

# OMH 6700B

Silicon Power/Waveheads



The OMH-6700B Silicon Power/Waveheads provide flexibility to measure both the optical power and wavelength of laser sources from the blue to the near infrared spectrum. These products incorporate ILX's unique power and wavelength capability, based on integrating sphere technology. The OMH-6742B Power/Wavehead provides accurate power and wavelength measurement across the entire spectrum, from 400 to 1100 nm up to 1W optical power. The OMH-6790B Power/Wavehead was developed specifically for pump laser diodes with better wavelength measurement accuracy, low polarization dependent response, and the ability to make either connectorized or bare fiber measurements.

## Measure with Confidence

The OMH-6700B Silicon Power/Waveheads are calibrated to NIST traceable standards in an ILX calibration laboratory where accuracy and traceability are its primary concerns. ILX's documented quality system ensures conformance to continuous traceability and ultimately your confidence in the power/wavehead measurements.

## Simplify Optical Measurements

The integrating sphere measurement method simplifies optical power measurements of laser diodes and LEDs by eliminating measurement problems related to detector saturation, alignment beam profile, polarization, and back reflection. Integrating spheres are inherently insensitive to beam profiles, providing more flexibility for laser types and launch conditions. Filtered detectors on the interior of the sphere receive an equal distribution of incident light, ensuring that the calibration and resultant measurement accuracy are independent of the beam profile.

## Repeatable, Accurate Measurements

The detectors in the OMH-6700B power/waveheads are temperature-controlled to ensure that repeatable measurements are made independent of the

measurement environment. Controlling the temperature of the detectors increases the signal-to-noise ratio, improving the accuracy of the measurements.

## Measurement Flexibility

Each measurement head can be configured easily for fiber-coupled measurements. A choice of adapters is available for FC, SC and LC connectors. Bare fiber measurements are also possible with a bare fiber adapter. For the OMH-6790B model, even more flexibility is available with the addition of a fiber light exit port to connect to an OSA or other measurement instrument.



### Features

- Measures both power and wavelength for a broad range of applications from 400 to 1100 nm
- Integrating sphere based measurements for polarization insensitivity
- NIST traceable measurements for reliable accuracy
- Temperature controlled silicon photodetectors for unmatched stability
- Flexible inputs for both free-space and fiber coupled measurements
- Fiber exit port for external measurements (OMH-6790B only)

## Specifications<sup>1</sup>

	OMH-6703B	OMH-6742B	OMH-6790B
<b>Wavelength Measurement</b>			
Wavelength Range:	—	400 to 1100 nm	830 to 1100 nm
Accuracy: <sup>2</sup>	—	±1.0 nm	±0.2 nm
Detection (minimum power required):	—	-20dBm; 10 μW	0dBm; 1 mW
Temperature Coefficient:	—	<-0.03nm/°C	<-0.03nm/°C
<b>Power Measurement</b>			
Wavelength Range:	400 to 1100 nm	400 to 1100 nm	830 to 1100 nm
Power Range: <sup>3</sup>	-40 to +30 dBm 100 nW to 1W	-40 to +30 dBm 100 nW to 1W	-30 to +40 dBm 1 μW to 10W
Damage Threshold:	+37 dBm; 5W	+37 dBm; 5W	+42dBm; 16W
Accuracy: <sup>4</sup>	±5.0% <sup>5</sup>	±3.5% <sup>5</sup>	±5.0%
Polarization Dependent Response: <sup>6</sup>	—	—	±0.002 dB
Measurement Repeatability: <sup>7</sup>	—	—	±0.003 dB
Entrance Aperture:	6 mm	6 mm	Fiber input, 2.54 mm
Numerical Aperture:	—	—	0.1 to 0.3
Sensor Type:	Silicon	Silicon	Silicon
Noise:	1nW p-p (typical) <sup>8</sup>	5nW p-p (typical) <sup>9,10</sup>	50nW p-p (typical) <sup>9</sup>
Linearity: <sup>11</sup>	—	—	±0.05 dB, ±50nW
Fiber Exit Port:	—	—	For 10W of input power, 1 μW (nominal) output (60 dB attenuation); fiber core: 62.5 μm FC/PC receptacle
<b>General</b>			
Operating Temperature:	+10°C to +40°C	+10°C to +40°C	+10°C to +40°C
Storage Temperature:	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C
Relative Humidity (non-condensing):	Max 85%	Max 85%	Max 85%
Compatible Connector Types:	FC, Bare Fiber	FC, Bare Fiber	FC, LC, SC, Bare Fiber
Dimensions:	69 mm (dia.) x 30 mm (thick)	69 mm (dia.) x 30 mm (thick)	86 mm (H) x 86 mm (W) x 100 mm (D)
Weight:	13.3 ounces (377 g)	13.3 ounces (377 g)	2.95 lbs. (1.34 kg)

### Notes

Typical values provide supplemental information beyond guaranteed specification limits.

- Unless otherwise noted, all specifications measured at 23°C ±3°C after one-hour warm-up period. Fiber optic head specifications applicable for 9/125 to 110/140μm fiber, NA = 0.3.
  - This instrument's wavelength measurement technology provides "power-averaged" wavelength (i.e., spectral contributions to which detectors are sensitive are measured).
  - Typical photodiode response is linear over a 60 to 70 dB range between the effects of thermal noise and saturation of the diode. ILX power meter heads are calibrated above the noise threshold and linearity is verified in order to produce an accurate calibration for optical power measurements to 10W.
  - Includes traceability to NIST. Calibrated to 21°C ±3°C at 10 nm intervals. Uncertainty evaluated according to NIST Technical Note #1297: "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." Accuracy specifications are verified with the wavelength entered manually (instrument not in auto-wavelength mode). Add 1% for NA > 0.2, MaximumNA 0.30.
  - Manual wavelength mode. Add ±0.5% for auto-wavelength mode. Add ±0.5% for λ <440 nm and >1000 nm. For input power >100 mW, add ±0.05% / 100 mW.
  - Variation in meter response associated with changes in input polarization state. Specification is for flat endface (cleaved) fiber. Add PDL for connectors or angled/cleave measurements. For example, 8° cleave in SMF-28 fiber typically adds 0.015 dB PDL.
  - Variation in meter response from removing and replacing the fiber or connector into the detector head. Includes effects of variation in fiber orientation and bare fiber extension 1 to 5 mm from the holder. Add +0.003 dB for NA >0.20.
  - Measured over one minute, in gain range seven, medium filter mode.
  - Measured over one minute in medium filter mode. Applicable for responsivity >0.1 mA/W. For responsivity <0.1 mA/W, refer to calibration data provided with the power/wavehead.
  - Noise when RATE is set to SLOW on OMM-6810B Optical Power and Wavelength Meter.
  - Total variation from straight-line response. Valid across range limits if measured in auto-range mode. Measured at 920 nm, 23±5°C, constant temperature. Add ±0.005 dB/dB for input power >20 dBm.
- In keeping with our commitment to continuing improvement, ILX Lightwave reserves the right to change specifications without notice or liability for these changes.

## Ordering Information

OMM-6810B	Optical Power and Wavelength Meter (Available in 100V, 120V, 220, 240V)
OMH-6703B	Silicon Power Measurement Head, 1W, 400 to 1100 nm
OMH-6742B	Silicon Power/Wavelength Measurement Head, 1W, 400 to 1100 nm
OMH-6790B	Silicon Power/Wavelength Measurement Head, 10W, 830 to 1100 nm

## Accessories

OMH-6703B and OMH-6742B	AO271 FC Adapter Assembly BF-820 Bare Fiber Holder (requires adapter kit) AO122 Bare Fiber Adapter Kit
OMH-6790B	BF-820 Bare Fiber Holder (requires adapter ring) CA-100 FC Adapter CA-120 Bare Fiber Adapter Ring CA-150 SC Adapter CA-20001 LC Adapter CA-250 Bare Ferrule Adapter