

iConverter[®] XM5 Network Interface Device **Carrier Ethernet 2.0 Certified 10 Gigabit NID**

The iConverter[®] XM5 is a 10G Network Interface Device (NID) that provides service demarcation and aggregation for Carrier Ethernet 2.0 services. The XM5 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 features three 10G SFP+ or XFP ports and four SFP or RJ-45 gigabit ports. The 10G SFP+ ports also support 1G SFP transceivers. The XM5 can be deployed as a node on a 10G ring with ports for Gigabit and 10G spoke links, or as a demarcation NID on a 10G access link with aggregation UNI ports for multiple tenants or cell towers.

The XM5 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 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 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 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. These OAM features provide proactive fault detection and rapid isolation of potential service problems, enabling SLA assurance while reducing Operational costs (OPEX).

The XM5 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.



XFPs are not included

KEY FEATURES

- MEF Carrier Ethernet 2.0 Certified 10 Gigabit and 1000Mbps Fiber Access 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:
 - 3 SFP/SFP+ or XFP Ports
 - 4 RJ-45 10/100/1000 or 4 100/1000 SFP Ports
- Supports dual fiber and single-fiber SFP/SFP+/XFP 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

The XM5 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.

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 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 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 can be deployed to deliver a variety of 10G and gigabit services, and simplifies operations by reducing the need to inventory multiple NID models. Gigabit SFPs can be installed in the 10G ports to provide a seamless upgrade path to future 10G 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)

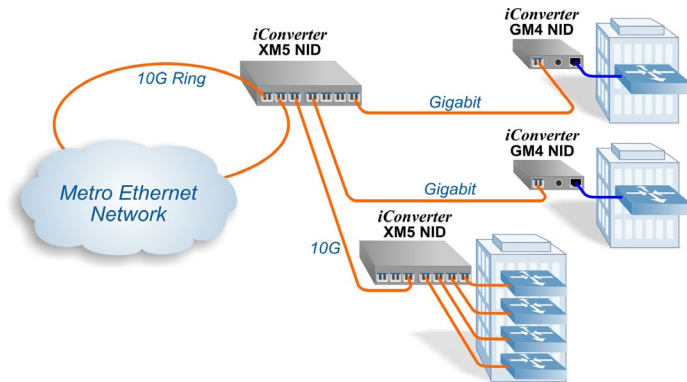
Service OAM and Testing
IEEE 802.3ah Link OAM with Dying Gasp
IEEE 802.1ag Connectivity Fault Management with 8 Maintenance Domain levels and 256 Maintenance Associations
IEEE 802.1ag Maintenance Intermediate Points for fault isolation
ITU-T-Y.1731 Performance Monitoring with threshold monitoring and 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

APPLICATIONS

Metro Ethernet Ring

In this application example, an iConverter XM5 NID is deployed as a mini-aggregation node on a 10G Metro Ethernet ring that provides connectivity to the ring and three fiber access links to customer locations. iConverter GM4 NIDs terminate the gigabit fiber links and provide service demarcation at each customer premise.

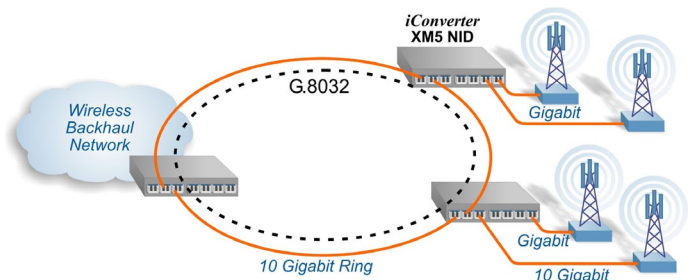
The other XM5 NID terminates the 10G fiber access link and provides demarcation at a multiple tenant building with four SFP UNIs for fiber connectivity to different subscribers.



Mobile Backhaul

In this application example, iConverter XM5 NIDs are deployed as nodes on a 10G wireless backhaul ring. The XM5 on the left is connected to the Wireless Backhaul Network, and provides NNI demarcation between the Wireless Carrier network and the Access Provider network ring. All XM5 NIDs on the ring support G.8032v2 Ethernet Ring Protection Switching for service protection with sub-50ms failover.

The XM5 NIDs on the right provide ring connectivity with gigabit and 10G access links (spokes) to cell towers with 1588v2 Packet Timing Protocol.



SPECIFICATIONS

Description	iConverter XM5 10G 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	Safety: EMI: ACT:	UL, cUL, CE, NEBS Level 3, UKCA FCC Class A TAA, BAA, NDAA
Environmental	RoHS, WEEE, REACH	
Port Types	Copper: Fiber: Serial: Management:	10/100/1000BASE-T (RJ-45) 100BASE-X (SFP) 1000BASE-X (SFP) 10GBASE-R (SFP+, XFP) RS-232 (RJ-45) 10/100/1000BASE-T (RJ-45)
Cable Types	Copper: Fiber: Serial: Management:	EIA/TIA 568A/B, Cat 5 and higher Multimode: 50/125µm, 62.5/125µm Single-mode: 9/125µm EIA/TIA 568A/B, Cat 3 and higher EIA/TIA 568A/B, Cat 5 and higher
AC Power Requirements	AC Adapter:	100 - 240VAC/50 - 60Hz 0.6A @ 110VAC
DC Power Requirements	DC Input: (Terminal Block)	+/- 20VDC to 60VDC (max power consumption 48W) 3-Pin Terminal (isolated)
	DC Input: (AC Adapter)	12VDC (max power consumption 48W) 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: Wide: Extended: Storage:	0 to 50°C -40 to 60°C -40 to 75°C -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

Step 1: Choose a Base Part Number (xxxx-yy-ppt)

Model Number	Description
9600-yy-ppt	XM5-NID with 3 SFP/SFP+ Ports
9601-yy-ppt	XM5-NID with 3 XFP Ports
9604-yy-ppt	XM5-NID with 3 SFP/SFP+ Ports and 1588 Boundary/Slave Clock
9605-yy-ppt	XM5-NID with 3 XFP Ports and 1588 Boundary/Slave Clock
9606-yy-ppt	XM5-NID with 3 SFP/SFP+ Ports and 1588 Boundary/Slave Clock and Alarm Relay Contact
9607-yy-ppt	XM5-NID with 3 XFP Ports and 1588 Boundary/Slave Clock and Alarm Relay Contact
9610-yy-ppt	XM5-NID with 3 SFP/SFP+ Ports and 1588 Boundary/Slave Clock, Alarm Relay Contact and 1588 Clock I/O Connector
9611-yy-ppt	XM5-NID with 3 XFP Ports and 1588 Boundary/Slave Clock, Alarm Relay Contact and 1588 Clock I/O Connector
9612-yy-ppt	XM5-NID with 3 SFP/SFP+ Ports and 1588 Boundary/Slave Clock and G.8262 SyncE
9613-yy-ppt	XM5-NID with 3 XFP Ports and 1588 Boundary/Slave Clock and G.8262 SyncE
9614-yy-ppt	XM5-NID with 3 SFP/SFP+ Ports and 1588 Boundary/Slave Clock, Alarm Relay Contact and G.8262 SyncE
9615-yy-ppt	XM5-NID with 3 XFP Ports and 1588 Boundary/Slave Clock, Alarm Relay Contact and G.8262 SyncE
9618-yy-ppt	XM5-NID with 3 SFP/SFP+ Ports and 1588 Boundary/Slave Clock, Alarm Relay Contact, 1588 Clock I/O Connector and G.8262 SyncE
9619-yy-ppt	XM5-NID with 3 XFP Ports and 1588 Boundary/Slave Clock, Alarm Relay Contact, 1588 Clock I/O Connector and G.8262 SyncE

All models support IEEE 1588 Transparent clock mode.

Contact Omnitron for other options. Order the appropriate 10 Gigabit, Gigabit and Fast Ethernet SFPs separately. [Visit the Omnitron Optical Transceivers web page.](#)

Step 2: Choose a Port Configuration (xxxx-yy-ppt)

04 = Four 10/100/1000BASE-T RJ-45 Ports
40 = Four 100/1000BASE-X SFP Ports

Step 3: Choose a Power Option (xxxx-yy-ppt)

B1 = Single Barrel Connector and AC/DC power adapter, 100-240VAC, 50-60Hz, with US power cord 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
C1 = Single Direct DC input, +/- 20VDC to 60VDC, 3 pin terminal connector, no AC/DC power adapter, 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

Step 4: Choose an Operating Temperature Range (xxxx-yy-ppt)

<leave blank> = Commercial temperature (0 to 50°C)
W = Wide temperature (-40 to 60°C)
Z = Wide temperature (-40 to 75°C)

ACCESSORIES

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



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