JDSU

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METRO Ethernet Forum MEMBER

10/100/1000 and Gig-E Testing

SmartClass™ Ethernet

Key Features

- **Proves acceptance for Service Level Agreements (SLAs) via industry-standard RFC 2544 test; ensures repeatable and reliable results so providers can reduce operating expenses by quickly turning up circuits or detecting problems**
- **Measures quality of service (QoS) parameters including throughput, latency, jitter, and error ratio with the capability to do so on a specific VLAN or Q-in-Q tag to allow fast analysis of triple-play networks**
- **Available in either a full tester or a loopback-only configuration. This allows the same loopback function of a fully featured testset at the fraction of the cost, and both versions are interoperable with the JDSU carrier Ethernet portfolio to enable capex reduction**
- **Provides comprehensive physical tests to validate error free cable and fiber connections and data layer tests to verity circuits can accurately pass data or IP traffic**
- **Designed for front-line technicians with little Ethernet or IP experience; provides an easy-to-use interface in 10 languages and comes complete with training information**

Ethernet Services Testing

SmartClass Ethernet is an easy-to-use, cost-effective Ethernet solution for physical layer cable testing, layer 2 and layer 3 traffic generation, and full RFC-2544 testing. Rugged, battery-operated, and application–specific, this test tool enables field technicians to turn up Ethernet and IP services by running an RFC 2544 test or by following a set of methods and procedures. SmartClass Ethernet is designed for front-line technicians who may not have experience dealing with emerging Metro Ethernet technologies yet need a solution for Ethernet and IP testing. Available in 10 languages, the tool may be configured as an optical or electrical only test set. It is configurable as either a far-end loopback device only or a full RFC-2544 compliant traffic generator.

The SmartClass Ethernet offers a unique, economical combination of feature-specific functionality.

Feature	Functionality
Loopback Testing interoperable with the JDSU carrier Ethernet portfolio	Enable a low-cost single ended loopback device for latency and RFC 2544 testing across a network
Ethernet and IP analysis and filtering	Filter and analyze incoming traffic to determine customer throughput and QoS
Physical Layer Diagnostics	Check that circuit is up and connected and physical layer is correct
Graphical Reporting	Professional Report Generation for validating or storing Service Level testing.
VLAN support including Q-in-Q support	Check VLAN and Q-in-Q mappings and prioritizations are properly set in network
Optical Power Measurements and traffic generation	Check optical link for loss and QoS parameters
Ethernet and IP Traffic Generation	Check to ensure that QoS parameters are being met by emulating customer traffic between customer locations or to a customer location.
Ping and Traceroute support	Check connectivity exists between locations
RFC 2544 traffic testing	Check that full Service Level Agreements are being met by testing to international standard via an automated test that ensures repeatability

Specifications & Features

Interfaces

Electrical Ethernet/IP

100/100/1000 Mbps	Single RJ-45

Optical Ethernet/IP

1000 Mbps	SFP Interface

Modes of Operation

Traffic, RFC 2544, Loopback, Ping, Traceroute, Cable Test, and Optical Power Measurements

Traffic Testing

Link Configuration

Duplex Modes	Full/Half
Flow Control	
Autonegotiation	

Traffic Generation

Ethernet Traffic Generation

Constant, Ramp, Bursty, Flood

Configurable Source and Destination MAC address, Frame Format, Type Field (for DIX), Frame Length (including under-sized and Jumbo frames), VLAN ID, VLAN Priority, Frame Payload, Utilization %

Configurable SVLAN ID, SVLAN Priority, SVLAN DEI, SVLAN TPI, CVLAN ID, CVLAN Priority

IP Traffic Generation

Constant, Ramp, Bursty, Flood, Ping, TraceRoute

Configurable Source and Destination IP Address, Packet Length, Packet Payload, Utilization %, TOS/DSCP

Configurable DHCP server address for static or dynamic addressing

ARP support

Traffic Filtering

MAC Source and Destination Address, SVLAN ID, SVLAN Priority, SVLAN TPI, CVLAN ID, CVLAN Priority

Source and Destination IP Addresses, Prefix Length, TOS/DSCP fields

RFC 2544 Automated Testing

Throughput Test

Latency Test

Frame Loss Test

Back to Back Frame Test

Bit Error testing Patterns

Layer 2 (Framed) Bit Error Patterns

PRBS (223-1, 231-1, and inverted selections)

All 1s, All 0s, User defined

Framed Pattern NCITS TR-25:1999

Long Continuous Random Test Pattern (CRPAT)

Long Continuous Jitter Test Pattern (CJPAT)

Long Compliant Supply Noise Pattern (CSPAT)

Key Results

Link Status

Link Active

Frame Detected

Sync Obtained

Configuration Status

Auto-negotiation Link Configuration ACK

Auto-negotiation Link Advertisement Status

Destination MAC address when using ARP

Link Stats

Bandwidth Utilization, Frame Rate, Rx/Tx L1 Mbps, Rx/Tx L2 Mbps, Rx/Tx L3 Mbps, Round Trip Delay, Service Disruption Time, CVLAN ID, SVLAN ID, CVLAN Priority, SVLAN Priority, Avg Packet Jitter, Max Packet Jitter

Link Counts

Total Received and Transmitted Frames, Pause Frames, VLAN Frames, Unicast Frames, Multicast Frames, Broadcast Frames, Frame Length (Bins)

Error Counts

FCS Errored Frames, Runts, Jabbers, Undersized Frames, OOS Frames, Lost Frames, IP Checksum Errors, IP Packet Length Errors, Acterna Payload Errors

Physical testing

Link speed, Link Status, Cable Status, MDI/MDIX, Distance to fault, Pin mapping, Pair length, polarity, skew

Optical Power Measurement (dbm)

Power Supply

4 AA field replaceable batteries (NiMH and Alkaline)

Battery operating time approx. 4 h of typical usage

Supports sleep mode (Instant-On, Auto power off after 2hrs)

AC line operation via external adapter/charger

AC converter provides country specific adaptor support (USA, UK, Australia, Europe)

Charging time, internal: 4 h from empty to full

Language Support

The SmartClass Ethernet supports Simplified Chinese, English, French, German, Italian, Japanese, Korean, Portuguese, Russian, and Spanish languages

General Specifications

Permissible Ambient Temperature

Nominal range of use	0°C to +50°C
Storage and transport	–10°C to +60°C

Humidity

Operating humidity	10% to 90%

Physical Specifications

Size (H x W x D)	230 x 120 x 50 mm
Weight, including batteries	<1 kg (2 lbs)
Display	240 x 160 monochrome display

Configurations

Packages

CSC-ETHLP-P1	electrical only loopback configuration
CSC-ETHLP-P2	optical and electrical loopback configuration
CSC-ETHLP-P3	optical and electrical loopback with accessories (SX and LX SFPs and multimode + singlemode fibers with LC+SC connectors)
CSC-ETHTR-P1	electrical traffic configuration
CSC-ETHTR-P2	optical and electrical traffic configuration
CSC-ETHTR-P3	optical and electrical traffic with accessories (SX and LX SFPs and multimode + singlemode fibers with LC+SC connectors)

Accessories

CSC-OPT	optical option
CSC-TRF	traffic option
AC-SFP-1000LX	1000LX SFP
AC-SFP-1000SX	1000SX SFP
AC-SFP-1000ZX	1000ZX SFP
AC-SFP-1000BX1	1310nm TX, 1490nm RX, Singlemode SFP
AC-SFP-1000BX2	1490nm TX, 1310nm RX, Singlemode SFP
AC-SFP-CWDM-1	1471nm CWDM SFP
AC-SFP-CWDM-2	1491nm CWDM SFP
AC-SFP-CWDM-3	1511nm CWDM SFP
AC-SFP-CWDM-4	1531nm CWDM SFP
AC-SFP-CWDM-5	1551nm CWDM SFP
AC-SFP-CWDM-6	1571nm CWDM SFP
AC-SFP-CWDM-7	1591nm CWDM SFP
AC-SFP-CWDM-8	1611nm CWDM SFP+ assorted cables