

iConverter® 2FXM2 Media Converter
and
Network Interface Device



**STANDALONE AND PLUG-IN MODULE
USER MANUAL**

Release 3.4

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1.0 OVERVIEW

This document describes the installation and configuration of the *iConverter* 2FXM2 standalone Network Interface Device and plug-in modules. The difference between the module types are indicated using the following legend throughout this User Manual:

SA	- Standalone
PI	- Plug-In

1.1 GENERAL DESCRIPTION

The Omnitron *iConverter*® 2FXM2 Network Interface Device (NID) with integrated management provides Fast Ethernet (100BASE-FX) fiber-to-fiber media conversion. It is also a managed optical switch that functions as a fiber repeater performing the Three Rs: Retiming, Reamplification and Reshaping of the fiber optic signal.

The 2FXM2 conforms to Ethernet in the First Mile (EFM) fiber standards to support Fiber-to-the-X (FTTX) Metropolitan and Enterprise LAN networks. 2FXM2 NIDs are used to provide managed demarcation points at the customer premises and network edge, offering Quality of Service and Bandwidth Control (rate-limiting) capabilities.

The IP-based remote management of the 2FXM2 can be accessed by Omnitron's *NetOutlook*® SNMP Network Management Software, third-party SNMP clients and Telnet. The management IP address is configured manually or as a DHCP client in the configuration menu. IP-less remote management is supported via 802.3ah OAM or Secure OAM protocol. A menu-driven CLI is accessible via Telnet, serial console port, or a modem connection to the serial console port.

IMPORTANT

This manual provides information on the installation and configuration of the module using the command line interface (serial console). For ongoing network management, Omnitron Systems recommends *NetOutlook*, an SNMP-based Network Management Software.

NetOutlook provides an efficient, user-friendly way to configure, monitor and manage devices installed on a single network or on a series of networks by providing an intuitive graphical display with real-time status and alarm (trap) information. The user can easily manage *iConverter* equipment on a large Enterprise network or Metropolitan Area network (MAN) from a single location without the need of additional resources.

The firmware of the Network Management Module (NMM) and *NetOutlook* must be the same or greater than the firmware on the 2FXM2 for the module to be managed.

1.1.1 Advanced Features

The 2FXM2 features Port VLAN, Tag VLAN, Provider VLAN and QoS prioritization which are defined in the IEEE 802.1Q, 802.1ad and 802.1p specifications. Ethernet Virtual Connections can be configured with Provider VLAN to support E-Line and E-LAN connections on Metro Ethernet Networks.

Access to the management control can be restricted with the Port VLAN and Tag VLAN features, helping to prevent Denial-Of-Service (DoS) and unauthorized management access.

Other advanced features include:

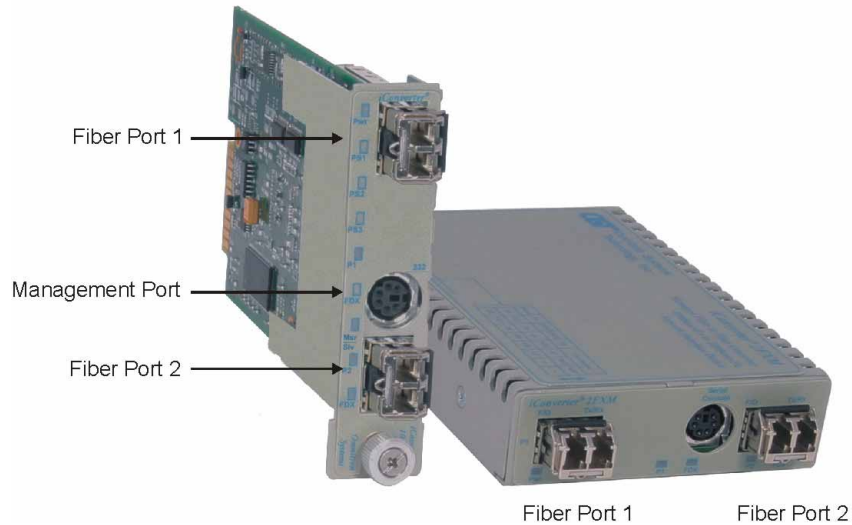
- Bandwidth Control (Rate Limiting)
- Port Access Control
- cNode Level 1 Agent
- Layer 2 Control Protocol (L2CP) Filter
- 802.3ah OAM and Extensions
- SNMPv1, SNMPv2c, SNMPv3

Refer to the appropriate sections for configuration information.

2.0 PORT STRUCTURE

2.1 OVERVIEW

The front panel of the 2FXM2 provides access to the management (serial console) and fiber ports. The SFP fiber ports support 100BASE-FX transceivers. The plug-in module features two additional Ethernet ports for connectivity via the chassis backplane.



2.1.1 Management Port **PI SA**

The 2FXM2 features a Serial RS-232 Console Port (aka Craft Interface) which can be connected to a computer for initial setup and configuration. The Serial Console Port is accessed through the mini DIN-6 female DCE interface. Connect the interface to a computer's DB-9 serial port using the mini DIN-6 male to DB-9 female cable adapter (Part # 8082-0), which is included with the 2FXM2.

An optional DB-9 male to female straight-through serial cable is available for extension (Part # 8081-3).

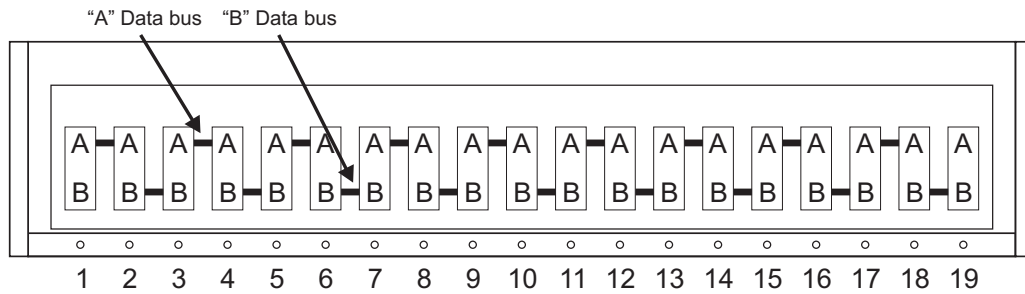
2.1.2 Fiber Ports **PI SA**

The fiber interfaces support the 100BASE-FX protocol. The fiber interfaces operate in manual mode and support half or full duplex operation. The fiber ports can be enabled or disabled via network management. A port disabled with the Port Access Control feature will still connect and allow 802.3ah OAM or IP-less (secure) OAM communication, but blocks normal data traffic.

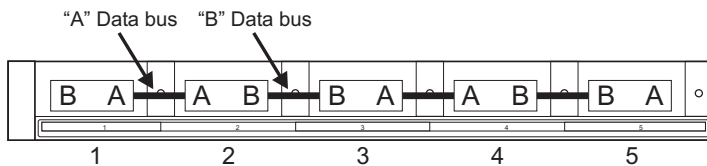
2.1.3 Backplane Ethernet Ports **PI**

The plug-in module supports two additional 10/100Mbps Ethernet Backplane Ports. The Backplane Ports A and B allow Ethernet data connectivity between adjacent modules in an *iConverter* chassis. The two backplane ports can be disabled or enabled via a DIP-switch or network management.

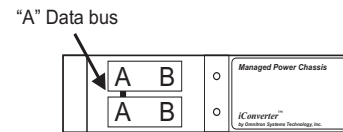
The *iConverter* 19-Module, 5-Module, 2-Module and 1-Module Redundant Chassis backplanes provide ethernet data connectivity between adjacent slots or ports. The A and B backplane ports connect the slots as illustrated.



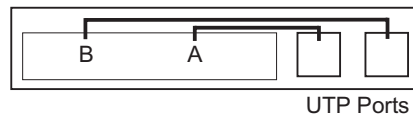
19-Module Chassis



5-Module Chassis



2-Module Chassis



1-Module Redundant Chassis

3.0 INSTALLATION PROCEDURE

3.1 OVERVIEW

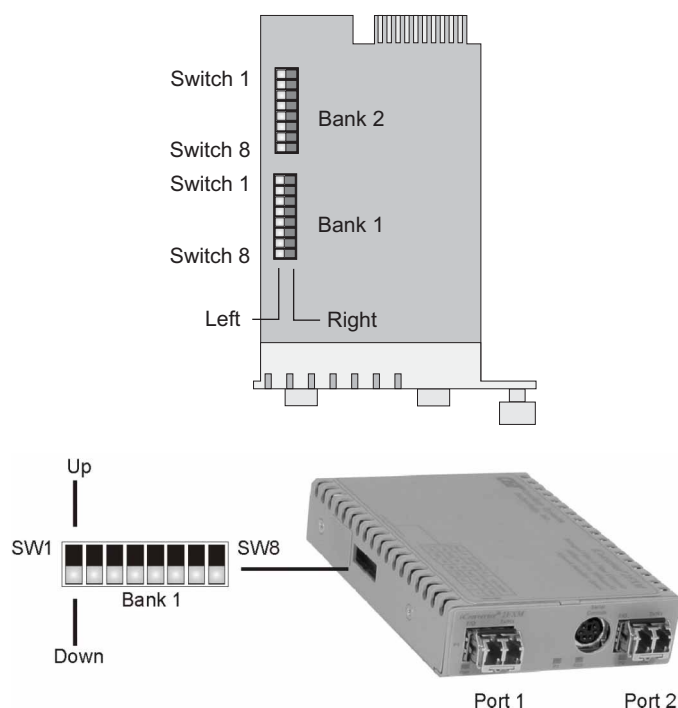
The following steps outline the installation and configuration procedures for the 2FXM2. Refer to the specified sections for detailed instructions.

- Configure DIP-switches (Section 3.2)
- Installing the Module and Connecting Cables (Section 3.3)
- Configure Module via Command Line Interface (Section 3.4)
- Verify Operation (Section 3.5)

When the setup and configuration procedures are completed, the 2FXM2 has been configured with the basic setup requirement for standard operation. To configure the module with additional features, see Section 4.0, “Detailed Module Configuration”.

3.2 CONFIGURING DIP-SWITCHES PI SA

The 2FXM2 plug-in module has two board-mounted banks of DIP-switches. The standalone unit has one bank of DIP-switches. The location of the DIP-switches are illustrate below.



DIP-switch Locations

3.2.1 Board-Mounted Bank 1 Settings **PI** **SA**

DIP-switch Bank 1 is available on both the plug-in and standalone modules. The table indicates the position of the switch; Left/Down or Right/Up. As indicated in the DIP-switch location diagram, Left and Right refers to the plug-in module and Down and Up refers to the standalone module.

	PI (Left/Right)	SA (Up/Down)
Switch	Left/Down (Factory Default)	Right/Up
SW1	Off: Pause Disable	On: Pause Enable
SW2	FDX: Fiber Port 1 Full-Duplex	HDX: Fiber Port 1 Half-Duplex
SW3	Reserved	Reserved
SW4	Reserved	Reserved
SW5	FDX: Fiber Port 2 Full-Duplex	HDX: Fiber Port 2 Half-Duplex
SW6 - SW8	See Link Mode DIP-Switch Table in Section 3.2.1.6	

3.2.1.1 SW1 - Pause Disable/Enable “Off/On”

Pause operation is based on the Pause Disable/Enable DIP-switch setting. Setting the Pause DIP-switch to the “Off” position (factory default) forces the port to operate in No Pause mode. Setting the Pause DIP-switch to the “On” position allows the port to operate in Symmetrical Pause mode.

3.2.1.2 SW2 - Fiber Port 1 Full/Half-Duplex “FDX/HDX”

When the DIP-switch is in the Full Duplex “FDX” position (factory default), the fiber port will facilitate a connection that supports Full-Duplex operation. Setting this DIP-switch to Half-Duplex “HDX” facilitates a connection that supports only Half-Duplex.

3.2.1.3 SW3, SW4 - Reserved

These DIP-switches are for factory use only.

NOTE: DIP-switches marked Reserved must be kept in the Left (factory default) position.

3.2.1.5 SW5 - Fiber Port 2 Full/Half Duplex “FDX/HDX”

When the DIP-switch is in the Full Duplex “FDX” position (factory default), the fiber port facilitates a connection that supports Full-Duplex operation. Setting this DIP-switch to Half-Duplex “HDX” facilitates a connection that supports only Half-Duplex.

3.2.1.6 SW6, SW7, SW8 - Link Modes

These three DIP-switches configure the link mode settings. The following table details possible Link Mode DIP-switch configurations.

PI				SA			
SW6	SW7	SW8	Result	SW6	SW7	SW8	Result
Left	Left	Left	Link Segment mode (LS)	Down	Down	Down	Link Segment mode (LS)
Right	Left	Left	Link Propagate mode (LP)	Up	Down	Down	Link Propagate mode (LP)
Left	Right	Left	Remote Fault Detection mode plus Link Segment mode (RFD+LS)	Down	Up	Down	Remote Fault Detection mode plus Link Segment mode (RFD+LS)
Right	Right	Left	Remote Fault Detection mode plus Link Propagation mode (RFD+LP)	Up	Up	Down	Remote Fault Detection mode plus Link Propagation mode (RFD+LP)
Left	Left	Right	Symmetrical Fault Detect mode (SFD)	Down	Down	Up	Symmetrical Fault Detect mode (SFD)
Right	Left	Right	Asymmetrical LP P1 to P2 (ALP P1-P2)	Up	Down	Up	Asymmetrical LP P1 to P2 (ALP P1-P2)
Left	Right	Right	Asymmetrical LP P2 to P1 (ALP P2-P1)	Down	Up	Up	Asymmetrical LP P2 to P1 (ALP P2-P1)
Right	Right	Right	Asymmetrical RFD+LP P1 to P2	Up	Up	Up	Asymmetrical RFD+LP P1 to P2

NOTE: Connecting two converters set to any of the RFD modes are illegal and will cause a “deadly embrace” lockup.

NOTE: It is recommended to keep the LS setting (default) until initial configuration is complete.

For detailed information on the operation of the different Link Modes, download the application note “*iConverter* Link Modes” available on Omnitron’s web page:

<http://www.omnitron-systems.com/downloads.php>

3.2.2 Board-Mounted Bank 2 Settings PI

DIP-switch Bank 2 is only available on the plug-in module.

Switch	Left (Factory Default)	Right
SW1	A-DS: Backplane Port A Disabled	A-EN: Port A Enabled
SW2	B-DS: Backplane Port B Disabled	B-EN: Port B Enabled
SW3	Reserved	Reserved
SW4	M/SL: Master/Slave Auto-Select	SL: Slave-Mode Only
SW5 - SW8	Reserved	Reserved

3.2.2.1 SW1 - Backplane Port A Enabled “A-DS/A-EN”

When the DIP-switch is in the Left “A-DS” position (factory default), Backplane Port A of the 2FXM2 is isolated from the chassis Backplane. When the DIP-switch is in the Right “A-EN” position, Backplane Port A of the 2FXM2 is enabled. This port allows Ethernet Backplane connectivity to an adjacent module via the chassis Backplane Port A. See the backplane illustrations in Section 2.1.3.

3.2.2.2 SW2 - Backplane Port B Enabled “B-DS/B-EN”

When the DIP-switch is in the Left “B-DS” position (factory default), Backplane Port B is isolated from the chassis Backplane. When the DIP-switch is in the Right “B-EN” position, Backplane Port B is enabled. This port allows Ethernet Backplane connectivity to an adjacent module via the chassis Backplane Port B. See the backplane illustrations in Section 2.1.3.

3.2.2.3 SW4 - Master/Slave Auto-Select and Slave-Only “M/SL / SL

When multiple management modules such as the *iConverter* Network Management Module (NMM) and the 2FXM2 (or multiple self-managed modules such as the 2FXM2) are installed in the same chassis, only one management module can act as the chassis master. The master management module has the ability to make changes to the settings of the other modules in the chassis, while the slave management modules cannot make the changes. If an NMM is installed in the chassis, the NMM will always be the master, otherwise the lowest slot number with a management module installed will become chassis master.

When this DIP-switch is in the Left “M/SL” position (factory default), the assignment of mastership is automatically negotiated by the installed management modules. To designate a specific management module as the master when no NMM is installed in the chassis, set the DIP-switch on the master module to the Left “M/SL” position, and set the other installed management modules’ DIP-switches to the Right “SL” position to enable Slave-Only mode.

Only the chassis master can change configuration settings of other modules.

3.2.2.4 SW3, SW5, SW6, SW7, SW8 - Reserved

These DIP-switches are for factory use only.

NOTE: DIP-switches marked Reserved must be kept in the Left (factory default) position.

3.3 INSTALLING PLUG-IN MODULES AND CONNECTING CABLES

PI

- a. Carefully slide the module into an open slot in the chassis. Align the module with the installation guides and ensure that the module is firmly seated against the backplane. Secure the module by fastening the front panel thumbscrew (push in and turn clockwise to tighten) to the chassis front. Verify the “Pwr” LED is ON (indicating the chassis is powered).

SA

- a. The 2FXM2 standalone Network Interface Device (NID) is available in tabletop and wall-mounting models. For wall-mounting, attach the NID to a wall, backboard or other flat surfaces. For tabletop installations, place the unit on a flat level surface. Attach the rubber feet to the bottom of the NID to prevent the unit from sliding. Make sure the unit is placed in a safe, dry and secure location.

To power the unit using the AC/DC adapter, connect the AC/DC adapter to the AC outlet. Then connect the barrel plug at the end of the wire on the AC/DC adapter to the 2.5mm DC barrel connector (center-positive) on the unit. Confirm that the unit has powered up properly by checking the power status LED located on the front of the unit.

To power the unit using a DC power source, prepare a power cable using a two-conductor insulated wire (not supplied) with a 14 AWG gauge minimum. Cut the power cable to the length required. Strip approximately 3/8 of an inch of insulation from the power cable wires. Connect the power cables to the 2FXM2 standalone unit by fastening the stripped ends to the DC power connector.

Connect the power wires to the DC power source. The Power LED should indicate the presence of power.

WARNING: Note the wire colors used in making the positive and negative connections. Use the same color assignment for the connection at the DC power source.

NOTE: If mounting with a safety ground attachment, use the safety ground screw at the rear of the unit.

PI

SA

- b. Insert the SFP Fiber transceivers into the Port 1 and Port 2 SFP receptacles on the 2FXM2.

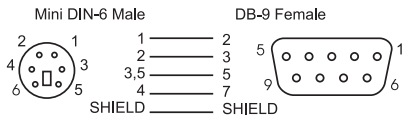
NOTE: The release latch of the SFP Fiber transceiver must be in the closed (up) position before insertion.

- c. Connect the appropriate multimode or single-mode fiber cable to the fiber port of the installed module. It is important to ensure that the transmit (Tx) is attached to the receive side of the device at the other end and the receive (Rx) is attached to the transmit side. When using single-fiber (SF) media converter models, the Tx wavelength on one end has to match the Rx wavelength on the other. Based on this guideline, single fiber SFP fiber transceiver models must be used in pairs, such as the 7014-1 matched with the 7015-1.

NOTE: In order to support Remote OAM Management Mode, Port 1 of the 2FXM2 must be connected to the Port 1 on the 2FXM2 or 10/100M2 link partner.

3.4 CONFIGURE THE MODULE VIA COMMAND LINE INTERFACE PI SA

To configure, attach the 2FXM2 to a DB-9 serial (RS-232) equipped computer with terminal emulation software such as HyperTerminal. The 2FXM2 Serial Console Port (DCE) is a mini DIN-6 female connector which can be changed to a DB-9 connector with the included adapter (Part #8082-0). Attach the ends of a serial cable to the serial port of the PC and the Serial Console Port of the 2FXM2. This is a standard asynchronous serial interface. The pin-outs are illustrated below.



Serial Connector Pin Outs

Start HyperTerminal and select the correct COM Port in the HyperTerminal “Connect To:” window.

Set the PC’s serial port to the following:

Bits Per Second: 57,600
Stop Bits: 1
Data Bits: 8
Parity: NONE
Hardware Flow Control: NONE

Power the chassis containing the 2FXM2 module and press <ENTER> to bring up a command line prompt on the attached PC.

The module is configured with the following defaults:

IP

IP Address: 192.168.1.220
IP Subnet Mask: 255.255.255.0

Passwords

Serial: No password assigned
FTP: No password assigned
Telnet: public

SNMPv1/v2c Communities

READ: public
WRITE: public

SNMPv3 Parameters

User 1 name (read only):	guest		
User 2 name (read/write):	admin		
User 1 Privacy pwd:	publicguest	User 1 Authen pwd:	publicguest
User 2 Privacy pwd:	privateadmin	User 2 Authen pwd:	privateadmin

The *Management Options* screen will be displayed.

PI SA

```
Management Options                                iConverter, Serial Agent

Network Management
1: Chassis and Module Management
2: Set Module Identifier

Management Module Preferences
3: IP and Control Preferences
4: SNMP Preferences
5: Abandon Preference Changes
6: Save Preference Changes
7: Restore to Factory Defaults
8: Restart Management Module
9: Other Networking Features

Management Module Maintenance
10: Firmware Update
11: Set Date/Time

IP Address      = 192.168.1.220
Chassis Number = 1

Enter Choice, (H)elp, E(x)it >
```

A new 2FXM2 module does not have a password, and will skip the *Password Entry* screen and go straight to the *Management Options* screen. If a password has been set, the *Password Entry* screen will be displayed. Type the password and press <ENTER>, the 2FXM2 will respond with the *Management Options* screen.

PI SA

```
Omnitron Systems Technology, Inc.                iConverter, Serial Agent
Copyright 2001-2007 OST, Inc.                      Password Entry

-----
Omnitron Systems Technology      Technical Support:    (949) 250-6510
140 Technology #500              Sales/Products:     (800) 675-8410
Irvine, CA 92618                 On the web at:      www.omnitron-systems.com
-----

IP Address    192.168.1.220
MAC           00:00:00:00:00:00

[xxxxxxxxx]
Please enter the password >
```

3.4.1 Setting IP and Control Preferences

An IP address is required for the SNMP manager to address the 2FXM2. The factory default setting is 192.168.1.220. The IP address can be configured manually or automatically as a DHCP client.

3.4.1.1 Setting IP Parameters Manually

To manually configure the IP address and control parameters, select 3 from the *Management Options* screen. The *IP and Control Preferences* screen will appear.

PI SA

IP and Control Preferences Screen

iConverter, Serial Agent

1: Set IP	192.168.1.220
2: Set Subnet Mask	255.255.255.0
3: Set Gateway	192.168.1.1
4: Chassis Number	1
5: Chassis Name (also sysName)	2FXM2
6: Enable/Disable TELNET	Enabled
7: Enable/Disable FTP	Disabled
8: Enable/Disable Soft Switch Reload	Disabled
9: TELNET Password	*****
10: FTP Password	
11: Serial Password	

Enter Choice, Management Options Screen(0), (H)elp, E(x)it >

To configure the IP address of the 2FXM2, select 1 at the *IP and Control Preferences* screen, and press <ENTER>. Backspace over the existing value, type the new value (in x.x.x.x format), and press <ENTER>.

To configure the subnet mask of the 2FXM2, select 2 at the *IP and Control Preferences* screen, and press <ENTER>. Backspace over the existing value, type the new value (in x.x.x.x format), and press <ENTER>.

To configure the gateway of the 2FXM2, select 3 at the *IP and Control Preferences* screen, and press <ENTER>. Backspace over the existing value, type the new value (in x.x.x.x format), and press <ENTER>.

To save the new values, select 0 and press <ENTER> to return to the *Management Options* screen, then select 6 and press <ENTER> to *Save Preference Changes*.

3.4.1.2 Setting IP Parameters as DHCP Client

To configure the IP automatically as a DHCP client, select 9 from the *Management Options* screen. The *Other Networking Features* screen will appear.

```

Management Options                                iConverter, Serial Agent

Network Management
1: Chassis and Module Management
2: Set Module Identifier

Management Module Preferences
3: IP and Control Preferences
4: SNMP Preferences
5: Abandon Preference Changes
6: Save Preference Changes
7: Restore to Factory Defaults
8: Restart Management Module
9: Other Networking Features

Management Module Maintenance
10: Firmware Update
11: Set Date/Time

IP Address      = 192.168.1.220
Chassis Number = 1

Enter Choice, (H)elp, E(x)it > 9

```

```

Other Networking Features Screen                iConverter, Serial Agent

1: Enable/Disable DHCP Client                  Disabled
2: Enable/Disable Keep Alive Trap              Disabled
3: Keep Alive Trap interval (10-600 secs)      10
4: Enable/Disable SW1 Switch Block             Enabled
5: Serial Baud Rate                           57600 bps

Enter Choice, Management Options Screen(0), (H)elp, E(x)it >

```

To enable DHCP client, select *1* at the ***Other Networking Features*** screen and follow the screen prompts to enable DHCP.

To save the new values, select *0* and press <ENTER> to return to the ***Management Options*** screen, then select *6* and press <ENTER> to ***Save Preference Changes***.

3.4.1.3 Setting the Chassis Number and Name

A Chassis Name, or sysName, can be assigned for identification of the 2FXM2 in the SNMP client. The name can be any 1-32 character alphanumeric string.

The Chassis Number can remain as 1 (factory default) when the 2FXM2 is installed without an *iConverter* NMM in the same chassis. When the 2FXM2 is installed in the same chassis as an NMM, then the 2FXM2 must be set to the Chassis Number of the NMM.

To set the Chassis Number, select *4* at the ***IP and Control Preferences*** screen, press <ENTER> and follow the instructions to enter the chassis number.

To set the Chassis Name, select *5* at the ***IP and Control Preferences*** screen, press <ENTER> and follow the instructions to enter the chassis name.

NOTE: When the NMM is installed into the chassis and is set to Remote OAM, the chassis number of the 2FXM2 is automatically assigned by the NMM.

IP and Control Preferences Screen		iConverter, Serial Agent
1:	Set IP	192.168.1.220
2:	Set Subnet Mask	255.255.255.0
3:	Set Gateway	192.168.1.1
4:	Chassis Number	1
5:	Chassis Name (also sysName)	2FXM2
6:	Enable/Disable TELNET	Enabled
7:	Enable/Disable FTP	Disabled
8:	Enable/Disable Soft Switch Reload	Disabled
9:	TELNET Password	*****
10:	FTP Password	
11:	Serial Password	
Enter Choice, Management Options Screen(0), (H)elp, E(x)it >		

To save the new values, select *0* and press <ENTER> to return to the **Management Options** screen, then select *6* and press <ENTER> to **Save Preference Changes**.

3.4.1.4 Setting 2FXM2 Passwords

The 2FXM2 is shipped from the factory without password protection on the Serial Console Port. It is highly recommended that the network administrator set a password in order to prevent unauthorized access to the unit. The password can be any 1-32 character alphanumeric string.

The 2FXM2 is shipped from the factory with Telnet enabled and FTP disabled. From the **IP and Control Preferences** screen, select *6* to enable or disable Telnet, and select *7* to enable or disable FTP.

To set the password for Telnet access, select *9* at the **IP and Control Preferences** screen, press <ENTER> and then follow the screen prompts to enter and verify the password. The default password for Telnet access is “public”.

To set the password for FTP access, select *10* at the **IP and Control Preferences** screen, press <ENTER> and then follow the screen prompts to enter and verify the password.

To set the password for serial access, select *11* at the **IP and Control Preferences** screen, press <ENTER> and then follow the screen prompts to enter and verify the password.

```

IP and Control Preferences Screen                                iConverter, Serial Agent

1: Set IP                                     192.168.1.220
2: Set Subnet Mask                           255.255.255.0
3: Set Gateway                               192.168.1.1
4: Chassis Number                            1
5: Chassis Name (also sysName)               2FXM2
6: Enable/Disable TELNET                     Enabled
7: Enable/Disable FTP                       Disabled
8: Enable/Disable Soft Switch Reload         Disabled
9: TELNET Password                           *****
10: FTP Password
11: Serial Password

Enter Choice, Management Options Screen(0), (H)elp, E(x)it >

```

To save the new values, select *0* and press <ENTER> to return to the *Management Options* screen, then select *6* and press <ENTER> to *Save Preference Changes*.

3.4.2 Setting SNMP Preferences

To set the SNMP Preferences for the 2FXM2 module, select *4* from the *Management Options* screen, press <ENTER> to enter the *SNMP Preferences* screen.

```

Management Options                                            iConverter, Serial Agent

Network Management
1: Chassis and Module Management
2: Set Module Identifier

Management Module Preferences
3: IP and Control Preferences
4: SNMP Preferences
5: Abandon Preference Changes
6: Save Preference Changes
7: Restore to Factory Defaults
8: Restart Management Module
9: Other Networking Features

Management Module Maintenance
10: Firmware Update
11: Set Date/Time

IP Address      = 192.168.1.220
Chassis Number = 1

Enter Choice, (H)elp, E(x)it > 4

```

SNMP Preferences Screen		iConverter, Serial Agent	
Chassis Number	= 1	SNMP Engine ID	80001CAE03000687003B19
1: sysContact		Omnitron (949) 250-6510	
2: sysLocation		Irvine, CA USA	
3: SNMP Writes		Enabled	
SNMP v1/v2c -----			
4: Read Community		*****	
5: Write Community		*****	
6: Agent		Enabled	
SNMP V3 -----			
7: Agent		Enabled	
8: User 1 name (read only)		guest	
9: User 2 name (read/write)		admin	
10: User 1 Security		13: User 2 Security	noAuthNoPriv
11: User 1 Privacy pwd		14: User 2 Privacy pwd	*****
12: User 1 Authen. pwd		15: User 2 Authen. pwd	*****
Traps Hosts -----			
16: Address 1	255.255.255.255	20: Address 5	255.255.255.255
17: Address 2	255.255.255.255	21: Address 6	255.255.255.255
18: Address 3	255.255.255.255	22: Address 7	255.255.255.255
19: Address 4	255.255.255.255	23: Address 8	255.255.255.255
Enter Choice, Management Options Screen(0), (H)elp, E(x)it >			

3.4.2.1 Setting SNMPv1/v2c Read and Write Community Names

The 2FXM2 is shipped from the factory with the SNMP agent enabled with the default SNMP Read and Write Community name as “public”. See Section 3.4 for all factory default settings.

The SNMP Read Community Name is necessary for reading data from the 2FXM2. The name can be any 1-32 character alphanumeric string. To set the SNMP Read Community Name, select 4 at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts.

The SNMP Write Community Name is necessary for writing data to the 2FXM2. The name can be any 1-32 character alphanumeric string. To set the SNMP Write Community Name, select 5 at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts.

To save the new values, select 0 and press <ENTER> to return to the **Management Options** screen, then select 6 and press <ENTER> to **Save Preference Changes**.

3.4.2.2 Setting SNMPv3 Parameters

SNMPv3 implements a security model that provides for message integrity, authentication, and encryption. Authentication for SNMPv3 is provided through a unique User Name and Authentication Password for each access level.

Two access levels or accounts are available; Read-Only Level (User 1) and Read and Write Level (User 2). User 1 is allowed to request information from the module. User 2 is allowed to request information from and set configuration to the module. To set the User 1 name, select 8 at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts. To set the User 2 name, select 9 at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts. The 2FXM2 is shipped with default values pre-assigned. See Section 3.4 for all factory default settings.

The module supports the three levels of Authentication and Encryption (Security Levels) for User 1 and User 2; noAuthNoPriv, authNoPriv and authPriv. noAuthNoPriv uses username for authentication,

authNoPriv provides authentication based on the HMAC-MD5 algorithm and authPriv provides DES 56-bit encryption based on the HMAC-MD5 algorithm.

To set User 1 security, select *10* at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts. To set the User 2 security, select *13* at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts.

To set User 1 privacy password, select *11* at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts. To set the User 2 privacy password, select *14* at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts.

To set User 1 authentication password, select *12* at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts. To set the User 2 authentication password, select *15* at the **SNMP Preferences** screen, press <ENTER> and then follow the screen prompts.

To save the new values, select *0* and press <ENTER> to return to the **Management Options** screen, then select *6* and press <ENTER> to **Save Preference Changes**.

Community name and User name can be any 1-32 character alphanumeric string

Authentication Password and Privacy Password can be any 1-16 character alphanumeric string.

3.4.2.3 Setting the SNMP Trap IP Host Addresses

SNMP traps are used to report events that occur during the operation of a network, and may require the attention of the network administrator. The 2FXM2 is capable of sending SNMP traps to up to eight different SNMP Traphosts.

To enter the IP address of the first Traphost Address, select *4* at the **Management Options** screen to access the **SNMP Preferences** screen. Select *16* at the **SNMP Preferences** screen and press <ENTER>. Then backspace over the existing value, type the new value (in x.x.x.x format), and press <ENTER>. To enter the IP addresses of additional trap-receiving Traphost Addresses, repeat this process for Traphost Addresses 2-8 (menu options 17-23).

To save the new values, select *0* and press <ENTER> to return to the **Management Options** screen, then select *6* and press <ENTER> to **Save Preference Changes**.

3.4.2.4 Enabling/Disabling SNMPv1/v2c Agent

To disable/enable SNMPv1/v2c agent, select *4* at the **Management Options** screen to access the **SNMP Preferences** screen. Select option *6* to disable/enable SNMPv1/v2c agent. When disabled, the module will not respond to any requests via the SNMPv1/v2c protocol.

3.4.2.5 Enabling/Disabling SNMPv3 Agent

To disable/enable SNMPv3 agent, select *4* at the **Management Options** screen to access the **SNMP Preferences** screen. Select option *7* to disable/enable SNMPv3 agent. When disabled, the module will not respond to any requests via the SNMPv3 protocol.

Note: Both SNMPv1/v2c and SNMPv3 agents can be enabled at the same time.

3.4.3 Enabling/Disabling Soft-switch Reload

The Soft-switch Reload function controls the configurations of the 2FXM2 and other *iConverter* modules managed by the 2FXM2 following a power up.

When the Soft-switch Reload is disabled, the configurations of the 2FXM2 and the other managed modules (non-management modules) following a return of power are determined by their hardware DIP-switch settings.

When the Soft-switch Reload is enabled, the configurations of the 2FXM2 and the other managed modules following a return of power are determined by the previous software settings stored in the FLASH memory of the 2FXM2. Each of the hardware DIP-switch settings on the module are ignored until a change is made to the DIP-switch, then the hardware settings will take effect.

To set the Soft-switch Reload function, select 8 at the *IP and Control Preferences* screen, press <ENTER> and then follow the screen prompts to change the setting.

PI SA

IP and Control Preferences ScreeniConverter, Serial Agent

1: Set IP192.168.1.220

2: Set Subnet Mask255.255.255.0

3: Set Gateway192.168.1.1

4: Chassis Number1

5: Chassis Name (also sysName)2FXM2

6: Enable/Disable TELNETEnabled

7: Enable/Disable FTPDisabled

8: Enable/Disable Soft Switch ReloadDisabled

9: TELNET Password*****

10: FTP Password

11: Serial Password

Enter Choice, Management Options Screen(0), (H)elp, E(x)it >

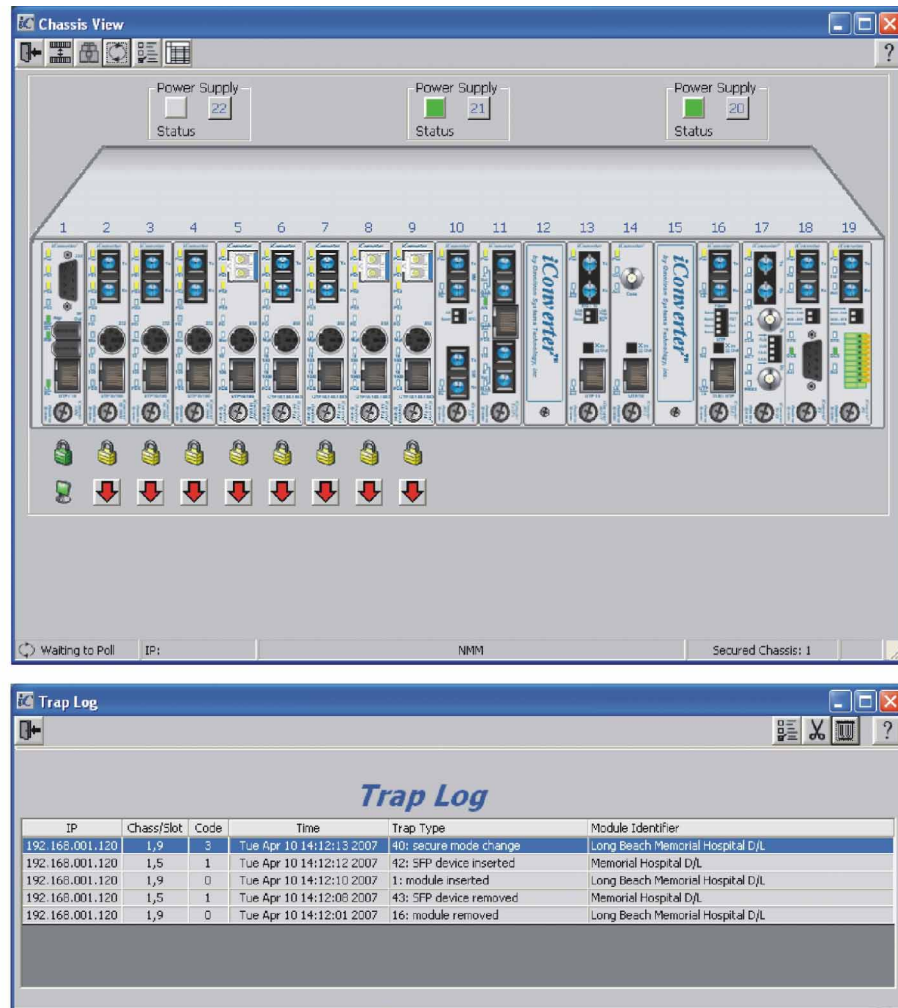
To save the new values, select 0 and press <ENTER> to return to the *Management Options* screen, then select 6 and press <ENTER> to *Save Preference Changes*.

3.4.4 Access the 2FXM2 Remotely

Remote access to the 2FXM2 is provided via SNMP, Telnet, FTP or an external serial modem connected to the Serial Console Port.

3.4.4.1 Accessing the 2FXM2 via NetOutlook (SNMP)

The 2FXM2 module can be remotely accessed by SNMP-client software such as Omnitron's *NetOutlook* SNMP Management Software or third-party SNMP management software. See Setting SNMP Preferences Section 3.4.2, on how to configure the required parameters.



NetOutlook Chassis View and Trap Log Screens

3.4.4.2 Accessing the 2FXM2 via Telnet

The 2FXM2 is shipped from the factory with Telnet enabled. The default Telnet password is “public”. It is highly recommended that the network administrator set a new Telnet password in order to prevent unauthorized access to the unit. Telnet configuration parameters are available from the *IP and Control Preferences* screen, option 6.

```

IP and Control Preferences Screen                                iConverter, Serial Agent

1: Set IP                                192.168.1.220
2: Set Subnet Mask                       255.255.255.0
3: Set Gateway                           192.168.1.1
4: Chassis Number                        1
5: Chassis Name (also sysName)           2FXM2
6: Enable/Disable TELNET                 Enabled
7: Enable/Disable FTP                    Disabled
8: Enable/Disable Soft Switch Reload     Disabled
9: TELNET Password                       *****
10: FTP Password
11: Serial Password

Enter Choice, Management Options Screen(0), (H)elp, E(x)it >6
Disable TELNET (Y/N)?>

```

To save the new values, select *0* and press <ENTER> to return to the *Management Options* screen, then select *6* and press <ENTER> to *Save Preference Changes*.

The 2FXM2 may be accessed and configured via Telnet using any standard Telnet client. Only one Telnet session can be active at a time. An inactive Telnet session terminates automatically after 5 minutes.

3.4.4.3 Updating the 2FXM2 Firmware via the Serial Console Port

To update the 2FXM2 firmware from the Serial Console Port, select *10* at the *Management Options* screen, press <ENTER>. The 2FXM2 will display the following:

```

Management Options                                              iConverter, Serial Agent

Network Management
1: Chassis and Module Management
2: Set Module Identifier

Management Module Preferences
3: IP and Control Preferences
4: SNMP Preferences
5: Abandon Preference Changes
6: Save Preference Changes
7: Restore to Factory Defaults
8: Restart Management Module
9: Other Networking Features

Management Module Maintenance
10: Firmware Update
11: Set Date/Time

IP Address      = 192.168.1.220
Chassis Number = 1

Enter Choice, (H)elp, E(x)it > 10
UPDATE: Are you sure? (Y/N) > Y
Please Xmodem file now:

```

From the terminal program, use the Xmodem protocol to send the new 2FXM2-xxx.bin firmware file to the 2FXM2 module (where xxx represents the release level of the software).

Once the file transfer begins, the data uploads to the 2FXM2. The process takes about five minutes over a serial connection.

When the upload is complete, the 2FXM2 displays the update status and then automatically restarts with the newly loaded firmware.

3.4.4.4 Updating the 2FXM2 Firmware via FTP

Using an FTP application, upload the new firmware into the FTP root directory of the 2FXM2. When the file transfer is complete, the 2FXM2 verifies the file and then automatically restarts with the newly loaded firmware.

For detailed instructions on updating the management modules and other modules in the same chassis via FTP, download the application note “*iConverter* Management: Updating Modules via FTP” available on Omnitron’s web page:

<http://www.omnitron-systems.com/downloads.php>

See Setting 2FXM2 Passwords Section 3.4.1.4, on how to configure FTP.

3.5 VERIFY OPERATION PI SA

Once the module has been installed and configured, per Sections 3.2 - 3.4, verify the module is operational by viewing the status of the LED indicators. The table below provides a description for each LED indicator.

The Power LED indicates the modules is receiving power from the chassis or power cord. The plug-in modules has an LED indicator for each available power supply in the chassis (the 19-Module Chassis has three, the 5-Module Chassis has two).

The Fiber Optic LEDs (“P1” and “P2”) indicate the fiber optic connection has been established. A blinking LED indicates the presence of data.

Refer to Section 6.0, Troubleshooting Guide, for help in determining possible fault conditions.

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LED Function "Legend"	Color	Off State	On / Blinking State	On / Blinking State
Power "Pwr"	Green	No power	On: Module has power	On: Module has power
Power Supply Status #X	Green	Chassis Power Supply not installed	On: Power available from installed Power Supply #X Blinking: No power available from installed Power Supply #X	Not available on standalone
Port 1 Fiber Link Activity "P1"	Green	No Fiber Link	On: Fiber link is active Blinking: Fiber Data Activity	On: Fiber link is active Blinking: Fiber Data Activity
Port 1 Half/Full Duplex "FDX"	Green	Half-Duplex	On: Full-Duplex	On: Full-Duplex
Chassis Management Master/Slave "Msr/Slv"	Green	Chassis Slave Mode	On: Chassis Master Blinking: Operating in OAM Mode	Not available on standalone
Port 2 Fiber Link Activity "P2"	Green	No Fiber Link	On: Fiber link is active Blinking: Fiber Data Activity	On: Fiber link is active Blinking: Fiber Data Activity
Port 2 Half/Full Duplex "FDX"	Green	Half-Duplex	On: Full-Duplex	On: Full-Duplex

4.0 DETAILED MODULE CONFIGURATION PI SA

4.1 OVERVIEW

The 2FXM2 has module parameters that require configuration depending on the application. The *Module* configuration screen is accessible by selecting the module slot number from the *Chassis View* screen. To access the *Module* configuration menu, select *1* at the *Management Options* screen, press <ENTER>. The *Chassis Selection* screen will be displayed. From the *Chassis Selection* screen, select the chassis number where the 2FXM2 module is installed.

NOTE: Module configuration is also available using *NetOutlook*.

PI

Chassis Selection		iConverter, Serial Agent
Number	Chassis Name	
1	NMM	
2	Not Available	
3	Not Available	
4	Not Available	
5	Not Available	
6	Not Available	
7	Not Available	
8	Not Available	
9	Not Available	
10	Not Available	
11	Not Available	
12	Not Available	
13	Not Available	
14	Not Available	
15	Not Available	
16	Not Available	
17	Not Available	
18	Not Available	
19	Not Available	
Connected to Chassis Number 1		
Chassis Number(1-19), Management Options(0), (H)elp, E(x)it > 1		

By selecting Chassis Number 1, from the *Chassis Selection* screen, the *Chassis View* screen will be displayed.

PI

Chassis View 19 Slot			iConverter, Serial Agent		
Chassis Number = 1					
Slot	Model	Type	Slot	Model	Type
1	8000-0	NMM	16	N/A	
2	8903-1	10/100M	17	N/A	
3	8911-1	10/100M	18	N/A	
4	N/A		19	N/A	
5	8959N-0	2FXM2	20	N/A	
6	N/A		21	8200-9	Power Supply
7	N/A		22	N/A	
8	N/A				
9	N/A				
10	N/A				
11	N/A				
12	N/A				
13	N/A				
14	N/A				
15	N/A				
Module to View(1-22), Chassis Selection(0), (R)eset, (H)elp, E(x)it > 5					

SA

Chassis View 1 Slot			iConverter, Serial Agent
Chassis Number = 1			
Slot	Model	Type	Module Identifier
1	8959N-0	2FXM2	
Module to View(1), Management Options(0), (R)eset, (H)elp, E(x)it >1			

From the **Chassis View** menu, select the desired module (select *1 or 5*), press <ENTER>. The **Module** configuration screen will be displayed.

PI

Module - iConverter 2FXM2		iConverter, Serial Agent				
Identifier -						
Chassis Number	= 1	Switch	ON condition	OFF condition	H/W	Actual
Slot Number	= 11		1: Pause Enabled	Pause Disabled	Off	Off
Model Number	= 8959N-0		2: Port 1 HDX	Port 1 FDX	Off	Off
			3: Not Available			
Serial Number	= xxxxxxxx		4: Not Available			
Manufacturing Date	= xxxxxxxx		5: Port 2 HDX	Port 2 FDX	Off	Off
Product Revision	= xx		6: Link Propagate	Link Segment	Off	Off
Software Revision	= xx		7: Remote Fault	Normal	Off	Off
			8: Symm Fault Det	Normal	Off	Off
LED			9: BP A Enabled	BP A Disabled	Off	Off
1: Power	= On		10: BP B Enabled	BP B Disabled	Off	Off
2: Power Supply 1	= Off		11: Not Available			
3: Power Supply 2	= Off		12: Slave Only	Master/Slave	Off	Off
4: Power Supply 3	= Off		13: Not Available			
5: Port 1 Link	= Off		14: Not Available			
6: Port 1 FDX	= Off		15: Not Available			
7: BP Master	= Off		16: Not Available			
8: Port 2 Link	= Off	OAM settings:				
9: Port 2 FDX	= Off		17: IP protocol State	On		
			18: Management Mode	Secure OAM		
Toggle Switch(1-16), (I)dentifier, (R)eset, (H)elp, (P)ortStat, Port(C)tl >						

The **Module** configuration screen provides general information concerning the configuration and status of the module. The screen displays the model and serial numbers, hardware and software revisions, as well as the condition of the LEDs and DIP-switches. The DIP-switches can be re-configured (options *1 -10, 12*) without removing the module from the chassis. Select the appropriate option to change the DIP-switch setting. Selecting DIP-switch options *1 - 10* and *12*, will cause the selection to change states under the 'Actual' heading.

NOTE: The Plug-In Module configuration screen is shown. The standalone Module configuration screen will display LED 2, 3, 4, and 7 and DIP-switches 9, 10 and 12 as NOT AVAILABLE.

4.2 MODULE MANAGEMENT MODE

From the **Module** configuration screen, the management mode can be changed. Select option *18* to change the mode. The management mode options will be displayed.

PI

Module - iConverter 2FXM2		iConverter, Serial Agent				
Identifier -						
Chassis Number	= 1	Switch	ON condition	OFF condition	H/W	Actual
Slot Number	= 11		1: Pause Enabled	Pause Disabled	Off	Off
Model Number	= 8959N-0		2: Port 1 HDX	Port 1 FDX	Off	Off
			3: Not Available			
Serial Number	= xxxxxxxxx		4: Not Available			
Manufacturing Date	= xxxxxxxxx		5: Port 2 HDX	Port 2 FDX	Off	Off
Product Revision	= xx		6: Link Propagate	Link Segment	Off	Off
Software Revision	= xx		7: Remote Fault	Normal	Off	Off
			8: Symm Fault Det	Normal	Off	Off
LED			9: BP A Enabled	BP A Disabled	Off	Off
1: Power	= On		10: BP B Enabled	BP B Disabled	Off	Off
2: Power Supply 1	= Off		11: Not Available			
3: Power Supply 2	= Off		12: Slave Only	Master/Slave	Off	Off
4: Power Supply 3	= Off		13: Not Available			
5: Port 1 Link	= Off		14: Not Available			
6: Port 1 FDX	= Off		15: Not Available			
7: BP Master	= Off		16: Not Available			
8: Port 2 Link	= Off	OAM settings:				
9: Port 2 FDX	= Off		17: IP protocol State	On		
			18: Management Mode	Secure OAM		
Toggle Switch(1-16), (I)dentifier, (R)eset, (H)elp, (P)ortStat, Port(C)tl >						
Mode (1=OAM Off, 2=Auto Secure OAM, 3=Auto ah OAM, 4=Secure OAM, 5=ah OAM): 3						

The 2FXM2 module supports several management options. Option *18* configures how the module will communicate to its remote partner. ‘Auto Secure OAM’ (option 2) and ‘Secure OAM’ (option 4) uses Omnitron’s proprietary secure encrypted management channel. ‘Auto Secure OAM’ will force the remote partner to communicate using the Secure OAM protocol while ‘Secure OAM’ will only attempt to communicate with the remote partner over the secure protocol. The management channel can support IP or IP-less connectivity based on the configuration of the ‘IP Protocol State’, option *17*. ‘Auto ah OAM’ (option 3) and ‘ah OAM’ (option 5) conforms to the IEEE 802.3ah specification. ‘Auto ah OAM’ will force the remote partner to communicate using the ah OAM protocol while ‘ah OAM’ will only attempt to communicate with the remote partner over the ah protocol. This option provides an industry standard method of fault detection and monitoring. The management channel supports both IP and IP-less connectivity based on the configuration, option *17* and *18*.

NOTE: See *NetOutlook* User Manual for complete information on the management modes.

4.3 PORT CONFIGURATION

The **Port** configuration screen provides access to the port level configuration parameters, such as, Port Access, Bandwidth Control, L2CP Control, SFP information, 802.3ah, Port VLANs, Tagged VLANs and cNode Loopback. To access the **Port** configuration screen, select **C** from the **Module** configuration screen and press <ENTER>. The **Port** configuration screen will appear.

PI

Module - iConverter 2FXM2		iConverter, Serial Agent	
Identifier -			
Chassis Number	= 1	Port Access Control Setup	
Slot Number	= 1	-----	
Model Number	= 8959N-0	11: Port 1 Enable	On
		12: Port 2 Enable	On
Feature Selection		Port VLAN Path Setup	
-----		-----	
1: 802.1Q Processing Enable	Off	13: Port 1 to Port 2	Enable On
2: Configure Tag VLAN Control		14: Port 1 to BP A	Enable On
3: Configure VLAN Membership		15: Port 1 to BP B	Enable On
4: Save TAG VLAN parameters		16: Port 2 to BP A	Enable On
5: Configure 802.3ah parameters		17: Port 2 to BP B	Enable On
6: Configure 802.3ah events		18: BP A to BP B	Enable On
7: SFP Information		19: Port 1 to Mngmnt	Enable On
8: Bandwidth Control		20: Port 2 to Mngmnt	Enable On
9: L2CP Control		21: BP A to Mngmnt	Enable On
10: cNode Loopback		22: BP B to Mngmnt	Enable On
Enter Choice, Previous Screen(0), (H)elp, E(x)it >			

SA

Module - iConverter 2FXM2		iConverter, Serial Agent	
Identifier - Host			
Chassis Number	= 1	Port Access Control Setup	
Slot Number	= 1	-----	
Model Number	= 8959N-0	11: Port 1 Enable	On
		12: Port 2 Enable	On
Feature Selection		Port VLAN Path Setup	
-----		-----	
1: 802.1Q Processing Enable	Off	13: Port 1 to Port 2	Enable On
2: Configure Tag VLAN Control		14: Port 1 to Mngmnt	Enable On
3: Configure VLAN Membership		15: Port 2 to Mngmnt	Enable On
4: Save TAG VLAN parameters			
5: Configure 802.3ah parameters			
6: Configure 802.3ah events			
7: SFP Information			
8: Bandwidth Control			
9: L2CP Control			
10: cNode Loopback			
Enter Choice, Previous Screen(0), (H)elp, E(x)it >			

4.3.1 Port Access

The Port Access option allows the ports to be disabled/enabled while maintaining the port configuration and network link

To configure Port Access, select option *11* for the Port 1 and option *12* for the Port 2 from the **Port** configuration screen.

4.3.2 Bandwidth Control

The 2FXM2 Bandwidth Control is accessed by selecting option 8 at the **Port** configuration screen.

The 2FXM2 provides separate ingress and egress rate control on each port.

Ingress rates are limited by Committed Information Rate (CIR) and Committed Burst Size (CBS). The committed information rate (CIR) is the rate at which the network supports data transfer under normal operations. The committed burst size (CBS) defines the number of bits that can transmit over a specified time interval when congestion is occurring. Ingress CIR values are entered as a number of kbps, ranging from 64kbps to 100,000kbps. CIR values will be rounded to the nearest 64k. CBS values can range from 5kB to 150kB.

Ingress rate limiting provides an excess traffic policy with the option to “drop” the excess frames or “accept, send PAUSE” to the port’s link partner when traffic excess the ingress CIR and CBS values.

Egress rate are selected from a menu of 20 options.

Egress rate limiting can be selected to use either Starvation Queuing (low latency) or Weighted Fair Queuing (high latency). Starvation Queuing processes all high priority traffic before any low priority traffic and uses a strict priority scheme. Weighted Fair Queuing will process high priority traffic more often then low priority traffic in an 8 (high priority), 4, 2, 1 (low priority) weighted scheme.

PI SA

```
Bandwidth Control - iConverter 2FXM2                                iConverter Serial Agent
Identifier -

Chassis Number      = 1
Slot Number         = 1
Model Number        = 8959N-0

      Port 1   Control
-----
1: Ingress CIR      100000 kbps
2: Ingress CBS      150 kB
3: Excess Traffic Policy Drop
4: Egress rate      100 Mbps
5: Queueing         Fair Weight

      Port 2   Control
-----
6: Ingress CIR      100000 kbps
7: Ingress CBS      150 kB
8: Excess Traffic Policy Drop
9: Egress rate      100 Mbps
10: Queueing         Fair Weight

Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

To change the ingress rate of the Port 1, select option 1.

```
Change Fiber CIR (range 64 to 100000)> 142
```

To change the ingress rate of the Port 2, select option 6.

```
Change Port 2 CIR (range 64 to 100000)> 100000
```

To change the egress rate, select option 4 for Port 1 or option 9 for the Port 2. The egress rates are displayed. Select the desired egress rate.

```
PI SA

Bandwidth Control - iConverter 2FXM2                               iConverter, Serial Agent
Identifier -

Chassis Number      = 1
Slot Number         = 1
Model Number        = 8959N-0

-----
Port 1 Control
-----
1: Ingress CIR      100000 kbps
2: Ingress CBS      150 kB
3: Excess Traffic Policy Drop
4: Egress rate      100 Mbps
5: Queueing         Fair Weight

-----
Port 2 Control
-----
6: Ingress CIR      100000 kbps
7: Ingress CBS      150 kB
8: Excess Traffic Policy Drop
9: Egress rate      100 Mbps
10: Queueing        Fair Weight

-----
1: 64 Kbps          11: 6 Mbps
2: 128 Kbps         12: 7 Mbps
3: 256 Kbps         13: 8 Mbps
4: 512 Kbps         14: 9 Mbps
5: 768 Kbps         15: 10 Mbps
6: 1 Mbps           16: 20 Mbps
7: 2 Mbps           17: 30 Mbps
8: 3 Mbps           18: 40 Mbps
9: 4 Mbps           19: 50 Mbps
10: 5 Mbps          20: 100 Mbps

Select Fiber Egress Rate from menu above (1-20) >
```

4.3.3 Layer 2 Control Protocol Filter

Layer 2 Control Protocol Filter provides the ability to discard, forward or tunnel L2CP frames based on the network requirements. Select ‘discard’, ‘forward’ or ‘tunnel’..

The Layer 2 Control Protocol Filter is accessed by selecting option 9 from the **Port** configuration screen.

```
PI SA

L2CP Control - iConverter 2FXM2                               iConverter, Serial Agent
Identifier -

Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0

1: Global L2CP Control      Forward

Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

Select the appropriate option to configure the module for the desired operation.

4.3.4 SFP Information

The 2FXM2 module will provide general and specific information on the SFP. This information is best viewed with SNMP management software. The following is the information available:

4.3.4.1 SFP A0 Information Display

This section displays fixed SFP Module information for the following areas.

- Identifier Values
- Connector Values
- Encoding Rules
- Link Length
- Vendor OUI
- Laser Wavelength
- Vendor Serial Number
- Diagnostic Monitoring Type
- SFF-8472 Compliance
- Extended Identifier
- Transceiver Codes
- Normal Bit Rate
- Vendor Name
- Vendor Revision Number
- Options
- Date Code
- Enhanced Options

4.3.4.2 SFP A2 Information Display

This section displays decoded SFP data collected for the following statistics.

- Measured Temperature
- Measured Bias
- Measured Rx Power
- Temperature Low Alarm Setting
- Temperature Low Warning Setting
- Vcc Low Alarm Setting
- Vcc Low Warning Setting
- Bias Low Alarm Setting
- Bias Low Warning Setting
- Tx Power Low Alarm Setting
- Tx Power Low Warning Setting
- Rx Power Low Alarm Setting
- Rx Power Low Warning Setting
- Measured Vcc
- Measured Tx Power
- Temperature High Alarm Setting
- Temperature High Warning Setting
- Vcc High Alarm Setting
- Vcc High Warning Setting
- Bias High Alarm Setting
- Bias High Warning Setting
- Tx Power High Alarm Setting
- Tx Power High Warning Setting
- Rx Power High Alarm Setting
- Rx Power High Warning Setting

SFP information can be obtained by selecting option 7 from the **Port** configuration screen.

PI SA

```
SFP Information - iConverter 2FXM2                      iConverter, Serial Agent
Identifier -
Chassis Number = 1    Slot Number = 1    Model Number = 8959N-0    Port = 1

Address A0 Page Contents
=====
00: 03 04 07 00 10 02 00 00 00 00 00 01 03 00 14 C8 .....
10: 37 37 00 00 43 4F 52 45 54 45 4B 20 20 20 20 77..xxxxxxx
20: 20 20 20 20 00 00 00 00 43 54 2D 30 31 35 35 53 ....xxxxxxx
30: 53 50 2D 4D 42 35 4C 44 30 30 30 05 1E 00 84 xxxxxxxxxxxxxx....
40: 00 1A 00 00 41 31 36 37 45 43 35 30 30 30 30 30 ....A167EC500000
50: 36 20 20 20 30 35 31 32 30 37 20 20 68 90 01 A4 6  051207 h...
60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
80: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
90: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
A0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
B0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
C0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
D0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
E0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
F0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....

Enter Previous Screen(0), (n)ext page, (H)elp, E(x)it > n

SFP Information - iConverter 2FXM2                      iConverter, Serial Agent
Identifier -
Chassis Number = 1    Slot Number = 1    Model Number = 8959N-0    Port = 1

Address A2 Page Contents
=====
00: 64 00 F6 00 5A 00 FB 00 8C A0 75 30 88 B8 79 18 d...Z.....u0..y.
10: 9C 40 03 E8 88 B8 07 D0 09 D0 00 FB 07 CB 01 3C .@.....<
20: 18 A6 00 05 13 94 00 06 00 00 00 00 00 00 00 .....
30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
40: 00 00 00 00 3F 80 00 00 00 00 00 00 00 01 00 00 .....?.....
50: 01 00 00 00 01 00 00 00 01 00 00 00 00 00 00 AE .....
60: 24 A8 80 78 17 14 03 F0 00 00 00 00 00 00 02 F8 $.x.....
70: 00 40 00 00 00 40 00 00 00 00 00 00 00 00 00 00 .@...@.....
80: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
90: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
A0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
B0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
C0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
D0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
E0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....
F0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....

Enter Previous Screen(0), (b) previous page, (H)elp, E(x)it >
```

4.3.5 802.3ah Parameters

The 802.3ah parameters can be monitored and/or configured in the **802.3ah Control** screen.

- 802.3ah OAM State - The 802.3ah OAM State turns 802.3ah processing on or off for the selected port. When the port is configured as “Disabled” it will not respond to OAMPDUs (OAM Protocol Data Units). They will be dropped by the processor and not acted upon. When the port is configured as “Enabled”, it will respond to and be involved in the Discovery process and other supported 802.3ah

OAM functions.

- 802.3ah OAM Mode - The 802.3ah OAM Mode sets the selected port to “Passive” or “Active” configuration mode. In “Passive” mode the port cannot initiate Discovery, send Variable Requests or initiate Loopback Mode. It can observe and report only the port status of its 802.3ah enabled remote partner. An “Active” port can initiate Discovery, send Variable Requests and initiate loopback mode.
- Loopback Mode - The Loopback Mode turns loopback operations “On” or “Off”. When Loopback Mode is set to “Off”, the port of the 802.3ah enabled local device will not initiate Loopback operations. It can respond to loopback commands from its 802.3ah enabled remote partner if set to “Passive” or “Active”. When Loopback Mode is set to “On”, the port of the 802.3ah enabled local device will initiate Loopback operations and set the 802.3ah enabled remote partner into loopback. In this mode, the 802.3ah enabled local device will not respond to any other configuration changes until its port is set to “Off.”
- Loopback Mode Timeout (sec) - The Loopback Mode Timeout field controls the length of time that the port will be set to Loopback “On” mode. Loopback can be set between 0 and 300 seconds. The 0 setting disables the timer.
- Unidirectional Mode - OAM provides a mechanism to notify the remote link partner when one direction of a link is non-operational and therefore data transmission is disabled. The ability to operate a link in a unidirectional mode for diagnostic purposes supports the maintenance objective of failure detection and notification. The 802.3ah unidirectional link can be enabled on the fiber port. Unidirectional fiber link allows a fiber port to send link fault OAMPDUs when a link fault is detected.

4.3.5.1 Local Status Section

The Local Status section displays the status of Port 1 and Port 2 of the 802.3ah enabled local device. The local device is controlled directly by SNMP, Telnet or via the Serial Port and has the ability to communicate with an 802.3ah enabled remote partner.

- Discovery State - Indicates the Discovery state (“Complete”, “In Process” or “Incomplete”) of the local ports. If “Complete” is displayed, Discovery has been completed. If “In Process”, Discovery has been initiated but no response from the 802.3ah enabled remote partner has been received by the local device. If “Incomplete”, Discovery has received a response from the 802.3ah enabled remote partner but the Discovery process is not yet completed.
- Multiplexer State - Indicates the Multiplexer state (“Discard” or “Forward”) of the local ports. If “Forward” is displayed, the local device is forwarding non-OAMPDU network frames to the **lower** sublayer. If “Discard”, the local device is discarding non-OAMPDU network frames.
- Parser Action - Indicates the Parser Action (“Discard”, “Forward” or “Loopback”) of the local ports. If “Forward” is displayed, the local device is forwarding non-OAMPDU network frames to the **higher** sublayer. If “Loopback”, the local device is looping back non-OAMPDUs network frames. If “Discard”, the device is discarding non-OAMPDUs network frames.

4.3.5.2 Remote Status Section

The Remote Status section displays the status of the ports of the 802.3ah enabled remote partner. These remote ports are connected to Port 1 and Port 2 of the local device. The remote partner is managed by the local device via the 802.3ah OAM channel.

- Discovery State - Indicates the Discovery state (“Complete”, “In Process” or “Incomplete”) of the remote ports. If “Complete” is displayed, Discovery has been completed. If “In Process”, Discovery has been initiated but no response from the local device has yet been received by the remote partner. If “Incomplete”, Discovery is in process, but is not yet completed.
- Multiplexer State - Indicates the Multiplexer state (“Discard”, “Forward” or “Unknown”) of the remote

ports. If “Forward” is displayed, the remote partner is forwarding non-OAMPDUs to the lower sublayer. If “Discard”, the remote partner is discarding non-OAMPDUs network frames. If “Unknown”, the Multiplexer state of the remote partner is indeterminate.

- **Parser Action** - Indicates the Parser Action state (“Discard”, “Forward”, “Loopback” or “Unknown”) of the remote ports. If “Forward” is displayed, the remote partner is forwarding non-OAMPDUs network frames to the **higher** sublayer. If “Loopback” is displayed, the remote partner is looping back non-OAMPDUs network frames. If “Discard” is displayed, the remote partner is discarding non-OAMPDUs network frames. If “Unknown”, the Parser Action state of the remote partner is indeterminate.
- **Critical Event** - Indicates the Critical Event state (“Yes”, “No” or “Unknown”) of the remote partner. If “Yes” is displayed, the local device has detected a Critical Event. If “No”, the local device has not detected a critical event. If “Unknown,” the Critical Event status of the remote partner is indeterminate.
- **Link Fault** - Indicates the remote partner has detected a fault in the receive direction (“Yes”, “No” or “Unknown”). If “Yes” is displayed, the receive link is down. If “No”, the receive link is up. If “Unknown,” the link fault status is indeterminate.
- **OAM Mode** - Indicates the OAM mode (“Active” or “Passive”) of the remote partner.
- **Supports** - Indicates the supported options (Variable Access “Var”, Link Event Notification “Events”, Loopback “LB”, Unidirectional “UNI” or blank if no options are supported) of the remote partner.
- **OUI** - Indicates the three hex byte IEEE organizational specific identifier (or blank if unknown) of the remote partner.

802.3ah parameters can be accessed by selecting options 5 from the **Port** configuration screen. Port 1 configuration screen is displayed.

PI

SA

802.3ah Control - iConverter 2FXM2

iConverter, Serial Agent

Identifier -

Chassis Number = 1

Slot Number = 1

Model Number = 8959N-0

Port # = 1

1: 802.3ah OAM State

Disabled

Local Status

2: OAM Mode

Active

Discovery State

Disabled

3: Loopback Mode

Disabled

Multiplexer State

Forward

4: Loopback Timeout

30 sec

Parser Action

Forward

5: Unidirectional Mode

Disabled

Remote Status

Discovery State

Unknown

Critical Event

No

Link Fault

No

Multiplexer State

Unknown

Parser Action

Unknown

Mode

Unknown

Supports

Unknown

OUI:

Unknown

Enter, Previous Screen (0), (n)ext page, (H)elp, E(x)it >

To configure the 802.3ah parameters for the Port 2, type an *n* and press <ENTER>.

4.3.6 802.3ah Events

802.3ah events can be accessed by selecting options 6 from the *Port* configuration screen.

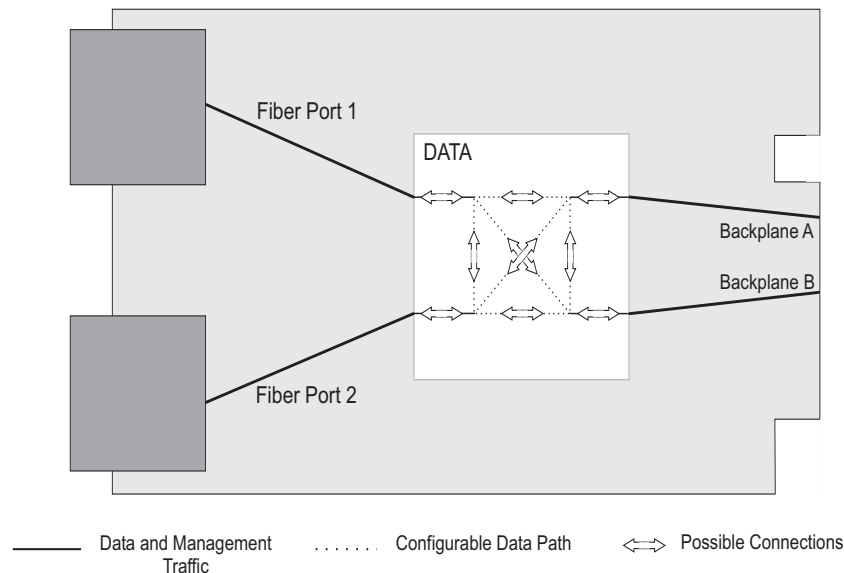
PI SA

802.3ah Event - iConverter 2FXM2		iConverter, Serial Agent	
Identifier -			
Chassis Number = 1		Slot Number = 1	Model Number = 8959N-0
Port 1			
1: Symbol Period Window	0 second	<	0 symbols>
2: Symbol Period Threshold	0 symbols		
3: Frame Window	0 seconds		
4: Frame Threshold	0 frames		
5: Frame Period Window	0 second	<	0 frames>
6: Frame Period Threshold	0 frames		
7: Frame Seconds Summary Window	0 seconds		
8: Frame Seconds Summary Threshold	0 seconds		
Port 2			
9: Symbol Period Window	0 second	<	0 symbols>
10: Symbol Period Threshold	0 symbols		
11: Frame Window	0 seconds		
12: Frame Threshold	0 frames		
13: Frame Period Window	0 second	<	0 frames>
14: Frame Period Threshold	0 frames		
15: Frame Seconds Summary Window	0 seconds		
16: Frame Seconds Summary Threshold	0 seconds		
Enter Choice, Previous Screen(0), (H)elp, E(x)it >			

4.3.7 Port VLAN

The flow of data on the module is controlled by configuring the Port VLAN settings. The block diagram illustrates the flow of both the management traffic and the data traffic for a plug-in module (standalone modules do not have backplane access). The data traffic is controlled by a switch matrix which provides complete control of the data traffic. The management traffic is simply enabled or disabled at each port. By default traffic flows between all ports on the module.

Using the Port VLAN settings, data will only be forwarded across the enabled path, unless blocked by one of the other features (Port Access or Tag VLAN). Secure OAM and ah OAM Management data will pass to and from the Management port even if the path has been “disabled”. This allows OAM maintenance functions to always be enabled. Port VLAN control is inactive when Tag VLAN processing is turned on.



Port VLAN Block Diagram

Port VLAN is access by selecting options *13 - 22* or *13 - 15* depending on the module type; plug-in or standalone.

PI

```

Module - iConverter 2FXM2                                iConverter, Serial Agent
Identifier -

Chassis Number      = 1                                Port Access Control Setup
Slot Number         = 1                                -----
Model Number        = 8959N-0                          11: Port 1 Enable                On
                                                           12: Port 2 Enable                On

Feature Selection
-----
1: 802.1Q Processing Enable  Off  -----
2: Configure Tag VLAN Control  13: Port 1 to Port 2  Enable  On
3: Configure VLAN Membership   14: Port 1 to BP A    Enable  On
4: Save TAG VLAN parameters    15: Port 1 to BP B    Enable  On
5: Configure 802.3ah parameters 16: Port 2 to BP A    Enable  On
6: Configure 802.3ah events     17: Port 2 to BP B    Enable  On
7: SFP Information             18: BP A   to BP B    Enable  On
8: Bandwidth Control           19: Port 1 to Mngmnt  Enable  On
9: L2CP Control                 20: Port 2 to Mngmnt  Enable  On
10: cNode Loopback             21: BP A   to Mngmnt  Enable  On
                                   22: BP B   to Mngmnt  Enable  On

Enter Choice, Previous Screen(0), (H)elp, E(x)it >

```

SA

```

Module - iConverter 2FXM2                                iConverter, Serial Agent
Identifier - Host

Chassis Number      = 1                                Port Access Control Setup
Slot Number         = 1                                -----
Model Number        = 8959N-0                          11: Port 1 Enable                On
                                                           12: Port 2 Enable                On

Feature Selection
-----
1: 802.1Q Processing Enable  Off  -----
2: Configure Tag VLAN Control  13: Port 1 to Port 2  Enable  On
3: Configure VLAN Membership   14: Port 1 to Mngmnt  Enable  On
4: Save TAG VLAN parameters    15: Port 2 to Mngmnt  Enable  On
5: Configure 802.3ah parameters
6: Configure 802.3ah events
7: SFP Information
8: Bandwidth Control
9: L2CP Control
10: cNode Loopback

Enter Choice, Previous Screen(0), (H)elp, E(x)it >

```

4.3.8 Tagged VLAN

The 2FXM2 supports the IEEE 802.1Q tag VLAN packet tagging and un-tagging and the 802.1p Quality of Service priority standards.

The following parameters are configured for each port:

4.3.8.1 Port Priority (PRI)

This (IEEE 802.1p based) user-specified value of 0 through 7 can be assigned as a QoS priority level (0 being lowest and 7 being highest) to packets ingressing (entering) a port. If no value is specified by the user, a default priority value of “0” is assigned.

The PRI value is always assigned to all untagged packets. Tagged packets are assigned the PRI value when the “PVID” option is selected in the “Tagged Packet Use” section.

4.3.8.2 Port VLAN ID (PVID)

This (IEEE 802.1Q based) user-specified value of 0 through 4094 can be assigned as a Port VLAN ID (PVID) to packets ingressing a port. If no value is specified by the user a default PVID value of “2” is assigned.

The PVID value is always assigned to untagged packets. Tagged packets are assigned the PVID value when the “PVID” option is selected in the “Tagged Packet Use” section.

4.3.8.3 Tagged Packet Use

This section defines how tagged packets ingressing a port are processed.

Selecting the “PVID” option causes the PRI and PVID user-specified values to be used as the packet’s VLAN ID (VID) for processing of the packet.

Selecting the “TVID” (Tagged VLAN ID) option causes the packet’s original Tag VLAN ID (TVID) and priority level to be used as the packet’s VLAN ID (VID) for processing of the packet.

NOTE: Untagged packets are always assigned the port’s PRI and PVID values as their VID.

4.3.8.4 Ingress Security

This section selects the ingress security level of a port.

Selecting the “**Low**” option allows any packet to ingress a port.

Selecting the “**High**” option allows only packets that are assigned a VLAN ID (VID) value of which this port is a member (according to the Membership Table) to ingress a port.

4.3.8.5 Port Type

This section defines the port type.

Selecting the “**Tunnel**” option, sets the egress mode to “Pass” for each VID assigned to the port in the membership table. The port is set to “Accept Tagged” frames.

Selecting the “**Trunk**” option, the port is set to a Egress Tag Mode of “Provider Tag”. Frames ingressing will have the “Provider Tag” removed.

Selecting the “**Access**” option, sets the egress mode to “Pass” for each VID assigned to the port in the membership table. The port is set to “Discard Tagged” frames.

4.3.8.6 Global Settings

The 2FXM2 allows the setting of the customer facing port (C-TAG) and the network facing port (S-TAG). C-Tag is used by the port when Port Type is set to “Access” or “Tunnel”. The C-Tag defaults to 0x8100h. S-TAG is used by the port when Port Type is set to “Trunk”. The S-Tag defaults to 0x8100h. If the S-Tag is changed the port functions as an IEEE 802.1ad S-Tag port.

Tagged VLAN is accessed by selecting option 2 from the **Port** configuration screen. The **Tag VLAN Control** screen will be displayed.

PI

```

Tag VLAN Control - iConverter 2FXM2                               iConverter, Serial Agent
Identifier -
Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0

Port 1 1: Port Priority (PRI)          0      BP B 16: Port Priority (PRI) 0
      2: PVID (Port VLAN ID)          2      17: PVID (Port VLAN ID)      2
      3: Tagged Packets Use            PVID    18: Tagged Packets Use      PVID
      4: Ingress Security              Low     19: Ingress Security        Low
      5: Port Type                    Tunnel   20: Port Type                Tunnel

Port 2 6: Port Priority (PRI)          0      Mngmnt 21: Port Priority (PRI) 0
      7: PVID (Port VLAN ID)          2      22: PVID (Port VLAN ID)      2
      8: Tagged Packets Use            PVID    23: Tagged Packets Use      PVID
      9: Ingress Security              Low     24: Ingress Security        Low
     10: Port Type                    Tunnel   25: Port Type                Tunnel

BP A 11: Port Priority (PRI)          0      Module Global Settings
     12: PVID (Port VLAN ID)          2      26: C-TAG (hex)            8100
     13: Tagged Packets Use            PVID    27: Q-in-Q (S-TAG) (hex)   8100
     14: Ingress Security              Low
     15: Port Type                    Tunnel

Enter Choice, Previous Screen(0), (H)elp, E(x)it >

```

SA

```

Tag VLAN Control - iConverter 2FXM2                               iConverter, Serial Agent
Identifier -
Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0

Port 1 1: Port Priority (PRI)          0      Module Global Settings
      2: PVID (Port VLAN ID)          2      16: C-TAG (hex)            8100
      3: Tagged Packets Use            PVID    17: Q-in-Q (S-TAG) (hex)   8100
      4: Ingress Security              Low
      5: Port Type                    Tunnel

Port 2 6: Port Priority (PRI)          0
      7: PVID (Port VLAN ID)          2
      8: Tagged Packets Use            PVID
      9: Ingress Security              Low
     10: Port Type                    Tunnel

Mngmnt 11: Port Priority (PRI)          0
     12: PVID (Port VLAN ID)          2
     13: Tagged Packets Use            PVID
     14: Ingress Security              Low
     15: Port Type                    Tunnel

Enter Choice, Previous Screen(0), (H)elp, E(x)it >

```

4.3.9 VLAN Membership Table

The VLAN Membership Table lists the permitted VLAN ID (VID) for each egress port on the module. Only packets that are assigned a VID value that matches one of the egress port's VID memberships are allowed to egress through the port.

When the Ingress Security is set to High for a specific port, the membership table is used to list the VID's of the packets that are allowed to ingress that port.

VLAN Membership is accessed by selecting option 3 from the *Port* configuration screen. The *VLAN Membership* screen will be displayed.

PI

```
VLAN Membership - iConverter 2FXM2          iConverter, Serial Agent
Identifier -

Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0

          VLAN ID (VID)      Port 1      Port 2      BP A      BP B      Mngmnt

VLAN TABLE IS EMPTY

Add new entry (a), Delete entry (d), Edit entry (e), Clear table (c)

Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

SA

```
VLAN Membership - iConverter 2FXM2          iConverter, Serial Agent
Identifier -

Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0

          VLAN ID (VID)      Port 1      Port 2      Mngmnt

VLAN TABLE IS EMPTY

Add new entry (a), Delete entry (d), Edit entry (e), Clear table (c)

Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

Initially the table is empty. To configure the ports with VLAN IDs, select option (a) from the *VLAN Membership* configuration screen.

PI

```
Membership Entry - iConverter 2FXM2          iConverter, Serial Agent
Identifier -

Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0

      VLAN Table Membership Entry 1
      -----

1: VLAN ID                2
2: Port 1 Membership      No
3: Port 2 Membership      No
4: BP A  Port Membership  No
5: BP B  Port Membership  No
6: Mngmnt Port Membership No

7: Submit Entry As Defined

Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

SA

```
Membership Entry - iConverter 2FXM2          iConverter, Serial Agent
Identifier -

Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0

      VLAN Table Membership Entry 1
      -----

1: VLAN ID                2
2: Port 1 Membership      No
3: Port 2 Membership      No
4: Mngmnt Port Membership No

5: Submit Entry As Defined

Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

To add a VLAN ID to the membership table, select option *1* and enter the ID #. To associate the VLAN ID to a port, select the appropriate port option (2 - 6).

PI

```
Membership Entry - iConverter 2FXM2          iConverter, Serial Agent
Identifier -
```

```
Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0
```

```
VLAN Table Membership Entry 1
-----
```

```
+1: VLAN ID              100
+2: Port 1 Membership     Yes
 3: Port 2 Membership     No
 4: BP A Port Membership  No
 5: BP B Port Membership  No
 6: Mngmnt Port Membership No
```

```
*7: Submit Entry As Defined
```

```
Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

SA

```
Membership Entry - iConverter 2FXM2          iConverter, Serial Agent
Identifier -
```

```
Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0
```

```
VLAN Table Membership Entry 1
-----
```

```
+1: VLAN ID              100
+2: Port 1 Membership     Yes
 3: Port 2 Membership     No
 4: Mngmnt Port Membership No
```

```
*5: Submit Entry As Defined
```

```
Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

Once all the VLAN IDs have been assigned, select option 7 or 5 to save the entries.

PI

```
VLAN Membership - iConverter 2FXM2                      iConverter, Serial Agent
Identifier -

Chassis Number = 1      Slot Number = 1      Model Number = 8959N-0

          VLAN ID (VID)      Port 1      Port 2      BP A      BP B      Mngmnt
1:         100              Yes        No         No         No         No

Add new entry (a), Delete entry (d), Edit entry (e), Clear table (c)

Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

The VLAN membership entries are saved from the *Port* configuration screen, option 4.

4.3.10 cNode Loopback

The 2FXM2 has implemented Iometrix cNode Level 1 agent for testing performance metrics. The agent recognizes measurement packets and loops them back to the sending cNode device. Iometrix cNode equipment is required to obtain performance metrics.

cNode configuration is accessed by selecting option 10 from the *Port* configuration screen.

PI

SA

```
cNode Control -iConverter 2FXM2                      iConverter, Serial Agent
Identifier -

Chassis Number = 1      Slot Number = 2      Model Number = 8959N-0

1:      cNode Loopback      Disabled
2:      cNode Rate Limit    64 Kbps

Enter Choice, Previous Screen(0), (H)elp, E(x)it >
```

From the menu, loopback can be enabled or disabled and the rate limit can be selected.

4.3.11 Port Statistics

The 2FXM2 module provides port statistics on both Port 1 and Port 2.
The Port Statistics can be viewed by selecting option *P* from the *Module* configuration screen.

PI

Module - iConverter 2FXM2
Identifier -

iConverter, Serial Agent

Chassis Number	= 1	Switch	ON condition	OFF condition	H/W	Actual
Slot Number	= 11		1: Pause Enabled	Pause Disabled	Off	Off
Model Number	= 8959N-0		2: Port 1 HDX	Port 1 FDX	Off	Off
			3: Not Available			
Serial Number	= xxxxxxxx		4: Not Available			
Manufacturing Date	= xxxxxxxx		5: Port 2 HDX	Port 2 FDX	Off	Off
Product Revision	= xx		6: Link Propagate	Link Segment	Off	Off
Software Revision	= xx		7: Remote Fault	Normal	Off	Off
			8: Symm Fault Det	Normal	Off	Off
LED			9: BP A Enabled	BP A Disabled	Off	Off
1: Power	= On		10: BP B Enabled	BP B Disabled	Off	Off
2: Power Supply 1	= Off		11: Not Available			
3: Power Supply 2	= Off		12: Slave Only	Master/Slave	Off	Off
4: Power Supply 3	= Off		13: Not Available			
5: Port 1 Link	= Off		14: Not Available			
6: Port 1 FDX	= Off		15: Not Available			
7: BP Master	= Off		16: Not Available			
8: Port 2 Link	= Off	OAM settings:				
9: Port 2 FDX	= Off		17: IP protocol State	On		
			18: Management Mode	Secure OAM		

Toggle Switch(1-16), (I)dentifier, (R)eset, (H)elp, (P)ortStat, Port(C)tl > P

PI SA

Port Statistic
Module - iConverter 2FXM2
Identifier -

iConverter, Serial Agent

Chassis Number = 1
Slot Number = 1
Model Number = 8959N-0

Port Statistics

	Port 1	Port 2
Rx Bytes	0	0
Rx Packets	0	0
Rx Total Packets	0	0
Tx Bytes	0	0
Tx Packets	0	0

Enter Choice, Previous Screen(0), (H)elp, E(x)it >

To refresh the Port Statistic screen, press <ENTER>.

5.0 2FXM2 SPECIFICATIONS

	Plug-in Module	Standalone Tabletop	Standalone Wall-Mount
Description	100BASE-FX Fiber to 100BASE-FX Fiber Converter and Network Interface Device		
Protocols	100BASE-FX with 2048 bytes max. frame size		
Cable Types			
Fiber	Multimode: 50/125, 62.5/125, 100/140 um, Single-mode: 9/125 um		
Serial	RS-232, 22 to 24 AWG, 12 to 50 pF/ft.		
Connector Types			
Fiber	SFP: LC		
Serial	Mini DIN-6 female, mini DIN-6 male to DB-9 female adapter included		
Controls	DIP-Switches and LEDs		
802.1p Priority Levels and VID Priority Level Groups	4 Levels (PRI 0-1, 2-3, 4-5, 6-7)		
Power Requirements			
DC Power	1.2A @ 3.3VDC	Nominal: 0.6A @ 9VDC Voltage Range: 8 - 15VDC	
DC Power Connector	Power supplied by backplane	2.5mm Barrel Connector or Terminal Connector	
AC Power Adapter [US]	N/A	100-120VAC/60Hz 0.08A @ 120VAC	
AC Power Adapter [Universal]	N/A	100-240VAC/50-60Hz 0.08A @ 120VAC	
Dimensions	W: 2.8" x D: 4.5" x H: 0.85"	W: 3.1" x D: 4.8" x H: 1.0"	W: 3.8" x D: 4.8" x H: 1.0"
Weight			
without power adapter	8 oz.	1 lb.	
with power adapter	N/A	1.5 lb.	
Compliance	UL, CE, FCC Class A		
IP-Based Management	Telnet; SNMPv1, SNMPv2c, SNMPv3		
Temperature			
Operational - Commercial	0 to +50°C		
Operational - Wide Range	-40 to +60°C		
Operational - Extended	-40 to +75°C		
Storage	-40 to +80°C		
Humidity (non-condensing)	5 to 95%		
Altitude (Operational)	-100m to 4,000m		
MTBF [hrs]			
without power adapter	500,000		
with power adapter [US]	N/A	250,000	
with power adapter [Unv]	N/A	100,000	

6.0 TROUBLESHOOTING GUIDE

6.1 OVERVIEW

The 2FXM2 module has several LED indicators available to assist in the determination of problems. Refer to Section 3.5, Verify Operation, for LED definitions.

6.1.1 Power Issues

Problem:

The Power LED does not illuminate after installation is complete or no LED indicators are ON

Possible Causes:

- A. For standalone modules, confirm that the power supply is connected to both the module and the AC or DC power source. If Power LED is still not illuminated, use a voltmeter and check the voltage of the power source (AC/DC converter used with the standalone unit should measure between 9 -15 VDC no load at the barrel connector).
- B. For plug-in module, confirm that the chassis is connected to an AC or DC power source. If the Power LED is still not illuminated, remove the module and verify the operation of other modules in the chassis. If power is present and the module will not turn ON, replace the module.
- C. The plug-in module requires ~ 4.0 watts (3.3VDC @ 1.2 amps) for normal operation. The AC Power Supply in a 19-Module Chassis can supply ~ 60 watts (3.3VDC @ 18amp). A fully loaded 19-Module chassis of 2FXM2 modules will require two power supplies for standard operation. This condition will cause the power LED not to illuminate.

6.1.2 Fiber Issues

Problem:

The Fiber Optic link LED does not illuminate after installation is complete.

Possible Causes:

- A. Verify the Link Mode selection is set to Link Segment (LS). Until a stable link is established, leave the Link Mode configured for LS. After a Link presence is established, the Link Mode selection can be modified.
- B. Confirm that the fiber optic cable is properly connected to the *iConverter* 2FXM2 and the remote fiber optic device. Connecting the fiber between the Tx of the far end to the Rx on the near end will cause the P1 LED on the near end to illuminate (only when the link mode is configured for Link Segment). Completing the connection will cause the far end P1 LED to illuminate.
- C. Confirm that the fiber cable type matches the fiber transceiver type (multimode, single-mode) on the *iConverter* 2FXM2.
- D. If using a dual-fiber model, confirm that the transmitter (Tx) is attached to the receiver side of its link partner, and that the receiver (Rx) is attached to the transmitter. A optical power meter will assist in determining which cable should be connected to the Tx and Rx of the module. To insure proper operation, a minimum of -30dBm must be present at the fiber optic receiver.
- E. If using a single-fiber model, confirm that the Tx wavelength on the *iConverter* 2FXM2 matches the Rx of the connected fiber optic device. Single-fiber units transmit and receive at different wavelengths (1510nm/ 1310nm). Verify the model numbers to insure proper compatibility.

NOTE: If corrective actions do not resolve your situation, please contact Omnitron Systems Technical Support.

7.0 WARRANTY

This product is warranted to the original purchaser against defects in material and workmanship for a period of TWO YEARS from the date of shipment. A LIFETIME warranty may be obtained by the original purchaser by REGISTERING this product with Omnitron within 90 days from the date of shipment. TO REGISTER, COMPLETE AND MAIL OR FAX THE ENCLOSED REGISTRATION FORM TO THE INDICATED ADDRESS. Or you may register your product on the Internet at <http://www.omnitron-systems.com>. During the warranty period, Omnitron will, at its option, repair or replace a product which is proven to be defective.

For warranty service, the product must be sent to an Omnitron designated facility, at Buyer's expense. Omnitron will pay the shipping charge to return the product to Buyer's designated US address using Omnitron's standard shipping method.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate use and/or maintenance of the equipment by Buyer, Buyer-supplied equipment, Buyer-supplied interfacing, unauthorized modifications or

tampering with equipment (including removal of equipment cover by personnel not specifically authorized and certified by Omnitron), or misuse, or operating outside the environmental specification of the product (including but not limited to voltage, ambient temperature, radiation, unusual dust, etc.), or improper site preparation or maintenance.

No other warranty is expressed or implied. Omnitron specifically disclaims the implied warranties of merchantability and fitness for any particular purpose.

Exclusive Remedies

The remedies provided herein are the Buyer's sole and exclusive remedies. Omnitron shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

Technical Support

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