M1 Multi-speed Appliances

Compact Layer 2-3 Test Platform

100/50/40/25/10/5/2.5/1G and 10/100/1000M

Solution Overview

VIAVI M1 Appliance for TestCenter is the industry's highest density, compact appliance that offers a comprehensive portfolio of products that will help generate, analyze, capture, and filter network packets. M1 Appliance combines VIAVI's industry-leading Layer 2–3 traffic generation and analysis with powerful network emulation and application layer protocols for emulating a wide range of device types, users, and protocols.

The M1 also delivers the highest performance with the most competitive total cost of ownership (TCO) in a compact 2U appliance form factor. The M1 can be used in a benchtop lab environment where excessive equipment noise can be an issue for operators or in a traditional test lab environment. The M1's flexibility makes it perfect throughout the test lifecycle for functional, performance, and benchmark testing of data center and service provider network infrastructure and evolving SDN and NFV technologies.

Features & Benefits

- Multi-speed 100/50/40/25/10/5G/2.5G/1G, and 10/100M/1000M Ethernet for flexible interconnect with various options, including Long Reach optical transceiver, Short Reach optical transceiver, Direct Attached Copper Cable (DAC), and 1GBASE-T
- Low noise for benchtop operation in proximity to users
- Traffic and protocol performance identical to fX2 mainframe test modules and fully interoperable with all VIAVI TestCenter hardware
- Full chassis chaining and external timing sync available via direct connect, NTP, PTP, GPS, and CDMA
- Full suite of VIAVI TestCenter protocols and test packages are available

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Applications

SDN and Data Center—Validate forwarding performance and functional capabilities of Software-Defined Networks (SDN) with ultra-low latency and flexible port density. Supports key technologies like VXLAN, OpenFlow, PCE, Segment Routing and BGP-LS

Device Benchmarking—Test using IETF RFC 2544, RFC 2889, & RFC 3918 methodologies with easy test setup using dynamically bound traffic and automated wizards

Core and Edge Routers & Switches—Verify scale, reliability, and performance of Layer 2 & 3 services, including data, multicast, and video delivered via unicast routing, multicast routing, switching, and MPLS VPN technologies

Carrier Ethernet—Verify scale, reliability, and performance of Ethernet services delivered via Ethernet OAM, MPLS-TP, VPLS, PWE3 Pseudowire, bridged Ethernet, packet transport protocols, or combinations of these technologies

Subscriber Emulation—Verify setup & tear down of thousands of access subscribers using different services over various tunneling technologies (VLAN, L2GRE, MPLS, VPNs, VPLS, etc...) under normal or exceptional traffic conditions

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Technical Specifications

VIAVI M1 Appliance	
Inter-NIC and inter-system time synchronization	Stratum-3 rated oscillator is the default time source. Transmit line clock is at the precise nominal Ethernet rate ± < 1 PPM on initial shipment. Accurate to ± 4.6 PPM 15 years of operation • Frame time-stamp resolution of 2.5ns • GPS and CDMA-based external time sources are supported • IEEE 1588v2 and NTP packet-based external time sources are supported • TIA/EIA-95B-based external time sources are supported
Histograms	Port-level histograms
Operating Condition	Supported for 41° to 86° F (5° to 30° C) ambient temperature. 20% to 80% relative humidity
AC Input Range	100-240VAC (Autosensing)
Max Power Draw	Maximum of 2000W
Product Weight	Unit installed weight: 32 lb. (14.5 kg) Shipping weight: 42 lb. (19 kg)
Product Dimensions	2U rack mount height 20" (D) x 17.5" (W) x 3.5" (H) or 50.80cm x 44.45cm x 8.89cm
M1-KIT-04-START	**M1 4-PORT 10G/1G SFP+ AND LAYER 2-3 SW KIT**
User Reservation	Per-port reservation available
Number of Ports	4 SFP+ ports
Port Speed	10/1G
Media Support	10G Direct Attach Copper Cable, 10GBASE-SR, 10GBASE-LR, 1000BASE-SX, 1000BASE-LX, 1000BASE-T
Transmit/Receive Streams per Port	64k/128k
Stream Block Definitions per Port	512, each capable of generating multiple streams
Capture Buffer Size	256 MB
VFDs	6
Min/max Frame Size (w/CRC)	100% line rate for frames of 58-16383 bytes /Sub-line rate for frames from 33–57 bytes
Latency Measurement Resolution	2.5 ns Tx timestamp resolution with intra-chassis and inter-chassis synchronization

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Technical Specifications

M1-KIT-06-START	M1 8-PORT 10G/1G SFP+ AND LAYER 2-3 SW KIT
User Reservation	Per-port reservation available
Number of Ports	8 SFP+ ports
Port Speed	10/1G
Media Support	10G Direct Attach Copper Cable, 10GBASE-SR, 10GBASE-LR, 1000BASE-SX, 1000BASE-LX, 1000BASE-T
Transmit/Receive Streams per Port	64k/128k
Stream Block Definitions per Port	512, each capable of generating multiple streams
Capture Buffer Size	256 MB
VFDs	6
Min/max Frame Size (w/CRC)	• 100% line rate for frames of 58-16383 bytes • Sub-line rate for frames from 33-57 bytes
Latency Measurement Resolution	2.5 ns Tx timestamp resolution with intra-chassis and inter-chassis synchronization
M1-KIT-15-START	**M1 16-PORT FX2 10/100/1000 ETHERNET SFP NIC AND HW TIMING KIT**
User Reservation	Per-port reservation available
Number of Ports	16 SFP ports
Port Speed	1000M/100M/10M
Media Support	1000MBASE-SX, 1000MBASE-LX, 10/100/1000MBASE-T* (full-duplex only) *VIAVI accessory Part Number (ACC-6092A) is needed to support BASE-T (RJ-45)
Transmit/Receive Streams per Port	32k/64k
Stream Block Definitions per Port	512, each capable of generating multiple streams
Capture Buffer Size	8 MB
VFDs	6, available for each of 1024 stream templates
Min/max Frame Size (w/CRC)	• 100% line rate for 1G frames of 58-16383 bytes controlled by fixed, increment, decrement, random and IMIX modes • 10/100 max frame length of 16350 when not using PPM adjust • 10BASE-T max frame length of 13000 when using PPM adjust
Latency Measurement Resolution	2.5 ns Tx timestamp resolution with intra-chassis and inter-chassis synchronization

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Technical Specifications

M1-KIT-18-START	M1 8-PORT FX2 10/100/1000 SFP, 4-PORT 10/1G SFP+ TIMING KIT
User Reservation	Per-port reservation available
Number of Ports	8 SFP ports, 4 SFP+ ports
Port Speed	1000M/100M/10M ; 10G/1G
Media Support	• 1000MBASE-SX, 1000MBASE-LX, 10/100/1000MBASE-T* (full-duplex only) • 10G Direct Attach Copper Cable, 10GBASE-SR
Transmit/Receive Streams per Port	• FX2 10/100/1000 SFP card: 32k/64k • FX2 10/1G SFP+ card: 64k/128k
Stream Block Definitions per Port	512
Capture Buffer Size	• FX2 10/100/1000 SFP card: 256 MB • FX2 10/1G SFP+ card: 8 MB
VFDs	6
Min/max Frame Size (w/CRC)	• FX2 10/100/1000 SFP card — 100% line rate for 1G frames of 58-16383 bytes controlled by fixed, increment, decrement, random and IMIX modes — 10/100 max frame length of 16350 when not using PPM adjust — 10BASE-T max frame length of 13000 when using PPM adjust • FX2 10/1G SFP+ card — 100% line rate for frames of 58-16383 bytes — Sub-line rate for frames from 33–57 bytes
Latency Measurement Resolution	2.5 ns Tx timestamp resolution with intra-chassis and inter-chassis synchronization

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M1-KIT-21-START	M1 4-PORT DX3 100/50/40/25/10G QSFP28, L2-3 & 2544 STARTER KIT
User Reservation	Test port speed groups per card
Number of Ports	4 QSFP28 ports
Port Speed	100G/50G/40G/25G/10G Ethernet
Media Support	CR, SR, LR, CWDM, CLR, PSM, at multi-rate (100/50/40/25/10G)
Transmit/Receive Streams per Port	• Stats/Streams @100G; Tx=8K Rx=16K/4K (Basic Stats/ Latency stats) • Stats/Streams @50/40G; Tx=8K Rx=8K/2K (Basic Stats/ Latency stats) • Stats/Streams @25/10G; Tx=4K Rx=4K/1K (Basic Stats/ Latency stats) • Stream fields can be varied to create billions of flows
Capture Buffer Size	8 MB per port
VFDs	4
Min/max Frame Size (w/CRC)	60 to 16,004
Latency Measurement Resolution	2.5 ns Tx timestamp resolution with intra-chassis and inter-chassis synchronization
M1-KIT-23-START	**M1 2-PORT DX3 100/50/40/25/10 QSFP28, 4-PORT FX2 10/1G SFP+ KIT**
User Reservation	Test port speed groups per card
Number of Ports	2 QSFP28 ports and 4 SFP+ ports
Port Speed	100G/50G/40G/25G/10G Ethernet
Media Support	• DX3 100/50/40/25/10 QSFP28 card: CR, SR, LR, CWDM, CLR, PSM, at multi-rate (100/50/40/25/10G) • FX2 10/1G SFP+ card: 10G Direct Attach Copper Cable, 10GBASE-SR, 10GBASE-LR, 1000BASE-SX, 1000BASE-LX, 1000BASE-T
Transmit/Receive Streams per Port	• DX3 100/50/40/25/10 QSFP28 card — Stats/Streams @100G; Tx=8K Rx=16K/4K (Basic Stats/ Latency stats) — Stats/Streams @50/40G; Tx=8K Rx=8K/2K (Basic Stats/ Latency stats) — Stats/Streams @25/10G; Tx=4K Rx=4K/1K (Basic Stats/ Latency stats) — Stream fields can be varied to create billions of flows — FX2 10/1G SFP+ card: 64k/128k
Capture Buffer Size	8 MB per port
VFDs	4
Min/max Frame Size (w/CRC)	60 to 16,004
Latency Measurement Resolution	2.5 ns Tx timestamp resolution with intra-chassis and inter-chassis synchronization

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M1-KIT-25-START	M1 4-PORT 1G SFP NIC, 8-PORT 10G/5G/2.5G/1G/100M COPPER KIT
User Reservation	Per-port reservation available
Number of Ports	8 10G BASE-T ports, 4 SFP ports
Port Speed	• 1G SFP NIC card: 1000M/100M/10M Ethernet • 10G/5G/2.5G/1G/100M COPPER card: 10G/5G/2.5G/1G/100M Ethernet
Media Support	10GBASE-T, 1000MBASE-SX, 1000MBASE-LX, 10/100/1000MBASE-T* (full-duplex only) *VIAVI accessory Part Number (ACC-6092A) is needed to support BASE-T (RJ-45)
Transmit/Receive Streams per Port	• 1G SFP NIC card: Tx=32k; Rx=64k • 10G/5G/2.5G/1G/100M COPPER card: Tx=8K; Rx=8K
Capture Buffer Size	8 MB per port
VFDs	4 per stream
Min/max Frame Size (w/CRC)	60 to 16,004
Latency Measurement Resolution	2.5 ns Tx timestamp resolution with intra-chassis and inter-chassis synchronization

Requirements

- Windows-based workstation with 10/100/1000 Mbps Ethernet NIC; mouse and color monitor required for GUI operation
- Linux- or Windows-based workstation for scripting
- Mac-, Linux-, or Windows-based workstation for Rest API support

Ordering Information

Part Number	Description
M1-KIT-04-START	M1 4-PORT 10G/1G SFP+ AND LAYER 2-3 SW KIT
M1-KIT-06-START	M1 8-PORT 10G/1G SFP+ AND LAYER 2-3 SW KIT
M1-KIT-15-START	M1 16-PORT FX2 10/100/1000 ETHERNET SFP NIC AND HW TIMING KIT
M1-KIT-18-START	M1 8-PORT FX2 10/100/1000 SFP, 4-PORT 10/1G SFP+ TIMING KIT
M1-KIT-21-START	M1 4-PORT DX3 100/50/40/25/10G QSFP28, L2-3 & 2544 STARTER KIT
M1-KIT-23-START	M1 2-PORT DX3 100/50/40/25/10 QSFP28, 4-PORT FX2 10/1G SFP+ KIT
M1-KIT-25-START	M1 4-PORT 1G SFP NIC, 8-PORT 10G/5G/2.5G/1G/100M COPPER KIT

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