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Find the *Yokogawa / Ando AQ8201-31* at our website: ***Click HERE***

Optical Test and Measurement System
AQ8201 Series

Halfsize Frame AQ8203



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High-speed, high-accuracy measurem optical device specifications

General

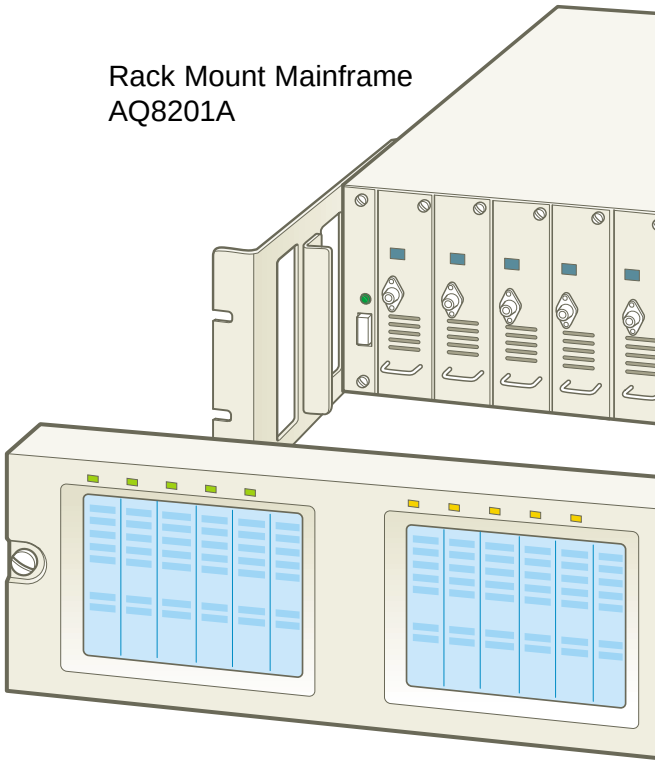
The configuration of measurement systems for evaluation is a major issue in the volume production of optical devices for WDM. The Optical Test and Measurement System AQ8201 Series has a wide lineup of modules to meet diverse needs quickly. The 19-inch rack design makes space-efficient, flexible system 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.
- 1 frame can mount up to 10 modules and can save space.
- Applies mainframe for 19-inch rack.
- Highly-visible 6.5-inch TFT color LCD
- Wide variety of module lineup
- Support for LabVIEW driver

Easy to build up system necessary for your application

Rack Mount Mainframe
AQ8201A



Modules lineup



Display Controller Module
AQ8201-03



WDM DFB-LD Module
AQ8201-110



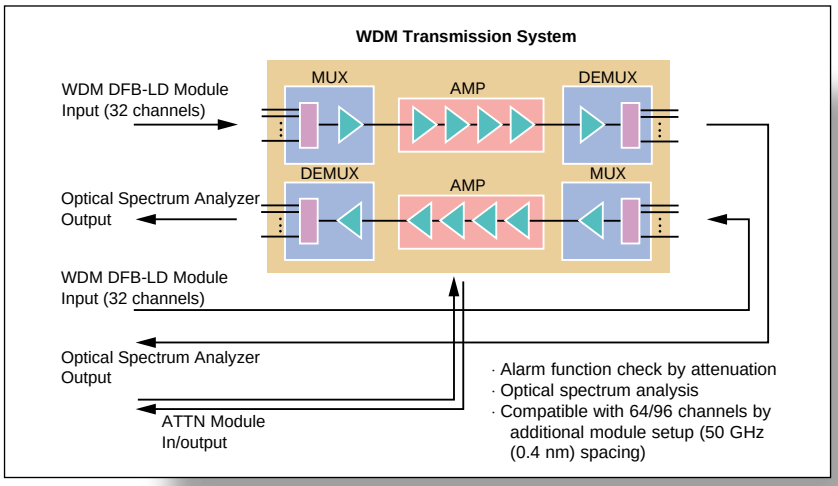
ASE Module
AQ8201-12, 12A

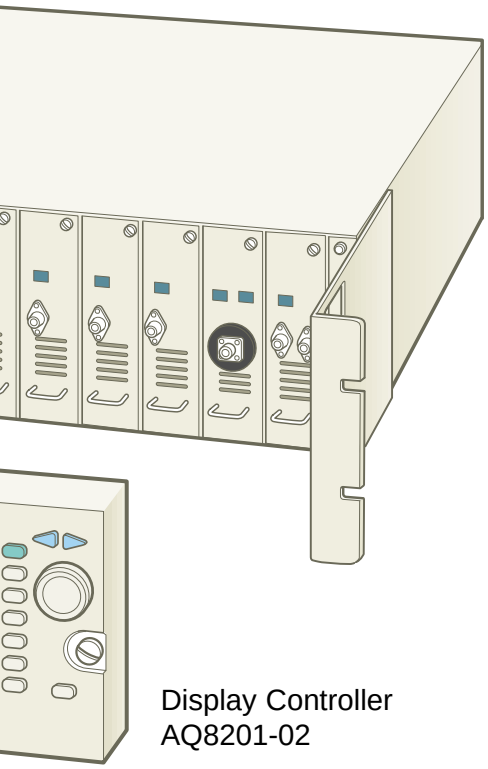


ECL Module
AQ8201-13, 13B

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ent of WDM





Display Controller
AQ8201-02

Optical Test and Measurement System Components

Product name	Model	Slot width
Rack Mount Mainframe	AQ8201A	–
Display Controller	AQ8201-02	–
Display Controller Module	AQ8201-03	2 slots
WDM DFB-LD Module (Light source)	AQ8201-110	1 slot
ASE Module (Light source)	AQ8201-12, 12A	2 slots
ECL Module (Light source)	AQ8201-13, 13B	1 slot
OPM Module (Optical power meter)	AQ8201-21	1 slot
ATTN Module (Optical attenuator)	AQ8201-32, 32A, 33	1 slot
RLM Module (Return loss measurement)	AQ8201-71	1 slot

System configuration image





OPM Module
AQ8201-21



ATTN Module
AQ8201-32, 32A, 33

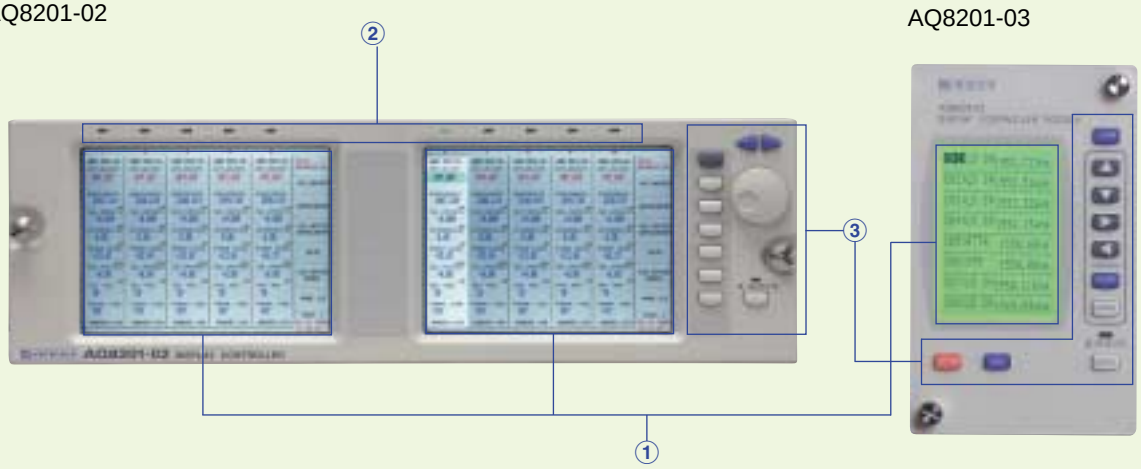


RLM Module
AQ8201-71

Display Controller

Display Controller
AQ8201-02

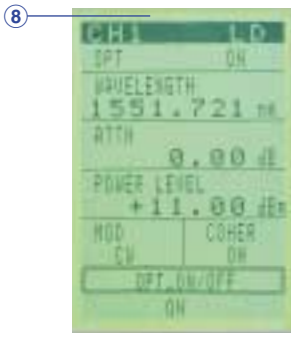
Display Controller Module
AQ8201-03



(AQ8201-02 display screen)



(AQ8201-03 display screen)



Display Controller

Operation panel for Rack Mount Main Frame

① AQ8201-02 displays information for 1 frame (10 slots) simultaneously.
AQ8201-03 displays information for 8 slots simultaneously. (AQ8201-03 cannot control ASE module and RLM module.)

② Operating slots and modules can be identified by LEDs.

③ Rotary 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.

④ The function key menu for the selected module.

• DFB-LD, ECL module

⑤ Optical output on/off, wavelength and attenuation settings.

• OPM module

⑥ Optical power, wavelength, and range settings.

• ATTN module

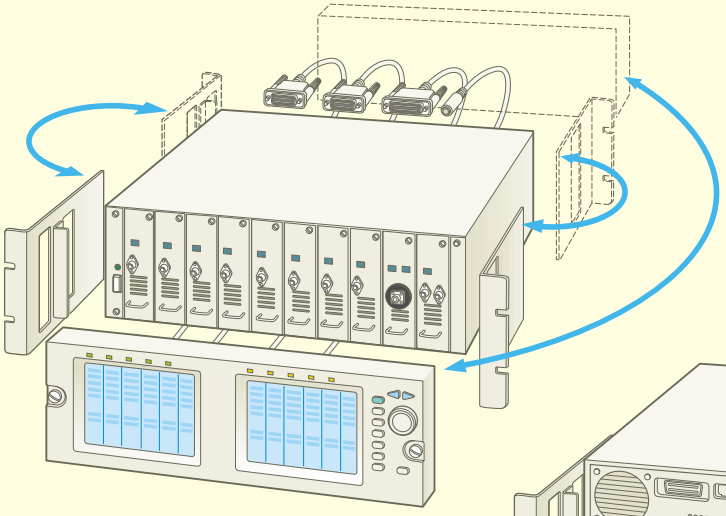
⑦ Attenuation and wavelength shutter on/off settings.

• Display Controller module

⑧ AQ8201-03 displays detailed contents of selected 1 module only.

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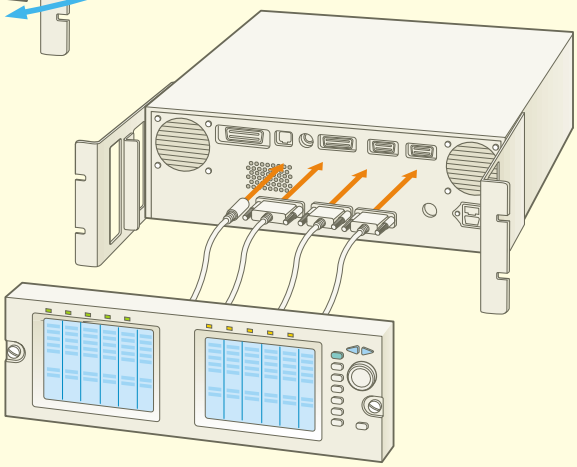
Easy to mount



(Display controller attached to the front.)

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

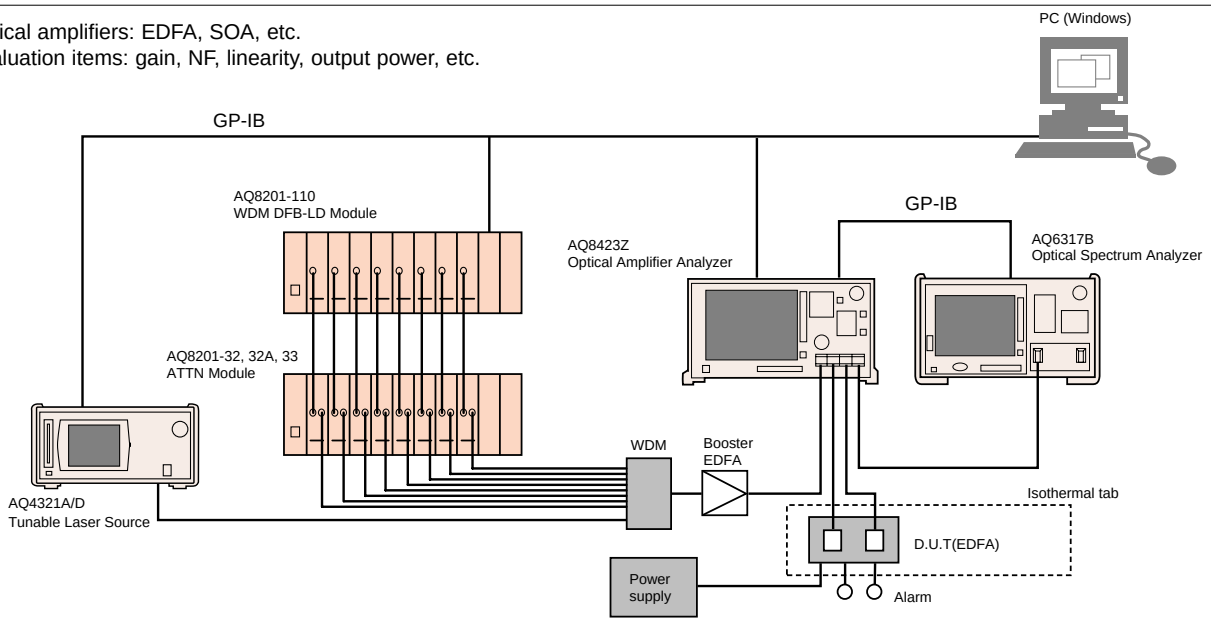
● Display controller is used for monitoring and set-up of modules mounted in the main frame.



(Display controller attached to back.)

Application

• Optical amplifiers: EDFA, SOA, etc.
Evaluation items: gain, NF, linearity, output power, etc.



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For WDM device evaluation and ma

General

The AQ8203 Halfsize Frame is for specification evaluation of WDM-related devices such as MUX/DEMUX, AWG and EDFA.

Lineup of modules, such as light sources including WDM DFB-LD, optical attenuators and optical power meters, are ready to realize various applications. They are used in the AQ8201 Optical Test and Measurement System, providing total support of functions from research and development to manufacturing.
For example, installation cost efficiency can be improved using the small, light, versatile AQ8203 Halfsize Frame (three modules can be mounted) for research/development and maintenance, and the AQ8201 Optical Test and Measurement System (ten modules can be mounted) for production.

Features

Compact and portable

- Designed to be practical for research and development as well as for production sites.
- 3 modules can be mounted.

Half size frame

- Frame is half as wide as a 19-inch rack, and is mountable to 19-inch rack.

Compatible with AQ8201's modules

- Can be used efficiently for research and development as well as device production.

Various modules for diverse applications

- Lineups includes: WDM DFB-LD light source, ASE light source, ECL light source, Optical attenuator, Optical powermeter, Optical return loss meter

LabVIEW driver provided

Product lineup

Product name	Model	Slot width
Halfsize Frame	AQ8203	–
WDM DFB-LD Module (Light source)	AQ8201-110	1 slot
ASE Module (Light source)	AQ8201-12, 12A	2 slots
ECL Module (Light source)	AQ8201-13, 13B	1 slot
OPM Module (Optical power meter)	AQ8201-21	1 slot
ATTN Module (Optical attenuator)	AQ8201- 32, 32A, 33	1 slot
RLM Module (Return loss measurement)	AQ8201-71	1 slot

Modules lineup



WDM DFB-LD Module
AQ8201-110



ASE Module
AQ8201-12, 12A



ECL Module
AQ8201-13, 13B



OPM Module
AQ8201-21



ATTN Module
AQ8201-32, 32A, 33

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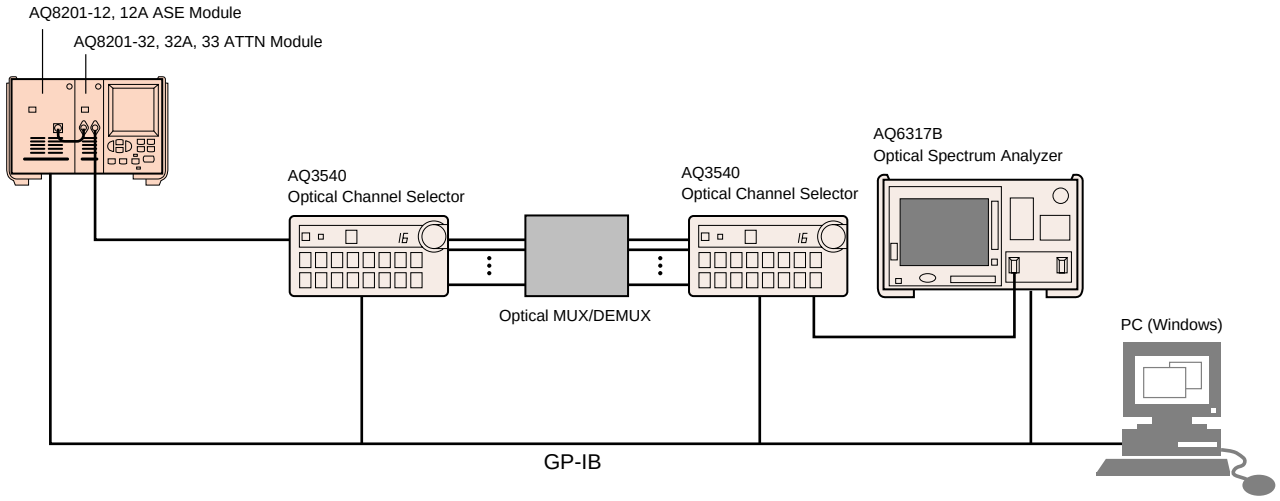
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Three modules can be mounted!

Application

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



Display



① AQ8203 displays information for 3 slots simultaneously.
② Operation switches are designed for simple adjustment and operation of mounted modules.



③ Displays optical output on/off, wavelength and attenuation settings, etc. (Displays details of only one module.)



RLM Module
AQ8201-71

Specifications

Mountable Modules

- AQ8201-110 WDM DFB-LD Module (Light source)
- AQ8201-12 ASE Module (Light source)
- AQ8201-12A ASE Module (High power type light source)
- AQ8201-13 ECL Module (Light source)
- AQ8201-13B ECL Module (Light source for L-band)
- AQ8201-21 OPM Module (Optical power meter)
- AQ8201-32 ATTN Module (High resolution type optical attenuator)
- AQ8201-32A ATTN Module (Optical attenuator for L-band)
- AQ8201-33 ATTN Module (High resolution type optical attenuator for L-band)
- 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 (for 19-inch EIA standard rack front attachment)

AQ8201A Rack Mount Mainframe

Display interface	2 x VGA output (D-sub15-pin)
KEY interface	PS/2 input (DIN 6-pin)
GP-IB interface	IEEE-488.2 compatible
DC/LED interface	For connecting the Display Controller (AQ8201-02)
Power requirements	AC 100 to 120/200 to 240 V, 50/60 Hz, Max. 400 VA
Environmental conditions (Note)	Operation temperature: 5 to 40 °C Storage temperature: 0 to 50 °C Humidity: 85 %RH or less (no condensation)
Dimentions and mass	Approx. 431.2 (W) x 132.6 (H) x 545 (D) mm Approx. 15.5 kg (mountable on a 19-inch EIA standard rack)
Accessory	Rack mount angle: 2 (8 x screws)
Options	AQ8201-91 Vent cover (with slit) AQ8201-92 Blank cover (without slit) AQ8201-96 Rack mount kit (for 19-inch EIA standard rack front attachment)

Note: When 10 modules of AQ8201-110 are in operation, the operation temperature is 10 to 30 °C.

AQ8201-02 Display Controller

Display	6.5-inch TFT color LCD
Display interface	2 x VGA input (D-sub 15-pin)
KEY interface	Panel key and encoder output (equivalent to PS/2)
DC/LED interface	For connecting the Rack Mount Mainframe (AQ8201) display interface
Environmental conditions	Operation temperature: 5 to 40 °C Storage temperature: 0 to 50 °C Humidity: 85 %RH or less (no condensation)
Dimentions and mass	Approx. 425 (W) x 132.5 (H) x 70 (D) mm Approx. 2.6 kg
Options	Extension cables for attaching displsy controller to the front

AQ8201-03 Display Controller Module

Display	LCD 160 x 240 dots (RF-STN Black/White type)
Environmental conditions	Operation temperature: 5 to 40 °C Storage temperature: 0 to 50 °C Humidity: 85 %RH or less (no condensation)
Dimentions and mass	Approx. 79.5 (W) x 130 (H) x 324 (D) mm Approx. 1.5 kg
Controllable module	WDM DFB-LD Module, ECL Module (Note), OPM Module, ATTN Module

* Only AQ8201A Rack Mount Mainframe can be mounted.
Note: Calibration mode cannot be used.

AQ8203 Halfsize Frame

Display	STN color LCD
GP-IB interface	IEEE-488.2 compatible
Power requirements	AC 100 to 120/200 to 240 V, 50/60 Hz, 190 VA or less
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. 212 (W) x 132.5 (H) x 400 (D) mm (except prominent parts) Approx. 5.4 kg
Accessories	Instruction manual, remote interlock short plug, remote interlock connecting plug, optical output control key: 2, blank panel: 2, dust cover (for GP-IB connector, for external extension connector), power cord
Options	Halfsize rack mount kit (for one unit, for connecting two units)

AQ8201-110 WDM DFB-LD Module (Light source)

Available wavelength range		1524.110 to 1620.500 nm [1]
Wavelength accuracy		λp±0.01 nm (typ.) [2, 3]
Wavelength setting resolution		0.001 nm
Spectral width	Coherence control OFF	5 MHz or less
	Coherence control ON	50 MHz (typ.)
Optical output level		+10 dBm or more [6]
SMSR		45 dB (typ.) [5]
Output level stability	15 minutes	Within ±0.005 dB [6]
	24 hours	Within ±0.03 dB [6]
Wavelength stability	15 minutes	Within ±0.005 nm [2]
	24 hours	Within ±0.01 nm [2]
Wavelength range		1.6 nm (min.) [2]
Optical attenuation range		10 dB (0.01 dB step)
Optical isolation		55 dB (typ.)
RIN		-145 dB/Hz (typ.)
Internal modulation		100 Hz to 300 kHz (CHOP)
Applicable fiber		SM (9/125 µm)
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)
Dimentions and mass		Approx. 39.5 (W) x 130 (H) x 339 (D) mm Approx. 0.7 kg

*Specifications assured at fixed temperature within 25±3 °C
*Specifications assured after warm-up for one hour.
Notes:
1) Select from AQ8201-110 available wavelength.
2) CW light, attenuation 0.0 dB, at fiber end (FC/Angled PC-FC/SPC, 2 m, SMF), coherence control "OFF"
3) λp is specified wavelength.
4) CW light, attenuation 0.0 dB, coherence control "OFF", with end of the optical connector mounted on the panel.
5) Attenuation 0.0 dB at the center wavelength
6) Ambient temperature: constant in 20 to 30 °C, CW light, attenuation 0.0 dB, at fiber end (FC/Angled PC-FC/SPC, 2 m, SMF), coherence control "ON"
7) Angled PC is manufactured by SEIKOH GIKEN. : return loss is 60 dB or more

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*Option 01 – 04 can be specified only in case of new order. Unless specifically noted, options can be used simultaneously.

• Option 01 (for high output level)

Optical output level	+13 dBm or more

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

• Option 02 (for PMF)

Applicable fiber	PM (9/125 µm)
Polarization extinction ratio	20 dB or more Note

Note: Assured at the end of the optical connector mounted on the panel.

• Option 03 External modulation (for sine wave-form)

External modulation	100 Hz to 300 kHz
Input connector	SMA

Note: Cannot use Option 03 and Option 04 simultaneously.

• Option 04 External modulation (for CHOP)

External modulation	100 Hz to 300 kHz
Input connector	SMA

Note: Cannot use Option 04 and Option 03 simultaneously.

AQ8201-110 Available Wavelength Table

Please contact our agent or sales offices when you require other wavelength than as below.
Optical frequency (Unit: THz) Wavelength (Unit: nm) *Based on ITU-T grid standard.

Frequency(THz)	Wavelength(nm)	Frequency(THz)	Wavelength(nm)	Frequency(THz)	Wavelength(nm)	Frequency(THz)	Wavelength(nm)	Frequency(THz)	Wavelength(nm)
185.000	1620.500	187.350	1600.173	189.700	1580.350	192.050	1561.013	194.400	1542.142
185.050	1620.062	187.400	1599.746	189.750	1579.934	192.100	1560.606	194.450	1541.746
185.100	1619.624	187.450	1599.320	189.800	1579.518	192.150	1560.200	194.500	1541.349
185.150	1619.187	187.500	1598.893	189.850	1579.102	192.200	1559.794	194.550	1540.953
185.200	1618.750	187.550	1598.467	189.900	1578.686	192.250	1559.389	194.600	1540.557
185.250	1618.313	187.600	1598.041	189.950	1578.270	192.300	1558.983	194.650	1540.162
185.300	1617.876	187.650	1597.615	190.000	1577.855	192.350	1558.578	194.700	1539.766
185.350	1617.440	187.700	1597.189	190.050	1577.440	192.400	1558.173	194.750	1539.371
185.400	1617.004	187.750	1596.764	190.100	1577.025	192.450	1557.768	194.800	1538.976
185.450	1616.568	187.800	1596.339	190.150	1576.610	192.500	1557.363	194.850	1538.581
185.500	1616.132	187.850	1595.914	190.200	1576.196	192.550	1556.959	194.900	1538.186
185.550	1615.696	187.900	1595.489	190.250	1575.782	192.600	1556.555	194.950	1537.792
185.600	1615.261	187.950	1595.065	190.300	1575.368	192.650	1556.151	195.000	1537.397
185.650	1614.826	188.000	1594.641	190.350	1574.954	192.700	1555.747	195.050	1537.003
185.700	1614.391	188.050	1594.217	190.400	1574.540	192.750	1555.343	195.100	1536.609
185.750	1613.957	188.100	1593.793	190.450	1574.127	192.800	1554.940	195.150	1536.216
185.800	1613.522	188.150	1593.369	190.500	1573.714	192.850	1554.537	195.200	1535.822
185.850	1613.088	188.200	1592.946	190.550	1573.301	192.900	1554.134	195.250	1535.429
185.900	1612.654	188.250	1592.523	190.600	1572.888	192.950	1553.731	195.300	1535.036
185.950	1612.221	188.300	1592.100	190.650	1572.476	193.000	1553.329	195.350	1534.643
186.000	1611.787	188.350	1591.678	190.700	1572.063	193.050	1552.926	195.400	1534.250
186.050	1611.354	188.400	1591.255	190.750	1571.651	193.100	1552.524	195.450	1533.858
186.100	1610.921	188.450	1590.833	190.800	1571.239	193.150	1552.122	195.500	1533.465
186.150	1610.489	188.500	1590.411	190.850	1570.828	193.200	1551.721	195.550	1533.073
186.200	1610.056	188.550	1589.989	190.900	1570.416	193.250	1551.319	195.600	1532.681
186.250	1609.624	188.600	1589.568	190.950	1570.005	193.300	1550.918	195.650	1532.290
186.300	1609.192	188.650	1589.146	191.000	1569.594	193.350	1550.517	195.700	1531.898
186.350	1608.760	188.700	1588.725	191.050	1569.183	193.400	1550.116	195.750	1531.507
186.400	1608.329	188.750	1588.304	191.100	1568.773	193.450	1549.715	195.800	1531.116
186.450	1607.897	188.800	1587.884	191.150	1568.362	193.500	1549.315	195.850	1530.725
186.500	1607.466	188.850	1587.463	191.200	1567.952	193.550	1548.915	195.900	1530.334
186.550	1607.035	188.900	1587.043	191.250	1567.542	193.600	1548.515	195.950	1529.944
186.600	1606.605	188.950	1586.623	191.300	1567.133	193.650	1548.115	196.000	1529.553
186.650	1606.174	189.000	1586.203	191.350	1566.723	193.700	1547.715	196.050	1529.163
186.700	1605.744	189.050	1585.784	191.400	1566.314	193.750	1547.316	196.100	1528.773
186.750	1605.314	189.100	1585.365	191.450	1565.905	193.800	1546.917	196.150	1528.384
186.800	1604.885	189.150	1584.946	191.500	1565.496	193.850	1546.518	196.200	1527.994
186.850	1604.455	189.200	1584.527	191.550	1565.087	193.900	1546.119	196.250	1527.605
186.900	1604.026	189.250	1584.108	191.600	1564.679	193.950	1545.720	196.300	1527.216
186.950	1603.597	189.300	1583.690	191.650	1564.271	194.000	1545.322	196.350	1526.827
187.000	1603.168	189.350	1583.271	191.700	1563.863	194.050	1544.924	196.400	1526.438
187.050	1602.740	189.400	1582.854	191.750	1563.455	194.100	1544.526	196.450	1526.050
187.100	1602.311	189.450	1582.436	191.800	1563.047	194.150	1544.128	196.500	1525.661
187.150	1601.883	189.500	1582.018	191.850	1562.640	194.200	1543.730	196.550	1525.273
187.200	1601.455	189.550	1581.601	191.900	1562.233	194.250	1543.333	196.600	1524.885
187.250	1601.028	189.600	1581.184	191.950	1561.826	194.300	1542.936	196.650	1524.498
187.300	1600.600	189.650	1580.767	192.000	1561.419	194.350	1542.539	196.700	1524.110

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

Spectrum density (-13 dBm/nm)		1525 to 1570 nm (typ.) [1)] 1530 to 1565 nm [1)]
Total output power		+10 dBm or more [1)] (AQ8201-12) +15 dBm or more [1)] (AQ8201-12A)
Output level stability	5 minutes	±0.005 dB (typ.) [1, 2)]
	1 hour	Within ±0.05 dB [1, 3)]
Optical modulation mode		CW
Polarization extinction ratio		0.1 dB (typ.)
Optical attenuation range		6dB (0.1 dB step)
Applicable fiber		SM (9/125 µm)
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) x 130 (H) x 339 (D) mm Approx. 1.3 kg

*Specifications assured after warm-up for one hour.
Notes:
1) CW light, attenuation 0.0 dB, at fiber end (SMF, FC/PC, 2 m)
2) 5 minutes (at constant temperature in 20 to 30 °C)
3) In one hour (±1 °C in 0 to 40 °C)
4) FC, ST and SC connector are available

AQ8201-13 ECL Module (Light source)

Available wavelength range		1460 to 1580 nm
Wavelength setting resolution		10 pm
Wavelength accuracy		Within ±0.2 nm [1, 2, 3, 4)]
Wavelength repeatability		±50 pm (typ.) [1, 2, 4)]
Wavelength setting time		3 seconds (typ.) [5)]
Spectral width	Coherence control OFF	5 MHz (typ.) [1, 2)]
	Coherence control ON	100 MHz (typ.) [1, 2)]
Optical output level	1460 to 1580 nm	+6 dBm or more [1, 2, 7)]
	1490 to 1580 nm	+8 dBm or more [1, 2, 7)]
	1520 to 1580 nm	+10 dBm or more [1, 2, 7)]
SMSR		45 dB or more [1, 2, 6)]
Output level stability	15 minutes	Within ±0.005 dB [1, 2, 4, 7)]
	1 hour	Within ±0.01 dB [1, 2, 4, 7)]
Wavelength stability	15 minutes	Within ±0.005 nm [1, 2, 4)]
	24 hours	Within ±0.01 nm (typ.) [1, 2, 4)]
Optical attenuation range		10 dB (0.01 dB step) [1, 6)]
RIN		-145 dB/Hz (typ.) [1, 2)]
Internal modulation		100 Hz to 300 kHz (CHOP) [8)]
External modulation		100 Hz to 300 kHz (Sine Wave)
Applicable fiber		SM (9/125 µm)
Optical connector		FC/Angled PC [9)]
Laser product class		IEC825: class3A
Environmental conditions		Operation temperature: 23 ± 5 °C [10)] Storage temperature: 0 to 50 °C Humidity: 85 %RH or less (no condensation)
Dimensions and mass		Approx. 39.5 (W) x 130 (H) x 339 (D) mm Approx. 1.2 kg

*Specifications assured after warm-up for one hour.

Notes
1) Temperature fixed at 23 °C, CW light, 2 m fiber output, single vertical mode
2) Optical attenuation: 0.0 dB
3) After wavelength calibration
4) C-band: 1520 to 1570 nm
5) Full span (120 nm)
6) Wavelength: 1550 nm
7) Spectrum width: coherence control "ON"
8) Setting resolution: 0.1 kHz, accuracy: ±2 %
9) Angled PC is manufactured by SEIKOH GIKEN.: return loss is 60 dB or more
10) Ambient temperature of the mainframe

AQ8201-13B ECL Module (L-band compatible)

Available wavelength range		1500 to 1620 nm
Wavelength setting resolution		10 pm
Wavelength accuracy		Within ±0.2 nm [1, 2, 3, 4)]
Wavelength repeatability		±50 pm (typ.) [1, 2, 4)]
Wavelength setting time		3 seconds (typ.) [5)]
Spectral width	Coherence control OFF	5 MHz (typ.) [1, 2)]
	Coherence control ON	100 MHz (typ.) [1, 2)]
Optical output level	1500 to 1620 nm	+6 dBm (typ.) [1, 2, 7)]
	1530 to 1620 nm	+8 dBm (typ.) [1, 2, 7)]
	1560 to 1620 nm	+10 dBm (typ.) [1, 2, 7)]
SMSR		45 dB or more [1, 2, 6)]
Output level stability	15 minutes	Within ±0.005 dB [1, 2, 4, 7)]
	1 hour	Within ±0.01 dB [1, 2, 4, 7)]
Wavelength stability	15 minutes	Within ±0.005 nm [1, 2, 4)]
	24 hours	Within ±0.01 nm (typ.) [1, 2, 4)]
Optical attenuation range		10 dB (0.01 dB step) [1, 6)]
RIN		-145 dB/Hz (typ.) [1, 2)]
Internal modulation		100 Hz to 300 kHz (CHOP) [8)]
External modulation		100 Hz to 300 kHz (Sine Wave)
Applicable fiber		SM (9/125 µm)
Optical connector		FC/Angled PC [9)]
Laser product class		IEC825: class3A
Environmental conditions		Operation temperature: 23 ± 5 °C [10)] Storage temperature: 0 to 50 °C Humidity: 85 %RH or less (no condensation)
Dimensions and mass		Approx. 39.5 (W) x 130 (H) x 339 (D) mm Approx. 1.2 kg

*Specifications assured after warm-up for one hour.

Notes
1) Temperature fixed at 23 °C, CW light, 2 m fiber output, single vertical mode
2) Optical attenuation: 0.0 dB
3) After wavelength calibration
4) L-band: 1560 to 1610 nm
5) Full span (120 nm)
6) Wavelength: 1600 nm
7) Spectrum width: coherence control "ON"
8) Setting resolution: 0.1 kHz, accuracy: ±2 %
9) Angled PC is manufactured by SEIKOH GIKEN.: return loss is 60 dB or more
10) Ambient temperature of the mainframe

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AQ8201-21 OPM Module (Optical power meter)

Wavelength range		700 to 1700 nm
Photodetector		Cooled InGaAs
Application		Small-diameter silica fiber emission [1]
Optical connector		AQ9389B (FC) Connector Adapter (standard) [2]
Polarization dependent loss		0.02 dB_{P-P} (typ.) [3]
Power range	CW light	-80 to +27 dBm [4]
	Chopped light	-80 to +24 dBm [4]
Inaccuracy under reference condition		±2.5 % (at 1310 nm calibration point) [5]
Total accuracy		±5 % (1000 to1650 nm) [6]
Linearity		±0.05 dB (1000 to 1650 nm, -40 to +27 dBm) [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) x 130 (H) x 339 (D) mm Approx. 0.8 kg
Accessories		Plug for analogue output

*Specifications assured at fixed temperature within 23±5 °C
*Specifications assured after warm-up for one hour.
Notes:
1) Applicable fiber ≦ 62.5/125 µm (GI) NA ≦ 0.275
2) ST and SC connector are also available
3) At 1550 nm wavelength, SM fiber
4) At 1310 nm wavelength
5) Reference conditions:
   1. Power level: -20 dBm (10 µW), CW light
   2. SM fiber, master FC connector
   3. Ambient temperature: 23±5 °C
   4. Calibrated with AQ9389B (FC) connector adapter (If you disconnect connector adapter, the accuracy of specifications may be lost. When you change connector adapter, we recommend you to have recalibration.)
6) Operation conditions:
   1. Power level: -20 dBm (10 µW), 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 a wavelength within wavelength specified in total accuracy.
   2. CW light, ambient temperature: 23±5 °C
8) 1. Averaging 1s (averaging executed 10 times)
   2. In wavelength 1200 to 1600 nm
   3. CW, chopped light (270 Hz)

AQ8201-71 RLM Module (Return loss measurement)

Wavelength range	1280 to 1600 nm
Dynamic range	65 dB or more [1]
Relative measurement accuracy	Within ±0.4 dB (0 to 50 dB) [2] Within ±0.7 dB (50 to 60 dB) [2]
Measurement stability	Within ±0.02 dB [3]
Applicable fiber	SM (9/125 µm)
Input connector(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) x 130 (H) x 339 (D) mm Approx. 1.2 kg

*Specifications assured after warm-up for one hour.
General conditions otherwise specified:
• Optical input level: -5 to 0 dBm, CHOP (270 Hz)
• Wavelength: 1550 nm
• Reference: fresnel reflection (using master cord for AQ8201-71)
• Ambient temperature: 23±1 °C
Notes
1) Varies depending on master cord
2) Depends on stability of light source to be used, linearity of photo receiver and isolation of optical directional coupler.
3) Display stability with Fresnel reflection measurement: 5 minutes
4) Angled PC is manufactured by SEIKOH GIKEN.
5) Do not connect other master cord than one specified by ANDO to output connector.

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AQ8201-32 ATTN Module (Optical attenuator)

Wavelength range	1200 to 1600 nm
Insertion loss	2.5 dB or less (1310/1550 nm) [1, 2]
Maximum attenuation level	60 dB
Attenuation deviation	Within ±0.1 dB (1310/1550 nm) [1, 2]
Repeatability	Within ±0.02 dB [1]
Minimum attenuation step	0.01 dB
Optical return loss	60 dB or more (1310/1550 nm) [1, 2, 3]
Polarization dependent loss	0.05 dB_{P-P} (typ.) (1550 nm) [1]
Maximum input power	+23 dBm
Shutter isolation	100 dB or more
Applicable fiber	SM (9/125 µm)
Optical connector	FC/Angled PC [4]
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) x 130 (H) x 339 (D) mm Approx. 1 kg

*Specifications assured at fixed temperature within 25±3 °C.
*Specifications assured after warm-up for one hour.
Notes
1) At constant temperature
2) Using master cord
3) With FC/Angled PC connector (Return loss: 63 dB or more)
4) Angled PC is manufactured by SEIKOH GIKEN.

AQ8201-32A, 33 ATTN Module (L-band compatible)

Wavelength range	1480 to 1650 nm
Insertion loss	2.5 dB or less (1550 nm) [1, 2]
Maximum attenuation level	60 dB
Attenuation deviation	Within ±0.1 dB (1520 to 1620 nm) [1, 2]
Repeatability	±0.01 dB (typ.) (AQ8201-32A) ±0.005 dB (typ.) (AQ8201-33)
Minimum attenuation step	0.01 dB (AQ8201-32A) 0.001 dB (AQ8201-33)
Optical return loss	60 dB or more (1550 nm) [1, 2, 3]
Polarization dependent loss	0.05 dB_{P-P} (typ.) (1550 nm) [1]
Maximum input power	+23 dBm
Shutter isolation	100 dB or more
Applicable fiber	SM (9/125 µm)
Optical connector	FC/Angled PC [4]
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) x 130 (H) x 339 (D) mm Approx. 1 kg

*Specifications assured at fixed temperature within 25 °C.
*Specifications assured after warm-up for one hour.
Notes
1) At constant temperature
2) Using master cord
3) With FC/Angled PC connector (Return loss: 63 dB or more)
4) Angled PC is manufactured by SEIKOH GIKEN.

*Specifications are subject to change without notice.
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