

JDSU MAP-280

8-Slot Multiple Application Platform



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Multiple Application Platform (MAP-200)

Platform Overview



Flexible, Dynamic Solution for Comprehensive Optical and Electro-Optical Testing

The JDSU Multiple Application Platform (MAP-200) is designed to help manage the test and measurement needs of an industry that requires flexibility and dynamic performance. Our goal is to offer researchers, designers, and manufacturing engineers a platform that exceeds all others with its modularity, reliability, and flexibility. The MAP-200 module breadth and performance are consistent with the fiber optic technology leadership from JDSU.

Outstanding Support

JDSU is committed to providing you with the strongest possible application support—a commitment that extends beyond the operation of our products to understanding the specifics of the measurements being implemented. We believe in learning from every customer interaction. Combining your measurement experiences with ours and leveraging the flexibility and performance of our products, enables us to deliver more powerful solutions.

We strive to optimize measurement performance, reduce cycle times, and minimize ownership costs. Together, we can create solutions within your capital budget that simplify your development, without compromising the performance and reliability necessary to keep your program or factory on track.

Our next-generation products are born out of your needs. Throughout our history, we have listened to our customers with eagerness to explore new ideas and opportunities. These ideas may range from simple product enhancements to new product concepts. We have confidence in our product breadth, yet we are equally driven toward finding innovative ways to add value to your test and measurement applications.

Targeted Tools–The MAP-200 Solution Selection Guide

Multiple MAP-200 Mainframe Configurations

The MAP-200 mainframes are offered in three configurations for optimal adaptability within test sets: a three-slot configuration and a 19-inch rack, eight-slot configuration with either front- or rear-facing orientation for optimal fiber routing. All three configurations are 3 RU high. The MAP-200 mainframes include all hardware required for bench-top use, including rubber-accented feet located at the corners for optimal stability and vibration isolation. Investment protection is maximized for previous-generation MAP customers using a simple transition kit that allows the insertion of previously field-deployed MAP modules in the MAP-200 mainframe. The MAP-200 also provides additional cost savings by letting users share the modules within a mainframe.



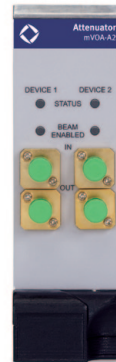
The MAP-200 Solution Selection Guide



MAP EDFA

Available in six configurations: pre-amplifier, booster, booster-high power, mid-span access booster, in-line and booster-DWDM. Features a low noise figure, high output power, and high gain. Currently the high power booster model offers an output of 21 dBm.

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MAP Variable Optical Attenuator

A high resolution, wide wavelength range attenuator. Available with 1 or 2 devices per module, single-mode or multimode fiber, four standard connector types, and tap option or optional power control feature.

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MAP Polarization Controller

An efficient, precise polarization controller that can create any state of polarization. May also be used as part of a polarization state analyzer.

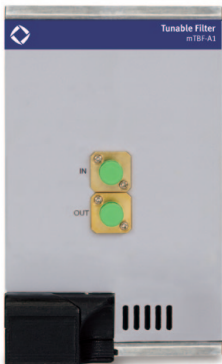
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MAP Variable Backreflector

Provides precise levels of return loss to transmitters allowing measurements of system sensitivity or system degradation as a function of backreflection. Available in single-mode or multimode and with an optional coupler for monitoring.

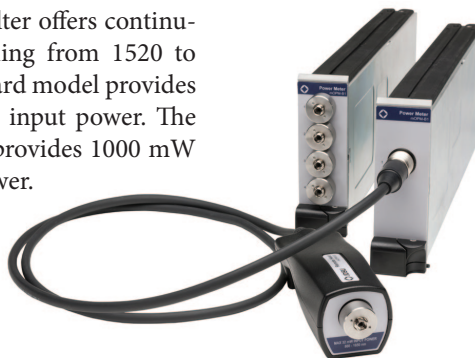
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MAP Tunable Filter

Tunable bandpass filter offers continuous wavelength tuning from 1520 to 1630 nm. The standard model provides 300 mW maximum input power. The high power option provides 1000 mW maximum input power.

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MAP Optical Power Meter

Features high accuracy, high linearity, and extremely low polarization dependent loss (PDL). Incorporates a standard analog output. Model with 10 mm detector adapter may be used with up to 72 channel multimode ribbon fibers.

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MAP Broadband Source

Offers an amplified spontaneous emission (ASE) output that features flattened high power density across the C-band. The source provides high spectral stability.

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The MAP-200 Solution Selection Guide



MAP Tunable DBR Laser

New-generation tunable laser ideal for DWDM testing where the capability to change wavelength on demand over the C- and L-bands with 25 GHz spacing is essential.

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MAP Fabry-Perot Laser

Produces a stable light source at desired wavelengths. Offers optimal stability and features such as built-in internal modulation capabilities, and variable power control.

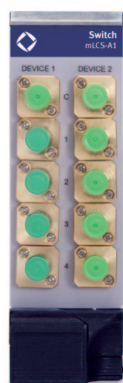
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MAP LED Source

Provides a high-power light emitting diode (LED)-based light source with variable output power.

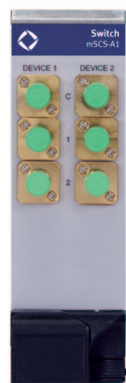
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MAP Large Channel Count Switch

A bidirectional switch, allows connections of a common port to up to 50 channels. Available in single- or dual-switch configurations. Exhibits low insertion loss and high return loss.

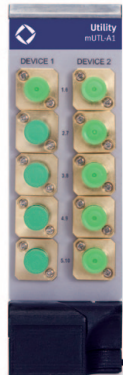
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MAP Small Channel Count Switch

A low-cost switch allowing for a number of configurations. The switch is bidirectional, transparent to signal format, and available in both single-mode and multimode versions.

Page 46



MAP Utility

Simplifies the mechanical integration of passive optical components for test sets. Highly configurable and contains passive optical devices such as splitters and taps. Supports angle or flat polish connectors as well as single-mode and multimode fibers.

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Adapters and Calibrated Jumpers

For use with the JDSU power meters from the MAP, c-Series, SWS, OCETS, and legacy product lines.

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The MAP-200 Solution Selection Guide

Application Reference Table

The MAP-200 system of products addresses standard testing requirements in addition to evolving testing challenges. See the table below for a sampling of tests and the appropriate measurement equipment.

	40GE 100GE	10 Gb/s NETWORK TEST BED	BIT ERROR RATE	EXTINCTION RATIO	EYE MASK	INSERTION LOSS	INTRINSIC JITTER	NOISE FIGURE	OPTICAL GAIN	OSNR	POLARIZATION DEPENDANT GAIN	POLARIZATION DEPENDENT LOSS	RETURN LOSS
Broadband Source		✓				✓				✓		✓	✓
Couplers and Splitters	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EDFA		✓						✓	✓	✓			
Fabry-Perot Laser	✓	✓				✓						✓	✓
Polarization Controller		✓						✓		✓	✓	✓	✓
Power Meter	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Switches	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tunable Filter		✓				✓		✓	✓	✓	✓	✓	✓
Tunable DBR Laser		✓				✓	✓	✓	✓		✓	✓	✓
Variable Backreflector		✓											✓
Variable Optical Attenuator	✓	✓	✓		✓			✓	✓	✓	✓		

Multiple Application Platform

MAP-200



MAP-230B (top) and MAP-280 (bottom) mainframes

- Key Features**
- Available in three mainframe configurations
 - GPIB- and LXI-compliant (Ethernet)
 - Optional 10.4-inch touch screen display module with integrated keypad and scroll wheel
 - DVI port for external display
 - USB device ports for external keyboard and mouse
 - Hot-swappable module (module can be inserted or removed without powering down)
 - Field replaceable controller/power supply module
 - Compatible with current MAP modules

Applications

- Enables transceiver and transponder testing
- Permits comprehensive passive and active component, laser, and amplifier testing
- Facilitates 10 G and 40 G system and subsystem testing

Compliance

- Optical source modules, when installed in the MAP Mainframe, meet the requirements of standard IEC 60825-1(2002) and comply with CFR 1040.10 except deviations per Laser Notice No. 50, July 2001 Key Feature Number 4
- CSA/UL/IEC 61010-1
- LXI Class C compliant

The JDSU Multiple Application Platform (MAP-200) is an optical test and measurement platform optimized for cost-effective development and manufacturing of optical transmission network elements. Today's rapidly changing optical market requires investment in productivity-enhancing technologies and tools, making the MAP-200 scalable test platform the right tool needed in even the most stringent environments.

Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 builds on the differentiation of offering the broadest portfolio of modules in the densest and most configurable platform. The MAP-200 is optimized for test applications in lab and manufacturing environments ranging from insertion loss testing to dispersion penalty testing (see Table 1).

Passives

- Insertion Loss
- Polarization Dependent Loss
- Return Loss

Lasers and Amplifiers

- Gain Flatness
- Output Power
- Transient Response
- Spectral Width
- Side Mode Suppression Ratio
- Wavelength
- NF and OSNR

Optical Transport

- Stress Receiver Compliance
- Jitter Testing
- Sensitivity
- Dispersion Penalty
- SMSR
- Receiver Overload
- Eye Mask/Extinction Ratio
- OSNR Sensitivity

Table 1 List of MAP-200 applications by technology

Multiple MAP-200 Mainframe Configurations

The MAP-200 mainframes are offered in three configurations for optimal adaptability within test sets: a three-slot configuration and a 19-inch rack, eight-slot configuration with either front- or rear-facing orientation for optimal fiber routing. All three configurations are 3 RU high. The MAP-200 mainframes come standard with hardware required for bench-top use including rubber-accented feet located at the corners for optimal stability and vibration isolation. Investment protection is maximized by use of a simple transition kit, which allows insertion of previously field-deployed MAP modules in the MAP-200 mainframe. Furthermore, the MAP-200 provides additional cost savings by letting users share the modules within a mainframe.

High-Performance MAP-200 Modules

The MAP-200 portfolio of modules include 16 types of high-performance modules including signal conditioning and switching, sources and amplification, and power meters.

MAP Power Meters provide high absolute power measurement accuracy over a broad power and wavelength range. They support a broad combination of fiber types and connectivity option optimized for datacom and telecom applications. High speed data logging capability allows for making transient measurements.

MAP Amplifiers are designed to meet the broadest optical signal amplification applications. They are available at various saturated output power, gain flattened or non-gain flattened, C-band, L-band, and with low noise figure.

MAP Attenuators provide the highest performance optical power control solution. The attenuators offer the lowest insertion loss, highest input power capability, low polarization dependent loss (PDL), high dynamic range, and ultra-flat attenuation over wavelength.

MAP Tunable Filters provide the lowest loss and narrowest bandwidth filter with the highest input power capability in the industry.

MAP Switches are the most configurable optical signal routing solutions in their class. MAP Switches are available in configurations including low channel count matrix (2x2) and single input to multiple outputs ranging from 2 to 50. In the 1x2 and 2x2 format, the modules are available with up to eight switches per single slot module.

MAP Sources are ideal sources for applications requiring a stable stimulus for parametric measurements. The sources are available at key telecom wavelengths, with broad or narrow spectral bandwidth, or with tunable spectrum.

Other functions available in the MAP-200 include a variable backreflector, polarization controller, and utility modules.



Figure 1 Keypad/display module

Elaborate Local Interface and Friendly Graphical User Interface

To view the graphical user interface (GUI) and for local control, the MAP-200 mainframes are compatible with standard universal serial bus (USB) keyboards, USB mice, and digital video interface (DVI) monitors. For added convenience and flexibility, JDSU offers an optional purpose-built keypad/display module (MAP-200BKD), shown in Figure 1, that provides full local control capabilities. The MAP-200BKD features a scroll wheel, seven soft keys, five navigation buttons, plus seven pre-assigned buttons to navigate the GUI. Touch capability and user-friendly controls come standard for operation with the touch of a finger or with the supplied stylus. Located at the back of the MAP-200BKD module is an industry-standard mounting hole compatible with commercially available display mounts or the purpose-built MAP-200 Keypad Display 19-inch rack-mount kit (MAP-200B09). Alternatively, the GUI can be accessed in a PC environment via a virtual network connection (VNC) client.

When in use with the MAP-230B mainframe, shown in Figure 2b, the MAP-200BKD module can be mounted to the top face of it. Pop-out feet located on the mainframe lets users position the combined unit in a front-facing manner to ensure optimal viewing and interaction with the unit.



Figure 2a



Figure 2b



Figures 2a and 2b Suggested MAP-230B and MAP-200BKD implementation. Figure 2a shows the MAP-200BKD mounted on the MAP-230B, an optimal configuration for applications requiring high interactivity with the GUI. Figure 2b shows the MAP-200BKD next to the MAP-280, a configuration that is optimal for applications requiring high interactivity with the device under test (DUT) and the MAP-200 modules, as well as monitoring via the GUI.

Extensive Input/Output Interfaces

The MAP-200 is a USB-, General Purpose Interface Bus- (GPIB-), and Ethernet-enabled device that supports the latest test equipment interface standard, local area network (LAN) extension interface for instrumentation (LXI). LXI is the Ethernet-based successor to GPIB. The LXI standard defines devices using open-standard for system inter-device communication.

All mainframe configurations include:

- GPIB, Ethernet, and USB device ports for remote communication
- 4 USB host ports for installing peripheral devices, including USB drives, a mouse, and a keyboard
- LXI-compliant Trigger Bus connections
- Ethernet reset button
- Laser interlock key in the front and remote interlock connector in the rear
- LXI-compliant light emitting diodes (LEDs) on the front panel
- DVI connector for external monitor

Standard Compliant Automation Drivers

MAP-200 is supplied with Interchangeable Virtual Instrument (IVI) drivers, which are intuitive and optimized for ease of use with popular Application Development Environments such as LabVIEW, Visual C++, Visual Basic, and LabWindows™. These drivers provide full control of the modules and provide drop-in instrument programming capabilities, allowing test programmers to focus on test-level functions and sequences rather than the details required to communicate with the specific modules in the MAP system. The IVI drivers allow for simulation mode that lets Automation Developers capture system configurations so they can perform most of their development off line, freeing hardware for other purposes. These features make test automation development and debugging fast and easy.

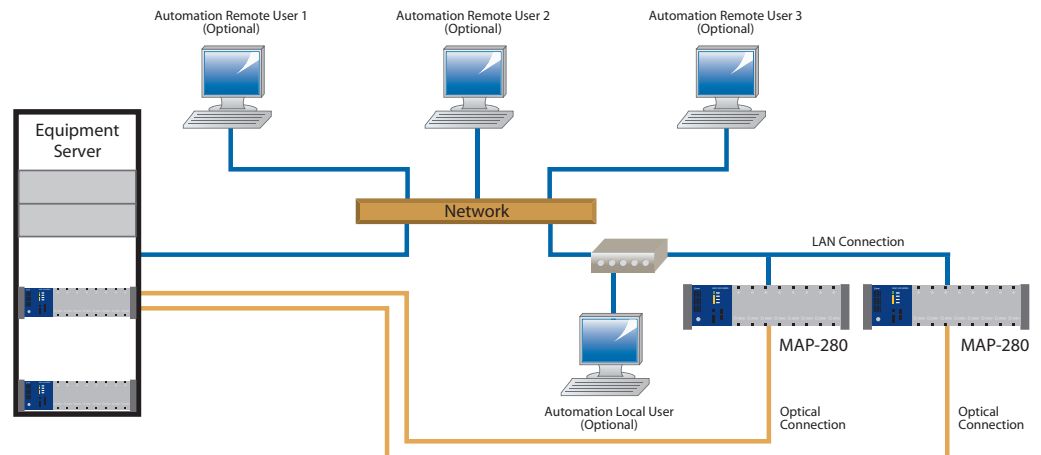


Figure 3 MAP implementation within a shared resource environment

Mainframe Specifications

Parameter	MAP-230B	MAP-280	MAP-280R
Capacity	3 modules	8 modules	8 modules
Controller			
CPU		Power PC architecture	
Operating System		Linux	
Internal Storage		200 MB user flash storage	
Interfaces			
Remote interface		USB, GPIB, Ethernet 10/100/1000Base-T	
USB device compatibility		Mouse, keyboard, memory stick	
Display External		MAP-200KD (optional) or standard DVI monitor	
Ports			
USB host ports		2 rear and 2 front	
USB device ports		1 front	
LAN		1 rear	
GPIB		1 rear	
DVI video		1 rear	
LXI triggers		25-pin Micro-D connectors	
Automation			
Driver type		IVI-compliant	
Driver compatibility		LabVIEW, LabWindows, Visual C++, Visual Basic	
Accessibility		Multi-user sharing support	
Electrical and Safety			
Power ¹		100 to 125V AC/200 to 240V AC, 50/60 Hz, Auto-switching (field-replaceable as part of the power supply controller module)	
Power consumption		200 VA	
Local interlock		Key located in front	
Remote interlock		Terminals located in rear	
Mechanical and Environment ²			
Rack-mount kit	Optional	Included	Included
Dimensions (W x H x D) ³	29.2 x 14.9 x 42.0 cm (11.5 x 5.9 x 16.6 in)	49.6 x 14.9 x 42.0 cm (19.6 x 5.9 x 16.6 in)	49.6 x 14.9 x 42.0 cm (19.6 x 5.9 x 16.6 in)
Weight	5.9 kg (13 lb)	6.8 kg (15 lb)	6.8 kg (15 lb)
Operating temperature		0 to 50°C	
Storage temperature		–30 to 60°C	
Humidity		15–80% RH, 0 to 40°C non-condensing	

1. The MAP-200 system has been tested and certified to an Altitude of 2,000 metres

2. Mains supply voltage fluctuation shall not exceed 10% of nominal supply voltage

3. Dimensions include bench-top mounting hardware

MAP-200BKD Display Specifications

Parameter	Specification
Display dimensions (H x W)	10.4-inch color screen
Resolution	800 x 600 resolution
Power	Supplied from mainframe via MAP-200A01 Keypad/Display Cable Harness Kit
Weight	1.8 kg (4 lb)

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Product Code	Description
Mainframes (Required)	
MAP-280	MAP-200 8-slot mainframe
MAP-280R	MAP-200 8-slot mainframe factory reversed configuration
MAP-230B	MAP-200 3-slot mainframe
Power Cords (Required)	
CORD-AU	Australia/China power cord
CORD-EU	European power cord
CORD-JP	Japan power cord
CORD-UK	United Kingdom power cord
CORD-US	United States power cord
Accessories (Optional)	
MAP-200BKD	MAP-200 stand-alone keypad/display module
MAP-200A01	MAP-200BKD keypad/display cable harness kit
MAP-200A03	MAP-200 8-slot mainframe 19-inch rack-mount kit
MAP-200A013	MAP-200 adaptor kit for single width MAP modules (requires one kit per device)
MAP-200A013D	MAP-200 adaptor kit for double width MAP modules (requires one kit per device)
MAP-200B09	MAP-200BKD keypad/display module rack-mount kit
MAP-200A10	MAP-200 3-slot mainframe 19-inch rack-mount kit
Replacement/Spare Parts (Optional)	
MAP-200A02	MAP-200 controller for MAP-280 and MAP-230B
MAP-200A02R	MAP-200 controller for MAP-280R
MAP-200A04	MAP-200 safety interlock key
MAP-200A06	MAP-200 blanking plates (kit of 3)
MAP-200A07	MAP-200 stylus
MAP-200A08	MAP-200 3-slot mainframe flip-up feet
MAP-200A11	MAP-200 detachable side panels for bench-top use
MAP-200A12	MAP-200 handles for detachable side panels

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 LabVIEW and LabWindows are registered trademarks of National Instruments Corporation.
 UL is a registered trademark of Underwriters Laboratories Inc.

MAP Erbium-Doped Fiber Amplifier (mEDFA-A1)



Key Features

- Pre-amp, booster and in-line configurations
- High output power and gain maximize operating range
- Low noise figure minimizes optical impairment
- Monitoring and alarms available
- Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

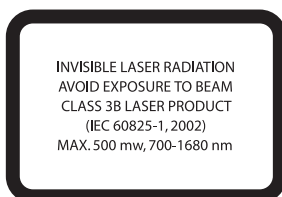
Applications

- In-line, pre-amp and booster amplifier emulation
- Dense wavelength division multiplexing (DWDM) transmission for multi-channel applications
- SONET/SDH systems for single channel applications
- Optical signal-to-noise ratio (OSNR) experiments

The Multiple Application Platform (MAP) Erbium-Doped Fiber Amplifier (mEDFA-A1) is optimized for the industry-leading MAP-200 platform from JDSU. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print. The MAP EDFA has a saturated output power ranging from 14 dBm to 21 dBm, features noise figures as low as 3.7 dB and has gain flatness better than 2.0 dB. All MAP EDFA models are available for operation in C- or L-band.

Safety Information

- The MAP EDFA, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1 (2002), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001.



Specifications

Parameter	1550	1552	1552	1554	1558	1590	1592	1594
Amplifier type	Pre-amp	Booster	Booster high power	In-line	Booster DWDM	Pre-amp	Booster	In-line
Operating wavelength range	1528 to 1565 nm	1528 to 1565 nm	1528 to 1565 nm	1528 to 1565 nm	1528 to 1563 nm	1565 to 1610 nm	1565 to 1610 nm	1565 to 1610 nm
Input signal	Single channel	Single channel	Single channel	Single channel	Multichannel (DWDM)	Single channel	Single channel	Single channel
Saturated output power (minimum) ¹	>14 dBm	>17 dBm	>20 dBm	>17 dBm	>21 dBm	>15 dBm	>15 dBm	>20 dBm
Noise figure (maximum) ²	<3.7 dB	<4.5 dB	<5.0 dB	<4.1 dB	<5.5 dB	<5.2 dB	<5.5 dB	<5.5 dB
Small signal gain (minimum) ³	>37 dB	>30 dB	>32 dB	>35 dB	>25 dB	>24 dB	>22 dB	>28 dB
Input/output monitors	No	Yes	Yes	No	Yes	No	Yes	Yes
Polarization dependent loss (PDL) (maximum)	<0.2 dB	<0.2 dB	<0.2 dB	<0.2 dB	<0.25 dB	<0.3 dB	<0.3 dB	<0.3 dB
Polarization mode dispersion (PMD) (maximum)	<0.5 ps	<0.4 ps	<0.4 ps	<0.5 ps	<0.65 ps	<0.6 ps	<0.6 ps	<0.6 ps
Input/output isolation (typical)	N/A/32 dB	45/32 dB	45/32 dB	32/32 dB	32/32 dB	N/A/40 dB	40/40 dB	40/40 dB
Spectral gain flatness (maximum) (p-p) ⁴	N/A	N/A	N/A	N/A	<2.0 dB	N/A	N/A	N/A
Operating temperature	0 to 40°C							
Storage temperature	-30 to 60°C							
Humidity	Maximum 95% RH non-condensing from 0 to 45°C							
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)							
Weight	1.3 kg (2.87 lb)							

Note: All specifications guaranteed at 1550 nm and at 23°C

1. Saturated Output Power measured:

at 1550 nm at $P_{in} = -4$ dBm

at 1550 nm at $P_{in} = -4$ dBm (mid-span) for models 1550, 1552, 1554, 1558

at 1590 nm at $P_{in} = 0$ dBm (mid-span) for models 1590, 1592, 1594

2. Noise figure measured:

at $P_{in} = -30$ dBm for model 1550

at $P_{in} = -4$ dBm for models 1552, 1558, 1592

at $P_{in} = -20$ dBm for models 1554, 1590, 1594

3. Small signal gain measured:

at $P_{in} = -30$ dBm for model 1550

at $P_{in} = -20$ dBm for model 1552, 1554, 1590, 1592, 1594

at $P_{in} = -4$ dBm for model 1558

4. Flatness optimized:

for $P_{in} = -4$ dBm for model 1558

Note: 1558 Input Power Monitor: Min Power displayed typical - 18 dBm and Max Power displayed typical +3 dBm

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Product Code	Description
Base Options (Required, select one)	
MEDFA-A15500	14 dBm C-band, Single Channel, Pre-amp
MEDFA-A15520	17 dBm C-band, Single Channel, Booster
MEDFA-A15522	20 dBm C-band, Single Channel, Booster
MEDFA-A15540	17 dBm C-band, Single Channel, In-Line Booster
MEDFA-A15580	21 dBm C-band, DWDM, Booster
MEDFA-A15900	15 dBm L-band, Single Channel, Pre-amp
MEDFA-A15920	15 dBm L-band, Single Channel, Booster
MEDFA-A15940	20 dBm L-band, Single Channel, In-Line Booster
Connector Options (Required, select one)	
MFP	FC/PC connector type
MFA	FC/APC connector type

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MAP Variable Optical Attenuator

(mVOA-A2)



Key Features

- Ultra low insertion loss (<1.0 dB) and outstanding spectral uniformity
- Fastest transition speed in its class (up to 25 dB/s)
- Configurable by user at time of order (fiber type, density, built-in options, high power option)
- Optional built-in power monitor provides comprehensive closed-loop power control settings
- Optional higher power capability can withstand up to 2W input power for single-mode fiber (500 mW for MMF)
- Can be automated when used with MAP-200
- LXI-compliant interfaces and IVI drivers

Applications

- Transmitter dispersion testing and eye mask testing
- Receiver sensitivity testing
- EDFA noise figure and gain flatness testing
- Power meter calibration
- Loss simulation

Safety Information

- The MAP Variable Optical Attenuator, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Variable Optical Attenuator (mVOA-A2) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print.

The mVOA-A2 is a stepper motor and filter based attenuator that takes advantage of the latest available technologies to provide the highest performance optical power level control solution with the lowest optical impairments.

- Ultra low insertion loss to minimize loss budget utilization
- High accuracy and high repeatability to reduce measurement uncertainty
- Fast transition speed to reduce testing time
- Flat spectral response to reduce wavelength dependent uncertainty in multi-wavelength applications (CWDM, DWDM)
- Low backreflection to reduce instabilities due to reflected light
- Optional built-in wavelength calibrated power meter reduces the uncertainty by reducing external connections
- High input power capability for EDFA testing and multi-wavelength applications

The MAP Variable Optical Attenuator is a hot-pluggable cassette designed for use within the Multiple Application Platform (MAP). The MAP is a general purpose high density test and measurement platform for lab or production environments. Up to 16 independently controlled attenuators can be installed in a single MAP chassis.

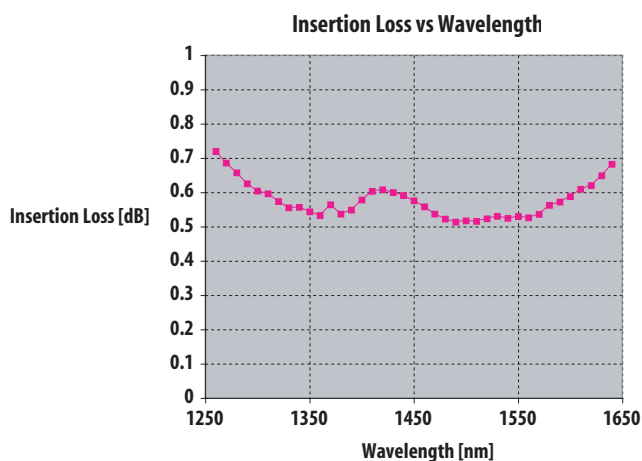


Figure 1: Example of insertion loss of the MAP Variable Optical Attenuator with single-mode fiber

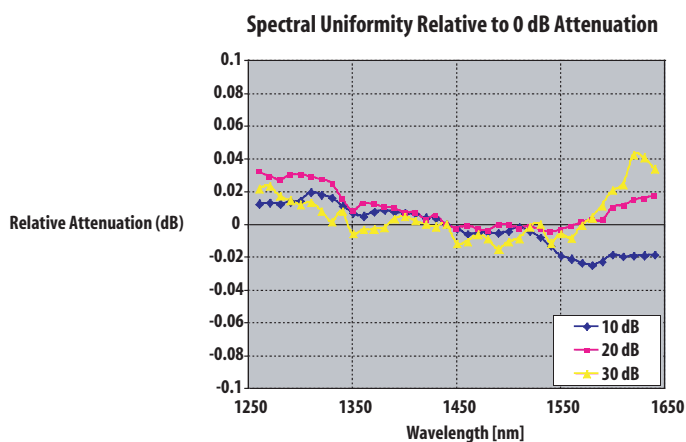


Figure 2: Example of spectral uniformity relative to 0 dB attenuation

Specifications

Parameter	Single-mode		Multimode ¹⁰	
	No power control	With power control	No power control	With power control
Insertion loss at minimum attenuation ^{1, 2, 3}	<1.0 dB ^{4, 5}	<1.7 dB ⁵	<1.5 dB ⁴	<2.2 dB
Maximum input power (Standard power/High power option) ¹³	+23 dBm/+33 dBm		+23 dBm/+27 dBm	
Wavelength range	1260 to 1650 nm		750 to 1350 nm	
Attenuation range ¹	70 dB		65 dB	
Attenuation flatness ^{8, 9}	±0.04 dB from 0 to 30 dB		N/A	
Attenuation slew rate (nominal)	25 dB/s typical		20 dB/s typical	
Attenuation setting resolution	0.001 dB		0.001 dB	
Attenuation accuracy ^{1, 3, 12, 14}	±0.1 dB		±0.1 dB	
Attenuation repeatability ^{2, 3, 11, 12, 14}	±0.01 dB		±0.01 dB	
Closed loop output power range (In-line power monitor option)	N/A	−49 to +11 dBm @ 1310/1550 ±15 nm	N/A	−40 to +5 dBm @ 850/1310 ±15 nm
Relative power meter uncertainty ^{3, 5, 9}	N/A	±0.03 dB	N/A	±0.03 dB
Power setting repeatability ^{5, 9}	N/A	±0.015 dB	N/A	±0.015 dB
Power setting resolution	N/A	0.001 dBm	N/A	0.001 dBm
Polarization dependent loss (from 0 to 25 dB) ^{3, 6}	<0.08 dB	<0.15 dB	N/A	N/A
Return loss ⁷	>55dB typical APC/45dB typical PC		>30 dB typical (PC connector)	
Shutter isolation	100 dB typical			
Warm up time	30 minutes			
Calibration period	2 years			
Operating temperature	0 to 50°C			
Storage temperature	−30 to 60°C			
Operating humidity (relative, non-condensing)	<90% @ 23°C, <20% @ 50°C			
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)			
Weight	1.1 kg (2.43 lb) single/1.3 kg (2.87 lb) dual			

- At 1310 ±15 nm and 1550 ±15 nm for SM unit and at 850 ±15 nm and 1300 ±15 nm for MM unit
- Including one mated pair of connectors
- At 23 ±5°C
- Not including tap coupler loss, if installed. Add 0.7 dB for tap coupler option
- Value shown is for 1550 nm. For 1300/1310 nm the value is typical
- At 1550 nm ±15 nm only
- At 1550 nm ±15 nm for SMF, 1300 nm ±15 nm for MMF
- From 1480 nm to 1640 nm relative to 0 dB attenuation
- For unpolarized light
- Multimode specifications are valid for category 4 CPR
- Constant wavelength, constant temperature, constant state of polarization
- Measured using low coherence laser source
- Damage at high optical power due to scratched or poorly cleaned connectors may result. For high power applications, incident light must be applied from “IN” port to “OUT” port. JDSU assumes no responsibility for these user conditions
- From 0 to 45 dB attenuation

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

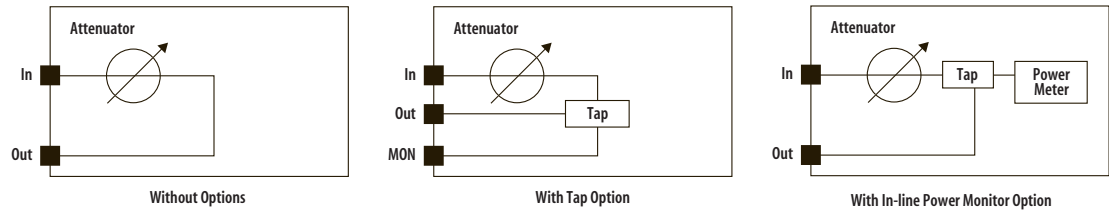
The MAP Variable Optical Attenuators are defined by selecting the required options from the product configurator in the table below. Select one option from each of the three categories (Base, Fiber Type, and Connector Type Options).

Product Code	Description
Base Options (Required, select one)	
MVOA-A2SS0	Single Attenuator, standard power, no built-in options
MVOA-A2SS1	Single Attenuator, standard power, 10/90 splitter for external power monitor
MVOA-A2SSM	Single Attenuator, standard power, with integrated power monitor
MVOA-A2SH0	Single Attenuator, high power, no built-in options
MVOA-A2SH1	Single Attenuator, high power, 10/90 splitter
MVOA-A2SHM	Single Attenuator, high power, with integrated power monitor
MVOA-A2DS0	Dual Attenuator, standard power, no built-in options
MVOA-A2DS1	Dual Attenuator, standard power, 10/90 splitter
MVOA-A2DSM	Dual Attenuator, standard power, with integrated power monitor
MVOA-A2DH0	Dual Attenuator, high power, no built-in options
MVOA-A2DH1	Dual Attenuator, high power, 10/90 splitter
MVOA-A2DHM	Dual Attenuator, high power, with integrated power monitor
Fiber Type Options (Required, select one)	
M100	9/125 fiber type
M101	50/125 fiber type
M102	62.5/125 fiber type
Connector Type Options (Required, select one)	
MFP	FC/PC connector type
MFA	FC/APC connector type (M100 only)
MSC	SC/PC connector type
MSU	SC/APC connector type (M100 only)

Sample Configuration

The following configuration specifies a single attenuator, standard power, no built-in options, 9/125 fiber type, and FC/PC connector type.

MVOA-A2SS0 with options M100 and MFP



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MAP Polarization Controller

(mPCS-A1)



Key Features

- Complete polarization control
- Designed to meet IEEE Std. 802.3ae™ 10 GbE testing requirements
- Designed to perform fast polarization dependent loss (PDL) measurements (4-state Mueller method)
- Compact single width cassette
- Very high angular accuracy and absolute fast axis alignment accuracy
- Can be automated when used with MAP-200
- LXI-compliant interfaces and IVI drivers

Applications

- Passive component PDL and polarization mode dispersion (PMD) measurements
- EDFA noise and polarization dependent gain (PDG) measurements
- 10 GbE transceiver worst-case relative intensity noise and dispersion penalty measurements
- Optical signal to noise ratio (OSNR) and extinction ratio (ER) measurements

Safety Information

- The MAP Polarization Controller, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Polarization Controller (mPCS-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print.

The mPCS-A1 provides an efficient and precise way of creating any state of polarization. It can also be used as part of a polarization state analyzer. The mPCS-A1 is comprised of three rotating elements: a high extinction ratio polarizer, a quarter-wave plate and a half-wave plate. The controller configuration can be offered with a single-mode (SM) or a polarization maintaining fiber (PMF) input.

The polarization controllers can be combined with other instruments to complete measurement test systems such as erbium-doped fiber amplifier (EDFA) or passive component test sets.

Specifications

Parameter	1310 nm	1550 nm
Wavelength range	1260 to 1360 nm	1420 to 1630 nm
Insertion loss (IL) ^{1,3}	<1.5 dB	<1.5 dB
IL variation with wavelength ^{1,3}	±0.1 dB	±0.1 dB
IL variation with rotation ^{1,3,4}	±0.05 dB	±0.05 dB
Return loss (RL)	>45 dB	>45 dB
Extinction ratio ²	>40 dB	
Fast axis alignment accuracy	<± 0.5°	
Angular accuracy	±0.1°	
Rotational resolution	0.075°	
Maximum rotational speed per element	900°/s	
Maximum optical input power	100 mW	
Calibration	2 years	
Operating temperature	10 to 40°C	
Storage temperature	-30 to 60°C	
Humidity	Maximum 95% RH from 10 to 40°C non-condensing	
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)	
Weight	1.6 kg (3.5 lb)	

1. From 1520 to 1630 nm for the 1550 nm version
2. Measured with a >45 dB polarized narrow spectral line source
3. At 23°C 5°C
4. IL variation using an incoherent (broadband) source with both waveplates rotating at differing rates

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Product Code	Description
Base Options (Required, select one)	
MPCS-A1300	Polarization controller, 1260 to 1360 nm
MPCS-A1500	Polarization controller, 1420 to 1630 nm
Fiber Type Options (Required, select one)	
M100	9/125 fiber type
M103	PMF fiber type
Connector Options (Required, select one)	
MFP	FC/PC connector type
MFA	FC/APC connector type
MSC	SC/PC connector type
MSU	SC/APC connector type

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MAP Variable Backreflector (mVBR-A1)



- Key Features**
- Operation at 850/1310 or 1310/1550 nm
 - Single-mode or multimode fiber
 - Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

Applications

- Transmitter/receiver development and testing
- Reflection testing for connectors
- Quality assurance acceptance testing
- Laser development and production

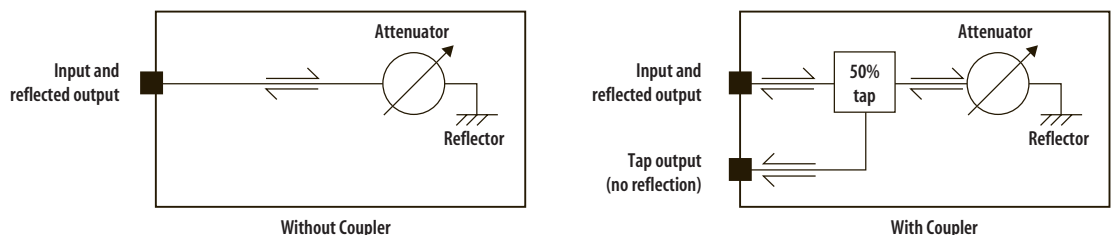
Safety Information

- The MAP Variable Backreflector, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Variable Backreflector (mVBR-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized by density and maximum configurability to meet specific application requirements in the smallest possible foot print. The MAP Variable Backreflector cassette provides precise levels of return loss (RL) to transmitters, enabling system sensitivity measurement or system degradation as a function of back-reflection measurement.

When used with a transmitter/receiver pair and characterization equipment, the MAP backreflector can be used to establish the magnitude of reflections that significantly degrade transmission system performance, and to characterize the problems they cause.

The MAP backreflector uses the JDSU linear attenuator prism and high reflectivity mirror to precisely control the level of RL. The cassette is available in single-mode (SM) or multimode (MM) fibers and with an optional coupler for monitoring.



Optical Configurations for the Variable Backreflector Cassette

Specifications

Parameter	Single-mode fiber (SMF) without Coupler	Single-mode fiber (SMF) with 50/50 Coupler	Multimode fiber (MMF) without Coupler	Multimode fiber (MMF) with 50/50 Coupler
Wavelength range	1260 to 1650 nm	1260 to 1650 nm	750 to 1350 nm	750 to 1350 nm
Maximum backreflection level	> -5.0 dB	> -9.5 dB	> -5.0 dB	> -9.5 dB
Minimum backreflection level (APC/PC)	< -60 / < -45 dB	< -60 / < -45 dB	-30 / < -30 dB	-30 / < -30 dB
Insertion loss (IL) (IN to OUT) ^{1,2,3}	N/A	< 5.0 dB	N/A	< 6.0 dB
Relative backreflection setting accuracy ^{1,3,4}	±0.2	±0.2	±0.4	±0.4
Backreflection setting resolution	0.01	0.01	0.01	0.01
Fiber type	9/125 µm	9/125 µm	50/125 or 62.5/125 µm	50/125 or 62.5/125 µm
Polarization dependent loss (PDL) ¹	< 1.0 dB	< 1.0 dB	N/A	N/A
Maximum optical input power	200 mW			
Calibration period	2 years			
Warm-up time	30 minutes			
Operating temperature	0 to 50°C			
Storage temperature	-30 to 60°C			
Humidity	< 90% at 23°C, < 20% at 50°C (relative non-condensing)			
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)			
Weight	1.1 kg (2.43 lb) single backreflector / 1.3 kg (2.87 lb) dual backreflector			

1. At 1310 ±15 and 1550 ±15 nm for SM units and at 850 ±15 nm and 1310 ±15 nm for MM units
2. Including one mated pair of connectors
3. At 23 ±5°C
4. From maximum backreflection to -40 dB for SM units and from maximum backreflection to -25 dB for MM units

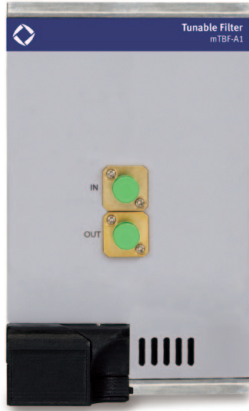
Ordering Information

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Product Code	Description
Base Options (Required, select one)	
MVBR-A1S0	Single Backreflector, no built-in option
MVBR-A1S1	Single Backreflector with built-in 50/50 splitter
MVBR-A1D0	Dual Backreflector, no built-in option
MVBR-A1D1	Dual Backreflector with built-in 50/50 splitter
Fiber Type Options (Required, select one)	
M100	9/125 fiber type
M101	50/125 fiber type
M102	62.5/125 fiber type
Connector Options (Required, select one)	
MFP	FC/PC connector type
MFA	FC/APC connector type (M100 only)
MSC	SC/PC connector type
MSU	SC/APC connector type (M100 only)

MAP Tunable Filter

(mTBF-A1)



- Key Features**
- Available in three FWHM bandwidths (0.11, 0.25, 0.55 nm)
 - Low polarization dependent loss (PDL) (<0.3 dB)
 - Wide wavelength range (1520 to 1630 nm)
 - Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

Applications

- Spontaneous emission suppression
- Amplifier characterization (Up to 1 W input power)
- BER testing
- Tunable laser-based testing

Safety Information

- The MAP Tunable Filter, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Tunable Filter (mTBF-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print. The MAP Tunable Filter is a tunable bandpass filter that offers continuous wavelength tuning from 1520 to 1630 nm. It is used for applications requiring low insertion loss (IL), high rejection, narrow bandwidth and wavelength tuning resolution of 0.005 nm. The standard model has a maximum input power of 300 mW and the high power option provides a maximum input power of 1000 mW.

Two options are available:

- the peak search option, used to find the absolute maximum transmission power within the filter's wavelength tuning range or a local maximum transmission power within a user-defined wavelength range
- 10% tap option for power monitoring

MAP Tunable Filter is ideal for applications where the user needs to suppress amplified spontaneous emissions (ASE) or isolate specific wavelengths. These applications include amplifier characterization, bit error rate (BER) testing and optical signal-to-noise ratio (OSNR) measurement.

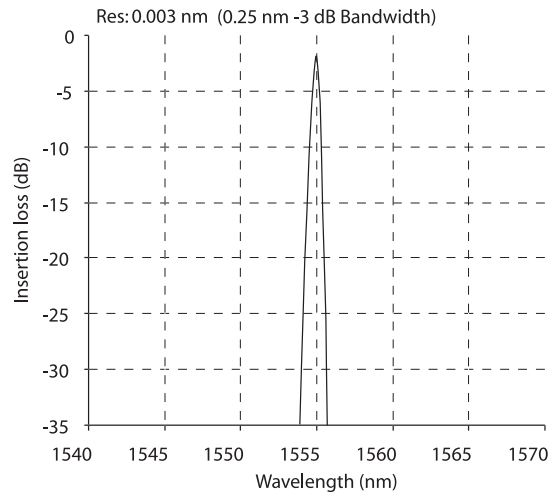


Figure 1. Model "G" filter shape shows the low IL and sharpness of the filter.

The filter makes use of a diffraction grating to separate the input light along several discrete paths. A stepper-motor rotates the grating to transmit the desired wavelength along the output fiber.



Figure 2. mTBF GUI - detailed view

Specifications

Parameter	Model C	Model G	Model K
Wavelength range	1520 to 1630 nm	1520 to 1630 nm	1520 to 1630 nm
Optical shape	Gaussian	Gaussian	Gaussian
–3 dB bandwidth ¹	0.11 nm ±15%	0.25 nm ±15%	0.55 nm ±15%
3/20 dB ratio ¹	0.40 ±0.05	0.31 ±0.05	0.31 ±0.05
Insertion loss (IL) ²			
1520 to 1610 nm	<6.0 dB	<5.8 dB	<5.8 dB
1610 to 1630 nm	<8.0 dB	<8.0 dB	<8.0 dB
Input power ³	300 mW or 1 W	300 mW or 1 W	300 mW or 1 W
Return loss (RL) ⁴		>45 dB	
Wavelength resolution		0.005 nm	
Polarization dependent loss (PDL) ⁵ , 1520 to 1630 nm		<0.3 dB	
Tuning speed		>5 nm/s	
Peak to average background noise		>45 dB	
Accuracy		±0.2 nm	
Peak search accuracy		<0.2 dB from output peak power	
Polarization mode dispersion (PMD)		<0.3 ps	
Group delay variation within a –3 dB bandwidth		<5 ps	
Recommended calibration period		1 year	
Operating temperature		10 to 35°C	
Storage temperature		–10 to 60°C	
Dimensions (W x H x D)		8.1 x 13.26 x 37.03 cm (3.19 x 5.22 x 14.58 in)	
Weight		2.3 kg (5.07 lb)	

1. Measured at 1550 nm
2. Add 1.2 dB for tap or peak search option
3. At 23°C ±5°C
4. At selected wavelength
5. Input power is within the range of –20 dBm to +20 dBm. Excludes PDL effect

Ordering Information

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Product Code	Description
Base Options (Required, select one)	
MTBF-A1CS0	Tunable Filter, C Model, 0.11 nm –3 dB Bandwidth, Standard Power (300 mW)
MTBF-A1GS0	Tunable Filter, G Model, 0.25 nm –3 dB Bandwidth, Standard Power (300 mW)
MTBF-A1KS0	Tunable Filter, K Model, 0.55 nm –3 dB Bandwidth, Standard Power (300 mW)
MTBF-A1CH0	Tunable Filter, C Model, 0.11 nm –3 dB Bandwidth, High Power (1 W)
MTBF-A1GH0	Tunable Filter, G Model, 0.25 nm –3 dB Bandwidth, High Power (1 W)
MTBF-A1KH0	Tunable Filter, K Model, 0.55 nm –3 dB Bandwidth, High Power (1 W)
Built-in Options (Optional, select one)	
M10SPLITTER	10% Output Tap option
MPOWMON	Power Monitor option
Connector Options (Required, select one)	
MFP	FC/PC connector type
MFA	FC/APC connector type
MSC	SC/PC connector type
MSU	SC/APC connector type

MAP Optical Power Meter Module

(mOPM-B1)



Key Features

- Panel mount or remote head configuration
- Single, dual, or quad channel configurations available
- 250 kHz sampling rate for high-speed applications
- 750 to 1700 nm operating wavelength range
- Maximum input power up to 27 dBm available
- Compatible with single-mode and multimode fiber
- Ability to store up to 100,000 data points per channel

Applications

- Amplifier characterization
- Receiver and transmitter testing
- Absolute power measurement
- Optical switching time measurement

Compliance

- The MAP Optical Power Meter, when installed in a MAP chassis, complies with CE, CSA/UL/IEC61010-1, plus LXI Class C requirements

The Multiple Application Platform (MAP-200) Optical Power Meter Module (mOPM-B1) is a second-generation power meter that brings a range of panel mount and remote head configurations to the JDSU MAP-200 platform.

The MAP-200 is the first photonic layer lab and manufacturing platform to be LAN Extensions for Instrumentation (LXI)-compliant, bringing the full power of Ethernet connectivity and ease of use of interchangeable virtual instrument (IVI) drivers to the optical test environment. The MAP-200 platform's industry-leading density and configurability enables test engineers to meet specific application requirements in the smallest possible footprint.

The MAP Optical Power Meter Module extends the optical power measurement capability of the MAP-200 by offering three grades of optical performance available in panel-mount or remote-head configurations with 1, 2, or 4 inputs per module.

Optical Performance

All three performance grades are based on indium gallium arsenide (InGaAs) detectors and are suitable for applications using single-mode (SM) or multimode (MM) fiber. They feature high accuracy, high linearity, and extremely low polarization dependant loss (PDL). The general purpose grade provides a measurement range of -70 to +10 dBm. The high-performance detector features thermal stabilization, which results in an extended wavelength range and a power measurement range of -80 to +10 dBm. The high power grade extends high-power measurement capability to +27 dBm.

Packaging Options

The mOPM-B1 comes factory-configured with panel-mounted detectors or as an interface module with 1, 2, or 4 electrical connections for remote heads. Remote heads facilitate positioning the detector close to the device under test (DUT) and away from other test equipment. The interface module is compatible with all performance grades of remote head and can accommodate a mix of performance grades. For example, an application requiring a general purpose optical power measurement (OPM) and a high-power OPM could be connected to the same Remote Head Base module, thereby reducing the number of slots used in the MAP-200 chassis.

Enhanced Functionality

All mOPM-B1 configurations support array capture with memory depth of 100,000 points per optical sensor. This feature combined with an adjustable sampling frequency (up to 250 kHz) is ideal for data logging applications or for capturing transient events.

Accessories

For ultimate flexibility, the detector heads offer JDSU AC1xx-series interchangeable detector adapters that are available for most connector types, as well as a fiber holder that permits bare fiber measurements. The mOPM-B1 is supplied with a detector cover and fixed connection (FC)-detector adapter as standard accessories. As an option for remote head users, a 1.8 m (6 foot) extension cable is available.

GUI

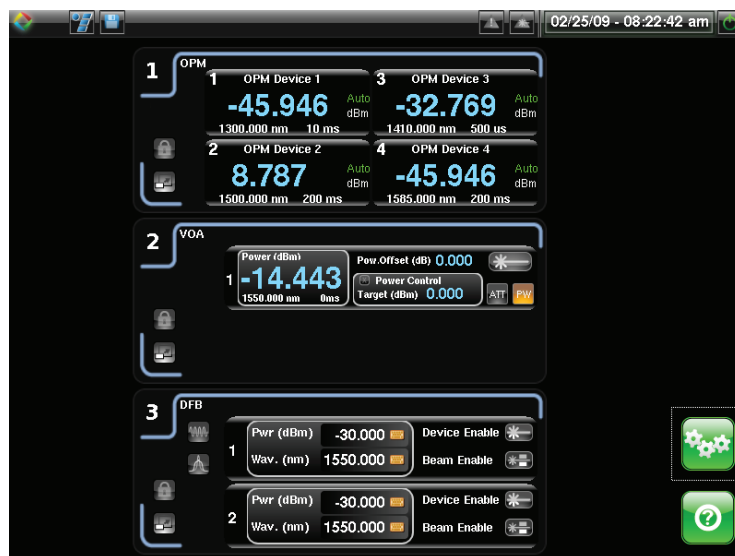


Figure 1. mOPM main user interface

Super Application: OPMscope

The OPMscope is a Super Application designed for use with the MOPM-B1 line of power meters on the MAP-200 platform. This software feature is an intuitive tool geared for designers and allows graphical representation of optical signals, much like a digital sampling scope, but in the optical domain. This tool can be used to trigger on rising or falling edges, with the ability to see history using pre-trigger data points. It allows users to pan and zoom to see details and monitor transients. It allows export of up to 100,000 captured data for extended analysis from up to four optical heads simultaneously.

Additional Applications

- DUT settling time, cross talk, rise time and fall time
- measures synchronization and additional stability
- measures link recovery time
- allows for performance comparison (for example, comparing sequential switching to random switching)

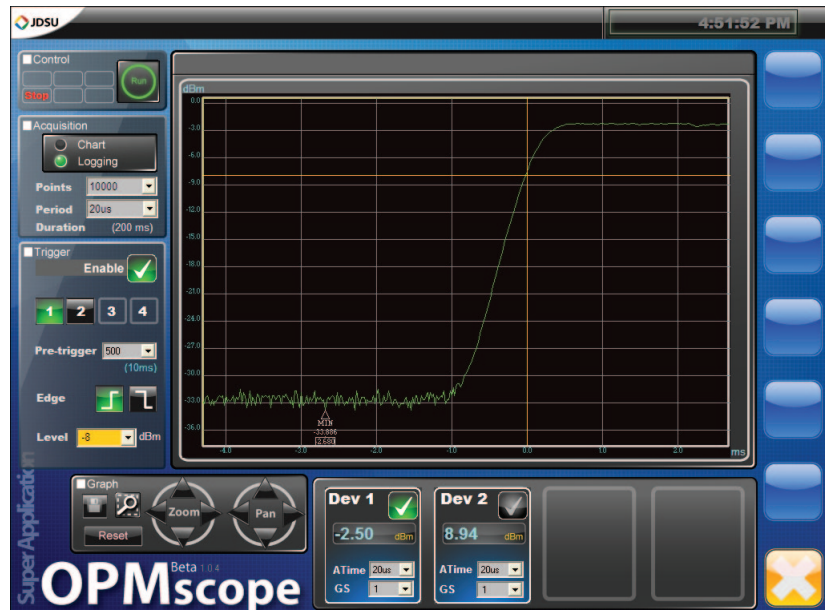


Figure 2. OPMscope main user interface

Specifications

Parameters	General Purpose	Premium Performance	High Power
Detector type	InGaAs	TEC InGaAs	Filtered InGaAs
Detector size	2 mm	3 mm	2 mm
Wavelength range	800 -1650 nm	750 -1700 nm	800 -1630 nm
Fiber type ¹	SMF and MMF with NA 0.27 (maximum core size 62.5 µm)		
Dynamic range	+11 dBm to -70 dBm	+11 dBm to -80 dBm	+27 dBm to -45 dBm
Uncertainty at reference condition ²	± 2.5 % (800-1510 nm)	± 2.2 % (800-1510 nm)	± 3.9 % (800-960 nm)
	± 2.4 % (1510-1600 nm)	± 2.3 % (1510-1600 nm)	± 3.6 % (960-1300 nm)
	± 2.7 % (1600-1635 nm)	± 2.5 % (1600-1635 nm)	± 3.7 % (1300-1510 nm)
			± 3.8 % (1510-1600 nm)
Total uncertainty ³			± 4.0 % (1600-1635 nm)
	± 3.2 % ±5pW (800-900 nm)	± 3.0 % ±1pW (800-1510 nm)	± 4.6 % ±100pW (800-900 nm)
	± 5.2 % ±5pW (900-960 nm)	± 3.1 % ±1pW (1510-1600 nm)	± 7.9 % ±100pW ⁶ (900-960nm)
	± 3.1 % ±5pW (960-1510 nm)	± 3.4 % ±1pW (1600-1635 nm)	± 3.9 % ±100pW (960-1300 nm)
	± 3.1 % ±5pW (1510-1600 nm)		± 4.4 % ±100pW (1300-1510 nm)
	± 3.8 % ±5pW (1600-1635 nm)		± 4.5 % ±100pW (1510-1600 nm)
			± 5.2 % ±100pW (1600-1635 nm)
Linearity (at 23 ± 5°C)	± 0.010 dB ±5 pW	± 0.010 dB ±1 pW	±0.010 dB ±100 pW (for -45 dBm to +10dBm) ± 0.03 dB (for +10 dBm to +27 dBm)
Noise (peak to peak) ⁴	2 pW	1 pW	50 pW
Return loss		>55 dB typ	
Relative uncertainty due to polarization ⁵	<±0.015 dB	<±0.01 dB	<±0.07 dB
Maximum number of channels (Panel mount)	1,2, or 4	1, 2, or 4	1,2, or 4
Sampling time		4 µs (250 kHz)	
Averaging time		20 µs to 5 s	
Buffer size		100000 points	
Supported connectors ⁷	FC, ST, SC, MT-RJ, LC, E2000, MU, MTP, Bare Fiber		
Recalibration period		1 year	
Warm-up time		30 minutes	
Operating temperature		5 to 40°C	
Humidity		15 – 80% Relative humidity, non-condensing	
Dimension (W x H x D)		4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)	
Weight		1.2 kg (2.65 lb)	

- For 62.5 µm core fiber, additional uncertainty of 1%(PC) or 2%(APC) must be added due to overfill of 2mm detector
- Fiber SMF-28, T=23±5°C, Spectral width of source< 6 nm, Optical Power on detector= -20 dBm
- SMF 28, N/A of fiber ≤ 0.27, Temperature, humidity and power range per Table
- 1 second averaging time, 300 consecutive measurements(300s), T=23 ± 5°C
- All states of polarization, constant power, straight connector, T=23 ± 5°C.
WL=1550nm±30nm, MPMHP at WL=1310 nm.
- For 900 – 960 nm only, uncertainty indicated is for 15-35 °C
- Note that MT Connector size prevents the use of adjacent channels. Therefore a 4 channel cassette only allows 2 MT input at a time.

Ordering Information

Parameters	Remote Head
Cable Length	1.4 m (4.5 feet)
Dimension	13.8 cm x 5 cm x 5 cm (5.4in x 2in x 2in) excluding cable
Weight	0.6 kg (1.3 lb)

Panel-Mount Head Application

Base Module Options (Required: Panel-mount detector types cannot be mixed and matched)

MOPM-B1PMH Panel-Mount Head Module

Panel-Mount Detector Options (Select type and specify quantity)

MPMGP	2 mm InGaAs Panel-Mount Head General Purpose	Qty 1, 2, or 4 per Module
MPMHP	2 mm InGaAs Panel-Mount Head High Power	Qty 1, 2, or 4 per Module
MPMPP	3 mm InGaAs Panel-Mount Head Premium Performance	Qty 1, 2, or 4 per Module

Remote Head Application

Base Module Options (Required: Select one)

MOPM-B1RH1 Single-Channel Remote Head Module

MOPM-B1RH2 Dual-Channel Remote Head Module

MOPM-B1RH4 Quad-Channel Remote Head Module

Remote Head Options (Select type and specify quantity)

MOPM-B1RHGP	2 mm InGaAs Remote Head General Purpose	1 detector per head
MOPM-B1RHHP	2 mm InGaAs Remote Head High Power	1 detector per head
MOPM-B1RHPP	3 mm InGaAs Remote Head Premium Performance	1 detector per head

Optional Accessories¹

Part Number	Description	Image
AC100	Detector cap	
AC101	FC adapter	

Applications

Part Number	Description
MSUP-OPMSCOPE	Optical Scope Licensed Super Application for MOPM-B1 Power Meters

Sample Configuration for Panel Mount

Type of Detector	Single Channel	Dual Channel	Quad Channel
General Purpose	MOPM-B1PMH MPMGPx1	MOPM-B1PMH MPMGPx2	MOPM-B1PMH MPMGPx4
High Power	MOPM-B1PMH MPMHPx1	MOPM-B1PMH MPMHPx2	MOPM-B1PMH MPMHPx4
Premium Performance	MOPM-B1PMH MPMPPx1	MOPM-B1PMH MPMPPx2	MOPM-B1PMH MPMPPx4

1. All General Purpose and Premium Performance MOPM are supplied with one AC100 and one AC101 per detector. All High Power MOPM are supplied with one AC100 and one high power FC adapter per detector.

MAP Broadband Source (mBBS-A1)



Key Features

- Flattened output power spectrum
- High output power density
- High spectral stability
- Control and monitoring features
- Can be automated when used with MAP-200
- LXI-compliant interfaces and IVI drivers

Applications

- Optical component spectral tests
- Systems compliance tests
- Optical measurement systems
- Sensor and imaging experiments

Safety Information

- The MAP Broadband Source, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1 (2002), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001.

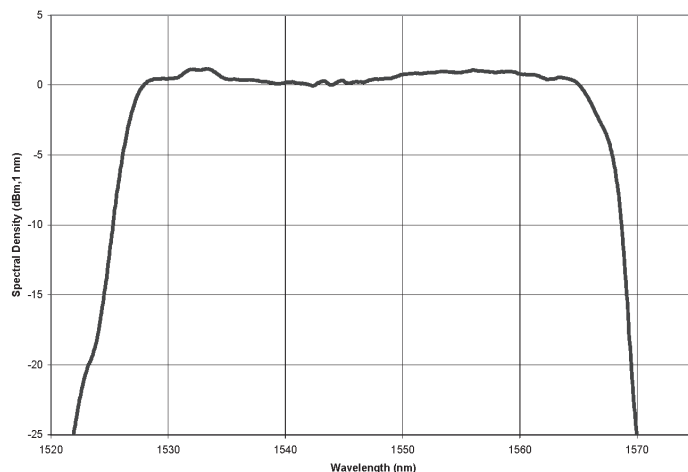
INVISIBLE LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT
(IEC 60825-1, 2002)
MAX. 500 mW, 700-1680 nm

The Multiple Application Platform (MAP) Broadband Source (mBBS-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print.

Utilizing the latest advances in erbium technology, the MAP BBS offers an amplified spontaneous emission (ASE) output that features flattened high power density across the C-band. The source provides high spectral stability.

The addition of the BBS Cassette can be used for many applications including OSNR (optical signal to noise ratio) experiments, calibration of test equipment, and noise source for active or passive component testing.

The MAP BBS models provide specialized variants and optical performance not available in the Benchtop BBS.



Spectral Density Plot
C-band 50 mW

Specifications

Parameter	C-Band 50 mW Output Power	C-Band 100 mW Output Power
Operating wavelength range	1527 to 1568 nm	1525 to 1568 nm
Total optical power (minimum) ¹	50 mW	100 mW
Spectral gain flatness (maximum) ²	1.8 dB	1.8 dB
Total output power stability		0.02 dB
Output isolation (minimum)		45 dB
Operating temperature		0 to 50°C
Storage temperature		–30 to 60°C
Humidity		Maximum 95% RH non-condensing from 0 to 45°C
Dimensions (W x H x D)		4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)
Weight		2.3 kg (5.07 lb)

¹ Measured at 1550 nm at 23°C after one hour warm up

² Flatness range 1529 to 1565 nm for C-Band model

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Product Code	Description
Base Options (Required, select one)	
MBBS-A1C050	C-Band Broadband Source, 50 mW output power
MBBS-A1C100	C-Band Broadband Source, 100 mW output power
Connector Options (Required, select one)	
MFP	FC/PC connector type
MFA	FC/APC connector type



If the configurations available do not meet your performance requirements, please contact your global sales and customer service team to discuss the potential for specialized solutions.

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MAP Tunable DBR Laser (mTLG-A1)



- Key Features**
- Single, Dual, or Quad channel configurations available
 - C- or L-Band tunability
 - Wavelength tuning range of 38 nm
 - 25 GHz channel spacing
 - Narrow linewidth <5 MHz
 - C-band features:
 - Output power >12 dBm
 - SMSR 40 dB min

Applications

- Optical amplifier testing
- Tunable laser grids
- DWDM transmission testing
- Fiber characterization
- Transmitter and receiver testing

Compliance

- The MAP Tunable DBR Laser, when installed in a MAP chassis, complies with CE, CSA/UL/IEC61010-1, plus LXI Class C requirements and meets the requirements of Class 1M in standard IEC 60825-1 (A2:2001)

INVISIBLE LASER RADIATION
DO NOT VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS
CLASS 1M PRODUCT
(IEC/EN 60825-1 / A2:2001)
40mW at 1550nm

The Multiple Application Platform (MAP-200) Tunable Distributed Bragg Reflector (DBR) laser (mTLG-A1) is a new-generation tunable laser that is ideal for DWDM testing where the capability to change wavelength on demand over the C- and L-bands with 25 GHz spacing is essential.

The MAP-200 is the first photonic layer lab and manufacturing platform to be LAN Extensions for Instrumentation (LXI)-compliant, bringing the full power of Ethernet connectivity and ease of use of interchangeable virtual instrument (IVI) drivers to the optical test environment. The MAP-200 platform's industry-leading density and configurability enables test engineers to meet specific application requirements in the smallest possible footprint.

The new mTLG-A1 is based on a Sampled Grating Distributed Bragg Reflector (SG-DBR) laser with an integral wavelength locker. Wavelength and output power settings are controlled using the MAP-200 local interface or automation interfaces. The integrated wavelocker and automatic power control loop enable very stable operation.



Figure 1. mTLG screen capture

Specifications

Parameter	C-Band	L-Band
Wavelength		
Tuning range	191.30 to 196.10 THz, 1528.77 to 1567.13 nm	186.35 to 190.95 THz, 1570.01 to 1608.76 nm
Accuracy ^{1,2,3}	± 2 GHz (± 0.016 nm)	
Stability 15 minutes ^{1,2,3}	± 0.005 nm Typ	
Stability 24 hours ^{1,2,3}	± 0.01 nm Typ	
Channel spacing	25 GHz	
Power		
Setting range ⁴	7 to 13 dBm	7 to 11 dBm
Stability 15 minutes ^{1,2,3}	± 0.005 dB Typ	
Stability 24 hours ^{1,2,3}	± 0.03 dB Typ	
Resolution	< 0.1 dB Typ	
Spectral properties		
Linewidth ⁵	≤ 5 MHz	
SMSR	40 dB min, 45 dB Typ	38 dB min, 45 dB Typ
RIN	-140 dB/Hz Typ; -135 dB/Hz Max	-138.5 dB/Hz Typ; -133.5 dB/Hz Max
Other		
Fiber type	Polarization maintaining fiber; Slow axis aligned with connector key	
Supported connectors	FC/APC	
Warm-up time	1 hour	
Operating temperature	10 to 40°C	
Humidity	$< 80\%$ RH, 10 to 40°C non-condensing	
Dimension	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)	
Weight	1.3 kg (2.95 lbs) maximum (varies with configuration)	

1. At full power.
2. After 1-hour warm up.
3. Constant temperature within $25 \pm 3^\circ\text{C}$.
4. Power at max setting: > 12 dBm for C-band and > 10 dBm for L-band.
5. Natural (instantaneous) linewidth of the laser; with self-homodyne measurements indicated linewidth is typically 50-100 MHz.

Ordering Information

Product Code	Description
MTLG-A1C10	C-band single laser
MTLG-A1C20	C-band dual density per module
MTLG-A1C40	C-band quad density per module
MTLG-A1L10	L-band single laser
MTLG-A1L20	L-band dual density per module
MTLG-A1L40	L-band quad density per module
MTLG-A1C1L1	C- and L-band dual density per module

MAP Fabry-Perot Laser (mFPL-A1)



Key Features

- Dual independent sources available in a single cassette
- Single-mode (SM)/Multimode (MM) output
- Internal modulation
- Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

Applications

- Insertion loss (IL) testing
- Return loss (RL) testing
- Polarization dependent loss (PDL) testing
- Dense wavelength division multiplexing (DWDM) testing

Compliance

- The MAP Fabry-Perot Laser Source, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1 (2002), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001.

The Multiple Application Platform (MAP) Fabry-Perot Laser Source (mFPL-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print.

The mFPL-A1 consists of a Fabry-Perot laser diode combined with a high performance laser driver circuitry for optimal wavelength and power stability. It features internal modulation capabilities and variable power control. Cassettes can be configured with two independent sources for maximum instrumentation density.

INVISIBLE LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT
(IEC 60825-1, 2002)
MAX. 500 mw, 700-1680 nm

Single-mode (SM) Specifications

Parameter	980 nm	1310 nm	1480 nm	1550 nm	1625 nm	1650 nm
Peak wavelength	980 ±20 nm	1310 ±20 nm	1480 ±20 nm	1550 ±20 nm	1625 ±20 nm	1650 ±20 nm
Spectral width (FWHM)	<5 nm	<5 nm	<5 nm	<6 nm	<7 nm	<7 nm
Total power ^{1,2}	0 dBm	−3 dBm	−3 dBm	−3 dBm	−3 dBm	−3 dBm
Fiber type	Flexcor™	SMF-28	SMF-28	SMF-28	SMF-28	SMF-28
Modulation ³	0.2 to 20 kHz					
Stability (15 minutes) ^{1,2,4}	±0.005 dB					
Connector type	FC/PC, FC/APC					
Operating temperature	10 to 40°C					
Storage temperature	−30 to 60°C					
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)					
Weight	0.5 kg (1.1 lb)					

1. After 30 minute warm-up
2. Measured at constant temperature of 23 ±5°C
3. Modulation duty cycle is adjustable from 15% to 85%. Modulation depth is fixed at 100%
4. Measured at full power

Multimode (MM) Specifications

Parameter	850 nm	1310 nm	1550 nm
Peak wavelength	850 ±20 nm	1310 ±20 nm	1550 ±20 nm
Spectral width (FWHM)	<8 nm	<8 nm	<8 nm
Total power ^{1,2}	−3 dBm	−6 dBm	−6 dBm
Modulation ³	0.2 to 20 kHz		
Stability (15 minutes) ^{1,2,4}	±0.01 dB		
Connector type	FC/PC, FC/APC		
Operating temperature	10 to 40°C		
Storage temperature	−30 to 60°C		
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)		
Weight	0.5 kg (1.1 lb)		

1. After 30 minute warm-up
2. Measured at constant temperature of 23 ±5°C
3. Modulation duty cycle is adjustable from 15% to 85%. Modulation depth is fixed at 100%
4. Measured at full power

Ordering Information

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Product Code	Description
Base Options (Required, select one)	
MFPL-A1100	Fabry-Perot mono-wavelength laser source
MFPL-A1200	Fabry-Perot bi-wavelength laser source
Laser Wavelength Options (Required, select one or two)	
MWL1650A	1650 nm wavelength
MWL1625A	1625 nm wavelength
MWL1550A	1550 nm wavelength
MWL1480A	1480 nm wavelength
MWL1310A	1310 nm wavelength
MWL0980A	980 nm wavelength
MWL0850A	850 nm wavelength
Fiber Type Options (Required, select one)¹	
M100	9/125 fiber type
M101	50/125 fiber type (850, 1310 and 1550 nm only)
M102	62.5/125 fiber type (850, 1310 and 1550 nm only)
M104	Flexcore fiber (980 nm only)
Connector Options (Required, select one)	
MFP	FC/PC connector type
MFA	FC/APC connector type (M100 only)

1. SM and MM fiber type options cannot be combined in one module

UL is a registered trademark of Underwriters Laboratories Inc.
Flexcor is a registered trademark of Corning Inc.

MAP Light Emitting Diode Source (mLED-A1)



Key Features

- Dual independent sources available in a single cassette
- Single-mode (SM)/Multimode (MM) output
- Internal modulation circuitry
- Can be automated when used with MAP-200
- LXI-compliant interfaces and IVI drivers

Applications

- Optical component spectral tests
- Systems compliance tests
- Sensors and imaging

Safety Information

- The MAP LED Source, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1(2002), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001.

The Multiple Application Platform (MAP) Light Emitting Diode Source (mLED-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print.

The mLED-A1 is a high-power LED based light source with variable output power. High output power and excellent wavelength stability, combined with built in modulation circuitry, make this light source suitable for wavelength division multiplexing (WDM) component manufacturing and testing. Other applications of this device include sensing, spectroscopy and amplified spontaneous emissions (ASEs) loading for optical signal-to-noise ratio (OSNR) measurements.

INVISIBLE LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT
(IEC 60825-1, 2002)
MAX. 500 mw, 700-1680 nm

Specifications

Parameter	Single-mode (SM) 1310 nm	Single-mode (SM) 1550 nm	Multimode (MM) 850 nm	Multimode (MM) 1310 nm	Multimode (MM) 1550 nm
Peak wavelength	1310 ±20 nm	1550 ±20 nm	850 ±20 nm	1310 ±20 nm	1550 ±20 nm
3 dB width	>40 nm	>40 nm	—	—	—
Spectral ripple (RB = 0.1 nm)	0.35 dB	0.35 dB	—	—	—
Total power ^{1,2}	0 dBm	0 dBm	−3 dBm	−3 dBm	−3 dBm
Modulation	0.2 to 20 kHz				
Stability (15 minutes) ^{1,2,3}	±0.01 dB				
Connector type	FC/PC, FC/APC				
Operating temperature	10 to 40°C				
Storage temperature	−30 to 60°C				
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)				
Weight	0.5 kg (1.1 lb)				

1. After 30 minute warm-up
2. Measured at constant temperature of 23 ±5°C
3. Measured at full power

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Product Code	Description
Base Options (Required, select one)	
MLED-A1100	LED mono-wavelength laser source
MLED-A1200	LED bi-wavelength laser source
Laser Wavelength Options (Required, select one or two)	
MWL1550A	1550 nm wavelength
MWL1310A	1310 nm wavelength
MWL0850A	850 nm wavelength
Fiber Type Options (Required, select one)¹	
M100	9/125 fiber type (1310 and 1550 nm only)
M101	50/125 fiber type
M102	62.5/125 fiber type
Connector Options (Required, select one)	
MFP	FC/PC connector type
MFA	FC/APC connector type (M100 only)

1. SM and MM fiber type options cannot be combined in one module

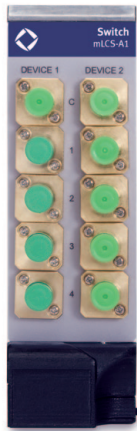


If the configurations available do not meet your performance requirements, please contact your global sales and customer service team to discuss the potential for specialized solutions.

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MAP Large Channel Count Switch

(mLCS-A1)



- Key Features**
- Insertion loss (IL) <0.7 dB and return loss (RL) >57 dB
 - Low polarization dependent loss (PDL) 0.04 dB
 - Up to 1x50 switch configurations in a single width cassette
 - Single and dual 2xN switch configurations

Applications

- Dense wavelength division multiplexing (DWDM) channel testing
- Amplifier characterization
- Bit error rate (BER) testing
- Signal routing

Safety Information

- The MAP Large Channel Count Switch, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Large Channel Count Switch (mLCS-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print.

The MAP Large Channel Count Switch is based on JDSU expanded beam and alignment technologies and exhibits low insertion loss (IL) and high return loss (RL). It is available in single-switch configurations from 1x4 up to 1x50, dual independent switch configurations from 1x4 up to 1x25, and both single and dual independent switch configurations from 2x4 to 2x16. An important element of an optical test bed, optical switches increase throughput by enabling time-saving automation, reduce uncertainty from repeated connector mating, and maximize usage of expensive test equipment.

Specifications

Parameter	Single-mode fiber SMF 9/125 Typical/Maximum	Multimode fiber MMF 50/125 and 62.5/125 Typical/Maximum
Wavelength range	1270 to 1670 nm	850 to 1350 nm, 750 to 940 nm
Insertion loss (IL) ¹ (N = number of output channels)		
N ≤ 25	0.5 dB/0.7 dB	0.4 dB/0.6 dB
N > 25, 2xN	0.8 dB/1.2 dB	0.7 dB/1.0 dB
Polarization dependent loss (PDL) ¹		
N ≤ 25	0.02 dB/0.04 dB	N/A
N > 25, 2xN	0.04 dB/0.08 dB	N/A
Return loss (RL) ^{1,2}		
N ≤ 25	62 dB/57 dB	25 dB/20 dB
N > 25, 2xN	55 dB/45 dB	20 dB/20 dB
IL Stability		
N ≤ 25		±0.02 dB/±0.025 dB
N > 25, 2xN		±0.03 dB/±0.04 dB
Repeatability sequential switching		
N ≤ 25		±0.005 dB/±0.01 dB
N > 25, 2xN		±0.01 dB/±0.03 dB
Repeatability random switching		
N ≤ 25		±0.01 dB/±0.05 dB
N > 25, 2xN		±0.03 dB/±0.08 dB
Crosstalk		
N ≤ 25		–80 dB/N/A
N > 25, 2xN		–80 dB/N/A
Switching time (first channel / each additional channel)		25 ms/15 ms
Maximum input power (optical)		300 mW
Lifetime		> 100 million cycles
Operating temperature		–5 to 55°C
Storage temperature		–30 to 60°C
Dimensions (W x H x D)		4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)
Weight		1.3 kg (2.87 lb) maximum (varies with configuration)

1. Excluding connectors. All optical measurements taken after temperature has been stabilized for one hour

2. RL is based on 1 m pigtail (equivalent to bulkhead version)

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Product Code	Description
Base Options (Required, select one)	
MLCS-A1104B	Single 1x4 switch, bulkheads
MLCS-A1106B	Single 1x6 switch, bulkheads
MLCS-A1108B	Single 1x8 switch, bulkheads
MLCS-A1112P	Single 1x12 switch, pigtails
MLCS-A1116P	Single 1x16 switch, pigtails
MLCS-A1124P	Single 1x24 switch, pigtails
MLCS-A1132P	Single 1x32 switch, pigtails
MLCS-A1142P	Single 1x42 switch, pigtails
MLCS-A1150P	Single 1x50 switch, pigtails
MLCS-A1204B	Dual independent 1x4 switch, bulkheads
MLCS-A1208P	Dual independent 1x8 switch, pigtails
MLCS-A1212P	Dual independent 1x12 switch, pigtails
MLCS-A1216P	Dual independent 1x16 switch, pigtails
MLCS-A1225P	Dual independent 1x25 switch, pigtails
MLCS-A1104BD	Single 2x4 E configuration switch, bulkheads
MLCS-A1108BD	Single 2x8 E configuration switch, bulkheads
MLCS-A1116PD	Single 2x16 E configuration switch, pigtails
MLCS-A1204PD	Dual 2x4 E configuration switch, pigtails
MLCS-A1208PD	Dual 2x8 E configuration switch, pigtails
MLCS-A1216PD	Dual 2x16 E configuration switch, pigtails
Fiber Type Options (Required, select one)	
M100	9/125 fiber type
M101	50/125 fiber type
M102	62.5/125 fiber type
Connector Options (Required, select one)	
MFP	FC/PC connector type
MFA	FC/APC connector type (for M100 fiber type option only)
MSC	SC/PC connector type
MSU	SC/APC connector type (for M100 fiber type option only)



If the configurations available do not meet your performance requirements, please contact your global sales and customer service team to discuss the potential for specialized solutions.

MAP Small Channel Count Switch

(mSCS-A1)



- Key Features**
- Insertion loss (IL) <0.8 dB and return loss (RL) >55 dB
 - Low polarization dependent loss (PDL) 0.08 dB
 - Up to 8 switches per cassette
 - Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

Applications

- Dense wavelength division multiplexing (DWDM) channel testing
- Amplifier characterization
- Bit error rate (BER) testing
- Signal routing

Safety Information

- The MAP Small Channel Count Switch, installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Small Channel Count Switch (mSCS-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print.

The mSCS-A1 is based on optical prism and mirror technology that directs incident light into selected output channels. It is available in 1x2 and 2x2 configurations and supports multiple devices per MAP cassette, single-mode or multimode fiber, and four connector types. An important element of an optical test bed, optical switches increase throughput by enabling time-saving automation, reducing uncertainty from repeated connector mating, and maximizing usage of expensive test equipment.

Specifications

Parameter	Single-mode fiber (SM)	Multimode fiber (MM)
Wavelength	1310 and 1550 nm	850 and 1310 nm
Insertion loss (IL) ¹		
1 x 2	≤0.8 dB	≤0.8 dB
2 x 2	≤1.0 dB	≤1.1 dB
Return loss (RL) ¹	>55 dB	>20 dB
Polarization dependent loss (PDL) ¹	≤0.1 dB	N/A
Repeatability	±0.05 dB	±0.02 dB
Crosstalk	<-60 dB	<-35 dB
Optical input power	300 mW	
Switching speed	10 ms	
Latching	Yes	No
Lifetime	>10 million cycles	
Operating temperature	0 to 50°C	
Storage temperature	-30 to 60°C	
Humidity	90% relative, non-condensing	
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)	
Weight	1.1 kg (2.43 lb) maximum (varies with configuration)	

1. Unless otherwise specified, all specifications at start of life at 23°C ±3°C, 45% RH ±5% and optical input power of -25 to 0 dBm, excluding connectors

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Base Options (Required, select one)

Product Code	Description
MSCS-B1112B	MAP SCS Cassette, one 1x2 switch, bulkheads
MSCS-B1212B	MAP SCS Cassette, two 1x2 switch, bulkheads
MSCS-B1412P	MAP SCS Cassette, four 1x2 switch, pigtails (for M100 fiber type option only)
MSCS-B1612P	MAP SCS Cassette, six 1x2 switch, pigtails (for M100 fiber type option only)
MSCS-B1812P	MAP SCS Cassette, eight 1x2 switch, pigtails (for M100 fiber type option only)
MSCS-A1122B	MAP SCS Cassette, one 2x2 switch, bulkheads
MSCS-A1222B	MAP SCS Cassette, two 2x2 switch, bulkheads
MSCS-A1422P	MAP SCS Cassette, four 2x2 switch, pigtails (for M100 fiber type option only)
MSCS-A1622P	MAP SCS Cassette, six 2x2 switch, pigtails (for M100 fiber type option only)
MSCS-A1822P	MAP SCS Cassette, eight 2x2 switch, pigtails (for M100 fiber type option only)

Fiber Type Options (Required, select one)

M100	9/125 fiber type
M101	50/125 fiber type
M102	62.5/125 fiber type

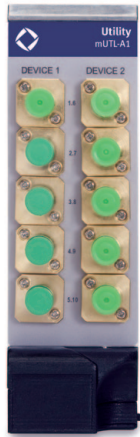
Connector Options (Required, select one)

MFP	FC/PC connector type
MFA	FC/APC connector type (for M100 fiber type option only)
MSC	SC/PC connector type
MSU	SC/APC connector type (for M100 fiber type option only)

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MAP Utility

(mUTL-A1)



Key Features

- Coupling, splitting and mux/demux functionality in a robust package
- Supports single-mode and multimode fibers
- User-defined configurability
- Ideal for individual lane testing on WDM signals for 100GE and 40GE applications

Applications

- Bit error rate (BER) test
- Passive component test
- Optical amplifier test

Safety Information

- The MAP Utility, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Utility (mUTL-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print. The MAP Utility is designed to simplify the mechanical integration of passive optical components for test sets. It supports angled or flat polish connectors as well as single-mode (SM) and multimode (MM) fibers.

A blank MAP Utility cassette is available for mechanical mounting of components such as isolators, circulators or fixed attenuators. The cassettes are supplied with mounting hardware and ten bulkhead adapters for ease-of-integration.

Single-Mode (SM) Specifications

Parameter	SM 1x2, 1/99 Coupler (Fused)	SM 1x2, 10/90 Coupler (Fused)	SM 1x2, 30/70 Coupler (Fused)	SM 1x2, 50/50 Coupler (Fused)
Fiber type	9/125 μ m			
Wavelength	1310/1550 nm			
Insertion loss (IL)	<24.0/1.2 dB	<11.8/1.2 dB	<6.5/2.4 dB	<4.1 dB
Optical power handling	300 mW			
Number of slots	1			
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)			
Weight	1.0 kg (2.2 lb)			

Multimode (MM) Specifications

Parameter	MM 10/90 Coupler (Micro-optic)	MM 50/50 Coupler (Micro-optic)
Fiber type	50/125 or 62.5/125 μ m	
Wavelength	850/1310 nm	
IL	<11.8/1.2 dB	<4.1 dB
Optical power handling	300 mW	
Number of slots	1	
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)	
Weight	<1.0 kg (2.2 lb)	

mWDM-A1100GE Specifications

Parameter	
Fiber type	9/125 μ m
Wavelength	1295.6, 1300.1, 1304.6, 1309.1 nm
IL	<2.0 dB
Pass bandwidth	$\pm$ 1.50 nm
Ripple in passband	<0.5 dB
Return loss	>45 dB
Isolation adjacent channel	>15 dB
Isolation non-adjacent channel	>15 dB
Internal fiber length	1 $\pm$ 0.1 m
Number of slots	1
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)
Weight	<1.0 kg (2.2 lb)

mWDM-A1040GE Specifications

Parameter

Fiber type	9/125 μ m
Wavelength	1271, 1291, 1311, 1333 nm
IL	<1.7 dB
Pass bandwidth	$\pm$ 6.50 nm
Ripple in passband	<0.5 dB
Return loss	>45 dB
Isolation adjacent channel	>30 dB
Isolation non-adjacent channel	>50 dB
Internal fiber length	1 $\pm$ 0.1 m
Number of slots	1
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)
Weight	<1.0 kg (2.2 lb)

Ordering Information

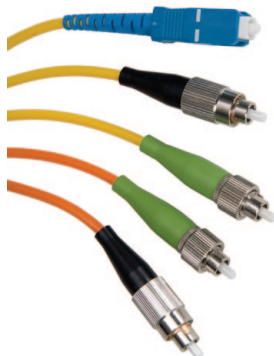
For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Product Code	Description
Base Options (Required)	
MUTL-A1000	MAP Utility, Blank
Splitter Options (Optional, select one, two, or three)	
MUTL-A101SB	MAP Utility, 1% Coupler, Bulkheads
MUTL-A110SB	MAP Utility, 10% Coupler, Bulkheads
MUTL-A130SB	MAP Utility, 30% Coupler, Bulkheads
MUTL-A150SB	MAP Utility, 50% Coupler, Bulkheads
MWDM-A1100GE	MAP Utility, Mux/Demux, Bulkheads
MWDM-A1040GE	MAP Utility, Mux/Demux, Bulkheads
Fiber Type Options (Required if splitter option selected, select one)	
M100	9/125 fiber type
M101	50/125 fiber type
M102	62.5/125 fiber type
Connector Options (Required)	
MFP	FC/PC connector type
MFA	FC/APC connector type (for M100 fiber type option only)
MSC	SC/PC connector type
MSU	SC/APC connector type (for M100 fiber type option only)

Adapters and Calibrated Jumpers

AC Adapters are for use with the JDSU power meters from the MAP, c-Series, SWS, OCETS, and legacy product lines.

The AC900 series are new precision adapters with a locking feature for better measurement precision that can be used with the mOPM-B1, mORL-A1, and all c-Series. For compatibility questions, or if you need an adaptor not listed, contact the Technical Assistance Center (TAC) support.



Measurement Accessories

AC100 Series

Product Code	Description
AC100	Detector cap
AC101	FC adapter
AC102	ST adapter
AC103	SC adapter
AC104	D4 adapter
AC108	Diamond HMS-0
AC112	MT (ribbon connector)
AC113	Ribbon fiber holder (requires AC120)
AC114	MU
AC115	E2000
AC116	FC, ST, SC universal adapter
AC117	MPO/MTP
AC118	LC
AC119	MT-RJ
AC120	Adapter holder (for AC121 and AC113)
AC121	Bare fiber holder (requires AC120)

AC900 Series

Product Code	Description
AC900	Magnetic quick cap
AC901	FC adapter
AC903	SC adapter
AC917	MPO adapter
AC918	LC adapter

Power Cords (Required)

Product Code	Description
CORD-AU	Australia/China power cord
CORD-EU	European power cord
CORD-JP	Japan power cord
CORD-UK	United Kingdom power cord
CORD-US	United States power cord

Calibrated Hybrid Jumper

Product Code	Fiber Type	WL Range (μm)
CH200-07-FAFP	50/125, FAFP	0.8, 1.3
CH200-A9-FAFP	9/125, FAFP	1.3, 1.5
CH200-17-FAFP	62.5/125, FAFP	0.8, 1.3

Additional Accessories

UCAs (Universal Connector Adapters– Mating Sleeves)

Product Code	Description
ACS00	FC/PC to FC/PC
ACS01	FC/PC to SC/PC
ACS02	FC/APC to FC/APC
ACS03	FC/APC to SC/APC

Integrating Spheres

AC330	33 dBm integrating sphere for high power and single fiber
AC990	Multi-fiber integrating sphere

Fiber Optic – Production and Lab Test Support



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About Technical Support

JDSU provides dedicated post-sales support with a team that is ready to help you answer any questions or concerns about Instrumentation products.

Standard Technical Support

(Included with every instrumentation product purchase) Our technical support specialists are available live, via our global toll-free 800 number or via e-mail (8:00 AM to 5:00 PM ET, Monday through Friday). If you experience a problem with the operation of a JDSU product, our Technical Support Specialist is trained to work with you, to carry out technical troubleshooting to resolve or confirm the reported problem. If a problem is confirmed, the Technical Support Specialist will take appropriate action to address your needs.

All service (repair, calibration, and upgrade) for our products is provided via the JDSU Technical Support Team.

Replacement user manuals and JDSU software updates are also included in our standard support package.

24-7 Emergency Technical Support

JDSU 24-7 Emergency Technical Support via our global toll-free 800 number is also included in our standard level of support. If you require emergency technical support, a Technical Support Specialist will be paged, and will return your call promptly.

For further information, including Extended Support Options and Technical Training, please contact JDSU.

Contact Support

Regular support hours of operation are 8:00 AM to 5:00 PM ET, Monday through Friday, excluding holidays.

Emergency Technical Support is available 24 hours a day, 7 days a week if your equipment is not functioning and you have an urgent requirement for assistance. Dial one of the telephone numbers and follow the voice prompts to page a specialist.



Test & Measurement Regional Sales

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