

>>Optical Power and Energy Meters >>Laser Power and Energy Meter, USB Only Interface

Laser Power and Energy Meter, USB Only Interface

- ▶ Compact USB Interface for Power and Energy Measurements
- ▶ New Design for Better Accuracy, Reliability, & Usability
- ▶ New Red C-Series Connector for Quick Exchange
- ▶ Over 25 Compatible Sensors



PM100USB



Compatible to All C-Type Power and Energy Sensors
Sensors Not Included



Data Transfer via Hi-Speed USB2.0 to PC

Related Items

- Self-Contained Sensor and Power Meter
- Microscope Slide Power Sensor
- Power and Energy Meters
- Fiber Attenuators

Overview Specs Pin Diagrams Sensor Compatibility Applications Software Sensor Selection Feedback

Features

- Compact Console Interfaces Power and Energy Sensors with a PC
- Same Functionality as the PM100D Console
- Advanced Measurement and Display Features
- Compatible with over 25 Photodiode, Thermal, and Pyroelectric Sensors
- Sensor and USB PC Connections with Indicator Lights
- No External Power Supply Required

The PM100USB Console is a compact power and energy meter interface which allows PC control of an attached power or energy sensor. It contains many of the same features as the PM100D and PM100A Consoles, except it does not have a display screen or built-in console controls. Instead, the console and sensor are completely controlled via a USB connection and the supplied software. The PM100USB converts the signal from the attached sensor and transfers it to the PC.

The PM100USB is compatible with more than 25 [standard photodiode](#), [slim photodiode](#), [integrating sphere](#), [fiber](#), [thermal](#), and [pyroelectric](#) sensors (see [Power Meter Compatibility Chart](#)). Additionally, it allows the connection of unamplified anode or cathode grounded photodiodes with up to 5 mA photocurrent, thermal elements with a maximum output voltage of 1 V, and pyroelectric sensors with a maximum output voltage of 100 V. Depending on the connected sensor, it can measure optical powers in the range from 100 pW to 200 W and energy from 3 μJ to 15 J. When used together with the ultra compact [S15xC Series fiber sensor](#), the PM100USB becomes a compact and portable fiber power meter that is ideal for multi sensor applications.

Computer Control

The PM100USB and connected sensor are controlled through a PC running the supplied software. The standard GUI offers three panels for the display of various numeric parameters, a larger main panel and two subpanels. The displayed parameter can be selected, i.e. power, energy and their min or max values as well as their units. The GUI offers data logging with graphical, tabular or histogram representation and statistical evaluation of the measurements. The data can be stored as a text file. A driver set for the integration into 3rd party software or customized applications is provided as well. For driver software, as well as programming reference guides for LabVIEW™, Visual C++, Visual C#, and Visual Basic, please see the Software tab.

Console Design

Like the PM100D the PM100USB features broad current and voltage measurement ranges and the capability of measuring power and energy. The AD converter allows for more measurement ranges of smaller spans, a higher acquisition rate, and higher precision. A selectable bandwidth of either 20 Hz or 100 kHz offers more flexibility and adaptability to specific measurement tasks while using photodiode sensors. The higher bandwidth is optimal for pulse-detection; the lower bandwidth offers better accuracy.

Additionally, the power meter can adapt to the thermal time constant of thermal sensors leading to significantly faster measurements with thermal sensors. Thermal sensors have an individual time constant that can vary greatly from unit to unit. Like the PM100D, the PM100USB can adjust to this individual constant for each sensor and thus minimize the response time of the system (sensor + console).

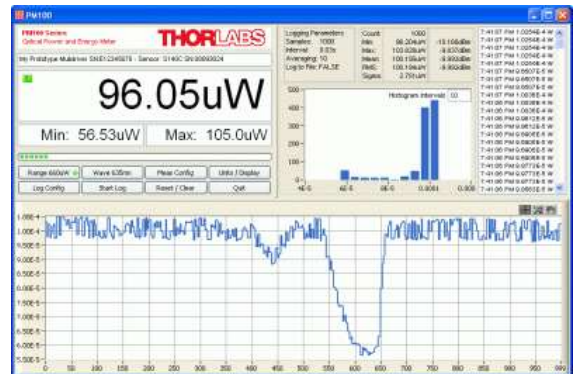
Fiber Power Meter Option

The compact, integrated, fiber sensors of the [S15xC Series](#) can be connected directly to the PM100USB turning the PM100USB into a compact, single unit fiber power meter. Any handling limitations due to cable movements or cable handling are avoided thus making this device ideal for multi-sensor applications that do not require a console but is controlled remotely via PC. The S150C offers exchangeable fiber adapters for FC, SMA, LC, SC, ST, and LC fiber connectors.

Item #	PM100USB
Compatible Sensors	Photodiode, Thermal, and Pyroelectric
Optical Power Range ^a	100 pW to 200 W
Optical Energy Range ^a	3 μJ to 15 J
Available Sensor Wavelength Range ^a	185 nm - 25 μm
GUI Display Refresh Rate	300 Hz
Bandwidth ^a	DC - 100 kHz
Photodiode Sensor Range ^b	50 nA - 5 mA
Thermopile Sensor Range ^b	1 mV - 1 V
Pyroelectric Sensor Range ^b	100 mV - 100 V

a. Sensor Dependent

b. Ranges Selectable in Watts (Photodiode and Thermopile) or Joules (Pyroelectric) and is dependent on the sensor used.



PM100USB Control Software

Laser Power and Energy Meter, USB Only Interface

- Compact, USB Power and Energy Meter Interface
- Compatible with Over 25 Photodiode, Thermal, and Pyroelectric Sensors
- USB PC Connectivity
- Console comes Calibrated with Certificate of Calibration
- 1 GB USB Memory Stick with Software including LabVIEW™ and LabWINDOWS™ /CVI Driver Set, and Operating Manual

Please note that sensors are not included with the PM100USB console. For information about our compatible sensors, please see the sensor descriptions below.

Based on your currency / country selection, your order will ship from Newton, New Jersey

+1 Qty Docs Part Number - Universal

Price Available / Ships

PM100USB USB Power and Energy Meter Interface for C-Type Sensors

\$410.00 Today

Add To Cart

Standard Photodiode Power Sensors

For General Purpose Optical Power Measurements
 Integrated Viewing Target for Easy Sensor Alignment
 Ø9.5 mm Sensor Aperture
 Compatible Fiber Adapters: [S120-xx Series](#)
 Compatible with the [PM200](#), [PM100D](#), [PM100USB](#), [PM100A](#), and [PM320E](#) Consoles
 Sensor, Protective Cap, IR Target, and Thread Adapter Included



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S120C and CP90F Quick-Release Mount

The S12xC Standard Photodiode Power Sensors are ideal for metering low power coherent and incoherent sources from the UV to the NIR. The NIST-Traceable, calibrated sensors feature an integrated viewing target for easy alignment, enhanced shielding against electromagnetic interference, over temperature alert device, and large Ø9.5 mm sensor aperture. The sensors are compatible with [30 mm cage systems](#), [Ø1/2" posts](#), and [SM1 \(1.035"-40\) lens tubes](#), and are ideal for free-space and fiber-coupled sources.

Item #	S120VC	S120C	S121C	S122C
Sensor Image (Click the Image to Enlarge)				
Aperture Size	Ø9.5 mm			
Wavelength Range	200 - 1100 nm	400 - 1100 nm	400 - 1100 nm	700 - 1800 nm
Power Range	50 nW - 50 mW		500 nW - 500 mW	50 nW - 40 mW
Detector Type	Si Photodiode (UV Extended)	Si Photodiode		Ge Photodiode
Linearity	±0.5%			
Resolution ^a	1 nW		10 nW	2 nW
Measurement Uncertainty ^b	±3% (440 - 980 nm) ±5% (280 - 439 nm) ±7% (200 - 279 nm, 981 - 1100 nm)	±3% (440 - 980 nm) ±5% (400 - 439 nm) ±7% (981 - 1100 nm)		±5%
Coating/Diffuser	Reflective ND (OD1.5) ^c	Reflective ND (OD1) ^d	Reflective ND (OD2) ^e	Absorptive ND (Schott NG9)
Head Temperature Measurement	NTC Thermistor 4.7 kΩ			
Housing Dimensions	Ø30.5 mm x 12.7 mm			
Cable Length	1.5 m			
Post Mounting ^{c,d,e}	Universal 8-32 / M4 Tap, Post Not Included			
Aperture Thread	External SM1 (1.035"-40)			
Fiber Adapters	S120-FC , S120-SMA , S120-ST , S120-LC , S120-SC (Not Included)			

- a. Measured with PM100D console in low bandwidth setting.
- b. Beam diameter > 1 mm.
- c. For the S120VC, these specifications are valid for devices with serial numbers 1203xxx or higher. Older versions had a reflective ND diffuser (OD1). Additionally, they came with an 8-32 tap and M4 adapter. For additional information, please contact [technical support](#).
- d. For the S120C, these specifications are valid for devices with serial numbers 1203xxx or higher. Older versions had an absorptive ND diffuser (Schott NG3). Additionally, they came with an 8-32 tap and M4 adapter. For additional information, please contact [technical support](#).
- e. For the S121C, these specifications are valid for devices with serial numbers 1203xxx or higher. Older versions had a absorptive ND diffuser (Schott NG9). Additionally, they came with an 8-32 tap and M4 adapter. For additional information, please contact [technical support](#).

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+1 Qty Docs Part Number - Universal

Price Available / Ships

S120VC Standard Photodiode Power Sensor, Si, 200 - 1100 nm, 50 mW

\$407.00 3-5 Days

S120C Standard Photodiode Power Sensor, Si, 400 - 1100 nm, 50 mW

\$294.00 Today

S121C Standard Photodiode Power Sensor, Si, 400 - 1100 nm, 500 mW

\$319.00 3-5 Days

S122C Standard Photodiode Power Sensor, Ge, 700 - 1800 nm, 40 mW

\$587.00 Today

Add To Cart

Slim Photodiode Power Sensors

For Optical Power Measurements in Confined Spaces
 Very Slim Design: 5 mm Thin on Sensor Side
 Ø9.5 mm Sensor Aperture
 Slideable ND Filter Automatically Changes Sensor Power Range
 Compatible with the [PM200](#), [PM100D](#), [PM100USB](#), [PM100A](#), and [PM320E](#) Consoles
 Optional SM1A29 Adapter with UV/IR Target and External SM1 Threading ([More Details](#))

The S13xC Slim Photodiode Power Sensors are designed to take optical source power measurements in locations where space and accessibility are at a premium. The 5 mm thin Slim Photodiode Sensors can fit between closely space optics, cage systems, and other arrangements where standard power meters may not fit. The NIST-Traceable, calibrated sensors also feature a large Ø9.5 mm sensor aperture and slideable neutral density filter for dual power ranges in one compact device.

A separately available SM1A29 adapter can be attached by 2 setscrews to any S130 series power sensor to mount fiber adapters, light shields, filters or any other SM1-threaded (1.035"-40) mechanics or optics.



[Click to Enlarge](#)
SM1A29: SM1 Thread Adapter Mounted on a S130C Sensor



[Click to Enlarge](#)
S130C Sensor in a 30 mm Cage

Item #	S130VC	S130C	S132C
Sensor Image (Click the Image to Enlarge)			
Aperture Size	Ø9.5 mm		
Wavelength Range	200 - 1100 nm	400 - 1100 nm	700 - 1800 nm ^a
Power Range (with filter)	500 pW - 0.5 mW ^b (Up to 50 mW) ^b	500 pW - 5 mW (Up to 500 mW)	5 nW - 5 mW (Up to 500 mW)
Detector Type	Si Photodiode (UV Extended)	Si Photodiode	Ge Photodiode
Linearity	±0.5%		
Resolution	100 pW ^c		1 nW ^d
Measurement Uncertainty ^e	±3% (440 - 980 nm) ±5% (280 - 439 nm) ±7% (200 - 279 nm, 981 - 1100 nm)	±3% (440 - 980 nm) ±5% (400 - 439 nm) ±7% (981 - 1100 nm)	±5%
Coating/Diffuser	Reflective ND (OD1.5) ^b	Reflective ND (OD2) ^f	Absorptive ND (Schott NG9/KG3) ^a
Housing Dimensions	150 mm x 19 mm x 10 mm; 5 mm Thickness on Sensor Side		
Cable Length	1.5 m		
Post Mounting	8-32 and M4 Taps		

- a. For the S132C, these specifications are valid for devices with serial numbers 1203xxx or higher. Older versions had a reflective ND diffuser (OD1), which would decrease the wavelength range from 700 nm to 1800 nm to 1200 nm to 1800 nm. For additional information, please contact [technical support](#).
- b. For the S130VC, these specifications are valid for devices with serial numbers 1203xxx or higher. Older versions had an optical power range of 5 nW to 5 mW (50 nW to 50 mW with filter) and a reflective ND diffuser (OD1). For additional information, please contact [technical support](#).
- c. Measured with PM100D console in low bandwidth setting, without filter.
- d. Measured with PM100D console in low bandwidth setting at 1550 nm, without filter.
- e. Beam Diameter > 1 mm.
- f. For the S130C, these specifications are valid for devices with serial numbers 1203xxx or higher. Older versions had an absorptive ND diffuser (Schott NG9). For additional information, please contact [technical support](#).

Based on your currency / country selection, your order will ship from Newton, New Jersey

+1	Qty	Docs	Part Number - Universal	Price	Available / Ships
	<input type="text"/>		S130VC Slim Photodiode Power Sensor, Si, 200 - 1100 nm, 50 mW	\$592.00	✓ Today
	<input type="text"/>		S130C Slim Photodiode Power Sensor, Si, 400 - 1100 nm, 500 mW	\$489.00	✓ Today
	<input type="text"/>		S132C Slim Photodiode Power Sensor, Ge, 700 - 1800 nm, 500 mW	\$695.00	✓ Today
	<input type="text"/>		SM1A29 Customer Inspired! SM1 Thread Adapter for Slim Photodiode Sensors	\$40.20	✓ Today

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Integrating Sphere Photodiode Power Sensors

- For Measurements Independent of Beam Shape and Entrance Angle
- Integrating Sphere Design Acts as a Diffuser with Minimal Power Loss
- Ø5 mm, Ø7 mm, or Ø12 mm Input Aperture
- Removable [S120-FC](#) Fiber Adapter (FC/PC and FC/APC) Included
- Compatible Fiber Adapters: [S120-xx Series](#) and S140-BFA [Bare Fiber Adapter](#)
- Compatible with the [PM200](#), [PM100D](#), [PM100USB](#), [PM100A](#), and [PM320E](#) Consoles

These Integrating Sphere Photodiode Power Sensors are the ideal choice for power measurements independent of beam uniformity, divergence angle, beam shape, or entrance angle, making them excellent for use with fiber sources and off-axis free space sources.

Our integrating spheres are designed for wavelength ranges from the visible through the NIR. Sensor heads for use between 350 and 2500 nm use a single Ø1" or Ø2" sphere made from Zenith® PTFE and feature a black housing to minimize reflected light around the entrance aperture. These sensors use either a silicon photodiode for detection in the 350 - 1100 nm range or an InGaAs photodiode for detection in the 800 - 1700 nm, 900 - 1650 nm, or 1200 - 2500 nm wavelength range.

The S180C integrating sphere for 2.9 - 5.5 µm uses two connected, gold-plated Ø20 mm spheres, with an entrance port in the first sphere and a port for the MCT (HgCdTe) detector located in the second sphere. Compared to single-sphere designs, the two-sphere configuration improves device sensitivity by minimizing the internal sphere surface area while still effectively shielding the detector from direct illumination. This design reduces the effect of input angle, divergence, and beam shape on the measurement result by effectively shielding the photodiode without the use of a baffle or other shielding mechanism.

The integrating spheres below feature large Ø5 mm, Ø7 mm, or Ø12 mm apertures, externally SM1-threaded (1.035"-40) front connections, enhanced shielding against electromagnetic interference, and an over-temperature alert sensor. Because of the large active detector areas of these sensors, the included S120-FC fiber adapter can be used with FC/PC- or FC/APC-terminated fiber. The externally SM1-threaded adapter can be removed using a size 1 screwdriver to place components closer to the window. NIST-traceable data is stored in the sensor connector.



[Click to Enlarge](#)
S142C with the S120-FC Fiber Adapter (Included)



[Click to Enlarge](#)
S142C and S140-BFA Bare Fiber Adapter (Sold Separately)

Item #	S140C	S142C	S144C	S145C	S146C	S148C	S180C
Sensor Image (Click the Image to Enlarge)							
Aperture	Ø5 mm	Ø12 mm	Ø5 mm	Ø12 mm		Ø5 mm	Ø7 mm
Wavelength Range	350 - 1100 nm		800 - 1700 nm		900 - 1650 nm	1200 - 2500 nm	2.9 µm - 5.5 µm
Power Range	1 µW - 500 mW	1 µW - 5 W	1 µW - 500 mW	1 µW - 3 W	10 µW - 20 W	1 µW - 1 W	1 µW - 3 W
Detector Type	Si Photodiode			InGaAs Photodiode			MCT (HgCdTe) Photodiode
Linearity	±0.5%						
Resolution ^a	1 nW			10 nW	1 nW	10 nW	
Measurement Uncertainty ^b	±3% (440 - 980 nm) ±5% (350 - 439 nm) ±7% (981 - 1100 nm)		±5%				
Responsivity ^c (Click for Plot)	 Raw Data	 Raw Data	 Raw Data	 Raw Data	 Raw Data	 Raw Data	 Raw Data
Integrating Sphere Material (Size)	Zenith® PTFE (Ø1")	Zenith® PTFE (Ø2")	Zenith® PTFE (Ø1")	Zenith® PTFE (Ø2")		Zenith® PTFE (Ø1")	Gold Plating (Two Ø20 mm Spheres)
Head Temperature Measurement	NTC Thermistor 4.7 kΩ						
Housing Dimensions	Ø45 mm x 30.5 mm	70 mm x 74 mm x 70 mm	Ø45 mm x 30.5 mm	70 mm x 74 mm x 70 mm		Ø45 mm x 30.5 mm	59.0 mm x 50.0 mm x 28.5 mm
Cable Length	1.5 m						
Post Mounting	8-32 and M4 Taps						
Aperture Thread	Included Adapter with SM1 (1.035"-40) External Thread						
Compatible Fiber Adapters	S120-FC (Included) , S120-SMA , S120-ST , S120-SC , S120-LC or S140-BFA						

a. Measured with PM100D console in low bandwidth setting.

b. Beam diameter > 1 mm

c. All sensor responsivities are calibrated to a NIST-traceable source with measurements taken in 5 nm intervals except for the S180C. See the S180C responsivity graph to see the NIST-traceable reference points.

Based on your currency / country selection, your order will ship from Newton, New Jersey

+1	Qty	Docs	Part Number - Universal	Price	Available / Ships
	<input type="text"/>		S140C Integrating Sphere Photodiode Power Sensor, Si, 350 - 1100 nm, 500 mW	\$675.00	✓ Today
	<input type="text"/>		S142C Integrating Sphere Photodiode Power Sensor, Si, 350 - 1100 nm, 5 W	\$937.00	✓ Today
	<input type="text"/>		S144C Integrating Sphere Photodiode Power Sensor, InGaAs, 800 - 1700 nm, 500 mW	\$793.00	✓ Today
	<input type="text"/>		S145C Integrating Sphere Photodiode Power Sensor, InGaAs, 800 - 1700 nm, 3 W	\$973.00	✓ Today
	<input type="text"/>		S146C Integrating Sphere Photodiode Power Sensor, InGaAs, 900 - 1650 nm, 20 W	\$973.00	✓ Today
	<input type="text"/>		S148C Customer Inspired! Integrating Sphere Photodiode Power Sensor, InGaAs, 1200 - 2500 nm, 1 W	\$814.61	✓ Today
	<input type="text"/>		S180C NEW! Integrating Sphere Photodiode Power Sensor, MCT (HgCdTe), 2.9 - 5.5 µm, 3 W	\$3,533.33	✓ Today

Fiber Photodiode Power Sensors

For Fiber-Based Optical Power Measurements
 Compact Sensor Integrated into the Connector
 Integrated Design for use in the Field and Lab
 Includes [PM20-FC Fiber Adapter](#)
 o S150C and S151C Sensors also Include [PM20-SMA Adapters](#)
 Compatible with all [PM20-xx Series Fiber Adapters](#)
 Compatible with the [PM200](#), [PM100D](#), [PM100USB](#), [PM100A](#), and [PM320E](#) Consoles



[Click to Enlarge](#)

PM100D with S150C Sensor and FC Cable

Item #	S150C	S151C	S154C	S155C
Sensor Image (Click the Image to Enlarge)				
Included Connectors	FC ^d & SMA		FC ^d	
Wavelength Range	350 - 1100 nm	400 - 1100 nm	800 - 1700 nm	
Power Range	100 pW to 5 mW (-70 dBm to +7 dBm)	1 nW to 20 mW (-60 dBm to +13 dBm)	100 pW to 3 mW (-70 dBm to +5 dBm)	1 nW to 20 mW (-60 dBm to +13 dBm)
Detector Type	Si Photodiode		InGaAs Photodiode	

Linearity	±0.5%			
Resolution ^a	10 pW (-80 dBm)	100 pW (-70 dBm)	10 pW (-80 dBm)	100 pW (-70 dBm)
Measurement Uncertainty ^b	±3% (440 - 980 nm) ±5% (350 - 439 nm) ±7% (981 - 1100 nm)	±3% (440 - 980 nm) ±5% (400 - 439 nm) ±7% (981 - 1100 nm)	±5%	
Coating/Diffuser	N/A	Absorptive ND (Schott NG3)	N/A	
Head Temperature Measurement ^c	NTC Thermistor 3 kΩ			
Aperture Thread	External SM05 (0.535"-40)			
Fiber Adapters	Included: PM20-FC & PM20-SMA ; Optional: PM20-LC , PM20-SC , PM20-ST		Included: PM20-FC ; Optional: PM20-LC , PM20-SC , PM20-ST , PM20-SMA	

- a. Measured with PM100D console in low bandwidth setting.
 - b. For a beam diameter > 1 mm incident on the active area of the detector (i.e. at the detector surface after the light has exited the fiber and passed through any internal optics).
 - c. This specification is valid for devices with serial numbers 1203xxx and higher. For older versions, please contact [technical support](#).
 - d. Because of the large active detector area of these sensors, the included PM20-FC fiber adapter can be used with both FC/PC- and FC/APC-connectorized fiber.
- Based on your currency / country selection, your order will ship from Newton, New Jersey**

+1	Qty	Docs	Part Number - Universal	Price	Available / Ships
	<input type="text"/>		S150C Compact Fiber Photodiode Power Sensor, Si, 350 - 1100 nm, 5 mW	\$294.00	✓ Today
	<input type="text"/>		S151C Compact Fiber Photodiode Power Sensor, Si, 400 - 1100 nm, 20 mW	\$335.00	✓ Today
	<input type="text"/>		S154C Compact Fiber Photodiode Power Sensor, InGaAs, 800 - 1700 nm, 3 mW	\$422.00	✓ Today
	<input type="text"/>		S155C Compact Fiber Photodiode Power Sensor, InGaAs, 800 - 1700 nm, 20 mW	\$484.00	✓ Today

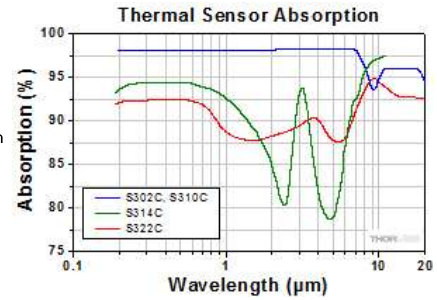
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Thermal Sensors for General Applications

For General Broadband Optical Power Measurements
 Available Aperture Sizes Between Ø9.3 mm and Ø25 mm (See Table Below)
 Broadband Coatings with Flat Response over a Large Wavelength Range
 Compatible with the [PM200](#), [PM100D](#), [PM100USB](#), [PM100A](#), and [PM320E](#) Consoles

Thorlabs' Standard Thermal Power Sensors are designed for broadband optical power measurements of low (100 µW) to high (200 W) power sources. Each thermal sensor's broadband coating has a flat spectral response over a wide wavelength range, as shown in the plot to the right.

NIST-traceable response curves are stored in the sensor connector. Aperture sizes from Ø9.3 mm to Ø25 mm allow easy alignment and measurement of large-spot-size laser sources. These sensors feature external SM1 (1.035"-40) threading on the front for easy integration into existing cage and lens tube systems in addition to fiber coupling applications.



The S302C and S310C sensors have the same absorption curve as the S305C thermal sensor (sold below).

Item #	S302C	S310C	S314C	S322C
Sensor Image (Click Image to Enlarge)				
Aperture Size	Ø9.3 mm (Ø12 mm with Black SM1-Threaded Shield Removed)	Ø20 mm	Ø25 mm	
Wavelength Range	0.19 - 25 µm	0.19 - 25 µm	0.25 - 11 µm	0.25 - 11 µm
Power Range	100 µW - 2 W	10 mW - 10 W	10 mW - 40 W	100 mW - 200 W
Detector Type	Stabilized Thermal Absorber	Thermal Surface Absorber		
Linearity	±1%			
Resolution ^a	1 µW	200 µW	1 mW	5 mW
Measurement Uncertainty ^b	±3% @ 1064 nm ±5% @ 190 - 2940 nm	±3% @ 1064 nm ±5% @ 190 - 1064 nm	±3% @ 1064 nm ±5% @ 250 - 2940 nm	±3% @ 1064 nm ±5% @ 266 - 1064 nm
Response Time ^c	3 s	<1 s		1 s
Cooling	Convection (Passive)			Active Fan Cooling
Housing Dimensions	Ø40 mm x 50 mm	55 mm x 55 mm x 54 mm	100 mm x 100 mm x 55 mm	100 mm x 100 mm x 87 mm
Cable Length	1.5 m			
Post Mounting	M4, 60 mm Long Ø1/2" Post Included	M6, 75 mm Long Ø1/2" Post Included		
Cage Mounting	N/A	30 mm Cage Systems via Four 4-40 Tapped Holes		
Aperture Thread	Externally SM1 (1.035"-40) Threaded for Ø1" Lens Tubes and Fiber Adapters	SM1-Threaded (1.035"-40) Adapter Plate for Ø1" Lens Tubes and Fiber Adapters		

- a. Measurement taken with the PM100D console with the acceleration circuit switched off. Resolution performance will be similar with our other power meter consoles.
 - b. For all of these sensors except the S314C; spectral calibration (the response values for wavelength correction outside of this calibration range) is interpolated from the general absorption curve for the absorber. Other calibration wavelengths are available on request.
 - c. Measured with display (0 - 90%).
- Based on your currency / country selection, your order will ship from Newton, New Jersey**

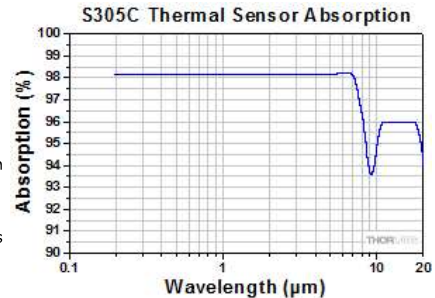
+1	Qty	Docs	Part Number - Universal	Price	Available / Ships
	<input type="text"/>		S302C Thermal Power Sensor, Stabilized, 0.19 - 25 μm, 2 W	\$711.00	✓ Today
	<input type="text"/>		S310C Thermal Power Sensor, Surface Absorber, 0.19 - 25 μm, 10 W	\$711.00	✓ Today
	<input type="text"/>		S314C Thermal Power Sensor, Surface Absorber, 0.25 - 11 μm, 40 W	\$881.00	✓ Today
	<input type="text"/>		S322C Thermal Power Sensor, Surface Absorber, 0.25 - 11 μm, 200 W, Fan Cooled	\$1,300.00	✓ Today

Slim Thermal Sensor

Item #	S305C
Aperture Size	Ø10 mm
Wavelength Range	0.19 - 25 μm
Power Range	10 mW - 5 W
Detector Type	Thermal Surface Absorber
Linearity	±1%
Resolution ^a	100 μW
Measurement Uncertainty ^b	±3% @ 1064 nm; ±5% @ 190 - 2940 nm
Response Time ^c	<1 s
Cooling	Convection (Passive)
Housing Dimensions	40.7 mm x 40.7 mm x 18 mm (1.6" x 1.6" x 0.71")
Cable Length	1.5 m
Post Mounting	Universal 8-32 / M4 Tap, Post Not Included
Cage Mounting	3 x 4-40 Threads for 30 mm Cage Compatibility
Aperture Thread	SM1 (1.035"-40) External Thread for Ø1" Lens Tubes and Fiber Adapters

Housing Dimensions: 40.7 mm x 40.7 mm x 18 mm (1.6" x 1.6" x 0.71")
 For General Broadband Optical Power Measurements
 Ø10 mm Aperture Size
 Broadband Coating with Flat Response over a Large Wavelength Range
 Compatible with the [PM200](#), [PM100D](#), [PM100USB](#), [PM100A](#), and [PM320E](#) Consoles
 30 mm Cage System and SM1 Lens Tube Compatible

The S305C Slim Thermal Power Sensor is designed for detecting broadband optical powers from 10 mW - 5 W sources. Its slim profile makes it particularly useful in tight spaces. The broadband coating used on this thermal sensor features a flat response over a wide range of wavelengths, as shown in the plot to the right.



NIST-traceable response curves are stored in the sensor connector. The aperture size of Ø10 mm allows easy alignment and measurement of laser sources with large spot sizes. The Slim Thermal Sensor features external SM1 (1.035"-40) threading on the front for integration into existing [Ø1" lens tube systems](#), in addition to fiber coupling applications, and it also offers 4-40 taps at three corners that are compatible with our [30 mm cage systems](#). The sensor housing has virtually the same dimensions as a 30 mm cage plate. For use in particularly tight spaces, the front adapter can be removed to reduce the thickness from 18 mm to 15 mm.

The S305C sensor has the same absorption curve as the S302C and S310C thermal sensors featured above.

- a. Measurement taken with the PM100D console with the acceleration circuit switched off.
- b. Spectral calibration (the response values for wavelength correction outside of this calibration range) is interpolated from the general absorption curve for the absorber. Other calibration wavelengths are available on request.
- c. Measured with display (0 - 90%).

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+1	Qty	Docs	Part Number - Universal	Price	Available / Ships
	<input type="text"/>		S305C Customer Inspired! Compact Thermal Power Sensor, Surface Absorber, 0.19 - 25 μm, 5 W	\$711.00	✓ Today

High-Sensitivity Thermal Sensor

Item #	S401C
Aperture Size	Ø10 mm
Wavelength Range	0.19 - 10.6 μm
Power Range	10 μW - 1 W (3 W ^a)
Detector Type	Stabilized Thermal Volume Absorber
Linearity	±0.5%
Resolution	1 μW
Measurement Uncertainty ^b	±3% @ 1064 nm; ±5% @ 190 nm - 10.6 μm
Response Time	<1 s
Cooling	Convection (Passive)

For Broadband Optical Power Measurements Down to 10 μW
 Housing Dimensions: 33.0 mm x 43.0 mm x 18.5 mm (1.30" x 1.69" x 0.73")
 Ø10 mm Aperture Size
 Compatible with the [PM200](#), [PM100D](#), [PM100USB](#), [PM100A](#), and [PM320E](#) Consoles
 Included Adapter with External SM1 Threading (1.035"-40)
 29.4 mm (1.16") Long, Removable Light Shield Included (See Photo to the Right)



The S401C High-Sensitivity Thermal Sensor is designed for detecting broadband optical powers from 10 μW to 1 W sources with a resolution of 1 μW. The broadband coating used on this thermal sensor offers high absorption at wavelengths between 0.19 and 10.6 μm (shown in the plot below and to the right), which makes the sensor ideal for use with aligning and measuring [Mid-IR Quantum Cascade Lasers \(QCLs\)](#).

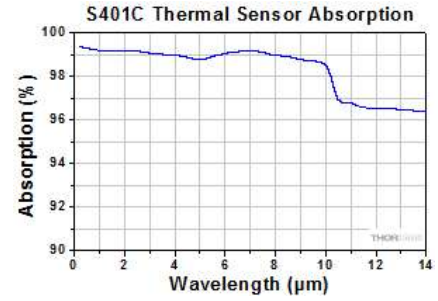
[Click to Enlarge](#)
 S401C Thermal Sensor with Included Light Shield

This sensor uses a thermal volume absorber, as these typically have significantly higher responsivities than thermal surface absorbers for detecting very low power levels and short (ns) pulses. However, this improvement usually comes at the expense of response time. The S401C sensor provides the best of both worlds, as it offers a similar response time to our fastest surface absorber thermal sensors (<1 s) without sacrificing the sensitivity needed for low power measurements.

The sensor aperture size of Ø10 mm allows easy alignment and measurement of laser sources with large spot sizes. The sensor also includes a removable, externally SM1-threaded (1.035"-40) adapter, which is held to the front of the sensor by two Philips-head screws. This adapter allows the sensor to be used with our [Ø1" lens tubes](#), our fiber adapters (sold below), and the included, internally SM05-threaded (0.535"-40) light shield, as shown in the photo above and to the right. For use in particularly tight spaces, the adapter can be

Housing Dimensions	33.0 mm x 43.0 mm x 18.5 mm (1.30" x 1.69" x 0.73")
Cable Length	1.5 m
Post Mounting	Universal 8-32 / M4 Tap, Post Not Included
Cage Mounting	N/A
Aperture Thread	SM1 (1.035"-40) External Thread for Ø1" Lens Tubes and Fiber Adapters

removed to reduce the thickness from 18.5 mm to 15 mm. The connector stores NIST-traceable calibration curves for the sensor.



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S401C High-Sensitivity Thermal Power Sensor, 0.19 - 10.6 µm, 10 µW - 1 W

\$711.00



Today

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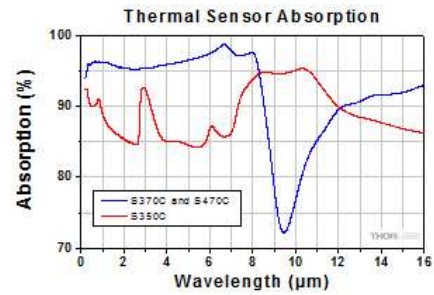
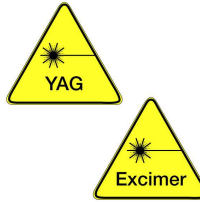
Thermal Sensors for Excimer and YAG Lasers

For Optical Power Measurements of Excimer (S350C) and YAG (S370C and S470C) Lasers

Ideal for Applications with High Peak Powers

High-Sensitivity Version (S470C) Ideal for High-Peak-Power Pulses with Low Average Power

Compatible with the [PM200](#), [PM100D](#), [PM100USB](#), [PM100A](#), and [PM320E](#) Consoles



[Click to Enlarge](#)

These absorption curves are shown over a broader wavelength range than the sensors' operating ranges. See the table below for the operating wavelength range of each sensor.

The S350C, S370C, and S470C Thermal Sensors are designed for high-peak-power pulsed laser sources. All of these units are post-mountable for free-space applications and feature NIST-traceable data stored in the sensor connector.

S350C

The S350C sensor features a Ø40 mm aperture and a 40 W max power (CW). It is designed for Excimer lasers and other applications that require measuring high-power, large-spot-size lasers.

S370C and S470C

The S370C and S470C are designed for YAG lasers. Both incorporate a Schott glass absorber on top of the thermal absorber; this glass layer allows them to detect pulses with high peak powers. The S370C features a large Ø25 mm aperture ideal for large-spot-size beams, and is compatible with average powers from 10 mW to 10 W (CW).

In comparison, the S470C has a smaller aperture of Ø15 mm and a lower max average power of 5 W. However, the S470C's smaller absorber decreases the response time to <2 s, and it has a thermal detector that can measure average powers down to 100 µW. With a housing size of only 45 mm x 45 mm x 18 mm, this thermal sensor head is also the most compact of our specialized thermal sensor heads for use with high-power lasers.

Item #	S350C	S370C	S470C
Sensor Image (Click the Image to Enlarge)			
Aperture Size	Ø40 mm	Ø25 mm	Ø15 mm
Wavelength Range	0.19 - 1.1 µm, 10.6 µm	0.4 - 5.2 µm	0.25 - 10.6 µm
Power Range	10 mW - 40 W (CW)	10 mW - 10 W (CW)	100 µW - 5 W (Pulsed and CW)
Max Power Density	2 kW/cm ² (Avg.)	35 W/cm ² (Avg.); 100 GW/cm ² (Peak)	
Detector Type	Thermal Surface Absorber	Thermal Volume Absorber	
Linearity	±1%		
Resolution ^a	1 mW	250 µW	±0.5% 10 µW
Measurement Uncertainty ^b	±3% @ 351 nm; ±5% @ 190 - 1100 nm	±3% @ 1064 nm; ±5% @ 400 - 1064 nm	±3% @ 1064 nm; ±5% @ 250 nm - 10.6 µm
Response Time ^c	1 s	3 s	<2 s
Cooling	Convection (Passive)		
Housing Dimensions	100 mm x 100 mm x 55 mm	75 mm x 75 mm x 51.5 mm	45 mm x 45 mm x 18 mm
Cable Length	1.5 m		
Post Mounting	Ø1/2" Posts via M6 Tap (75 mm Long Post Included)	Ø1/2" Posts via M6 Tap (75 mm Long Post Included)	Ø1/2" Posts via Universal 8-32 & M4 Tap (Post Not Included)
Cage Mounting	N/A	30 mm Cage Systems via Four 4-40 Taps	N/A
Aperture Thread	N/A	External SM1-Threaded (1.035"-40) Adapter Plate for Mounting Ø1" Lens Tubes and Fiber Adapters	External SM1 (1.035"-40) for Mounting Ø1" Lens Tubes and Fiber Adapters

a. Measurement taken with the PM100D console with the acceleration circuit switched, except for the S470C, which was measured with the PM200 console. Resolution performance will be similar with our other power meter consoles.

b. Spectral calibration (the response values for wavelength correction outside of this calibration range) is interpolated from the general absorption curve for the absorber. Other calibration wavelengths are available on request.

c. Measured with display (0 - 90%).

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+1	Qty	Docs	Part Number - Universal	Price	Available / Ships
	<input type="text"/>		S350C Thermal Power Sensor, Surface Absorber, 0.19 - 1.1 μm and 10.6 μm , 40 W	\$1,050.00	✓ Today
	<input type="text"/>		S370C Thermal Power Sensor, Volume Absorber, 0.4 - 5.2 μm , 10 W	\$1,090.00	✓ Today
	<input type="text"/>		S470C High-Sensitivity Thermal Power Sensor, Volume Absorber, 0.25 - 10.6 μm , 0.1 mW - 5 W	\$1,110.00	✓ Today

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Pyroelectric Energy Sensors

For General Purpose and High Energy Optical Pulse Measurements
 Black Broadband Coating with Flat Response Over a Wide Wavelength Range
 Ceramic Coating with High Damage Thresholds for High-Energy-Density Lasers
 Ø11 mm - Ø45 mm Sensor Area
 Comes with BNC Connector for Oscilloscope Use and a Sensor Adapter for Use with the [PM200](#), [PM100D](#), [PM100USB](#), and [PM320E](#) Consoles



[Click to Enlarge](#)
 ES220C Sensor Mounted in a 30 mm Cage System

The ESxxx Standard and High Energy Pyroelectric Sensors are designed to measure pulsed coherent and incoherent sources. Pyroelectric sensors are not suited for CW measurements, as they convert energy from light pulses into voltage pulses. A black broadband or ceramic coating is used for low or high power measurements, respectively. Large sensor areas from Ø11 mm - Ø45 mm allow easy alignment. The energy sensors features BNC connectors for use with an oscilloscope, as well as standard power meter connectors which contain NIST and PTB-traceable calibration data.

Item #	ES111C	ES120C	ES145C	ES220C	ES245C
Sensor Image (Click the Image to Enlarge)					
Aperture Size	Ø11 mm	Ø20 mm	Ø45 mm	Ø20 mm	Ø45 mm
Wavelength Range	0.185 - 25 μm				
Energy Range	10 μJ - 150 mJ	100 μJ - 500 mJ	500 μJ - 2 J	500 μJ - 3 J	1 mJ - 15 J
Detector Type	Pyroelectric Energy Sensor with Black Broadband Coating			Pyroelectric Energy Sensor with Ceramic Coating	
Resolution	100 nJ	1 μJ	1 μJ	25 μJ	50 μJ
Linearity	±1%				
Measurement Uncertainty	±5% @ 0.185 - 25 μm				
Housing Dimensions	Ø36 mm x 16 mm	Ø50 mm x 18 mm	Ø75 mm x 21 mm	Ø50 mm x 18 mm	Ø75 mm x 21 mm
Cable Length	1.5 m				
Post Mounting	8-32 Mounting Thread, 8-32 and M4 Insulating Adapters Included				
Cage Mounting	N/A	Four 4-40 Threadings for 30 mm Cage Systems	N/A	Four 4-40 Threadings for 30 mm Cage Systems	

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+1	Qty	Docs	Part Number - Universal	Price	Available / Ships
	<input type="text"/>		ES111C Pyroelectric Energy Sensor, Broadband Coating, 0.185 - 25 μm , 150 mJ	\$1,240.00	✓ Today
	<input type="text"/>		ES120C Pyroelectric Energy Sensor, Broadband Coating, 0.185 - 25 μm , 500 mJ	\$1,290.00	✓ Today
	<input type="text"/>		ES145C Pyroelectric Energy Sensor, Broadband Coating, 0.185 - 25 μm , 2 J	\$1,490.00	✓ Today
	<input type="text"/>		ES220C Pyroelectric Energy Sensor, Ceramic Coating, 0.185 - 25 μm , 3 J	\$1,550.00	✓ Today
	<input type="text"/>		ES245C Pyroelectric Energy Sensor, Ceramic Coating, 0.185 - 25 μm , 15 J	\$1,800.00	✓ Today

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Recalibration Service for Photodiode Power Sensors

Thorlabs offers Calibration Services for our photodiode optical power sensors. To ensure accurate measurements, we recommend recalibrating the sensors annually. Recalibration of the console is included with the recalibration of a sensor.

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+1	Qty	Docs	Part Number - Universal	Price	Available / Ships
	<input type="text"/>		CAL1 Recalibration Service for Si Power Meter Sensors Except S130 Series	\$138.00	Lead Time
	<input type="text"/>		CAL2 Recalibration Service for Ge & InGaAs Power Meter Sensors Except S132 Series and S148C	\$155.00	Lead Time
	<input type="text"/>		CAL-S130 Recalibration Service for Si Power Meter Sensors for S130 Series and PM160	\$160.00	Lead Time
	<input type="text"/>		CAL-S132 Recalibration Service for Ge Power Meter Sensors for S132 Series only	\$170.00	Lead Time
	<input type="text"/>		CAL4 NEW! Recalibration Service for MCT and Extended InGaAs Mid-IR Power Sensors (S148C and S180C)	\$277.78	Lead Time

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[Wireless Power Meter with Sensor](#)

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