iConverter® microNID™

The iConverter microNID is a low-latency, compact and cost-effective Network Interface Device (NID) that provides service activation testing, fault and performance monitoring. The two-port microNID enables the delivery of service-assured Business Ethernet, 4G/LTE macro cell and metro/small cell backhaul services.

The microNID enables Service Providers to deliver premium services with Service Level Agreements where cost, space and power consumption are constraints. Cable MSOs can deliver value-added commercial Ethernet services and wireless backhaul over their existing DOCSIS networks with guaranteed Quality of Service.

The microNID is available with two SFP ports, two RJ-45 ports, or one SFP and one RJ-45 port. The SFP ports support 100BASE-X or 1000BASE-X fiber transceivers, 100/1000BASE-T and 1000BASE-T copper transceivers. The RJ-45 ports support 100/1000Mbps bridging, with auto-negotiation for data-rate and duplex mode. The RJ-45 ports also support auto MDI/MDI-X, eliminating the need for crossover cables.

The microNID provides circuit provisioning, Service Activation Testing, Service OAM, and timing synchronization at the demarcation point in applications where traffic management and Class of Service are deployed at the head end, central office, or network edge.

Integrated ITU-T Y.1564 and RFC 2544 test heads provide multi-flow Service Activation Testing of throughput, latency, jitter and frame loss at full wire speed. The microNID also supports 3rd party loop-up/loop-down service activation testing at full line-rate.

The microNID features real time OAM Performance Monitoring and Fault Management functionality. It supports IEEE 802.1ag Connectivity Fault Management, ITU-T Y.1731 Performance Monitoring and RFC 5357 TWAMP Performance Monitoring for both Layer 2 and Layer 3 networks.

The microNID can be powered with an external AC to DC power adapter, with direct DC power, or through the RJ-45 port (PoE/PD) with 802.3af/at compliant PoE Power Sourcing Equipment (PSE).

The microNID can be remotely managed via TELNET, SNMPv1, SNMPv2c and SNMPv3, and is integrated into Omnitron's NetOutlook® Network Management Software. It can also be managed by third party management and performance portals.

SFPs not included

KEY FEATURES

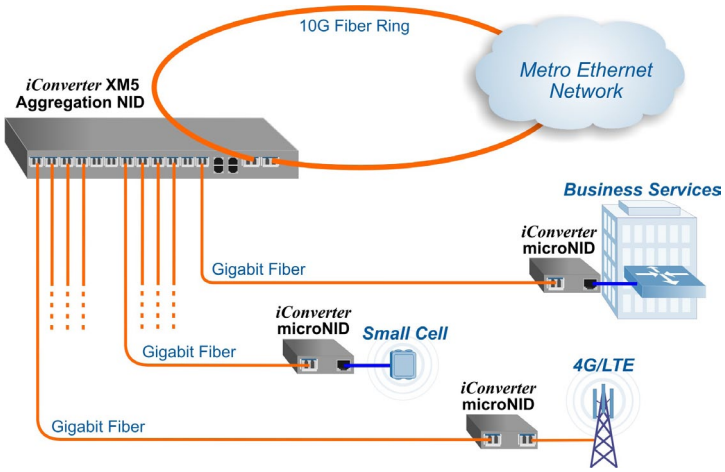
- 100/1000BASE-T Copper and 100/1000BASE-X SFP Network Interface Device
- Small Form Pluggable (SFP) transceivers for standard, CWDM or DWDM wavelengths
- Low-latency cut-through flow processing
- IEEE 802.1ag End-to-End Fault Management (FM)
  - 3.3msec Continuity Check Messages (CCM)
- ITU-T Y.1731 Performance Monitoring (PM)
- RFC 5357 TWAMP Reflector
- RFC 2544 and ITU-T Y.1564 Ethernet Activation Service Testing
- Third party Tester interoperability with Auto Loop Up/Down
- Utilization metering with RMON and flow statistics
- SNMP management via NetOutlook Network Management software
- Third party support for NMS and SLA monitoring software
- Supports Static or Dynamic IP (DHCP Client) Configuration
- SNMP Trap generation and configurable Trap Hosts
- AC, DC and PoE powered
- Commercial (0 to 50ºC), wide (-40º to 60ºC) and extended (-40º to 75º C) temperature ranges
- Made in the USA

APPLICATIONS

Service Provider Application

In this application diagram, a Service Provider fiber access network provides Carrier Ethernet connectivity for business services and mobile backhaul services (for a Small Cell and 4G/LTE Macro Cell). An iConverter XM5 Aggregation NID is deployed at a hub location on a 10G fiber ring. The XM5 Aggregation NID provides traffic management and Class of Service prioritization for the Carrier Ethernet services.

The Service Provider deploys copper-to-fiber and a copper-to-copper microNIDs at the demarcation to provide performance monitoring and fault management for SLA assurance, and synchronization timing for the backhaul circuits.



Cable MSO Application

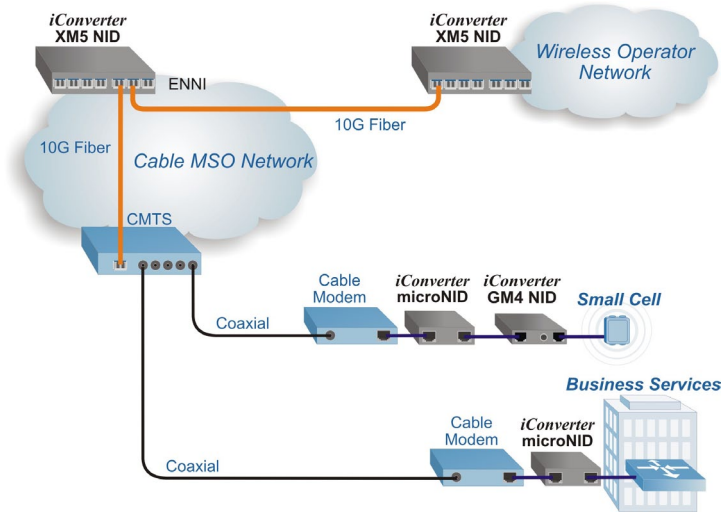
In this application, a Cable MSO is providing backhaul services to a Wireless Operator with connectivity to a small cell. The Cable MSO is also providing Ethernet business services to a customer within their network.

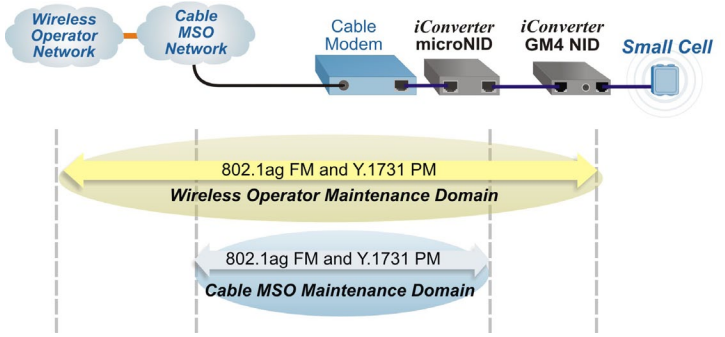
A 10G fiber transport link connects Cable MSO Network to the Wireless Operator Network with a pair of iConverter XM5 10G NIDs. The iConverter XM5 10G NID at the Cable MSO network provides ENNI demarcation, traffic management and Class of Service prioritization for multiple Ethernet Virtual Connections (EVCs).

A Cable Modem Termination System (CMTS) at the Cable MSO's hub location distributes coax links terminated with cable modems at the remote locations.

The Cable MSO deploys an iConverter copper-to-copper microNID at the small cell site to provide performance monitoring and fault management for SLA assurance, and synchronization timing for the backhaul circuits. A iConverter GM4 is deployed by the Wireless Operator to provide performance and fault monitoring between the Small Cell site and the WIreless Operator Network.

The Cable MSO is also providing a commercial Carrier Ethernet business service by deploying an iConverter copper-to-copper microNID with a cable modem at the customer premise for the SLA assured commercial service.





INTERFACE CONFIGURATIONS

- 2-Port Module Configuration
  - 2 x SFP Ports: 100/1000BASE-X Fiber transceivers and copper transceivers
  - 1 x SFP and 1 RJ-45 copper port
  - 2 x RJ-45 copper ports
- SFP transceivers for standard, CWDM or DWDM wavelengths

TRAFFIC MANAGEMENT

- Service Multiplexing of over 64 EVCs
- User-configurable Ethertype for UNI and NNI ports
- All ports configurable as UNI or NNI
- 10,240 byte maximum frame size

NETWORK MANAGEMENT

- Remote management via TELNET, SSH, SNMPv1/v2c/v3
- SNMP management via Omnitron's *NetOutlook*® Network Management software
- MEF 30 and 31 Service OAM Fault Management MIBs

SYNCHRONIZATION AND TIMING

- NTP – Network Time Protocol

SERVICE OAM

- IEEE 802.1ag End-to-End Connectivity Fault Management (CFM) – with 8 Maintenance Domain levels and 256 Maintenance Associations
- 3.3msec Continuity Check Messages (CCM)
- Supports IEEE 802.1ag Maintenance Intermediate Points (MIPs) for fault isolation
- Hardware-based Delay and Loopback measurement with nanosecond resolution
- ITU-T Y.1731 End-to-End Performance Monitoring with threshold monitoring and crossing alerts
- IEEE 802.3ah Ethernet Link OAM with dying gasp

SERVICE TESTING

- RFC 2544 with wire-speed, per flow testing of throughput, latency, jitter and loss
- ITU-T Y.1564 Ethernet Service Activation testing with multi-flow testing of information rate, latency, jitter and frame loss
- RFC 2544 and ITU-T Y.1564 1G test head support generation/reception of in-service and out-of-service L2, L3 and L4 frames
- Can be configured as a RFC 2544 or ITU-T Y.1564 test initiator or responder
- RFC 5357 TWAMP responder
- Per-port and per-flow Loopback with MAC swap
- Compatible with third party in-band loopback testing

SPECIFICATIONS

Description	***iConverter* microNID™** Network Interface Device	
Standard Compliances	IEEE 802.3, 802.1Q, 802.1ad, 802.1ax, 802.1p, 802.1ag, 802.3ad, 802.3ah, 802.3af, 802.3at, 1588v2 RFC 2819 (RMON), 2863 (IF-MIB), 2131 (DHCP), 2544 ITU-T G.8262, Y.1731, Y.1564 MEF 30, 31	
Management	IPv4 address, Telnet, SNMPv1/v2c/v3, SSH In-Band via Ethernet port	
Regulatory Compliances*	UL, CE, FCC Class A, NEBS Level 3	
Environmental	RoHS, WEEE, REACH	
Frame Size	10,240 bytes max frame size	
Port Types	Copper: Fiber:	100/1000BASE-T (RJ-45) 100BASE-X (SFP) 1000BASE-X (SFP)
Cable Types	Copper: Fiber:	EIA/TIA 568 A/B, Category 5 and higher Depends on SFP transceiver installed
MTBF (hrs)	w/o AC Adapter: w/ AC Adapter:	699,000 250,000
Warranty	3 year warranty with 24/7/365 free Technical Support	

* Pending

AC Power Requirements	AC Adapter:	100 - 240VAC/50-60Hz 0.1A @ 240VAC
DC Power Requirements	DC Input: (Terminal Block)	11 - 60VDC, 0.60A @ 12VDC (typical) 0.16A @ 48VDC (typical) 3-Pin Terminal (isolated)
	DC Input: (AC Adapter)	11 - 60VDC, 0.60A @ 12VDC (typical) 2.5mm Barrel Connector
	DC Input: (PoE)	44 - 57VDC, 0.16A @ 48VDC (typical) RJ-45 (Alternative A & B)
Dimensions W x D x H	3.8" x 4.8" x 1.0" (96.5 mm x 121.9 mm x 25.4 mm)	
Weight	w/o AC Adapter: w/ AC Adapter:	1.0 lb. (453.6 grams) 1.5 lbs. (680.4 grams)
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	

ORDERING INFORMATION

Model Number	Description
5000-02-pt	microNID with 2 x RJ-45 100/1000 ports
5000-11-pt	microNID with 1 x SFP 100/1000 port and 1 x RJ-45 100/1000 port
5000-20-pt	microNID with 2 x SFP 100/1000 ports

Base Model Number: 5000-xx-pt

Select the model from ordering table above.

Add power option (**p**) and operating temperature range (**t**) to the model type selected.

Power Options (p):

D = Barrel Connector and AC/DC Power Adapter, 100-240VAC, 50-60Hz, with US power cord	**N** = PoE Powered (on PoE/PD RJ-45 port) and Barrel Connector and AC/DC Power Adapter, 100-240VAC, 50-60Hz, with US power cord
E = Barrel Connector and Universal AC/DC Adapter, 100-240 VAC, 50-60Hz, No Power Cord	**P** = PoE Powered (on PoE/PD RJ-45 port) and Barrel Connector and Universal AC/DC Adapter, 100-240 VAC, 50-60Hz, No Power Cord
F = Direct DC 3 pin terminal connector, no AC/DC power adapter	**R** = PoE Powered (on PoE/PD RJ-45 port) and Direct DC 3 pin terminal connector, no AC/DC power adapter

Power options **N**, **P** and **R** are only available on the RJ-45 models.

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)	

For SFP transceiver ordering information, see SFP Transceiver web page.

Please consult Omnitron for other configurations and RoHS (5/6) compliant models.

Model Number	Description
8250-0	DIN Rail Mounting Kit
8251-0	DIN Rail Mounting Clip
8260-0	1U Rack Mount Shelf