

## MTP1000 with LaserBlade, VOABlade, PowerBlade & SwitchBlade

Smarter Modular Test Platform

### KEY FEATURES

- Up to 9 blades per MTP1000
- Multiple MTP1000 units controlled from a single PC
- Your choice of 4 different types of blades
- All-in-one benchtop test platform with multi-functional blades
- One intuitive and easy to use software for all the Blades
- Ethernet or USB connectivity
- SCPI compliant remote control for simple automation
- Limitless scalability
- 19" Rack mountable

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# MTP1000



Providing you with unsurpassed versatility,  
unrivalled stability & uniformity in performance

Coherent Solutions' MTP1000 holds up to 9 Blades in one single unit and you can control multiple MTP1000 units from a single computer through one intuitive controller software. With 4 different types of blades available, you can replace stacks of test instruments with one MTP1000 for a quick and simple remote automation of your test set-up.

## Ultimate Scalability and Versatility Built-in

With the modular architecture, you can set up a testing platform with just the right number of blades to suit your current requirement while future proofing yourself with the potential to add more.

The available blades are:

LaserBlade, holds 2 or 4 lasers of your choice (C and/or L)

VOABlade, holds 2 or 4 variable optical attenuators

PowerBlade, holds up to 4 in-line power meters

SwitchBlade, holds up to 2 x 4 port configuration

## Remote Control

MTP1000 comes equipped with USB and ethernet connectivity, so that you can control and monitor the instrument remotely from a different location. You can

also talk to the instrument using SCPI commands to automate the testing procedures, this will save you valuable time.

## Efficient Use of Space

MTP1000 platform lets you make the most of your testing bench space by housing up to 9 blades of your choice.

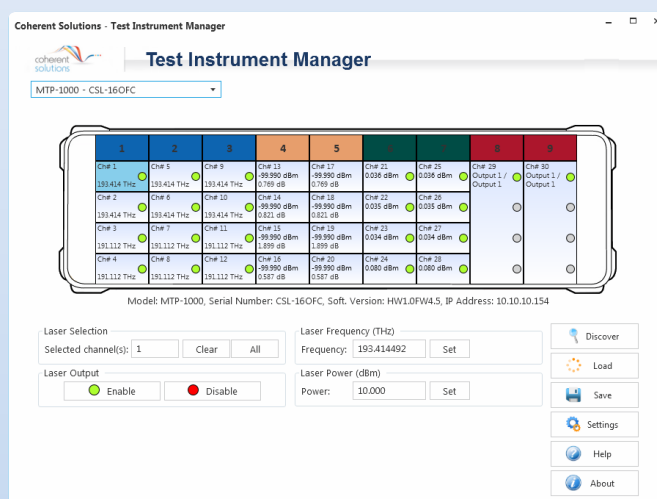
This enables you to replace a tower of stacked equipment with just one mainframe.

## 19-inch Rack Mountability

The MTP1000 mainframe with the optional rack mounting brackets is compatible with any 19-inch rack for easy integration into your testing set up.

## Intuitive and Functional Software Interface

The control software for MTP1000, Test Instrument Manager (TIM), uses graphical representation of the instrument for intuitive control of connected units. The same software controls different types of Blade modules, to save you time and effort in control and set up of the test platform.



## MTP1000 Technical Specifications

### General Specification

	MTP1000
Dimensions H x W x D	220 x 480 x 500 mm   8.7 x 18.9 x 19.7 inch
Weight	18 kg   39.7 lbs
PC interface method	USB 2.0, Ethernet
Operating system requirement	Windows 7, 8 or 10 (32 or 64 bit)
Power supply	~100 - 240 V; 50/60 Hz; 500 W
Operating temperature range	5 °C to 45 °C   41 °F to 113 °F
Storage temperature range	-40 °C to 70 °C   -40 °F to 158 °F

## Product Warranty

All Coherent Solutions' products come with a standard 3 year warranty.



# LaserBlade

## Unrivalled Versatility & Flat Power Response



Coherent Solutions' LaserBlade provides unsurpassed versatility with unrivalled stability and uniformity in performance. As a Continuous Wave (CW), tunable laser source it offers high-power output, narrow 100 kHz linewidth and 0.01 pm resolution tunability (C and/or L bands). With up to 9 LaserBlades in a single MTP1000, you have up to 36 individual lasers - which can be controlled individually or in sync through one, intuitive software application.

## KEY FEATURES

- Your choice of 2 or 4 lasers per blade
- Full tunability across C and/or L band
- Smarter calibration for enhanced power flatness
- 0.01pm tuning resolution
- Up to 36 lasers per MTP1000
- Narrow 100 kHz linewidth, up to 15 dBm of power

## Target Applications

- Stable local oscillator for coherent receivers
- WDM network loading
- General purpose stable light source for telecom and physics
- Amplifier testing
- With its polarization maintaining output, it is ideal for experiment and testing that require precise control of your polarization state.

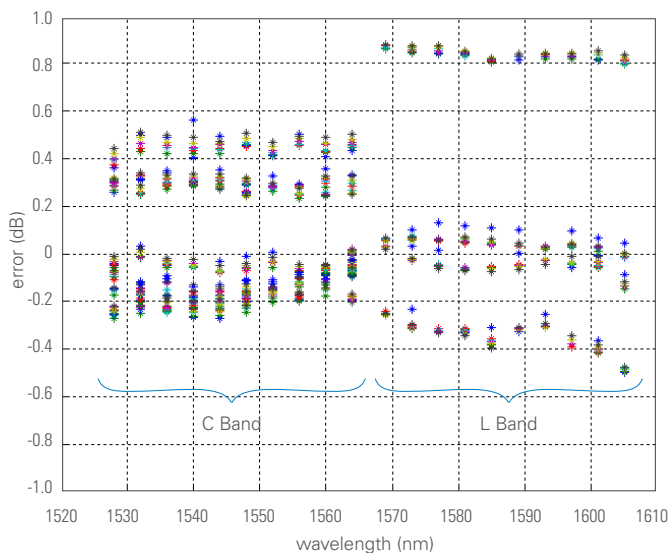
## Superior Power Accuracy

The LaserBlade provides advanced calibration for flat power response, ideal for applications including coherent / Orthogonal Frequency-Division Multiplexing (OFDM) transmission and WDM networks.

## Smarter Calibration for More Powerful Characterization

Coherent Solutions provides superior calibration to ensure a flat power response. With all the lasers under control of the TIM application, you can see how well each is characterized to work together for even results.

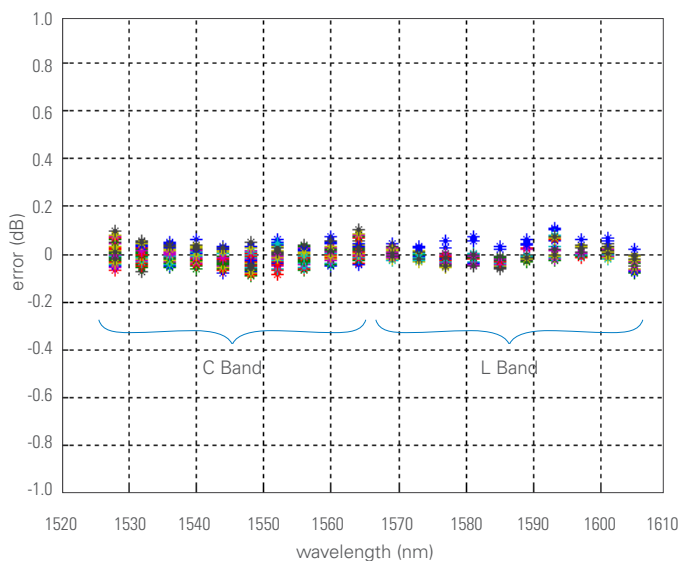
### Typical ITLA Lasers



This figure illustrates the typical output power accuracy of standard ITLA lasers. The output power of each is recorded using a NIST traceable optical power meter. Measurements from each laser are taken at 10 different wavelengths for 7 different power settings. The data is taken from random sample of 12 lasers.

**Mean error (abs) = 0.25dB**  
**Pk-Pk error = 1.038dB**

### LaserBlade with Power Calibration



This figure illustrates the results of the same measurements, using the same lasers, integrated into the LaserBlade and calibrated using our standard production calibration process.

When the LaserBlade is inserted into the MTP1000 and controlled via the TIM application the Pk-Pk error across the entire sample range is reduced from >1dB to 0.2dB.

**Mean error (abs) = 0.03dB**  
**Pk-Pk error = 0.20dB**

## LaserBlade Technical Specifications<sup>1</sup>

Wavelength Tuning	NARROW LINEWIDTH LASER			GRID LASER	
	C band	L band	C & L band	C band	L band
Operating wavelength range (nm)	1527.605 - 1567.132	1567.132 - 1608.760	1527.605 - 1608.760	1528.773 - 1563.862	1567.773 - 1607.466
Operating frequency range (THz)	191.30 - 196.25	186.35 - 191.30	186.35 - 196.25	191.70 - 196.10	186.50 - 191.10
Laser type	Thermally tuned External Cavity Diode Laser (ECDL)			Digital Supermode Distributed Bragg Reflector (DSDBR)	
Frequency tuning resolution (wavelength) <sup>2</sup>	1 MHz (~0.01 pm)			50 GHz (~410 pm)	
Tuning time	< 25 s			< 25 s	

### Spectral Characteristics

Linewidth (FWHM), instantaneous <sup>3</sup>	< 100 kHz (25 kHz typ.)	<5000 kHz (800 kHz Typ.)
Side-mode suppression ratio	40 dB (55 dB typ.)	40dB (45 dB typ.)
Relative frequency accuracy <sup>2</sup>	± 1.5 GHz	± 1.8 GHz
Absolute frequency accuracy <sup>2</sup>	± 2.5 GHz	± 1.8 GHz
Frequency stability (wavelength) over 24 hours <sup>2</sup>	± 0.3 GHz (± 3 pm)	T.B.D.

### Optical Power

	C or L Standard	C or L High	C & L High	Standard	
Maximum optical output power	13.4 dBm	15.4 dBm	12.2 dBm	13.4 dBm	10.4 dBm
Minimum optical output power	6.6 dBm	6.6 dBm	3.4 dBm	8.6 dBm	5.6 dBm
Optical power uncertainty after calibration <sup>4</sup>	± 0.4 dB			± 0.4 dB	
Power stability over 24 hours	± 0.03 dB typ.			T.B.D.	
Power flatness over entire wavelength range	± 0.25 dB			± 0.25 dB	
Output power tuning resolution	0.01 dB			0.01 dB	
Power monitoring	Built-in			Built-in	
Polarization extinction ratio at the PM fiber output	> 20 dB			> 20 dB	
Relative intensity noise RIN (for 13 dBm)	-145 dB/Hz (10 MHz - 40 GHz)			-145 dB/Hz (10 MHz - 40 GHz)	
Connectors	FC/APC, FC/PC, SC/PC, SC/APC			FC/PC, SC/PC	

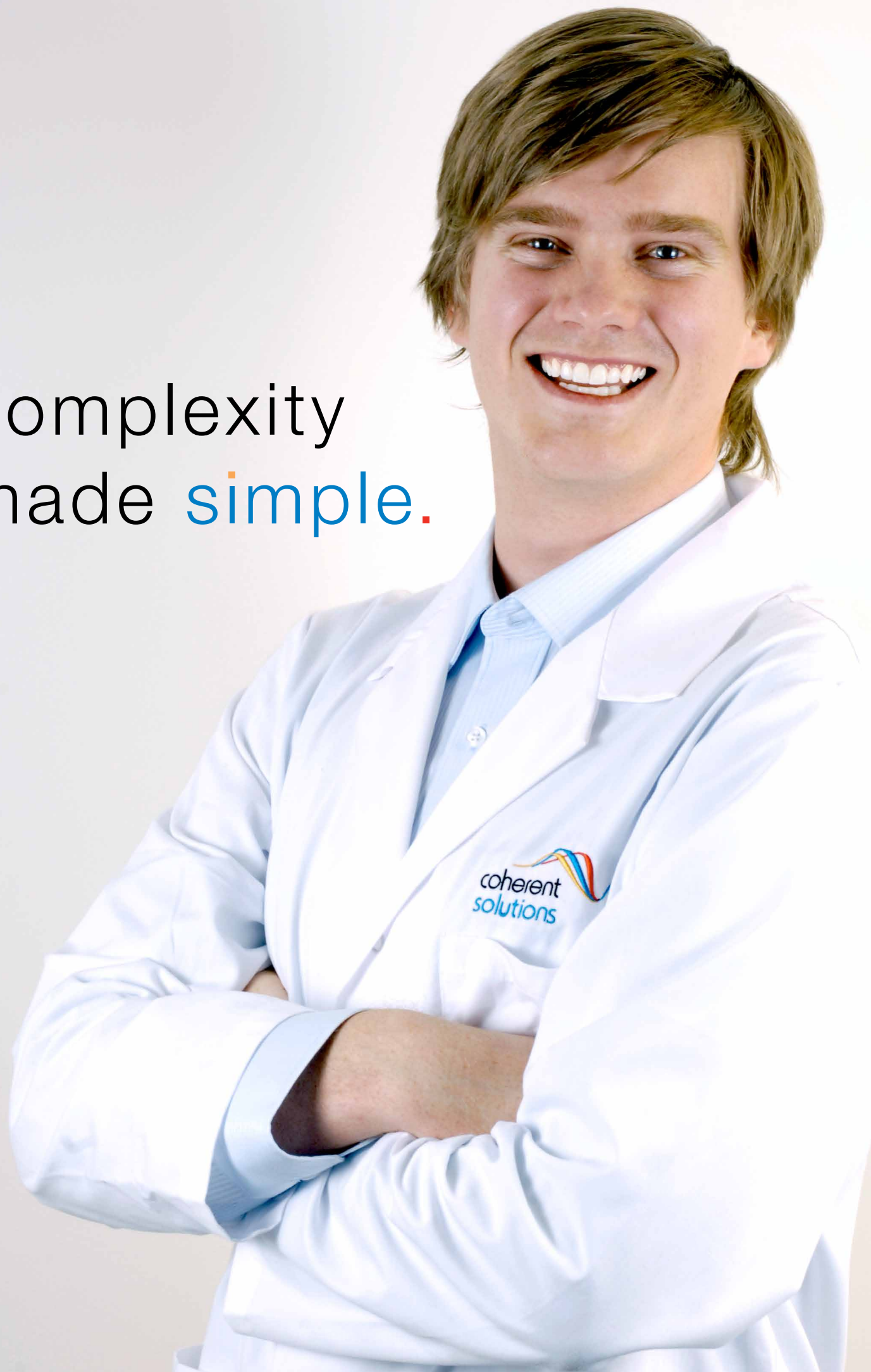
**Notes:** <sup>1</sup> Specifications are valid at 23 °C ± 3 °C. <sup>2</sup> Varies slightly according to wavelength. <sup>3</sup> The laser uses a small FM dithering as part of its wavelength-locking mechanism. The instantaneous linewidth is measured in 1 ms (integration time). <sup>4</sup> At maximum output power.

### General Specification

	LaserBlade
Dimensions H x W x D	130 x 40 x 305 mm   5.1 x 1.6 x 12 inch
Weight	~ 1 kg   ~ 2.2 lbs
Operating temperature range	5 °C to 45 °C   41 °F to 113 °F
Storage temperature range	-40 °C to 70 °C   -40 °F to 158 °F



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# VOABlade

Fast Variable Optical Attenuator with constant output power regulation - Optical power stabilization made simple.



Coherent Solution's VOABlade is a reliable, fast and high density attenuation solution for research and continuous-production environments. Each blade has an integrated power meter for precise output power control, even with fluctuating input. With up to 9 VOABlades in a single MTP1000, you have up to 36 individual attenuators - which can be controlled individually or in sync through one, intuitive software application.

## KEY FEATURES

- Your choice of 2 or 4 attenuators per blade
- Choose between broad and narrow wavelength
- Integrated Power Meters for precise output power control
- Polarization-maintaining fiber compatible
- Up to 36 attenuators per MTP1000

### Stable Power Output

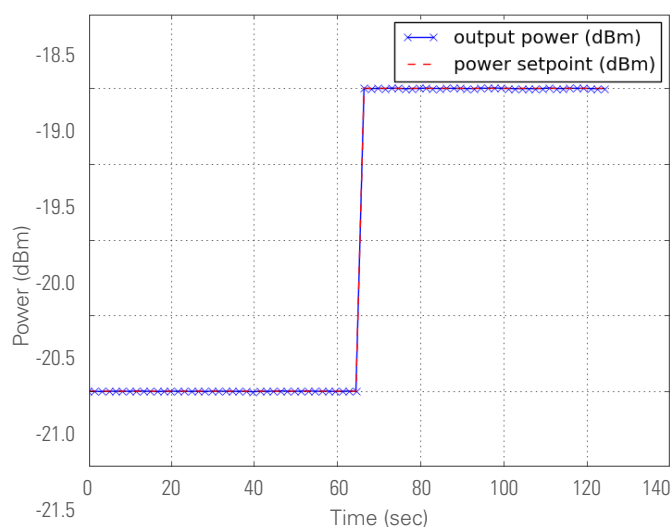
The built-in power meter and power stabilization function lets you set and maintain the output power stability even when the input power fluctuates. You will get reliable and repeatable test results, each and every time.

### Select the Best Fit for your Application

You can choose the broad wavelength range model for versatility or the narrow wavelength models for the best accuracy and performance.

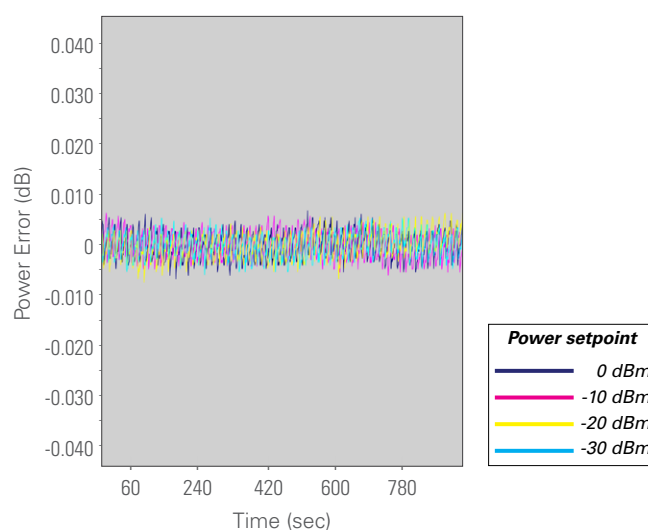


## VOABlade Power Control



This graph illustrates how quickly Coherent Solutions' VOA moves to the desired setpoint.

## VOABlade Power Stability - Power Mode



This graph illustrates the power output stability of < 0.005 dB RMS at various power setpoints.

## VOABlade Technical Specifications<sup>1</sup>

Band	Broadband	1550 nm	1490 nm	1310 nm
Fiber Connector	FC/UPC, FC/APC			
Fiber type	SMF-28			
Number of Channels	2 or 4			
Wavelength range	1260 nm to 1620 nm	1520 nm -1620 nm	1440 nm -1530 nm	1260 nm -1360 nm
Attenuation range	> 45 dB			
Resolution	0.01 dB			
Insertion loss <sup>4</sup>	< 2.0 dB	< 1.2 dB	< 1.8 dB	< 2.0 dB
Attenuation Speed	0.1 to 1000 dB/s			
PDL <sup>2, 4</sup>	0.25 dB			
Warm up time	< 20 mins			
Power metering option	-50 dBm to +20 dBm			
Power meter linearity <sup>3</sup>	±0.1 dB	±0.06 dB	±0.06 dB	±0.06 dB
Averaging time of monitor power meter	2ms to 1s			
Return loss <sup>4</sup>	> 45 dB			
Maximum safe input power	+23 dBm			

**Notes:** <sup>1</sup> Specifications are valid at 23 °C ± 3 °C. <sup>2</sup> < 10dB attenuation. <sup>3</sup> +10dBm to -40dBm, 23 °C. <sup>4</sup> Excluding connectors.

Preliminary Specifications as of May 2016

General Specification	VOABlade
Dimensions H x W x D	130 x 40 x 305 mm   5.1 x 1.6 x 12 inch
Weight	~ 1 kg   ~ 2.2 lbs
Operating temperature range	5 °C to 45 °C   41 °F to 113 °F
Storage temperature range	-40 °C to 70 °C   -40 °F to 158 °F

# PowerBlade

In-line power meters with low insertion loss. Real-time power monitoring made simple.



Coherent Solution's PowerBlade is an accurate and reliable solution to your power monitoring needs. Its low loss, in-line architecture allows convenient integration to your existing test set-up.

## KEY FEATURES

- In-line power meter
- Suitable for high power measurements up to 20 dBm
- Very low insertion loss
- Power meter linearity of  $\pm 0.1$  dB
- Supports broad wavelength from 1260 nm to 1620 nm
- Up to 36 power meters per MTP1000

PowerBlade Technical Specifications<sup>1</sup>

Band	Broadband	1550 nm	1490 nm	1310 nm
Fiber Connector	FC/APC, FC/PC, SC/PC, SC/APC			
Fiber type	SMF-28 or PM			
Number of Channels	2 or 4			
Wavelength range	1260 nm to 1620 nm	1520 nm -1620 nm	1440 nm -1530 nm	1260 nm -1360 nm
Power metering option	-50 dBm to +20 dBm			
Power meter linearity <sup>2</sup>	±0.1 dB	±0.05 dB	±0.05 dB	±0.05 dB
Insertion loss <sup>3</sup>	< 0.1 dB			
Wavelength dependent loss	0.02 dB			
PDL <sup>3</sup>	0.2 dB			
Power meter uncertainty <sup>2, 3</sup>	±0.34 dB (typical)   ±0.55 dB (max)			
Averaging time of monitor power meter	2ms to 1s			
Return loss <sup>3</sup>	> 45 dB			
Maximum safe input power	+23 dBm			

Notes: <sup>1</sup> Specifications are valid at 23 °C ± 3 °C. <sup>2</sup> +10dBm to -40dBm, 23 °C. <sup>3</sup> Excluding connectors.

Preliminary Specifications as of May 2016

General Specification	PowerBlade
Dimensions H x W x D	130 x 40 x 305 mm   5.1 x 1.6 x 12 inch
Weight	~ 1 kg   ~ 2.2 lbs
Operating temperature range	5 °C to 45 °C   41 °F to 113 °F
Storage temperature range	-40 °C to 70 °C   -40 °F to 158 °F



MTP1000 Smarter Modular Test Platform

# SwitchBlade

Reliable low-loss optical switch with a superior remote connectivity. Sequential testing automation made simple.



Automate your testing procedure and save time with SwitchBlade modular optical switch. Coherent Solutions' SwitchBlade is your efficient solution for test procedure automation. The optical switches ensure repeatable and low-loss switching to various test set-ups. Taking advantage of MTP1000 mainframe's flexible connectivity and high channel density form-factor, SwitchBlade easily becomes an integral part of your test setup.

## KEY FEATURES

- Your choice of various port configurations
- Low insertion loss providing higher performance
- Various wavelength options including 850 nm, 1310 nm & 1550 nm
- Up to 36 switches per MTP1000
- Built in position monitoring

## SwitchBlade Technical Specifications<sup>1</sup>

1 x 1 & 1 x 2 Optical Switch	9 $\mu$ m CORE SINGLE MODE			50 $\mu$ m or 62.5 $\mu$ m CORE MULTI MODE		
	Minimum	Typical	Maximum	Minimum	Typical	Maximum
Wavelength range	1260 ~ 1630 nm			850 / 1300 nm		
Insertion loss <sup>2, 5, 6</sup>		0.5 dB	1.0 dB		0.1 dB	0.4 dB
Return loss		-50 dB				
Polarization dependent loss <sup>2</sup>			0.1 dB			
Wavelength dependent loss			0.3 dB			
Crosstalk <sup>2</sup>		-80 dB			-80 dB	
Repeatability <sup>3</sup>			$\pm 0.1$ dB			$\pm 0.1$ dB
Optical power			500 mW			500 mW
Durability	3x10 <sup>7</sup> cycles			3x10 <sup>7</sup> cycles		
Connectors	FC/APC, FC/PC, SC/PC, SC/APC					

1 x 4 Optical Switch	9 $\mu$ m CORE SINGLE MODE			50 $\mu$ m or 62.5 $\mu$ m CORE MULTI MODE		
	Minimum	Typical	Maximum	Minimum	Typical	Maximum
Wavelength range	1260 ~ 1630 nm			850 / 1300 nm		
Insertion loss <sup>2, 5, 6</sup>		0.8 dB	1.2 dB		0.8 dB	1.0 dB
Return loss		-50 dB				
Polarization dependent loss <sup>2</sup>			0.1 dB			
Wavelength dependent loss			0.3 dB			
Crosstalk <sup>3</sup>		-80 dB			-80 dB	
Repeatability <sup>4</sup>			$\pm 0.1$ dB			$\pm 0.1$ dB
Optical power			500 mW			500 mW
Durability	3x10 <sup>7</sup> cycles			3x10 <sup>7</sup> cycles		
Connectors	FC/APC, FC/PC, SC/PC, SC/APC					

2 x 2 Optical Switch	9 $\mu$ m CORE SINGLE MODE			62.5 $\mu$ m CORE MULTI MODE		
	Minimum	Typical	Maximum	Minimum	Typical	Maximum
Wavelength range	1310 / 1550 nm			850 / 1300 nm		
Insertion loss <sup>2, 5, 6</sup>		0.5 dB	1.0 dB		0.4 dB	0.8 dB
Return loss		-50 dB				
Polarization dependent loss <sup>2</sup>			0.1 dB			
Wavelength dependent loss			0.3 dB			
Crosstalk <sup>3</sup>		-60 dB			-60 dB	
Repeatability <sup>4</sup>			$\pm 0.1$ dB			$\pm 0.1$ dB
Optical power			500 mW			500 mW
Durability	3x10 <sup>7</sup> cycles			3x10 <sup>7</sup> cycles		
Connectors	FC/APC, FC/PC, SC/PC, SC/APC					

**Notes:** <sup>1</sup> Specifications are valid at 23 °C  $\pm$  3 °C. <sup>2</sup> Excluding connectors. <sup>3</sup> Power off isolation is same as crosstalk. <sup>4</sup> Repeatability is defined after 100 cycles. <sup>5</sup> IL is measured at specified wavelength, 23°C. <sup>6</sup> IL is for single-band. Dual-band option adds 0.3 dB.

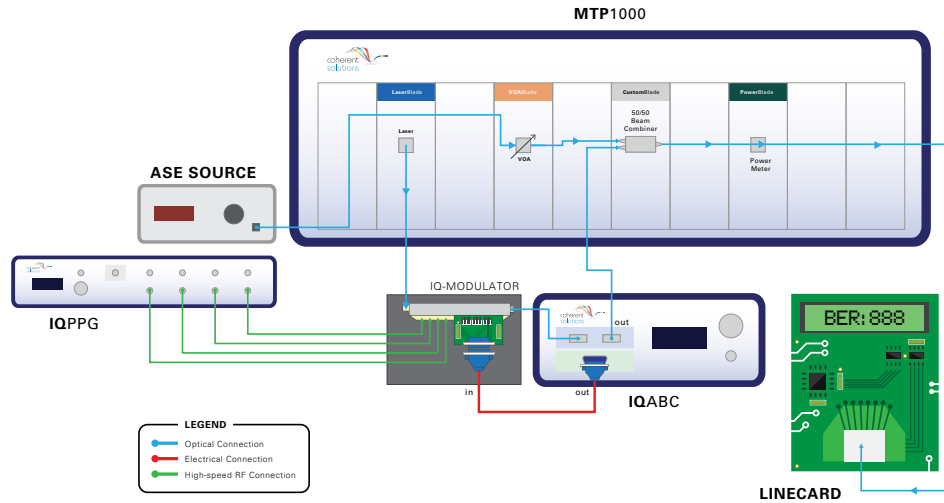
General Specification	SwitchBlade
Dimensions H x W x D	130 x 40 x 305 mm   5.1 x 1.6 x 12 inch
Weight	~ 1 kg   ~ 2.2 lbs
Operating temperature range	5 °C to 45 °C   41 °F to 113 °F
Storage temperature range	-40 °C to 70 °C   -40 °F to 158 °F

\*Please contact Coherent Solutions for any special wavelength request.

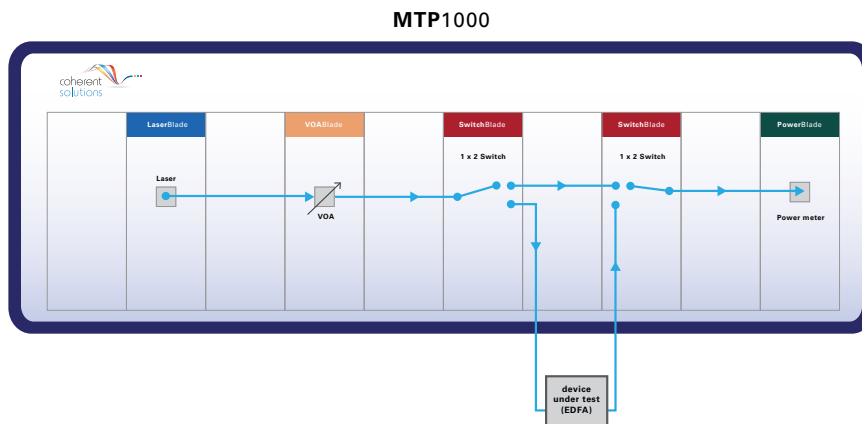


# Applications

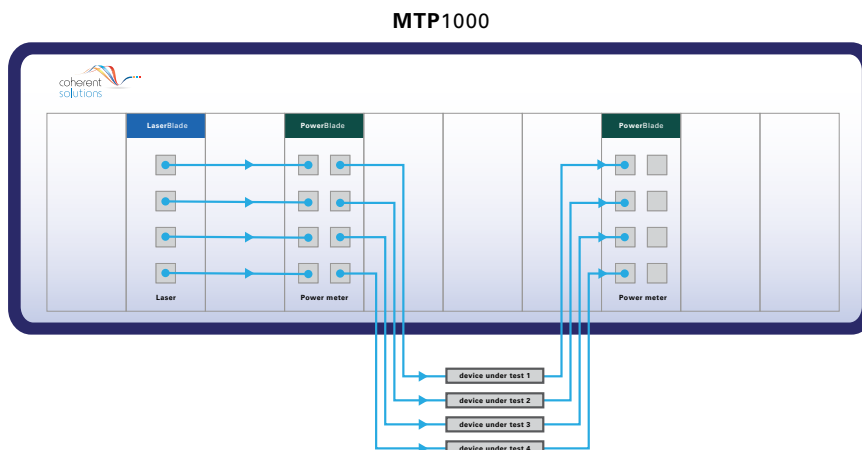
## Coherent Receiver DSP Stress testing using **MTP1000**



## EDFA Response Linearity test using **MTP1000**



## Insertion Loss test using **MTP1000** - In Parallel



# Ordering Information

**Mainframe:** MTP1000

**LaserBlade:** LaserBlade - X - X - XX - X - XX

**Type of laser**

1 = Narrow linewidth laser  
5 = Grid laser

**Number of lasers**

2 = 2 lasers  
4 = 4 lasers

**Wavelength Band**

C = C band  
L = L band  
B = C & L band\*

**Connector Type**

FC = FC/PC  
FA = FC/APC\*  
SC = SC/PC  
SA = SC/APC\*

**Optical Power**

S = Standard power  
H = High power\*

**Example:** LaserBlade - 1 - 4 - C - H - FC

\* Only available for Narrow Linewidth Laser.

N.B. The C & L band option allows only 1 laser per blade

**VOABlade:** VOABlade - X - XX - XX - XX

**Number of attenuators**

2 = 2 attenuators  
4 = 4 attenuators

**Wavelength Band**

BB = Broadband  
13 = 1310 nm  
14 = 1490 nm  
15 = 1550 nm

**Connector Type**

FC = FC/PC  
FA = FC/APC  
SC = SC/PC  
SA = SC/APC

**Fiber Type**

SM = SMF-28  
PM = Polarization  
Maintaining

**Example:** VOABlade - 2 - 15 - SM - FC

**PowerBlade:** PowerBlade - X - XX - XX - XX

**Number of power meters**

2 = 2 power meters  
4 = 4 power meters

**Wavelength Band**

BB = Broadband  
13 = 1310 nm  
14 = 1490 nm  
15 = 1550 nm

**Connector Type**

FC = FC/PC  
FA = FC/APC  
SC = SC/PC  
SA = SC/APC

**Fiber Type**

SM = SMF-28  
PM = Polarization  
Maintaining

**Example:** PowerBlade - 2 - 15 - SM - FC

**SwitchBlade:** SwitchBlade - X - XX - X - XX

**Number of switches**

1 = 1 switch  
2 = 2 switches (11, 12, 22)\*  
4 = 4 switches (11)\*

**Type of switch**

11 = 1 x 1 switch  
12 = 1 x 2 switch  
14 = 1 x 4 switch  
22 = 2 x 2 switch  
24 = 2 x 4 switch

**Connector Type**

FC = FC/PC  
FA = FC/APC  
SC = SC/PC  
SA = SC/APC

**Fiber Type**

9 = 9 um  
5 = 50 um (11,12,14)\*  
6 = 62.5 um

**Example:** SwitchBlade - 2 - 12 - 9 - N - FC

\* Only available for stated Type of switch

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**To find out more, get in touch with us today.**

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