ8201-11,11A,11B	1 slot
ASE Module (Light source)	AQ8201-12,12A	2 slots
ECL Module (Light source)	AQ8201-13	1 slot
OPM module (Optical power meter)	AQ8201-21	1 slot
ATTN Module (Optical attenuator)	AQ8201-31,32,33	1 slot
MWA Module (Optical spectrum analyzer)	AQ8201-61	5 slot
RLM module (Return loss measurement)	AQ8201-71	1 slot

ECL Module
AQ8201-13



OPM Module
AQ8201-21





ATTN Module
AQ8201-31, 32, 33



ASE Module
AQ8201-12, 12A

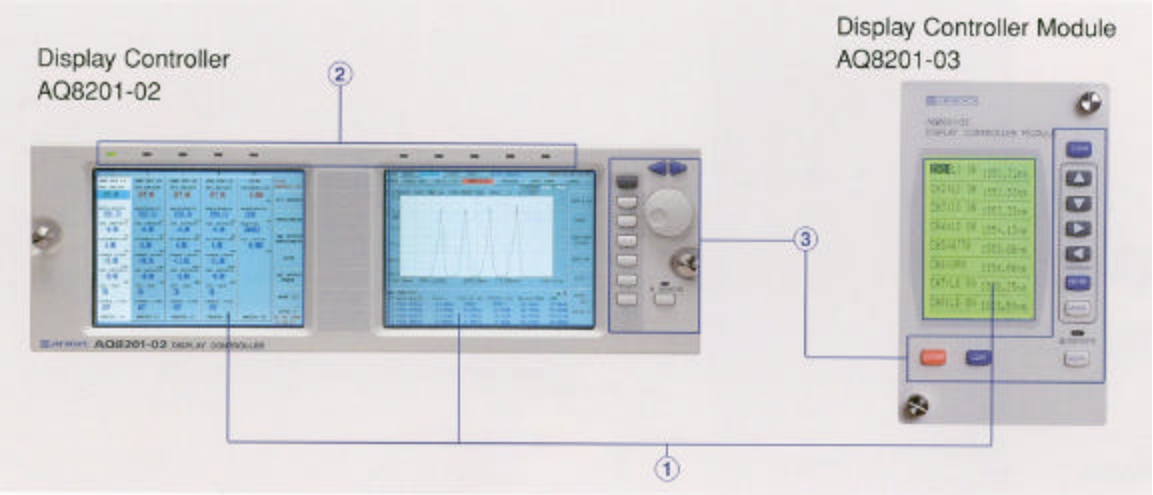


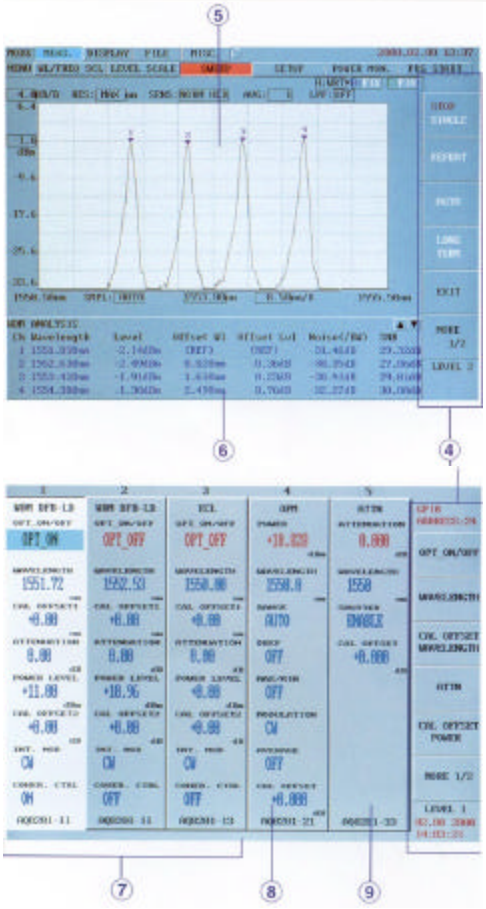
MWA Module
AQ8201-61



RLM Module
AQ8201-71

Display controller





Display Controller

Operating panel for Rack Mount Main Frame

①AQ8201-02 displays information for 1 frame (10 slots) simultaneously.

②Operating slots and modules can be identified by LEDs.

③Rotary knob (AQ8201-02) and operation switches designed for simple adjustment and operation of mounted modules.

Display screen

Displays set-up and measurement results for modules slot by slot.

④The function key menu for selected module.

- MWA module

⑤Optical spectrum display

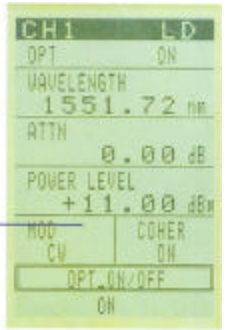
⑥The overall results for analysis data (peak wavelength, wavelength spacing, peak level, SNR, etc.).

- DFB-LD, ECL module

⑦Optical output on/off, wavelength and attenuation settings.

- OPM module

⑧Optical power, wavelength, and range settings.



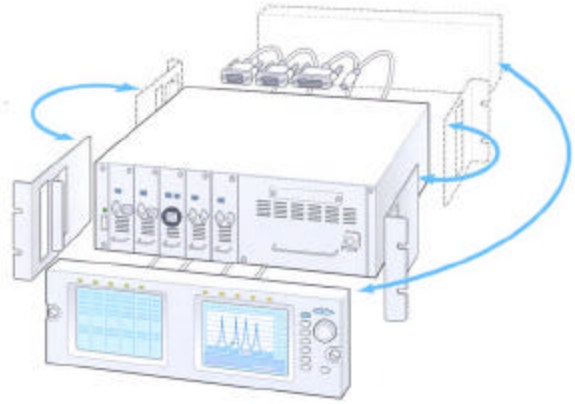
- ATTN module

⑨Attenuation and wave length shutter on/off settings

- Display Controller module

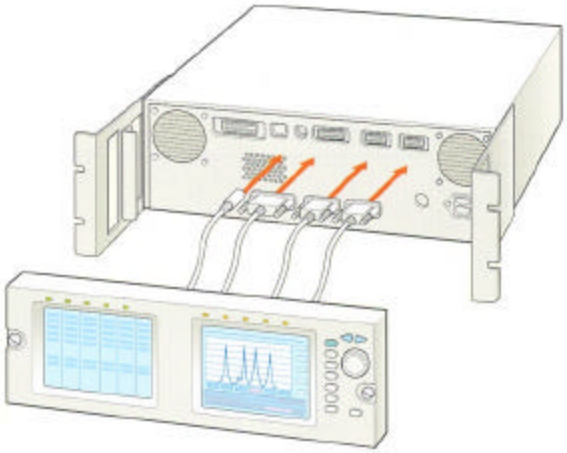
⑩AQ8201-03 displays detailed contents of selected 1 module only.

Easy to mount



(Display controller front mounted.)

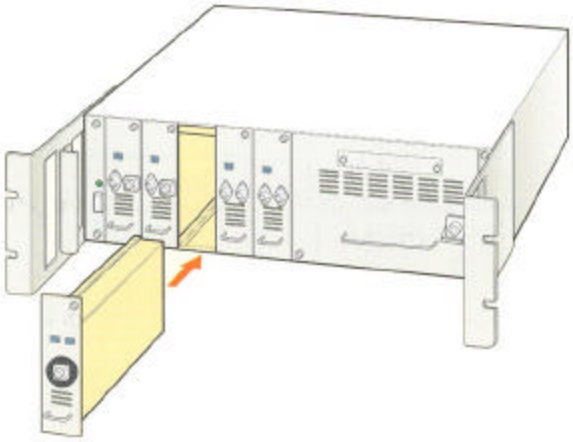
⊙Display controller can be attached to either front or back. (Requires extension cord when attached to front.)



(Display controller attached to back.)

⊙Display controller is used for monitoring and set-up of modules in the main frame.

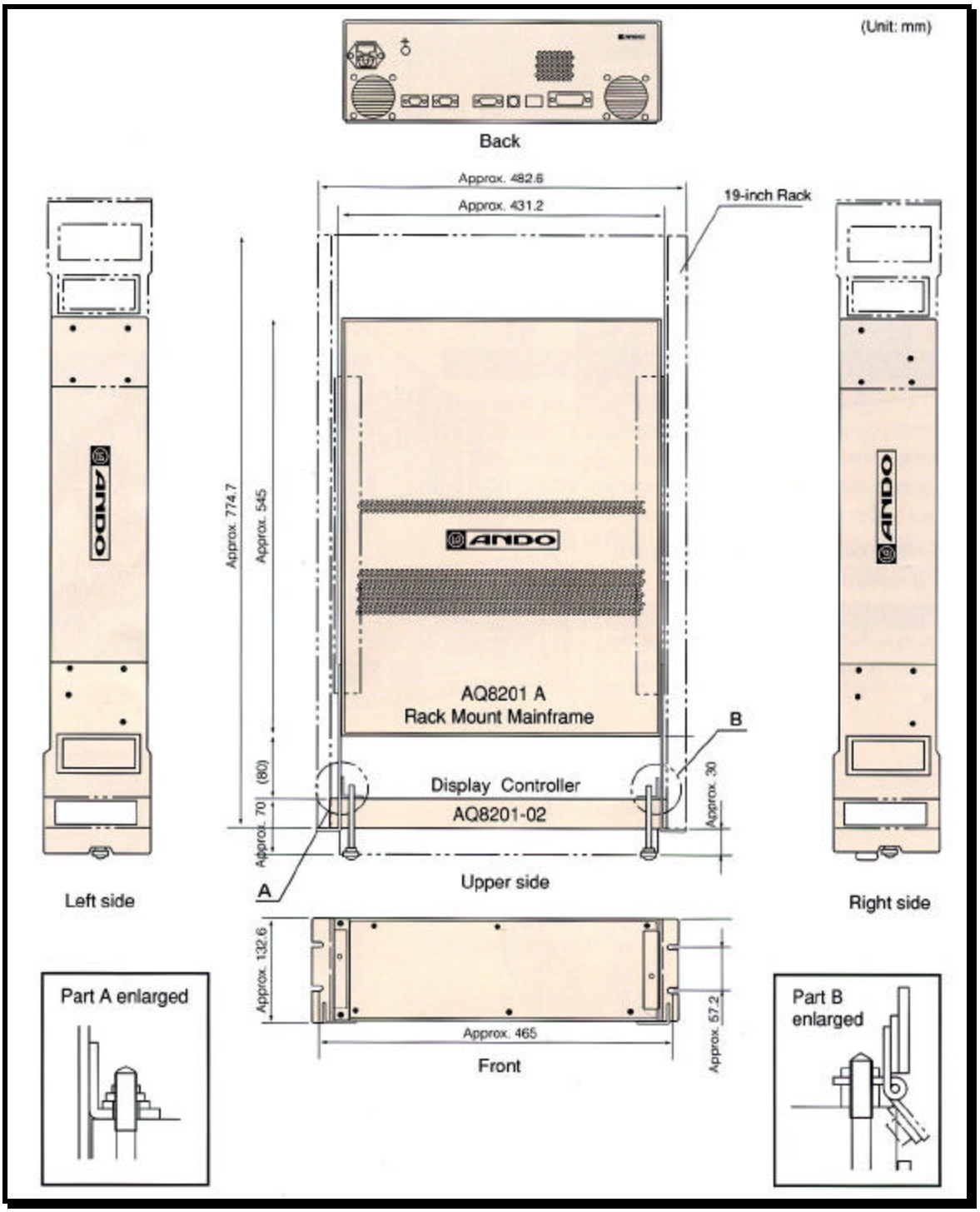
⊙When an MWA module (optical spectrum analyzer) is mounted on the main frame, one display screen is used exclusively for the MWA module.



⊙As illustrated at left, the structure is so simple that you can easily mount/dismount modules.

Fit to the 19-inch rack

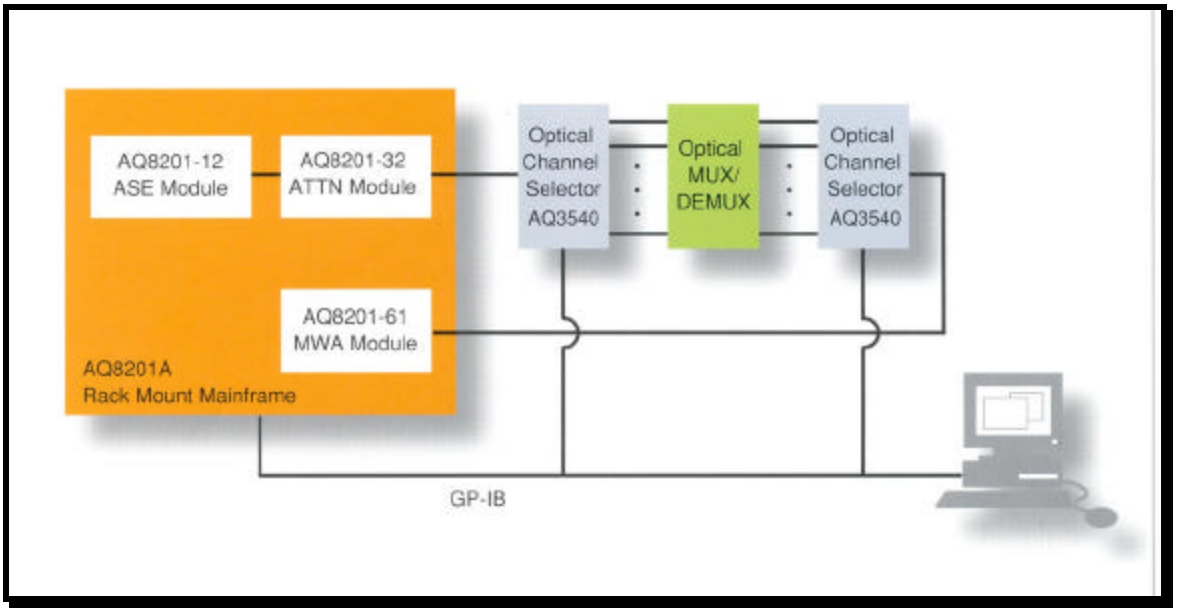
Appearance of AQ8201A Rack Mount Mainframe



Applications

MUX/DEMUX test configuration

MUX/DEMUX: AWG, FBG, Filter, etc.
Evaluation items: insertion loss, center wavelength,
Flatness, NdB band width, etc.



Specifications

System configurations

AQ8201 series, Optical Test and Measurement System, consist of mainframe, display and various modules.

- AQ8201A Rack Mount Mainframe
- AQ8201-02 Display Controller

Note Extension cable (2 for VGA, 1 for keyboard, and 1 for power supply/signal) for attaching display controller in the front is option.

- **Modules**
  - AQ8201-03 Display Controller Module
  - AQ8201-11 WDM DFB-LD Module (Light source)
  - AQ8201-11A WDM DFB-LD Module (Light source for PM fiber)
  - AQ8201-11B WDM DFB-LD Module (Light source for L-band)
  - AQ8201-12 ASE Module (Light source)
  - AQ8201-12A ASE Module (High power type light source)
  - AQ8201-13 ECL module (Light source)
  - AQ8201-21 OPM Module (Optical power meter)
  - AQ8201-31 ATTN Module (Optical attenuator)
  - AQ8201-32 ATTN Module (High resolution type optical attenuator)
  - AQ8201-33 ATTN Module (High resolution type optical attenuator)
  - AQ8201-61 MWA Module (optical spectrum analyzer)
  - AQ8201-71 RLM Module (Return loss measurement)
- **Others**
  - AQ8201-91 Vent cover (with slit)
  - AQ8201-92 Blank cover (without slit)
  - AQ8201-96 Rack Mount Kit (fro mounting 19-inch rack)

AQ8201A rack Mount Mainframe

Display interface	2× VGA output (D-sub 15-pin)
GP-IB interface	Based in IEEE-488.2 standard
Power supply	AC 100 to 120/200 to 240V, 50/60 Hz, Max, 400VA
Environmental conditions	Operation temperature: 5 to 40°C Storage temperature: 0 to 50°C Humidity: 85%RH or less (no condensation)
Dimensions and mass	Approx. 431.2 (W) × 132.6 (H) × 545 (D) mm Approx. 13kg (mountable on a 19-inch rack)

Note: When 10 modules of AQ8201-11, 11A, 11B are in operation temperature is 10 to 30℃

Accessory for AQ8201A

Rack mount angle: 2 (8×screws)

Options for AQ8201A

AQ8201-91 Vent cover (with slit)
AQ8201-92 Blank cover (without slit)

AQ8201-02 Display Controller

Display	6.5-inch TFT color LCD
Environmental conditions	Operation temperature: 5 to 40°C Storage temperature: 0 to 50°C Humidity: 85%RH or less (no condensation)
Dimensions and mass	Approx. 425 (W) × 132.5 (H) × 70 (D) mm Approx. 4kg

AQ8201-03 Display Controller Module

Display	LCD 160×240 dots (RF-STN Black/White type
Environmental Conditions	Operating temperature: 5 to 40°C Storage Temperature: 0 to 50°C Humidity: 85% RH or less (no condensation)
Dimensions and mass	Approx. 79.5 (W) × 130 (H) × 324 (D) mm Approx. 1.5kg

AQ8201-11, 11A WDM DFB-LD Module (Light Source)

Available wavelength range		1524.11 to 1570.01nm ①
Center wavelength		ëp±0.15nm ②③
Wavelength accuracy		Within ±0.05nm
Spectral width	Coherence control ON	50MHz (typ.)
	Coherence control OFF	5 MHz or less
Optical output level		+10dBm or more ②(AQ8201-11) +13dBm or more ④(AQ8201-11A)
Polarization extinction ratio		20 dB (typ.) ④ (AQ8201-11A)
SMSR		30 dB or more ⑤
Output level stability	15 minutes	Within ±0.005dB ⑥
	24 hours	Within ±0.03dB ⑥
Wavelength stability	15 minutes	Within ± 0.005nm ②
	24 hours	Within ±0.01nm ②
Wavelength range		1.6nm (min.) ②
Optical attenuation range		10dB (0.01dB step)
Optical isolation		55dB or more
RIN		-145 dB/Hz
Internal modulation		100 Hz to 300 kHz (CHOP)
External modulation		100 Hz to 300 kHz (Sine Wave)
Applicable fiber		SM (10/125µm) (AQ8201-11) PM (10/125µm) (AQ8201-11A)
Optical connector		FC/Angled PC ⑦
Laser product class		IEC825: class3A
Environmental conditions		Operation temperature: 5 to 40°C Storage temperature: 0 to 50°C Humidity: 85%RH or Less (no condensation
Dimensions and mass		Approx. 39.5 (W) × 130 (H) × 339 (D) mm Approx. 0.7 kg

*Specifications assured after warm-up for one hour.

Notes:

① Select from Aqaq8201-11, 11A available wavelength on next page.

② CW light, attenuation 0.0dB, coherence control "OFF", at fiber end (FC/Angled PC FC/SPC, 2m, SMF

③ ëp is specified wavelength.

④ CW light, Attenuation 0.0dB, Coherence control OFF, with end of the optical connector mounted on panel.

⑤ Attenuation 0.0dB at the center wavelength

⑥ Ambient temperature: constant in 20 to 30℃, CW light, attenuation 0.0dB, coherence control "ON", at fiber end (FC/Angled PC-FC/SPC, 2m, SMF)

⑦ Angled PC in manufactured by SEIKOH GIKEN. : Return loss over 60dB or more

Options for AQ8201-02

Extension cables for attaching display controller to the front.

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AQ8201-11, 11A Available wavelength Table

(Please consult your vendor or sales offices when you require other wavelengths than listed)

Frequency (THz)	Wavelength (nm)	Frequency (THz)	Wavelength (nm)	Frequency (THz)	Wavelength (nm)
190.95	1570.01	192.90	1554.13	194.85	1538.58
191.00	1569.59	192.95	1553.73	194.90	1538.19
191.05	1569.18	193.00	1553.33	194.95	1537.79
191.10	1568.77	193.05	1552.93	195.00	1537.40
191.15	1568.36	193.10	1552.52	195.05	1537.00
191.20	1567.95	193.15	1552.12	195.10	1536.61
191.25	1567.54	193.20	1551.72	195.15	1536.22
191.30	1567.13	193.25	1551.32	195.20	1535.82
191.35	1566.72	193.30	1550.92	195.25	1535.43
191.40	1566.31	193.35	1550.52	165.30	1535.04
191.45	1565.90	193.40	1550.12	195.35	1534.64
191.50	1565.50	193.45	1549.72	195.40	1534.25
191.55	1565.09	193.50	1549.32	195.45	1533.86
191.60	1564.68	193.55	1548.91	195.50	1533.47
191.65	1564.27	193.60	1548.51	195.55	1533.07
191.70	1563.86	193.65	1548.11	195.60	1532.68
191.75	1563.45	193.70	1547.72	195.65	1532.29
191.80	1563.05	193.75	1547.32	195.70	1531.90
191.85	1562.64	193.80	1564.92	195.75	1531.51
191.90	1562.23	193.85	1546.52	195.80	1531.12
191.95	1561.83	193.90	1546.12	195.85	1530.72
192.00	1561.42	193.95	1545.72	195.90	1530.33
192.05	1561.01	194.00	1545.32	195.95	1529.94
192.10	1560.61	194.05	1544.92	196.00	1529.55
192.15	1560.20	194.10	1544.53	196.05	1529.16
192.20	1559.79	194.15	1544.13	196.10	1528.77
192.25	1559.39	194.20	1543.73	196.15	1528.38
192.30	1558.98	194.25	1543.33	196.20	1527.99
192.35	1558.58	194.30	1542.94	196.25	1527.60
192.40	1558.17	194.35	1542.54	196.30	1527.22
192.45	1557.77	194.40	1542.14	196.35	1526.83
192.50	1557.36	194.45	1541.75	196.40	1526.44
192.55	1556.96	194.50	1541.35	196.45	1526.05
192.60	1556.55	194.55	1540.95	196.50	1525.66
192.65	1556.15	194.60	1540.56	196.55	1525.27
192.70	1555.75	194.65	1540.16	196.60	1524.50
192.75	1555.34	194.70	1539.77	196.65	1524.50
192.80	1554.94	194.75	1539.37	196.70	1524.11
192.85	1554.54	194.80	1538.98		

AQ8201-11B WDM DFB-LD Module (Light Source)

Available wavelength range		1570.42 to 1620.50nm①
Center wavelength		ëp±0.15 nm②③
Wavelength accuracy		Within ±0.05nm
Spectral width	Coherence control ON	50 MHz (typ.)
	Coherence control OFF	5 MHz or less
Optical output level		+ 10dBm or more②
SMSR		30dB or more④
Output level stability	15 minutes	Within ± 0.005dB⑤
	24 hours	Within ± 0.03dB⑤
Wavelength stability	15 minutes	Within ± 0.005dB②
	24 hours	Within ± 0.01dB②
Wavelength range		1.6nm (min.) ②
Optical attenuation range		10dB (0.01dB step)
Optical isolation		55dB or more
RIN		-145dB/Hz
Internal modulation		100Hz to 300kHz (CHOP)
External modulation		100Hz to 300kHz (Sine Wave)
Applicable fiber		SM (10/125µm)
Optical connector		FC/Angled PC⑥
Laser product class		IEC825: class3A
Environmental Conditions		Operation temperature: 5 to 40℃ Storage temperature: 0 to 50℃ Humidity:85%RH or less (no condensation)
Dimensions and mass		Approx. 39.5(W)×130(H)×339(D) mm Approx. 0.7kg

*Specifications assure after warm-up for one hour

Notes:

①Select from AQ8201-11B available wavelength on next page.

②CW light, attenuation 0.0dB, coherence control “OFF”, at fiber end (FC/Angled PD-FC/SPC, 2m, SMF)

③ëp is specified wavelength.

④Attenuation 0.0dB at the center wavelength.

⑤Ambient temperature: constant in 20 to 20°C, CW light, attenuation 0.0dB, coherence control “ON”, at fiber end (FC/Angled PC-FC/SPC, 2m, SMF)

⑥Angled PC is manufactured by SEIKOH GIKEN.: return loss over 60dB or more

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AQ8201-11B Available Wavelength Table

(Please consult your vendor or sales offices when you require other wavelength than as below)

Frequency (Tz)	Wavelength (nm)	Frequency (Thz)	Wavelength (nm)	Frequency (THz)	Wavelength (nm)
185.00	1620.50	187.00	1603.17	189.00	1586.20
185.05	1620.06	187.05	1602.74	189.05	1585.78
185.10	1619.62	187.10	1602.31	189.10	1585.36
185.15	1619.19	187.15	1601.88	189.15	1584.95
185.20	1618.75	187.20	1601.46	189.20	1584.53
185.25	1618.31	187.25	1601.03	189.25	1584.11
185.30	1617.88	187.30	1600.60	189.30	1583.69
185.35	1617.44	187.35	1600.17	189.35	1583.27
185.40	1617.00	187.40	1599.75	189.40	1582.85
185.45	1616.57	187.45	1599.32	189.45	1582.44
185.50	1616.13	187.50	1598.89	189.50	1582.02
185.55	1615.70	187.55	1598.47	189.55	1581.60
185.60	1615.26	187.60	1598.04	189.60	1581.18
185.65	1614.83	187.65	1597.62	189.65	1580.77
185.70	1614.39	187.70	1597.19	189.70	1580.35
185.75	1613.96	187.75	1596.76	189.75	1579.93
185.80	1613.52	187.80	1596.34	189.80	1579.52
185.85	1613.09	187.85	1595.91	189.85	1579.10
185.90	1612.65	187.90	1595.49	189.90	1578.69
185.95	1612.22	187.95	1595.06	189.95	1578.27
186.00	1611.79	188.00	1594.64	190.00	1577.86
186.05	1611.35	188.05	1594.22	190.05	1577.44
186.10	1610.92	188.10	1593.79	190.10	1577.03
186.15	1610.49	188.15	1593.37	190.15	1576.61
186.20	1610.06	188.20	1592.95	190.20	1576.20
186.25	1609.62	188.25	1592.52	190.25	1575.78
186.30	1609.19	188.30	1592.10	190.30	1575.37
186.35	1608.76	188.35	1591.68	190.35	1574.95
186.40	1608.33	188.40	1591.26	190.40	1574.54
186.45	1607.90	188.45	1590.83	190.45	1574.13
186.50	1607.47	188.50	1590.41	190.50	1573.71
186.55	1607.04	188.55	1598.99	190.55	1573.30
186.60	1606.60	188.60	1598.57	190.60	1572.89
186.65	1606.17	188.65	1589.15	190.65	1572.48
186.70	1605.74	188.70	1588.73	190.70	1572.06
186.75	1605.31	188.75	1588.30	190.75	1571.65
186.80	1604.88	188.80	1587.88	190.80	1571.24
186.85	1604.46	188.85	1587.46	190.85	1570.83
186.90	1604.03	188.90	1587.04	190.90	1570.42
186.95	1603.60	188.95	1586.62		

NOTES

①Temperature fixed at 23℃, CW light, 2m fiber output, single vertical mode
②Optical attenuation: 0.0dB
③After wavelength calibration
④C-band: 1520 to 1750 nm
⑤Full span (120 nm)
⑥Wavelength: 1550 nm
⑦Spectrum width: coherence control ON
⑧Setting resolution: 0.1 kHz, accuracy: ±2 %
⑨Angled PC is manufactured by SEIKOH GIKEN, return loss over 60dB or more
⑩Ambient temperature of the mainframe

AQ8201-12, 12A ASE Module (Light Source)

Spectrum density (-13 dbm/nm)		1525 to 1570nm① (typ.) 1530 to 1565nm①
Optical output power		+ 10dBm or more ① (AQ8201-12) +15dBm or more ① (AQ8201-12A)
Output level stability	5 minutes	within ±0.005 dB①②
	1 hour	within ±0.05dB①③
Optical modulation mod		CW
Polarization extinction mod		0.1dB (typ.)
Optical attenuation rang		6dB (0.1dB step)
Applicable fiber		SM (10/125μm)
Optical connector		AQ9441 (*) Universal adapter (option)④
Laser product class		IEC825: class 3A
Environmental conditions		Operating temperature: 5 to 40°C Storage temperature: 0 to 50°C Humidity: 85%RH or less (no condensation
Dimensions and mass		Approx. 79.5 (W)×130(H)×339(D)mm Approx. 2kg

* Specifications assured after warm-up for one hour.

NOTES: ①CW light, attenuation 0.0dB, at fiber end (SMF,FC/PC, 2m)
②5 minutes (at constant temperature in 20 t 30℃)
③In one hour (± 1℃ in 0 t 40℃)
④FC, ST and SC connector are available

AQ8201-13 ECL Module (Light Source)

Available wavelength range		1460 to 1580nm
Wavelength setting range		10 pm
Wavelength accuracy		Within ±0.2mm①②③④
Wavelength repeatability		± 50 pm (typ.)①②④
Wavelength setting time		3 seconds (typ.)⑤
Spectral width	Coherence control ON	100 MHz (typ.)①②
	Coherence control OFF	5 MHz (typ.)①②
Optical output level	1460 to 1580nm	+6 dBm or more①②⑦
	1490 to 1580nm	+8 dBm or more①②⑦
	1520 to 1580nm	+ 10 dBm or more①②⑦
SMSR		45dB or more①②⑥
Output level stability	15 minutes	Within ±0.005dB①②④⑦
	1 hour	Within ±0.01dB①②④⑦
Wavelength stability	15 minutes	Within ±0.005nm①②④
	24 hours	Within ±0.01nm (typ.)①②④
Optical attenuation range		10dB (0.01dB step)①⑥
RIN		-145 dB/Hz (typ.)①②
Internal modulation		100Hz to 300kHz (CHOP)⑧
External modulation		100Hz to 300kHz (Sine Wave)
Applicable fiber		SM (10/125μm)
Optical connector		FC/Angled PC⑨
Laser product class		IEC825: class3A
Environmental conditions		Operating temperature: 23 ± 5℃⑩ Storage temperature: 0 to 50°C Humidity: 85%RH or less (no condensation)
Dimensions and mass		Approx. 39.5(W)×130(H)×339(D)mm Approx. 1.2kg

**Specifications assured after warm-up for one hour.*

AQ8201-21 OPM module (Optical power meter)

Wavelength range		700 to 1700nm
Photodetector		Cooled InGaAs
Application		Small-diameter silica fiber emission①
Optical connector		AQ9389B (FC) Connector Adapter (standard)②
Polarization dependant loss		0.02dB P-P (typ.)③
Power range	CW light	-80 to +27 dBm ④
	Chopped light	-80 to +24 dBm ④
naccuracy under reference condition		± 2.5 % (at 1310nm calibration point) ⑤
Total accuracy		± 5% (1000 to 1650nm) ⑥
Linearity		±0.05dB (1000 to 1650nm, -40 to +27dBm)⑦
Noise	CW light	- 73 dBm or less ⑧
	Chopped light	
Environmental conditions		Operating temperature: 5 to 40°C Storage temperature: 0 to 50°C Humidity:85%RH or less (no condensation)
Dimensions and mass		Approx. 39.5 (W) × 130 (H) × 339 (D)mm Approx. 1.2 kg

*Specifications assured at fixed temperature within 23±5°C
* Specifications assured after warm-up for one hour.

Notes:
① Applicable fiber 62.5/125µm (GI) NA 0.275
② ST and SC connector are also available
③ At 1550nm wavelength, SM fiber
④ AT 1310nm wavelength
⑤ Reference conditions
1.Powre level: -20dBm (10µW), CW light
2.SM fiber, master FC connector
3.Ambient temperature: 23 ± 5°C
4.Calibrated with AQ9389B (FC) connector adapter (If you disconnect adapter, the accuracy of specifications may be lost. When you change connector adapter, we recommend recalibration.
⑥ Operating conditions:
1.Power level: -20dBm (10µW), CW light
2. 50 µm optical fiber, Na 0.2
3.Ambient temperature: 23±5°C
4.With AQ9389B (FC) connector adapter
⑦ 1.Linearity at wave length within wavelength specified in total accuracy
2.CW light, environmental temperature: 23±5°C
⑧ 1.Averaging 1s (averaging executed 10 times)
2.In wave length 1200 to 1600nm
3.CW, chopped light (270 Hz)

Accessory for AQ8201-21

Plug for analog output: 1

AQ8201-31, 32 ATTN Module (Optical attenuator)

Wavelength range	1200 to 1600nm
Insertion loss	2.5dB or less (1310/1550nm)① ②
Maximum attenuation leve	60dB
Attenuation deviation	Within ± 0.1 (1310/1550nm)dB① ②
Repeatability	Within ±0.02dB①
Minimum attenuation step	0.05 dB (AQ8201-31) 0.01 dB (AQ8201-32)
Optical return loss	60dB or more (1310/1550nm)①②③
olarization dependant los	0.05 dBmP-P (typ.) (1550nm)①
Maximum input power	+ 23 dBm
Shutter isolation	100dB or more
Applicable fiber	SM (10/125 µm)
Optical connector	FC/Angled PC④
Environmental conditions	Operating temperature: 5 to 40°C Storage temperature: 0 to 50°C Humidity:85%RH or less(no condensation)
Dimensions and mass	Approx. 39.5(W)×130(H)339(D)mm Approx. 1 kg

*Specifications assured after warm-up for one hour.
*Specifications assured at fixed temperature within 25 ± 3°C.

Notes
① At constant temperature
② Using master cord
③ With FC/Angled PC connector (return loss: 63dB or more)
④ Angled PC is manufactured by SEIKOH GIKEN.

AQ8201-33 ATTN module (Optical attenuator)

Wavelength range	1480 to 1650nm
Insertion loss	2.5 dB or less (1550nm)① ②
Maximum attenuation rang	60db
Attenuation deviation	Within ±0.1dB (1520 to 1620nm) ① ②
Repeatability	±0.005 dB (typ.)① (AQ8201-33)
Minimum attenuation range	0.001dB (AQ8201-33)
Optical return loss	60dB or more (1550)nm)① ② ③
olarization dependant los	0.05dBP-P (typ.) (1550)nm)①
Maximum input power	+23 dBm
Shutter isolation	100dB or more
Applicable fiber	SM (10/125 µm)
Optical connector	FC/Angled PC④
Environmental conditions	Operating temperature: 5 to 40°C Storage temperature: 0 to 50C Humictiy:85%RH or less(no condensation)
Dimensions and mass	Approx.39.5(W)×130(H)×339(D)mm Approx. 1kg

*Specifications assured after warm-up for one hour.
*Specifications assured at fixed temperature within 25± 3°C

Notes
①At constant temperature
②Using master cord
③With FC/Angled PC connector (Return loss: 63dB or more
④Angled PC is manufactured by SEIKOH GIKEN

Measurement wavelength rang	1200 to 1700nm (vaccum wavelength)
Wavelength accuracy	within ±0.05nm (1550 to 1570nm)① within ±0.3nm (1200 to 1700nm) ①
Wavelength linearity	within ±0.02nm (1500 to 1570nm) ①
Wavelength repeatability	within ±0.005nm (1 minute)
Wavelength resolution	Max. resolution: 0.08nm (typ.)(1550 to 1600nm) Resolution setting: Max.,0.2, 0.5, 1.0nm Resolution accuracy: ±5% (resolution: 0.2nm or more)②
Measurement level range	-90 t + 20dBm (1200 to 1600nm) ② -80 to + 20dBm (1600 to 1700nm) ②
Level accuracy	±0.3dB (typ.) (1310/1550nm, input: -30dBm, sensitivity mode: HIGH 1 to 3②
Polarization dependant loss	within ± 0.05dB (1310/1550nm) ②
Level linearity	within ±0.05dB (input: -40 to 0 dBm, Sensitivity mode: HIGH 1 to 3
Level flatness	within ±0.1dB (1550 t 1570nm)①
Level reproducibility	within ±0.02dB (1310/1550nm, input:-23dBm
Dynamic range (Stray light level)	40dB or more (1523nm, peak: ±1.0nm, Resolution: 0.08nm) 30dB or more (1523nm, peak: ±0.4nm, Resolution: 0.08nm)
Optical input return loss	30dB (typ.) (1310/1550nm)
Sweep time	Approx. 1 second (Span: 50nm or less, sensitivity mode : NORMAL HOLD, averaging time: 1, sample point: AUTO)
Automatic measurement	Program function (5 programs, 200 steps Long term function
Measurement condition settings	Span: 0 to 500nm Sensitivity mod: NORMAL HOLD, AUTO, HIGH 1/2/3 Averaging: 1 to 1000 Sample point: 11 to 20001, AUTO Automatic setting function Sweep between markers 0 nm sweep Averaging measurement of pulse light
Trace display	Level scale setting Simultaneous display of 3 individual traces Max./min. display Roll averaging display Differential trace display Power density display, % display, Frequency axis

Data analysis	WDN analysis (Table of wavelength, Level and SNR list.) EDFA analysis (gian/NF), peak search spectrum width search, notch width search, Delta marker (max. 100), line marker (analysis range setting), graphical display for long term measurement
Others	Wavelength self-calibration function. (built-in reference light source), wavelength Level offset function, label function
Internal memory	2 Mbyte
Applicable fiber	SM (10/125 μm)
Optical connector	AQ9441(*) Universal Adapter (Option)③
Environmental conditions	Operating temperature: 5 to 40°C Storage temperature: 0 to 50°C Humidity: 85%RH or less (no condensation)
Dimensions and mass	Approx. 200(W)×130(H)×339(D)mm Approx. 5kg

*Specifications assured after warm-up for one hour.

Notes:
①10/125 SM fiber (FC/PC connector), at constant temperature within 25 ±3℃
②10/125 SM fiber (FC?PC connector), at constant temperature within 10 to 35℃
③Specify FC, SC or ST connector

AQ8201-71 RLM Module (Return loss measurement)

Wavelength range	1280 to 1600nm
Dynamic range	65dB or more①
Relative measurement accuracy	within ±0.4dB (o to 50dB)② within ±0.7dB (50 to 60dB)②
Measurement stability	Within ±0.002dB③
Applicable fiber	SM (10/125 μm)
nput connection (from light source	FC/PC
Output connector (to DUT)	SC/Angled PC ④,⑤
Environmental conditions	Operating temperature: 5 to 40°C Storage temperature: 0 to 50°C Humidity: 85%RH or less (no condensation)
Dimensions and mass	Approx.39.5(W)×130(H)×339(D)mm Approx. 1.2kg

*Specifications assured after warm-up for one hour.

General conditions otherwise specified:

- Optical input level: -5 to 0dBm, CHOP (270 Hz)
- Wavelength: 1550 nm
- Reference: fresnel refraction (master cord)
- Ambient temperature: 23±1°C

Notes
①Varies depending on master cord
②Depends on stability of light source to be used, linearity of photo receiver and isolation of optical directional coupler
③Fresnal reflection measurement for 5 minutes
④Angled PC is manufactured by SEIKOH GIKEN.
⑤Do not connect other master cord than one specified by ANDO to output connector

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