

CMA Family





# CMA5000 Multi-Layer Network Testing Platform

Testing of 1 and 10 Gigabit Ethernet, DWDM, SONET/SDH, OTDR, ORL, PMD and CD made simple

## Benefits and Applications

### Benefits

Multi-Layer Network Test Platform to:

- Accelerate the deployment of services
- Optimize network performance and bandwidth
- Reduce the total cost of measurement

### Applications

A true multi-layer network test solution to install, commission and document the:

- Physical layer
- Data link layer
- Network layer
- Transport layer

Today's telecommunications professionals are faced with unprecedented challenges ranging from accelerating the deployment of high-speed communications services to increasing customer quality of service and reducing costs. Anritsu's CMA5000 Multi-Layer Test Platform eliminates those challenges with the touch of a single button and instills confidence that your network is operating at its full potential.

### Reduce the Total Cost of Measurement

The CMA5000 is the premier test and measurement solution for installing, commissioning and documenting multiple layers of the optical network. Utilizing a common platform, the CMA5000 reduces the total cost of measurement by providing a complete testing solution that minimizes training, increases user efficiency, reduces equipment inventory and decreases test time via best-in-class specification.

### Accelerate the Deployment of Services

Designed to maximize performance and accelerate the deployment of new services, the CMA5000 allows you to quickly and easily characterize critical network parameters and diagnose network impairments faster than the competition. Network performance and

reliability can quickly be documented to accelerate the deployment of new services and time to revenue.

### Optimize Performance and Bandwidth

With its ability to span the **Physical, Data Link, Network and Transport layers** with test and measurement applications including **DWDM, SONET/SDH, Gigabit Ethernet, OTDR and Dispersion**, the CMA5000 is the ideal solution to characterize each fiber and network for maximum performance and revenue generation.



2003

FROST & SULLIVAN

Product Innovation Award

# The Platform

Utilizing a PC based, open architecture design and common user interface, the CMA5000 is able to easily remain up-to-date with the latest applications necessary to install and maintain current and evolving telecommunications networks. Numerous test technologies have been incorporated into an expandable platform, allowing a single unit to adapt and evolve to meet any testing need. Thus, the CMA5000 provides best-in-class performance for every testing application to dramatically decrease testing time, further reducing the cost of measurement.



## Features

- 1 Full range of I/O connections, including Ethernet, USB, IrDA, PS/2, VGA, Serial, Parallel, and PC-card slots
- 2 Large 26.7 cm (10.4") touch screen
- 3 Dedicated hard keys for one button operation, including Test, Stop, Mass Storage, Setup, Print and Help
- 4 Cursor knob with integral push button for precise cursor location
- 5 Drives include a minimum 20GB hard drive, modular CD-ROM, CD-RW or floppy
- 6 LEDs to indicate external power, battery and drive activity



Small Bay Adapter (SBA)  
(Up to 2 Modules)



Mid Bay Adapter (MBA)  
(up to 4 Modules)



Large Bay Adapter (LBA)  
(up to 4 modules)

## Deployment of Services

- Critical network parameters must be characterized and network impairments diagnosed efficiently to reduce time to revenue

## Network Commissioning

- Network performance and reliability must be achieved and documented quickly to facilitate accelerated deployment of services

## DWDM Network Equipment Installation

- Proper DWDM system tuning eliminates non-linear effects, maximizing bandwidth and revenue

## Physical Medium Characterization

- Efficient, accurate measurements and meticulous documentation ensure that your network is deployed on a solid foundation

Deployment of Services

Network Commissioning

DWDM Network Equipment Installation

Physical Medium Characterization



Each of the four major milestones of network deployment presents different test requirements, and the CMA5000 is tailored to deliver optimal performance every step of the way.

# OTDR

## Features and Benefits

### OTDR

- Never obsolete - modular design allows new or additional modules to be added
- Sophisticated analysis software provides consistent and accurate fiber characterization
- Dedicated testing modes simplify commonly performed tasks
- Easy to use for any skill level - testing from fault location to advanced analysis
- Dual touch screen and hard key user interfaces ensure smooth and efficient operation
- Solutions for all network types: Metro, CWDM, ultra-long haul and PON based, FTTP deployments
- Complete fiber characterization from 10 available wavelengths
- Automated, on-the-box reporting

The CMA5000 Optical Time Domain Reflectometer (OTDR) application represents the latest offering from a company that's been in the OTDR business for over 25 years. Our world-class OTDR modules continue this tradition with the latest in high performance hardware and dedicated, easy to use software.

### High Performance Hardware

To satisfy even the most demanding testing requirements, the CMA5000 series OTDR modules, feature a multitude of available wavelengths including 850nm, 1240nm, 1300nm, 1310nm, 1383nm, 1410nm, 1490nm, 1550nm, 1625nm and 1650nm. Up to four of these wavelengths can then be combined into a single optical port providing full spectrum fiber characterization at the press of a button and are ideal for testing backbone or metro networks that deploy CWDM. For ultra-long haul systems, the CMA5000 OTDR modules feature up to 50 dB of dynamic range (enough to see approximately 250km of fiber) - with an impressive 1 meter resolution. Challenging new architectures such as Fiber-To-The-x (FTTx) deployments that incorporate Passive Optical Networks (PON) are also easily addressed with our exclusive PON solution featuring dead zones as small as 1 meter and the ability to classify up to a 1X32 splitter.

### Dedicated, Easy to Use Software

To simplify testing, the CMA5000 features dedicated testing modes to automate and simplify the task at hand. FAULT LOCATE mode is designed for the novice just starting out or someone who only uses an OTDR occasionally. Simply connect the fiber and press test, the unit will verify the fiber is connected correctly, select testing parameters, execute the test and provide a text response indicating fault/break location and end to end loss. For those who have more experience or would like to perform more advanced testing, CLASSIC OTDR mode allows the user to select all parameters, compare up to eight traces and even generate splice loss reports. Cable commissioning is also automated through the use of CONSTRUCTION OTDR mode where a wizard allows the user to select the required testing wavelengths, number of fibers and file naming scheme. The wizard then becomes the project manager guiding the user through the testing and ensuring consistency with testing parameters and file naming - virtually eliminating user induced errors.



Full fiber characterization with the press of a button.

# Reflectance and Optical Return Loss

## Reflectance and Optical Return Loss

With data rates increasing and video applications growing exponentially, reflectance and optical return loss (ORL) become key parameters that will make or break your network. To simplify testing these, Anritsu has developed a unique OTDR based, ORL application that provides meter accuracy, combined with the trouble-shooting ability of an OTDR to add the expertise you need in testing today's demanding optical systems.

## Added Value

To further increase the value of your CMA5000 OTDR, it can be equipped with one of two integrated power meters (standard or CATV), a high output stabilized light source and integrated Visual Fault Locator (VFL). These options are integrated into the single slot OTDR module and do not require an additional module slot like some other solutions. In addition, all OTDR wavelengths are available as stabilized light sources reducing the equipment cost and providing a complete end-to-end loss testing solution.



VIP provides a safe and efficient means to analyze and document connectors.

Simply connect the fiber, enter your PASS/FAIL threshold and press test. If a test fails ORL, a quick press of our exclusive troubleshooting key presents a table listing the top three contributors to the failing ORL - complete with location. By identifying the problem connector, technicians will save hours of random troubleshooting time. The ORL option also functions as a 1 km single mode launch box increasing its value.

The system also supports a Video Inspection Probe (VIP) which can be used to view and document optical connector end faces. In addition to examining patch cords, the probe can also inspect bulkhead connectors without the need for disassembly.

Whatever your testing needs, our world-class OTDR products are designed to reduce the time to install, commission and maintain fiber spans.

## Features and Benefits

### Optical Return Loss

- Dedicated module provides highly accurate ORL measurements using OTDR techniques
- Unique "troubleshoot" feature pinpoints segments and events contributing to excess ORL
- Module can also be used as standard 1km lead-in fiber

### Light Source/Power Modules

- Integral to OTDR Modules
- Single port for OTDR and source eliminates uncertainties due to reconnection

### Video Inspection Probe

- On screen display eliminates eye safety concerns
- Image capture provides documented record of fiber end-face

# DWDM Network Equipment

## Features and Benefits

### Optical Spectrum Analysis

Increased revenue through accurate channel characterization:

- +40 pm wavelength accuracy over spectrum and temperature
- +0.4 dB power accuracy over spectrum and temperature
- High resolution, two-pass Diffraction Grating
- Channel Select option allows user to drop a wavelength with a flat top tunable filter
- Easy-to-use - one button complete spectral characterization
- User-defined configurations for custom DWDM testing
- Unsurpassed ORR

### Polarization Mode Dispersion

- Patented interferometric technique
- No auto-correlation peak for accurate characterization of all necessary PMD parameters: PMD, length PMD coefficient and second order PMD value
- Multiple test modes including multiple scans and long term PMD testing
- All band testing
- Highest dynamic range on the market: 55dB with standard light source and more than 64dB with the high power source
- Fast measurement time: less than 8 seconds
- Test through multiple EDFAs
- Easy to use touch screen interface combined with an innovative parameter set-up scheme
- Professional, comprehensive reporting of all settings and test results in a standard .pdf format at the press of a button

The OSA applications lower CWDM and DWDM installation and maintenance costs by providing industry leading spectral analysis of system critical parameters. Operating from 1250 to 1650 nm, these OSA modules for the CMA5000 are the perfect tools for testing large wavelength range CWDM system.

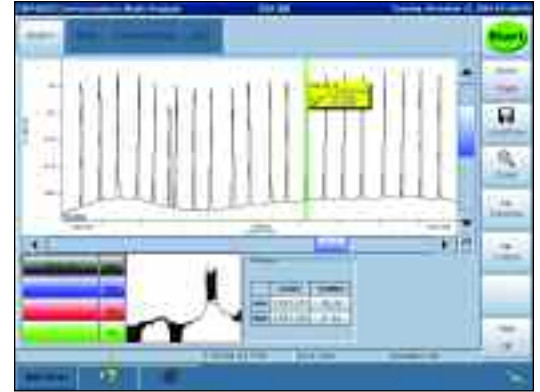
Two different modules are available to meet all test requirements: the OSA 400 and the OSA 425.

### OSA 425: Performance and economy.

The OSA 425 is a subset of the OSA 400 module providing the right mix of specification and value to meet all the most stringent DWDM network needs. Ideal for CWDM and lower density DWDM systems, the OSA 425 provides high accuracy measurements to help insure your network is running properly.

### OSA 400: Highest performance for DWDM systems.

The OSA 400 provides laboratory grade specifications in a rugged field module and is ideal for critical measurements on DWDM systems.



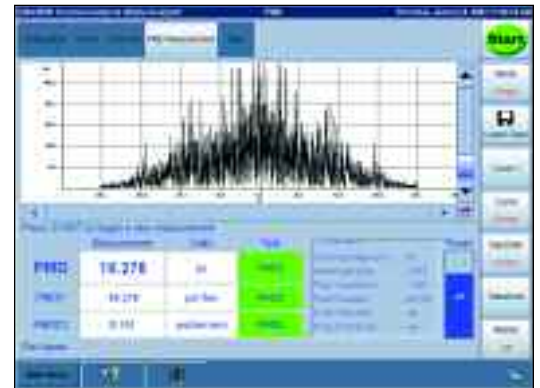
Complete channel analysis including wavelength (or frequency), power, OSNR and system gain tilt for balancing your network.

With the tightest wavelength spacing and best ORR & OSNR available in a field package, it quickly and accurately identifies problems with source drift, output stability and optical amplifier operation. In addition, it features a unique flat-topped narrow band filter that can be used to drop a single channel (at speeds up to 40Gbps) from the DWDM network for detailed transport testing.

# Polarization Mode Dispersion (PMD)

By performing complete PMD Characterization of your high data-rate networks, the CMA5000 PMD application helps optimize throughput and increase revenue. Its simple, one-button operation allows installers, carriers and system providers alike release the full potential of their high-rate spans.

The unique pi-shifted interferometric technique provides high accuracy and high dynamic ranges with a standard light source. This high performance module achieves tests through multiple EDFAs, reduces testing time by fast measurements and exceptional ease of use, and covers all wavelength bands. It is fully compliant with EIA/TIA FTOP-124 and IEC-61941 standards.



Determine right from the field if your fiber link meets PMD requirements.

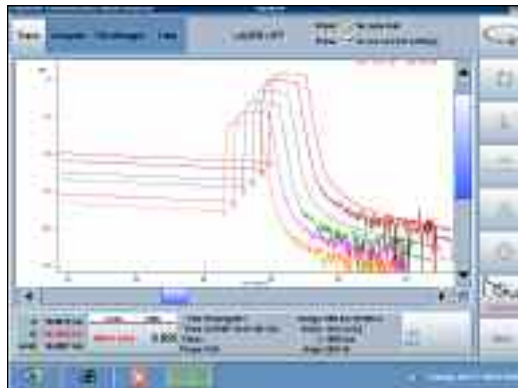
# OTDR/Chromatic Dispersion

The field portable CMA5000 OTDR/Chromatic Dispersion (OTDR/CD) measurement system is a dedicated module that combines the advanced capabilities of Anritsu's OTDR technology with Anritsu's experience in Chromatic Dispersion. The CMA5000 OTDR/CD measurement system gives installers and network providers a combined module that can be used as an OTDR and a chromatic dispersion measurement system, reducing testing times while increasing network performance.

The CMA5000 OTDR/CD measurement system is based upon the industry accepted time-of-flight measurement method (FOTP-168) that can evaluate chromatic dispersion of individual fiber links. Utilizing a single fiber for the test and multiple wavelengths, results in an increase

in the accuracy of the measurement, as well as, a reduction in the testing time. This translates into improved network performance and efficiency, resulting in increased revenue for the network provider.

Anritsu understands how valuable your time is, so we've provided intuitive, easy-to-use setup menus and single-button operation. The CMA5000 OTDR/CD measurement system has been designed to provide optimal test efficiency to facilitate quicker turn-up of services and reduce the cost of testing. The combined unit has an auto-test feature that will determine the optimum settings. In addition, intuitive setup menus guide the user through a few minor settings that minimize the testing and setup times.



## Features and Benefits

### Gigabit Ethernet

Increased revenue through:

- Targeted applications to efficiently measure critical network parameters including: utilization, throughput, latency, frame loss and burstability

Added value through performance:

- The Auto-negotiation capability allows the most important network parameters to be viewed immediately and automatically

Reduced cost of measurement:

- Unsurpassed ease-of-use allows users to capture all relevant network statistics with the press of a single-button

### Ethernet Reflector

- Simple, unattended operation
- Battery or AC power
- Small size, rugged construction
- Full line rate Gigabit Ethernet capability
- Interchangeable SFP optics
- Single optical/electrical ports or dual optical/electrical ports
- LED link status and speed indicators
- Full auto-negotiation

# Gigabit Ethernet

The CMA5000 Gigabit Ethernet module features four full gigabit line rate ports - two GBIC ports and two RJ-45 electrical 10/100/1000 ports. Test basic networks with the T'Gen / Monitor application. The RFC-2544 application measures critical parameters during network installation, including throughput, latency, burstability and frame loss (as detailed in RFC-2544).

For in depth troubleshooting, the Channel Statistics option allows the user to quickly identify the root cause of network impairments, not just the symptoms. Channel Statistics presents detailed statistics on all traffic received for up to 8,000 individual Ethernet or IP addresses, VLAN tags or MPLS labels. Full line rate traffic generation and shaping for 10/100/1000 BASE-T, 1000 BASE-SX, 1000 BASE-LX AND 1000 BASE-EX networks, combined with comprehensive professional reporting, ensures the easy installation, maintenance, troubleshooting and documentation of 10/100/1000 Mbps based Ethernet networks.

### Dedicated test applications including:

- Ping
- Traffic Generation and Monitoring
- RFC2544
  - Throughput
  - Frame Loss
  - Latency
  - Jitter



Intuitive test results in both a tabular and graphical display



Quick and automated RFC 2544 testing

# CMA Ethernet Reflector

The ability to rapidly deploy Ethernet based services is critical in today's marketplace. The Anritsu CMA Ethernet Reflector, used with an IP or Ethernet test set, offers the ability to easily measure throughput, round trip latency, even RFC suites at almost half the cost of using two test sets. A simple connection to the network endpoint where you want to test is all that is needed to gain unattended MAC or IP address swapping with the CMA Ethernet Reflector.



# MPEG Analysis

Essential to the successful rollout of a IPTV or VOD system is the ability to test every layer of the new network. This requirement is important not only during deployment, but also once the network is turned up; providers need to monitor or proactively test the network on a routine basis to ensure problems are identified and dealt with before customers begin to complain.

The CMA5000 coupled with the 5700 Gigabit Ethernet module and optional MPEG transport stream analysis software can help troubleshoot your VoD system. The combination of the GigE module and this software allows for complete Ethernet testing and MPEG-2 transport stream analysis.

The importance of performing MPEG transport stream analysis is critical. One of these important parameters contained within the MPEG stream is PCR (Program Clock Reference) which allows the receiver to synchronize their clock with the clock of the encoder of the stream. This allows proper decoding and presentation of the frames. Any inaccuracies of the PCR caused by network jitter or an encoding problem can cause poor quality video and audio to the end viewer, thus complete PCR analysis is very important.



Summary Screen provides instant pass/fail indication of the MPEG transport stream



Expanded results to show the exact cause of the errors

# 10 Gigabit Ethernet

The CMA5000 10 Gigabit Ethernet test set easily enables network installation, commissioning and troubleshooting. The module is a double size module featuring modular optics. The user interface has dedicated modes for unsurpassed ease of use; these modes include Ping, Traffic generation/monitoring and Performance analysis (RFC2544). These targeted applications ensure easy and efficient measurement of critical networks parameters including throughput, frame loss and Latency.

### Dedicated test applications including:

- Ping
- Traffic Generation and monitoring
- RFC2544
- BERT(optional)
- Sequence test (optional)



User defined traffic generation allows real network simulation.

## Features and Benefits

### MPEG Analysis

The Anritsu CMA5000 provides a complete platform for a cable operator's VoD system by testing:

- Physical layer testing utilizing the OTDR and OSA
- RFC2544 testing utilizing the 5700 Gigabit Ethernet module
- MPEG-2 transport stream analysis via optional software

### 10 Gigabit Ethernet

- The Traffic Generation application provides fast, efficient end-to-end testing with traffic generation capabilities up to full line rate and per port user definable
- In addition to the basic Traffic Generator, the CMA5000 10 Gigabit Ethernet application also allows the transmit and receive statistics to be displayed simultaneously
- The CMA5000's ability to swap the Ethernet and IP source and destination addresses provides a simple, logical loopback for single ended link certification
- Automated RFC 2544 testing provides simple acquisition of:
  - Throughput
  - Frame Loss
  - Latency
  - Jitter

# Transport Network Commissioning (SONET/SDH)

## Features and Benefits

### eXtended Transport Analysis

Increased revenue through maximized network efficiency and QoS:

- Measure and generate Jitter & Wander at all interface rates from 1.5 Mbps to 2.5 Gps
- Verify QoS with objective performance tests in compliance with ITU-T M2100 & G826
- All-in-one module, from PDH/T-carriers to SONET/SDH up to 10 Gbps
- Round Trip Delay measurement with 100 ns of resolution
- Reduced field force training and test time through targeted applications
- Best price/performance SONET/SDH tester on the market
- Monitor your "Next-Gen SONET/SDH" network up to 10 Gbps

For characterizing and documenting network performance levels, the **CMA5000 eXtended Transport Analysis (XTA) application** provides efficient, reliable testing of a multitude of parameters, including Alarm and Error analysis, APS with 125  $\mu$ s resolution, Round Trip Delay measurement with 100 ns resolution, network availability and performance evaluation. The XTA application characterizes networks supplying PDH/T-carriers to SONET/SDH up to 10 Gb/s and offers one of the most complete sets of electrical and optical interfaces available. In addition, with the new "Next-Gen SONET/SDH" option, operators and equipment manufacturers of SONET/SDH transmission systems can now quickly and easily test the new parameters of Next Generation



Monitor your Next Generation SONET/SDH network up to 10 Gbps



Verify QoS with objective performance tests in compliance with ITU-T M2100 & G826.

SONET/SDH networks, including Virtual Concatenation (VCAT), Link Capacity Adjustment Scheme (LCAS) and Differential Delay. All operations will be tremendously simplified by the easy-to-use graphical user interface that is characteristic of all CMA 5000 applications. The "Next Generation SONET/SDH" option will make configuring and performing tests on the XTA application virtually automatic. Installation and maintenance professionals can rely on the XTA application for all physical layer testing from DS0/E0 through OC-192/STM64. The CMA 5000 XTA is also the first field portable SONET/SDH tester with Jitter and Wander option up to 2.5 Gbps.

# CMA4500

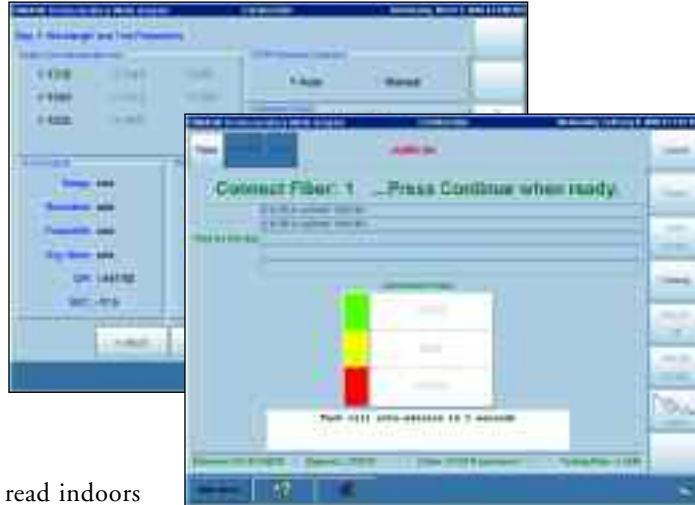
## Optical Time Domain Reflectometer

In addition to the CMA5000, Anritsu also offers the CMA4500 as a cost effective solution for those who only require OTDR and Loss Test Set capabilities. This dedicated OTDR offers all of the features and benefits of the CMA5000 with an OTDR module, in a rugged, non-modular package.

### You can have it all with the CMA4500

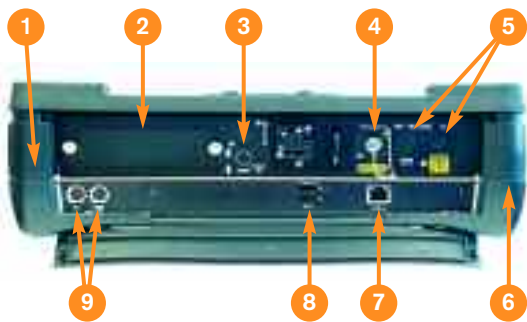
Highlights include a powerful PC based unit, large, high resolution color display that's easy to read indoors or out, touch screen and hard key user interfaces and several optics options to cover any testing requirements from single mode to multimode, from 1 meter to 250 Km. Additional features include dual USB ports, a 10/100 Ethernet interface and an optional integrated CD-R/W drive for ease data transfer.

Whether you're a first time user or industry veteran, the CMA4500 will take fiber installation, maintenance and documentation of your optical network to a new level.



### Added value through performance

As added value, the CMA4500 can be equipped with a stabilized light source and power meter for complete end-to-end loss testing. In addition, a Visual Fault Locator (VFL) option enables users to visually locate breaks within central offices and quickly identify specific fibers within a cable or splice tray. Round this out with the optional connector inspection microscope to reduce costly and timely troubleshooting of connector related issues and your CMA4500 quickly becomes the one tool you rely on to get your customers up and running.



### Features and Benefits

#### CMA4500

- All-in-one test set with fixed optics reduces complexity and equipment needed
- Increased network reliability through accurate fiber characterization
- Sophisticated analysis software provides consistent and accurate fiber characterization
- Dedicated testing modes simplify commonly performed tasks
- Full function OTDR - testing from fault location to advanced analysis
- Dual touch screen and hard key user interfaces ensure smooth and efficient operation
- Solutions for Metro, CWDM, ultra-long haul and PON based, fiber-to-the-premise (FTTP) deployments

- 1 Optional internal floppy or CD-R/W drive
- 2 Li-ion battery for extended battery life
- 3 AC charger/adaptor with charge level indicator
- 4 Universal connector with full range of adapters
- 5 Loss test set options for complete all-in-one testing
- 6 Standard 20 GB hard drive
- 7 10/100MB Ethernet/Fast Ethernet port for network connectivity
- 8 USB ports for easy "plug and play"
- 9 PS/2 ports for external keyboard and mouse

# CMA50

## Power Meters, Light Sources, Loss Test Sets

### Features and Benefits

#### Power Meters

- Multi-calibration wavelength addressing all network types : datacom, multimedia, WDM as well as FTTx
- High input power capacity enables characterization of RF TV optical signal

#### Light Sources

- Up to 4 sources per unit, out of a single port
- High power and stable output for high dynamic range testing and accurate loss readings

#### Loss Test Sets

- Includes EZTest one button bi-directional measurement option to test up to 4 wavelengths in one press

CMA50 is an all-in-one compact tester designed to reduce testing and data reporting time with good specs & unique features. It is ready for all markets: from long haul to FTTx or datacom.

Rugged design withstands years of use in the most challenging environments. Powered with rechargeable battery pack or four standard AA batteries.

- Interchangeable optical connectors
- Visual Fault Location source option
- Remote control and network testing via RJ45 port. Ideal for troubleshooting networks up to the demarcation point. Ideal for troubleshooting ONT/ONU in FTTx networks
- File Transfer via USB port
- Stores up to 1500 data measurement readings
- Pass or fail indicators for in-field compliance
- Automatic wavelength recognition between CMA50 light sources and CMA50 power meter



# CMA5

## Power Meters and Light Sources

### CMA5

- Economical series without compromise on specifications
- Pocketsize and rugged design
- Three-year warranty
- Interchangeable fiber-optic adapters

### Light Sources

- 4 different single wavelength variants at 850nm, 1310nm
- Up to two wavelengths on a single port to address all network types from datacom to WDM

### Optical Power Meters

- Several calibration wavelengths addressing all network types : datacom, multimedia, WDM as well as FTTx
- High input power capacity enables optical amplifier characterization and multimedia/CATV measurements



## Features and Benefits

### NetWorks

- Exclusive, patented\* Smart Splice Template feature for automatic template generation
- Batch Processing that allows the user to perform operations such as launch cord removal, analysis, parameter changes or file reformatting on an entire group of traces in seconds
- Batch display for quick visual inspection of up to eight traces simultaneously
- Multiple printing and reporting options create customized test results
- Innovative one step Bi-directional splice loss report generation wizard

# Accessories

## OTDR Emulation Software - NetWorks

### The complete OTDR and Loss Test Set data emulation software package

Analyzing test data can be a time consuming task, particularly in high fiber count networks. NetWorks data emulation software incorporates many time saving features to make your report generation easier and less labor intensive. Whether you're viewing OTDR trace results or compiling comprehensive reports, NetWorks will save valuable time and produce professional test results. Featuring powerful tools for analyzing, reporting, and printing OTDR and loss test set data.



# Related Anritsu Products

## MT9083A ACCESS Master



Designed for construction and maintenance of Access, FTTx, LAN and Metro optical networks, the ACCESS Master MT9083A is the first all-in-one tool that does not compromise performance. It features extremely high resolution to see those closely spaced splices and connectors, while still being able to certify 100+ km spans- quickly and accurately. In addition to verifying the integrity of the fiber plant, network performance can also be verified ensuring the customer experience is at its highest level.

Optical fibers are a key technology in today's modern communications systems, including access networks such as FTTx, CATV, and opti-

cal LANs. Moreover, optical-fiber technologies are playing increasingly important roles in mobile communications and digital broadcasting systems. Technicians maintaining these diverse systems are forced to carry a large variety of test equipment on-site, including OTDRs, Light Sources, Optical Power Meters, Visible Light Sources, etc., as well as a notebook computer for evaluating the FTTx QoS. On the other hand, fiber construction requires measuring instruments with different functions and performance. As an example, FTTx access networks use single mode (SM) fiber whereas optical LANs use multimode (MM) fiber. In addition, core and backbone networks utilize long fibers while optical access networks use short fibers, both requiring different types of measuring instruments with different performance. But now Anritsu's new line of MT9083A ACCESS Master OTDRs solves all these problems by providing all the measurement functions and performance required for optical fiber construction and maintenance in a compact, lightweight, all-in-one unit that eliminates the burden of carrying many different test sets and instruments on-site. Whatever your work, construction or maintenance, long haul or intra-building, Anritsu has an MT9083A model for your needs.

## CMA 3000 Mobile and Fixed Access Network Tester

CMA 3000 is designed specifically for field technicians who install and maintain mobile-access and fixed-access networks. The CMA 3000 is a powerful tool for a wide range of applications, including fast first-aid troubleshooting to comprehensive, in-depth and all-layer analysis of transmission problems. The basic CMA 3000 configuration, with its two 2 Mbps receivers and transmitters, supports framed and unframed testing and monitoring of 2 Mbps systems.



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