

ML9001A
Optical Power Meter
Operation Manual

Eighth Edition

Read this manual before using the equipment.
Keep this manual with the equipment.

Measurement Solutions
ANRITSU CORPORATION

Document No.: M-W0420AE-8.0

JL.
X

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Insure that you clearly understand the meanings of the symbols BEFORE using the equipment.

Some or all of the following symbols may not be used on all Anritsu equipment. In addition, there may be other labels attached to products which are not shown in the diagrams in this manual.

Symbols Used in Manual

DANGER 

This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

WARNING 

This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

CAUTION 

This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and/or in Manual

The following safety symbols are used inside or on the equipment near operation locations, and/or in manual to provide information about safety items and operation precautions. Insure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



This indicates warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.

ML9001A
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Operation Manual

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SECTION 3

OPERATION

3.1 Safety measures

- (1) Check that the power supply voltage agrees with the VOLTAGE SELECTOR setting on the rear panel. Also, use the correct fuse. (Refer to the note before the table of contents.)
Before replacing the fuse, set the [POWER] switch to OFF and unplug the power cord.
- (2) Always ground the terminal (A@) on the rear panel to prevent an electric shock hazard.
- (3) Always set the [POWER] switch to OFF when connecting an optical sensor to the ML9001A or When removing it. If the sensor is connected when the power is on, it may be damaged.
- (4) Over-input to the optical sensor will damage the photodiode. Do not input light exceeding the measurable range.

3.2 Other Precautions

- (1) Note the following points when the MA9411A, MA9413A, MA9711A, and MA9712A optical power sensors are used without an adaptor.
 - . Do not touch the photodiode light-receiving surface. If it is dirty, wipe the dirt off carefully with lens paper.
 - . When light strikes a surface of the receiving element other than the light-receiving surface, the sensitivity changes. Therefore, use the sensor so that it strikes the light receiving surface directly.
- (2) If a load with a low input resistance is connected to the recorder output terminal, an error occurs. Use a recorder with an input resistance of 100 k Ω or more.
The recorder output is not averaged. Insert a filter at the recorder input to eliminate noise when measuring low-level light. The averaged value can be recorded.
- (3) When power is turned on again after sudden power off or power failure, the initial status is set.

3.3 Explanation of Controls

3.3.1 Control layout

Figures 3-1 and 3-2 show the front and rear panels, respectively.

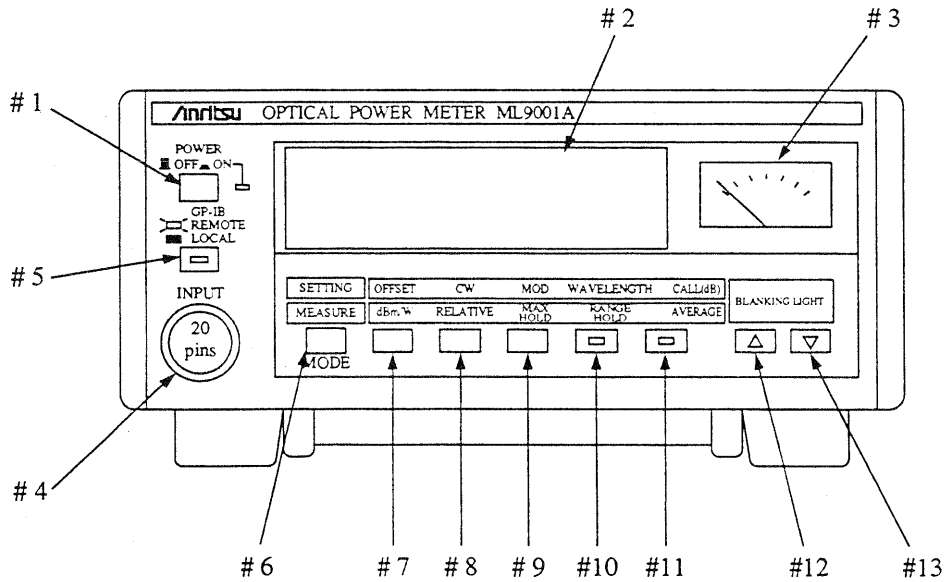


Fig. 3-1 Front Panel

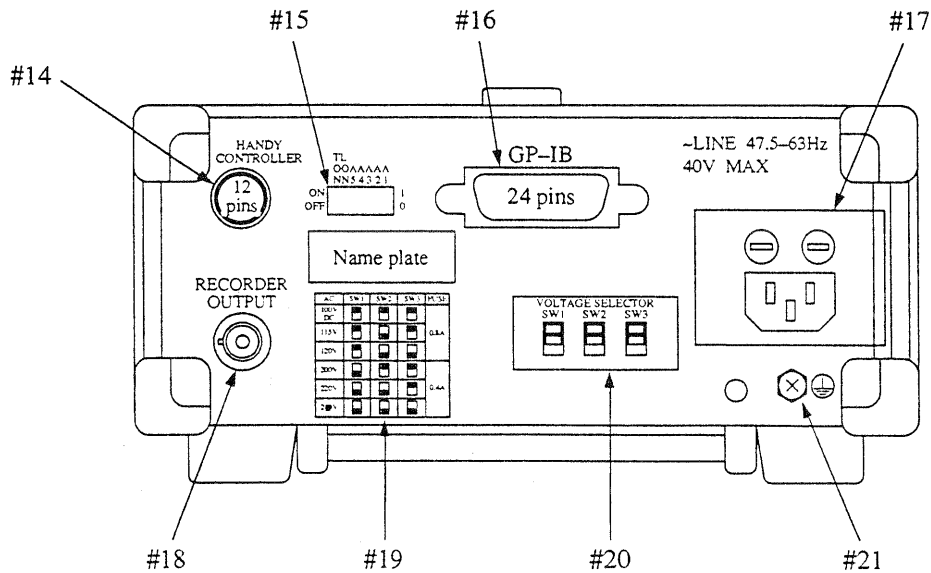
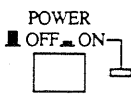
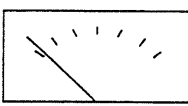
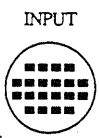

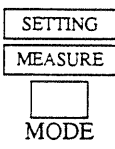


Fig. 3-2 Rear Panel

3.3.2 Explanation of key functions

Table 3-1 explains the keys functions. The numbers correspond to the numbers in Figs. 3-1 and 3-2. Also, refer to detailed key operation and display examples described in paragraph 3.6.

Table 3-1 Key Functions

No.	Name	Function
#1		<p>Key to turn power on or off</p> <p>When this key is pressed, the LED on the right comes on to indicate that power is supplied.</p>
#2	Indicator	Liquid crystal to display measured values, settings etc.
#3		Analog meter to monitor measured values
#4		<p>Connector for connecting optical sensor</p> <p>Always set [POWER] to OFF before connecting the optical sensor.</p>
#5		<p>Key to release REMOTE (When controlled by external controller) condition and return to LOCAL status</p> <p>The Key LED comes on in the REMOTE status</p> <p>Note: The LOCAL status cannot be set at local lockout.</p>
#6		<p>Key to switch each operation function</p> <p>Each time this key is pressed, SETTING and MEASURE are set alternately and indicated.</p> <p>The measurement conditions are set in the SETTING mode and the actual measurement is set in the MEASUREMENT mode</p>

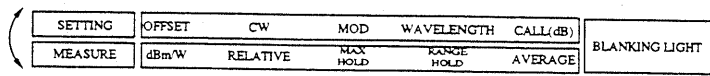


Table 3-1 Key Functions (Cont'd)

No.	Name	Function
#7	OFFSET dBm/W <input data-bbox="310 449 358 485" type="checkbox"/>	<p>- OFFSET -(SETTING mode)</p> <p>Key to automatically adjust zero</p> <p>When zero-adjustment is completed, the ML9001A automatically enters the MEASUREMENT mode. When zero-adjustment is mode, always block a light input to the sensor.</p> <p>If zero-adjustment cannot be made because a light is being input, a buzzer sounds.</p> <p>- dBm/W -(MEASURE mode)</p> <p>Key to switch measurement units in display section #2 to dBm or watts (W)</p> <p>The resolution is 0.01 dB for dBm units and 0.1% to 1% for W units.</p>
#8	CW RELATIVE <input data-bbox="315 1262 363 1297" type="checkbox"/>	<p>- CW -(SETTING mode)</p> <p>Key to set continuous (CW) light measurement mode</p> <p>CW is displayed on the lower-left of the display section #2 during measurement in the CW light mode.</p> <p>- RELATIVE - (MEASUREMENT mode)</p> <p>Key to set relative measurement mode</p> <p>When this Key is pressed, the current measured value is displayed on the left of the display section #2. The difference (relative value) between the current value and subsequently measured value will be displayed on the right of the display section #2. At this time, REF and RELATIVE are displayed at the upper-left and upper-middle of the display section #2, respectively.</p>

Table 3-1 Key Functions (Cont'd)

No.	Name	Function
#8	(con't)	<p>When the measured value is displayed in dBm, the relative value is displayed with a resolution of 1/1000 dB. However, when the dynamic range of the relative value measurement exceeds ± 9.999 dB, the resolution of the relative value automatically becomes 1/100 dB. Furthermore, if [BLANKING] #12 is pressed when the relative value is displayed at a resolution of 1/1000 dB, the last place disappears, and the display resolution becomes 1/100 dB.</p> <p>When the measured value is displayed in W, the relative value is also displayed in W and the same resolution. However, the range of the relative value display in W is from 1/10 of the measurement value to 10 times the measured value. When the relative value display exceeds this range, it blinks at 1/10 of the measurement value or a relative value with 10 times of the measurement value. Press [dBm/W] #7 to release the relative value display mode.</p>
#9	MOD MAX HOLD <input data-bbox="310 1152 363 1188" type="checkbox"/>	<p>- MOD -(SETTING mode)</p> <p>Key to set modulated (MOD) light input mode</p> <p>When this key is pressed, the MOD mode is set, the LEDs of [BLANKING] #12 and [LIGHT] #13 come on the currently-set modulation frequency is displayed on the left of the display section #2. In this condition, one of the twelve modulation frequencies shown below can be set using the [BLANKING] #12 and [LIGHT] #13. However, 270 Hz is set first.</p>

Table 3-1 Key Functions(Cont'd)


No.	Name	Function
#9	(cont.)	<p>Settable modulation frequency (Hz)</p> <p>CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8 CH9 CH10 170 220 270 320 375 412 478 562 711 783 CH11 CH12 871 1000</p> <p>- MAX HOLD - (MEASURE mode)</p> <p>Key to set maximum hold measurement mode</p> <p>When this key is pressed, the maximum measured value from that time is always displayed on the left of the display section #2. MAX is displayed on the lower-left of the display section #2. However, if the measured value is displayed in W and exceeds 120 mW, the maximum value is displayed in parenthesis (" ").</p>
#10	<p>WAVELENGTH RANGE HOLD</p> 	<p>- WAVELENGTH - (SETTING mode)</p> <p>Key to set wavelength to correct wavelength sensitivity of optical power sensor</p> <p>In the normal measurement condition, the currently-set wavelength is displayed on the left of the display section #2. When this Key is pressed, the LEDs of [BLANKING] #12 and [LIGHT] #13 come on and the ML9001A enters the wavelength-settable mode. The wavelength can then be set in 1 nm steps using keys #12 and #13. Furthermore, if keys #12 and #13 are pressed continuously, the set wavelength changes quickly. Each time [WAVELENGTH] is pressed, the set wavelength changes as shown on the next page.</p>

Table 3-1 Key functions (Cont'd)

No.	Name	Function
#10 (cont.)		Optical power sensor
		Settable wavelength using [WAVELENGTH] Key
	MA9411A	→ 633 nm → 780 nm → 850 nm
	MA9412A	→ 780 nm → 810 nm → 850 nm → 880 nm
	MA9413A	
	MA9711A	
	MA9712A	→ 850 nm → 1200 nm → 1300 nm → 1550 nm
	MA9714B	
	MA9611A	
	MA9612A	

When the wavelength is set, the measured value is corrected automatically by the wavelength sensitivity correction value of the sensor and the absolute value at the set wavelength is displayed.

If you try to set a wavelength that exceeds the lower or upper limits shown in the table below, a buzzer sounds to notify that the setting is impossible. At this time, the wavelength is set to the lower or upper limit.

Optical power sensor	Lower limit	Upper limit
MA9411A		
MA9412A	380 nm	1150 nm
MA9413A		
MA9711A		
MA9712A	750 nm	1800 nm
MA9714B		
MA9611A		
MA9612A	750 nm	1700 nm

Table 3-1 Key Functions (Cont'd)


No.	Name	Function
#10	(cont.)	<p>The set wavelength is retained by the RAM backup even when [POWER] is set to OFF. However, if the optical power sensor is changed, the initial reference wavelength is set: 850 nm for the short-wavelength band (MA9411A, MA9412A and MA9413A) and 1300 nm for the long-wavelength band (MA9711A, MA9712A, MA9714B, MA9611A, and MA9612A).</p> <p>- RANGE HOLD - (MEASURE mode)</p> <p>Key to switch automatic range switching and fix measurement range</p> <p>When this key is pressed, the mode is fixed to the measurement range selected at that time and the key LED and LEDs of [BLANKING] #12 and [LIGHT] #13 come on. When it is pressed again, the mode returns to automatic range switching and the LEDs go out. The measurement range can be changed in the RANGE HOLD status by using keys #12 and #13.</p>
#11	<p>CAL (dB) AVERAGE</p> 	<p>- CAL (dB) - (SETTING mode)</p> <p>Key to set calibration factor</p> <p>When this key is pressed, the currently-set calibration factor is displayed on the left of the display section #2, CAL FACTOR is displayed at the upper part, and the LEDs OF keys [BLANKING] #12 and [LIGHT] #13 come on.</p> <p>Furthermore, when this key is pressed again, the calibration factor is reset to 0.00 dB.</p> <p>When this key is pressed and the calibration factor is displayed, the calibration factor can be changed in 0.01 dB steps using keys #12 and #13.</p> <p>The settable range is -99.99 to +99.99 dB. If the setting exceeds this range, a buzzer sounds to notify that the setting is impossible.</p>

Table 3-1 Key Functions (Cont'd)

No.	Name	Function
#11	(cont.)	<p>When the calibration faction is set, the automatically corrected optical power value is displayed.</p> <p>However, If the optical power measured in watts exceeds 120 mW, 120 mW is displayed and blinks. (Values exceeding 120 mW are not displayed.)</p> <p>When [MAX HOLD] is turned on in this condition, the maximum value is displayed in parenthesis (" ____ "). Up to ± 99.99 dBm displayed for dBm display.</p> <p>When the calibration factor is not 0.00 dB, "CAL FACTOR $\hat{A} \hat{C} 0$" is displayed on the upper-left of the display setting #2.</p> <p>- AVERAGE - (MEASURE mode)</p> <p>Key to turn averaging processing ON/OFF</p> <p>When [AVERAGE] is turned ON, the key LED comes on and the response becomes slow. This function is useful when a low-level optical power with a fluctuating measured value input.</p>
#12	BLANKING	<p>- BLANKING - (When ∇ off)</p> <p>Key to erase last place of measured value displayed on right of display section #2</p> <p>This key is effective when the measured value is displayed in dBm or dB.</p> <p>- Setting key - (∇) (When ∇ on)</p> <p>Key to decrease value of each parameter when ∇ LED on (in MOD, WAVELENGTH, CAL FACTOR, and RANGBE HOLD modes)</p> <p>At this time, BLANKING does not operate.</p>

Table 3-1 Key Functions (Cont'd)



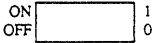
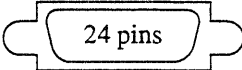
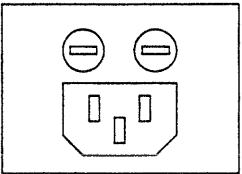
No.	Name	Function
#13	<p>LIGHT</p> 	<p>- LIGHT - (When Δ off)</p> <p>Key to turn on display section #2 backlight</p> <p>- setting key - (Δ) - (When Δ on)</p> <p>Key to increase value of each parameter when Δ LED on (MOD, WAVELENGTH, CAL FACTOR, and RANGE HOLD modes) At this time, LiGHT does not operate.</p>
#14	<p>HANDY CONTROLLER</p> 	<p>Input connector for connecting MN9001A Handy Controller</p>
#15	<p>TL OOAAAAA NN5 4 3 2 1</p> 	<p>Switch to set GP-IB address when GP-IB interface used This switch can be set to talk only or listen only.</p>
#16	<p>GP-IB</p> 	<p>GP-IB connector</p>
#17	<p>~LINE 48-63Hz 40VA MAX</p> 	<p>Power plug inlet</p> <p>There are two fuses in this inset. Use a fuse of the specified rating (100 to 120 Vac: 0.8 A; 200 to 240 Vac: 0.4 A)</p>

Table 3-1 Key Functions (Cont'd)

No.	Name	Function
-----	------	----------

#18

RECORDER
OUTPUT



Recorder output

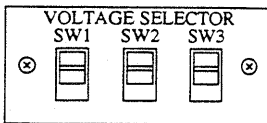
The watt linear output corresponds to 1 V for the full scale of each measurement range.

#19

AC	SW1	SW2	SW3	FUSE
100V DC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.8A
115V	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
120V	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
200V	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.4A
220V	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
240V	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

VOLTAGE SELECTOR switch #20 setting diagram

#20



AC input voltage setting switch

SW1 to 3 are set as shown in #19 according to the AC input supply voltage.

The settable voltages are 100, 115, 129, 200, 220, and 240 V.

CAUTION

Always set the [POWER] switch to OFF and unplug the AC power cord before setting these switches.

#21



Frame ground terminal

3.4 Preparing Measurement

3.4.1 Before turning on power

Check the following points before turning on the power.

(1) Environmental conditions

The ML9001A is designed to operate normally in an ambient temperature range of 0° to 50°C. However, do not use or store the instrument in locations:

- Where it is damp or dusty
- Where there may be exposure to active gases.

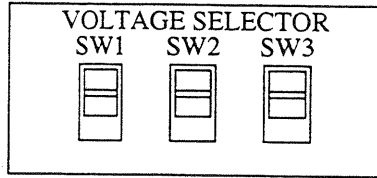
CAUTION

If the ML9001A is used at room temperature after being used or stored for a long period at low temperatures, condensation may occur and cause short-circuiting. To prevent this do not turn the power on until the instrument is completely dry.

(2) Supply voltage

Check that the VOLTAGE SELECTOR switches on the rear panel are set for the supply voltage and that the correct fuse is used.

The relationship between the supply voltage, VOLTAGE SELECTOR setting, and power fuse is shown on the next page.



AC	SW1	SW2	SW3	FUSE
100V DC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.8A
115V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
120V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
200V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.4A
220V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
240V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

The indicated working range for each set AC voltage is shown in the table below. Set the VOLTAGE SELECTOR switches according to the supply voltage.

Example:

When the supply power is 110 V, set the VOLTAGE SELECTOR switches for 115 V.

AC	Working voltage range
100 V/DC	85 V to 110 V
115 V	98 V to 126 V
120 V	102 V to 132 V
200 V	170 V to 220 V
220 V	187 V to 242V
240 V	204 V to 250 V

Notes:

1. Always set the [POWER] switch to OFF and remote the AC power cord from the AC inlet when setting the VOLTAGE SELECTOR switches.
2. Set the VOLTAGE SELECTOR switches for AC 100 V/DC position and use a 0.8 A fuse when using the DC-AC Inverter MZ5006A Opt. 09, set the VOLTAGE SELECTOR switches for AC 220 V position and use a 0.4 A fuse.

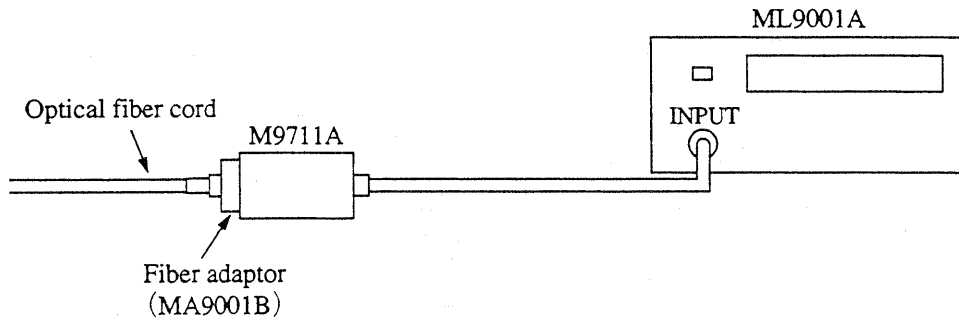
(3) Grounding

Always grounds the frame ground terminal (\oplus) on the rear panel to prevent an electric shock hazard.

(4) Optical power sensor setup

Connect the MA9412A, MA9612A, MA9413A, MA9712A, or MA9714B and the MA9411A, MA9611A or MA9711A with the ML9001A Optical Power Meter using optical power sensor connection cords A and B, respectively.

When an optical fiber output is measured directly with a direct input type optical power sensor such as the MA9411A, MA9413A, MA9711A and MA9712A sensors, a fiber adaptor (ex. MA9001B) corresponding to an optical fiber cord plug is installed at the input side of the optical power sensor.



3.4.2 Power ON

- (1) Connect the sensor, then set [POWER] switch to ON. A display check is performed at power-on. All segments of the indicator and all LEDs (except MEASURE) are displayed for approximately 1 second.
- (2) The condition that is set immediately after the display check is performed is called the initial condition. The initial condition settings are as follows:
 - . MEASURE mode
 - . dBm mode
 - . CW mode
 - . AVERAGE, RANGE HOLD, MAX HOLD: OFF
 - . Previous WAVELENGTH value and previous CAL FACTOR valueHowever, when the power sensor is changed, the reference wavelength values of the current wavelength band are set (0.85 mm for short-wavelength band and 1.3 mm for long-wavelength band).
 - . Display backlight :OFF
 - . BLANKING: OFF
 - . LOCAL status
- (3) When the MN9001A Handy Controller is connected, the ML9001A automatically enters the MEASURE mode and becomes operable immediately after it is turned on.
- (4) Warm-up
For high-accuracy optical power measurement, warm-up the ML9001A for approximately thirty minutes.

3.4.3 Before starting measurement

Block any light to the optical power sensor and make zero-adjustment by pressing the [OFFSET] key before starting measurement. The zero adjustment procedure is described in paragraph 3.6.1

If the instrument is not zero-adjusted, there will be measurement error.

3.5 Explanation of Display

Figure 3-3 shows each segment of the display.

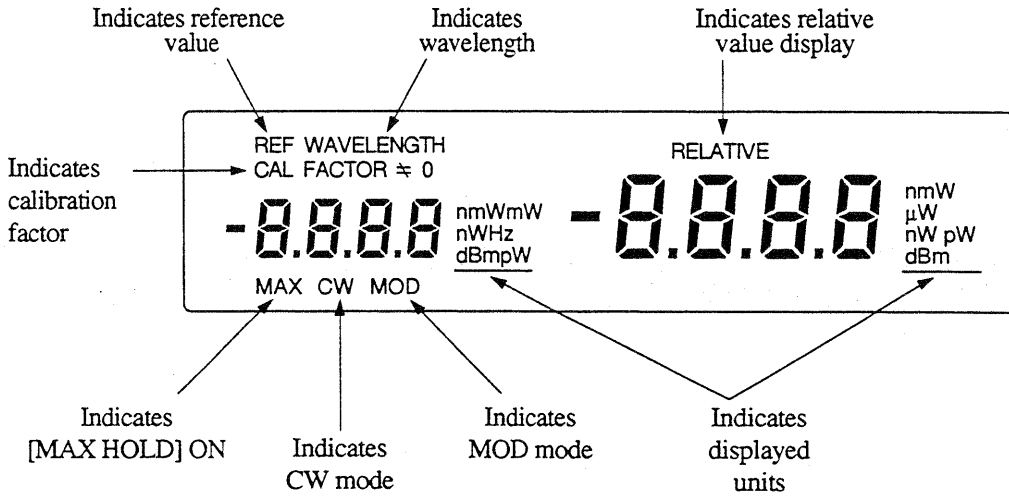


Fig. 3-3 Display Segments

3.6 Key operation and Display

The front-panel key operations and display are explained using a typical example. Unless otherwise specified, the key operation and display from the initial condition are shown.

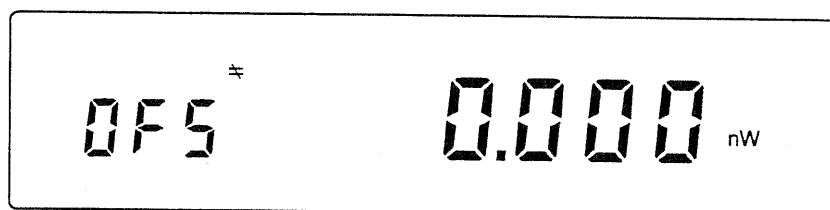
[] Indicates pressing the key and $\#$ indicates a blinking segment of the display. For the initial condition, refer to paragraph 3.4.2 (2).

3.6.1 OFFSET

Shield the sensor form light.

Procedure	Remark
MODE	Select SETTING mode.
OFFSET	Zero is adjusted automatically.

<Display>



. Display after zero adjusted

Optical power sensor	dBm display	W display
MA9411A, MA9611A	dBm	± 0.01 nW or less
MA9711A	dBm	± 0.01 mW or less
MA9712A, MA9714B	dBm	± 0.1 nW or less
MA9412A	dBm	± 0.2 pW or less
MA9612A	dBm	± 0.05 pW or less
MA9413A	dBm	± 1.0 pW or less

When the W display shows the value in the above table, zero has been adjusted.

After zero is adjusted, the ML9001A enters the MEASURE mode automatically.

Note:

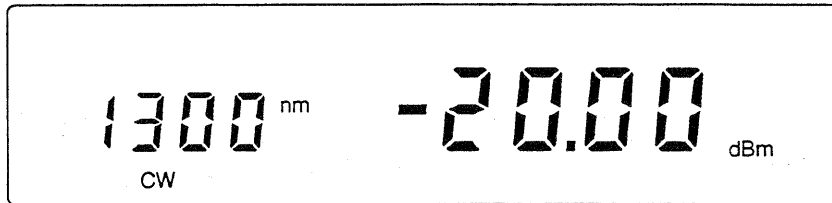
In the modulated-light measurement mode, OFFSET cannot be executed. A buzzer sounds if this operation is attempted in the modulated-light measurement mode.

3.6.2 dBm and display

. dBm display

In the initial condition, the values shown below are displayed in dBm. At this time, the wavelength displayed is a reference wavelength or previously set wavelength as described in #10 on page 3-6.

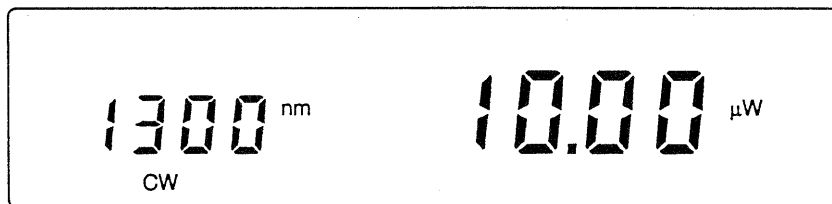
<Display>



. W display

Peocedure	Remarks
<input type="checkbox"/> dBm/W	The measured value units are switched from dBm to W.

<Display>



However, if the displayed value exceeds +120 mW, the display blinks at 120 mW.

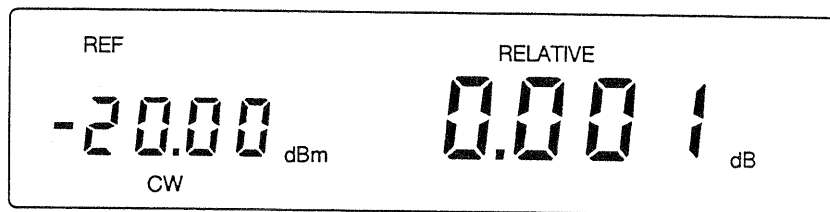
3.6.3 Relative value display

dB display

The relative value is displayed in dB when the value was displayed in dB before pressing [RELATIVE].

Peocedure	Remarks
RELATIVE	The reference value is displaead on the left and the relative value is displyed on the right.

<Display>



To set absolute value measurement, press the [dBm/W] key.

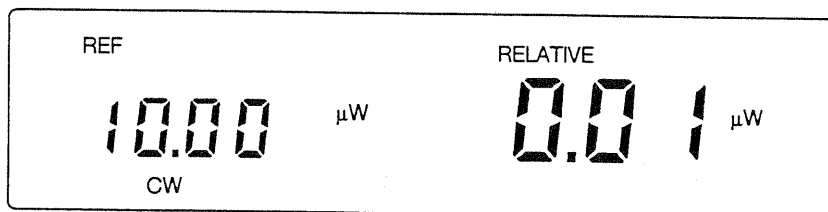
W display

The relative value is also displayed in W when the value was displayed in W before pressing [RELATIVE].

However, the W relative value is displayed in the range of 1/10 to 10 times the reference value.

Peocedure	Remarks
dBm/W	The measured value units are switched from dBm to W.
RELATIVE	The reference value is displaead on the left and the relative value is displyed on the right.


<Display>



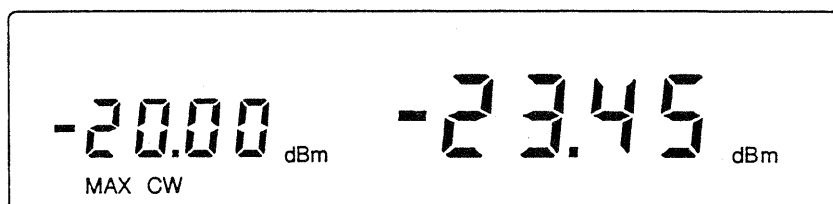
To set absolute value measurement, press the [dBm/W] key.

3.6.4 MAX HOLD

This function is convenient for finding the maximum optical power such as in optical-axis adjustment of optical fiber.

Peocedure	Remarks
	When the key is pressed, the maximum value is displayed on the left.

<Display>



When the [MAX HOLD] key is pressed when MAX HOLD is on, MAX HOLD is turned off.

3.6.5 When measuring with fixed measurement range

Peocedure	Remarks
dBm/W	The measured value units are switched from dBm to W.
RELATIVE	The reference value is displaead on the left and the relative value is displdy on the right.

When the range is held, any measurement range can be set using the [▽] and [△] keys.

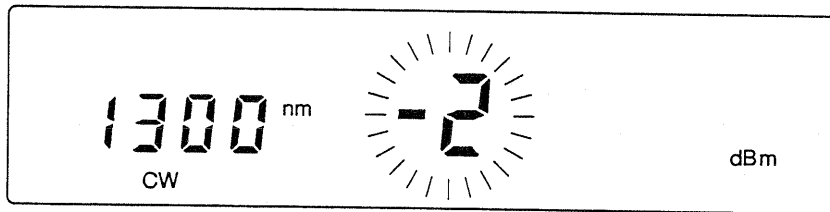
• Over-range

When the measurement value is greater than the fixed measurement range, the highest place of the full-scale blinks as shown below and the analog meter swings to the right. The W value of the full-scale blinks at W display.

<Display>

Example:

When -20 to -30 dBm measurement range fixed



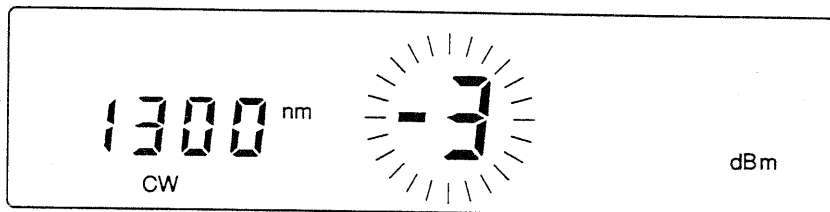
• Under-range

When the measured value is smaller than the fixed measurement range, the lowest place of the measurement range blinks as shown on the next page and analog meter swings to the left. The value does not blink at W display and the measured value is displayed in W.

<Display>

Example:

When -20 to -30 dBm measurement range fixed

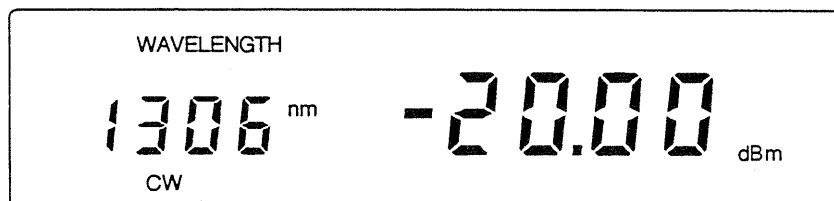


3.6.6 When modulated light received

The ML9001A can measure both continuous light (CW) and modulated light (MOD). It can measure the optical power at a set modulated frequency by selecting the MOD mode by pressing the [MOD] key and by setting the frequency as shown below using the [∇] and [△] keys.

Peocedure	Remarks
<input type="button" value="MODE"/>	Select SETTING mode.
<input type="button" value="MOD"/>	Select MOD mode. LED of <input type="button" value="∇"/> and <input type="button" value="△"/> keys light.
<input type="button" value="∇"/> or <input type="button" value="△"/>	Set frequency (12 frequencies).

<Display>







To return to the CW measurement mode, press the [CW] key, the CW mode is selected and continuous light can be measured.

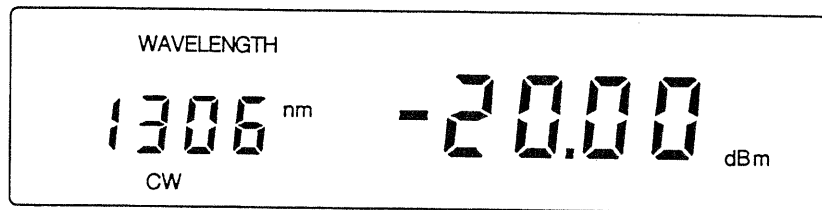
3.6.7 Setting wavelength

Two wavelengths: (1) 1306 nm and (2) 1550 nm are set as described below as example of setting the wavelength of the light to be measured and correcting the wavelength sensitivity of the optical sensor. (However, these examples are only for the MA9711A, MA9712A, MA9714B, MA9611A and MA9612A.)

(1) Setting 1306 nm

Peocedure	Remarks
MODE	Select SETTING mode.
WAVELENGTH	Select wavelength setting mode. LED of  and  keys light.
	Press  Key six times.

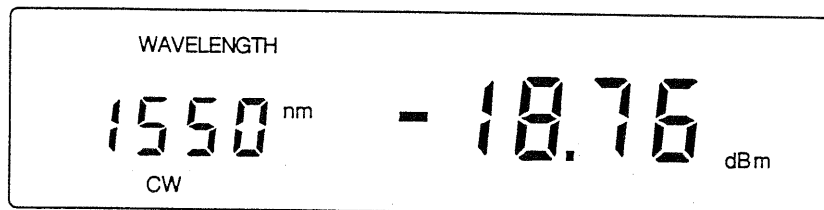
<Display>



(2) Setting 1550 nm

Peocedure	Remarks
MODE	Select SETTING mode.
WAVELENGTH	Select wavelength mode.
WAVELENGTH	Change wavelength step. (Refer to paragraph 3.3.1)

<Display>

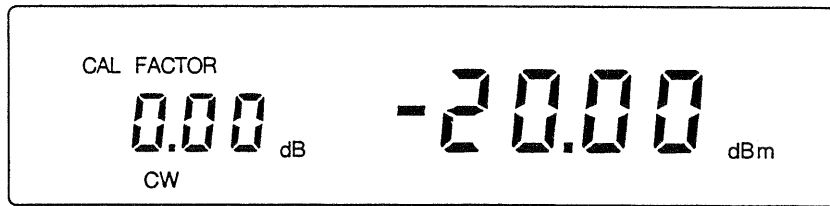


3.6.8 Setting calibration factor

This function is used to set an arbitrary calibration factor so the absolute optical power can be read directly. In this example, a 10 dB optical attenuator is used to set -10 dB as the calibration factor in advance and the absolute value is read directly.

Peocedure	Remarks
<input type="button" value="MODE"/>	Select SETTING mode.
<input type="button" value="CAL (dB)"/>	Select calibration factor setting mode. LED of <input type="button" value="▽"/> and <input type="button" value="△"/> keys light.

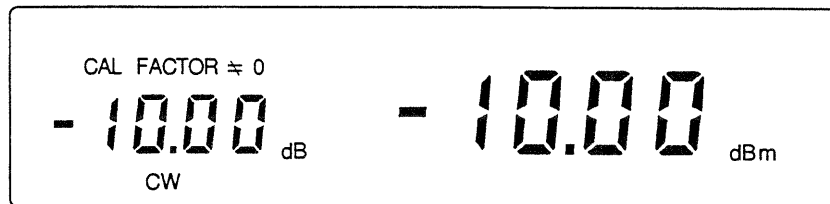
<Display>



- Set calibration factor to -10.00 dB.

Peocedure	Remarks
<input type="button" value="△"/>	Press the key to set the calibration factor to -10.00 dB. (If the key is pressed continuously, the setting changes quickly.)

<Display>



When the CAL FACTOR setting is not 0, CAL FACTOR = 0 is displayed as shown in the figure above.

When the [CAL(dB9)] key is pressed in the calibration factor setting mode, the calibration factor is reset to 0.00 dB.

3.6.9 BLANKING

This function is used to erase the last place of the measured value and change the resolution. For example, in the RELATIVE (dB) mode, the measured value is usually displayed at a resolution of 1/1000 dB, but it can also be displayed at a resolution of 1/100 dB by pressing the BLANKING [Å§] key. The 1/1000 dB setting can be returned by pressing the key again.

<Display>

