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 Module)
- 5LT35C — Single Mode Optical Loss Tester 1310nm/1550nm (CATV Power Meter Module)
- 5LT83 — Multi Mode Optical Loss Tester 850nm/1300nm (Standard Power Meter Module)
- 5LT83C — Multi Mode Optical Loss Tester 850nm/1300nm (CATV Power Meter Module)

The CMA5 Series Optical Loss Tester is a multi-functional instrument for testing fiber optic networks. This pocket-sized, lightweight 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 µW
- CW or modulated output
- Optional 200/10GHz 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, oil 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 install 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 it in your eyes. If it 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.

**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.

- **CMA5 Series Optical Loss Tester Laser Safety Label: See Figure 1-2**

---

Table 1: Laser Safety Classifications Based on IEC 60825-1:2007

<table>
<thead>
<tr>
<th>Model</th>
<th>Class</th>
<th>Max. Output Power (mW)</th>
<th>Emitted Wave Length (nm)</th>
<th>Beam Radiation Angle [deg.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>5LT35</td>
<td>1</td>
<td>0.66</td>
<td>CW</td>
<td>850</td>
</tr>
<tr>
<td>5LT35B</td>
<td>1</td>
<td>2.15</td>
<td>CW</td>
<td>1300</td>
</tr>
<tr>
<td>5LT35C</td>
<td>2</td>
<td>1.41</td>
<td>CW</td>
<td>1310</td>
</tr>
<tr>
<td>5LT35</td>
<td>3</td>
<td>1.41</td>
<td>CW</td>
<td>1550</td>
</tr>
</tbody>
</table>

Note: These values are typical optical output powers when each and every reasonably foreseeable single-fault condition is included.

**CW: continuous wave**

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

**Figure 1-2: CMA5 Series Optical Loss Tester Laser Safety Labels**
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 (SLT35, SLT35C/10/125 µm SM fiber, SLT85/ 85/125/125 µm MM fiber) for Loop Loss Testing. Even if a compatible fiber is used, the output power 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.

### Loop Loss Testing Display

![Loop Loss Testing Display](image)

**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 3. 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 rekey Loop Loss Testing, press Loss to return to the LCD display of Light Source or Optical Power Meter, and press Loss again.

### Optical Loss Measurement

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

1. 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.
2. Select the wavelength for testing.
3. 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.
4. 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 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 5).

![Optical Loss Measurement Setup](image)

**Figure 3** Optical Loss Measurement Setup

6. 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.

![Optical Loss Measurement Display](image)

**Figure 5** Loop Loss Testing display

### Operation

#### Preparing the Unit for Testing

Use the following procedure to ensure that the CMA5 Series Optical Loss Tester is operating properly:

1. Clean all optical output/input ports and connectors.
2. Connect the output and input ports with a patch cord.
3. Turn on the CMA5 Series Optical Loss Tester. Make sure that both ports are set to the same wavelength.
4. If a compatible fiber (SLT35, SLT35C/10/125 µm SM fiber or SLT85/85/125/125 µm MM fiber) is connected, the optical output power should read approximately -7 dBm. If a 50/125 µm SM fiber is connected to SLT85, the rated output power (=7 dBm) cannot be obtained due to differences in core diameter, NA, and fiber excitation conditions.

### 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 3. 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 rekey Loop Loss Testing, press Loss to return to the LCD display of Light Source or Optical Power Meter, and press Loss again.

### Operation Controls

![Operation Controls](image)

**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)
   - Optical 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.”

2. **Input Connector (Laser Detection)** (See Figure 2-2)
   - Optical 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. The 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

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>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.</td>
</tr>
<tr>
<td>Func</td>
<td>Press to switch between CMA5 SLT35/83 LCD display of Light Source and Optical Power Meter. The default boot strap panel is the Optical Power Meter.</td>
</tr>
<tr>
<td>X</td>
<td>Key to select wavelength. When powered on, Optical Power Meter is in the default state. X is used to select wavelength of optical power. Press to light source, and X is used to select wavelength of light source.</td>
</tr>
<tr>
<td>dB/dBm</td>
<td>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 “dB.”</td>
</tr>
<tr>
<td>Ref</td>
<td>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 SLT35/83 is switched to dBm mode, LCD displays the difference in dB between the reference level and the current power.</td>
</tr>
<tr>
<td>Loss</td>
<td>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 SLT35/83 will display the loss of optical fiber at wavelength of 1310 nm/1550 nm or 850 nm/1300 nm. If the wavelength measured before shipment is different from the displayed Light Source output power, the value can change during measurement, but the measurement accuracy is maintained. The actual output level must match the stored reference level to make accurate measurements based on the stored reference level.</td>
</tr>
<tr>
<td>La On</td>
<td>Press to activate Light Source. Press Func to switch the view of the LCD display from “PM” to “LS.”</td>
</tr>
<tr>
<td>CW/MOD</td>
<td>Press the key when light source is on, CMA5 SLT35/83 will switch the mode of optical power output. CMA5 SLT35/83 provides three modes of wave output: Modulated frequency (Mod) is mainly used for optical fiber identification. The selected modulated frequency (720 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 optical communication quality. Modulated frequency (Mod) is mainly used for optical fiber identification. Wave mode is displayed on the LCD.</td>
</tr>
<tr>
<td>CH</td>
<td>This indicator appears when the external power supply is used.</td>
</tr>
</tbody>
</table>
The power meter has an auto zeroing function. Use the following steps to perform auto zeroing:

1. Press and hold the Auto Off key until "HELD" appears on the screen. The Auto-Off indicator will be cleared, as shown in Figure 8.

To disable the Auto-Off feature, press and hold the Off key until "OFF" appears on the screen. The Auto-Off indicator will be displayed, as shown in Figure 7.

Changing Between Light Source and Power Meter Mode

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

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 the figure. Press the Le On key to power the light source on, as shown in Figure 13. Even if a compatible fiber (SLT55, SLT55:10/125 µm SM fiber, SLT53:62.5/125 µm MM fiber) is used, the output power value measured by the power meter may differ from the displayed light source output power.

NOTE:
- Use a compatible fiber (5LT35, 5LT35C:10/125 µm SM fiber, 5LT33:62.5/125 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 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.
- Current power meter wavelength. This field is also used to show the measured wavelength during loop loss tests.
- Current power meter measurement. This field is also used to show the result of a loop loss test for one wavelength.

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.

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.

© LT indicates the current operation is loop loss testing.
© PM indicates the current operation is switched to Optical Power Meter module.
© LS indicates the current operation is switched to light source module.
© AUTO OFF indicates Auto-off function is on.
© Remaining battery power indicator
© Current Wavelength of light source module

This indicates a measured wavelength during loop loss tests.
Output power or Modulated Frequency under mode of light source module
This indicates a result of loop loss during loop loss tests.

NOTE:
- Use compatible fiber (SLT55, SLT55:10/125 µm SM fiber, 6LT83:62.5/125 µm MM fiber) for Loop Loss Testing. 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 the figure. Press the Le On key to power the light source on, as shown in Figure 13. Even if a compatible fiber (SLT55, SLT55:10/125 µm SM fiber, SLT53:62.5/125 µm MM fiber) is used, the output power value measured by the power meter may differ from the displayed light source output power.

General Care

To change the wavelength of the power meter, press the CAL key to change the testing wavelength. Press the CW/MOD key to switch between continuous wave (CW) and 1kHz or 2kHz 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 λ (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 CAL 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 the Le On key to power the light source.
**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 excessive usage 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 explosion, accident, or breakdown of any other machinery, factory, 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 environmental conditions, etc.
- The fault is due to activities or ingress of living organisms, such as insects, spiders, fungus, pollen, or seeds.

In addition, warranty is valid only for the original equipment purchased. It is not transferable if the equipment is resold. Anritsu Corporation shall assume no liability for injury or financial loss due to 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 those liquids may adhere
- In salty air or in places where chemically active gases (sulfer dioxide, hydrogen sulfide, 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 voltage fluctuations are present
- In places where condensation occurs
- In the presence of lubricating oil mists
- In places where electric potential is 100 V or more (2000 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 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 Technical Support.

**Industrial Science and Technology, and the National Institute of Information and Communications Technology, and was found to meet the published specifications.**

**NOTE:** 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.

**Specifications**

**Model**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Type</th>
<th>Voltage</th>
<th>Current</th>
<th>Power</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPM-1000</td>
<td>AC</td>
<td>100 V</td>
<td>0.5 A</td>
<td>70 W</td>
<td>80%</td>
</tr>
</tbody>
</table>

**Operating Specifications**

- **Power supply:** One 9V alkaline battery, or optional AC adapter/Importer: 100 V to 240 V, 50 Hz to 60 Hz, 7.5 V
- **Battery Life:** (typical) OPM mode: 40 hours OPM-LS mode: 20 hours
- **Auto Shut Off:** 3 minutes
- **Operating Temperature:** –10°C to 55°C
- **Temperature:** 10°C to 55°C
- **Storage Temperature:** –25°C to 60°C
- **Relative Humidity:** 0% to 95% (Non-condensing)
- **Mass:** 300 ± 50 g
- **Dimensions:** 145 × 75 × 25 mm (5.7 × 2.9 × 1 inches)

**Auto-Shut Off:**

- **At Time of Operation:**
  - **Temperature:** 10°C to 55°C
  - **Storage Temperature:** –25°C to 60°C
  - **Relative Humidity:** 0% to 95% (Non-condensing)

**Battery Life:**

- **Typical:** OPM mode: 40 hours OPM-LS mode: 20 hours

**General Specifications**

- **Power supply:** One 9V alkaline battery, or optional AC adapter/Importer: 100 V to 240 V, 50 Hz to 60 Hz, 7.5 V
- **Battery Life:** (typical) OPM mode: 40 hours OPM-LS mode: 20 hours
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- **Relative Humidity:** 0% to 95% (Non-condensing)
- **Mass:** 300 ± 50 g
- **Dimensions:** 145 × 75 × 25 mm (5.7 × 2.9 × 1 inches)

**Electrical Safety:**

- To reduce risk of equipment damage, injury or death, adhere to the following electrical safety 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 is in use.
- Use only the optional AC adapter available from Anritsu for use with this product.
- Electric Shock:
  - The fault is due to improper or insufficient maintenance by the customer.
  - 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 environmental conditions, etc.
  - The fault is due to activities or ingress of living organisms, such as insects, spiders, fungus, pollen, or seeds.

**Laser Safety:**

- Class 1 (IEC60825-1:2007)

**Laser Output:**

- This product complies with 21 CFR 1040.10 AND 1040.11 EXCEPT FOR NOTICES NO.50, DATED JUNE 24, 2007

**Accessories**

- **AC Adapter:** E28-2000
- **Carrying Case:** CMA-POUCH-A
- **Carrying Pouch/Shoulder Strap:** CMA-P-STRAP-SC
- **FC Connector Adapter (for Power Meter Port):** CMA5-AD-LS-FC
- **FC Connector Adapter (for Light Source Port):** CMA5-AD-LS-ST
- **FC Connector Adapter (for Power Meter Port, FC, SC, ST):** CMA5-AD-LS-FC
- **FC Connector Adapter (for Power Meter Port):** CMA5-AD-LS-FC
- **FC Connector Adapter (for Light Source Port, FC, SC and ST):** CMA5-AD-LS-FC

**Electrical Safety:**

- To reduce risk of equipment damage, injury or death, adhere to the following electrical safety 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 is in use.
- Use only the optional AC adapter available from Anritsu for use with this product.
- Electric Shock:
  - The fault is due to improper or insufficient maintenance by the customer.
  - 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.
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