

iConverter GM3 Network Interface Devices

Carrier-Grade NIDs for 1000Mbps and 100Mbps Ethernet Fiber Access

The *iConverter* GM3 is a flexible and cost-effective Network Interface Device (NID) with Service and Link Operations, Administration and Maintenance (OAM) capabilities. The GM3 provides Carrier Ethernet service demarcation with rapid service activation, SLA assurance and fault management.

The GM3 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 GM3 provides per-flow service mapping, traffic policing and shaping. CIR/EIR “two rates, three colors” ingress port policing provides granular bandwidth optimization. The GM3 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 GM3 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).

iConverter GM3 NIDs provide industry-leading interoperability with the most comprehensive 802.1ag and Y.1731 standards implementations.

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

The GM3 fiber ports support Gigabit (1000BASE-X) or Fast Ethernet (100BASE-FX) SFP transceivers, and the copper interface operates at 1000, 100 or 10Mbps. The GM3 is available in 2-port or 3-port options. The 3-port configuration supports geo-diverse redundant access links or multi-tenant demarcation with two subscriber ports.



SFPs not included

KEY FEATURES

- Network Interface Device for 1000Mbps and 100Mbps Carrier Ethernet Fiber Access
- 802.1ad VLAN stacking (Q-in-Q) for E-Line and E-LAN service multiplexing
- Smallest full-function NIDs available with the lowest power consumption
- Advanced traffic management with service mapping and traffic policing and shaping
- MEF 9, 14 and 21 Certified Compliant
- MEF 30 and 31 Compliant
- IEEE 802.1ag End-to-End Connectivity Fault Management (CFM)
- ITU-T Y.1731 End-to-End Performance Monitoring
- Zero-Touch Provisioning
- Granular Rate Limiting using Committed Information Rate (CIR) and Committed Burst Size (CBS) per UNI, EVC and CoS
- Remote management through TELNET, SNMPv1/v2c/v3 and IP-less 802.3ah OAM extensions
- SNMP management via Omnitron's *NetOutlook*® Network Management software
- Fully integrated with Cyan CyPortal®
- Geo-diverse uplink redundancy (1:1) option
- Supports 1000BASE-X and 100BASE-FX Small Form Pluggable (SFP) transceivers for standard or CWDM applications
- Commercial (0 to 50°C), wide (-40° to 60°C) and extended (-40° to 75° C) temperature ranges

The GM3 is available as a compact standalone unit or as a chassis plug-in module. The GM3 plug-in module can be mounted in any *iConverter* chassis and manage other modules in the same chassis, and operate as a Network Interface Device. It features two Gigabit Ethernet backplane ports for connectivity to adjacent modules in a chassis for multi-port and multi-service configurations.

The standalone GM3 is available with or without integrated mounting brackets. It is DC powered and available with an external AC/DC power adapter, or with a terminal connector for wiring directly to a DC power source.

The GM3 also functions as a fiber transport module for the modular *iConverter* T1/E1 and Ethernet Multiplexer System.

TRAFFIC MANAGEMENT

- IEEE 802.1Q VLAN tagging and 802.1ad Q-in-Q VLAN stacking
- Service Multiplexing of up to 256 EVCs
- User-configurable EtherType
- Ingress and Egress traffic management
- CIR/EIR Color Aware “two rates, three colors” bandwidth profiles for ingress rate limiting
- Advanced Flow and CoS classification per Port, VLAN ID, PCP, IPv4/IPv6 (TOS/DiffServe) Priority, MAC address, IP address, TCP Port or L2CP
- Layer 2 Protocol Tunneling (L2PT) to encapsulate STP, VTP, PVST and CDP protocols (subscriber CISCO protocols)
- All ports configurable as UNI or NNI
- 10,240 byte Jumbo frames

INTERFACES AND REDUNDANCY

- Available with dual SFP fiber ports for geo-diverse uplink redundancy (1:1)
- Supports Rapid Spanning Tree Protocol (RSTP)
- Port Mirroring
- Subscriber network service port available in copper RJ-45 or SFP Fiber interfaces
- Three-port configuration supports redundant access link or multi-subscriber applications
- Supports 1000BASE-X and 100BASE-FX Small Form Pluggable (SFP) transceivers for standard or CWDM applications

SERVICE OAM AND TESTING

- IEEE 802.1ag End-to-End Connectivity Fault Management (CFM) – with 8 Maintenance Domain levels and 256 Maintenance Associations
- Supports 802.1ag Maintenance Intermediate Points (MIPs) for fault isolation
- ITU-T Y.1731 End-to-End Performance Monitoring
- Advanced classification and filtering of Layer 1, 2, 3 or 4 subscriber traffic as a EVC or CoS flow
- Y.1731 threshold monitoring and threshold crossing alerts
- IEEE 802.3ah Ethernet Link OAM with dying gasp
- Zero Touch Provisioning
- Per-port and per-flow Loopback with MAC swap
- Compatible with third party in-band loopback testing
- Built-in UTP cable tester for troubleshooting through to the Customer Equipment

NETWORK MANAGEMENT

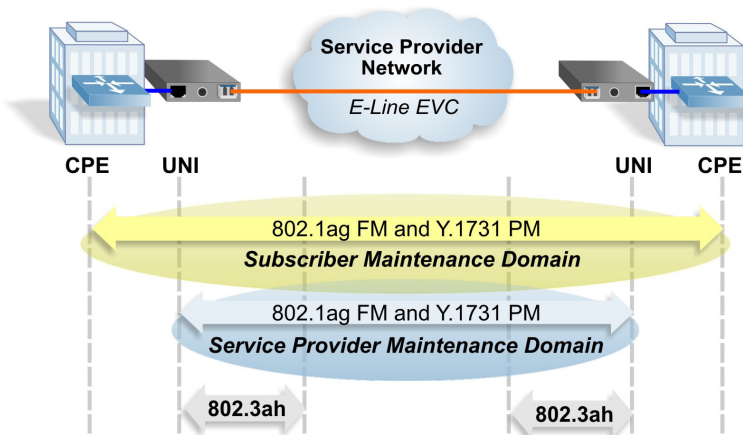
- Remote management via TELNET, SNMPv1/v2c/v3
- SNMP management via Omnitron's *NetOutlook* Network Management software
- IP-less management through 802.3ah OAM extensions
- Fully integrated with Cyan CyPortal for SLA monitoring



The GM3 provides comprehensive support of the latest carrier-class Ethernet Service OAM standards, enabling service assurance and reducing operational costs. IEEE 802.1ag Connectivity Fault Management (CFM) provides Maintenance Domain and Maintenance Associations for Subscribers, and multiple Service Providers. IEEE 802.1ag functions proactively monitor service availability and provide tools for rapid fault isolation.

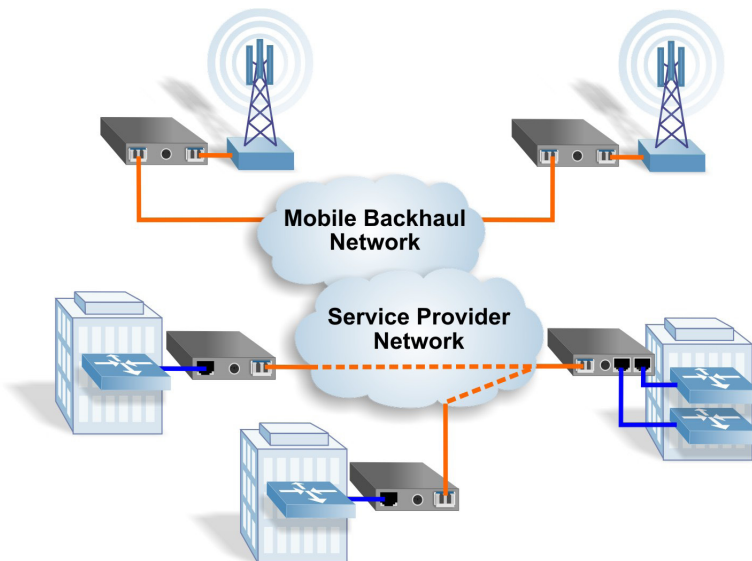
ITU-T Y.1731 Performance Monitoring provides the ability to monitor SLA parameters including frame delay, frame delay variation and frame loss. Hardware-based Delay Measurement and Loopback Measurement with nanosecond resolution provides the highest level of service testing and SLA assurance for delay sensitive voice and financial services.

802.3ah Link OAM provides tools for fault management and troubleshooting the first mile access links.



In this application, the GM3 NIDs on the top are used for demarcation of LTE Mobile Backhaul and provide performance monitoring for latency sensitive voice data.

The GM3 NIDs on the bottom are providing demarcation for business services. The GM3 NID at the subscriber location on the right is providing a UNI with multiplexed services to two other locations.



SPECIFICATIONS

Description	10/100/1000BASE-T to 100BASE-FX or 1000BASE-X Network Interface Device	
Protocols	10BASE-T, 100BASE-TX, 1000BASE-T, 100BASE-FX, 1000BASE-X	
Other Protocols	TCP/IP, ICMP, ARP, RSTP, SNMP, DAYTIME	
IP-Based Management	Telnet, SNMPv1, SNMPv2c, SNMPv3	
Compliances	UL, cUL, CE, FCC Class A, NEBS 3 compliant, MEF 9, MEF 14, MEF 21, MEF 30, MEF 31	
Frame Size	Up to 10,240 bytes	
UTP Cable	EIA/TIA 568 A/B, Category 5 and higher	
Fiber Cable	Multimode: 50/125um, 62.5/125um, 100/140um Single-mode: 9/125um	
Serial Cable	RS-232, 22 to 24 AWG, 12 to 50 pF/ft.	
Copper Connector	RJ-45	
Fiber Connectors	SFP: Any MSA Standard LC, RJ-45 (1000, 10/100/1000Mbps) Dual Fiber: SC, ST Single Fiber: SC	
Serial Connector	Mini DIN-6 female; Mini DIN-6 male to DB-9 female adapter included	
Temperature	Standard Operating: 0 to 50° C Wide Operating: -40 to 60° C Extended Operating: -40 to 75° C Storage: -40 to 80° C	
DC Power Input Connector	Plug-in Module: Standalone:	Power supplied by backplane 2.5mm Barrel Connector or 2-Pin Terminal Connector
DC Power	2 Port Plug-in Module: 3 Port Plug-in Module: Standalone:	1.6A @ 3.3VDC (typical) 2.0A @ 3.3VDC (typical) 8 - 32VDC 0.6A @ 9VDC (typical) 0.45A @ 12VDC (typical)
AC Power Adapter	AC Power Adapter:	100 - 240VAC/60Hz 0.1A @ 120VAC (typical)
Dimensions	Plug-in Module: Standalone (SA): SA with integrated brackets:	W: 0.85" x D: 4.5" x H: 2.8" W: 3.1" x D: 4.8" x H: 1.0" W: 3.8" x D: 4.8" x H: 1.0"
Weight	Plug-in Module: Without Power Adapter: With Power Adapter:	8oz. 1.0 lb. 1.5 lb.
Humidity	5% to 95% (non-condensing)	
Altitude	-100m to 4,000m	
MTBF (hrs)	Plug-in Module: Standalone Without Power Adapter: US Power Adapter: Universal Adapter:	340,000 420,000 250,000 100,000

ORDERING INFORMATION

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<Blank>	Standard Operating Temperature Range Model
W	Wide Operating Temperature Range Model
Z	Extended Operating Temperature Range Model

<Blank>	Plug-in Module
A	Standalone and External US AC Power Supply
B	Standalone and External Universal AC Power Supply
C	Standalone and DC Terminal Power
D	Standalone with integrated mounting brackets and External US AC Power Supply
E	Standalone with integrated mounting brackets and External Universal AC Power Supply
F	Standalone with integrated mounting brackets and DC Terminal Power

Port Configuration			Fiber Type	Distance	Connector Types				Tx Lambda (nm)	Rx Lambda (nm)	Min. Tx Power (dBm)	Max. Tx Power (dBm)	Min. Rx Sensitivity (dBm)	Max. Rx Power (dBm)	Min Att.	Link Budget (dB)
P1	P2	P3			ST	SC	SFP	RJ45								
FF	UTP	-	MM/DF	220/550m	8920P-0	8922P-0	-	-	850	850	-10	-4	-17	-3	-	7
FF	UTP	-	SM/DF	12km	8921P-1	8923P-1	-	-	1310	1310	-9.5	-3	-19.5	-3	-	10
FF	UTP	-	SM/DF	34km	-	8923P-2	-	-	1310	1310	-5	0	-23	-3	3	18
FF	UTP	-	SM/DF	80km	-	8923P-3	-	-	1550	1550	-5	0	-23	-3	3	18
FF	UTP	-	SM/DF	110km	-	8923P-4	-	-	1550	1550	0	5	-24	-3	8	24
FF	UTP	-	SM/DF	140km	-	8923P-5	-	-	1550	1550	2	5	-28	-8	13	30
FF	UTP	-	SM/SF	20kms	-	8930P-1	-	-	1310	1550	-9.5	-3	-20	-3	-	10.5
FF	UTP	-	SM/SF	20kms	-	8931P-1	-	-	1550	1310	-9.5	-3	-20	-3	-	10.5
FF	UTP	-	SM/SF	40kms	-	8930P-2	-	-	1310	1550	-3	0	-20	-3	3	17
FF	UTP	-	SM/SF	40kms	-	8931P-2	-	-	1550	1310	-3	0	-20	-3	3	17
SFP	UTP	-	-	-	-	-	8939P-0	-	Visit www.omnitron-systems.com/optical-transceivers.php for more information							
UTP	UTP	SFP	-	-	-	-	8970P-0	-	Visit www.omnitron-systems.com/optical-transceivers.php for more information							
UTP	UTP	UTP	-	100m	-	-	-	8974P-0								
SFP	SFP	UTP	-	-	-	-	8975P-0	-	Visit www.omnitron-systems.com/optical-transceivers.php for more information							
SFP	SFP	SFP	-	-	-	-	8979P-0	-	Visit www.omnitron-systems.com/optical-transceivers.php for more information							
UTP	UTP	-	-	100m	-	-	-	8989P-0								
SFP	SFP	-	-	-	-	-	8999P-0	-	Visit www.omnitron-systems.com/optical-transceivers.php for more information							

FF - Fixed Fiber, UTP - Unshielded Twisted Pair, SFP - Small Form Pluggable Transceiver

When using single-fiber (SF) media converter models, the Tx wavelength on one end has to match the Rx wavelength on the other.