

iConverter[®] XM5-1G Network Interface Device **Carrier Ethernet 2.0 Certified 8-Port Gigabit NID**

The iConverter[®] XM5-1G is a Gigabit Network Interface Device (NID) that provides service demarcation and aggregation for Carrier Ethernet 2.0 services. The XM5-1G provides comprehensive support of the latest carrier-class Ethernet Service OAM, testing and protection standards. These advanced capabilities enable rapid service deployments, Service Level Agreement (SLA) assurances, comprehensive fault management and service protection to reduce operating costs and improve customer satisfaction.

The XM5-1G features a combination of Gigabit SFP ports and 10/100/1000 RJ-45 ports for UNI or NNI deployments to deliver wholesale Ethernet, 4G/LTE mobile backhaul, business and cloud services

The XM5-1G supports MEF-certified User-to-Network Interface (UNI) functions including Class of Service (CoS) management, granular rate-limiting, and 802.1ad Provider Bridge VLAN stacking (Q-in-Q) for service multiplexing of multiple E-Line, E-LAN and E-Tree services. The XM5-1G provides flexible per-flow service mapping, traffic policing and shaping. CIR/EIR “two rates, three colors” ingress port policing provides the granular bandwidth optimization required for CE 2.0 services such as Business Ethernet Services and Mobile Backhaul. The XM5-1G also provides advanced classification and filtering of subscriber traffic as an EVC or CoS flow based on Layer 1, 2, 3 or 4 identifiers.

The XM5-1G supports carrier-class Ethernet Service OAM standards. IEEE 802.1ag Connectivity Fault Management (CFM) proactively monitors service availability and provides tools for rapid fault isolation. ITU-T Y.1731 Performance Monitoring provides the ability to monitor key SLA parameters including frame delay, frame delay variation and frame loss.

The XM5-1G supports ITU-T Y.1564 and RFC 2544 service testing to easily verify the configuration and performance of Ethernet services prior to customer hand off. RFC 2544 provides per flow testing of Key Performance Indicators (KPI), such as throughput, latency, jitter and frame loss up to full wire speed. Y.1564 is a comprehensive Carrier Ethernet testing standard that tests all data flows and service attributes, including multi-flow Information Rate and Traffic Policing.

The XM5-1G supports ITU-T G.8031 Ethernet Linear Protection Switching and G.8032v2 Ethernet Ring Protection Switching with Connectivity Check Messages (CCM) at 3.3ms rate for sub-50ms protection switching. G.8032v2 includes multi-ring protection and sub-ring support.



SFPs not included

KEY FEATURES

- MEF Carrier Ethernet 2.0 Certified 8-Port Gigabit NID
- Integrated IPv4, IPv6, SNMPv1/v2c/v3, SSH, Telnet and IP-less 802.3ah OAM management
- SNMP management via NetOutlook[®] Network Management software
- Multiple port configurations:
 - 8 Gigabit SFPs or
 - 4 100/1000 SFP and 4 10/100/1000 RJ-45 copper or
 - 2 100/1000 SFP and 6 10/100/1000 RJ-45 copper or
 - 8 10/100/1000 RJ-45 copper
- Supports dual fiber and single-fiber SFP transceivers for standard, CWDM or DWDM wavelengths
- RJ-45 port supports 10/100/1000 and Half/Full-Duplex auto-negotiation and MDI/MDIX auto-crossover
- 10,056 byte Jumbo frames
- Advanced traffic management with service mapping, traffic policing and shaping with Hierarchical Rate Limiting
- IEEE 802.1ag Connectivity Fault Management
- ITU-T Y.1731 End-to-End Performance Monitoring
- RFC 5357 TWAMP responder and initiator
- Zero-Touch Provisioning
- ITU-T Y.1564 Ethernet Service Activation Testing
- IETF RFC 2544 Ethernet Service Activation Testing
- ITU-T G.8262 Sync-E and IEEE 1588v2 Timing
- ITU-T G.8031 and G.8032v2 Ethernet Protection Switching
- IEEE 802.1ax/802.3ad LAG with LACP
- Available with redundant AC or DC power inputs
- TAA, BAA and NDAA Compliant, and Made in the USA
- Commercial (0 to 50°C), wide (-40° to 60°C) and extended (-40° to 75° C) temperature ranges

Zero-Touch Provisioning (ZTP) allows providers to achieve efficiencies in service activation that accelerate turn up and reduce the need for on-site technicians. ZTP allows service provisioning to be centralized, standardized and remotely managed.

The integrated management eliminates the cost and space required for external management hardware. The integrated management provides comprehensive remote configuration and performance monitoring.

The XM5-1G supports IPv4 and IPv6 addressing, IP-Less protocol using the IEEE 802.3ah OAM channel or using SNMPv1/v2c/v3, SSH, Telnet or serial console port.

The IP address is user-defined or can be resolved through DHCP. Telnet and serial console (CLI) management interfaces are also supported, and utilize an easy-to-use, menu-driven interface. The CLI interface provides local configuration access.

SNMP management is available via Omnitron's NetOutlook® SNMP Network Management Software with an intuitive Graphical User Interface, or third party SNMP software.

The XM5-1G is available with single or dual DC power terminals, or available with an external AC to DC power adapter. Built-in mounting brackets provide table-top and wall-mounting capability, and can also be rack-mounted using the 1U 19" or 23" rack-mounting shelf.

The XM5-1G can be deployed to deliver a variety of Gigabit and Fast Ethernet services, and simplifies operations by reducing the need to inventory multiple NID models. Fast Ethernet SFPs can be installed in the Gigabit ports to provide a seamless upgrade path to future Gigabit services.

ADVANCED FEATURES

Management
IPv4, IPv6, Telnet, SNMPv1, SNMPv2c, SNMPv3, SSH, Serial Console
SNMP management via NetOutlook Network Management software
MEF 30 and 31 Service OAM Fault Management MIBs
Link Layer Discovery Protocol (LLDP)
Syslog
Alarm Relay Contacts
Traffic Management
IEEE 802.1Q VLAN Tagging
IEEE 802.1ad Q-in-Q VLAN Tagging
Service Multiplexing of up to 256 EVCs
User-configurable Ethertype
All ports configurable as UNI or NNI
Ingress and Egress traffic management
Hierarchical rate limiting with two-level color aware policing
CIR/EIR color aware "two rates, three colors" bandwidth profiles
Port Mirroring
IEEE 802.1p CoS Priority
per Port, VLAN ID, PCP, IPv4/IPv6 (TOS/DiffServe) Priority, MAC address, IP address, TCP Port or L2CP
L2CP Policy Management
L2PT Tunneling to encapsulate STP, VTP, PVST and CDP protocols
RFC 4541 IGMP Snooping
DHCP Relay Option 82
Timing and Synchronization
IEEE 1588v2 Boundary Clock, Slave Clock and Transparent Clock
ITU-T G.8262 Synchronous Ethernet
10 MHz, 1 PPS Clock I/O
Network Time Protocol (NTP)

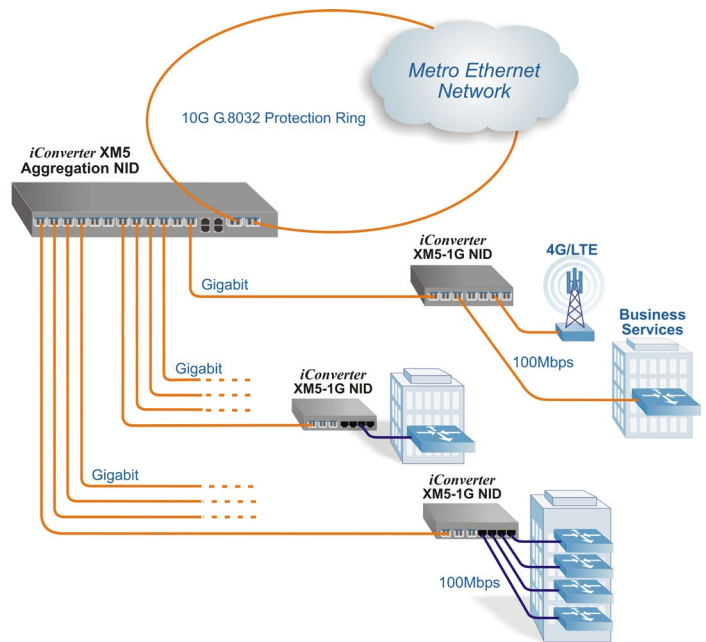
Service OAM and Testing
IEEE 802.3ah Link OAM with Dying Gasp
IEEE 802.1ag Connectivity Fault Management with 8 Maintenance Domain levels and 256 Maintenance Associations
IEEE 802.1ag Maintenance Intermediate Points for fault isolation
ITU-T-Y.1731 Performance Monitoring with threshold monitoring and crossing alerts
Advanced classification and filtering of Layer 1, 2, 3 or 4 subscriber traffic as an EVC or CoS flow
RFC 5357 TWAMP IP SLA Performance Monitoring
IETF RFC 2544 (built-in Test-head) with wire-speed, per flow testing of throughput, latency, jitter and loss
ITU-T-Y.1564 Service Testing (built-in Test-head) with multi-flow testing of information rate, latency, jitter and frame loss
Per port and per flow loopback with MAC (Layer 2) swap or IP (Layer 3) swap
Third party in-band loopback support
Zero-Touch Provisioning (DHCP/TFTP)
Portal integration with Cyan Blue Planet, Ocular IP, Orion Solarwinds and Web EMS
Built-in UTP cable tester for troubleshooting to the Customer Equipment
Protection and Redundancy
Port Redundancy (Primary and Backup Link)
IEEE 802.1ax/802.3ad LAG with LACP (1:1 and 1+1)
ITU-T-G.8031 Ethernet Linear Protection with sub-50ms failover
ITU-T-G.8032 Ethernet Ring Protection with sub-50ms failover
IEEE 802.1w Rapid Spanning Tree Protocol
Security and Authentication
TACACS+, RADIUS, 802.1x
Access Control Lists

For 10G applications with the same advanced features, see the [iConverter XM5 NID](#).

APPLICATION

In this application example, an **iConverter XM5 10G Aggregation Demarcation Device** is deployed as an Carrier Ethernet aggregation node on a 10G fiber ring. iConverter XM5-1G NIDs terminate the Gigabit fiber links and provide 100Mbps service demarcation at cell towers and customer premise.

The XM5-1G NIDs provide comprehensive support of Carrier Ethernet performance monitoring, fault management, timing and protection standards to enable rapid service deployments and service assurance.



SPECIFICATIONS

Description	iConverter XM5-1G 1G Network Interface Device	
Standard Compliances	IEEE 802.1Q, 802.1ad, 802.1p, 802.3, 802.3ah, 802.1ag, 1588v2 RFC 2819 (RMON), 2863 (IF-MIB), 2131 (DHCP), 2544 ITU-T G.8031, G.8032, G.8262, Y.1731, Y.1564 MEF Carrier Ethernet 2.0 Certified MEF 6.2, 9, 10.2, 14, 21, 26.1, 30, 31, 33	
Regulatory Compliances	UL, CE, FCC Class A, NEBS Level 3, UKCA	
Environmental	RoHS, WEEE, REACH, TAA, BAA, NDA	
Port Types	Copper:	10/100/1000BASE-T (RJ-45)
	Fiber:	100BASE-X (SFP) 1000BASE-X (SFP)
	Serial:	RS-232 (RJ-45)
	Management:	10/100/1000BASE-T (RJ-45)
Cable Types	Copper:	EIA/TIA 568A/B, Cat 5 and higher
	Fiber:	Multimode: 50/125µm, 62.5/125µm Single-mode: 9/125µm
	Serial:	EIA/TIA 568A/B, Cat 3 and higher
	Management:	EIA/TIA 568A/B, Cat 5 and higher
AC Power Requirements	AC Adapter:	100 - 240VAC/50 - 60Hz 0.3A @ 110VAC
DC Power Requirements	DC Input: (Terminal Block)	+/- 20VDC to 60VDC (max power consumption 30W) 3-Pin Terminal (isolated)
	DC Input: (AC Adapter)	12VDC (max power consumption 30W) 2.5mm Barrel Connector

Management	IPv4, IPv6, Telnet, SNMPv1, SNMPv2c, SNMPv3, SSH, Serial Console	
Frame Size	Up to 10,056 bytes	
Dimensions W x D x H	7.29" x 9.15" x 1.63" (185.17 mm x 232.41 mm x 41.4 mm)	
Weight	3.24 lbs (1.47 kg)	
Temperature	Commercial:	0 to 50°C
	Wide:	-40 to 60°C
	Extended:	-40 to 75°C
	Storage:	-40 to 80°C
Humidity	5 to 95% (non-condensing)	
Altitude	-100m to 4,000m	
Warranty	3 year warranty with 24/7/365 free Technical Support	

ORDERING INFORMATION

Model Number	Description
964y-00-ppt	XM5-1G with no clocking modes or connectors
964y-02-ppt	XM5-1G with 1588 Boundary/Slave Clock
964y-03-ppt	XM5-1G with 1588 Boundary/Slave Clock and 1588 Clock I/O Connector
964y-06-ppt	XM5-1G with 1588 Boundary/Slave Clock and G.8262 SyncE
964y-07-ppt	XM5-1G with 1588 Boundary/Slave Clock, 1588 Clock I/O Connector and G.8262 SyncE
964y-10-ppt	XM5-1G with Alarm Relay Contacts and no clocking modes or connectors
964y-12-ppt	XM5-1G with Alarm Relay Contacts and 1588 Boundary/Slave Clock
964y-13-ppt	XM5-1G with Alarm Relay Contacts and 1588 Boundary/Slave Clock and 1588 Clock I/O Connector
964y-16-ppt	XM5-1G with Alarm Relay Contacts and 1588 Boundary/Slave Clock and G.8262 SyncE
964y-17-ppt	XM5-1G with Alarm Relay Contacts and 1588 Boundary/Slave Clock, 1588 Clock I/O Connector and G.8262 SyncE
Base Model Number: 964y-xx-ppt	
Select the model from ordering table above.	
Add port configuration (y), power option (pp) and operating temperature range (t) to the model type selected.	
Port Configuration (y):	
0 = Eight 100/1000 SFP Ports	2 = Two 100/1000 SFP Ports and Six 10/100/1000 RJ-45 Ports
1 = Four 100/1000 SFP Ports and Four 10/100/1000 RJ-45 Ports	3 = Eight 10/100/1000 RJ-45 Ports
Power Options (pp):	
B1 = Single Barrel Connector and AC/DC power adapter, 100-240VAC, 50-60Hz, with US power cord and integrated mounting brackets	C1 = Single Direct DC input, +/- 20VDC to 60VDC, 3 pin terminal connector, no AC/DC power adapter, and integrated mounting brackets
B2 = Dual Barrel Connector and AC/DC power adapter, 100-240 VAC, 50-60Hz, with US power cord, and integrated mounting brackets	C2 = Dual Direct DC input, +/- 20VDC to 60VDC, 3 pin terminal connector, no AC/DC power adapter, and integrated mounting brackets
Operating Temperature Options (t):	
<leave blank> = Commercial temperature (0 to 50°C)	W = Wide temperature (-40 to 60°C)
Z = Extended temperature (-40 to 75°C)	
All models support IEEE 1588 Transparent clock mode.	
Contact Omnitron for other options. Order the appropriate Gigabit and Fast Ethernet SFPs separately. Visit the Omnitron Optical Transceivers web page.	

Accessories	
Model Number	Description
8261-0	19" 1U Rack Mount Shelf for XM5-1G (up to 2 converters)
8261-2	23" 1U Rack Mount Shelf for XM5-1G (up to 2 converters)



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