VIAVI Solutions

Brochure

VIAVI

Fusion JMEP smart SFP

JMEP3 and JMEP10: Gigabit Ethernet transceivers for service activation test, troubleshooting, and network performance monitoring

The VIAVI JMEP smart SFPs are gigabit Ethernet smart SFP transceivers that add remote network test, diagnostic and performance management capability to existing network infrastructure. There are two transceiver varieties, a 1 Gbps JMEP3, and a 10 Gbps JMEP10, both of which can seamlessly deploy inline or out-of-line, in existing network devices. They provide network operators and service providers with remote test points that enable performance-assured service delivery and increase the value of existing network infrastructure.

Both JMEP devices provide additional test and monitoring features at the remote end. They simulate multiple simultaneous loads on the network via Y.1564 traffic generation as well as micro-burst monitoring for throughput as a function of time-of-day with resolution to 1 msec.

Benefits

- Simple to use, easy to deploy in existing network SFP ports
- Turns network ports into service-assurance tools, enabling Ethernet operation, administration, and maintenance (OAM) for any 1 Gigabit Ethernet network
- Simplifies test and troubleshooting procedures to reduce equipment upgrades, truck rolls, and mean time to repair (MTTR)
- Compatible with a host of VIAVI portable test instruments including OneAdvisor 800 and 1000, NSC 100, and the whole T-BERD/MTS product line which includes the rack-mounted MAP-2100
- Monitors across mobile-backhaul networks without additional instrumentation

Features

- Fully compatible with RFC 2544 and Y.1564 (L2/L3) test methodologies
- RFC 6349 TrueSpeed, standards-based L4-TCP throughput test
- Activates test loopbacks (L2/L3)
- Monitors inline performance using Y.1731/ TWAMP-Light (RFC 5357)
- Measures throughput, availability, frame loss, frame delay, and frame delay variation
- Enables OAM 802.1ag for fault isolation
- Optical variants covering 1G and 10G line rates

Applications

- Service activation and assurance for Ethernet mobile backhaul for 3G, 4G, private 5G, LTE, and small cells
- Ethernet business-services SLA verification and assurance
- Synchronous Ethernet (SyncE) end points

Micro-Burst Detection

A key feature of the JMEPs is micro-burst detection. In TCP networks, there is the potential for intense bursts of traffic for short periods (e.g., oversubscription of multiple ports on a router). These can cause retransmits/resets/packet loss, all of which can have a dramatic effect on application performance e.g. poor VoLTE voice quality.

Regular "synthetic" testing whilst powerful in most aspects, can't detect these bursts, so it's necessary to detect them in the live streams at either Port, EVC or IP Flow level.

Regular traffic counters, e.g., in routers, may indicate a normal level of utilization, but it's averaged over a longer sampling period. To detect micro-bursts traffic must be monitored with millisecond accuracy to observe spikes that regular counters miss.

VIAVI has been detecting micro-bursts for over a decade in deployed T1 networks, with technology that we have developed, refined, and now imported into our JMEPs.

VIAVI TrueSpeed, Carrier-Grade TCP Throughput Testing

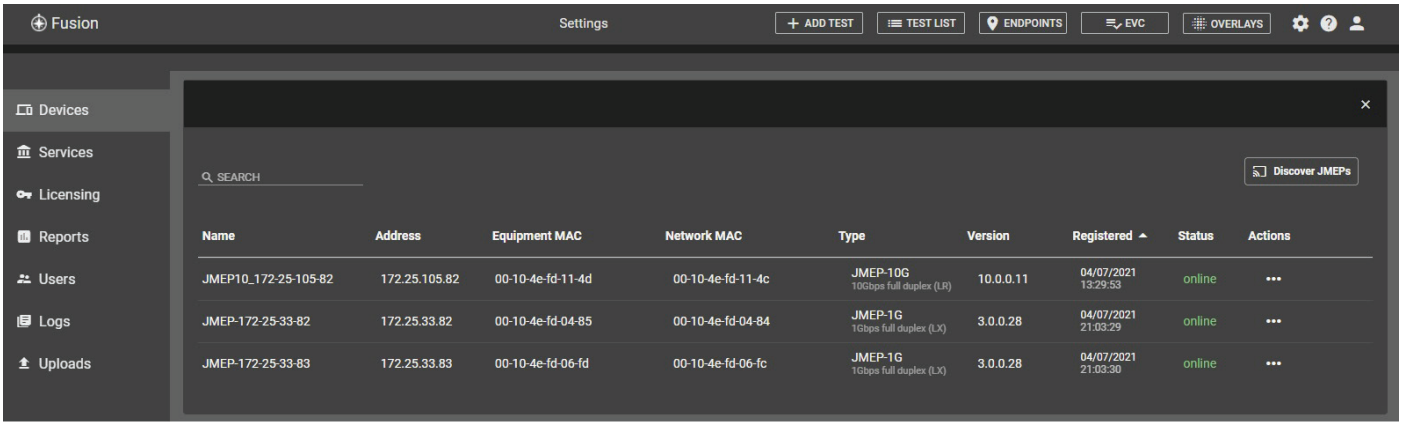
Accurate TCP throughput testing is paramount to a network operator's ability to sell business class Ethernet services to enterprise customers. Compliant with IETF RFC 6349, VIAVI TrueSpeed is a carrier-grade TCP throughput test which provides accurate and indisputable test results to and/or from a JMEP.

For example, when an Internet trouble ticket comes in, most service providers have little insight as to where the root cause lies, which leads to an expensive tech dispatch. A TrueSpeed test run to a JMEP can, within seconds, let a service provider know if a tech needs to be dispatched or not, potentially saving millions in OpEx.

Carrier Ethernet QoS Enabler

JMEP transceivers enable more efficient testing and troubleshooting by leveraging RFC 2544 and Y.1564 as well as Y.1731 and RFC 5357 methodologies to support end-to-end performance monitoring in multiservice/multi-class-of-service environments. It measures KPIs such as network delay, jitter, and packet loss to guarantee that SLAs are met. The probe also supports key service operations and maintenance capabilities, letting service providers easily verify service continuity and isolate faults.

Supporting industry standards, JMEP transceivers are based on decades of VIAVI optical technology and communications test and measurement expertise.

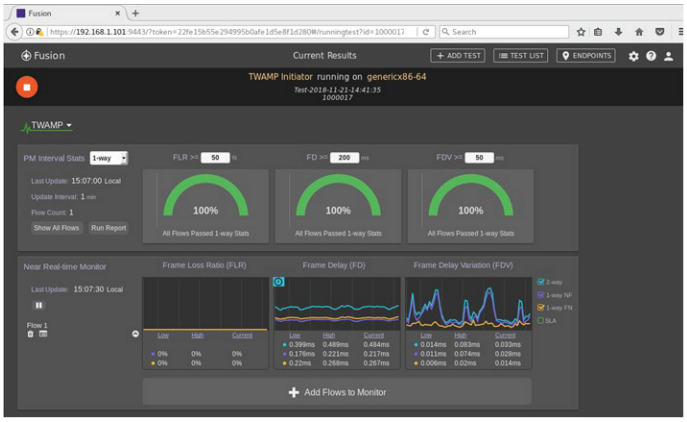


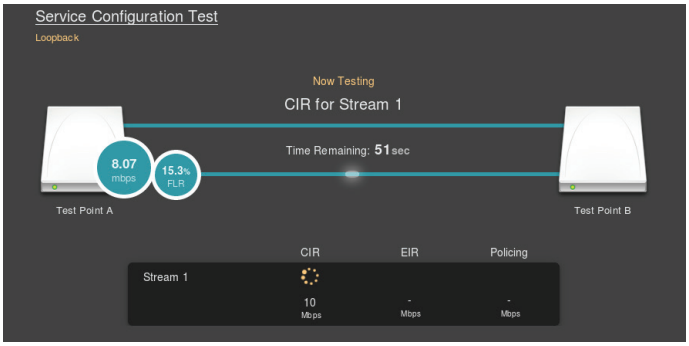
Fusion controller communicating with two JMEP types

JMEP transceivers are a key enabler of the Transport Assurance platform. EtherASSURE provides a more efficient test and troubleshooting process by leveraging RFC 2544 and Y.1564 methodologies and one-button automated testing with centralized performance reporting. It also supports Y.1731/TWAMP-Light (RFC 5357) functionality on multiple services concurrently. The VIAVI Small Cell Assurance Solution also leverages JMEP to deliver unmatched capabilities that help mobile service providers overcome the rollout and assurance challenges associated with small-cell deployments.

Performance Monitoring Features

- Inline performance monitoring
- Standards-based connectivity fault management (802.1ag) and performance monitoring (Y.1731, RFC 5357)
- Up-and-down maintenance end point (MEP) configuration
- Support for Y.1731 reflector and initiator modes on up to 10 Ethernet virtual connections (EVCs)
- Performance monitoring on up to 10 services
- Supports a TWAMP-Light reflector (RFC 5357) on multiple services/QoS concurrently
- Throughput, frame loss, frame delay, and frame delay variation measurements

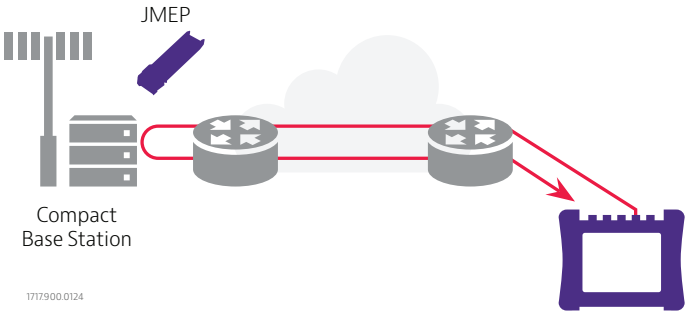




JMEP Service Activation/Troubleshooting Test Features

- Activates Layer 2 and Layer 3 loopbacks on any port
- RFC 6349 TrueSpeed, standards-based L4-TCP throughput test
- Supports per-port or per-EVC loopbacks
- Interworks with QT-600, T-BERD/MTS 5800, MAP-2100, NSC-100 Companion, vTA, vPMA and OneAdvisor 800/1000
- Complies with RFC 2544 and Y.1564 test methodologies; provides additional capabilities beyond the standard

Automated Turn-up Testing



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JMEP hot-pluggable transceivers drop in to standards-compliant SFP ports and provide a high-speed serial links at up to 1.25 Gbps signaling rates. They are compatible with the INF-8074i (small form factor pluggable transceiver) standard. An embedded engine performs Ethernet operations, administration, and maintenance (OAM) functions based on industry standards (802.1ag and Y.1731) including test turn-up automation, enhanced CPE demarcation, and performance monitoring.

The block diagram in Figure 1 depicts JMEP architecture. Each direction has a unique MAC address. The network can address commands directly to the MAC for test and turn-up after which the probe can continue to operate with its own MAC or can assume the MAC address of the device to which it is connected, for example an eNodeB. With full MAC and PCS layer implementation, the JMEP performs rate adaptation as defined by IEEE802.3.

Optical JMEP transceivers consist of an optical assembly housing the transmitter and receiver and an electrical sub-assembly. All are packaged together with a top metal cover and bottom shield. The optical sub-assembly consists of a high-performance transmitter equipped with a DFB laser.

All JMEP transceivers support standard digital diagnostic monitoring interfaces using a two-wire serial ID interface as defined in SFP MSA specification SFF-8472. Users can monitor transceiver parameters including temperature, voltage, laser bias current, laser power, and receiver power. Alarms and warnings are provided when monitored parameters exceed predefined threshold values. JMEP transceivers also include a loss-of-signal-detect circuit, which provides a TTL logic high output when it detects an unusable input optical signal level.

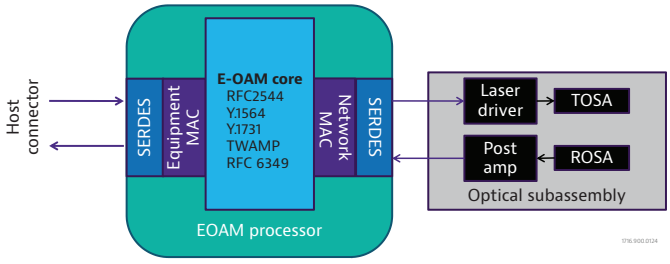

Figure 1. Simplified optical block diagram of JMEP3

Part Description	Catalog #
JMEP 1G – LX 10 km smart SFP, 1310 nm	JMEP01LX10A11
JMEP 1G – ZX 80 km smart SFP, 1550 nm	JMEP01ZX80A11
JMEP 1G – EX 40 km BiDi Downlink smart SFP, 1490 nm TX/1310 nm RX	JMEP01BX40D11
JMEP 1G – EX 40 km BiDi Downlink smart SFP, 1310 nm TX/1490 nm RX	JMEP01BX40U11
JMEP 1G – CU smart SFP, RJ45	JMEP01CU00A10
JMEP 1G – LR 10 km smart SFP, 1310 nm	JMEP10LR10A01

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