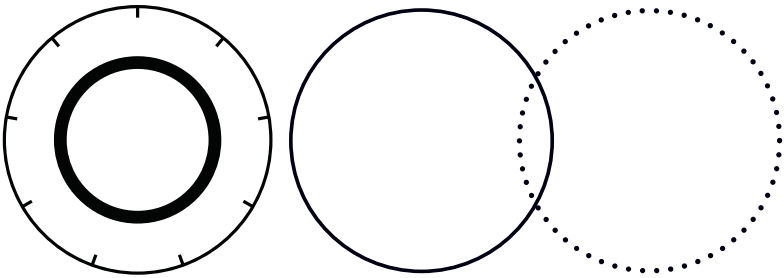
PM10K+/PM15K+ Laser Sensor Systems

Quick Start Guide



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Corporate Addresses:

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Product Made in the Wilsonville, Oregon U.S.A.

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1.0 Safety Information

This section provides an introduction to safety information, including signal words and symbols that users must know before measurements are taken.

1.1 Signal Words and Symbols

This documentation contains particular hazards defined or special attention is drawn to particular conditions. This is indicated with signal words in accordance with ANSI Z-535.6 and safety symbols (pictorial hazard alerts) in accordance with ANSI Z-535.3 and ISO 7010.

The following signal words designate the degree or level of hazard when there is risk of injury:

Signal Word	Description
WARNING!	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION!	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related. 'NOTICE' may also be used when there is the risk of property damage.

1.2 Laser and Electrical Safety

At all times, make sure that all personnel are protected from accidental or unnecessary exposure to laser radiation when the sensor system is used with a laser. Refer to laser safety precautions provided with any laser systems used with the sensor.

The PM10K+/PM15K+ does not have dangerous voltages.

NOTICE

Do not disassemble the enclosure. There are no user-serviceable parts inside.

All units should be operated as assembled. The Warranty is canceled if the enclosure is disassembled.

2.0 Before Work is Started

Coherent product information includes software downloads, documentation, data sheets, application notes and more. It is at an easy to access location on the Coherent website at:

https://www.coherent.com/resources

- For the manual, do a search for 'PowerMax PM10K+' or the title: *PM10K+/PM15K+ Sensor Systems Operator's Manual* (P/N 2303642)
- For software used with PowerMax sensors, do a search for 'Coherent Meter Connection'

3.0 Set Up Hardware

This section shows how to set up a PM10K+/PM15K+ and to connect to a personal computer.

The sensor can be set up with:

- an adjustable supplied dovetail rail mount
- customer-supplied mount posts on the metric and imperial thread holes
- directly onto an optical work surface/table

CAUTION!
Do NOT touch the sensor surface when the unit is held. Contamination can cause damage and incorrect measurements.

In addition to the detailed instructions, a two-part training video series, on PM10K+/PM15K+ Sensor Systems setup and operation, are available at:

Setup: https://youtu.be/K3QIDxOGFVI

Operation and Measurement: https://youtu.be/Pgz4J4FQ5xs

NOTICE
Unless otherwise noted, the procedures in this section show the PM10K+ version of the sensor, for demonstration purposes.The procedures are essentially the same for the other models.

3.1 Unpack the Sensor System

1. Remove the top layer of material and accessories.

Figure 1. Packaging Inner Foam Tray (PM10K+ example)

2. Remove the sensor. Hold the attached handle and lift it out of the box. Refer to Figure 2. The sensor is heavy and has a handle that can be removed.

Figure 2. Lift and Remove with Handle

3. Put all of the components on a clean surface.

NOTICE

The contents of the shipping box can be different for different models that are ordered.

4. Set the sensor on a surface with access to the handle.
5. Use a a source of clean dry air to make sure that the absorber surface is free of dirty material. Refer to Figure 3.

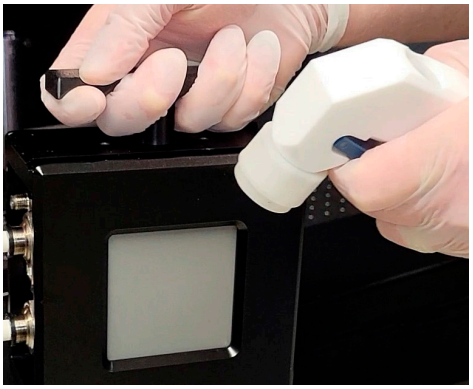

Figure 3. Use Clean Dry Air to Remove Dirty Material

3.2 Set Up With Dovetail Mount

Coherent recommends that users use the supplied side-locked rail mount accessory. It is easier to move the sensor in one axis to help put the beam in the center, and not on a fixed mount with posts attached directly to the sensor.

To install with dove-tail rails, do the following:

CAUTION!

The protective cover for the absorber surface must be removed when the sensor is used.

1. Remove the plastic protective cover from the sensor. Refer to Figure 4.

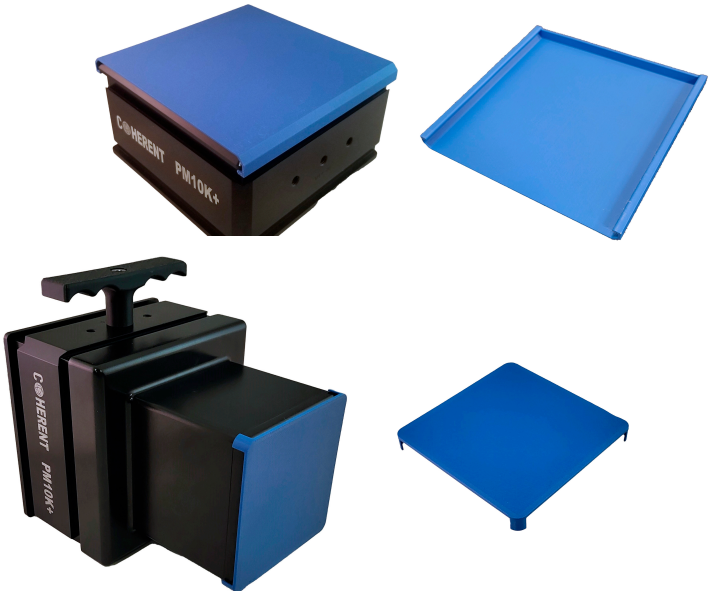

Figure 4. Sensors with Protective Cover Plates Examples

2. Keep the protective cover plate. It is necessary to have when the unit is sent or shipped, to prevent damage to the absorber surface.

3. Find the rail mount plate accessory. Refer to the Accessories section in the *PM10K+/PM15K+ Sensor Systems Operator's Manual*. Refer to Figure 5.

Figure 5. Rail Mount Accessory

Customer-supplied posts can now be attached to the rail mount plate, if necessary. The mount plate can be loosened to move the sensor back and forth during beam alignment, and then made secure by tightening the screw when in the right location.

4. If necessary, install mount posts onto the rail mount plate.

   Coherent recommends that when posts are used, that a minimum two are set up, to prevent unwanted turns when a single post is used. Due to the variety of post sizes and lengths necessary for different setups, Coherent does not supply mount posts with the PM10K+/PM15K+.

   Refer to the example of the dovetail mount attached with posts in Figure 7.

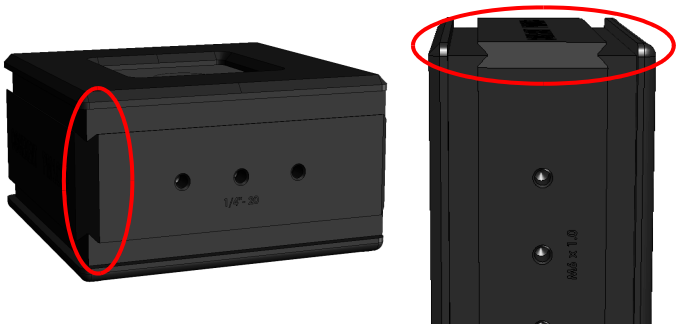

Figure 6. Rail Mounts

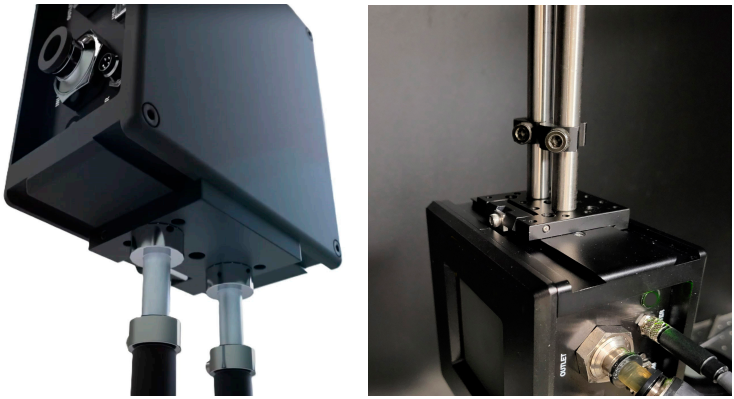

Figure 7. Dove-tail Mount with Post Setup Examples

5. Put the rail mount plate onto the dovetail rail on the unit. Refer to Figure 8.

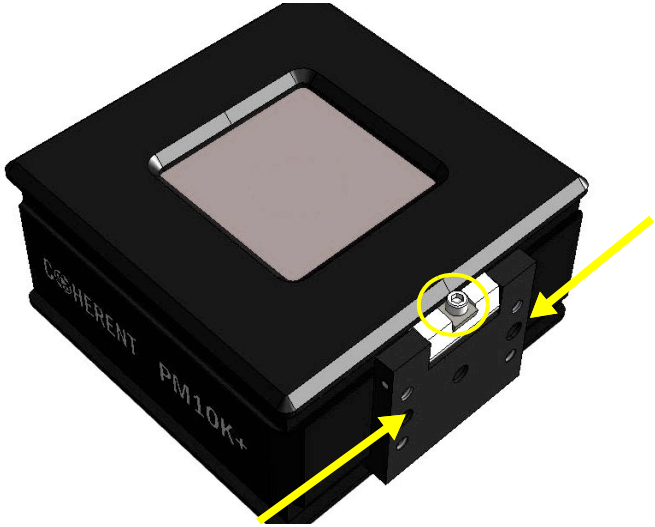

Figure 8. Move Mount Plate onto Dove-tail Rail

6. Tighten the lock screw on the mount base, shown with a circle in Figure 8.

3.3 Set Up with Posts in Mount Holes (Optional)

This procedures shows how to set up a fixed mount with posts attached directly to the sensor.

1. Note the location of the mount holes with threads on either side of the power sensor. One side has M6 x 1.0 mount holes, the other side has 1/4-in. x 20 holes. Refer to the examples in Figure 9.

Figure 9. Threaded 1/4 - 20 and M6 x 1.0 Mount Hole Locations

2. Take the customer-supplied mount posts, with correct threads, and turn them into the threaded holes until hand-tight. Refer to Figure 10.

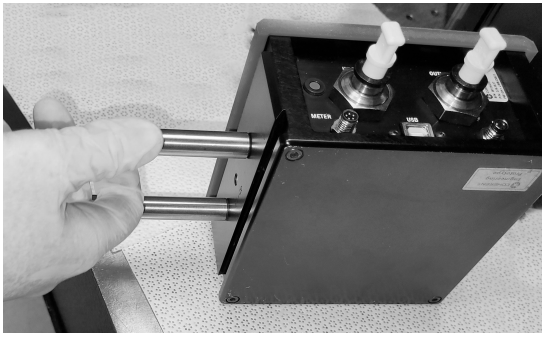

Figure 10. Install Threaded Mount Posts Directly

See Figure 11 for an example of a direct post-mount setup.

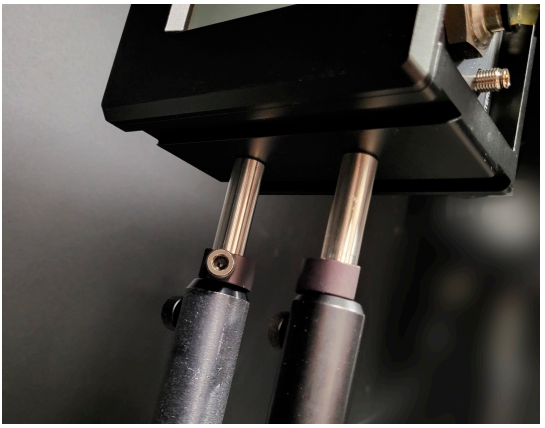

Figure 11. Direct Post Mount Setup Example

3.4 Set up Water Supply System

CAUTION!
Water flow must always be within the correct flow rate, stability and temperature specifications. If not, incorrect measurements can occur.

3.4.1 Required Hardware and Water Supply

The water must flow in the direction from the inlet to the outlet in the sensor system, at a nominal flow rate of 8 liters per minute and a minimum of 6 liters per minute and between 10 to 25 deg C. For full water supply/coolant requirements refer to the *PM10K+/PM15K+ Sensor Systems Operator's Manual* (P/N 2303642).

The water inlet and outlet are 10mm outer diameter push-to-connect.

Water hoses are not included with the PM10K+/PM15K+ Sensor Systems. Customer-supplied hoses can be attached directly to the push-to-connect fittings on the sensor. Tubes with size that can attach to the push-to-connect fittings on the sensor system must be used. However, 3/8-inch outer diameter tubes can be used with the supplied 3/8-in adapter fittings.

Figure 12. Example Water Tubes

3.4.2 Install Water Hoses

CAUTION!
It is very important to prevent contamination on the sensor element. Do not touch the sensor element. It can deposit natural oils from your fingertips onto the absorber surface. Do not use solvents to clean the surface.

It is recommended that water hoses are given labels at each end to identify 'hot' or 'cold'. This makes sure that connections are made correctly with cold into the *INLET* port and hot into the *OUTLET* port.

To set up water supply for the PM10K+/PM15K+ Sensor Systems:

CAUTION!
If the inlet and outlet water connections are installed in reverse, it will cause incorrect measurements.

1. Collect the necessary tools and parts, including water hoses of sufficient length to reach the cooling system or chiller. Use water hoses that support the specifications shown in the *PM10K+/PM15K+ Sensor Systems Operator's Manual* .
2. If installed, remove the protective caps to the water inlet and outlets. Push the outer ring of the inlet in to release each cap, and then remove the cap. Refer to Figure 13.

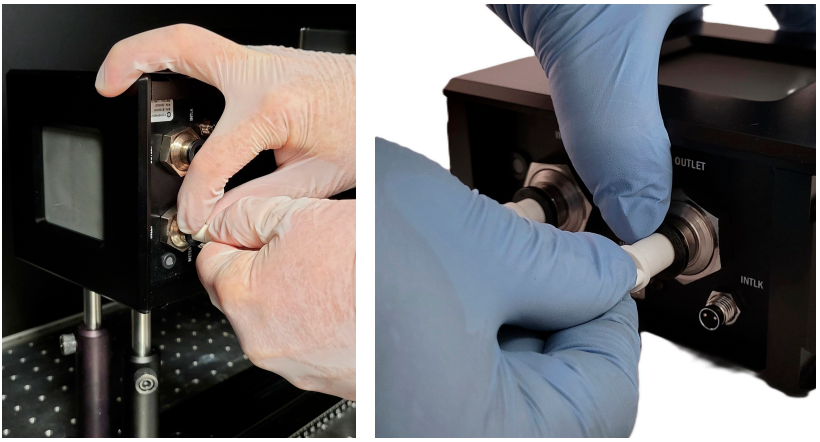

Figure 13. Remove Protective Caps

The end of the hose (or step-down fitting, if used) for water that comes from the chiller, goes into the sensor fitting with label *INLET*. The water fitting for the line to return water to the chiller is with label *OUTLET*. Refer to Figure 14.

Figure 14. Water Inlet and Outlet Fitting Labels

3. If 10mm customer-supplied hoses are used, attach the water hoses to the correct INLET and OUTLET push-to-connect fittings on the PM10K+/PM15K+ sensor. Refer to Figure 15.

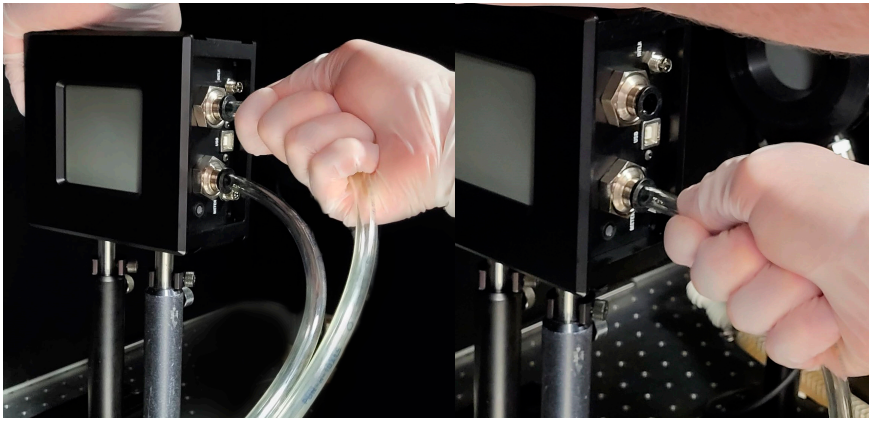

Figure 15. Attach Water Hoses Directly to Fittings on Sensor

CAUTION!

Make sure that the correct hose size is installed to the fitting. The correct size for the fitting is 10mm. If a 3/8-in. hose is put directly into a push-to-connect fitting on the sensor, it will not create a seal and can leak water. The adapter fittings must be used with 3/8-in. water hoses to correct seals on the 10mm inlet or outlet.

4. If 3/8-in. customer-supplied hoses are used, do the following:
   - Attach the supplied 3/8-in.-to-10mm adapter fittings on the hoses. Refer to Figure 16.

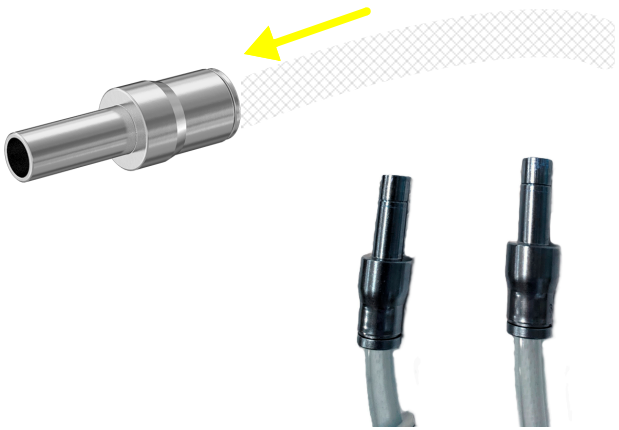

Figure 16. Install Water Hoses onto 3/8-in Adapters

- Then install the hoses, with the adapter fittings, to the correct INLET and OUTLET connectors. Refer to Figure 17.

Figure 17. Water Hoses Installed With Step-down Fittings

3.5 Connect Communications Interfaces

For USB + DB25 (PN 2293937) or RS-232 (PN 2293938) setups that use a PC workstation, a USB or RS-232 cable is used to connect to a PC with measurement software, depending on the configuration. A cable with a DB25 connector on one end can be connected to a meter for a metered setup (USB + DB25 model).

NOTICE

Complete full installation of all software *before* physical connection of a PowerMax sensor to the computer.

3.5.1 Connect Sensor to a PC with USB

A supplied standard USB 2 cable is used to connect the sensor system and PC.

Use of the USB interface is the best way to get the optimal performance. It provides a wider dynamic range and improved speed-up function than the DB25 cable can provide with a stand-alone meter.

1. Attach the type-B end of the USB cable to the connector labeled ‘USB’ on the sensor system. Refer to Figure 18.

Figure 18. Sensor System USB Connector - USB Model

2. Attach the other end of the USB cable to a USB port on the PC.

3.5.2 Connect Sensor to PC with RS-232

A standard RS-232 cable is used to attach the RS-232 model sensor (PN 2293938), to a workstation computer.

Connect the sensor to a workstation computer:

1. Attach the RS-232 cable to the sensor at the connector with label RS232. Refer to Figure 19.

Figure 19. RS-232 Connector - RS-232 Model

2. Attach the other end of the cable to the correct RS-232 connector on the workstation computer.

3.5.3 Connect Sensor to a Meter

For USB + DB25 (PN 2293937) configured systems with a metered setup, do as follows:

1. Find the 2m DB25 analog cable (P/N 2311500). Refer to Figure 20.

Figure 20. DB25 Cable for Meter Connection

NOTICE

The DB-25 cables are made with electronics that are programmed specific to the individual units that they are shipped with. Cables are not interchangeable between sensor heads. There is an identifying label with serial information that must match that of the sensor used.

2. Make sure that the serial number on the cable is the same as the serial number on the PM10K+ sensor. Each cable is calibrated to the sensor it is shipped with.
3. Attach the small barrel-end of the DB-25 cable to the METER input on the PM10K+/PM15K+ Sensor Systems sensor. Refer to Figure 21.

Figure 21. Meter Cable Connector - USB + DB25 Model Example

4. Attach the DB25 connector from thePM10K+/PM15K+ sensor to a meter, as shown in the example in Figure 22.

Figure 22. Connect Sensor to Meter with DB25 Cable

3.6 Provide Power

3.6.1 Supply Power - USB Sensors

For the systems configured with the USB + DB25 model (PN 2293937), there is NO power setup necessary other than to make sure that the supplied USB cable or the meter cable is installed correctly. Power is supplied through the cable from the meter and the LED indicator displays.

3.6.2 Supply Power - RS-232 Sensors

The RS-232 sensor systems (PN 2293938) must have an external power supply.

To connect the power supply:

1. Attach the connector from the supplied 5V power supply to the 5-24V input on the interface panel on the sensor. Refer to Figure 23.

Figure 23. Power Connector - PM10K+ RS-232 Model

2. When power is supplied, the senor powers on immediately and the LED indicator displays.

3.7 Set up Protective Interlock

For function, description, specifications, and installation instructions for the supported customer-supplied cable interface for the interlock, refer to the *PM10K+/PM15K+ Sensor Systems Operator's Manual* (PN 2303642). The interlock connector location for a 2-pin, M8 barrel cable is shown in Figure 24.

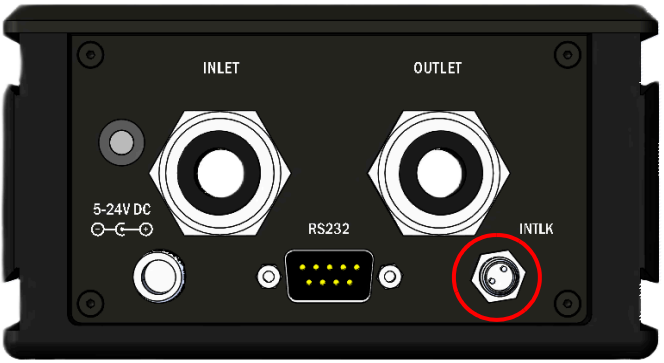

Figure 24. Interlock Connector (PM10K+ RS-232 Model)

The other end of the customer-supplied interlock cable connects to the user's interlock chain. An example cable is shown in Figure 24.

Figure 25. Example M8, 2-pin Barrel Male Connector With 2-wire Pigtail

3.8 Understand Front Panel LED Indicator

Table 1-1 and shows the blink rate states and status for the LED indicator light, depending on the configuration, when using USB or RS-232.

Table 1-1. LED Status Indicator States, Modulated (USB/RS-232)

Duration	USB Connection	RS-232 Connection
Slow 0.5 Hz on/off blink	USB Communication not established (hub not working/connected, host computer asleep) No host communication (no driver, etc.)	NA
Sinusoidal pulse or 'breathing'	USB connection is established, host is communicating, but measurement data are not streaming	Device is powered ON but not yet streaming
Fast 10 Hz on/off blink	Measurement data are streaming	Measurement data are streaming

4.0 Software

Coherent Meter Connection software operates correctly in a Windows 10 (or higher) environment.

NOTICE

Complete full installation of all software *before* physical connection of a sensor to the computer.

4.1 Install Software

Refer to *PM10K+/PM15K+ Sensor Systems Operator's Manual* (P/N 2303642) for system requirements for the software and installation instructions.

Before the software is installed, first make sure that administrative privileges are given that are necessary for installation.

1. Go to the Coherent website to find the software and drivers necessary to operate the PM10K+/PM15K+:
   https://www.coherent.com/resources
2. Search for and download these installation files (, where 'x' is the latest version). The filename will look something like this:

   `Coherent-Meter-Connection-v1.x.x.x-Release-Setup.exe`
3. Save the installation file to the computer.

NOTICE

To prevent instability of the software, it is strongly recommended to first disable computer hibernation or suspend mode before the software is installed.

4. Start the installation and follow the prompts.

   For more detailed installation information, refer to the *PM10K+/PM15K+ Sensor Systems Operator's Manual* (P/N 2303642).

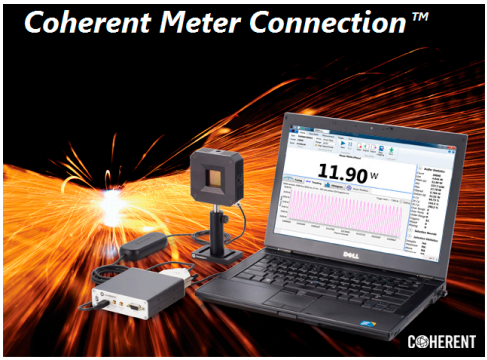

Figure 26. Example Coherent Meter Connection Splash Screen

4.2 Use Host Commands

For instructions about communication with the sensor directly with host commands, refer to the *PM10K+/PM15K+ Sensor Systems Operator's Manual* (P/N 2303642). It is available at:

https://www.coherent.com/resources

5.0 Support and Service

This section gives information about how to contact Customer Support, how to get service, and how to ship the product.

Coherent gives telephone and web-based technical aid as a service to its customers. Coherent assumes no liability thereby for injuries or damage that can occur when such services are provided.

5.1 Support in the USA and North America

For general Technical Support, contact your local Coherent Service Representative, or contact Coherent as follows:

- By phone: 1(800) 343-4912 or 1-503-454-5700
- By e-mail directly: LSMservice@coherent.com
  or e-mail: Customer.Support@Coherent.com
- To see a list of contact names, phone numbers, and addresses worldwide, visit the Coherent website: www.Coherent.com

5.2 Get Service

To get service under warranty, the Customer must tell the Company of the defect before the expiration of the warranty period and prepare for the performance of service.The Company will give direction whether to do warranty service at the Customer's facility, the Company's facility, or an approved repair facility. If Customer is directed by the Company to ship the product to a Coherent repair facility with a Company-provided Return Material Authorization (RMA) number:

- Refer to the *PM10K+/PM15K+ Sensor Systems Operator's Manual* (P/N 2303642) for warranty and instructions to pack and ship it.
- Coherent shall pay the cost to ship the Product back to the Customer in conjunction This is done if product failures happen in less than the first twelve (12) months of time of sale or during an extended 12-month warranty period.

5.3 Calibration

To maintain a high level of performance, Coherent recommends that meters and sensors are given service and re-calibrated one time a year. Refer to *PM10K+/PM15K+ Sensor Systems Operator's Manual* (P/N 2303642).

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部件名称 Part Name	产品中有害物质的名称及含量 有害物质 Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板组装 Printed Circuit Board Assembly	X	O	O	O	O	O
电缆装配 Cable Assembly	X	O	O	O	O	O
硬件 Hardware	X	O	O	O	O	O
电源 Power Supply	X	O	O	O	O	O

本表格依据 SJ/T 11364 的规定编制
O: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。
X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

Download software and manuals at https://www.coherent.com/resources

2303643 AC

PM10K+/PM15K+ Laser Sensor Systems Quick Start Guide

Part No. 2303643, Rev. AC