# CMA50
# Operation Manual

## Eighth Edition

**For safety and warning information, please read this manual before attempting to use the equipment.**
**Keep this manual with the equipment.**

## ANRITSU CORPORATION

Part No.: 41315I

26 June 2006 (First Edition)
6 July 2010 (Eighth Edition)
©2006 - 2010 ANRITSU CORPORATION
All rights reserved. No part of this manual may be reproduced without the prior written permission of the publisher.
The contents of this manual may be changed without prior notice.
Composed in the USA, and printed in Japan.

**Notice to U.S. Government End Users**

The Software and Documentation are “Commercial Items,” as that term is defined at 48 C.F.R. 2.101, consisting of “Commercial Computer Software” and “Commercial Computer Software Documentation,” as such terms are used in 48 C.F.R. 12.212 or 48 C.F.R. 227.7202, as applicable. Consistent with 48 C.F.R. 12.212 or 48 C.F.R. 227.7202-1 through 227.7202-4, as applicable, the Commercial Computer Software and Commercial Computer Software Documentation are being licensed to the U.S. Government end users (a) only as Commercial Items and (b) with only those rights as are granted to all other end users pursuant to the terms and conditions herein. Unpublished rights reserved under the copyright laws of the United States.

- The contents of this manual may be subject to change without prior notice.
- No part of this manual may be reproduced without the prior written permission of the publisher.

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

## 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. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that 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 in Manual

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure 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 a 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.

## For Safety

### DANGER ⚠

NEVER touch parts where the label shown on the left is attached. Such parts have high voltages of at least 1kV and there is a risk of receiving a fatal electric shock.

### WARNING ⚠

1. ALWAYS refer to the Operation Manual when working near locations at which the alert mark shown on the left is attached. If the advice in the Operation Manual is not followed there is a risk of personal injury or reduced equipment performance. The alert mark shown on the left may also be used with other marks and descriptions to indicate other dangers.

2. IEC 61010 Standard

   The IEC 61010 standard specifies four categories to ensure that an instrument is used only at locations where it is safe to make measurements. This instrument is designed for measurement category I (CAT I). DO NOT use this instrument at locations specified as category II, III, or IV as defined below.

   Measurement category I (CAT I):
   Secondary circuits of a device that is not directly connected to a power outlet.

   Measurement category II (CAT II):
   Primary circuits of a device that is directly connected to a power outlet, e.g., portable tools or home appliance.

   Measurement category III (CAT III):

   Primary circuits of a device (fixed equipment) to which power is supplied directly from the distribution panel, and circuits running from the distribution panel to power outlet.

   Measurement category IV (CAT IV):

   Building service-line entrance circuits, and circuits running from the service-line entrance to the meter or primary circuit breaker (distribution panel).

3. Laser radiation warning
   - NEVER look directly into the cable connector on the equipment nor into the end of a cable connected to the equipment. There is a risk of injury if laser radiation enters the eye.
   - The Laser Safety label is attached to the equipment for safety. See the help sets for the individual Test Modules for the type and location of the Laser Safety label for a given test module.

**Electrical Shock**

4. To reduce risk of equipment damage, injury, or death, adhere to the following warnings:
   - Do not use the CMA50 or its AC charger/adapter if the case of either is cracked or damaged.
   - Use the CMA50 only with the AC charger/adapter provided for the CMA50 by Anritsu. Anritsu does not guarantee the safety and functionality of other power supplies.
   - Do not use the CMA50 AC charger/adapter outdoors or in wet environments.
   - Make sure that the AC input to the AC charger/adapter is within the voltages indicated on the AC charger/adapter's case.
   - Do not attempt to service the product in any way other than routine maintenance as described in this manual.
   - If power is supplied without earthing the equipment, there is a risk of receiving a severe or fatal electric shock or causing damage to the internal components.

**Repair**

**WARNING ⚠**

5. This equipment cannot be repaired by the operator. DO NOT attempt to remove the equipment covers or unit covers or to disassemble internal components. Only qualified service personnel with a knowledge of electrical fire and shock hazards should service this equipment. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel. In addition, there is a risk of damage to precision components.

**Calibration**

6. The performance-guarantee seal verifies the integrity of the equipment. To ensure the continued integrity of the equipment, only Anritsu service personnel, or service personnel of an Anritsu sales representative, should break this seal to repair or calibrate the equipment. If the performance-guarantee seal is broken by you or a third party, the performance of the equipment cannot be guaranteed. Be careful not to break the seal by opening the equipment or unit covers.

**Falling Over**

7. This equipment should always be positioned in the correct manner. If the cabinet is turned on its side, etc., it will be unstable and may be damaged if it falls over as a result of receiving a slight mechanical shock.
   Always set up the equipment in a position where the power switch can be reached without difficulty.

**Replacing Battery**

8. 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**

9. 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.

**LCD**

10. This instrument uses a Liquid Crystal Display (LCD). DO NOT subject the instrument to excessive force or drop it. If the LCD is subjected to strong mechanical shock, it may break and liquid may leak.

    This liquid is very caustic and poisonous.

    DO NOT touch it, ingest it, or get in your eyes. If it is ingested accidentally, 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

Class 1, 1M, and 2 indicate the danger degree of the laser radiation specified below according to IEC 60825-1:2007.

Class 1: Lasers that are safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

Class 1M: Lasers emitting in the wavelength range from 302.5 to 4000 nm that are safe under reasonably foreseeable conditions of operation, but may be hazardous if the user employs optics within the beam. Two conditions apply:

for diverging beams, if the user views the laser output with certain optical instruments (for example, eye loupes, magnifiers and microscopes) within a distance of 100 mn;

or

for collimated beams, if the user views the laser output with certain optical instruments (for example, telescopes and binoculars).

Class 3R: Lasers that emit in the wavelength range from 302.5 to $10^6$ nm where direct intrabeam viewing is potentially hazardous but the risk is lower than for Class 3B lasers.

**CAUTION** ⚠

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

**WARNING⚠**

The laser in this equipment is classified as Class 1 or 3R according to the IEC 60825-1:2007 standard.

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

| Product Type | Model Name | Class | Max. Optical Output Power (mW)* | Pulse Width (s)/ Repetition Rate | Emitted Wavelength (nm) | Beam Divergence (deg) | Laser Aperture |
|---|---|---|---|---|---|---|---|
| Loss Test Set (LTS)/ Light Source (LS) | 50LTS35/ 50LS35 | 1 | 0.5 | CW | 1310 nm | 11.5 | Fig. 1 [2] |
| | | 1 | 0.5 | CW | 1550 nm | 11.5 | Fig. 1 [2] |
| | 50LTS345/ 50LS345 | 1 | 0.5 | CW | 1310 nm | 11.5 | Fig. 1 [2] |
| | | 1 | 0.5 | CW | 1490 nm | 11.5 | Fig. 1 [2] |
| | | 1 | 0.5 | CW | 1550 nm | 11.5 | Fig. 1 [2] |
| | 50LTS356/ 50LS356 | 1 | 0.5 | CW | 1310 nm | 11.5 | Fig. 1 [2] |
| | | 1 | 0.5 | CW | 1550 nm | 11.5 | Fig. 1 [2] |
| | | 1 | 0.5 | CW | 1625 nm | 11.5 | Fig. 1 [2] |

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

| Product Type | Model Name | Class | Max. Optical Output Power (mW)* | Pulse Width (s)/ Repetition Rate | Emitted Wavelength (nm) | Beam Divergence (deg) | Laser Aperture |
|---|---|---|---|---|---|---|---|
| Loss Test Set (LTS)/ Light Source (LS) | 50LTS 3456/ 50LS 3456 | 1 | 0.5 | CW | 1310 nm | 11.5 | Fig. 1 [2] |
| | | 1 | 0.5 | CW | 1490 nm | 11.5 | Fig. 1 [2] |
| | | 1 | 0.5 | CW | 1550 nm | 11.5 | Fig. 1 [2] |
| | | 1 | 0.5 | CW | 1625 nm | 11.5 | Fig. 1 [2] |
| | 50LTS 8335/ 50LS 8335 | 1 | 0.1 | CW | 850 nm | 32.0 | Fig. 1 [1] |
| | | 1 | 0.1 | CW | 1300 nm | 32.0 | Fig. 1 [1] |
| | | 1 | 0.1 | CW | 1310 nm | 11.5 | Fig. 1 [2] |
| | | 1 | 0.1 | CW | 1550 nm | 11.5 | Fig. 1 [2] |
| Visual Fault Locator | 50-OPT-V | 3R | 5 | CW | 650 nm | 23.0 | Fig. 1 [3] |

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

Table 2 Incorporated Laser Specification

| Type | Model Name | Max. Optical Output Power (mW)* | Pulse Width (s)/ Repetition Rate | Emitted Wavelength (nm) | Beam Divergence (deg) |
|---|---|---|---|---|---|
| Loss Test Set (LTS)/ Light Source (LS) | 50LTS35/ 50LS 35 | 1.41 | CW | 1310 | 11.5 |
| | | 1.41 | CW | 1550 | 11.5 |
| | 50LTS345/ 50LS345 | 1.41 | CW | 1310 | 11.5 |
| | | 1.41 | CW | 1490 | 11.5 |
| | | 1.41 | CW | 1550 | 11.5 |
| | 50LTS356/ 50LS356 | 1.41 | CW | 1310 | 11.5 |
| | | 1.41 | CW | 1550 | 11.5 |
| | | 1.41 | CW | 1625 | 11.5 |

Table 2 Incorporated Laser Specification (Continued)

| Type | Model Name | Max. Optical Output Power (mW)* | Pulse Width (s)/ Repetition Rate | Emitted Wavelength (nm) | Beam Divergence (deg) |
|---|---|---|---|---|---|
| Loss Test Set (LTS)/ Light Source (LS | 50LTS 3456/ 50LS 3456 | 1.41 | CW | 1310 | 11.5 |
| | | 1.41 | CW | 1490 | 11.5 |
| | | 1.41 | CW | 1550 | 11.5 |
| | | 1.41 | CW | 1625 | 11.5 |
| | 50LTS 8335/ 50LS 8335 | 0.66 | CW | 850 | 32.0 |
| | | 1.41 | CW | 1300 | 32.0 |
| | | 1.41 | CW | 1310 | 11.5 |
| | | 1.41 | CW | 1550 | 11.5 |
| Visual Fault Locator | 50-OPT-V | 5 | CW | 650 | 23 |

*: Maximum output power is the estimated value when something breaks down.

Table 3 Indication Labels on Product

| | Type | Sample | Affixed to: | Model Name |
|---|---|---|---|---|
| 1 | Certification | THIS PRODUCT COMPLIES WITH 21 CFR 1040. 10 AND 1040. 11 EXCEPT FOR DEVIATIONS PURSUANT TO LASER NOTICE NO. 50, DATED JUNE 24, 2007 | Fig. 1, A | 50LTS35/ 50LS35/ 50LTS345/ 50LS345/ 50LTS356/ 50LS356/ 50LTS3456/ 50LS3456/ 50LTS8335/ 50LS8335 |
| 2 | Class 1 Laser | ⚠ IEC 60825-1: 2007 CLASS 1 LASER PRODUCT | Fig. 1, B | |
| 3 | Identification | ANRITSU CORPORATION 5-1-1,Onna, Atsugi-shi Kanagawa 243-8555, Japan Made in Japan<br>Options:50-OPT-N [ ] 50-OPT-V [ ] MANUFACTURED: | Fig. 1, C | |

Table 3 Indication Labels on Product (Continued)

| | Type | Sample | Affixed to: | Model Name |
|---|---|---|---|---|
| 4 | Class 3R Laser | | Fig. 1, D | 50-OPT-V |
| 5 | Warning | | Fig. 1, E | |
| 6 | Aperture | | Fig. 1, F | |

## Laser Radiation Markings

Fig. 1: Location of Laser Beam Apertures and Affixed Labels

## For U.S. Customers

### Please Recycle

**Ni-MH**

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Before disposing of this product, discharge the battery, and then mail the battery to your local recycling center.

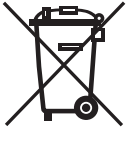
1. Attach the battery pack to the product.
2. Disconnect the AC charger/adapter, if used.
3. Turn the power switch to on.
4. Leave the product on until the power indicator goes off; the battery is now discharged.
5. Remove the battery.
6. Deliver it to your local recycling center, or mail it to the following address:

   ANRITSU COMPANY
   490 Jarvis Drive
   Morgan Hill, CA 95037-2809
   USA

# For EU & EFTA Customers

## Please Recycle

**Ni-MH**



Read the following when using products to which the marks shown to the left are attached.

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste. Check with your local solid-waste disposal officials for details of recycling options or proper disposal in your area.

Before disposing of this product, discharge the battery, and then mail the battery to your local recycling center.

1. Disconnect the AC adapter, if used.
2. Turn the power switch to on.
3. Leave the product on until the power indicator goes off; the battery is now discharged.
4. Remove the battery.
5. Please recycle in accordance with your national or regional legislation.

Nach Gebrauch der Ver Kaufsstelle Zurückgeben.

Après usage à rapporter au point de vente.

## Equipment Certificate

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 Warranty

Anritsu Corporation will repair this equipment free-of-charge if a malfunction occurs within three years after shipment due to a manufacturing fault, under the condition that this warranty is void when:

- The fault is outside the scope of the warranty conditions 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, flooding, earthquake, etc.
- The fault is due to use of non-specified peripheral equipment, peripheral parts, consumables, etc.
- The fault is due to use of a non-specified power supply or in a non-specified installation location.

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.

## Anritsu Corporation Contact

In the event that this equipment malfunctions, contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the CD version.

## Notes on Export Management

This product and its manuals may require an Export License/Approval by the Government of the product's country of origin for re-export from your country.
Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not.
When you dispose of export-controlled items, the products/manuals need to be broken/shredded so as not to be unlawfully used for military purpose.

## Disposal Procedure

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

## Lifetime of Parts

The life span of certain parts used in this instrument is determined by the operating time or the power-on time. Due consideration should be given to the life spans of these parts when performing continuous operation over an extended period. The safety of the instrument cannot be guaranteed if component parts are used beyond their life spans. These parts must be replaced at the customer's expense even if within the guaranteed period described in Warranty at the beginning of this manual.

## Use in a residential environment

This instrument is designed for an industrial environment. In a residential environment this instrument may cause radio interference in which case the user may be required to take adequate measures.

## Cautions against computer virus infection

- Copying files and data
  Only files that have been provided directly from Anritsu or generated using Anritsu equipment should be copied to the instrument. All other required files should be transferred by means of USB or CompactFlash media after undergoing a thorough virus check.
- Adding software
  Do not download or install software that has not been specifically recommended or licensed by Anritsu.
- Network connections
  Ensure that the network has sufficient anti-virus security protection in place.

## Crossed-out Wheeled Bin Symbol

Equipment marked with the Crossed-out Wheeled Bin Symbol complies with council directive 2002/96/EC (the “WEEE Directive”) in the European Union.

For products placed on the EU market after August 13, 2005, please contact your local Anritsu representative at the end of the product’s useful life to arrange disposal in accordance with your initial contract and the local law.

## CE Conformity Marking

Anritsu affixes the CE conformity marking on the following product(s) in accordance with the Council Directive 93/68/EEC to indicate that they conform to the EMC and LVD directive of the European Union (EU).

**CE marking**

### 1. Product Model

Model: CMA50 Loss Test set

### 2. Applied Directive

EMC: Directive 2004/108/EC

LVD: Directive 2006/95/EC

## 3. Applied Standards

• EMC Emission: EN61326-1: 2006 (Class A)

Immunity: EN61326-1: 2006 (Table 2)

| | Performance Criteria* |
|---|---|
| IEC 61000-4-2 (ESD) | B |
| IEC 61000-4-3 (EMF) | A |
| IEC 61000-4-4 (Burst) | B |
| IEC 61000-4-5 (Surge) | B |
| IEC 61000-4-6 (CRF) | A |
| IEC 61000-4-11 (V dip/short) | B |

*Performance Criteria:

A: During testing, normal performance within the specification limits.

B: During testing, temporary degradation, or loss of function or perfromance which is self-recovering.

- LVD: EN 61010-1: 2001 (Pollution Degree 2)
- Laser Safety: EN60825-1 Part 1

## 4. 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

## C-Tick Conformity Marking

Anritsu affixes the C-Tick mark on the following product(s) in accordance with the regulation to indicate that they conform to the EMC framework of Australia/New Zealand.

**C-Tick marking**

### 1. Product Model

Model: CMA50 Loss Test set

### 2. Applied Directive

EMC: EN61326-1: 2006 (Class A)

The following notices are applicable to China RoHS Requirements only.

## 产品中有毒有害物质或元素的名称及含量

| 部件名称 | 有毒有害物质或元素 | | | | | |
|---|---|---|---|---|---|---|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 [Cr(VI)] | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 印刷线路板 (PCA) | × | ○ | × | × | ○ | ○ |
| 机壳、支架 (Chassis) | × | ○ | × | × | ○ | ○ |
| LCD | × | × | × | × | ○ | ○ |
| 其他（电缆、风扇、连接器等） (Appended goods) | × | ○ | × | × | ○ | ○ |

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

## 环保使用期限

这个标记是根据 2006/2/28 公布的「电子信息产品污染控制管理办法」以及 SJ/T 11364-2006「电子信息产品污染控制标识要求」的规定，适用于在中国销售的电子信息产品的环保使用期限。仅限于在遵守该产品的安全规范及使用注意事项的基础上，从生产日起算的该年限内，不会因产品所含有害物质的泄漏或突发性变异，而对环境污染，人身及财产产生深刻地影响。

注）电池的环保使用期限是 5 年。

## Technical Support, Services, and Repairs

Our Technical Support Center is at your service to answer technical questions and provide return authorization for service, repairs, or other returns.

### Technical Support Center

Phone: 1-800-ANRITSU or 972-761-4600
(Canada, U.S., Latin and South America)
Fax: +1 972-671-1877
e-mail: us-sales@anritsu.com
Web: www.anritsu.com

All returns require a Return Materials Authorization (RMA) number. If possible, return the unit in its original shipping materials. If the original shipping materials are not available, please contact the Technical Support Center for instructions.

Whether or not the warranty period of your Anritsu product has expired, the unit can be returned to Anritsu for repairs. Out-of-warranty repairs are billed for time and materials. Call our Technical Support Center for further information.

Anritsu offers a performance verification service that extensively tests this product and documents its performance. All test equipment used in the verification process is traceable to NIST or NPL standards, and is calibrated annually. Anritsu recommends an annual calibration of CMA5000a test modules.

# Table of Contents


**Safety Symbols .....iii**

**For Safety .....v**

**Chapter 1: CMA50 Series Overview ..... 1-1**

Theory of Operation .....1-2
Unpacking and Inspection .....1-2
Unit Description .....1-3
Front Panel .....1-3
Top Panel .....1-4
Back Panel .....1-5
Bottom Panel .....1-6
Keypad .....1-8
Power Meter Connection .....1-14
Power Meter Adapter Caps .....1-14
Cleaning the Power Meter Port .....1-15
Connecting Fiber to the Power Meter .....1-15
Light Source Connection .....1-16
Hybrid Universal Connector and Adapters .....1-16
Cleaning the Hybrid Universal Connector .....1-18
Cleaning Hybrid Universal Adapters .....1-19
Changing the Hybrid Universal Adapter .....1-19
Connecting Fiber to the Source Port .....1-20
Cautions on Handling Optical Fiber Cables .....1-21

**Chapter 2: Getting Started .....2-1**

Instrument Operating Modes .....2-1
EZ Test Mode – Automated Bi-Directional Loss Testing 2-2
EZ Test 6025 (Auto Wavelength ID) Mode .....2-2
Loss Test Set Mode .....2-2
Power Meter Mode .....2-3
Optical Return Loss Mode .....2-3

No Save Mode ..... 2-4
VFL Mode ..... 2-4
CMA50 Operating Mode Selection Guide ..... 2-5
Measurement Mode LCD Layout ..... 2-6
Main Measurement Display – Power Meter & Loss Test Set Modes ..... 2-6
Main Measurement Display – No Save Mode ..... 2-8
Main Measurement Display – EZ Test Mode ..... 2-9
Main Measurement Display – EZ Test 6025 (Auto Wave ID) Mode ..... 2-10
Main Measurement Display – Optical Return Loss Mode 2-13
Light Source Display ..... 2-14
VFL Display ..... 2-15
Menus and Screen Functions ..... 2-16
Main Menu ..... 2-16
Operating Mode Selection ..... 2-16
File Save Mode ..... 2-18
Select Wavelengths Menu ..... 2-19
Mass Storage Menu ..... 2-21
Save File ..... 2-22
Close File ..... 2-24
Name File ..... 2-25
Storage Mode ..... 2-27
Load File ..... 2-29
Editing a File ..... 2-29
Delete File(s) ..... 2-33
Erase Drive ..... 2-34
Communications ..... 2-35
Network Testing ..... 2-36
Setups Menu ..... 2-37
Display Resolution ..... 2-38
Set Thresholds ..... 2-39
LCD Contrast ..... 2-44
Factory Defaults ..... 2-45
Speaker (ON/OFF) ..... 2-46

More (access to Setups Menu screen 2) ..... 2-47
Modulation Freq (Frequency) ..... 2-48
Auto Shut Down ..... 2-50
Software Upgrade ..... 2-51
Backlight ..... 2-51
Language ..... 2-53
Auto Zero ..... 2-54
Version Information ..... 2-55

**Chapter 3: Test Methods ..... 3-1**

Setting and Clearing Reference Readings ..... 3-1
Setting References ..... 3-1
Manual Reference Setting ..... 3-2
Clearing References ..... 3-2
Verifying Patchcords ..... 3-3
Absolute Power ..... 3-4
System Attenuation (Loss) Measurements ..... 3-5
Local Reference Input ..... 3-5
Remote Reference Input ..... 3-6
Optical Loss Measurements ..... 3-7
Patch Panel to Patch Panel Test Method ..... 3-7
Patch Panel to Connector Test Method ..... 3-9
Connector to Connector Test Method ..... 3-11
Editing Power Measurement Readings ..... 3-13
EZ Test Mode ..... 3-15
Physical Connection ..... 3-15
Auto Bi-Directional Loss Measurement ..... 3-16
Setting References in EZ Test Mode ..... 3-21
EZ Test 6025 (Auto Wavelength ID) Mode ..... 3-29
Physical Connection ..... 3-29
Setting References in 6025 (Auto Wave ID) Mode 3-30
6025 (Auto Wave ID) Mode Test Operation ..... 3-30
Optical Return Loss Mode ..... 3-34
Standard ORL Test ..... 3-34
Quick ORL Test ..... 3-41
Editing the Fiber Count Number in ORL Mode ..... 3-41

Visual Fault Locate Mode ..... 3-42
VFL Testing ..... 3-42
PING Test ..... 3-43

**Chapter 4: Network Connections ..... 4-1**
USB Drive ..... 4-1
Accessing the USB Drive ..... 4-2
USB (TCP/IP) Connection ..... 4-5
First Time USB (TCP/IP) Connection ..... 4-5
Normal USB (TCP/IP) Operation ..... 4-15
10/100 Ethernet Connection ..... 4-16
10/100 Ethernet LAN Connection via DHCP (automatic IP address assignment) ..... 4-16
Test the Network Connection ..... 4-18
First Time 10/100 Ethernet Connection (Direct peer to peer connection) ..... 4-19
Normal Ethernet Operation ..... 4-24
Data File Download ..... 4-27
Software Upgrade Procedures ..... 4-28
Operating System Upgrade ..... 4-28
Application Upgrade ..... 4-31
Version Verification ..... 4-34

**Chapter 5: Maintenance and Service .....5-1**
Cleaning the CMA50 ..... 5-1
Cleaning the LCD Display ..... 5-1
Cleaning the Power Meter Port ..... 5-1
Cleaning the Source Port(s) ..... 5-1
Power and Batteries ..... 5-2
Installing the Ni-MH battery pack ..... 5-2
AC charger/adapter ..... 5-6
Battery Replacement – Ni-MH battery pack to AA alkaline ..... 5-7
Troubleshooting and Messages ..... 5-8
Recommended Calibration ..... 5-9

**Appendix A: CMA50 Series Specifications ..... A-1**

**Index ..... IX-1**

# Chapter 1: CMA50 Series Overview

The CMA50 series consists of Power Meters, Light Sources and Loss Test Sets, all of which are light-weight, yet rugged in design to handle any testing situation.

Designed for attenuation and throughput measurements of fiber optic links, the CMA50 Power Meters are ideal for troubleshooting networks. The power meters include large mass storage capacity, pass or fail indicators for in-field compliance, and an 10/100 Ethernet interface option for network testing.

CMA50 Light Sources provide stable output for point-to-point attenuation measurements or tone modulation for easy fiber identification. A variety of wavelength combinations and connector options can meet any testing needs, from FTTx networks to long haul telephony links to multi-mode LAN and CATV.

CMA50 Loss Test Sets are offered with several calibration wavelength and connector options. With options including pass or fail threshold analysis, large capacity for test results storage, and 10/100 Ethernet interface for network testing.

The Operating Mode selections available are dependent upon the type of CMA50 unit.

- *Loss Test Set*
  - EZ Test (Master/Slave)[1]
  - EZ Test (6025 - Auto Wave ID) (TX/RX)
  - LTS (Save/No Save)
  - PM (Save/No Save)
  - ORL[1, 2]
  - VFL (Standard on LTS configurations)
- *Power Meter only*
  - PM (Save)
  - PM (No Save)
  - VFL[3]
- *Light Source only*
  - Light Source
  - VFL[3]

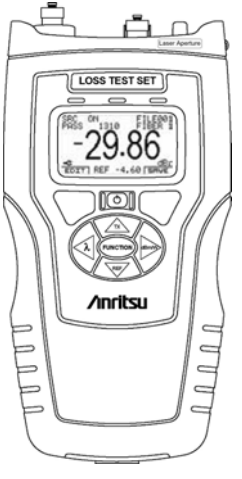



Fig. 1-1: CMA50

[1] *Requires option B (EZ Test)*
[2] *Requires option O (ORL)*
[3] *Requires option V (VFL)*

## Theory of Operation

The interchangeable connector adapter system couples light from the fiber under test to the CMA50's receiver, a high performance InGaAs photodetector that converts the light energy to an electrical signal. The CMA50 then digitizes the signal for processing by a microcontroller. The results are displayed on the backlit graphic LCD in the desired units and with traceable calibration accuracy to the user-specified wavelength.

## Unpacking and Inspection

Inspect the shipping container for damage. Remove all items from the shipping container and check for damage.

The following items are included in shipping container:

- CMA50 Series Power Meter, Loss Test Set, or Light Source
- Ni-MH battery pack
- AC charger/adapter
- 1 Power Meter adapter cap (Power Meters and Loss Test Sets only)
- 1 Hybrid Universal adapter (Loss Test Sets and Light Sources only)
- Certificate of Compliance
- PC Interface CD – this CD includes a PDF of the CMA50 Series Operation Manual
- Mandrel (ORL Loss Test Sets only)

## Unit Description

### Front Panel

The front panel of each CMA50 unit includes the following components:

1 LED Indicators ***for future applications***

2 LCD Display A backlit graphic LCD displays measurement results, test parameters, etc.

3 Keypad Sealed elastomeric keypad provides simple operation and environmental protection.

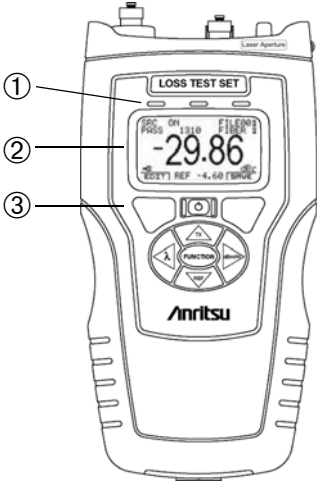



Fig. 1-2: CMA50 Unit Front

## Top Panel

Depending on the configuration of the unit, the CMA50 top panel includes the following components:

1 Power Meter port — This port, labeled POWER METER, couples the fiber under test to the optical power meter via an interchangeable connector adapter.

2 Multimode Optical port — This port, labeled “MM”, couples the fiber under test to the multimode LEDs via a configurable connector output. Do not look directly into this port or any fiber connected to it.

3 Laser On LED — The LED, directly below the symbol, illuminates whenever a source is active. *(Light Sources, Loss Test Sets, or VFL option only)*

4 Singlemode Optical port — This port, labeled “SM”, couples the fiber under test to the singlemode lasers via a configurable connector output. This port contains a Class I laser device. Do not look directly into this port or any fiber connected to it. *(Light Sources and Loss Test Sets only)*

5 Visual Fault Locator port — This port, labeled “VFL” is only on units equipped with the Visual Fault Locator option. When connected to a fiber, the VFL provides a visible red glow at a break or bend. Do not look directly into this port or any fiber connected to it.

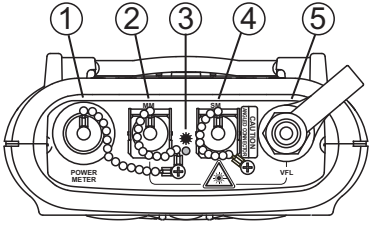



Fig. 1-3: CMA50 Unit Top Panel

## Back Panel

The back panel of each CMA50 unit includes the following components:

| | | |
|---|---|---|
| 1 | Serial Number label | Serial number of the unit, in numeric and bar code forms. |
| 2 | Model Number label | Model number of the unit. *(includes source wavelengths for Light Sources and Loss Test Sets only)* |
| 3 | Compliance and Warning labels | The various Compliance and Warning labels for the unit. |
| 4 | Tilt bail | Adjustable tilt bail. |
| 5 | Battery Compartment | Houses either the rechargeable Ni-MH battery pack or 4 replaceable AA alkaline batteries. |

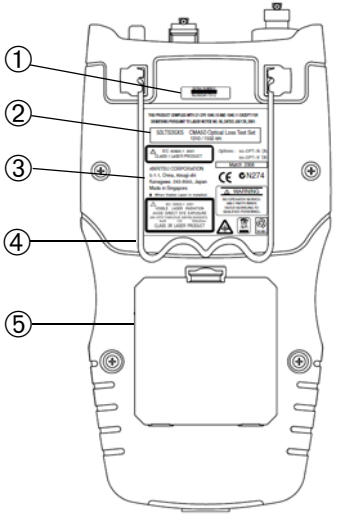



Fig. 1-4: CMA50 Unit Back

## Bottom Panel

The CMA50 bottom panel includes the following components:

1 10/100 Ethernet port — The port, identified by this symbol , allows support of basic ethernet functions (such as PING testing, on units equipped with the Network Test option) and software upgrades.

2 USB port — The Universal Serial Bus (USB) port is identified by the symbol. This port allows the retrieval of data (readings) stored on the unit, as well as software upgrades.

3 Battery pack status LED — This tri-color LED displays the status of the Ni-MH battery pack:

**Orange** (Steady) – the AC charger/adapter is plugged in and the battery pack is charging.

**Orange/Yellow/Green** (Flickering) – the AC charger/adapter is plugged in and the battery pack is pulse charging in order to transition to maintenance charge.

**Green** (Steady) – the AC charger/adapter is plugged in and the battery is refreshed. The battery will continue charging in maintenance charge mode. See the Note on page 1-7.

**Red** (Steady) – Battery voltage is below the low limit. Plug in the AC charger/adapter or change the battery pack.

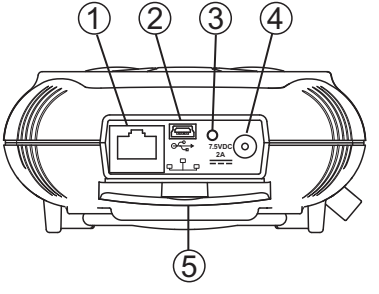



Fig. 1-5: CMA50 Unit Bottom

**Note**

At the moment the LED turns Green (Steady), the battery will have approximately 85% capacity. A few hours of maintenance charge is sometimes required to bring the battery to 100% capacity. Total charge time for a completely dead battery is 14–16 hours. The user may start a charge or discharge cycle at any time with minimal "memory" issues. The battery pack can be left in maintenance charge indefinitely.

| | | |
|---|---|---|
| 4 | AC charger/adapter input | This port, labeled "7.5VDC 2A", accepts the AC charger/adapter for external AC powering and re-charging of the Ni-MH battery pack. |
| 5 | I/O port door | The I/O port door protects the various connectors when they are not in use. Fig. 1-5 on page 1-6 shows the door in its open position. |

## Keypad

The following details the various functions of the keys that comprise the front panel keypad:

### Power Key

- Toggles the instrument ON and OFF.
- When the instrument is operating, press and hold the **Power** key for two seconds to power down the instrument. A warning is generated if you attempt a power down while a test is in progress.

**Note**

The CMA50 can be forced to power down in any situation by holding down the Power key for more than 30 seconds, forcing the unit to reset.

### Left softkey

- **Menu Mode**
  - When in a Menu or item/parameter select screen, press the **Left** softkey to go back to the previous screen or menu.
- **All Modes**
  - The function of this softkey varies. The current function of the softkey is as indicated by its designator in the lower left corner of the LCD display.

**Note**

The Left softkey has the legend “BACK” on older (i.e.: NetTest branded) CMA50 units.

### Right softkey

- **EZ Test/Loss Test Set Mode/Power Meter/Optical Return Loss Modes**
  - The **Right** softkey acts as a SAVE softkey in these modes, saving the current measurement reading and performing save-to-file operation.
- **Menu Mode:**
  - When the softkey's indicator reads "INFO", press the **Right** softkey to access the unit's Version Information screen. See "Version Information" on page 2-55 for further details.
- **All Modes**
  - The function of this softkey varies. The current function of the softkey is as indicated by its designator in the lower right corner of the LCD display.

### Note

The Right softkey is referred to as the "Auto Test" key on older (i.e.: NetTest branded) CMA50 units.

### TX (Transmit) – Up Arrow Key

- **Power Meter Mode/Optical Return Loss Mode:**
  - This key has no function in Power Meter mode and Optical Return Loss mode.
- **Loss Test Set Mode:**
  - The **TX – Up Arrow** key toggles the transmitter (Light Source or VFL) ON and OFF.
  - Press and hold the **TX – Up Arrow** key for two seconds to enable modulation of the current source (at 270Hz, 1KHz, or 2KHz) or the VFL (2Hz).
- **6025 (Auto Wave ID) Mode:**
  - Defines the unit as the transmitter (TX) unit.
- **Menu Mode/Wizard Mode:**
  - Pressing the **TX – Up Arrow** key will traverse (if applicable) and highlight any selections in the upward direction. This key does not enable or disable the Light Source or VFL while in Menu mode.

### REF (Power Meter Reference) – Down Arrow Key

- **Power Meter Mode/Loss Test Set Mode:**
  - When in a test mode (Manual, Power Meter, Fiber Test), pressing the **REF – Down Arrow** key displays the Reference screen. See “Setting and Clearing Reference Readings” on page 3-1 for more information.

- **Optical Return Loss Mode:**
  - This key has no function in Optical Return Loss mode.
- **Menu Mode/Wizard Mode:**
  - Pressing the **REF – Down Arrow** key will traverse (if applicable) and highlight any selections in the downward direction.

### dBm/W – Right Arrow Key

- **Power Meter Mode/Loss Test Set Mode:**
  - Press the **dBm/W – Right Arrow** key to cycle through the units setting; dBm, dBr, and Watts.
- **Optical Return Loss Mode:**
  - This key has no function in Optical Return Loss mode.
- **Menu Mode/Wizard Mode:**
  - Pressing the **dBm/W – Right Arrow** key will traverse (if applicable) and highlight any selections in the right direction.

### Note

The legend on the dBm/W key is “UNITS” on older (i.e.: NetTest branded) CMA50 units.

### λ (Wavelength) – Left Arrow Key

- **Power Meter Mode:**
  - Press the λ **– Left Arrow** key to cycle through all of the selected factory calibrated wavelengths. The LCD displays the measured power (in dBm) for the applicable wavelengths.
  - For Loss Test Sets, the available wavelengths are: 1310/1490/1550/1625/850/1300 nm, back to 1310 nm.

**Note**

If the user has pre-selected fewer wavelength than what is available, only those wavelengths will be in the cycle list.

If the user has opted to automatically save files by selecting SAVE FILES on the File Save Mode screen (see Fig. 2-11 on page 2-18) this key is inactive: use the **SAVE** softkey to cycle through the wavelengths.

- **Loss Test Set Mode:**
  - Press the λ **– Left Arrow** key to cycle through all of the wavelengths supported by the CW Light Source.
  - When a Source is ON, pressing the λ **– Left Arrow** key activates the next wavelength's source.
  - For the singlemode Quad Loss Test Set, the available wavelengths are: 1310/1490/1550/1625 nm, back to 1310 nm.

**Note**

If the instrument has fewer source capable wavelengths than in the previous example, or if the user has preselected fewer wavelengths, only those wavelengths will be in the cycle list.

- **Menu Mode/Wizard Mode:**
  - Pressing the λ **– Left Arrow** key will traverse (if applicable) and highlight any selections in the left direction.

### FUNCTION Key

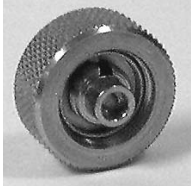
- When in the following test modes — Power Meter, Loss Test Set, EZ Test 6025 (Auto Wave ID), VFL (option) — pressing the **FUNCTION** key exits the measurement mode and displays the Main Menu screen (see Fig. 2-9 on page 2-16).
- When in a setup parameter select state, pressing the **FUNCTION** key will, depending on the item selected:
  - Cycle through the various selections.
  - Select or clear a selection (as indicated by placing or removing a check mark in front of the selected item).
  - Move the highlight to an editable field.

### Note

The legend on the FUNCTION key is “ENTER” on older (i.e.: NetTest branded) CMA50 units.

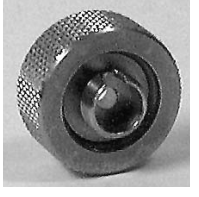
# Power Meter Connection

## Power Meter Adapter Caps



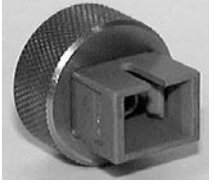
LP-D4
D4 Adapter

LP-LC
LC Adapter



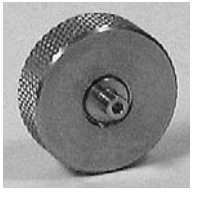
LP-FC
FC Adapter

LP-ST
ST Adapter



LP-SC
SC Adapter

LP-DIN
DIN Adapter



LP-U125
1.25mm Adapter

LP-UN Universal
2.5mm Adapter

### Note

Other Power Meter adapter caps are available. Contact Anritsu for details.

## Cleaning the Power Meter Port

The Power Meter port on the CMA50 should be cleaned if you can see contaminant. It is not necessary to perform this procedure with each use.

1. Remove the adapter cap (if in place).
2. Moisten a small diameter, non-cotton swab with isopropyl alcohol and gently wipe the detector window located in the center of the port.
3. Hold a can of compressed air approximately 2 inches (50mm) from the Power Meter port and apply air to the port once or twice.
4. Clean all threads on the adapter cap
5. Reconnect the adapter cap to the Power Meter port.

### Note

Avoid hand contact with the Power Meter detector window.

## Connecting Fiber to the Power Meter

1. Attach the desired adapter cap to the Power Meter port.
2. Clean and connect a patch cord of known good quality to the adapter cap attached to the Power Meter port.
3. Clean the connector of the system to be tested.
4. Attach the free end of the patch cord to the connector of the system to be tested.

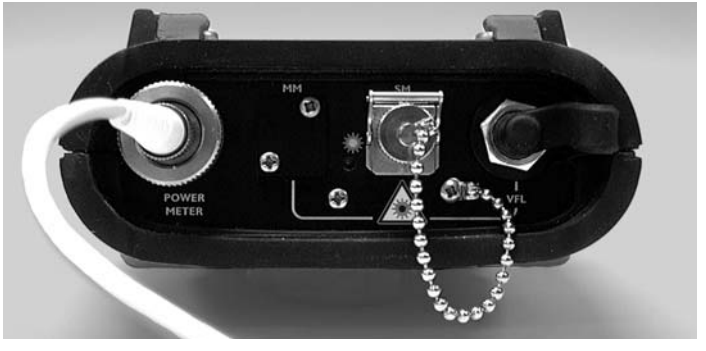



Fig. 1-6: Patch Cord Connected to Power Meter Port

## Light Source Connection

### Hybrid Universal Connector and Adapters

Depending on the configuration of your CMA50 it may be equipped with one or two Hybrid Universal connectors (multimode/singlemode Quad wavelength Loss Test Sets and Light Sources are equipped with two). The Hybrid Universal connector's dust cap protects the ferrule's tip from dust, dirt, or damage which could affect measurement results.

The following shows the adapters currently available for the Hybrid Universal connector:

UNIV-FC
Adapter

UNIV-AFC
Adapter

UNIV-SC
Adapter

UNIV-ST
Adapter

In addition to the adapters pictured above, Hybrid Universal adapter are also available for DIN (UNIV-DIN) and LC (UNIV-LC) style connectors. Other hybrid universal adapters may be available. Contact Anritsu for details.

**Note**

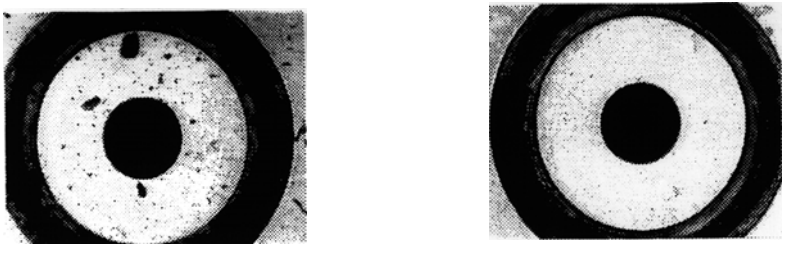
The UNIV-SC can be used with both UPC-SC and APC-SC style connectors.

**CAUTION**

CMA50s equipped with angled-polish (APC) hybrid universal connectors require angled-polish hybrid universal adapters.

## Cleaning the Hybrid Universal Connector

1. Remove the dust cap and detach the hybrid universal adapter.
2. Apply compressed air to the ferrule tip.
3. Wipe the ferrule tip clean with a precision cleaning tissue moistened with isopropyl alcohol.
4. Apply compressed air to dry the ferrule tip.
5. OPTIONAL: With the CMA50 powered down, inspect the ferrule using a hand microscope or magnifier. It should appear similar to the Clean Ferrule tip in Fig. 1-7.



Contaminated Ferrule Tip Clean Ferrule Tip

Fig. 1-7: Magnified Ferrule Tip

It is advisable to clean the hybrid adapter before mounting it on the hybrid universal connector.

## Cleaning Hybrid Universal Adapters

1. If attached, remove the hybrid universal adapter from the Source port. See the following procedure, “Changing the Hybrid Universal Adapter”, for details.
2. Clean the hybrid universal adapter with a precision cleaning tissue or a round nylon brush moistened with isopropyl alcohol.
3. Apply compressed air to the hybrid universal adapter to dry it.

## Changing the Hybrid Universal Adapter

1. Position the CMA50 so that the text on the Top Panel is reading right side up (see Fig. 1-3 on page 1-4).
2. Remove the dust cap on the currently installed adapter.
3. Push down on the adapter’s locking handle. You will hear a “click” when the locking mechanism disengages.
4. Slide the adapter out of the Source port.
5. Slide the new adapter into the Source port.
6. Push up on the adapter’s locking handle. You will hear a “click” when the locking mechanism engages.

When you install an adapter for a different connector type, you may need to change the dust cap.

**To change the dust cap:**

1. Use a small Phillips screwdriver to remove the screw that attaches the dust cap chain to the top plate of the CMA50. Retain the screw.
2. Use the screw removed in step 1 to attach the chain of the new dust cap to the top plate of the CMA50.
3. Mate the old dust cap to the adapter removed in the previous procedure.

## Connecting Fiber to the Source Port

1. Clean and connect a patch cord of known good quality to the hybrid universal adapter attached to the Source port.
2. Clean the connector of the system to be tested.
3. Attach the free end of the patch cord to the connector of the system to be tested.

Fig. 1-8: Patch Cord Connected to Power Meter Port

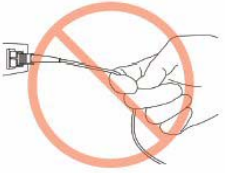
**CAUTION ⚠**

Never force the connector ferrule or insert it at an angle into the adapter. Optical fibers are susceptible to loss from macrobends or other stress. Position the patch cord to minimize mechanical strain (see Fig. 1-8).

## Cautions on Handling Optical Fiber Cables

Optical fiber cables may degrade in performance or be damaged if handled improperly.

Note the following points when handling them.



**CAUTION ⚠**

**Do not pull the cable when removing the connector.**
Doing so may break the optical fiber inside the cable, or remove the cable sheath from the optical connector.

**CAUTION ⚠**

**Do not excessively bend, fold, or pinch an optical fiber cable.**
Doing so may break the optical fiber inside the cable.
Keep the bend radius of an optical fiber cable at 30 mm or more.
If the radius is less, optical fiber cable loss will increase.

**CAUTION ⚠**

**Do not excessively pull on or twist an optical fiber cable. Also, do not hang anything by using a cable.**
Doing so may break the optical fiber inside the cable.

**CAUTION ⚠**

**Be careful not to hit the end of an optical connector against anything hard such as the floor or a desk by dropping the optical fiber cable.**
Doing so may damage the connector end and increase connection loss.

**WARNING ⚠**

**Do not touch the end of a broken optical fiber cable.**
The broken optical fiber may pierce the skin, causing injury.

**CAUTION ⚠**

**Do not disassemble optical connectors.**
Doing so may cause part to break or the performance to degrade.

# Chapter 2: Getting Started

**Note**

Make sure the batteries are fully charged before powering the unit. Any attempt to power the unit when batteries are discharged, may cause improper operation.

## Instrument Operating Modes

The CMA50 can be configured to operate in **EZ Test Mode** (for automated bi-directional loss testing; requires Automatic Bi-directional option), **Loss Test Set (LTS) Mode** (Light Source capable), **Power Meter (PM) Mode**, and **Optical Return Loss (ORL) Mode** (requires ORL option and Automatic Bi-directional option). Additionally, units equipped with the Visual Fault Locator (VFL) option can operate in **VFL** mode.

EZ Test mode, LTS mode and PM mode can automatically save measurement readings to the CMA50's internal data storage as both PMT and TXT files. The PMT files can be loaded on the CMA50 for viewing and editing. PMT files are also CMA5000/4500 and NetWorks/TraceView compatible. The TXT files are ASCII semicolon separated files which can be loaded into a text editor or imported into a spreadsheet. A No Save mode, available in both LTS and PM modes, does not support the saving of measurement data.

The operating mode is selected via the FUNCTION key (see "Operating Mode Selection" on page 2-16 for details). The currently active operating mode is maintained throughout power cycles (Power OFF/Power ON).

Basic features for each of the operating modes include:

## EZ Test Mode – Automated Bi-Directional Loss Testing

The EZ Test mode automated bi-directional loss test is an optional feature available for CMA50 Loss Test Sets. Using two similar CMA50 LTS units, (compatible source/meter wavelengths) the EZ Test mode performs automated bi-directional loss measurements on a fiber link. The two units act as a "Master" and "Slave" to provide a 2-way communications path for controlling the test and passing of results for local display and storage.

## EZ Test 6025 (Auto Wavelength ID) Mode

EZ Test 6025 (Auto Wave ID) is an automated uni-directional, multi-wavelength test mode. The first unit, acting as the light source (transmitter) communicates with a second CMA50, acting as a power meter (receiver), which automatically selects the wavelength and the appropriate calibration and reference levels, and displays the wavelength measurements while simultaneously updating the results.

This mode is included for compatibility with the GN6025 series of products.

## Loss Test Set Mode

Loss Test Set mode is used primarily for performing Loss Measurements.

- The λ (Wavelength) key cycles through the SOURCE capable wavelengths, whether the SOURCE mode is ON or OFF.
- Supports saving of test data via Mass Storage.
- The dBm/W key cycles through dBm, dBr, and Watts units. Displays dBr if a reference is in use.
- The REF (Reference) key establishes a Reference value and allows access for editing the reference value.
- The TX (Transmit) key turns on the light source of the currently displayed wavelength and places the CMA50 in Source mode operation. In Source mode (Light Source ON), the λ key cycles to the next source-capable wavelength, turns on the source for that wavelength, and forces the displayed Power/Loss measurement wavelength to match the currently enabled Source wavelength.

- Press and hold the TX (Transmit) key for 2 seconds to enable modulation of the current source. See “Modulation Freq (Frequency)” on page 2-48 for more information.

### Power Meter Mode

Power Meter mode is primarily used for performing equipment testing and documentation.

- All factory calibrated wavelengths are available.
- The dBm/W key cycles through dBm, dBr, and Watts units. Displays dBr if a reference is in use.
- The REF (Reference) key establishes a Reference value and allows access for editing the reference value.
- Supports saving of test data via Mass Storage.
- The TX (Transmit) key is not active in Power Meter mode.

### Optical Return Loss Mode

Optical Return Loss (ORL) mode is an optional feature for CMA50 singlemode Loss Test Sets that are equipped with the Automatic Bi-directional Test option. ORL mode utilizes a Wizard to establish the critical Incident Power and a Mandrel Wrap reference value in order to provide accurate ORL measurement values.

- ORL measurements can be made at the following wavelengths: 1310nm, 1490nm, 1550nm, and 1625nm. The available wavelengths will vary with the configuration of the given CMA50 singlemode Loss Test Set.
- Supports saving of test data via Mass Storage (“Cycle λ, Then Fiber” mode only).
- The λ (Wavelength) and TX (Transmit) keys are not active in ORL mode.
- The dBm/W key is not active, as all ORL values are displayed in dB only.

### No Save Mode

No Save mode allows you to make Power Meter or Loss Test Set measurements in a non-storage mode of operation. Mass Storage is not supported in No Save mode.

### VFL Mode

Visual Fault Locator (VFL) mode is available on units equipped with the VFL option. See “Visual Fault Locate Mode” on page 3-42 for details.

- Press and hold the TX (Transmit) key for 2 seconds to enable 2Hz modulation for the VFL.

## CMA50 Operating Mode Selection Guide

| Mode | Units Required | Measure Power dBm or dBr | Independent Light Source | Measure Link Loss dB | Wavelengths | Automation | Save Data to File | GN6025 Compatible |
|---|---|---|---|---|---|---|---|---|
| EZ Test (Master/Slave) | 2 | No | No | Yes | All installed singlemode laser sources | Full, Bi-Directional | Always | No |
| EZ Test 6025 (Auto Wave ID) | 2 | No | No | Yes | All installed laser sources | Full, One Direction | Always | Yes |
| LTS (No Save) | 1 | Yes | Yes | No | All installed laser sources | Manual | No | Yes |
| LTS (Save) | 1 | Yes | Yes | No | All installed laser sources | Semi | Yes (Choice of two Auto-incrementing modes) | Yes |
| PM (No Save) | 1 | Yes | No | No | All factory calibrated | Manual | No | Yes |
| PM (Save) | 1 | Yes | No | No | All factory calibrated | Semi | Yes (Choice of three Auto-incrementing modes) | Yes |
| ORL | 1 | No | Yes | Yes | All installed laser sources | Semi | Always | Yes |
| VFL | 1 | N/A | Yes | No | 650nm | Manual | N/A | N/A |

# Measurement Mode LCD Layout

### Note

The unit defaults to the wavelength, power units, and reference power level (if applicable) displayed during the last operation of unit.

## Main Measurement Display – Power Meter & Loss Test Set Modes

1 Source Mode — Indicates whether the light source is ON or OFF.

**Note**

When transmitting a modulated signal the “ON” indicator changes to show the rate of modulation; “270”, “1K” or “2K”.

2 Modulation Detect — Indicates detection of a modulated signal (at 270Hz, 1KHz or 2KHz). See “Modulation Freq (Frequency)” on page 2-48 for details.

3 Active Wavelength — Current meter wavelength in nanometers (nm).

4 Power/Loss Value — Measurement is displayed as 0.1 or 0.01 resolution, as described in “Display Resolution” on page 2-38.

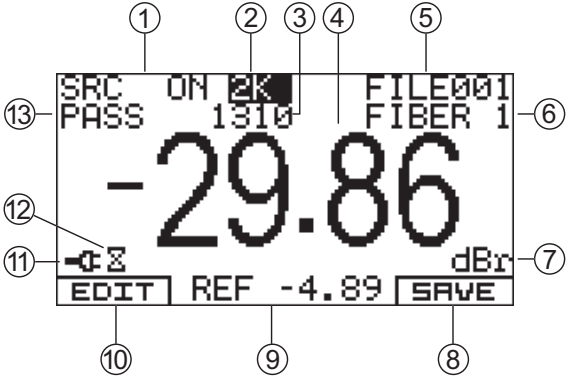



Fig. 2-1: Main Measurement Display

| | | |
|---|---|---|
| 5 | Filename | Filename for the current test data. |
| 6 | Fiber Count | Number assigned to the current fiber under test. |
| 7 | Power Units | dBm or Watts for absolute power; dBr for relative power. |
| 8 | Right Softkey | Displays the current function assigned to the right softkey. |
| 9 | Reference Value | Displays the reference power level in dBm when the unit is in relative power mode (dBr). |
| 10 | Left Softkey | Displays the current function assigned to the left softkey. |
| 11 | Plug Icon or Battery Icon | Indicates that the unit is connected to an external power supply (plug icon) or the unit is operating on battery power (battery icon) with the amount of remaining charge displayed. |
| 12 | Auto-Shut Down | When this indicator is displayed, the unit is set to power down after a user set time period (from 1 to 99 minutes) from the last keypress. See “Auto Shut Down” on page 2-50 for more information. |
| 13 | Threshold Status | This PASS/FAIL indicator shows whether or not the displayed value exceeds the threshold as set on the Set Thresholds screen in Setups. See “Set Thresholds” on page 2-39 for more information. |

## Main Measurement Display – No Save Mode

Fig. 2-2 depicts a typical measurement in No Save mode.

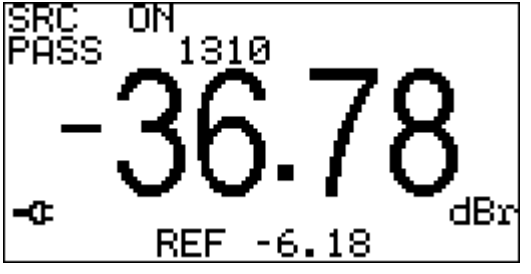



Fig. 2-2: Main Measurement Display – No Save Mode

### Note

This screen displays the same indicators as detailed in Fig. 2-1, except that it does not display a filename, fiber count or the right and left softkey indicators.

## Main Measurement Display – EZ Test Mode

| | | |
|---|---|---|
| 1 | Filename | File name for the current test data. |
| 2 | Test Wavelengths | Wavelengths selected for the current test |
| 3 | A-B Measurement Results | Measurement results (in dB) for the current test in the A-B direction per each wavelength tested. |
| 4 | B-A Measurement Results | Measurement results (in dB) for the current test in the B-A direction per each wavelength tested. |
| 5 | Fiber Count | Number assigned to the current fiber under test. |
| 6 | Right Softkey | Labeled as SAVE, stores the reading to the current file. |

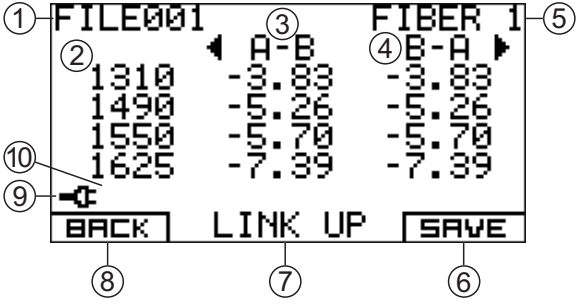



Fig. 2-3: EZ Test – Automated Bi-Directional Loss Measurement Results Display

**Note**

This softkey is labeled RTRY if a Test Error occurs.

| | | |
|---|---|---|
| 7 | Link Status Message | Status of the current link. This message reads “LINKING” when the test is establishing the link and “LINK UP” once the link is established. |
| 8 | Left Softkey | When labeled as BACK, press this softkey to return to the previous screen. When labeled as CNCL press this softkey to cancel the current action. |

| | | |
|---|---|---|
| 9 | Plug Icon or Battery Icon | Indicates that the unit is connected to an external power supply (plug icon– see Fig. 2-3) or the unit is operating on battery power (battery icon) with the amount of remaining charge displayed. |
| 10 | Auto-Shut Down | When this indicator is displayed, the unit is set to power down after a user set time period (from 1 to 99 minutes) from the last keypress. See “Auto Shut Down” on page 2-50 for more information. |

## Main Measurement Display – EZ Test 6025 (Auto Wave ID) Mode

Fig. 2-4 depicts a typical EZ Test 6025 (Auto Wave ID) mode transmitter display.

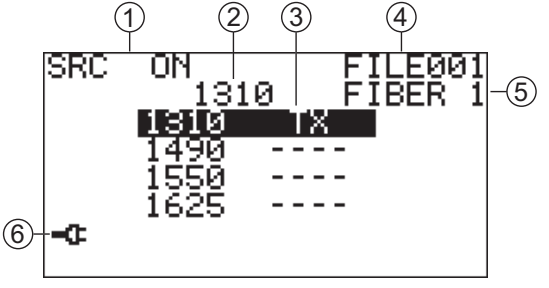



Fig. 2-4: EZ Test 6025 (Auto Wave ID) Transmitter Display

### Note

A unit assumes the transmitter role by pressing the **TX** key.

| | | |
|---|---|---|
| 1 | Source Mode | Indicates whether the light source is ON (transmitting) or OFF. |
| 2 | Active Wavelength | Current source (transmitter) wavelength in nanometers (nm). |
| 3 | Wavelength List | List of the available wavelengths. Up to four wavelengths may be displayed. The current operating wavelength is highlighted and is followed by a TX designator. |
| 4 | Filename | File name for the current test data. |
| 5 | Fiber Count | Number assigned to the current fiber under test. |

| | | |
|---|---|---|
| 6 | Plug Icon or Battery Icon | Indicates that the unit is connected to an external power supply (plug icon– see Fig. 2-4) or the unit is operating on battery power (battery icon) with the amount of remaining charge displayed. |

Fig. 2-5 depicts a typical EZ Test 6025 (Auto Wave ID) mode receiver display. Upon entry, the unit defaults to receiver mode. Press the **TX** key to switch the unit to transmitter mode.

| | | |
|---|---|---|
| 1 | Source Mode | Indicates whether the light source is ON (transmitting) or OFF (receiving). |
| 2 | Active Wavelength | Current meter (receiver) wavelength in nanometers (nm) |
| 3 | Wavelength List | List of the available wavelengths. Up to four wavelengths may be displayed. The current operating wavelength is highlighted and is followed by the current measurement at that wavelength. |
| 4 | Filename | File name for the current test data. |
| 5 | Fiber Count | Number assigned to the current fiber under test. |
| 6 | Power Units | dBm for absolute power; dBr for relative power. |
| 7 | Right Softkey | Labeled as SAVE, stores the reading to the current file. |

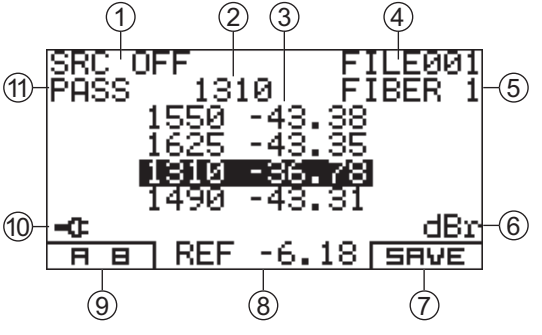



Fig. 2-5: EZ Test 6025 (Auto Wave ID) Receiver Display

| | | |
|---|---|---|
| 8 | Reference Value | Displays the reference power level in dBm when the unit is in relative power mode (dBr).<br>**Note**<br>A reference value is only displayed when a reference is set. See “Setting References” on page 3-1 for more information) |
| 9 | Left Softkey | Labeled as either “A B” or “B A” depending on the direction of the current test. |
| 10 | Plug Icon or Battery Icon | Indicates that the unit is connected to an external power supply (plug icon– see Fig. 2-5) or the unit is operating on battery power (battery icon) with the amount of remaining charge displayed. |
| 11 | Threshold Status | This PASS/FAIL indicator shows whether or not the displayed value exceeds the threshold as set on the Set Thresholds screen in Setups. See “Set Thresholds” on page 2-39 for more information. |

## Main Measurement Display – Optical Return Loss Mode

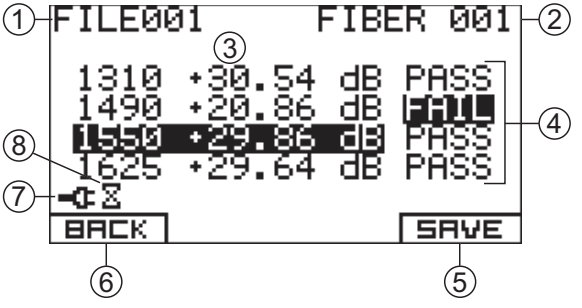



Fig. 2-6: Main Measurement Display – ORL Mode

| | | |
|---|---|---|
| 1 | Filename | Filename for the current test data. |
| 2 | Fiber Count | Number assigned to the current fiber under test. |
| 3 | Wavelength List | List of the available wavelengths. Up to four wavelengths may be displayed. The current operating wavelength is highlighted and is followed by the current ORL measurement, in dB, at that wavelength. |
| 4 | ORL Threshold Status | The PASS/FAIL indicators show whether or not the current ORL measurement is below the value set in the ORL Thresholds settings. “FAIL” flags indicate readings below the threshold. See “ORL Thresholds Setup” on page 2-43. |
| 5 | Right Softkey | Labeled as SAVE, stores the reading to the current file. |
| 6 | Left Softkey | When labeled as BACK, press this softkey to return to the previous screen. When labeled as CNCL press this softkey to cancel the current action. |
| 7 | Plug Icon or Battery Icon | Indicates that the unit is connected to an external power supply (plug icon) or the unit is operating on battery power (battery icon) with the amount of remaining charge displayed. |

| | | |
|---|---|---|
| 8 | Auto-ShutDown | When this indicator is displayed, the unit is set to power down after a user set time period (from 1 to 99 minutes) from the last keypress. See “Auto Shut Down” on page 2-50 for more information. |

## Light Source Display

The display for a Light Source only CMA50 is shown in Fig. 2-7. The unit defaults to the wavelength and modulation mode displayed at last operation of unit.

| | | |
|---|---|---|
| 1 | Active Wavelength | Current source wavelength in nanometers (nm). |
| 2 | Source Mode | Indicates that the light source is either: “ON” (transmitting in CW mode), transmitting a modulated signal (“270”, “1K” or “2K”) or “OFF” (not transmitting). |
| 3 | Auto-Shut Down | When this indicator is displayed, the unit is set to power down after a user set time period (from 1 to 99 minutes) from the last keypress. See “Auto Shut Down” on page 2-50 for more information. |
| 4 | Plug Icon or Battery Icon | Indicates that the unit is connected to an external power supply (plug icon) or the unit is operating on battery power (battery icon) with the amount of remaining charge displayed. |

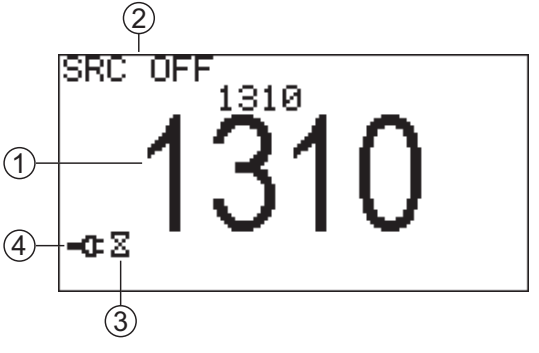



Fig. 2-7: Light Source Display

## VFL Display

Units equipped with the VFL (Visual Fault Locator) option display the screen shown in Fig. 2-8 when VFL is selected as the operating mode. See “VFL Testing” on page 3-42 for additional information.

| | | |
|---|---|---|
| 1 | VFL | Indicates that the unit is currently set to VFL mode. |
| 2 | Source ON/OFF | Indicates whether the VFL source is: ON (transmitting in CW mode), 2H (modulated transmission at 2Hz) or OFF. |
| 3 | Active Wavelength | Current source wavelength in nanometers (nm). |
| 4 | Auto-Shut Down | When this indicator is displayed, the unit is set to power down after a user set time period (from 1 to 99 minutes) from the last keypress. See “Auto Shut Down” on page 2-50 for more information. |
| 5 | Plug Icon or Battery Icon | Indicates that the unit is connected to an external power supply (plug icon) or the unit is operating on battery power (battery icon) with the amount of remaining charge displayed. |

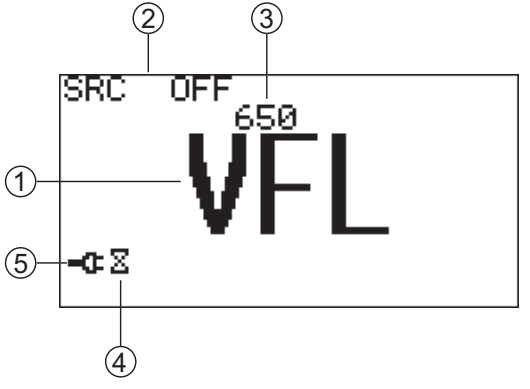



Fig. 2-8: VFL Display

# Menus and Screen Functions

## Main Menu

Pressing the **FUNCTION** key, while in an operating mode, displays the Main Menu screen (see Fig. 2-9). Use the **Up** and **Down Arrow** keys to traverse the menu selections.

Fig. 2-9: Main Menu Screen

### Note

Depending on the configuration of the CMA50 in use and the operating mode selected, not all menu items may be available. Selecting a menu item which is not available for the unit and/or operating mode causes the CMA50 to display a warning screen.

## Operating Mode Selection

The Operating Mode selections available are dependent upon the type of CMA50 unit.

- ***Loss Test Sets:***
  - EZ Test (Master/Slave)[1]
  - EZ Test (6025 - Auto Wave ID) (TX/RX)
  - LTS (Save/No Save)
  - PM (Save/No Save)
  - ORL[1, 2]
  - VFL[3]
- ***Power Meter only***
  - PM (Save)
  - PM (No Save)
  - VFL[3]
- ***Light Source only:***
  - Light Source
  - VFL[3]

[1] *Requires option B (EZ Test)*
[2] *Requires option O (ORL)*
[3] *Requires option V (VFL)*

### Note

When you power up the unit, the last operating mode and file save environment used are highlighted on the Mode Select screen.

**To select the Operating mode:**

1. With the Main Menu displayed (see Fig. 2-9) and the first selection highlighted, press the **FUNCTION** key. The Mode Select screen appears.

### Note

To select an Operating mode right after powering up the CMA50, skip step 1.

2. Use the **Up** and **Down Arrow** keys to move the highlight to the desired operating mode.
3. Press the **FUNCTION** key. The first settings screen for the selected operating mode appears. Proceed making the settings for the selected mode.

Fig. 2-10: Mode Select Screen

### Note

The **MENU** softkey is only available on the Mode Select screen right after power up – until you run a test. After running a test, the softkey legend changes to **BACK**.

### Note

Operating mode selection does not apply to CMA50 Light Sources that do not have the VFL option.

## File Save Mode

Use the File Save mode screen to set the save environment when testing in either Power Meter (PM) mode or Loss Test Set (LTS) mode.

**To set the File Save mode:**

1. Select either **PM** or **LTS** on the Mode Select screen (see Fig. 2-10). The File Save mode screen (Fig. 2-11) appears.

   **Note**

   File Save mode selection applies to Power Meter (PM) and Loss Test Set (LTS) operating modes only.

2. Highlight the desired save mode:
   - **DO NOT SAVE FILES**
   - **SAVE FILES**
3. Press the **FUNCTION** key to select the highlighted mode.

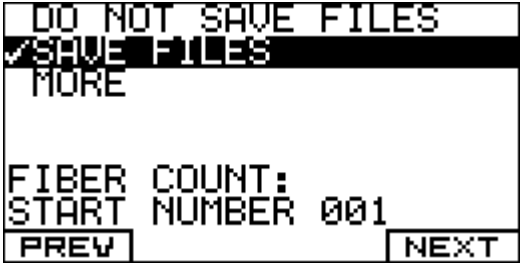



Fig. 2-11: File Save Mode Screen

**Note**

The **MORE** selection is only active when **SAVE FILES** is selected. Selecting MORE displays the Storage Mode screen. See “Storage Mode” on page 2-27 for more information.

## Select Wavelengths Menu

The Select Wavelengths menu allows you to pre-select the test wavelengths for the various Operating Modes.

**To select wavelengths:**

1. With the Main Menu displayed (see Fig. 2-9 on page 2-16), highlight **SELECT WAVELENGTHS** and then press the **FUNCTION** key. The Select Wavelengths screen appears.

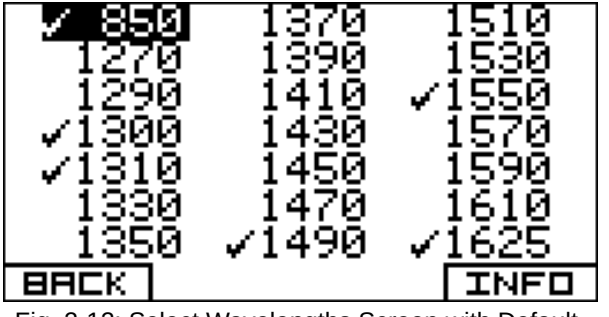



Fig. 2-12: Select Wavelengths Screen with Default Selections

### Note

The number of wavelengths varies with the type of the CMA50 unit (Power Meter/Loss Test Set/Light Source) and its current Operating mode (EZ Test, Loss Test Set, Power Meter, or Optical Return Loss mode).

2. Use the **Up** and **Down Arrow** keys to highlight the desired wavelength and then press the **FUNCTION** key to select it. A check mark appears before the selected wavelength.
3. Repeat step 2 to select all desired wavelengths.
4. Press the **BACK** softkey key to return to the Main Menu screen.

Selected wavelengths are maintained throughout a power cycle (Power On/Power Off) for the following operating modes:

- **Loss Test Set Mode/Optical Return Loss Mode/EZ Test Modes**– Only the wavelengths that support the on-board Light Sources are displayed on Select Wavelength screen. For example, a Quad singlemode CMA50 Loss Test Set would display the following wavelengths; 1310nm, 1490nm, 1550nm, and 1625nm.
- **Power Meter Mode** – Select from 21 available wavelengths. The following wavelengths are selected as the Factory Default setting: 850nm, 1300nm, 1310nm, 1490nm, 1550nm, and 1625nm.

  If the current wavelength does not have light source capability, pressing the TX key will force it to the next wavelength in the cycle that does support the light source, and will enable the light source.

## Mass Storage Menu

The Mass Storage menu provides access to the various Mass Storage selections.

**To access the Mass Storage Menu screen:**

1. With the Main Menu displayed (see Fig. 2-9 on page 2-16) highlight **MASS STORAGE** and then press the **FUNCTION** key.
   The Mass Storage Menu screen appears.
2. Use the **Up** and **Down Arrow** keys to move the highlight to the desired menu item.
3. Press the **FUNCTION** key to display the screen for the selected menu item.

The following sections detail the various Mass Storage menu selections:

- Save File
- Close File
- Name File
- Storage Mode
- Load File
- Delete File(s)
- Erase Drive

Fig. 2-13: Mass Storage Menu Screen

### Note

The Mass Storage menu functions are not available on CMA50 Light Sources.

## Save File

Measurement data may be saved to a file at any time. This operation saves all measurements taken up to performing the save. Once the SAVE is performed, the file is still open and active when you return to the measurement mode screen and store more readings.

**To save measurements:**

1. With the Mass Storage menu displayed (see Fig. 2-13 on page 2-21) highlight **SAVE FILE** and then press the **FUNCTION** key. The Save File screen appears.
2. Confirm that the filename is correct and then press the **SAVE** softkey (Right softkey) to continue.

   or

   If you need to rename the file, press the **CNCL** softkey (Left softkey) and then select **NAME FILE** from the Mass Storage menu screen (see Fig. 2-13 on page 2-21).

Fig. 2-14: Save File Screen

**WARNING⚠**

If a file already exists with the same name, the warning message, shown in Fig. 2-15 appears. Select the **SAVE** softkey to overwrite the file or select the **CNCL** (Cancel) softkey and then select **FILE NAME** from the Mass Storage menu to set up a new name for the file.

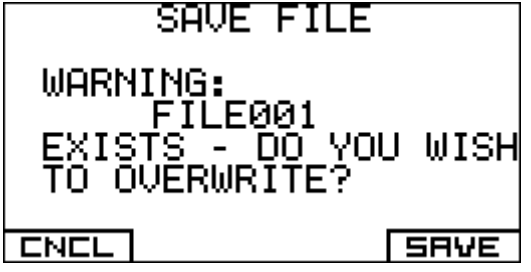



Fig. 2-15: Save File Screen – Warning Message

## Close File

The CLOSE FILE function allows you to save all the measurements taken up to this point and closes the file to any further measurement data. Once a CLOSE is performed, the current file is closed and a new file is opened for the collection of new measurements.

**To close the current measurement file:**

1. With the Mass Storage menu displayed (see Fig. 2-13 on page 2-21) highlight **CLOSE FILE** and then press the **FUNCTION** key. The Close File - End Test screen appears.
2. Confirm that the filename is correct and then press the **SAVE** softkey (Right softkey) to continue.

   or

   If you need to rename the file, press the **CNCL** softkey (Left softkey) and then select **NAME FILE** from the Mass Storage menu screen (see Fig. 2-13 on page 2-21).

**WARNING** ⚠

If a file already exists with the same name, the warning message, shown in Fig. 2-17 appears. Select the **SAVE** softkey to overwrite the file or select the **CNCL** (Cancel) softkey and then select **FILE NAME** from the Mass Storage menu to set up a new name for the file.

Fig. 2-16: Close File Screen

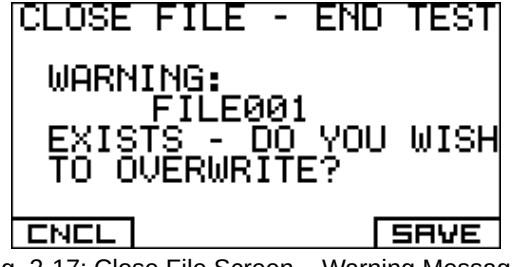



Fig. 2-17: Close File Screen – Warning Message

## Name File

Select NAME FILE to set up a filename and enable or disable the filename auto-incrementing option. By default the filename field contains the last saved filename, or the next number increment filename when the filename auto-increment feature is enabled.

Filenames cannot exceed eight characters.

**To edit information on the File Name screen:**

1. With the Mass Storage menu displayed (see Fig. 2-13 on page 2-21), highlight **NAME FILE** and then press the **FUNCTION** key. The File Name screen appears.
2. To edit the fields on the File Name screen, press the **FUNCTION** key again. The Alphanumeric matrix appears with both the first character of the filename and the corresponding character in the matrix highlighted.
3. Use the following keys to edit the File Name field:
   - Use the **Up/Down/Left/Right Arrow** keys to navigate the highlight through the matrix to select the desired character.
   - Use the **RGHT** softkey (Right softkey) to navigate the highlight in the File Name field.
4. To enable the filename auto-increment feature place a "#" character at the end of the filename.

Fig. 2-18: File Name – Initial Screen

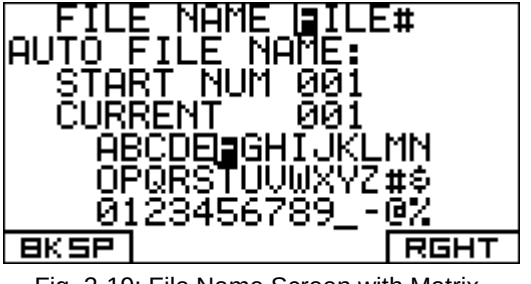



Fig. 2-19: File Name Screen with Matrix

### Note

Use the **BKSP** softkey to delete characters/digits from the File Name field.

5. When you have finished editing the filename, press the **FUNCTION** key. The initial File Name screen appears with the new file name displayed.
6. Press the **BACK** softkey to return to the Mass Storage menu.

   or

   Continue at step 7 to edit the START NUM and CURRENT fields.
7. To change the START NUM (Start Number), press the **Down Arrow** key to move the highlight to the START NUM field.
8. Press the **FUNCTION** key. The first digit of the Start Number is highlighted.
9. Use the **Right/Left Arrow** keys to move the highlight to the desired digit and then use the **Up** and **Down Arrow** keys to increment/decrement the selected digit.
10. Repeat step 8 until all the desired digits are set and then press the **FUNCTION** key to continue.
11. Press the **Down Arrow** to move the highlight to the CURRENT field.
12. Press the **FUNCTION** key. The first digit in the Current field is highlighted.
13. Use the **Right/Left Arrow** keys to move the highlight to the desired digit and then use the **Up** and **Down Arrow** keys to increment/decrement the selected digit.
14. Repeat step 13 until all the desired digits are set and then press the **BACK** softkey to return to the Mass Storage menu.

## Storage Mode

The STORAGE MODE menu item allows you to select the current operating mode's auto-incrementing behavior as well as entering a Fiber Count start value.

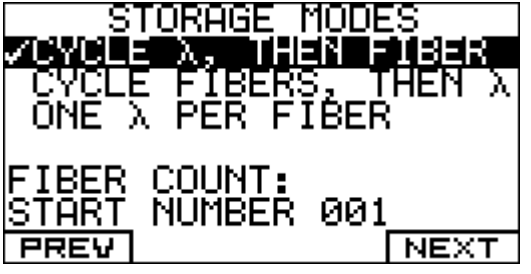



Fig. 2-20: Storage Modes Screen

### Note

Storage Mode selection does not apply when operating either the Power Meter or Loss Test Set in a No Save mode; the No Save mode is a non-storage mode of operation.

There are three Storage Modes available:

- **Cycle λ, Then Fiber** – Auto increment through the pre-selected list of test wavelengths, and then increment to the next Fiber count by pressing the **SAVE** softkey.
- **Cycle Fibers, Then λ** – Auto increment through all fiber counts (from the Start Number through the desired number of fibers) by pressing the **SAVE** softkey and then press the λ key to advance to the next wavelength in the pre-selected list of test wavelengths.
- **One λ Per Fiber** – Auto increment through all fiber counts (from the Start Number through the desired number of fibers). The wavelength is manually entered and can be changed for each measurement by pressing the λ key. This storage mode is only available in Power Meter mode.

**To set the Storage Mode:**

1. With the Mass Storage menu displayed (see Fig. 2-13 on page 2-21) highlight **STORAGE MODE** and then press the **FUNCTION** key. The Storage Modes screen appears.
2. Highlight the desired storage mode by using the **Up** and **Down Arrow** keys and then press the **FUNCTION** key to select it. The selected mode displays a check mark to its left.

### Note

Any of the three Storage modes can be used when operating in Power Meter mode. When operating in Loss Test Set mode, your choices are limited to either “Cycle λ, Then Fiber” or “Cycle Fibers, Then λ”. In ORL mode “Cycle λ, Then Fiber” is the only choice available.

3. Press the **BACK** softkey to return to the Mass Storage menu.
   or
   Continue at step 4 to edit the Fiber Count Start Number.
4. Press the **Down Arrow** key until “START NUMBER” is highlighted in the Fiber Count Start Number field.
5. Press the **FUNCTION** key. The first digit of the Start Number is highlighted.
6. Use the **Right Arrow** key to move the highlight to the desired digit and then use the **Up** and **Down Arrow** keys to increment/decrement the selected digit.
7. Repeat step 6 until all the desired digits are set and then press the **BACK** softkey to return to the Mass Storage menu.

## Load File

The LOAD FILE menu item allows you to load a saved file for viewing or editing.

The type of file which can be loaded depends on the current operating mode. Power Meter files can only be loaded when in either Power Meter mode or LTS mode, while ORL files can only be loaded in ORL mode.

### Note

ORL files are distinguished from Power Meter/LTS files by the "_06" after the filename, as shown in Fig. 2-21.

**To load a file:**

1. With the Mass Storage menu displayed (see Fig. 2-13 on page 2-21) highlight **LOAD FILE** and then press the **FUNCTION** key. The Load File screen appears (see Fig. 2-21).
2. Highlight the desired filename using the **Up** and **Down Arrow** keys and then press the **LOAD** softkey key. The selected file is displayed in the Edit mode screen (see Fig. 2-22).

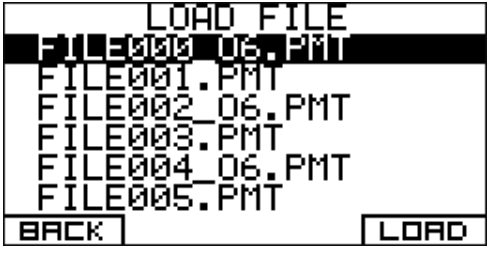



Fig. 2-21: Load File Screen

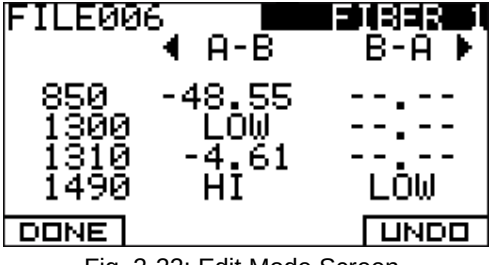



Fig. 2-22: Edit Mode Screen

## Editing a File

When a saved file has been loaded (see "Load File" above) it can then be edited.

**To edit a file:**

1. Make sure that the proper test setup is established. See Chapter 3, "Test Methods" for details on the various test setups.
2. Follow the steps outlined in "To load a file" on page 2-29 if you do not currently have a saved file loaded.
3. With the initial Edit Mode screen displayed (see Fig. 2-22 on page 2-29) use the **Right** and **Left Arrow** keys to scroll to the desired Fiber number.
4. Press the **Down Arrow** key once to move the highlight to the first reading in the A-B column.
   - Use the **Up and Down Arrow** keys to move the highlight within the column.
   - Press the **Right Arrow** key once to move the highlight to the B-A column, if desired.

   The **Right** and **Left Arrow** keys can also be used to cycle between the A-B, B-A, and AVG columns.
5. With the desired reading highlighted, press the **FUNCTION** key. One of the following two screens will appear, depending on which was used at the previous file edit:
   - Real Time Edit screen (see Fig. 2-24)
   - Manual Edit screen (see Fig. 2-25 on page 2-31)

   Use the **FUNCTION** key to toggle between the two screens.

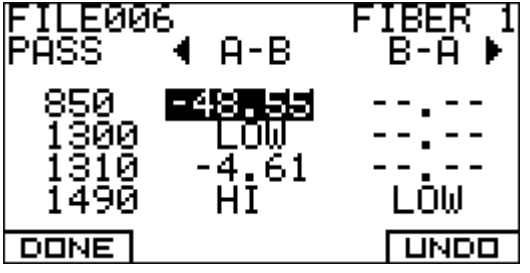



Fig. 2-23: Reading to Edit Highlighted

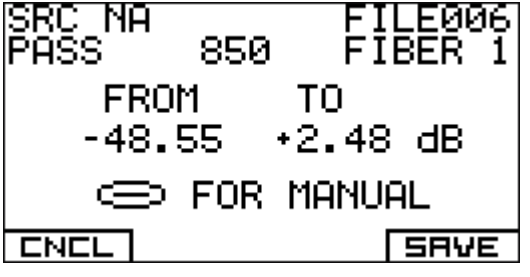



Fig. 2-24: Real Time Edit Screen

### Note

When editing an ORL file a prompt screen is displayed which allows you to establish new values for the Incident power and Mandrel reference (see Fig. 2-26).

See steps 7 through 11 on pages 3-36 through 3-38 for details and then proceed to step 6 below.

6. For a Real Time edit, make sure that the Real Time Edit screen is displayed (see Fig. 2-24 on page 2-30) and then continue at step 8.
7. For a Manual edit, make sure that the Manual Edit screen is displayed (see Fig. 2-25).
   a. Use the **Left** and **Right Arrow** keys to position the highlight at the first digit to be edited.
   b. Use the **Up** and **Down Arrow** keys to increment/decrement the highlighted digit.
   c. Repeat steps 7a and 7b until the desired value is displayed.
8. Press the **SAVE** softkey. The Edit Mode screen (see Fig. 2-22 on page 2-29) appears with the edited value highlighted.
9. Highlight the next value to edit and repeat steps 5 through 8 or select another Fiber number and repeat steps as needed or proceed to step 10.

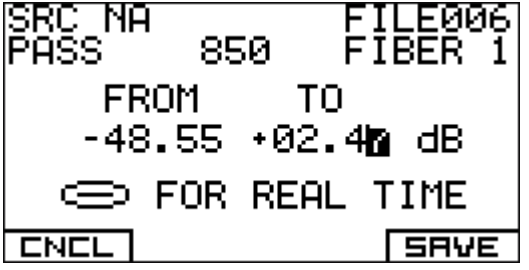



Fig. 2-25: Manual Edit Screen

Fig. 2-26: ORL Reference Prompt Screen

10. Press the **DONE** softkey. The Save Changes to File screen appears (see Fig. 2-27):
    - Press the **YES** softkey to save the file with the changes made and return to the Load File screen (see Fig. 2-21 on page 2-29).
    - Press the **NO** softkey to return to the Load File screen without saving the changes.

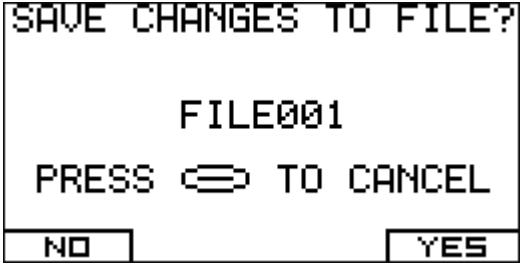



Fig. 2-27: Save Changes to File Screen

## Delete File(s)

The DELETE FILE(S) menu item presents a list of filenames through which you can scroll and select an archived file, or group of files, for deletion.

**To delete files:**

1. With the Mass Storage menu displayed (see Fig. 2-13 on page 2-21) highlight **DELETE FILE(S)** and then press the **FUNCTION** key. The initial Delete File(s) screen appears.
2. Highlight the desired filename using the **Up** and **Down Arrow** keys and then press the **FUNCTION** key to select it. A check mark appears in front of the highlighted filename.
3. Repeat step 2 to select all desired files for deletion.
4. Select the **DEL** softkey to delete the file(s). A warning message appears (see Fig. 2-29).
5. Select the **DEL** softkey again to complete the deletion.

### Note

Pressing the **BACK** softkey at any point prior to step 5 brings you to the previous screen without deleting selected files.

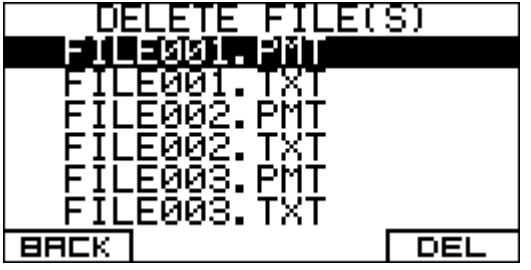



Fig. 2-28: Delete File(s) – Initial Screen

Fig. 2-29: Delete File(s) – Warning Screen

## Erase Drive

The ERASE DRIVE menu item allows a user to erase all data files saved to the CMA50's FLASH drive.

**To erase the FLASH drive:**

1. With the Mass Storage menu displayed (see Fig. 2-13 on page 2-21) highlight **ERASE DRIVE** and then press the **FUNCTION** key. The Erase Drive screen appears.

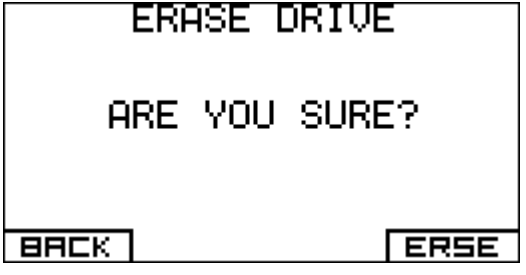



Fig. 2-30: Erase Drive Screen

2. Press the **ERSE** softkey. All the data files saved to the FLASH drive are erased and the unit returns to the Mass Storage menu.
   or

   Press the **BACK** softkey to return to the Mass Storage menu without erasing the FLASH drive.

## Communications

The COMMUNICATIONS menu item provides access to setup the CMA50 for functions including: retrieval of data (readings) stored on the unit, supporting basic ethernet functions (such as Ping testing), and remote operation, via the unit's USB and 10/100 Ethernet ports. See Fig. 1-5: "CMA50 Unit Bottom"on page 1-6 for location of the ports.

**To access the Communication Port settings:**

1. With the Main Menu displayed (see Fig. 2-9 on page 2-16) highlight **COMMUNICATIONS** and then press the **FUNCTION** key. The Communications Ports screen appears.
2. Use the **Up** and **Down Arrow** keys to move the highlight to the desired menu item, and then press the **FUNCTION** key.
3. Depending on the selection made in step 2 one of the following occurs:
   - If USB DRIVE was selected, the USB Mode screen appears.
   - If USB (TCP/IP) was selected, the Network Settings screen appears.
   - If 10/100 Ethernet was selected, the Set IP, Mask, Gateway screen appears. Select either DHCP (AUTO) or MANUAL and press the FUNCTION key to continue.

***For further details on the Communication Ports settings see Chapter 4, "Network Connections".***

Fig. 2-31: Communication Ports Screen

## Network Testing

The NETWORK TESTING menu item provides access to the PING test function. See “PING Test” on page 3-43 for details.

### Note

You cannot select the NETWORK TESTING menu item until you have selected 10/100 Ethernet on the Communications Port screen (see Fig. 2-31 on page 2-35). The 10/100 Ethernet menu selection is only accessible on units equipped with the N option (Network Test).

## Setups Menu

The Setups menu provides access to the various Setups selections. The Setups menu is divided over two screens.

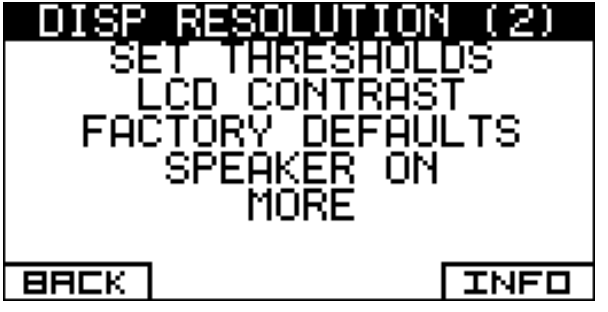



Fig. 2-32: Setups Menu Screen 1

**To access the Setups Menu screen 1:**

1. With the Main Menu displayed (see Fig. 2-9 on page 2-16) highlight **SETUPS** and then press the **FUNCTION** key. Screen 1 of the Setups Menu appears.
2. Use the **Up** and **Down Arrow** keys to move the highlight to the desired menu item:
   - Display Resolution
   - Set Thresholds
   - LCD Contrast
   - Factory Defaults
   - Speaker On
   - More (accesses Setups screen2)
3. Depending on the selected menu item, pressing the **FUNCTION** key will either:
   - Toggle/cycle the setting for the selected menu item.
   - Display a sub-menu for the selected menu item.

## Display Resolution

You can specify a 1 or 2 place decimal reading for dBm, dBr, and Watts readings.

**To set the display resolution:**

1. With the Main Menu displayed (see Fig. 2-9 on page 2-16) highlight **SETUPS** and then press the **FUNCTION** key. The Setups Menu screen 1 appears.
2. Use the **Up** and **Down Arrow** keys to move the highlight to **DISP RESOLUTION**, if it is not already highlighted.
3. Press the **FUNCTION** key to toggle the selection. The default setting is "(2)", which denotes a 2 place decimal setting.
4. Press the **BACK** softkey to return to the Main Menu screen.

   or

   Use the **Down Arrow** key to access the next desired Setups menu selection.

### Note

The Display Resolution setting does not apply to CMA50 Light Source only units or to test results in EZ Test mode. EZ Test mode automatically uses the 2 place decimal reading. ORL mode also only uses the 2 place decimal reading.

## Set Thresholds

The SET THRESHOLDS menu item allows you to set values that trigger the PASS/FAIL indicator (see Fig. 2-1 on page 2-6). Thresholds can be set either manually or via a wizard. In addition, the ORL threshold settings are also accessed through the Set Thresholds mode screen.

Fig. 2-33: Set Thresholds Mode Screen

### *Manual Threshold Setup*

1. With the Setups menu displayed (see Fig. 2-32 on page 2-37) highlight **SET THRESHOLDS** and then press the **FUNCTION** key. The Set Thresholds mode screen appears.
2. Use the **Down arrow** key to move the highlight to **MANUAL**, if not already highlighted.
3. Press the **FUNCTION** key. The Set Thresholds –Manual screen appears (see Fig. 2-34 on page 2-40).
4. Use the **Up** and **Down Arrow** keys to position the highlight on the desired wavelength.
5. Press the **FUNCTION** key, the highlight moves to the last digit of the current threshold value for the selected wavelength.
6. Use the **Up** and **Down Arrow** keys to increment/decrement the selected digit.
7. Use the **Left** and **Right Arrow** keys to position the highlight at the next desired digit of the threshold value.
8. Repeat Steps 6 and 7 to change all the desired digits of the current threshold value.

9. Press the **FUNCTION** key and select the next desired wavelength.
   or
   If setting all the thresholds to the same value, press the **ALL** softkey and then proceed to Step 11.
10. Repeat steps 4 through 9 until all desired threshold values are entered.
11. Press the **BACK** softkey to return to the Setups Menu screen 2.

### Note

Set Thresholds does not apply to CMA50 Light Source only units.

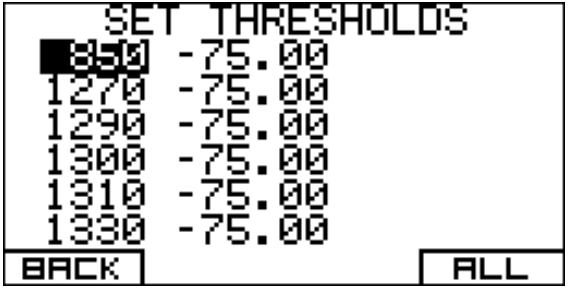



Fig. 2-34: Set Thresholds Screen – Manual

### *Thresholds Wizard Setup*

The Thresholds Wizard provides a means to calculate the thresholds, at all wavelengths, based on expected network loss.

1. With the Setups menu displayed (see Fig. 2-32 on page 2-37) highlight **SET THRESHOLDS** and then press the **FUNCTION** key. The Set Thresholds mode screen appears (see Fig. 2-33 on page 2-39).
2. Highlight **WIZARD**, if not already highlighted.
3. Press the **FUNCTION** key. The Fiber Attenuation screen appears (see Fig. 2-35). The values shown in Fig. 2-35 are the factory default attenuation values.
4. Edit the attenuation values, if desired, or continue at step 5.

   **To edit the Attenuation Values:**

   a. Use the **Up** and **Down Arrow** keys to position the highlight on the desired wavelength.
   b. Press the **FUNCTION** key, the highlight moves to the last digit of the current attenuation value for the selected wavelength.
   c. Use the **Up** and **Down Arrow** keys to increment/decrement the selected digit.
   d. Use the **Left** and **Right Arrow** keys to position the highlight at the next desired digit of the attenuation value.
   e. Repeat steps 4c and 4d to change all the desired digits of the current threshold value.
   f. Press the **FUNCTION** key and select the next desired wavelength.
   g. Repeat steps 4b through 4f to change all desired wavelengths.

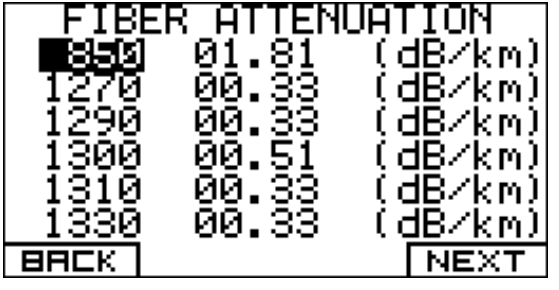



Fig. 2-35: Fiber Attenuation Screen

5. Press the **NEXT** softkey, the Fiber Specs screen appears (see Fig. 2-36).
6. Use the **Up/Down/Right/Left Arrow** keys to enter the desired values (see Step 4 on page 2-41 for details) for the fiber under test for the following:
   - LENGTH KM (fiber length in km)
   - CONN LOSS (average connector loss, per connector, in dB)
   - SPLC LOSS (average splice loss, per splice, in dB)
   - NUM CONNS (number of connectors)
   - NUM SPLCS (number of splices)
7. Press the **NEXT** softkey, the Set Thresholds screen appears (see Fig. 2-37).
8. Review the threshold values and edit, if desired, by using the **Up/Down/Right/Left Arrow** keys (see Step 4 on page 2-41 for details).
9. Press the **BACK** softkey to close the Thresholds Wizard and return to screen 1 of the Setups menu.

   or

   If you desire to set all of the threshold values to the same value, highlight the wavelength with the desired value (enter the value, if necessary) and then press the **ALL** softkey. The threshold values change to the value of the selected wavelength. Then press the **BACK** softkey.

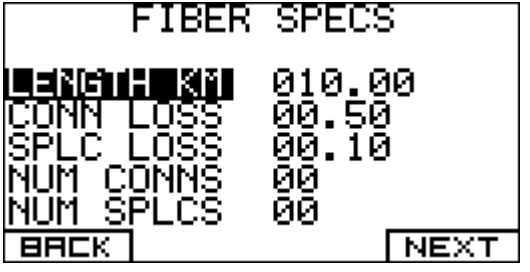



Fig. 2-36: Fiber Specs Screen

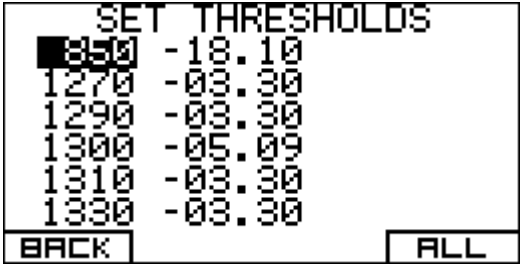



Fig. 2-37: Set Thresholds Screen – Wizard Mode

### *ORL Thresholds Setup*

The ORL thresholds setting is accessed through the Set Thresholds mode screen (see Fig. 2-33 on page 2-39).

1. With the Setups menu displayed (see Fig. 2-32 on page 2-37) highlight **SET THRESHOLDS** and then press the **FUNCTION** key. The Set Thresholds mode screen appears.
2. Use the **Down arrow** key to move the highlight to **ORL**, if not already highlighted.
3. Press the **FUNCTION** key. The ORL Set Thresholds screen appears (see Fig. 2-38).
4. Use the **Up** and **Down Arrow** keys to position the highlight on the desired wavelength.
5. Press the **FUNCTION** key, the highlight moves to the last digit of the current threshold value for the selected wavelength.
6. Use the **Up** and **Down Arrow** keys to increment/decrement the selected digit.
7. Use the **Left** and **Right Arrow** keys to position the highlight at the next desired digit of the threshold value.

   Repeat Steps 6 and 7 to change all the desired digits of the current threshold value.

   or

   If you desire to set all of the threshold values to the same value, highlight the wavelength with the desired value (enter the value, if necessary) and then press the **ALL** softkey. The threshold values change to the value of the selected wavelength.

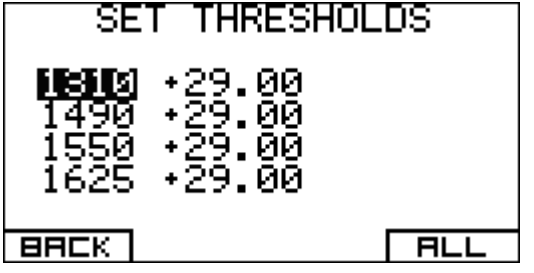



Fig. 2-38: ORL Set Thresholds Screen

## LCD Contrast

You can adjust the contrast level of the CMA50's LCD display.

**To adjust the LCD contrast:**

1. With the Main Menu displayed (see Fig. 2-9 on page 2-16) highlight **SETUPS** and then press the **FUNCTION** key. The Setups Menu screen 1 appears (see Fig. 2-32 on page 2-37).
2. Use the **Up** and **Down Arrow** keys to move the highlight to **LCD CONTRAST**, if it is not already highlighted.
3. Press the **FUNCTION** key to cycle through the contrast settings. The contrast adjusts from its current level towards the maximum, and then wraps to the minimum level.

### Note

If you select a contrast level that results in an unreadable display, press either the **Right** or **Left Arrow** key. This action will restore the factory default contrast setting.

4. Press the **BACK** softkey to return to the Main Menu screen.
   or
   Use the **Down Arrow** key to access the next desired Setups menu selection.

### Note

The user-set contrast setting is maintained by the CMA50 on a power cycle. The contrast setting is also maintained when the unit is reset to its factory defaults via the FACTORY DEFAULTS menu item (see "Factory Defaults" on page 2-45).

## Factory Defaults

The FACTORY DEFAULTS menu item provides a way to return the various Setups menu items to their factory default settings.

**To set the CMA50 to its factory defaults:**

1. With the Setups menu displayed (see Fig. 2-32 on page 2-37) highlight **FACTORY DEFAULTS** and then press the **FUNCTION** key. The Set Defaults screen appears.

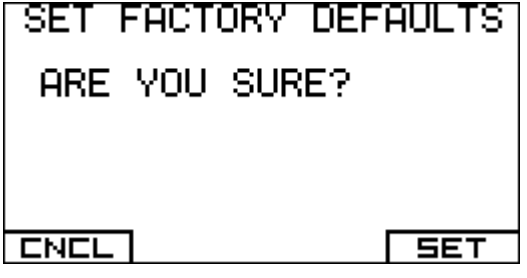



Fig. 2-39: Set Defaults Screen

2. Select the **SET** softkey to return the Setups menu setting to their factory defaults. The unit returns to the Setups Menu screen 1.
   or

   Press the **CNCL** (Cancel) softkey to abort.

## Speaker (ON/OFF)

The SPEAKER setting is an ON or OFF item which instructs the CMA50 (Loss Test Sets only) to sound a tone at the end of an EZ Test. If set to ON, the tone sounds at the end of an EZ Test, or to indicate an interruption in the test. In addition, when the Speaker is set to ON, a tone sounds in Power Meter or Loss Test Set mode when a signal, modulated at the same frequency set in the Modulation Frequency setting (see “Modulation Freq (Frequency)” on page 2-48) is detected.

**To set the speaker:**

1. With the Main Menu displayed (see Fig. 2-9 on page 2-16) highlight **SETUPS** and then press the **FUNCTION** key. The Setups Menu screen 1 appears (see Fig. 2-32 on page 2-37).
2. Use the **Up** and **Down Arrow** keys to move the highlight to **SPEAKER**, if it is not already highlighted.

### Note

Depending on the last setting established, the selection will read either “SPEAKER ON” or “SPEAKER OFF”.

3. Press the **FUNCTION** key to toggle the selection ON or OFF. The factory default setting is “ON”.
4. Press the **BACK** softkey to return to the Main Menu screen.

   or

   Use the **Down Arrow** key to access the next desired Setups menu selection.

### More (access to Setups Menu screen 2)

The MORE menu selection provides access to the Setups Menu screen 2.

Fig. 2-40: Setups Menu Screen 2

**To access the Setups Menu screen 2:**

1. With the Setups Menu screen 1 displayed, (see Fig. 2-32 on page 2-37) highlight **MORE** and then press the **FUNCTION** key. Screen 2 of the Setups Menu appears.
2. Use the **Up** and **Down Arrow** keys to move the highlight to the desired menu item:
   - Modulation Freq
   - Auto Shut Down
   - Software Upgrade
   - Backlight
   - Language
3. Depending on the selected menu item, pressing the **FUNCTION** key will either:
   - Toggle the setting for the selected menu item.
   - Display a sub-menu for the selected menu item.

## Modulation Freq (Frequency)

The MODULATION FREQ feature allows selection of a modulated frequency on CMA50 Power Meters and Loss Test Sets. The selected modulation frequency defines the source output frequency, as well as the detection frequency for display. This feature is primarily used as a method of fiber identification. The modulation frequency can be set to either 270 Hz, 1000 Hz (1KHz) or 2000 Hz (2KHz) When a fiber with a signal modulated at the selected frequency is attached to the unit's Power Meter port, the measurement results screen appears, shown in the figure below, with the detected modulation rate highlighted. In addition, a tone will sound if the Speaker is set to ON (see "Speaker (ON/OFF)" on page 2-46)

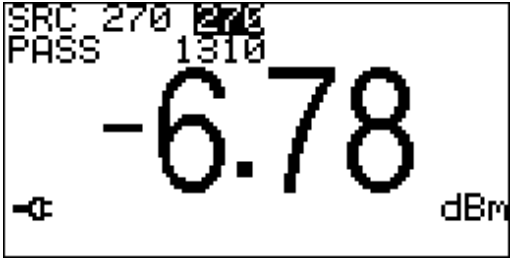



Fig. 2-41: Results Screen with 270 Hz Modulated Signal Detected

### Note

Modulation Frequency feature does not apply to units running in either VFL mode or 6025 (Auto Wave ID) mode. In addition it does not apply to CMA50 Light Source only units.

In addition, if a Modulated signal is detected when operating in either Power Meter or Loss Test Set mode, with FILE SAVE enabled, the SAVE softkey and REF hardkey will be disabled.

**To set the Modulation Frequency:**

1. With the Setups Menu screen 1 displayed (see Fig. 2-32 on page 2-37), highlight **MORE** and then press the **FUNCTION** key. Screen 2 of the Setups Menu appears.
2. Highlight **MODULATION FREQ** and then press the **FUNCTION** key. The Modulation Frequency screen appears.
3. Use the **Up** and **Down Arrow** keys to highlight the desired setting:
   - NONE
   - 270 HZ
   - 1000 HZ
   - 2000 HZ
4. Press the **FUNCTION** key to select the highlighted setting. A check mark appears to the left of the selected modulation frequency.

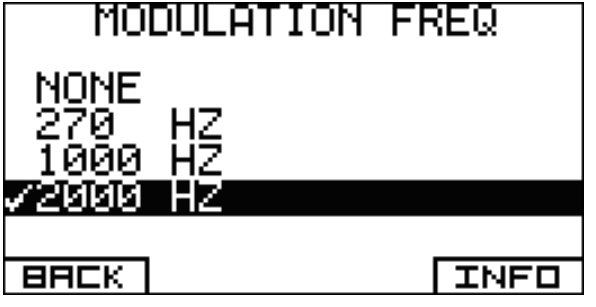



Fig. 2-42: Modulation Frequency Screen

## Auto Shut Down

AUTO SHUT DOWN automatically powers down the CMA50 after a set time based on instrument keypad and USB or 10/100 Ethernet inactivity. The Auto Shut Down interval can be set from 1 through 99 minutes. Its default setting is 10 minutes.

Fig. 2-43: Auto Shut Down Screen

**To set the Auto Shut Down:**

1. With the Setups Menu screen 1 displayed (see Fig. 2-32 on page 2-37), highlight **MORE** and then press the **FUNCTION** key. Screen 2 of the Setups Menu appears.
2. Highlight **AUTO SHUT DOWN** and then press the **FUNCTION** key. The Auto Shut Down screen appears.
3. With **ENABLE** highlighted, press the **FUNCTION** key. A check mark appears to the left of ENABLE to signify that Auto Shutdown is now enabled. Continue at step 4 to change the auto shutdown time interval, if desired.
4. Press the **Down Arrow** key to move the highlight to **MIN** (minute).
5. Press the **FUNCTION** key. Upon the first entry, the highlight moves to the second digit of the minute value.
6. Use the **Up** and **Down Arrow** keys to increment/decrement the digit value.
7. Use the **Left Arrow** key to move the highlight to the first digit of the minute value and then repeat step 6.

### Note

Subsequent presses of **FUNCTION** key will toggle the highlight between **MIN** and the previously highlighted digit.

8. Press the **BACK** softkey to return to screen 2 of the Setups Menu.

### Software Upgrade

See “Software Upgrade Procedures” on page 4-28 for details.

### Backlight

The BACKLIGHT setting allows you to set the duration that the display backlight is turned on after a keypress. A check mark to the left of one of the various settings denotes the current selection. If no check mark is displayed, the Backlight is off (which is the default setting). You can select from the following:

- Always On
- 10 Seconds
- 20 Seconds
- 30 Seconds

Selecting a short duration, or using the default setting (no check mark displayed – backlight off) will conserve battery power.

Fig. 2-44: Backlight Screen

**To set the Backlight:**

1. With the Setups Menu screen 1 displayed (see Fig. 2-32 on page 2-37), highlight **MORE** and then press the **FUNCTION** key. Screen 2 of the Setups Menu appears.
2. Highlight **BACKLIGHT** and then press the **FUNCTION** key. The Backlight screen appears (see Fig. 2-44 on page 2-51).
3. Use the **Up** and **Down Arrow** keys to move the highlight to the desired setting.
4. Press the **FUNCTION** key to select the desired backlight duration setting. A check mark appears before the highlighted selection.
   OR –
   To turn off the Backlight, when a selection has already been made, highlight the selection with the check mark and then press the **FUNCTION** key to clear the selection.
5. Press the **BACK** softkey to return to screen 2 of the Setups Menu.

## Language

Use the Language setting to select the operating language for the unit.

**To set the Language:**

1. With the Setups Menu screen 1 displayed (see Fig. 2-32 on page 2-37), highlight **MORE** and then press the **FUNCTION** key. Screen 2 of the Setups Menu appears.
2. Highlight **LANGUAGE** and then press the **FUNCTION** key. The Language screen appears.
3. Use the **Up** and **Down Arrow** keys to highlight the desired setting:
   - ENGLISH
   - JAPANESE
4. Press the **FUNCTION** key to select the highlighted setting. The unit now operates using the selected language.

Fig. 2-45: Language Screen

## Auto Zero

Auto Zero allows you to “zero” the Power Meter; this is highly recommended when testing at temperature extremes.

**WARNING** ⚠

Make sure that the Power Meter (Detector) port is covered (the dust cap is in place).

1. With the Main Menu displayed (see Fig. 2-9 on page 2-16) highlight **AUTO ZERO** and then press the **FUNCTION** key. The initial Auto Zero screen appears.
2. Press the **ZERO** softkey to start the Auto Zero process. The PLEASE WAIT display appears to indicate that the Auto Zero is in process. This will take several seconds.
   Upon completion, the display changes to read “AUTO ZERO PASSED”.
3. Press the **BACK** softkey to return to the Main Menu screen .

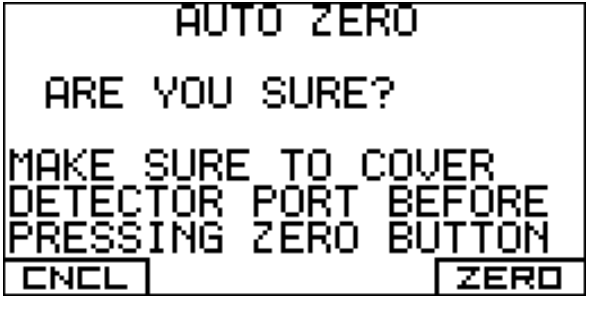



Fig. 2-46: Auto Zero – Initial Screen

**Note**

If the message “AUTO ZERO FAILED” appears, make sure that the detector (Power Meter port) is completely blocked, and then perform the Auto Zero again. If the procedure fails again, contact the Anritsu Technical Support Center (see page xxxii).

## Version Information

Version information for the CMA50 is available on the Version Information screen (see Fig. 2-47), which is accessed by pressing the **INFO** softkey. The Version Information screen displays the model and serial number for the unit, as well as the version numbers for the Applications software and Operating System. There are two ways to access the Version Information screen, depending on whether you have just powered up the unit or are already running a test.

**To view the Version Information screen at power up:**

1. Press the **Power** key to start the CMA50.
2. When the Mode Select screen appears (see Fig. 2-10 on page 2-17), press the **MENU** softkey.

> **Note**
>
> The **MENU** softkey is only available on the Mode Select screen right after power up – until you run a test. After running a test, the softkey legend changes to **BACK**.

3. The Main Menu screen appears (see Fig. 2-9 on page 2-16).
4. Press the **INFO** softkey. The Version Information screen appears.

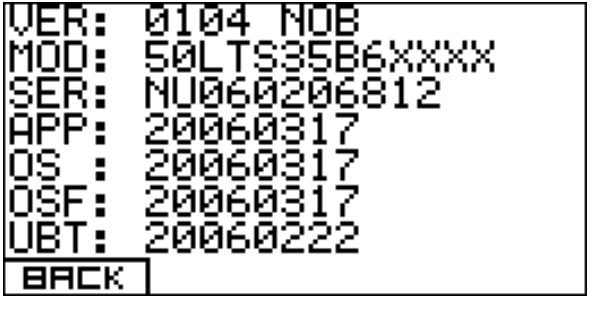



Fig. 2-47: Version Information Screen

> **Note**
>
> Fig. 2-47 is provided as a visual reference only. The model, serial number, and software version dates will vary depending on the given CMA50 unit.

**To view the Version Information screen while in a test mode:**

1. Press the **FUNCTION** key when in the Measurement Results screen for the current test. The Main Menu screen appears (see Fig. 2-9 on page 2-16).
2. Press the **INFO** softkey. The Version Information screen appears (see Fig. 2-47 on page 2-55).

### Note

This method of accessing the Version Information screen is not applicable in ORL mode.

# Chapter 3: Test Methods

## Setting and Clearing Reference Readings

### Setting References

**Note**

For best results when setting references, set the operating mode of the CMA50 to a No Save mode. This allows you to cycle through the wavelengths via the λ (Wavelength) key.

Use the following procedure to set a reference value for the current wavelength.

1. Press the **REF** key, the Reference screen appears (see Fig. 3-1).
2. Press the **SAVE** softkey to save the reference value and return to the Measurement screen (see Fig. 2-1 on page 2-6).
3. To advance to the next wavelength, press the λ (**Wavelength**) key.
4. Repeat steps 1 through 3 for all wavelengths to be tested.

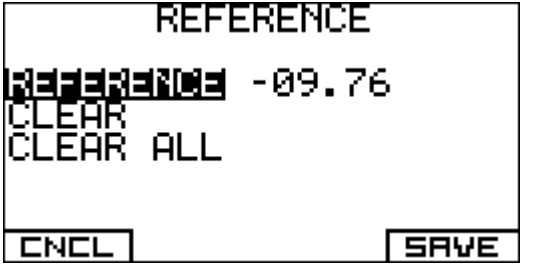



Fig. 3-1: Reference Screen

**Note**

For details on setting references for auto bi-directional measurement made in EZ Test mode, see “Setting References in EZ Test Mode” starting on page 3-21.

## Manual Reference Setting

1. To set a manual reference, use the λ (**Wavelength**) key to cycle to the desired wavelength.
2. Press the **REF** key, the Reference screen appears (see Fig. 3-1 on page 3-1). Make sure that REFERENCE is highlighted.
3. Press the **FUNCTION** key. The highlight moves to the last digit of the reference value.
4. Use the **Left** and **Right Arrow** keys to traverse the highlight to the desired position and then use the **Up** and **Down Arrow** keys to increment/decrement the selected digit.
5. When you finish entering the reference value, press the **SAVE** softkey.
6. Press the **SAVE** softkey to set the reference for the current wavelength and return to the Measurement screen.
7. Repeat steps 2 through 7 for each wavelength to be tested.

## Clearing References

Use the following procedure to clear existing reference values.

1. Press the **REF** key, the Reference screen appears (see Fig. 3-1 on page 3-1).
2. Press the **Down Arrow** key to highlight the text “CLEAR”.

   or

   Press the **Down Arrow** key again to highlight the text “CLEAR ALL”, to clear all references stored.
3. Press the **FUNCTION** key. The reference value is replaced by the text “NONE”.
4. Press the **SAVE** softkey to return to the Measurement screen.

## Verifying Patchcords

Use the following procedure to verify all reference patchcords, in both directions, before performing any tests.

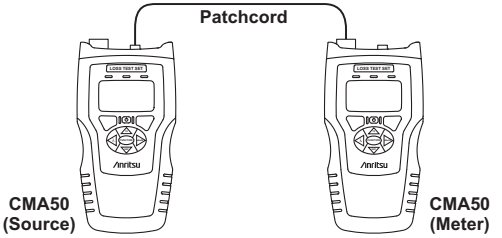


Fig. 3-2: Verifying Patchcord(s)

1. Connect the patchcord to be used in testing (a short patchcord, with the same fiber and connector type as the system to be tested), between the CMA50 acting as the source and the CMA50 acting as the meter.
2. Set both units to the same wavelength.
3. Set the CMA50 acting as the meter to dBm mode. The measured level should closely match the output level specified for the light source (typically around -18 dBm for multimode LED sources and >-7 dBm for singlemode laser sources). If not, clean the connections or check for bends in the fiber.
4. Press the **REF** key, the Reference screen appears (see Fig. 3-1 on page 3-1)
5. Press the **SAVE** softkey to save the reference value. The meter returns to the Measurement display which indicates 0.0 dBr (relative loss).
6. Reverse the connections. If the loss displayed on the CMA50 (Meter) is ≤0.5dB, the patchcord is good and will provide a valid test. Otherwise, clean the connectors or, if necessary, replace the patchcord and repeat steps 4 and 5 until a reading of ≤0.5dB or less is achieved.

## Absolute Power

Use this method to measure actual power levels in Watts or dBm (a logarithmic measure based on 0 dBm = 1mW). Remember to clear any stored reference (see "Optical Loss Measurements" on page 3-7) to assure that the PASS/FAIL indicator refers to dBm. This method is useful for measuring output power levels of transmission equipment and troubleshooting fiber systems. Power Meter Mode with the data storage mode set to One λ Per Fiber is an ideal mode of operation for this application.

1. Press the λ (**Wavelength**) key to select the same wavelength (displayed) as the transmission equipment using the fiber under test.
2. Set the CMA50 so that the power unit is set to dBm by pressing the **dBm/W** key until the power units on the display reads "dBm" (see Fig. 2-1 on page 2-6).
3. Use a known good fiber optic patchcord to connect the CMA50 to the desired system connection point (transmitter output in the example in Fig. 3-3). Read and record the absolute power in dBm. (Compare this to the original or specified transmitter output power, or other pass/fail criteria.)
4. Repeat steps 1 through 3 for additional fibers.

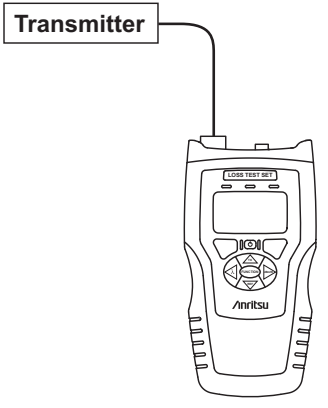



Fig. 3-3: Absolute Power Measurement

## System Attenuation (Loss) Measurements

### Local Reference Input

This method allows entering a reference value when the two units that will be referencing the test patchcords are the ones used to measure the system.

1. Use the procedure outlined in “Verifying Patchcords” on page 3-3 to verify all reference patchcords.
2. Attach the source and meter using the number of patchcords and in-line adapters required for the specific test scenario used. See “Optical Loss Measurements” (page 3-7 through page 3-12) for details.
3. Set both units to the same wavelength and then press the **TX** key on the CMA50 source. The CMA50 meter displays the coupled output power of the source in dBm. The measured level should closely match the output level specified for the source, typically around - 18 dBm for multimode LED sources and >-7 dBm for singlemode laser sources.

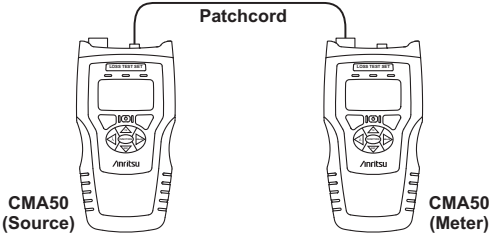


Fig. 3-4: Reference

**Note**

The reading is in dBr when there is a previously stored reference. Press the **dBm/W** key to cycle the unit to dBm.

4. Press the **REF** key on the CMA50 meter. The Reference screen appears (see Fig. 3-1 on page 3-1).
5. Press the **SAVE** softkey. The meter returns to the Measurement display which indicates 0.0 dBr (relative loss).

6. Repeat steps 1 through 5 of the Reference procedure for each wavelength to be tested, ensuring that both the optical source and meter are set to the proper wavelength.

### Remote Reference Input

As an alternative to the Local Reference method, two CMA50 Loss Test Sets can be referenced remotely. The two users can go directly to opposite ends of the system without the need to reference together at a common site. To perform system testing in this manner, substitute the following Manual Reference procedure for the Local Reference Input method (see page 3-5).

1. Use the procedure outlined in “Verifying Patchcords” on page 3-3 to verify all reference patchcords.
2. Set a reference using the patchcord to be used on the source side of the system under test. For example, by doing a loop-back if using an LTS unit.
3. This reference value needs to be communicated to the user at the power meter side of the system.
4. The user on the power meter side can then add the value from the source side patchcord to the reference value for the patchcord on the power meter side (if any). See “Manual Reference Setting” on page 3-2 for more information.

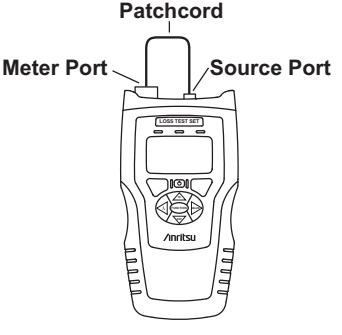



Fig. 3-5: Loop-back

## Optical Loss Measurements

This section details three different testing scenarios:

- Patch Panel to Patch Panel Test Method
- Patch Panel to Connector Test Method
- Connector to Connector Test Method

### Patch Panel to Patch Panel Test Method

Patch Panel to Patch Panel is the most commonly used test method. This procedure requires two patchcords.

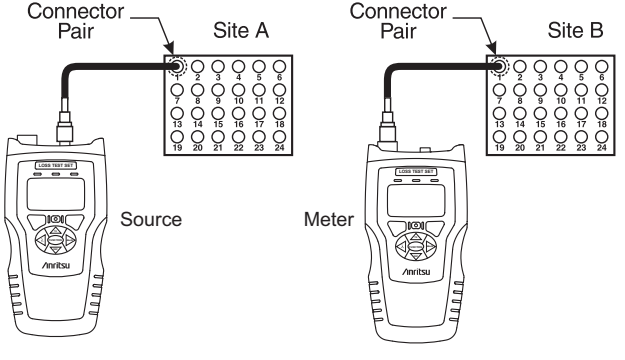



Fig. 3-6: Patch Panel to Patch Panel

1. Depending on your test setup, establish the reference, using either:
   - "Local Reference Input" (see page 3-5), with one patchcord between the source and the meter.
   - "Remote Reference Input" (see page 3-6), with one patchcord on the source side only.
2. Leave the patchcord attached to the source, disconnect the other end and attach it to the system to be tested.

**Note**

Never disconnect the patchcord end connected to the source after referencing. The coupled output level of the source may change when the patchcord is reconnected.

3. Use a second test patchcord to connect the CMA50 acting as the meter to the opposite end of the system to be tested. Power readings will be in dB and include two connector pairs and loss across the fiber.

**Note**

The system under test has two connector pairs. The reference established in step 1 does not eliminate either connector pair.

**Note**

For manual bi-directional testing reverse the source/meter roles of the two CMA50 units. Repeat this procedure, creating a new file for the second direction.

## Patch Panel to Connector Test Method

This procedure requires two patchcords and an in-line adapter.

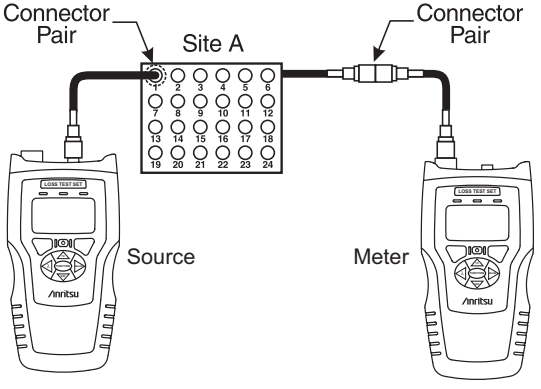



Fig. 3-7: Patch Panel to Connector

1. Depending on your test setup, establish the reference, using either:
   - "Local Reference Input" (see page 3-5), with two patchcords attached by an inline adapter.
   - "Remote Reference Input" (see page 3-6) If the source is on the patch panel side, just one patchcord on the source side and a second patchcord on the power meter side.

If the source is on the connector side, two patchcords attached by an inline adapter on the source side and no reference is necessary on the power meter side.

2. Leave the patchcords connected at both the CMA50 acting as the meter and the CMA50 acting as the source, using an in-line adapter attached to the patchcord that will be attached at the connector end of the fiber under test.

**Note**

Never disconnect the patchcord end connected to the source after referencing. The coupled output level of the source may change when the patchcord is reconnected.

3. Connect the source to one end of the system to be tested. Connect the meter to the opposite end of the system to be tested. Power readings will be in dBm and include one connector pair and loss across the fiber.

**Note**

The system under test has two connector pair only. The connector pair on the connector side is referenced out.

**Note**

For manual bi-directional testing reverse the source/meter roles of the two CMA50 units. Repeat this procedure, creating a new file for the second direction.

### Connector to Connector Test Method

This procedure requires three patchcords and two in-line adapters.

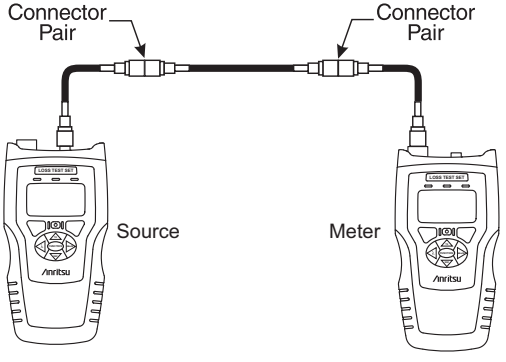



Fig. 3-8: Connector to Connector

1. Depending on your test setup, establish the reference, using either:
   - "Local Reference Input" (see page 3-5), with three patchcords attached by two inline adapters.
   - "Remote Reference Input" (see page 3-6), with two patchcords attached by one inline adapter on the source side and one patchcord on the power meter side.

2. Remove the second patchcord after the source, leaving the in-line adapters attached to the patchcords connected to the CMA50 acting as the meter and the CMA50 acting as the source. Leave the patchcords connected to the meter and source in place.

**Note**

Never disconnect the patchcord end connected to the source after referencing. The coupled output level of the source may change when the patchcord is reconnected

3. Connect the source to one end of the system to be tested. Connect the meter to the opposite end of the system to be tested. Power readings will be in dBm and include only the loss across the fiber.

**Note**

Both connector pairs are referenced out.

**Note**

For manual bi-directional testing reverse the source/meter roles of the two CMA50 units. Repeat this procedure, creating a new file for the second direction.

## Editing Power Measurement Readings

Use the following procedure to edit saved power measurement readings.

1. Press the **EDIT** softkey on the Main Measurement Display screen (see Fig. 3-9). The Browse screen (see Fig. 3-10 on page 3-14) appears with the Fiber Count number highlighted.

### Note

The EDIT softkey is only available when operating in either Power Meter Mode or Loss Test Set Mode.

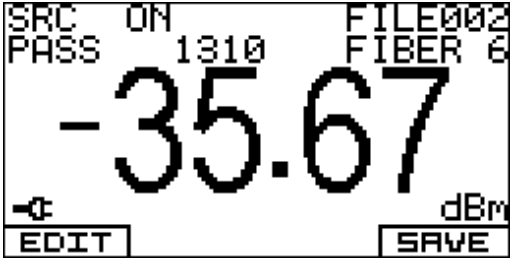



Fig. 3-9: Main Measurement Display Screen

2. Use the **Up/Down Arrow** keys to cycle through the Fiber Count number.
   - If you cycle to a Fiber Count number for which there is no power measurement value, the screen appears as shown in Fig. 3-10.
   - If you cycle to a Fiber Count number for which there is a saved power measurement reading, the screen appears as shown in Fig. 3-11.

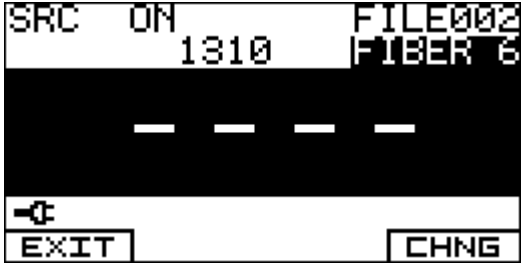



Fig. 3-10: Browse Screen

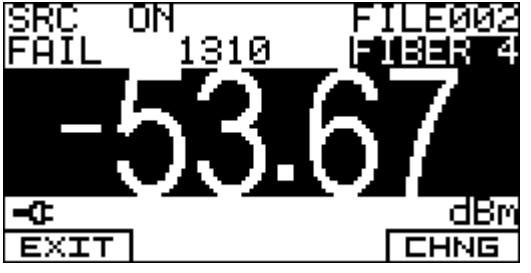



Fig. 3-11: Browse Screen with Saved Reading

3. Press the λ (**Wavelength**)/ **Left Arrow** key to cycle to the desired wavelength, if testing at more than one wavelength.
4. Press the **CHNG** (Change) softkey to continue. The Main Measurement Display screen appears (see Fig. 3-9 on page 3-13).
5. Press the **SAVE** softkey. The edited measurement is saved and the wavelength/fiber number advances.

## EZ Test Mode

EZ Test mode is an optional feature available for CMA50 Loss Test Sets. Using two similar CMA50 LTS units, (compatible source/meter wavelengths) the EZ Test mode performs automated bi-directional loss measurements on a fiber link. The two units act a “Master” and “Slave” to provide a 2-way communications path for controlling the test and passing of results for local display and storage.

### Physical Connection

EZ Test mode requires two CMA50 units, one to act as the Master and one to act as the Slave. See Fig. 3-12.

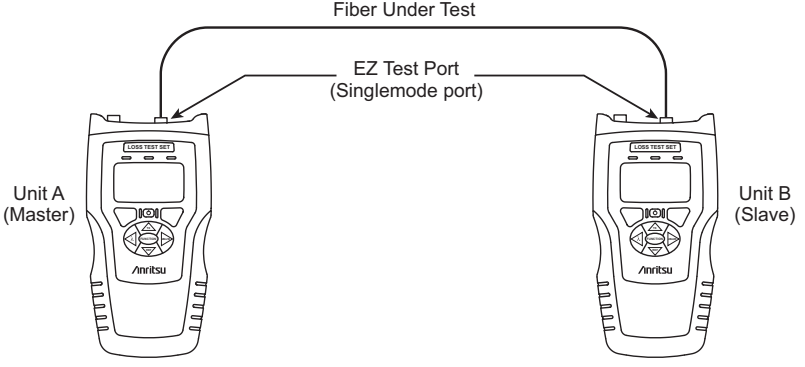



Fig. 3-12: Typical EZ Test Mode Setup

## Auto Bi-Directional Loss Measurement

1. Power up both units and then select **EZ TEST** on the Mode Select screen (see Fig. 2-10 on page 2-17).
2. The EZ Test Mode screen appears.

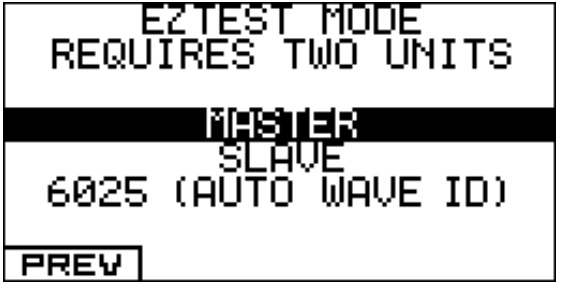



Fig. 3-13: EZ Test Mode Screen

3. On one unit, highlight **MASTER** and then press the **FUNCTION** key. The unit is now set as the Master for the test.
4. On the Second unit, highlight **SLAVE** and then press the **FUNCTION** key. The unit is now set as the Slave for the test. Both units now display the EZ Test Setup screen (see Fig. 3-14 on page 3-17).

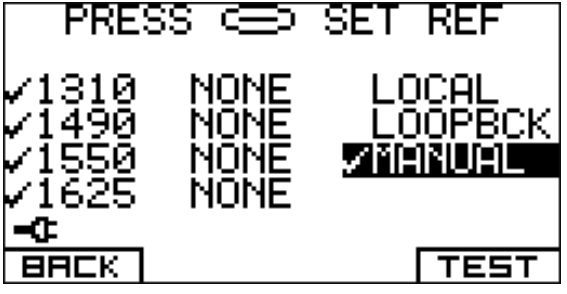



Fig. 3-14: EZ Test Setup Screen

Use this screen to select the wavelengths and type of referencing used for the test. Navigate the screen by using the **Right**, **Left**, **Up**, and **Down Arrow** keys to place the highlight in the desired position.

- **To change the wavelength selection:**
  - Move the highlight to the desired wavelength. The wavelengths are listed in the left hand column of the EZ Test Setup screen.
  - Press the **FUNCTION** key to select or clear the highlighted wavelength, depending on its current state.

### Note

Make sure that the same wavelengths are selected on both units, otherwise the EZ Test will fail to operate properly.

- **To change the reference type:**
  - Move the highlight to the desired type of reference. The reference types are listed in the right hand column of the EZ Test Setup screen.
  - Press the **FUNCTION** key to select the highlighted reference type. A Wizard for the selected reference type is launched.

5. After completing the selected reference type, press the **TEST** softkey. Depending on the unit, Master or Slave, the following screens appear.

Fig. 3-15: Connect First Fiber Screen – Master

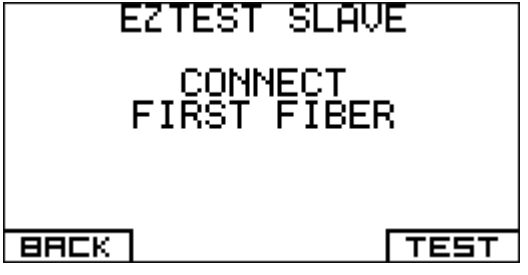



Fig. 3-16: Connect First Fiber Screen – Slave

6. Connect to the fiber under test and then press the **TEST** softkey on both units. The initial EZ Test appears (see Fig. 3-17 on page 3-19) and the link between the two units (Master and Slave) is established.

### Note

The legend at the bottom of the screen changes from “LINKING” to “LINK UP” when the link is established.

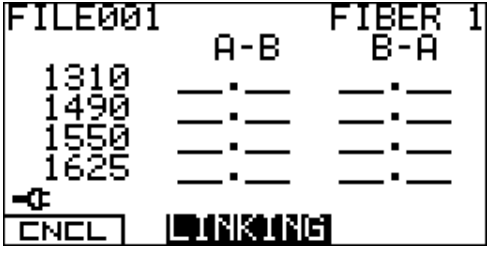



Fig. 3-17: Initial EZ Test Results Screen - Linking

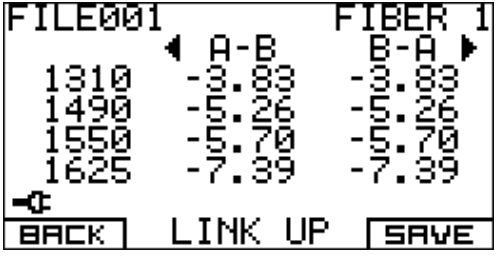



Fig. 3-18: EZ Test Results Screen - Bi-directional

7. Upon completion of the test, the bi-directional loss data (in dB units) for the current fiber is presented in the “A-B” and “B-A” columns.
8. Use the λ (**Wavelength**)/ **Left Arrow** key or the **dBm/W/ Right Arrow** key to toggle the Test Results screen to display either the bi-directional results (see Fig. 3-18) or the two-way averaged results (see Fig. 3-19 on page 3-20).

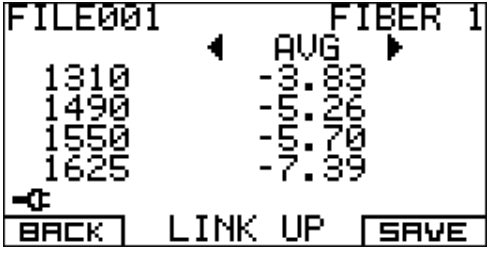



Fig. 3-19: EZ Test Results Screen - Two Way Averaged

### Note

Results that exceed the Threshold settings (see “Set Thresholds” on page 2-39) will be highlighted on the EZ Test Results screen.

9. Press the **SAVE** softkey on both units. The measurement data is saved to Mass Storage and the units prompt for the connection of the next fiber.

   The Select Next Fiber screen (see Fig. 3-20 on page 3-21) appears on the Master unit and the Please Wait for Next Fiber Number screen (see Fig. 3-21 on page 3-21) appears on the Slave unit. At this point you can use the next fiber number as displayed, or change the fiber number on the Master unit by using the Arrow keys. Use the **Left** and **Right Arrow** keys to select the desired digit and use the **Up** and **Down Arrow** keys to increment/decrement the selected digit. When you have entered the desired number, press the **NEXT** softkey. The Connect Fiber screen appears on both units prompting connection of the fiber number as set on the Master unit.

Fig. 3-20: Select Next Fiber Screen

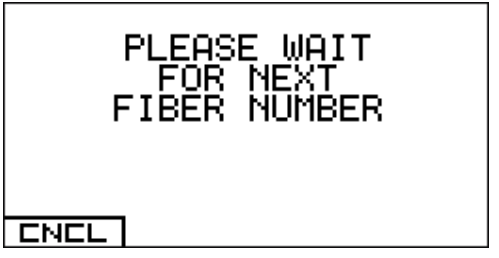



Fig. 3-21: Please Wait for Next Fiber Number Screen

### Setting References in EZ Test Mode

There are three methods of setting references for an auto bi-directional loss test in EZ Test mode: Side by Side, Loopback, and Manual. All three are accessed from the EZ Test Setup screen (see Fig. 3-14 on page 3-17). Highlight and select the desired reference type to launch a wizard used to setup the reference.

#### *Side by Side Reference*

The Side by Side reference method is ideal when referencing can be performed from a common site. This reference requires two patchcords (which will be used for the bi-directional test) and an inline adapter.

1. Follow steps 1 through 4 of the “Auto Bi-Directional Loss Measurement” procedure on page 3-16.
2. Highlight **LOCAL** on the EZ Test Setup screen (see Fig. 3-14 on page 3-17) and then press the **FUNCTION** key. The following screen appears.

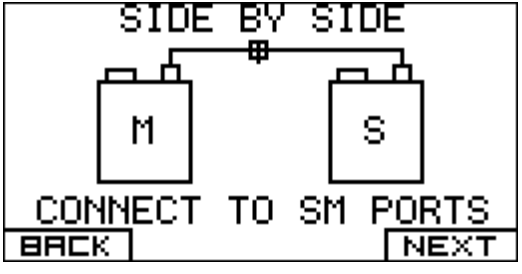



Fig. 3-22: Side by Side Wizard – Initial Screen

3. Connect the two patch cords together using the inline adapter and then connect the free ends of the patchcords to the SM (singlemode) ports on the CMA50 LTS units, as shown in the figure above.
4. Press the **NEXT** softkey on both units. The Master unit attempts to establish a link to the Slave unit, as indicated by the message “LINKING” at the bottom of the screen (see Fig. 3-23). Once the link is established the message changes to “LINK UP” (see Fig. 3-24 on page 3-23).

### Note

If communications cannot be established after several attempts, the text message displays “NO LINK”, this indicates a bad patchcord. Replace the patchcord and retry.

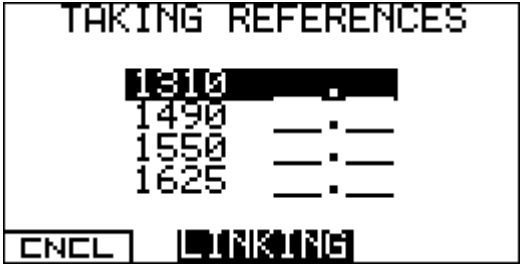



Fig. 3-23: Taking References – Linking

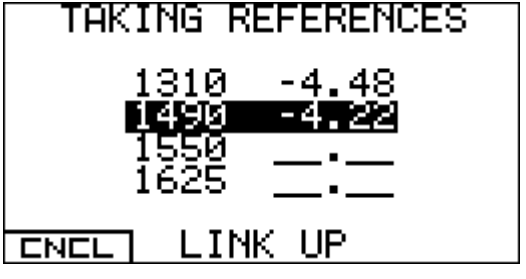



Fig. 3-24: Taking References – Link Up

Once the communication link is established, the first selected wavelength is highlighted and the reference power value is posted on the display. Each wavelength in turn is highlighted and the applicable reference is displayed.

5. When reference values for all test wavelengths are established, the References Saved screen appears (see Fig. 3-25 on page 3-24). Power down both units and send each to its respective site.

### Note

Do not disconnect the patchcord end connected to the source after referencing. The coupled output level of the source may change when the patchcord is reconnected.

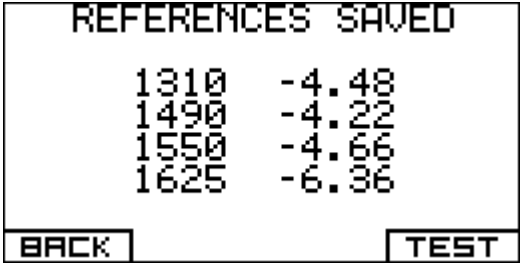



Fig. 3-25: References Save Screen

***Loopback Reference***

The Loopback reference method requires two short patchcords (3 meters or less), one for each unit (Master and Slave). This method is useful when the two units (Master and Slave) are at different locations.

1. Follow steps 1 through 4 of the “Auto Bi-Directional Loss Measurement” procedure on page 3-16.

2. Highlight **LOOPBCK** on the EZ Test Setup screen (see Fig. 3-14 on page 3-17) and then press the **FUNCTION** key. The initial Loopback wizard screen appears (see Fig. 3-26).

   Use one of the patchcords to connect the Power Meter port to the SM (singlemode) port on the Master unit. Using the other patchcord, repeat on the Slave unit.

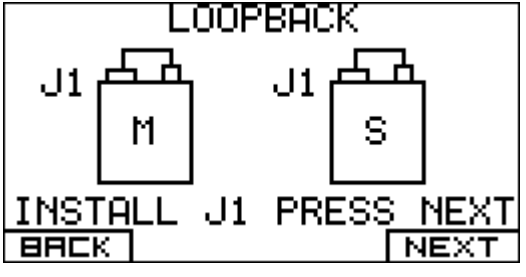



Fig. 3-26: Loopback Wizard – Initial Screen

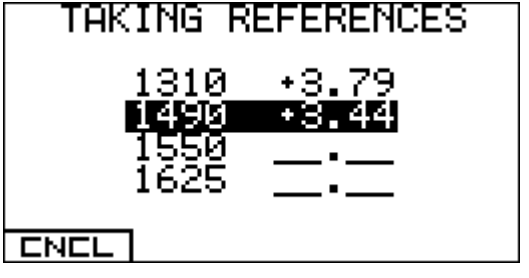



Fig. 3-27: Loopback Wizard – Taking References

3. Press the **NEXT** softkey on both units. The software on both the Master and the Slave establish reference readings for the selected wavelengths.

   The first selected wavelength is highlighted and the reference power value is posted on the display. Each wavelength in turn is highlighted and the applicable reference is displayed (see Fig. 3-27).

4. When reference values for all test wavelengths are established, the References Saved screen appears (see Fig. 3-25 on page 3-24). Continue the bi-directional measurement by pressing the **TEST** softkey on both units or press the **BACK** softkey to return to the initial Loopback wizard screen to reestablish the reference values if they are not acceptable.

### Note

Disconnect the patchcord from the Power Meter port only. Do not disconnect the patchcord end connected to the source after referencing. The coupled output level of the source may change when the patchcord is reconnected.

### *Manual Reference*

Manual referencing allows editing of the current reference values, and also provides a means of clearing all currently displayed reference values.

1. Follow steps 1 through 4 of the "Auto Bi-Directional Loss Measurement" procedure on page 3-16.
2. Highlight **MANUAL** on the EZ Test Setup screen (see Fig. 3-14 on page 3-17) and then press the **FUNCTION** key. The Manual Reference wizard screen appears.

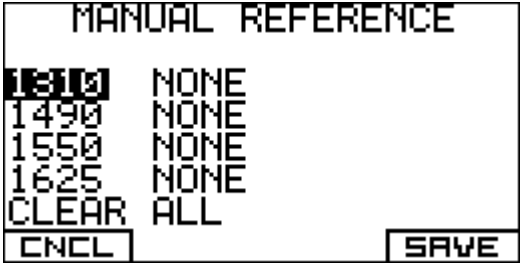



Fig. 3-28: Manual Reference Wizard – Initial Screen

**Note**

If there were manual reference values stored from a previous test, those values replace the "NONE" designators shown in Fig. 3-28.

3. Use the **Up** and **Down Arrow** keys to highlight the first desired wavelength, if not already highlighted.

4. Press the **FUNCTION** key. The highlight moves to the last digit of the reference value for the selected wavelength. If there was no reference for the wavelength, the text “NONE” changes to “-00.00”, with the highlight on the last “0”.

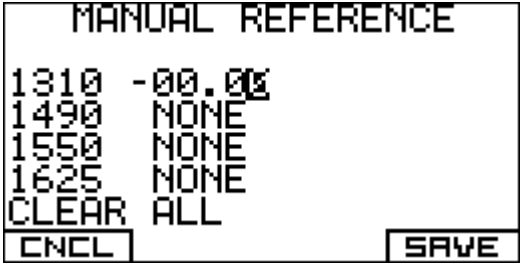



Fig. 3-29: Editing the First Reference Value

5. Use the **Up** and **Down Arrow** keys to increment/decrement the selected digit.
6. Use the **Left** and **Right Arrow** keys to position the highlight on the next desired digit.
7. When the desired reference value is entered, press the **FUNCTION** key. The reference value is set and the highlight moves back to the Wavelength column.
8. Repeat steps 3 through 7 until all desired reference values are entered on both units (Master and Slave).
9. Press the **SAVE** softkey to save the reference values and return to the EZ Test Setup screen (see Fig. 3-14 on page 3-17).

## EZ Test 6025 (Auto Wavelength ID) Mode

In EZ Test 6025 (Auto Wave ID) mode one unit is configured as a transmitter. A second CMA50, acting as a power meter (receiver), detects the transmitter signal and selects the appropriate calibration and reference levels, and displays the wavelength measurements while simultaneously updating results.

### Physical Connection

6025 (Auto Wave ID) mode requires two CMA50 units, one to act as the transmitter (light source) and one to act as the receiver (power meter). See Fig. 3-30.

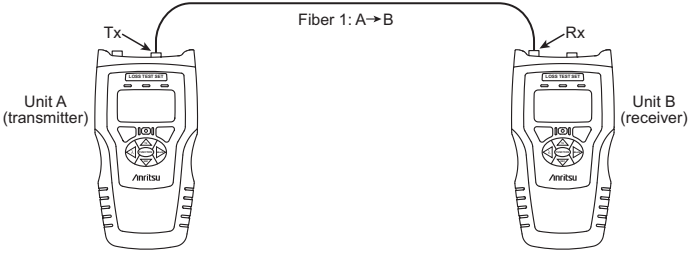



Fig. 3-30: Typical Auto Wavelength ID Setup

### Note

The unit which is acting as the receiver is the unit that will save readings. You must insure that the **A B**, **B A** softkey is set correctly before starting to save measurement data.

## Setting References in 6025 (Auto Wave ID) Mode

References for 6025 (Auto Wave ID mode testing are set in the same manner as references in standard Power Meter mode. See “Setting and Clearing Reference Readings” on pages 3-1 through 3-2 for details.

## 6025 (Auto Wave ID) Mode Test Operation

1. Power up both units and select **EZ TEST** on the Mode Select screen (see Fig. 2-10 on page 2-17).
2. The EZ Test Mode screen appears. Highlight **6025 (AUTO WAVE ID)** and then press the **FUNCTION** key.

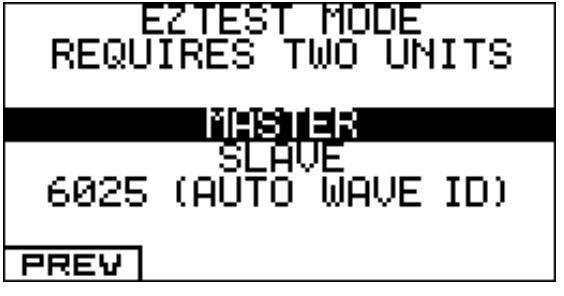



Fig. 3-31: EZ Test Mode Screen

3. The Wavelength Selection screen appears with it’s default setting (all available wavelengths selected). Clear any wavelengths that you do not want to include in the test.

**Note**

Make sure that the same wavelengths are selected on both units.

4. Press the **TEST** softkey on both units. The following screen appears.

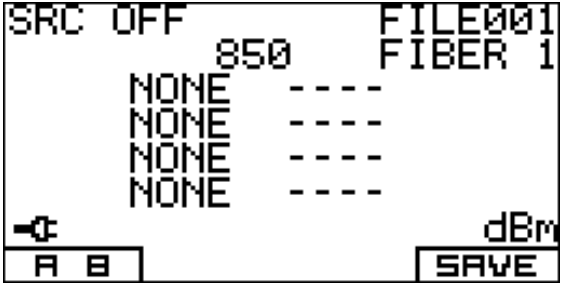



Fig. 3-32: 6025 (Auto Wave ID) Mode Initial Test Screen

5. Make sure that unit acting as the receiver is set to the correct test direction, as this is the unit that saves the readings. Toggle the **Left** softkey to set the test direction to either **A B** or **B A**.
6. Attach the CMA50 transmitter (source) unit to one end of the fiber under test.
7. Attach the CMA50 receiver (meter) unit to the other end of the fiber under test.
8. Press the **TX** key on the CMA50 transmitter unit. The display should be similar to the one shown in Fig. 3-33 on page 3-32.

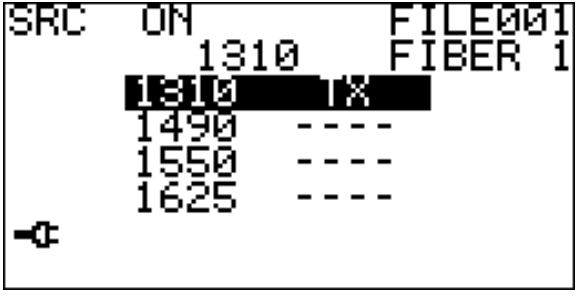



Fig. 3-33: 6025 Mode – Transmitter Display

The current wavelength is highlighted and followed by the TX indicator. The unit will continually cycle through the selected wavelengths.

9. The unit acting as the receiver displays the currently detected wavelength, followed by the measured power level. The wavelength and power readings are highlighted in real time. The unit's display will appear similar to the one shown in Fig. 3-34 on page 3-33.

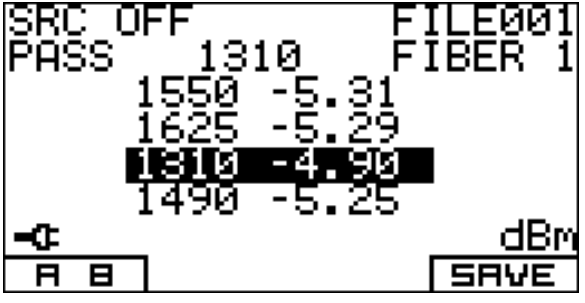



Fig. 3-34: 6025 Mode – Receiver Display

The unit will cycle through all wavelengths continuously, *without advancing to the next fiber.*

10. To advance to the next fiber, save the current measurement. This will cause the unit to advance to the next Fiber Count.

    Measurement files can be loaded on to the CMA50 for viewing and editing. See “Load File” and “Editing a File” on pages 2-29 through 2-31 for details. Measurement files can also be loaded into NetWorks/OTDR and TraceView for viewing and further processing on a PC.

### Note

The default storage mode for 6025 mode is **Cycle λ, Then Fiber**. This mode is used regardless of the current Storage Mode setting.

## Optical Return Loss Mode

Optical Return Loss (ORL) mode requires that you collect and save an Incident Power value and then a Mandrel-wrap reference value per the selected wavelengths for the current test. These two values, which are stored in the unit, are required in order to provide accurate ORL measurement value, are established by the ORL Reference wizard (see details below).

### Note

Once the Incident Power value and Mandrel-wrap reference values have been entered, subsequent ORL tests can be conducted using the "Quick ORL Test" as detailed on page 3-41, however for the best possible test results use of the Standard ORL test is recommended. In addition, you must use the Standard ORL test for the first time ORL test when using a new unit, or for the first test after upgrading the unit's applications software.

ORL mode requires a CMA50 Loss Test Set equipped with both Option B (EZ Test) and Option O (ORL).

### Standard ORL Test

Use the following procedure when performing the initial ORL Test with a CMA50.

1. Power up the CMA50 Loss Test Set, select **ORL** on the Mode Select screen (see Fig. 2-10 on page 2-17) and then press the **FUNCTION** key. The first screen of the ORL Reference wizard appears. The number of wavelengths displayed on this screen varies with the configuration of the unit's light source. The example in Fig. 3-35 is of a quad wavelength unit.

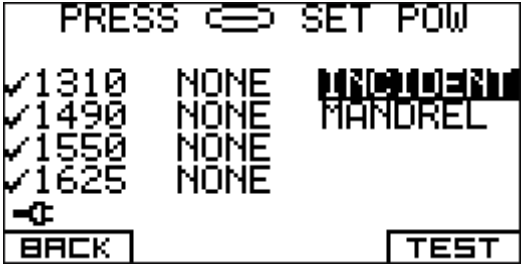



Fig. 3-35: ORL Reference Wizard – Initial Screen

2. Select the desired test wavelengths by pressing the **Left Arrow** key. The ORL Wavelength Selection screen appears (see Fig. 3-36 on page 3-35) with the first wavelength highlighted. If the desired wavelengths are already selected, proceed to step 6

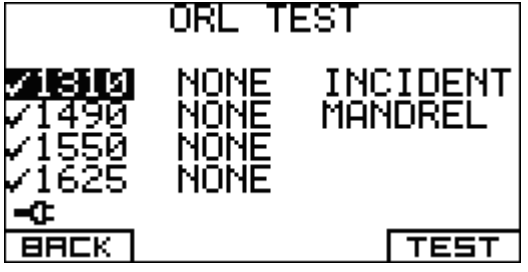



Fig. 3-36: ORL Wavelength Selection Screen

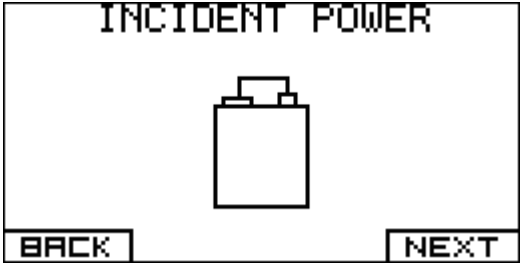



Fig. 3-37: Incident Power Setup Diagram Screen

3. Use the **Up** and **Down Arrow** keys to position the highlight on the desired wavelength and then press the **FUNCTION** key to select (place a check mark to the left) or clear (remove the check mark) the highlighted wavelength.
4. Repeat step 3 until all desired wavelengths are selected.
5. Press the **Right Arrow** key to return to the first screen of the ORL Reference wizard (see Fig. 3-35 on page 3-34).
6. Use the **Up** or **Down Arrow** key to highlight **INCIDENT**, if not already highlighted.

7. Press the **TEST** softkey, the Incident Power setup diagram screen appears (see Fig. 3-37). Attach a patchcord between the Power Meter port and the SM (singlemode) port, as shown in the diagram.

### Note

Make sure that the end of the patchcord connected to the SM (singlemode) port has an angle-polished connector.

8. Press the **NEXT** softkey, Incident Power collection begins for the selected wavelengths. The reading at each selected wavelength is rated as either GOOD, FAIR, or POOR. Reading for each wavelength updates at about one second intervals. When you achieve the desired readings (either FAIR or GOOD at all selected wavelengths), press the **SAVE** softkey to stop collection (see Fig. 3-38) and advance to the Mandrel Reference Setup Diagram screen.

### Note

The SAVE softkey is not available until incident power readings are displayed for all selected wavelengths

### Note

POOR readings are highlighted (see Fig. 3-38 on page 3-37). To correct POOR readings; press the **CNCL** softkey (to return to the Incident Power Setup Diagram screen), clean the connections and then press the **NEXT** softkey to repeat the Incident Power reference. If the readings still register as POOR, replace the patchcord.

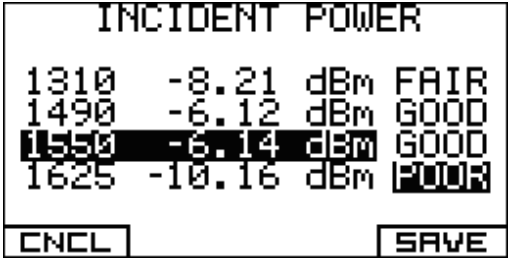



Fig. 3-38: Incident Power Screen with SAVE Softkey

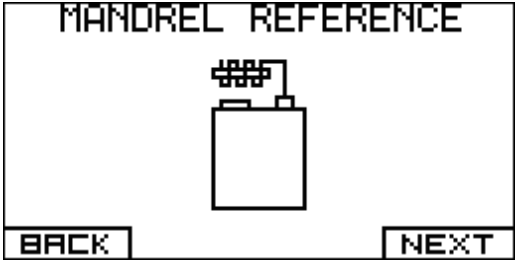



Fig. 3-39: Mandrel Reference Setup Diagram Screen

9. Disconnect the patchcord from the Power Meter port as shown in Fig. 3-39. Do not disturb the connection at the SM (singlemode) port.
10. Wrap the patchcord around the mandrel (provided with the CMA50 ORL Loss Test Set), typically 6 to 8 wraps (see Fig. 3-40).

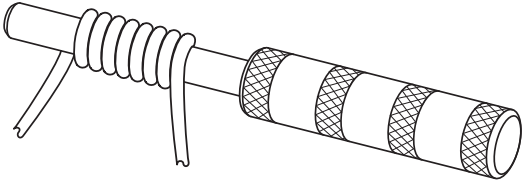


Fig. 3-40: Mandrel Wrap

11. Press the **NEXT** softkey, the Mandrel Reference collection begins for the selected wavelengths. The reading at each selected wavelength is rated as either GOOD, FAIR, or POOR. Reading for each wavelength updates at about one second intervals. When you achieve the desired readings (either FAIR or GOOD at all selected wavelengths), press the **SAVE** softkey to stop collection (see Fig. 3-41).

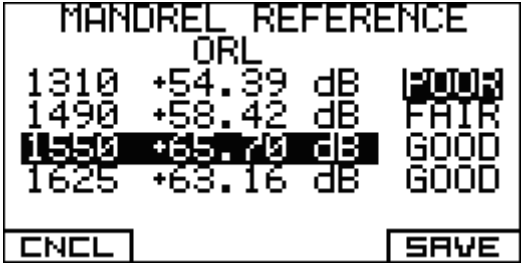



Fig. 3-41: Mandrel Reference Screen with SAVE Softkey

**Note**

Properly mandreled connection values should meet APC connection specs.

**Note**

The SAVE softkey is not available until Mandrel reference readings are displayed for all selected wavelengths.

### Note

To correct a POOR mandrel reference, make one or two additional wraps of the patchcord around the mandrel. If that fails to clear the POOR readings; press the **CNCL** softkey and then press the **BACK** softkey to return to the initial screen of the ORL Reference wizard (see Fig. 3-35 on page 3-34), clean the connection at the SM (singlemode) port and then press the **TEST** softkey to repeat the Incident Power reference and the Mandrel reference (start at Step 7 on page 3-36). If the readings still register as POOR, replace the patchcord and start again at Step 7 on page 3-36.

12. ORL measurements are collected and displayed for the selected wavelengths. The ORL measurement for each wavelength updates at about one second intervals. ORL measurements that exceed the values set on the ORL Threshold screen (see Fig. 2-38 on page 2-43) display a "FAIL" flag to the right of the reading (see Fig. 3-42). Press the **SAVE** softkey to stop the data collection and advance to the Save File screen.

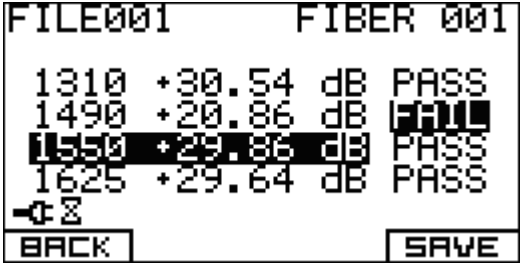



Fig. 3-42: ORL Measurement Results Screen

Fig. 3-43: Save File Screen

**Note**

The SAVE softkey is not available until ORL readings are displayed for all selected wavelengths

13. Connect the patchcord to the next fiber to be tested and then press the **SAVE** softkey to continue. The Fiber Count increments to the next number. Repeat this step until all fibers for the current file are tested and saved.

**Note**

The current Fiber count number can be edited while in the ORL Measurement Results screen. See “Editing the Fiber Count Number in ORL Mode” for details.

14. To close the current file, press the **BACK** softkey to return to the initial screen of the ORL Reference wizard screen (see Fig. 3-35 on page 3-34), and then press the **FUNCTION** key. The Close File - End Test screen appears. Press the **SAVE** softkey to close the current file and return to the initial screen of the ORL Reference wizard screen. At this point you can either press the BACK softkey to return to the Main Menu screen (see page 2-16), or press the **TEST** softkey to start a new ORL test.

## Quick ORL Test

### Note

Use this procedure only when the Incident Power and Mandrel-wrap reference values stored on the unit are considered adequate to perform your current ORL testing. If not, use the procedure outlined in "ORL mode requires a CMA50 Loss Test Set equipped with both Option B (EZ Test) and Option O (ORL)." starting on page 3-34.

1. Power up the CMA50 Loss Test Set, select **ORL** on the Mode Select screen (see Fig. 2-10 on page 2-17) and then press the **FUNCTION** key. The first screen of the ORL Reference wizard appears (see Fig. 3-35 on page 3-34).
2. Press the **Left Arrow** key to move the highlight to the first wavelength listed.
3. Using the **Up** and **Down Arrow** keys and the **FUNCTION** key to select the desired wavelengths, or skip to step 4 if the desired wavelengths are already selected.
4. Press the **TEST** softkey to start the test.

## Editing the Fiber Count Number in ORL Mode

This feature allows you to overwrite an existing reading or to store the current reading into the applicable fiber count slot.

**To edit the Fiber Count number:**

1. Once the ORL Measurement Results screen (see Fig. 3-42 on page 3-39) displays values for all the selected wavelengths, press the **FUNCTION** key.
2. The last digit of the Fiber Count indicator (located in the upper right corner of the display) is highlighted. Use the **Left** and **Right Arrow** keys to position the highlight on the desired digit and then use the **Up** and **Down Arrow** keys to increment or decrement the highlighted digit.

3. When you have changed all of the desired digits, press the **SAVE** softkey. The current ORL measurement values are saved and the Fiber Count increments to the next number.

**Note**

If you press the **CNCL** softkey, you will advance to the next Fiber Count number without saving the current ORL measurement values.

## Visual Fault Locate Mode

Visual Fault Locate (VFL) mode is available on CMA50 units equipped with the Visual Fault Locator option. Connecting a fiber to the Visual Fault Locator (VFL) allows the unit to find breaks or severe bends in the fiber. The VFL produces a visible red glow at the break or bend.

### VFL Testing

1. Remove the dust cap from the VFL port. See Fig. 1-3 on page 1-4 for the location of the VFL port.
2. Connect the fiber under test to the VFL port.

**Note**

The connector of the fiber under test must have a 2.5mm ferrule to insure a proper fit into the VFL port universal connector adapter.

3. Power up the CMA50, if not already operating.
4. Highlight **VFL** on the Mode Select screen.
5. Press the **FUNCTION** key. The VFL screen appears (see Fig. 2-8 on page 2-15).

6. Press the **TX** key to start the VFL.
   - Press the **TX** key once to activate CW (continuous wave) mode.
   - Press and hold the **TX** key for two (2) seconds to switch to the Modulated mode (2Hz).
7. Press the **TX** key again to turn off the VFL.

## PING Test

The PING test is accessed by selecting NETWORK TESTING on the Main Menu screen (see Fig. 2-9 on page 2-16).

### Note

You cannot select the NETWORK TESTING menu item until you have selected 10/100 Ethernet on the Communications Port screen (see Fig. 2-31 on page 2-35). The 10/100 Ethernet menu selection is only accessible on units equipped with the N option (Network Test).

#### *To perform PING testing*

1. Set 10/100 Ethernet as the current Communications port, if not already selected. See either "First Time 10/100 Ethernet Connection (Direct peer to peer connection)" on page 4-19 or "Normal Ethernet Operation" on page 4-24 for details on how to set up the 10/100 Ethernet connection.
2. Highlight **NETWORK TESTING** on the Main Menu screen (see Fig. 2-9 on page 2-16).
3. Press the **FUNCTION** key, PING Test screen appears. See Fig. 3-44 on page 3-44.

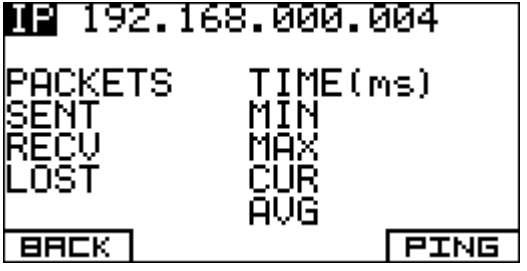



Fig. 3-44: PING Test Screen

4. Edit the IP address, if necessary.
   a. Press the **FUNCTION** key. The highlight moves to the first digit of the IP address.
   b. Use the **Up/Down Arrow** keys to increment/decrement the digit.
   c. Use the **Left/Right Arrow** keys to move the highlight to the next desired digit.
   d. Repeat steps 4b and 4c until the desired IP address is displayed.
   e. Press the **FUNCTION** key. The highlight returns to the IP heading.
5. Press the **PING** softkey to start the test. The test results cycle on the screen.
6. Press the **CNCL** softkey to stop the PING test.
7. Press the **BACK** softkey again to return to the Main Menu screen.

# Chapter 4: Network Connections

The CMA50 can communicate to a PC over its USB port or (optional) 10/100 Ethernet port using TCP/IP protocol. You must first establish a network connection between the PC and the CMA50 before you attempt to download data files or perform a software upgrade. Depending on the function to be performed and the physical connection made to the CMA50, select the desired port on the Communication Ports screen:

- USB DRIVE
- USB (TCP/IP)
- 10/100 ETHERNET

See “Communications” on page 2-35 for details on accessing the Communication Ports screen.

## USB Drive

The USB Drive feature allows Power Meter and ORL files to be transferred from the CMA50 to a PC using a standard USB drive interface. In addition, this feature also provides an simplified method for installing software upgrades.

## Accessing the USB Drive

Access to the USB drive is obtained when the unit is connected to the PC via the “A to mini-B” USB cable. The cable is supplied as part of the CMA50 Communications Accessory Kit.

**To Auto-Detect the USB Drive:**

1. Connect the “mini-B” end of the USB cable to USB port at the base of the CMA50 (see Fig. 1-5 on page 1-6).
2. Connect the “A” end of the USB cable to the PC.
3. If the CMA50 is currently performing a measurement, the measurement continues until it reaches its conclusion. USB Mode screen (see Fig. 4-1) appears on the unit followed by the Removable Disk window (see Fig. 4-2 on page 4-3) on the PC.
   OR –
   If you have just powered ON the CMA50, the USB Mode screen will be the first screen displayed after the Splash screen, followed by the Removable Disk window on the PC.

Fig. 4-1: USB Mode Screen

### Note

If the unit in use does not auto-detect the USB drive, see “To manually access the USB Drive:” on page 4-4.

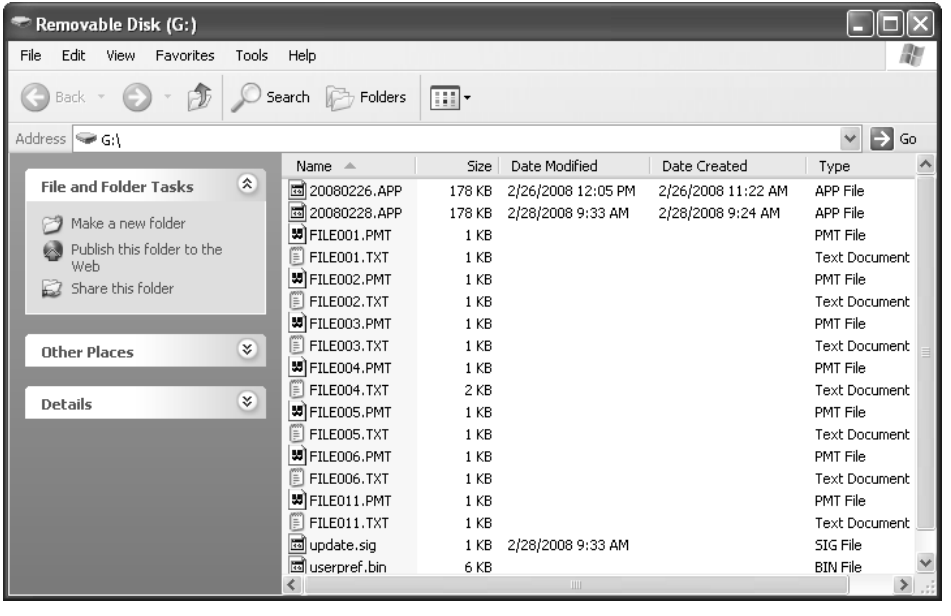



Fig. 4-2: Removable Disk Window

Use the following procedure to manually detect the USB drive.

**To manually access the USB Drive:**

1. Connect the “mini-B” end of the USB cable to USB port at the base of the CMA50 (see Fig. 1-5 on page 1-6).
2. Connect the “A” end of the USB cable to the PC.
3. If the CMA50 is currently performing a measurement wait until the measurement concludes and then press the **FUNCTION** key to access the Main Menu screen (see Fig. 2-9 on page 2-16).
   OR –
   If you have just powered ON the CMA50, wait until the Mode Select screen appears (see Fig. 2-10 on page 2-17) and then press the **MENU** softkey to access the Main Menu screen.
4. Highlight **COMMUNICATIONS** and then press the **FUNCTION** key. The Communications Port screen appears (see Fig. 2-31 on page 2-35).
5. Highlight **USB DRIVE**, if not already highlighted and then press the **FUNCTION** key.
6. The USB Mode screen (see Fig. 4-1 on page 4-2) appears on the CMA50, followed shortly by the Removable Disk window on the PC (see Fig. 4-2 on page 4-3).

### Note

If a file is currently opened when the USB Drive is selected, the Close File screen (see Fig. 2-16 on page 2-24) appears. Once the file is closed, the USB Mode screen appears (see Fig. 4-1 on page 4-2).

## USB (TCP/IP) Connection

### First Time USB (TCP/IP) Connection

#### Note

A USB connection between the CMA50 and a PC requires a “A to mini-B” cable. This cable is supplied as part of the CMA50 Communications Accessory Kit.

***On the CMA50***

1. Connect the “mini-B” end of the USB cable to USB port at the base of the CMA50 (see Fig. 1-5 on page 1-6).
2. Connect the “A” end of the USB cable to the PC.
3. If the CMA50 is currently in a measurement mode, continue with the measurement until you reach the results screen for the test; then press the **FUNCTION** key on the CMA50. When the Main Menu screen appears (see Fig. 2-9 on page 2-16) continue at step 4
   OR –
   If you have just powered ON the CMA50, press the **MENU** softkey and then continue at step 4.
4. Press the **Up/Down Arrow** keys to highlight **COMMUNICATIONS**.
5. Press the **FUNCTION** key, the Communications Ports screen appears (see Fig. 2-31 on page 2-35).
6. Use the **Up/Down Arrow** keys to highlight the **USB (TCP/IP)** line, if necessary.
7. Press the **FUNCTION** key, the Networks Settings screen appears (see Fig. 4-3 on page 4-6).

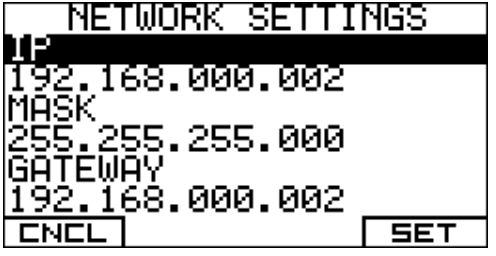



Fig. 4-3: Network Settings Screen

8. If the NETWORK SETTINGS (IP address, MASK, and GATEWAY) are correct, proceed to step 10. In most cases the default settings are sufficient.

   **To change the Network Settings:**

   a. Use the **Up** and **Down Arrow** keys to highlight the desired heading (IP, MASK, or GATEWAY).
   b. Press the **FUNCTION** key, the highlight moves from the selected heading to the first digit of the address.
   c. Use the **Up** and **Down Arrow** keys to increment/decrement the highlighted digit.
   d. Use the **Left** and **Right Arrow** keys to move the highlight to the next desired digit of the selected address.
   e. When you have finished editing the selected address, press the **FUNCTION** key. The highlight returns to the selected address heading.

9. Repeat steps 8a through 8e until all desired address fields have been modified.

10. Press the **SET** softkey, the Please Wait screen appears, and then the Communications Ports screen appears, with a check mark in front of the USB (TCP/IP) menu item. The current IP address is also displayed.
11. Press the **BACK** softkey, the Main Menu screen appears, (see Fig. 2-1 on page 2-6).

### *On the PC*

1. Place the software CD from the Communications Accessory Kit in the PC's CD drive.
2. The Windows operating system should detect a new USB device as shown in Fig. 4-4, below.

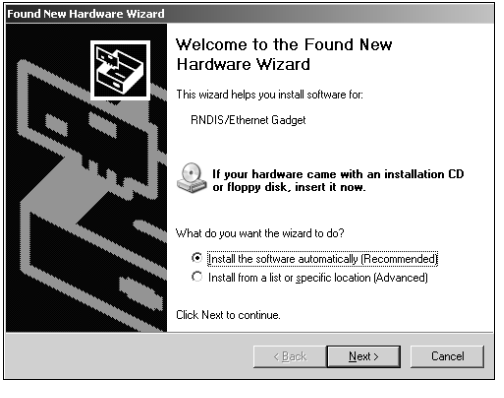



Fig. 4-4: Found New Hardware Wizard – Initial Window

3. Click the **Next>** button, a warning message appears (see Fig. 4-5).

Fig. 4-5: Hardware Installation Warning Message.

4. Click the **Continue Anyway** button, the next Wizard screen appears (see Fig. 4-6 on page 4-9).

Fig. 4-6: Found New Hardware Wizard – Completed

5. Click the **Finish** button. The Wizard finishes the driver installation.
6. Re-boot the PC if prompted by Windows.

### *From the Windows Desktop*

7. Right click on **My Network Places** and then select **Properties** from the menu.

8. Right click on the **Local Area Connection** for the USB Ethernet/RNDIS Gadget (Local Area Connection 2 in Fig. 4-7, below).

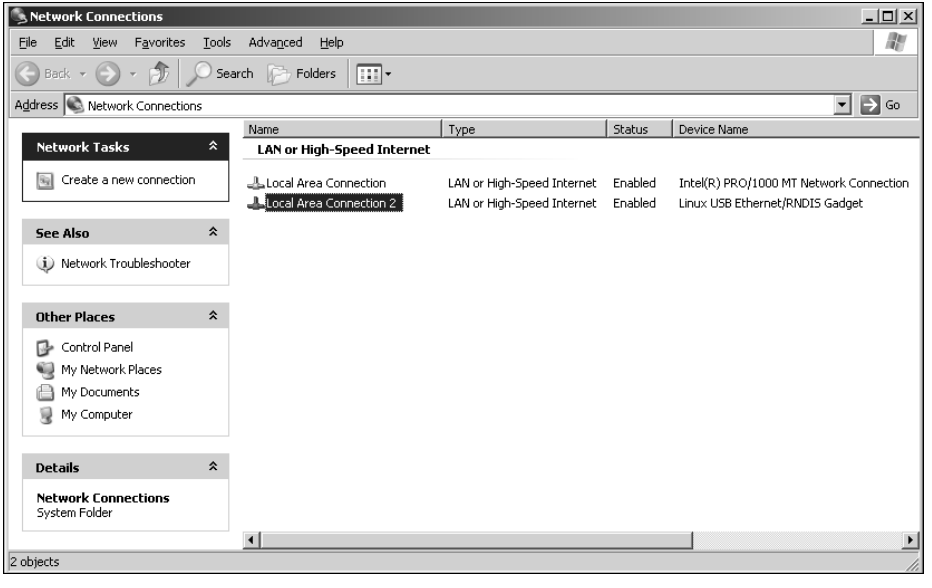



Fig. 4-7: Network Connections Window – USB Ethernet/RNDIS Gadget Selected

9. Select **Properties** from the menu, the Local Area Connection Properties dialog appears (see Fig. 4-8, below).

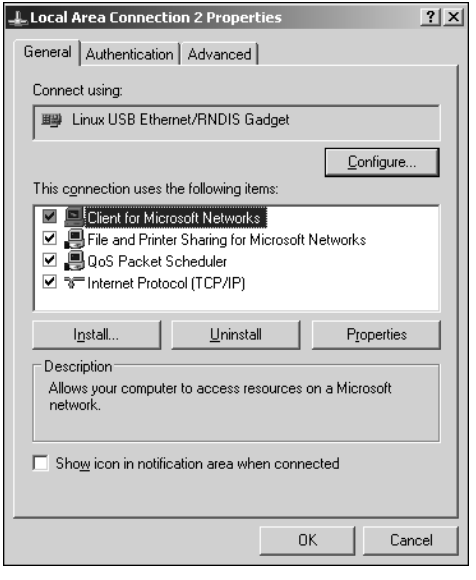



Fig. 4-8: Local Area Connection 2 Properties Dialog

10. Select **Internet Protocol (TCP/IP)** from the list. Scroll down the list, if necessary.
11. Click the **Properties** button, the Internet Protocol (TCP/IP) Properties dialog appears (see Fig. 4-9, below).

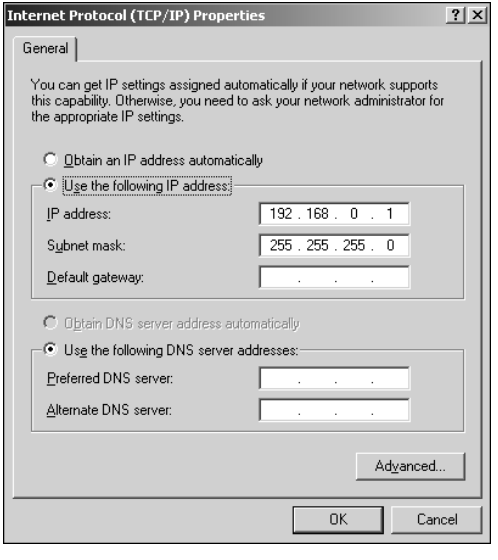



Fig. 4-9: Internet Protocol (TCP/IP) Properties Dialog

12. Select **Use the following IP address**.
13. Enter an IP address that is compatible (on the same network) as the address specified on the CMA50. If the default address (192.168.0.2) was used on the CMA50, then 192.168.0.1 is recommended on the PC.
14. Click the **OK** button, the Internet Protocol (TCP/IP) Properties dialog closes.
15. Click the **OK** button on the Local Area Connection Properties dialog, the dialog closes.
16. Close the Networks Connections window.

### *Test the Network Connection*

- Open your web browser (Internet Explorer, for example) and enter `ftp://192.168.0.2` in the Address line, and then press the **Enter** key. See Fig. 4-10 on page 4-14.

**Note**

If a different IP address was specified on the CMA50 then substitute that address for the address in the bullet above.

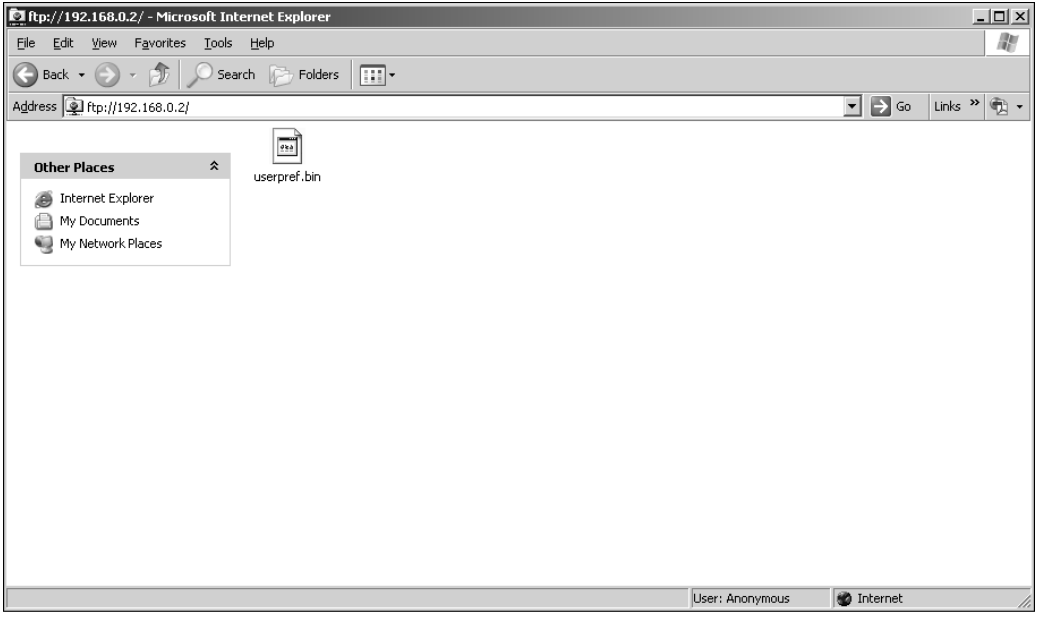



Fig. 4-10: Broswer with ftp Address

## Normal USB (TCP/IP) Operation

Use the following procedure for all subsequent USB (TCP/IP) operations after configuring the USB (TCP/IP) network connection (as outlined in "First Time USB (TCP/IP) Connection" on page 4-5).

### *ON the CMA50*

1. Connect the "mini-B" end of the USB cable to USB port at the base of the CMA50 (see Fig. 1-5 on page 1-6).
2. Connect the "A" end of the USB cable to the PC.
3. If the CMA50 is currently in a measurement mode, continue with the measurement until you reach the Results screen for the test; then press the **FUNCTION** key on the CMA50. When the Main Menu screen appears (see Fig. 2-9 on page 2-16) continue at step 4
   OR –
   If you have just powered ON the CMA50, press the **MENU** softkey and then continue at step 4.
4. Press the **Up/Down Arrow** keys to highlight **COMMUNICATIONS**.
5. Press the **FUNCTION** key, the Communications Ports screen appears (see Fig. 2-31 on page 2-35).
6. Use the **Up/Down Arrow** keys to highlight the **USB (TCP/IP)** line, if necessary.
7. Press the **FUNCTION** key, the Networks Settings screen appears (see Fig. 4-3 on page 4-6).
8. Press the **SET** softkey, the Please Wait screen appears, and then the Communications Ports screen appears, with a check mark in front of the USB (TCP/IP) menu item. The current IP address is also displayed.

***On the PC***

- Open your web browser (Internet Explorer, for example) and enter `ftp://192.168.0.2` in the Address line, and then press the **Enter** key. See Fig. 4-10 on page 4-14.

**Note**

If a different IP address was specified on the CMA50, then substitute that address for the address in the bullet above.

## 10/100 Ethernet Connection

### 10/100 Ethernet LAN Connection via DHCP (automatic IP address assignment)

**Note**

Automatic IP address assignment (DHCP) requires the LAN to which the CMA50 is connected to support DHCP services.

***On the CMA50***

1. Connect one end of the Ethernet cable to 10/100 Ethernet port at the base of the CMA50 (see Fig. 1-5 on page 1-6).
2. Connect the remaining end of the Ethernet cable to the LAN port.
3. If the CMA50 is currently in a measurement mode, continue with the measurement until you reach the Results screen for the test; then press the **FUNCTION** key on the CMA50. When the Main Menu screen appears (see Fig. 2-9 on page 2-16) continue at step 4
   OR –
   If you have just powered ON the CMA50, press the **MENU** softkey and then continue at step 4.
4. Press the **Up/Down Arrow** keys to highlight **COMMUNICATIONS**.

5. Press the **FUNCTION** key, the Communications Ports screen appears (see Fig. 2-31 on page 2-35).
6. Use the **Up/Down Arrow** keys to highlight the **10/100 Ethernet** line.

### Note

The 10/100 Ethernet selection is only accessible if the CMA50 is equipped with the N option (Network Test).

7. Press the **FUNCTION** key, the Set IP, Mask, Gateway screen appears (see Fig. 4-11 on page 4-17).

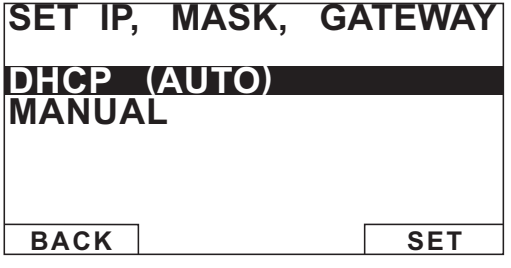



Fig. 4-11: Set IP, Mask, Gateway Screen

8. Press the **Up/Down Arrow** keys to highlight the **DHCP (AUTO)** line.
9. Press the **FUNCTION** key. The PLEASE WAIT message appears while the CMA50 is requesting an IP address from the LAN.

If an IP address is successfully obtained, the NETWORK SETTINGS screen will be displayed and the IP, MASK, and GATEWAY fields will be automatically filled in.

**Note**

Take note of the IP address, as it is needed later (see "On the PC" on page 4-18).

If an IP address is not obtained, the message NO SERVER/SERVICE is displayed. Press the **OK** softkey to continue, using the previous IP address, or press the **CNCL** softkey to return to the Communications Ports screen (see Fig. 2-31 on page 2-35).

10. To accept the IP, MASK, and GATEWAY settings, press the **SET** softkey. A PLEASE WAIT message will appear for a few moments. Otherwise press the **CNCL** softkey and no network connection will be established.

## Test the Network Connection

### *On the PC*

- Open your web browser (Internet Explorer, for example) and enter `ftp://w.x.y.z` in the Address line, where `w.x.y.z` is the IP address supplied by the LAN (see Step 9 on page 4-17), and then press the **Enter** key. You should see one or more files in the browser window (see Fig. 4-10 on page 4-14).

## First Time 10/100 Ethernet Connection (Direct peer to peer connection)

### Note

Direct connection of the CMA50 10/100 Ethernet port to a PC 10/100 Ethernet port requires an Ethernet crossover cable.

***On the CMA50***

1. Connect one end of the Ethernet crossover cable to 10/100 Ethernet port at the base of the CMA50 (see Fig. 1-5 on page 1-6).
2. Connect the remaining end of the Ethernet crossover cable to the 10/100 Ethernet port on the PC.
3. If the CMA50 is currently in a measurement mode, continue with the measurement until you reach the Results screen for the test; then press the **FUNCTION** key on the CMA50. When the Main Menu screen appears (see Fig. 2-9 on page 2-16) continue at step 4
   OR –
   If you have just powered ON the CMA50, press the **MENU** softkey and then continue at step 4.
4. Press the **Up/Down Arrow** keys to highlight **COMMUNICATIONS**.
5. Press the **FUNCTION** key, the Communications Ports screen appears (see Fig. 2-31 on page 2-35).
6. Use the **Up/Down Arrow** keys to highlight the **10/100 Ethernet** line.

### Note

The 10/100 Ethernet selection is only accessible if the CMA50 is equipped with the N option (Network Test).

7. Press the **FUNCTION** key, the Set IP, Mask, Gateway screen appears (see Fig. 4-11 on page 4-17).
8. Press the **Up/Down Arrow** keys to highlight the **MANUAL** line.

9. Press the **FUNCTION** key, the Networks Settings screen appears (see Fig. 4-3 on page 4-6).
10. If the NETWORK SETTINGS (IP address, MASK, and GATEWAY) are correct, proceed to step 13. In most cases the default settings are sufficient.

> **Note**
>
> If a peer-to-peer network is used (CMA50 directly connected to a PC), it is customary to use the 192.168.x.x address range.

**To change the Network Settings:**

a. Use the **Up** and **Down Arrow** keys to highlight the desired heading (IP, MASK, or GATEWAY).
b. Press the **FUNCTION** key, the highlight moves from the selected heading to the first digit of the address.
c. Use the **Up** and **Down Arrow** keys to increment/decrement the highlighted digit.
d. Use the **Left** and **Right Arrow** keys to move the highlight to the next desired digit of the selected address.
e. When you have finished editing the selected address, press the **FUNCTION** key. The highlight returns to the selected address heading.

11. Repeat steps 10a through 10e until all desired address fields have been modified.
12. Press the **SET** softkey, the Please Wait screen appears, and then the Communications Ports screen appears, with a check mark in front of the 10/100 Ethernet menu item. The current IP address is also displayed.

***On the PC***

1. Right click on **My Network Places** and then select **Properties** from the menu.
2. Right click on the **Local Area Connection** for the 10/100 Ethernet device (Local Area Connection 2 in Fig. 4-12 on page 4-21).

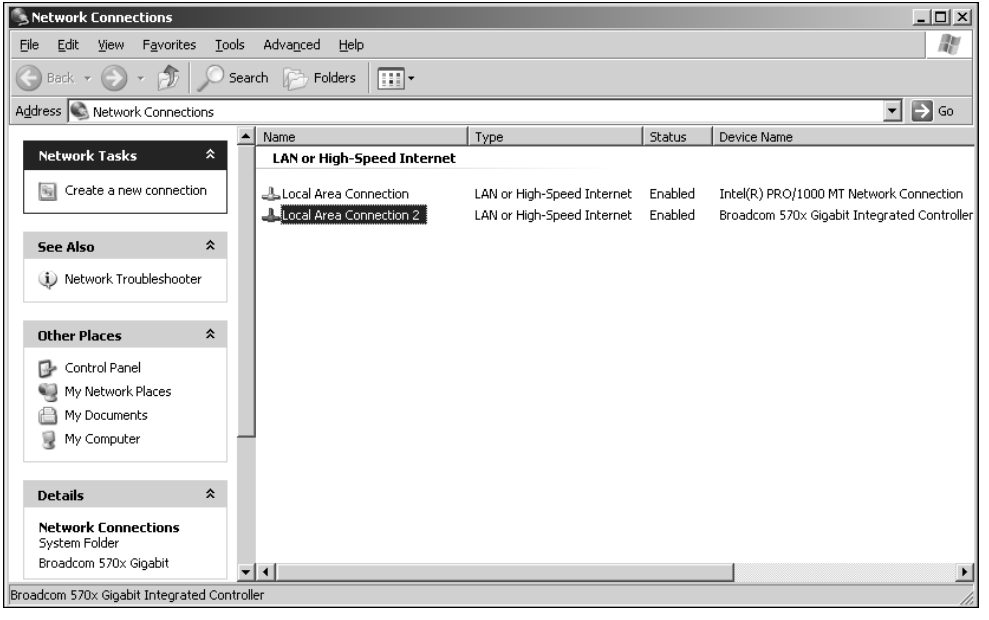



Fig. 4-12: Network Connection Window – 10/100 Ethernet Device Selected

3. Select **Properties** from the menu, the Local Area Connection Properties dialog appears (see, Fig. 4-13 below).

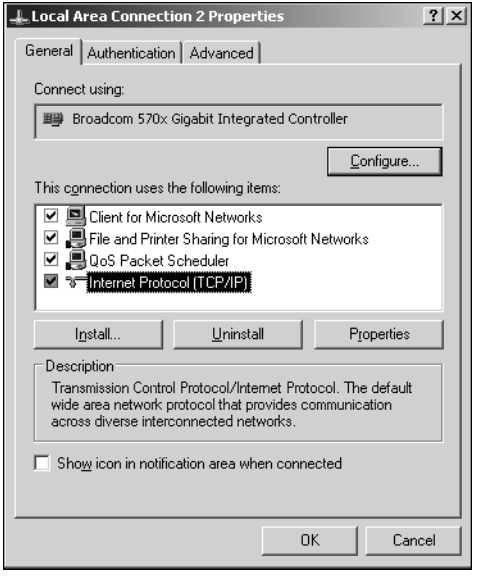



Fig. 4-13: Local Area Connection 2 Properties Dialog

4. Select **Internet Protocol (TCP/IP)** from the list. Scroll down the list, if necessary.
5. Click the **Properties** button, the Internet Protocol (TCP/IP) Properties dialog appears (see Fig. 4-14, below).

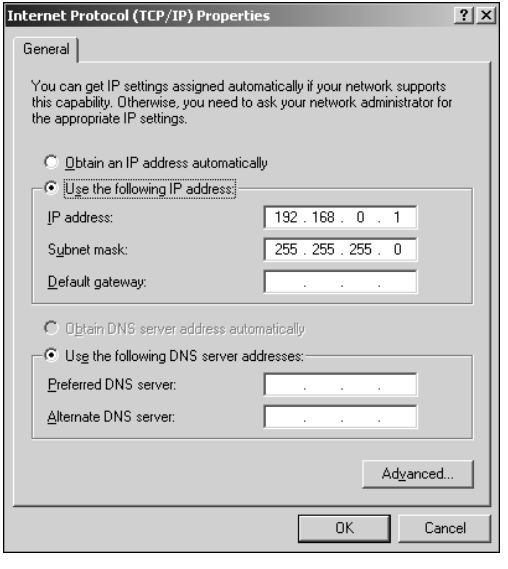



Fig. 4-14: Internet Protocol (TCP/IP) Properties Dialog

6. Select **Use the following IP address**.
7. Enter an IP address that is compatible (on the same network) as the address specified on the CMA50. If the default address (192.168.0.2) was used on the CMA50, then 192.168.0.1 is recommended on the PC.
8. Click the **OK** button, the Internet Protocol (TCP/IP) Properties dialog closes.
9. Click the **OK** button on the Local Area Connection Properties dialog, the dialog closes.
10. Close the Networks Connections window.

### *Test the Network Connection*

- Open your web browser (Internet Explorer, for example) and enter `ftp://192.168.0.2` in the Address line, and then press the **Enter** key. See Fig. 4-10 on page 4-14.

**Note**

If a different IP address was specified on the CMA50, then substitute that address for the address in the bullet above.

## Normal Ethernet Operation

Use the following procedure for all subsequent Ethernet operation after configuring the Ethernet network connection (as outlined in “First Time 10/100 Ethernet Connection (Direct peer to peer connection)” on page 4-19).

**Note**

Direct connection of the CMA50 10/100 Ethernet port to a PC 10/100 Ethernet port requires an Ethernet crossover cable.

***On the CMA50***

1. Connect one end of the Ethernet crossover cable to 10/100 Ethernet port at the base of the CMA50 (see Fig. 1-5 on page 1-6).
2. Connect the remaining end of the Ethernet crossover cable to the 10/100 Ethernet port on the PC.
3. If the CMA50 is currently in a measurement mode, continue with the measurement until you reach the Results screen for the test; then press the **FUNCTION** key on the CMA50. When the Main Menu screen appears (see Fig. 2-9 on page 2-16) continue at step 4
   OR –
   If you have just powered ON the CMA50, press the **MENU** softkey and then continue at step 4.
4. Press the **Up/Down Arrow** keys to highlight **COMMUNICATIONS**.
5. Press the **FUNCTION** key, the Communications Ports screen appears (see Fig. 2-31 on page 2-35).
6. Use the **Up/Down Arrow** keys to highlight the **10/100 Ethernet** line.

**Note**

The 10/100 Ethernet selection is only accessible if the CMA50 is equipped with the N option (Network Test).

7. Press the **FUNCTION** key, the Set IP, Mask, Gateway screen appears (see Fig. 4-11 on page 4-17).
8. Press the **Up/Down Arrow** keys to highlight the **MANUAL** line.
9. Press the **FUNCTION** key, the Networks Settings screen appears (see Fig. 4-3 on page 4-6).
10. Press the **SET** softkey, the Please Wait screen appears, and then the Communications Ports screen appears, with a check mark in front of the 10/100 Ethernet menu item. The current IP address is also displayed.

***On the PC***

- Open your web browser (Internet Explorer, for example) and enter `ftp://192.168.0.2` in the Address line, and then press the **Enter** key. See Fig. 4-10 on page 4-14.

**Note**

If a different IP address was specified on the CMA50, then substitute that address for the address in the bullet above.

## Data File Download

Use the following procedure to download data files from the CMA50 to a PC.

1. Establish a Network Connection using one of the methods detailed in the following sections:
   - **USB Drive** – see “USB Drive” on page 4-1
   - **USB (TCP/IP)** – see “Normal USB (TCP/IP) Operation” on page 4-15
   - **Ethernet (option)** – see “Normal Ethernet Operation” on page 4-24

   If the network connection selected is the USB Drive, skip step 2 and continue at step 3.
2. Open your web browser (Internet Explorer, for example) and establish the ftp connection. See “On the PC” on page 4-16 or page 4-26 for details.
3. Select the files to download.
4. Right click and then select **Copy** from the menu.
5. Browse to the desired destination folder on the PC.
6. Right click and then select **Paste** from the menu.

### Note

Other standard Windows file management operations such as Drag and Drop are supported for download (copy) operation.

## Software Upgrade Procedures

**IMPORTANT –** Make sure the unit is running from the external power supply (or fully charged batteries) so power is not interrupted during the upgrade process.

**IMPORTANT –** Copy (backup) all data files from the CMA50 prior to starting the Software Upgrade process (see “Data File Download” on page 4-27). **The internal storage will be FORMATTED and ALL FILES WILL BE DESTROYED after the Operating System upgrade is complete**.

### Operating System Upgrade

**WARNING⚠**

When installing an Operating System upgrade, always install the Operating System first, then install the Application software.

1. Establish a Network Connection using one of the methods detailed in the following sections:
   - **USB Drive** – see “USB Drive” on page 4-1
   - **USB (TCP/IP)** – see “USB (TCP/IP) Connection” on page 4-5
   - **Ethernet (option)** – see “10/100 Ethernet Connection” on page 4-16
2. Place the Software Upgrade CD in the PC’s CD drive.
3. Double-click on **My Computer**.
4. Right click on the **CD drive** and then select **Open**.
5. Double-click on the dated folder (e.g. 20050603) and then double-click on the OS folder.

6. Select all files in the OS folder, right click and select **Copy** from the menu.
7. If the network connection selected is the USB Drive, paste the selected files into the Removable Disk window (see Fig. 4-2 on page 4-3) and then continue at step 10.
   OR –
   If the network connection selected is either the USB (TCP/IP) or Ethernet (option), skip step 7 and continue at step 8.
8. Open your web browser (Internet Explorer, for example) and establish the ftp connection. See “On the PC” on page 4-16 for details.
9. Right click on the web browser window and select **Paste** from the menu. The selected files are copied from the PC to the CMA50.
10. Power off CMA50.
11. Press and hold the **FUNCTION** key; while still holding down the **FUNCTION** key, press the **POWER** key. The Unit Update screen appears (see Fig. 4-15).

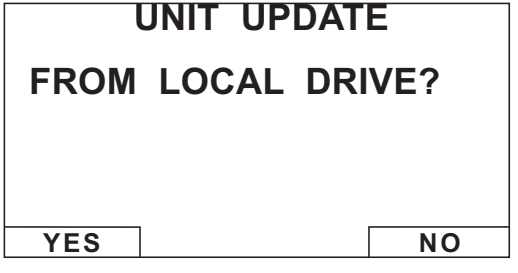



Fig. 4-15: Unit Update Screen

12. Press the **YES** softkey, the following message appears:

    **UPDATE IN PROGRESS**

    Each phase of the update, and its progress (as noted by a progress bar for each file) is displayed under the UPDATE IN PROGRESS message. The three phases are:

    - LOADING
    - ERASING
    - WRITING

    When complete, the following message appears:

    **UNIT UPDATE FINISHED**

    The unit will re-boot after 2 seconds.

### Note

If unforeseen circumstances prevent the upgrade from completing, the unit may not boot properly. In this case attempt to retry the upgrade process starting at step 9. If the unit does not power off, completely remove power by disconnecting the AC charger/adapter or removing the batteries. If repeated attempts at upgrade are not successful, contact the Anritsu Technical Support Center (see page xxxii).

## Application Upgrade

### *On the PC*

1. Establish a Network Connection using one of the methods detailed in the following sections:
   - **USB Drive** – see "USB Drive" on page 4-1
   - **USB** – see "USB (TCP/IP) Connection" on page 4-5
   - **Ethernet (option)** – see "10/100 Ethernet Connection" on page 4-16
2. Place the Software Upgrade CD in the PC's CD drive.
3. Double-click on **My Computer.**
4. Right click on the **CD drive** and then select **Open**.
5. Double-click on the dated folder (e.g. 20050603) and then double-click on the APP folder.
6. Select all files in the APP folder, right click and select **Copy** from the menu.
7. If the network connection selected is the USB Drive, paste the selected files into the Removable Disk window and then proceed to "On the CMA50", below.
   OR –
   If the network connection selected is either the USB (TCP/IP) or Ethernet (option), skip step 7 and continue at step 8.
8. Open your web browser (Internet Explorer, for example) and establish the ftp connection. See "On the PC" on page 4-16 for details.
9. Right click on the web browser window and select **Paste** from the menu. The selected files are copied from the PC to the CMA50.

***On the CMA50***

1. Press the **FUNCTION** key, the Main Menu screen appears (see Fig. 2-9 on page 2-16).
2. Press the **Up/Down Arrow** keys to highlight **SETUPS**.
3. Press the **FUNCTION** key, the SETUPS menu (screen 1) appears (see Fig. 2-32 on page 2-37).
4. Press the **Up/Down Arrow** keys to highlight **MORE**.
5. Press the **FUNCTION** key, screen 2 of the SETUPS menu appears (see Fig. 2-40 on page 2-47).
6. Use the **Up/Down Arrow** keys to highlight **SOFTWARE UPGRADE.**
7. Press the **FUNCTION** key, the initial Upgrade App SW screen appears (see Fig. 4-16).

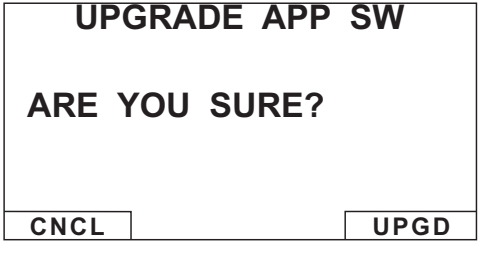



Fig. 4-16: Initial Upgrade App SW Screen

8. Press the **UPGD** softkey, the Upgrade In Progress screen appears (see Fig. 4-17).
9. The CMA50 will power off when the upgrade is complete.

### Note

If the SOFTWARE UPGRADE function is requested when a valid set of files is not present on the CMA50's internal storage, the Update Not Found screen appears (see Fig. 4-18).

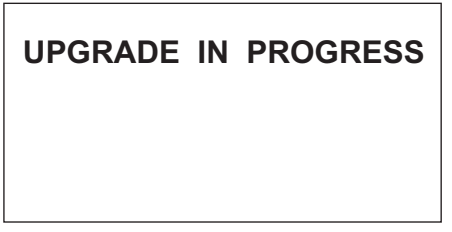



Fig. 4-17: Update In Progress Screen

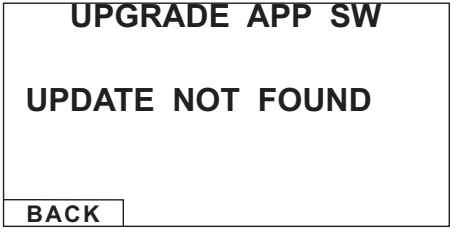



Fig. 4-18: Update Not Found Screen

### Version Verification

See “Version Information” on page 2-55 for details on verifying version information before or after an upgrade.

# Chapter 5: Maintenance and Service

## Cleaning the CMA50

All surfaces of the CMA50 casework, except for the LCD display, should be cleaned with a soft, lint-free cloth dampened with water.

**CAUTION** ⚠

Do not use acetone or hydrocarbon cleaners. Doing so may permanently damage the CMA50 and may void your warranty.

### Cleaning the LCD Display

If the LCD is oily or heavily soiled, use isopropyl alcohol or a standard window cleaner. Spray the solution on a lint-free cloth rather than spraying directly on the LCD.

### Cleaning the Power Meter Port

See “Cleaning the Power Meter Port” on page 15 for details.

### Cleaning the Source Port(s)

See “Cleaning the Hybrid Universal Connector” on page 18 for details on cleaning the Source port(s).

## Power and Batteries

The CMA50 series have a three way powering system to maximize versatility and battery life:

- **External AC charger/adapter:** Use this adapter to provide power from AC and to charge the Ni-MH (nickel-metal hydride) battery pack. When the unit is on and plugged in, its AC adapter powers the unit and trickle charges the Ni-MH battery pack simultaneously (when the Ni-HM battery pack is installed in the CMA50's battery compartment. Only use the AC charger/adapter supplied by Anritsu.
- **Ni-MH rechargeable battery pack:** The removable Ni-MH rechargeable battery pack, when installed, powers the unit in absence of the AC charger/adapter. Only use Ni-MH battery packs supplied by Anritsu.
- **Replaceable batteries:** In absence of either the AC charger/adapter or the rechargeable Ni-MH battery pack, the CMA50 can be powered using 4 AA alkaline batteries.

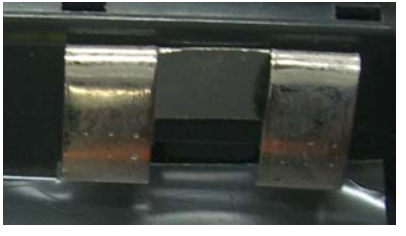
### Installing the Ni-MH battery pack

There are two types of Ni-MH battery packs:

- - without insulating plate (G0257A)
- - with insulating plate (G0237A)

To determine the type of the battery pack, check the contacts inside the battery housing.

Your unit will require the battery pack WITH insulating plate, if the battery contacts have smaller protrusions as shown below:

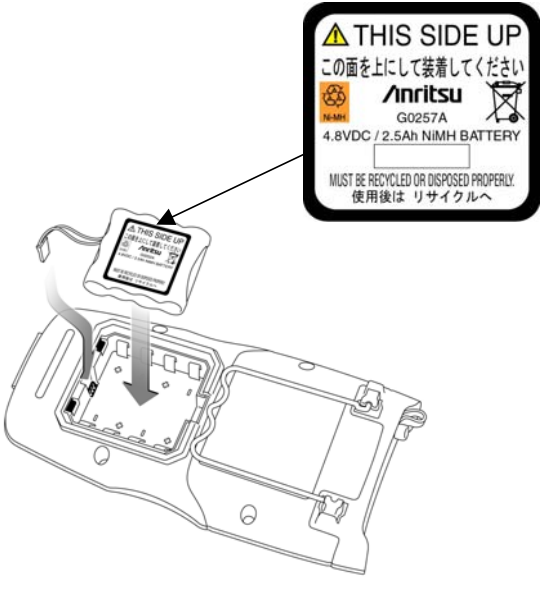


Your unit will require the battery pack WITHOUT insulating plate, if the battery contacts have larger protrusions as shown below:

Use the following procedure to install the Ni-MH battery pack.

1. If operating, power down the CMA50.
2. Open the battery compartment, located on the lower back side of the unit, by pulling down on the latch while lifting up on the battery compartment cover.
3. Remove AA alkaline batteries, if installed.
4. Plug the connector on the Ni-MH battery pack into the receptacle at the base of the battery compartment.

5. Slide the Ni-MH battery pack into the battery compartment, making sure that the **THIS SIDE UP** label is visible.




6. Replace the battery compartment cover.

**WARNING ⚠**

Always turn off the CMA50 before removing either the Ni-MH battery pack or old AA alkaline batteries. If the batteries are removed with the power on, reference values and data files could be lost.

**Note**

See pages 1-6 and 1-7 for information regarding recharge status of the Ni-MH battery pack. Use the following procedure when connecting the AC charger/adapter to the CMA50. The CMA50 can be operated while the Ni-MH battery pack is charging.

### AC charger/adapter

To use the AC charger/adapter:

1. Plug the AC charger/adapter's transformer into an AC outlet.

   **Note**

   Make sure that the AC charger/adapter's transformer is equipped with the correct plug type.

2. Open the connector door at the base of the CMA50.
3. Plug the other end of AC charger/adapter into the AC charger/adapter input port, labeled "7.5VDC 2A" (see Fig. 1-5 on page 1-6).

**CAUTION ⚠**

To prevent possible damage to the CMA50, use only the AC charger/adapter supplied by Anritsu.

### Battery Replacement – Ni-MH battery pack to AA alkaline

Use the following procedure when replacing the Ni-MH battery pack with AA alkaline batteries:

1. If operating, power down the CMA50.
2. Open the battery compartment, located on the lower back side of the unit, by pulling down on the latch while lifting up on the battery compartment cover.
3. Lift out the Ni-MH battery pack and unplug it from its receptacle at the base of the battery compartment.

**Note**

Use a thin, blunt, non-conductive instrument, such as a small straight blade screwdriver, to pry up one end of the battery pack for removal. **Do not pull on the battery pack wires.**

4. Insert 4 new AA alkaline batteries in the compartment, following the polarity symbols next to the battery contacts.
5. Replace the battery compartment cover.

**WARNING** ⚠

Always turn off the CMA50 before removing either the Ni-MH battery pack or old AA alkaline batteries. If the batteries are removed with the power on, reference values and data files could be lost.

**CAUTION** ⚠

Do not store the CMA50 for long periods of time with the replaceable alkaline batteries in the unit. The batteries may corrode and/or leak and damage the unit.

## Troubleshooting and Messages

Each time the CMA50 is powered up, it performs an internal self-test. The LCD screen displays the Anritsu logo and a progress bar during the self-test. When the self-test is complete, the LCD displays the Mode Selection screen. The unit performs other self-diagnostics and displays the following error messages to prevent inaccurate measurements and to inform users of problems:

| | |
|---|---|
| LOW | Indicates that the input power received by the CMA50 is lower than the minimum range of -75 dBm (-55 dBm for option C - CATV). |
| HIGH | Indicates that the input power received by the CMA50 is higher than the maximum range of +10 dBm (+30 dBm for option C - CATV). |
| Blank Display | If nothing is displayed after pressing the **Power** key (see page 1-8), the most probable cause is that the batteries (either the rechargeable Ni-MH battery pack or the AA Alkaline batteries) are completely discharged. Plug in the AC charger/adapter or install new AA Alkaline batteries to power the CMA50. |

### Note

In the event of the CMA50's software not responding, holding down the Power key for more than 30 seconds forces the unit to reset.

## Recommended Calibration

Anritsu recommends that CMA50 units be calibrated once every three (3) years with traceability to a national standard. Many government, military, and quality standards require documentation that equipment has been calibrated within the recommended period. To send a unit in for calibration, see “Technical Support Center” on page xxxii for details.

# Appendix A: CMA50 Series Specifications

*All specifications are subject to change without notice.*

| General Family Specifications | |
|---|---|
| **Power** | 4 - AA Alkaline Batteries or Rechargeable NiMH battery pack, 110/220Vac Adapter |
| **Battery Life** | 20 hours, typical |
| **Auto Shut-Off** | Programmable (1 to 99 minutes) or disabled |
| **Connector Ports - Sources** | Universal Latching connector with choice of adapter |
| **Connector Ports - Meters** | Universal Screw-type connector with choice of adapter |
| **Dimensions** | 210 x 110 x 41 mm (8.3 x 4.3 x 1.6 in) |
| **Weight** | <910 g (2 lbs) (including batteries) depending on configuration |
| **Operating Temperature** | -10°C to +50°C (+14°F to +122°F) |
| **Storage Temperature** | -25°C to +60°C (-13°F to +140°F) |
| **Warranty** | 3 years |

| Light Sources | | | | |
|---|---|---|---|---|
| **Multimode** | | | | |
| **Center Wavelength[1]** | **850nm** | | **1300nm** | |
| **Wavelength Accuracy** | ±20nm | | +30/-20nm | |
| **Emitter Type** | LED | | LED | |
| **Output Power (62.5/125 µm fiber)** | -20dBm | | -20dBm | |
| **Source Linewidth (FWHM)** | <50nm | | <200nm | |
| **Stability (1 hour)[2]** | ±0.1dB | | ±0.1dB | |
| **Output Modes** | CW (Continuous Wave), 270Hz, 1KHz, 2KHz Modulation | | | |
| **Singlemode** | | | | |
| **Center Wavelength[1]** | **1310nm** | **1490nm** | **1550nm** | **1625nm** |
| **Wavelength Accuracy** | ±20nm | ±20nm | ±20nm | ±20nm |
| **Emitter Type** | Laser Diode | Laser Diode | Laser Diode | Laser Diode |
| **Output Power (G.652 fiber)** | -7dBm | -7dBm | -7dBm | -7dBm |
| **Source Linewidth (FWHM)** | <5nm | <5nm | <5nm | <5nm |
| **Stability (1 hour)[2]** | ±0.05dB | ±0.15dB | ±0.05dB | ±0.15dB |
| **Output Modes** | CW (Continuous Wave), 270Hz, 1KHz, 2KHz Modulation | | | |

| Visual Fault Locator (Option V) | |
|---|---|
| **Center Wavelength**[1] | 650nm ±20nm |
| **Emitter Type** | Laser Diode |
| **Output Power (G.952 fiber)** | 1mW (0dBm) Max, 0.8mW (-1.0dBm) typical |
| **Output Modes** | CW (Continuous Wave), 2Hz Modulation |

| Power Meters | | |
|---|---|---|
| **Model** | **Standard** | **CATV (Option C)** |
| **Wavelength of Operation** | 850nm, 1300nm, 1310nm, 1490nm, 1550nm, 1625nm plus CWDM wavelengths from 1270nm to 1610nm in 20nm increments | |
| **Detector Type** | InGaAs | |
| **Measurement Range** | -75dBm to +10dBm | -50dBm to +27dBm |
| **Measurement Accuracy**[3,4,7] | ±0.2dB with $P_{in}$ = -65dBm to +5dBm | ±0.2dB with $P_{in}$ = -37dBm to +27dBm |
| **Linearity**[5] | ±0.1dB | ±0.1dB |
| **Maximum Input Power**[6,7] | +10dBm | +27dBm |
| **Modulation Detection**[8] | 270Hz, 1KHz, and 2KHz | |

| Power Meters (continued) | |
|---|---|
| **Wavelength Detection** | Automatic recognition of calibrated wavelengths<br>(when used in conjunction with a CMA50 light source) |
| **Display Resolution** | 0.01 (mW, µW, nW, dBr, dBm) |

| Auto Bi-Direction Test Mode (Option B) | |
|---|---|
| **Wavelengths** | **All Equipped Singlemode Wavelengths** |
| **Link Loss Range**[1] | 50dB (approximately 200km at 1550nm) |
| **Link Loss Accuracy**[1] | ±0.25dB excluding connector pair uncertainty |
| **Testing Time** | 2.5 seconds per wavelength |

| Optical Return Loss (ORL) Measurement (Option O) | |
|---|---|
| **Wavelengths** | **All Equipped Singlemode Wavelengths** |
| **ORL Range**[1] | 0 to 55dB |
| **ORL Accuracy**[1] | ±0.75dB with $P_{in}$ = 0dB to +50dB<br>Derates above $P_{in}$ = +50dB to ±1.5dB at +55dB |
| **ORL Stability**[1] | ±0.5dB at 20dB ±0.5dB |

| Options | |
|---|---|
| **V Option**<br>Visual Fault Locator | Visible light source at 650nm allowing to visually detect a fiber fault up to 5 km. |
| **N Option**<br>Network test | LAN access and network level continuity and frame time delay through TCP/IP protocol over its built-in 10/100 Mbps Network Interface Card |
| **B Option**<br>EZ Test | Available on Loss Test Set configurations, provides one button multiple wavelength automatic bi-directional measurement. When readings are taken between two EZ Test equipped units, this feature automatically takes loss measurements at all wavelengths in each direction, and presents the combined results on both units. |
| **O Option**<br>ORL | Optical Return Loss (ORL) option allows the measurement of optical return loss readings required for high speed transmission systems. |

**Notes:**

1 Typical at +23°C.

2 After 10 minute warm-up period.

3 At time of calibration. Calibration conditions: 1310nm, -10dBm, +23°C.

4 Accuracy derates below 1000nm. At 850nm, Measurement Accuracy is ±0.35 with $P_{in}$ = -60dBm to +5dBm (or $P_{in}$ = -32dBm to +27dBm for CATV Option C units).

5 At +23°C, from -65dBm to +2dBm (or -37dBm to +23dBm for CATV Option C units).

6 Do not exceed maximum input power.

7 If the power meter is routinely used to measure optical signals in excess of 0dBm (+20dBm for Option C), more frequent calibration is recommended to insure measurement accuracy.

8 $P_{in}$ = ≥-50dBm

| **Available Configurations** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Multimode Sources** | | **Singlemode Sources** | | | | **Power Meter** |
| **Model Number** | **850nm** | **1300nm** | **1310nm** | **1490nm** | **1550nm** | **1625nm** | |
| **CMA50 Light Sources** | | | | | | | |
| **50LS35** | | | X | | X | | no |
| **50LS83** | X | X | | | | | no |
| **50LS345** | | | X | X | X | | no |
| **50LS356** | | | X | | X | X | no |
| **50LS3456** | | | X | X | X | X | no |
| **50LS8335** | X | X | X | | X | | no |

| Available Configurations (continued) | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Multimode Sources | | Singlemode Sources | | | | Power Meter |
| Model Number | 850nm | 1300nm | 1310nm | 1490nm | 1550nm | 1625nm | |
| **CMA50 Loss Test Sets (Include Light Source and Power Meter)** | | | | | | | |
| **50LTS35** | | | X | | X | | yes[a] |
| **50LTS83** | X | X | | | | | yes[a] |
| **50LTS345** | | | X | X | X | | yes[a] |
| **50LTS356** | | | X | | X | X | yes[a] |
| **50LTS3456** | | | X | X | X | X | yes[a] |
| **50LTS8335** | X | X | X | | X | | yes[a] |
| **CMA50 Power Meters** | | | | | | | |
| **50PMS** | no | no | no | no | no | no | Standard |
| **50PMC** | no | no | no | no | no | no | CATV |

[a] CMA50 Loss Test Set are equipped with either a Standard or CATV (Option C) Power Meter

# Index

## Symbols

λ (Wavelength) key 1-12

## Numerics

1.25mm adapter 1-14
10/100 Ethernet 2-35
10/100 Ethernet Connection
    First time 4-19
10/100 Ethernet LAN connection
    via DHCP 4-16
10/100 Ethernet port 1-6, 4-16
1KHz 1-10
2.5mm adapter 1-14
270Hz 1-10
2Hz 1-10
2KHz 1-10
6025 (Auto Wave ID) mode
    operation 3-30
    setting references 3-30
    TX (Transmit) key 1-10
    Wavelength Selection screen 3-30

## A

A B softkey 3-29
A to mini-B cable 4-2
A-B measurement results 2-9
Absolute Power measurement 3-4
AC charger/adapter 1-2, 5-2, 5-6
    input 1-7
accessing Setups 2-37
Accessing unit information
    INFO softkey 2-55
    Version Information screen 2-55
active wavelength 2-14
Active Wavelength indicator 2-6, 2-10, 2-11, 2-15
Adapter Caps
    Power Meter 1-14
ALL softkey 2-40, 2-42, 2-43
Application Upgrade
    Software Upgrade Procedures 4-31
Attenuation Values 2-41
Auto Shutdown 2-50
Auto Test key - *See* Right softkey
Auto Zero 2-54
Auto-Detect 4-2
auto-increment feature 2-25

automated bi-directional loss testing 3-15
Auto-Shut Down
indicator 2-7, 2-10, 2-14, 2-15
average splice loss 2-42

## B

B A softkey 3-29
B-A measurement results 2-9
BACK key - *See* Left softkey
Back Panel 1-5
battery compartment 1-5
label
compliance symbols and information 1-5
Model number 1-5
Safety class 1-5
BACK softkey 3-40, 4-7
BACKLIGHT setting 2-51
batteries 5-2
replacement 5-7
Battery Compartment 1-5
battery fluid warning x
Battery Icon 2-7, 2-10, 2-11, 2-12, 2-13, 2-14, 2-15
battery pack
disposal procedure xxii
recycling
EU & EFTA customers xx
U.S. Customers xix
Battery pack status LED 1-6
bi-directional testing (manual) 3-8, 3-10, 3-12
BKSP (backspace) softkey 2-26
Bottom Panel 1-6
10/100 Ethernet port 1-6
AC charger/adapter input 1-7
Battery pack status LED 1-6
I/O port door 1-7
USB port 1-6
Browse screen 3-13

## C

calibrated (primary) wavelengths 1-12
Calibration 5-9
calibration seal viii
CAT I vi
CAT II vi
CAT III vi
CAT IV vi
CATV option (option C) 5-8
caution symbol iv
CE conformity marking xxv
Certificate of Compliance 1-2
changing
Hybrid Universal adapters 1-19
Network Settings 4-6, 4-20
character matrix 2-25
China RoHS requirements xxix
CHNG (Change) softkey 3-14
Class 1 Laser safety xi
Class 1M Laser safety xi

Class 3R Laser safety xi
cleaning
CMA50 5-1
Hybrid Universal adapters 1-19
Hybrid Universal connector 1-18
LCD display 5-1
Power Meter port 1-15, 5-1
Source Port(s) 5-1
Clearing References 3-2
Close File 2-24
warning message 2-24
CMA50
cleaning 5-1
forced reset 5-8
operating modes 2-1
Specifications A-1–A-4
CMA50 Operating Mode Selection Guide 2-5
CMA50 Series 1-1
items included 1-2
Theory of Operation 1-2
CMA50 Series Operation Manual 1-2
CNCL (Cancel) softkey 2-22, 2-23, 2-24, 2-45, 3-42
Communications
menu 2-35
Port settings 2-35
10/100 Ethernet 2-35
USB (TCP/IP) 2-35
USB Drive 2-35
Communications Accessory Kit
option 4-2
Communications Port screen
USB (TCP/IP) menu item 4-7
Compliance and Warning labels 1-5
CONN LOSS 2-42
Connect First Fiber screen 3-18
connecting fiber
Power Meter port 1-15
connector loss 2-42
Connector to Connector Test Method 3-11
Continue Anyway button 4-8
C-tick conformity marking xxviii
CURRENT field 2-26
Cycle Fibers, Then λ 2-27
Cycle λ, Then Fiber 2-27

## D

D4 adapter 1-14
Data File Download 4-27
dBm/W key 3-5
default IP address 4-13
DEL softkey 2-33
Delete File(s) 2-33
DEL softkey 2-33
Warning Screen 2-33
detector window 1-15
DHCP (automatic IP address assignment)
10/100 Ethernet LAN connection 4-16
DIN adapter 1-14
Direct peer to peer connection 4-19
10/100 Ethernet Connection 4-19
Display Resolution 2-38

disposal procedure xxii
Down Arrow key 1-10
download data files 4-27

## E

Edit Files 2-29
EDIT softkey 3-13
editing
    IP address 3-44
    Power Measurement readings 3-13
editing attenuation values 2-41
Electrical Shock vii
ENTER key - *See* FUNCTION key
Erase Drive 2-34
ERSE (erase) softkey 2-34
Ethernet Connection
    First Time 4-19
Ethernet crossover cable 4-19, 4-24
Ethernet Operation
    Normal 4-24
External AC charger/adapter 5-2
EZ Test
    Master 3-15
    Slave 3-15
EZ Test 6025 (Auto Wave ID) mode 2-2, 3-29
    Receiver display 2-11
    Transmitter display 2-10
EZ Test mode
    automated bi-directional loss testing 2-2, 3-15
    change the fiber number 3-20
    Connect First Fiber screen 3-18
    Please Wait for Next Fiber Number screen 3-21
    reference type 3-18
        Loopback reference 3-24
        Manual reference 3-27
        Side by Side reference 3-21
    Results screen 3-19
        Bi-directional 3-19
        Linking 3-19
        Two Way Averaged 3-20
    Select Next Fiber screen 3-21
    Setup screen 3-17
    wavelength selection 3-17
EZ Test Mode screen 3-16

## F

Factory Defaults 2-45
FAIL flag 3-39
FC adapter 1-14
Fiber Attenuation screen 2-41
Fiber Count 2-9
Fiber Count indicator 2-7, 2-10, 2-11, 2-13, 3-41
Fiber Count number 2-13, 3-41
    editing in ORL mode 3-41
fiber length in km 2-42
Fiber Specs screen 2-42
    CONN LOSS 2-42
    LENGTH KM 2-42

NUM CONNS 2-42
NUM SPLCS 2-42
SPLC LOSS 2-42
File Name screen 2-25
auto-increment feature 2-25
character matrix 2-25
RGHT softkey 2-25
START NUM (Start Number) field 2-26
File Save mode 2-18
screen 2-18
Filename indicator 2-7, 2-9, 2-10, 2-11, 2-13
FLASH drive. 2-34
forced reset 5-8
Front Panel
Keypad 1-3
LCD Display 1-3
LED indicators 1-3
Function key 1-13

## G

Gateway 4-6

## H

High input power indicator 5-8
Hybrid Universal adapters 1-2, 1-16, 1-17
changing 1-19
cleaning 1-19
UNIV-AFC 1-17
UNIV-DIN 1-17
UNIV-FC 1-17
UNIV-LC 1-17
UNIV-SC 1-17
UNIV-ST 1-17
Hybrid Universal connector 1-16
cleaning 1-18

## I

I/O port door 1-7
IEC 61010 Standard vi
Incident Power
ratings 3-36
to correct POOR readings 3-36
screen 3-37
Incident Power setup
diagram screen 3-35
INFO softkey 2-55
InGaAs photodetector 1-2
input power indicator
HIGH 5-8
LOW 5-8
Inspection 1-2
IP address 3-44, 4-6
default address 4-13
editing 3-44

## K

Keypad 1-3, 1-8

# L

Language 2-53
Laser On LED 1-4
Laser radiation warning vii
Laser safety
    Class 1 xi
    Class 1M xi
    Class 3R xi
Laser Safety label vii
LC adapter 1-14
LCD
    warning x
LCD contrast 2-44
LCD Display 1-3
LCD display
    cleaning 5-1
LCD layout
    Measurement screen 2-6
LED Indicators 1-3
Left softkey 1-8
Left softkey indicator 2-7, 2-9, 2-12, 2-13
LENGTH KM 2-42
Light Source
    connection to 1-16
    Operating Mode selection 2-16
Light Source (2KHz) 1-10
Light Source display 2-14
    active wavelength 2-14
Link Status message 2-9
Liquid Crystal Display warning x
Load File 2-28, 2-29
Local Area Connection Properties dialog 4-11, 4-22
Local Reference Input 3-5
loop-back 3-6
Loopback reference 3-24
Loss Test Set
    Operating Mode selection 2-16
Loss Test Set mode 2-2
Low input power indicator 5-8

# M

Main Measurement display
    EZ Test 6025 (Auto Wave ID) mode
        Receiver display 2-11
        Transmitter display 2-10
    EZ Test mode 2-9
    No Save mode 2-8
    Optical Return Loss (ORL) mode 2-13
Main Menu screen 2-16
mandrel 1-2, 3-37
Mandrel Reference
    rating 3-38
        to correct POOR readings 3-39
    screen 3-38
    setup diagram 3-37
Mandrel reference 3-36
manual bi-directional testing 3-8, 3-10, 3-12
Manual reference 3-27
    setting 3-2
Manual Threshold setup 2-39

Mask 4-6
Mass Storage
    Name File 2-25
Mass Storage menu 2-21
    Close File 2-24
    Delete File(s) 2-33
    Erase Drive 2-34
    Load File 2-28, 2-29
    Save File 2-22
    Storage Mode 2-27
Master 3-15
measurement category I vi
measurement category II vi
measurement category III vi
measurement category IV vi
Measurement screen
    Loss Test Set mode 2-6
    Power Meter mode 2-6
MENU softkey 2-17, 2-55
MODE SELECT screen 2-17
    MENU softkey 2-17
Model Number label 1-5
Modulated Signal Detected 2-48
modulation 1-10, 2-48
    VFL (2Hz) 1-10
Modulation Detect indicator 2-6
Modulation Frequency 2-48, 2-49
Multimode Optical port 1-4

## N

N option (Network Test) 4-25
Name File 2-25
    Start Num field 2-26
Name File screen
    CURRENT field 2-26
Network Settings
    changing 4-6, 4-20
    Gateway 4-6
    IP 4-6
    Mask 4-6
Network Testing 2-36
    IP address 3-44
    option N (Network Test) 2-36
    Ping test 3-43
NEXT softkey 2-42, 3-22
Ni-MH battery pack 1-2
    installing 5-2
    status LED 1-6
NO LINK message 3-23
No Save mode 2-4, 2-8
NO SERVER/SERVICE message 4-18
NONE designator 3-27
Normal USB (TCP/IP) operation 4-15
NUM CONNS 2-42
NUM SPLCS 2-42
number of connectors 2-42
number of splices 2-42

## O

One λ Per Fiber 2-27
operating modes 1-1, 2-1

EZ Test mode
automated bi-directional loss test 2-2
Light Source 2-16
Loss Test Set 2-16
Loss Test Set mode 2-2
No Save mode 2-4
Power Meter 2-16
Power Meter mode 2-3
No Save mode 2-4
Selecting an operating mode 2-17
Selection Guide 2-5
VFL mode 2-4
Operating System Upgrade 4-28
OS folder 4-29
Optical Loss measurements 3-7
Connector to Connector 3-11
Patch Panel to Connector 3-9
Patch Panel to Patch Panel 3-7
Optical Return Loss mode 2-3, 3-34
options
option B (Automated Bi-Directional Loss) 2-2
option C (CATV) 5-8
option N (Network Test) 2-36, 4-19
option O (ORL mode) 2-3
option V (Visual Fault Locator - VFL) 2-4, 3-42
ORL files
_06 designator 2-29
ORL Measurement Results
FAIL flag 3-39
screen 3-39
Fiber Count number 3-39
ORL mode 2-3, 3-34
ORL Reference wizard 3-34
ORL testing
Quick ORL test 3-41
Standard ORL test 3-34
ORL Threshold Status indicator 2-13
FAIL flag 3-39
ORL Thresholds 2-43
ORL Wavelength Selection screen 3-35
OS folder 4-28

## P

PASS/FAIL indicator 2-7, 2-12, 3-4
Patch Panel to Connector Test Method 3-9
Patch Panel to Patch Panel Test Method 3-7
patchcords
verifying 3-3
PC Interface CD 1-2
performance-guarantee seal viii
PING softkey 3-44
PING test 2-36, 3-43
Please Wait for Next Fiber Number screen 3-21
Plug Icon 2-7, 2-10, 2-11, 2-12, 2-13, 2-14, 2-15
Power 5-2
External AC charger/adapter 5-2
Ni-MH battery pack 5-2

Replaceable batteries 5-2
power cycle 2-20
Power key 1-8
forced power down 1-8
Power measurement
Absolute 3-4
Power Measurement readings
editing 3-13
Power Meter
Operating Mode selection 2-16
Power Meter adapter cap 1-2, 1-14
1.25mm 1-14
2.5mm 1-14
D4 1-14
DIN 1-14
FC 1-14
LC 1-14
SC 1-14
ST 1-14
Power Meter mode 2-3
Power Meter port 1-4
cleaning 1-15, 5-1
connecting fiber 1-15
Power Units indicator 2-7, 2-11
Power/Loss value indicator 2-6
prohibited operation symbol iv

## Q

Quick ORL test 3-41

## R

recycle symbols iv
recycling
battery pack
EU & EFTA xx
U.S. xix
REF (Power Meter Reference) key 1-11
REF key 3-5
Reference
Clearing 3-2
screen 3-1
Setting 3-1
reference type
EZ Test mode 3-18
Reference Value 2-7, 2-12
Remote Reference Input 3-6
Repair warning viii
repairs xxxii
replacement
batteries 5-7
reset unit 1-8
Return Materials Authorization number xxxii
RGHT softkey 2-25
Right Arrow key 1-11
Right softkey 1-9
Right softkey indicator 2-7, 2-9, 2-11, 2-13
RMA xxxii
RoHS
China requirements xxix
RTRY softkey 2-9

# S

safety precaution symbol iv
safety symbols iii
caution iv
prohibited operation iv
safety precaution iv
warning iv, v
Save File 2-22
warning message 2-23
Save File screen 3-39
save measurements 2-22
SAVE softkey 1-12, 2-23, 3-40
SC adapter 1-14
select an operating mode 2-17
Select Next Fiber screen 3-21
Select Wavelengths 2-19
menu 2-19
Serial Number label 1-5
Set IP, Mask, Gateway screen 4-17
DHCP (AUTO) 4-17
SET softkey 2-45, 4-7
Set Thresholds 2-39
Manual Threshold setup 2-39
Thresholds Wizard setup 2-41
setting 2-49, 2-53
Setting Reference
Manual 3-2
Setting References 3-1
setting references
6025 (Auto Wave ID) mode 3-30
Setups menu
Display Resolution 2-38
Factory Defaults 2-45
LCD contrast 2-44
MORE
access to Setups menu screen 2 2-47
screen1 2-37
Set Thresholds 2-39
Setups Menu screen2 2-47
Setups Menu screen 2 2-47
Auto Shutdown 2-50
Auto Zero 2-54
Modulation Freq 2-48
Software Upgrade 2-51
Side by Side reference 3-21
Singlemode Optical port 1-4
Slave 3-15
software
version verification 4-34
Software Upgrade 2-51
Software Upgrade Procedures 4-28
Application Upgrade 4-31
Operating System Upgrade 4-28
Source Mode indicator 2-6, 2-10, 2-11, 2-13, 2-14, 2-15
Source port(s)
cleaning 5-1
Speaker (ON/OFF) 2-46
Specifications A-1–A-4
SPLC LOSS 2-42
ST adapter 1-14
Standard ORL test 3-34

START NUM (Start Number) field 2-26
START NUM field. 2-26
Storage Mode 2-27
    Cycle Fibers, Then λ 2-27
    Cycle λ, Then Fiber 2-27
    One λ Per Fiber 2-27
    setting 2-28
symbols
    safety iii
System Attenuation (Loss) measurements 3-5
    Local Reference Input 3-5
    Remote Reference Input 3-6

## T

technical support xxxii
Technical Support Center xxxii
TEST softkey 3-18, 3-36
Test Wavelengths 2-9
Threshold Status indicator 2-7, 2-12
Thresholds
    ORL 2-43
Thresholds Wizard 2-41
    Attenuation Values 2-41
    Fiber Attenuation screen 2-41
tilt bail 1-5
to force a reset 5-8
Top Panel
    Laser On LED 1-4
    Multimode Optical port 1-4
    optical ports 1-4
    Power Meter port 1-4
    Singlemode Optical port 1-4
    VFL port 1-4
troubleshooting 5-8
TX (Transmit) key 1-10
TX key 3-5

## U

unit reset 1-8
UNITS 1-11
UNITS key - *See* dBm/W key
Universal Serial Bus 1-6
Unpacking 1-2
Up Arrow key 1-10
UPGD (Upgrade) softkey 4-33
USB 1-6
USB (TCP/IP) 2-35
USB (TCP/IP) Connection
    first time 4-5
USB (TCP/IP) menu item 4-7
USB (TCP/IP) Operation
    Normal 4-15
USB Drive 2-35, 4-1
    accessing 4-2
    Auto-Detect 4-2
    manual access 4-4
USB port 1-6

## V

verifying patchcords 3-3

Version Information screen 2-55
Version Verification 4-34
VFL mode 2-4
VFL port 3-42
viewing version information
    at power up 2-55
    in a test mode 2-56
Visual Fault Locator (VFL) 3-42
    mode 3-42
    Modulated mode (2Hz) 3-43
    option 1-4
    port 1-4

## W

Warning labels 1-5
warning message
    Save File 2-23
warning symbol iv, v
warranty xxi
Wavelength (λ) key 1-12
    SAVE softkey 1-12
Wavelength List 2-10, 2-11
Wavelength list 2-13
wavelength selection
    EZ Test mode 3-17
Wavelength Selection screen
    6025 (Auto Wave ID) mode 3-30
wavelengths
    EZ Test mode 2-20
    Loss Test Set mode 2-20
    Power Meter mode 2-20
    selecting 2-19
Windows Desktop 4-9
wizard
    Loopback reference 3-24
    Manual reference 3-27
    ORL reference 3-34
    Side by Side reference 3-21

## Z

ZERO softkey 2-54