

### iConverter® 2FXM2

#### 100BASE-X SFP to 100BASE-X SFP Media Converter and Network Interface Device

The iConverter 2FXM2 is a carrier-grade Network Interface Device (NID) that provides Fast Ethernet fiber to fiber media conversion with integrated management.

For Service Providers, the 2FXM2 NID provides MEF 9, 14 and 21 certified demarcation of Carrier Ethernet E-Line services. The 2FXM2 is a cost-effective demarcation device for Service Providers to deliver best-effort Ethernet services.

For Enterprise and Government and Utility networks, the 2FXM2 enables secure demarcation and management for mission-critical applications delivered over fiber infrastructure.

#### IEEE 802.3ah Operations, Administration and Maintenance

The 2FXM2 supports the IEEE 802.3ah Link OAM standard with Fault Detection, Performance Monitoring and Remote Loopback for Ethernet in the First Mile (EFM) access links.

#### Fault Detection

The 2FXM2 detects and indicates link faults, dying gasp and other critical events. Dying gasp is supported on all standalone models and plug-in models when installed in a 1-Module or 2-Module chassis with dying gasp support. The 2FXM2 also supports Unidirectional Link Fault Detection that indicates faults in either direction of the fiber link.

#### Performance Monitoring

802.3ah Performance Monitoring tools are used for the detection and notification of link performance (quality) faults. Ethernet data performance can deteriorate slowly over time, and the 2FXM2 allows the setting of error-per-second thresholds with event notification for early indication of issues that may be resolved prior to loss of service.

#### Remote Loopback

Remote Loopback is used for fault localization and link performance testing. When a 2FXM2 port is in loopback mode, all received link traffic is looped back and transmitted back unaltered. The statistics from the 2FXM2 port and the remote link partner can be compared for consistency.

#### VLAN with 802.1ad Q-in-Q and QoS for E-Line services

The iConverter 2FXM2 supports the IEEE 802.1Q tag Virtual Local Area Network (VLAN) packet tagging and untagging (including Q-in-Q tunneling and 802.1ad service provider tag) and the 802.1p Quality of Service priority standards.

VLAN 802.1ad tunneling technology enables service providers to offer their customers E-Line services via Ethernet Virtual Circuits (EVC). The 802.1p Quality of Service (QoS) prioritization standard enables delivery of high-priority, real-time applications such as voice and video over Ethernet.



SFPs not included

### KEY FEATURES

- Carrier-Grade optical Ethernet Network Interface Device
- Integrated SNMPv1, SNMPv2c, SNMPv3 and IP-less 802.3ah management
- 802.3ah Link OAM for performance monitoring, early fault detection and dying-gasp
- VLAN with 802.1ad Q-in-Q for E-Line services
- Quality of Service for prioritizing Voice/Data/Video traffic
- Bandwidth control (rate limiting) with 64Kb increments
- Port MIB statistics and optical performance statistics
- Port Access Control for enhanced security
- 2,048 byte Jumbo frames
- Layer 2 Control Protocol (L2CP) Policy Control
- Configurable Link Fault Propagation modes
- Small Form Pluggable (SFP) transceivers with Optical Statistics for standard or CWDM applications
- Commercial (0 to 50°C), wide (-40° to 60°C) and extended (-40° to 75°C) temperature ranges
- MEF 9, 14 and 21 Certified
- NEBS Level 3 Compliant
- Lifetime Warranty and free 24/7 Technical Support

## Port Bandwidth Control and Port Access Control

The enhanced Bandwidth Control feature controls bandwidth between the fiber ports in 64Kbps increments from 64K to Full Line Speed.

The 2FXM2 features Port Access Control which blocks user service while maintaining the network link. Port Access Control enables the service provider to control user access while maintaining port configuration for easy disabling or enabling of customer service. Port Access Control provides enterprise administrators the capability to improve network security by controlling port access when the port is not in use.

## Port Statistics and Optical Performance Statistics

The 2FXM2 supports reporting of utilization, port and optical performance statistics. Port statistics are available for 38 different parameters for each fiber port. Additionally, full optical performance statistics are available on SFP fiber transceivers with a digital diagnostic interface.

Port and optical performance statistics reporting provides the ability to monitor customer bandwidth utilization, network performance and the link signal quality for each individual port.

## Fiber Port Options

The 2FXM2 Small Form Pluggable (SFP) model supports a wide variety of SFP transceivers for FTTX and CWDM applications. SFP fiber transceivers are available with multimode (MM) dual fiber, single-mode (SM) dual fiber and single-mode single-fiber (SF) options.

## Link Modes

The 2FXM2 features multiple, user-selectable link fault detection modes, including Link Fault Propagation, Remote Fault Detection and Asymmetrical Fault Detection. These Link Modes provide rapid fault detection and isolation by monitoring the state of the cabling hardware, and operate independently of the network management.

## Form Factors

The 2FXM2 is available as a compact standalone unit or as a chassis plug-in module. The hot-swappable 2FXM2 plug-in module can be mounted in a 19 or 5-Module chassis with redundant AC and DC power supplies. It can also be mounted in a 2-Module AC or DC powered chassis, or in a 1-Module chassis with AC or DC power input.

The plug-in module can manage other modules in the same chassis and operate as a managed fiber-to-fiber media converter. It features two Ethernet backplane ports for connectivity to adjacent modules in a chassis for multi-port and multi-service configurations.

The standalone 2FXM2 is available as a tabletop or wall-mount unit. The tabletop model can be DIN-rail mounted using an optional DIN-rail mounting kit. Both the tabletop and the wall-mount models are DC powered and are available with an external AC to DC power adapter or a terminal connector for DC power. The 2FXM2 standalone unit combines management capability with a compact chassis for deployment at the demarcation point.

# MANAGEMENT

The 2FXM2 has integrated management, eliminating the cost and space required for external management hardware. The iConverter management system provides comprehensive remote configuration and performance monitoring.

iConverter management is available via IP-Less protocol using the 802.3ah OAM channel or Omnitron's Secure OAM channel, or using SNMP or Telnet.

Management is accessed via Omnitron's NetOutlook® SNMP Network Management Software with an intuitive Graphical User Interface, or third party SNMP software. Telnet and CLI management interfaces are also supported, and utilize an easy- to-use, menu-driven interface. The CLI interface is accessed via a Serial Console Port, that provides local configuration and allows for firmware updates. Additionally, the port can be connected to a serial modem to provide an alternative remote management path.

## IP-Based Secure Management

The 2FXM2 can be managed through IP protocols, SNMPv1, SNMPv2c, SNMPv3 and Telnet. The IP address of the 2FXM2 can be user-defined or resolved through the DHCP host on the network. The IP protocols for management access can be enabled or disabled individually or as a group. Access to the management is protected by password authentication. SMNPv3 strengthens secure access to devices by a combination of authenticating and encrypting packets over the network. Management VLAN can also be defined to separate management traffic from customer traffic.

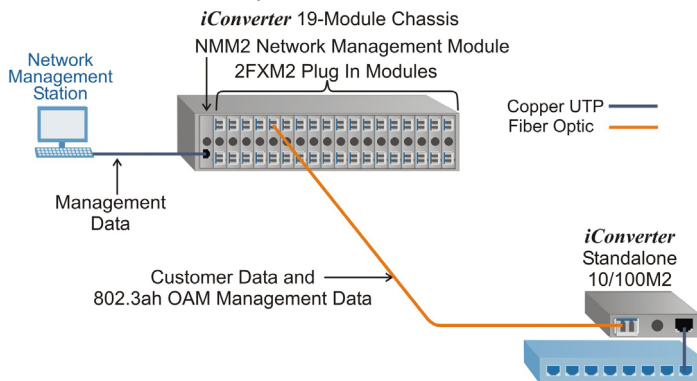
## 802.3ah and Secure OAM Management Channels

When utilizing a Remote OAM management channel (Secure IP-less or 802.3ah), the remote demarcation NID is securely managed by its fiber link partner located at the Central Office or Point of Presence. The network management IP address is accessed from the Network Management Module (NMM2) in the 19-Module Chassis providing a secure management channel to all remote demarcation NIDs. See the Secure IP-less Management application example on page 3.

# APPLICATION EXAMPLES

## Secure IP-less Management

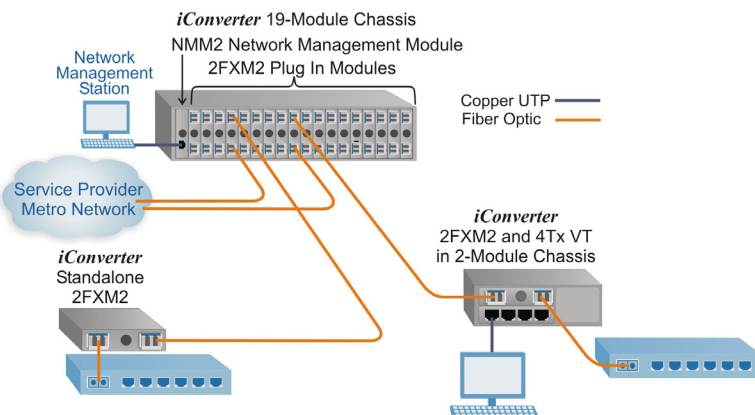
An iConverter 2FXM2 is installed in a 19-Module Chassis with an iConverter Network Management Module (NMM2) at the Central Office or Network Core. The 2FXM2 has an integrated management processor that isolates the encrypted management data from the customer data and communicates with the NMM2 via a separate management backplane bus. Management traffic on the user data lines is IP-less and carried on a securely encrypted data channel to protect the management from unauthorized access. The 19-Module chassis requires only a single IP address to manage itself and up to eighteen remote 10/100M2 or 2FXM2 NIDs managed by the OAM channel. This is the ideal configuration for networks that separate secure management traffic from the service (customer) traffic on different networks, or when management IP addresses are at a premium.



## Securely Managed Access Network

At the Central Office, the 2FXM2 plug-in module is installed in a managed iConverter 19-Module chassis for high-density fiber distribution. At Customer Premises on the right, a 2FXM2 plug-in module and an iConverter 4TxVT four-port switch module are installed in a 2-Module chassis, and share data via the Ethernet Backplane. This configuration functions as a remotely managed demarcation switch with two fiber uplink ports and four copper ports that drop off Ethernet services. At Customer Premises on the left, the 2FXM2 standalone NID provides two fiber uplink ports for intelligent demarcation of Ethernet services.

This configuration can also be deployed in an Enterprise campus, municipal, government or utility network.



# SPECIFICATIONS

Description	<b>iConverter 2FXM2</b> 100BASE-X to 100BASE-X Fiber Media Converter and Network Interface Device	
Standard Compliances	IEEE 802.1Q, 802.1p, 802.3, 802.3ah, 802.1ad RFC 2819 (RMON), 2863 (IF-MIB), 2131 (DHCP) MEF 9, 14, 21	
Management	Telnet, SNMPv1, SNMPv2c, SNMPv3, Serial Console	
Regulatory Compliances	UL, CE, FCC Class A, NEBS Level 3, RoHS2 (6/6), WEEE, REACH	
Frame Size	Up to 2,048 bytes	
Port Types	Fiber:	100BASE-FX (SFP) 100BASE-LX (SFP) 100BASE-ZX (SFP) 100BASE-BX (SFP)
	Serial:	RS-232 (Mini DIN-6 female) Mini DIN-6 to DB-9 adapter included
Cable Types	Fiber:	Multimode: 50/125um, 62.5/125um Single-mode: 9/125um
	Serial:	RS-232, 22 to 24 AWG, 12 to 50 pF/ft
AC Power Requirements	AC Adapter: (US)	100 - 120VAC/60Hz, 0.08A @ 120VAC
	AC Adapter: (Universal)	100 - 240VAC/50 - 60Hz, 0.08A @ 120VAC
DC Power Requirements	DC Input: (backplane)	3.3VDC, 1.2A @ 3.3VDC
	DC Input: (Terminal Block)	+8 to +15VDC, 0.6A @ 9VDC 2-Pin Terminal (non-isolated)
	DC Input: (AC Adapter)	+8 to +15VDC, 0.6A @ 9VDC 2.5mm Barrel Connector
Dimensions	Plug-in:	W: 0.85" x D: 4.5" x H: 2.8" L: 21.59 mm x B: 114.3 mm x H: 71.12 mm
	Standalone:	W: 3.1" x D: 4.8" x H: 1.0" L: 78.74 mm x B: 121.92 mm x H: 25.4 mm
	w/mounting brackets:	W: 3.8" x D: 4.8" x H: 1.0" L: 96.52 mm x B: 121.92 mm x H: 25.4 mm
Weight	Plug-in:	8 oz. (226.79 grams)
	Standalone w/o AC adapter:	1.0 lbs. (453.6 grams)
	Standalone w/ AC adapter:	1.5 lbs. (680.4 grams)
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 (operational)	
MTBF (hours)	Plug-in:	500,000
	w/o AC adapter:	500,000
	w/ AC adapter (US):	250,000
	w/ AC adapter (Unv):	100,000
Warranty	Lifetime warranty with 24/7/365 free Technical Support	

# ORDERING INFORMATION

8 9 5 9 N - 0 - x x

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

<Blank>	Plug-in Module
A	Standalone with External US AC Power Supply
B	Standalone with External Universal AC Power Supply
C	Standalone with 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

Contact Omnitron for RoHS (5/6) compliant models.

For more information on the variety of SFPs available, visit Omnitron's web site at: [www.omnitron-systems.com](http://www.omnitron-systems.com)

Model	Fiber Type	Spec. Distance (km)	Wavelength (nm)	Min. Tx Power (dBm)	Max. Tx Power (dBm)	Min. Rx Power (dBm)	Max. Rx Power (dBm)	Min. Attenuation (dB)	Link Budget (dB)
7006-0	MM/DF	5	1310	-20	-14	-31	-14	-	11
7007-1	SM/DF	30	1310	-15	-8	-32	-8	-	17
7007-2	SM/DF	60	1310	-5	0	-35	-3	3	30
7007-3	SM/DF	120	1550	-5	0	-35	-3	3	30
7014-1	SM/SF	30	1310 / 1550	-14	-8	-32	-3	-	18
7015-1	SM/SF	30	1550 / 1310	-14	-8	-32	-3	-	18
7014-2	SM/SF	50	1310 / 1550	-8	0	-34	-3	3	26
7015-2	SM/SF	50	1550 / 1310	-8	0	-34	-3	3	26
7014-3	SM/SF	80	1310 / 1550	0	5	-34	-3	8	34
7015-3	SM/SF	80	1550 / 1310	0	5	-34	-3	8	34



© 2016 Omnitron Systems Technology, Inc. All rights reserved. iConverter and NetOutlook are Registered Trademarks of Omnitron Systems Technology, Inc. Trademarks are owned by their respective companies. Specifications are subject to change without notice.

091-8940N-001H 8/16



800-675-8410 • 949-250-6510 • [www.omnitron-systems.com](http://www.omnitron-systems.com) • [info@omnitron-systems.com](mailto:info@omnitron-systems.com) • 38 Tesla, Irvine, CA 92618