OPTICAL POWER METER
OPM36M

Instructions

sanwa

SANWA ELECTRIC INSTRUMENT CO.,LTD.
DEMPA BLDG.,2-4-4,SOTOKANDA
CHIYODA-KU,TOKYO 101-0021,JAPAN

OPM36M Instructions

1. Introduction

This instrument is a laser power meter using a Si photodiode as the optical sensor. It uses separate measuring sensors for CD player measurement(stick type sensor), MD player measurement , DVD-RAM drive measurement of PC.

The measuring functions include:

In addition to the W measurement, relative value measurement (W(REL)), maximum value hold, averaging are available.

The RS-232C interface is provided to enable transfer of measurements to a PC.

2. Caution

- Do not look directly at the measured light and be careful against penetration of reflected light in your eye.
  Incidence of high-power light in your eye may cause drop in your eyesight or loss of eyesight in the worst case.
  Special care is required when using the IR light because it is not visible for human eyes.
- Avoid applying light exceeding the measuring limit (50 mW) because excessive light input may destroy the photodiode used in the optical sensor.
- When the power source is changed in the middle of measurement (battery ⇔ AC adapter), the instrument is reset to the initial status.
- Warm up the instrument for a few minutes before proceeding to measurement.
- Avoid using the instrument in a place with high temperature and humidity or subject to vibrations.
- Do not touch the light sensor surface directly with your hand. Contamination of the surface will results in measurement errors.
- This instrument has been calibrated in combination with the sensor probe.
  Do not use other combination of sensor probe and instrument than that provided in this specific package.

3. Standard Accessories

MD sensor	x 1
• DVD-RAM sensor	x 1
• CD sensor(stick type)	x 1
• Connecting cord of MD sensor and DVD-RAM sensor	x 1
• Instructions manual	x 1
• 006P alkaline battery	x 1
• AC adapter (AD-30)	x 1

(Optional Accessory)

• Model KB-RS-OPM	x 1

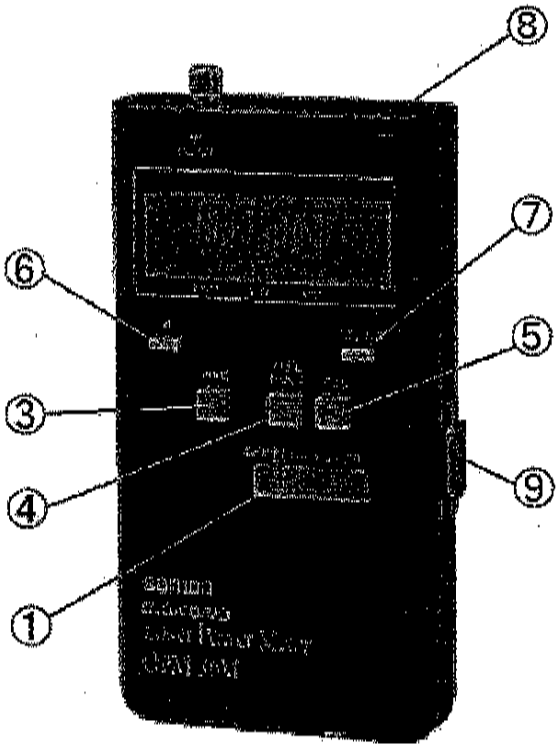
RS-232C connection cable (for PC connection),
D-sub 9-pin female connector (with inch screws) on both end, cross wiring, 2 meters.

4. Specifications

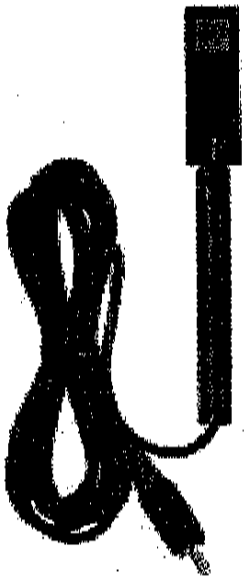
Model	OPM36M
Display	4-digit digital display
Range	5 ranges, automatically switched
Optical sensor	Si photodiode (10 x 10 mm) in each sensor
Optical power measuring range	0.001 μW to 50.00 mW
Light input method	Direct photodiode input
Calibrated wavelengths	Wavelengths used by DVD-RAM, CD and MD
Measuring accuracy	±5% (@ direct-reading calibration wavelength, 100 μW)
Measuring resolution	W/W(REL) modes: 0.01% to 0.11%
Measuring interval	6.66 times/sec.
Measuring functions	W measurement, W(REL) measurement, direct-reading wavelength switching, averaging (sequential averaging of 20 date items), RS-232C output, low battery voltage indication
Power supply	006P alkaline battery or AC adapter (AD-30)
Environmental condition	Temperature: 0°C to 40°C Humidity: Max. 80%RH (without condensation)
Dimensions	Main instrument: 164 x 85 x 35 mm CD sensor (stick type): 126 x 15 x 4 mm MD sensor: 68 x 72 x 6 mm DVD-RAM sensor: 123 x 138 x 8 mm
Weight	Main instrument: 300 grams CD sensor (stick type): 40 grams MD sensor: 30 grams DVD-RAM sensor: 80 grams

5. Operating Instructions

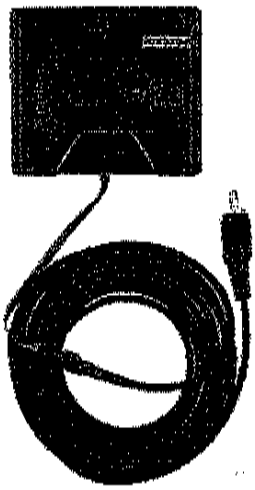
Nomenclature



OPM36M

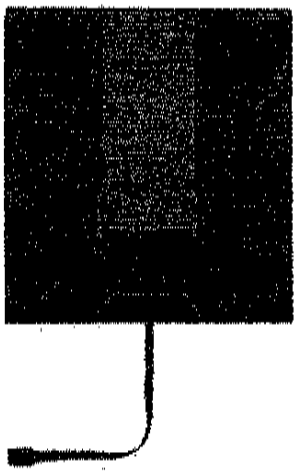


CD sensor



MD sensor

②



DVD-RAM sensor

① POWER switch	Slide switch for turning the instrument ON and OFF.
② CD sensor, MD sensor, DVD-RAM sensor	Surface area size: 10 x 10 mm (in each sensor)
③ AVE key	Key for switching the averaging mode ON/OFF. Press the key to display the average of 20 data items obtained by sequential averaging. The LCD shows the "AVE" marking during averaging. Press the key again to exit from the averaging mode.
④ MAX HOLD key	Key for switching the maximum-value hold mode ON/OFF. The maximum-value hold function holds the display of the maximum value reached by a measurement. The LED in the key lights during maximum-value hold. Press the MAX HOLD key again or the REL key to exit from the maximum-value hold mode.
⑤ REL key	Key for measuring the relative value of the input light power. The display at the moment this key is pressed is stored as the reference value, and the instrument displays the relative value of measurement after change in the light. The LED in the key lights during the REL measuring mode. Press the dBm/W key again or the MAX HOLD key to exit from the REL measuring mode.
⑥ λ key	Key for switching the direct-reading wavelengths. The wavelength is set to CD in the initial status after power ON. Each press of the key switches the wavelengths in cycle of: CD → MD → DVD → CD... The set wavelength is indicated by the position of a dot in the LCD.
⑦ REL-MR key	Press and hold this key in the REL measuring mode to display the reference value in the REL measuring mode only while this key is held depressed.

⑧ AC adapter jack	Connection plug for the AC adapter (AD-30). (Do not use other AC adapter than specified.)
⑨ RS-232C data output connector (D-sub 9-pin male)	Connector for the PC. Use a cross-connected cable equipped with D-sub 9-pin female connectors (inch screws) on both ends.

RS-232C Data Output Specifications

As the data is output permanently while the instrument is ON, it is not required to send any command from the PC application.

◇ Data output format

Data is output in ASCII codes in the order as shown below.
(Assuming that → = DVD → B nm, CD → C nm, MD → D nm)

Examples)

In W mode, 12.34 μW, λ = MD:
NOR, 12.34μW, Dnm, CR LF

In REL mode, 12.34 μW, λ = CD:
REL, 12.34μW, Cnm, CR LF

In W mode + AVE mode, 12.34μW, λ = DVD:
AVE, 12.34μW, Bnm, CR LF

In REL mode + AVE mode, 12.34μW, λ = DVD:
AVE/REL, 12.34μW, Bnm, CR LF

Low battery, in W mode, -12.34μW, λ = CD:
NOR, -12.34μW, Cnm, LB CR LF

Note: CR = Carriage Return. LF = Line Field.

◇ RS-232C communication specifications

Communication rate:	19200 bps fixed
Data bits	8 bits
Parity	None
Stop bit	1 bit

◇ How to download data using Windows standard accessory HyperTerminal

1) Connect the instrument to the RS-232C port of your PC and turn the instrument ON.
2) In the Communication setting, set one of COM1 to COM4 Direct according to the port in use on your PC.
3) In "Property", set the port as shown below.

bit/sec.	19200 bps
Data bits	8 bits
Parity	None
Stop bit	1 bit
Flow control	Hardware

4) In the Communication menu, select [Connect] to start data reception.

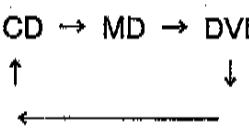
6. Measurement Method

Measuring procedure

1) Set the POWER switch to ON.
   The initial status of the instrument after power ON is as follows.

Range:	Maximum sensitivity range
Mode:	W measuring mode
Wavelength:	CD
MAX HOLD:	OFF
Averaging:	OFF

2) Set the measuring wavelength using the λ key.
   Press the λ key to switch the measuring wavelength:



   The set wavelength is indicated by the position of a dot in the LCD.
   When performing measurement using a wavelength other than the five direct-reading wavelengths, use the closest direct-reading wavelength to the measuring wavelength then correct the meter reading according to the sensitivity correction data.

3) Apply the light to be measured on the optical sensor surface and perform measurement as described below.

◇ To measure laser light, align the laser head position by moving it slowly up/down and to the left and right so that the laser beam hits the center of the optical sensor surface from the perpendicular direction.
In general, the maximum value in a measurement is most often the real value of the measured light.
This can be measured easily using the maximum-value hold function of the instrument.

◇ With certain types of lasers, the "return light" from the optical sensor surface may alter the laser power. In such a case, prevent the "return light" by slightly changing the angle of the head.

◇ Measurement of weak laser power below 1 mW is often affected by extraneous light (disturbance light).
The optical power before measurement (disturbance light) can be canceled by using the REL measuring mode of this instrument.

◇ Absolute optical power level measurement
When the measured optical power is:
over +50.00 mW "HI .mW" is displayed.

◇ Relative optical power measurement in REL measuring mode
Press the REL key to enter the REL measuring mode.
The optical power value at the moment the REL key is pressed is stored in memory as the reference value, and the measurements in this mode provide the relative values with respect to the reference value.
The LED in the REL key lights during the REL measuring mode.
When the measured optical power is:
over +50.00 mW "HI .mW" is displayed.
Press the REL key again or the MAX HOLD key to exit from the REL measuring mode.
Press and hold the REL-MR key during REL measuring mode to display the reference value in the REL measuring mode only while the key is held depressed.

◇ Maximum-value hold measurement

Press the MAX HOLD key to initiate maximum-value hold measurement.
This function holds and displays the maximum value in each measurement.
The LED in the key lights during maximum-value hold measurement.
Press the MAX HOLD key again or the REL key to exit from the maximum-value measurement.

◇ Averaging measurement

In any measuring mode, press the AVE key to display the result of sequential averaging of the past 20 data items.
The LCD shows the AVE marking during averaging.
Press the AVE key again to exit from the AVE mode.