

9743

OPTICAL SENSOR

Instruction Manual

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For regional contact information, please go to our website at <http://www.hioki.com>.

The Declaration of Conformity for instruments that comply to CE mark requirements may be downloaded from the HIOKI website.

Warranty

Warranty malfunctions occurring under conditions of normal use in conformity with the Instruction Manual and Product Precautionary Markings will be repaired free of charge. This warranty is valid for a period of one (1) year from the date of purchase. Please contact the distributor from which you purchased the product for further information on warranty provisions.

Introduction

Thank you for purchasing the HIOKI Model 9743 OPTICAL SENSOR. To obtain maximum performance from the device, please read this manual first, and keep it handy for future reference.

Upon first use of the 9743, please confirm the software version of your 3664 OPTICAL POWER METER.

The 3664 software version is shown under the "3664" on the display screen at power up. If the 3664 is Version 1.02 or later, the 9743 can be used immediately. If the 9743 is connected to a 3664 that is Version 1.01 or earlier, "Err1" will be displayed on the 3664 screen and measurement will not be possible. If "Err1" appears on the 3664 display screen, please download the 3664 Sensor Data Setup Software (Hioki 3664 Setup Utility) from our website (<http://www.hioki.co.jp>) and set up your 3664. For detailed instructions on how to perform the sensor data setup of the 3664, see the document included with the downloaded files.

Overview

The 9743 is an optical sensor for the 3664 OPTICAL POWER METER capable of measuring up to 100 mW in the range of wavelengths from 380 to 450 nm.

Inspection and Maintenance

Initial Inspection

When you receive the device, inspect it carefully to ensure that no damage occurred during shipping. If damage is evident, or if it fails to operate according to the specifications, contact your dealer or Hioki representative.

Preliminary Checks

- Before using the device the first time, verify that it operates normally to ensure that the no damage occurred during storage or shipping. If you find any damage, contact your dealer or Hioki representative.
- Before using the device, make sure that the insulation on the cables is undamaged and that no bare conductors are improperly exposed. Using the device in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

Maintenance and Service

- To clean the device, wipe it gently with a soft cloth moistened with water or mild detergent. Never use solvents such as benzene, alcohol, acetone, ether, ketones, thinners or gasoline, as they can deform and discolor the case.
- With the exception of ethyl alcohol, avoid using organic solvents to clean the detector window. These solvents can damage the detector window.
- If the device seems to be malfunctioning, contact your dealer or Hioki representative.
- Pack the device so that it will not sustain damage during shipping, and include a description of existing damage. We cannot accept responsibility for damage incurred during shipping.

Safety Information

This manual contains information and warnings essential for safe operation of the device and for maintaining it in safe operating condition. Before using it, be sure to carefully read the following safety precautions.

⚠ DANGER

This device is designed to comply with IEC 61010 Safety Standards, and has been thoroughly tested for safety prior to shipment. However, mishandling during use could result in injury or death, as well as damage to the device. Be certain that you understand the instructions and precautions in the manual before use. We disclaim any responsibility for accidents or injuries not resulting directly from device defects.

Safety Symbol

⚠ In the manual, the **⚠** symbol indicates particularly important information that the user should read before using the device. The **⚠** symbol printed on the device indicates that the user should refer to a corresponding topic in the manual (marked with the **⚠** symbol) before using the relevant function.

The following symbols in this manual indicate the relative importance of cautions and warnings.

- ⚠ DANGER** Indicates that incorrect operation presents an extreme hazard that could result in serious injury or death to the user.
- ⚠ WARNING** Indicates that incorrect operation presents a significant hazard that could result in serious injury or death to the user.
- ⚠ CAUTION** Indicates that incorrect operation presents a possibility of injury to the user or damage to the device.
- NOTE** Indicates advisory items related to performance or correct operation of the device.

Operating Precautions



Follow these precautions to ensure safe operation and to obtain the full benefits of the various functions.

⚠ WARNING

The sensor detector window reflects irradiated laser light. Under certain circumstances even this reflected light can reach levels dangerous to the eye, potentially causing blurring or loss of vision, so please use sufficient caution when handling.

⚠ CAUTION

- To prevent malfunctions in the 3664 or the optical sensor, avoid connecting or disconnecting the optical sensor connector while power for the 3664 is ON.
- To avoid damaging the optical sensor and to ensure accurate measurements, avoid dropping or applying any physical shock to the optical sensor.
- Avoid touching the detector window with your bare hands. The detector window must be clean for the sensor to meet the specified performance parameters.
- Avoid scratching the detector window with sharp or pointed objects (e.g., the tips of tweezers) or against hard surfaces. Damage to the detector window may prevent the sensor from meeting specified performance parameters.
- To avoid breaking the cables, do not bend or pull them.
- To avoid broken wires, always grasp the plug to disconnect the optical sensor connector. Avoid pulling on the cable itself.

⚠ CAUTION

- When measuring an extremely concentrated beam the optical power density on the sensor may become excessive and accurate measurement may not be possible. This may also cause the sensor to wear out. In order to avoid a loss of sensor sensitivity, use the 9743 under conditions where the optical power density is 10 mW/mm² or less when the incident power is 50 mW or less.
- When the incident power is greater than 50 mW position the sensor so that the beam size is as large as possible on the sensor detector window. Incident power of 100 mW is possible if the full area is irradiated.
- This device is not designed to be entirely water- or dust-proof. Do not use it in an especially dusty environment, nor where it might be splashed with liquid. This may cause damage.
- This device is designed for use indoors. It can be operated at temperatures between 0 and 40°C (32 and 104°F) without degrading safety.

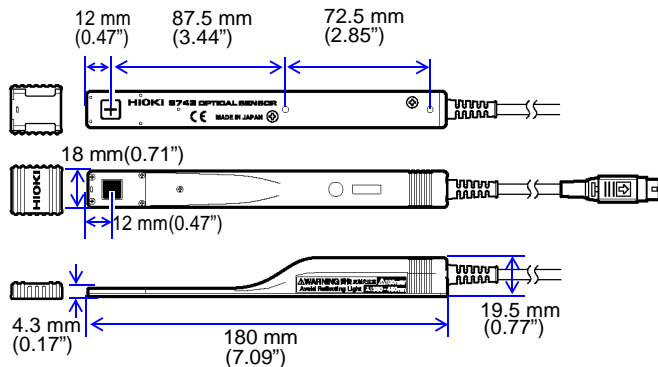
NOTE

To ensure accurate measurements, make sure the detector window is free of dust, stains, and any damage.

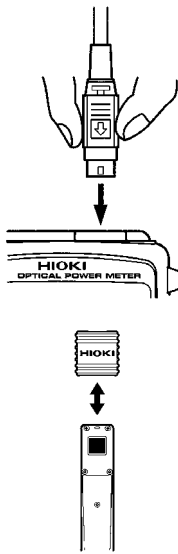
Specifications

| | |
|---|--|
| Measurement wavelength | 380 to 450 nm |
| Acceptable power range | -50 dBm to +20 dBm at the calibration wavelength |
| Maximum rating | 100 mW (+20 dBm) with total irradiation |
| Detector type | Si photodiode |
| Dimensions of light-receiving area | Approx. 10 mm x 10 mm |
| Measurement accuracy | ±4.3% Calibration conditions: Direct a 100 μW collimated He-Ne laser beam (approx. 1.5 mm dia) with a wavelength of 405 nm perpendicularly into the center of the sensor. (Our standard wavelength: 405 nm ±5 nm) Accuracy is ±5% when the sensor is used with the 3664. |
| Default wavelength settings (Model 3664) | 400 nm, 403 nm, 405 nm, 408 nm These are the default wavelengths stored in memory by the 3664. They cannot be edited. |
| Analog output (Model 3664) | Approx. 0.7 V (when measurement precision calibration conditions are input) |
| Operating temperature and humidity ranges | 0 to 40°C (32 to 104°F), 80% RH or less (no condensation) |
| Storage temperature and humidity ranges | -10 to 50°C (14 to 122°F), 80% RH or less (no condensation) |
| Accuracy guarantee for temperature and humidity | 23 ± 5°C (73 ± 9°F), 80% RH or less |
| Guaranteed accuracy period | 1 year |
| Location for use | Indoors, altitude up to 2000 m (6562-ft.) |
| Dimensions | Approx. 18W x 180H x 19.5D mm (0.71"W x 7.09"H x 0.77"D) (excluding projections) Cable lengths Approx. 2000 mm (78.74") |
| Mass | Approx. 110 g (3.9 oz.) |
| Applicable Standards | Safety :EN61010 Pollution degree 2 EMC :EN61326 |
| Accessory | Instruction manual |

Dimensional Diagram



Measurement Procedure



1. Make sure power for the 3664 is OFF.
2. Place the 9743 optical sensor with the arrow side facing up and insert into the optical sensor connector of the 3664.
3. Turn on power for the 3664. **If the 3664 display shows "Err1", then the 3664 is not compatible with this device. Refer to "Introduction", and set up your 3664.**
4. Remove the cover of the optical sensor.
5. Irradiate with light.

NOTE

- Always grasp the connector with the arrow to connect or disconnect the optical sensor. (You must grasp the connector to disconnect the sensor.)
- To prevent dust accumulation, stains, and damage, cover the detector window with the sensor cover when the sensor is not in use.
- Take care to avoid misplacing the sensor cover.
- Note the correct orientation of the sensor cover. The HIOKI logo should face in the direction indicated in the diagram above.

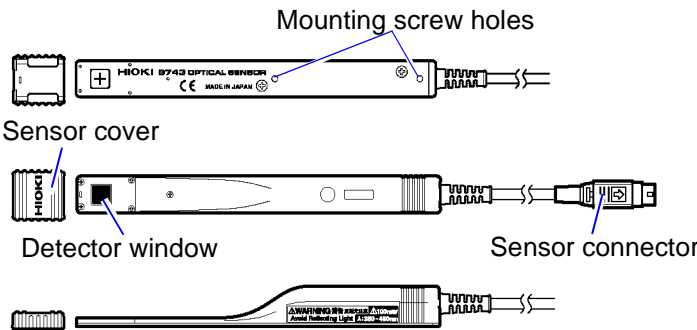
Cleaning the detector window

⚠ CAUTION

With the exception of ethyl alcohol, avoid using organic solvents to clean the detector window. These solvents can damage the detector window.

1. Open the sensor cover.
2. Wipe the detector window of the sensor using lens cleaning paper or other lint-free material. If lint remains on the detector window, blow off with an optical lens airbrush. If the detector window is soiled, fluff the tip of a cotton swab. Moisten the cotton tip in ethyl alcohol and wipe the surface.

Names of Parts



The 9743 can be fixed in place with M3 screws by using the mounting screw holes. Please use 3 mm or shorter screws.