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THORLABS

# PM204 - May 15, 2018

Item # PM204 was removed from our e-commerce site on May 15, 2018. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

## OPTICAL POWER METER KITS

**Kits Include Meter, Sensor, and Post Assembly**
**Digital or Analog Meter**
**Wavelengths from 200 nm to 25 µm**
**Powers from 500 pW to 10 W**



PM130D


PM206

PM120VA

Hide Overview

### OVERVIEW

**Features**

- Includes Console, Sensor, and Mounting Components
- C-Series Meter Consoles Compatible with Other C-Series Sensors
- Large, Easy-to-Read Digital or Analog Display
- USB 2.0 Connectivity and Graphical User Interface
- Rechargeable Battery for 8 hr Remote Operation, AC Adapter Included
- SMA Output (0 to 2 V) on Meters for Monitoring Signal
- Recalibration Services Available

Our optical power meter kits consist of a handheld power and energy meter, a C-Series photodiode or thermal sensor, and a post mounting assembly. The sensor in each of these kits is paired with either a PM100D

**Kit Based on the PM100A Analog/Digital Meter**

| Item # | Power Range | Wavelength Range | Sensor Type | Meter Type |
|---|---|---|---|---|
| PM120VA | 50 nW - 50 mW | 200 - 1100 nm | Si (S120VC) | Analog/Digital Meter (PM100A) |

**Kits Based on the PM100D Digital Meter**

| Item # | Power Range | Wavelength Range | Sensor Type | Meter Type |
|---|---|---|---|---|
| PM120D | 50 nW - 50 mW | 400 - 1100 nm | Si (S120C) | Digital Meter (PM100D) |
| PM121D | 500 nW - 500 mW | 400 - 1100 nm | Si (S121C) | Digital Meter (PM100D) |
| PM130D | 500 pW - 500 mW[a] | 400 - 1100 nm | Slim Si (S130C) | Digital Meter (PM100D) |
| PM122D | 50 nW - 40 mW | 700 - 1800 nm | Ge (S122C) | Digital Meter (PM100D) |
| PM310D | 10 mW - 10 W | 0.19 - 25 µm | Thermal (S310C) | Digital Meter (PM100D) |

**Kits Based on the PM200 Touch Screen Meter**

| Item # | Power Range | Wavelength Range | Sensor Type | Meter Type |
|---|---|---|---|---|
| PM204 | 50 nW - 50 mW | 200 - 1100 nm | Si S120VC | Touch Screen Meter PM200 |
| PM201 | 50 nW - 50 mW | 400 - 1100 nm | Si S120C | Touch Screen Meter PM200 |
| PM202 | 500 nW - 500 mW | 400 - 1100 nm | Si S121C | Touch Screen Meter PM200 |
| PM203 | 500 pW - 500 mW[a] | 400 - 1100 nm | Slim Si S130C | Touch Screen Meter PM200 |

digital power meter or a PM200 touch screen power meter, except for the PM120VA which includes the PM100A analog/digital power meter. For a full list of available kits, see the tables the right.

| Item # | Power Range | Wavelength Range | Sensor Type | Meter Type |
|---|---|---|---|---|
| PM205 | 50 nW - 40 mW | 700 - 1800 nm | Si S122C | Touch Screen Meter PM200 |
| PM206 | 10 mW - 10 W | 0.19 - 25 µm | Thermal S310C | Touch Screen Meter PM200 |

[a] The PM203 features a sliding neutral density filter. Without the filter, the power measurement range is 500 pW to 5 mW, while with the filter, the range is 5 mW to 500 mW. The position of the ND filter is automatically detected by the power meter.

Suitable for both absolute and relative power measurements, the PM100A analog/digital power meter is an optical power meter featuring an analog needle display and a supplemental LCD screen. The analog needle is ideal for relative power measurements and for watching small power fluctuations. While available here as part of the PM120VA kit which includes an S120VC sensor, the PM100A is also compatible with all C-Series photodiode sensors and thermal sensors but not with the pyroelectric energy sensors.

The PM100D digital power meter features a menu driven control panel, 4" backlit display, and an SD card slot for storing data. This console is compatible with all of our C-Series sensors for power or energy measurements, including our pyroelectric energy sensors.

The PM200 touch screen power and energy meter offers a brilliant 5.7" touch screen and many enhanced features such as data recording to internal memory or a USB drive and the ability to use uploaded spectral response curves for more accurate power measurements. Additional optional features include a temperature and humidity module and a fiber inspection camera (avalable soon). Like the PM100D, this console is compatible with all of our C-Series sensors.

All three meters have USB 2.0 connectivity and a rechargeable battery for field work. Please see the *Specs* and *Display* tabs for for more information, or see the PM100A, PM100D, and PM200 full product presentations to learn about all of their features.

The power meters and sensors in these kits can also be purchased individually. Additionally, Thorlabs offers a self-contained wireless power meter and sensor combination designed for both handheld operation and remote control via bluetooth or USB. The features of the PC control software are highlighted in the *Software* tab.

**Recalibration Service**
Recalibration services are available for our photodiode and thermal power meter sensors and consoles. We recommend recalibrating your Thorlabs sensor and console as a pair; however, each may be recalibrated individually. To order this service for your sensor or combined sensor and console, scroll to the bottom of the page and select the appropriate Item # that corresponds to your sensor. To order this service for only your console, please contact Tech Support.

Hide PM100 Specs

## PM100 SPECS

Click here for the complete PM100A product presentation.

| PM100A Specifications | |
|---|---|
| **Photodiode Sensor Input (Current)** | |
| **Measurement Ranges** | 6 Decades; 50 nA - 5 mA |
| **Units** | W |
| **Accuracy** | ±0.2% of Full Scale (5 µA - 5 mA)<br>±0.5% of Full Scale (50 nA)<br>±3% Full Scale Analog Meter |
| **Bandwidth** | DC to 100 kHz, Dependent on Sensor and Settings |
| **Analog Output** | |
| **Connector** | SMA |
| **Voltage Range** | 0 - 2 V |
| **Bandwidth** | Up to 100 kHz, Dependent on Sensor and Settings |
| **Accuracy** | ±3% |
| **General** | |
| **Sensor Input** | Female DB9 for C-Series Connectors |
| **Display** | Analog Needle with 132 x 32 pixel LCD Readout |
| **Display Update Rate** | 20 Hz |

| PM100A Specifications | |
|---|---|
| **Display Screens** | Numerical, Relative Measurements, Tuning, Statistics, Mechanical Analog Needle |
| **Memory Card** | N/A |
| **A/D Converter** | 16 bit |
| **Computer Connectivity** | USB 2.0, Mini USB |
| **Battery** | Li-Polymer 3.7 V, 1300 mAh; up to 8 hrs of Operation |
| **Dimensions** | 7.2" x 4.3" x 1.6" (183 mm x 109 mm x 40 mm) |
| **Operating / Storage Temp** | 0 to 40 °C / -40 to 70 °C |
| **Mounting** | Kickstand, 1/4"-20 Mounting Hole |

Click here for the complete PM100D product presentation.

| PM100D Specifications | |
|---|---|
| **Photodiode Sensor Input (Current)** | |
| **Measurement Ranges** | 6 Decades; 50 nA - 5 mA |
| **Units** | W, dBm, W/cm$^2$, A |
| **Accuracy** | ±0.2% of Full Scale (5 µA - 5 mA)<br>±0.5% of Full Scale (50 nA) |
| **Bandwidth** | DC to 100 kHz, Dependent on Sensor and Settings |
| **Thermopile Sensor Input (Voltage)** | |
| **Measurement Ranges** | 4 Decades; 1 mV - 1 V |
| **Units** | W, dBm, W/cm$^2$, V |
| **Accuracy** | ±0.5% of Full Scale (10 mV - 1 V)<br>±1% of Full Scale (1 mV) |
| **Bandwidth** | DC to 10 Hz, Dependent on Sensor and Settings |
| **Time Constant Correction** | 1 - 30 s |
| **Analog Output** | |
| **Connector** | SMA |
| **Voltage Range** | 0 - 2 V |
| **Bandwidth** | Up to 100 kHz, Dependent on Sensor and Settings |
| **Accuracy** | ±3% |
| **General** | |
| **Sensor Input** | Female DB9 for C-Series Connectors |
| **Display** | 3.2" x 2.4" (81.4 mm x 61 mm), 320 x 240 pixels |
| **Display Update Rate** | 20 Hz |
| **Display Screens** | Numerical, Bar Graph, Trend Graph, Statistics, Simulated Analog Needle |
| **Memory Card** | SD, 1 GB |
| **A/D Converter** | 16 bit |
| **Computer Connectivity** | USB 2.0, Mini USB |
| **Battery** | Li-Polymer 3.7 V, 1300 mAh; up to 8 hrs of Operation |
| **Dimensions** | 7.2" x 4.3" x 1.6" (183 mm x 109 mm x 40 mm) |
| **Operating / Storage Temp** | 0 to 40 °C / -40 to 70 °C |
| **Mounting** | Kickstand, 1/4"-20 Mounting Hole |

Hide PM100A Display

PM100A DISPLAY

## PM100A Display

| Standard Absolute Measurements | Relative Measurements |
|---|---|

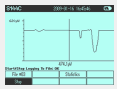
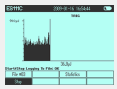
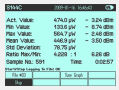
## PM100A Display

| | |
|---|---|
|  |  |
| This display shows the current absolute power values on both the mechanical needle and the LCD display. | Shows positive or negative power deviation from an initially zeroed position (needle in middle position). The offset and the absolute power value will be displayed in two sub displays in negative presentation. |
| **Power Tuning with Sound Support** | **Statistics Screen** |
|  |  |
| This display shows the maximum reached power level.<br>The level can be reset to the actual power level. | A display showing the current, min, max, and average power.<br>All items can be reset to restart data sampling. |
| **Wavelength Setting** | |
|  | |
| Configuration screen to set the wavelength of the incident beam. Easy switching between 9 user preconfigurable wavelengths. | |

Hide PM100D Display

## PM100D DISPLAY

### PM100D Display

| | |
|---|---|
| **Numeric Screen (Power Mode)** | **Numeric Screen (Energy Mode)** |
|  This display combines a clear, numerical 4-digit read out of the optical power, a bar graph function with zooming capabilities, and configurable sub displays. |  A display with the same option as on the left for optical energy read outs. |
| **Trend Graph (Power Mode)** | **Needle Tuning (Power Mode)** |
|  For laser tuning and beam alignment to visualize changes and trends together with an additional 4-digit numerical value of the absolute power. |  A display imitating an analog needle together with an additional 4-digit numerical value for laser tuning tasks. A special feature is a resettable max hold indicator and a shiftable tuning sound. |
| **Pulse Chart (Energy Mode)** | **Statistics Screen (Power Mode)** |
|  Like the Trend Graph (Power Mode), this shows changes and trends together with an additional 4-digit numerical value of the absolute energy of incident beam pulses. |  The statistics display shows the actual, minimum, maximum and mean value in linear and logarithmic representation; further the standard deviation, the max/min ratio, the number of samples and the elapsed time. |

### Common Display Elements

- Header line with sensor information, date/time, and battery state
- Status line with warning annunciators
- Bar graph and configurable left and right sub display areas to display a minimum and a maximum value or a ratio of both values (numerical screen only)
- Tool tip text above the menu
- Easily accessible menu via buttons

Hide PM200 Specs

## PM200 SPECS

Click here for the complete PM200 product presentation.

### PM200 Specifications

| PM200 Specifications | |
|---|---|
| **Detector Compatibility** | Photodiode Sensors S100C Series<br>Thermal Sensors S300C Series<br>Pyroelectric Sensors ES100C/ES200C Series<br>Photodiode Sensors: 5 mA (Max)<br>Thermopile Sensors: 1 V (Max)<br>Pyroelectric Sensors: 100 V (Max) |
| **Display Type** | 5.7" TFT, 640 x 480 Pixels, 18 bit Color |
| **Viewing Area** | 118 mm x 88 mm |
| **Display Update Rate** | Max 15 Hz |
| **Display Format** | Numerical, Bargraph, Trendgraph, Statistics, Simulated Analog Needle |
| **Backlight Display** | LED, Adjustable |
| **Overall Dimensions (H x W x D)** | 170 mm x 125 mm x 38 mm |
| **Features** | Rotatable Two Position Kickstand,<br>Removable Rubberboot, Touch-Pen,<br>Fixture for Optional Fiber Inspection Camera |
| **Weight** | 0.57 kg |
| **Operating Temperature** | 0 °C to 40 °C |
| **Storage Temperature** | -40 °C to 70 °C |
| **Current Input (Photodiode Sensors)** | |
| **Connector** | DB9F, Left Side |
| **Units** | W, dBm, W/cm², A |
| **Measurement Ranges** | 6 Decades; 50 nA - 5 mA<br>Ranges Selectable in W, Sensor Dependent |
| **Display Resolution** | 1 pA / Responsivity Value (A/W) |
| **AD Converter** | 16 bit |
| **Accuracy** | ±0.2% full scale (5 µA - 5 mA)<br>±0.5% full scale (50 nA) |
| **Bandwidth** | DC - 100 kHz, Dependent on Sensor and Settings |
| **Wavelength Correction** | nm (A/W) |
| **Beam Area Setting** | Diameter 1/e² or Rectangular x,y |
| **Voltage Input (Thermopile Sensors)** | |
| **Connector** | DB9F, Left Side |
| **Units** | W, dBm, W/cm², V |
| **Measurement Ranges** | 4 Decades; 1 mV - 1 V<br>Ranges Selectable in W, Sensor Dependent |
| **Display Resolution** | 1 µV / Responsivity Value (V/W) |
| **AD Converter** | 16 bit |
| **Accuracy** | ±0.5% f.s. (10 mV - 1 V)<br>±1% f.s. (1mV) |
| **Bandwidth** | DC - 10 Hz, Dependent on Sensor and Settings |
| **Time Constant Correction Range** | 1 - 30 s |
| **Wavelength Correction** | Sensor Dependent; nm, (V/W) |
| **Beam Area Setting** | Diameter 1/e² or Rectangular x,y |
| **Voltage Input (Pyro Sensors)** | |
| **Connector** | DB9F, Left Side |
| **Units** | J, J/cm², W, W/cm², V |
| **Measurement Ranges** | 4 Decades; 200 mV - 2V - 20 V - 100 V<br>Ranges Selectable in J, Sensor Dependent |
| **Display Resolution** | 100 µV / Responsitivity Value (V/J) |
| **AD Converter** | 16 bit |

| PM200 Specifications | |
|---|---|
| **Accuracy** | ± 0.5% full scale |
| **Trigger Threshold** | 0.1% - 99.9% full scale |
| **Max Repetition Rate** | 3 kHz |
| **Wavelength Correction** | Sensor Dependent (nm, V/J) |
| **Beam Area Setting** | Diameter 1/e² or Rectangular x,y |

| PM200 Specifications (Continued) | |
|---|---|
| **Analog Output** | |
| **Connector** | Audio 3.5 mm, Left Side |
| **Signal** | Amplified Input Signal - Not Corrected |
| **Voltage Range** | 0 to 2 V |
| **Accuracy** | ±3% |
| **Bandwidth** | up to 100 kHz, Dependent on Sensor and Settings |
| **Auxiliary In-/Output** | |
| **Connector** | 2 x 6 Pins, 0.1" Socket, Top Side |
| **Function** | External Trigger Input<br>4 x GPIO<br>2 x 10 bit ADC |
| **Sensor Temperature Control** | |
| **Supported Temperature Sensor** | Thermistor |
| **Temperature Measurement Range** | -10 °C to +80 °C |
| **Sound** | |
| **Type** | Speaker 300 Hz - 5 kHz |
| **Function** | Laser Tuning Support, Console Function Support |
| **Memory** | |
| **Type** | Nand Flash |
| **Size** | 128 MB |
| **Interfaces** | |
| **Type** | USB2.0 |
| **Connector (Host)** | Mini USB, Top Side |
| **Connector (Device)** | USB Type A, Left Side |
| **Power Management** | |
| **Battery** | LiPo 3.7 V 2600 mAh |
| **Charger / DC Input** | 5 V / 2 A |
| **Power Connector** | Center Hole |
| **Included Accessories** | |
| **Hardcase** | For Console and Sensor(s) |
| **External Power Supply** | 5 VDC / 2.4 A with Power Cord |
| **USB Cable** | USB Type A Connector to Mini USB Connector (2 m) |
| **Cable for Analog Output** | 3.5 mm Audio Connector to Flying Leads (2 m) |
| **External Memory** | USB Flash Drive 2 GB |
| **Instrument Drivers** | on USB Flash Drive |
| **Application Software** | on USB Flash Drive |
| **User Manual** | Quick Reference as Hardcopy,<br>Manual on USB Flash Drive |
| **Optional Accessories** | |
| **Environmental Measurement Module** | Displays Temperature and Relative Humidity |
| **Fiber Inspection Camera Module** | Monochrome Fiber Inspection Camera with Power Measurement Capability |

For a full list of the sensor head specifications please visit the Photodiode Power Sensors, Thermal Power Sensors, or Pyroelectric Energy Sensors pages.

For other information, please contact tech support.

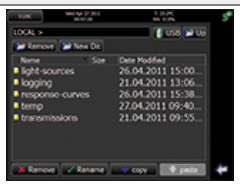
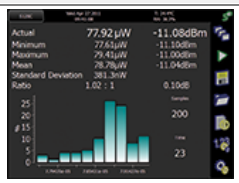
Hide PM200 Display

## PM200 DISPLAY

**Click Here for an Interactive PM200 Touch Screen Demo**

### Features

- Header Line with Info About the Sensor, Date/Time, and Battery State
- Vertical Navigation Bar on the Right
- 90° Screen Flip According to Device Orientation
- Configurable Widgets on Most Screens
- Selectable Color Scheme for All Screens

| Numeric Display | | Measurement Settings | |
|---|---|---|---|
|  Click to Enlarge | The large power or energy readout is the main element of the numeric display. Supplementary display icons can be added to show various pieces of information. (e.g., a corresponding bar graph scale with integrated min-max indicators offers a quasi-analog view of the data). All display elements can be quickly configured. |  Click to Enlarge | This screen provides overview and control over all settings of the connected sensor. Additionally, the logging stop criteria and logging interval are configured here. |
| **Needle Display** | | **File Manager** | |
|  Click to Enlarge | The needle display with its minimum and maximum indicators is very convenient for laser tuning. The large numeric display below the gauge provides an exact power readout. This screen offers the same convenient configuration features as the numeric display. |  Click to Enlarge | The file manager provides access to the local drive or to a user-supplied USB flash drive. Typically logging files, user calibration, or correction curves are stored here. |
| **Graph Display** | | **Sensor Information** | |
|  Click to Enlarge | The graph display shows the power or energy reading as a function of time. While recording data, this screen can be toggled with the statistic display. Directly after recording or after loading stored data, you can zoom into the graph and set a cursor for data analysis. |  Click to Enlarge | The sensor information screen shows sensor-relevant data and the response curve with indicators for minimum, maximum, and set wavelength, which are stored in the sensor EEPROM. |
| **Statistic Display** | | **Color Schemes** | |
|  Click to Enlarge | On the statistics screen, all important parameters are calculated and displayed in linear and logarithmic format. The numbers are supported by a histogram, which can be enlarged. All data is initially stored to a temporary file that can be saved. |  Click to Enlarge | On the color scheme display the display color can be adjusted for own preference and best visibility. |
| **Settings Page** | | **Multi-Language GUI** | |
|  Click to Enlarge | The settings page offers easy access to all measurement and system-related settings. |  Click to Enlarge | The language of the GUI can be choosen between 6 different operating languages on the multi-language screen. |

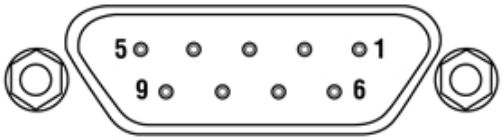
The user can customize the display screen by selecting various measurement tasks to be shown on the screen. Some screens are partly configurable by the user, for example, the user can display the min and max values within a certain time period or enable visual and audible peak indicator as a tuning aid.

Hide Pin Diagrams

## PIN DIAGRAMS

### Sensor Connector

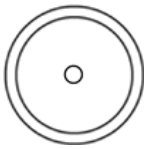
### D-type Female




| Pin | Connection |
|---|---|
| 1 | +5 V (Drive max 50 mA from this pin) |
| 2 | EEPROM Digital I/O |
| 3 | Photodiode Ground (Anode), Thermal and Pyro Sensor Ground, Analog Ground |
| 4 | Photodiode Cathode |
| 5 | Pyro-Electric Sensor + |
| 6 | DGND |
| 7 | PRESENT (Connect this pin via a 1kΩ - 10kΩ resistor to Pin 3 (AGND)) |
| 8 | Thermal Sensor + |
| 9 | N.C. |

### Analog Output

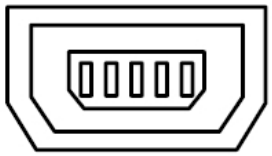
### SMA Female



0 ... 2 V

### Computer Connection

### USB Type Mini-B



USB Type Mini-B to Type A Cable Included

Hide Software

## SOFTWARE

### Compatible Power Meters

- PM100A Analog Power and Energy Meter Console
- PM100D Digital Power and Energy Meter Console
- PM100USB USB Interface Digital Power Meter
- PM200 Touchscreen Power and Energy Meter Console
- PM400 Capacitive Touchscreen Power and Energy Meter Console
- PM160, PM160T, and PM160T-HP Wireless Handheld Power Meters with Bluetooth® Technology
- PM16 Series Compact USB Power Meters

The Optical Power Monitor software is not compatible with the PM320E Benchtop Power Meter.

## Optical Power Monitor

The Optical Power Monitor GUI software features power measurement, readout from up to eight power meters, and remote wireless operation.

For details on specific software features, please see the user manual, which can be downloaded here.

Users interested in the legacy Power Meter Software can find it by visiting the software page here.

Software

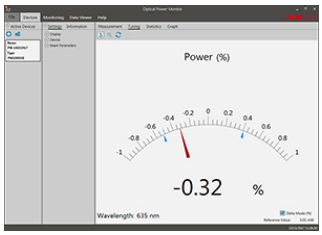
## Optical Power Monitor GUI Software for Touchscreen, Handheld, and USB-Interface Power Meters

### Features

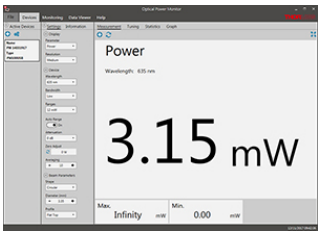
- Operate up to Eight Power Meters Simultaneously
- Record and Analyze Measurements in Real Time
- Intuitive Analog Display and Graphing Modes
- Configurable Long-Term Data Logging
- Compatible with USB and Bluetooth® Connections

The Optical Power Monitor software GUI enables seamless control of up to eight power meters that are connected via USB or Bluetooth® wireless technology[a]. The latest software, firmware, drivers, and utilities for these power meters can be downloaded here.

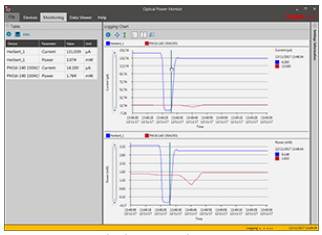
Multiple data measurement and analysis functions are integrated into the GUI package. The interface offers a user-friendly design with minimal use of color and low brightness that is ideal use in dark lab environments while wearing laser safety glasses. Measured data can be displayed in real time as a simulated analog needle, digital values, line graph, or bar graph. Continuously logged and short-term measurements can be recorded for data viewing and analysis at a later point. A built-in statistics mode analyzes measured data and continuously updates to reflect new measurements within the pre-determined measurement period.



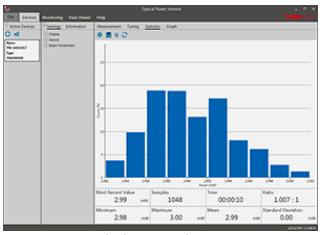

Click to Enlarge
**Tuning Mode:** Simulated analog needle and digital measurement value provided. Delta Mode, enabled above, shows the fluctuation range during the measurement period.




Click to Enlarge
**Measurement Mode:** Set up and configure up to eight power meters.



Click to Enlarge
**Data Logging:** Enable long-term measurement and simultaneous recording from up to eight power meters. Save data as .csv files for later processing while measurement results are displayed in a graph in real time.



Click to Enlarge
**Statistics Mode:** Calculate numerical statistics for a pre-determined measurement period. The panel displays the analyzed values in a bar graph and the results as numerical values.

The Optical Power Monitor software package installs the GUI, which then can be used to control the touchscreen, handheld, or USB-interface power meters. Firmware updates for supported power meters are also available. Programming examples and drivers for interfacing with our power and energy meter consoles using LabVIEW, Visual C++, Visual C#, and Visual Basic are installed with the software; refer to the manual for details.

Please note that the Optical Power Monitor Software uses different drivers than the Power Meter Utilities Software and Thorlabs recommends using the new driver TLPM.dll. For users who wish to use the legacy Power Meter Software or use custom software designed using the older PM100D.dll driver, a Power Meter Driver Switcher program is included for easy swapping of the installed driver between the two versions.

a. The PM160, PM160T, and PM160T-HP power meters are equipped with Bluetooth® connections.

Hide Analog/Digital or Digital Meter with 50 nW to 50 mW Si Sensor (200 - 1100 nm)

## Analog/Digital or Digital Meter with 50 nW to 50 mW Si Sensor (200 - 1100 nm)

| Kit | PM120VA | PM204 |
|---|---|---|
| Click Image to Enlarge |  |  |
| **Included Meter** | PM100A | PM200 |
| **Display** | Analog Needle with 132 x 32 Pixel LCD | 5.7" Color Touch Screen, VGA Resolution |
| **Applications** | Absolute and Relative Power Measurements | All Power and Energy Measurements |
| **Connectivity** | USB 2.0 Connectivity | |
| **Console Sensor Compatibility** | All C-Series Photodiode and Thermal Power Sensors | All C-Series Photodiode and Thermal Power Sensors as well as all Pyroelectric Energy Sensors |

| Included Sensor | S120VC |
|---|---|
| **Wavelength Range** | 200 - 1100 nm |
| **Power Range** | 50 nW - 50 mW |
| **Resolution** | 1 nW |
| **Detector Type** | Si Photodiode |
| **Aperture** | Ø9.5 mm |
| **Spec Sheet** | |

These kits include our PM100A or PM200 meter console, a 120VC photodiode power sensor, and a post assembly, consisting of a BA2 base, PH2 post holder, and TR2 Ø1/2" post. This is a general purpose kit for low power lasers (50 nW - 50 mW) within the visible and NIR. Many of our laser diodes and HeNe lasers are suitable for use with this power meter kit.

Thorlabs offers a recalibration service for power and energy meter kits, which can be ordered below (see Item # CAL1). Enter only the Part # and Serial # of the sensor that requires recalibration. We will also recalibrate the corresponding console free of charge; ensure that the console is included with your shipment.

If you wish to recalibrate only your console, please contact Tech Support for details.

| Part Number | Description | Price | Availability |
|---|---|---|---|
| **PM120VA** | **Analog/Digital Power Meter, Si Sensor, 200-1100 nm, 50 nW - 50 mW** | **$1,366.80** | **Today** |
| **PM204** | **Touch Screen Power & Energy Meter, Si Sensor, 200 - 1100 nm, 50 nW - 50 mW** | **$2,085.90** | **3-5 Days** |

Hide Digital Meter with 50 nW to 50 mW Si Sensor (400 - 1100 nm)

## Digital Meter with 50 nW to 50 mW Si Sensor (400 - 1100 nm)

| Kit | PM120D | PM201 |
|---|---|---|
| Click Image to Enlarge |  |  |
| **Included Meter** | PM100D | PM200 |
| **Display** | 4" Backlit Digital Display | 5.7" Color Touch Screen, VGA Resolution |
| **Applications** | All Power and Energy Measurements | |
| **Connectivity** | USB 2.0 Connectivity | |
| **Console Sensor Compatibility** | All C-Series Photodiode and Thermal Power Sensors | All C-Series Photodiode and Thermal Power Sensors as well as all Pyroelectric Energy Sensors |

| Included Sensor | S120C |
|---|---|
| **Wavelength Range** | 400 - 1100 nm |
| **Power Range** | 50 nW - 50 mW |
| **Resolution** | 1 nW |
| **Detector Type** | Si Photodiode |
| **Aperture** | Ø9.5 mm |
| **Spec Sheet** | |

These kits include our PM100D or PM200 meter console, a S120C photodiode power sensor, and a post assembly, consisting of a BA2 base, PH2 post holder, and TR2 Ø1/2" post. This is a general purpose kit for low power lasers (50 nW - 50 mW) within the visible and NIR. Many of our laser diodes and HeNe lasers are suitable for use with this power meter kit.

Thorlabs offers a recalibration service for power and energy meter kits, which can be ordered below (see Item # CAL1). Enter only the Part # and Serial # of the sensor that requires recalibration and include the corresponding console for recalibration during shipment.

If you wish to recalibrate only your console, please contact Tech Support for details.

| Part Number | Description | Price | Availability |
|---|---|---|---|
| **PM120D** | **Digital Power & Energy Meter, Si Sensor, 400-1100 nm, 50 nW - 50 mW** | **$1,377.00** | **Today** |
| **PM201** | **Touch Screen Power & Energy Meter, Si Sensor, 400 - 1100 nm, 50 nW - 50 mW** | **$1,971.66** | **Today** |

Hide Digital Meter with 500 nW to 500 mW Si Sensor (400 - 1100 nm)

## Digital Meter with 500 nW to 500 mW Si Sensor (400 - 1100 nm)

| Kit | PM121D | PM202 |
|---|---|---|
| Click Image to Enlarge |  |  |
| **Included Meter** | PM100D | PM200 |
| **Display** | 4" Backlit Digital Display | 5.7" Color Touch Screen, VGA Resolution |
| **Applications** | All Power and Energy Measurements | |
| **Connectivity** | USB 2.0 Connectivity | |
| **Console Sensor Compatibility** | All C-Series Photodiode and Thermal Power Sensors | All C-Series Photodiode and Thermal Power Sensors as well as all Pyroelectric Energy Sensors |

| Included Sensor | S121C |
|---|---|
| **Wavelength Range** | 400 - 1100 nm |
| **Power Range** | 500 nW - 500 mW |
| **Resolution** | 1 nW |
| **Detector Type** | Si Photodiode |
| **Aperture** | Ø9.5 mm |
| **Spec Sheet** | |

These kits include our PM100D or PM200 meter console, a S121C photodiode power sensor, and a post assembly, consisting of a BA2 base, PH2 post holder, and TR2 Ø1/2" post. This is a general purpose kit for low to medium power lasers (500 nW - 500 mW) within the visible and NIR spectrums (<1100 nm). It is similar to the S120C, which is included in the kit above, but an ND filter attenuates the light before the sensor.

Thorlabs offers a recalibration service for power and energy meter kits, which can be ordered below (see Item # CAL1). Enter only the Part # and Serial # of the sensor that requires recalibration and

include the corresponding console for recalibration during shipment.

If you wish to recalibrate only your console, please contact Tech Support for details.

| Part Number | Description | Price | Availability |
|---|---|---|---|
| PM121D | Digital Power & Energy Meter, Si Sensor, 400-1100 nm, 500 nW - 500 mW | $1,408.62 | 3-5 Days |
| PM202 | Touch Screen Power & Energy Meter, Si Sensor, 400 - 1100 nm, 500 nW - 500 mW | $1,992.06 | Today |

Hide Digital Meter with 500 pW to 500 mW Si Sensor (400 - 1100 nm)

## Digital Meter with 500 pW to 500 mW Si Sensor (400 - 1100 nm)

| Kit | PM130D | PM203 |
|---|---|---|
| Click Image to Enlarge |  |  |
| **Included Meter** | PM100D | PM200 |
| **Display** | 4" Backlit Digital Display | 5.7" Color Touch Screen, VGA Resolution |
| **Applications** | All Power and Energy Measurements | |
| **Connectivity** | USB 2.0 Connectivity | |
| **Console Sensor Compatibility** | All C-Series Photodiode and Thermal Power Sensors | All C-Series Photodiode and Thermal Power Sensors as well as all Pyroelectric Energy Sensors |

| Included Sensor | S130C |
|---|---|
| **Wavelength Range** | 400 - 1100 nm |
| **Power Range** | 500 pW - 500 mW |
| **Resolution** | 100 pW |
| **Detector Type** | Si Photodiode |
| **Aperture** | Ø9.5 mm |
| **Spec Sheet** | |

These kits include our PM100D or PM200 meter console, a S130C photodiode power sensor, and a post assembly, consisting of a BA2 base, PH2 post holder, and TR2 Ø1/2" post. The kit's slim sensor head is ideal for use in tight spaces as it is only 0.2" (5 mm) thick at its sensor. A sliding neutral density filter extends the power range that the sensor can be used to measure. With the filter out of the beam path, the power detection range is 500 pW to 5 mW. With the filter in the beam path, power detection from 50 nW to 500 mW is possible; however, power levels below 5 mW should be detected without the filter in the beam path for optimal results. The filter's position is automatically detected and accounted for by the power meter console.

Thorlabs offers a recalibration service for power and energy meter kits, which can be ordered below (see Item # CAL-S130). Enter only the Part # and Serial # of the sensor that requires recalibration and include the corresponding console for recalibration during shipment.

If you wish to recalibrate only your console, please contact Tech Support for details.

| Part Number | Description | Price | Availability |
|---|---|---|---|
| PM130D | Digital Power & Energy Meter, Slim Si Sensor, 400-1100 nm, 500 pW - 500 mW | $1,586.10 | Today |
| PM203 | Touch Screen Power & Energy Meter, Slim Si Sensor, 400 - 1100 nm, 500 pW - 500 mW | $2,169.54 | Today |

Hide Digital Meter with 50 nW to 40 mW Ge Sensor (700 - 1800 nm)

## Digital Meter with 50 nW to 40 mW Ge Sensor (700 - 1800 nm)

| Kit | PM122D | PM205 |
|---|---|---|
| Click Image to Enlarge |  |  |
| **Included Meter** | PM100D | PM200 |
| **Display** | 4" Backlit Digital Display | 5.7" Color Touch Screen, VGA Resolution |
| **Applications** | All Power and Energy Measurements | |
| **Connectivity** | USB 2.0 Connectivity | |
| **Console Sensor Compatibility** | All C-Series Photodiode and Thermal Power Sensors | All C-Series Photodiode and Thermal Power Sensors as well as all Pyroelectric Energy Sensors |

| Included Sensor | S122C |
|---|---|
| **Wavelength Range** | 700 - 1800 nm |
| **Power Range** | 50 nW - 40 mW |
| **Resolution** | 10 nW |
| **Detector Type** | Ge Photodiode |
| **Aperture** | Ø9.5 mm |
| **Spec Sheet** | |

Included Sensor S122C

These kits include our PM100D or PM200 meter console, a S122C photodiode power sensor, and a post assembly, consisting of a BA2 base, PH2 post holder, and TR2 Ø1/2" post. This combination is ideal for customers working with wavelengths in the far red to NIR (700 - 1800 nm). The sensor has a fluorescing alignment disk surrounding its active area, which simplifies IR beam alignment.

Thorlabs offers a recalibration service for power and energy meter kits, which can be ordered below (see Item # CAL2). Enter only the Part # and Serial # of the sensor that requires recalibration and include the corresponding console for recalibration during shipment.

If you wish to recalibrate only your console, please contact Tech Support for details.

| Part Number | Description | Price | Availability |
|---|---|---|---|
| PM122D | Digital Power & Energy Meter, Ge Sensor, 700-1800 nm, 50 nW - 40 mW | $1,690.14 | Today |
| PM205 | Touch Screen Power & Energy Meter, Ge Sensor, 700 - 1800 nm, 50 nW - 40 mW | $2,274.60 | Today |

Hide Digital Meter with 10 mW to 10 W Thermal Sensor (0.19 - 25 µm)

## Digital Meter with 10 mW to 10 W Thermal Sensor (0.19 - 25 µm)

| Kit | PM310D | PM206 |
|---|---|---|
| Click Image to Enlarge |  |  |
| **Included Meter** | PM100D | PM200 |
| **Display** | 4" Backlit Digital Display | 5.7" Color Touch Screen, VGA Resolution |
| **Applications** | All Power and Energy Measurements | |
| **Connectivity** | USB 2.0 Connectivity | |
| **Console Sensor Compatibility** | All C-Series Photodiode and Thermal Power Sensors | All C-Series Photodiode and Thermal Power Sensors as well as all Pyroelectric Energy Sensors |

| Included Sensor | S310C |
|---|---|
| **Wavelength Range** | 0.19 - 25 µm |
| **Power Range** | 10 mW - 10 W |
| **Resolution** | 200 µW |
| **Detector Type** | Thermal |
| **Aperture** | Ø20 mm |
| **Spec Sheet** | |

These kits include our PM100D or PM200 meter console, a S310C thermal power sensor, and a post assembly, consisting of a BA2 base, PH2 post holder, and TR2 Ø1/2" post. This combination is ideal for customers working with higher power lasers (up to 10 W) or longer wavelengths (up to 25 µm). Thermal sensors typically have slow response times, but our S310C sensor has been optimized, resulting in a fast response time (<1 s).

Thorlabs offers a recalibration service for power and energy meter kits, which can be ordered below (see Item # CAL-S200). Enter only the Part # and Serial # of the sensor that requires recalibration and include the corresponding console for recalibration during shipment.

If you wish to recalibrate only your console, please contact Tech Support for details.

| Part Number | Description | Price | Availability |
|---|---|---|---|
| **PM310D** | **Digital Power & Energy Meter, Thermal Sensor, 0.19-25 µm, 10 mW - 10 W** | **$1,794.18** | **Today** |
| **PM206** | **Touch Screen Power & Energy Meter, Thermal Sensor, 0.19 - 25 µm, 10 mW - 10 W** | **$2,399.04** | **Today** |

Hide Recalibration Service for Photodiode Power Sensors

## Recalibration Service for Photodiode Power Sensors

Thorlabs offers calibration services for our photodiode optical power sensors and consoles. To ensure accurate measurements, we recommend recalibrating the sensors annually. Recalibration of the console is included with the recalibration of a sensor at no additional cost. If you wish to

| Calibration Service Item # | Compatible Power Meter Sensors |
|---|---|
| **CAL1** | S120VC, S120C, S121C, S170C, S140C, S142C, S150C, S151C |
| **CAL2** | S122C, S144C, S145C, S146C, S154C, S155C |
| **CAL-S130** | S130VC, S130C |
| **CAL-S132** | S132C |

recalibrate only your power meter console, please contact Tech Support for details.

| Calibration Service Item # | Compatible Power Meter Sensors |
|---|---|
| CAL4 | S148C, S180C |

Refer to the table to the right for the appropriate calibration service Item # that corresponds to your power meter sensor. Once the appropriate Item # is selected, enter the Part # and Serial # of the sensor that requires recalibration prior to selecting Add to Cart.

| Part Number | Description | Price | Availability |
|---|---|---|---|
| CAL1 | Recalibration Service for Si Power Meter Sensors Except S130 Series | $143.82 | Lead Time |
| CAL2 | Recalibration Service for Ge & InGaAs Power Meter Sensors Except S132 Series and S148C | $162.18 | Lead Time |
| CAL-S130 | Recalibration Service for Si Power Meter Sensors for S130 Series and PM160 | $167.28 | Lead Time |
| CAL-S132 | Recalibration Service for Ge Power Meter Sensors for S132 Series only | $177.48 | Lead Time |
| CAL4 | Recalibration Service for MCT and Extended InGaAs Mid-IR Power Sensors (S148C and S180C) | $289.68 | Lead Time |

Hide Recalibration Service for Thermal Power and Pyroelectric Energy Sensors

## Recalibration Service for Thermal Power and Pyroelectric Energy Sensors

Thorlabs offers recalibration services for our thermal power and pyroelectric energy sensors. To ensure accurate measurements, we recommend recalibrating the sensors annually. Recalibration of the console is included with the recalibration of a sensor at no additional cost. If you wish to recalibrate only your power meter console, please contact Tech Support for details.

| Sensor Type | Sensor Item #s |
|---|---|
| Thermal Power | S175C, S322C, S350C, S370C, S401C, S405C, S415C, S425C, S425C-L, S470C |
| Pyroelectric Energy | ES111C, ES120C, ES145C, ES220C, ES245C |

The table to the right lists the sensors for which this calibration service is available. Please enter the Part # and Serial # of the sensor that requires recalibration prior to selecting Add to Cart.

| Part Number | Description | Price | Availability |
|---|---|---|---|
| CAL-S200 | Recalibration Service for Thermal Power and Pyroelectric Energy Sensors | $182.58 | Lead Time |


THORLABS
Attenuation: 0dB
Wavelength: 800nm
Bandwidth: 10Hz
Range: 13.0mW
1.320 mW
ZERO
1.317 mW
inf : 1
inf W
BA2