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VIAVI Solutions 5G

Enabling Australia's Field Technicians to build, troubleshoot and maintain better communications networks.

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T-BERD®/MTS-4000 Multiple Services Test Platform

Platform Overview

JDSU

The Industry's First Handheld Tester that Combines Advanced Fiber, Copper, xDSL, and Triple-Play Features

- Cost-effective, modular, and hand-held platform
- Large, 7-inch display (touchscreen option)
- Flexible connectivity (WiFi/ Bluetooth/1 G Ethernet/USB) and scripting capability for automatic data reporting
- Up to two embedded modules for simultaneous testing from the physical layer to the service layer
- Fiber features include: OTDR, PON meter, video inspection scope, laser source/power meter, and VFL
- Copper measurements include: volt/ohm meter, TDR, resistive fault locator, and wideband tones/spectral analysis up to 30 MHz
- VDSL and ADSL testing features utilize Infineon Technologies chipset and licensed option for Dr. DSL® diagnostic solutions from Aware, Inc.
- Triple-play service testing includes IPTV and VoIP measurements from DSL access interfaces or standard Ethernet port
- Automated scripting capability that simplifies testing and reporting
- Integrated web browser

Handheld tester with large, 7-inch color screen

Remarkable growth in triple-play services has created a complex mix of topology scenarios for delivering voice, video, and data to the customer. Triple-play services require highly scalable and resilient infrastructures to deliver a high quality of experience (QoE). The increasing complexity and performance requirements of today's access networks puts greater than ever demands on field service technicians.

The JDSU T-BERD®/MTS-4000 offers the first multi-test platform that addresses the complete requirements of field service technicians entrusted with the installation and maintenance of leading-edge fiber- and copper-based digital subscriber line (DSL) access networks and triple-play services.

The T-BERD/MTS-4000 gives service providers the power of a single instrument that provides complete triple-play access network and services testing, thus dramatically improving productivity. This one tool lets technicians complete service calls faster with fewer call-backs (repeats), because it quickly identifies the causes of nearly every possible problem. The modular design of the tester enables maximum flexibility and upgradeability and seamless support for future requirements and new testing capabilities, which provides continuous return on investment (RoI).

The lightweight T-BERD/MTS-4000 features a wide 7-inch color display with a touchscreen option that lets technicians easily view an actual Internet Protocol television (IPTV) stream, web browser, or complex test results, such as an optical time domain reflectometry (OTDR) trace or spectrum analysis waveform analysis.

Its unprecedented connectivity capabilities give the T-BERD/MTS-4000 platform more uses than other test equipment with features and functionalities, such as remote assistance, remote control, testing automation, and wireless connection, making it an ideal companion in the field.

Solutions That Improve Your Bottom Line

Scalable and modular platform for fiber, copper, and triple-play services testing

This brochure introduces the powerful capabilities of the T-BERD/MTS-4000—the first tool that offers service technicians every capability needed to test fiber and copper access networks as well as the services residing on them. The T-BERD/MTS-4000 offers a level of performance and value that builds on the tradition of the approximately 70,000 T-BERD/MTS and HST-3000 testers deployed worldwide. The T-BERD/MTS-4000 is the one tool that today's service technicians need to meet the challenge of exceeding customer expectations in the highly competitive triple-play services market.

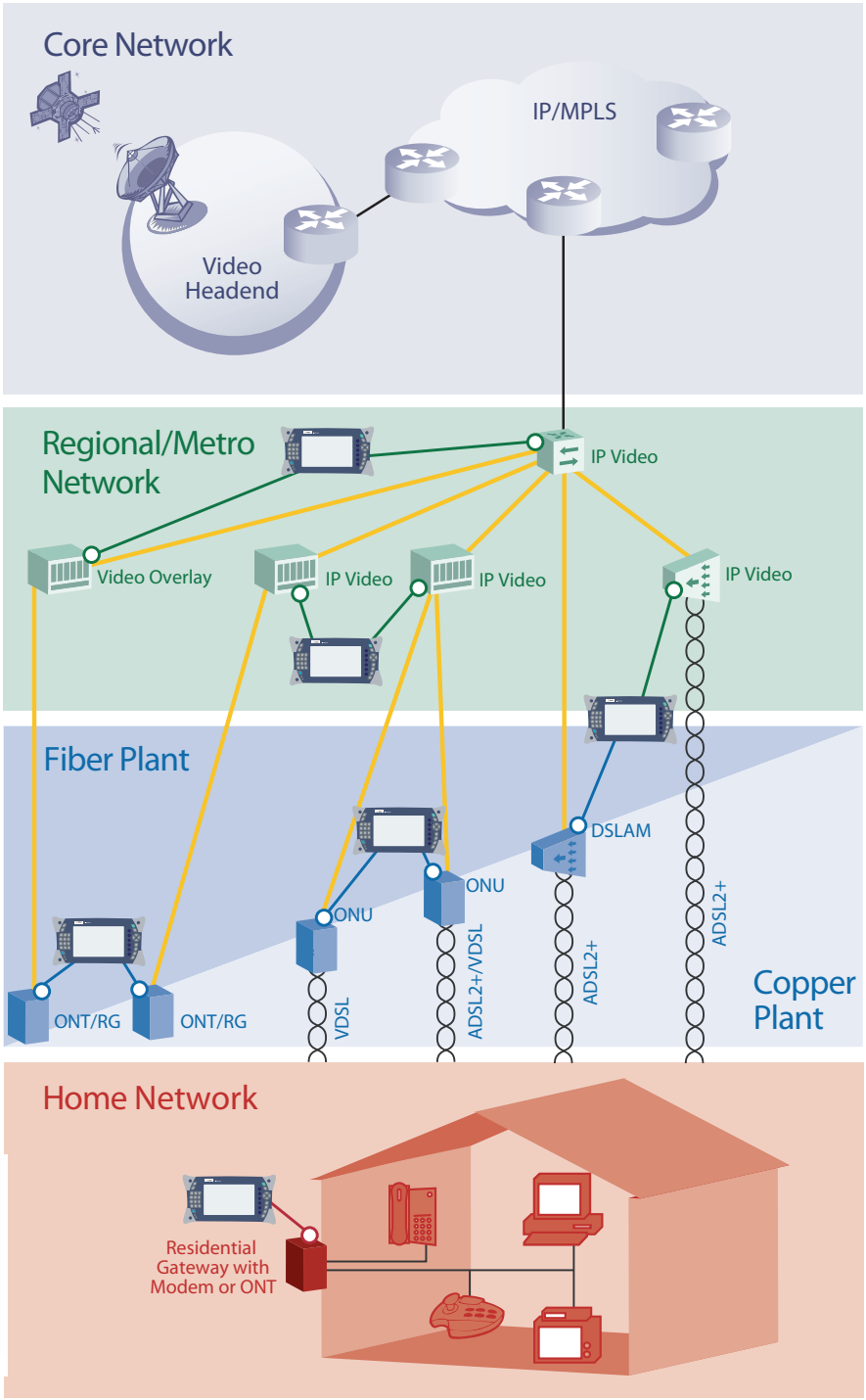
The T-BERD/MTS-4000 all-in-one test tool

Install and Qualify the Fiber/Copper Architecture

The T-BERD/MTS-4000 provides the full range of capabilities needed to test today's various leading-edge fiber (FTTx) and copper access networks plus the expandability needed to test the next generation. The variety of testing technologies offered by the T-BERD/MTS-4000 provide all of the testing functions that technicians need at every stage of the network life cycle in a single, compact, and rugged unit:

- Inspect and qualify optical connectors with a fiber inspection probe.
- Qualify the output power levels of the optical line termination (OLT)/ central office (CO) switch with a power meter (for a standard or passive optical network [PON]).
- Ensure end-to-end fiber connectivity with a loss test set and/or visual fault locator (VFL).
- Qualify and troubleshoot fiber networks with an OTDR.
- Qualify and troubleshoot copper lines with a full suite of tests, including voltage current, resistance, opens, balance, load coil detection, plain old telephone service (POTS), tones, noise, spectral, time domain reflectometry (TDR), and RFL.
- Qualify xDSL for network support of ADSL through very high bit-rate DSL (VDSL2).

Test fiber and DSL/Copper from a single platform

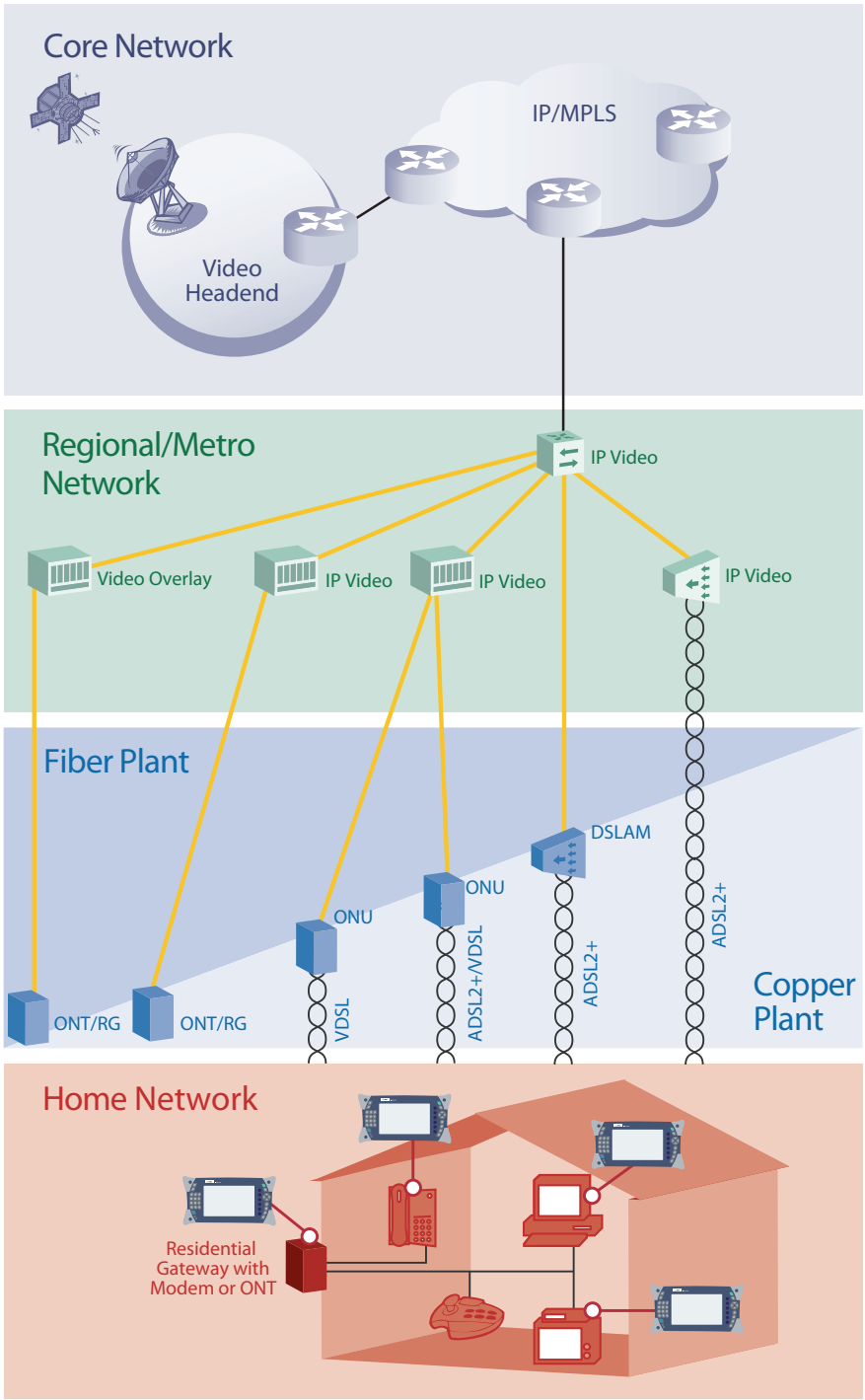


For network installation and qualification, the T-BERD/MTS-4000 provides a full range of capabilities to test today's leading-edge FTTx and copper access networks, plus it offers the expandability needed to test the next generation.

Turn Up the Services

Physical layer testing in the access network does not reveal all of the quality of service (QoS) issues that impact packet-based triple-play applications. Turning up triple-play services and assuring QoS is a multifaceted process that requires comprehensive and exacting attention to detail. The T-BERD/MTS-4000 provides a full collection of physical and triple-play service testing features to ensure proper installation, provisioning, and maintenance of reliable networks that consistently provide high-quality triple-play services.

- Validate the output power levels of the optical network terminal (ONT) with a standard or PON power meter.
- Validate Ethernet cable with TDR; fault, polarity, and skew results for Gigabit Ethernet (GigE).
- Validate Ethernet with ping, trace route, and file transfer protocol/ hypertext transfer protocol (FTP/ HTTP) tests.
- Simulate customer and test services tests at the ONT using a browser to configure and then test triple-play services suite.
- Validate voice over Internet Protocol (VoIP) with test results, including both R-factor and Mean Opinion Score (MOS) as well as content, transport, transaction, and physical link quality.
- Validate IPTV with test features that can simulate IPTV by displaying the status of 6 simultaneous streams in terminate mode or 10 in monitor mode and can decode and display I-frames, packet loss analysis, QoS timeline, and jitter graphs.



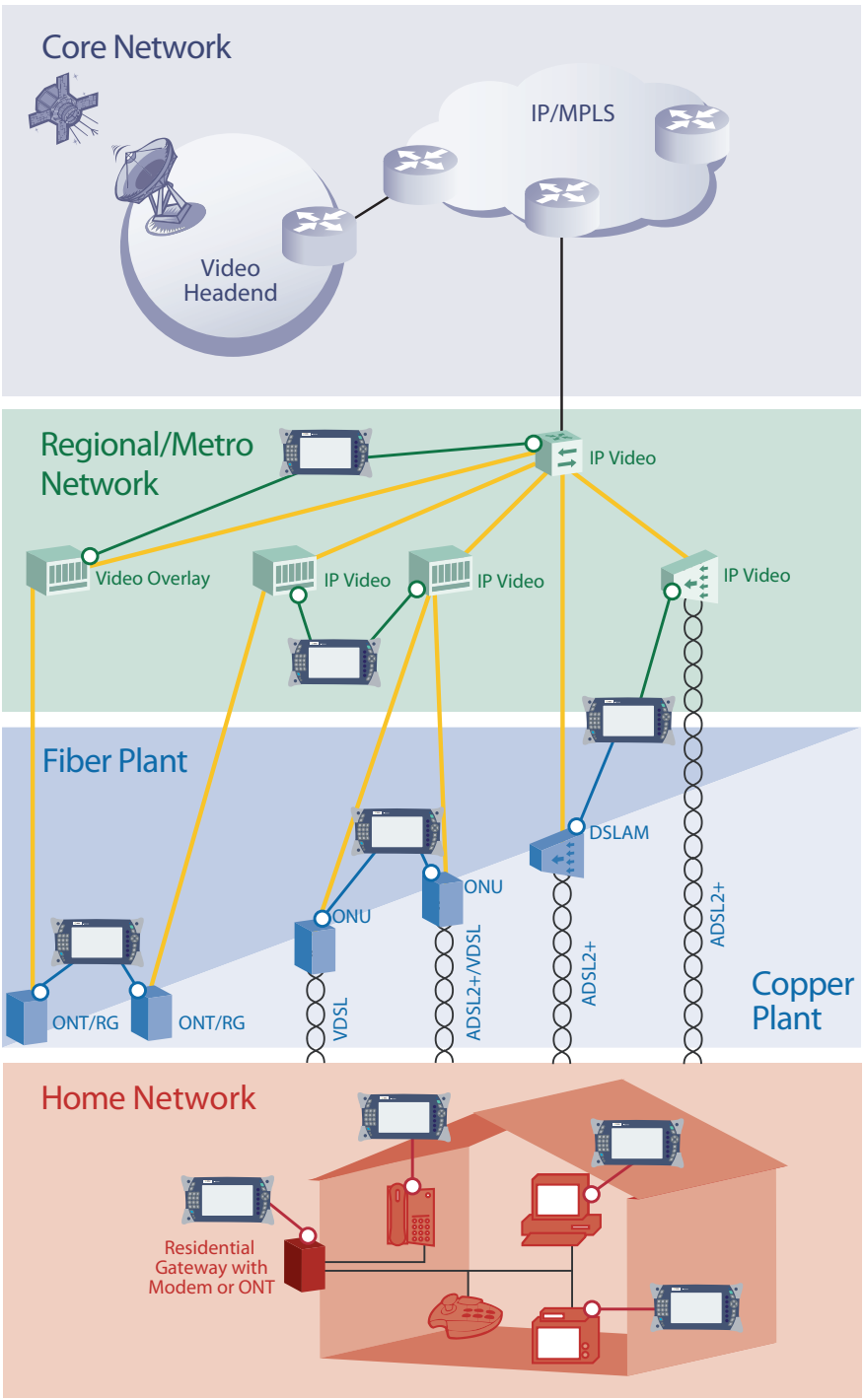
The T-BERD/MTS-4000 provides a full range of physical and triple-play service testing features to ensure proper turn-up of reliable networks that consistently provide high-quality triple-play services.

Troubleshoot the Network

Troubleshooting the access network is the most challenging field service task facing today's telecommunications operators. Faults can come from almost anywhere including problems with triple-play services, the copper or fiber along the network, copper or fiber in the customer's premises, home wiring, the set top box or ONT, or customer's setup, such as a misconfigured personal computer (PC). In addition, the network extends over a wide geographic area and can be difficult to access, being close to or inside the customer premises.

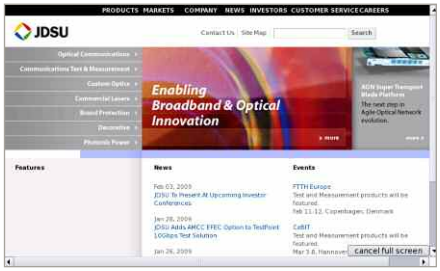
Field service technicians who typically focus on a single application—usually copper, fiber, or triple-play services—now must expand their skill set to address today's expansive range of possible problems. The T-BERD/MTS-4000 equips technicians with the ideal tool, because it provides all of the functionality needed to validate and troubleshoot Triple-Play networks and services, such as:

- Testing the ONT using a browser and Triple-Play test suite to validate services
- Performing golden modem operation to troubleshoot common DSL problems
- Offering complete copper testing to isolate and resolve copper span problems
- Troubleshooting optical connectors with a fiber inspection probe
- Determining equipment optical input/output power levels of the ONT using the standard or PON power meter
- Conducting fiber fault location and troubleshooting with an in-service OTDR and VFL

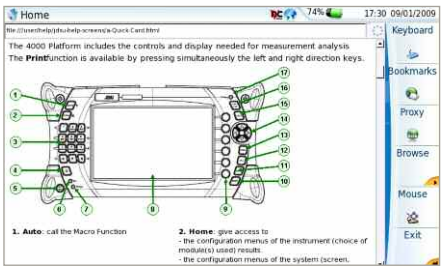


The T-BERD/MTS-4000 is the ideal field tool for validating and troubleshooting copper, fiber, and triple-play services – using one test platform.

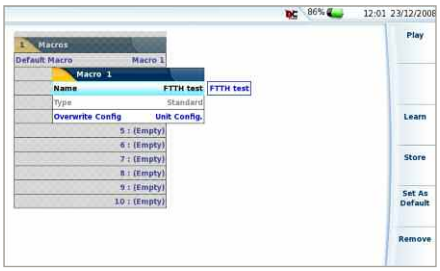
Manage the Process



Integrated web browser



HTML/PDF reader screen



User-defined fiber macro functions

Scripting capability with easy Pass/Fail

Fiber optic and copper FTTx access networks and triple-play services present a greater testing challenge to service technicians than ever before. The T-BERD/MTS-4000 platform provides all of the testing capabilities needed to meet this challenge plus innovative connectivity and automation capabilities that make it possible to lower costs and reduce the possibility of errors. The T-BERD/MTS-4000 can also interface directly with automated workforce management solutions that are capable of managing the testing process, yielding substantial improvements in operational efficiency.

Technicians can utilize the T-BERD/MTS-4000 browser letting them connect to the Internet to verify data services, contact online assistance, and download reference traces and settings from a database. A 10/100/GigE and WiFi connection provides Internet connectivity. WiFi and Bluetooth wireless connectivity makes it easy to transfer data, such as results files, from the T-BERD/MTS-4000 platform to a laptop or personal data assistant (PDA) without the need for a cable or client application. Technicians can also use the test platform for e-mail or FTP communications such as sending measurement results. A PDF/HTML viewer is provided to view documents and manuals.

Internet connectivity can also be used to take full control of the T-BERD/MTS-4000 from a remote location, making it possible to leverage the expertise of a single senior technician who can provide remote assistance without traveling to the customer site. Automatic software updates allow for keeping pace with test technology changes and new test scripts.

The T-BERD/MTS-4000 lets technicians create scripts to automate testing procedures making their jobs simpler and thus improving productivity, completeness, and accuracy. It also promotes easy implementation and enforcement of defined best practices that can ensure best-in-class service to customers and reduce churn.

Built-in intelligence manages the instrument through the test setup, execution, results storage, and results upload processes. It simplifies complex processes, which are often reduced to the single push of a button. The new tester provides a wide range of connectivity options, making it easy to integrate scripts with the back office to easily document, audit, and compare results against benchmarks.

Using the T-BERD/MTS-4000 automation features guarantee adherence to provider-set thresholds for service performance. JDSU customers have achieved substantial savings in time and money through automation of service turn-up and repair.

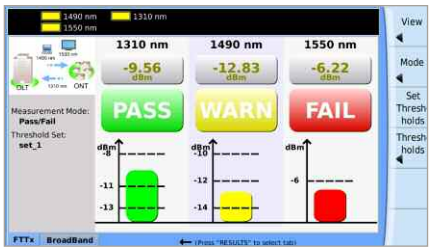
The T-BERD/MTS-4000 features single-button access to all testing functions for installation, turn-up, and maintenance of fiber- and copper-based networks and triple-play services

One Tool for Fiber, Copper, xDSL, and Services

Power level measurements

Connector inspection screen

OTDR/fault locator screen



PON power meter screen

The T-BERD/MTS-4000 provides an integrated approach toward field testing with test support for specific application uses. Field-swappable modules are available for multi-service testing, and as many as two modules can run simultaneously.

Bringing Fiber, Copper, and Triple-Play Services Testing Closer Together

In leading-edge fiber- and copper-based DSL access networks fiber and copper coexist. Technicians may have to test both fiber and copper throughout the network. The JDSU T-BERD/MTS-4000 offers test performance unlike what technicians have experienced previously: fiber-only testing, copper/xDSL-only testing with triple-play services, and fiber/copper/xDSL testing with triple-play services.

Complete Fiber Optics Test Solution

During FTTx network installation and maintenance, field technicians must accurately and completely characterize the fiber link. In addition to built-in functionality, the T-BERD/MTS-4000 meets advanced fiber test needs.

The T-BERD/MTS-4000 has built-in, basic fiber optic test options for quick and easy verification of fiber links:

– **Power level measurement:** The broadband power meter lets technicians easily verify the presence of a signal. This meter covers 850 to 1550 nm over a range of +10 to 60 dBm.

– **Visual fault location:** The VFL enables easy and visual break localization and network connectivity check.

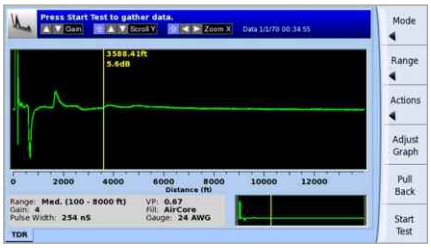
– **Optical connector inspection via USB interface:** The optional Inspect Before You Connect fiber inspection probe enables quick and easy control of connector end faces.

The T-BERD/MTS-4000 also has these dedicated fiber optic modules available:

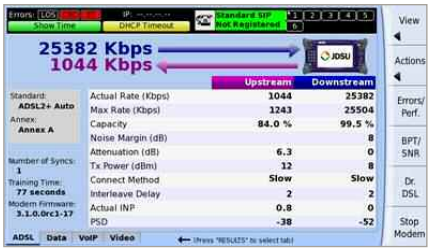
– **Last Mile OTDR Module with built-in loss test set option:** Suits the installation, turn-up, and maintenance testing of Access/FTTx networks and features industry-leading OTDR performance. It offers up to three simultaneous test wavelengths (between 1310, 1550, 1625, and 1650 nm) and can perform out-of-service as well as in-service PON testing. Using the same port as the OTDR, a lost test set is also available to easily perform quick fiber identification, power level, and insertion loss measurements.

– **PON Selective Power Meter Module:** Analyzes FTTx/PON-based systems and offers Through Mode testing that allows simultaneous measurement of PON downstream wavelengths (1490 and 1550 nm) and the upstream wavelength (1310 nm). The module also offers a Burst Mode function that supports analysis at 1310 nm. Pre-define pass/fail thresholds on the instrument to simplify measurements and ensure easy-to-interpret results, while the module GUI ensures that users will not miss the temporary collapsing signal.

The JDSU FiberTrace and FiberCable PC analysis software transfers data and generates comprehensive reports. The proof-of-performance report can be easily customized, for instance to include pass/fail indicators for quick analysis of problem areas.



Copper trace screen (TDR)



VDSL test interface

Example of IPTV video stream test

IPTV video stream summary

Complete Copper/Triple-Play Services Test Solution

Copper technologies and services in access networks evolve quickly because of consumer demand for high-speed Internet access, video on demand, and other applications. As a result, network operators must equip crews with one scalable, easy-to-use test tool that performs fast, accurate measurements under any condition.

The T-BERD/MTS-4000 has built-in and optional features for comprehensive copper testing and Internet Protocol (IP) service-level testing:

- **Complete Copper Testing:** Perform copper testing, including digital volt-ohm meter (DVOM), time division reflectometry, wideband transmission impairment measurement set (TIMS), spectral noise, and resistive fault locator (RFL). Wideband test capabilities allow for copper troubleshooting and line qualifications testing up to 30 MHz for VDSL services.
- **xDSL Testing:** Verify the circuit and service with modem emulation and replacement for asymmetric digital subscriber line (ADSL), ADSL2, ADSL2+, and VDSL2. Aware's Technician Dr. DSL lets field technicians troubleshoot common DSL problems through source identification and calculating the data rate impact of each disturber.
- **Triple-Play Testing:** Conduct advanced tests for the installation and maintenance of DSL and PON-based Triple Play. Turn-up and troubleshoot IPTV services that carry video program content over access networks, including support for all video QoS measurements.
- **VoIP Testing:** Turn up and troubleshoot VoIP service connectivity; feature availability and voice quality; and conduct IP ping, packet statistic, and trace route analysis to identify, diagnose, and sectionalize VoIP network and equipment problems.

The Ideal Platform for Testing Next-Generation Access Networks and Services

Accessories available for all supporting tests

Complete All-in-One FTTx Network Test Solution

The T-BERD/MTS-4000 targets field technicians who must perform multilayer tests starting from the physical layer, with both copper and optical fiber qualification, to Wifi, Ethernet, xDSL as well as IP triple-play tests (IP video, VoIP, and IP Data).

In one unit, the T-BERD/MTS-4000 includes all the features of the complete Fiber Optics Test Solution and the complete Copper/Triple-Play Services test solution.

Both the Fiber Optics or Copper/Triple-Play Services test solutions can be upgraded later to the all-in-one platform.

Ensuring a positive customer experience requires testing the access network and the services before the customer uses them. The T-BERD/MTS-4000 provides a single platform that deliver complete testing of copper- and fiber-based access networks and services with the highest levels of performance, convenience, and upgradeability on the market.

Function screen with multiple applications

A wide variety of application modules available

Contact JDSU today to get more information on how you can equip your field technicians with the T-BERD/MTS-4000 platform—the ideal solution for complete testing of next-generation fiber and copper access networks and triple-play services throughout the physical and service layer life cycle.

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