

CMA5 Series

Optical Loss Tester



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Anritsu Corporation
5-1-1 Onna, Atsugi-shi, Kanagawa,
243-8555, Japan

■ General

Thank you for purchasing the CMA5 Series Optical Loss Tester. These lightweight, handheld units are designed for the field installation, testing and commissioning of all types of optical fiber systems.
Three models are available:

- 5LT35 ---- Single Mode Optical Loss Tester 1310nm/1550nm (Standard Power Meter Model)
- 5LT83 ---- Multi Mode Optical Loss Tester 850nm/1300nm (Standard Power Meter Model)
- 5LT35C ---- Single Mode Optical Loss Tester 1310nm/1550nm (CATV Power Meter Model)

The CMA5 Series Optical Loss Tester is a multi-functional instrument for testing fiber optic networks. This pocket-sized, light weight instrument features a large LCD display, intelligent testing modes, and an easy-to-use interface to deliver high customer value and satisfaction. The CMA5 integrates a laser source module and power meter module in one convenient set that can perform both power and link loss measurements. Applications include installation, routine inspection and daily maintenance of MAN, WAN and CATV systems as well as laboratory testing and research work. The CMA5 features an extended (recommended 3 year) calibration interval for additional customer value and convenience.

■ Features

- Pocket-size, large LCD display
- Multi-wavelength measurements
- Direct loss measurement in dB units
- Link loss testing
- Absolute power measurement units in dBm or μ W
- CW or modulated output
- Optional 270/1K/2K Hz modulated frequencies
- Dual-wavelength output to a single port
- Dual-mode powering system including a 9V battery and AC adapter
- Low power indicator
- Auto off feature for conserving battery life

■ Applications

- Cable and link loss measurement
- Network auditing and maintenance
- Troubleshooting and repair
- Connector and coupling losses
- Bare fiber loss measurement
- Fiber identification

■ Precautions

Use care when working with any optical transmission equipment. Avoid looking directly at any optical fibers or optical sources. Refer to your company’s safety procedures when working with optical systems and components.
It is important to keep all optical connections and surfaces free from dirt, oils or other contaminants to ensure proper operation. This applies to all connectors that are connected to the unit’s optical port. Scratched or contaminated connectors can reduce system performance. Refer to your company practices for cleaning optical connectors. Always replace the protective dust cap when not in use.

Replacing Battery

When replacing the battery, use the specified battery and insert it with the correct polarity. If the wrong battery is used, or if the battery is inserted with reversed polarity, there is a risk of explosion causing severe injury or death.

Battery Fluid

DO NOT short the battery terminals and never attempt to disassemble the battery or dispose of it in a fire. If the battery is damaged by any of these actions, the battery fluid may leak. This fluid is poisonous.
DO NOT touch the battery fluid, ingest it, or get in your eyes. If it is accidentally ingested, spit it out immediately, rinse your mouth with water and seek medical help. If it enters your eyes accidentally, do not rub your eyes, rinse them

with clean running water and seek medical help. If the liquid gets on your skin or clothes, wash it off carefully and thoroughly.

Battery Disposal

DO NOT expose batteries to heat or fire. Do not expose batteries to fire. This is dangerous and can result in explosions or fire. Heating batteries may cause them to leak or explode.

■ Laser Safety

CAUTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Laser Class

Anritsu CMA5 Series Optical Loss Tester is fully compliant with the CDRH (FDA) Federal Register 21CFR parts 1040.10 and 1040.11 except for deviations pursuant to Laser Notice 50, dated June 24, 2007, and these products are classified as Class 1 Laser Emissions levels according to IEC60825-1: 2007. The Class 1 level is considered to be eye and radiation exposure safe. This compliance is met when the product is used as intended.

Location of Hazard symbol and Laser class label

The following labels are located on the front panel or backside.
a. Laser class Label: (See Figure 1-2.)



Figure 1-1 Back side of CMA5 Series Optical Loss Tester

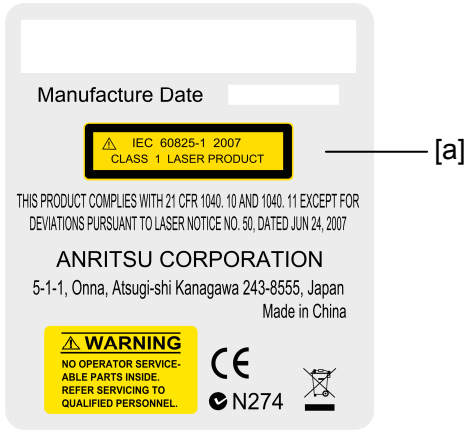


Figure 1-2 CMA5 Series Optical Loss Tester Laser Safety Labels

Laser Safety Classifications

Table 1 Laser Safety Classifications Based on IEC 60825-1:2007						
Model Name	Class	Max. Optical Output Power (mW)*	Pulse Width (s)/ Repetition Rate	Emitted Wave-length (nm)	Beam Radiation Angle [deg.]	Laser Aperture
5LT83	1	0.66	CW	850	23.0	Figure 2 ①
5LT83	1	1.41	CW	1300	23.0	Figure 2 ①
5LT35 5LT35C	1	1.41	CW	1310	11.5	Figure 2 ①
5LT35 5LT35C	1	1.41	CW	1550	11.5	Figure 2 ①

*: Indicates the possible optical output power when each and every reasonably foreseeable single-fault condition is included.
CW: continuous wave

Table 2 Specifications of Laser Built into CMA5				
Model Name	Max. Optical Output Power (mW)*	Pulse Width (s)/ Repetition Rate	Emitted Wavelength (nm)	Beam Radiation Angle [deg.]
5LT83	0.66	CW	850	23.0
5LT83	1.41	CW	1300	23.0
5LT35 5LT35C	1.41	CW	1310	11.5
5LT35 5LT35C	1.41	CW	1550	11.5

■ Operating Controls

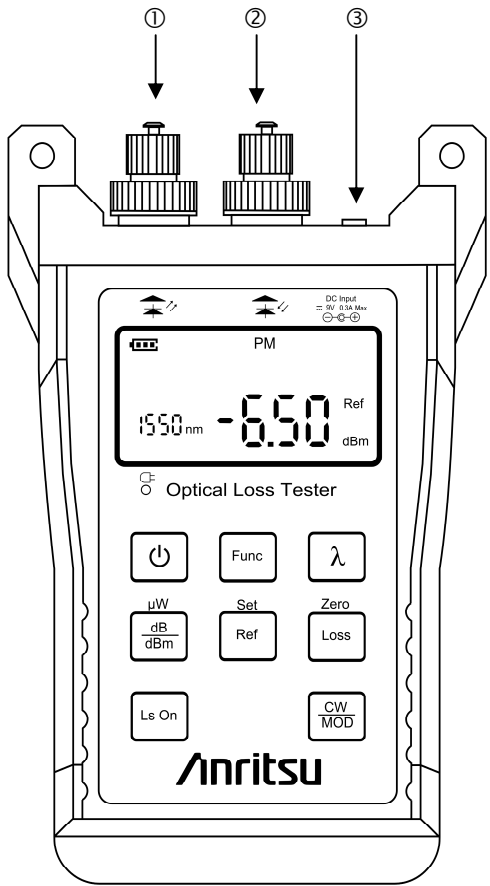


Figure 2 CMA5 Series Optical Loss Tester Operating Controls

NOTE: All models of the CMA5 Series Optical Loss Testers have similar functions and controls.

1. Output Connector (Laser Aperture) (See Figure 2-①.)
①Optical output port (CMA5 Series Optical Loss Tester is supplied with one connector adapter (FC, SC, or ST) as a standard accessory).

CAUTION: Be sure to use the adapter caps specifically made for the CMA5 Series Light Sources only. Light Source adapter caps are marked as “LS” and Power Meter adapter caps are marked as “OPM.” Note that the “OPM” connector is structured so that it can also be attached to the output-side. Improper attachment of the connector may cause damage to the sleeve.

2. Input Connector (Laser Detection) (See Figure 2-②.)
②Optical input port (CMA5 Series Optical Loss Tester is supplied with one connector adapter (FC, SC, or ST) as a standard accessory).

CAUTION: Be sure to use the adapter caps specifically made for the CMA5 Series Power Meter only. Power Meter adapter caps are marked as “OPM.” Do not use CMA5 Series Light Source adapter caps on the Power Meter port.

3. External Power Jack (See Figure 2-③.)
Connect the supplied AC adapter to this external power jack.① Power jack requirement: 9V DC @300mA Max.

NOTE: Wavelength values listed will vary with model.

CAUTION: Use either the supplied AC adapter or a commercially available battery. The CMA5 Series Optical Loss Tester does not support rechargeable battery packs. The AC adapter can be used with battery packs inserted.

Key	Description
	Power on and off of the instrument. The power will automatically turn off by default if there is no key operation for 5 minutes. The auto-off function will be cancelled if you hold on this key until “P” appears on the screen
Func	Press to switch between CMA5 5LT35/83 LCD display of Light Source and Optical Power Meter. The default boot-strap panel is the Optical Power Meter.
λ	Key to select wavelength. When powered on, Optical Power Meter is in the default state. λ is used to select wavelength of optical power. Press Func to switch to light source, and λ is used to select wavelength of light source.
dB/dBm	When “PM” is displayed on the screen, press this key to switch the measurement mode between absolute power (dBm) and relative power (dB). Hold the key (several seconds) until “HELD” appears on the screen, and the mode switches to μW.
Ref	Press this key to display the reference value stored in memory. Hold the key down for several seconds until "HELD" appears on the display, and store this value in internal memory as the reference power level. When CMA5 5LT35/83 is switched to dB mode, LCD displays the difference in dB between the reference level and the current power.
Loss	Key for Loop Loss Testing. Optical loss measurement is performed using the reference power that is the Light Source power measured before shipment and stored in the memory. (Refer to “Loop Loss Testing” for details.) Press this key, and CMA5 5LT35/83 will display the loss of optic fiber at wavelength of 1310 nm/1550 nm or 850 nm/1300 nm; hold this key for several seconds until “HELD” displays to start auto-zeroing. (Refer to “Auto Zeroing” for details.)
Ls On	Press to activate Light Source. Press Func to switch the view of the LCD display from “PM” to “LS.”
CW/MOD	Press the key when light source is on, CMA5 5LT35/83 will switch the mode of optical power wave output. CMA5 5LT35/83 provides three modes of wave outputs: Modulated frequency (Mod) is mainly used for optic fiber identification. The selected modulated frequency (270 Hz, 1000 Hz or 2000 Hz) is displayed on the screen; normally, it is Continuous Wave (CW) to work with the optical power measurement or optic communication quality. Modulated frequency (Mod) is mainly used for optic fiber identification. Wave mode is displayed on the LCD.
	This indicator appears when the external power supply is used.

■ Operation

Preparing the Unit for Testing

Use the following procedure to assure that the CMA5 Series Optical Loss Tester is operating properly.

- Clean all optical output/input ports and connectors.
- Connect the output and input ports with a patch cord.
- Turn on the CMA5 Series Optical Loss Tester. Make sure that both ports are set to the same wavelength.
- If a compatible fiber (5LT35, 5LT35C:10/125 μm SM fiber or 5LT83:62.5/125 μm MM fiber) is connected, the optical output power should read approximately -7 dBm. If a 50/125 μm MM fiber is connected to 5LT83, the rated output power (≥-7 dBm) cannot be obtained due to differences in core diameter, NA, and fiber excitation conditions.

■ Optical Loss Measurement

The following procedure describes how to perform an Optical Loss Measurement using the CMA5 Series Optical Loss Tester.

- This procedure requires two patch cords and an in-line adapter. Refer to figure 2 and attach one patch cord to the output connector and the other patch cord to the input connector of the unit. Use the in-line adapter to connect the two patch cords together.
- Select the wavelength for testing.
- In the absolute power (dBm) measurement mode, press and hold **Ref** until “HELD” appears on the display to store the current measurement value as a reference. If testing at two wavelengths, repeat steps 2 and 3 for the second wavelength.
- Disconnect the patch cord connected to the input port (Power Meter) from the in-line adapter, then disconnect the patch cord from the input port. Leave the patch cord connected to the output port (Light Source).

NOTE: After storing the reference power in memory, do not disconnect the patch cord from the output connector. Disconnection and reconnection of the patch cord may cause changes in the output level such that it will no longer match the stored reference value. The actual output level must match the stored reference level to make accurate measurements based on the stored reference level.

5. Via the in-line adapter, connect the fiber under test to the patch cord that is connected to the output port (Light Source). Connect the input port (Power Meter) to the other end of the fiber under test (See Figure 3).

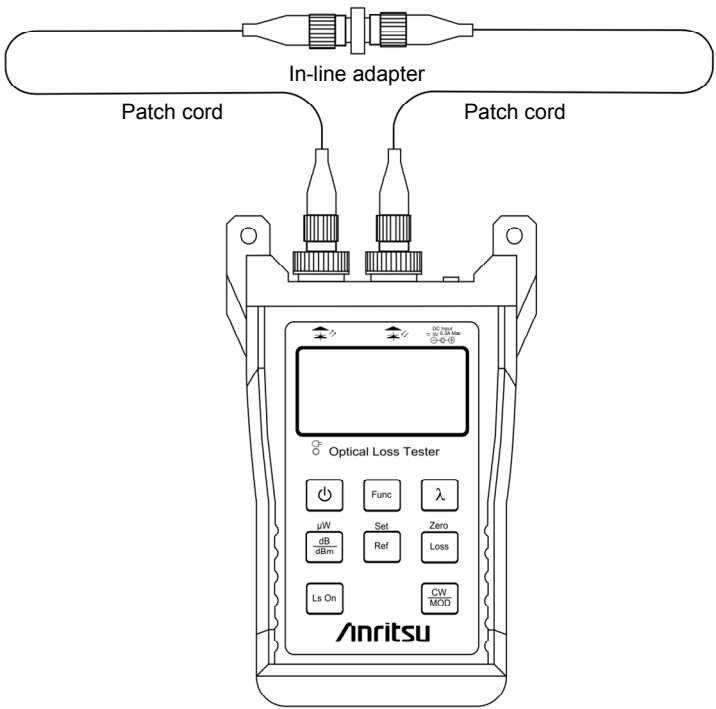


Figure 3 Optical Loss Measurement Setup

- Place the CMA5 in relative power (dB) display mode, and record the power reading displayed on the power meter. If the power meter being used does not have a stored reference feature, subtract the reading from the previously recorded (written down) reference power reading to determine the end-to-end loss.

■ Loop Loss Testing

Loop Loss Testing facilitates an automatic evaluation of loop loss between a source and a destination based on the optical output power value which was calibrated and stored in the unit before shipment. Loop Loss Testing does not require a reference power value measurement in advance and can shorten the optical loss measurement time. You can evaluate both losses of two wavelengths at the same time. Note: Measurement error can occur if the Light Source power measured before shipment is different from the actual Light Source output power. Consider Loop Loss Testing as a simplified Optical Loss Measurement.

Use a compatible fiber (5LT35, 5LT35C:10/125 μm SM fiber, 5LT83: 62.5/125 μm MM fiber) for Loop Loss Testing. Even if a compatible fiber is used, the output power value measured by the power meter may differ from the displayed Light Source output power.

If a fiber other than compatible fibers is used, accurate optical loss cannot be measured due to an error.

For accurately measuring optical loss, refer to the previous chapter “Optical Loss Measurement.”

After powering on, press **Loss**, and you can test the loop loss using the Light Source power measured before shipment as the reference power value. See Figure 4 for connection details.

NOTE: Since the CMA5 Series Optical Loss Tester does not have any communication functions, it is impossible to perform automated uni-directional/bi-directional loss measurement.

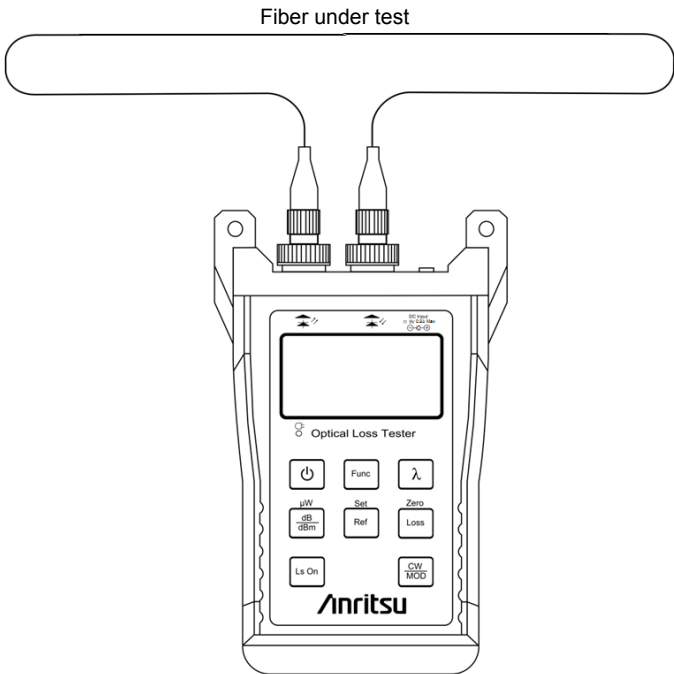


Figure 4 Connection when optical loop loss testing

Press **Loss** to start the optical loss measurement at 1310 nm/1550 nm or 850 nm/1300 nm as shown in Figure 5. The measured optical loss is displayed as relative value (dB) of “optical power of each wavelength measured before shipment” and “input optical power.” Even if the value can change during measurement, the measurement will complete in several seconds. The measured value is kept on the screen.

To retry Loop Loss Testing, press **Loss** to return to the LCD display of light Source or Optical Power Meter, and press **Loss** again.

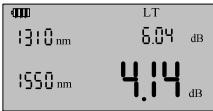
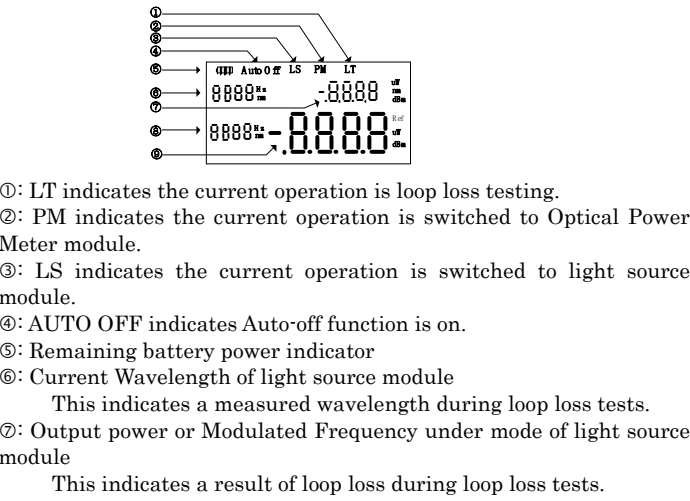


Figure 5 Loop Loss Testing display

■ LCD of CMA5 series Optical Loss Tester



NOTE:Use a compatible fiber (5LT35, 5LT35C:10/125 μm SM fiber, 5LT83: 62.5/125 μm MM fiber) for Loop Loss Testing. Even if a compatible fiber is used, the output power value measured by the power meter may differ from the displayed Light Source output power. This value is provided for reference purpose only and may differ from the actual value. If you want to check the actual value, connect the Light Source and power meter with patch cord.

⑧: Current power meter wavelength. This field is also used to show the measured wavelength during loop loss tests.
⑨: Current power meter measurement. This field is also used to show the result of a loop loss test for one wavelength.

■ Warning Regarding the Use of the Calibration Knob

CAUTION: Users are strongly prohibited to use this knob which is intended for calibration only. Any use of this knob without the guidance of a trained technician may result in a system malfunction. Anritsu will not be responsible for any damage or loss resulting from this action.

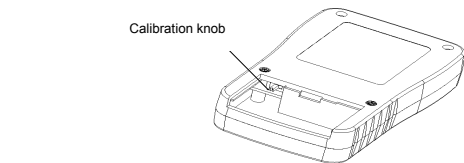


Figure 6 Position of calibration knob

■ Specific Operation

The CMA5 series Optical Loss Tester integrates light sources and an optical power meter in one convenient set that can perform both power and link loss measurements. The instructions for specific operations are as follows.

■ Power on

The default mode of the instrument is Optical Power Meter mode, as shown in Figure 7. After power on, the unit is ready to perform optical power testing (the “LO” value shown in the figure 7 indicates that the current input power is lower than the minimum detectable level for the instrument).

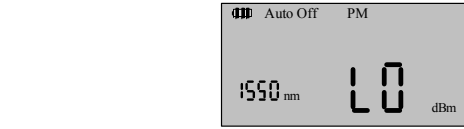


Figure 7 Display of Optical Power Meter

To disable the Auto-Off feature, press and hold until “P” appears on the screen. The Auto-Off indicator will be cleared, as shown in Figure 8.

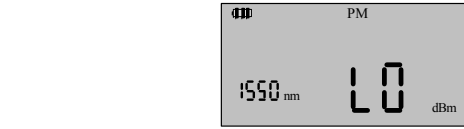


Figure 8 Power Meter Display, Auto-off Feature Disabled.

■ Optical Power Testing

Using the instrument’s front panel keys:
Press **λ** to switch to the testing wavelength.
Press **dB/dBm** to switch the power meter measurement mode between absolute power (dBm) and relative power (dB).
Press **Ref** to display the reference power value stored in memory.
Press and hold **Ref** until “HELD” appears on the screen to store the current testing power value in memory as the reference power value.
Note: A reference power value can be set for each wavelength.
Figure 9 shows the reference power value stored in memory.

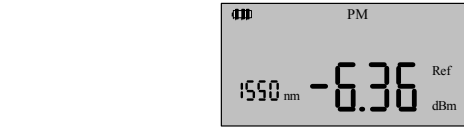


Figure 9 Power Meter Display, Reference power setting

NOTE: To test in absolute power mode, press **dB/dBm** until **dBm** is indicated on the display. To test relative power, store the reference power in memory, and press **dB/dBm** to switch to relative power (dB) measurement mode. Figure 10 shows an example of the relative power display.



Figure 10 Relative power measurement display

To change the power units to “μW”, press and hold the **dB/dBm** key until “HELD” appears on the screen, as shown in Figure 11.

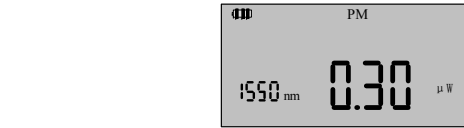


Figure 11 Power units in μW

■ Changing Between Light Source and Power Meter Mode

Press **Func** to change between light source (LS) and power meter (PM) mode. The unit operating in light source mode is shown in Figure 12.

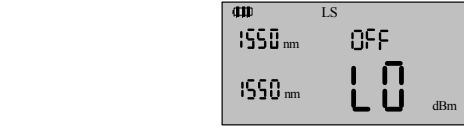


Figure 12 Light Source Mode

■ Light Source

The unit operating in light source mode is shown in Figure 12. “OFF” indicates that the light source is off. If the light source is on, a power value or modulation frequency will be displayed in this field. Press the **LS On** key to power the light source on, as shown in Figure 13. Even if a compatible fiber (5LT35, 5LT35C:10/125 μm SM fiber, 5LT83: 62.5/125 μm MM fiber) is used, the output power value measured by the power meter may differ from the displayed light source output power.



Figure 13 Light Source Display

When the light source is on, press the **λ** key to switch the testing wavelength. Press the **CW/MOD** key to switch between continuous wave (**CW**) and 270, 1kHz, or 2 kHz modulated output (**MOD**), and the modulation frequency of the light source is displayed.

NOTE: When the display indicates light source “LS” mode, the power meter continues to operate and the measured optical power is displayed at ⑨ (refer to the figure in the Display Indicators section). However the measurement wavelength of the power meter and the measurement mode (absolute or relative power) cannot be changed while operating in light source mode.

To change the wavelength of the power meter, press the **Func** key to switch from light source mode to the power meter mode. Then press the **λ** key to select the wavelength to be measured by the power meter or press the **dB/dBm** key to switch the measurement mode between absolute power (dBm) and relative power (dB). Press the **Func** key again to return to light source mode.

Press **LS On** to power off the light source.

■ Auto Zeroing

The power meter has an auto zeroing function. Use the following procedure to perform the auto zeroing function.

- Replace the dust cap on the power meter connector (to prevent leakage).
 - After power on, press and hold **Loss** until “SUCC” is displayed, which indicates auto zeroing function was successful.
 - If “ERR” is displayed it indicates the auto zeroing function was unsuccessful. Check whether the dust cap is tightly fastened to the power meter connector; and then re-try the auto zeroing function.
- If repeated attempts at auto zeroing are unsuccessful, please contact the customer service department of Anritsu or our agents for assistance.

■ Maintenance

The CMA5 Series Optical Loss Tester requires no periodic maintenance other than battery replacement and periodic calibration (once every 3 years).

Battery Replacement

Normally one 9 volt alkaline battery will provide 40 hours (OPM mode) or 20 hours (OPM+LS mode) of continuous use.

To replace the battery:

1. Remove the unit from its protective boot by pulling down at the bottom of the boot to release the unit. Then slide the unit out of the boot.
2. Open the battery compartment located on the lower backside of the unit, by pressing down at the arrow on its cover and sliding the cover off the unit.
3. Replace the battery with a fresh 9 volt alkaline battery.
4. Replace the battery compartment cover.
5. Replace the protective boot.

General Care

To avoid damage to the CMA5 Series Optical Loss Tester, do not use cable connectors that are dirty or faulty. A dust cap is provided for the source connector, and should be in place when the unit is not in use to prevent foreign material from entering the port.

To clean the source connector, use only a small diameter, non-cotton swab lightly moistened with pure isopropyl alcohol. Be sure to follow your company’s procedures if different.

Clean the CMA5 Series Optical Loss Tester’s case with a damp cloth. Do not use solvents or abrasives.

■ Warranty Information

Anritsu Corporation certifies that this equipment was tested before shipment using calibrated measuring instruments with direct traceability to public testing organizations recognized by national research laboratories, including the National Institute of Advanced Industrial Science and Technology, and the National Institute of Information and Communications Technology, and was found to meet the published specifications.

Anritsu Corporation provides the following warranty against stoppages arising due to manufacturing error, and against problems with operation occurring even though the procedures outlined in the operation manual were followed.

Hardware:
Problems occurring within a period of three years from the date of delivery will be corrected by Anritsu Corporation at no cost to the user.
The hardware and software warranties are not valid under any of the following conditions:

- The fault is outside the scope of the warranty conditions separately described in the operation manual.
- The fault is due to mishandling, misuse, or unauthorized modification or repair of the equipment by the customer.
- The fault is due to severe usage clearly exceeding normal usage.
- The fault is due to improper or insufficient maintenance by the customer.
- The fault is due to natural disaster, including fire, wind, flooding, earthquake, lightning strike, or volcanic ash, etc.
- The fault is due to damage caused by acts of destruction, including civil disturbance, riot, or war, etc.
- The fault is due to explosion, accident, or breakdown of any other machinery, facility, or plant, etc.
- The fault is due to use of non-specified peripheral or applied equipment or parts, or consumables, etc.
- The fault is due to use of a non-specified power supply or in a non-specified installation location.
- The fault is due to use in unusual environments^(Note).
- The fault is due to activities or ingress of living organisms, such as insects, spiders, fungus, pollen, or seeds.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation shall assume no liability for injury or financial loss of the customer due to the use of or a failure to be able to use this equipment.

NOTE:
For the purpose of this Warranty, "unusual environments" means use:

- In places of direct sunlight
- In dusty places
- In liquids, such as water, oil, or organic solvents, and medical fluids, or places where these liquids may adhere
- In salty air or in places where chemically active gases (sulfur dioxide, hydrogen sulfide, chlorine, ammonia, nitrogen dioxide, or hydrogen chloride etc.) are present
- In places where high-intensity static electric charges or electromagnetic fields are present
- In places where abnormal power voltages (high or low) or instantaneous power failures occur
- In places where condensation occurs
- In the presence of lubricating oil mists
- In places at an altitude of more than 2,000 m
- In the presence of frequent vibration or mechanical shock, such as in cars, ships, or airplanes

■ Anritsu Corporation Contact

In the event that this equipment malfunctions, contact an Anritsu Service and Sales office. Contact information can be found in a separate file.

■ Compliance Information

General:
Units bearing the CE mark have been tested to show compliance to the EMC Directive 2004/108/EC. Copies of compliance documentation are available from Anritsu Customer Service.

Authorized representative

Name: Murray Coleman
Head of Customer Service EMEA
ANRITSU EMEA Ltd.

Address, city: 200 Capability Green, Luton Bedfordshire,
LU1 3LU

Country: United Kingdom

Units bearing the C-tick mark have been tested to show compliance to Australia's Framework for EMC. Copies of compliance documentation are available from Anritsu Technical Support.

EMC:
The CMA5 Series Optical Loss Tester is an EN61326-1: 2013 Class A product with respect to radiated and conducted emissions. In a domestic environment, this product can possibly cause radio interference, in which case the user may be required to take adequate measures. Such measures may include relocation or reorientation of the product.

In order to reproduce EMC compliant operation as tested, the user must:

- Use only the optional AC adapter available from Anritsu for use with this product.

NOTE: EMC and Safety Compliance of this product assume that the unit is operated from battery power while taking measurements.

Electrical Safety:
To reduce risk of equipment damage, injury or death, adhere to the following warnings:

- Do not use the CMA5 Series Optical Loss Tester or the optional AC adapter if the CMA5 Series Optical Loss Tester or the optional AC adapter's case is cracked or damaged.
- Use the CMA5 Series Optical Loss Tester only with the optional AC adapter available from Anritsu for the CMA5 Series Optical Loss Tester. Anritsu does not guarantee the safety and functionality of other AC adapters.
- The CMA5 Series Optical Loss Tester optional AC adapter is not intended for use in outdoor or wet environments.
- Ensure that the AC input to the optional AC adapter is within the voltage marked on the power supply's case.
- Do not attempt to service the product in any way other than the routine maintenance as described in this manual.

Batteries:
Batteries may contain lead, cadmium, lithium or other toxic substances. Batteries must be disposed of, or recycled, in accordance with their label instructions and local regulations.

Recycling:
After this product has served its purpose, it should be recycled according to local regulations. In the European Union, the WEEE (Waste Electronic and Electrical Equipment) Directive 2012/19/EC specifies that electronic waste be returned to a recycling center for dismantling and re-use of materials. Please contact your Anritsu representative for directions as to disposal of Anritsu products for your area.



■ Specifications

Model		CMA5 Optical Loss Tester		
		5LT35	5LT83	5LT35C
Main Frame		5LT35-YY*1 5LT83-YY*1 5LT35C-YY*1		
Standard Accessories		Operators Manual Rubber Protective Cover 9V Alkaline Battery		
Light Source Port	Compatible fiber	10/125 μm SM, PC-polished	62.5/125*3 μm GI, PC-polished	10/125 μm SM, PC-polished
	Wavelength (nm)	1310/1550 +/-20 (SMF)	850/1300 +/-20 (GIF)	1310/1550 +/-20 (SMF)
	Output Power (dBm)	≥ -7*2	≥ -7*3	≥ -7*2
	Spectrum Width (nm)	≤ 5 nm (FWHM)		
	Emitter Type	LD		
	Stability	short-term: +/-0.05 dB/15 minutes		
		long-term: +/-0.10 dB/8 hours @1310/1550 nm; +/-0.15 dB/8 hours @850/1300 nm		
	Output Modes	CW (Continuous Wave) 270 Hz, 1 kHz, 2 kHz Modulation (+/-2%)		
	Connector Type	FC/PC, SC/PC, ST/PC (user replaceable)		
	Compatible fiber	SM (10/125 μm),GI (50 /125 μm, 62.5/125 μm)		
Optical Power Meter Port	Calibrated Wavelength	850, 1300, 1310, 1490, 1550, 1625 nm		
	Measurement Range	-60 to + 10*4 dBm (-50 to +10*4 dBm @850nm)		-40 to +23 *4 dBm
	Accuracy (dB)	+/-0.2*4 dB@-10dBm (±0.5*4 dB@850 nm)		
	Linearity	+/- 0.2*4 dB	+/- 0.5*4 dB	+/- 0.2*4 dB
	Resolution	0.01 dB		
	Auto-Zeroing	Yes		
	Warm Up Time	60 s		
	Connector Type	FC, SC, ST (user replaceable)		
	Power supply	One 9V Alkaline battery, or optical AC adapter(Input: 100V to 240V, 50Hz to 60Hz, output: 7.5V)		
General Specifications	AC Adapter (Accessory)	Input: 100-240 V, 50-60 Hz*5 Output: 7.5 V		
	Battery Life (typical)	OPM mode: 40 hours OPM+LS mode: 20 hours		
	Auto Shut Off	5 minutes		
	Operating Temperature	-10° to 50°C		
	Storage Temperature	-25° to 60°C		
	Relative Humidity	0 to 95% (Non-condensing)		
	Mass	300 g (0.66 lbs) or less (Excluding Rubber Protective Cover and 9V Alkaline Battery)		
	Dimensions (H×W×T)	145 × 75 × 25 mm (5.7 × 2.9 × 1 inches) (Excluding Rubber Protective Cover)		
	Warranty	3 years		
	Laser Safety	Class 1 (IEC60825-1:2007) THIS PRODUCT COMPLES WITH 21CFR 1040.10 AND 1040.11 EXCEPT FOR DEVIATIONS PURSUANT TO LASER NOTICE NO.50, DATED JUNE 24,2007		
	EMC	EN61326-1 (Class A, Table 2), EN61000-3-2:2006+A2:2009 (Class A)		

NOTE: Specification shall be guaranteed at 25°C (±3°C).

- *1: Specify one connector adapter for YY. FU=FC/PC, SU=SC/PC, TU=ST/PC
- *2: When SM fiber (10/125 μm, NA 0.1, PC-polished) is connected.
- *3: When GI fiber (62.5/125 μm, NA 0.275, PC-polished) is connected.
50/125 μm GI fiber can be also connected.
The Light Source output of 5LT83 uses 62.5/125 μm GI fiber. If a 50/125 μm GI fiber is connected to the optical output port, the rated output power (≥ -7 dBm) cannot be obtained due to differences in core diameter, NA, and fiber excitation condition. The optical output power can drop by about 2-10 dB from the rated output power.
- *4: When GI fiber (62.5/125 μm) is connected to optical power meter port.
- *5: Operating voltage: within the range of +10% to -10% from the rated voltage

■ Accessories

Model	Name
GN-3HH-CASE	Hard Case (for two CMA5 series)
CMA5-POUCH-A	Carrying Pouch/Shoulder Strap
CMA5-BAT	9V Alkaline Battery
Z1525A	AC Adapter (CMA5)
CMA5-AD-LS-FC	FC Connector Adapter (for Light Source Port)
CMA5-AD-LS-SC	SC Connector Adapter (for Light Source Port)
CMA5-AD-LS-ST	FT Connector Adapter (for Light Source Port)
CMA5-AD-LS-ALL3	Connector Adapter (for Light Source Port, FC, SC and ST)
CMA5-AD-PM-FC	FC Connector Adapter (for Power Meter Port)
CMA5-AD-PM-SC	SC Connector Adapter (for Power Meter Port)
CMA5-AD-PM-ST	ST Connector Adapter (for Power Meter Port)
CMA5-AD-PM-ALL3	Connector Adapter (for Power Meter Port, FC, SC and ST)
J1530A	SC Plug in Converter (UPC(P)-APC(J))
J1532A	FC Plug in Converter (UPC(P)-APC(J))
J1534A	LC-SC Plug-in Converter (for SM,SC(P)-LC(J))
J1535A	LC-SC Plug-in Converter (for MM,SC(P)-LC(J))