

**OPTICAL HANDY POWER METER  
ML9002A**



The ML9002A is a compact handy power meter with a measurement level as wide as other more expensive instruments. Seven optical sensors are available for different wavelengths, measurement levels, and optical input types. Each can be calibrated for three common wavelengths so absolute optical power can be read directly. Each optical sensor can either be incorporated directly in the main frame or connected using a connecting cord. The ML9002A can be used to check optical disks, optical printers and optical communications systems and can back-up on-site operations as a powerful multifunctional measuring instrument for maintenance.

**Features**

• **Accurate optical power measurement**

The power of a narrow beam can be accurately measured even when an adaptor is changed because anti-reflection optical sensor is used.

• **Long-distance measurement with wide measurement level range**

An unprecedented wide measurement level has been achieved in this handy optical power meter. Optical power of -70 to +3 dBm (MA9621A Optical Power Sensor) in the 1.3 μm band and -70 to +10 dBm (MA9423A Optical Power Sensor) in the 0.85 μm band can be measured.

• **Direct absolute power readings for three wavelengths**

Each optical sensor is calibrated at three wavelengths (0.633/0.78/0.85 μm or 0.66/0.78/0.85 μm for short wavelengths, and 0.85/1.3/1.55 μm for long wavelengths). The absolute power is indicated automatically just by switching to the measured wavelength.

• **Flexible measurements**

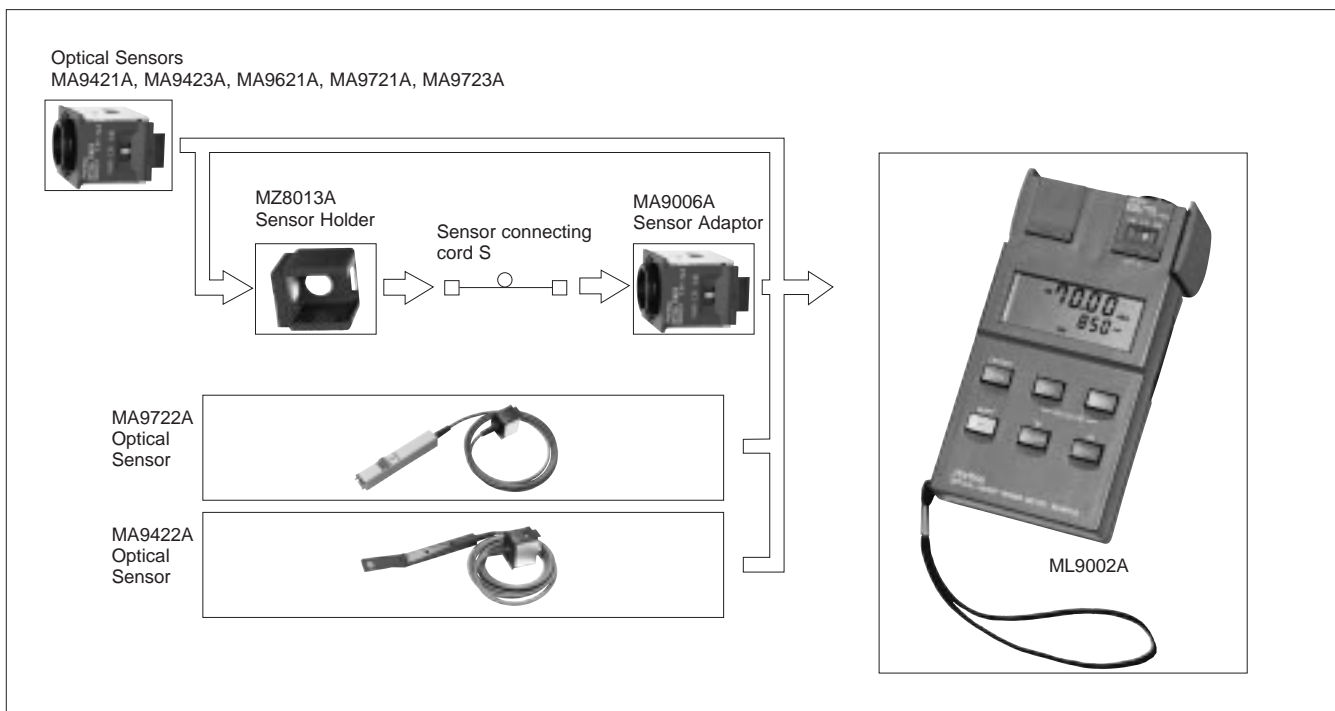
Two types of connections, a plug-in system (sensor incorporated into main frame), or a cord system (sensor connected using connecting cord), are possible so that measurement capabilities are flexible.

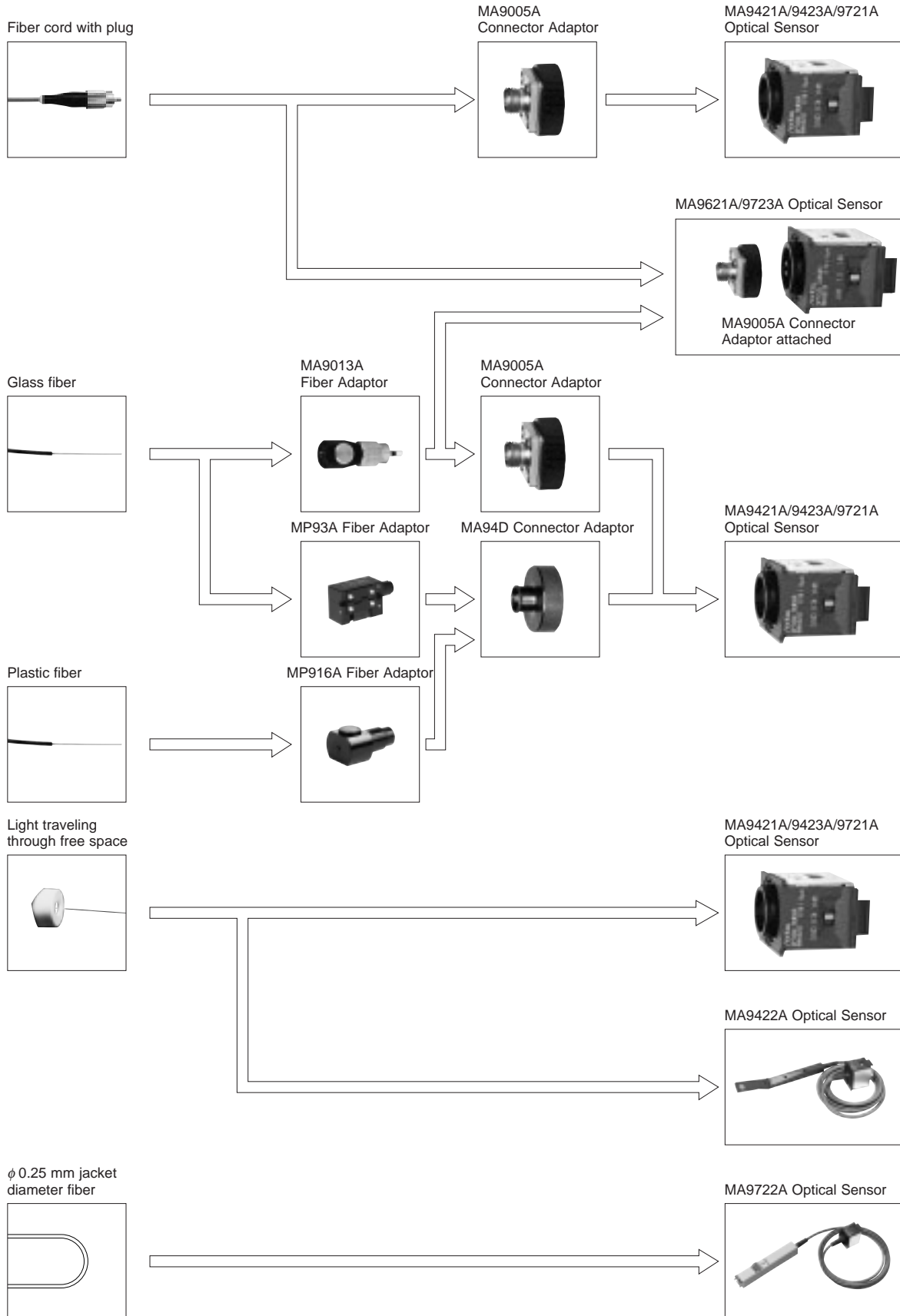
• **Monitoring without cutting optical fiber**

The optical power in an optical fiber cable (ø0.25 mm, UV-coated fiber) can be measured by using the MA9722A Optical Power Sensor.

• **Compatible with various connectors**

The ML9002A can be quickly connected to FC, D4, RUNGE, ST, DIN, DIAMOND, and SC connectors just by replacing the connector adaptor.





## Specifications

Main frame	Unit display	W, W(REL), dBm, and dB(REL), selectable, 4 digits						
	Recorder output	1 V/full-scale, 0.316 V/-5 dB						
	Averaging	ON/OFF settings						
	Range hold	Range settings						
	Buzzer	1 dB sound threshold level setting						
	Auto power off	After 5 minutes non-use (with internal Ni-Cd battery)						
	Dimensions and mass	90 (W) x 196 (H) x 38 (D) mm, ≤700 g						
Sensors	Model	MA9421A	MA9422A	MA9423A	MA9621A	MA9721A	MA9723A	MA9722A
	Wavelength (μm)	0.38 to 1.15			0.75 to 1.7	0.75 to 1.8		
	Element	Si photodiode			InGaAs photodiode	Ge photodiode		
	Active area diameter	9.5 mm	9 mm	9.5 mm	1 mm	5 mm	1 mm	3 mm
	Input	Direct			FC connector adaptor	Direct	FC connector adaptor	Direct*1
	Measurement range (dBm)	-60 to +20 (at 0.85 μm)	-50 to +20 (at 0.85 μm)	-70 to +10 (at 0.85 μm)	-70 to +3 (at 1.3 μm)	-40 to +10 (at 1.3 μm)	-60 to +3(at 1.3 μm, 0° to 40°C)	-50 to 0 (at 1.3 μm, 0° to 40°C)
	Dimensions and mass	30 (W) x 30 (H) x 37 (D) mm, ≤100 g	15 (W) x 16 (H) x 140 (D) mm, ≤200 g	30 (W) x 30 (H) x 37 (D) mm, ≤100 g				20 (W) x 20 (H) x 128 (D) mm, ≤300 g
Overall	Measurement accuracy	±5% (-10 dBm, CW mode)				±5% (-10 dBm, CW mode)*2		Not specified
	Calibration wavelength	0.633/0.78/0.85 μm		0.66/0.78/0.85 μm	0.85/1.3/1.55 μm		Not specified	
	Measurement resolution	W/W(REL): 0.1 to 1%, dBm/dB(REL): 0.01 dB						
	Operating hours	20 hr or more, floating operation possible (on internal Ni-Cd battery)						
	Temperature range	Operating: 0° to 50°C, Storage: -30° to 50°C, Recharging: 10° to 45°C						
	EMC*3	EN55011: 1991, Group 1, Class A EN50082-1: 1992						
	Safety	EN61010-1: 1993 (Installation Category II, Pollution Degree II)						

\*1: Used for 0.25 μm jacket diameter fiber

\*2: For wavelength 1.55 μm, it is specified at 23° ±5°C

\*3: Electromagnetic Compatibility

## Ordering information

Please specify model/order number, name and quantity when ordering.

Model/Order No.	Name
ML9002A	<b>Main frame</b> Optical Handy Power Meter
	<b>Optical sensors</b>
MA9421A	Optical Sensor
MA9422A	Optical Sensor (Thin sensor)
MA9423A	Optical Sensor
MA9621A	Optical Sensor (MA9005A Connector Adaptor attached)
MA9721A	Optical Sensor
MA9722A	Optical Sensor (fiber identification sensor)
MA9723A	Optical Sensor (MA9005A Connector Adaptor attached)
	<b>Standard accessories</b>
Z0178	AC adaptor: 1 pc
J0017	Power cord, 2.5 m: 1 pc
B0232	Blank panel: 1 pc
W0400CE	ML9002A instruction manual: 1 copy
J0477	Auto-power-off override plug: 1 pc
	<b>Optional accessories</b>
MA9005A*	Connector Adaptor (for optical sensor)
MA9006A	Sensor Adaptor (for sensor connecting cord S/T)
MP93A	Fiber Adaptor (≤150 μm clad dia., 0.8 to 1.0 mm jacket dia.)
MP94D	Connector Adaptor (for MP93A and MP916A)
MA9013A	Fiber Adaptor
MZ8013A	Sensor Holder
J0056B	FC-FC-2M-SM (FC optical fiber cord, 2 m, SM)
J0200B	FC-FC-2M-GI (FC optical fiber cord, 2 m, GI)
J0436	Sensor connecting cord S (for ML9002A sensors)
J0438	Recorder output cord
Z0179	Carrying case (with shoulder strap)
Z0182	Soft case
B0234	Battery box

\*: Choose from the options listed in the following table when ordering non-FC optical connector.

## Optical connector options table

Option No.	Optical connector
21	D4
22	RUNGE
23	Amphenol Type 906
24	OF-2
34	DIAMOND*1
35	HP-SMA, Amphenol Type 905
38	ST
39	DIN
40	SC
41	TOCP172*2

\*1: 3.5 mm diameter ferrule, M9 screw

\*2: For MA9421A, MA9423A only