ION System C3210 Series

10/100/1000BASE-T to 1000BASE-SX/LX

Slide-in-Module

User Guide

33496 Rev. D

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ION System C3210 Slide-in-Module User Guide, 33496 Rev. D

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Revision History

Rev	Date	Description
A	05/03/11	Released for firmware version 1.0.4. New features include Circuit ID support, SNMP v1/v2c setting, and Web Interface enhancements, and updated Help files.
B	05/16/11	Revised for ION Rel. **1.1.0**. New features include 1) ION x6010 T1/E1 support, 2) Reset Counters, 3) Connector Type display, and 4) Updated Help files.
C	09/12/11	Revised for ION Rel. 1.2.0 with: 1) Increased Rate Limiting options. 2) SNMPv3. 3) BootP Address mode. 4) WRR or Strict Egress Queue Modes. 5) Serial File Transfer (X/Y/Zmodem) commands. 6) IONMM System Name displays in CLI prompt. 7) Password can be changed using the community write string, and any login or password that is not fixed.
D	04/05/12	Revised for v 1.2.0 with Egress and Rate Limit changes.

Cautions and Warnings

Definitions

Cautions indicate that there is the possibility of poor equipment performance or potential damage to the equipment. Warnings indicate that there is the possibility of injury to person.

Cautions and Warnings appear here and may appear throughout this manual where appropriate. Failure to read and understand the information identified by this symbol could result in poor equipment performance, damage to the equipment, or injury to persons.

Cautions

 **Do not** ship or store devices near strong electrostatic, electromagnetic, magnetic, or radioactive fields.


Caution: When handling chassis cards, observe electrostatic discharge precautions. This requires proper grounding (i.e., wear a wrist strap).


Caution: Copper based media ports, e.g., Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are intended to be connected to intra-building *(inside plant)* link segments that are not subject to lightening transients or power faults. They are **not** to be connected to inter-building *(outside plant)* link segments that are subject to lightening.


Caution: **Do not** install the C3210 in areas where strong electromagnetic fields (EMF) exist. Failure to observe this caution could result in poor C3210 performance.


Caution: Read the installation instructions before connecting the chassis to a power source. Failure to observe this caution could result in poor performance or damage to the equipment.


Caution: Only trained and qualified personnel should install or perform maintenance on the ION219-A chassis. Failure to observe this caution could result in poor performance or damage to the equipment.

Caution: Do not let optical fibers come into physical contact with any bare part of the body since they are fragile, and difficult to detect and remove from the body.

Caution: Do not bend any part of an optical fiber/cable to a diameter that is smaller than the minimum permitted according to the manufacturer's specification (usually about 65 mm or 2.5 in)!

Warnings

Warning: Use of controls, adjustments or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Warning: Visible and invisible laser radiation when open. **Do not** stare into the beam or view the beam directly with optical instruments. Failure to observe this warning could result in an eye injury or blindness.

Warning: DO NOT connect the power supply module to external power before installing it into the chassis. Failure to observe this warning could result in an electrical shock or death.

Warning: Select mounting bracket locations on the chassis that will keep the chassis balanced when mounted in the rack. Failure to observe this warning could allow the chassis to fall, resulting in equipment damage and/or possible injury to persons.

Warning: Do not work on the chassis, connect, or disconnect cables during a storm with lightning. Failure to observe this warning could result in an electrical shock or death.

See Appendix A on page 232 for Electrical Safety Warnings translated into multiple languages.

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Section 1: Introduction

Document Overview

The purpose of this manual is to provide the user with an understanding of the Transition Networks C3210 Ethernet media converter. This manual documents the following models:

- **C3210-1013** 10/100/1000BASE-T / 1000BASE-SX media converter*****
- **C3210-1014** 10/100/1000BASE-T / 1000BASE-LX media converter*****
- **C3210-1015** 10/100/1000BASE-T / 1000BASE-LX media converter*****
- **C3210-1017** 10/100/1000BASE-T / 1000BASE-LX media converter
- **C3210-1024** 10/100/1000BASE-T / 1000BASE-SX media converter
- **C3210-1029-A1** 10/100/1000BASE-T / 1000BASE-LX media converter*****
- **C3210-1029-A2** 10/100/1000BASE-T / 1000BASE-LX media converter*****
- **C3210-1029-B1** 10/100/1000BASE-T / 1000BASE-LX media converter
- **C3210-1029-B2** 10/100/1000BASE-T / 1000BASE-LX media converter
- **C3210-1035** 10/100/1000BASE-T / 1000BASE-LX media converter
- **C3210-1040** 10/100/1000BASE-T (RJ-45) [100 m/328 ft.] 100BASE Open SFP

Models shown with an asterisk (*****) are available in a model with an open SFP port. The SFP models with the DMI option have a D"" at the end of the model number (e.g., **TN-SFP-SXD**).

Product Overview

The C3210 is a group of Ethernet media converters that are designed as slide-in modules that install in an ION system chassis. The C3210 can be managed when installed in a managed ION chassis. If the C3210 is linked over fiber to a stand-alone device, it will be the Point System SGFEB10xx-120 (the SGFEBs are un-managed devices).

The ION C3210 media converters are 2- port Ethernet devices capable of media conversion between copper and fiber ports. These are chassis managed devices designed as slide-in-cards (SICs) for installation in an ION system chassis. A stand-alone equivalent can be found in the Point System product family, SGFEB10xx-120.

These devices can be managed via Command Line Interface (CLI), Web interface, or Telnet. Access is through the IONMM (ION Management Module), also installed in the ION chassis. See the printed *C3210 Installation Guide #33414* or locate it on the web at http://www.transition.com, then click on Products/Product Finder to locate the manual.

C3210 Series Features

The C3210 supports the following features.

The ION C3210 device provides an interface between 10/100/1000Base-T ports and 1000Base-SX/LX ports allowing users to integrated fiber optic cabling into 10/100/1000Base-T copper environments. The overall benefits include:

- Integrate fiber into copper based networking environments
- Can be used in any ION Platform Chassis
- Bridging legacy 10/100 devices into a Gigabit Backbone
- Secure Uni-directional transmission
- Standards based, will link with any standard 10/100/1000Base-T and any standard 1000Base-SX or LX ports

The following manageable features are available when used in an ION Platform chassis along with an ION Management Module (IONMM):

- 10K Jumbo Frame Support
- Copper and Fiber Auto-Negotiation
- Switch Selectable Speeds
- AutoCross™
- Link Pass Through
- Remote Fault Detect
- Pause
- Automatic Link Restoration
- MAC filtering for network access control (authentication and authorization)
- Backward compatibility / Point System support
- IEEE 802.1P QoS, IPv4 TOS/Diffserv, IPv6 traffic class
- IEEE 802.1q Port VLAN, tagging and doubling tagging (Q-in-Q)
- VLAN Forwarding and VLAN Tag Management
- Field Upgradeable Firmware
- Virtual Cable Test on UTP port
- Uni-directional data transmission
- Bandwidth Allocation
- DMI digital diagnostics per SFF-8472
- RMON counters for each port
- Circuit ID and Device Description
- Serial File Transfer (X/Y/Zmodem) commands

These features are discussed in the following sections.

10K Jumbo Frame Support

The C3210 devices support jumbo frames. The MTU (Maximum Transmission Unit) frames size can be 10240 bytes (not configurable). Note: If the C3210 is linked to a SGFEB, then the maximum supported frame size is limited to the capability of the SGFEB (1623 bytes).

Auto-Negotiation (802.3u)

This feature allows two devices to configure to achieve the best possible mode of operation over a copper link, automatically. The C3210 broadcasts its speed and duplex (full or half) capabilities to the connected device and negotiates the best mode of operation. Auto-Negotiation allows quick connections because the optimal link between the devices is established automatically.

In a scenario where the C3210 links to a non-negotiating device, disable Auto-Negotiation. In this instance, the mode of operation will drop to the lowest common denominator between the two devices (e.g., 10 Mbps at half-duplex).

Disabling this feature allows forcing the connection to the desired speed and duplex mode of operation.

Pause

Pause is used to suspend data transmission temporarily to relieve buffer congestion. If an Ethernet device needs some time to clear network congestion, it will send a pause signal to the Ethernet device at the other end, then that device will wait a predetermined amount of time before re-transmitting its data.

This feature reduces data bottlenecks and allows efficient use of network devices, preventing data losses.

The pause feature is set using the SNMP interface to one of four settings:

- Disable (no pause)
- Symmetrical pause
- Asymmetric Tx (transmit) pause
- Asymmetric Rx (receive) pause

Enable the Pause feature, if available, on all Ethernet network devices attached to the C3210, otherwise disable this feature. Note that all Ethernet devices support this in full duplex mode.

AutoCross (10/100/1000Base-T)

When active, the *AutoCross*™ feature allows the use of a straight-through (MDI) or crossover (MDIX) copper cable when connecting to 10/100Base-T or 10/100/1000Base-T converters. AutoCross determines the characteristics of the connection and configures the copper port to link up automatically. This occurs regardless of the cable configuration (MDI or MDI-X).

Note: Transition Networks recommends leaving *AutoCross* in default mode (Auto).

Bandwidth Profiling

A Bandwidth Profile is a method of characterizing Service Frames for the purpose of rate enforcement or policing. The C3210 devices support bandwidth profiling at the per-port level. Each port has an ingress bandwidth profile used to control the ingress traffic and an egress bandwidth profile for regulating traffic leaving the port. This feature provides TX and RX rate limiting from a pre-defined list of values in order to accommodate bursty traffic.

Configuration Backup and Restore

The firmware uses Trivial File Transfer Protocol (TFTP) to upload its present configuration onto a TFTP server, and can also download the configuration from the TFTP server and update its settings. This is useful when you want to program more than one unit to the same configuration. One unit can be programmed and that configuration can be used to populate the other units. Care should be taken on some settings such as IP address and virtual LAN (VLAN) settings.

Note: Transition Networks recommends as a "best practice" to backup SIC card configuration after it is fully configured so that in the event of an error or hardware failure, the configuration can be easily and rapidly restored.

For more information see "Backup and Restore Operations" on page 267.

DMI Optical Management

Devices with Diagnostic Monitoring Interface (DMI) support allow diagnosing problems within the network. DMI devices have four functions:

- Transmit power
- Receive power
- Transmit bias current
- Temperature

Within each function, the DMI device will send a trap whenever a high or low warning event or high or low alarm event occurs (for a total of 16 traps).

Optical SFP transceivers support digital diagnostics monitoring (DDM) functions per industry-standard SFF-8472.

Backwards Compatibility / Point System Support

The ION Platform offers backwards compatibility with Transition Networks' Point System family of media converters. Not only can an ION module be linked to a Point System Module over fiber, but Point System modules can be installed in the ION chassis through the use of an ION system adapter card.

The backplane in the ION chassis will power the Point System modules, allowing the module to perform its copper-to-fiber media converter functions. Full read/write management of Point System modules is also available in the ION chassis. This requires the use of a Point System Management Module along with the ION system adapter card.

By supporting management modules from both the ION Platform and the Point System, users are able to re-deploy and fully manage their Point System devices, easing their migration to the ION Platform.

Management Access Methods

Management of the C3210, and subsequently the other slide-in modules, is accomplished through one of the following methods.

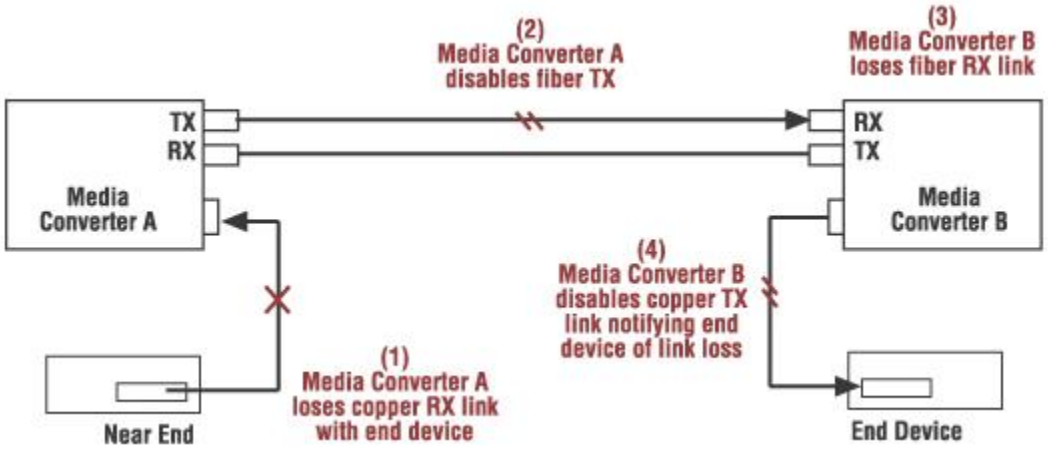
- Universal Serial Bus (USB) – uses a command line interface (CLI) to access and control the C3210 through a locally connected workstation.
- Telnet session – uses the CLI to access and control the C3210 through the network.
- Simple Network Management Protocol (SNMP) – both public and private Management Information Bases (MIBs) allowing for a user to easily integrate and manage the ION platform with an SNMP based network management system (NMS).

TFTP (Trivial File Transfer Protocol)

The TFTP client provides uploading and downloading of files out of the device's file system. Typical applications for this protocol on this device include backup of configuration, restore known configuration from a file, firmware image upgrade/downgrade, log files backup, certificate download for SSH, SSL applications etc.

Link Pass Through

Link Pass Through is a troubleshooting feature that allows the media converter to monitor both the fiber and copper RX ports for loss of signal. In the event of a loss of RX signal on one media port, the converter will automatically disable the TX signal of the other media port, thus "passing through" the link loss. The end device is automatically notified of link loss which prevents loss of valuable data unknowingly transmitted over an invalid link.



IP Access

Any management of the system via IP can be locked at the system level, or only on certain ports. For example, management can occur via web/SNMP only on Port 1, so that access via other ports can be blocked.

MAC Filtering

When enabled on a port, stops learning all MAC addresses. To allow any frame with a MAC address not in the Static MAC database access, you must add the new address or it will be discarded. This allows filtering any unauthorized access to the network by unknown MAC addresses.

MAC Addresses Blocking

The MAC address can be added to the static MAC address database with the 'connected port' as zero. This will cause any frames from that MAC address database to cause an ATU-member violation on that port, resulting in sending a trap. This could cause excessive traps (overload the Central Processing Unit (CPU) with interrupts) depending on the traffic generated by that MAC. You can disable MAC violations by setting the **Ignore SA Violation** on the port that is receiving the MAC address via the Web interface at **Port** > **Advanced** > **MAC Security** > **SA Lock**.

The SA Lock enabled feature will detect if the device connected to this port has been changed, and when an unknown MAC address ingresses this port.

Applicable Standards

- IEEE 802.1p QoS packet classification
- IEEE 802.1q VLAN and double VLAN tagging
- IEEE 802.1 Port-based Network Access Control

IEEE 802.1p QoS Packet Classification

Quality of Service (QoS) is a mechanism that lets service providers offer different levels of services to customers. The QoS varies between customers based on the Service Level Agreement (SLA) they chose for the kind of service they want. The priorities of the customer traffic are assigned based on their SLAs.

The C3210 provides QoS at the Layer 2 level using CoS bits per IEEE 802.1p. The priority bits in the 802.3ac tag can be remapped as frames ingress the device based on Ingress port, Source MAC address, Destination MAC address, or VLAN ID in the 802.1q tag, or on the basis of remapping to a user-defined priority on a per port basis.

The C3210 also provides QoS based on DSCP/ToS bits in the IP header.

The C3210 supports four output queues. Based on a frame's priority bits (layer 2 or layer 3), frames are assigned the egress output queues. The C3210 offers weighted round robin (WRR) 8-4-2-1 scheduling on the output queues to minimize frame latencies and starvation of lower priority queues.

Device Description / Circuit ID

The x323x supports the Circuit ID, a company-specific identifier assigned by a provider to a data or voice network between two locations. This circuit is then leased to a customer by that ID. If a subscriber has a problem with the circuit, the subscriber contacts the telecom provider with this Circuit ID to initiate service action on the specified circuit. The ION Circuit ID port identifier is based on the agent-local identifier of the circuit (defined in RFC 3046), detected by the agent and associated with a particular port. The x323x supports the Circuit ID, a company-specific identifier assigned by the user to identify the

converter and individual ports in any manner desired. At the device level, the x323x supports a 'Device Description' character string entry of up to 64 bytes.

RFC 2544 Benchmarking

The C3210 supports IETF RFC 2544 (Benchmarking Methodology for Network Interconnect Devices). RFC 2544 defines several tests that can be used to describe the performance characteristics of a network interconnecting device, as well as specific formats for reporting the results of the tests (e.g., throughput, latency, frame loss rate, system recovery). The following RFC2544 testing reports are available for the C3210: Back-to-Back Test Report, Frame Loss Test Report, Latency Test Report, and Throughput Test Report.

Serial File Transfer (X/Y/Zmodem)

The C3210 supports serial get, put, and upgrade CLI commands using the Xmodem, Xmodem-1k, Ymodem, and Zmodem protocols. These commands function similar to the TFTP download function; technical support can download configuration files and firmware files through the C3210 USB port by entering the corresponding CLI commands.

Supported MIBs

The C3210s support public (standard) and private Management Information Bases (MIBs).

Public MIBs

The C3210 provides complete management through the SNMP interface. It supports standard MIBs for management using SNMPv1/v2 as shown in the table below.

Private MIBs

The Transition Networks private MIBs for SNMP IP-based management feature extensive management options, including:

Table 1: Supported MIBs

#	MIB	RFC # or Private	Description
1	BRIDGE-MIB	RFC4188	Bridge MIB module for managing devices that support IEEE 802.1D
2	ENTITY-MIB	RFC 4133	MIB module for representing multiple logical entities supported by a single SNMP agent
3	ENTITY-SENSOR-MIB	RFC 3433	Defines Entity MIB extensions for physical sensors
4	EtherLike-MIB	RFC3635	Describe generic objects for Ethernet-like network interfaces
5	IANA-MAU-MIB	RFC 4836	Defines dot3MauType OBJECT-IDENTITIES and IANAifMauListBits, IANAifMauMediaAvailable, IANAifMauAutoNegCapBits, and IANAifJackType
6	IEEE8021-CFM-MIB	RFC ____	Connectivity Fault Management module for managing IEEE 802.1ag
7	IEEE8021-TC-MIB	RFC ____	Textual conventions used throughout the various IEEE 802.1 MIB modules

8	IF-MIB	RFC 2863	Describes generic objects for network interface sub-layers
9	MAU-MIB	RFC 4836	Management information for 802.3 MAUs
10	P-BRIDGE-MIB	RFC 4363	Module for managing Priority and Multicast Filtering
11	Q-BRIDGE-MIB	RFC 4363	Module for managing Virtual Bridged LANs
12	RFC1213-MIB (MIB-II)	RFC 1213	Defines the second version of the Management Information Base (MIB-II) for use with network management protocols in TCP/IP-based internets
13	RMON-MIB	RFC 1757	Defines objects for managing remote network monitoring devices (i.e., monitors or probes)
14	TRANSITION-SMI	Private	Transition Networks Enterprise Structure of Management Information; assigns ION platform module identities
15	TRANSITION-TC	Private	Transition Networks Inc MIB Textual Conventions module; defines textual conventions used in the Transition enterprise MIBs
16	TN-ION-BPC-MIB	Private	Transition Networks, Inc. Enterprise MIB for Chassis Management.
17	TN-ION-CHASSIS-MIB	Private	Transition Networks, Inc. Enterprise MIB for Chassis Management
18	TN-ION-MGMT-MIB	Private	Transition Networks, Inc. Enterprise MIB for basic management of the ION Platform
19	TN-PROV-BRIDGE-MIB	Private	Transition Networks, Inc. Enterprise MIB for IEEE Bridge provisioning, i.e., IEEE MAC/VLAN bridges
20	TN-ION-VLAN-MGMT-MIB	Private	Transition Networks, Inc. Enterprise module for managing VLAN and QoS in ION platform products
21	TN-ION-ENTITY-SENSOR-MIB	Private	Transition Networks, Inc. module for managing all ION power supply and fan modules)
22	ION-DEV-SYS-SNMPMGMT-MIB	Private	Transition Networks Enterprise MIB for ION device SNMP management feature
23	ION-DEV-SYS-STATE-MIB	Private	Transition Networks Enterprise MIB for ION device state
24	ION-DEV-SYS-TFTP-MIB	Private	Transition Networks Enterprise MIB for ION device TFTP feature
25	ION-DEV-SYS-UPGRADER-MIB	Private	Transition Networks Enterprise MIB for ION device upgrader feature

An example of a private MIB objects tree is shown in the figure below.

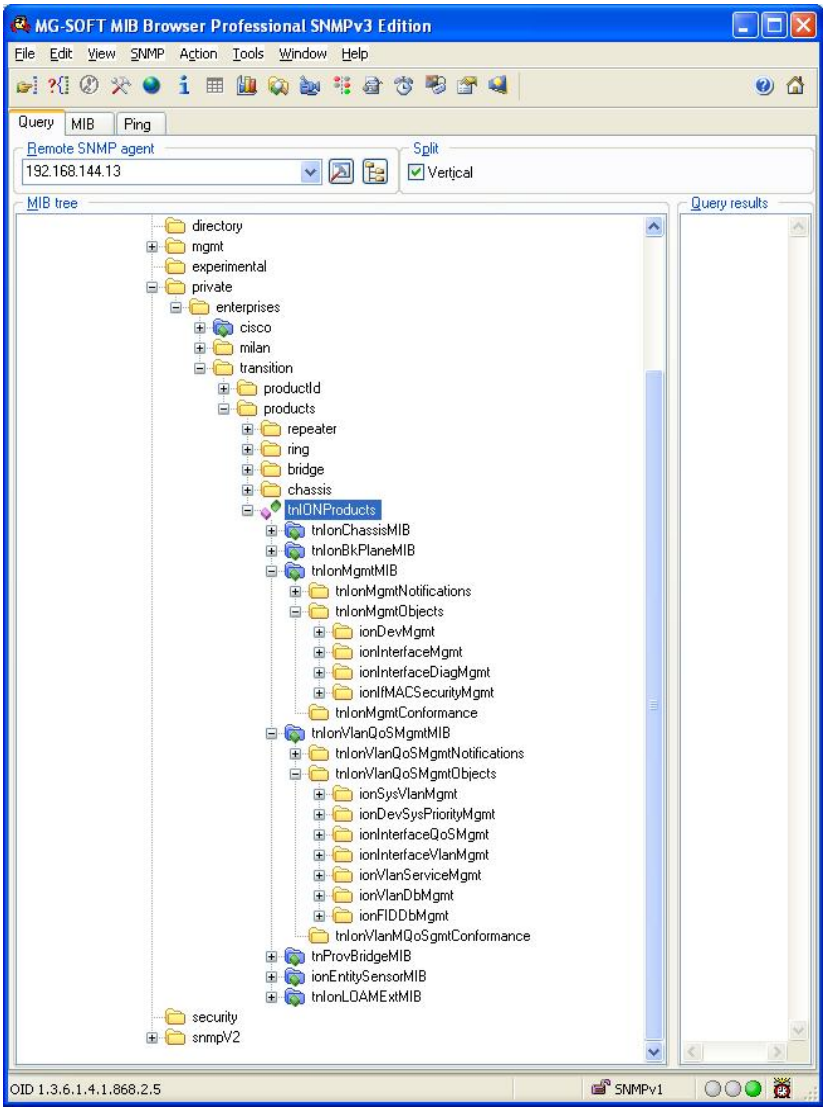


Figure 1: Private MIB Objects

Downloading, Compiling and Integrating MIBs

You can download industry standard MIBs from http://www.ietf.org.

To download ION system private MIBs:

1. Go to the TN software downloads page at http://www.transition.com/TransitionNetworks/TechSupport/Downloads/Software.aspx and locate the **Management MIB** section.
2. Click the link in the far right column (e.g., **Download mcc16.zip**).
3. At the **File Download** window, click **Save**.
4. At the **Save As** dialog box, verify the filename and **Save in** location (e.g., *C:\TFTP*-Root) and click **Save**.
5. At the **Download complete** dialog click **Close**. The downloaded file is saved to the specified folder location.
6. If you plan to integrate the ION system with an SNMP-based management application, then you must also compile the MIBs for that platform. For example, if you are running HP OpenView, you must compile the ION system MIBs with the HP OpenView NMS (Network Management System). See the NMS documentation for compiler instructions.
7. While working with MIBs, be aware that:
   a. Mismatches on datatype definitions can cause compiler errors or warning messages.
   b. The MIB datatype definitions are not mismatched; however, some standard RFC MIBs do mismatch.
   c. If your MIB compiler treats a mismatch as an error, or if you want to delete the warning message, refer to the "Technical Support" section on page 405.

Set up your ION system SNMP configuration via the command line interface (CLI). Refer to "Configuring SNMP" on page 214. For a complete list of the available commands, see the C3210 CLI Reference Manual, 33497.

For Additional MIB Information

For information on traps that the IONMM supports, see "Appendix G: SNMP Traps Supported" on page 543.

For more information on the SNMP Agent, Network Management Station (NMS), MIBS, MIB modules and MIB Variables, the Object ID (OID), the MIB Tree / branch /node, MIB Table Indices, values, notations and transaction types, etc., see the SNMP Primer at http://www.transition.com/pshelp/snmp.html#indices

C3210 Models

The various C3210 models (Standard / Single Fiber Models and Chassis / Standalone Models) are described below.

Duplex Fiber Models and Simplex Fiber Models

ION products are available as chassis models. The models can include both standard and single-fiber models, as well as specific models that support the DMI option. **Note:** the -D after the model number indicates DMI option support.

Single fiber technology offers a 50% savings in fiber utilization. It is an attractive solution to maximize the usage of a limited number of fiber runs. In a traditional optical link, a fiber pair consists of two uni-directional strands. The single fiber technology multiplexes two optical wavelengths into a single strand fiber, so these devices are usually used in pairs. *It is recommended these Single Fiber Models be used in pairs.

Chassis Models (*Cxxxx*)

The ION Chassis models (also called slide-in-cards or SICs, or slide-in-modules) and managed devices have specific features and functions that are controlled via the ION Management Module. A network administrator can configure, monitor and troubleshoot ION slide-in-modules remotely via the ION Management Module.

An end-to-end fiber integration solution can be achieve by pairing the modules in a high density ION chassis with the modules in another ION chassis, or a Transition Networks' Point System™ stand-alone media converter.

The various C3210 models are described in detail in the table below.

Table 2: C3210 Models and Descriptions

Product Number	Port One	Port Two
C3210-1013	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-SX 850nm multimode (SC) [62.5/125 µm: 220 m/722 ft.; 50/125 µm: 550 m/1804 ft.]
C3210-1014	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-LX 1310nm single mode (SC) [10 km/6.2 mi.]
C3210-1015	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-LX 1310nm single mode (SC) [25 km/15.5 mi.]
C3210-1017	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-LX 1550nm single mode (SC) [65 km/40.4 mi.]
C3210-1024	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-SX 1310nm extended multimode (SC) [2 km/1.2 mi.]
C3210-1029-A1	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC) [20 km/12.4 mi.]
C3210-1029-A2	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC) [20 km/12.4 mi.]
C3210-1029-B1	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC) [40 km/24.9 mi.]
C3210-1029-B2	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC) [40 km/24.9 mi.]
C3210-1035	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	1000BASE-LX 1550nm single mode (SC) [125 km/77.7 mi.]
C3210-1040	10/100/1000BASE-T (RJ-45) [100 m/328 ft.]	100BASE Open SFP

Physical Specifications

The physical specifications for the chassis slide-in modules are described in the table below.

Table 3: C3210 Model Specifications

Dimensions	SIC: 3.4” x 0.86” x 6.5” (86 mm x 22 mm x 165 mm)	
MAC Filtering	1K MAC addresses	
Power Input	Standalone: 12VDC @ 375mA	
	SIC: Powered by the Chassis	
Environment	0 to 50°C (32 to 122°F) operating;	
	5% - 95% humidity (non-condensing)	
	0 to 10,000 ft. altitude	
Storage Temp	-40 to 85°C (-40 to 185°F)	
Standards	IEEE 802.3, IEEE Std. 802.3ab, IEEE 802.3u, IEEE	
	802.3z, IEEE 802.3p, IEEE 802.3q	
Data Rate	10/100/1000Mbps; Layer-2	
Max Frame Size	10,240 Bytes (jumbo frame support)	
DIP Switches	SW1: TP Auto-Negotiation.	SW2: TP Speed
	SW3: TP Duplex	SW4: Link Pass Through
	SW5: Fiber Duplex	SW6: Unused
HW/SW Jumpers	Hardware/Software mode, AutoCross™	
Status LEDs	**PWR** (Power): ON = Connection to powered backplane	
	LACT (Fiber Link): ON = Fiber link, Blinking = activity	
	UTP Duplex/Link: Orange = half duplex link, Blinking = half duplex activity, Green = Full duplex link, Blinking =Full duplex activity.	
	Speed: Off = 10MBps operation (or no link), Orange = 100 Mbps operation, Green = 1000Mbps operation.	
Power Consumption	3.6 Watts, 300mA @ 112VDC	
Shipping Weight	1 lb. [.45 kg]	
Regulatory Compliance	CISPR/EN55022 Class A, EN55024, EN61000, FCC Class A, CE Mark	

MEF Certification

The Transition Networks ION system S3220, S2220, S3230, S3240, C2220, C3220, and C3230 have MEF 9, MEF 14, and MEF 21Certification. The MEF Certificates and Test Reports are available on our web site at www.transition.com.

Documentation Conventions

The conventions used within this manual for commands/input entries are described in the table below.

Table 4: Documentation Conventions

Convention	Meaning
Boldface text	Indicates the entry must be made as shown. For example: **ipaddr=<**addr> In the above, only **ipaddr=** must be entered exactly as you see it, including the equal sign (=).
< >	Arrow brackets indicate a value that must be supplied by you. Do not enter the symbols < >. For example: **ipaddr=<**addr> In place of <addr> you must enter a valid IP address.
[ ]	Indicates an optional keyword or parameter. For example: **go** [**s=**<xx>] In the above, **go** must be entered, but **s=** does not have to be.
{ } |	Indicates that a choice must be made between the items shown in the braces. The choices are separated by the | symbol. For example: **state=**{**enable** | **disable**} Enter **state=enable** or state**=disable**.
“ ”	Indicates that the parameter must be entered in quotes. For example: **time=**<**“**value**”**> Enter **time=”20100115 13:15:00”**.
>	Indicates a selection string. For example: Select **File > Save**. This means to first select/click **File** then select/click **Save**.

Related Manuals and Online Helps

A printed Documentation Postcard is shipped with each C3210. Context-sensitive Help screens, as well as cursor-over-help (COH) facilities are built into the Web interface. A substantial set of technical documents, white papers, case studies, etc. are available on our web site at www.transition.com.

The ION system and related device manuals are listed below.

1. ION C3210 User Guide (this manual)
2. C3210 Systems CLI Reference Manual, 33497
3. ION Management Module (IONMM) User Guide, 33457
4. ION219-A 19-Slot Chassis Installation Guide, 33412
5. ION Dry Contact Relay (DCR) Kit Install Guide, 33422
6. IONPS-A AC Power Supply Install Guide, 33423
7. IONPS-D DC Power Supply Install Guide, 33424
8. IONADP Kit Install Guide (Point System Card Adapter for ION Chassis) 33413
9. E-MCR-05 Media Converter Rack User's Guide, 33392
10. ION NID Manuals (model specific)
11. SFP manuals (product specific)
12. Release Notes (software version specific)
13. Product Documentation Postcard, 33504

This manual may provide links to third part web sites for which Transition Networks is not responsible. Information in this document is subject to change without notice. All information was deemed accurate and complete at the time of publication. This manual documents the latest software/firmware version. While all screen examples may not display the latest version number, all of the descriptions and procedures reflect the latest software/firmware version, noted in the Revision History on page 2.

Section 2: Installation and System Setup

General

This section describes how to install the C3210 and the procedures to access and initially set up the device through either a local serial interface (USB) or a remote Ethernet connection (Telnet session or Web interface).

Installing the C3210 in the ION Chassis

The C3210 is a slide-in module that can only be installed in a Transition Networks ION chassis (ION001-x and ION219-x). For a complete list of ION platform products, go to the Transit Networks website at: http://www.transition.com.

The following describes how to install the C3210 in the ION chassis.

Caution: Failure to wear a grounding device and observe electrostatic discharge precautions when installing the C3210 could result in damage or failure of the module.

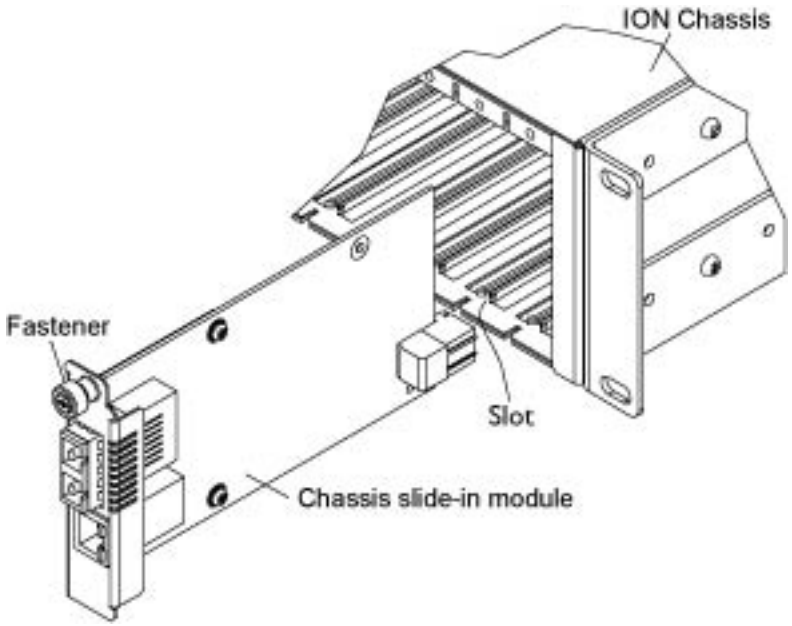


Figure 2: Chassis Installation

IMPORTANT

The C3210 slide-in cards are "hot swappable" devices, and can be installed with chassis power on.

1. Locate an empty slot in the ION System chassis.
2. Grasp the edges of the C3210 by its front panel.
3. Align the card with the upper and lower slot guides, and carefully insert the C3210 into the slot.
4. Firmly seat the C3210 against the chassis back panel.
5. Push in and rotate clockwise the panel fastener screw to secure the C3210 to the chassis (see Figure 8: Chassis Installation on the previous page).
6. Note that the card's Power LED lights. See Accessing the C3210 on page 46.

Installing SFPs

Some models allow you to install a Small Form-Factor Pluggable (SFP) device of your choice in order to make a fiber connection. The C3210-1040 has a single SFP port.

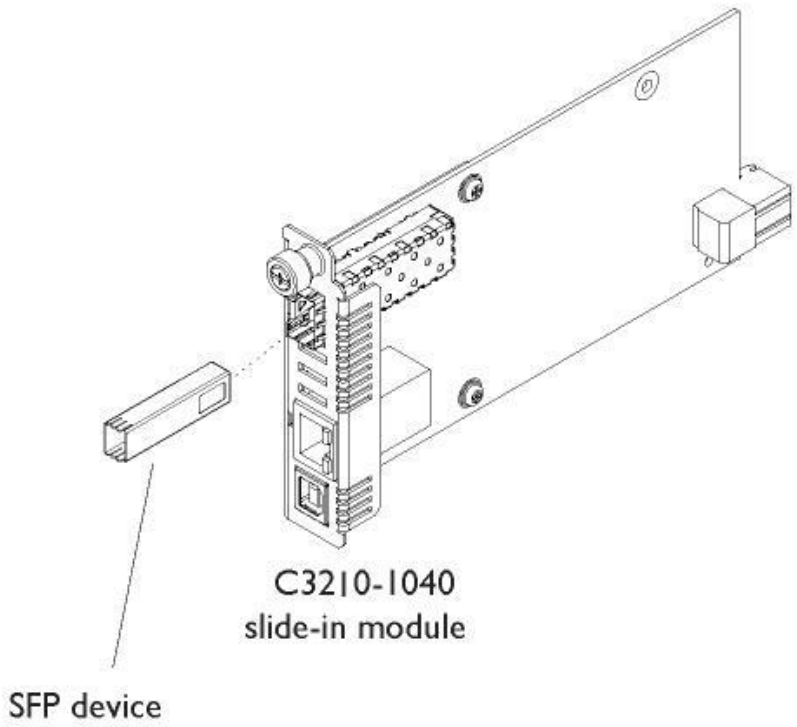


Figure 3: SFP Installation

To install an SFP in the C3210:

1. Position the SFP device at either installation slot, with the label facing up.
2. Carefully slide the SFP device into the slot, aligning it with the internal installation guides.
3. Ensure that the SFP device is firmly seated against the internal mating connector.
4. Connect the fiber cable to the fiber port connector of the SFP device.

Connections and LEDs

The connections and LEDs resident on the various models are described below.

Model C3210 Connectors and LEDs

The C3210 connectors and LEDs are shown in the figure below and described in Table 5.

Figure 4: Model C3210 Connectors and LEDs

The C3210-10xx connectors and LEDs are described in the table below.

Table 5: Model C3210-10xx Connectors and LED Descriptions

Connector/LED	Description
1000Base-X SFP port connector	Lets you install a Small Form-Factor Pluggable (SFP) device of your choice in order to make a fiber connection. Used to connect the C3210 via fiber to another device (switch, router, media converter, etc.).
10/100/1000 (Copper port) Network connectors	One connector for Ethernet 10/100Base-T. The RJ-45 connectors allow the network administrator to manage the chassis through a remote computer using either a remote Telnet session or the Web interface.
PWR (Power) LED	When lit, indicates that there is power to the C3210.
LACT (Link active) LED	Yellow – operation is 10 MBps, 10Base-T. Green – operation is 100 MBps, 100Base-T.
DUP (Duplex) LED	When lit, indicates duplex mode: • Yellow – half-duplex • Green – full duplex Blinking indicates link activity.

Connecting the C3210 to the Standalone SGFEB10xx-120

Connect the C3210 to the unmanaged Point System SGFEB10xx-120 using fiber ports. If two fiber lines are supported, connect the local and remote device's primary lines together, and connect the secondary lines together. The C3210 can be managed when installed in a managed ION chassis.

Accessing the C3210

The C3210 can be accessed through either a local serial interface via a USB connection or through an Ethernet network connection. The network connection can be done via a Telnet session or a Web graphical user interface (GUI).

Access via Local Serial Interface (USB)

The C3210 can be connected to a local management station (PC) through a serial interface using a USB connection. The C3210 is controlled by entering command line interface (CLI) commands at the local management station. To use the serial interface (USB) the following is required:

- Personal computer (PC)
- USB cable (type A male connector on one end and type B male connector on the other)
- Terminal emulator program (e.g., HyperTerminal) on the PC
- USB driver installed on the PC
- Configured COM port

IMPORTANT

In order to control the chassis slide-in module through a USB serial interface, the command line prompt must be showing the location of the module to be managed.

Operating Systems Supported

The following USB drivers are provided with the ION system on a CD, and are also available at http://www.transition.com/TransitionNetworks/TechSupport/Downloads/Software.aspx:

Windows® 7	Windows 7 x64	Windows XP® 32 bit
Windows 2000	Windows 2003 32 bit	Windows Vista®
Windows Vista x64	Windows XP 64 bit	

Virtual COM port (VCP) drivers make the USB device appear as an additional COM port available to the PC. Application software can access the USB device in the same way as it would access a standard COM port.

Installing the USB Driver (Windows XP)

IMPORTANT

The following driver installation instructions are for the *Windows XP* operating system only. Installing the USB driver using another operating system is similar, but not necessarily identical to the following procedure.

To install the USB driver on a computer running *Windows XP*, do the following.

1. Extract the driver (from the provided CD or from the website) and place it in an accessible folder on the local drive of the PC.

2. Connect the C3210 to the USB port on the PC.

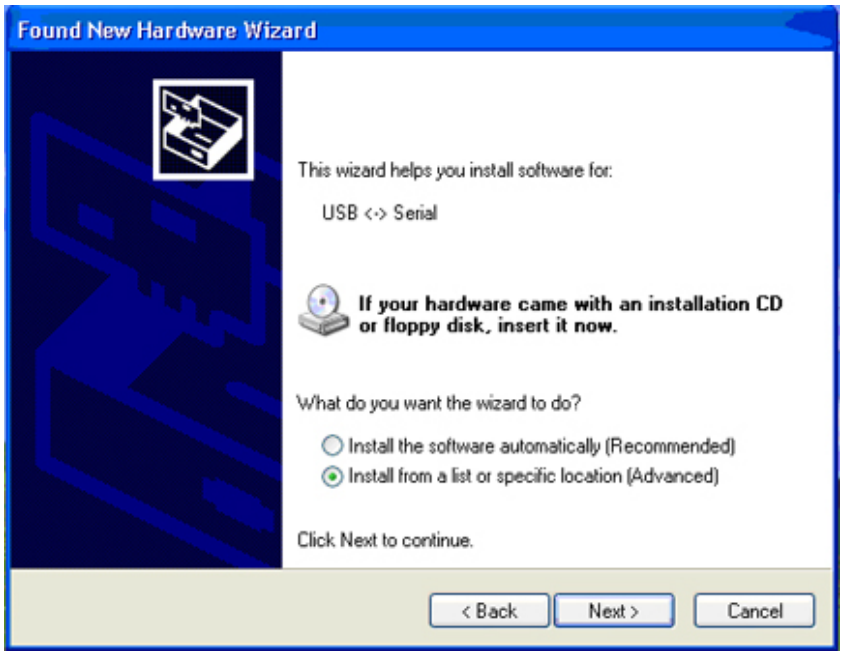
   Note: for slide-in modules installed in an ION Chassis, the USB connection will be made to the ION Management Module (IONMM) if one is installed in the ION chassis.

   The *Welcome to the Found New Hardware Wizard* window displays.

3. Select **No, not this time**.

4. Click **Next**.

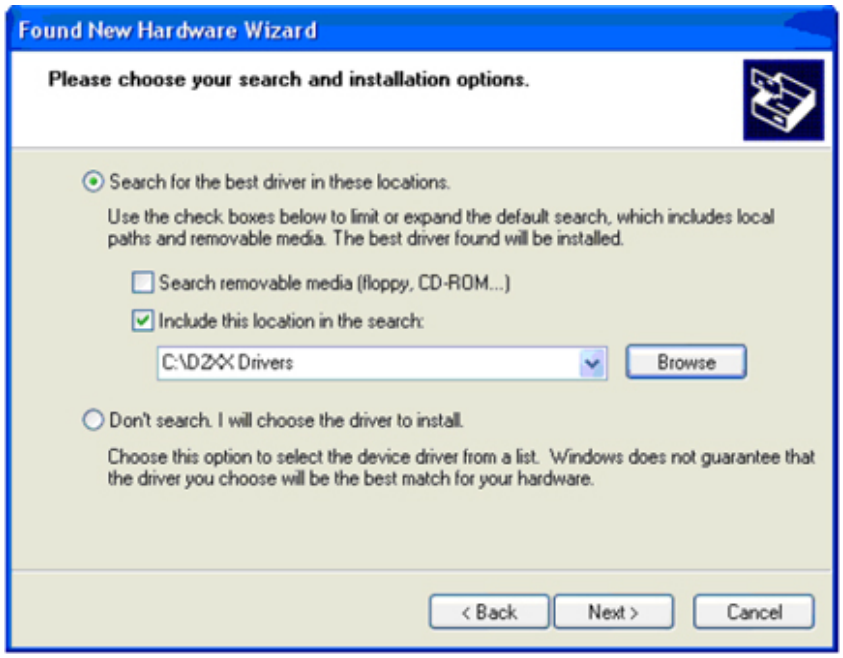
The installation options window displays.



5. Select **Install from a list or specific location (Advanced)**.

6. Click **Next**.

   The driver search installation options window displays.



7. Click **Browse**.

8. Locate and select the USB driver downloaded in step 1 above.

9. Click **Next**.

   Driver installation begins.

10. When the finished installing screen displays, click **Finish**.

The USB driver installation is complete. You must now configure access the C3210 via an Ethernet network.

Access via an Ethernet Network

The C3210 can be managed remotely through the Ethernet network via either a Telnet session or the Web interface. Before this is possible, you must set up the IP configuration for the C3210.

IMPORTANT

It is recommended that you initially set up the IP configuration through the serial interface (USB connection). See "Performing Initial System Setup" on page 56.

Otherwise, in order to communicate with the C3210 across the network for the first time, you must change the network settings (IP address, subnet mask and default gateway address) of your PC to coincide with the defaults of the C3210 (see "Appendix B: Factory Defaults" on page 179). Make note of the original settings for the PC as you will need to reset them after setting the IP configuration for the C3210.

Starting a Telnet Session

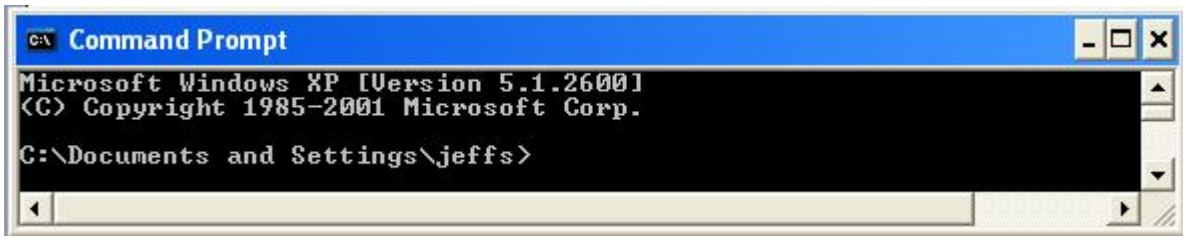
The C3210 can be controlled from a remote management station via a Telnet session over an Ethernet connection. The C3210 is controlled and configured through CLI commands. Use the following procedure to connect to and access the C3210 via a Telnet session.

1. Click **Start**.

2. Select **All Programs > Accessories**.

3. Click **Command Prompt**.

   The command prompt window displays.



4. At the command line type: **telnet** <xx>

where:

xx = IP address of the C3210

5. Press **Enter**. The login prompt displays.

Note: If your systems uses a security protocol (e.g., RADIUS, SSH, etc.), enter the login and password required by that protocol.

6. Type your login (the default is **ION**). **Note:** the login is case sensitive.

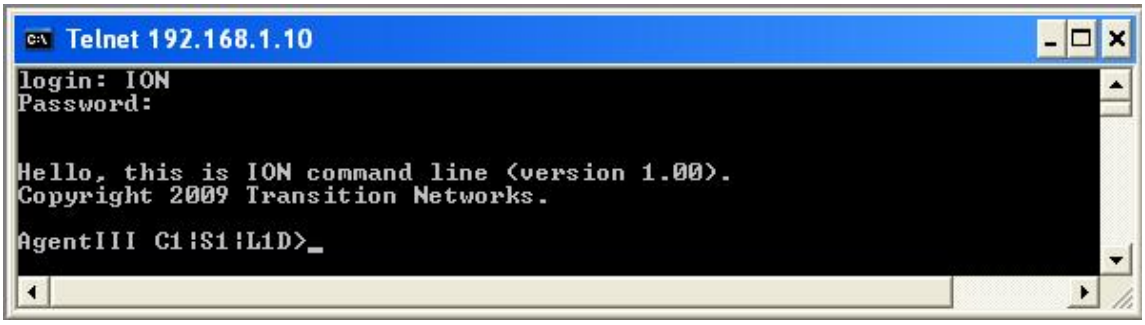
7. Press **Enter**.

   The password prompt displays.

8. Type your password (the default is **private**). **Note:** the password is case sensitive.

9. Press **Enter**.

   The command line prompt displays.



10. Enter a **go** command to change the location for the command prompt. The **go** command format is: **go [c=CHASSIS] [s=SLOT] [l1ap=PORT] [l2ap=PORT] (l1p=PORT|l2p=PORT|l3p=PORT|l1d|l2d|l3d)**

11. Enter commands to set up the various configurations for the C3210. For configuration information, see Section 4: "Configuration" on page 89. For a description of all available CLI commands see the *ION Systems CLI Reference Manual, 33473*.

Note: If required by your organization's security policies and procedures, use the CLI command **set community write=<xx>** to change the default password. See the *ION Systems CLI Reference Manual*, 33473.

Terminating a Telnet Session

To terminate the Telnet session:

1. Type **q(**uit).
2. Press the **Enter** key.

Web Browsers Supported

The ION system supports the following web browsers.

- Firefox (Mozilla Firefox) 3 - 6
- Internet Explorer 6- 9
- Google Chrome 3 - 13

Starting the Web Interface

The C3210 can be controlled and configured from a remote management station via a Web graphical user interface (GUI) over an Ethernet connection. Information is entered into fields on the various screens of the interface. **Note:** fields that have a grey background can not be modified.

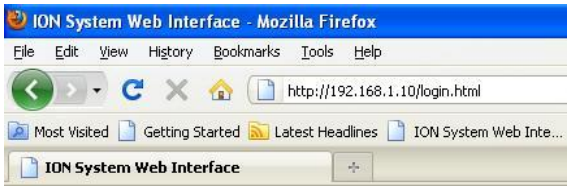
A Web session can be used to connect to and set up the C3210.

IMPORTANT

- Do not use the back button to navigate the screens. This will cause the connection to drop.
- Do not use the back space key in grayed out fields. This will cause the connection to drop.
- For DHCP operations, a DHCP server must be on the network and available.

To sign in to the C3210 via the Web:

1. Open a web browser.



2. In the address (URL) block, type the IP address of the C3210 (the default address is 192.168.1.10).
3. Click **Go** or press **Enter**.

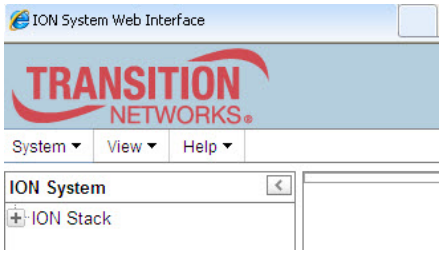
The ION System sign in screen displays.

Note: If your systems uses a security protocol (e.g., RADIUS, SSH, etc.), you must enter the login and password required by that protocol.

1. Type the System name (the default is **ION**). **Note:** the System name is case sensitive - all upper case.

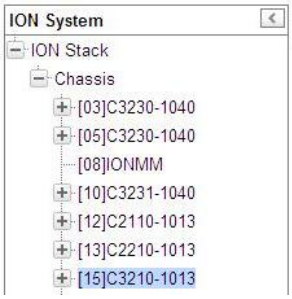
2. Type the password (the default is **private**). **Note:** the password is case sensitive - all lower case.

3. Click **Sign in** or press **Enter**. The opening screen displays.

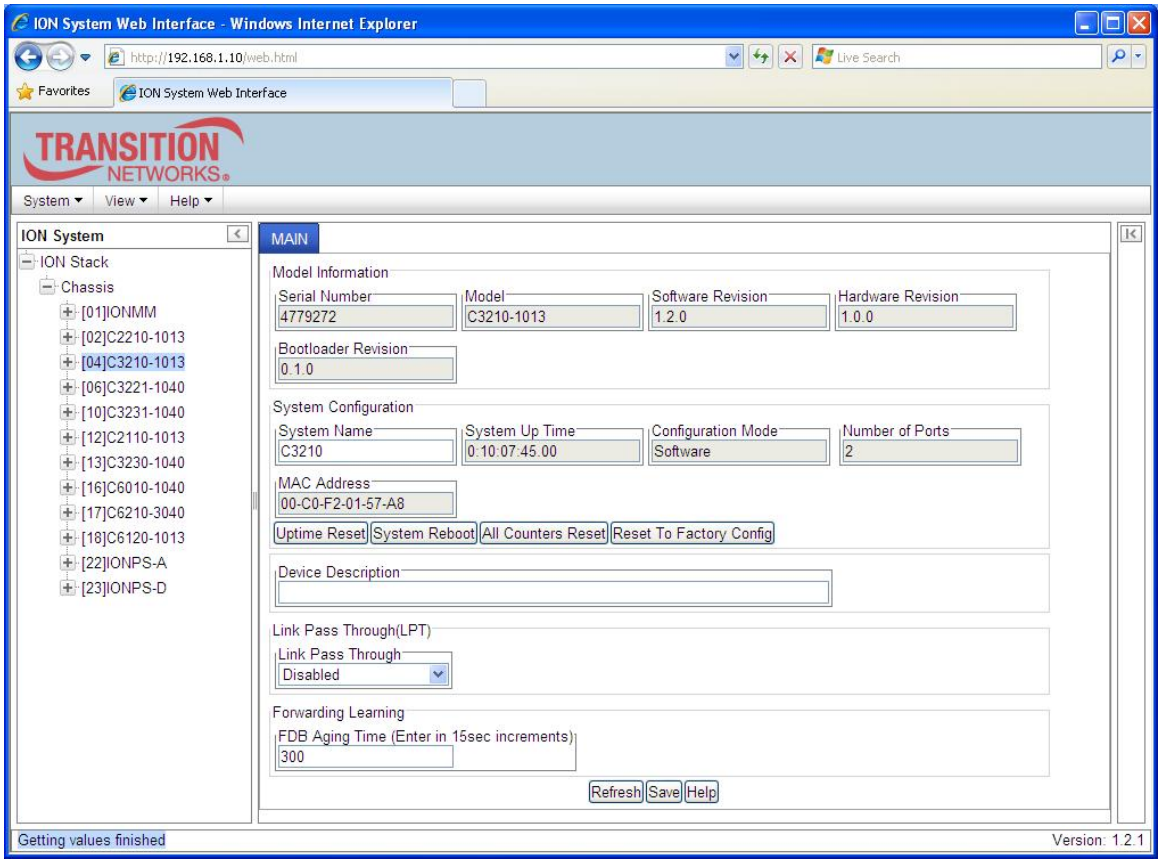


4. Click the plus sign [+] next to **ION Stack**. This unfolds "ION Stack" node in the left tree view and will refresh device status.

5. Click the plus sign [+] next to **Chassis** to unfold the chassis devices.



6. Select the appropriate model C3210. The **MAIN** screen displays for the selected C3210.

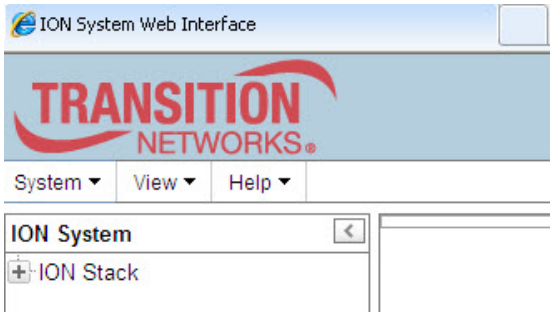


7. You can use the various tabs to configure the system, devices and ports. For configuration information, see "Section 4: Configuration" on page 165.

Note: If required, use the **set community** CLI command to change the default password according to your organization's security policies and procedures.

Terminating the Web Interface

To sign out from the Web interface, in the upper left corner of the ION System Web Interface:



1. Click the **System** dropdown.

2. Click **Sign out**.

The ION sign in screen displays.

Note: The C3210 does not automatically log out upon exit or after a timeout period, which could leave it vulnerable if left unattended. Follow your organizational policy on when to sign out from the ION System via the Web Interface

Section 3: Management Methods

General

The C3210s are managed either directly or through the IONMM. Whether the C3210 is managed directly or indirectly, management is accomplished through one of the following methods.

- Telnet session – uses a command line interface (CLI) to access and control the IONMM through the network.
- Universal Serial Bus (USB) – uses a CLI to access and control the IONMM through a locally connected workstation.
- Web-browser – access and control the IONMM using a standard web browser and a graphical user interface (GUI).

The C3210 can be remotely managed directly (i.e., not through IONMM). This enables administrators to monitor and configure remote stand-alone C3210s straight from the Network Management Station (NMS) without leaving the office.

IONMM Managed Devices

IONMM devices that are managed through the IONMM are either chassis resident (C3210) or standalone modules (S32xx or media converters) that are connected as remotes to chassis resident modules. Communications between the IONMM and remote devices is through the ION Chassis backplane. See the *IONMM User Guide* for details.

Managing Slide-In and Remote Modules Using CLI Commands

Management of modules other than the IONMM can be accomplished by entering CLI commands through either the local USB serial interface or a remote Telnet session. CLI commands can operate on the device level or port level. This is indicated by the status of the command prompt's preamble.

For example:

```
AgentIII C1|S7|L1D>
```

or just:

```
C1|S1|L1D>
```

This prompt indicates that any subsequent commands entered are for the module located in chassis 1/slot1. In order to enter a command for a different device or port in the ION system, you must change the location of the command prompt. The **go** command lets you change the hierarchical location of the command prompt. Before using the command, a familiarity with the hierarchy structure in the ION system is essential.

A representation of the hierarchy is shown in the figure below.

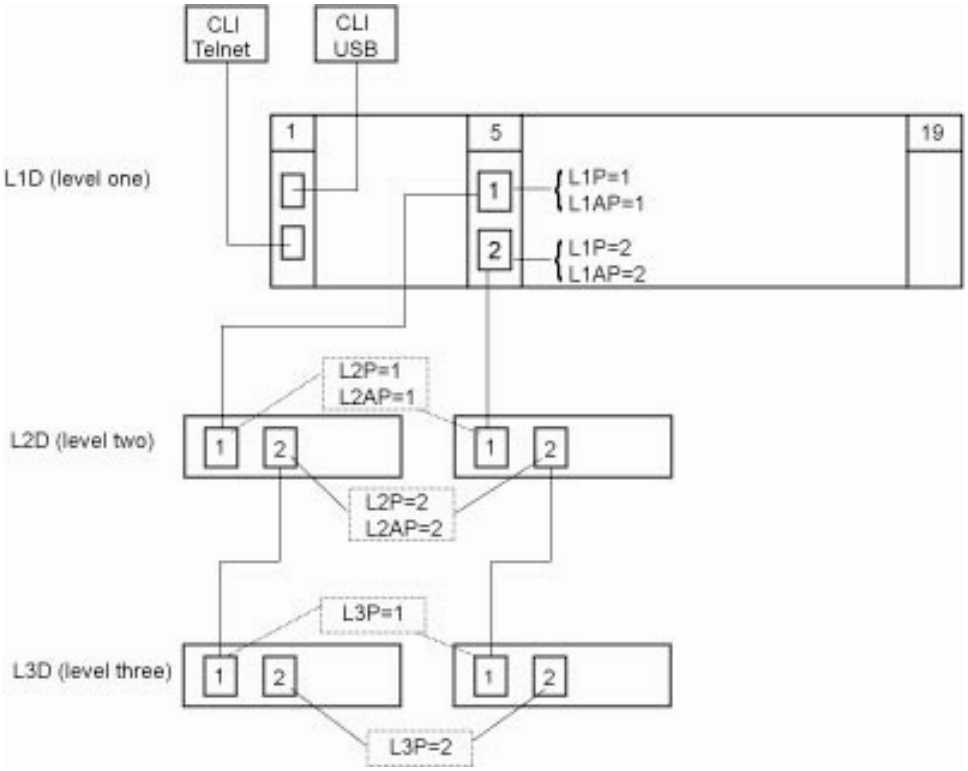


Figure 5: CLI Location Hierarchy

In the above figure, there are three levels of devices:

- L1D, or level one device, refers to devices (IONMM and other chassis-resident devices) that are installed in the chassis.
- L2D, or level two device, refers to a device that is directly connected to a port in a NID in the chassis and has other devices connected to it.
- L3D, or level three device, refers to a device that is directly connected to a port in a level one device.

The ports on a device are divided into two categories: Device ports and Attachment ports.

- Device ports – These are ports on a specified device that are used as service ports for either customer or network connections, and are typically attached to routers or switches. These ports are labeled L1P=, L2P= and L3P=. The L1, L2, and L3 indicate the level of the device that the port is on. Devices attached to a port with this designation **can not** be managed by the IONMM.
- Attachment port – These are also ports on a specified device; they are labeled L1AP= and L2AP= and indicate an attachment point for another ION family device that **can** be managed by the IONMM.

Physically these are the same port. That is, L1P1 and L1AP1 are both port one on a level one device. However, it is how they are used that determines their syntax. For example, L1P1 indicates that the port is used to connect to a service device that is not managed by the IONMM. L1AP1 indicates that the port is used to connect to a level two device that can be managed by the IONMM.

Example 1

In the CLI location hierarchy, to go to the first port (L3P1) on device L3D in the network topology shown in Figure 19, you would enter the following command from the base prompt.

```
C1|S1|L1D>go s=5 l1ap=2 l2ap=1 l3p=1
```

The resulting command line prompt would be:

```
C1|S5|L1AP2|L2AP1|L3P1>
```

Any CLI command appropriate for the port can now be entered.

Example 2

In the CLI location hierarchy, to go to device L2D in the network topology shown in Figure 5, you would enter the following command from the base prompt.

```
C1|S1|L1D>go s=5 l1ap=2 l2d=1
```

The resulting command line prompt would be:

```
C1|S5|L1AP1|L2D>
```

Any CLI command appropriate for the device can now be entered.

The following describes the procedure for using CLI commands to manage the C3210s.

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

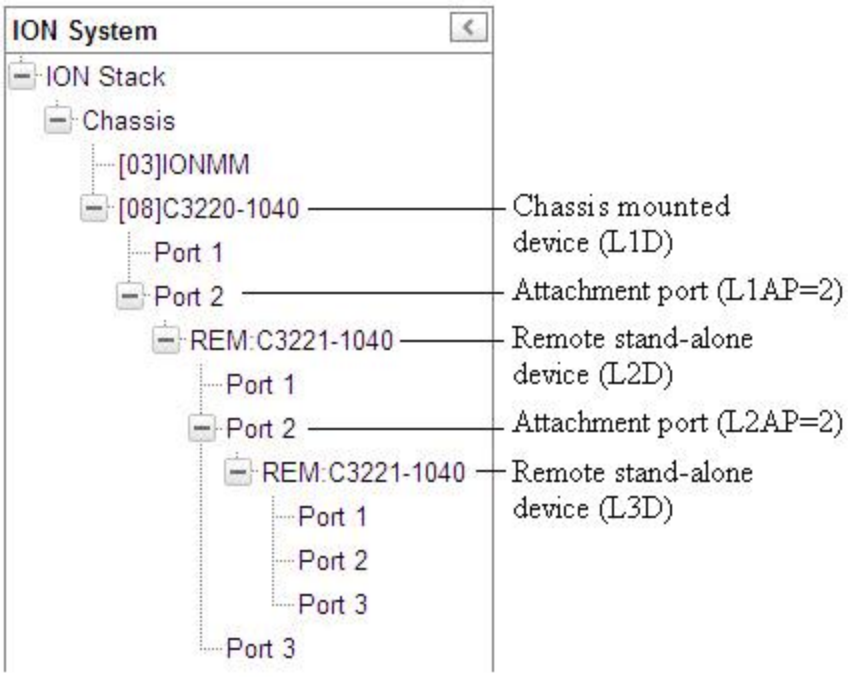
2. Use the **go** command to change the operational location to the device/port to be managed. The **go** command format is:
   go [c=CHASSIS] [s=SLOT] [l1ap=PORT] [l2ap=PORT] (l1p=PORT|l2p=PORT|l3p=PORT|l1d|l2d|l3d)

3. Configure the C3210 using the appropriate commands. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.

4. To return the location to the IONMM, type **home** and press **Enter**.

Managing Slide-In and Remote Modules via the Web Interface

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).



2. Click on the slide-in module or port to be managed.

3. The operations that can be performed depend on the type of slide-in module. Refer to the product documentation for the information. See the "Related Manuals" section on page 38.

Direct Managed Devices

Direct management is for standalone devices that are not connected to a module that is managed through the ION Management Module (IONMM). In direct management, the network and/or USB cable is connected directly to the module to be managed.

Managing Standalone Modules Using CLI Commands

Management of standalone modules can be accomplished by entering CLI commands through either the local USB serial interface or a remote Telnet session. CLI commands can operate on the device level or port level. This is indicated by the status of the command prompt's preamble.

For example:

```
AgentIII C1|S7|L1D>
```

or just:

```
C1|S7|L1D>
```

This prompt indicates that any subsequent commands entered are for the device instead of a port. In order to enter a command for a port, you must change the location of the command prompt. The **go** command allows you to change the hierarchical location of the command prompt.

The **go** command format is:

go [c=CHASSIS] [s=SLOT] [l1ap=PORT] [l2ap=PORT] (l1p=PORT|l2p=PORT|l3p=PORT|l1d|l2d|l3d)

EXAMPLE

In the CLI location hierarchy, to go to port 1 on a device, you would enter the following command from the base prompt:

```
C1|S7|L1D>go l1p=1
```

The resulting command line prompt would be:

```
C1|S7|L1P1>
```

Any CLI command appropriate for the port can now be entered.

Subsequently, to return to the device level, you would enter the following:

```
C1|S7|L1P1>go l1d
```

The resulting command line prompt would be:

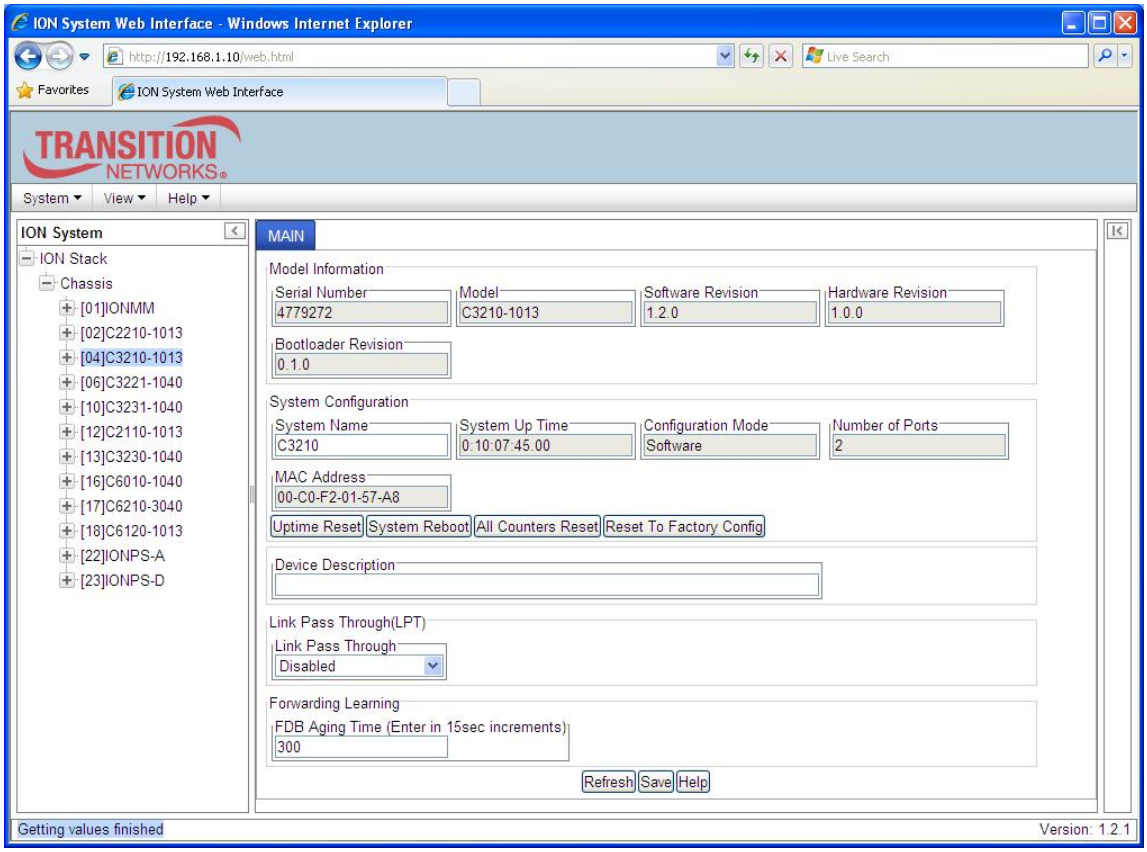
```
C1|S7|L1D>
```

Managing Standalone Modules via the IONMM Web Interface

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. Click the plus sign **[+]** next to **ION Stack** to unfold the "ION Stack" node in the left tree view if not already done.

3. Click the plus sign **[+]** next to **Chassis** and click the plus sign **[+]** next to a module.



4. Click on the module or port to be managed (e.g., the C3210-1013 above).

5. Select the various tabs to perform the applicable operations.

Menu System Descriptions

The table below describes the ION Web interface in terms of its system-level pane, dropdowns, tabs and sub-tabs. Note that menus and tabs vary slightly by model.

Table 6: System-Level Menu Description

Dropdown / Tab	Description
ION System pane	**ION Stack** - consists of one chassis or one standalone device. The Stack Members table lists the Stack's chassis and its type. **Chassis** - the ION System family of products; the Chassis View shows a summary view of one such chassis. Model Information includes: ***** Serial Number - The serial number of the chassis itself. Individual C3210s also have their own serial numbers. ***** Model Name - The exact model name of this device. When contacting Technical Support, please be sure to give this name rather than the less specific Catalog number. ***** Software Revision, Hardware Revision, and Bootloader Revision. ***** Chassis Members table - lists local physical components in slots 1 to 19. **Device** – provides tabs and sub-tabs for the IONMM and C3210s in the ION system. **Port** - provides tabs and sub-tabs for a selected C3210 port.
System Dropdown	Sign out.
View Dropdown	Refresh.
Help Dropdown	Online Help, ION Product Home Page, About ION System Web Interface.
MAIN Tab	Sections: Model Information, System Configuration, Device Description, Link Pass Through (LPT), and Forwarding Learning sections. Buttons: Uptime Reset, System Reboot, All Counters Reset, and Reset To Factory Config buttons. Refresh, Save, and Help buttons.

The table below describes the ION Web interface in terms of its port-level tabs and sub-tabs.

Table 7: Port-Level Menu Description

Tab	Description
MAIN Tab	Sections: Circuit ID, Port Configuration, Auto Negotiation Settings, Capabilities Advertised, Port Forward Management Port Forward Management, and Virtual Cable Test (VCT). Buttons: *Virtual Cable Test, Refresh, Save,* and *Help.*
ADVANCED Tab	Sections: Bandwidth Allocation, MAC Security, VLAN Forwarding Rules, Priority Forwarding Rules, VLAN Tag Management, and User Priority. Buttons: *Refresh, Save,* and *Help.*
COUNTERS Tab	Sections: RMON Counters, Port Counter Received, Port Counters Sent, and Dot3 Statistics. Buttons: *Reset Counters*, *Refresh,* and *Help.*
DMI Tab (Port 2 only)	Sections: Interface Characteristics, Diagnostic Monitoring, Supported Media Length. The DMI (Diagnostic Maintenance Interface) function displays C3210 diagnostic and maintenance information such as interface characteristics, diagnostic monitoring parameters, and supported media lengths. See "DMI (Diagnostic Maintenance Interface) Parameters" on page 248 for more information. **Note**: not all C3210 and SFP models support DMI. Transition Networks models that support DMI have a "D" at the end of the model number. If you click the DMI tab on a C3210 model that does not support DMI, the message "*The DMI feature is not supported on current port*."

Reboot, Reset, and Power Off Function Notes

Certain functions such as a System Reboot, Reset to Factory Configuration, Reset Power to a Slot, and Power Off a Slot) cause the system to delete certain stored files. ***Caution***: In some circumstances, these stored files are lost unless you first perform a System Backup. See the "Backup and Restore Operations" section starting on page 199 for information on how to save the stored files from deletion.

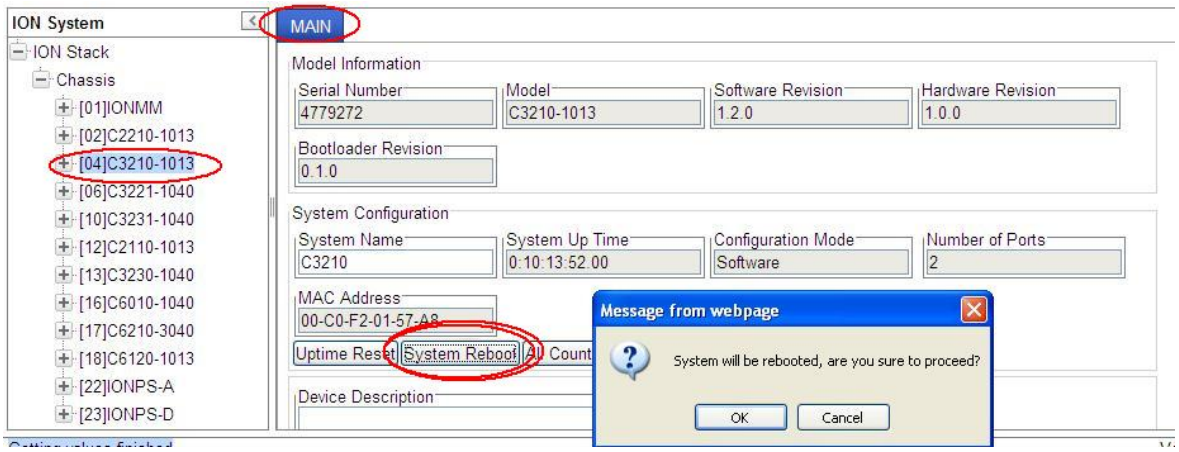
For more information on how the Reboot, Reset, and Power Off functions impact stored files, see:

- Table 15: Back Up and Restore File Content and Location on page 209
- Table 16: File Status after a Reset to Factory Defaults on page 214
- Table 17: File Content and Location after a System Reboot on page 218
- Table 18: File Content and Location after a Firmware Upgrade on page 233

Doing a reboot, restart or upgrade of the IONMM, a power restart of the chassis, or a reset to factory removes temporary files (e.g. configuration backup files, Syslog file). A Factory Reset also removes the permanent settings (e.g. configuration files, HTTPS certification file, SSH key).

System Reboot

Clicking the **System Reboot** button resets all system states and reinitializes the system; all configuration data is saved during a restart.



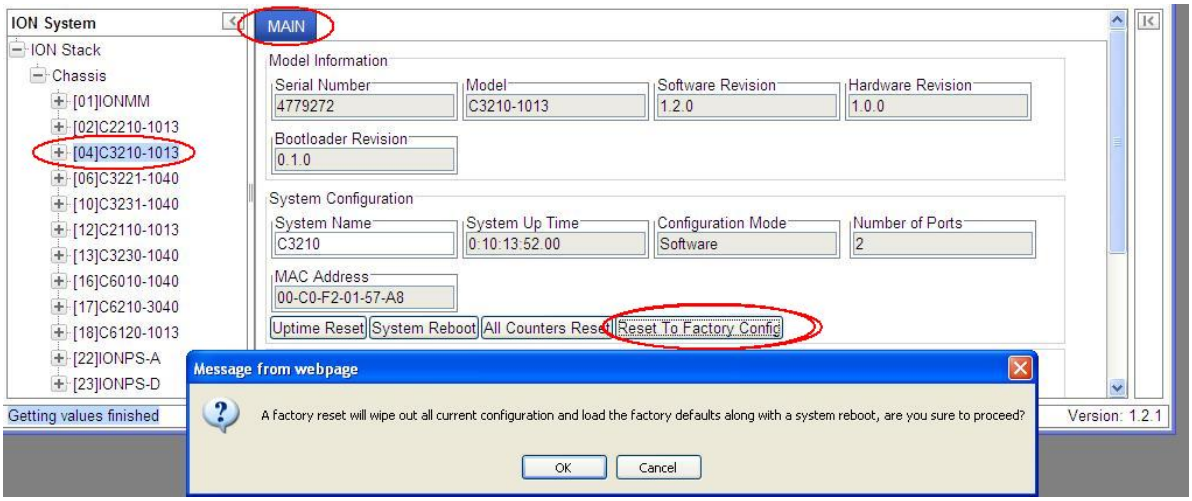
Press the **Cancel** button if you are not sure you want a system reboot to occur.
Press the **OK** button to clear the webpage message and begin the reboot process.

The message "*Loading, please wait...* displays.

Note that a System Reboot can take several minutes.

Reset To Factory Config

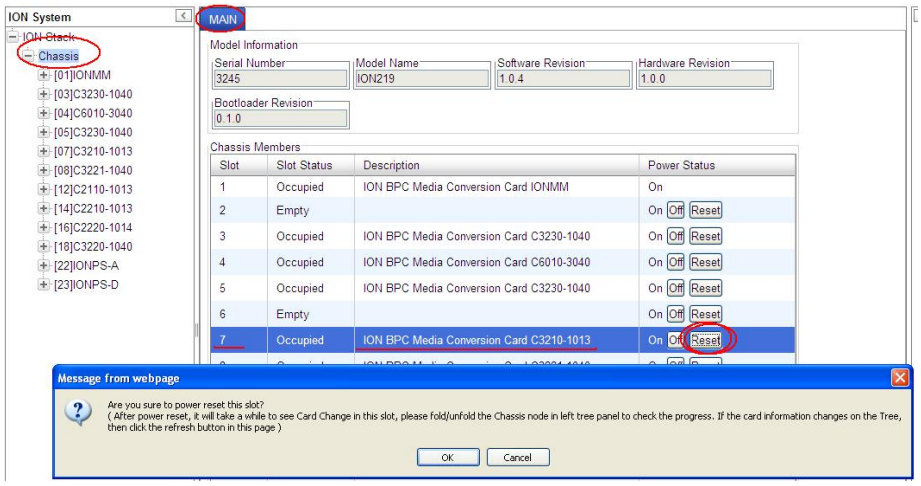
Clicking the **Reset To Factory Config** button resets the entire system configuration to the state it was in when it shipped from the factory. This permanently removes all current configuration details and loads the factory default settings. The message "*A factory reset will wipe out all current configuration and load the factory defaults along with a system reboot; are you sure to proceed?*" displays.



You should only click **OK** if you wish to reboot. Otherwise, click **Cancel** if you are not sure you want a factory reset / reboot to occur.

Reset Power to a Slot

At the **Chassis** > **MAIN** tab, you can click the Reset button to reset power for the selected slot in the chassis. The message "*Are you sure to power reset this slot?*" displays.

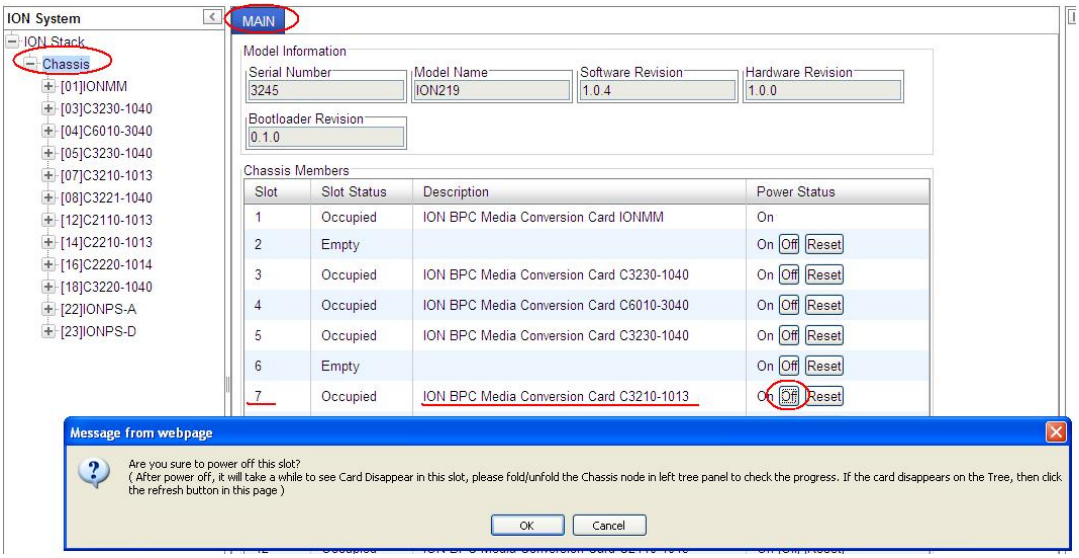


After power reset it will take a while to see card change in this slot; fold/unfold the Chassis node in the tree panel to check the progress. If the card information changes on the Tree, then click the **Refresh** button on this page.

If you are not sure that you want to reset this chassis, click the **Cancel** button to clear the message and return to normal operations without resetting power to this slot.

Power Off a Slot

At the **Chassis** > **MAIN** tab, you can click the **Off** button to remove power to a selected slot in the chassis. The message "*Are you sure to power off this slot?*" displays.



If you are not sure that you want to power off this slot, click the **Cancel** button to clear the message and return to normal operations without resetting power to this slot.

After power off, it will take a while for the card to disappear from this slot; fold/unfold the Chassis node in the left tree panel to check the progress. If the card information changes on the Tree, then click the **Refresh** button on this page.

Section 4: Configuration

General

After the C3210 has been installed and access has been established, the device and its ports must be configured to operate within your network. The configuration establishes operating characteristics of the device and the ports associated with the C3210.

Configurations can be done either by entering CLI commands (USB / Telnet) or through a Web interface. For complete descriptions of all CLI commands, see the *C3210 CLI Reference Manual, 33497*.

The operating characteristics that can be defined for the C3210 are:

- System setup
- Features
  - Ethernet Interface *(AutoCross,* Auto negotiation / Capabilities Advertised, Bandwidth allocation, Speed, Duplex mode)
  - Flow control (Pause frames/back pressure)
  - Forward Learning (FDB Aging)
  - Port Forward Management
  - IP/IEEE priority remapping
  - Link pass through (LPT)
  - Device ID / Circuit ID
  - Virtual Cable Test
- Security
  - Media access control (MAC) security
  - VLAN Forwarding and VLAN Tag Management

Note: Transition Networks recommends as a "best practice" to back up each SIC card's configuration after it is fully configured so that in the event of an error or hardware failure, the configuration can be easily and rapidly restored.

System Configuration

The system configuration defines:

- a name for the C3210
- a device description (optional)

The entry for the system name must be a text string with no spaces between characters. Note that numbers, upper/lower case characters, and special characters (~!@#$%^&*()_+") are allowed.

The system configuration can be defined via the CLI or the Web interface.

System Configuration – CLI Method

The system information can be alphabetic, numeric or a combination.

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).
2. Type **set system name**=NAME, where NAME is the new system name, and press **Enter**.

   For example:

```
C1|S5|L1D>set system name=C3210-1013
```

3. Verify the new system definition. Type **show card info** and press **Enter**. For example:

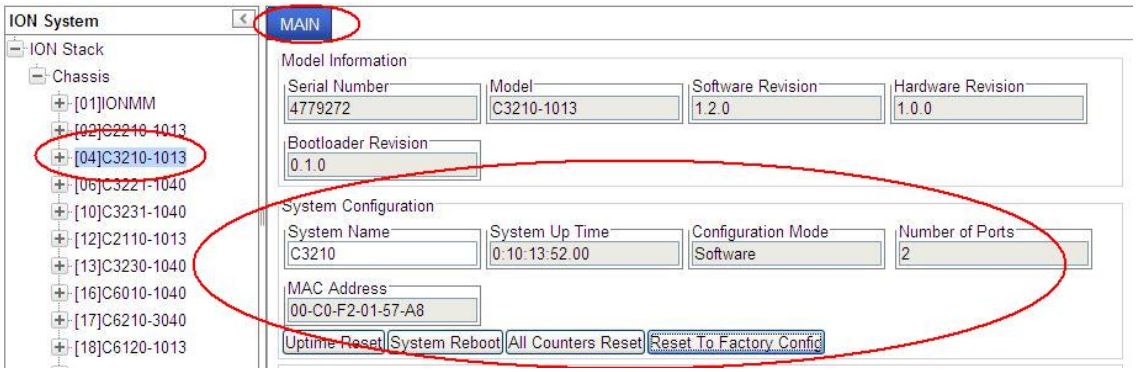
```
Agent III C1|S6|L1D>show card info
System name:        C3210
Uptime:             5 days, 20:02:25
MAC:                00-c0-f2-01-57-a8
Port number:        2
Serial number:      4779272
Config mode:        software
Software:           1.2.0
Bootloader:         0.1.0
Hardware:           1.0.0
Agent III C1|S6|L1D>
```

Note: the **show card info** command does not work on a Power Supply module.

System Configuration – Web Method

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. At the device's **MAIN** tab, locate the **System Configuration** section.



3. In the **System Name** field, enter the name and for the C3210. The name can be alphabetic, numeric or a combination, but can not contain any spaces between the characters.

4. Scroll to the bottom and click **Save**.

Device Description Configuration

The x222x/x32xx supports a Device Description at the device level and a Circuit ID at the port level.

The Device Description provides the option to configure an ASCII text string up to 63 bytes and override the default information, which is vlan-module-port in binary format.

The Device Description can be configured in the x222x/x32xx using either the CLI or Web method.

Device Description– CLI Method

1. Access the NID through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. At the device's command prompt type: **set device description**=<xx> where:

   xx = the Device Description to be used for this device or port.

3. Press **Enter**.

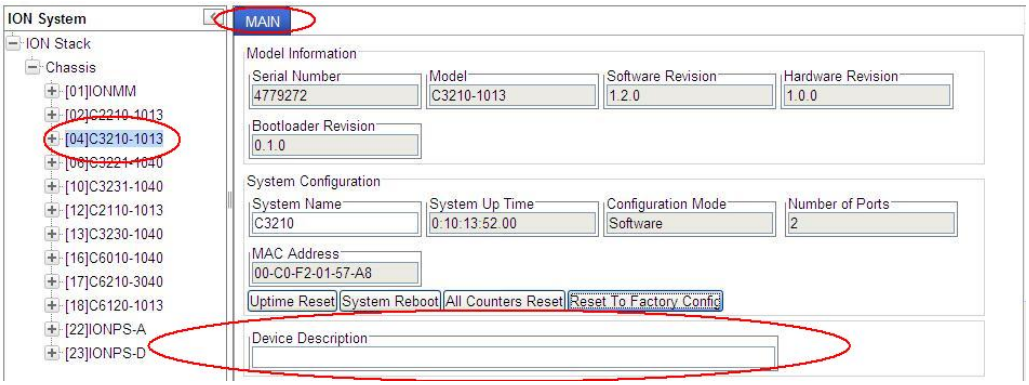
4. Verify the Device Description setting. Type **show device description** and press **Enter**. Note that the dash ("-") is required, and the letters "ID" must be upper-case. The Device Description information displays. For example:

```
Agent III C1|S9|L1P1>set device description  zzzzzzz
Error: this command should be executed on a device!
Agent III C1|S9|L1P1>go l1d
Agent III C1|S9|L1D>set device description  zzzzzzz
Agent III C1|S9|L1D>show device description
Device description: zzzzzzz
Agent III C1|S9|L1D>
```

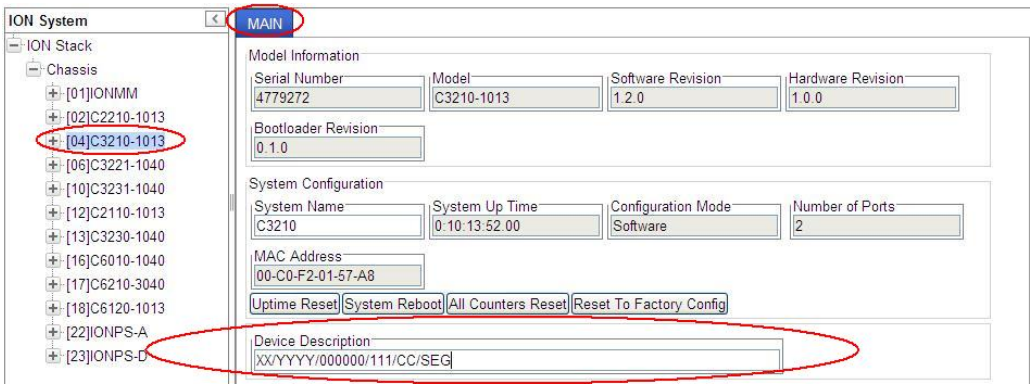
Device Description Config – Web Method

1. Access the x222x/x32xx through the Web interface (see "Starting the Web Interface" on page 45).

2. At the x222x/x32xx **MAIN** tab, locate the **Device Description** section.



3. Enter the Device Description of up to 64 bytes for the device.



4. Scroll to the bottom and click the **Save** button.

If you enter more than 64 characters for the Circuit ID and then click **Save**, the characters entered display in red, and the message "*Invalid input found!*" displays in the lower left corner of the Web interface.
To recover:

a) Click Refresh, and re-enter a Circuit ID of 64 or fewer characters and click **Save**.
b) The message "*Setting values succeeded*" displays in the lower left corner of the Web interface.

Circuit ID Configuration

The x222x/x32xx supports a Device Description at the device level and a Circuit ID at the port level.

The Circuit ID provides the option to configure an ASCII text string up to 63 bytes and override the default information, which is vlan-module-port in binary format.

The Circuit ID can be configured in the x222x/x32xx using either the CLI or Web method.

Circuit ID Config – CLI Method

1. Access the NID through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. At the device's command prompt type: **set circuit-ID=**<xx> where:

   xx = the Circuit ID to be used for this device or port.

3. Press **Enter**.

4. Verify the Circuit ID setting. Type **show circuit-ID** and press **Enter**. Note that the dash ("-") is required, and the letters "ID" must be upper-case. The Circuit ID information displays. For example:

```
C1|S16|L1D>set circuit XX/YYYY/000000/111/CC/SEG
C1|S16|L1D>show circuit-ID
Circuit-ID:          XX/YYYY/000000/111/CC/SEG
C1|S16|L1D>
```

5. At the each of the device port's command prompts, enter the Circuit ID as in step 2 and 3.

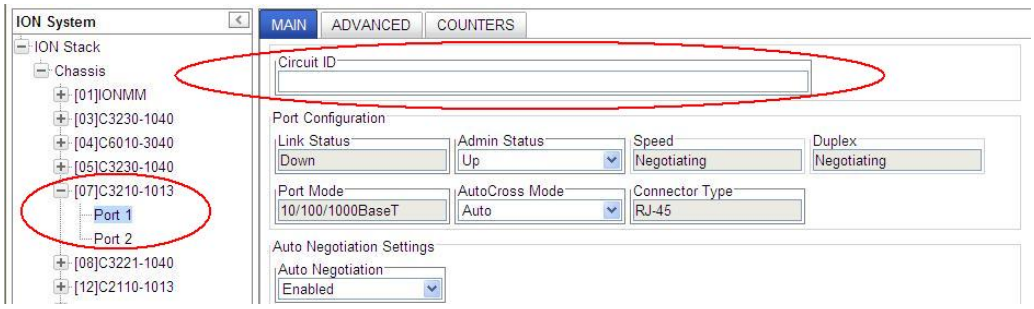
6. At the each of the device port's command prompts, verify the Circuit ID setting as in step 4. For example:

```
C1|S16|L1D>go l1p=1
C1|S16|L1P1>set circuit-ID=xx/yyyy/000000/111/cc/seg
C1|S16|L1P1>show circuit-ID
Circuit-ID:          xx/yyyy/000000/111/cc/seg
C1|S16|L1P1>

C1|S16|L1P1>go l1p=2
C1|S16|L1P2>set circuit XX/YYYY/000000/111/CC/SEG
C1|S16|L1P2>show circuit-ID
Circuit-ID:          XX/YYYY/000000/111/CC/SEG
C1|S16|L1P2>
```

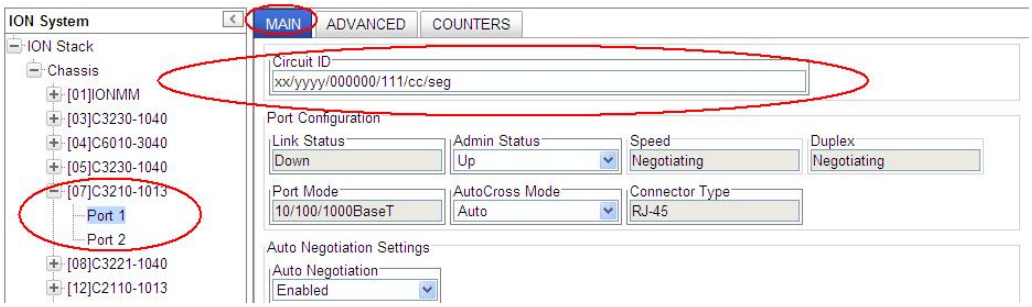
Circuit ID Config – Web Method

1. Access the x222x/x32xx through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the appropriate port and locate the **Circuit ID** field.



3. Enter the Circuit ID of up to 64 bytes for the port. The default is blank.



4. Click **Refresh** to update screen information.
5. Repeat steps 2 -4 for each port as required.
6. Click **Save** when done.

If you enter more than 64 characters for the Circuit ID and then click **Save**, the characters entered display in red, and the message "*Invalid input found!*" displays in the lower left corner of the Web interface. To recover:

c) Click Refresh, and re-enter a Circuit ID of 64 or fewer characters and click **Save**.
d) The message "*Setting values succeeded*" displays in the lower left corner of the Web interface.

Link Pass Through (LPT) Configuration

The C3210 supports LPT (Link Pass Through) at the device level.

The LPT feature can be configured in the C3210 using either the CLI or Web method.

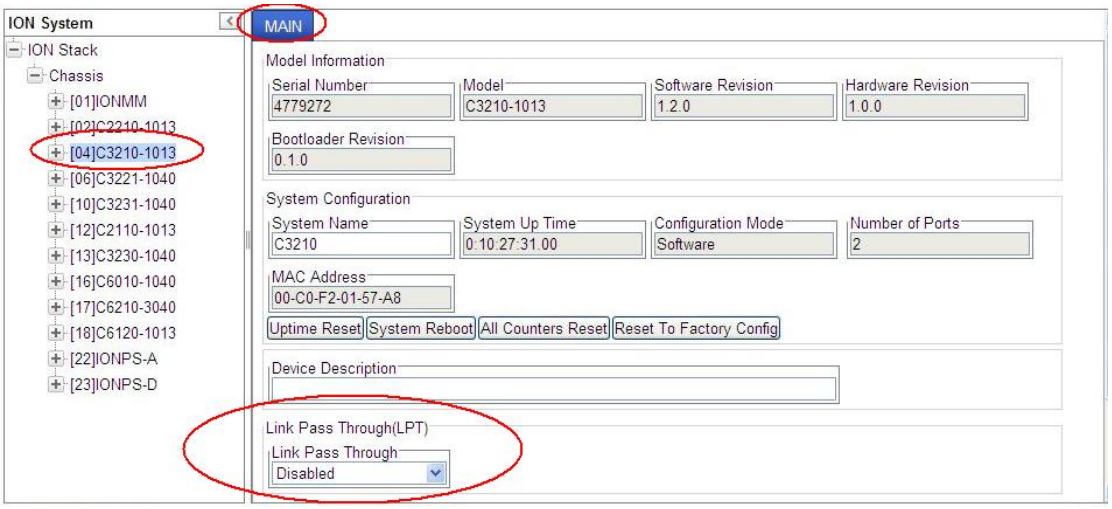
Link Pass Through (LPT) Config – CLI Method

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).
2. At the device's command prompt type: **set lpt state** =xx, where xx= <enable or disable>.
3. Press the **Enter** key.
4. Type **set lpt monitor-port**=xx, where xx is the port that performs LPT monitoring.
5. Press the **Enter** key.
6. Verify the LPT setting. Type **show lpt config** and press **Enter**. For example:

```
C1|S8|L1D>show lpt config
Link pass through configuration:
--------------------------------------------------------------------------
Link pass through state:                              enable
Transparent link pass through state:                  notSupported
Selective link pass through state:                    notSupported
Link pass through monitor port:                       3
Remote fault detect state:                            notSupported
C1|S8|L1D>
```

Link Pass Through (LPT) Config – Web Method

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).
2. At the **MAIN** tab, locate the **Link Pass Through (LPT)** section.



3. Select **Enabled** or **Disabled**. The default is Disabled. Click **Save** when done.

Configuring AutoCross

Normally, twisted pair (copper) ports must be connected so that the Transmit pair on one end is connected to the Receive pair on the other end, and vice versa. If the cabling is done so that Transmit on one end is wired to Transmit on the other, and Receive is wired to Receive, the link will not come up.

Hubs and switches are deliberately wired opposite of the way end stations are wired, so that when a hub or switch is connected to an end station, a straight through Ethernet cable can be used and the pairs will match up properly. When two hubs/switches are connected to each other, or two end stations are connected to each other, a crossover cable is used to make sure that the correct pairs are connected.

The standard wiring for end stations is known as Media Dependent Interface (MDI), and the standard wiring for hubs and switches is known as Media Dependent Interface with Crossover (MDIX).

On C3210 devices the *AutoCross* feature makes it possible for hardware to automatically correct errors in cable selection, making the distinction between a straight through cable and a crossover cable unimportant.

Note:

- This feature is defined on a port level; depending on the physical connector it is not applicable for all ports.
- Transition Networks recommends leaving *AutoCross* in default mode, **Auto**.

AutoCross Config – CLI Method

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).
2. At the device port's command line, type:

   set ether autocross=xx

   where:

   xx = cable type. Valid choices are:

   - **Auto** – hardware will automatically correct errors in cable selection.
   - **MDI** – transmit pair on one end of the cable is connected to the receive pair on the other end.
   - **MDIX** – cross over cable is used.

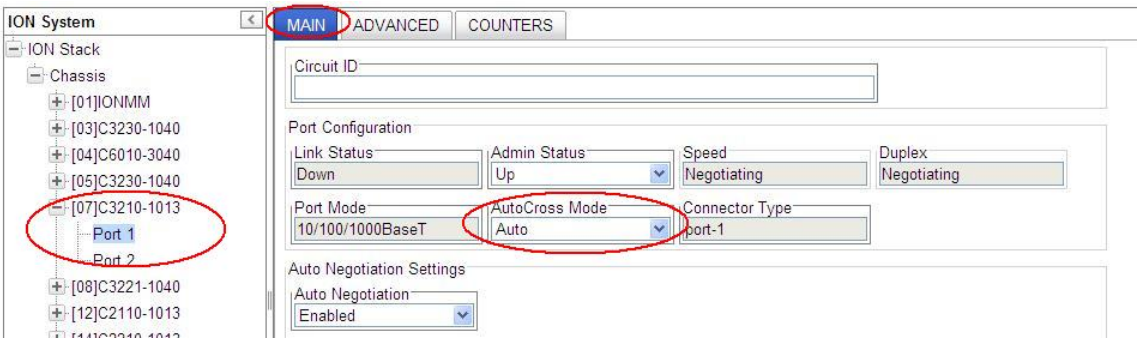
3. Press **Enter**.

AutoCross Config – Web Method

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the appropriate port's **MAIN** tab.

3. Locate the **Port Configuration** section.



4. In the **AutoCross Mode** field, select the mode to be used.

   - **Auto** – ION System hardware will automatically correct errors in cable selection (default mode - recommended).
   - **MDI** – the transmit pair on one end of the cable is connected to the receive pair on the other end.
   - **MDIX** – a cross over cable is used.

Configuring Auto Negotiation

The auto negotiate feature is defined on a port basis, letting you set the capabilities that will be advertised for a device over a specific port.

Auto negotiation is a feature that can be used by devices that are capable of different transmission rates (such as 10 Mbit/sec and 100 Mbit/sec), different duplex modes (half-duplex and full duplex), and/or different standards at the same speed. Every device declares its possible modes of operation when attempting to connect to another device. The two devices then choose the best possible modes of operation that are shared by the two devices. These modes of operation include:

- speed
- duplex
- pause capability (whether Pause frames are supported)

When one device supports auto negotiation and the other does not, the device that has auto negotiation abilities can determine the speed of the other device, and then select the same speed for itself. However, this procedure can not determine the duplex setting of the other device, so half-duplex is always assumed. If one device is using full duplex while the other one is using half-duplex, a duplex mismatch occurs. The usual effect of this mismatch is that the connection works but at a very low speed.

Disabling the auto negotiate feature allows you to force the connection to the desired speed and duplex mode of operation as long as both devices can support the operation.

Note: The auto negotiate feature is always enabled for gigabit devices/ports. The pause default value for a copper port is “disabled”.

10/100/1000BaseT Port – CLI Method

1. Access the C3210 through either a USB connection (see “Starting a USB Session” on page 41) or a Telnet session (see “Starting a Telnet Session” on page 43).

2. At the command line, type: **set ether autoneg state**=xx where:

   xx = **enable** or **disable**

3. Press **Enter**.

4. If Auto negotiation is enabled, go to step 5.
   If Auto negotiation is disabled, go to step 9

5. Set the advertised speed/duplex capabilities; type: **set ether adv-cap** where:

   xx = advertised speed capability; valid choices are:

   - **10TFD** (TP port 10 Mbps full duplex)
   - **10THD** (TP port 10 Mbps half-duplex)
   - **100TFD** (TP port 100 Mbps full duplex)
   - **100THD** (TP port 100 Mbps half-duplex)
   - **1000TFD** (TP port 1000 Mbps full duplex)
   - **1000THD** (TP port 1000 Mbps half-duplex)
   - **1000XFD** (fiber port 1000 Mbps full duplex)
   - **1000XHD** (fiber port 1000 Mbps half-duplex)

   To specify more than one capability use a plus sign (+) between entries (e.g., adv-cap=10TFD+100TFDl+1000THD)

6. Press **Enter**.

7. Set the advertised pause frame capability; type: **set ether pause=xx** where:

   xx = advertised pause capability; valid choices are:

   - **nopause** (the port will advertise that is has no pause capabilities)
   - **apause** (asymmetric; the port will advertise that it can only transmit pause frames)
   - **bpause** (asym/sym; the port will advertise that it supports both asymmetric and symmetric capabilities (not supported on all models)
   - **pause** (the port will advertise it has pause capability)
   - **spause** (symmetric; the port will advertise that it can transmit and receive pause frames) (not supported on all models)

8. Press **Enter**.

9. Set the speed of this port; type: **set ether speed=xx** where:

   xx = speed setting; valid choices are:

   - **10M**
   - **100M**
   - **1000M**

10. Press **Enter**.

11. Set the duplex of this port; type: **set ether duplex=xx** where:

    xx = duplex setting; valid choices are:

    - **full**
    - **half**

12. Press **Enter**.

13. Verify the configuration has been set. Type: **show ether config** and press **Enter**. The current Ethernet configuration displays. For example:

```
Agent III C1|S6|L1P1>show ether config
Port-11013
TP port:
------------------------------------------------------------------------
Link operation status:        down
Admin status:                 up
Port mode:                    RJ-45
PHY operation mode:           phy10-100-1000BaseT
Speed:                        Negotiating
Duplex:                       Negotiating
Autocross:                    auto
PHY mode change cap:          false

AutoNeg admin state:          enable
Advertisement:
Capability:                   10THD+10TFD+100THD+100TFD+1000THD+1000TFD
Pause:                        nopause
Agent III C1|S6|L1P1>
```

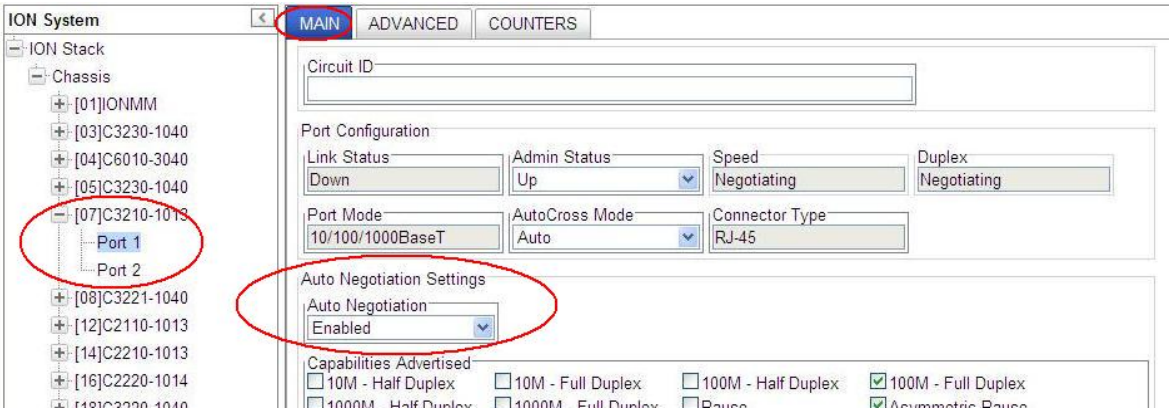
```
Agent III C1|S6|L1P1>go l1p=2
Agent III C1|S6|L1P2>show ether config
Port-21013
FIBER port:
------------------------------------------------------------------------
Link operation status:        down
Admin status:                 up
Port mode:                    SC Multimode Fiber
PHY operation mode:           phy1000BaseX
Speed:                        Negotiating
Duplex:                       Negotiating
PHY mode change cap:          false

AutoNeg admin state:          enable
Advertisement:
Capability:                   1000XHD+1000XFD
Pause:                        nopause
Agent III C1|S6|L1P2>
```

10/100/1000BaseT Port – Web Method

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the appropriate port.

3. Locate the **Auto Negotiation Settings** section on the **MAIN** tab.



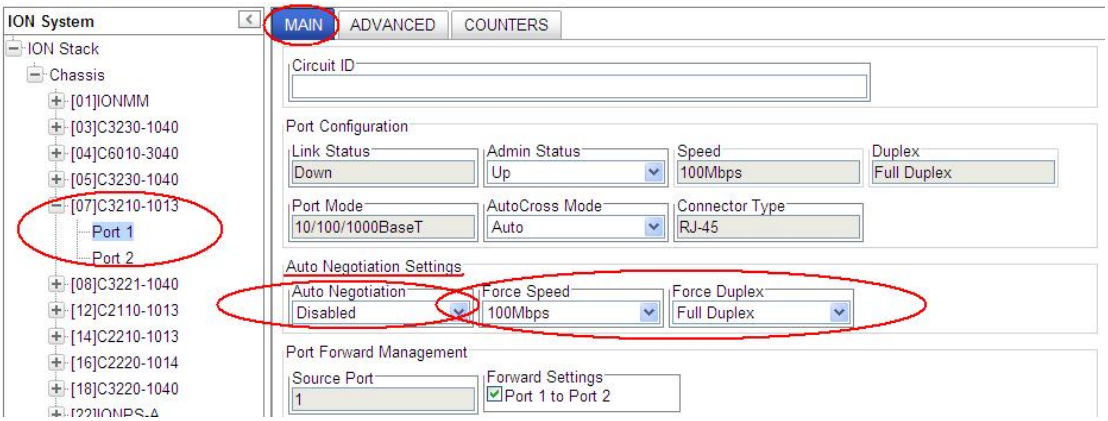
4. In the **Auto Negotiation** field, select whether this feature is enabled or disabled.

5. If **Auto Negotiation** is set to **Enabled**, in the **Capabilities Advertised** field, select:

   - the speed and duplex settings to be advertised to other devices
   - the type of pause frames supported on this port (**Pause** and/or **Asymmetric Pause**)

6. If you want to manually force speed and duplex settings, set **Auto Negotiation** to **Disabled**, click **Save**, and then select:

   - the port's operating speed,
   - the port's duplex mode of operation.



7. Click **Save** when done.

Set Ethernet Port Speed / Duplex Mode (Force Speed / Duplex Mode)

Disabling the auto negotiate feature lets you force the connection to the desired speed and duplex mode of operation as long as both devices can support the operation.

Note: The Auto Negotiate feature is always enabled for gigabit devices/ports.

A port's Ethernet port speed and Duplex mode can be configured in the C3210 using either the CLI or Web method.

Set Ethernet Port Speed / Duplex Mode – CLI Method

Use this procedure to define the port's Ethernet transmission speed and Duplex mode to be used on the Ethernet port. The defaults are 10 Mbps and Full Duplex.

Note: This command is only applicable on a copper port.

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).
2. At the command line, type: **set ether autoneg state disable** and press **Enter**.
3. Set the speed of this port; type: **set ether speed=xx** where:

   xx = speed setting; valid choices are:

   - **10M**
   - **100M**
   - **1000M**

4. Press **Enter**.
5. Set the Duplex mode for this port; type: **set ether duplex=xx** where:

   xx = duplex setting; valid choices are:

   - **full**
   - **half**

6. Press **Enter**.

7. Verify the configuration has been set. Type: **show ether config** and press **Enter**.
   The Ethernet configuration displays. The first example below show a TP port, the second example shows a Fiber Port:

```
Agent III C1|S6|L1P1>show ether config
Port-11013
TP port:
------------------------------------------------------------------------
Link operation status:        down
Admin status:                 up
Port mode:                    RJ-45
PHY operation mode:           phy10-100-1000BaseT
Speed:                        Negotiating
Duplex:                       Negotiating
Autocross:                    auto
PHY mode change cap:          false

AutoNeg admin state:          enable
Advertisement:
Capability:                   10THD+10TFD+100THD+100TFD+1000THD+1000TFD
Pause:                        nopause
Agent III C1|S6|L1P1>go l1p=2
Agent III C1|S6|L1P2>show ether config
Port-21013
FIBER port:
------------------------------------------------------------------------
Link operation status:        down
Admin status:                 up
Port mode:                    SC Multimode Fiber
PHY operation mode:           phy1000BaseX
Speed:                        Negotiating
Duplex:                       Negotiating
PHY mode change cap:          false

AutoNeg admin state:          enable
Advertisement:
Capability:                   1000XHD+1000XFD
Pause:                        nopause
Agent III C1|S6|L1P2>
```

Set Ethernet Port Speed / Duplex Mode – Web Method

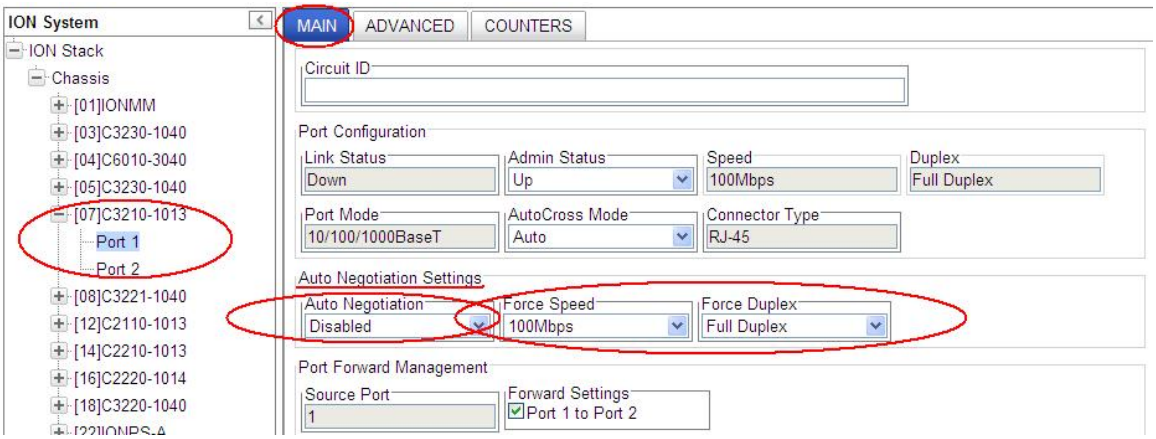
Use this procedure to define the transmission speed and Duplex mode to be used on the Ethernet port. The defaults are 10 Mbps and Full Duplex.

Note: This command is only applicable on a copper port.

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the appropriate port.

3. Locate the **Auto Negotiation Settings** section on the port's **MAIN** tab.



8. Set **Auto Negotiation** to **Disabled**.

9. In the **Force Speed** field, select the copper port's Ethernet operating speed (10M | 100M). The default is 10 Mbps.

10. In the **Force Duplex** field, select the port's Duplex mode of operation (Half Duplex | Full Duplex). The default is Full Duplex.

11. Click **Save**.

Bandwidth Allocation / Rate Limiting

The C3210's Bandwidth Allocation (Rate Limiting) can be configured to limit both Ingress bandwidth and Egress bandwidth. If so configured, traffic at rates over this CIR (Committed Information Rate) is discarded. Note that these limits cannot be set faster than the port speed.

Bandwidth Allocation / Rate Limiting can be configured in the C3210 using either the CLI or Web method.

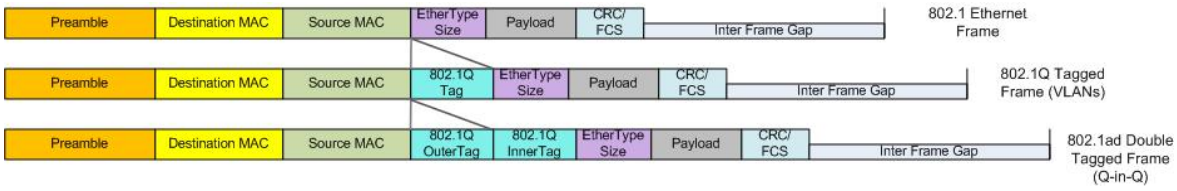
Set Bandwidth Allocation / Rate Limiting – CLI Method

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. At the command line, define which transmission layer is to be counted when determining the rate limit. Type **set bw alloc-type={countAllLayer1 | countAllLayer2 | countAllLayer3}**. The default is Count all Layer 1 bytes.

   - **Counts All Layer 1**: (the default): in determining the rate limit, this selection counts the following bytes in a frame: Preamble (8 Bytes) + DA to CRC + Inter Frame Gap (12 bytes).
   - **Counts All Layer 2**: in determining the rate limit, this selection counts the bytes in a frame from the DA to the CRC in determining the rate limit.
   - **Counts All Layer** 3: in determining the rate limit, this selection counts the following bytes in a frame:
     - from the DA (Destination MAC Address) to the CRC (18 bytes if untagged)
     - from the DA (Destination MAC Address) to the CRC (22 bytes if tagged)

     Note: The Counts All Layer 3 selection will skip the Ethernet header, the CRC, and Tags (if any tags exist).



3. Press **Enter**.
4. Define the ingress and egress rate limits of the port. Type **set irate=<xx> erate=<yy>** where:

   xx = In-rate: Ingress rate in kbps

   yy = Egress-rate: Egress rate in kbps

The valid selections for irate (ingress) and egress-rate (erate) are:

On 1000M port: Unlimited, 1M, 2M, 3M, 4M, 6M, 8M, 10M, 20M, 30M, 40M, 50M, 60M, 70M, 80M, 100M, 200M, 300M, 400M, 500M, 600M, 700M, 800M, and 900M bps.

On 100M port: Unlimited, 1M, 2M, 3M, 4M, 6M, 8M, 10M, 20M, 30M, 40M, 50M, 60M, 70M, and 80M bps.

The default Egress and Ingress Rate Limit are "Unlimited" for both copper ports and fiber ports.

5. Press **Enter**.

6. Verify the bandwidth allocation for the port. Type **show bandwidth allocation** and press **Enter**.

   Example:

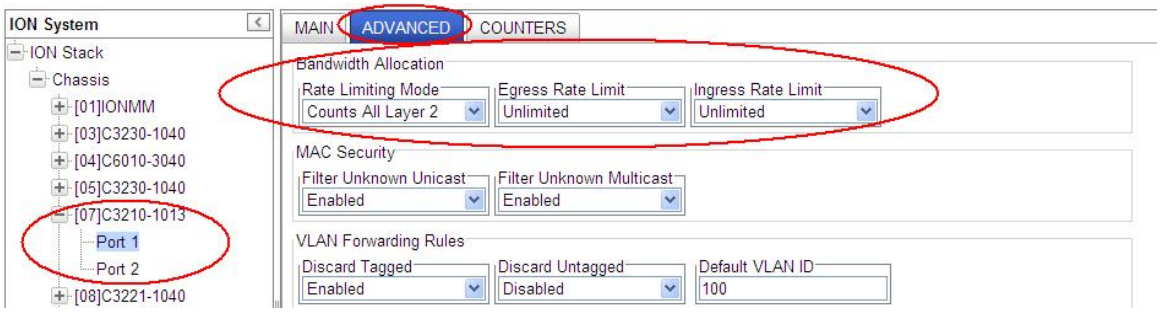
```
C1|S15|L1P2>set bw alloc-type countAllLayer3
C1|S15|L1P2>set irate=rate1M erate=rate1M
C1|S15|L1P2>show bandwidth allocation
Bandwidth allocation type:    countAllLayer3
Ingress rate:                 rate1M
Egress rate:                  rate1M
C1|S15|L1P2>
```

Set Bandwidth Allocation / Rate Limiting – Web Method

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the appropriate port's **ADVANCED** tab.

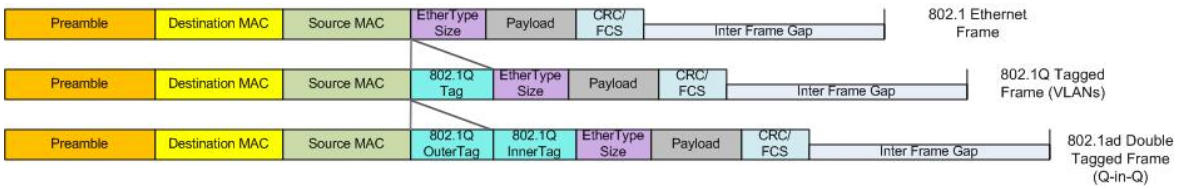
3. Locate the **Bandwidth Allocation** section.



4. In the **Rate Limiting Mode** field, select which bytes in a frame are to be counted in determining the rate limit:

   - **Counts All Layer 1**: (the default): in determining the rate limit, this selection counts the following bytes in a frame: Preamble (8 Bytes) + DA to CRC + Inter Frame Gap (12 bytes).
   - **Counts All Layer 2**: in determining the rate limit, this selection counts the bytes in a frame from the DA to the CRC in determining the rate limit.
   - **Counts All Layer** 3: in determining the rate limit, this selection counts the following bytes in a frame:
     - from the DA (Destination MAC) to the CRC (18 bytes if untagged)
     - from the DA (Destination MAC) to the CRC (22 bytes if tagged)

     Note: The Counts All Layer 3 selection will skip the Ethernet header, the CRC, and Tags (if any tags exist).



5. In the Egress Rate Limit field, select the Egress bandwidth limit in bits per second. Traffic which goes over this rate is discarded. See below for the rate limit selections and default.

   In the Ingress Rate Limit field, select the Ingress bandwidth limit in bits per second. This is the Committed Information Rate (CIR) on this interface for Ingress. Traffic above this rate is discarded. See below for the rate limit selections and default. The valid selections for irate (ingress) and egress-rate (erate) are:

   On 1000M port: Unlimited, 1M, 2M, 3M, 4M, 6M, 8M, 10M, 20M, 30M, 40M, 50M, 60M, 70M, 80M, 100M, 200M, 300M, 400M, 500M, 600M, 700M, 800M, and 900M bps.

On 100M port: Unlimited, 1M, 2M, 3M, 4M, 6M, 8M, 10M, 20M, 30M, 40M, 50M, 60M, 70M, and 80M bps.

The default Egress and Ingress Rate Limit are "Unlimited" for both copper ports and fiber ports.

6. Click **Save** when done.

Security Features

One or more of the following can be defined for the C3210:

- Media Access Control (MAC) addressing
- Virtual LANs (VLANs)

Configuring MAC Address Blocking

The MAC address can be added to the static MAC address database with the 'connected port' as port zero. This will cause any frames from that MAC address database to cause an ATU-member violation on that port, resulting in sending a trap. This could cause excessive traps (overload the Central Processing Unit (CPU) with interrupts) depending on the traffic generated by that MAC.

This feature remembers the Ethernet MAC address connected to the switch port and allows only that MAC address to communicate on the port. If any other MAC address tries to communicate through the port, port security will take the action specified by the Set Ethernet Port Source MAC Address Lock Action command.

The 'SA lock' (Source Address Lock) function is used to detect if the device connected to this port is changed. After the 'SA lock' is enabled, any new MAC is received will trigger the 'SA lock action'. If the MAC address is already learned by the device, 'SA lock action' won't be triggered. Note that this feature only blocks data traffic, not management traffic.

MAC Address Blocking can be configured for the C3210 port using either the CLI or Web method.

MAC Address Blocking – CLI Method

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).
2. Access the desired port.
3. Enable the Ethernet Source Address Lock. Type: **set ether src-addr-lock true** and press **Enter**.
4. Select the Ethernet Source Address Lock Action. Type: **set ether src-addr-lock action=x**

   where:

   x = the SA lock action to perform = {all | discard | discardandnotify | shutdown }

   The SA Lock Actions performed when encountering an unknown MAC address are:

   discard: frames with unknown MAC addresses are discarded. This is the default value.

   discard and notify: A trap is sent to notify the intrusion/SA change and the frame is discarded.

   shutdown: This will shutdown the interface on receiving the frame.

   all: All of the above actions take place. The frame is discarded, a trap is sent and the port is shutdown to prevent intrusion attack.

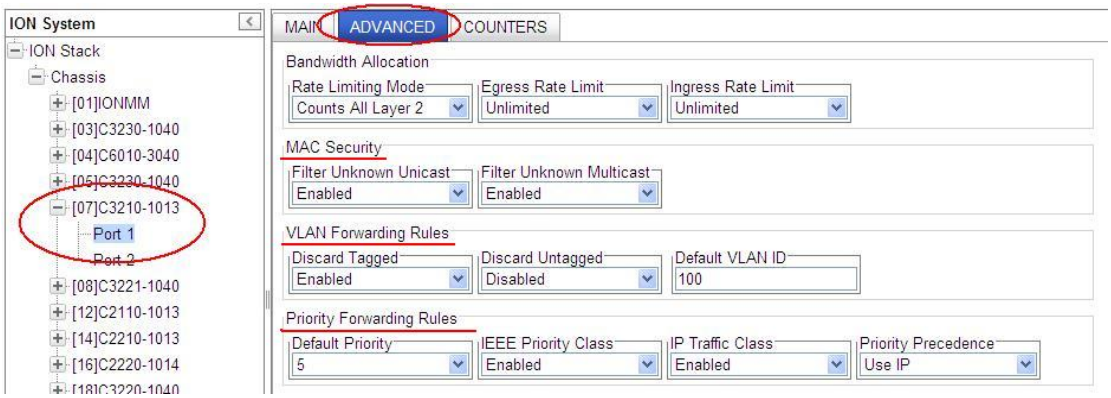
5. Press **Enter**.

6. Verify the security configuration. Type **show ether security config** and press **Enter**.
   The Ethernet Port Security configuration table displays. For example:

```
Agent III C1|S13|L1P1>set ether src-addr-lock true
Agent III C1|S13|L1P1>set ether src-addr-lock action discardandnotify
Agent III C1|S4|L1P1>show ether security config
Ethernet port security configuration:
-------------------------------------------------------------------------
Source MAC address lock:           disable
Source MAC address lock action:    discard
Filter unknown dest unicast:       disable
Filter unknown dest multicast:     enable
Agent III C1|S4|L1P1>go l1p=2
Agent III C1|S4|L1P2>show ether security config
Ethernet port security configuration:
-------------------------------------------------------------------------
Source MAC address lock:           disable
Source MAC address lock action:    discard
Filter unknown dest unicast:       disable
Filter unknown dest multicast:     disable
Agent III C1|S4|L1P2>
```

MAC Address Blocking – Web Method

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).
2. Select the desired port.
3. Select the **ADVANCED** tab.



4. Locate the **MAC Security** section.
5. In the **SA Lock** field, select **Enabled**. The **SA Lock** (Source Address Lock) when set to **Enabled** monitors for any source MAC address change on this port. This feature is used to detect if the device connected to this port has been changed, and is also useful for detecting intrusion when an unknown MAC address ingress this port.
6. In the **SA Lock Action** (Source Address Lock Action) field, select **Enabled**. When SA Lock is set to Enabled to monitor for any source MAC address change on this port, '**SA Lock Action**' sets the action to be taken when such an event is detected. This feature is useful to detect if the device connected to this port has been changed and also for intrusion when unknown MAC address ingress this port.

   The SA Lock Actions performed on encountering an unknown MAC address are:

   Discard: frames with unknown MAC addresses are discarded. This is the default value.

   Discard and Notify: A trap is sent to notify the intrusion/SA change and the frame is discarded.

   Shutdown: This will shut down the interface on receiving the frame.

   All: All the above actions take place. The frame is discarded, a trap is sent and the port is shutdown to prevent intrusion attack.
7. In the **Filter Unknown Unicast** field, select **Enabled** to filter all unicast frames with an unknown destination address from egressing this Port.
8. In the **Filter Unknown Multicast** field, select **Enabled** to filter all multicast frames with unknown destination address from egressing this Port.

9. Locate the **VLAN Forwarding Rules** section.
10. At the **Discard Tagged** field, select Enabled or Disabled. At **Discard Untagged** select Enabled or Disabled. At **Force Default VLAN** select Enabled or Disabled
11. Enter a **Default VLAN ID** in the range of 2-4093.
12. Locate the **Priority Forwarding Rules** section.
13. In the **Default Priority** field, select the default priority (**0-7**, where 0 is the lowest priority) for frames ingressing this port, if it doesn't have any IEEE 802.3ac tag or any IP TOS/Diffserv traffic class fields.
14. In the **IEEE Priority Class** field, select **Enabled** so that if the frame is IEEE tagged, and this mib variable is set to 'true', the 802.1p bits are used as the frame's priority.
15. In the **IP Traffic Class** field, select **Enabled** so that if the frame has IP TOS/Diffserv traffic class fields, and this mib variable is set to 'true', the traffic class fields will be used as the frame's priority.
16. In the **Priority Precedence** field, select **Enabled** so that if the frame has IP TOS/Diffserv traffic class fields, and IEEE 802.3ac tagged, then 'Priority Precedence' decides which one is to be considered as the frame's priority.
17. In the **SA Priority Override** field, select **Enabled** to let a frame's Source MAC address decide the priority of the frame. The new priority value is assigned based on the priority assigned to that MAC address in the MAC forwarding database.
18. In the **DA Priority Override** field, select **Enabled** to let a frame's Destination MAC address decide the priority of the frame. The new priority value is assigned based on the priority assigned to that MAC address in the MAC forwarding database.
19. In the **VID Priority Override** field, select Enabled to let a frame's VLAN ID (VID) decide the priority of the frame. The new priority value is assigned based on the priority assigned to that VLAN ID in the VLAN database.
20. Click the **Save** button at the bottom of the screen.

Configuring Port Forward Management / IP Access Blocking

Any management of the system via IP can be locked at the system level, or only on certain ports. For example, management can occur via web/SNMP only on Port 1, so that access via other ports can be blocked. For each port, define the set of ports that frames ingressing this Source port can be forwarded to, and define the port that will perform its management functions.

Port Forward Management / IP Access Blocking can be configured in the C3210 using either the CLI or Web method.

Port Forward Management / IP Access Blocking – CLI Method

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).
2. Access the desired port.
3. Set the forwarding port list. Type: **set fwd portlist=y**

   where: y = the port number{1 or 2} to be forwarded to
4. Press **Enter**.
5. Enable port management access. Type **set port mgmtaccess=z**

   where: z=enable or disable
6. Press **Enter**.
7. View the port list. Type **show fwd portlist** and press **Enter**. The FWD Portlist table displays. For example:

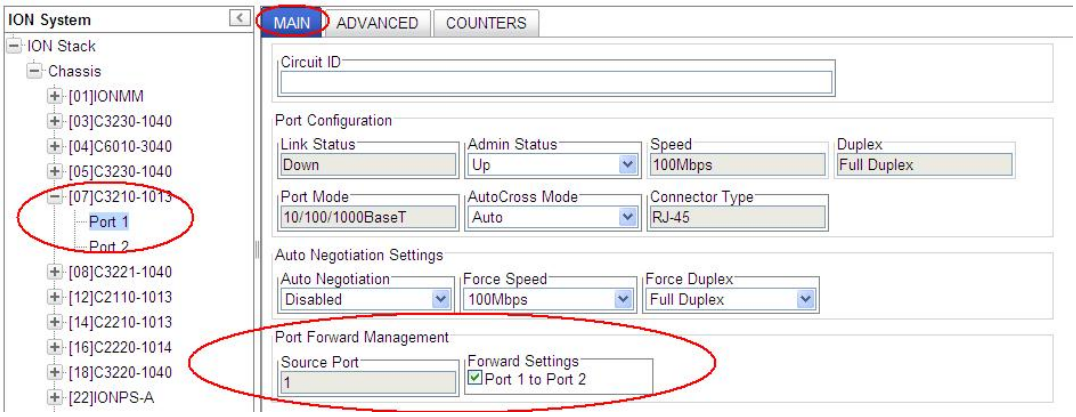
```
C1|S1|L1D>go s=13 l1p=1
C1|S13|L1P1>set fwd portlist 2
C1|S13|L1P1>show fwd portlist
port-id             fwd portlist        mgmt access
-------------------------------------------------------------------------
1                   2                   disable

C1|S13|L1P1>set port mgmtaccess enable
C1|S13|L1P1>show fwd portlist
port-id             fwd portlist        mgmt access
-------------------------------------------------------------------------
1                   2                   enable

C1|S13|L1P1>set fwd portlist 2,3
C1|S13|L1P1>show fwd portlist
port-id             fwd portlist        mgmt access
-------------------------------------------------------------------------
1                   2,3                 enable
```

Port Forward Management / IP Access Blocking – Web Method

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the appropriate port.

3. On the port's **MAIN** tab, locate the **Port Forward Management** section.



4. In the **Forward Settings** fields, check the checkbox for the set of ports that frames ingressing this Source port can be forwarded to.

5. Check the checkbox for the **Management via Port x** as required for this port.

6. Click **Save**.

Configuring VLAN Features

A virtual LAN, commonly known as a VLAN, is a group of hosts with a common set of requirements that communicate as if they were attached to the same wire, regardless of their physical location. A VLAN has the same attributes as a physical LAN, but it allows for end stations to be grouped together even if they are not located on the same LAN segment. Network reconfiguration can be done through software instead of physically relocating devices.

A VLAN can be thought of as a broadcast domain that exists within a defined set of switches. Ports on a switch can be grouped into VLANs in order to limit traffic flooding since it is limited to ports belonging to that VLAN and its trunk ports. Any switch port can belong to a VLAN. Packets are forwarded and flooded only to stations in the same VLAN. Each VLAN is a logical network, and packets destined for stations that do not belong to the same VLAN must be forwarded through a routing device. Each VLAN can also run a separate instance of the spanning-tree protocol (STP).

VLANs are created to provide the segmentation services traditionally provided by routers in LAN configurations. VLANs address issues such as scalability, security, and network management. Routers in VLAN topologies provide broadcast filtering, security, address summarization, and traffic flow management. By definition, switches may not bridge IP traffic between VLANs as it would violate the integrity of the VLAN broadcast domain.

Virtual LANs are essentially Layer 2 constructs, whereas IP subnets are Layer 3 constructs. In a campus LAN employing VLANs, a one-to-one relationship often exists between VLANs and IP subnets, although it is possible to have multiple subnets on one VLAN or have one subnet spread across multiple VLANs. Virtual LANs and IP subnets provide independent Layer 2 and Layer 3 constructs that map to one another and this correspondence is useful during the network design process.

A virtual LAN (VLAN) is a collection of network nodes that share the same broadcast domain regardless of their physical location or connection point in the network. A VLAN serves as a logical workgroup with no physical barriers. This allows users to share information and resources as though located on the same LAN. VLANs also allow a single physical LAN to be divided into multiple logical LANs.

This section covers Port VLAN and VLAN tunneling configuration including:

Port VLAN Config –CLI Method on page 77 (Port VLAN Forwarding Rules and Tag Management)

Port VLAN Config –Web Method on page 78 (Port VLAN Forwarding Rules and Tag Management)

VLAN Tunneling Config on page 80

Configuring Port VLAN Forwarding Rules and VLAN Tag Management

You can configure the C3210 copper port for VLAN Forwarding and VLAN Tag Management using either the CLI or Web method.

Port VLAN Config –CLI Method

1. Access the NID through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).
2. Define the interface's VID. Type **set port default-vid**<1-4094> and press **Enter**. This VLAN ID is given to untagged frames on ingress into the device.
3. Define discard tagged frame handling for this port. Type **set port discard-tagged**<false|true> and press **Enter**. If you enter **set port discard-tagged=true**, then all tagged non-management frames ingressing this port are filtered. All untagged and priority tagged frames are processed as normal frames.
4. Define discard untagged frame handling for this port. Type **set port discard-untagged**<false|true> and press **Enter**. If you enter **set port discard-untagged=true**, then - all untagged and priority tagged non-management frames ingressing this port are filtered. All 802.1Q tagged frames are processed as normal frames.
5. Select whether this port is to be forced to use the default VID. Type **set port force-default-vid**<false|true> and press **Enter**. This forces all untagged and (802.1Q) tagged frames to take up the interface's Default VLAN ID.
6. Define the port's VLAN tagging/port type.
   Type **set port vlan tag mode**<customer|network|provider> and press **Enter**.

   This is the interface's tagging mode. The interface can be set as:

   Network: This is the normal network mode. It can take untagged and 802.3ac tagged frames. In this mode, 802.1q can be enabled on the interface. Frames with an Ethertype of 0x8100 are considered as tagged.

   Provider: In provider mode, frames are considered provider tagged if it matches the 'Provider Ether Type'. Frames which are ingress with a provider tag are stripped of their provider tag on egressing this interface. If the frame's ethertype doesn't match the 'Provider Ether Type' it is as untagged.

   Customer: The customer mode is a normal access port which is not 802.1Q-aware.
7. If you selected **Provider** in step 6 above, select the port's VLAN tagging Provider EtherType.
   Type **set port vlan tag provider ethtype**<x8100|x88a8|x9100> and press **Enter**.
   Skip this step if you selected **Customer** or **Network** in step 5 above.
8. Verify the VLAN configuration. Type **`show vlan config`** and press **Enter**.

9. For example:

```
C1|S8|L1P1>set port default-vid<2-4094>
C1|S8|L1P1>set port discard-tagged<false|true>
C1|S8|L1P1>set port discard-untagged<false|true>
C1|S8|L1P1>set port force-default-vid<false|true>
C1|S8|L1P1>set port vlan tag mode<customer|network|provider>
C1|S8|L1P1>set port vlan tag provider ethtype<x8100|x88a8|x9100>
C1|S3|L1D>show vlan config
vlan id   vlan state          vlan portlist
--------------------------------------------------------------------------------
2         enable              none
C1|S3|L1D>
```

Port VLAN Config –Web Method

1. Access the NID through the Web interface (see "Starting the Web Interface" on page 45).
2. Select the appropriate port.
3. At the port's **ADVANCED** tab, locate the **VLAN Forwarding Rules** section.

4. In the **Discard Tagged** field, select **Enabled** if tagged frames are to be discarded. The default is Disabled (tagged frames are not discarded).

5. In the **Discard Untagged** field, select **Enabled** if untagged frames are to be discarded. The default is Disabled (untagged frames are not discarded).

6. In the **Default VLAN ID** field, enter the associated **VLAN ID** number. The valid range is from 2–4094. This sets the VLAN ID which is to be used for all management traffic to and from the device. The management station that belongs to this VLAN is the only one able to manage the C3210. When the value is not 0 or 1, the Management traffic is expected to be tagged with the Management VLAN ID configured when 802.1Q is enabled.

7. Locate the **VLAN Tag Management** section.

8. In the **Frame Tag Mode** field, select **Network**, **Provider**, or **Customer** as the frame tag mode for this port. The default Status is **Network**. If you select **Provider**, the **Provider Ether Typ**e field activates. If you select **Network**, the **Network Mode Tagging** field activates. If you select **Customer**, neither field is active.

9. If you selected **Provider** in step 8 above, the **Provider Ether Type** field becomes active. Select either **X8100**, **X9100**, or **X88A8** as the **Provider Ether Type** for this port.

10. If you selected **Network** in step 8 above, the **Network Mode Tagging** field becomes active. Select either **Unmodified**, **Remove Tag**, or **Add Tag** for **Network Mode Tagging** for this port. The default is **Add Tag**.

11. Click the **Save** button when done.

Configuring VLAN Tunneling (802.1q Tunneling)

Sending multiple VLANs across the service provider's Metro Ethernet network can be accomplished with VLAN Tunneling, also known as 802.1q Tunneling. The original 802.1Q specification allows a single VLAN header to be inserted into an Ethernet frame. Q-in-Q allows multiple VLAN headers to be inserted into a single frame.

VLAN Tunneling is a mechanism that service providers can use to provide secure Ethernet VPN services to their customers. Ethernet VPNs using VLAN Tunneling are possible because of the two-level VLAN tag scheme used. The outer VLAN tag is referred to as the service provider VLAN tag (S-Tag) and uniquely identifies a given customer within the network of the service provider. The inner VLAN tag is referred to as the customer VLAN tag (C-Tag) because the customer assigns it. It is possible for multiple customer VLANs to be tagged using the same outer or service provider VLAN tag, thereby trunking multiple VLANs among customer sites.

VLAN Tunneling lets service providers use a single VLAN to support multiple VLANs of customers, while preserving customer VLAN IDs and keeping traffic in different customer VLANs segregated. At the same time, it significantly reduces the number of VLANs required to support the VPNs. VLAN Tunneling encapsulates enterprise customers' VLANs into a VLAN of the service provider.

VLAN Tunneling accomplishes the following:

- Enterprise customers receive transparent Layer 2 links between sites within a metro area, such as a link from a branch office to a main campus.
- Service providers can separate or group traffic on a per-customer basis using outer VLAN tags as it traverses the common infrastructure so that the same infrastructure can provide service to multiple customers.
- The VLAN ID of the enterprise and the VLAN ID of the service provider do not have to match.
- Customers can treat the switching infrastructure in a remote site as if it were part of the local site. They can use the same VLAN space and run protocols such as STP across the provider infrastructure through 802.1q.

The VLAN Tunneling model allows the customer edge switch on each side of the tunnel to view the service provider infrastructure as nothing more than a transparent bridge.

How VLAN Tunneling Works

A tunnel port is a port that is configured to support 802.1q (VLAN) tunneling. Each customer comes in on a dedicated customer-facing port on the service provider switch where a VLAN that is dedicated to tunneling is assigned. The service provider assigns each customer an outer VLAN tag or a service provider VLAN tag that uniquely identifies him within the network. The service provider VLAN also keeps the customer traffic isolated from other customer traffic that is traversing the same service provider network. That service provider VLAN supports all the VLANs of the customer.

VLAN Tunneling refers to multiple tagging of dot1Q frames as they enter a service provider switch from a client switch. VLAN Tunneling can tag or untag any frames that it receives from the customer tag. VLAN Tunneling also has native VLAN frames that are untagged. The service provider switch adds the outer VLAN tag.

Tagged and untagged customer traffic comes from a port on a customer device and enters the service-provider edge switch through a tunnel port. Each customer edge port that is connected to a VLAN tunnel

port is typically configured as a trunk port. The customer trunk port is unaware of the provider VLAN tunnel and can communicate with all of its other trunk ports that are connected to the metro network of the provider as if they were directly connected. This makes the process transparent to the enterprise's switching network.

A hub customer edge might have connectivity to two remote spoke sites and have only half of the VLANs from the hub site go to one site, and the remaining VLANs go to the second remote site. This is possible using two service provider VLANs for this enterprise customer when certain sites need to see only some and not all of the VLAN traffic from the hub site.

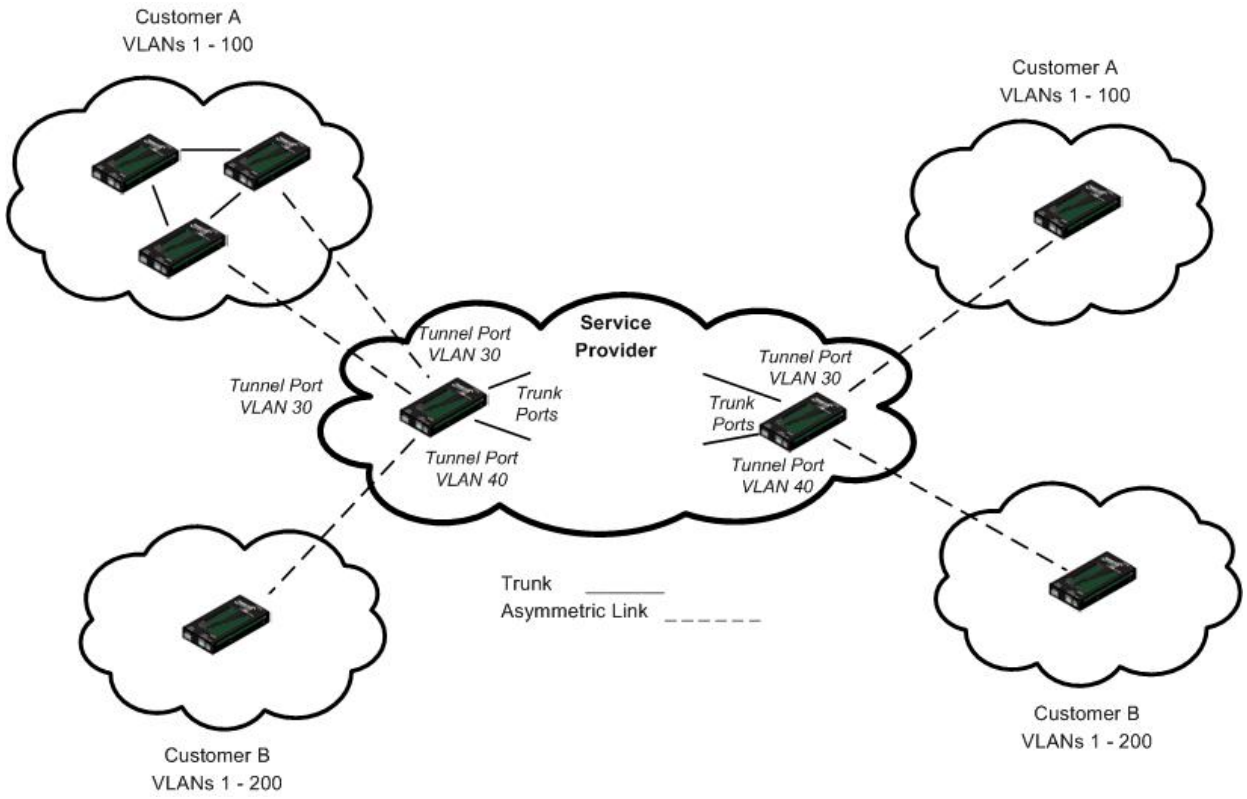


Figure 6: VLAN Tunneling Example

The link between the 802.1q trunk port on a customer device and the tunnel port is an "asymmetrical" link. One end is designated an 802.1q trunk port, and the other end is configured as a tunnel port. The tunnel port is configured with an access VLAN ID that is unique to a customer.

Using the VLAN tunneling feature, a service provider uses a single VLAN to support customers who have multiple VLANs. Customer VLAN IDs are preserved, and traffic from various customers is segregated within the service-provider infrastructure even when they appear to be on the same VLAN.

Thus VLAN tunneling expands VLAN space by using a 'VLAN-in a-VLAN' hierarchy, and by tagging the already-tagged packets. The port configured to support VLAN tunneling is called a tunnel port. When configuring tunneling, a tunnel port is assigned to a VLAN that is dedicated to tunneling. Each customer requires a separate VLAN, but that VLAN supports all of the customer's VLANs.

Summary

The original 802.1Q specification allows a single VLAN header to be inserted into an Ethernet frame. Q-in-Q allows multiple VLAN headers to be inserted into a single frame, an essential capability for implementing Metro Ethernet network topologies.

IEEE 802.1Q-in-Q is an Ethernet networking standard for Ethernet frame formats. 802.1Q-in-Q is an amendment to IEEE 802.1Q, and not an independent specification of its own; but the amendment, a non-trivial extension, acquired this alias. It is also known simply as "QinQ" or "Q-in-Q".

In a multiple VLAN header context, the term "VLAN tag" or just "tag" for short is often used in place of "802.1Q VLAN header". Q-in-Q allows multiple VLAN tags in an Ethernet frame.

When used in the context of an Ethernet frame, a Q-in-Q frame is a frame that has two VLAN 802.1Q headers (double-tagged).

Prerequisites for VLAN Tunneling Functions

1. Network topology and network administration have been reviewed.
2. Business and service policies have been established.

Restrictions for Configuring VLAN Tunneling Functions

The ION system supports static VLAN configuration. While VLAN Tunneling works well for Layer 2 packet switching, there are incompatibilities with some Layer 2 features and with Layer 3 switching.

1. A tunnel port cannot be a routed port.
2. IP routing is not supported on a VLAN that includes 802.1Q ports.
3. Fallback bridging is not supported on tunnel ports.
4. Tunnel ports do not support IP access control lists (ACLs).
5. Layer 3 quality of service (QoS) ACLs and other QoS features related to Layer 3 information are not supported on tunnel ports.
6. Cisco's Dynamic Trunking Protocol (DTP) is not compatible with 802.1Q tunneling.
7. Loopback detection is supported on 802.1Q tunnel ports.
8. If management is required over a provider port, it must use Management VLAN.
9. You can set up a VLAN without Management VLAN enabled. You can not set up a VLAN without setting up VLAN Forwarding Rules, because then it would not validate any frames with no filtering rules in the VLAN filtering database.

For specific procedures on configuring VLAN Tunneling via the CLI or Web method, see "Appendix F: VLAN Tunneling Configuration Examples" on page 524.

Section 5: Operations

General

This section describes the non-configuration operations that can be performed for the C3210.

Backup and Restore Operations (Provisioning)

Through the Web interface you can back up and restore the configuration information for the IONMM and any or all of the C3210s in the ION system.

A Backup is used to get the SIC card running configuration, convert it to CLI commands, and save those CLI commands into the backup file. The backup file is stored in the IONMM.
Note: Transition Networks recommends as a "best practice" to back up each SIC card's configuration after it is fully configured, so that in the event of an error or hardware failure, the configuration can be easily and rapidly restored.

A Restore is used to send the CLI commands in the configuration file to a SIC after removing the current SIC running configuration. If a problem causes the SIC card configuration restoration to stop (e.g., due to a lost network connection between the PC host and Agent card) the SIC card will use the previous configuration to run the traffic. If the IONMM card is downloading the restore configuration data to the SIC card, and the SIC card is physically removed from the chassis, the SIC card will use the factory default configuration setting when it is re-inserted into the chassis.

Transition Networks recommends that you to enter a "**show card info**" CLI command to view the SIC card's current configuration before a backup/restore operation to verify the desired configuration settings. There are several CLI **show** commands that allow you to display (show) information about a SIC card's configuration. For a complete description of these and other CLI commands see the *C3210 CLI Reference Manual, 33497*.

Note: Disable the DHCP client for each device that you backup/restore.

IMPORTANT

Doing a reboot, restart or upgrade of the IONMM, a power restart of the chassis, or a reset to factory removes temporary files (e.g. configuration backup files, Syslog file). A Factory Reset also removes the permanent settings (e.g. configuration files, HTTPS certification file, SSH key).

For more information on how the Reboot, Reset, and Power Off functions impact stored files, see:

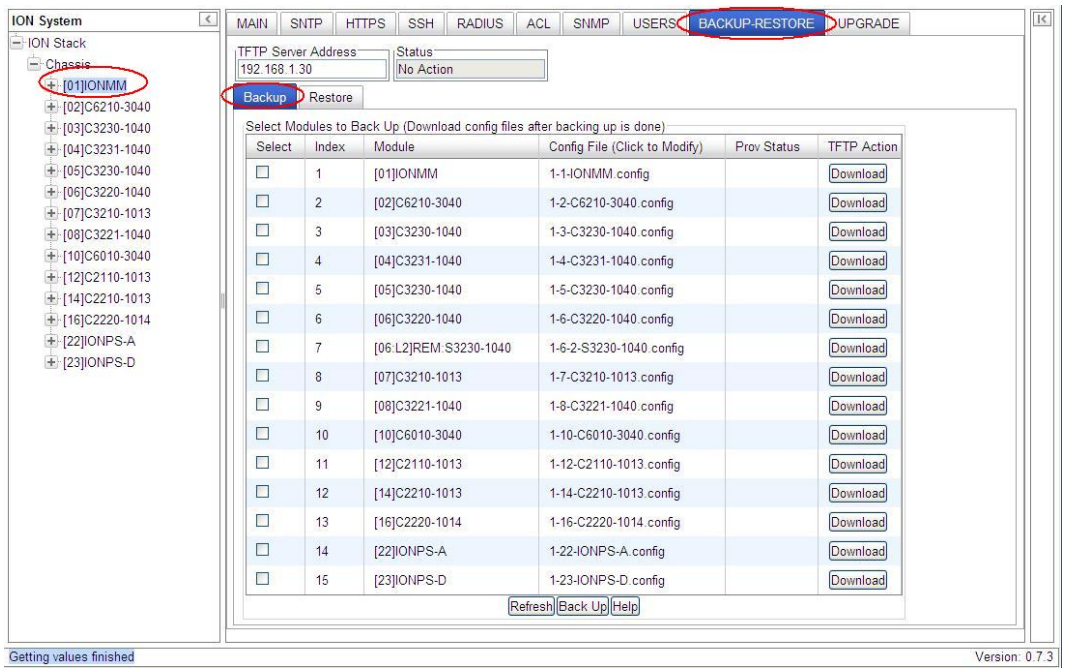
- Table 15. Back Up and Restore File Content and Location on page 224
- Table 16. File Status after a Reset to Factory Defaults on page 228
- Table 17. File Content and Location after a System Reboot on page 232
- Table 18. File Content and Location after a Firmware Upgrade on page 248

Backing Up Slide-In and Remote Modules

The following procedure describes how to back up the configuration of one or more slide-in or remote modules in the ION system. The backup file is stored in the IONMM.

1. Access the IONMM through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the **BACKUP-RESTORE** tab. Select the **Backup** sub-tab if not already displayed.



3. Verify that the TFTP Server address shown is correct, that the TFTP Server is running and configured, and that the file to be downloaded is located correctly (e.g., at *C:\TFTP-Root*).

4. Verify that the card list shown in the table is correct; if not correct, fold and then unfold the "ION Stack" node in the left tree view to refresh.

5. Note the **Prov Status** field message (Wrong Firmware, No Action, etc.).

6. In the **Select** column, check the checkbox of each module to be backed up.

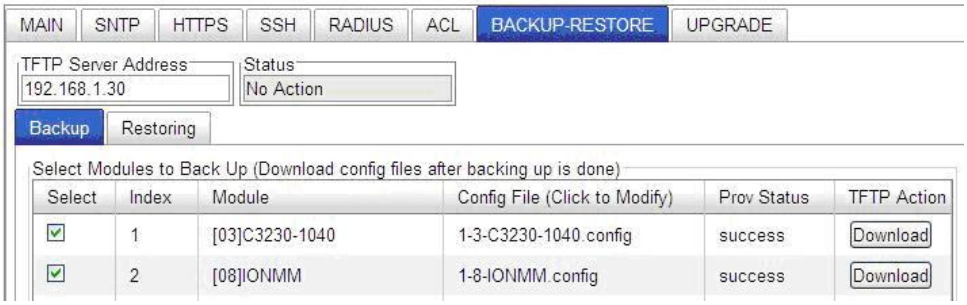
7. Do you want to rename the backup file?

Yes	**No**

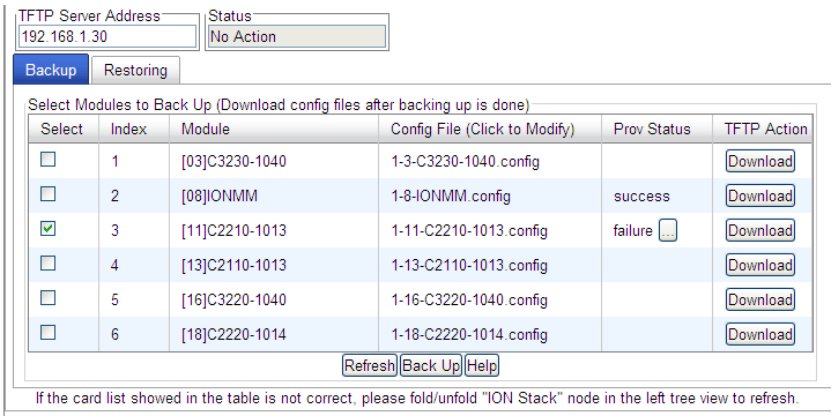
a) In the **Config File** column, click the file name. b) Type a new name for the backup file. **Note:** the file name must be 1–63 characters long and must end with **.config**. c) Continue with step 8 below.	Continue with step 9 below.

8. Click the **Download** button. When completed, the message "*File has successfully transferred via TFTP*" displays.
9. Click the **OK** button to clear the web page message.
10. Click the **Back Up** button.
11. At the confirmation message, click **OK**. The message "*Backup is being processed ...*" displays. The Back Up operation can take several minutes.
12. When the confirmation window displays, click **OK**. The backup file is saved in the IONMM.

    The **Prov Status** column displays the provision operation result (*ongoing*, *success*, or *fail*).



13. If the Back Up operation fails, go to step 15 below.
14. To send a copy of the backup file to the TFTP Server:
    a. Make sure the TFTP Server is running and configured.
    b. In the **TFTP Server Address** field, enter the IP address of the server.
    c. Click the **Download** button. The message "*File is being transferred*" displays.
    d. When the successful completion message displays, click **OK**. The TFTP Server now contains an emergency backup file for the module specified.
15. If the **Backup** operation fails, the **Prov Status** column displays failure ... Click the box to download an error log from the device.



The error (.ERR) log file is downloaded to the TFTP server address specified, in TFTP-Root with a filename such as *1-11-C2210-1013.config*. You can open the file in WordPad. See "The Config Error Log (config.err) File" section on page 397 for error messages and possible recovery procedures.

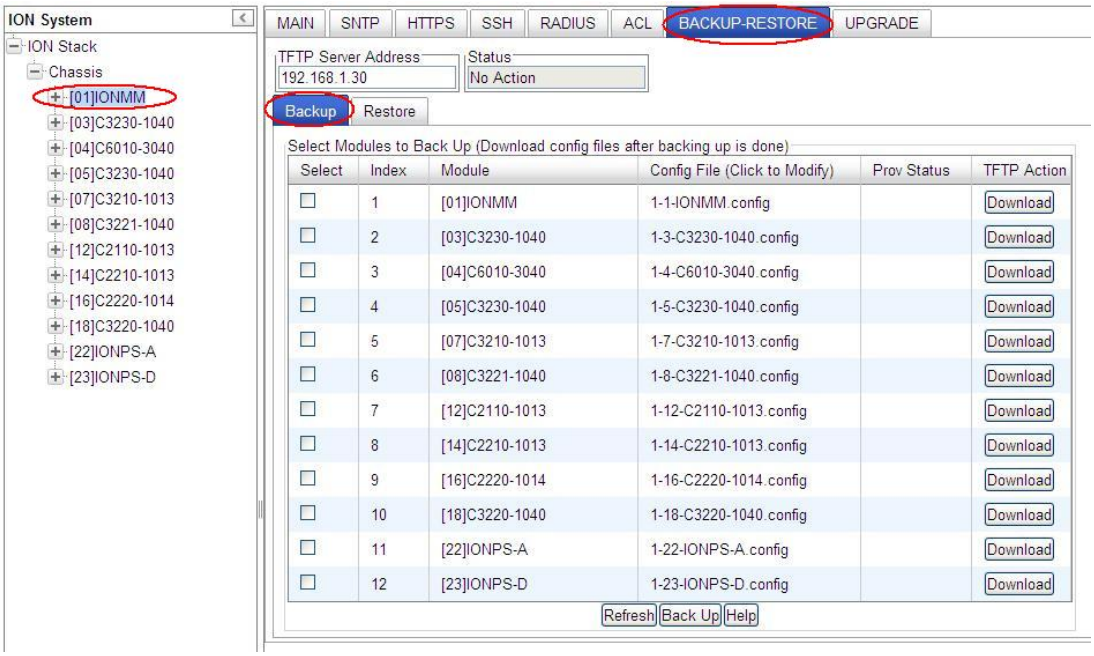
Backing Up Standalone Modules

The following procedure describes how to back up the configuration of a standalone module.

IMPORTANT

Doing a reboot, restart, an upgrade or a reset to factory settings may cause some configuration backup files, HTTPS certification file, SSH key file, and Syslog file to be lost.

1. Access the IONMM module through the Web interface (see "Starting the Web Interface" on page 45).
2. Select the **BACKUP-RESTORE** tab.



3. In the **Select** column, check the checkbox of the module to be backed up.
4. Do you want to rename the backup file?

Yes	**No**

a) In the **Config File** column, click the file name. b) Type a new name for the backup file. **Note:** the file name must be from 1–63 characters in length and must end with **.config**. c) Continue with step 5.	Continue with step 5.

5. Click the **Download** button. When completed, the message "*File has successfully transferred via TFTP*" displays.
6. Click the **OK** button to clear the web page message.
7. Click the **Back Up** button.
8. At the confirmation message, click OK. The message "*Backup is being processed ...*" displays. The Back Up operation can take several minutes.
9. To send a copy of the backup file to the TFTP server:
    a. Make sure the TFTP Server is running and configured.
    b. In the **TFTP Server Address** field, enter the IP address of the TFTP server.
    c. Click the **Download** button.
    d. When the successful completion message displays, click **OK**.

When the Back Up is successfully completed, you can edit the Config file (optional) or continue with the applicable Restore procedure:

- Editing the Config File (Optional) on page 93
- Restoring Slide-In and Remote Modules on page 94

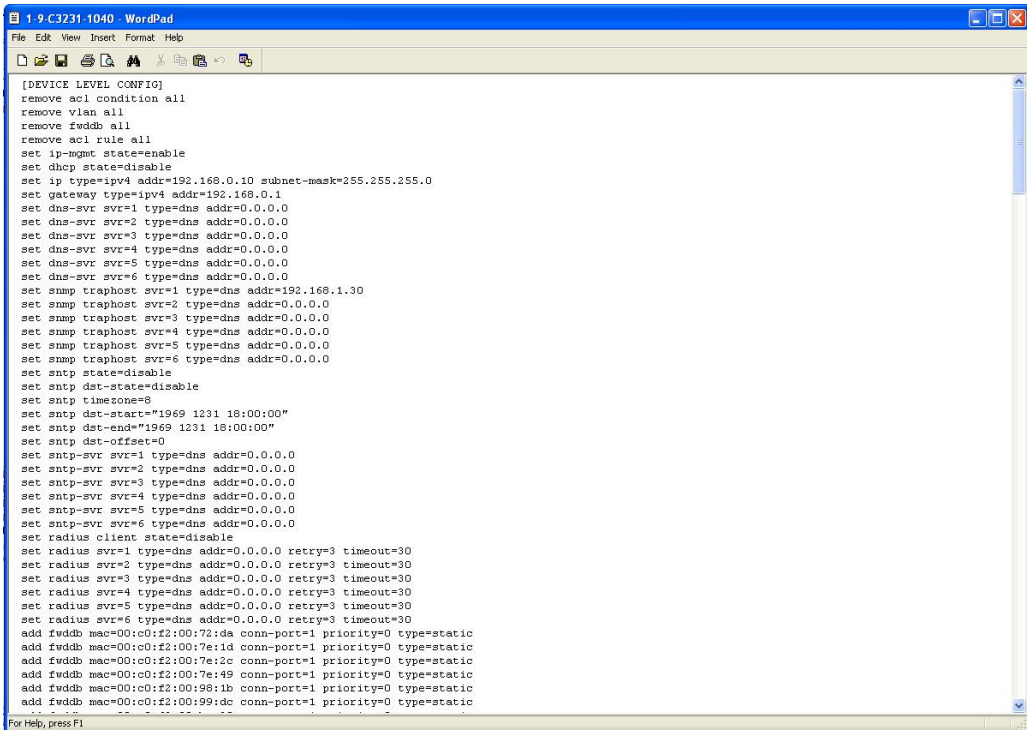
Editing the Config File (Optional)

In some circumstances you may need to edit the backup Config file before restoring it. For example, you may want to globally change the VLAN IDs or other addressing.

The procedure below provides steps typically used in editing a Config file.

1. Complete the applicable Backup procedure from the previous section.
2. Open the Config file (in Notepad, WordPad, Word, OpenOffice Writer, etc.) from the TFTP server location (e.g., C:*TFTP-Root\1-9-C3231-1040.config*).
3. Edit the Config file sections. Each Config file contains a DEVICE LEVEL CONFIG section and two PORT x CONFIG sections.
4. Save the edited Config file back to the TFTP server location (e.g., C:*TFTP-Root\1-9-C3210-1040.config*).
5. Continue with the applicable Restore procedure from the following section using the edited Config file.

A sample portion of a typical Config file is shown below.



Restoring Slide-In and Remote Modules

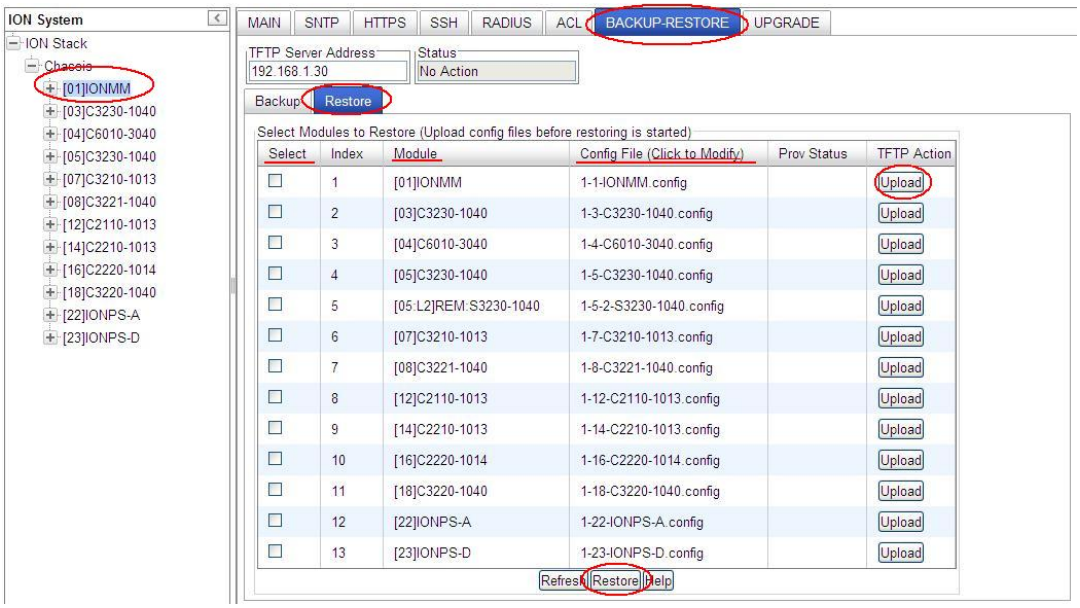
The following procedure describes how to restore the configuration of one or more slide-in or remote modules in the ION system. **Note**: these Restore procedures require that the TFTP server be running and properly configured, and that the backup configuration file is named and located properly.

IMPORTANT

A restore operation can only be performed for a module that had its configuration file backed up (see Backing Up Standalone Modules on page 252).

1. Access the IONMM through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the **BACKUP-RESTORE** tab and select the **Restore** sub-tab. The "Modules to Restore" table displays.



3. If the list of modules shown in the table is not correct, unfold the ION Stack in the left tree view, and then refold it to refresh the table information.

4. In the **Select** column, check the checkbox of each module to be restored.

5. Is the configuration file to be restored different than the one shown in the Config File column?

Yes	**No**
a) In the **Config File** column, click the file name. b) Type the name of the backup file to be restored. **Note:** the file name must end with **.config**. c) Continue with step 5.	Continue with step 5.

6. Does the configuration file need to be retrieved from the TFTP server?

Yes	**No**
a) In the **TFTP Server Address** field, enter the IP address of the server. b) Click **Upload**. c) When the successful transfer message displays, click **OK**. d) Continue with step 6.	Continue with step 6.

7. Click the **Upload** button. The config file is uploaded via the TFTP server. When done, the message "*File has been successfully transferred via TFTP.*"

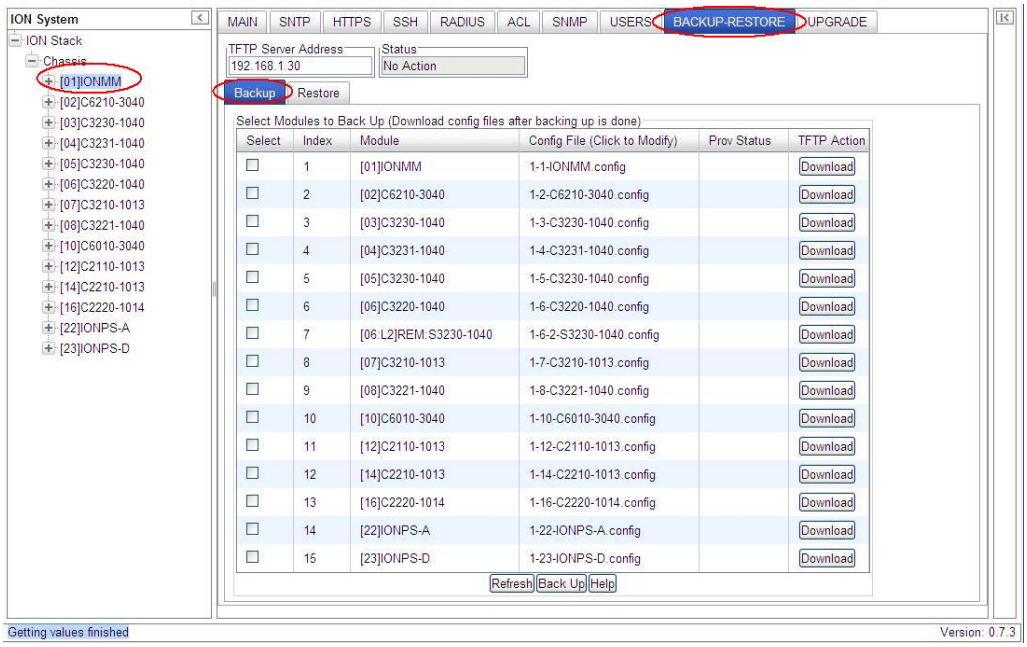
8. Click the **OK** button to clear the Webpage message.

9. Click the **Restore** button.

10. When the confirmation window displays, click **OK**.

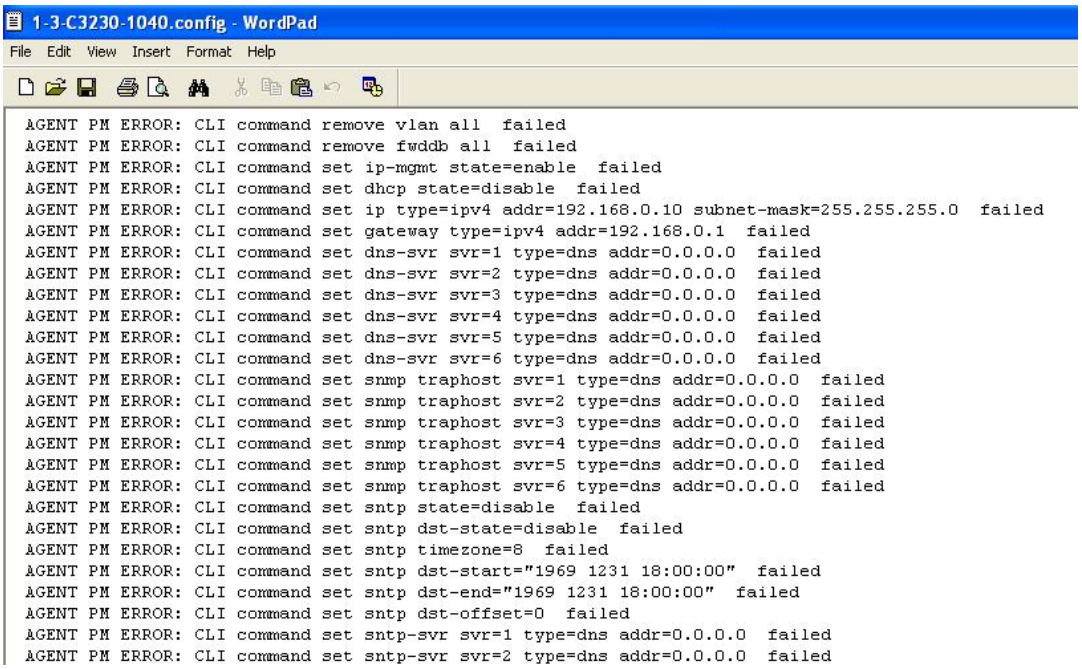
    The configuration will be restored from the specified file. During the Restore operation the message "*Restoring is being processed ...*" displays, and the **Prov Status** column displays "ongoing". When the Restore operation is successfully completed, *success* displays in the **Prov Status** column.

11. If the **Restore** operation fails, the **Prov Status** column displays failure . Click the box to download an error log from the device.



The error log file (.ERR file) is downloaded to the TFTP server address specified, at *C:\TFTP-Root* with a filename such as *1-11-C2210-1013.config*. You can open the file in WordPad or a text editor.

A sample portion of an error log file (.ERR file) is shown below.



See "The Config Error Log (config.err) File" on page 353 for message descriptions.

Back Up and Restore File Content and Location

The IONMM card stores all configuration backup files, HTTPS certification file, SSH key file, and Syslog file.

Note: Doing a reboot, restart, an upgrade or a reset to factory settings may cause some configuration backup files, HTTPS certification file, SSH key file, and Syslog files to be lost.

The Back Up operation backs up all of the SNMP settings (the same as what can be set via the Web interface / CLI) for one SIC into a file containing a list of CLI commands. This file can be downloaded from IONMM. When restoring for one SIC, you can upload a provisioning backup file (this file must have been made via the Backup operation and must be for the same SIC type) to the IONMM and do a Restore. See the IONMM **PROVISIONING** tab description. Currently, the Backup content includes configuration files, HTTPS certification file, SSH key file, the Syslog file, and certain other files, as outlined in the table below.

Table 8: Back Up and Restore File Content and Location

File Type	Filename	File Description	Stored Directory	Backed up? (Y/N)	Changed after Restore? (Y/N)
Provisioning backup files	e.g., '1-1-IONMM.config'	These files are only used by provisioning Restore	/tftpboot	Yes - these files are created during Backup operation	No
Net-SNMP configuration file	snmpd.conf	This file is a configuration file for Net-SNMP	/agent3/conf/snmp	No - not needed; the configurations included in this file are backed up by SNMP set operations.	Yes
HTTPS configuration file*	lighttpd-ssl.conf	This file is a configuration file for HTTPS	/agent3/conf/lighttpd	No - not needed; the configurations included in this file are backed up by SNMP set operations	Yes
HTTPS certification file	server.pem	HTTPS certificate	/agent3/conf/lighttpd	No	No
SSH host key**	dropbear_rsa_host_key dropbear_dss_host_key	SSH host key files	/agent3/conf/lighttpd	No (see Note 1)	No
SSH user key file**	authorized_keys	Currently we have one 'root' user; this file is the user key file for 'root'	/root/.ssh	No (see Note 2)	No
Syslog file	sys.log	The syslog file for IONMM	/tftpboot	No	Always changes
MIB configuration files	e.g., 'agent3.conf ' 'ifMib.conf '	The MIB configuration files for SNMP setting	/agent3/conf	No - not needed; the configurations included in this file will be backed up by SNMP set operations	Yes

Back Up and Restore Notes:

1. The HTTPS certificate is stored in '/agent3/conf/lighttpd', and is retained over power cycle and upgrades. For SSH, the host keys (RSA and DSA) are stored in '/agent3/conf/dropbear', and are also retained over power cycle and upgrades.
2. For the SSH user key, there is a 'root' user and the user key for 'root' is stored in '/root/.ssh'. This key is retained for power cycle but not upgrades. The Dropbear SSH2 server uses the Linux users as the users and it maintains the user keys with the Linux users.

Displaying Information

There are several CLI commands that allow you to display (show) information about the C3210 configuration. For a complete description of these and other CLI commands see the *C3210 CLI Reference Manual, 33497*.

Reset to Factory Defaults

If need be, you can reset all configurations in the IONMM back to their original factory defaults. This operation can be accomplished through either the CLI or Web method.

IMPORTANT

This operation deletes **all** configuration information that was saved in the IONMM, including the IP address you assigned to the IONMM.

Resetting Defaults – CLI Method

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. At the command prompt type: **reset factory**.

3. Press **Enter**. The following displays:

```
Warning: this command will restart the specified card, connection will be
   lost!
C1|S18|L1D>
```

   All configuration parameters will be reset to their factory values. For a list of all factory defaults, see "Appendix B: Factory Defaults" on page 179).

   Note: Your USB and/or Telnet session will be disconnected.

4. Set the IP configuration (see "Doing the Initial System Setup" on page 48).

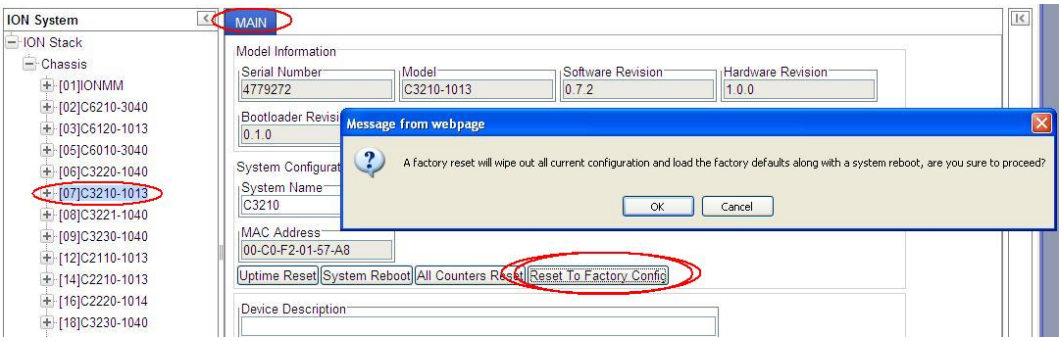
Resetting Defaults – Web Method

Caution: This operation deletes all configuration information that was saved in the C3210, including the IP address you assigned to the C3210.

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the **MAIN** tab.

3. Locate the **System Configuration** section.



4. Click the **Reset to Factory Config** button. The message "*A factory reset will wipe out all current configuration and load the factory defaults along with a system reboot; are you sure to proceed?*" displays.

5. Click **Cancel** if you are sure you want to proceed with the Reboot. Click **OK** only if you wish to reboot.

   All configuration parameters will be reset to their factory values. For a list of all factory defaults, see "Appendix B: Factory Defaults" on page 179).

   Note: Your Web session will be discontinued.

6. Set the IP configuration (see "Doing the Initial System Setup" on page 48).

File Status after Reset to Factory Defaults

The table below shows the status of C3210 files after a system re-boot.

Table 9: File Status after a Reset to Factory Defaults

File Type	Filename	File Description	Stored Directory	Status after Restore to Factory Default
Provisioning backup files	e.g., '1-1-IONMM.config'	These files are only used by provisioning Restore	/tftpboot	Lost
Net-SNMP configuration file	snmpd.conf	This file is a configuration file for Net-SNMP	/agent3/conf/snmp	Restored to factory configuration
HTTPS configuration file	lighttpd-ssl.conf	This file is a configuration file for HTTPS	/agent3/conf/lighttpd	Restored to factory configuration
HTTPS certification file	server.pem	HTTPS certificate	/agent3/conf/lighttpd	Restored to factory configuration
SSH host key	dropbear_rsa_host_key dropbear_dss_host_key	SSH host key files	/agent3/conf/lighttpd	Restored to factory configuration
SSH user key file	authorized_keys	Currently we have one 'root' user; this file is the user key file for 'root'	/root/.ssh	Restored to factory configuration (lost)
Syslog file	sys.log	The syslog file for IONMM	/tftpboot	Lost
MIB configuration files	e.g., 'agent3.conf' 'ifMib.conf'	The MIB configuration files for SNMP setting	/agent3/conf	Restored to factory configuration (lost)

Resetting Uptime

The C3210 system uptime field displays the amount of time that the C3210 has been in operation.

The System Up Time is displayed in the format days:hours:minutes:seconds.milliseconds. For example, a **System Up Time** field display of **9:8:15:18.26** indicates the ION system has been running for 9 days, 8 hours, 15 minutes, 18 seconds, and 26 milliseconds.

The ION **System Up Time** counter can be reset via the CLI method or Web method.

Reset System Uptime – CLI Method

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).
2. At the command prompt type: **reset uptime** and press **Enter**. The System Up Time field resets to zero, and immediately begins to increment.

For example:

```
C1|S7|L1P2>reset uptime
Error: this command should be executed on a device!
C1|S7|L1P2>go l1d
C1|S7|L1D>reset uptime
C1|S7|L1D>
```

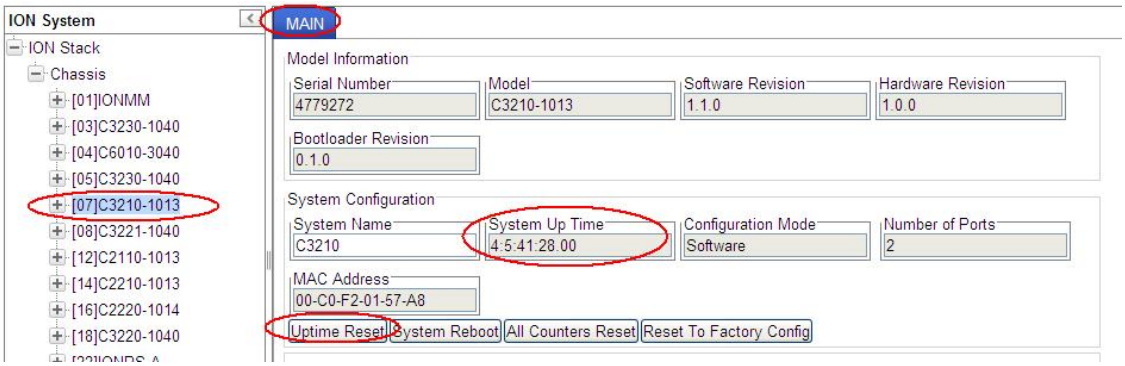
Use the **show system information** command to display the current system uptime.

Note: The **reset uptime** command is not available for the Power Supply modules.

Reset System Uptime – Web Method

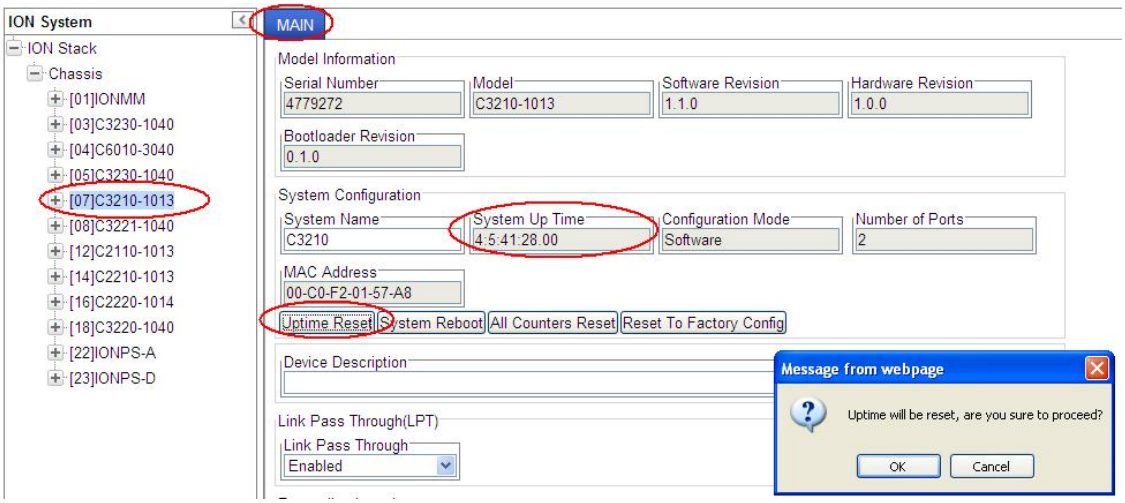
1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 26).

2. At the **MAIN** tab, locate the **System Configuration** section.



3. If desired, observe and record the **System Up Time** field count.

4. Click the **Uptime Reset** button.



5. At the "*Uptime reset, are you sure*" window, click **OK** to reset the system up time.

   The message "*Setting values succeeded*" displays at the bottom left of the screen when the up time reset is done.

6. Click the **Refresh** button at the bottom of the screen. The **System Up Time** field resets to zero, and immediately begins to increment.

Resetting Counters

Before running certain diagnostics / tests, you may want to reset (zero out) all or some C3210 device and/or port counters.

The C3210 counters can be reset via the CLI method or Web method.

Reset All Ports Counters – CLI Method

This is a device-level command to reset all of the C3210 ports counters.

1. Access the C3210 through either a USB connection (see "Start a USB Session in HyperTerminal and Log In " on page 70) or a Telnet session (see "Starting a Telnet Session" on page 72).
2. At the command prompt type: **reset all ports counters** and press **Enter**. For example:

```
AgentIII C1|S7|L1D>show cardtype
Card type:                    C3220-1013
AgentIII C1|S7|L1D>reset ?
  all
  factory
  uptime
AgentIII C1|S7|L1D>reset all ports counters
AgentIII C1|S7|L1D>
```

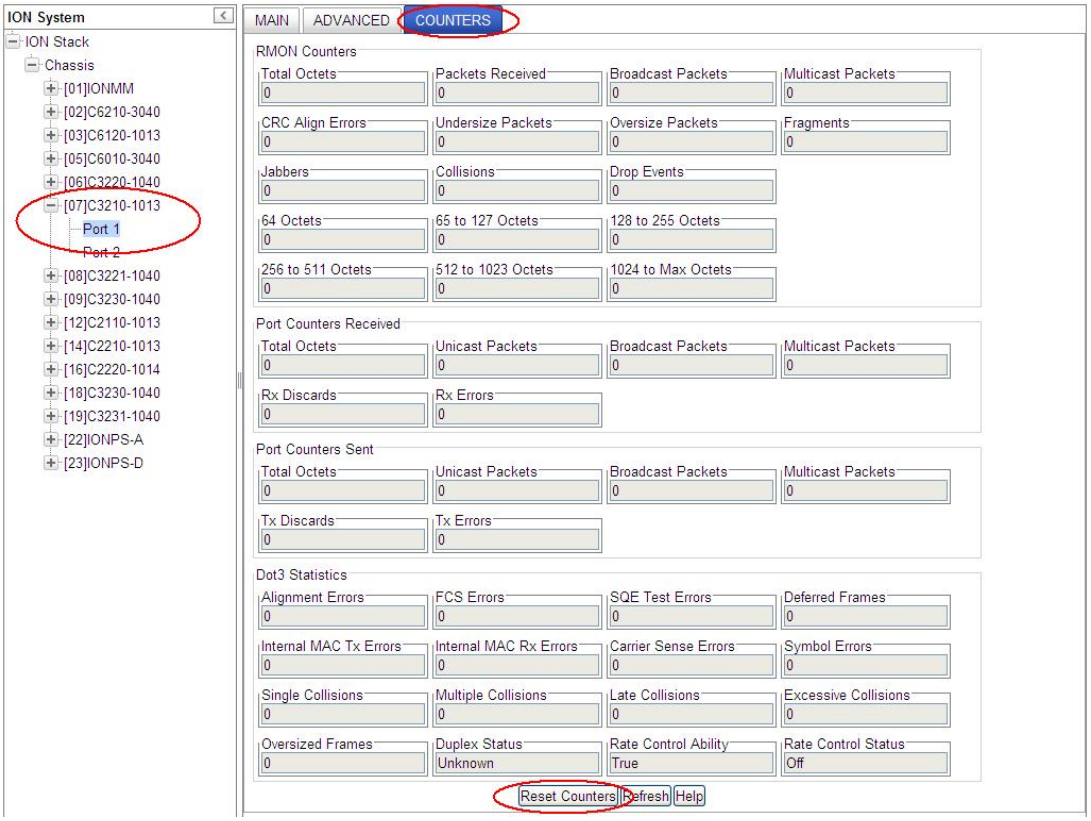
Use the **show ether statistics** command to display Port Counters Received, Port Counters Sent, and related information.

The counters that are reset include all Port Counters, Port LOAM Counters, Port LOAM Event Configuration, Port LOAM Event Log, and Port DMI.

Reset Port Counters– Web Method

This is a port-level function used to reset all of a C3210 port's counters.

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 26).
2. Select the desired C3210 port.
3. Select the **COUNTERS** tab.



4. If desired, click the **Refresh** button and observe and record the various counter field counts for later comparison.

5. Click the **Reset Counters** button. The C3210 port-level counters are reset to zero and begin incrementing immediately. The counters that are reset include:

   - RMON Counters
   - Port Counters Received
   - Port Counters Sent
   - Dot3 Statistics

Clear All Ethernet Port Counters – CLI Method

This is a port-level command to reset all of a C3210 port's Ethernet counters.

1. Access the C3210 via either a USB connection (see "Start a USB Session in HyperTerminal and Log In " on page 70) or a Telnet session (see "Starting a Telnet Session" on page 72).
2. Select the desired C3210 port.
3. At the command prompt type **clear ether all counters** and press **Enter**. For example:

```
C1|S3|L1D>clear ether all counters
Error: this command should be executed on a port!
C1|S3|L1D>go l1p=1
C1|S3|L1P1>clear ether all counters
C1|S3|L1P1>
```

The counters that are reset include all Port Counters, Port LOAM Counters, Port LOAM Event Configuration, Port LOAM Event Log, and Port DMI.

All Counters Reset – Web Method

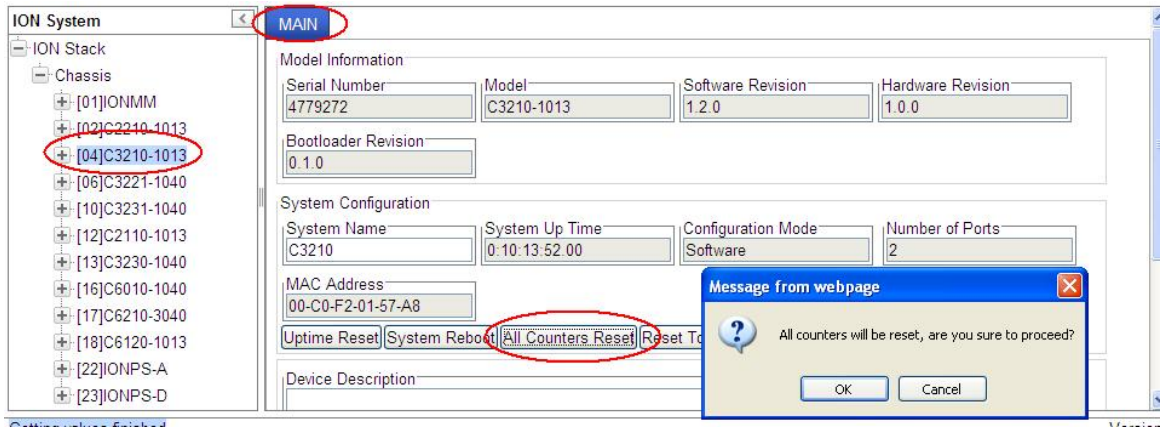
This is a device-level function to reset all of the C3210 counters.

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 26).

2. At the **MAIN** tab, locate the **System Configuration** section.

3. If desired, observe and record the various counter field counts for later comparison.

4. Click the **All Counters Reset** button. The message "*All counters will be reset, are you sure to proceed?*" displays.



5. Click the **OK** button to proceed. The C3210 device counters are reset to zero and begin incrementing immediately. These counters are reset:

   - Port > COUNTERS
   - Port > LOAM > Counters
   - Port > LOAM > Event Configuration
   - Port > LOAM > Event Log
   - Port > DMI >

Reboot

At times you may have to reboot (restart) the ION system. This operation can be accomplished by either the CLI or Web method.

Note: this operation can take several minutes. The amount of time for the reboot to complete depends on the ION system configuration. When the reboot is finished, some devices (usually remote devices) will show the error condition of a "red box" around items like IP address, Trap Manager IP addresses, and/or DNS Entries. The 'red box' condition occurs while the devices are resetting; this condition can continue several minutes after the reboot.

See Table 11 in this section for file content and location after a System Reboot.

 Doing a system reboot, restart, upgrade, or a reset to factory settings will cause all configuration backup files, HTTPS certification file, SSH key file, and Syslog file to be deleted.

Rebooting – CLI Method

After a C3210 reboot via CLI while connected via USB port, you must disconnect and then reconnect USB cable for the console to become accessible again.

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. At the command prompt type: **reboot** and press **Enter**. A warning displays: *this command will restart system, connection will be lost and please login again!* The ION system reboots the C3210. If this operation is performed on a standalone module, the connection / session is terminated.

3. To reestablish the connection / session, wait about one minute, and then:

   - For a USB connection

     a) Select **Call>Disconnect**.

     b) Select **File>Exit**.

     c) Disconnect then reconnect one end of the USB cable.

     d) Start a USB session (see "Starting a USB Session" on page 41).

   - For a Telnet session

     a) Press **Enter**.

     b) Start a Telnet session (see "Starting a Telnet Session" on page 43).

Rebooting – Web Method

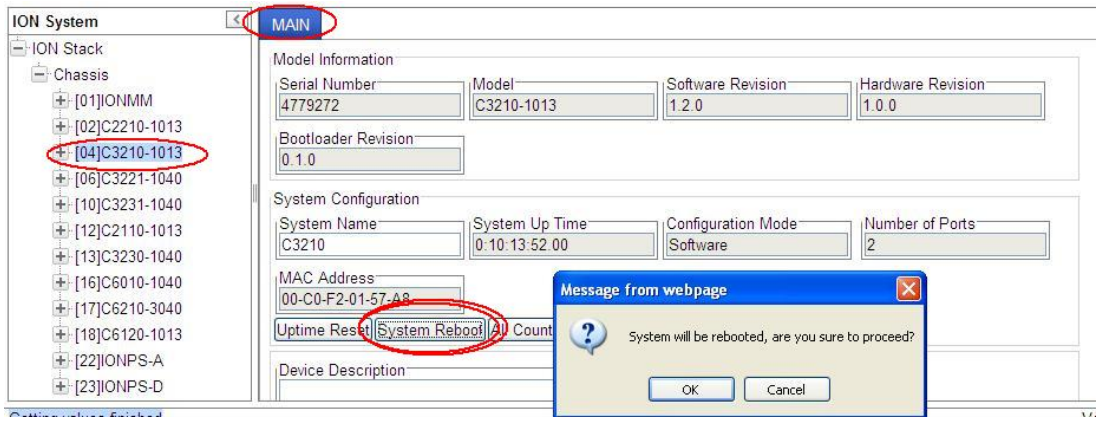
Caution: Doing a system reboot will cause all configuration backup files, HTTPS certification file, SSH key file, and Syslog file to be lost.

Note: If you have a USB or Telnet session established, terminate the session before doing the reboot.

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the **MAIN** tab.

3. Locate the **System Configuration** section.



4. Click the **System Reboot** button. The confirmation message "*System will be rebooted, are you sure to proceed?*" displays.

5. At the confirmation window, click the **OK** button to start the reboot, or click **Cancel** to quit the reboot.

   The C3210 will restart and will be available for operations after about one minute.

Reboot File Content and Location

The table below shows file content and location resulting from a system re-boot.

Table 10: File Content and Location after a System Reboot

File Type	Filename	File Description	Stored Directory	Lost after Reboot? (Y/N)
Provisioning backup files	e.g., '1-1-IONMM.config'	These files are only used by provisioning Restore	/tftpboot	Yes
Net-SNMP configu-ration file	snmpd.conf	This file is a configuration file for Net-SNMP	/agent3/conf/snmp	No
HTTPS configuration file	lighttpd-ssl.conf	This file is a configuration file for HTTPS	/agent3/conf/lighttpd	No
HTTPS certification file	server.pem	HTTPS certificate	/agent3/conf/lighttpd	No
SSH host key	dropbear_rsa_host_key dropbear_dss_host_key	SSH host key files	/agent3/conf/lighttpd	No
SSH user key file	authorized_keys	Currently we have one 'root' user; this file is the user key file for 'root'	/root/.ssh	No
Syslog file	sys.log	The syslog file for IONMM	/tftpboot	No
MIB configuration files	e.g., 'agent3.conf' 'ifMib.conf'	The MIB configuration files for SNMP setting	/agent3/conf	No

Upgrade the IONMM and/or C3210 Firmware

Occasionally changes must be made to the firmware version that is currently stored in IONMM or C3210 memory. This could occur because of features, fixes or enhancements being added.

Note: Transition Networks recommends that before completing any steps on an install that you verify that the management module has the latest firmware version installed and running. The latest firmware version is at: http://www.transition.com/TransitionNetworks/TechSupport/Downloads/Software.aspx. Ideally, all the cards in a chassis will be upgraded to the latest versions at the same time; running devices with a mix of old and new firmware can cause a "red box" condition. See "Section 5: Troubleshooting" on page 202.

Note: You can not upgrade a module with multiple BIN files.

Upgrading modules via the IONMM will cause all configuration backup files to be lost.

You can upgrade the IONMM or C3210 Firmware from the Command Line Interface (CLI) or via the Web interface.

Upgrading IONMM and/or C3210 Firmware – CLI Method

Perform this procedure to upgrade the IONMM Firmware from the CLI.

1. Access the IONMM through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. Display the current version of the IONMM firmware. Type **show card info** and press **Enter**.

3. Determine the current TFTP server address using the **prov** command and press **Enter**. For example:

   prov get tftp svr addr
   prov set tftp svr type=(ipv4|dns) addr=ADDR

4. Go to the Transition Networks Software Upgrades web page at http://www.transition.com/TransitionNetworks/TechSupport/Downloads/Software.aspx.

5. Locate the "**Agent Firmware**" section and click the link in the right hand column (e.g., "**Download IONMM.bin.0.5.bin**").

6. Zip the downloaded file.

7. Retrieve the firmware database file using the **tftp get** command to get the file from the TFTP Server, and then press **Enter**. For example:

   tftp get iptype=(ipv4 |dns) **ipaddr=**ADDR **remotefile=**RFILE **[localfile=**LFILE**]**
   tftp put iptype=(ipv4|dns) **ipaddr=**ADDR **localfile=**LFILE **[remotefile=**RFILE**]**

8. Unzip the file. Type **update firmware-db file=FILENAME** and press **Enter**.

9. Verify the Update results. Type **show firmware-db update result** and press **Enter**.

10. Upgrade the module. Type **upgrade module** and press **Enter**.

    A table of available modules displays with upgrade instructions.

```
C1|S8|L1D>upgrade module
Available modules:

index     module                                        loc
-------------------------------------------------------------------------------
1         ION219                                        c=1 s=0 l1d
2         C3230-1040                                    c=1 s=3 l1d
3         C3230-1040                                    c=1 s=5 l1d
4         IONMM                                         c=1 s=8 l1d
5         C3231-1040                                    c=1 s=10 l1d
6         C2110-1013                                    c=1 s=12 l1d
7         C2210-1013                                    c=1 s=13 l1d
8         C3210-1013                                    c=1 s=15 l1d
9         C2220-1014                                    c=1 s=16 l1d
10        C3220-1040                                    c=1 s=18 l1d
11        IONPS-A                                       c=1 s=22 l1d


Choose the module you want to upgrade: (eg. 1,3,16; at most 8 modules to
   upgrade
, press 'q' to exit upgrade) 1,2,3,4,5,6,10,11
8
It may take some time to finish the task, you can continue with other works,
   then use "show firmware upgrade result" to check result.
```

11. Choose the module(s) to upgrade (# **8** in the example above) and press **Enter**.

12. Verify the Upgrade results. Type **show firmware upgrade result** and press **Enter**.
    The firmware upgrade results are displayed in a table. If the firmware upgrade was successful, the *time started* and *time completed* display. For example:

```
C1|S8|L1D>show firmware upgrade result
index     module                    status   reason   time started     time completed
-------------------------------------------------------------------------------------------
1         C3210-1013 c=1 s=15 l1d   success           05:24:37         05:24:45
2                                                     00:00:00         00:00:00
3                                                     00:00:00          00:00:00
4                                                     00:00:00          00:00:00
5                                                     00:00:00          00:00:00
6                                                     00:00:00          00:00:00
7                                                     00:00:00          00:00:00
8                                                     00:00:00          00:00:00
C1|S8|L1D>
```

    If a module upgrade was unsuccessful, the reason for the failure displays in the "reason" column of the table (e.g., *invalid input file*, *protocol timeout*). See "Section 5 – Troubleshooting" on page 301 for error messages and recovery procedures.

Upgrading IONMM and/or C3210 Firmware – Web Method

The following describes the procedure for upgrading the firmware in the IONMM through the Web Interface. If the IONMM is to be upgraded at the same time as other modules in the ION Chassis, see Upgrading Slide-In and Remote Modules.

Note: Doing an IONMM / C3210 firmware upgrade will cause all configuration backup files to be lost.

The steps involved include **A**. Verify the current IONMM / C3210 Firmware version, **B**. Locate the current IONMM / C3210 Firmware version, **C**. Run the TFTP Server, and **D**, either 1. Upgrade IONMM / C3210 Firmware from the **MAIN** tab, or 2. Upgrade IONMM / C3210 Firmware from the **UPGRADE** tab.

A. Verify the Current IONMM / C3210 Firmware Version

Perform this procedure to display the current version of the IONMM firmware via the web interface.

1. Access the IONMM via the Web interface (see "Starting the Web Interface" on page 45).
2. Select the **MAIN** tab and locate the **Software Revision** area in the **Model Information** section. (You can also use the **Help** dropdown and select **About ION System Web Interface** to determine the current firmware version.)
3. Note the current version of the C3210 or IONMM firmware for use in steps D1 and D2 below.

B. Locate the New IONMM / C3210 Firmware Version

Perform this procedure to locate the IONMM Firmware version via the Web interface.

1. Go to the Transition Networks Software Upgrades web page at http://www.transition.com/TransitionNetworks/TechSupport/Downloads/Software.aspx.
2. Locate the "**Agent Firmware**" section and examine the link in the right hand column (e.g., "**Download x222x / x32xx_1.0.3_AP.bin**").
3. Compare the IONMM / C3210 version displayed in the **MAIN** tab **Software Revision** area with the version number on the web site, and continue if the web site version is newer than the current (running) version.
4. Click the link located in step 1 above to download the new firmware file.

C. Run TFTP Server

This process requires a TFTP Server to load the new firmware. **Note**: A TFTP Server is not the same as an FTP server; they use different protocols. You can not connect to the TFTP Server with an FTP client.

1. Install, run and configure the TFTP Server.
2. Copy the file downloaded in step 4 above to the required TFTP Server location.
   Note: the upgrade file must be resident in the default directory on the TFTP server (normally *C:TFTP-Root*).
3. Note the location of the downloaded file and its filename for use in steps D1 and D2 below.

D. Upgrade the IONMM / C3210 Firmware

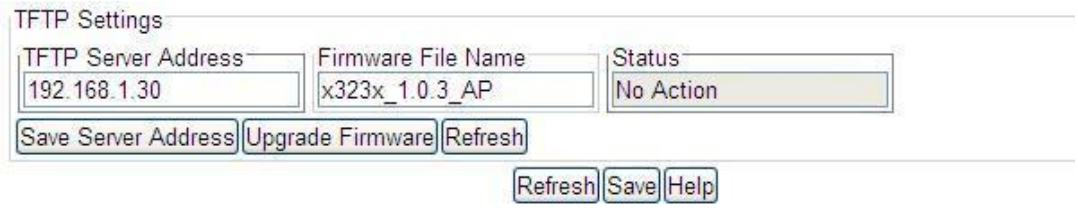
Perform this procedure to upgrade the IONMM / C3210 Firmware from either

- the IONMM **MAIN** tab (step D1) or
- the **UPGRADE** tab (step D2).

D1. Upgrade IONMM / C3210 Firmware from the **MAIN** Tab.

1. Access the IONMM card through the Web interface (see "Starting the Web Interface" on page 45).
2. Select the **MAIN** tab.
3. Locate the **TFTP Settings** section at the bottom of the screen.

4. Enter the **TFTP Server Address.** This is the IP address of the TFTP Server from step C ("Run TFTP Server") above.
5. Enter the **Firmware File Name**. This is the name of the firmware file from step C sub-step 2 above.



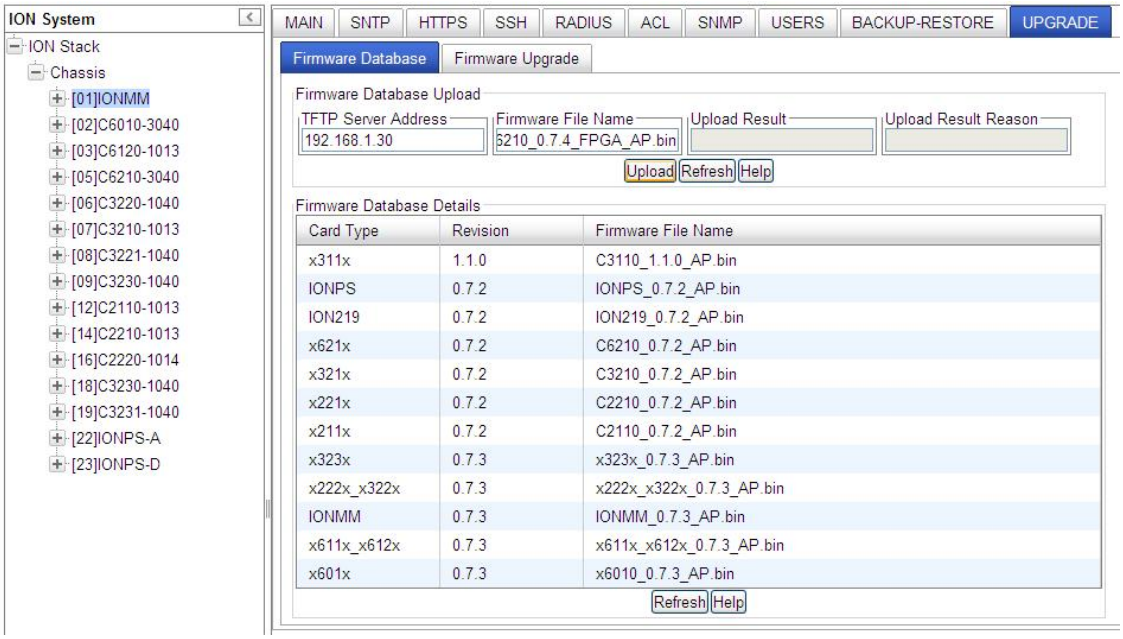
6. Click the **Upgrade Firmware** button.

   The message "*The specified firmware on the TFTP Server will be upgraded to the current module; are you sure to proceed?*" displays.

7. Click **OK**.
   The file is downloaded and the C3210 and/or IONMM reboots. When the reboot is complete, the message "*[xx]IONMM rebooting finished*" displays.
8. Click the **Refresh** button. The **Software Revision** area is updated from the old version number to the new version number (e.g., from 1.0.1 to 1.0.3).
9. If you will be using the same TFTP Server Address for future upgrades, click the **Save Server Address** button.

D2. Upgrade IONMM / C3210 Firmware from the **UPGRADE** Tab

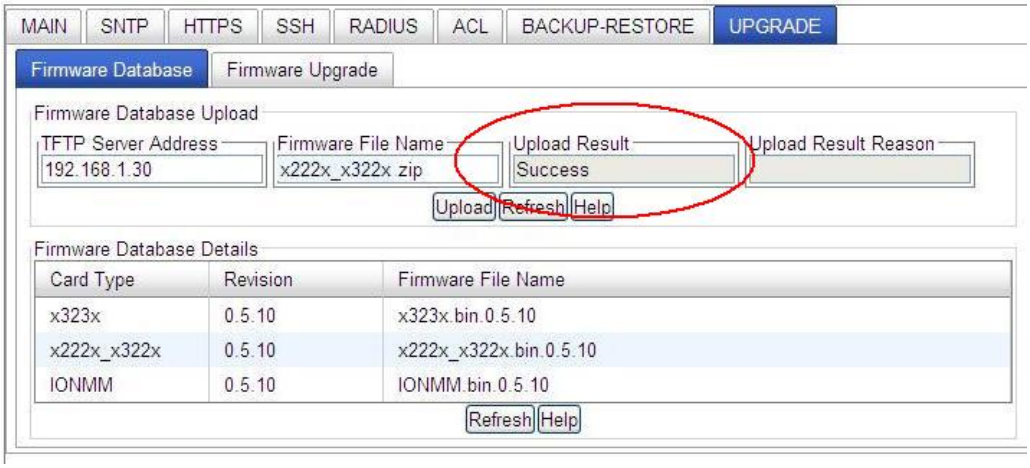
1. Access the IONMM card through the Web interface (see "Starting the Web Interface" on page 45).
2. Select the **UPGRADE** tab.
3. Select the **Firmware Database** sub-tab if not already selected.
4. Locate the **Firmware Database Upload** section.



5. Enter the **TFTP Server Address.** This is the IP address of the TFTP Server from step C ("Run TFTP Server") above.
6. Enter the **Firmware File Name**. This is the name of the firmware file from step C sub-step 5 above.
7. Click the **Upload** button.

   The message "*The Firmware Database File is being transferred.*" displays during the upload, and the **Upload Result** area displays *In Progress*.

   When successfully completed, the message "*Getting all records finished*" displays, the **Upload Result** area displays "*Success*", and the **Firmware Database Details** section displays updated firmware information.



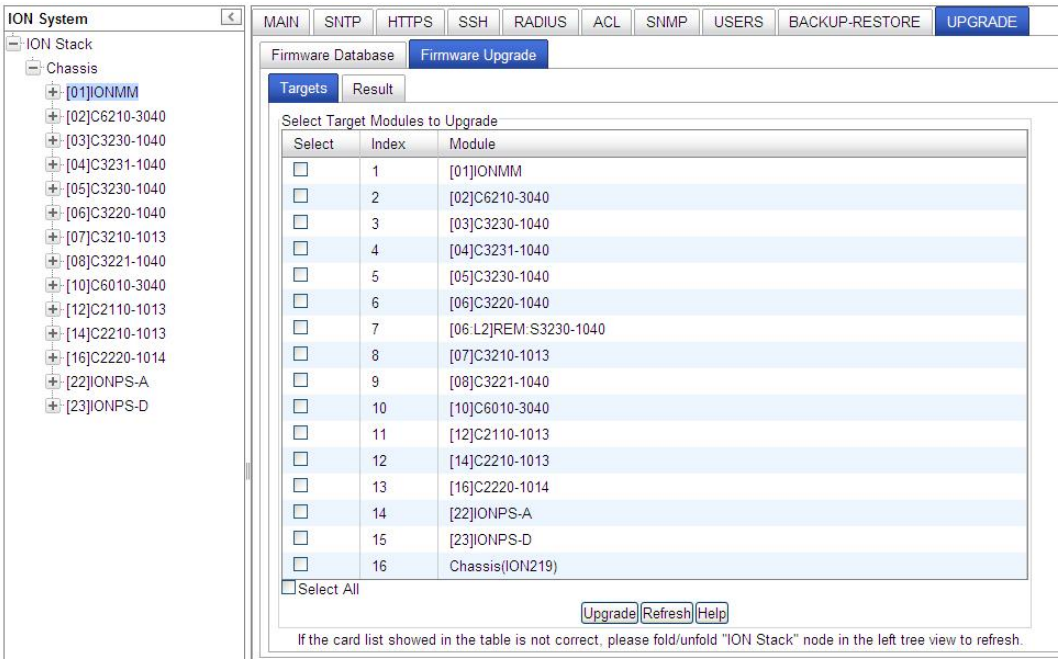
8. If the firmware upload operation failed, the **Upload Result** area displays either:

   - **None**: no operation was performed, or
   - **Failure**: the specified operation has failed.

   The **Upload Result Reason** area displays a description of the cause of the upload 'Failure'. This area is blank if the **Upload Result** displayed is anything other than 'Failure'.

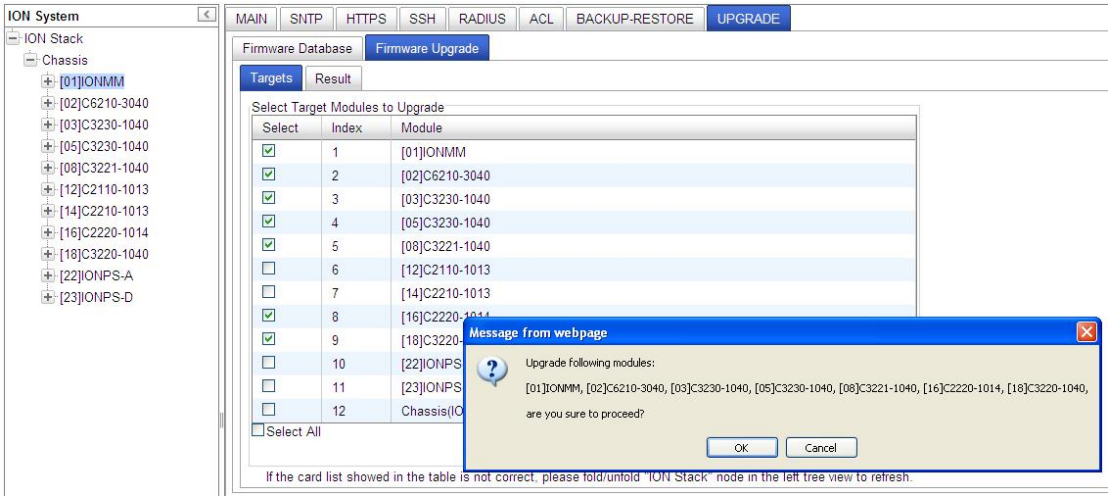
9. Click the **Firmware Upgrade** sub-tab.

10. Click the **Targets** sub-tab if not already displayed. The modules available to be upgraded display in a table.



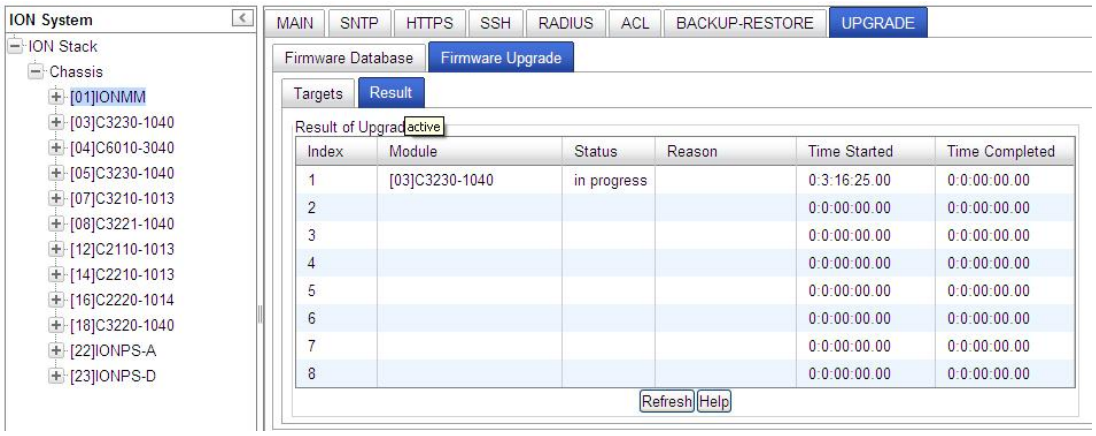
11. In the **Select** column, check the **IONMM** and/or one or more C3210s as the Target Module(s) to be upgraded.

12. Click the **Upgrade** button. A confirmation message displays:

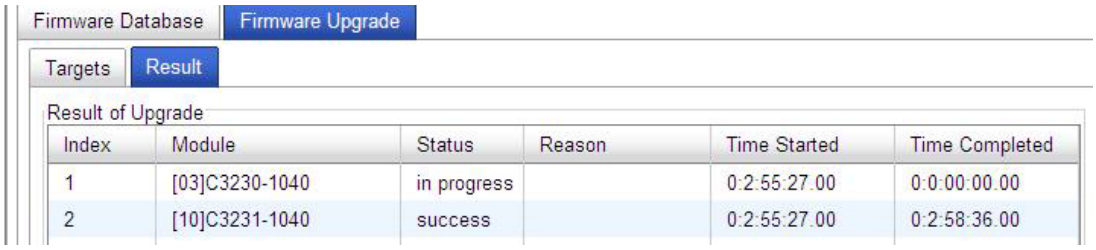


13. Click the **OK** button to proceed.
    During the upload, the message "*Getting records in progress...*" displays.
    If the upload was successful, the message "*Getting all records finished*" displays.
    If the upload was unsuccessful, "*Getting records failed (http server error)*" displays.

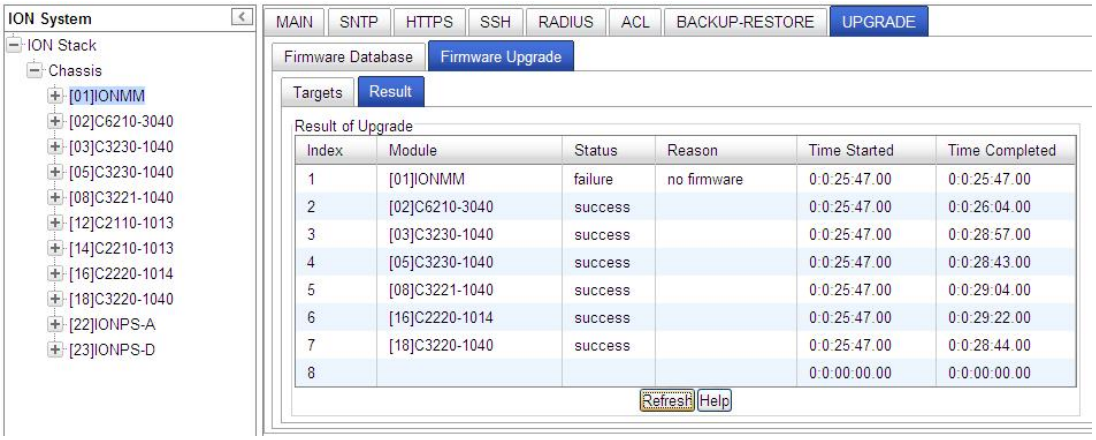
14. Click the **Result** sub-tab. A table displays with upgrade status information.



15. Click the **Refresh** button.



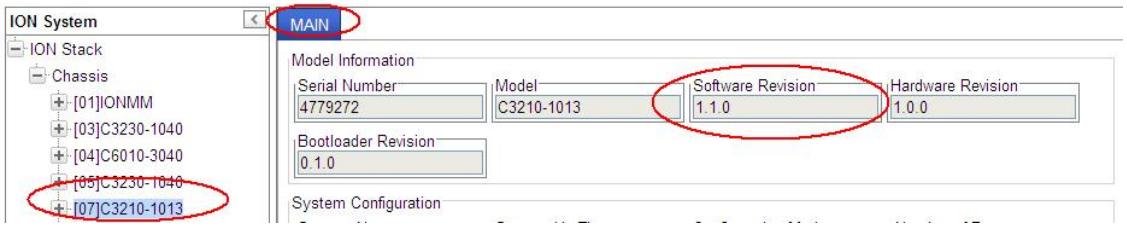
16. If upgrading more than one device, you may have to click **Refresh** again.



Note: the upgrade will take one or more minutes to complete. The exact amount of time for the upgrade depends on the number of modules being upgraded.

17. After the upgrade has successfully completed, "*success*" displays in the **Status** column of the Result sub-tab window. If the upgrade fails, the **Reason** column displays a failure code. See "Section 5 – Troubleshooting" on page 201 for error messages and recovery procedures.

18. Check the **MAIN** tab for each upgraded module to ensure that the correct revision level is displayed in the **Software Revision** field.



The sample screen above shows the C3210 **MAIN** tab with the **Software Revision** field indicating a successful firmware upgrade to version **1.1.0**.

Upgrading Slide-In and Remote Modules Firmware via TFTP

This procedure is used to upgrade one or more of the slide-in modules installed in the ION Chassis or a remote module connected to a slide-in module.

Before you can upgrade the firmware in the ION system modules you must do the following:

- Have the upgrade files resident in the default directory on the TFTP Server (normally *C:/TFTP-Root*). To find the latest version of the firmware, go to: http://www.transition.com/TransitionNetworks/TechSupport/Downloads/Software.aspx.
- Create the Database Index and Archive Files (below).
- Perform the Module Firmware Upgrade (page 299).

Creating the Database Index and Archive Files

The database index file is a listing of the modules that can be upgraded and the firmware file that will be used to upgrade each module. The index file must be named **db.idx**. The archive file is a zip file containing the index file and the firmware upgrade files. The archive file must be named **db.zip** in Windows XP, or just "**db**" in Windows 7.

The following describes the procedure for creating the firmware database index and archive files.

1. Launch the program that will be used to create the index file (**db.idx**).

   Note: a program such as Notepad can be used to create the file.

2. Make an entry for each firmware file to be used for the upgrade in the following format:

   model rev file

   Where:

   model = name of the module
   rev = revision level of the firmware upgrade file
   file = name of the firmware upgrade file

   Note: Each of the three fields must be separated by a single space or a single tab.

   Example: the example below shows a **db.idx** file for a system that has two modules (IONMM and C3210), and no second level remotes.

   ```
   IONMM 1.0.5  IONMM_1.0.5_AP
   C3210  1.1.0  C3210_1.1.0_AP
   ```

3. Save the file as **db.idx**.

   Note: if you used a program, such as Notepad, that does not allow you to save the file as .idx, then save it as a text file and rename it (i.e., change *db.txt* to *db.idx*).

4. Create a zip file that contains each of the upgrade files and the index file. Save the .zip file to the TFTP Server root directory (e.g., filename of **C3210_1.1.0_AP.zip**).

   For example, using the files listed in the example above, the db.zip file would contain the following four files:

   - db.idx
   - C3210_1.1.0_AP
   - IONMM_1.0.5_AP

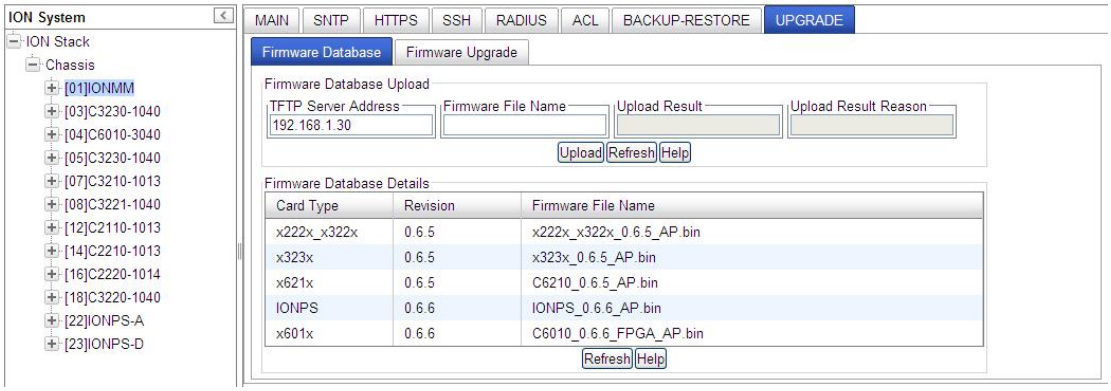
5. Perform the upgrade (see Performing the Module Firmware Upgrade below).

Performing the Module Firmware Upgrade

The upgrade consists of two parts: uploading the archive file to the IONMM, and then loading the upgrade file into the appropriate modules. The following procedure is for upgrading the ION family modules. This procedure assumes that the TFTP server is running and is configured to send and receive transmissions, and that it contains the .zip file created on the previous page.

1. Access the IONMM through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the **Upgrade** tab. The **Firmware Database** sub-tab displays.



3. In the **TFTP Server IP Address** field, enter the IP address of the TFTP Server where the upgrade (zip) file is located.

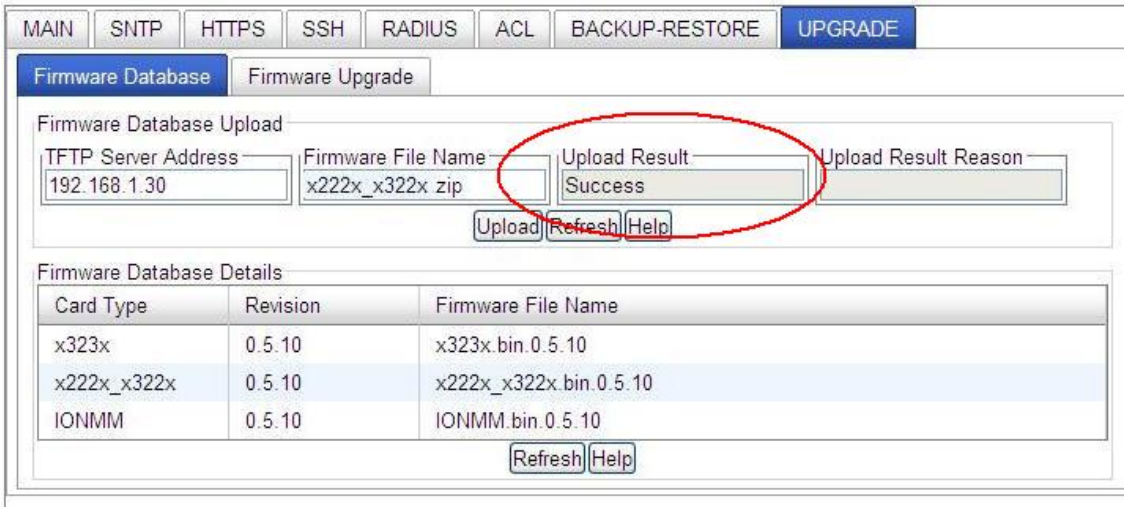
4. In the **Firmware File Name** field, enter the name of the zip file you created (e.g., **x222x / x32xx.bin.10.5.zip**). **Note**: Be sure to include the .zip extension in the filename.

5. Click the **Upload** button.

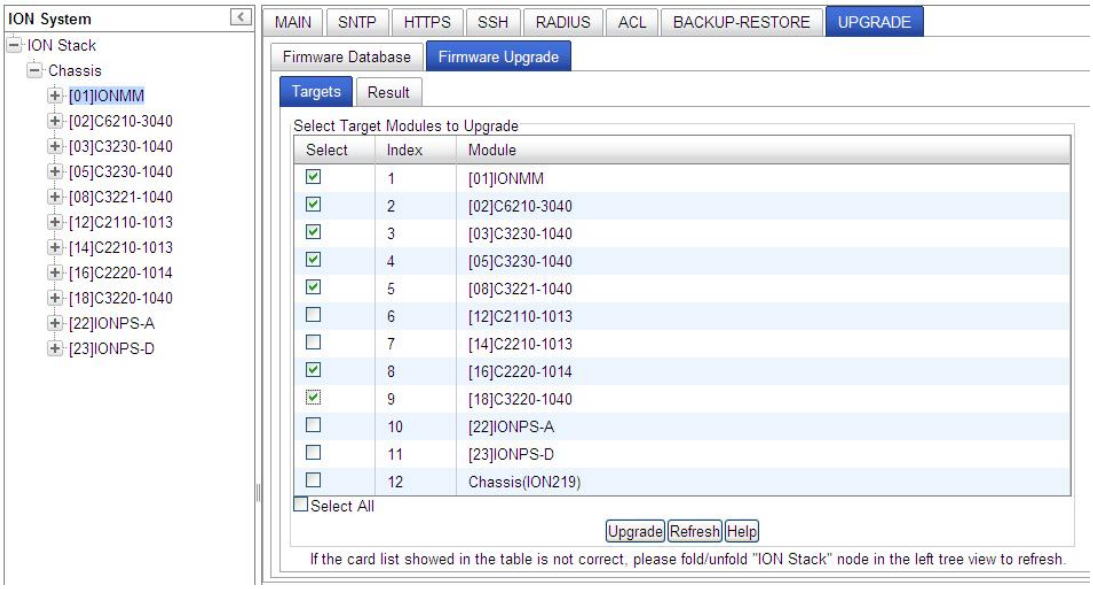
   The firmware file is uploaded from the TFTP server. **Note:** this operation can take several minutes. The amount of time for the upload to complete depends on the size of the file. The messages "*Getting values in progress*" and "*Getting values finished*" display during the upload process.

6. Wait for the file to successfully upload. The messages "*The Firmware Database File is being transferred....*" and "*Getting all records finished*" display during the upload process.

The message "*Success*" displays in the **Upload Result** field and the modules listed in the **db.idx** file will be listed in the **Firmware Database Details** section.



7. Select the **Firmware Upgrade** sub-tab. The **Targets** sub-tab displays.



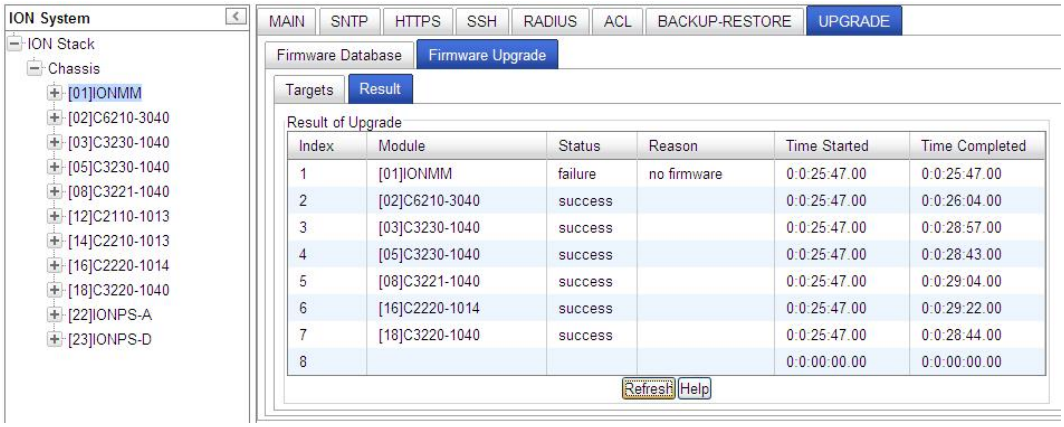
8. In the **Select** column, check the checkbox of each module to be upgraded.

   Note: You **CAN NOT** upgrade a module and a remote module connected to it at the same time. In order to upgrade both, you must first do one and then the other.

9. Click the **Upgrade** button.

10. When the confirmation window displays, click **OK**.

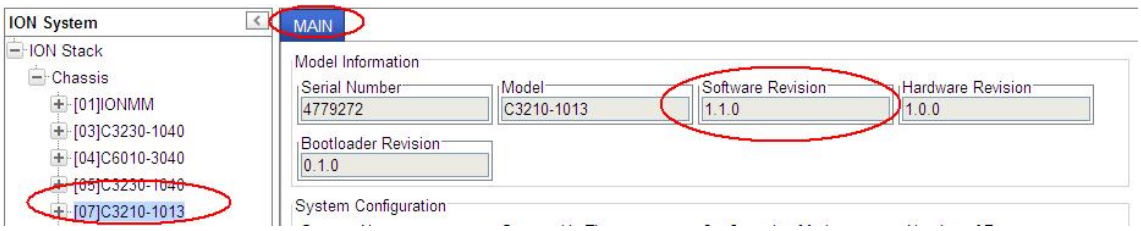
11. To monitor the progress, select the **Result** sub-tab and click **Refresh**.



Note: the upgrade will take one or more minutes to complete. The exact amount of time for the upgrade depends on the number of modules being upgraded.

After the upgrade has successfully completed, "*success*" displays in the **Status** column of the Result sub-tab window. If the upgrade fails, the **Reason** column displays a failure code. See "Section 5 – Troubleshooting" on page 261 for error messages and recovery procedures.

12. Check the **MAIN** tab for each module to ensure that the correct revision level is displayed in the **Software Revision** field.



Firmware Upgrade File Content and Location

The table below shows file content and location resulting from a firmware upgrade.

Table 11: File Content and Location after a Firmware Upgrade

File Type	Filename	File Description	Stored Directory	Lost after Firmware Upgrade? (Y/N)
Provisioning backup files	e.g., '1-1-IONMM.config'	These files are only used by provisioning Restore	/tftpboot	Yes
Net-SNMP configuration file	snmpd.conf	This file is a configuration file for Net-SNMP	/agent3/conf/snmp	No
HTTPS configuration file	lighttpd-ssl.conf	This file is a configuration file for HTTPS	/agent3/conf/lighttpd	No
HTTPS certification file	server.pem	HTTPS certificate	/agent3/conf/lighttpd	No
SSH host key	dropbear_rsa_host_key dropbear_dss_host_key	SSH host key files	/agent3/conf/lighttpd	No
SSH user key file	authorized_keys	Currently we have one 'root' user; this file is the user key file for 'root'	/root/.ssh	Yes
Syslog file	sys.log	The syslog file for IONMM	/tftpboot	Yes (1)
MIB configuration files	e.g., 'agent3.conf' 'ifMib.conf'	The MIB configuration files for SNMP setting	/agent3/conf	No

(1) Exception: after an upgrade from v1.0.3 to v0.5.12, the User Public-Key is not saved. In ION v1.0.3, the user-public key is binding with the Linux root user and is stored in the root file system (/root/.ssh/). This file system will be replaced after this version upgrade, so this key will be lost. You can still log in through SSH, but you must upload the public key again in order to use it. In v 0.5.14, the stored key was moved from the root file system to the application flash area (/agent3/conf). This missing key problem will occur only if you upgrade from 0.5.14 to a later release. In ION versions after 0.5.14, the user-public key is saved after an upgrade.

Transfer Files via Serial Protocol (X/Y/Zmodem) – CLI Method

Use the **serial (get|put|upgrade) protocol=(xmodem|xmodem-1k|ymodem|zmodem)** commands to transfer a file over a serial line. These commands can only be entered at the device level (e.g., when the command line prompt is `C1|S8|L1P1>` or similar). These commands function similar to the TFTP download function; technical support can download configuration files and firmware files through the C3210 USB port by entering the corresponding CLI commands.

General Usage: **serial** (get|put|upgrade) **protocol**=(xmodem|xmodem-1k|ymodem|zmodem) **file**=FILE%s

Perform this procedure to upgrade the C3210 firmware from the CLI.

1. Access the IONMM through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).
2. Sends a request to the server / local file system to download content for a subsequent ***put*** command. Type **serial get protocol zmodem file=xxxx** and press **Enter**.
3. Send a request to the server / local file system to upload content. Type **serial put protocol zmodem file=xxxx** and press **Enter**.
4. Perform a firmware upgrade over the selected serial line. Type **serial upgrade protocol zmodem file=xxxx** and press **Enter**.

For example:

```
C1|S1|L1D>serial ?
  get
  put
  upgrade
C1|S1|L1D>serial get protocol zmodem file=xxxx
Warning: the input file name will be ignored when using ymodem/zmodem
to retrieve file!
now start to transfer the file  ...
Š□CCCCCCCCCCC□□B□B0□□B□B0□□B□B0□□□□B□B0□□B□B0□□B□B0□□□□B□B0□□B□B0□□B□B0
□□B□B0□□B□B0□□B□B0□□B□B0□□B□B0
file transfer failed!
C1|S1|L1D>serial put protocol zmodem file=xxxx
now start to transfer the file  ...
Š□lsz: cannot open /tftpboot/xxxx: No such file or directory
□□B□B0□□B□B0□□B□B0□□
B□B0□□B□B0
Can't open any requested files.
□□B□B0□□B□B0□□B□B0□□B□B0□□B□B0
file transfer failed!
C1|S1|L1D>serial upgrade protocol zmodem file=xxxx
now start to transfer the file  ...
**B000000063f694ceive.**B000000063f694
CCCCCCCCCCCBB0BBBB0BBBB0BBBB0BB0BB0BB0BB0
file transfer failed!
C1|S1|L1D>
```

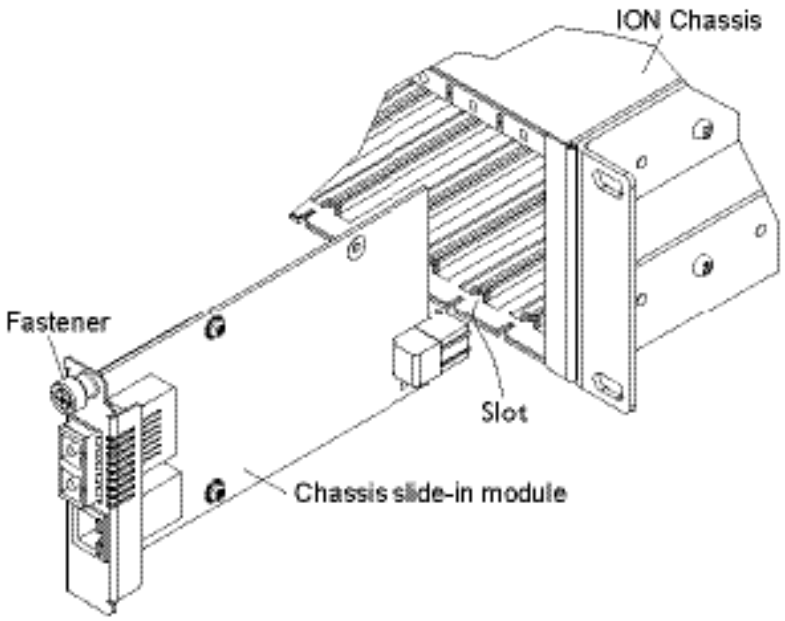
If the serial file transfer causes HyperTerminal (HT) to have problems recognizing ION CLI commands, type **q** and press **Enter**, and then log back in to HT.

Replacing a Chassis Resident C3210

The C3210 is a “hot swappable” device (it can be removed and installed while the chassis is powered on). To replace a chassis resident C3210, do the following.

1. Backup the configuration (see “Backing Up Slide-In and Remote Modules” on page 150).

2. Disconnect any cables attached to the C3210.



3. Loosen the panel fastener by turning it counterclockwise.

4. Pull the C3210 from the ION Chassis.

5. Carefully slide the new C3210 fully into the slot until it seats into the backplane.

6. Push in and rotate the attached panel fastener screw clockwise to secure the C3210 to the ION chassis.

7. Connect the appropriate cables to the C3210.

8. Load the configuration into the new C3210 (see “Restoring Slide-In and Remote Modules” on page 234).

Section 6: Troubleshooting

General

This section provides basic and specific problem determination processes, and a description of problem conditions that may occur or messages that may be displayed. This section also documents ION system tests and C3210 and jumpers, and describes where and how to get technical support.

IMPORTANT

For each procedure described in this section, do each step sequentially as indicated. If the result of a step causes the problem to be corrected, **do not** continue with the other steps in the procedure.

Basic ION System Troubleshooting

This basic process is intended to provide some high-level techniques that have been found useful in isolating ION problems. This process is not a comprehensive guide to troubleshooting the ION system. The intent here is to 1) avoid missing any important information, 2) simplify analysis of captured information, and 3) improve accuracy in finding and explaining problem causes and solutions.

This basic process applies to these ION system and related components:

- ION Chassis
- ION C3210s (SICs, or slide-in-cards)
- IONMM
- ION software (ION System Web Interface or ION command line interface - CLI).
- ION power supply
- ION options (ION SFPs, ION LG Kit, etc.)
- Data cables, electrical cables, and electrical outlets
- Third party network equipment (circuit protection equipment, battery backup, 3rd party client or server software – RADIUS or TFTP, etc.)

When troubleshooting an ION system / network problem on site:

1. Document the operation taking place when the failure occurred.
2. Capture as much information as possible surrounding the failure (the date and time, current configuration, the operation in process at the time the problem occurred, the step you were on in the process, etc.).
3. Start a log of your ideas and actions, and record where you were in the overall scheme of the system process (i.e., initial installation, initial configuration, operation, re-configuration, upgrading, enabling or disabling a major feature or function, etc.).
4. Write down the error indication (message, LED indicator, etc.). Take a screen capture if the problem displayed in software.
5. Start with the most simple and work towards the more complex possible problem causes (e.g., check the network cables and connections, check the device LEDs, verify the C3210s are seated properly, view the CLI **show** command output, verify IP addresses and Gateway IP address, check Windows Event Viewer, ping the interface, run the various tests if functional, etc.).
6. Write down your initial 2-3 guesses as to the cause of the problem.
7. Verify that the TN product supports the function you are attempting to perform. Your particular TN product or firmware version may not support all the features documented for this module. For

the latest feature information and caveats, see the release notes for your particular device/system and firmware release.

8. Use the Web interface or command line interface (CLI) to obtain all possible operating status information (log files, test results, **show** command outputs, counters, etc.)
9. Use the ION system manual procedure to retry the failed function or operation.
10. For the failed function or operation, verify that you entered valid parameters using the cursor-over-help (COH) and/or the ION system manual.
11. Based on the symptoms recorded, work back through each step in the process or operation to recall a point at which the problem occurred, and examine for a possible failure point and fix for each.
12. Document each suspected problem and attempted resolution; eliminate as many potential causes as possible.
13. Isolate on the 1-2 most likely root causes of what went wrong, and gain as much information as you can to prove the suspected cause(s).
14. If you find a sequence of actions that causes the problem to recur, replicate the full sequence several times and document it if possible.
15. Review your logged information and add any other comments that occur to you about what has taken place in terms of system behavior and suspected problem causes and solutions.
16. Review the "Recording Model Information and System Information" section on page 202 before calling TN for support.

Error Indications and Recovery Procedures

The types of indications or messages reported include:

These message types and their recommended recovery procedures are covered in the following subsections.

LED Fault and Activity Displays

Refer to this section if the LEDs indicate a problem. For any LED problem indication:

1. Check the power cord connections and power outlet.
2. Check the data cables for obvious problems, incorrect cable type, incorrect wiring, etc.
3. Make sure the USB cable is properly connected.
4. Check the power supply voltages (see related documentation).
5. Verify that the ION system devices have the latest firmware versions. Download the latest firmware version and upgrade as necessary.
6. Check if other network devices are working properly.

Power (PWR) LED is off (not lit):

1. Check for a loose power cord.
2. Check for a power supply failure. Replace power supply if failed.
3. Make sure all circuit protection and connection equipment and devices are working.
4. Verify that the ION system power supply is within operating range.
5. Remove the card from the chassis and re-insert it. Replace if failed.
6. Make sure the mode displayed matches the hardware setting on the device. See the "Jumper Settings" section on page 222.

LACT (Link Activity) LED off (not lit):

1. Check the data cables for obvious problems, incorrect type, incorrect wiring, etc.
2. See if the administrator has manually disabled the console device (PC) via the Web interface.
3. Check if other network devices are working properly.
4. Remove the suspect card from the chassis and re-insert it.
5. Check Auto-Negotiation setting.
6. See if the port transmission mode / speed (full or half-duplex, etc.) match those of the attached device.
7. Verify that the ION system devices have the latest firmware versions (see "Upgrade the Firmware" on page 120). Download the latest firmware version and upgrade as necessary.

Fault LED is lit:

1. Check for a problem with the IONMM, software, or configuration.
2. Make sure all circuit protection and connection equipment and devices are working.
3. Verify that the ION system power supply is within operating range.
4. Remove the card from the chassis and re-insert it.
5. Make sure the USB cable is properly connected.
6. Reset the IONMM.

TX or RX LED off (not flashing):

1. Check the data cables for obvious problems, incorrect cable type, incorrect wiring, etc.
2. Check if other network devices are working properly.
3. Verify that the ION system devices have the latest firmware versions.
4. Download the latest firmware version and upgrade as necessary.
5. Remove the card from the chassis and re-insert it.

Problem Conditions

Cannot access the IONMM via Telnet
Cannot access the IONMM via the Web
Cannot access the IONMM via USB port
Management Module does not power on
Telnet connection is lost after a CLI command is executed
Upgrade fails
Upload fails
USB connection resets after a CLI command is executed

1. Verify that the default password has not been changed.
2. Check with your IT department that the network is up and running.
3. Refer to the IONMM User Guide for details.

Cannot access the C3210 via the Web Interface

1. Can you access the IONMM?

Yes	No
Continue with Step 2.	See "Cannot access the IONMM via the Web" on page 172.

2. Power cycle the C3210.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot upgrade modules

See Upgrade fails on page 177.

Cannot upload upgrade files

See Upgrade fails on page 177.

Configuration Mode Mismatch

On the device **MAIN** tab, in the **System Configuration** section in the **Configuration Mode** box, the mode displayed does not match the hardware setting on the device.

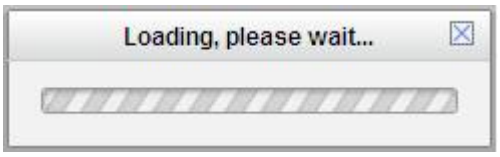
The device may have a jumper or switch that disables software management of the device. When Configuration Mode is **hardware**, the devices take some of the configurations from DIP switches or jumpers on the device. In **software** mode, configuration is controlled by management.

1. Refer to the "Jumper Settings" section on page 312 for details on hardware mode configuration.
2. Contact Transition Networks for more information. Contact Technical Support in the US/Canada at 1-800-260-1312, or International at 00-1-952-941-7600.

Ethernet connection works, but at a very low speed

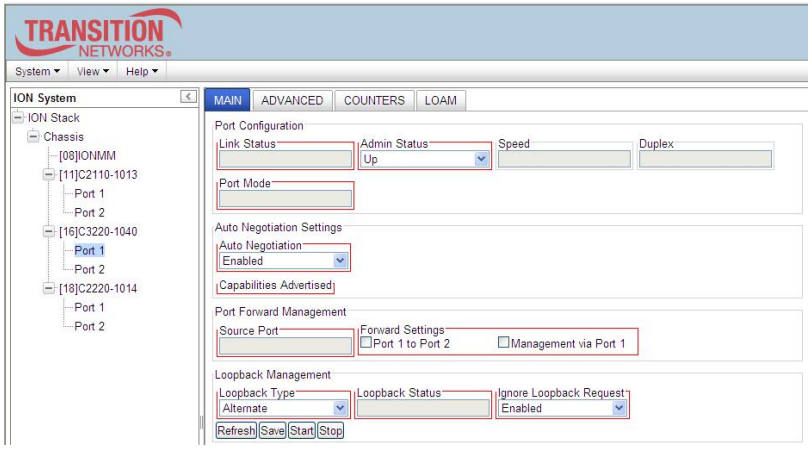
1. Check if the **Auto Negotiate** feature is enabled.
2. If **Auto Negotiate** is enabled, check if one device is using full duplex while the other one is using half-duplex (a duplex mismatch condition). The usual effect of this mismatch is that the connection works but at a very low speed.
3. Change Ethernet connection settings; see "Configuring Auto Negotiation" on page 77.

loading, please wait ... Displays continuously



1. Wait for one or more minutes for the operation to complete.
2. Click the ☒ icon to close the message.
3. Check the parameter entries and retry the operation.
4. Click the **Refresh** button and try the operation again.
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Parameter Boxes Outlined in Red / Cannot Enter Parameters



1. Check if the device is physically connected and powered on..
2. Refresh the IONMM or C3210 by clicking the **Refresh** key.
3. Collapse and then expand the ION System tree (i.e., fold and then unfold the "ION Stack" node in the left tree view) to refresh.
4. Cycle power for the module in question.
5. Upgrade the devices to the latest software version.
6. Reboot the device by clicking the **Reboot** key. Check if the parameter boxes are again outlined in black and that you can enter parameters.
7. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Red box Condition after Reboot

When the reboot is finished, some devices (usually remote devices) will show the error condition of a "red box" around items like IP address, Trap Manager IP addresses, and/or DNS Entries. The ‘red box’ condition occurs while the devices are resetting; this condition can continue several minutes after the reboot. Until the system is ready to be fully managed, certain fields may display within "red boxes". The "red boxes" will disappear when the system is ready to be fully managed.

1. Wait a couple of minutes for the current operation to complete, and then continue operation.

2. Check the devices’ firmware versions. For example, a C2220 has only certain items ‘red boxed’. The IONMM in this case is at latest version and shows certain new functions on the GUI, while the C3210 is at an older version and shows the newer functions as ‘red boxed’. Since the older version of C3210 does not have knowledge of the new features, it will not respond to the IONMM for the new items, and the IONMM shows those items as ‘red boxed’. Upgrade the devices to the latest software version.

3. Reboot the system. See the “Reboot” section on page 115 for more information.

4. Contact Transition Networks for more information. Contact Technical Support in the US/Canada at 1-800-260-1312, or International at 00-1-952-941-7600.

TFTP Server Address is empty or invalid!

1. On a device MAIN tab, in the **TFTP Settings** section, you clicked the **Save Server Address** button with no TFTP Server Address entered, or with an invalid TFTP Server Address entered.

2. Enter a valid **TFTP Server Address** and click the **Save Server Address** button.

Windows XP Cannot Find Drivers For My Device

This error can occur if the information programmed into the device EEPROM do not match those listed in the INF files for the driver. If they do not match, the driver cannot be installed for that device without either reprogramming the device EEPROM or modifying the INF files.

1. Contact Transition Networks for more information. Contact Technical Support in the US/Canada at 1-800-260-1312, or International at 00-1-952-941-7600.

Windows XP Forces a Reboot after Installing a Device

This problem can occur if an application is accessing a file while the New Hardware Wizard is trying to copy it. This usually occurs with the FTD2XX.DLL file.

1. Select not to restart the computer and then unplug and re-plug the device. This may allow the device to function properly without restarting.
2. Restart the computer to allow the device to work correctly.
3. Contact Transition Networks for more information. Contact Technical Support in the US/Canada at 1-800-260-1312, or International at 00-1-952-941-7600.

Driver Installation Fails and Windows XP Gives Error Code 10

Windows error code 10 indicates a hardware error or failed driver installation. This error may appear if a device has insufficient power to operate correctly (e.g. plugged into a bus powered hub with other devices), or may indicate a more serious hardware problem. Also, it may be indicative of USB root hub drivers being incorrectly installed.

1. Contact Transition Networks for more information. Contact Technical Support in the US/Canada at 1-800-260-1312, or International at 00-1-952-941-7600.

Windows XP Displays an Error and then Terminates Installation

If the following screen is displayed with this message, Windows XP has been configured to block the installation of any drivers that are not WHQL certified.

To successfully install the device, you must change the driver signing options to either warn or ignore in order to allow the installation to complete.

1. To change the current driver signing setting, in Windows XP, go to "Control Panel\System", click on the "Hardware" tab and then click "Driver Signing".
2. Select the desired signing option.

For other USB Driver / OS Messages (Win2K, Vista, Windows 7, Linux, Mac) refer to the separate document with Driver / OS install, uninstall and troubleshooting information.

Little indication of an IONPS-D Power Supply failure in Web interface

Meaning: If a power supply is powered down or loses input power, the only indication on the web interface is a Power reading of 0.0. The "Power Status OK" means that the Power Sensor is operating normally, not that the input power is OK.
Recovery: To check the loss of power, check at **IONPS-A** > **MAIN** tab > **Sensor and Fan(s)** section > **Power** value field. See Appendix D: ION Power Supply / DCR / ADP / LG Configuration on page 269 for more information.

User Public-Key Missing after Upgrade from v1.0.3 to v0.5.12

Meaning: In ION v1.0.3, the user-public key is binding with the Linux root user and is stored in the root file system (*/root/.ssh/*). This file system will be replaced after this version upgrade, so this key will be lost.

Recovery: This missing key problem will occur only if you upgrade from 0.5.14 to a later release. In ION versions after 0.5.14, the user-public key is saved after an upgrade. You can still log in through SSH, but you must upload the public key again in order to use it. In v 0.5.14, the stored key was moved from the root file system to the application flash area (*/agent3/conf*).

Problem: "*Unknown command.*" message displays when entering system name/contact/location.
Problem: The **System Name** can not be restored when the system name contains special character "space" in the middle.
Meaning: The "Unknown command." message displays when the system name/contact/location contains a "space" character within the text using the CLI command "**set system name**" or "**set system contact**" or "**set system location**" is entered. The entry for the system contact, system location, and system name must be a text string with no spaces between characters. Note that numbers, upper/lower case characters, and special characters (~!@#$%^&*()_+") are allowed.
Recovery: From the Web interface, at the device's **MAIN** tab in the **System Configuration** section, re-enter the "**System Name**" or "**System Contact**" or "**System Location**", making sure there are no spaces between the text characters.

From the CLI, re-enter the "**set system name**" or "**set system contact**" or "**set system location**" CLI command, making sure there are no spaces between the text characters.

Problem: Bandwidth Ingress fault

Meaning: With rate set at 100Mbps with Full Duplex and Frame Size = 9216 a bandwidth Ingress fault occurs. When Ingress rate limiting is set at or below 512Kbps, the S322x will pass approximately 1 Mbps of traffic. At 768kbps and above rate limiting is working. This problem only happens on Ingress (not Egress) and only happens when connected at 100Mbps Full Duplex. Packets of 1518k or less work fine. This is a known hardware component limitation that only occurs when using very large Jumbo Frame (>5k) and very low bandwidth (≤512k).

Recovery: Change the rate, duplex mode, frame size, packet size, or Ingress Rate Limit. See the related section of this manual for details.

CLI Messages

The following are messages that may appear during CLI (Command Line Interface) operations.

Ambiguous command

A. This message indicates either a) the input for one of the parameters is incorrect, or b) a hyphen is missing between two parts of the command.

1. Verify the CLI command syntax.
2. Retry the operation.

B. You typed part of a valid CLI command and pressed **Enter** before completing the command syntax. For example, if you type

C1|S7|L1D>**add v**

and then press the **Enter** key, the message "*% Ambiguous command.*" displays.

1. Type the part of the command that failed (**add v** in the example above), type a question mark (**?**), and the press **Enter**. The valid commands that start with the part of the command you initially entered are displayed.
2. Verify the CLI command syntax.
3. Retry the operation.

C. The system was unable to resolve the desired command based on the portion of the command entered. For example, you entered the following: `C1|S7|L1D>set dot1`

1. Verify the command syntax.
2. Retry the CLI command syntax.
3. See the *C3210 CLI Reference Manual, 33497*.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Bad advertisement capability!

This message indicates that the capabilities specified for the Set Ethernet Port Advertisement Capability command are not valid choices.

1. Verify the command syntax.
2. Retry the operation. For a complete list of the available commands, see the C3210 CLI Reference Manual, 33497.

3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot get link pass through information on this card

This message indicates that a link pass through (LPT) CLI command was entered for an IONMM. CLI commands for LPT operations are only valid for slide-in modules other than the IONMM. For example:

```
C1|S7|L1D>show lpt config
Cannot get link pass through information on this card!
C1|S7|L1D>
```

1. Use the **go** command to change from the IONMM to the specific slide-in module. The **go** command format is:
   go [c=CHASSIS] [s=SLOT] [l1ap=PORT] [l2ap=PORT] (l1p=PORT|l2p=PORT|l3p=PORT|l1d|l2d|l3d)

2. Retry the operation. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.

3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot get OAM configuration on this port!

This message indicates that a port level command was entered for the IONMM but the command is only valid for the other types of slide-in modules.

1. The C3210 does not support this function. Use another command or switch to a C3210 that supports OAM.
2. For a complete list of the available commands, see the C3210 CLI Reference Manual, 33497.

3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot get port security on this port!

This message indicates that a port level command was entered for the IONMM but the command is only valid for the other types of slide-in modules.

1. Use the **go** command to change location of where the command operates. The **go** command format is: **go [c=CHASSIS] [s=SLOT] [l1ap=PORT] [l2ap=PORT] (l1p=PORT|l2p=PORT|l3p=PORT|l1d|l2d|l3d)**
2. Retry the operation. For a complete list of the available commands, see the C3210 CLI Reference Manual, 33497.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Command incomplete

This message indicates that not all of the required fields were entered for the CLI command.

1. Verify the command syntax. Re-enter the command followed by a question mark (?) with a space between the command and the question mark. The possible keywords that you can enter with the command appear.
2. Retry the operation. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Could not open connection to the host on port 23. Connection failed.

This message indicates that the Telnet server and client are configured for different ports. For Telnet operations the default port is 23.

1. Ensure that the Telnet port is set to 23 for both the server and the client. This will require someone with administrative rights in order to make a change.
2. Add the port number to the Telnet command. Example:

   Telnet <ipaddr> <port#>
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Error: this command should be executed on a device

This message indicates that the CLI command was entered for a port and it is only applicable for a device.

1. Use the **go** command to change location of where the command operates. The **go** command format is: **go [c=CHASSIS] [s=SLOT] [l1ap=PORT] [l2ap=PORT] (l1p=PORT|l2p=PORT|l3p=PORT|l1d|l2d|l3d)**
2. Retry the operation. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Error: this command should be executed on a port

This message indicates that the CLI command was entered for a card and it is only applicable for a port.

1. Use the **go** command to change location of where the command operates. The **go** command format is: **go [c=CHASSIS] [s=SLOT] [l1ap=PORT] [l2ap=PORT] (l1p=PORT|l2p=PORT|l3p=PORT|l1d|l2d|l3d)**
2. Retry the operation. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to get MAC address!

This message indicates that communications to the module can not be established.

1. Verify that the correct hierarchy has been specified in the command (see "Managing Slide-In and Remote Modules Using CLI Commands" on page 49).
2. For all modules (slide-in and remote) check the following:
   - module is properly seated/connected
   - module is powered up
3. Wait 60 seconds then retry the operation.
4. Cycle power for the module in question. **Note:** for slide-in modules, pull the module out so it is no longer connected to the backplane, then slide the module back in, ensuring that it is firmly seated.
5. Retry the operation. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.

6. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to get port type!

This message indicates that a port level command was entered for the IONMM but the command is only valid for the other types of slide-in modules.

1. Use the **go** command to change location of where the command operates.
2. Retry the operation. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Failed to set DHCP client state!

This message indicates a problem in the DHCP setup / configuration.

1. Verify the operation in the "Assigning a Dynamic IP Address" section on page 41.
2. Retry the operation. See the related DHCP command in *the C3210 CLI Reference Manual, 33497*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Failed to set current time
Failed to set SNTP state!
Failed to set SNTP daylight savings time state!
Failed to set timezone!
Failed to set SNTP server
Failed to set SNTP server!
Failed to set system contact
Failed to set system name
Failed to set system location!

These messages indicate a problem in the SNTP setup / configuration.

1. Make sure this is the command / function you want.
2. See the commands in *the C3210 CLI Reference Manual, 33497*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Error location parameter number!
Error: parameter out of range, chassis-id range is (0 .. 15)!)
Error: parameter out of range, slot-id range is (1 .. 32)
Error: parameter out of range, slot-id range is (0 .. 32)
Incomplete location command!

This message indicates that one or more parameters for the **go** command are missing. The go command was entered to set location parameters, but the module, slot and/or port value(s) were no included in the command string.

The go command can operate on a local or remote card/port, and you must give the last parameter to specify the target is a port or device. For example, the input go c=1 s=14 does not include the port parameter, so the CLI module displays "Incomplete location parameters".

1. Verify the command syntax.
2. Re-enter the go command and be sure to include all of the location parameters (chassis / slot / port) in the format:
   go [c=<1-16>] [s=<1-32>] [l1ap=<1-15>] [l2ap=<1-15>] (l1p=<1-5>|l2p=<1-15>|l3p=<1-15>|l1d|l2d|l3d)
   for a slide in card, or
   go [c=<0-16>] [s=<0-32>] [l1ap=<1-15>] [l2ap=<1-15>] (l1p=<1-5>|l2p=<1-15>|l3p=<1-15>|l1d|l2d|l3d)
   for a standalone card.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Invalid location parameters, cannot find the physical entity!

This message indicates that the system can not detect the presence of the device or port specified in the **go** command.

1. Verify that the correct hierarchy has been specified in the command (see "Managing Slide-In and Remote Modules Using CLI Commands" on page 29).
2. For all modules (slide-in and remote) check the following:
   - module is properly seated/connected
   - module is powered up
3. Wait 60 seconds then retry the operation.
4. Cycle power for the module in question. **Note:** for slide-in modules pull the module out so it is no longer connected to the backplane, then slide the module back in, ensuring that it is firmly seated.
5. Retry the operation.
6. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Invalid user!

This message indicates that the specified user is not valid.

1. Verify the user.
2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Login incorrect

This message indicates that either the login or password entered while trying to establish a USB or Telnet connection is incorrect.

1. Verify the login/password.

   Note: the login and password are case sensitive. The default login is **ION** and the default password is **private**.

2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

No DMI support on this port!

This message indicates that you entered a DMI command for a port that does not support DMI.

1. Verify that the port supports DMI. For Transition Networks C3210s and SFPs, the model number will have a “D” at the end.
2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

There is no matched command

This message indicates that there is no such command available on this system.

1. Verify the command syntax.
2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Unable to open xx. Please check your port settings.

This message indicates that HyperTerminal no longer recognizes which COM port to use for its connection.

1. Check that the USB cable is connected to the management station and the IONMM.
2. Check that the COM port is listed for the device manager on the management station.
   a) On the desktop, right-click on **My Computer**.
   b) Select **Manage**.
   c) Click **Device Manager**.
   d) In the right panel, expand the list for **COM & LPT**.
3. Is the COM port in the list?

Yes	**No**
Continue with step 4.	Restart the management station (PC).

4. In the HyperTerminal window, select **File>Properties**.
5. Check that the correct port is listed in the **Connect using** field.
6. Restart the management station.
7. Reboot the IONMM.
8. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Error, you should first give full location parameters

The location value is incomplete; it is missing the module, slot and/or port value(s). This message can display when a device-level command is entered (e.g., **show lpt config**).

When you change a bigger container, the value of smaller object is cleared. For example, originally the operated object is Chassis=1, slot=4, L1AP=1 L2AP=2 L3D, and then when the command chassis 3 is entered. This automatically sets the value of module, slot and port to 0.

If the value of module, slot and port are not set in later commands, and then you run a device-level command (e.g., **show lpt config**), this error message displays.

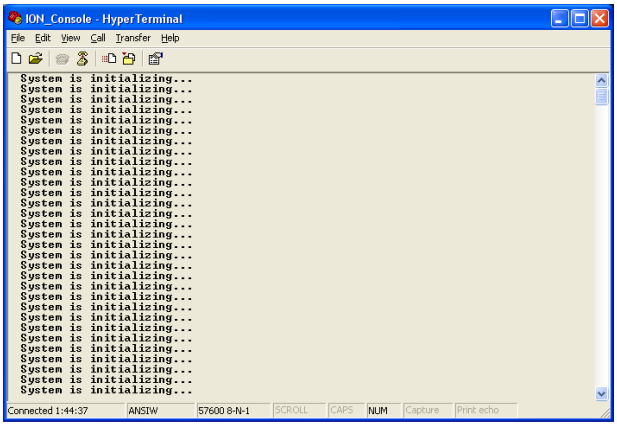
Enter the **go** command and be sure to include all of the location parameters.

go [c=<1-16>] [s=<1-32>] [l1ap=<1-15>] [l2ap=<1-15>] (l1p=<1-5>|l2p=<1-15>|l3p=<1-15>|l1d|l2d|l3d)

for a slide in card.

System is initializing...

CLI is receiving continuous error message "*system is initializing...*"



1. Wait for a few minutes for the message to clear.
2. Cycle power to the IONMM.
3. Retry the operation.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

This command is only available on <x222x / x32xx> card!

1. Verify the command entered is the one you want.
2. Verify that the device for the command entered can support the function of the command.
3. Retry the operation.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Error: this command should be executed on a port!

1. Verify the command entered is the one you want.
2. Change to the desired port; enter the **go** command with all of the location parameters (chassis / slot / port).
3. Retry the operation from the port (i.e., type **show fwd portlist** and press **Enter**).

Unknown command!

The command you entered is not supported, or you entered the wrong command format / syntax.

1. Verify the CLI command syntax.
2. Retry the operation.
3. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

There is no matched command.

The command you entered is not supported, or you entered the wrong command format / syntax.

1. Verify the CLI command syntax.
2. Retry the operation.
3. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Error location parameter number!

The **go** command you entered had an invalid or missing parameter.

1. Enter the **go** command with all of the location parameters (chassis / slot / port) in the format:

```
go [c=CHASSIS] [s=SLOT] [l1ap=PORT] [l2ap=PORT] (l1p=PORT|l2p=PORT|l3p=PORT|l1d|l2d|l3d)
```

Fail to set link pass through state!

You tried to set the LPT state to an unacceptable state. For example, you typed:

```
C1|S3|L1D>set lpt state=enable
```

and then pressed **Enter**.

1. Verify the CLI command syntax.
2. Check the **set lpt monitor-port** and **set selective lpt state** command settings.
3. Enter the **show lpt config** command and in the Link Pass Through configuration, check if the Link pass through state is set to **notSupported** or if the **Remote fault detect state** is set to **notSupported**.

   If either is set to **notSupported**, change the setting to enable (e.g., type **set rfd state enable** and press **Enter**).
4. Retry the operation.
5. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497.*
6. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

TFTP transfer failed!

1. The attempted firmware upgrade via the **tftp upgrade** command was unsuccessful.
2. Verify the CLI command syntax.
3. Verify the firmware version.
4. Be sure the TFTP server is configured and running.
5. Check that the remotefile is in the proper location (e.g., the file *x222x / x32xx.bin.0.5.4* is at *C:\TFTP-Root*).
6. Retry the operation. See the **tftp upgrade** command in the *C3210 CLI Reference Manual, 33497.*
7. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to transfer the file!

The file transfer attempt failed. The command you entered to do a tftp file transfer was unsuccessful (e.g., **tftp get** or **tftp put** or **tftp transfer**).

1. Check the command syntax. See "TFTP Commands" page on page 117.
2. Make sure the TFTP server is configured and running.
3. Verify the filename to be transferred and the IP address of the TFTP server.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to transfer the file!
tftp get: set address type failed.
tftp put failed.
The file transfer attempt failed. The command you entered to do a tftp file transfer was unsuccessful (e.g., tftp get or tftp put or tftp transfer). For example:

```
C1|S4|L1D>tftp get iptype ipv4 ipaddr 192.168.1.30 remotefile xxxx
tftp get: set address type failed.
C1|S4|L1D>tftp put iptype ipv4 ipaddr 192.168.1.30 localfile xxxx
tftp put failed.
C1|S4|L1D>tftp upgrade iptype ipv4 ipaddr 192.168.1.30 remotefile xxxx
tftp get: set address type failed.
```

1. Check the command syntax. See "TFTP Commands" page on page 157.
2. Make sure the TFTP server is configured and running.
3. Verify the filename to be transferred and the IP address of the TFTP server.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot set remote fault detect state on this card!

The attempted **set rfd state** command was rejected: `C1|S7|L1D>set rfd state enable`

1. Verify that the card you entered the command on supports this function. See Set RFD State on page 150.
2. Retry the operation. See the **dot1bridge aging-time** command in the *C3210 CLI Reference Manual, 33497.*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to set aging time!

The attempted **set dot1bridge aging-time** command was not able to complete.

1. Verify the **dot1bridge aging-time** command syntax. See Configure Forwarding Learning Aging Time on page 141.
2. Retry the operation. See the **dot1bridge aging-time** command in the *C3210 CLI Reference Manual, 33497*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Get aging time failed!

The attempted show dot1bridge aging-time command failed to complete.

1. Verify the **dot1bridge aging-time** command syntax. See Configure Forwarding Learning Aging Time on page 131.
2. Retry the operation. See the **dot1bridge aging-time** command in the *C3210 CLI Reference Manual, 33497*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

CLI command remove fwddb all failed

The attempted C3220-1040 Backup/Restore failed during the restore; the restore displays "ongoing" status, and will not succeed.

The dynamic MAC address should not be backed up or restored - only static entries should be backed-up and restored.

1. Retry the operation. See "Backup/Restore Operations" on page 126.
2. See the *C3210 CLI Reference Manual, 33497*.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

The format of Ethtype value should like 0x8810, 0x88a8 etc.

The attempted CLI command entry failed (e.g., `set dot1bridge`).

1. Retry the operation with the correct parameter entry.
2. See the *C3210 CLI Reference Manual, 33497* for the full set of available command parameters.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Redundancy is not supported on this card!

The attempt to set or show fiber redundancy failed. For example, you entered the command: **show redundancy info**, but the device does not support fiber redundancy.

1. Verify that the card you entered the command on supports this function.
2. Retry the operation on a card that supports this function. See the "Fiber Redundancy Commands" section of the related manual.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Invalid user!

You entered the command **show ssh public-key user admin**, but specified the wrong user (e.g., you typed **admin** instead of **root**).

1. Retry the operation using the correct user information. See "Show SSH Public Key of a User" on page 116.
2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to set SSH server state!

You entered the command **set ssh server state=enable**, but have not generated an ssh host key.

1. This command / function is not supported on the C3210. Try a different command or switch to another device that supports this command / function.
2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to set management VLAN id!
Fail to set management VLAN state!

You entered the command **set mgmt vlan state** or **set mgmt vlan port** or **set mgmt vlan vid** to enable or configure Management VLAN, but the operation failed.

1. Verify the VLAN Management configuration using the **show vlan** command and the **show vlan service** command.
2. Review the set mgmt vlan command syntax for the port / state / vid. See the "VLAN Commands" on page 129.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Upgrade is only supported on IONMM card!

You entered a firmware *upgrade* or firmware *update* command from a device other than the IONMM. For example:

```
C1|S3|L1D>show firmware upgrade result
C1|S3|L1D>show firmware-db update result
C1|S3|L1D>show upgrade firmware file
C1|S3|L1D>update firmware-db file cert
C1|S3|L1D>upgrade module
```

1. Make sure of the command you want to enter. See "Firmware Upgrade Commands" on page 167.
2. Use the **home** command to go to the IONMM device.
3. Re-enter the firmware upgrade command from the IONMM.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot set bandwidth alloc type on this card!

You entered the command **set bw alloc-type countAllLayerx** on a card that does not support it. For example:

```
C1|S7|L1P1>set bw alloc-type countAllLayer2
Cannot set bandwidth alloc type on this card!
```

1. Verify if the card supports bandwidth allocation.
2. Use the **go** command to switch to a different card and switch to the port level.
3. Verify the command entry. See "Bandwidth Commands" on page 53.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot set ingress and egress rate on this card!

You entered the command **set irate=xx erate=xx** on a card that does not support it. For example:

```
C1|S7|L1P1>set irate noLimit erate noLimit
Cannot set ingress and egress rate on this card!
```

1. Verify if the card supports rate limiting.
2. Use the **go** command to switch to a different card and switch to the port level.
3. Verify the command entry. See "Bandwidth Commands" on page 53.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

DMI is only supported on FIBER port!

You entered the command **show dmi info** on a card that does not support it. For example:

```
C1|S7|L1P1>show dmi info
DMI is only supported on FIBER port!
```

1. Verify if the card supports DMI.
2. Use the **go** command to switch to a different card port supporting Fiber.
3. Verify the command entry. See "DMI Commands" on page 55.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Link OAM is not supported on this card!

You entered the command **show oam rx loopback control** on a card that does not support it.
For example:

```
C1|S7|L1P1>show oam rx loopback control
Link OAM is not supported on this card!
```

1. Verify if the card supports loopback.
2. Use the **go** command to switch to a different card port supporting loopback.
3. Verify the command entry. See "OAM Commands" on page 58.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot clear loopback counters on this card!
Cannot set administrate state on this port!
Cannot set advertisement capability on this port!
Cannot set autocross on this card!
Cannot set auto negotiation state on this port!
Cannot set Ethernet port speed for this card!
Cannot set Ether port duplex mode on this card!
Cannot set far end fault on this card!
Cannot set filter unknown dest multicast frames on this port!
Cannot set filter unknown dest unicast frames on this port!
Cannot set pause on this port!
Cannot set source address lock action on this port!
No Time-domain reflectometer support on this card!
Cannot get port security configuration on this port!
Fail to get MAC control frames statistics!
Cannot show forwarding port list on this card!
Cannot show slot info on this card!
Cannot show USB port state on this card!
Cannot show USB port configure on this card!
Cannot show TP port cable length on this card!
Cannot set management VLAN on this card!
Cannot set PHY mode on this port!
Cannot clear counters on this port!
Cannot reset all ports' counters on this cards!

You entered a command (e.g., **clear ether all counters**) for a function not supported on the card. For example:

```
C1|S7|L1P1>clear ether all counters
Cannot clear loopback counters on this card!
```

1. Verify if the card supports the desired function. See Table 3 in the section "Ethernet Port Commands" on page 64.
2. Use the **go** command to switch to a different card port supporting loopback.
3. Verify the command entry. The command functions include 1) admin, 2) adv-cap, 3) autocross, 4) autoneg, 5) duplex, 6) fef, 7) filter-unknown-multicast, 8) filter-unknown-unicast, 9) loopback, 10) pause, 11) speed, and 12) src-addr-lock, 13) tdr, 14) ether security config, 15) fwddb, etc.

Cannot show port QoS configuration in this card!
Cannot show port QoS priority remapping in this card!
Cannot set tag type for priority in this card!
Cannot set default priority in this card!
Cannot set IEEE tag for priority in this card!

You entered a QOS command for a function not supported on the card. For example:

```
C1|S7|L1P1>show qos config
Cannot show port QoS configuration in this card!

C1|S7|L1P1>show qos priority remapping
Cannot show port QoS priority remapping in this card!
```

1. Verify if the card supports the desired function.
2. Use the **go** command to switch to a different card port supporting loopback.
3. Verify the command entry. See "QoS Commands" on page 98.

Cannot get VLAN database configuration on this card!

You entered a VLAN command for a function not supported on the card. For example:

```
C1|S7|L1D>show vlan
Cannot get VLAN database configuration on this card!
C1|S7|L1D>show vlan service
Cannot show VLAN service configuration on this card!
```

1. Verify if the card supports the desired function.
2. Use the **go** command to switch to a different card port supporting VLAN.
3. Verify the command entry. See "VLAN Commands" on page 160.

Fail to get system name!

You entered a command for system information, but the information on the card was not available. For example:

```
C1|S10|L1D>show card info
Fail to get system name!
```

1. Try entering the **show cardtype** command.
2. Select the **MAIN** tab > **System Configuration** section **>** **System Name** field, and verify the name and for the device.
3. Use the **set system name** command to enter the **System Name** information (e.g., **set system name**=NAME). Make sure no spaces are included in the name text.
4. Remove and reset the card.
5. Try the operation again.
6. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Set system name timeout.

You entered a command to define system information, but the information on the card was not accepted. For example:

```
C1|S10|L1D>set system name C3231
Set system name timeout.
```

1. Use the set system name command to enter the System Name information (e.g., **set system name=NAME**) without any special characters (e.g., without the ! or # or % or & characters).
2. Remove and reseat the card.
3. Try the operation again.
4. Select the **MAIN** tab > **System Configuration** section **> System Name** field, and verify the name for the device (e.g., no spaces between characters).
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

System is busy, please retry this command later!

You entered a **show** or **set** command, but the command was not accepted by the system. For example:

```
C1|S10|L1D>show https config
System is busy, please retry this command later!
C1|S10|L1D>
```

1. Wait 1-2 minutes and then retry the command.
2. Reboot the system and then retry the command.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Get HTTPS state no such object.
Get management VLAN state no such object.
IP management state no such object.

You entered a **show** or **get** command, but the command was not accepted by the system. For example:

```
C1|S10|L1D>show https config
HTTPS configuration:
------------------------------------------------------------------------
Get HTTPS state no such object.
C1|S10|L1D>show mgmt vlan config
vlan id   vlan state          vlan portlist
------------------------------------------------------------------------
Get management VLAN state no such object.
C1|S10|L1D>show ip-mgmt config
IP management configuration:
------------------------------------------------------------------------
IP management state no such object.
```

1. Wait 1-2 minutes and then retry the command.
2. Verify if the card supports the desired function.
3. Use the **go** command to switch to a different card / port supporting the desired feature.
4. Verify the command entry. Reboot the system and then retry the command.
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Warning: this command will restart system, connection will be lost and please login again!
Warm start failed.

You entered a **reboot** command, but the reboot was unsuccessful.

1. Wait 1-2 minutes and then retry the command.
2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

4 packets transmitted, 0 packets received, 100% packet loss

The attempted ping command failed. For example:

```
PING 192.168.1.10 (192.168.1.10): 56 data bytes
--- 192.168.1.10 ping statistics ---
4 packets transmitted, 0 packets received, 100% packet loss
```

1. Verify the IP address.
2. Check the cable connection.
3. Refer to the **Ping** command section.
4. Retry the command.
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Ping command can only be used on management card!

The attempted ping command was not accepted by the system. For example:

```
C1|S5|L1D>ping 192.168.1.30
Ping command can only be used on management card!
```

1. Use the **go** command to switch to the IONMM card.
2. Refer to the **Ping** command section.
3. Retry the command.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Only 100M fiber port can set far end fault!

The attempted far end fault command was not accepted by the system. For example:

```
C1|S16|L1P1>set ether fef enable
Only 100M fiber port can set far end fault!
```

1. Use the **go** command to switch to the 100M fiber port.
2. Re-enter the **fef** command.
3. Use an alternate Ethernet test command in place of the **fef** command.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Can not set 1000M speed for this card!

You tried to use the **set ether speed** command to set the device's speed to 1000 Mbps (1 Gbps), but the card you entered the command on does not support this speed. For example:

```
C1|S16|L1P1>set ether speed=1000M
Can not set 1000M speed for this card!
C1|S16|L1P1>
```

1. Use the **set ether speed ?** command to determine the card's speed capabilities.
2. Re-enter the **set ether speed= command** with a speed supported by the card.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to set Ethernet port speed!

You tried to use the **set ether speed** command to set the device's speed, but the command was not accepted. For example:

```
C1|S16|L1P1>set ether speed 1000
Fail to set Ethernet port speed!
C1|S16|L1P1>
```

1. Verify the command syntax; for example maker sure you entered "10M" or "100M", etc.
2. Use the **set ether speed ?** command to display the card's speed capabilities.
3. Re-enter the **set ether speed= command** with a speed supported by the card.
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Invalid pause value!

You tried to use the **set ether pause** command to set the device's pause mode / value, but the value was not accepted. For example:

```
C1|S16|L1P1>set ether pause=bpause
Invalid pause value!
```

1. Use the **set ether pause ?** command to display the card's pause capabilities.
2. Configure the device for full duplex mode; only stations configured for full duplex operation can send pause frames.
3. Select another pause type – nopause, apause (asymmetric), bpause (asym/sym), pause (the port will advertise it has pause capability), or spause (symmetric).
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Current VLAN tagging mode is not 'provider'!

You tried to set the port VLAN tag type, but the current tag mode doesn't match. For example:

```
C1|S16|L1P2>set port vlan tag provider ethtype=x8100
Current VLAN tagging mode is not 'provider'!
```

1. Set the VLAN tag mode to the desired mode using the **set port vlan tag mode** command.
2. Verify if the card supports the desired function.
3. Use the **go** command to switch to a different card / port supporting the desired feature.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot set VLAN network tagging on this port!

You tried to set the port's VLAN tag type, but the device does not support it. For example:

```
C1|S16|L1P2>set port vlan tag network tagging addTag
Cannot set VLAN network tagging on this port!
```

1. Make sure this is the command / function that you wanted.
2. Use the **go** command to switch to a device that supports VLAN tagging.
3. Try entering the **set port vlan tag** command again.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot show system information on this card!

You entered the **show system information** command from an unsupported device. For example:

```
C1|S22|L1D>show system information
Cannot show system information on this card!
```

1. Use the **go** command to switch to a different device (e.g., from the Power Supply to the IONMM or an x323x card).
2. Try entering the **show system information g** command again.

3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to set management VLAN id!

You tried to set the Management VLAN ID, but the VLAN ID was not accepted. For example:

```
C1|S18|L1D>set mgmt vlan port=2
Fail to set management VLAN id!
```

1. Verify the Management VLAN state setting (**set mgmt vlan state** command).
2. Verify the Management VLAN port setting (**set mgmt vlan port** command).
3. Try setting the Management VLAN ID again.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Invalid forward port list!

You entered an invalid parameter in response to a prompt (e.g., for a module number for firmware upgrade). For example:

```
C1|S7|L1D>upgrade module
Available modules:
index     module                                    loc
-------------------------------------------------------------------------
1         ION219                                    c=1 s=0 l1d
2         C3230-1040                                c=1 s=3 l1d
3         C3230-1040                                c=1 s=5 l1d
4         S3230-1040                                c=1 s=5 l1ap=2 l2d
5         IONMM                                     c=1 s=7 l1d
6         C3231-1040                                c=1 s=10 l1d
7         C2220-1014                                c=1 s=16 l1d
8         C3220-1040                                c=1 s=18 l1d
9         IONPS-A                                   c=1 s=22 l1d

Choose the module you want to upgrade: (eg. 1,3,16; at most 8 modules
to upgrade, press 'q' to exit upgrade)
show card info

Invalid forward port list!
```

1. Re-enter the command, wait for the prompt, and then enter a response in the correct syntax.
2. See the related command / function section of this manual.
3. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

L2CP is not supported on this card!

You tried to perform an L2CP function but the device does not support L2CP.

1. Make sure this is the command / function that you wanted.
2. Use the **go** command to switch to a device that supports L2CP.
3. Try entering the command again. See "Configuring L2CP" on page 268.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Please reboot the card for the changes to take effect!

You made a change that requires a system reboot in order for the change to take affect. For example:

```
C1|S5|L1D>set snmp traphost svr 1 type ipv4 addr 192.168.1.30
Please reboot the card for the changes to take effect!
C1|S5|L1D>
```

1. Reboot the card. See the "Reboot" section on page 292.
2. Continue the operation.
3. If a problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Get DMI identifier no such object.

You entered the CLI command to display DMI information, but it was not available. For example:

```
C1|S3|L1P2>show dmi info
Get DMI identifier no such object.
C1|S3|L1P2>
```

1. Make sure this is the command / function that you wanted.
2. Try entering the command again. See "DMI (Diagnostic Maintenance Interface) Parameters" on page 395.
3. If a problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Get SNMP version no such object.

You entered the CLI command to display SNMP configuration information, but it was not available. For example:

```
C1|S3|L1D>show snmp config
SNMP configuration:
--------------------------------------------------------------------------
Get SNMP version no such object.
C1|S3|L1D>
```

1. Make sure this is the command / function that you wanted.
2. Verify the command syntax. See "Configuring SNMP" on page 245.

3. For complete command descriptions, see the *C3210 CLI Reference Manual, 33497*.
4. Try entering the command again. See "DMI (Diagnostic Maintenance Interface) Parameters" on page 395.
5. If a problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to get cable length

You entered a VCT test / show cable length command but the Time Domain Reflector (TDR) test failed. For example, you entered **start ether tdr test** and pressed **Enter**.

1. Make sure the device supports the VCT Test (TDR Test) or the **show cable length** command (available for x2110).
2. Make sure you enter the Time Domain Reflector (TDR) test on an Ethernet copper port.
3. Verify the command syntax. See "Virtual Cable Test (VCT)" on page 409.
4. Type **show ether tdr config** to show the Ethernet port TDR Test configuration.
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Can not set speed on this port!

You entered the CLI command to define the C3210 port's operating speed, but the command failed. For example:

```
C1|S5|L1P2>set ether speed 100M
Can not set speed on this port!
C1|S5|L1P2>
```

1. Verify the C3210 supports this speed.
2. Verify the command syntax.
3. Re-enter the **set ether speed=** command with a speed supported by the card.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Fail to set port advertisement capability!

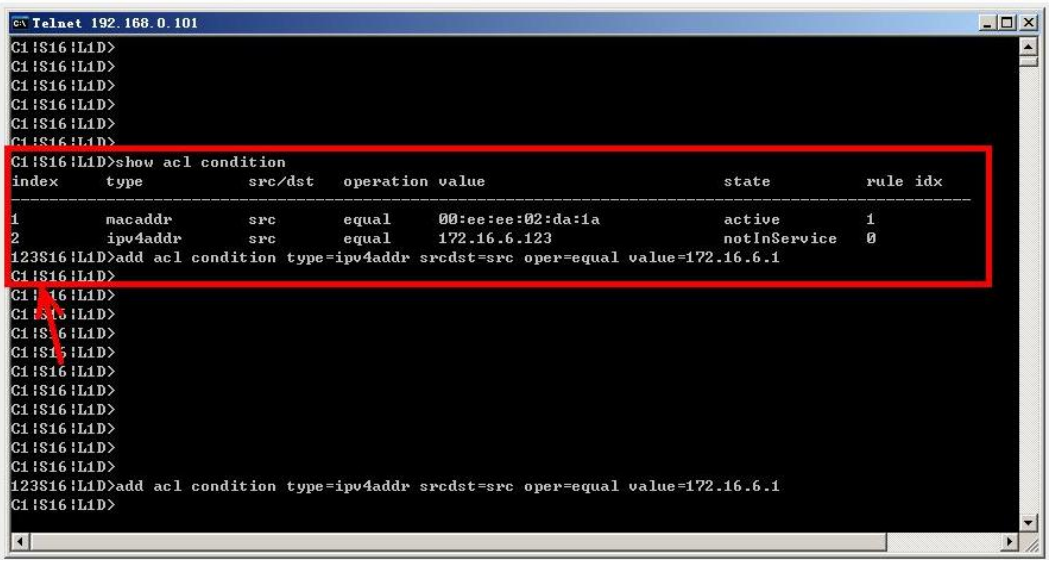
This message indicates that the capabilities specified for the Set Ethernet Port Advertisement Capability (set ether adv-cap) command are not valid choices. For example:

```
C1|S5|L1P2>set ether adv-cap 1000XFD
C1|S5|L1P2>set ether adv-cap 1000XHD
Fail to set port advertisement capability!
C1|S5|L1P2>
```

1. Verify the C3210 supports this capability.
2. Verify the command syntax.
3. Retry the operation. For a complete list of the available commands, see “Appendix A: CLI Command Summary” on page 174.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Long Command Causes Cursor Wrap to Same Line

When the input command reaches the input max length, the cursor does not return to the next line, but back to the beginning of the same line, overwriting the original data.



1. Press the Enter key towards the end of the command string and continue entering command text.
2. Try using HyperTerminal or the Web interface, at least temporarily.
3. Contact Transition Networks for more information. Contact Technical Support in the US/Canada at 1-800-260-1312, or International at 00-1-952-941-7600.

Please change to power supply slot first before showing its configure!

You entered the show power config command from a device other than the power supply. For example:

```
C1|S16|L1D>show power config
Please change to power supply slot first before showing its configure!
C1|S16|L1D>
```

1. Make sure this is the command you want.
2. Verify the command syntax.
3. Use the go command to switch to the slot containing the power supply (typically slot 22 and/or 23).
4. Contact Transition Networks for more information. Contact Technical Support in the US/Canada at 1-800-260-1312, or International at 00-1-952-941-7600.

Auto-negotiation is enabled, you can not set port speed now!

You entered a command to set the port speed, with the Auto-negotiation feature enabled; the Auto-negotiation function takes precedence.

1. Make sure of the port speed that you want.
2. Use the **set ether autoneg state** command and/or the set ether speed command as required.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot create VLAN database on this card!

This model of NID does not support the VLAN database. For example:

```
C1|S7|L1D>add vlan-db vid 2 priority=5 pri-override=enable
Cannot create VLAN database on this card!
C1|S7|L1D>
```

1. Make sure this is the function that you want.
2. Use the go command to switch to a NID that supports the VLAN database.
3. Re-enter the **add vlan-db** command.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot remove vlan on this card!

You entered a command to delete one or all VLANs from the NID, but the action cannot be performed. For example:

```
C1|S7|L1D>remove vlan all
Cannot remove vlan on this card!
C1|S7|L1D>remove vlan vid=3
Cannot remove vlan on this card!
C1|S7|L1D>
```

1. Make sure this is the function that you want.
2. Use the **go** command to switch to a NID that supports the VLAN database.
3. Use the **add vlan-db** command to add a VLAN VID if needed.

4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot remove forward database rows on this card!

You entered a command to delete a VLAN forward database VID (forward database row) from the NID, but the action cannot be performed. For example:

```
C1|S7|L1D>remove vlan-db vid 3
Cannot remove forward database rows on this card!
C1|S7|L1D>
```

1. Make sure this is the function that you want.
2. Use the **go** command to switch to a NID that supports the VLAN FDB.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

The specified conn-port does not exist!

You specified a connection port (conn-port) number outside the valid range.

1. Make sure this is the function that you want.
2. See "Configuring MAC Address Filtering" on page 234 for more information.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

The specified monitor-port does not exist!

You specified a monitoring port (monitor-port) number outside the valid range.

1. Make sure this is the function that you want.
2. See the related section (e.g., "Redundancy" or "Link Pass Through") for more information.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot show cable length for fiber port!

You entered the command to display the length of the copper cable for a port that does not support it.

1. Make sure the NID supports the **show cable length** command (only for x2110).
2. Verify the command syntax. See the related *User Guide* manual.
3. Type **show ether config** to show the Ethernet port's configuration.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Auto-negotiation is enabled, you can not set port duplex now!

You entered the command to assign a duplex mode, but the command is not functional if Auto-negotiation is currently enabled.

1. Either leave the Auto-negotiation setting and use the current duplex setting, or disable AutoNegotiation and set the Duplex mode as required.
2. See the "Set Ethernet Port Speed / Duplex Mode" section on page 105 for more information.
3. Use the **show ether config** command to display the current Auto-negotiation and Duplex settings.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

IP management is not supported on this card!
No tdm loopback supported on this card!
Syslog is not supported on this card!
TAOS status setting is not supported on this card!
TNDP is not supported on this card!

You entered a command for a function that is not supported on the C3210. For example:

```
C1|S15|L1D>set dhcp state disable
IP management is not supported on this card!
C1|S15|L1D>
```

1. Try another command on the C3210.
2. Try the command on another card that supports the attempted function.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot set if this port can be managed by CPU on this card!

You entered the command to set or show a port mgmtaccess function, but the C3210 does not support it. For example:

```
C1|S15|L1P1>set port mgmtaccess enable
Cannot set if this port can be managed by CPU on this card!
C1|S15|L1P1>
```

1. Review the related command section of this manual.
2. Verify that this NID supports the function attempted.
3. Try a related function on this NID.
4. Switch to another NID and try this function again.
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot set USB port state on this card!

You entered the command to set or show the current USB port state, but the C3210 does not support it. For example:

```
C1|S15|L1D>set usb state enable
Cannot set USB port state on this card!
C1|S15|L1D>
```

1. Review the related command section of this manual.
2. Verify that this NID supports the function attempted.
3. Try a related function on this NID.
4. Switch to another NID and try this function again.
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

tftp get: set address type failed.

You entered a tftp command, but the address entered was not accepted.

```
C1|S15|L1D>tftp get iptype ipv4 ipaddr 192.168.1.30 remotefile
C3210_1.0.4_AP
tftp get: set address type failed.
C1|S15|L1D>
```

1. Make sure the tftp server address is valid.
2. Verify that the TFTP Server is running and properly configured.
3. Try entering the tftp command again.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

At one time we can only backup at most 10 cards!
At one time we can only restore at most 10 cards!
Buckup finished
Error: this command should be executed on a device!
Error: this command should be executed on IONMM or a standalone SIC!
Fail to set card entity index!
Processing...
The MAX provision configure file name is 64!
The specified module does not exist!

You entered a "**backup**" or "**restore**" command to do a backup or restore function, but a problem was encountered or the process is not yet finished. You entered a "**prov**" command to do a backup or restore function, but a problem was encountered or the process is not yet finished.

1. Wait a few moments for the command to complete and the *Restore finished* or *Backup finished* message to display.
2. Retry the backup or restore operation with 10 or fewer devices listed.
3. Use the **go** command to switch to a device that supports this feature (IONMM or a standalone SIC).
4. Enter a config filename with less than 64 characters. See the "Configuring Backup / Restore" section on page 103.

5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot proceed because some other TFTP operation is currently in progress!
Please input config file name!
TFTP file transferring failed! Please make sure the TFTP server is up and the file being transferred does exist.
TFTP Server Address is empty or invalid!
The firmware has been successfully upgraded and the system will be rebooted soon
The specified firmware on the TFTP server will be upgraded to the current module, operation is currently in progress!
The sys.log file will be transferred to the TFTP server, are you sure to proceed?

You tried a TFTP transfer operation, but the operation failed or is still in process.

1. Wait for the "*operation is currently in progress!*" message to clear.
2. If an entry was requested in the message, enter the required information (e.g., valid TFTP Server address, or config file name).
3. Verify that this is the operation you want (e.g., click **OK** at the "*are you sure to proceed?*" message).
4. Verify the related command syntax in the applicable section of this manual (e.g., Syslog, or TFTP Upgrade section).
5. Retry the operation.
6. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Can't open any requested files.
cannot open /tftpboot/xxxx: No such file or directory
now start to transfer the file ...
***file transfer failed*!**
file transfer succeeded!
now start to upgrade the system ...
/usr/local/bin/flash_firmware /tftpboot/
upgrade failed!
upgrade failed due to wrong file %s!
upgrade failed when programming the flash!
upgrade succeeded, system will be rebooted ...
Usage: serial (get|put|upgrade) protocol=(xmodem|xmodem-1k|ymodem|zmodem) file=FILE
Warning: the input file name will be ignored when using ymodem/zmodem to retrieve file!
Warning: xmodem/xmodem-1k protocol might append some garbage at the end of the file!
Wrong parameter number!

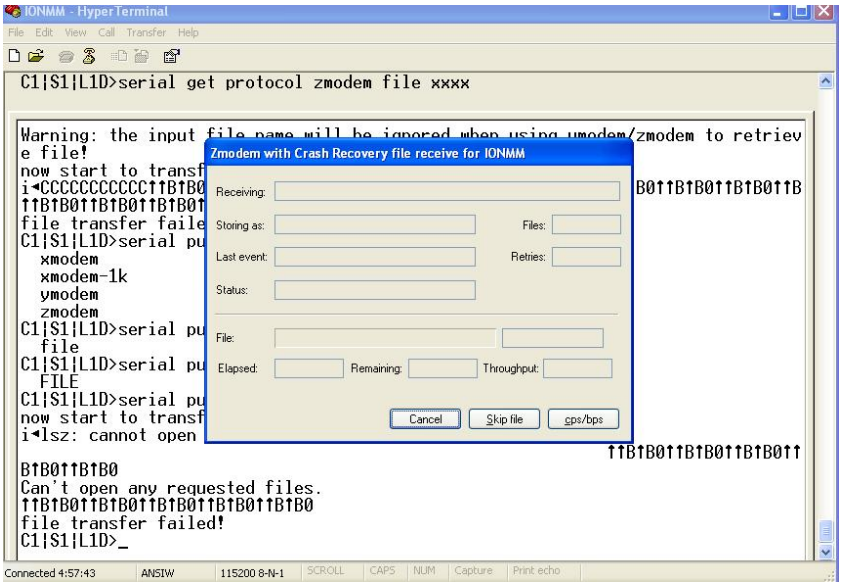
You entered a Serial File Transfer command, but the operation failed.

1. Verify that this is the operation you want.

2. Retry the operation; be sure to type the parameters as shown in the "Transfer Files via Serial Protocol (X/Y/Zmodem)" section on page 103.

3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

File Transfer Failed - ZModem Crash Recovery dialog box:



You entered a Serial File Transfer command, but the operation failed.

1. Either enter the requested information and click **cps/bps**, or click **Skip file**, or click **Cancel**.

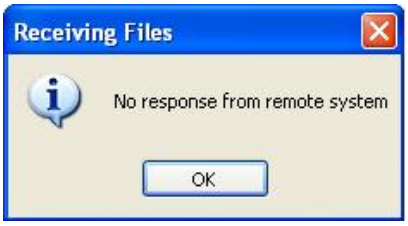
2. See the HyperTerminal Helps or the Hilgraeve web site for more HT information.

3. Retry the operation; be sure to type the parameters as shown in the "Transfer Files via Serial Protocol (X/Y/Zmodem)" section on page 103.

4. If the serial file transfer causes HT to have problems recognizing ION CLI commands, type **q** and press **Enter**, and then log back in to HT and retry the operation.

5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Receiving Files - No response from remote system



You entered a Serial File Transfer command, but the ZModem file transfer failed.

1. Click the **OK** button to clear the message dialog box.
2. See the HyperTerminal Helps or the Hilgraeve web site for more HT information.
3. Retry the operation; be sure to type the parameters as shown in the "Transfer Files via Serial Protocol (X/Y/Zmodem)" section on page 103.
4. If the serial file transfer causes HT to have problems recognizing ION CLI commands, type **q** and press **Enter**, and then log back in to HT and retry the operation.
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot find software version of this card!

The ION card's firmware version must be newer than a specified version, otherwise this message is returned. You used the go command to switch to another card, but the system checked its version and decided that the new CLI can not be run on this card at this firmware version.

1. Check the card's current firmware version.
2. Upgrade the card firmware. See "Upgrade the IONMM and/or C3210 Firmware" on page 107.
3. Retry the operation.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Software version of this card is too old, please upgrade it!

The ION card's firmware version was checked and found to be too old to support this newer CLI command.

1. Upgrade the card firmware. See "Upgrade the IONMM and/or C3210 Firmware" on page 107.
2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

This command is only valid on an IONMM!
Cannot show slot info on this card!

You entered a "**show slot info**" command on an ION card other than an IONMM card.

1. Enter another (supported) show command on this card, or use the "**go**" command to switch to the IONMM.
2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

ERROR Software version of this card ("cardVersion") is not supported, please upgrade to the same version as the IONMM
Getting card version failed
The failure get template config handler was called.

You attempted a function that is not supported by this version of firmware.

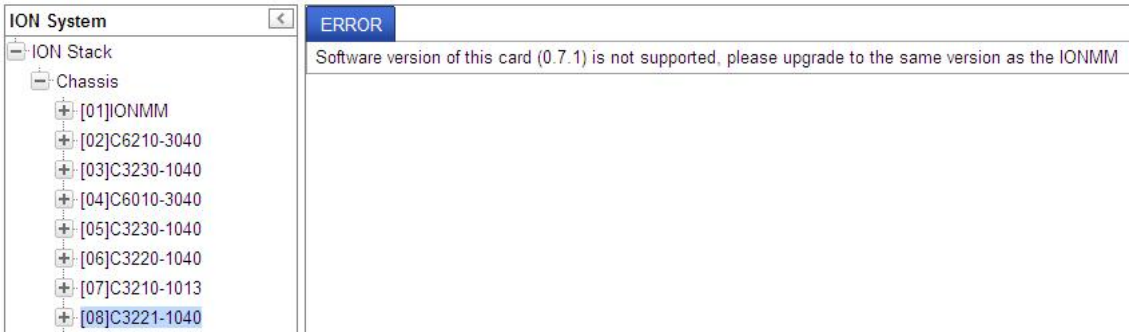
1. Enter another (supported) function at this card's firmware version, or use the "**go**" command to switch to another card.
2. Upgrade to a newer firmware version. See "TFTP Transfer / Upgrade Commands" on page 204 or "Upgrade / Update Firmware Commands" on page 207.
3. Retry the operation.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Online Help is not available until a specific configuration is entered.

You clicked on **Online Help** from the **Help** dropdown without first selecting a device.

1. Click the **OK** button to close the webpage message.
2. Select an ION device.
3. Click on **Help** > **Online Help** again.

ERROR: Software version of this card (0.7.1) is not supported, please upgrade to the same version as the IONMM



You selected a device in the tree, but its firmware version is not compatible with the IONMM.

1. Select the IONMM device.
2. Select the UPGRADE tab.
3. Perform a firmware upgrade to this card (and others that may have outdated firmware). See the Upgrade section on page 347.
4. If a problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Failed to retrieve DMI info on current port

You selected **C3230** > **Port 2** > **DMI** but the DMI information does not display.

1. Click **Refresh**.
2. Expand and contract the tree.
3. If a problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Current power status of this slot is off, please turn it on before you reset it!

The reset function only works when the slot power is in the On position for the unit to reboot/reset.

1. At **Chassis** > **MAIN** > **Chassis Members** click the "**On**" button in the **Power Status** column of the device before you click the "**Reset**" button.
2. If a problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Setting the VLANID failed with an SNMP operation error message:
Setting values failed (snmp operation error) or
Adding VLAN failed (snmp operation error)

You tried to add or edit a VLAN ID but the effort failed.

1. The card must be in “Network” mode (at Port 1 > Advanced > Frame Tag Mode) to set the VLAN ID. If it is not set to "Network", an SNMP error will occur. Before adding the ports for Management VLAN, set the Frame Tag Mode of that port to "Network". When Provider tagging is required for that port, then set the Frame Tag Mode to "Provider". A port with the Frame Tag Mode set to the default setting "Customer" can not be added to Member Ports for Management VLAN.
2. If a problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Web Interface Messages

IMPORTANT

For each procedure described below, do each step sequentially as indicated. If the result of a step causes the problem to be corrected, **do not** continue with the other steps in the procedure.

Cannot Ping IONMM Device

1. With the "Egress Rate Limit" set to "Unlimited", the PC can ping the device (e.g., S2220-1013).
2. After reducing the "Egress Rate Limit" to "80m", the ping fails. The return traffic to the PC is non-mgmt packet and is subjected to Egress rate-limiting, hence these packets are getting dropped.
3. Increase the port 1 "Egress Rate Limit" to "900m" or "800m" to reserve some Egress bandwidth for user management traffic. The PC can then ping to the S2220-1013 again, and the WEB UI can be managed again.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Cannot Ping IONMM Device

1. With the "Management VLAN" state set to "enabled", the PC can not ping the IONMM device. The reason is enabling the Management VLAN function gives management control to the Management VLAN that you enabled.
2. Enter the CLI command **set mgmt vlan state disable** and press **Enter**. The PC can ping to S2220-1013 success again, and the Web interface can be managed again.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Getting values failed (snmp operation timeout)

This message indicates that you entered an invalid parameter value.

1. Click the **Refresh** button to clear the message.
2. Verify the recent parameter entries. Refer to the related CoH (cursor-over-help) and revise parameter entries as needed.
3. Retry the operation.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Failed to start Virtual Cable Test.

This message indicates that the VCT test could not be started.

1. Check the following:
   - Module has power.
   - Cable is properly connected to the port.
2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Firmware DB operation failed, unzip failed.

This message indicates that the upload of the upgrade file failed.

1. Check that the **db.zip** file (Windows XP) or **db** file (Windows 7) file was specified in the **Database File Name** field.
2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

invalid input file

This message displays in the "**Upload Result Reason**" field at **IONMM** > **Upgrade** tab> **Firmware database** sub-tab if the "Firmware File Name" entered had an incorrect filename format.

1. Verify the parameter value entered; see "Upgrading IONMM Firmware – Web Method" on page 120 for valid input information.
2. Retry the operation with a valid firmware file name (e.g., *IONMM.bin.0.5.4*, or *x222x / x32xx.bin.0.5.4*).
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Invalid input found!

This message indicates that you entered a parameter outside the valid range (e.g., VLAN ID = 0).

1. Verify the parameter value to be entered; check the online Help for valid input information.
2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Invalid password!

This message indicates that the password entered during sign on is not valid.

1. Sign in using the correct password. The default password is **private**.

   Note: the password is case sensitive.

2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Failed to retrieve DMI info on current port.

You clicked the Device port's DMI tab, but the device does not support DMI. Not all NID models support DMI. The NIDs that support DMI have a "D" at the end of the model number.

1. Verify that the C3210 supports DMI.
2. See "DMI (Diagnostic Maintenance Interface) Parameters" on page 118 for more information.
3. Retry the operation.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Admin Status: Down (or **Testing)**

In the device's port, at the MAIN tab in the Port Configuration section, the Admin Status field displays "Down". Typically, if 'Admin Status' is Down, then 'Link Status' is also Down.

The status here is the desired state of the interface. The "Testing" status indicates that no operational packets can be passed. When a managed system initializes, all interfaces start with 'Admin Status' in the Down state. As a result of either explicit management action or per configuration information retained by the managed system, 'Admin Status' is then changed to either the Up or Testing states, or remains in the Down state.

1. Verify the initialization process; see "Section 2: Installation and System Setup" on page 40.
2. Verify the attempted operation procedure in the related section of this manual.

3. Retry the operation. Wait several minutes for initialization to take place.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Link Status: Down (or **Testing** or **Dormant,** or **NotPresent)**

This is the current operational state of the interface.

The 'Link Status' Testing state indicates that no operational packets can be passed.

If 'Admin Status' is Down then 'Link Status' likely will be Down.

If 'Admin Status' is changed to Up, then 'Link Status' should change to Up if the interface is ready to transmit and receive network traffic.

'Link Status' should change to Dormant if the interface is waiting for external actions (such as a serial line waiting for an incoming connection);

'Link Status' should remain in the Down state if and only if there is a fault that prevents it from going to the Up state;

'Link Status' should remain in the NotPresent state if the interface has missing (typically, hardware) components.

Link Status: *Down*: The ION system interface is not ready to transmit and receive network traffic due a fault.

1. Review any specific fault and its recommended recovery procedure.
2. Verify the initialization process; see "Section 2: Installation and System Setup" on page 40.
3. Verify the attempted operation procedure in the related section of this manual.
4. Retry the operation. Wait several minutes for initialization to take place.
5. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Link Status: *Dormant*: The ION system interface is waiting for external actions (such as a serial line waiting for an incoming connection).

1. Wait several minutes for initialization to take place, and then retry the operation.
2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Link Status: *NotPresent*: the interface has missing components (typically hardware).

1. Verify the ION system installation; see "Section 2: Installation and System Setup" on page 40.
2. Wait several minutes for initialization to take place, and then retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Link Status: *Testing*: The ION system interface can not pass operational packets.

1. Verify that diagnostic tests were run properly and completed successfully.
2. Wait several minutes for initialization to take place, and then retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Setting values failed (http server error)*

This message indicates a configuration entry error (e.g., https).

1. Enter a valid value. Refer to the Help screen for more information.
2. Retry the operation. See "Configuring HTTPS" on page 208.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Setting values failed (snmp operation error)*

This message indicates that the SNMP Configuration entered had an invalid SNMP entry (e.g., an unrecognized Trap Manager address entry).

1. Enter a valid value. Refer to the Help screen for more information.
2. Retry the operation. See "Configuring SNMP" on page 226.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *TFTP file transferring failed!*

This message indicates that a TFTP operation could not be completed.

TFTP for Backup download operation:

1. Verify that:
   a. The correct module(s) has been selected.
   b. The IP address of the TFTP server is correct.
   c. The TFTP server is online and available.
2. Perform a backup of the module(s) for which the download operation was intended. Make sure that the status of the backup operation for each module is "*Success*".
3. Retry the operation.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

TFTP for Restore upload operation:

1. Check:
   - The IP address of the TFTP server is correct.
   - The TFTP server in online and available.
   - The file to be uploaded is in the default directory on the server.
   - The correct module(s) has been selected.
2. Retry the operation.
3. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *TFTP operation failed!*

This message indicates that the upload portion of an upgrade operation failed.

1. Check:
   - The IP address of the TFTP server is correct.
   - The TFTP server in online and available.
   - The correct file name (**db.zip** in Windows XP or just "**db**" in Windows 7) is specified.
   - The **db.zip** (or **db**) file is in the default directory on the TFTP server.
2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *There is a problem with this website's security certificate.*

This message indicates that the security certificate presented by this website was changed.

1. Click the Continue to this website... selection.
2. See the "Configuring HTTPS" section on page 192.

Message: *Web UI Management connection Lost*

1. With the "Egress Rate Limit" set to "Unlimited", the PC can ping the device (e.g., S2220-1013).

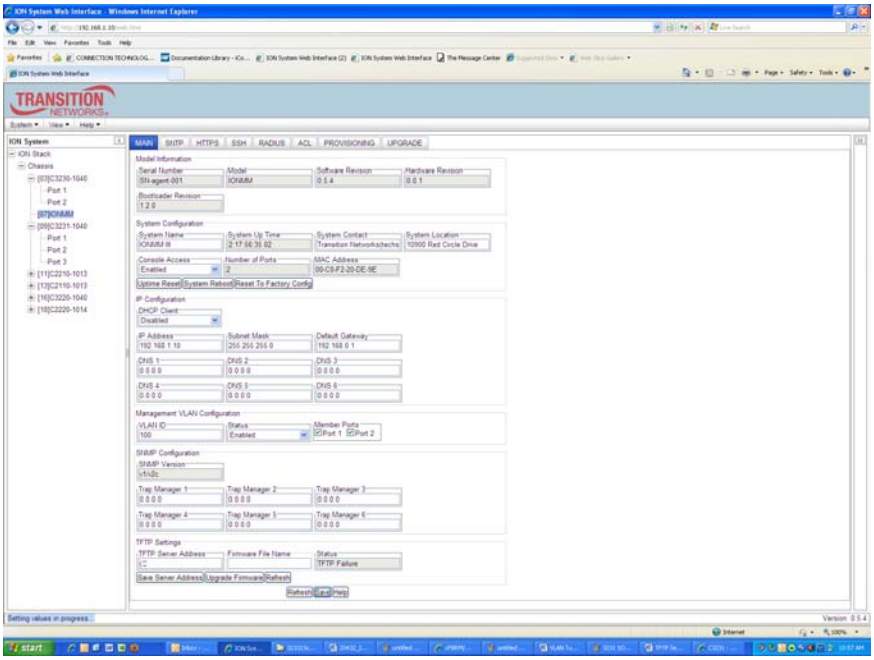
2. After reducing the "Egress Rate Limit" to "80m", the ping fails.
   The return traffic to the PC is non-mgmt packet and is subjected to Egress rate-limiting, hence these packets are getting dropped.

3. Increase the port 1 "Egress Rate Limit" to "900m" or "800m" to reserve some Egress bandwidth for user management traffic.
   The PC can ping to S2220-1013 again, and the WEB UI can be managed again.

4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

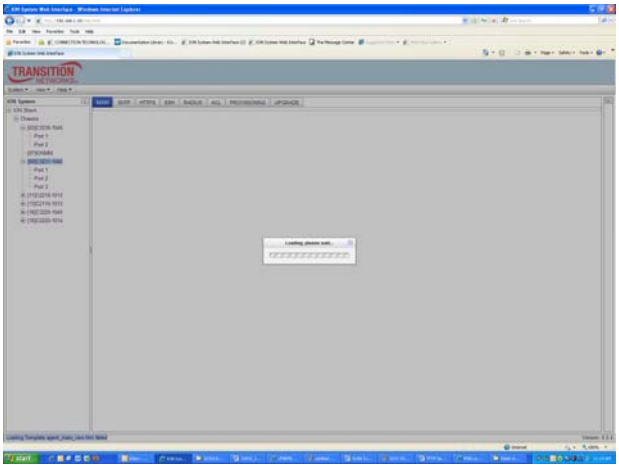
Message: "*Setting values in progress ...*" displays continuously

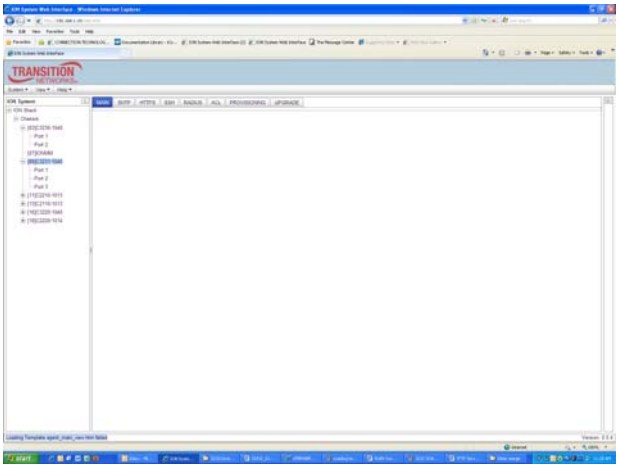
The message "Setting values in progress ..." displays for over 10 minutes after you set up a VLAN 100, then set Management VLAN to Enabled and clicked Save.



Getting values failed (http server error) then displays.

Loading Template agent_main_view.htm failed displays:





MAIN tab displayed is blank after you close the **Loading ...** dialog box.

Meaning: These messages display after you turn on the Management VLAN function either via the ION Web interface or the CLI. (The CLI command is **set mgmt vlan state=enable**, and the Web interface is from the IONMM **MAIN** screen in the **Management VLAN Configuration** section, where the **Status** field is set to **Enabled**. In both cases, management control is given to the Management VLAN that you enabled.

The recovery (re-gaining control from the CLI or Web interface) is to turn off Management VLAN via the CLI (**set mgmt vlan state=enable**) or via the Web interface (IONMM **MAIN** > **Management VLAN Configuration** > **Status** > **Enabled**).

Message: *Loading Template agent_main_view.htm failed*
Loading htm files failed
Loading htm file succeeded
Loading JavaScript file failed
Loading Template Config file failed

Meaning: The status displays at the lower left corner during Port 1 page loading.

Recovery: 1.Wait for the *Loading, please wait...* message to clear. This may take 1 minute or more. 2. See the *Loading, please wait...* message for details. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *The DMI feature is not supported on current port*

Meaning: Not all C3210 models support DMI. Transition Networks C3210s that support DMI have a "D" at the end of the model number. If you click the DMI tab on a C3210 model that does not support DMI, the message "The DMI feature is not supported on current port."

The DMI (Diagnostic Maintenance Interface) function displays C3210 diagnostic and maintenance information such as interface characteristics, diagnostic monitoring parameters, and supported media lengths.

Recovery: 1. Verify that the device and port support DMI. See "DMI (Diagnostic Maintenance Interface) Parameters" on page 248 for more information.

Message: *Loading Template agent_main_view.htm failed*

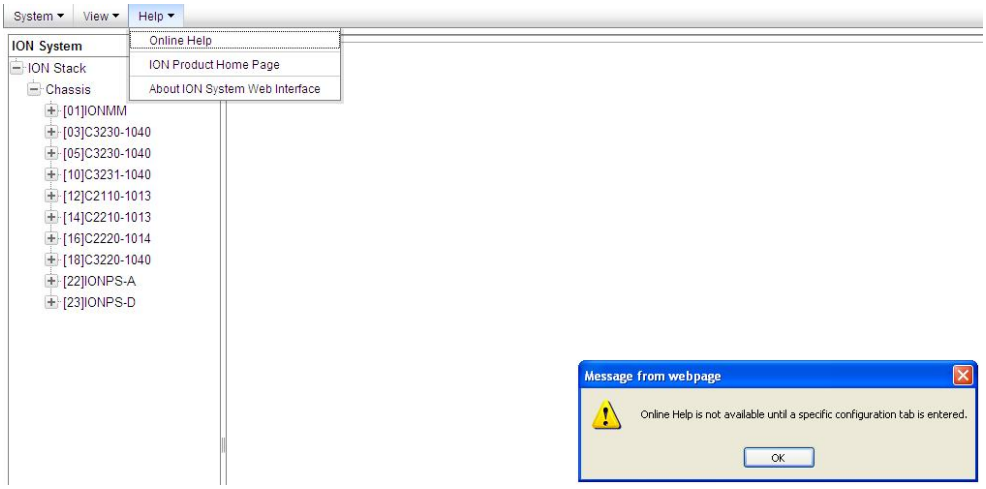
Message: *Loading htm files failed*

Meaning: The status displays at the lower left corner during Port 1 page loading.

Recovery: 1.Wait for the *Loading, please wait...* message to clear. This may take 1 minute or more. 2. See the *Loading, please wait...* message for details. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Online Help is not available until a specific configuration is entered.*

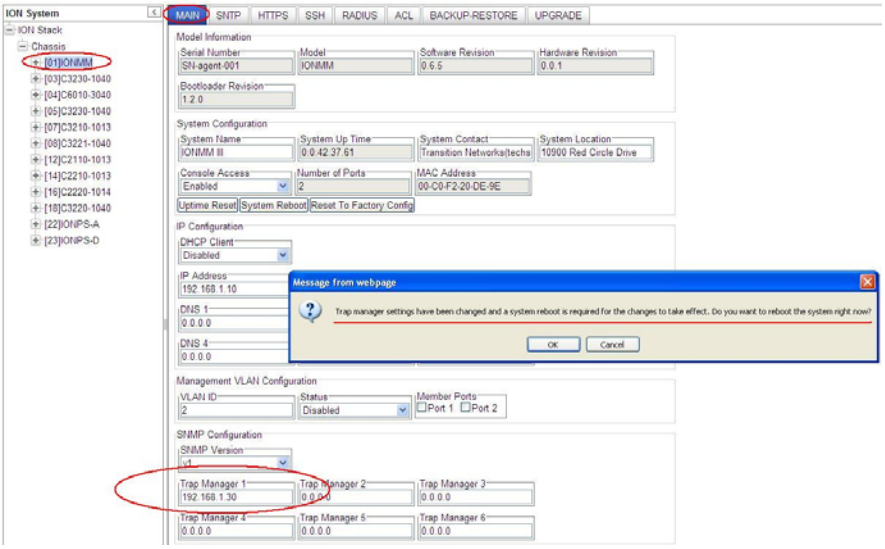
Meaning: You clicked on **Online Help** from the **Help** dropdown without first selecting a device.



Recovery:

1. Click the **OK** button to close the webpage message.
2. Select an ION device.
3. Click on **Help** > **Online Help** again.

Message: *Trap manager settings changed and a system reboot is required for the changes to take effect. – Do you want to reboot the system right now?*

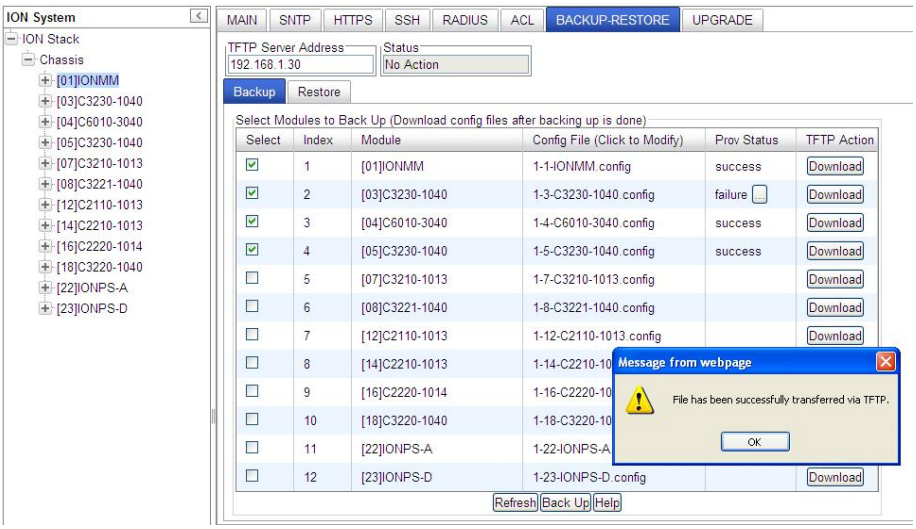


Meaning: Information only. At **IONMM > MAIN** > **SNMP Configuration** > **Trap Manager x** you entered an IP address for a trap server.

Recovery:

1. Click the **OK** button to clear the webpage message.
2. Verify the Trap Manager setting and continue operation.
3. If a problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *File has been successfully transferred via TFTP.*" but the Prov. status column displays failure [...].

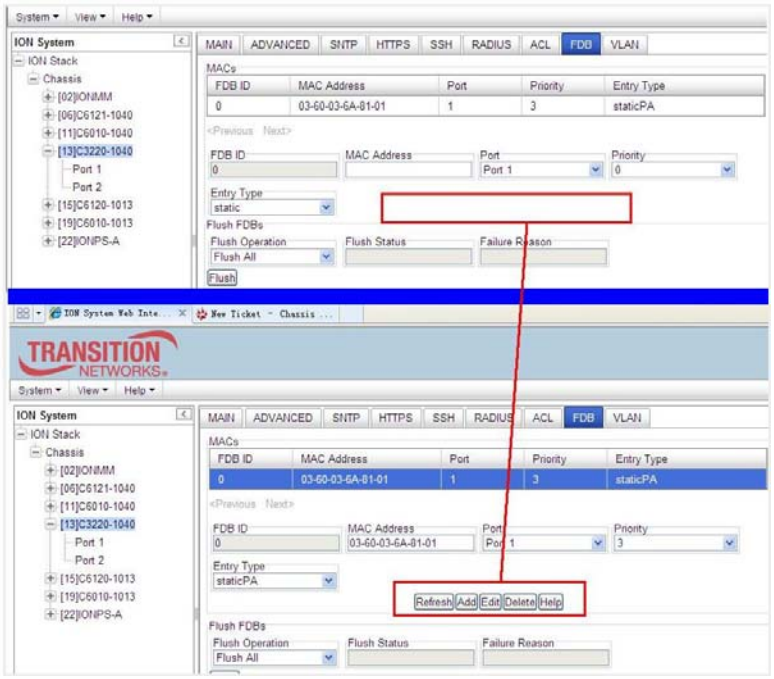


Meaning: At **IONMM > BACKUP-RESTORE** > **Backup** you selected a module to back up, the "successful transfer" message displays, but the Prov. Status column displays failure [...].

Recovery:

1. Click the **OK** button to clear the webpage message.
2. Click the [...] box after the word "failure" in the Prov Status column.
3. Open the config.ERR file at *C:\TFTP-Root*.
4. Fix any config commands and then retry the operation.
5. Verify the Backup and continue operation.
6. If a problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

In IE8 or IE9, at C3220 > FDB, the 'Refresh', 'Add', 'Edit', 'Delete', 'Help' buttons of FDB do not display.



1. Select IE8 **Tools** > **Compatibility Mode** to use the IE8 'Compatibility View'. The message "***Compatibility View*** - *192.168.1.10 is now running in Compatibility View.*' displays.

2. Log in to the ION system again.
3. Select the **FDB** tab.
4. Select at least one table of FDB, and then click the web page; the button will display normally.
4. Click one existing MAC address in the MAC address list.

Website displays incorrectly in Internet Explorer 8 or 9

Websites that were designed for earlier versions of Internet Explorer might not display correctly in the current version. However, you can often improve how a website will look in Internet Explorer by using the new 'Compatibility View' feature. When you turn on Compatibility View, the webpage displayed (and any other webpages within the website's domain) will display as if you were using an earlier version of Internet Explorer.

1. In IE8, click the **Stop** button on the right side of the Address bar.
2. If the page has stopped loading, click the **Refresh** button to try again.
3. Click the **Tools** button, and then click **Compatibility View**.

If Internet Explorer recognizes a webpage that is not compatible, the **Compatibility View** button displays on the Address bar. To turn Compatibility View on, click the **Compatibility View** button. From now on, whenever you visit this website, it will be displayed in Compatibility View. However, if the website receives updates to display correctly in the current version of Internet Explorer, Compatibility View will automatically turn off. Note that not all website display problems are caused by browser incompatibility. Interrupted Internet connections, heavy traffic, or website bugs can also affect how a webpage is displayed. To go back to browsing with Internet Explorer 8 on that site, click the **Compatibility View** button again.

4. Check your ION firmware version and upgrade to the latest if outdated. See the "Upgrade" section on page 266.

5. Check the Microsoft Support Online website http://support.microsoft.com/ph/807/en-us/#tab0 for more information.

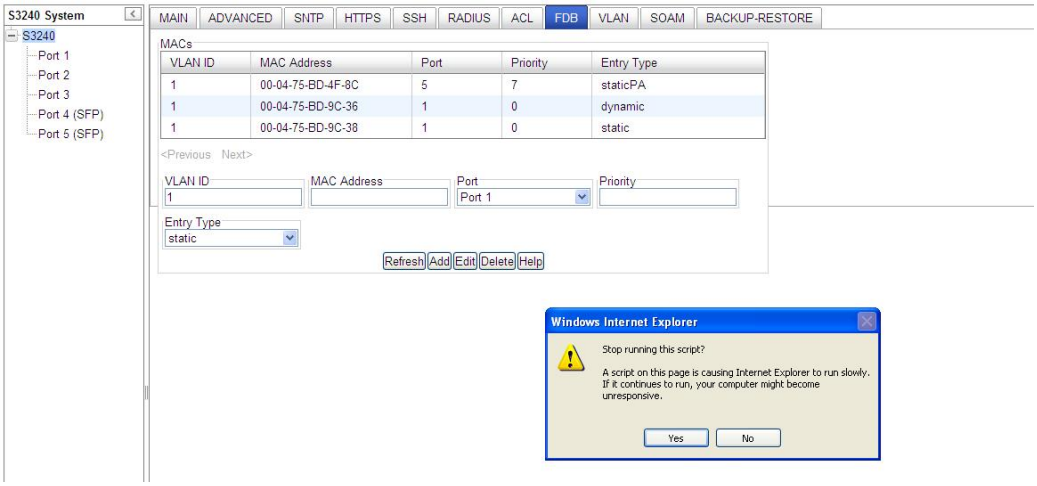
6. See also: http://msdn.microsoft.com/en-us/library/dd567845%28v=vs.85%29.aspx

http://support.microsoft.com/kb/960321

http://blogs.msdn.com/b/ie/archive/2008/08/27/introducing-compatibility-view.aspx

7. In IE9, click the **Compatibility View** toolbar button on the Address bar to display the website as if you were using an earlier version of Internet Explorer. See the Microsoft Support website Article ID: 956197 at http://support.microsoft.com/kb/956197.

Script error message received.
Stop running this script? A script on this page is causing Internet Explorer to run slowly. If it continues, your computer might become unresponsive. Yes / No
Error: Object doesn't support this property or method.
A Runtime Error has occured. Do you wish to Debug?
Done, but with errors on page.

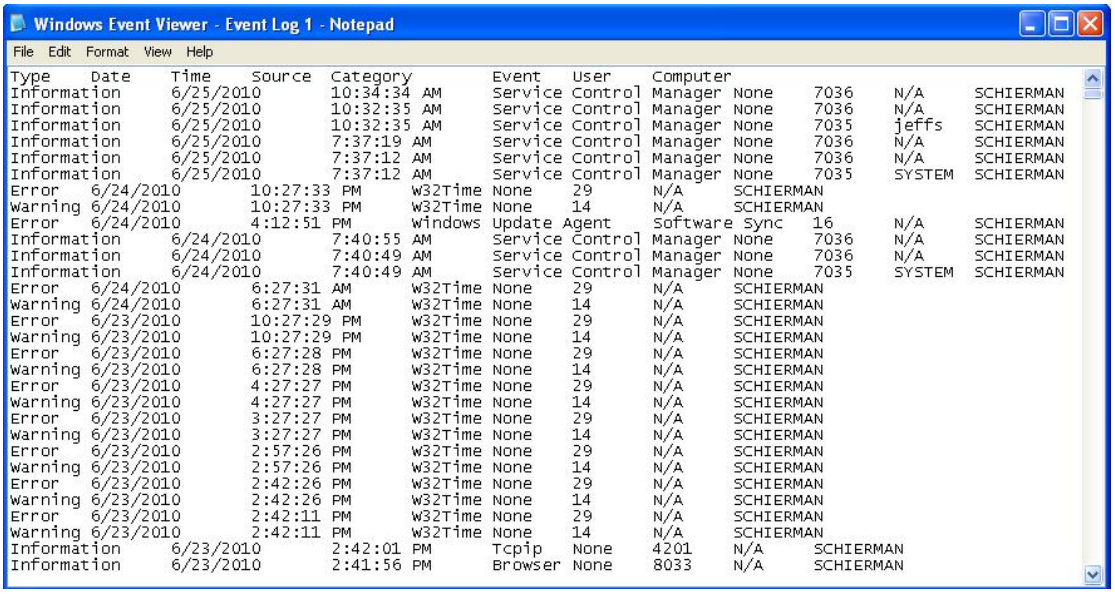


1. Click the **Yes** button to stop the script.
2. Click **Show Details** to display error details.
3. Disable script debugging.
4. Test a Web page from another user account, another browser, and another computer.
5. Verify that Active Scripting, ActiveX, and Java are not being blocked by Internet Explorer.
6. Remove all the temporary Internet-related files.
7. Install the latest Internet Explorer service pack and software updates.
8. For more advanced troubleshooting, see the Microsoft Support Article ID 308260 at http://support.microsoft.com/kb/308260.

Windows Event Viewer Messages

A sample Event Log file is shown below.

Windows Event Viewer - Event Log 1:



Windows Event Viewer - Event Log 1 - Notepad

File Edit Format View Help

Type	Date	Time	Source	Category	Event	User	Computer			
Information	6/25/2010	10:34:34 AM	Service Control Manager	None	7036	N/A	SCHIERMAN			
Information	6/25/2010	10:32:35 AM	Service Control Manager	None	7036	N/A	SCHIERMAN			
Information	6/25/2010	10:32:35 AM	Service Control Manager	None	7035	jeffs	SCHIERMAN			
Information	6/25/2010	7:37:19 AM	Service Control Manager	None	7036	N/A	SCHIERMAN			
Information	6/25/2010	7:37:12 AM	Service Control Manager	None	7036	N/A	SCHIERMAN			
Information	6/25/2010	7:37:12 AM	Service Control Manager	None	7035	SYSTEM	SCHIERMAN			
Error	6/24/2010	10:27:33 PM	W32Time	None	29	N/A	SCHIERMAN			
Warning	6/24/2010	10:27:33 PM	W32Time	None	14	N/A	SCHIERMAN			
Error	6/24/2010	4:12:51 PM	Windows Update Agent		Software Sync	16	N/A	SCHIERMAN		
Information	6/24/2010	7:40:55 AM	Service Control Manager	None	7036	N/A	SCHIERMAN			
Information	6/24/2010	7:40:49 AM	Service Control Manager	None	7036	N/A	SCHIERMAN			
Information	6/24/2010	7:40:49 AM	Service Control Manager	None	7035	SYSTEM	SCHIERMAN			
Error	6/24/2010	6:27:31 AM	W32Time	None	29	N/A	SCHIERMAN			
Warning	6/24/2010	6:27:31 AM	W32Time	None	14	N/A	SCHIERMAN			
Error	6/23/2010	10:27:29 PM	W32Time	None	29	N/A	SCHIERMAN			
Warning	6/23/2010	10:27:29 PM	W32Time	None	14	N/A	SCHIERMAN			
Error	6/23/2010	6:27:28 PM	W32Time	None	29	N/A	SCHIERMAN			
Warning	6/23/2010	6:27:28 PM	W32Time	None	14	N/A	SCHIERMAN			
Error	6/23/2010	4:27:27 PM	W32Time	None	29	N/A	SCHIERMAN			
Warning	6/23/2010	4:27:27 PM	W32Time	None	14	N/A	SCHIERMAN			
Error	6/23/2010	3:27:27 PM	W32Time	None	29	N/A	SCHIERMAN			
Warning	6/23/2010	3:27:27 PM	W32Time	None	14	N/A	SCHIERMAN			
Error	6/23/2010	2:57:26 PM	W32Time	None	29	N/A	SCHIERMAN			
Warning	6/23/2010	2:57:26 PM	W32Time	None	14	N/A	SCHIERMAN			
Error	6/23/2010	2:42:26 PM	W32Time	None	29	N/A	SCHIERMAN			
Warning	6/23/2010	2:42:26 PM	W32Time	None	14	N/A	SCHIERMAN			
Error	6/23/2010	2:42:11 PM	W32Time	None	29	N/A	SCHIERMAN			
Warning	6/23/2010	2:42:11 PM	W32Time	None	14	N/A	SCHIERMAN			
Information	6/23/2010	2:42:01 PM	Tcpip	None	4201	N/A	SCHIERMAN			
Information	6/23/2010	2:41:56 PM	Browser	None	8033	N/A	SCHIERMAN			

Message: `Information 6/25/2010 7:37:12 AM Service Control Manager None 7035 SYSTEM`

Meaning: Information message regarding SCM.

Recovery: No action required.

Message: `Error 6/24/2010 10:27:33 PM W32Time None 29 N/A SYSTEM`

Meaning: Error level message regarding W32Time.

Recovery: Open the file, examine the number of messages like this, and the potential problem level.

Message: `Warning 6/24/2010 10:27:33 PM W32Time None 14 N/A SYSTEM`

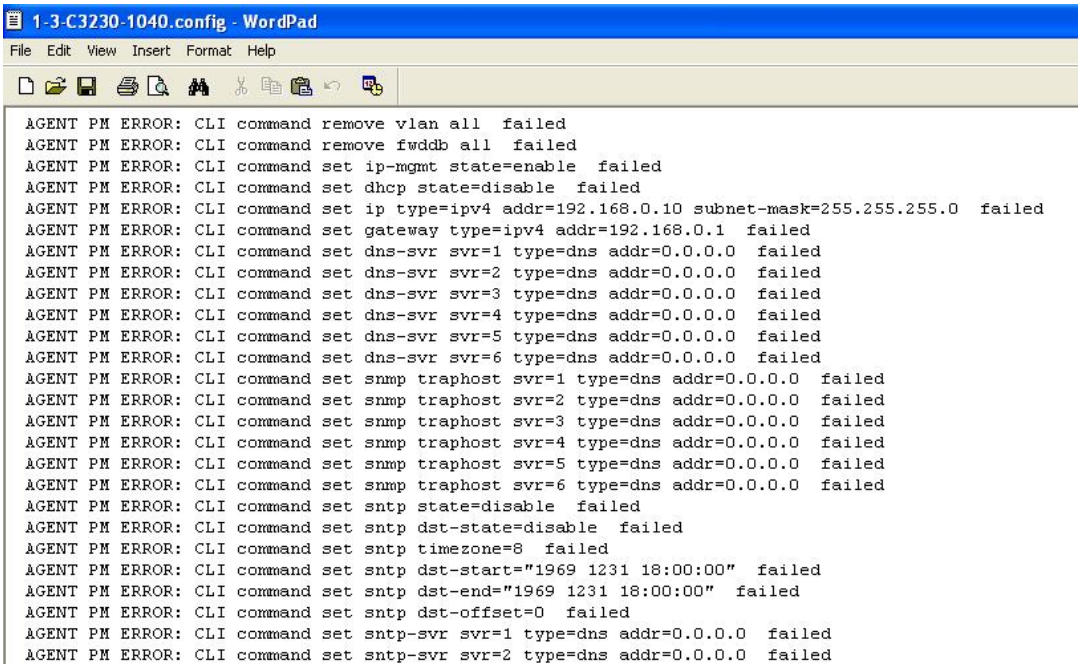
Meaning: Warning level message regarding W32Time.

Recovery: Check the other system logs for related messages. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

The Config Error Log (config.err) File

The error log file (.ERR file) is downloaded to the TFTP server address specified, in TFTP-Root with a filename such as *1-11-C2210-1013.config*. You can open the file in WordPad or a text editor.

A sample portion of an error log file (.ERR file) is shown below.



These messages show a translation of failed web interface functions that were attempted, translated into CLI commands.

The config.err files are saved in the TFTP server location specified (typically *C:\TFTP-Root*) with a file name something like: *1-2-2-C3220-1040_20100608.config.err*.

The first word in the message (e.g., add, set, remove) shows the type of action attempted.

The second word or phrase in the message (e.g., dhcp state, fwddb, gateway type, vlan-db vid, etc) lists the general function attempted. This is the part of the message immediately preceding the = sign.

The next word or phrase in the message is the specific function attempted that immediately follows the = sign or the second word of the message (e.g., `all`, `=enable`, =disable, `=8`, `=dns addr=0.0.0.0, etc.)`. This part of the error message may include several segments with = signs `(e.g., =0.0.0.0 retry=3 timeout=30`

The final word in the message line is the word "failed".

config.err Messages

Sample config.err file information is provided below.

1-2-2-C3220-1040_20100608.config.err

```
Line
1 AGENT PM ERROR: CLI command remove vlan all  failed
2 AGENT PM ERROR: CLI command remove fwddb all  failed
3 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:10 conn-port=1 priority=1 type=staticNRL  failed
4 AGENT PM ERROR: CLI command remove vlan all  failed
5 AGENT PM ERROR: CLI command remove fwddb all  failed
6 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:02 conn-port=1 priority=1 type=staticNRL  failed
7 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:03 conn-port=1 priority=1 type=staticNRL  failed
8 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:04 conn-port=1 priority=1 type=staticNRL  failed
9 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:05 conn-port=1 priority=1 type=staticNRL  failed
10 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:06 conn-port=1 priority=1 type=staticNRL  failed
11 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:07 conn-port=1 priority=1 type=staticNRL  failed
12 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:08 conn-port=1 priority=1 type=staticNRL  failed
13 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:09 conn-port=1 priority=1 type=staticNRL  failed
14 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:10 conn-port=1 priority=1 type=staticNRL  failed
15 AGENT PM ERROR: CLI command remove vlan all  failed
16 AGENT PM ERROR: CLI command remove fwddb all  failed
17 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:02 conn-port=1 priority=1 type=staticNRL  failed
18 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:03 conn-port=1 priority=1 type=staticNRL  failed
19 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:04 conn-port=1 priority=1 type=staticNRL  failed
20 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:05 conn-port=1 priority=1 type=staticNRL  failed
21 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:06 conn-port=1 priority=1 type=staticNRL  failed
22 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:07 conn-port=1 priority=1 type=staticNRL  failed
23 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:08 conn-port=1 priority=1 type=staticNRL  failed
24 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:09 conn-port=1 priority=1 type=staticNRL  failed
25 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:10 conn-port=1 priority=1 type=staticNRL  failed
26 AGENT PM ERROR: CLI command remove vlan all  failed
27 AGENT PM ERROR: CLI command remove fwddb all  failed
28 AGENT PM ERROR: CLI command add fwddb mac=01:00:00:00:00:10 conn-port=1 priority=1 type=staticNRL  failed
```

config.err Message Responses

Some typical error log file messages and the recommended responses are provided below (without the prefix of "`AGENT PM ERROR: CLI command`").

Message: `remove vlan all  failed`

Response: 1. Check if this is a recurring problem. 2. Verify the VLAN operation in the related section of this manual. Retry the VLAN operation. 3. See the related VLAN command in the *C3210 CLI Reference Manual, 33497*. 4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `remove fwddb all  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set ip-mgmt state=enable  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set dhcp state=disable  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set ip type=ipv4 addr=192.168.0.10 subnet-mask=255.255.255.0  failed`

Response: 1. Check if this is a recurring problem. 2. Verify the operation in the related section of this manual. Retry the operation. 3. See the related command in the *C3210 CLI Reference Manual, 33497*. 4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set gateway type=ipv4 addr=192.168.0.1  failed`

Response: 1. Check if this is a recurring problem. 2. Verify the operation in the related section of this manual. Retry the operation. 3. See the related command in *the C3210 CLI Reference Manual, 33497*. 4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set dns-svr svr=1 type=dns addr=0.0.0.0  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set snmp traphost svr=1 type=dns addr=0.0.0.0  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set sntp state=disable  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set sntp dst-state=disable  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set sntp timezone=8  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set sntp dst-end="1969 1231 18:00:00"  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set sntp dst-offset=0  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set sntp-svr svr=1 type=dns addr=0.0.0.0  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set radius client state=disable  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set radius svr=1 type=dns addr=0.0.0.0 retry=3 timeout=30  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `add vlan-db vid=100 priority=0 pri-override=disable  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `add vlan-db vid=200 priority=0 pri-override=disable  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set acl state=disable  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set acl table=filter chain=input policy=accept  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `set dot1dbridge ip-priority-index=0 remap-priority=0  failed`

Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: `AGENT PM ERROR: CLI command show dot1dbridge ip-tc priority remapping failed`

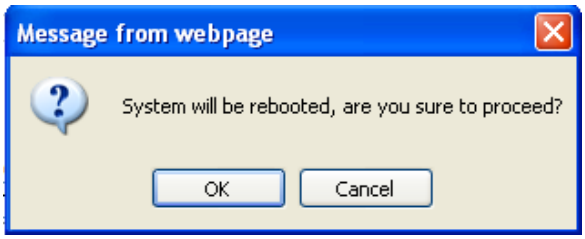
Response: 1. Check if this command is supported. 2. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Webpage Messages

Certain menu operations will display a webpage verification message to verify that you want to proceed. These messages also provide information on the effect that the operation will have if you continue. These messages display for operations such as **Reset to Factory Config**, **Reboot the System,** or other operational confirmation messages.

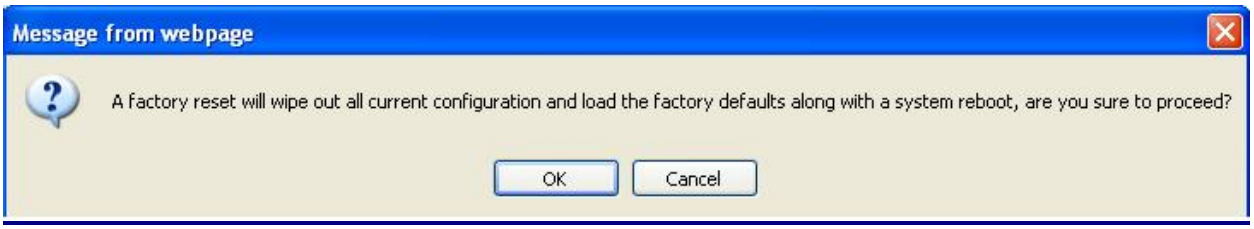
See "Menu System Descriptions" on page 44.

Message: *System will be rebooted, are you sure to proceed*?



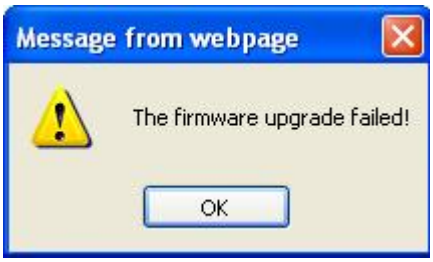
Response: Click **OK** only if you wish to reboot. Otherwise click **Cancel**.

Message: *A factory reset will wipe out all current configuration and load the factory defaults along with a system reboot; are you sure to proceed*?



Response: Click **OK** only if you wish to reboot. Otherwise click **Cancel**.

Message*: The firmware upgrade failed*!



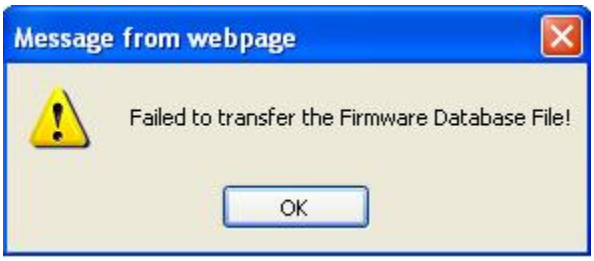
The **MAIN** tab **>** **TFTP Settings** section **Status** area displays "*TFTP Failure*".

Meaning: While performing a Firmware Upgrade from the **MAIN** tab > **TFTP Settings** section, a problem was detected. See the "Upgrade the IONMM and/or C3210 Firmware" section on page 109.

Recovery:

1. Click **OK** to clear the webpage message.
2. Make sure you are using a TFTP Server package (not an FTP package). You will not be able to connect to the TFTP Server with an FTP client.
3. Make sure that you downloaded the correct IONMM firmware file from the Transition Networks web site.
4. Verify the **TFTP Server Address** entry. It should be the IP address of your TFTP Server (e.g., 192.168.1.30).
5. Verify the **Firmware File Name** that you entered is the one you intended, and that it is in the proper filename format (e.g., **IONMM.bin.0.5.3**).
6. Check the log status in the TFTP Server package; when successful, it should show something like "*Sent IONMM.bin.0.5.3 to (192.168.1.30), 9876543 bytes*". The **TFTP Settings** section **Status** area should display "*Success*" when done.
7. Make sure that the Management VLAN function is disabled.
8. Reset the IONMM card. The **TFTP Settings** section **Status** area should display "*Success*" when done.
9. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message*: Failed to Transfer the Firmware Database File*!

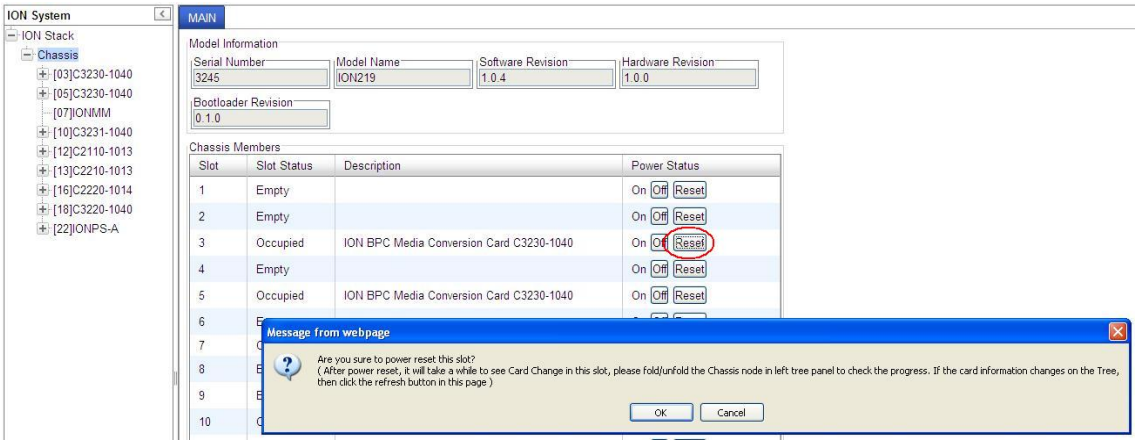


Meaning: A problem was detected while performing a Firmware Upgrade from the C3210 **MAIN** tab > **TFTP Settings** section or from the IONMM **UPGRADE** tab. See "Upgrade the IONMM and/or C3210 Firmware" on page 109.

Recovery:

1. Click **OK**.
2. Make sure you are using a TFTP Server package (not an FTP package). You will not be able to connect to the TFTP Server with an FTP client.
3. Make sure that you downloaded the correct IONMM firmware file from the Transition Networks web site.
4. Make sure the TFTP server is running and correctly configured.
5. Verify the **TFTP Server Address** entry. It should be the IP address of your TFTP Server (e.g., 192.168.1.30).
6. Verify the **Firmware File Name** that you entered is the one you intended, and that it is in the proper filename format (e.g., **IONMM.bin.0.5.3**). Include the filename extension if you have not done so.
7. Check the log status in the TFTP Server package; when successful, it should show something like "*Sent IONMM.bin.0.5.3 to (192.168.1.30), 9876543 bytes*". The **TFTP Settings** section **Status** area should display "*Success*" when done.
8. Reset the IONMM card. The **TFTP Settings** section **Status** area should display "*Success*" when done.
9. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Are you sure to power reset this slot? (After power reset, it will take a while to see card change in this slot; please fold/unfold the Chassis node in the left tree panel to check the progress. If the card information changes on the Tree, then click the Refresh button on this page.*)

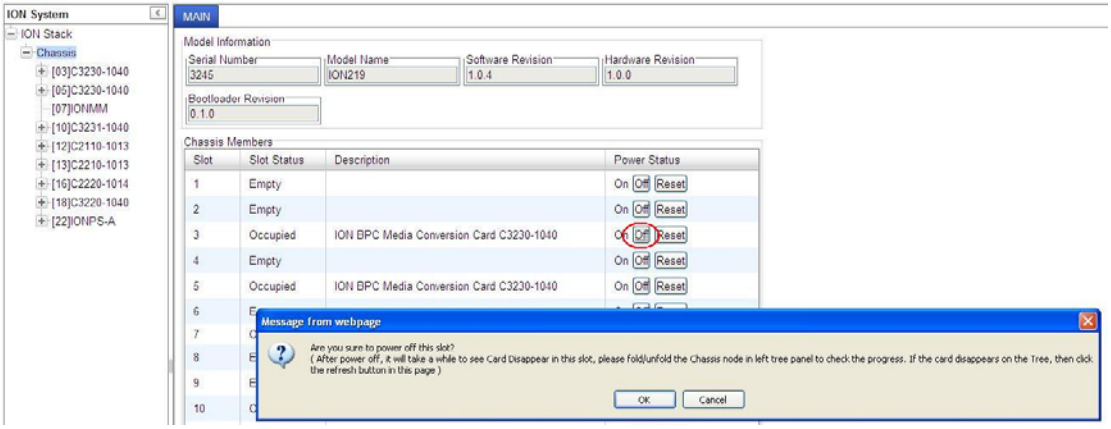


Meaning: A caution message generated at the **Chassis** > **MAIN** tab. You clicked the **Reset** button for a particular slot.

Recovery:

1. If you are not sure that you want to reset this slot, click the **Cancel** button to clear the message and return to normal operations without resetting power to this slot.
2. If you are sure that you want to reset this chassis, click the **OK** button to clear the message and reset power to the slot.
3. At the **Chassis** > **MAIN** tab, fold/unfold the Chassis node in the tree panel to check the progress.
4. If the card information changes on the Tree, then click the **Refresh** button on this page.
5. See "Menu System Descriptions" on page 44.
6. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Are you sure you want to power off this slot? (After power off, it will take a while to see Card Disappear in this slot; please fold/unfold the Chassis node in the left tree panel to check the progress. If the card information changes on the Tree, then click the Refresh button on this page.*)



Meaning: A caution message generated at the **Chassis** > **MAIN** tab. You clicked the **Off** button for a particular slot.

1. **Recovery**: If you are not sure that you want to power off this slot, click the **Cancel** button to clear the message and return to normal operations without resetting power to this slot.
2. If you are sure that you want to power off this slot, click the **OK** button to clear the message and remove power to the slot.
3. At the **Chassis** > **MAIN** tab, fold/unfold the Chassis node in the tree panel to check the progress.
4. If the card information changes on the Tree, then click the **Refresh** button on this page.
5. See "Menu System Descriptions" on page 44.
6. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

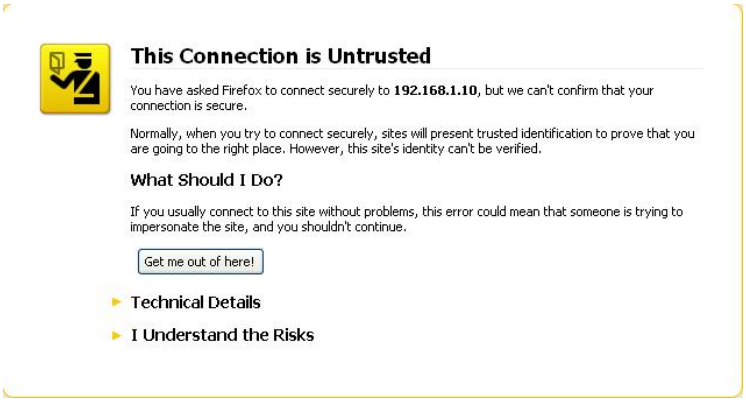
Message: *The Connection was Reset*

Meaning: The FireFox web browser connection failed to load the page.

Recovery:

1. Verify the URL (e.g., *http://* versus *https://*).
2. Check if the applicable server is running (TFTP, Syslog, HTTPS server) in the expected location.
3. Click the **Try again** button to retry the operation.

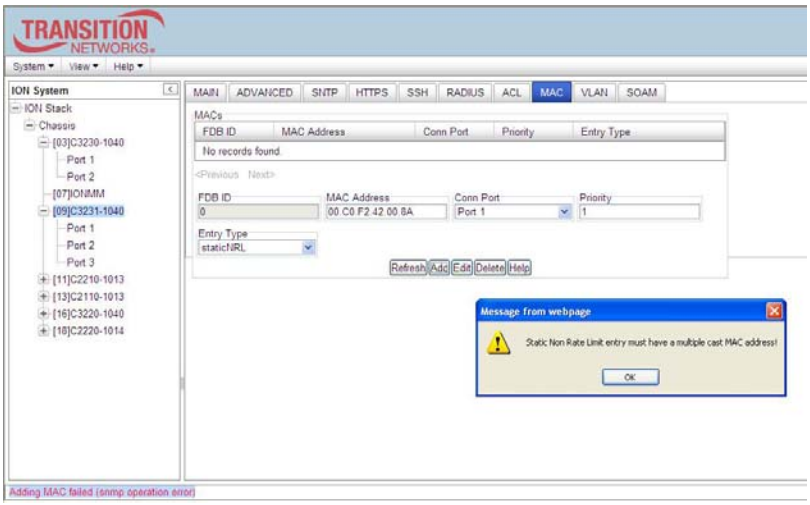
Message: *This Connection is Untrusted*



Meaning: You tried to connect via FireFox to a URL, but the FireFox web browser did not find a trusted certificate for that site.

Recovery: Click **Technical Details** for details, or click **I Understand the Risks** to continue operation.

Message: *Static Non Rate Limit entry must have a multiple cast MAC address!*



Meaning: When setting up MAC filtering, you entered a unicast MAC address and selected a Static NRL (Non Rate Limit) Entry Type.

Recovery:

1. Click **OK** to clear the message.
2. Either enter a multicast MAC Address, or select another Entry Type.

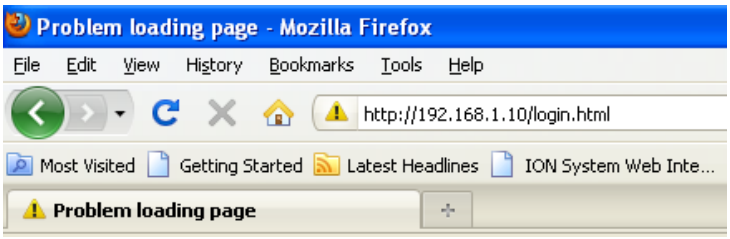
Message: *Local Area Connection x – A network cable is unplugged*

Meaning: You unplugged the USB cable at the C3210 or IONMM, or the C3210 or IONMM was unplugged from the ION chassis, or you pressed the Reset button on the IONMM.

Recovery:

1. If you pressed the Reset button on the IONMM, wait a few moments for the message to clear.
2. Plug the USB cable back into the IONMM's USB-DEVICE connector, or plug the USB cable back into the C3210's USB connector.
3. Try the operation again.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Problem loading page – Mozilla Firefox*

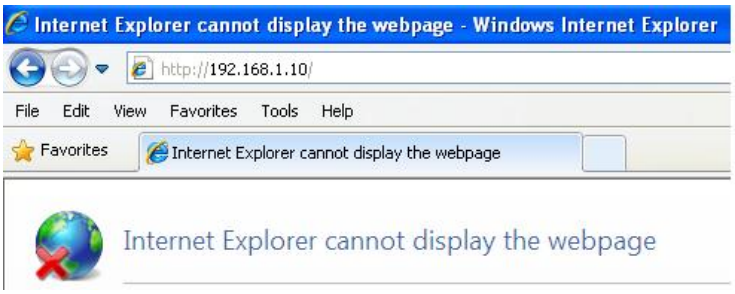


Meaning: You tried to log in to the ION system from the Mozilla Firefox browser, but the login failed.

Recovery:

1. Make sure the web browser you are using is supported. See "Web Browsers Supported" on page 72.
2. Verify the URL entered. See "Initial Setup with a Static IP Address via the CLI" on page 59.
3. Verify C3210 access. See "Accessing the C3210" on page 60.
4. Verify the IP address setting. See "Setting the IP Addressing" on page 89.
5. Verify the URL (e.g., http:// versus https://).
6. Try to log in to the ION system again.
7. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Internet Explorer cannot display webpage*

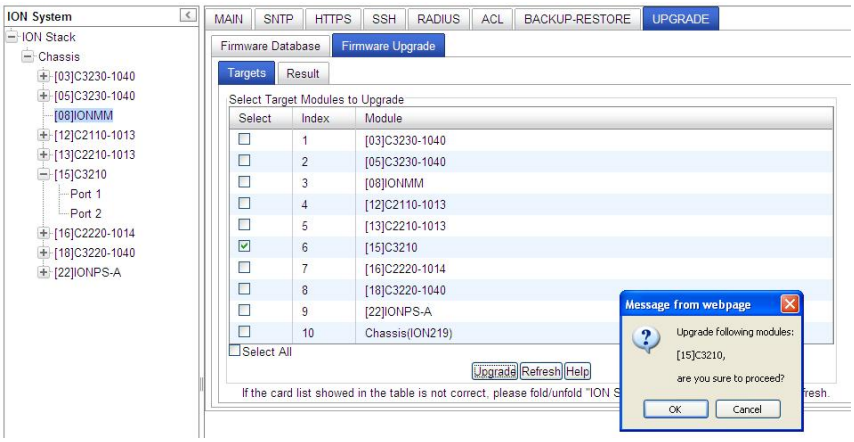


Meaning: You tried to log in to the ION system from IE, but the login failed.

Recovery:

1. Make sure the web browser you are using is supported. See "Web Browsers Supported" on page 42.
2. Verify the URL entered. See "Initial Setup with a Static IP Address via the CLI" on page 49.
3. Verify NID access. See "Accessing the C3210" on page 50.
4. Verify the IP address setting. See "Setting the IP Addressing" on page 69.
5. Verify the URL (e.g., http:// versus https://).
6. Try to log in to the ION system again.
7. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Upgrade following modules: [15]C3210, are you sure to proceed?*



Meaning: Verification message that you indeed want to upgrade the C3210 firmware.

Recovery:

1. If you are not sure you want to upgrade the C3210 firmware, click **Cancel** and continue operation.
2. If you are sure you want to upgrade the C3210 firmware, click **OK**. The upgrade process will continue.

See "Upgrade the IONMM and/or C3210 Firmware" on page 195 for more information.

ION System Tests

This section describes the C3210 system level tests, DMI functions, related test functions, and the xC3210 DIP switches and jumpers.

Virtual Cable Test (VCT)

The VCT feature uses TDR (Time Domain Reflectometry) to determine the quality of cables, connectors, and terminations. Problems that can be determined include opens, shorts, cable impedance mismatches, failed connectors, and termination mismatches.

The VCT runs the cable diagnostic by transmitting a signal of known amplitude sequentially along each of the TX and RX pairs of an attached cable. The transmitted signal continues along the cable until it is reflected from a cable imperfection, and that distance is displayed. If the test status returned is Normal, the distance displayed is the actual cable length. The VCT test is intrusive, as the tested port's link is brought down during the test.

When the VCT is activated, a pre-defined amount of time elapses before a VCT test pulse is transmitted. This ensures that the link partner loses link, so that it stops sending 100BASE-TX idles or 10 Mbps data packets. The VCT can be performed either when there is no link partner, or when the link partner is Auto-Negotiating or sending 10 Mbps idle link pulses.

Use the VCT test to determine if cabling is at fault when you cannot establish a link. Problems can include opens, shorts, cable impedance mismatches, failed connectors, and termination mismatches, bad magnetics.

Do not change the port configuration while the TDR test is running.

Due to cable characteristics, run the TDR test several times to get accurate results.

Do not change port status (e.g., remove the cable at the near or far end) as the results may be inaccurate.

The VCT test can be configured via the CLI method or the Web method.

VCT Test – CLI Method

Use the VCT test to determine if cabling is at fault when you cannot establish a link for a C3210 copper port.

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. Start the VCT Test. Type **start ether tdr test** and press **Enter**. The Time Domain Reflector (TDR) test starts on the specified Ethernet copper port.

3. Show the Ethernet port TDR Test configuration. Type **show ether tdr config** and press **Enter**. The Time Domain Reflectometry (TDR) test configuration displays for the Ethernet copper port. For example:

```
C1|S16|L1P1>show ether tdr config
Time-domain reflectometer configuration:
-----------------------------------------------------------------
TDR test state:                success
TDR test init time:            22:39:18
TDR test result valid:         true
C1|S16|L1P1>
```

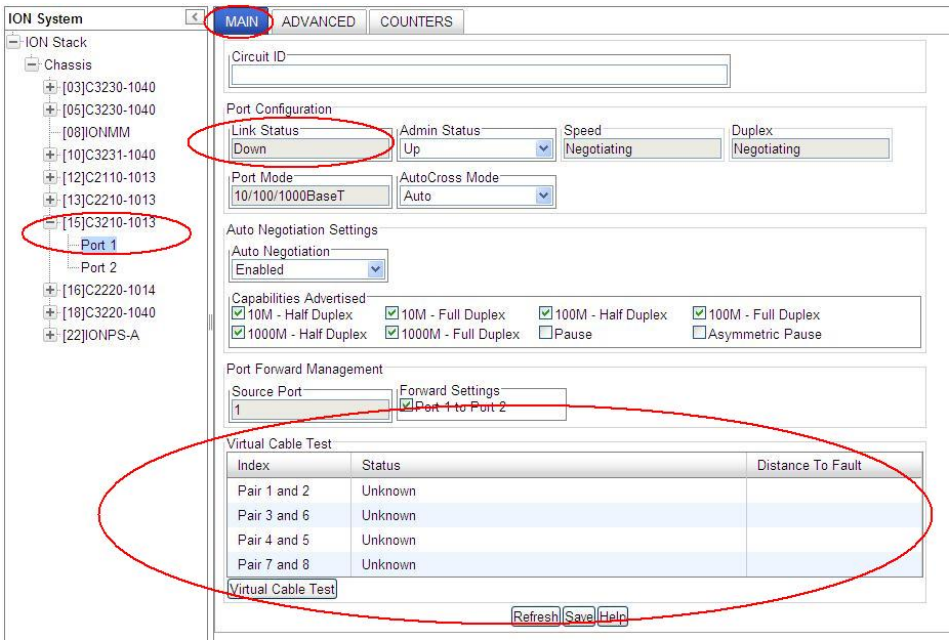
4. Show the Ethernet port TDR Test results. Type **show ether tdr test result** and press **Enter**. The results of an Ethernet port TDR test display for the copper port. For example:

```
C1|S5|L1P1>show ether tdr test result
Cable pair :
index                  distance to fault(unit)       status
-------------------------------------------------------------------------
pair1 and 2             0(meter)                      open
pair3 and 6             0(meter)                      open
pair4 and 5             0(meter)                      open
pair7 and 8             1(meter)                      open
C1|S5|L1P1>
```

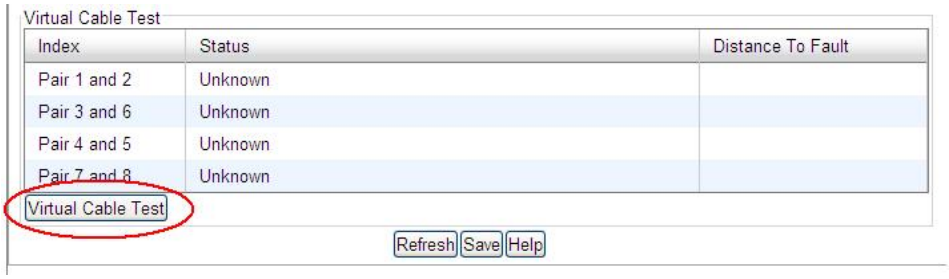
5. Run the TDR test several times to ensure accurate results. Do not change port status (e.g., remove the cable at the near or far end) as this may cause inaccurate results.

VCT Test – Web Method

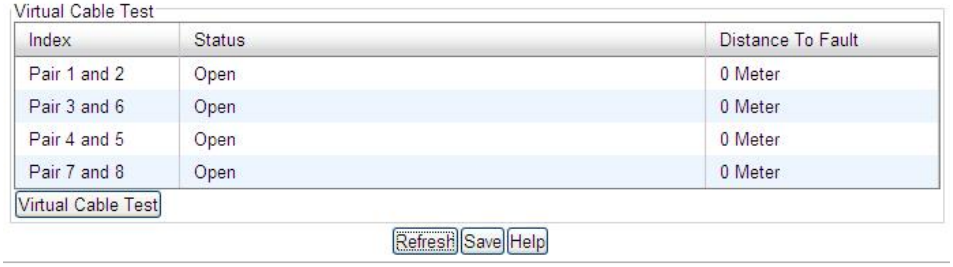
1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).
2. Select the desired port.
3. At the port-level **MAIN** tab, check the information displayed in the **Link Status** and **Virtual Cable Test** areas.



4. Click the **Virtual Cable Test** button. The VCT test runs and test information displays.



5. Check the information displayed in the **Link Status** (*Up* or *Down*) and **Virtual Cable Test** sections.



The possible VCT Test parameters and states are shown in the table below.

Table 12: VCT Parameters

Parameter	Fault State	Meaning
Link Status Down		VCT Test failed due to lost link.
Link Status Up		VCT Test passed; link is up. No action needed.
Index - Pair x to y		There are four pairs of standard category 5 cable. Each pair displays one of these states: Open, Broken, Shorted, Terminated, Impedance Mismatch, or Unknown.
Status – Normal		The pair is properly terminated at the remote end (not a fault state). The 'Distance To Fault' is blank.
Status – Open	X	Open (not connected) connection failure status. Cable impedance is greater than 333 ohms.
Status – Broken	X	Broken connection failure status.
Status – Shorted	X	Shorted connection failure status. Cable impedance is less then 333 ohms.
Status – Terminated		Connection terminated status (non-fault state).
Status – Impedance Mismatch	X	The impedance of the pair is mismatched.
Status – Unknown	X	None of the above (i.e., not Normal, Open, Shorted, Terminated, Impedance Mismatch, or Unknown).
Distance To Fault - 0 Meter		The overall distance to the fault in Meters (Open or no fault found).
Distance To Fault > 0 Meter		The overall distance to the fault in Meters.

DMI (Diagnostic Maintenance Interface) Parameters

The DMI (Diagnostic Maintenance Interface) function displays C3210 diagnostic / maintenance information such as fiber interface characteristics, diagnostic monitoring parameters, and supported fiber media lengths.

Note: Transition Networks C3210s that support DMI have a "-D" at the end of the model number.

DMI can be configured in the C3210 using either the CLI or Web method.

DMI Config – CLI Method

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. Set the Diagnostic Monitoring Interface receive preset power level. Type:

   set dmi rx-power-preset-level=xx

   Where:
   xx is a preset level for Rx Power on the Fiber port, in the range of 1 to 10.

3. Press **Enter**. For example: **set dmi preset-power-level=10**.

4. Display the DMI information. Type: **show dmi info** and press **Enter**. For example:

```
C1|S13|L0AP1|L1P2/>set dmi preset-power-level=10
C1|S13|L0AP1|L1P2/>show dmi info
Diagnostic monitoring interface information:
-------------------------------------------------------------------------
DMI connect type:                                          LC
DMI bit rate:                                              13*100Mbps
DMI link length(single mode fiber, 100m):                  100*100m
DMI link length(50 micron multi-mode fiber, 10m):          50*10m
DMI link length(62.5 micron multi-mode fiber, 10m):        50*10m
DMI link length(copper cable, m):                          N/A
DMI indentifier:                                           SFP
DMI laser wavelength:                                      1310*nm
DMI temperature:                                           47.3*C
DMI temperature alarm setting:                             normal
DMI bias current:                                          20912*uA
DMI bias current alarm setting:                            normal
DMI Tx power:                                              249*uW
DMI Tx power:                                              normal
DMI Rx power:                                              0*uW
DMI Rx power:                                              normal
DMI Rx power preset level:                                 0*uW
```

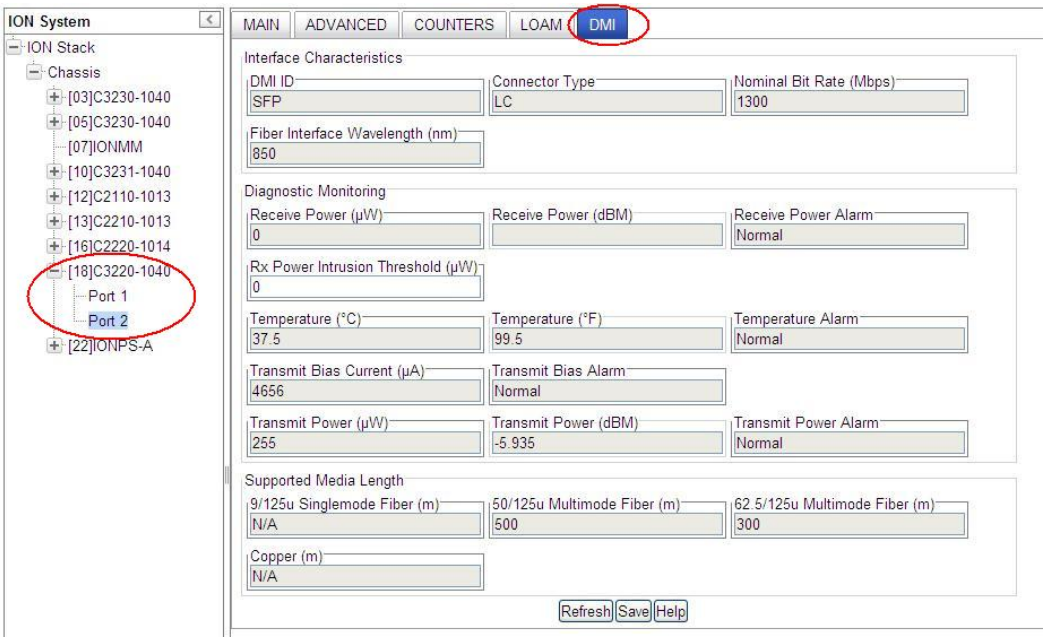
The DMI tab parameters are described in the table below.

DMI Config – Web Method

1. Access the C3210 through the Web interface (see "Starting the Web Interface" on page 45).

2. Select the desired device and port.

3. Select the **DMI** tab.



The Interface Characteristics, Diagnostic Monitoring, and Supported Media Length information fields display. See the table below for parameter descriptions.

4. You can click the **Refresh** button to update the information displayed.
   You can click the **Save** button to save the updated information.

The **DMI** tab parameters are described in the table below.

Table 13: DMI Parameters

Parameter	Possible Parameters	Description
DMI ID	Unknown, GBIC, soldered to mother-board, SFP, Re-served, vendor-specific	Specifies the physical device from SFF-8472 Rev 9.5 Standard: 00h Unknown or unspecified 01h GBIC 02h Module/connector soldered to motherboard 03h SFP 04-7Fh Reserved 80-FFh Vendor specific
Connector Type	LC, MT-RJ LC, SC, ST, RJ-45, VF-45, or unknown	The external optical or electrical cable connector provided as the interface. * MT-RJ: Media Termination - Recommended Jack for Duplex multimode connections. * LC: Lucent Connector or Local Connector for High-density connections, SFP transceivers. * SC: Subscriber Connector for Datacomm and Telecomm. * ST: BFOC Straight Tip / Bayonet Fiber Optic Connector for Multimode - rarely Singlemode (APC not possible). * VF-45: Snap connector for Datacom uses. See the "Connector Types" section below.
Nominal Bit Rate	(measured rate)	Bitrate in units of 100Mbps (the sample screen above shows 1300, or 1.3 Gbps).
Fiber Interface Wavelength	(measured wave-length)	The Nominal transmitter output wavelength at room tempera-ture. The unit of measure is nanometers (the sample screen above shows 850 nm).
Receive Power (uW)	(measured power measurement)	Receive power on local fiber measured in microwatts (the sam-ple screen above shows 11 uW).
Receive Power (dBM)	(measured signal strength)	Receive power on local fiber measured in dBM (decibels rela-tive to one milliwatt) which defines signal strength. The sample screen above shows -19.586 dBM.
Receive Power Alarm	Normal -1, Not Supported - 2, Low Warn - 3, High Warn - 4, Low Alarm - 6 High Alarm - 7	Alarm status for receive power on local fiber.
Rx Power Intru-sion Threshold (uW)	0-10	A preset level for Rx Power on the Fiber port. If the DMI read value falls below the preset value, an intrusion is detected, and a trap is generated.
Temperature (˚C)	(measured temp.)	Temperature of fiber transceiver in tenths of degrees C (Cel-sius). The sample screen above shows 40.1˚C.
Temperature (˚F)	(measured temp.)	Temperature of fiber transceiver in tenths of degrees F (Fahr-enheit). The sample screen above shows 104.2 ˚F.

Temperature Alarm	Normal -1, Not Supported - 2, Low Warn - 3, High Warn - 4, Low Alarm - 6 High Alarm - 7	Alarm status for temperature of fiber transceiver. An *ionDMITemperatureEvt* event is sent when there is a warning or alarm on DMI temperature
Transmit Bias Current (uA)	(measured current)	Transmit bias current on local fiber interface, in uA (microamperes). The sample screen above shows 14768 uA (microamps).
Transmit Bias Alarm	Normal -1, Not Supported - 2, Low Warn - 3, High Warn - 4, Low Alarm - 6 High Alarm - 7	Alarm status for transmit bias current on local fiber interface.
Transmit Power (uW)	(measured power)	Transmit power on local fiber measured in microwatts. The sample screen above shows 240 uW (microwatts).
Transmit Power (dBM)	(measured power)	Transmit power on local fiber measured in dBM (decibels relative to one milliwatt) which defines signal strength. The sample screen above shows -6.126 dBM.
Transmit Power Alarm	Normal -1, Not Supported - 2, Low Warn - 3, High Warn - 4, Low Alarm - 6 High Alarm - 7	Alarm status for transmit power on local fiber.
Supported Media Length	9/125u Singlemode Fiber (m)	Specifies the link length that is supported by the transceiver while operating in single mode (SM) fiber. The unit of measure is meters (m). The sample screen above shows N/A, indicating the media is not applicable.
Supported Media Length	50/125u Multimode Fiber (m)	Specifies the link length that is supported by the transceiver while operating in 50 micron Multimode (MM) fiber. The value is in meters. The sample screen above shows 500 meters as the supported media length.
Supported Media Length	62.5/125u MM Fiber (m)	Specifies the link length that is supported by the transceiver while operating in 62.5 micron Multimode (MM) fiber. The value is in meters. The sample screen above shows 300 meters as the supported media length.
Supported Media Length	Copper (m)	Specifies the link length that is supported by the transceiver while operating in copper cable. The value is in meters. The sample screen above shows N/A, indicating the media is not applicable.

Connector Types

The DMI connector type indicates the external optical or electrical cable connector provided as the interface. The information below is from SFF 8472 Rev 9.5.

Table 14: Connector Types

Value	Description of connector
00h	Unknown or unspecified
01h	SC
02h	Fibre Channel Style 1 copper connector
03h	Fibre Channel Style 2 copper connector
04h	BNC/TNC
05h	Fibre Channel coaxial headers
06h	FiberJack
07h	LC
08h	MT-RJ
09h	MU
0Ah	SG
0Bh	Optical pigtail
0C-1Fh	Reserved
20h	HSSDC II
21h	Copper Pigtail
22h-7Fh	Reserved
80-FFh	Vendor specific

The LC, MT-RJ LC, SC, ST, or VF-45 connector types (jacks) are shown below.

ST

SC

LC

MT-RJ

VF-45

Set Debug Level

You can use the CLI method to define the system debug level.

1. Access the C3210 through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. Set the desired debug level. Type:

   set dbg level=<0-2>

   where:
   0=debug Severity level 0 (Emergency: system is unusable - e.g., serious hardware failure or imminent power failure).
   1=debug Severity level 1 (Alert: action must be taken immediately).
   2=debug Severity level 2 (Critical condition).

3. Press **Enter**.

For example:
```
C1|S5|L1D>set dbg level 0
C1|S5|L1D>set dbg level 1
C1|S5|L1D>set dbg level 2
C1|S5|L1D>
```

DIP Switches and Jumper Settings

The C3210 has on-board components that can be used to configure device operation, typically at the direction of a TN technical support specialist. In most cases, the factory default settings provide optimal configuration settings; however, DIP Switch and Jumper setting changes may be required for operating mode changes or troubleshooting purposes.

PCB Identification

This section covers the following PCBs (printed circuit boards):

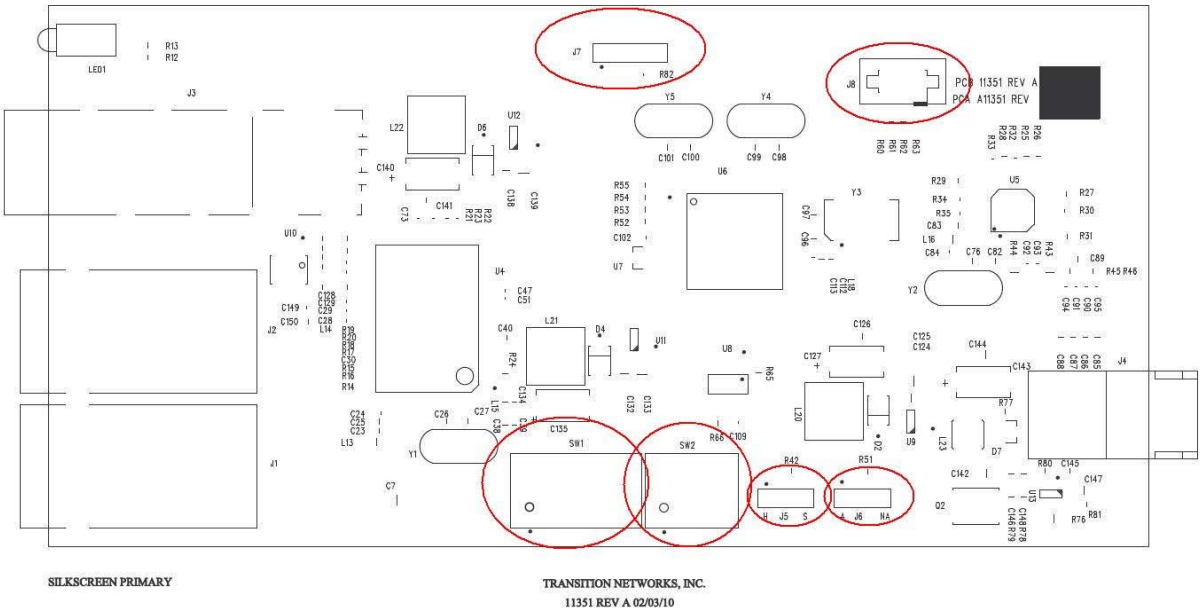
- **x3210** PCB: 11325 Rev. A, B and C (this information is silkscreened on the top of the PCB).
- **x3210** PCB: 11351 Rev. A (this information is silkscreened on the bottom of the PCB).

Each PCB has jumpers and / or DIP switches. Not all of these jumpers / DIP switches are intended for use in the field.

Note: Do not change these configurable items except at the direction of a TN technical support specialist.

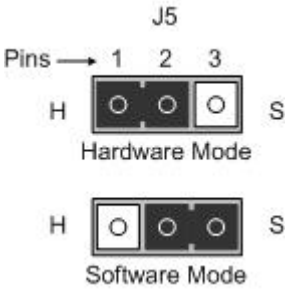
x3210 PCB

x3210 PCB: All PCBs (this information is silkscreened on the bottom of the PCB). This PCB has four jumpers and two DIP switches. **Note**: not all of these are used in the field.



J5 - Hardware / Software Mode Jumper

Jumper J5 enables x3210 Hardware Mode or Software Mode. The default setting is Software mode.

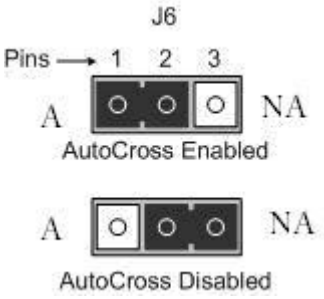


J5

Jumper Pin #s	**Function**
1-2	Hardware Mode (**H**).
2-3	Software Mode (**S**).

J6 - Autocross Enable / Disable Jumper

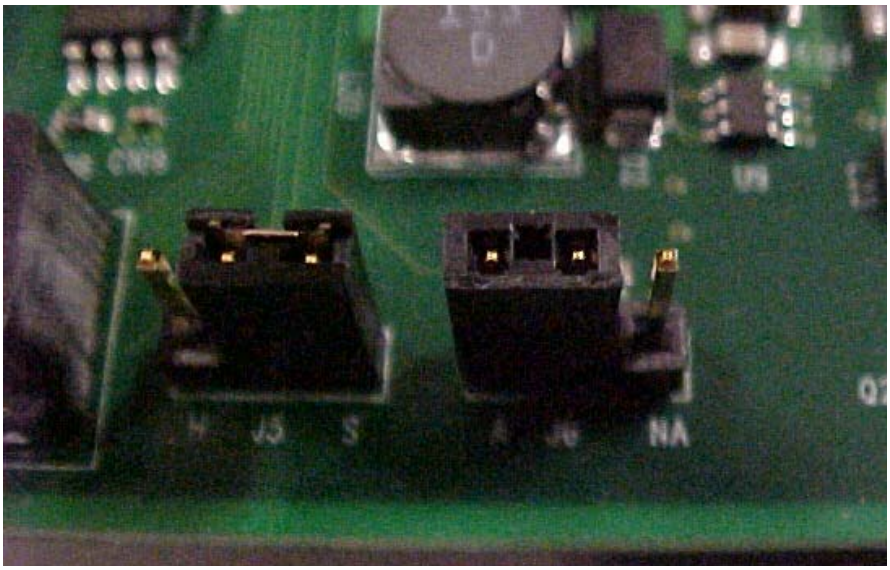
Jumper J6 can be used in the field to enable or disable the x3210 Autocross feature. The default setting is Autocross Enabled (A).



J6

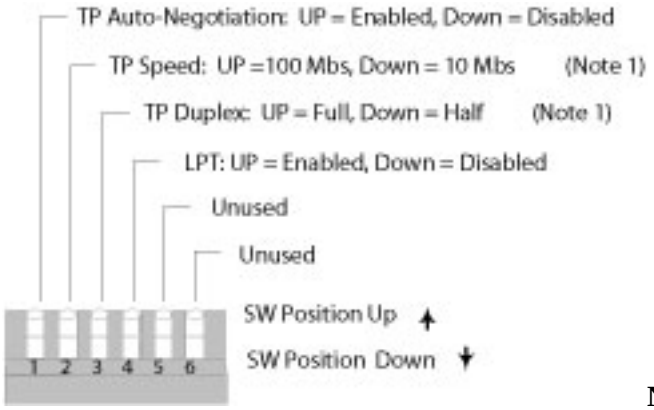
Jumper Pin #s	**Function**
1-2	Autocross Enabled (**A**).
2-3	Autocross Disabled (**NA**).

Jumpers J5 and J6 are shown below.



DIP Switch SW1 (Autoneg, Speed, Duplex, LPT, and Fiber Duplex)

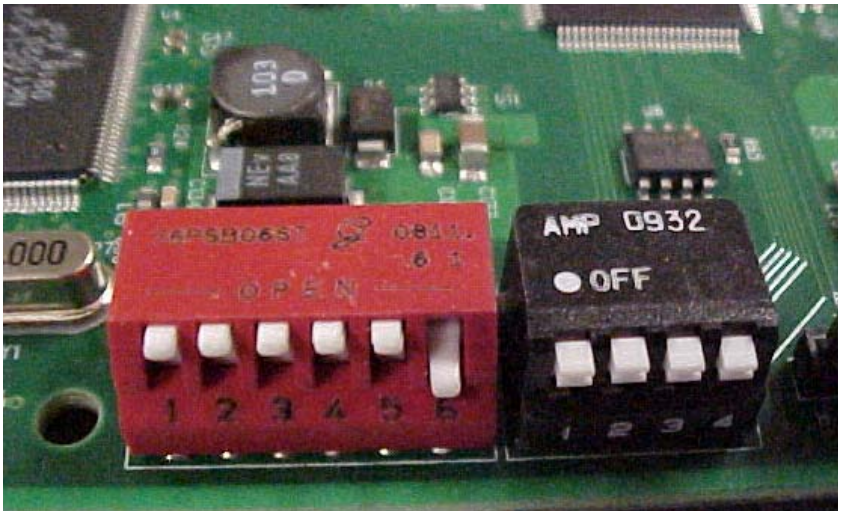
The 6-position DIP Switch SW1 can be used in the field to configure the x3210 TP1 AutoNegotiation, Speed, Duplex, LPT, and Fiber Duplex settings.



Note 1: Only use when Auto-Negotiation is disabled.

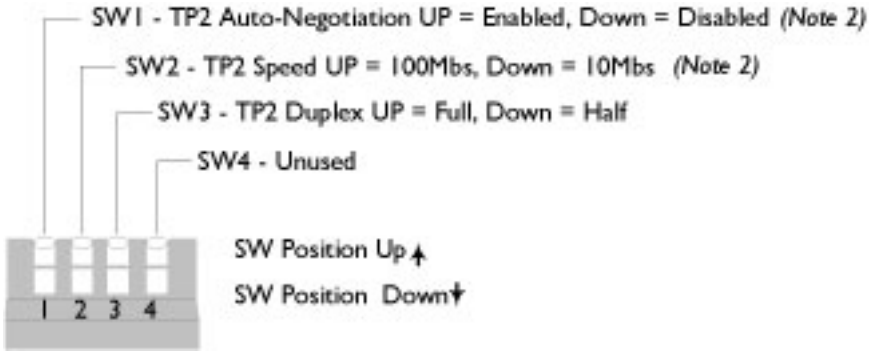
Switch #	High position (Up - Default)	Low position (Down)
1	TP1 AutoNegotiation Enabled	TP1 AutoNegotiation Disabled
2	TP1 100 Mbps Speed	TP1 10 Mbps Speed (only with AutoNegotiation disabled)
3	TP1 Full Duplex mode	TP1 Half Duplex mode (only with AutoNegotiation disabled)
4	LPT Enabled	LPT (Link Pass Through) Disabled (for TX to FX only)
5	Full duplex fiber	Half duplex fiber (valid only for 100FX)
6	Not used.	Not used.

DIP switches SW1 (left) and SW2 (right) are shown below.



DIP Switch SW2 (TP2 Autoneg, Speed, Duplex)

The 4-position DIP Switch SW2 can be used in the field to configure the x3210 TP2 AutoNegotiation, Speed, and Duplex settings.



Switch #	High position (Up)	Low position (Down)
1	TP2 AutoNegotiation Enabled	TP2 AutoNegotiation Disabled
2	TP2 100 Mbps Speed	TP2 10 Mbps Speed (only with AutoNegotiation disabled)
3	TP2 Full Duplex mode	TP2 Half Duplex mode (only with AutoNegotiation disabled)
4	Reserved – do not use.	Reserved – do not use.

Note 2: Only use when Auto-Negotiation is disabled.

J78 (Not Used)

Do not use. Jumper J7 is used for manufacturing / debug purposes only.

J8 (Not Used)

Do not use. Jumper J8 is used for manufacturing / debug purposes only.

Third Party Troubleshooting Tools

This section provides information on third party troubleshooting tools for Windows, Linux, etc. Note that this section may provide links to third party web sites. Transition Networks is not responsible for any third party web site content or application. The web site information was accurate at the time of publication, but may have changed in the interim.

- Ipconfig and ifconfig
- Windows Network Connections
- Ping
- Telnet
- PuTTY
- Tracert (Traceroute)
- Netstat
- Winipcfg
- Nslookup
- Dr. Watson

Note: IETF RFC 2151 is a good source for information on Internet and TCP/IP tools at ftp://ftp.rfc-editor.org/in-notes/rfc2151.txt.

Ipconfig

Ipconfig (Windows Vista): Use the procedure below to find your IP address, MAC (hardware) address, DHCP server, DNS server and other useful information under Windows Vista.

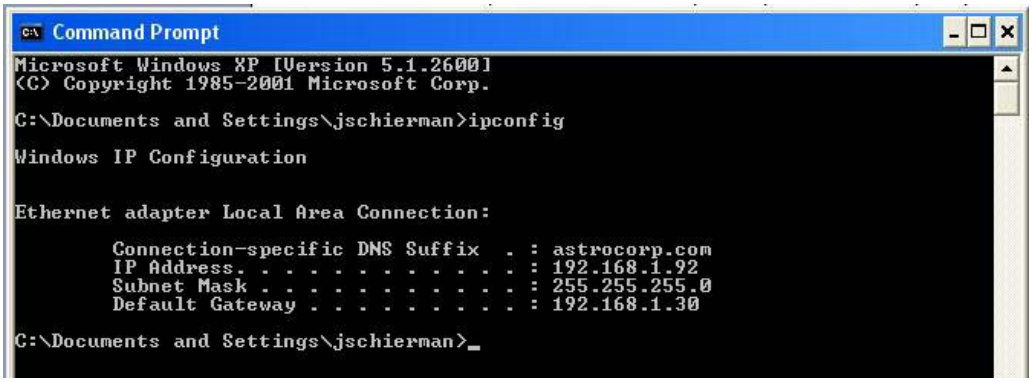
1. Go to the start menu and type **command** in the box.
2. Right-click on Command Prompt and click **Run as administrator**. If a User Account Control window pops up, click **Continue**.
3. At the **C:\>** prompt type **ipconfig** and press **Enter**. Your IP address, subnet mask and default gateway display. If your IP address is 192.168.x.x, 10.x.x.x, or 172.16.x.x, then you are receiving an internal IP address from a router or other device.
4. For more detailed information, type **ipconfig /all** at the prompt. Here you can get the same information as **ipconfig** plus your MAC (hardware) address, DNS and DHCP server addresses, IP lease information, etc.

Note: If you are receiving a 169.254.x.x address, this is a Windows address that generally means your network connection is not working properly.

Ipconfig (Windows XP): **ipconfig** (Internet Protocol Configuration) in Windows is a console application that displays all current TCP/IP network configuration values and refreshes Dynamic Host Configuration Protocol DHCP and Domain Name System DNS settings.

Use the **ipconfig** command to quickly obtain the TCP/IP configuration of a computer.

1. Open a Command Prompt. Click Start, point to Programs, point to Accessories, and then click Command Prompt.
2. Type **ipconfig** and press Enter. The Windows IP Configuration displays:



3. Make sure that the network adapter for the TCP/IP configuration you are testing is not in a Media disconnected state.
4. For more information, use the /all parameter (type **ipconfig /all** and press **Enter**).

The **ipconfig** command is the command-line equivalent to the **winipcfg** command, which is available in Windows ME, Windows 98, and Windows 95. Windows XP does not include a graphical equivalent to the **winipcfg** command; however, you can get the equivalent functionality for viewing and renewing an IP address using Windows' Network Connections (see below).

ifconfig

1. Verify that the machine's interfaces are up and have an IP address using the **ifconfig** command:

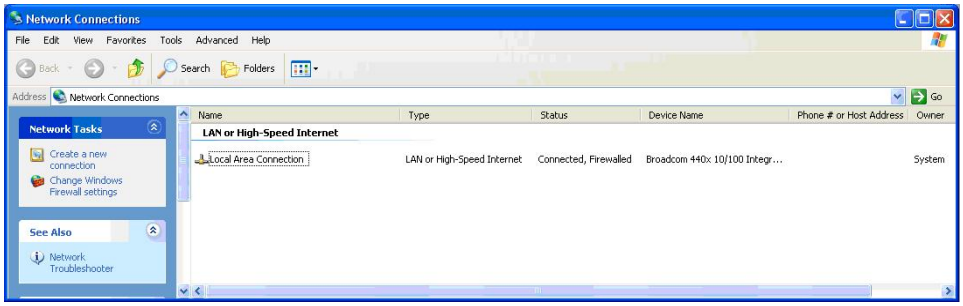
```
[root@sleipnir root]# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0C:6E:0A:3D:26
          inet addr:192.168.168.11  Bcast:192.168.168.255
Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:13647 errors:0 dropped:0 overruns:0 frame:0
          TX packets:12020 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:100
          RX bytes:7513605 (7.1 Mb)  TX bytes:1535512 (1.4 Mb)
          Interrupt:10

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:8744 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8744 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:892258 (871.3 Kb)  TX bytes:892258 (871.3 Kb)
```

The above machine is running normally. The first line of output shows that the Ethernet interface eth0 has a layer 2 (MAC or hardware) address of 00:0C:6E:0A:3D:26. This confirms that the device driver is able to connect to the card, as it has read the Ethernet address burned into the network card's ROM. The next line shows that the interface has an IP address of 192.168.168.11, and the subnet mask and broadcast address are consistent with the machine being on network 192.168.168.0.

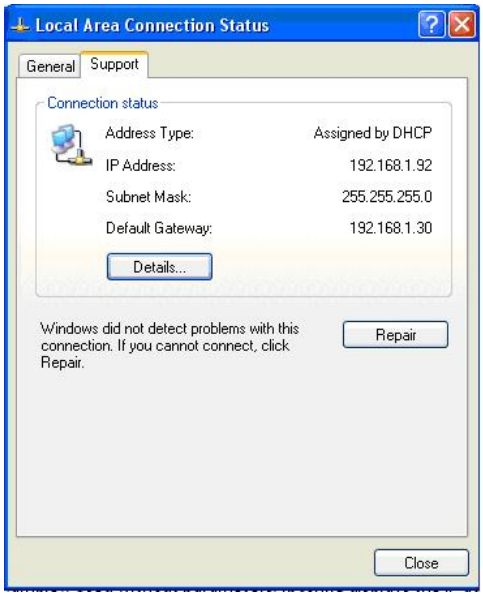
Windows Network Connections

In Windows XP you can view and renew an IP address using Windows Network Connections.

1. Open Network Connections from **Start** → **Settings** → **Network Connections**.



2. Right-click a network connection.
3. Click **Status**.
4. Click the **Support** tab. Your connection status information displays.

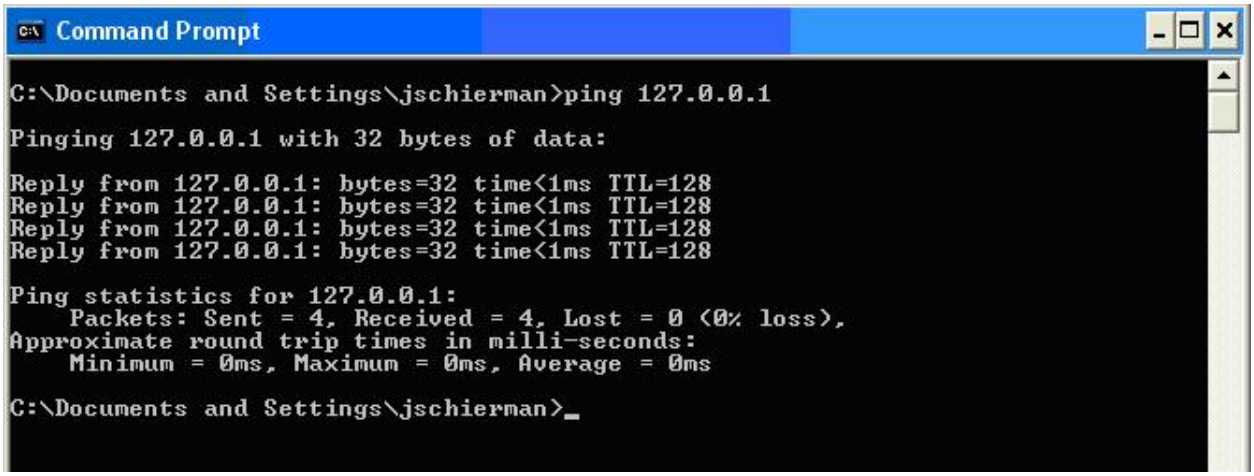


5. Click the **Details** button to display the Physical Address, IP Address, Subnet Mask, Default Gateway, DHCP Server, Lease Obtained, Lease Expires, and DNS Server addresses.

Ping

Use the **ping** command to test a TCP/IP configuration by using the ping command (in Windows XP Professional in this example). Used without parameters, ipconfig displays the IP address, subnet mask, and default gateway for all adapters.

1. Open a Command Prompt**.** To open a command prompt, click **Start**, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
2. At the command prompt, ping the loopback address by typing **ping 127.0.0.1**.



3. Ping the IP address of the computer.
4. Ping the IP address of the default gateway. If the **ping** command fails, verify that the default gateway IP address is correct and that the gateway (router) is operational.
5. Ping the IP address of a remote host (a host on a different subnet). If the **ping** command fails, verify that the remote host IP address is correct, that the remote host is operational, and that all of the gateways (routers) between this computer and the remote host are operational.
6. Ping the IP address of the DNS server. If the **ping** command fails, verify that the DNS server IP address is correct, that the DNS server is operational, and that all of the gateways (routers) between this computer and the DNS server are operational.

If the **ping** command is not found or the command fails, you can use Event Viewer to check the System Log and look for problems reported by Setup or the Internet Protocol (TCP/IP) service.

The **ping** command uses Internet Control Message Protocol (ICMP) Echo Request and Echo Reply messages. Packet filtering policies on routers, firewalls, or other types of security gateways might prevent the forwarding of this traffic.

Telnet

Telnet is a simple, text-based program that lets you connect to another computer via the Internet. If you've been granted the right to connect to that computer by that computer's owner or administrator, Telnet will let you enter commands used to access programs and services that are on the remote computer, as if you were sitting right in front of it.

The Telnet command prompt tool is included with the Windows Server 2003 and Windows XP operating systems. See the related OS documentation and helps for more information. Note that if you are only using computers running Windows, it may be easier to use the Windows Remote Desktop feature. For more information about Remote Desktop, see the related OS documentation and helps.

Telnet Client

By default, Telnet is not installed with Windows Vista or Windows 7, but you can install it by following the steps below.

To install Telnet Client:

1. Click the **Start** button, click **Control Panel**, click **Programs**, and then select **Turn Windows features on or off**. If prompted for an administrator password or confirmation, type the password or provide confirmation.
2. In the **Windows Features** dialog box, check the **Telnet Client** checkbox.
3. Click **OK**. The installation might take several minutes.

After Telnet Client is installed, open it by following the steps below.

To open the Telnet Client:

1. Clicking the **Start** button, type **Telnet** in the Search box, and then click **OK**.
2. To see the available telnet commands, type a question mark (**?**) and then press **Enter**.

Telnet Server

In Windows Server 2003 for most Telnet Server functions, you do not need to configure Telnet Server options to connect a Telnet client to the Windows Server 2003-based Telnet Server. However, in Windows Server 2003 you must configure Telnet Server options to be able to do certain functions.

For example, the following command uses the credentials of the user who is currently logged on to the client to create a Telnet connection on port 23 with a host named server01.

telnet server01

The following example creates the same Telnet connection and enables client-side logging to a log file named c:\telnet_logfile.

telnet -f c:\telnet_logfile server01

The connection with the host remains active until you exit the Telnet session (by using the **Exit** command), or you use the Telnet Server administration tool to terminate the Telnet session on the host.

For more information, see the Windows Server TechCenter at http://technet.microsoft.com/en-us/library/cc787407(WS.10).aspx.

1. If you try to enable and install Telnet in Windows 7, and the message "*An error has occurred. Not all of the features were successfully changed*" displays, one workaround is to use a third party Telnet client, such as PuTTY, which also supports recommended SSH client.

PuTTY

PuTTY is a simple, free, but excellent SSH and Telnet replacement for Windows 95/98/NT.

The PuTTY SSH and telnet client was developed originally by Simon Tatham for the Windows platform. PuTTY is open source software that is developed and supported by a group of volunteers. PuTTY has been ported to various other operating systems. Official versions exist for some Unix-like platforms, with on-going ports to Mac OS and Mac OS X.

The PuTTY terminal emulator application also works as a client for the SSH, Telnet, rlogin, and raw TCP computing protocols.

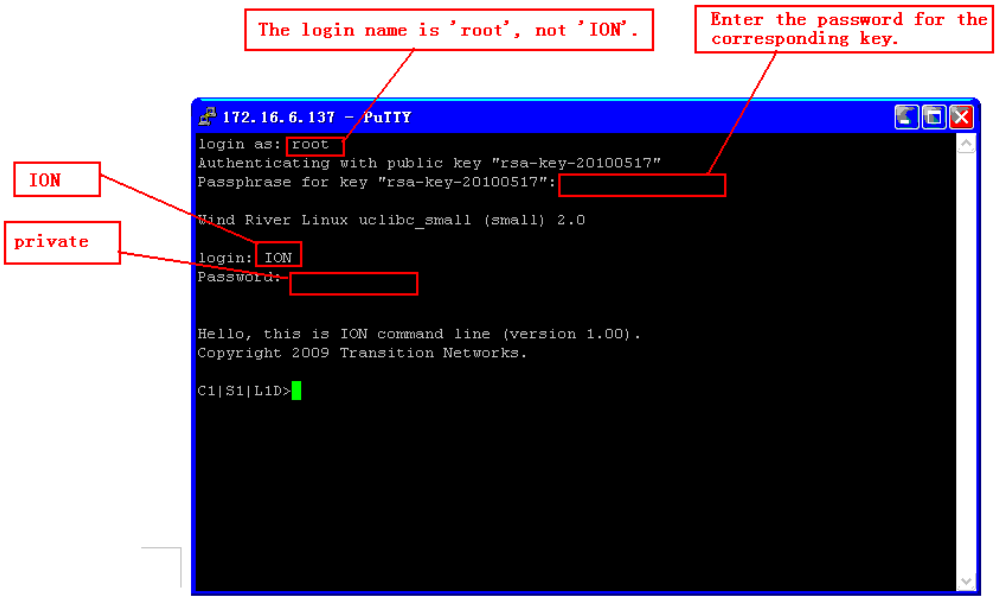
For PuTTY legal and technical details, see the PuTTY download page at http://putty.org/ or at http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html.

Note:

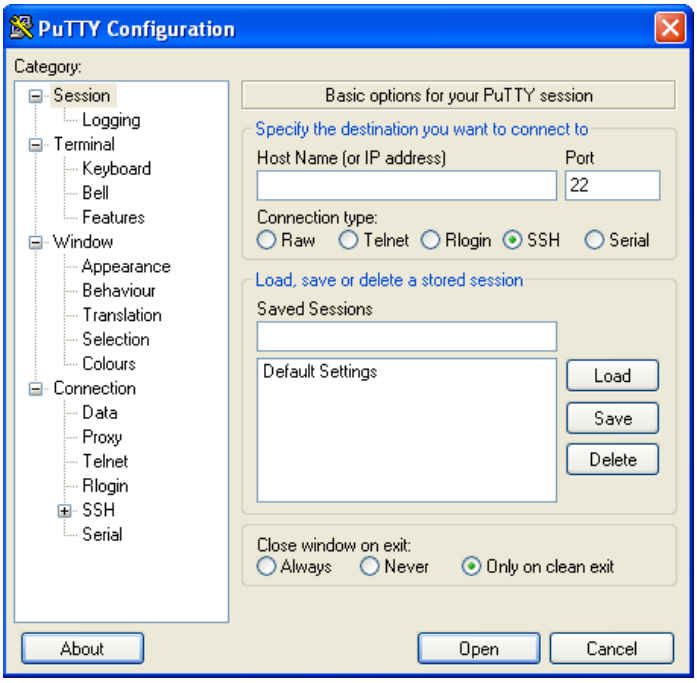
1) When the user-public key is loaded into the IONMM successfully, the key will take effect immediately; you do not need to restart the SSH server.

2) The ION system supports SSH2 keys only; SSH1 keys are not supported. When generating using puttyGen.exe, do not select the SSH1 keys.

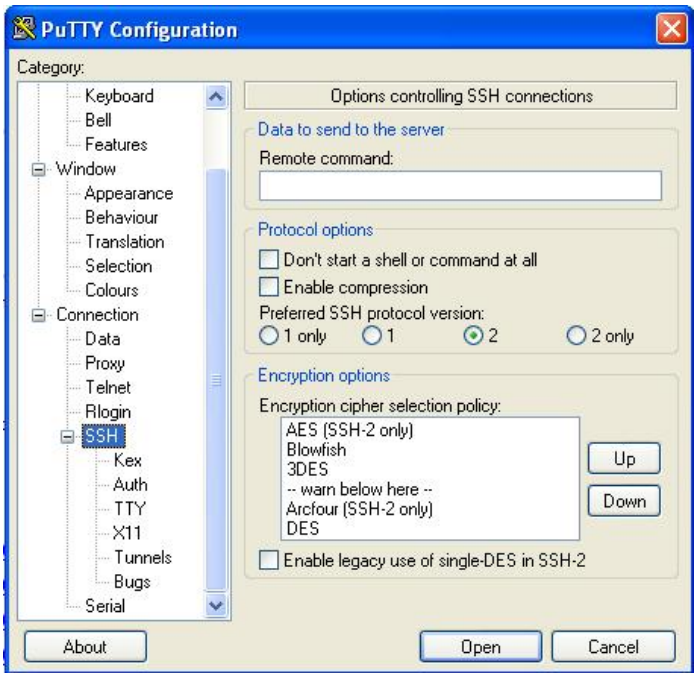
3) The ION system currently supports one user named 'root' with public key authentication.



PuTTY Basic Options:



PuTTY SSH Options:



Tracert (Traceroute)

Traceroute is a computer network tool used to determine the route taken by packets across an IP network. 'Tracert" (pronounced "traceroute") sends a test network message from a computer to a designated remote host and tracks the path taken by that message.

Tracert is a Windows based tool that allows you to help test your network infrastructure. In this article we will look at how to use tracert while trying to troubleshoot real world problems. This will help to reinforce the tool's usefulness and show you ways in which to use it when working on your own networks.

The traceroute tool is available on practically all Unix-like operating systems. Variants with similar functionality are also available, such as tracepath on modern Linux installations and tracert on Microsoft Windows operating systems. Windows NT-based operating systems also provide **pathping**, which provides similar functionality.

The tracert TCP/IP utility allows you to determine the route packets take through a network to reach a particular host that you specify. Tracert works by increasing the "time to live" (TTL) value of each successive packet sent. When a packet passes through a host, the host decrements the TTL value by one and forwards the packet to the next host. When a packet with a TTL of one reaches a host, the host discards the packet and sends an ICMP time exceeded. Tracert, if used properly, can help you find points in your network that are either routed incorrectly or are not existent at all.

The Tracert Windows based command-line tool lets you trace the path that an IP packet takes to its destination from a source. Tracert determines the path taken to a destination by sending ICMP (Internet Control Message Protocol) Echo Request messages to the destination. When sending traffic to the destination, it incrementally increases the TTL (Time to Live) field values to help find the path taken to that destination address.

Tracert options include:

-? which displays help at the command prompt.
-d which prevents tracert from attempting to resolve the IP addresses of intermediate routers to their names (this speeds up the display of tracert results). Using the **–d** option helps when you want to remove DNS resolution. Name servers are helpful, but if not available, incorrectly set, or if you just want the IP address of the host, use the **–d** option.

Netstat

Netstat (network statistics) is a command-line tool that displays network connections (both incoming and outgoing), routing tables, and a number of network interface statistics. It is available on UNIX, Unix-like, and Windows NT-based operating systems.

The **netstat** tool is used for finding network problems and determining the amount of traffic on the network as a performance measurement. It displays active TCP connections, ports on which the computer is listening, Ethernet statistics, the IP routing table, IPv4 statistics (for the IP, ICMP, TCP, and UDP protocols), and IPv6 statistics (for the IPv6, ICMPv6, TCP over IPv6, and UDP over IPv6 protocols). When used without parameters, **netstat** displays active TCP connections.

Note: parameters used with this command must be prefixed with a hyphen (-) and NOT a slash (/):

-a Displays all active TCP connections and the TCP and UDP ports on which the computer is listening.
-b Displays the binary (executable) program's name involved in creating each connection or listening port. (Windows XP, 2003 Server only - not Microsoft Windows 2000 or other non-Windows operating systems).
-e Displays Ethernet statistics, such as the number of bytes and packets sent and received.
-f Displays fully qualified domain names (FQDN) for foreign addresses.(not available under Windows)
-i Displays network interfaces and their statistics (not available under Windows).
-o Displays active TCP connections and includes the process ID (PID) for each connection. You can find the application based on the PID on the Processes tab in Windows Task Manager. This parameter is available on Windows XP, 2003 Server (but not on Windows 2000).
-p (Windows): Protocol : Shows connections for the protocol specified by Protocol. In this case, the Protocol can be tcp, udp, tcpv6, or udpv6. If this parameter is used with -s to display statistics by protocol, Protocol can be tcp, udp, icmp, ip, tcpv6, udpv6, icmpv6, or ipv6.
-p (Linux) Process : Show which processes are using which sockets (you must be root to do this).

Winipcfg

The **winipcfg** command is available in Windows ME, Windows 98, and Windows 95 to review your current TCP/IP network protocol settings. Follow these steps to view your current TCP/IP settings using **winipcfg**:

1. Click the Start button and then click Run.
2. Type **winipcfg** in the Open box, and then click OK. Your current TCP/IP settings are displayed.
3. To view additional information, click **More Info**.

Note: The Winipcfg display is not updated dynamically. To view changes, quit **winipcfg** and then run it again. If your IP address was dynamically allocated by a DHCP server, you can use the Release and Renew buttons to release and renew the IP address.

The following information is displayed by the **winipcfg** tool.

Adapter Address: This string of hexadecimal numbers represents the hard-coded identification number assigned to the network adapter when it was manufactured. When you are viewing the IP configuration for a PPP connection using Dial-Up Networking, the number is set to a default, meaningless value (because modems are not hard-coded with this type of address).

IP Address: This is the actual IP networking address that the computer is set to. It is either dynamically assigned to the computer upon connection to the network, or a static value that is manually entered in TCP/IP properties.

Subnet Mask: The subnet mask is used to "mask" a portion of an IP address so that TCP/IP can determine whether any given IP address is on a local or remote network. Each computer configured with TCP/IP must have a subnet mask defined.

Default Gateway: This specifies the IP address of the host on the local subnet that provides the physical connection to remote networks, and is used by default when TCP/IP needs to communicate with computers on other subnets.

Click **More Info** to display the following settings:

DHCP Server: This specifies the IP address of the DHCP server. The DHCP server provides the computer with a dynamically assigned IP address upon connection to the network. Clicking the Release and Renew buttons releases the IP address to the DHCP server and requests a new IP address from the DHCP server.

Primary and Secondary WINS Server: These settings specify the IP address of the Primary and Secondary WINS servers (if available on the network). WINS servers provide a service translating NetBIOS names (the alphanumeric computer names seen in the user interface) to their corresponding IP address.

Lease Obtained and Lease Expires: These values show when the current IP address was obtained, and when the current IP address is due to expire. You can use the Release and Renew buttons to release and renew the current IP address, but this is not necessary because the DHCP client automatically attempts to renew the lease when 50 % of the lease time has expired.

Nslookup

nslookup is a computer program used in Windows and Unix to query DNS (Domain Name System) servers to find DNS details, including IP addresses of a particular computer, MX records for a domain and the NS servers of a domain. The name nslookup means "name server lookup". A common version of the program is included as part of the BIND package.

Microsoft Windows 2000 Server, Windows 2000 Advanced Server, and Windows NT Server 4.0 Standard Edition provide the **nslookup** tool.

Windows' nslookup.exe is a command-line administrative tool for testing and troubleshooting DNS servers. This tool is installed along with the TCP/IP protocol through the Control Panel.

Nslookup.exe can be run in two modes: interactive and noninteractive. Noninteractive mode is used when just a single piece of data is needed.

1. The syntax for noninteractive mode is:

   nslookup [-option] [hostname] [server]

2. To start Nslookup.exe in interactive mode, simply type "**nslookup**" at the command prompt:

   C:\> nslookup

Default Server: nameserver1.domain.com

Address: 10.0.0.1

>

3. Type "**help**" or "**?**" at the command prompt to generate a list of available commands.

Notes

- The TCP/IP protocol must be installed on the computer running Nslookup.exe.
- At least one DNS server must be specified when you run the IPCONFIG /ALL command from a command prompt.
- Nslookup will always devolve the name from the current context. If you fail to fully qualify a name query (i.e., use a trailing dot), the query will be appended to the current context. For example, if the current DNS settings are att.com and a query is performed on www.microsoft.com; the first query will go out as www.microsoft.com.att.com because of the query being unqualified. This behavior may be inconsistent with other vendor's versions of Nslookup.

Dr. Watson

Dr. Watson detects information about Windows system and program failures and records the information in a log file. Dr. Watson starts automatically at the event of a program error. To start Dr. Watson, click **Start**, click **Run**, and then type **drwtsn32**. To start Dr. Watson from a command prompt, change to the root directory, and then type **drwtsn32**.

When a program error occurs, Dr. Watson creates a log file (Drwtsn32.log) which contains:

- The line *Application exception occurred*:.
- Program error information.
- System information about the user and the computer on which the program error occurred.
- The list of tasks that were running on the system at the time that the program error occurred.
- The list of modules that the program loaded.
- The state dump for the thread ID that is listed.
- The state dump's register dump.
- The state dump's instruction disassembly.
- The state dump's stack back trace.
- The state dump's raw stack dump.
- The symbol table.

The default log file path is:
C:\Documents and Settings\All Users\Application Data\Microsoft\Dr Watson.

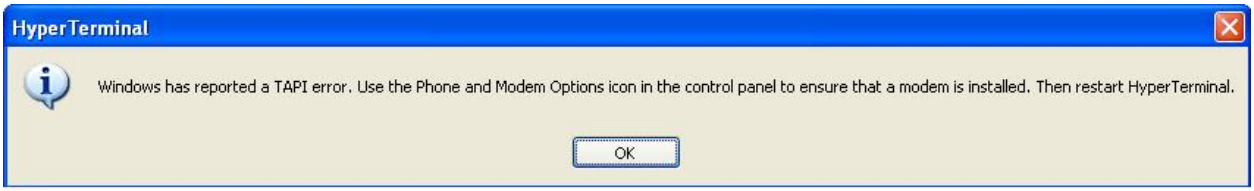
The default Crash Dump path is:
C:\Documents and Settings\All Users\Application Data\Microsoft\Dr Watson\user.dmp.

Third Party Tool Messages

This section discusses messages generated by HyperTerminal, Ping, and Telnet during ION system installation, operation and configuration.

HyperTerminal Messages

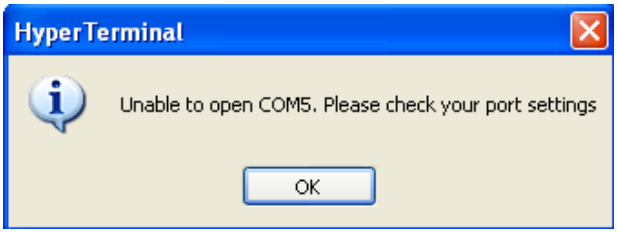
Message: *Windows has reported a TAPI error. Use the Phone and Modem Options icon in the Control Panel to ensure a modem is installed. Then restart HyperTerminal.*



Response:

1. Verify your **computer's Ports (COM & LPT)** setting. See "Configuring HyperTerminal" on page 53.
2. Use the **Computer Management > Device Manager** > **Troubleshooter** button located on the **General** tab in **Properties**.
3. Unplug and re-plug the USB connector on the IONMM card.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Unable to open COM x. Please check your port settings.*



Response:

1. Verify your **computer's Ports (COM & LPT)** setting. See "Configuring HyperTerminal" on page 53.
2. Use the **Computer Management > Device Manager** > **Troubleshooter** button located on the **General** tab in **Properties**.
3. Unplug and re-plug the USB connector on the IONMM card.
4. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Problem: HT Overtyping Problem - You tried to edit a typo in a CLI command, the new data is stored, but the old data is appended to it.

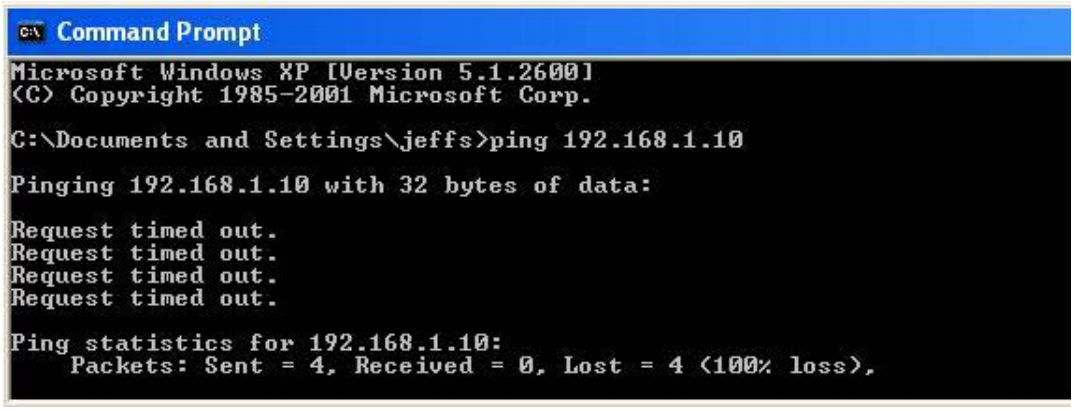
Meaning: HyperTerminal (HT) is a terminal emulation program developed by Hillgraeve, Inc., for Microsoft and supplied with some Windows OSes. In HyperTerminal, use the Enter key to drop to a new line, if required, and use the keyboard's Backspace key or the directional arrows to navigate within a text entry. Overtyping an entry should automatically replace the previous characters. This is a HyperTerminal problem that the ION CLI stack cannot resolve.

Response:

1. Upgrade to the latest version (a free download from www.hilgreave.com). The more current product seems to run more smoothly and has text editing features not found in earlier versions.
2. In HT, turn off local echo - refer to the HT helps and documentation for the command to use.
3. Make sure the keyboard Insert mode is turned off.
4. Download and use PuTTY or TeraTerm to use as a replacement for HT.

Ping Command Messages

Message: *Request timed out*.

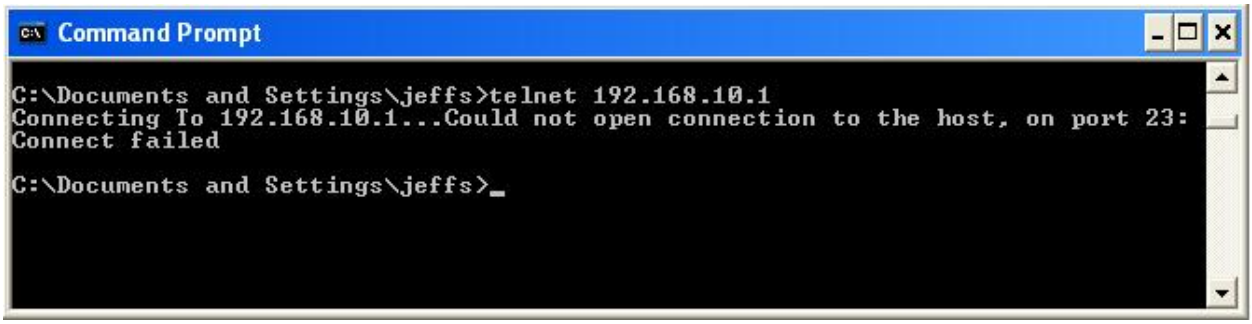


Meaning: The Ping command failed.
Recovery:

1. Verify the connection, verify correct IP address entry, and retry the operation.
2. Verify if the default IP address has changed using the Ipconfig (or similar) command.

Telnet Messages

Message: *Could not open connection to the host, on port 23: Connect failed*.



Meaning: The attempted Telnet connection failed.
Recovery:

1. Verify the physical connection, verify correct IP address entry, and retry the operation.
2. Check if the default IP address has changed using the Ipconfig (or similar) command.

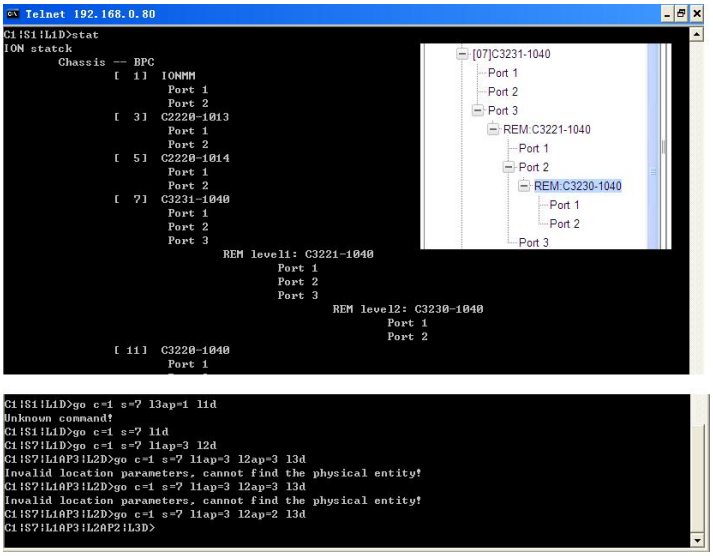
Message: *Invalid location parameters, cannot find the physical entity*!

```
C1!S7!L1AP3!L2D>go c=1 s=7 l1ap=3 l2ap=3 l3d
Invalid location parameters, cannot find the physical entity!
```

Meaning: The **go** command you entered includes a location that does not exist or that you entered incorrectly.

Recovery:

1. Run the **stat** command to verify your configuration.
2. Click the plus sign [+] next to **ION Stack** to unfold the "ION Stack" node in the left tree view to refresh device status.
3. Click the plus sign [+] next to **Chassis** to unfold the chassis devices.



4. Compare the **stat** command results to the Web interface tree view configuration information.
5. Re-run the **stat** command with the correct location parameters.
6. Ping the device in question.
7. Unplug and re-plug the USB connector on the IONMM card.
8. If the problem persists, contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Message: *Unknown command*!

```
C1!S1!L1D>go c=1 s=7 l3ap=1 l1d
Unknown command!
```

Meaning: The command you entered is not supported, or you entered the wrong command format / syntax.

Recovery:

1. Verify the CLI command syntax.
2. For a complete list of the available commands, see the *C3210 CLI Reference Manual, 33497*.

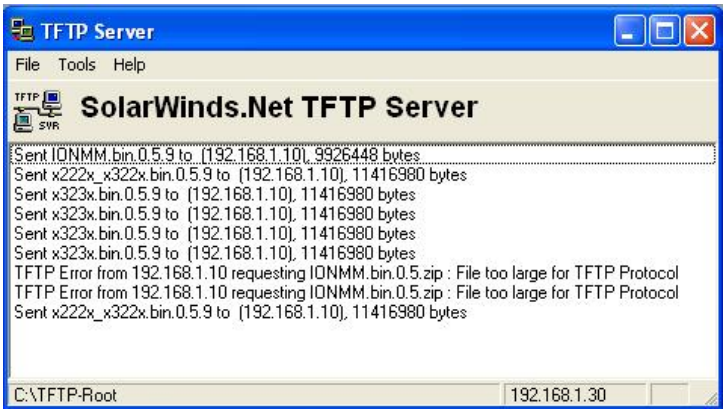
TFTP Server Messages

Messages like the ones below may display during TFTP Server operation, depending on the TFTP Server package that you selected.

Message: *File does not exist*

Meaning: A TFTP Server error - the TFTP Server Address that you specified does not contain the Firmware File Name specified.
Recovery: 1) Verify the TFTP server's correct file location (e.g., local disk at *C:\TFTP-Root*). 2) Make sure of the filename / extension. 3) Check the TFTP Server's online helps for suggestions.

Message: *File too large for TFTP Protocol*



Meaning: A TFTP Server error - you tried to upload a file e.g., (IONMM.bin.0.5 – 50Mb) but the TFTP server failed. The file you tried to upload via the TFTP server exceeded the file size capability.
Recovery: 1) Check if some extra files ended up in the zip folder – some repeated – 6 FW files total. 2) Remove some of the files from the zip folder and try the upload again. 3) Send the remaining files in a separate file. 4) Check the TFTP Server's online helps for suggestions.

PuTTY Messages

Messages like the ones below may display during PuTTY (or similar package) operation, depending on the package that you selected.

Message: *Server refused key*
Meaning: You can connect to a secure telnet session using password authentication, but when you try to connect using public key authentication, you receive a "*Server refused our key*" message on the client (PuTTy) session. For example, you generated a public/private key (using Puttygen) and saved them, loaded the client public key into the IONMM via TFTP, and enabled SSH. The PuTTY SSH Authentication pointed to the saved private key. You set the auto-log on user name to root as suggested, but when you activated PuTTY, after 20-30 seconds, the refusal message displayed and PuTTY reverted back to password authentication (the default).
Recovery:

1. When generating using puttyGen.exe, select the SSH2 keys - do not select the SSH1 keys.
2. Log in to PuTTy as 'root' with the public key authentication.
3. Use the online helps and documentation to set up Putty as suggested.
4. See the "PuTTY" section notes on page 408.

Technical Support

Technical support is available 24-hours a day at:

United States:	1-800-260-1312
International:	00-1-952-941-7600

Live Web chat

Chat live via the Web with a Transition Networks Technical Support Specialist.

Log onto www.transition.com and click the **Transition Now** link located in the lower left side.

Web-based training

Transition Networks provides 12-16 seminars per month via live web-based training.

Log onto www.transition.com and click the **Learning Center** link at the top of the page.

E-Mail

Ask a question anytime by sending an e-mail message to our technical support staff: techsupport@transition.com

Address

Transition Networks

10900 Red Circle Drive

Minnetonka, MN 55343, U.S.A.

Telephone: 952-941-7600

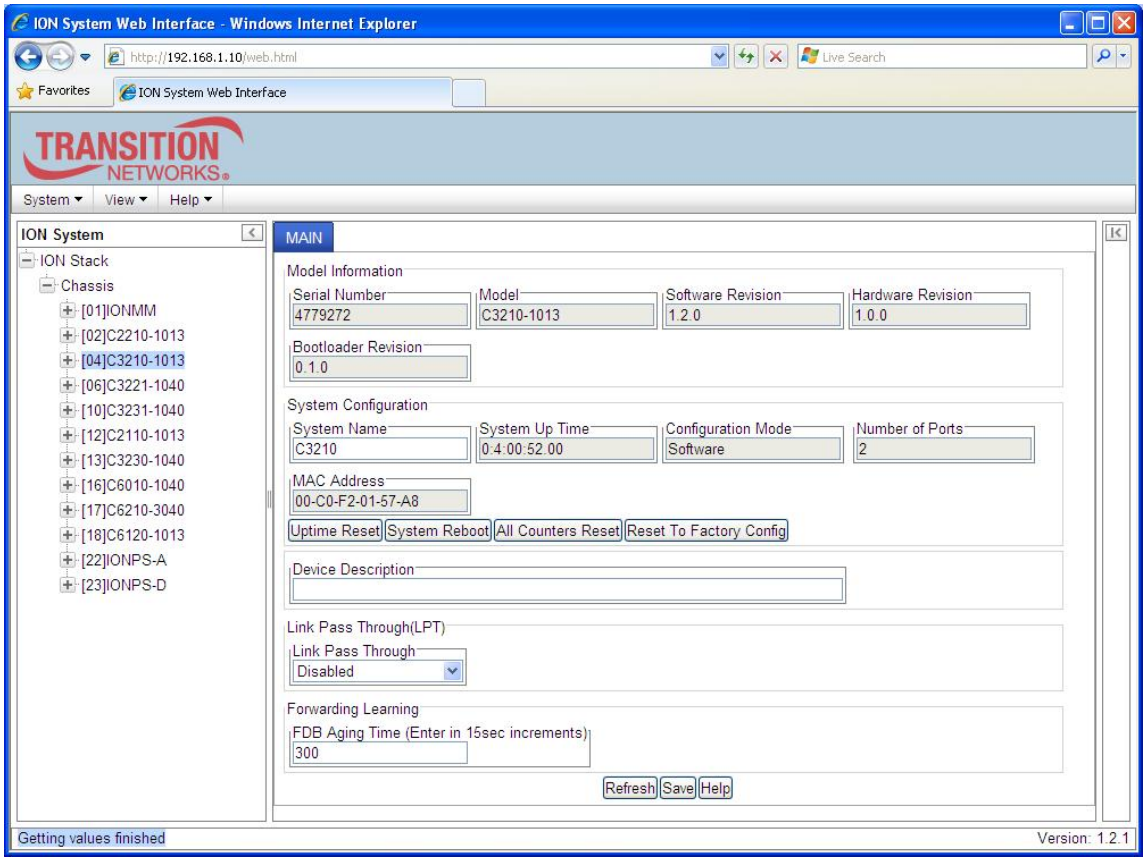
Toll free U.S.A & Canada: 800-526-9267

Fax: 952-941-2322

Recording Model Information and System Information

After performing the troubleshooting procedures, and before calling or emailing Technical Support, please record as much information as possible in order to help the Transition Networks Technical Support Specialist.

1. Select the ION system **MAIN** tab. (From the CLI, use the commands needed to gather the information requested below. This could include commands such as **show card info**, **show slot info**, **show system information**, **show ether config**, **show ip-mgmt config**, or others as request by the Support Specialist.



2. Record the **Model Information** for your system.

   Serial Number: _____ Model: _____

   Software Revision: _____ Hardware Revision: _____

   Bootloader Revision: _____

3. Record the **System Configuration** information for your system.

   System Up Time: _____ Configuration Mode: _____

   Number of Ports: _____ MAC Address: _____

   Device Description: _____

4. Provide additional Model and System information to your Technical Support Specialist. See "Basic ION System Troubleshooting" on page 301.

   Your Transition Networks service contract number: _____

   A description of the failure: _____

   _____

   _____

   A description of any action(s) already taken to resolve the problem (e.g., changing switch mode, rebooting, etc.): _____

   _____

   _____

   The serial and revision numbers of all involved Transition Networks products in the network:

   _____

   _____

   A description of your network environment (layout, cable type, etc.): _____

   _____

   _____

   Network load and frame size at the time of trouble (if known): _____

   The device history (i.e., have you returned the device before, is this a recurring problem, etc.):

   _____

   _____

   Any previous Return Material Authorization (RMA) numbers: _____

Important note on product identification: When the full part number of a ION System device is abbreviated for use in catalogs and marketing literature, the first set of numeric digits in the string is dropped and replaced by the last. In most ION System products, the first set of numeric digits in the full part number is the same as the last, so this process is transparent. With the IONMM, this is not true.

Appendix A: Warranty and Compliance Information

Warranty

This warranty is your only remedy. No other warranties, such as fitness for a particular purpose, are expressed or implied. Transition Networks is not liable for any special, indirect, incidental or consequential damages or losses, including loss of data, arising from any cause or theory. Authorized resellers are not authorized to extend any different warranty on transition networks' behalf.

Limited Lifetime Warranty	Effective for products shipped May 1, 1999 and after. Every Transition Networks' labeled product purchased after May 1, 1999 will be free from defects in material and workmanship for its lifetime. This warranty covers the original user only and is not transferable.
What the Warranty Does Not Cover	This warranty does not cover damage from accident, acts of God, neglect, contamination, misuse or abnormal conditions of operation or handling, including over-voltage failures caused by use outside the product's specified rating, or normal wear and tear of mechanical components. If the user is unsure of the proper means of installing or using the equipment, contact Transition Networks' free technical support services.
Establishing Original Ownership	To establish original ownership and provide date of purchase, please complete and return the registration card accompanying the product or register the product on-line on our product registration page. Transition Networks will at its option: • Repair the defective product to functional specifications at no charge • Replace the product with an equivalent functional product • Refund the purchase price of a defective product

Who to Contact for Returns

To return a defective product for warranty coverage, contact Transition Networks' technical support department for a return authorization number. Transition's technical support department can be reached through any of the following means:

Service Hours

Mon thru Fri 7 AM - 6 PM CST:

Contact Tech Support via telephone at 800-260-1312 or 952-941-7600
Fax 952-941-2322

Email techsupport@transition.com

Live web chat: Transition Now

Any Other Time
Voice Mail 800-260-1312 x 579 or 952-941-7600 x 579

How and Where to Send Returns

Send the defective product postage and insurance prepaid to the following address:

Transition Networks, Inc.

10900 Red Circle Drive

Minnetonka, MN 55343 USA

Attn: RETURNS DEPT: CRA/RMA # _____

Failure to properly protect the product during shipping may void this warranty. The return authorization number must be written on the outside of the carton to ensure its acceptance. We cannot accept delivery of any equipment that is sent to us without a CRA or RMA number.

CRA's are valid for 60 days from the date of issuance. An invoice will be generated for payment on any unit(s) not returned within 60 days.

Upon completion of a demo/ evaluation test period, units must be returned or purchased within 30 days. An invoice will be generated for payment on any unit(s) not returned within 30 days after the demo/ evaluation period has expired.

The customer must pay for the non-compliant product(s) return transportation costs to Transition Networks for evaluation of said product(s) for repair or replacement. Transition Networks will pay for the shipping of the repaired or replaced in-warranty product(s) back to the customer (any and all customs charges, tariffs, or/and taxes are the customer's responsibility).

Before making any non-warranty repair, Transition Networks requires a $200.00 charge plus actual shipping costs to and from the customer. If the

repair is greater than $200.00, an estimate is issued to the customer for authorization of repair. If no authorization is obtained, or the product is deemed ‘not repairable’, Transition Networks will retain the $200.00 service charge and return the product to the customer not repaired. Non-warranted products that are repaired by Transition Networks for a fee will carry a 180-day limited warranty. All warranty claims are subject to the restrictions and conventions set forth by this document.

Transition Networks reserves the right to charge for all testing and shipping incurred, if after testing, a return is classified as "No Problem Found."

THIS WARRANTY IS YOUR ONLY REMEDY. NO OTHER WARRANTIES, SUCH AS FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSED OR IMPLIED. TRANSITION NETWORKS IS NOT LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, ARISING FROM ANY CAUSE OR THEORY. AUTHORIZED RESELLERS ARE NOT AUTHORIZED TO EXTEND ANY DIFFERENT WARRANTY ON TRANSITION NETWORKS'S BEHALF.

Customer Pays Non-Compliant Return Costs

The customer must pay the non-compliant product(s) return transportation cost to Transition Networks for evaluation of said product(s) for repair or replacement. Transition Networks will pay for shipping the repaired or replaced in-warranty product(s) back to the customer (any and all customs charges, tariffs, or/and taxes are the customer's responsibility).

Non-Warranty Repair Costs

Before making any non-warranty repair, Transition Networks requires a $200 charge, plus actual shipping costs to and from the customer. If the repair is greater than $200, an estimate is issued to the customer for authorization before making the repair. If no authorization is obtained, or the product is deemed not repairable, Transition Networks will retain the $200 service charge and return the product to the customer not repaired.

Repaired Non-Warranty Products

Non-warranted products repaired by Transition Networks for a fee will carry a 180-day limited warranty. All warranty claims are subject to the restrictions and conventions set forth by this document.

Transition Networks reserves the right to charge for all testing and shipping incurred, if after testing, a return is classified as “No Problem Found.”

Compliance Information

Standards	CISPR22/EN55022 Class A, CE Mark
FCC Regulations	NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
CE Marking	This is a Class A product. In a domestic environment, this product could cause radio interference; as a result, the customer may be required to take adequate preventative measures.
UL Recognized	Tested and recognized by the Underwriters Laboratories, Inc.
Canadian Regulations	This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numériqué de la classe A est conformé à la norme NMB-003 du Canada.

European Regulations

WARNING:

This is a Class A product. In a domestic environment, this product could cause radio interference in which case the user may be required to take adequate measures.

Achtung !

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten. In diesem Fäll ist der Benutzer für Gegenmaßnahmen verantwortlich.

Attention !

Ceci est un produit de Classe A. Dans un environment domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilsateur de prende les measures spécifiques appropriées.

In accordance with European Union Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003, Transition Networks will accept post usage returns of this product for proper disposal. The contact information for this activity can be found in the 'Contact Us' portion of this document.

CAUTION: RJ connectors are NOT INTENDED FOR CONNECTION TO THE PUBLIC TELEPHONE NETWORK. Failure to observe this caution could result in damage to the public telephone network.

Der Anschluss dieses Gerätes an ein öffentlickes Telekommunikationsnetz in den EG-Mitgliedstaaten verstösst gegen die jeweligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.

Declaration of Conformity

Declaration of Conformity

Name of Mfg: Transition Networks
10900 Red Circle Drive, Minnetonka MN 55343 U.S.A.

Model Number(s): C3210-1013, C3210-1014, C3210-1015 C3210-1017 C3210-1024
C3210-1035, C3210-1040 C3210-1029-A1, C3210-1029-A2, C3210-1029-B1
C3210-1029-B2, C3210-1029-C1, C3210-1029-C2

Purpose: To declare that the C3210 series SICs to which this declaration refers are in compliance with the following directive(s) and standard(s):

EMC Directive 2004/108/EC; EN 55022:2006+A1:2007 Class A; EN55024:1998+A1:2001+A2:2003; EN61000-3-2; EN61000-3-3; CFR Title 47 Part 15 Subpart B Class A; Low Voltage Directive: 2006/95/EC; CFR Title 21 Section 1040.10 Class I.

I, the undersigned, hereby declare that the model number(s) listed in this declaration of conformity are in compliance with the directive(s) and standard(s) herein.

Stephen Anderson, Vice-President of Engineering

February 2011
Date

Electrical Safety Warnings

Electrical Safety

IMPORTANT: This equipment must be installed in accordance with safety precautions.

Elektrische Sicherheit

WICHTIG: Für die Installation dieses Gerätes ist die Einhaltung von Sicherheitsvorkehrungen erforderlich.

Elektrisk sikkerhed

VIGTIGT: Dette udstyr skal installeres i overensstemmelse med sikkerhedsadvarslerne.

Elektrische veiligheid

BELANGRIJK: Dit apparaat moet in overeenstemming met de veiligheidsvoorschriften worden geïnstalleerd.

Sécurité électrique

IMPORTANT: Cet équipement doit être utilisé conformément aux instructions de sécurité.

Sähköturvallisuus

TÄRKEÄÄ: Tämä laite on asennettava turvaohjeiden mukaisesti.

Sicurezza elettrica

IMPORTANTE: questa apparecchiatura deve essere installata rispettando le norme di sicurezza.

Elektrisk sikkerhet

VIKTIG: Dette utstyret skal installeres i samsvar med sikkerhetsregler.

Segurança eléctrica

IMPORTANTE: Este equipamento tem que ser instalado segundo as medidas de precaução de segurança.

Seguridad eléctrica

IMPORTANTE: La instalación de este equipo deberá llevarse a cabo cumpliendo con las precauciones de seguridad.

Elsäkerhet

OBS! Alla nödvändiga försiktighetsåtgärder måste vidtas när denna utrustning används.

Appendix B: Factory Defaults

The C3210 *Device* Level Factory Defaults are shown in Table 15 below.
The C3210 *Port* Level Factory Defaults are shown in Table 16.

Device-Level Factory Defaults

NOTE: The default settings shown are as seen in the tabs/fields of the Web interface.

Table 15: Device-Level Factory Defaults

Item/Field	Default Setting
Web Access Password	private
Telnet/USB Login	ION
Telnet/USB Password	private
Main tab	
System Configuration	System Name: e.g., C3210-1040
Configuration Mode	Software
Device Description	blank or (none)
Link Pass Through(LPT)	Enabled
Forwarding Learning	FDB Aging Time: 300

Port-Level Factory Defaults

NOTE: The default settings shown are as seen in the tabs/fields of the Web interface.

The C3210 *Device* Level Factory Defaults are shown in the table above.
The C3210 *Port* Level Factory Defaults are shown in the table below.

Table 16: Port-Level Factory Defaults

Item/Field	Default Setting
Main tab	
Circuit ID	blank
Link Status	Up
Admin Status	Up
Speed	Negotiating
Duplex	Negotiating
Port Mode	1000BaseX
AutoCross Mode	Auto
Connector Type	RJ-45 (Port 1) SC Multimode Fiber (Port 2)
Auto Negotiation	Enabled
Force Speed Force Duplex	100Mbps Full Duplex
Capabilities Advertised	• All speed/duplex boxes checked • Pause and Asymmetric Pause boxes unchecked
Pause Admin Mode	Disabled (copper port)
Forward Settings	All boxes checked
Virtual Cable Test	No records found
Advanced tab	
Rate Limiting Mode	Counts All Layer 2
Egress Rate Limit	Unlimited
Ingress Rate Limit	Unlimited
Filter Unknown Multicast	Disabled

Filter Unknown Unicast	Disabled
Discard Tagged	Disabled
Discard Untagged	Disabled
Default VLAN ID	1
Default Priority	0
IEEE Priority Class	Enabled
IP Traffic Class	Enabled
Priority Precedence	Use IEEE
Frame Tag Mode	Network
Provider Ether Type	X8100
Network Mode Tagging	Unmodified
User Priority	Remap → To 0 → 0 1 → 1 2 → 2 3 → 3 4 → 4 5 → 5 6 → 6 7 → 7
DMI tab (Port 2 only)	The DMI feature is not supported on current port.

Appendix C: SNMP Traps Supported

This appendix provides information on SNMP traps supported on the IONMM, including when a trap is generated and what information is in each trap.

All ION system critical events are reported via SNMP Traps. The ION system uses only SNMPv2 traps, with the definition of NOTIFICTION-TYPE in the MIB (Management Information Base).

Traps are generated when a condition has been met on the SNMP agent. These conditions are defined in the Management Information Base (MIB). The administrator then defines thresholds, or limits to the conditions, that are to generate a trap. Conditions range from preset thresholds to a restart.

All of the values that SNMP reports are dynamic. The information needed to get the specified values that SNMP reports is stored in the MIB. This information includes Object IDs (OIDs), Protocol Data Units (PDUs), etc. The MIBs must be located at both the agent and the manager to work effectively.

Traps List

1. ionSlotStatusChangeEvt
2. ionChassisDiscoveredEvt
3. ionChassisRemovedEvt
4. entSensorThresholdNotification
5. ionDMIRxIntrusionEvt
6. ionDMIRxPowerEvt
7. ionDMITxPowerEvt
8. ionDMITxBiasEvt
9. ionDMITemperatureEvt
10. newroot
11. topologyChange
12. linkDown
13. linkUp
14. risingAlarm
15. fallingAlarm
16. ionIfSourceAddrChangeEvt
17. ionDevSysAclIdsEvt

All ION system SNMP Trap messages conform to SNMPv2 MIB RFC-2573.

See the "Supported MIBs" section on page 32 for information on the C3210s support for public (standard) and private MIBs. For information on "Configuring SNMP" see page 234. See the *ION Management Module (IONMM) User Guide* manual for SNMP traps supported on the IONMM.

A sample SNMP Message sequence is shown below.

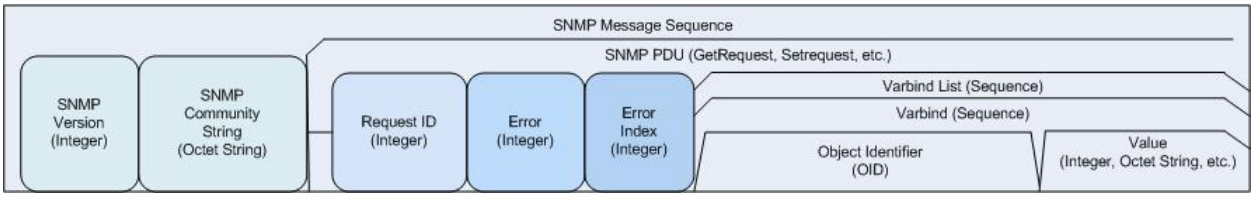


Figure C-1: SNMP Message Sequence

MIB Traps Summary

The ION system MIB Traps are summarized in the table below in terms of related MIB and varbinds.

Table 17: MIB Traps Summary

MIB (linked to section)	TRAP (linked to section)	VARBINDS
TN-ION-BPC-MIB	ionSlotStatusChangeEvt	entPhysicalIndex, ionChassisSlotNumber ionChassisSlotStatus
TN-ION-Chassis-MIB	ionChassisDiscoveredEVt	entPhysicalIndex ionChassisStackSerialNo
	ionChassisRemovedEvt	entPhysicalIndex ionChassisStackSerialNo
TN-ION-ENTITY-SENSOR-MIB	entSensorThresholdNotification	entSensorThresholdValue entSensorValue
TN-ION-MGMT-MIB	ionDMIRxIntrusionEvt	ifIndex ionDMIRxPwrLvlPreset ionDMIRxPowerLevel
	ionDMIRxPowerEvt	ifIndex ionDMIRxPowerAlarm ionDMIRxPowerLevel
	ionDMITxPowerEvt	ifIndex ionDMITxPowerAlarm ionDMITxPowerLevel
	ionDMITxBiasEvt	ifIndex, ionDMITxBiasAlarm, ionDMITxBiasCurrent
	ionDMITemperatureEvt	ifIndex ionDMITempAlarm ionDMITemperature

MIB (linked to section)	TRAP (linked to section)	VARBINDS
	rxPwrThreshold	
BRIDGE-MIB	newroot	
	topologyChange	
IF-MIB	linkDown	ifIndex, ifAdminStatus, ifOperStatus
	linkUp	ifIndex, ifAdminStatus, ifOperStatus
RMON	risingAlarm	alarmIndex, alarmVariable, alarmSampleType, alarmValue, alarmFallingThreshold
	fallingAlarm	alarmIndex, alarmVariable, alarmSam-pleType, alarmValue, alarmFallingThreshold
TN-ION-VLAN-MGMT-MIB	ionIfSourceAddrChangeEvt	
ION-DEV-SYS-ACL-MIB	ionDevSysAclIdsEvt	

TN-ION-MGMT-MIB.smi

```
ionDevSysMgmt          OBJECT IDENTIFIER ::= { ionDevMgmt 1 }
ionDevSysLPT               OBJECT IDENTIFIER ::= { ionDevMgmt 2 }

--
 --ION Ethernet Interface management
… …
    ::= { tnIonMgmtNotifications 6 }
```

Agent_III_Private MIBS

ION-DEV-SYS-ACL-MIB

The **ionDevSysAclIdsEvt** event is included in 'ION-DEV-SYS-ACL-MIB.my'. This event is related to 'iptableRulesTable' which is also defined in 'ION-DEV-SYS-ACL-MIB.my'.

```
 ionDevSysAclIdsEvt  NOTIFICATION-TYPE
     OBJECTS {
                 entPhysicalIndex, gRuleIndex
             }
STATUS  current
DESCRIPTION
```

"An ionDevSysAclIdsEvt event is sent if an IDS (Intrusion Detection Systems) is detected.
The entPhysicalIndex event indicates in which SIC the IDS is detected.
The entPhysicalIndex/gRuleIndex indicates which ACL rule is matched for this IDS."
::= { tnIonMgmtNotifications 16 }

ION-DEV-SYS-HTTPS-MIB

None

ION-DEV-SYS-IPMGMT-MIB

None

ION-DEV-SYS-RADIUS-MIB

None

ION-DEV-SYS-SNMPMGMT-MIB

None

ION-DEV-SYS-SNTP-MIB

None

ION-DEV-SYS-SSH-MIB

None

ION-DEV-SYS-TFTP-MIB

None

TN-ION-VLAN-MGMT-MIB.mib

The **ionIfSourceAddrChangeEvt** event is included ‘TN-ION-VLAN-MGMT-MIB.mib’.
The ‘ionIfSourceAddrChangeEvt’ event is related to ‘ionIfMACSecurityTable’ which is defined in ‘TN-ION-MGMT-MIB.smi’.

```
 ionIfSourceAddrChangeEvt  NOTIFICATION-TYPE
     OBJECTS {
                 ionFIDDbMacAddress, ionFIDDbConnPort
             }
STATUS  current
DESCRIPTION
```
"An ionIfSourceAddrChangeEvt event is sent when the ionIfSourceAddrLock is set to 'true',
the ionIfSourceAddrLockAction is set to 'discardAndNotify' or 'all' and there is an intrusion/SA change on this port."
::= { tnIonVlanQoSMgmtNotifications 1 }

TN_ION Private MIBS

TN-ION-BPC-MIB

ionSlotStatusChangeEvt

An ionSlotStatusChangeEvt event is sent when a new module is inserted in this slot or when it is removed. The chassis is identified by its entPhysicalIndex.

Varbinds

entPhysicalIndex

```
SYNTAX INTEGER

DESCRIPTION
"The entPhysicalIndex in this chassis."
```

ionChassisSlotNumber,

```
SYNTAX INTEGER
DESCRIPTION
```
"The slot number in this chassis."

ionChassisSlotStatus

```
SYNTAX INTEGER { empty(1), occupied(2) }
DESCRIPTION
```
"The status of the slot, whether occupied or empty."

OID

MIB Description

ionSlotStatusChangeEvt NOTIFICATION-TYPE
OBJECTS {
entPhysicalIndex,
ionChassisSlotNumber,
ionChassisSlotStatus
}
STATUS current
DESCRIPTION
"An ionSlotStatusChangeEvt event is sent when a new module is inserted in this slot or when it is removed. The chassis is identified by its entPhysicalIndex."
::= { tnIonBkPlaneNotifications 1 }

TN-IONCHASSIS-MIB

ionChassisDiscoveredEvt

An ionChassisDiscoveredEvt event is sent when a new chassis is discovered.

Varbinds

entPhysicalIndex

```
SYNTAX INTEGER
DESCRIPTION
```
"The entPhysicalIndex in this chassis."

ionChassisStackSerialNo

```
SYNTAX OCTET STRING
DESCRIPTION
```
"The chassis serial number, this is unique to each chassis."

OID

MIB Definition

```
ionChassisDiscoveredEvt NOTIFICATION-TYPE
OBJECTS {
         entPhysicalIndex,
         ionChassisStackSerialNo
         }
STATUS  current
DESCRIPTION
```
"An ionChassisDiscoveredEvt event is sent when a new chassis is discovered."
```
::= { tnIonChassisNotifications 1 }
```

ionChassisRemovedEvt

An ionChassisRemovedEvt event is sent when a managed chassis is removed.

Varbinds

entPhysicalIndex

```
SYNTAX INTEGER
DESCRIPTION
```
"The entPhysicalIndex in this chassis."

ionChassisStackSerialNo

```
SYNTAX OCTET STRING
DESCRIPTION
```
"The chassis serial number, this is unique to each chassis."

OID

MIB Description

```
ionChassisRemovedEvt NOTIFICATION-TYPE
OBJECTS {
           entPhysicalIndex,
                ionChassisStackSerialNo
         }
STATUS  current
DESCRIPTION
```
"An ionChassisRemovedEvt event is sent when a managed chassis is removed."
```
::= { tnIonChassisNotifications 2 }
```

TN-ION-ENTITY-SENSOR-MIB

entSensorThresholdNotification

The sensor value crossed the threshold listed in entSensorThresholdTable.

This notification is generated once each time the sensor value crosses the threshold.

The agent implementation guarantees prompt, timely evaluation of threshold and generation of this notification.

Varbinds

entSensorThresholdValue

```
SYNTAX        SensorValue
DESCRIPTION
```
"This variable indicates the value of the threshold.

To correctly display or interpret this variable's value, you must also know entSensorType, entSensorScale, and entSensorPrecision.

However, you can directly compare entSensorValue with the threshold values given in entSensorThresholdTable without any semantic knowledge."

entSensorValue

```
SYNTAX        SensorValue
DESCRIPTION
```
"This variable reports the most recent measurement seen by the sensor.

To correctly display or interpret this variable's value, you must also know entSensorType, entSensorScale, and entSensorPrecision.

However, you can compare entSensorValue with the threshold values given in entSensorThresholdTable without any semantic knowledge."

SensorValue TEXTUAL-CONVENTION

```
SensorValue ::= TEXTUAL-CONVENTION
STATUS       current
DESCRIPTION
```
"For sensors that measure volts AC, volts DC, amperes, watts, hertz, Celsius, or cmm, this item is a fixed point number ranging from -999,999,999 to +999,999,999. Use the value -1000000000 to indicate underflow. Use the value +1000000000 to indicate overflow. Use SensorPrecision to indicate how many fractional digits the SensorValue has.

For sensors that measure percentRH, this item is a number ranging from 0 to 100.

For sensors that measure rpm, this item can take only nonnegative values, 0..999999999.

For sensors of type truthvalue, this item can take only two values: true(1), false(2).

For sensors of type specialEnum, this item can take any value in the range (-1000000000..1000000000), but the meaning of each value is specific to the sensor.

For sensors of type other and unknown, this item can take any value in the range (-1000000000..1000000000), but the meaning of the values are specific to the sensor.

Use Entity-MIB entPhysicalTable.entPhysicalVendorType to learn about the sensor type."
SYNTAX INTEGER (-1000000000..1000000000)

OID

MIB Description

```
entSensorThresholdNotification NOTIFICATION-TYPE
OBJECTS { entSensorThresholdValue, entSensorValue }
STATUS current
DESCRIPTION
```
"The sensor value crossed the threshold listed in entSensorThresholdTable.

This notification is generated once each time the sensor value crosses the threshold.

The agent implementation guarantees prompt, timely evaluation of threshold and generation of this notification."
::= { entitySensorMIBNotifications 1 }

TN-ION-MGMT-MIB

ionDMIRxIntrusionEvt

An ionDMIRxIntrusionEvt event is sent if the ionDMIRxPowerLevel falls below the ionD-MIRxPwrLvlPreset indicating an intrusion on the fiber.

Varbinds

ifIndex

```
SYNTAX      INTEGER32()
DESCRIPTION
```
"IF-MIB Index of the port this was relevant to."

ionDMIRxPwrLvlPreset

```
SYNTAX      INTEGER(0..65535)
DESCRIPTION
```
"A preset level for Rx Power on the Fiber port, if the DMI read value falls below the preset value, an intrusion is detected, and a trap is generated."

ionDMIRxPowerLevel

```
SYNTAX      INTEGER
DESCRIPTION
```
"DMI: Diagnostic Monitoring Interface for fiber transceivers. Receive power on local fiber measured in microwatts."

OID

MIB Description

ionDMIRxIntrusionEvt NOTIFICATION-TYPE

```
OBJECTS {
            ifIndex, ionDMIRxPwrLvlPreset, ionDMIRxPowerLevel
         }
STATUS  current
DESCRIPTION
```
"An ionDMIRxIntrusionEvt event is sent if the ionDMIRxPowerLevel falls below the ionD-MIRxPwrLvlPreset indicating an intrusion on the fiber."

```
::= { tnIonMgmtNotifications 1 }
```

ionDMIRxPowerEvt

An ionDMIRxPowerEvt event is sent when there is a warning or alarm on Rx Power.

Varbinds

ifIndex

ionDMIRxPowerAlarm

```
SYNTAX INTEGER { normal(1), notSupported(2), lowWarn(3), highWarn(4),
lowAlarm(6), highAlarm(7) }
DESCRIPTION "."
```

ionDMIRxPowerLevel

```
SYNTAX      INTEGER
DESCRIPTION
```
"DMI: Diagnostic Monitoring Interface for fiber transceivers. Receive power on local fiber, measured in microwatts."

OID

MIB Description

```
ionDMIRxPowerEvt  NOTIFICATION-TYPE
OBJECTS {
        ifIndex, ionDMIRxPowerAlarm, ionDMIRxPowerLevel
         }
STATUS  current
DESCRIPTION
```
"An ionDMIRxPowerEvt event is sent when there is a warning or alarm on Rx Power."
```
::= { tnIonMgmtNotifications 2 }
```

ionDMITxPowerEvt

An ionDMITxPowerEvt event is sent when there is a warning or alarm on Tx Power.

Varbinds

ifIndex

ionDMITxPowerAlarm

```
SYNTAX INTEGER { normal(1), notSupported(2), lowWarn(3), highWarn(4),
lowAlarm(6), highAlarm(7) }
DESCRIPTION "."
```

ionDMITxPowerLevel

```
SYNTAX      INTEGER
DESCRIPTION "DMI: Diagnostic Monitoring Interface for fiber transceiv-
ers. Transmit power on local fiber measured in microwatts."
```

OID

MIB Definition

```
ionDMITxPowerEvt  NOTIFICATION-TYPE
OBJECTS {
       ifIndex, ionDMITxPowerAlarm, ionDMITxPowerLevel
        }
STATUS  current
DESCRIPTION
"An ionDMITxPowerEvt event is sent when there is a warning or alarm on Tx Power."
::= { tnIonMgmtNotifications 3 }
```

ionDMITxBiasEvt

An ionDMITxBiasEvt event is sent when there is a warning or alarm on Tx Bias current,

Varbinds

ifIndex

ionDMITxBiasAlarm

```
SYNTAX INTEGER { normal(1), notSupported(2), lowWarn(3), highWarn(4),
lowAlarm(6), highAlarm(7) }
DESCRIPTION "."
```

ionDMITxBiasCurrent

```
SYNTAX INTEGER
DESCRIPTION
```
"Transmit bias current on local fiber interface, in microamperes."

OID

MIB Description

```
ionDMITxBiasEvt  NOTIFICATION-TYPE
OBJECTS {
         ifIndex, ionDMITxBiasAlarm, ionDMITxBiasCurrent
         }
STATUS  current
DESCRIPTION
```
"An ionDMITxBiasEvt event is sent when there is a warning or alarm on Tx Bias current."
```
::= { tnIonMgmtNotifications 4 }
```

ionDMITemperatureEvt

Varbinds

ifIndex

ionDMITempAlarm

SYNTAX INTEGER
DESCRIPTION "."

ionDMITemperature

```
SYNTAX      INTEGER
STATUS      current
DESCRIPTION
```
"Temperature of fiber transceiver in tenths of degrees C."

OID

MIB Description

```
ionDMITemperatureEvt  NOTIFICATION-TYPE
OBJECTS {
           ifIndex, ionDMITempAlarm, ionDMITemperature
            }
STATUS  current
DESCRIPTION
```
"An ionDMITemperatureEvt event is sent when there is a warning or alarm on DMI temperature."
```
::= { tnIonMgmtNotifications 5 }
```

TN-PROVBRIDGE-MIB

None

ION Public MIBS

BRIDGE-MIB

newRoot

The newRoot trap indicates that the sending agent has become the new root of the Spanning Tree; the trap is sent by a bridge soon after its election as the new root, e.g., upon expiration of the Topology Change Timer, immediately subsequent to its election. Implementation of this trap is optional.

Varbinds

None

OID

MIB Description

```
newRoot NOTIFICATION-TYPE
-- OBJECTS     { }
STATUS      current
DESCRIPTION
"The newRoot trap indicates that the sending agent has become the new root of the Spanning Tree; the trap is sent by a bridge soon after its election as the new root, e.g., upon expiration of the Topology Change Timer, immediately subsequent to its election. Implementation of this trap is optional."
::= { dot1dNotifications 1 }
```

topologyChange

A topologyChange trap is sent by a bridge when any of its configured ports transitions from the Learning state to the Forwarding state, or from the Forwarding state to the Blocking state. The trap is not sent if a newroot trap is sent for the same transition. Implementation of this trap is optional.

Varbinds

None

OID

MIB Description

```
topologyChange NOTIFICATION-TYPE
-- OBJECTS     { }
STATUS      current
DESCRIPTION
"A topologyChange trap is sent by a bridge when any of its configured ports transitions from the Learning state to the Forwarding state, or from the Forwarding state to the Blocking state. The trap is not sent if a newroot trap is sent for the same transition. Implementation of this trap is optional."
::= { dot1dNotifications 2 }
```

ENTITY-MIB

```
entConfigChange NOTIFICATION-TYPE
```
STATUS current
DESCRIPTION
"An entConfigChange notification is generated when the value of entLastChangeTime changes. It can be utilized by an NMS to trigger logical/physical entity table maintenance polls.

An agent should not generate more than one entConfigChange 'notification-event' in a given time interval (five seconds is the suggested default). A 'notification-event' is the transmission of a single trap or informs PDU to a list of notification destinations.

If additional configuration changes occur within the throttling period, then notification-events for these changes should be suppressed by the agent until the current throttling period expires. At the end of a throttling period, one notification-event should be generated if any configuration changes occurred since the start of the throttling period. In such a case, another throttling period is started right away.

An NMS should periodically check the value of entLastChangeTime to detect any missed entConfigChange notification-events, e.g., due to throttling or transmission loss."
::= { entityMIBTrapPrefix 1 }

EtherLike-MIB

None

IANA-MAU-MIB

None

IEEE8021-CFM-V2-MIB

None

IEEE8021-TC-MIB

None

IF-MIB

linkDown

varbinds

ifIndex

```
SYNTAX      InterfaceIndex
```
DESCRIPTION
"A unique value, greater than zero, for each interface. It is recommended that values are assigned contiguously starting from 1. The value for each interface sub-layer must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization."

ifAdminStatus

```
SYNTAX  INTEGER {
```

```
      up(1),       -- ready to pass packets
      down(2),
      testing(3)   -- in some test mode
            }
DESCRIPTION
"The desired state of the interface.  The testing(3) state indicates that no
operational packets can be passed.  When a managed system initializes, all
interfaces start with ifAdminStatus in the down(2) state.  As a result of ei-
ther explicit management action or per configuration information retained by
the managed system, ifAdminStatus is then changed to either the up(1) or
testing(3) states (or remains in the down(2) state)."
```

ifOperStatus

```
SYNTAX  INTEGER {
                up(1),         -- ready to pass packets
                down(2),
                testing(3),    -- in some test mode
                unknown(4),    -- status can not be determined
                               -- for some reason.
                dormant(5),
                notPresent(6),    -- some component is missing
                lowerLayerDown(7) -- down due to state of
                                  -- lower-layer interface(s)
            }

DESCRIPTION
```

"The current operational state of the interface. The testing(3) state indicates that no operational packets can be passed. If ifAdminStatus is down(2) then ifOperStatus should be down(2). If ifAdminStatus is changed to up(1)then ifOperStatus should change to up(1) if the interface is ready to transmit and receive network traffic; it should change to dormant(5) if the interface is waiting for external actions (such as a serial line waiting for an incoming connection); it should remain in the down(2) state if and only if there is a fault that prevents it from going to the up(1) state; it should remain in the notPresent(6) state if the interface has missing (typically, hardware) components."

InterfaceIndex ::= TEXTUAL-CONVENTION

```
DISPLAY-HINT "d"
DESCRIPTION
```

"A unique value, greater than zero, for each interface or interface sub-layer in the managed system. It is recommended that values are assigned contiguously starting from 1. The value for each interface sub-layer must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization."

```
SYNTAX       Integer32 (1..2147483647)
```

OID

MIB Description

```
linkDown NOTIFICATION-TYPE
OBJECTS { ifIndex, ifAdminStatus, ifOperStatus }
STATUS  current
DESCRIPTION
```
"A linkDown trap signifies that the SNMP entity, acting in an agent role, has detected that the ifOper-Status object for one of its communication links is about to enter the down state from some other state (but not from the notPresent state). This other state is indicated by the included value of ifOperStatus."
```
::= { snmpTraps 3 }
```

linkUp

varbinds

ifIndex

```
SYNTAX      InterfaceIndex
DESCRIPTION
```
"A unique value, greater than zero, for each interface. It is recommended that values are assigned contiguously starting from 1. The value for each interface sub-layer must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization."

ifAdminStatus

```
SYNTAX  INTEGER {
      up(1),        -- ready to pass packets
      down(2),
      testing(3)    -- in some test mode
            }
DESCRIPTION
```
"The desired state of the interface. The testing(3) state indicates that no operational packets can be passed. When a managed system initializes, all interfaces start with ifAdminStatus in the down(2) state. As a result of either explicit management action or per configuration information retained by the managed system, ifAdminStatus is then changed to either the up(1) or testing(3) states (or remains in the down(2) state)."

ifOperStatus

```
SYNTAX  INTEGER {
      up(1),         -- ready to pass packets
      down(2),
      testing(3),    -- in some test mode
      unknown(4),    -- status can not be determined -- for some reason.
      dormant(5),
      notPresent(6),     -- some component is missing
      lowerLayerDown(7) -- down due to state of -- lower-layer interface(s)
            }
```

DESCRIPTION
"The current operational state of the interface. The testing(3) state indicates that no operational packets can be passed. If ifAdminStatus is down(2) then ifOperStatus should be down(2). If ifAdminStatus is changed to up(1) then ifOperStatus should change to up(1) if the interface is ready to transmit and receive network traffic; it should change to dormant(5) if the interface is waiting for external actions (such as a serial line waiting for an incoming connection); it should remain in the down(2) state if and only if there is a fault that prevents it from going to the up(1) state; it should remain in the notPresent(6) state if the interface has missing (typically, hardware) components."

InterfaceIndex ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"
DESCRIPTION
"A unique value, greater than zero, for each interface or interface sub-layer in the managed system. It is recommended that values are assigned contiguously starting from 1. The value for each interface sub-layer must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization."
SYNTAX Integer32 (1..2147483647)

OID

MIB Description

linkUp NOTIFICATION-TYPE
OBJECTS { ifIndex, ifAdminStatus, ifOperStatus }
STATUS current
DESCRIPTION
"A linkUp trap signifies that the SNMP entity, acting in an agent role, has detected that the ifOperStatus object for one of its communication links left the down state and transitioned into some other state (but not into the notPresent state). This other state is indicated by the included value of ifOperStatus."
::= { snmpTraps 4 }

LLDP-MIB

None

NOTIFICATION-LOG-MIB

None

P-BRIDGE-MIB

None

Q-BRIDGE-MIB

None

RFC1213-MIB

None

RMON-MIB (RFC 2819)

risingAlarm

SNMP trap that is generated when an alarm entry crosses its rising threshold and generates an event that is configured for sending SNMP.

Varbinds

alarmIndex

```
SYNTAX     Integer32 (1..65535)
DESCRIPTION
```

"An index that uniquely identifies an entry in the alarm table. Each such entry defines a diagnostic sample at a particular interval for an object on the device."

alarmVariable

```
SYNTAX     OBJECT IDENTIFIER
DESCRIPTION
```

"The object identifier of the particular variable to be sampled. Only variables that resolve to an ASN.1 primitive type of INTEGER (INTEGER, Integer32, Counter32, Counter64, Gauge, or TimeTicks) may be sampled.

Because SNMP access control is articulated entirely in terms of the contents of MIB views, no access control mechanism exists that can restrict the value of this object to identify only those objects that exist in a particular MIB view. Because there is thus no acceptable means of restricting the read access that could be obtained through the alarm mechanism, the probe must only grant write access to this object in those views that have read access to all objects on the probe.

During a set operation, if the supplied variable name is not available in the selected MIB view, a badValue error must be returned. If at any time the variable name of an established alarmEntry is no longer available in the selected MIB view, the probe must change the status of this alarmEntry to invalid(4).

This object may not be modified if the associated alarmStatus object is equal to valid(1)."

alarmSampleType

```
SYNTAX INTEGER {
      absoluteValue(1),
      deltaValue(2)
      }
DESCRIPTION
```

The method of sampling the selected variable and calculating the value to be compared against the thresholds. If the value of this object is absoluteValue(1), the value of the selected variable will be compared directly with the thresholds at the end of the sampling interval. If the value of this object is deltaValue(2), the value of the selected variable at the last sample will be subtracted from the current value, and the difference compared with the thresholds.

This object may not be modified if the associated alarmStatus object is equal to valid(1).

alarmValue

```
SYNTAX      Integer32
DESCRIPTION
```
"The value of the statistic during the last sampling period. For example, if the sample type is deltaValue, this value will be the difference between the samples at the beginning and end of the period. If the sample type is absoluteValue, this value will be the sampled value at the end of the period. This is the value that is compared with the rising and falling thresholds.

The value during the current sampling period is not made available until the period is completed and will remain available until the next period completes."

alarmRisingThreshold

```
SYNTAX      Integer32
DESCRIPTION
```
"A threshold for the sampled statistic. When the current sampled value is greater than or equal to this threshold, and the value at the last sampling interval was less than this threshold, a single event will be generated.
A single event will also be generated if the first sample after this entry becomes valid is greater than or equal to this threshold and the associated alarmStartupAlarm is equal to risingAlarm(1) or risingOrFallingAlarm(3).

After a rising event is generated, another such event will not be generated until the sampled value falls below this threshold and reaches the alarmFallingThreshold.

This object may not be modified if the associated alarmStatus object is equal to valid(1)."

OID

MIB Description

```
risingAlarm NOTIFICATION-TYPE
OBJECTS  { alarmIndex, alarmVariable, alarmSampleType, alarmValue, alarmRis-
ingThreshold }
STATUS   current
DESCRIPTION
```
"The SNMP trap that is generated when an alarm entry crosses its rising threshold and generates an event that is configured for sending SNMP traps."
::= { rmonEventsV2 1 }

fallingAlarm

The SNMP trap that is generated when an alarm entry crosses its falling threshold and generates an event that is configured for sending SNMP traps.

Varbinds

alarmIndex

```
SYNTAX     Integer32 (1..65535)
DESCRIPTION
```

"An index that uniquely identifies an entry in the alarm table. Each such entry defines a diagnostic sample at a particular interval for an object on the device."

alarmVariable

```
SYNTAX     OBJECT IDENTIFIER
DESCRIPTION
```

"The object identifier of the particular variable to be sampled. Only variables that resolve to an ASN.1 primitive type of INTEGER (INTEGER, Integer32, Counter32, Counter64, Gauge, or TimeTicks) may be sampled.

Because SNMP access control is articulated entirely in terms of the contents of MIB views, no access control mechanism exists that can restrict the value of this object to identify only those objects that exist in a particular MIB view. Because there is thus no acceptable means of restricting the read access that could be obtained through the alarm mechanism, the probe must only grant write access to this object in those views that have read access to all objects on the probe.

During a set operation, if the supplied variable name is not available in the selected MIB view, a badValue error must be returned. If at any time the variable name of an established alarmEntry is no longer available in the selected MIB view, the probe must change the status of this alarmEntry to invalid(4).

This object may not be modified if the associated alarmStatus object is equal to valid(1)."

alarmSampleType

```
SYNTAX INTEGER {
            absoluteValue(1),
            deltaValue(2)
            }
DESCRIPTION
```

The method of sampling the selected variable and calculating the value to be compared against the thresholds. If the value of this object is absoluteValue(1), the value of the selected variable will be compared directly with the thresholds at the end of the sampling interval. If the value of this object is deltaValue(2), the value of the selected variable at the last sample will be subtracted from the current value, and the difference compared with the thresholds.

This object may not be modified if the associated alarmStatus object is equal to valid(1).

alarmValue

```
SYNTAX     Integer32
DESCRIPTION
```
"The value of the statistic during the last sampling period. For example, if the sample type is deltaValue, this value will be the difference between the samples at the beginning and end of the period. If the sample type is absoluteValue, this value will be the sampled value at the end of the period. This is the value that is compared with the rising and falling thresholds.

The value during the current sampling period is not made available until the period is completed and will remain available until the next period completes."

alarmRisingThreshold

```
SYNTAX     Integer32
DESCRIPTION
```
"A threshold for the sampled statistic. When the current sampled value is greater than or equal to this threshold, and the value at the last sampling interval was less than this threshold, a single event will be generated. A single event will also be generated if the first sample after this entry becomes valid is greater than or equal to this threshold and the associated alarmStartupAlarm is equal to risingAlarm(1) or risingOrFallingAlarm(3).

After a rising event is generated, another such event will not be generated until the sampled value falls below this threshold and reaches the alarmFallingThreshold.

This object may not be modified if the associated alarmStatus object is equal to valid(1)."

MIB Description

```
fallingAlarm NOTIFICATION-TYPE
OBJECTS { alarmIndex, alarmVariable, alarmSampleType,
          alarmValue, alarmFallingThreshold }
STATUS    current
DESCRIPTION
```
"The SNMP trap that is generated when an alarm entry crosses its falling threshold and generates an event that is configured for sending SNMP traps."
```
::= { rmonEventsV2 2 }
```

RMON2-MIB

None

SNMP-COMMUNITY-MIB

None

SNMP-NOTIFICATION-MIB

None

SNMP-TARGET-MIB

None

Trap Server Log

The Trap Server log file contains information presented to the trap server by ION devices.

A sample part of a trap server log file is shown below.

Line
1
2
3 E=
4 Ebig=
5 IP=192.251.144.220
6 com=trap
7 GT=Notification
8 ST=
9 TS=Thu May 13 10:06:37 2010
10 VB-Count=3
11 Vars=iso.3.6.1.2.1.1.3.0 = Timeticks: (2822266290) 326 days, 15:37:42.90 | iso.3.6.1.6.3.1.1.4.1.0 = iso.3.6.1.2.1.47.2.0.1 | iso.3.6.1.6.3.1.1.4.3.0 = iso.3.6.1.2.1.47.2
12
13 E=
14 Ebig=
15 IP=192.251.144.220
16 com=trap
17 GT=Notification
18 ST=
19 TS=Thu May 13 10:06:42 2010
20 VB-Count=3
21 Vars=iso.3.6.1.2.1.1.3.0 = Timeticks: (2822266790) 326 days, 15:37:47.90 | iso.3.6.1.6.3.1.1.4.1.0 = iso.3.6.1.2.1.47.2.0.1 | iso.3.6.1.6.3.1.1.4.3.0 = iso.3.6.1.2.1.47.2
22
23 E=
24 Ebig=
25 IP=192.251.144.220
26 com=trap
27 GT=Notification
28 ST=
29 TS=Thu May 13 10:10:17 2010
30 VB-Count=3
31 Vars=iso.3.6.1.2.1.1.3.0 = Timeticks: (2822288348) 326 days, 15:41:23.48 | iso.3.6.1.6.3.1.1.4.1.0 = iso.3.6.1.2.1.47.2.0.1 | iso.3.6.1.6.3.1.1.4.3.0 = iso.3.6.1.2.1.47.2
32
33 E=
34 Ebig=
35 IP=192.251.144.220
36 com=trap
37 GT=Notification
38 ST=
39 TS=Thu May 13 10:10:18 2010
40 VB-Count=5
41 Vars=iso.3.6.1.2.1.1.3.0 = Timeticks: (2822288428) 326 days, 15:41:24.28 | iso.3.6.1.6.3.1.1.4.1.0 = iso.3.6.1.4.1.868.2.5.2.0.1 | iso.3.6.1.2.1.47.1.1.1.1.1.134217728 = 134217728 | iso.3.6.1.4.1.868.2.5.2.1.1.1.1.134217728.6 = 6 | iso.3.6.1.4.1.868.2.5.2.1.1.1.2.134217728.6 = 1

The trap server log file lines are described below.

3 E=
4 Ebig=
5 IP=192.251.144.220
6 com=trap
7 GT=Notification
8 ST=
9 TS=Thu May 13 10:06:37 2010
10 VB-Count=3
11 Vars=iso.3.6.1.2.1.1.3.0 = Timeticks: (2822266290) 326 days, 15:37:42.90 | iso.3.6.1.6.3.1.1.4.1.0 =

Table 18: Trap Server Log File Description

Category	Example	Meaning
E=		Endian
Ebig=		bugEndian
IP=	192.251.144.220	IP address
com=	trap	
GT=	Notification	
ST=		
TS=	Thu May 13 10:06:37 2010	Timestamp – the log date that the file was recorded
VB-Count=	3	
Vars=	iso.3.6.1.2.1.1.3.0 =	Varbinds (Variable bindings) - the variable number of values that are included in an SNMP packet. Each varbind has an OID, type, and value (the value for/from that Object ID).
Timeticks:	(2822266290) 326 days, 15:37:42.90	
iso.3.6.1.6.3.1.1.4.1.0 =	iso.3.6.1.2.1.47.2.0.1	
iso.3.6.1.6.3.1.1.4.3.0 =	iso.3.6.1.2.1.47.2	

For Additional SNMP MIB Trap Information

For information on Network Management for Microsoft Networks Using SNMP, see http://technet.microsoft.com/en-us/library/cc723469.aspx or the MSDN Library.

The notification MIB is described in section 4.2 and section 7.2 of RFC 2573, available from the IETF web site at http://www.ietf.org/rfc/rfc2573.txt.

Appendix D: ION Power Supply / DCR / ADP / LG Configuration

This appendix provides information on various options and Power Supply modules for the ION chassis:

- IONDCR (Dry Contact Relay) Module
- IONADP (Point System™-to-ION Adapter)
- ION Power Supply Temperature, Voltage, Power, and Fan sensors
- IONPS-A Redundant AC Power Supply for 19-Slot ION Chassis
- IONPS-D Redundant -48VDC Power Supply Module for 19-Slot ION Chassis

The ION chassis can support up to two power supply modules which mount in the rear of the chassis. A single power supply can be used to power all the devices installed in the chassis; however the system can be made redundant with the use of a second power supply. In this configuration, the power supplies operate in an instant-fail-over mode.

The ION Power Supply can be configured using either the CLI or Web method.

Power Supply Config – CLI Method

1. Access the Power Supply through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. To turn slot power on or off, or reset (reboot) a slot, type **set slot xx power yy** and press **Enter** (where xx = the PS slot number – 22 or 23, and yy = the function to perform – off, on, or reset).

3. To enable the Power Supply's Power Relay, type **set power relay state=enable** and press **Enter**.

4. Set the Power Supply or Fan's Sensor Notification / Relation / Severity / Value. For example:

```
C1|S5|L1P2>set slot 22 power ?
  off
  on
  reset
C1|S5|L1P2>set slot 22 power=on
C1|S22|L1D>set sensor stid=9 notif=true
C1|S22|L1D>set sensor stid=9 relation=lessThan
C1|S22|L1D>set sensor stid=9 severity=major
C1|S22|L1D>set sensor stid=9 value=9
```

5. Press **Enter**.

Note: Use the **stat** command to view the chassis slot assignments. Power Supplies are assigned slot 22 and slot 23 by default. The ION chassis has PS 1 ON and PS 2 ON LEDs to indicate power supply presence and function.

Note: Use the **show power config** command to view the existing power supply configuration. Example:

```
C1|S22|L1D>show power config
Power supply sensors information:

Temperature Sensor:
        Type:                   celsius
        Scale:                  units
        Precision:              0
        Value:                  26
        Operation status:       ok
        Units display:          The data units displayed for temperature is units(9)

Threshold information:
index          severity       relation       value          evaluation     notifEnable
-------------------------------------------------------------------------------
1              other          lessThan       0              false          false

2              minor          greaterThan    60             false          false

3              major          greaterOrEqual 65             false          false

4              critical       greaterOrEqual 70             false          true

Voltage Sensor:
        Type:                   voltsAC
        Scale:                  milli
        Precision:              0
        Value:                  12624
        Operation status:       ok
        Units display:          The data units displayed for volts is milli(8)

Threshold information:
index          severity       relation       value          evaluation     notifEnable
-------------------------------------------------------------------------------
1              critical       lessThan       11220          false          true
2              minor          greaterThan    13000          false          false
3              major          greaterOrEqual 14000          false          false
4              critical       greaterOrEqual 14673          false          true

Power Sensor:
        Type:                   watts
        Scale:                  units
        Precision:              0
        Value:                  26
        Operation status:       ok
        Units display:          The data units displayed for watts is in units(9)

Threshold information:
index          severity       relation       value          evaluation     notifEnable
-------------------------------------------------------------------------------
1              critical       lessOrEqual    10             false          true
2              minor          greaterThan    225            false          false
3              major          greaterOrEqual 250            false          false
4              critical       greaterOrEqual 275            false          true

Relay:
        Type:                   other
        Scale:                  units
        Precision:              0
        Value:                  2
        Operation status:       ok
        Units display:          The data units displayed for Relay is in units(9)

        Installed:              false
        State:                  disable
        Module type:            acModule
        Oper mode:              master

Fan-1:
        Type:                   rpm
```

```
        Scale:                  units
        Precision:              0
        Value:                  2685
        Operation status:       ok
        Units display:          The data units displayed for Fan 1 in RPM is in units(9)

Threshold information:
index          severity       relation       value          evaluation     notifEnable
-------------------------------------------------------------------------------------
1              critical       equalTo        0              false          true
2              minor          greaterThan    9000           false          false
3              major          greaterOrEqual 9500           false          false
4              critical       greaterOrEqual 9900           false          true
```

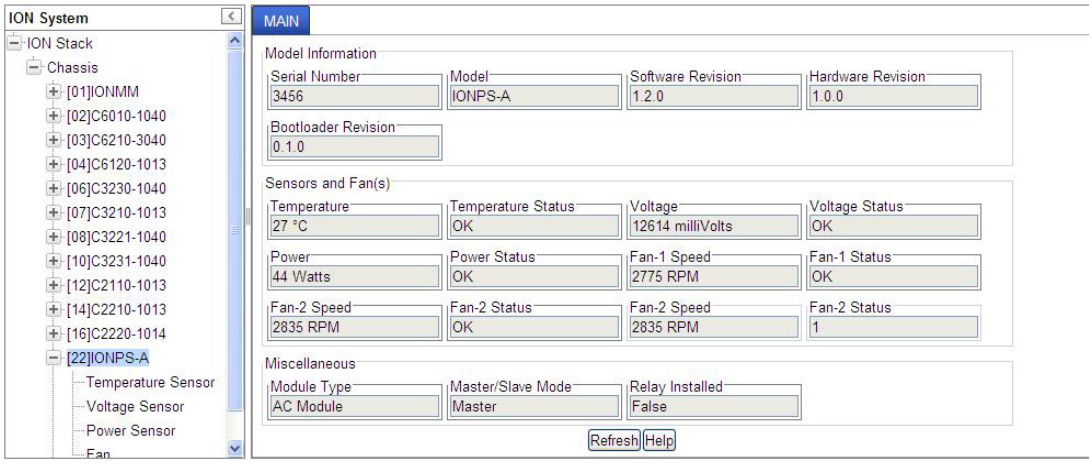
Fan-2:

```
        Type:                   rpm
        Scale:                  units
        Precision:              0
        Value:                  2760
        Operation status:       ok
        Units display:          The data units displayed for Fan 2 in RPM is in units(9)

Threshold information:
index          severity       relation       value          evaluation     notifEnable
-------------------------------------------------------------------------------------
1              critical       equalTo        0              false          true
2              minor          greaterThan    9000           false          false
3              major          greaterOrEqual 9500           false          false
4              critical       greaterOrEqual 9900           false          true
C1|S22|L1D>
```

Power Supply Config – Web Method

The ION Web interface allows configuration of the IONPS-A Power Supply's Temperature Sensor, Voltage Sensor, Power Sensor, and Fan.

1. Select the IONPS-A Power Supply. The Power Supply **MAIN** tab displays the current power supply information.



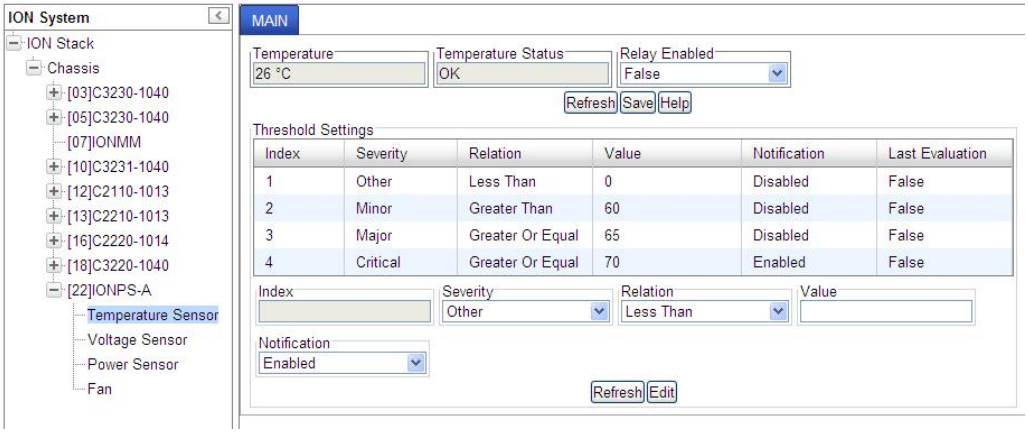
The **MAIN** tab displays an overview of power supply model information, data on the sensor and fan(s), and Miscellaneous information. The **MAIN** tab's **Miscellaneous** section includes:

- **Module Type**: AC or DC voltage.
- **Master/Slave Mode**: if a redundant module exists, this value indicates whether this is the Master power supply or the Slave power supply. The Slave power supply is the fail-over or redundant (backup) power supply.
- **Relay Installed**: tells whether the dry contact relay (DCR) is installed (ExtRelayInstalled) in the power supply.
- **Relay Enabled**: this setting enables or disables the relay contact if it is installed (SensorExtRelayInstalled) in the power supply. This relay contact is used to trigger an event to the user by attaching an external indicator. Displays only if the **Relay Installed** field displays **True**.

2. From the Power Supply's **MAIN** tab, expand / select the Temperature Sensor, Voltage Sensor, Power Sensor, or Fan for configuration and status information.

Temperature Sensor Configuration

The Threshold Settings table lists the threshold severity, relation, and comparison value for a sensor listed in the Entity-MIB Physical Table.



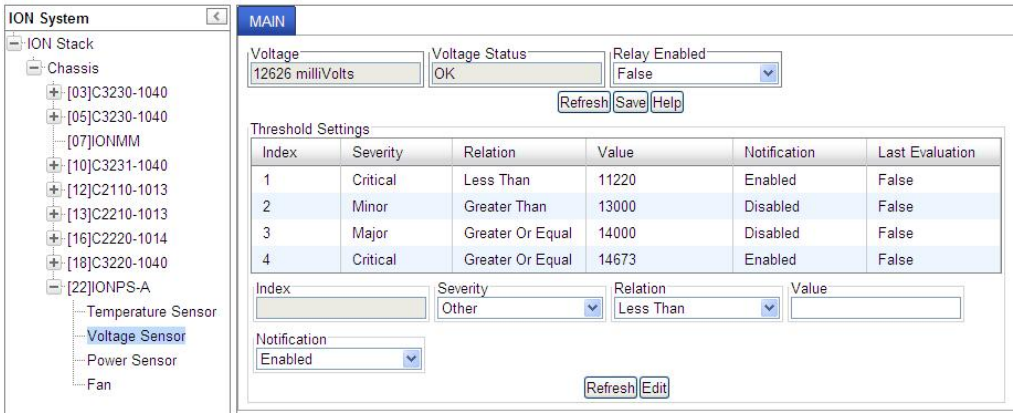
- **Temperature**: displays the most recent temperature measurement obtained by the agent for this sensor.
- **Temperature Status**: displays the operational status of the physical sensor.
  - **OK** - indicates that the agent can obtain the sensor value.
  - **Unavailable** - indicates that the agent presently cannot obtain the sensor value.
  - **Nonoperational** - indicates that the agent believes the sensor is broken. The sensor could have a hard failure (disconnected wire), or a soft failure (e.g., out-of-range, jittery, or wildly fluctuating readings).
- **Relay Enabled**: select **False** to disable DCR (Dry Contact Relay) operation or select **True** to enable it. This selection enables or disables the relay contact if it is installed (ExtRelayInstalled) in the power supply.
- **Index**: select an index line / number that uniquely identifies an entry in the Threshold Table. The index permits the same sensor to have several different threshold values set.
- **Severity**: select **Minor**, **Major**, **Critical** or **Other**. Critical is the most severe, Major is the next most severe, and Minor is the least severe. The system might shut down the sensor associated FRU automatically if the sensor value reaches the Critical problem threshold.
- **Relation**: Less Than (<), Less Or Equal (≤), Greater Than (>), Greater Or Equal (≥), Equal To (=), or Not Equal To (≠).
  - LessThan: if the sensor value is less than the threshold value.
  - LessOrEqual: if the sensor value is less than or equal to the threshold value.
  - GreaterThan: if the sensor value is greater than the threshold value.
  - GreaterOrEqual: if the sensor value is greater than or equal to the threshold value.
  - EqualTo: if the sensor value is equal to the threshold value.
  - NotEqualTo: if the sensor value is not equal to the threshold value.

Indicates the relation between sensor value (entSensorValue) and threshold value (ionEntSensorThresholdValue), required to trigger the alarm.
When evaluating the relation, entSensorValue is on the left of SensorThresholdRelation, and SensorThresholdValue is on the right (e.g., entSensorValue ≥ SensorThresholdValue).

- **Value**: defines the value of the threshold (e.g., for a Major threshold severity selection, set a relation of Greater than or equal to 65 as the requirement for notification). To correctly display or interpret this variable's value, you must also know the SensorType, SensorScale, and SensorPrecision. However, you can directly compare SensorValue with the threshold values given in the SensorThresholdTable without any semantic knowledge.
- **Notification**: select **Enabled** to be informed of Temperature Sensor events, or select **Disabled** to not receive notification of Temperature Sensor events. If this value is **Disabled**, then no SensorThresholdNotification will be generated on this device. If this value is **Enabled**, then whether a SensorThresholdNotification for a threshold will be generated or not depends on the instance value of SensorThresholdNotificationEnable for that threshold.
- **Last Evaluation**: displays **True** if parameters were included in the most recent measurement, otherwise displays **False**. This value indicates the result of the most recent evaluation of the threshold. If the threshold condition is True, then SensorThresholdEvaluation is True. If the threshold condition is False, then SensorThresholdEvaluation is False. Thresholds are evaluated at the rate indicated by the SensorValueUpdateRate (e.g., 0= on demand (when polled), when the sensor value changes (event-driven), or the agent does not know the update rate).

3. Click the **Save** button when finished with Temperature Sensor configuration.

Voltage Sensor Configuration



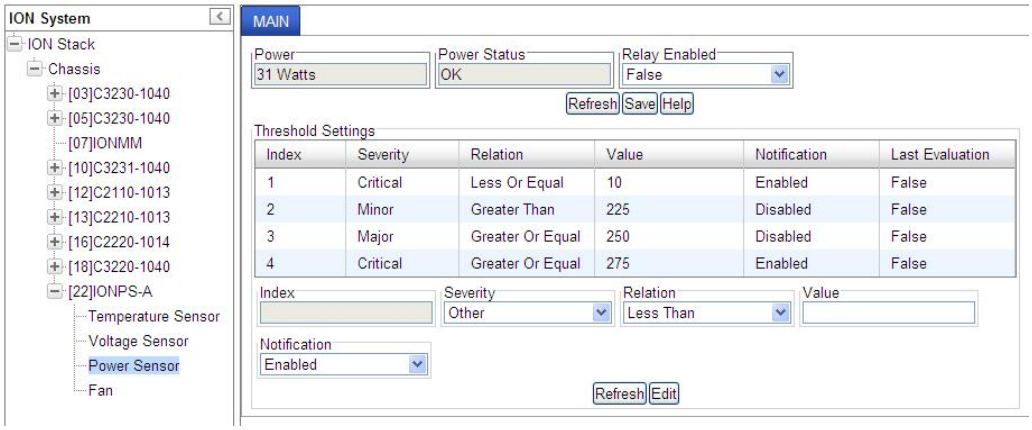
- **Voltage**: displays the most recent voltage measurement obtained by the agent for this sensor.
- **Voltage Status**: displays the operational voltage status of the sensor.
    - **OK -** indicates that the agent can obtain the sensor value.
    - **Unavailable -** indicates that the agent presently cannot obtain the sensor value.
    - **Nonoperational -** indicates that the agent believes the sensor is broken. The sensor could have a hard failure (disconnected wire), or a soft failure (e.g., out-of-range, jittery, or wildly fluctuating readings).
- **Relay Enabled**: select **False** to disable DCR (Dry Contact Relay) operation or select **True** to enable it. This selection enables or disables the relay contact if it is installed (ExtRelayInstalled) in the power supply.
- **Index**: select an index line / number that uniquely identifies an entry in the Threshold Table. The index permits the same sensor to have several different threshold values set.
- **Severity**: select **Other**, **Minor**, **Major**, or **Critical**. Critical is the most severe, Major is the next most severe, and Minor is the least severe. The system might shut down the sensor associated FRU automatically if the sensor value reaches the Critical problem threshold.
- **Relation**: Less Than (<), Less Or Equal (≥), Greater Than (>), Greater Or Equal (≥), Equal To (=), or Not Equal To (≠).
    - LessThan: if the sensor value is less than the threshold value.
    - LessOrEqual: if the sensor value is less than or equal to the threshold value.
    - GreaterThan: if the sensor value is greater than the threshold value.
    - GreaterOrEqual: if the sensor value is greater than or equal to the threshold value.
    - EqualTo: if the sensor value is equal to the threshold value.
    - NotEqualTo: if the sensor value is not equal to the threshold value.

  Indicates the relation between sensor value (SensorValue) and threshold value (SensorThresholdValue), required to trigger the alarm.
  When evaluating the relation, SensorValue is on the left of SensorThresholdRelation, and SensorThresholdValue is on the right (e.g., SensorValue ≥ SensorThresholdValue).

- **Value**: defines the value of the threshold (e.g., for a Major threshold severity selection, set a relation of Greater than or equal to 14000 as the requirement for notification). To correctly display or interpret this variable's value, you must also know the SensorType, SensorScale, and SensorPrecision. However, you can directly compare SensorValue with the threshold values given in the SensorThresholdTable without any semantic knowledge.
- **Notification**: select Enabled to be informed of Temperature Sensor events, or select Disabled to not receive notification of Temperature Sensor events. If this value is **Disabled**, then no SensorThresholdNotification will be generated on this device. If this value is **Enabled**, then whether a SensorThresholdNotification for a threshold will be generated or not depends on the instance value of SensorThresholdNotificationEnable for that threshold.
- **Last Evaluation**: displays **True** if parameters were included in the most recent measurement, otherwise displays **False**. This value indicates the result of the most recent evaluation of the threshold. If the threshold condition is True, then SensorThresholdEvaluation is True. If the threshold condition is False, then SensorThresholdEvaluation is False. Thresholds are evaluated at the rate indicated by the SensorValueUpdateRate (e.g., 0= on demand (when polled), when the sensor value changes (event-driven), or the agent does not know the update rate).

4. Click the **Save** button when finished with Voltage Sensor configuration.

Power Sensor Configuration



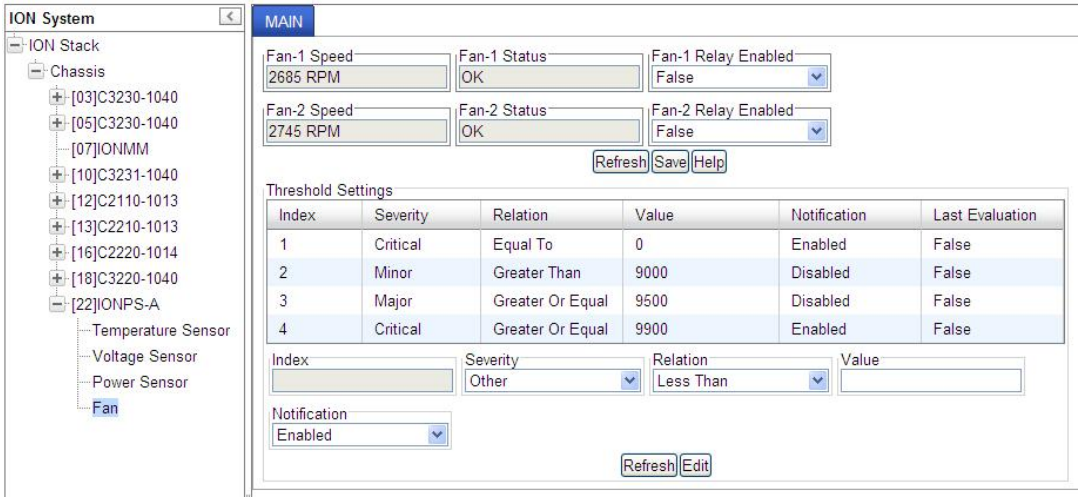
- **Power**: displays the most recent power measurement obtained by the agent for this sensor.
- **Power Status**: displays the operational power status of the sensor.
  - **OK** - indicates that the agent can obtain the sensor value.
  - **Unavailable** - indicates that the agent presently cannot obtain the sensor value.
  - **Nonoperational** - indicates that the agent believes the sensor is broken. The sensor could have a hard failure (disconnected wire), or a soft failure (e.g., out-of-range, jittery, or wildly fluctuating readings).
- **Relay Enabled**: select **False** to disable DCR (Dry Contact Relay) operation or select **True** to enable it. This selection enables or disables the relay contact if it is installed (ExtRelayInstalled) in the power supply.
- **Index**: select an index line / number that uniquely identifies an entry in the Threshold Table. The index permits the same sensor to have several different threshold values set.
- **Severity**: select **Other**, **Minor**, **Major**, or **Critical**. Critical is the most severe, Major is the next most severe, and Minor is the least severe. The system might shut down the sensor associated FRU automatically if the sensor value reaches the Critical problem threshold.
- **Relation**: Less Than (<), Less Or Equal (≤), Greater Than (>), Greater Or Equal (≥), Equal To (=), or Not Equal To (≠).
  - LessThan: if the sensor value is less than the threshold value.
  - LessOrEqual: if the sensor value is less than or equal to the threshold value.
  - GreaterThan: if the sensor value is greater than the threshold value.
  - GreaterOrEqual: if the sensor value is greater than or equal to the threshold value.
  - EqualTo: if the sensor value is equal to the threshold value.
  - NotEqualTo: if the sensor value is not equal to the threshold value.

  Indicates the relation between sensor value (entSensorValue) and threshold value (ionEntSensorThresholdValue), required to trigger the alarm.
  When evaluating the relation, entSensorValue is on the left of SensorThresholdRelation, and SensorThresholdValue is on the right (e.g., entSensorValue ≥ SensorThresholdValue).

- **Value**: defines the value of the threshold (e.g., for a Major threshold severity selection, set a relation of Greater than or equal to 14000 as the requirement for notification). To correctly display or interpret this variable's value, you must also know the SensorType, SensorScale, and SensorPrecision. However, you can directly compare SensorValue with the threshold values given in the SensorThresholdTable without any semantic knowledge.
- **Notification**: select Enabled to be informed of Temperature Sensor events, or select Disabled to not receive notification of Temperature Sensor events. If this value is **Disabled**, then no SensorThresholdNotification will be generated on this device. If this value is **Enabled**, then whether a SensorThresholdNotification for a threshold will be generated or not depends on the instance value of SensorThresholdNotificationEnable for that threshold.
- **Last Evaluation**: displays **True** if parameters were included in the most recent measurement, otherwise displays **False**. This value indicates the result of the most recent evaluation of the threshold. If the threshold condition is True, then SensorThresholdEvaluation is True. If the threshold condition is False, then SensorThresholdEvaluation is False. Thresholds are evaluated at the rate indicated by the SensorValueUpdateRate (e.g., 0= on demand (when polled), when the sensor value changes (event-driven), or the agent does not know the update rate).

5. Click the **Save** button when finished with Power Sensor configuration.

Fan Configuration



- **Fan-x Speed**: displays the most recent fan speed measurement obtained by the agent for this fan in RPM (e.g., 2730 revolutions-per-minute).
- **Fan-x Status**: displays the fan's operational status.
  - **OK** - indicates that the agent can obtain the sensor value.
  - **Unavailable** - indicates that the agent presently cannot obtain the sensor value.
  - **Nonoperational** - indicates that the agent believes the sensor is broken. The sensor could have a hard failure (disconnected wire), or a soft failure (e.g., out-of-range, jittery, or wildly fluctuating readings).
- **Fan-x Relay Enabled**: select **False** to disable the related Fan Relay operation or select **True** to enable it.
- **Index**: select an index line that uniquely identifies an entry in the Threshold Table. The index permits the same sensor to have several different threshold values set.
- **Severity**: select **Other**, **Minor**, **Major**, or **Critical**. Critical is the most severe, Major is the next most severe, and Minor is the least severe. The system might shut down the sensor associated FRU automatically if the sensor value reaches the Critical problem threshold.
- **Relation**: Less Than (<), Less Or Equal (≤), Greater Than (>), Greater Or Equal (≥), Equal To (=), or Not Equal To (≠).
  - **LessThan**: if the sensor value is less than the threshold value.
  - **Less Or Equal**: if the sensor value is less than or equal to the threshold value.
  - **Greater Than**: if the sensor value is greater than the threshold value.
  - **Greater Or Equal**: if the sensor value is greater than or equal to the threshold value.
  - **Equal To**: if the sensor value is equal to the threshold value.
  - **Not Equal To**: if the sensor value is not equal to the threshold value.

  Indicates the relation between sensor value and sensor threshold value, required to trigger the alarm.

When evaluating the relation, SensorValue is on the left of SensorThresholdRelation, and SensorThresholdValue is on the right (e.g., SensorValue ≥ SensorThresholdRelation ≥ SensorThresholdValue).

- **Value**: defines the value of the threshold (e.g., for a Major threshold severity selection, set a relation of Greater than or equal to 14000 as the requirement for notification). To correctly display or interpret this variable's value, you must also know the SensorType, SensorScale, and SensorPrecision. However, you can directly compare SensorValue with the threshold values given in the SensorThresholdTable without any semantic knowledge.
- **Notification**: select Enabled to be informed of Temperature Sensor events, or select Disabled to not receive notification of Temperature Sensor events. If this value is **Disabled**, then no SensorThresholdNotification will be generated on this device. If this value is **Enabled**, then whether a SensorThresholdNotification for a threshold will be generated or not depends on the instance value of SensorThresholdNotificationEnable for that threshold.
- **Last Evaluation**: displays **True** if parameters were included in the most recent measurement, otherwise displays **False**. This value indicates the result of the most recent evaluation of the threshold. If the threshold condition is True, then SensorThresholdEvaluation is True. If the threshold condition is False, then SensorThresholdEvaluation is False. Thresholds are evaluated at the rate indicated by the SensorValueUpdateRate (e.g., 0= on demand (when polled), when the sensor value changes (event-driven), or the agent does not know the update rate).

5. Click the **Save** button when finished with Fan configuration.

IONDCR (Dry Contact Relay) Module

The IONDCR is a field installable dry contact relay option module for the IONPS-A(AC) and IONPS-D (DC) power supplies.

The IONDCR module mounts in the lower right-hand corner of the IONPS face-plate, allowing the power supply to be tied into a separate alarm circuit. Contacts will be activated on the loss of power, enabling an external visual or audible alarm (third party power management alarm systems).

Figure D-1: The IONDCR Module

Applications for this type of fault alarm output would include enterprise networks as well as in industrial applications. The DCR module provides another layer of fault indicators, complementing network management software by providing a signal to either a local or remote alarm system.

The IONDCR can be installed in either the IONPS-A (AC) or the IONPS-D (DC) power supply.

IONDCR with IONPS-A (AC) Power Supply

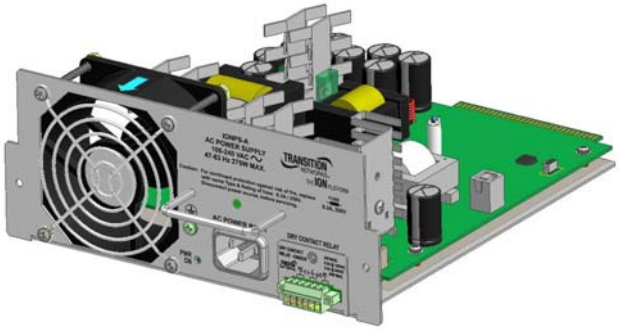


Figure D-2: IONDCR Installed in IONPS-A (AC) Power Supply

The IONDCR can be configured in either the IONPS-A or the IONPS-D via the CLI or Web interface.

IONDCR with IONPS-D (DC) Power Supply

Figure D-3: IONDCR Installed in IONPS-D (DC) Power Supply

With a relay is installed in the IONPS, and a sensor set to Relay Enabled (the threshold evaluation is *true* and the corresponding threshold notification is *enabled*) then a physical alarm will be generated to warn that maintenance is required.

The IONDCR can be configured in either the IONPS-A or in the IONPS-D via the CLI or Web interface.

IONDCR Config –CLI Method

1. Access the Power Supply through either a USB connection (see "Starting a USB Session" on page 41) or a Telnet session (see "Starting a Telnet Session" on page 43).

2. To turn slot power on or off, or reset (reboot) a slot, type **set slot**=xx **power**=yy and press **Enter** (where xx = the PS slot number – 22 or 23, and yy = the function to perform – off, on, or reset).

3. Use the **go** command to switch to the Relay.

4. To enable the Power Supply's Power Relay, type **set power relay state=enable** and press **Enter**.

5. Set the Power Supply or Fan's Sensor Notification / Relation / Severity / Value. For example:

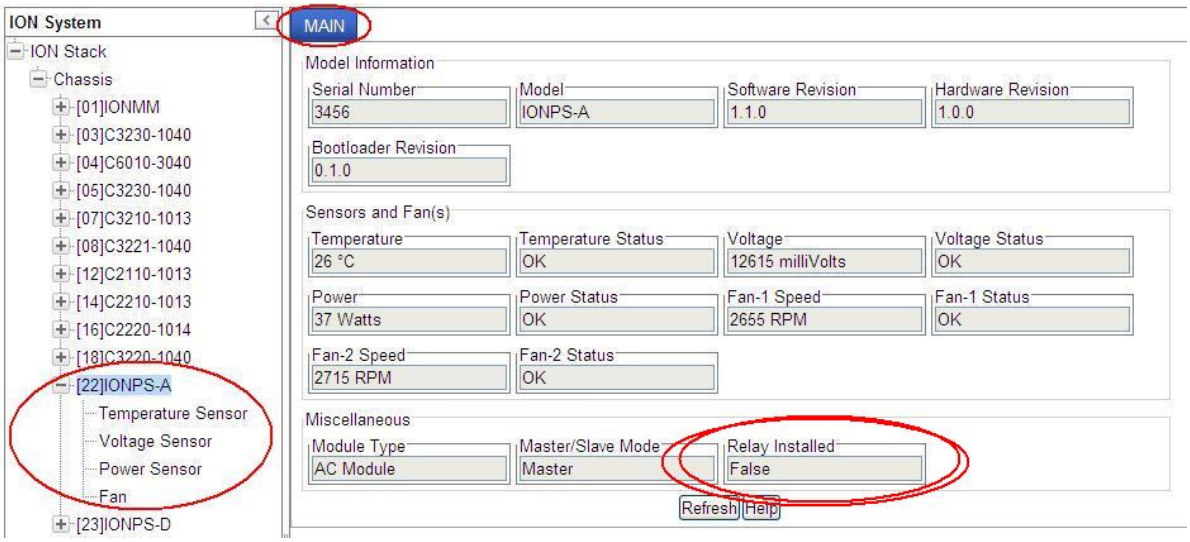
```
C1|S5|L1P2>set slot 22 power ?
  off
  on
  reset
C1|S5|L1P2>set slot 22 power=on
C1|S22|L1D>set sensor stid 9 ?
  notif
  relation
  severity
  value
C1|S22|L1D>set sensor stid=9 notif=true
C1|S22|L1D>set sensor stid=9 relation=lessThan
C1|S22|L1D>set sensor stid=9 severity=major
C1|S22|L1D>set sensor stid=9 value=9
```

Note: Use the **stat** command to view the chassis slot assignments. Power Supplies are assigned slot 22 and slot 23 by default. The ION chassis has **PS 1 ON** and **PS 2 ON** LEDs to indicate power supply presence and function.

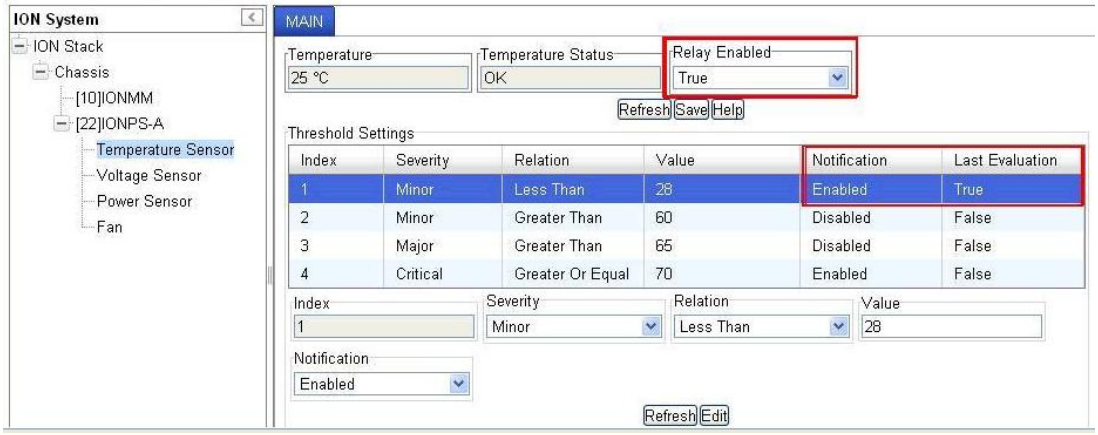
Note: Use the **show power config** command to view the existing power supply configuration.

IONDCR Config –Web Method

1. At the **IONPS-A**'s **MAIN** screen, locate the **Relay Installe**d field.



1. Under the **IONPS-A**, select the desired sensor's **MAIN** screen.
2. At the **Relay Enabled** dropdown, select **True**.
3. Click the **Save** button.
4. In the **Threshold Settings** table, select the desired **Index** number (line item).
5. Click the **Refresh** button.



6. Verify that the line item's **Notification** column shows **Enabled**, and the **Last Evaluation** column shows **True**.

IONADP (Point System™-to-ION Adapter)

The IONADP is an adapter card that allows the ION chassis to be backwards compatible with Point System™ media converter modules. This adapter is designed to sit between a Point System module and the backplane of the ION chassis. The purpose of the IONADP is to lengthen the Point System module so it can be securely mounted in an ION chassis while also connecting to the backplane allowing the ION chassis to power the Point System module.

SNMP management of the Point System modules installed in the ION chassis is possible by using a Point System management module along with the IONADP.

The ION modules and the Point System modules are managed independently by their own respective management modules. The ION management module and the Point System management module would each require a unique IP address assigned to them, while Focal Point can be used to access the management information from each management module simultaneously.

The IONADP allows the ION platform to be backwards compatible with Point System slide-in-modules. The IONADP kit includes adapter card, bracket, and four screws. Refer to the *IONADP Install Guide*, 33421 for more information.

Figure D-4: The IONADP Module

IONADP Config – CLI Method

1. *Information to be supplied.*

IONADP Config – Web Method

1. *Information to be supplied.*

Appendix E: ION C3210 to GFEB105 Feature Mapping

The C3210 is intended to be linked over fiber to a stand-alone CGFEB10xx-120. This appendix describes how these two converters work together, particularly in the area of Max frame size limitations in this configuration.

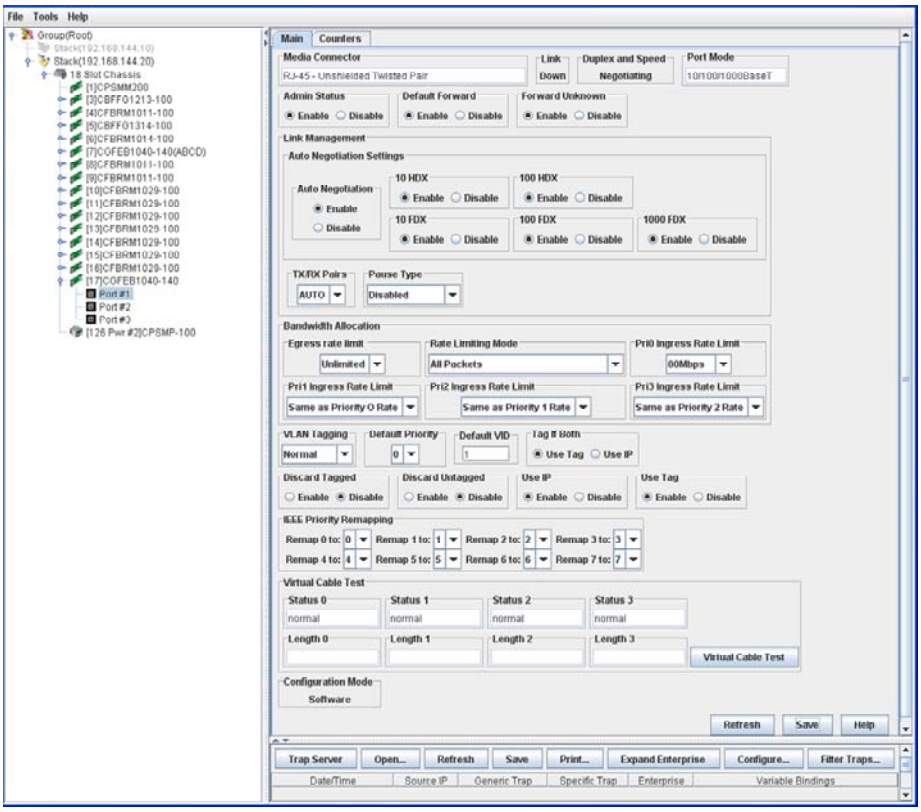
This appendix outlines the similarities and differences in the terminology used in the management of each product (see figures and table below) for concurrent C3210 and CGFEB10xx-120 users.

The SGFEB10xx-12x is a 10/100/1000 Ethernet Media Converter that can integrate 1000Base-SX/LX Fiber into 10/100/1000 Copper environments, extend network distance, and bridge legacy 10/100 devices to a Gigabit backbone. SGFEB10xx-12x features include Auto-Negotiation (copper and fiber ports), Switch-selectable speeds (UTP) when Auto Negotiation is off, AutoCross, Link Pass Through, Remote Fault Detect, and Pause.

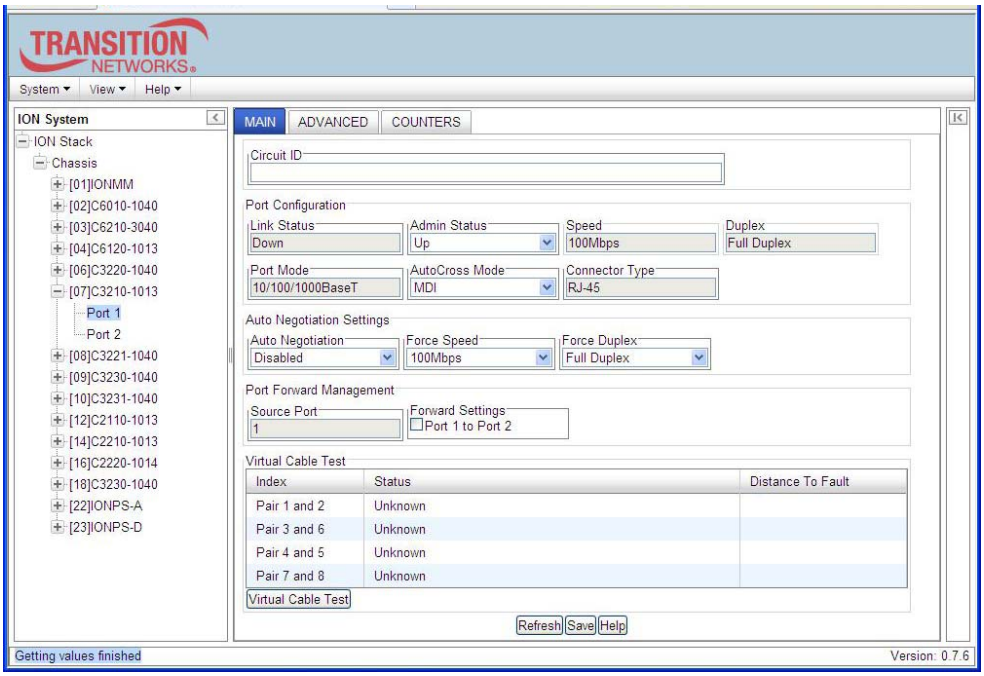
Device Level configuration is very similar, so the focus here is on the port level configuration comparisons. At port level, some fields like Auto Negotiation are not addressed here since they are the same between the devices. Fields which are very different are highlighted in the table below in red. These are distinguishable feature differences between the products.

PS GFEB Port 1 (Copper) Main Tab

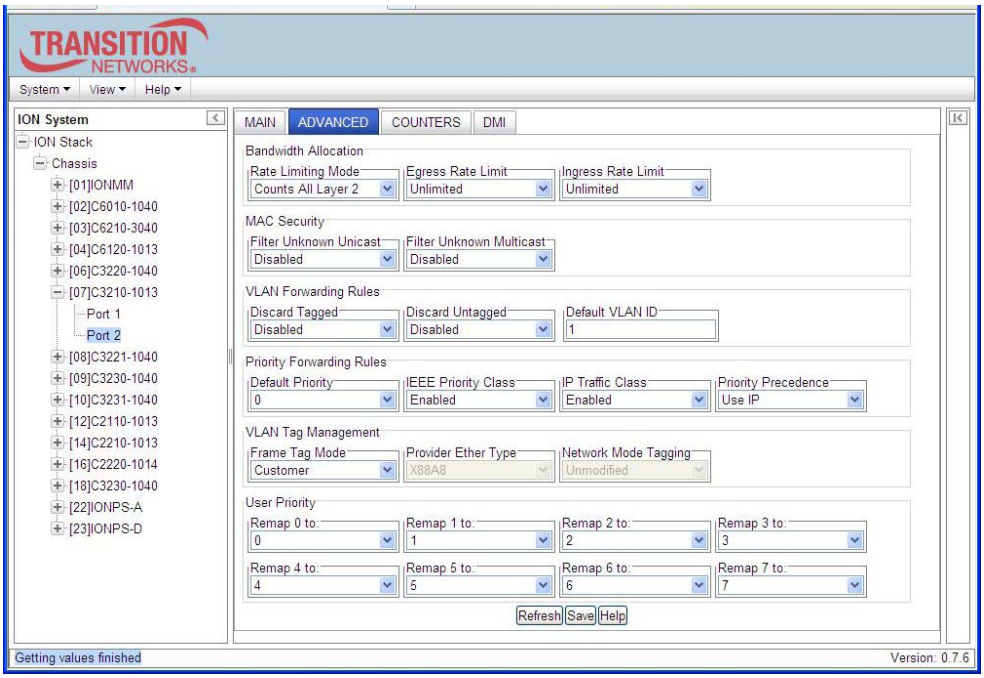
The Main tab of Port # 1 of the Point System CGFEB1040-140 is shown below.



ION 3210 Port level MAIN Tab



ION 3210 Port level ADVANCED Tab



Fields (features) which are very different are shown with an asterisk in red* in the table below.

Table 19: ION C3210-to-xGFEB105 Feature Mapping

PS GFEB	ION C3210	Description
Tx/Rx Pairs	Autocross	Autocross options of MDI, MDI-X, Auto.
Default Forward	Filter Unknown Multicast	To forward or discard unknown Multicast frames.
Forward unknown	Filter unknown Unicast	To forward or discard unknown Unicast frames.
Default priority	Default priority	Default priority of this port; frames that ingress this port untagged are assigned this priority
Default VID	Default VLAN ID	Default VLAN ID of this port; frames that ingress this port untagged are assigned this VLAN ID.
Rate Limiting Mode*	Rate Limiting Mode*	Controls how to count the rate for the purpose of rate limiting. CGFEB: the options are the types of frames (Broadcast, Multicast, Unknown, Unicast, or All Packets). C3210: the options are different. The Rate Limiting Mode field controls which bytes in a frame will be counted in determining the rate limit: • Counts All Layer 1: (the default): in determining the rate limit, this selection counts the following bytes in a frame: Preamble (8 Bytes) + DA to CRC + Inter Frame Gap (12 bytes). • Counts All Layer 2: in determining the rate limit, this selection counts the bytes in a frame from the DA to the CRC in determining the rate limit. • Counts All Layer 3: in determining the rate limit, this selection counts the following bytes in a frame; either 1) from the DA (Destination MAC) to the CRC (18 bytes if untagged), or 2) from the DA (Destination MAC) to the CRC (22 bytes if tagged). Note: The Counts All Layer 3 selection will skip the Ethernet header, the CRC, and Tags (if any tags exist).
Egress rate limit	Egress rate limit	Egress rate control, the actual list of values differs between the products.
Prio0 Ingress rate limit*	Ingress rate limit*	Ingress rate limiting. CGFEB: this is only for frames that are in the prio0 queue. ION C3110: the rate limits apply to all kinds of traffic.
Prio1 Ingress rate limit*	Not Applicable*	Ingress rate limiting. On CGFEB, this is only for frames that are in the prio1 queue.
Prio2 Ingress rate limit*	Not Applicable*	Ingress rate limiting. On CGFEB, this is only for frames that are in the prio2 queue.
Prio3 Ingress rate limit*	Not Applicable*	Ingress rate limiting. On CGFEB, this is only for frames that are in the prio3 queue.

PS GFEB	ION C3210	Description
Discard Tagged	Discard Tagged	To discard or forward tagged frames
Discard untagged	Discard untagged	To discard or forward untagged frames
VLAN Tagging* 1) Normal 2) Double Tag 3) Tag 4) Untag	VLAN Tag Management*: Frame Tag Mode & Network Mode tagging 1) Customer 2) Provider 3) Network (Add tag in network mode tagging) 4) Network (Remove tag in network mode tagging)	The devices do the same kind of VLAN tag/untagging options but the terminology options differ as highlighted.
Ether type default to 0x8100 not user configurable*	Provider Ether type *	The ION C3210 lets you choose one of the 3 Ether types (0x8100, 0x9100, 0x88a8) when Provider mode (double tagging) is enabled.
Use IP	IP traffic class	To enable or disable using the IP traffic class or DiffServ priority if present in the frame for switching decisions.
Use IEEE	IEEE priority class	To enable or disable using the IEEE priority if present in the frame for switching decisions.
Tag if Both	Priority precedence	If both the options of using IP and IEEE priority are enabled and if a frame happens to have both then which one should be used for switching decision is decided by this field. The options are 'use IP' or 'use IEEE' priority for this frame.
IEEE priority remapping	User priority	Gives a table of remapping options 0-7.

Counters which are very different are shown with an asterisk in red * in the table below.

PS GFEB	ION C3210	Description
Only RMON mib counters*	RMON, IF-MIB stats and Ether-like MIB statistics *	The ION C3210 provides more MIB counters.

Other notable differences are shown with an asterisk in red * in the table below.

PS GFEB	ION C3210	Description
Max frame size is 1632*	Max frame size is 10k*	The ION C3210 supports Jumbo frames.
'Port x-y Block forwarding' [3-port version] and 'Port VLAN' [2-port version] available at device level	It is available on each port as 'Port Forward Management' → Forward settings checkbox *	To allow frames to be forwarded between Port 1 and Port 2 or not. Typically used for spoofing in one direction.
No uptime information	Uptime available*	The ION C3210 reports System Uptime.
No unique string for device or port level	Unique string "Circuit ID" can be assigned to the device and on each port. *	The ION C3210 supports Circuit ID assignment and display.
No MAC address given to the unit	Has a unique MAC address used for all backplane communication. Not really used for any user communication. *	The ION C3210 supports MAC addressing.

Glossary

This section describes many of the terms and mnemonics used in this manual. Note that the use of or description of a term does not in any way imply support of that feature or of any related function(s).

100BASE-FX

100BASE-FX is a version of Fast Ethernet over optical fiber. It uses a 1300 nm near-infrared (NIR) light wavelength transmitted via two strands of optical fiber, one for receive (RX) and the other for transmit (TX). Maximum length is 400 meters (1,310 ft) for half-duplex connections (to ensure collisions are detected), 2 kilometers (6,600 ft) for full-duplex over multimode optical fiber, or 10,000 meters (32,808 feet) for full-duplex single mode optical fiber. 100BASE-FX uses the same 4B5B encoding and NRZI line code that 100BASE-TX does. 100BASE-FX should use SC, ST, or MIC connectors, with SC being the preferred option. 100BASE-FX is not compatible with 10BASE-FL, the 10 MBit/s version over optical fiber.

1000BASE-X

Refers to gigabit Ethernet transmission over fiber, where options include 1000BASE-CX, 1000BASE-LX, and 1000BASE-SX, 1000BASE-LX10, 1000BASE-BX10 or the non-standard -ZX implementations.

802.1

The IEEE standard for port-based Network Access Control. IEEE 802.1 is a working group of the IEEE 802 project of the IEEE Standards Association. It's concerns include 802 LAN/MAN architecture, internetworking among 802 LANs, MANs and other wide area networks, 802 Link Security, 802 overall network management, and those protocol layers above the MAC and LLC layers.

802.1ad

IEEE 802.1ad (Provider Bridges) is an amendment to IEEE standard IEEE 802.1Q-1998 (aka QinQ or Stacked VLANs), intended to develop an architecture and bridge protocols to provide separate instances of the MAC services to multiple independent users of a Bridged LAN in a manner that does not require cooperation among the users, and requires a minimum of cooperation between the users and the provider of the MAC service.

802.1ah

IEEE 802.1ah-2008 is a set of architecture and protocols for routing of a customer network over a provider network, allowing interconnection of multiple Provider Bridge Networks without losing each customer's individually defined VLANs. The final standard was approved by the IEEE in June 2008.

802.1p

The IEEE standard for QoS packet classification.

802.1p Prioritization

The ability to send traffic to various prioritization queues based on the 802.1q VLAN Tag priority field. **(**AKA, CoS. Standard: IEEE 802.1p**.)**

802.1q

IEEE 802.1Q, or VLAN Tagging, is a networking standard allowing multiple bridged networks to transparently share the same physical network link without leakage of information between networks. IEEE 802.1Q (aka, dot1q) is commonly refers to the encapsulation protocol used to implement this mechanism over Ethernet networks. IEEE 802.1Q defines the meaning of a VLAN with respect to the specific conceptual model for bridging at the MAC layer and to the IEEE 802.1D spanning tree protocol.

802.1Q VLAN

802.1Q is a standardized way of segmenting and distributing VLAN information. Switches that support 802.1Q can recognize and forward, a tag packet upon egress. See also VID, dot1Q, IEEE 802.1Q. Contrast “PVLAN”.)

ACL

(Access Control List) A set of data that informs a computer's operating system which permissions, or access rights, that each user or group has to a specific system object, such as a directory or file. Each object has a unique security attribute that identifies which users have access to it, and the ACL is a list of each object and user access privileges such as read, write or execute.

ARP

(Address Resolution Protocol) A protocol for mapping an IP address to a physical machine address that is recognized in the local network

Auto-Negotiation

With Auto-Negotiation in place, Ethernet can determine the common set of options supported between a pair of "link partners." Twisted-pair link partners can use Auto-Negotiation to figure out the highest speed that they each support as well as automatically setting full-duplex operation if both ends support that mode. (AKA, N-WAY Protocol. Standard: IEEE 802.3u.)

Auto MDI / MDIX

Auto MDI/MDIX automatically detects the MDI or MDIX setting on a connecting device in order to obtain a link. This means installers can use either a straight through or crossover cable and when connecting to any device, the feature is pretty self explanatory.

Auto-provisioning

A process that enables centralized management for multiple end user devices. It uses DHCP option 60, 66 and 67 to provide centralized firmware and configuration management. The feature provides mass firmware upgrade capability as well as booting-up full end device configuration without any manual intervention.

BPC

(Back Plane Controller) the ION system component that provides communication between the SIC cards and the IONMM. The BPC is an active device with a microprocessor and management software used to interconnect IONMM and SIC cards via the Ethernet management plane. The BPC has knowledge of the cards that are present in the system, and is responsible for managing the Ethernet switch that interconnects all the chassis slots.

BPDU

(Bridge Protocol Data Unit) Data messages that are exchanged across the switches within an extended LAN that uses a spanning tree protocol topology. BPDU packets contain information on ports, addresses, priorities and costs and ensure that the data ends up where it was intended to go. See also “STP”.

Bridge

A device that connects one local area network (LAN) to another LAN.

CE

A mandatory conformity mark on many products placed on the single market in the European Economic Area (EEA). The CE marking certifies that a product has met EU consumer safety, health or environmental requirements.

Circuit ID

A company-specific identifier assigned to a data or voice network between two locations. This circuit is then leased to a customer by that ID. If a subscriber has a problem with the circuit, the subscriber contacts the telecommunications provider to provide this circuit id for action on the designated circuit.

Several Circuit ID formats exist (Telephone Number Format, Serial Number Format, Carrier Facility Format and Message Trunk Format). Telecom Circuit ID formats (LEC circuit IDs) provide service codes for DSL, HDSL, ADSL, Digital data, SST Network Trunk, Switched Access, E1, Switched Access, Basic Data and Voice, LAN, SONET, Ethernet, Video, Voice, Digital Transmission, and others.

CLI

(Command-Line Interface) A mechanism for interacting with a computer operating system or software by typing commands to perform specific tasks. The CLI allows users to set up switch configurations by using simple command phrases through a console / telnet session.

Community

Two levels of ION system access privileges are password protected:

- Read access (Read ONLY) - a Community Name with a particular set of privileges to monitor the network without the right to change any of its configuration.
- Read/Write (Read and make changes) - a Community Name with an extended set of privileges to monitor the network as well as actively change any of its configuration.

CoS

(Class of Service) a 3-bit field within an Ethernet frame header when using 802.1Q tagging. The field specifies a priority value from 0 and 7 inclusive that can be used by Quality of Service (QoS) disciplines to differentiate traffic. While CoS operates only on Ethernet at the data link layer, other QoS mechanisms (such as DiffServ) operate at the network layer and higher. Others operate on other physical layer. See also ToS and QoS. In MEF terms, CoS is a set of Service Frames that have a commitment from the Service Provider to receive a particular level of performance.

CoS Queues

Class of Service allows traffic to be directed into different priority levels or “internal queues” in the switch on a particular network transaction. When network traffic congestion occurs, the data assigned to a higher queue will get through first. (Standard: IEEE 802.1p.)

CSA

(Canadian Standards Association) A not-for-profit membership-based association serving business, industry, government and consumers in Canada and the global marketplace.

C-Tag

(Customer Tag) When the 0x8100 tag is added twice, the outer tag is called the Provider tag and the inner one is called the Customer IEEE 802.1Q tag. The inner VLAN tag is referred to as the customer VLAN tag (C-Tag) because the customer assigns it. Contrast S-Tag. Before the standardization, some vendors used 0x8100 and 0x9100 for outer Provider tagging. The 0x88A8 tag was adapted by the IEEE later.

The C-Tag is one of several ION system VLAN tagging options. The ION system can provide QinQ service where a frame may contain one or more tags by adding or stripping provider tags on a per-port basis. There are different cases for VLAN service translation options that are possible in the ION system for dealing with C-Tags and S-Tags. Contrast with S-Tag. See also Provider tag.

dBm

(DeciBels below 1 Milliwatt) A measurement of power loss in decibels using 1 milliwatt as the reference point. A signal received at 1 milliwatt yields 0 dBm. A signal at .1 milliwatt is a loss of 10 dBm.

DCE

(Data Circuit-terminating Equipment) A device that sits between the data terminal equipment (DTE) and a data transmission circuit. Also called data communications equipment and data carrier equipment.

DHCP

(Dynamic Host Configuration Protocol) A protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network.

DHCP lets a network administrator supervise and distribute IP addresses from a central point, and automatically sends a new address when a computer is plugged into a different place in the network. (Standard: RFC 2131.)

DiffDerv

In terms of traffic classification, DiffDerv lets a network perform differentiated service treatments.

Discovery

Discovery allows a Service OAM-capable device to learn sufficient information (e.g. MAC addresses etc.) regarding other SOAM capable NIDs so that OAM frames can be exchanged with those discovered devices. With EVCs, discovery allows SOAM capable NIDs to learn about other Service OAM capable devices that support the same EVCs. These devices are expected to be at the edges of the OAM domain in which the discovery is carried out. See "LLDP" and "TNDP" for discovery mechanisms. Discovery occurs when a SOAM-capable NID learns sufficient information (e.g. MAC addresses etc.) regarding other SOAM capable NIDs to exchange OAM frames with those discovered NIDs.

DMI

(Diagnostic Monitoring Interface) Adds parametric monitoring to SFP devices.

DMM / DMR

(Delay Measurement Message / Delay Measurement Response) DMM/DMR is used to measure single-ended (aka, two-way) Frame Delay (FD) and Frame Delay Variation (FDV, aka, Jitter).

DNS

(Domain Name System) An internet service that translates domain names into IP addresses. DNS allows you to use friendly names, such as www.transition.com, to easily locate computers and other resources on a TCP/IP-based network

DoSAP

(Domain Service Access Point) A member of a set of SAPs at which a Maintenance Domain is capable of offering connectivity to systems outside the Maintenance Domain. Each DoSAP provides access to an instance either of the EISS or of the ISS.

Dr. Watson

Dr. Watson for Windows is a program error debugger. The information obtained and logged by Dr. Watson is used by technical support groups to diagnose a program error for a computer running Windows. A text file (Drwtsn32.log) is created whenever an error is detected, and can be delivered to support personnel by the method they prefer. There is an option to create a crash dump file, which is a binary file that a programmer can load into a debugger.

DSCP

DiffServ (Differentiated Services) Prioritization provides the ability to prioritize traffic internally based on the DSCP field in the IP header of a packet. (AKA, DiffServ Modification DSCP / DiffServ. Standard: RFC 3290.)

DSL

(Digital Subscriber Line) A copper loop transmission technology that enables high-speed access to customers in the local loop.

DST

(Daylight Savings Time) Advancing clocks so that afternoons have more daylight and mornings have less. Typically clocks are adjusted forward one hour near the start of spring (March) and are adjusted backward in autumn (November).

DTE

(Data Terminal Equipment) The RS-232C interface that a computer uses to exchange data with a modem or other serial device. An end instrument that converts user information into signals or reconverts received signals (e.g., a terminal).

Static IP addressing

"Static" comes from the word stationary, meaning not moving. A static IP address means it never changes. A static IP address is an IP address permanently assigned to a workstation. If a network uses static addressing, it means that each network interface has an assigned IP address that it always uses whenever it is online. With static addressing, the computer has a well-defined IP address which it uses always and which no other computer ever uses.

Dynamic IP addressing

"Dynamic" means moving or changing. A dynamic IP address is an address that is used for the current session only; when the session is terminated, the IP address is returned to the list of available addresses.

If a network uses dynamic addressing, it means that when a network interface asks to join the network, it is randomly allocated an IP address from a pool of available addresses within that network. Thus, under dynamic addressing, a computer may possess over time (e.g. across reboots) a variety of different IP addresses. Dynamic addressing is often used in scenarios where end-user computers are intermittently connected to the network.

The DHCP protocol provides a means to dynamically allocate IP addresses to computers on a network. A system administrator assigns a range of IP addresses to a DHCP server, and each client computer on the

LAN has its TCP/IP software configured to request an IP address from the DHCP server, which can grant the request. The request and grant process uses a lease concept with a controllable time period.

EEA

(European Economic Area) Established on 1 January 1994 following an agreement between member states of the European Free Trade Association, the European Community, and all member states of the European Union (EU). It allows these EFTA countries to participate in the European single market without joining the EU.

Egress Frame

A service frame sent from the Service Provider network to the CE. Contrast Ingress Frame.

Egress rules

Egress rules determine which frames can be transmitted out of a port, based on the Egress List of the VLAN associated with it. Each VLAN has an Egress List that specifies the ports out of which frames can be forwarded, and specifies whether the frames will be transmitted as tagged or untagged frames.

ESD

(Electrostatic Discharge) A sudden and momentary electric current that flows between two objects.

EtherType

One of two types of protocol identifier parameters that can occur in Ethernet frames after the initial MAC-48 destination and source identifiers. Ethertypes are 16-bit identifiers appearing as the initial two octets after the MAC destination and source (or after a tag).

Implies use of the IEEE Assigned EtherType Field with IEEE Std 802.3, 1998 Edition Local and Metropolitan Area Networks. The EtherType Field provides a context for interpretation of the data field of the frame (protocol identification). Several well-known protocols already have an EtherType Field.

The IEEE 802.3, 1998 Length/EtherType Field, originally known as EtherType, is a two-octet field. When the value of this field is greater than or equal to 1536 decimal (0600 hexadecimal) the EtherType Field indicates the nature of the MAC client protocol (EtherType interpretation). The length and EtherType interpretations of this field are mutually exclusive.

The ION system **Ether Type** parameters are set at the ION device port's **ADVANCED** tab in the **VLAN Tag Management** section.

Event log

Records events such as port link down, configuration changes, etc. in a database.

FCC

(Federal Communications Commission) An independent United States government agency established by the Communications Act of 1934 that is charged with regulating interstate and international communications by radio, television, wire, satellite and cable. The FCC's jurisdiction covers the 50 states, the District of Columbia, and U.S. possessions.

FDB

The Forwarding Database for an ION system VLAN, identified by a unique FDB ID and kept for a specified aging time.

FDX

(Full Duplex) Communication in both directions simultaneously.

Filtering Database

When a bridge receives data, it determines to which VLAN the data belongs either by implicit or explicit tagging. In explicit tagging, a tag header is added to the data. The bridge also keeps track of VLAN members in a filtering database which it uses to determine where the data is to be sent. Membership information for a VLAN is stored in a filtering database. The filtering database consists of two types of entries:

- *Static Entries*: Static information is added, modified, and deleted by management only. Entries are not automatically removed after some time (ageing), but must be explicitly removed by management.
- *Dynamic Entries*: Dynamic entries are “learned” by the bridge and cannot be created or updated by management. The learning process observes the port from which a frame with a given source addresses and VLAN ID (VID) is received, and updates the filtering database. The entry is updated only if a) this port allows learning, b) the source address is a workstation address and not a group address, and c) there is space available in the database.

Entries are removed from the filtering database by the aging process where, after a certain amount of time specified by management, entries allow automatic reconfiguration of the filtering database if the topology of the network changes.

Firmware

Computer programs and data stored in hardware - typically in read-only memory (ROM) or programmable read-only memory (PROM) - such that the programs and data cannot be dynamically written or modified during execution of the programs.

Flow Control

Prevents congestion and overloading when a sending port is transmitting more data than a receiving port can receive. (Standard: IEEE 802.3X.)

FNG alarm

A Fault Notification Generation (FNG) alarm is generated whenever a CCM (Continuity Check Message) is lost.

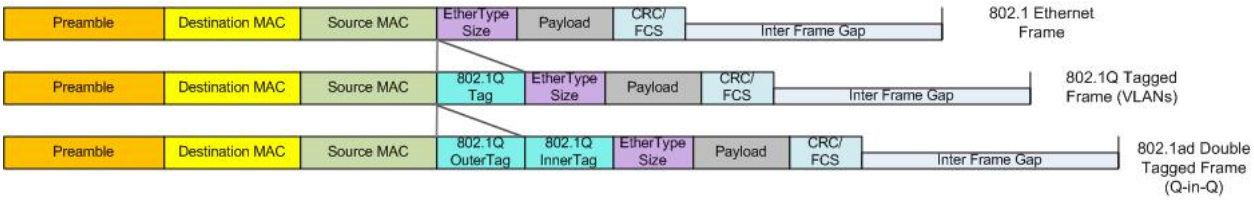
Frame

A unit of data that is transmitted between network points on an Ethernet network. An Ethernet frame has explicit minimum and maximum lengths and a set of required data that must appear within it. Each frame on an IEEE 802 LAN MAC conveys a protocol data unit (PDU) between MAC Service users. There are three types of frame; untagged, VLAN-tagged, and priority-tagged.

Frame Format

In Ethernet, a frame is a way of arranging sections of data for transfer over a computer network. The frame is a key element of an Ethernet system. A typical Ethernet frame is made up of three elements: a pair of addresses, the data itself, and an error checking field.

Frame Formats for 802.1, 802.1Q and 802.1ad are illustrated below.



Frame Loss Ratio

Frame loss ratio is the number of service frames not delivered divided by the total number of service frames during time interval T, where the number of service frames not delivered is the difference between the number of service frames arriving at the ingress ETH flow point and the number of service frames delivered at the egress ETH flow point in a point-to-point ETH connection.

Frame Delay

Frame delay is the round-trip delay for a frame, defined as the time elapsed from the start of transmission of the first bit of the frame by a source node until the reception of the last bit of the loopbacked frame by the same source node, when the loopback is performed at the frame's destination node.

FTP

(File Transfer Protocol) A standard network protocol used to exchange and manipulate files over a TCP/IP based network, such as the Internet. See also TFTP.

GBIC

(Gigabit Interface Converter) A transceiver that converts serial electrical signals to serial optical signals and vice versa. In networking, a GBIC is used to interface a fiber optic system with an Ethernet system, such as Fibre Channel and Gigabit Ethernet.

Gbps

(Gigabits Per Second) Data transfer speeds as measured in gigabits.

GUI

(Graphical User Interface) A type of user interface item that allows people to interact with programs in more ways than typing. A GUI offers graphical icons, and visual indicators, as opposed to text-based interfaces, typed command labels or text navigation to fully represent the information and actions available to a user. The actions are usually performed through direct manipulation of the graphical elements.

HSCP

(High-Security Console Password)

HTML

(HyperText Markup Language) The predominant markup language for web pages. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists etc as well as for links, quotes, and other items.

HTTPS

(Hypertext Transfer Protocol Secure) A combination of the Hypertext Transfer Protocol with the SSL/TLS protocol to provide encryption and secure identification of the server.

ICMP

(Internet Control Message Protocol) Part of the internet protocol suite that is used by networked computers to send error, control and informational messages indicating, for instance, that a requested service is not available or that a host or router could not be reached.

IEC

(International Electrotechnical Commission) The world's leading organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

IEEE

(Institute of Electrical and Electronics Engineers) An international non-profit, professional organization for the advancement of technology related to electricity.

IGMP

(Internet Group Management Protocol) A communications protocol used to manage the membership of Internet Protocol multicast groups. IGMP is used by IP hosts and adjacent multicast routers to establish multicast group memberships.

IGMP snooping

Internet Group Multicast Protocol snooping allows a switch to "listen in" on the IGMP conversation between hosts and routers. Based on the query and reports being passed through the switch, a forwarding database for multicast is created.

Ingress

The direction from the CE into the Service Provider network. Contrast ‘Egress’.

Ingress rules

A means of filtering out undesired traffic on a port. When Ingress Filtering is enabled, a port determines if a frame can be processed based on whether the port is on the Egress List of the VLAN associated with the frame.

IP

(Internet Protocol) One of the core protocols of the Internet Protocol Suite. IP is one of the two original components of the suite (the other being TCP), so the entire suite is commonly referred to as TCP/IP. IP is the method or protocol by which data is sent from one computer to another on the Internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet.

IPC

(Interprocess Communications) The exchange of data between one program and another either within the same computer or over a network. It implies a protocol that guarantees a response to a request.

IP Stacking

The capability to stack multiple switches together and manage them under one IP address.

IPToS

(IP Type of Service) Prioritization - The ability to prioritize traffic internally based on the IPToS field in the IP header of a packet.

ITU

ITU is the leading United Nations agency for information and communication technology issues, and the global focal point for governments and the private sector in developing networks and services. For nearly 145 years, ITU has coordinated the shared global use of the radio spectrum, worked to improve telecommunication infrastructure in the developing world, and established worldwide standards that foster seamless interconnection of a vast range of communications systems. See http://www.itu.int/net/about/itu-t.aspx.

ITU-T OAM Performance Monitoring

OAM functions for performance monitoring allow measurement of different performance parameters. The performance parameters are defined for point-to-point ETH connections. This covers Frame Loss Ratio and Frame Delay parameters. An additional performance parameter, Throughput, is identified per RFC 2544.

Jumbo Frame

Jumbo frames are frames larger than the standard Ethernet frame size, which is 1518 bytes (1522 if VLAN-tagged). Though this is not a standard, more vendors are adding support for jumbo frames. An initiative to increase the maximum size of the MAC Client Data field from 1500-bytes to 9000-bytes. The initiative was not adopted by the IEEE 802.3 Working Group, but it was endorsed by a number of other

companies. Larger frames would provide a more efficient use of the network bandwidth while reducing the number of frames that have to be processed. The Jumbo Frame proposal restricts the use of Jumbo Frames to full-duplex Ethernet links, and defines a "link negotiation" protocol that allows a station to determine if the station on the other end of the segment is capable of supporting Jumbo Frames.

Kbps

(Kilobits Per Second) Data transfer speeds as measured in kilobits.

LAN

(Local Area Network) A group of computers and associated devices that share a common communications line or wireless link. Typically, connected devices share the resources of a single processor or server within a small geographic area (for example, within an office building).

L2/L3/L4 Access Control List Port Based ACLs

ACLs allow administrators to create permit and deny lists based on various traffic characteristics such as Source MAC, Destination MAC, Source IP, Destination IP, and UDP/TCP ports.

Layer 2 Switch

A network device that functions as multi-port switch.

Layer 3 Switch

A network device that functions as a router and a multi-port switch.

Layer 4 Switch

A switch that makes forwarding decisions taking Layer 4 protocol information into account.

LBM

(Loopback Message) A unicast CFM PDU transmitted by a MEP, addressed to a specific MP, in the expectation of receiving an LBR.

LBR

(Loopback Reply) A unicast CFM PDU transmitted by an MP to a MEP, in response to an LBM received from that MEP.

LED

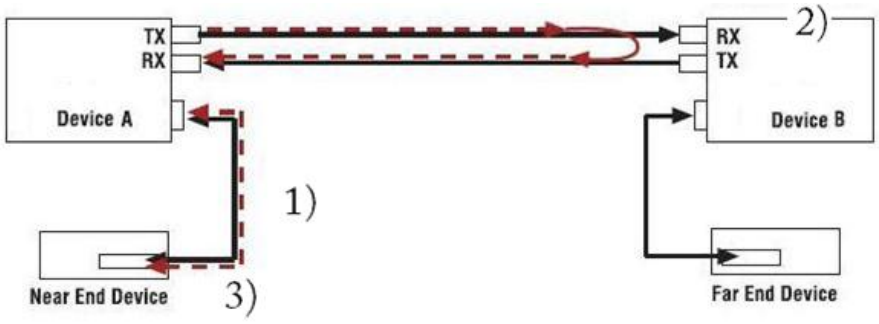
(Light Emitting Diode) An electronic light source.

LLDP

(Link Layer Discovery Protocol) A standard method for Ethernet Network devices such as switches, routers and wireless LAN access points to advertise information about themselves to other nodes on the network and store the information they discover. LLDP runs on all 802 media. The protocol runs over the data-link layer only, allowing two systems running different network layer protocols to learn about each other.

Loopback (LB)

The Loopback feature puts a device in a special mode that enables the device to loop back the signal from the RX port to the TX port on either media for testing and troubleshooting purposes. Test signals can then be inserted into the link and looped back as received by a device to test a particular segment of the link (i.e. copper or fiber). Loopback can be either local or remote depending on the location of the converter in the link.



1) Test signal inserted by near end device.

2) Device B set to remote loopback on Fiber.

3) Returned test signal received by near end device.

LPT

(Link Pass Through) A troubleshooting feature that allows a device to monitor both the fiber and copper RX ports for loss of signal. In the event of a loss of RX signal on one media port, the device will automatically disable the TX signal of the other media port, thus “passing through” the link loss.

MAC

(Media Access Control) An address that is a unique value associated with a network adapter. MAC addresses are also known as hardware addresses or physical addresses. They uniquely identify an adapter on a LAN.

MAC-based Security

the ability to lock the learning mechanism down on a port. This means that no further MACs will be learned on those ports. (AKA, MAC Lockdown.)

MAU

(Media Attachment Unit) In an Ethernet LAN, a device that interconnects the attachment unit interface port on an attached host computer to the Ethernet network medium (such as Unshielded Twisted Pair or coaxial cable). The MAU provides the services that correspond to the physical layer of the Open Systems Interconnection (OSI) reference model. A MAU can be built into the computer workstation or other device or it can be a separate device

Mbps

(Megabits per second) Data transfer speed measured in thousands of bits per second.

MDI

(Medium Dependent Interface) A type of Ethernet port connection using twisted pair cabling. The MDI is the component of the media attachment unit (MAU) that provides the physical and electrical connection to the cabling medium. MDI ports connect to MDIX ports via straight-through twisted pair cabling; both MDI-to-MDI and MDIX-to-MDIX connections use crossover twisted pair cabling. See also MDIX.

The standard wiring for end stations is known as Media Dependent Interface (MDI), and the standard wiring for hubs and switches is known as Media Dependent Interface with Crossover (MDIX). The C3210 device's *AutoCross* feature makes it possible for hardware to automatically correct errors in cable selection.

MDIX

(MDI Crossover) A version of MDI that enables connection between like devices. The standard wiring for end stations is known as Media Dependent Interface (MDI), and the standard wiring for hubs and switches is known as Media Dependent Interface with Crossover (MDIX).

The C3210 device's *AutoCross* feature makes it possible for hardware to automatically correct errors in cable selection. See also "MDI".

Media converter

Media converters transparently connect one type of media, or cabling, to another – typically copper to fiber. By bridging the gap between legacy copper infrastructures and fiber growth, media converters provide an economical way to extend the distance of an existing network, extend the life of non-fiber based equipment, or extend the distance between two like devices.

Transition Networks' brand of media converters makes conversion between disparate media types possible; while helping companies leverage their existing network infrastructure. These media conversion technologies are offered across a broad spectrum of networking protocols including Ethernet, Fast Ethernet, Gigabit, T1/E1, DS3, ATM, RS232/485, video, Power-over-Ethernet, and many more.

MSA

(Multi-Source Agreement) Common product specifications for pluggable fiber optic transceivers.

MSDU

(MAC Service Data Unit) The service data unit that is received from the logical link control (LLC) sub-layer which lies above the medium access control (MAC) sub-layer in a protocol stack (communications stack).

MT-RJ

(Mechanical Transfer-Registered Jack) A small form-factor fiber optic connector which resembles the RJ-45 connector used in Ethernet networks.

Multicast

One of the four forms of IP addressing, each with its own unique properties, a multicast address is associated with a group of interested receivers. Per RFC 3171, addresses 224.0.0.0 through 239.255.255.255, the former Class D addresses, are designated as multicast addresses in IPv4. The sender sends a single datagram (from the sender's unicast address) to the multicast address, and the intermediary routers take care of making copies and sending them to all receivers that have registered their interest in data from that sender. See also Unicast.

MVRP

(Multiple VLAN Registration Protocol) a standards-based Layer 2 network protocol, for automatic configuration of VLAN information on switches. It was defined in the IEEE 802.1ak amendment to 802.1Q-2005 standard. MVRP provides a method to dynamically share VLAN information and configure the needed VLANs within a layer 2 network.

Native VLAN

The initial VLAN to which a switch port belonged before becoming a trunking port. If the trunking port becomes an access port, in most of the cases, that port will go back to its native VLAN. Traffic coming from the initial VLAN is untagged. To avoid VLAN hopping, do not to use this VLAN for other purposes.

NIC

(Network Interface Card or Network Interface Controller) A computer hardware component designed to allow computers to communicate over a computer network. It is both an OSI layer 1 (physical layer) and layer 2 (data link layer) device, as it provides physical access to a networking medium and provides a low-level addressing system through the use of MAC addresses. It allows users to connect to each other either by using wireless communications or cables.

NID

(Network Interface Device) A device that serves as the demarcation point between the carrier's local loop and the customer's premises wiring. In telecommunications, a NID is a device that serves as the demarcation point between the carrier's local loop and the customer's premises wiring. In fiber-to-the-premises systems, the signal is transmitted to the customer premises using fiber optic technologies.
In general terms, a NID may also be called a Network Interface Unit (NIU), Telephone Network Interface (TNI), Slide-in-card (SIC), or a slide-in-module. See also “Media Converter”.

NMS

(Network Management Station) A high-end workstation that, like the Managed Device, is also connected to the network. A station on the network that executes network management applications that monitor and control network elements such as hosts, gateways and terminal servers. See also ‘SNMP’.

NTP

(Network Time Protocol) A protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks.

OAMPDU

(Ethernet OAM protocol data unit) The mechanism by which two directly connected Ethernet interfaces exchange OA information.

OID

(Object Identifier) Known as a "**Error! Reference source not found.** object identifier" or "MIB variable" in the SNMP network management protocol, an OID is a number assigned to devices in a network for identification purposes. Each branch of the MIB Tree has a number and a name, and the complete path from the top of the tree down to the point of interest forms the name of that point. A name created in this way is known as an Object ID or OID.

In SNMP, an Object Identifier points to a particular parameter in the SNMP agent.

OSI

(Open Systems Interconnection) A standard description or reference model for how messages should be transmitted between any two points in a telecommunication network. Its purpose is to guide product implementors so that their products will consistently work with other products. The reference model defines seven layers of functions that take place at each end of a communication.

OUI

(Organizationally Unique Identifier) the Ethernet Vendor Address component. Ethernet hardware addresses are 48 bits, expressed as 12 hexadecimal digits (0-9, plus A-F, capitalized). These 12 hex digits consist of the first/left 6 digits (which should match the vendor of the Ethernet interface within the station) and the last/right 6 digits, which specify the interface serial number for that interface vendor. These high-order 3 octets (6 hex digits) are called the Organizationally Unique Identifier or OUI.

Pause

The Pause feature (data pacing) uses Pause frames for flow control on full duplex Ethernet connections. If a sending device is transmitting data faster than the receiving device can accept it, the receiving station will send a pause frame to halt the transmission of the sender for a specified period of time.

Pause frames are only used on full duplex Ethernet link segments defined by IEEE 802.3x that use MAC control frames to carry the pause commands. Only stations configured for full duplex operation can send pause frames.

PD

(Powered Device) Modules that are designed to extract power from a conventional twisted pair Category 5 Ethernet cable. All PD modules are IEEE802.3af compatible, with built-in signature chip, output voltage adjustment and class programming.

PE

(Protocol Endpoint) A communication point from which data may be sent or received. It represents communication points at various levels on an Open Systems Interconnection (OSI) structure.

PDU

(Protocol Data Units) **1.** Information that is delivered as a unit among peer entities of a network and that may contain control information, address information or data. **2.** In a layered system, a unit of data which is specified in a protocol of a given layer and which consists of protocol control information and possibly user data of that layer.

PID

(Priority ID) on the C3210, the PID is configured at the ADVANCED tab in the "IEEE Priority Class" section; the selections are Remap 0 to: (PID) 0123.

(Process ID) in Netstat, the -o option displays active TCP connections and includes the process ID (PID) for each connection. You can find the application based on the PID on the Processes tab in Windows Task Manager. This parameter is avail-able on Windows XP, 2003 Server (but not on Windows 2000).

PoE

(Power over Ethernet) A system to safely transfer electrical power, along with data, to remote devices over standard category 5 cable in an Ethernet network. It does not require modification of existing Ethernet cabling infrastructure.

Port-Based Rate Limiting

The ability to regulate throughput on a per-port basis. (AKA, metering, Rate Limiting.)

Port Labeling

The ability to assign names to ports through the management interface.

Primary VID

The VID, among a list of VIDs associated with a service instance, on which all CFM PDUs generated by MPs except for forwarded LTMs are to be transmitted.

Priority-tagged frame

A tagged frame whose tag header carries priority information, but carries no VLAN identification information. Note: Priority tagged frames, which, by definition, carry no VLAN identification information, are treated the same as untagged frames for the purposes of VLAN identification. An untagged frame or a priority-tagged frame does not carry any identification of the VLAN to which it belongs. These frames are classified as belonging to a particular VLAN based on parameters associated with the receiving Port, or through proprietary extensions to this standard, based on the data content of the frame (e.g., MAC Address, Layer 3 protocol ID, etc.).

PSE

(Power Sourcing Equipment) In power over Ethernet (PoE), equipment that serves as power injectors to provide output of 48V DC power over the twisted-pair cable plant to terminal units with PoE compliant devices known as powered devices (PDs). For devices not PoE-compliant, splitters inserted into the Ethernet cabling provide 12V or 6V DC output.

PVID

(Port VID) A default VID that is assigned to an access port to designate the virtual LAN segment to which this port is connected. The PVID places the port into the set of ports that are connected under the designated VLAN ID. Also, if a trunk port has not been configured with any VLAN memberships, the virtual switch's PVID becomes the default VLAN ID for the ports connection.

PVLAN

(Private Virtual-LAN) a non-standardized way of segmenting ports into separate groups. (Contrast “802.1Q VLAN”.)

QoS

(Quality of Service) A mechanism to allow different classes of services to the customers.
The QoS varies on a per customer basis, depending on their Service Level Agreement (SLA) they chose, and the kind of service they want. Customer traffic priorities are assigned based on their SLAs. QoS is standardized at both layer 2 and layer 3.

Service providers offering Layer 2 services can use the IEEE 802.1 Q/p standard for QoS.
It allows a service provider to attach special tags, called VLAN IDs, to all incoming frames from a customer. With this, the service provider can have multiple customers using the same circuit, but still maintain separation between them. Each customer’s traffic is identified by a different VLAN tag. The method also allows for the addition of a priority value to be associated to the VLAN tag. By using the priority field, service providers can offer various classes of service.

The two current Layer 3 (IP) QoS standards are IETF RFC-791, which defines the ToS, and RFC-2475, which defines DSCP. Both standards use the same field in the IP packet header to identify the level of service for the packet.

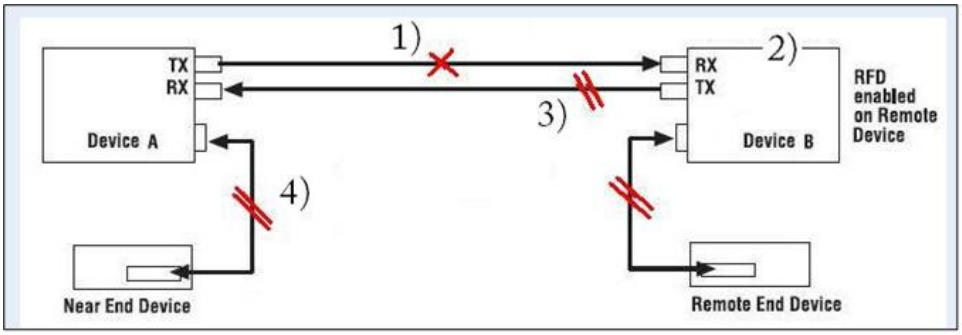
The various QoS parameters (either for Layer 2 or 3) are stored as part of the overhead in the transmitted frames. See also CoS and ToS.

RADIUS

(Remote Authentication Dial In User Service) Is a networking protocol that provides centralized authentication, authorization, and accounting management for computers to connect and use a network service.

RFD

(Remote Fault Detect) a troubleshooting feature found on Gigabit Ethernet copper-to-fiber media converters and NIDs. By enabling Remote Fault Detect on the remotely located device, the status of the fiber link will be monitored and any link failures will be reported back to the local converter. Should the remote converter lose its fiber RX signal, Remote Fault Detect will force the converter to shut down its fiber TX port. If Link Pass Though is enabled on both ends, then the copper ports will also be shut down to notify both end devices of the link failure. When you enable Remote Fault Detect on the remote device, the local end-device will be notified of remote fiber RX loss.



1) Device B loses Fiber link.

2) Device A disables its TX copper port via Link Pass Through (LPT) to alert the remote end device (Device A) of link loss.

3) Device B disables its Fiber TX port to alert Device A of link loss.

4) Device A disables its TX copper port via LPT to alert the Local end device of link loss.

RJ-45

The standard connector utilized on 4-pair (8-wire) UTP (Unshielded Twisted Pair) cable. The RJ-45 connector is the standard connector for Ethernet, **Error! Reference source not found.**, T1, and modern digital telephone systems.

RMON

(Remote Network Monitoring) Software that supports the monitoring and protocol analysis of LAN. A part of SNMP, RMON is a network management protocol that gathers remote network information. (Standard: RFC 1271.)

RS-232

(Recommended Standard 232) A standard for serial binary data signals connecting between a DSL (Data Terminal Equipment) and a DCE (Data Circuit-terminating Equipment). It is commonly used in computer serial ports.

SAP

(Service Access Point) The point at which an Ethernet service is offered.

SFP

(Small Form-Factor Pluggable) A compact, hot-pluggable transceiver used in telecommunication and data communications applications. It interfaces a network device mother board (for a switch, router, media converter or similar device) to a fiber optic or copper networking cable. The SFP transceiver is specified by a multi-source agreement (MSA) between competing manufacturers. The SFP was designed after the GBIC interface, and allows greater port density (number of transceivers per inch along the edge of a mother board) than the GBIC, thus SFP is also known as “mini-GBIC”. Optical SFP transceivers support digital diagnostics monitoring (DDM) functions according to the industry-standard SFF-8472. This feature lets you monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage. AKA, Digital Optical Monitoring (DOM), DMI (Diagnostic Monitoring Interface), or DMM (Diagnostic Maintenance Monitoring).

SGMII

(Serial Gigabit Media Independent Interface) A standard Gigabit Ethernet interface used to connect an Ethernet MAC-block to a PHY. To carry frame data and link rate information between a 10/100/1000 PHY and an Ethernet MAC, SGMII uses a different pair for data signals and for clocking signals, with both being present in each direction (i.e., TX and RX). The C3210 has SGMII support for use with 10/100/1000BASE-T copper SFPs. The C3210 uses the **set ether phymode=SGMII** CLI command to select SGMII mode.

SLA

(Service Level Agreement) In general terms, a part of a service contract where the level of service is formally defined in terms of a contracted delivery time or performance. In Metro Ethernet, the contract between the Subscriber and Service Provider specifying the agreed to service level commitments and related business agreements.

SMAC

(Static MAC) A MAC address that is manually entered in the address table and must be manually removed. It can be a unicast or multicast address. It does not age and is retained when the switch restarts. You can add and remove static addresses and define the forwarding.

SNMP SMI

(SNMP Structure of Management Information) a collection of managed objects, residing in a virtual information store. The SMI is divided into three parts: module definitions, object definitions, and, notification definitions. There are two types of SMI: SMIv1 and SMIv2. For additional information see IETF RFC 1155 v1 and RFC 2578 v2.

SNMP

(Simple Network Management Protocol) A request-response protocol that defines network communication between a Managed Device and a Network Management Station (NMS). A set of protocols for managing complex IP networks. (Standard: RFC 1157.)

SNMP Message

A sequence representing the entire SNMP message, which consists of the SNMP version, Community String, and SNMP PDU.

SNMP Version

An integer that identifies the version of SNMP (e.g., SNMPv1 = 0).

SNMP Community String

An Octet String that may contain a string used to add security to SNMP devices.

SNMP PDU

An SNMP PDU contains the body of an SNMP message. There are several types of PDUs (e.g., GetRequest, GetResponse, and SetRequest).

SNTP

(Simple Network Time Protocol) A less complicated version of Network Time Protocol, which is a system for synchronizing the clocks of networked computer systems, primarily when data transfer is handled via the Internet. SNTP is used to synchronize times on IP devices over a network. (Standard: RFC 2030.)

SSH

(Secure Shell) A network protocol that allows data to be exchanged using a secure channel between two networked devices. SSH was designed as a replacement for Telnet and other insecure remote shells, which send information, notably passwords, in plain text, leaving them open for interception. The encryption used by SSH provides confidentiality and integrity of data over an insecure network, such as the Internet. SSH is used to provide a secure Telnet session to the console/command line interface of a network device through an insecure environment. (AKA, Secured Telnet; Standard: SSH RFC 1034).

SSL

(Secure Socket Layer) A protocol for transmitting private documents via the Internet. SSL uses a cryptographic system that uses two keys to encrypt data; a public key known to everyone and a private or secret key known only to the recipient of the message. SSL is used to manage a network device via its web interface. (AKA, HTTPS, Standard: RFC 2818).

Static MAC Entry

Static MAC entry support means that users can assign MAC addresses to ports manually that never age out.

STID

(Sensor Transaction Identifier) The STID is used for power supply / sensor / IONDCR configuration via the **set sensor stid** command to define notification, relation, severity, and value parameters. The **show power config** command displays the power supply sensors information. The STID is shown in the Web interface at the **Power Supply** tab > **Temp**, **Volt**, **Power**, and **Fan** sub-tabs.

STP

(Spanning-Tree Protocol) A link layer network protocol that ensures a loop-free topology for any bridged LAN. STP prevents loops from being formed when switches are interconnected via multiple paths. STP is a Data Link Layer protocol that was standardized as IEEE 802.1D. STP creates a spanning tree within a mesh network of connected layer-2 bridges (usually Ethernet switches), and disables those links that are not part of the spanning tree, leaving a single active path between any two network nodes. With Spanning Tree, a device learns Ethernet (MAC) addresses by inspecting the Ethernet frame and recording the source MAC address in a dynamic table. The device also associates a learned MAC address with a port. The device can then make intelligent forwarding decisions based on the destination MAC address.

The collection of bridges in a LAN can be considered a graph whose nodes are the bridges and the LAN segments (or cables), and whose edges are the interfaces connecting the bridges to the segments. To break loops in the LAN while maintaining access to all LAN segments, the bridges collectively compute a spanning tree (which is not necessarily a minimum cost spanning tree).

The general STP rules describe a way of determining what spanning tree will be computed by the algorithm, but those rules require knowledge of the entire network. The bridges must determine the root bridge and compute the port roles (root, designated, or blocked) with only the information that they have. To ensure that each bridge has enough information, bridges use special data frames called Bridge Protocol Data Units (BPDUs) to exchange information about bridge IDs and root path costs. A bridge sends a BPDU frame using the unique MAC address of the port itself as a source address, and a destination address of the STP multicast address 01:80:C2:00:00:00. See also “BPDU”.

STP

(Shielded Twisted Pair) A special kind of copper telephone wiring used in some business installations. An outer covering or shield is added to the ordinary twisted pair telephone wires; the shield functions as a ground.

S-VLAN

Service VLAN (also referred to as Provider VLAN).

Syslog

A service run mostly on Unix and Linux systems (but also available for other OSes) to track events that occur on the system. Analysis can be performed on these logs using available software to create reports detailing various aspects of the system and/or the network.

Tagged frame

A packet that contains a header that carries a VLAN identifier and a priority value. Also called a VLAN tagged packet. A Tagged frame contains a tag header immediately following the Source MAC Address field of the frame or, if the frame contains a Routing Information field, immediately following the Routing Information field. There are two types of tagged frames: VLAN-tagged frames and priority-tagged frames.

Tagging / Tag Header

Sending frames across the network requires a way to indicate to which VLAN the frame belongs, so that the bridge will forward the frames only to those ports that belong to that VLAN, instead of to all output ports. This indication is added to the frame in the form of a tag header. The tag header a) allows user priority information to be specified, b) allows source routing control information to be specified, and c) indicates the format of MAC addresses. Frames in which a tag header has been added are called “tagged” frames. These tagged frames convey the VLAN information throughout the network.

TCP

(Transmission Control Protocol) One of the core protocols of the Internet Protocol Suite. TCP is one of the two original components of the suite (the other being Internet Protocol, or IP), so the entire suite is commonly referred to as TCP/IP. Whereas IP handles lower-level transmissions from computer to computer as a message makes its way across the Internet, TCP operates at a higher level, concerned only with the two end systems, for example a Web browser and a Web server. In particular, TCP provides reliable, ordered delivery of a stream of bytes from a program on one computer to another program on another computer.

TCP/IP

(Transmission Control Protocol/Internet Protocol) The basic communication language or protocol of the Internet and/or a private network (either an intranet or an extranet).

TCP/IP is a two-layer program. The higher layer, Transmission Control Protocol (TCP), manages the assembling of a message or file into smaller packets that are transmitted over the Internet and received by a TCP layer that reassembles the packets into the original message. The lower layer, Internet Protocol (IP), handles the address part of each packet so that it gets to the right destination.

TCP/UDP Port Prioritization

The ability to prioritize traffic internally based on a TCP or UDP port number. (AKA, Layer 4 Prioritization.)

TDM

(Time Division Multiplexing) A method of putting multiple data streams in a single signal by separating the signal into many segments, each having a very short duration. Each individual data stream is reassembled at the receiving end based on the timing.

TDR

1. (Time Domain Reflectometry) A measurement technique used to determine the characteristics of electrical lines by observing reflected waveforms. **2.** (Time Domain Reflector) An electronic instrument used to characterize and locate faults in metallic cables (for example, twisted wire pairs, coaxial cables). It can also be used to locate discontinuities in a connector, printed circuit board, or any other electrical path.

Telnet

A user command and an underlying TCP/IP protocol for accessing remote computers. Through Telnet, an administrator or another user can access someone else's computer remotely. Telnet is a terminal emulation program for TCP/IP networks that runs on your computer and connects your PC to a switch management. (Standard: RFC 854.)

TFTP

(Trivial File Transfer Protocol) A file transfer protocol, with the functionality of a very basic form of File Transfer Protocol (FTP). Due to its simple design, TFTP can be implemented using a very small amount of memory. Because it uses UDP rather than TCP for transport, TFTP is typically used to transfer firmware upgrades to network equipment.

TFTP Download / Upload

The ability to load firmware, configuration files, etc. through a TFTP server. (AKA, TFTP. Standard: RFC 1350.)

TFTP Root Directory

The location on the console device (PC) where files are placed when received, and where files to be transmitted should be placed (e.g., *C:\TFTP-Root*).

TFTP Server

An application that uses the TFTP file transfer protocol to read and write files from/to a remote server. In TFTP, a transfer begins with a request to read or write a file, which also serves to request a connection. If the server grants the request, the connection is opened and the file is sent in fixed length blocks of 512 bytes. Each data packet contains one block of data, and must be acknowledged by an acknowledgment

packet before the next packet can be sent. Examples of available packages include Open TFTP Server, Tftpd32, WinAgents TFTP Server for Windows, SolarWinds free TFTP Server, TFTP Server 1.6 for Linux, and TftpServer 3.3.1, a TFTP server enhancement to the standard Mac OSX distribution.

Threshold crossing event

See OAM Event.

Throughput

The maximum rate at which no frame is dropped. This is typically measured under test conditions.

TID

Transaction Identifier The TID is used in the CLI command "**show soam mep linktrace mep-id=<1-8191> local-parent-id=<1-4294967295> tid=<0-4294967295>**".

TLS

(Transport Layer Security) A protocol that ensures privacy between communicating applications and their users on the Internet. When a server and client communicate, TLS ensures that no third party may eavesdrop or tamper with any message. TLS is the successor to the Secure Sockets Layer (SSL).

TLV

Type, Length, Value format - LLDP frames are sent by each equipment on each port at a fixed frequency. A frame contains a Link Layer Discovery Protocol Data Unit (LLDPDU) which is a set of type, length, value (TLV) structures. An LLDP frame should start with mandatory TLVs (e.g., Chassis ID, Port ID, and Time to live). These mandatory TLVs are followed by any number of optional TLVs. The frame should end with a special TLV named end of LLDPDU. The IEEE 802.1ab specification contains a description of all of the TLV types.

TNDP

(TN Topology Discovery Protocol) the Transition Networks implementation of LLDP. When set to Enabled, the device entering this command/setting will no longer be discovered by the IONMM if it is remotely managed through this port. See also "LLDP" and the "set tndp" and "show tndp" CLI commands. See also "Discovery".

TOS

(Type of Service) The ToS byte in the IPv4 header has had several purposes over time, and has been defined in various ways by IETF RFC 791, RFC 1122, RFC 1349, RFC 2474, and RFC 3168. Currently, the ToS byte is a six-bit Differentiated Services Code Point and a two-bit Explicit Congestion Notification field.

The ToS model described in RFC 2474 uses the Differentiated Services Field (DS field) in the IPv4 Header and IPv6 Header. See also CoS and QoS.

TPID

(Tag Protocol Identifier) a field in a VLAN Tag for which EEE802.1Q specifies a value of 0x8100.

Trap

In SNMP, a trap is a type of PDU used to report an alert or other asynchronous event about a managed subsystem.

Also, a place in a program for handling unexpected or unallowable conditions - for example, by sending an error message to a log or to a program user. If a return code from another program was being checked by a calling program, a return code value that was unexpected and unplanned for could cause a branch to a trap that recorded the situation, and take other appropriate action.

An ION system trap is a one-way notification (e.g., from the IONMM to the NMS) that alerts the administrator about instances of MIB-defined asynchronous events on the managed device. It is the only operation that is initiated by the IONMM rather than the NMS. For a management system to understand a trap sent to it by the IONMM, the NMS must know what the object identifier (OID) defines. Therefore, it must have the MIB for that trap loaded. This provides the correct OID information so that the NMS can understand the traps sent to it.

TTL

(Time to live) an Ethernet counter that records the number of times a transmission is sent/received without errors. TTL specifies how long a datagram is allowed to “live” on the network, in terms of router hops. Each router decrements (reduces by one) the value of the TTL field prior to transmitting it. If the TTL field drops to zero, the datagram is assumed to have taken too long a route and is discarded.

The default TTL for ION software is 64. This means that a test packet must be successfully sent and received 63 times before a TTL expired message is generated. You can change the TTL value (e.g., a value of 255 is a demanding test because the packet must be sent and received error free 254 times).

Tunnel

A communication channel created in a computer network by encapsulating a communication protocol's data packets in (on top of) a second protocol that normally would be carried above, or at the same layer as, the first one (as in L2TP and VPN).

Tunneling

Encapsulating one type of packet inside the data field of another packet. This allows transmitting data that is structured in one protocol within the protocol or format of a different protocol. Tunneling can involve most OSI or TCP/IP protocol layers.

UAC

(User Account Control) Technology and security infrastructure of some *Microsoft* operating systems that improve OS security by limiting application software to standard user privileges until an administrator authorizes an increase.

UDP

(User Datagram Protocol) A connectionless protocol that, like TCP, runs on top of IP networks. Unlike TCP/IP, UDP/IP provides very few error recovery services, offering instead a direct way to send and receive datagrams over an IP network. It's used primarily for broadcasting messages over a network.

Unicast

One of the four forms of IP addressing, each with its own unique properties. The most common concept of an IP address is in unicast addressing, available in both IPv4 and IPv6. It normally refers to a single sender or a single receiver, and can be used for both sending and receiving. Usually, a unicast address is associated with a single device or host, but it is not a one-to-one correspondence. Some individual PCs have several distinct unicast addresses, each for its own distinct purpose. Sending the same data to multiple unicast addresses requires the sender to send all the data many times over, once for each recipient. See also Multicast.

Untagged frame

A frame that does not contain a tag header immediately following the Source MAC Address field of the frame or, if the frame contained a Routing Information field, immediately following the Routing Information field. An untagged frame or a priority-tagged frame does not carry any identification of the VLAN to which it belongs. Such frames are classified as belonging to a particular VLAN based on parameters associated with the receiving Port, or, through proprietary extensions to this standard, based on the data content of the frame (e.g., MAC Address, Layer 3 protocol ID, etc.).

USB

(Universal Serial Bus) A plug-and-play interface between a computer and add-on devices, such as media players, keyboards, telephones, digital cameras, scanners, flash drives, joysticks and printers.

UTC

(Coordinated Universal Time) A time standard based on International Atomic Time (TAI) with leap seconds added at irregular intervals to compensate for the Earth's slowing rotation. Leap seconds are used to allow UTC to closely track UT1, which is mean solar time at the Royal Observatory, Greenwich.

UTP

(Unshielded Twisted Pair) The most common form of twisted pair wiring, because it is less expensive and easier to work with than STP (Shielded Twisted Pair). UTP is used in Ethernet 10Base-T and 100Base-T networks, as well as in home and office telephone wiring. The twist in UTP helps to reduce crosstalk interference between wire pairs.

VAC

Volts AC (alternating current, as opposed to DC – direct current).

VCP

(Virtual Com Port) A driver that allows a USB device to appear as an additional COM port. The USB device can be accessed by an application in the same manner as a regular COM port.

Varbind

In SNMP, a Sequence of two fields, an Object ID and the value for/from that Object ID. Varbinds is short for Variable bindings. It's the variable number of values that are included in an SNMP packet. Each varbind is made of an OID, type, and value.

VDC

Volts DC (direct current, as opposed to AC – alternating current).

VID

(VLAN Identifier) The identification of the VLAN, which is defined by the standard IEEE 802.1Q. VID has 12 bits and allows the identification of 4096 VLANs.

VLAN

(Virtual LAN) Refers to a group of logically networked devices on one or more LANs that are configured so that they can communicate as if they were attached to the same wire, when in fact they are located on a number of different LAN segments.

VLAN Endstation Endpoint

A protocol endpoint representing an endstation network port and its VLAN-specific attributes.

VLAN Switch Endpoint

A protocol endpoint representing a switch port and its VLAN-specific attributes.

VLAN-tagged frame

A tagged frame whose tag header carries both VLAN identification and priority information. A VLAN-tagged frame carries an explicit identification of the VLAN to which it belongs (i.e., it carries a tag header that carries a non-null VID). A VLAN-tagged frame is classified as belonging to a particular VLAN based on the value of the VID that is included in the tag header. The presence of the tag header carrying a non-null VID means that some other device, either the originator of the frame or a VLAN-aware Bridge, has mapped this frame into a VLAN and has inserted the appropriate VID. Contrast “untagged frame”.

VLAN Tunneling

(Virtual LAN Tunneling) A mechanism that allows service providers to use a single VLAN to support multiple VLANs of customers, while preserving customer VLAN IDs and keeping traffic in different customer VLANs segregated. At the same time, it significantly reduces the number of VLANs required to support the VPNs. VLAN Tunneling encapsulates the VLANs of the enterprise customers into a VLAN of the service provider. Also called 802.1q Tunneling.

VOIP

(Voice over Internet Protocol) A general term for a family of transmission technologies for delivery of voice communications over IP networks such as the Internet or other packet-switched networks.

VPN

(Virtual Private Network) A VPN links two computers through an underlying local or wide-area network, while encapsulating the data and keeping it private. It is analogous to a pipe within a pipe. Even though the outer pipe contains the inner one, the inner pipe has a wall that blocks other traffic in the outer pipe. To the rest of the network, the VPN traffic just looks like another traffic stream. The term VPN can describe many different network configurations and protocols.
A VPN works by using a public telecommunication infrastructure while maintaining privacy through security procedures and tunneling protocols such as the Layer Two Tunneling Protocol (L2TP). In effect, the protocols, by encrypting data at the sending end and decrypting it at the receiving end, send the data through a "tunnel" that cannot be "entered" by data that is not properly encrypted.

Web-based Management

Allows users to manage the switch through a web browser. (AKA, Web GUI, Web interface, Web IF.)

Well Known Ethernet Multicast Addresses

Some common Ethernet multicast MAC addresses are shown below with their related Field Type and typical usage.

Ethernet Multicast Address	Usage
01-00-0C-CC-CC-CC	CDP (Cisco Discovery Protocol), VTP (VLAN Trunking Protocol)
01-00-0C-CC-CC-CD	Cisco Shared Spanning Tree Protocol Address
01-80-C2-00-00-00	Spanning Tree Protocol (for bridges) (IEEE 802.1D)
01-80-C2-00-00-01	Ethernet OAM Protocol (IEEE 802.3ah)
01-80-C2-00-00-02	IEEE Std 802.3 Slow Protocols multicast address
01-80-C2-00-00-03	IEEE Std 802.1X PAE address
01-80-C2-00-00-04	IEEE MAC-specific control protocols
01-80-C2-00-00-08	Spanning Tree Protocol (for provider bridges) (IEEE 802.1AD)
01-00-5E-xx-xx-xx	IPv4 Multicast (RFC 1112)
33-33-xx-xx-xx-xx	IPv6 Multicast (RFC 2464)

Well Known Ports

The set of all available port numbers are divided into three ranges: Well Known Ports, Registered Ports, and Dynamic and/or Private Ports. The Well Known Ports are those from 0 through 1023. The Registered Ports are those from 1024 through 49151. Registered ports require IANA registration. The Dynamic and/or Private Ports are those from 49152 through 65535.

For example, Port 443 is reserved for the HTTPS, port 179 for the BGP Border Gateway Protocol, and port 161 for SNMP.

To see all the used and listening ports on your computer, use the **netstat** (or similar) command line command. For further port assignment information, see IETF RFC 1700.

Port Number	Description
20	FTP
22	SSH Remote Login Protocol
23	Telnet
25	Simple Mail Transfer Protocol (SMTP)
53	Domain Name System (DNS)
69	Trivial File Transfer Protocol (TFTP)
80	HTTP
143	Interim Mail Access Protocol (IMAP)
161	SNMP /TCP
161	SNMP /UDP
161	SNMPTRAP /TCP
162	SNMPTRAP /UDP
179	Border Gateway Protocol (BGP)
190	Gateway Access Control Protocol (GACP)
389	Lightweight Directory Access Protocol (LDAP)

443	HTTPS
514	Syslog UDP
546	DHCP Client
547	DHCP Server
547	DHCP Server

Write View

A view name (up to 64 characters) for each SNMP group that defines the list of object identifiers (OIDs) that are able to be created or modified by users of the group.

Xmodem

A simple file transfer protocol developed in 1977 as the MODEM.ASM terminal program. XMODEM, like most file transfer protocols, breaks up the original data into a series of "packets" that are sent to a receiver, along with information that allows the receiver to tell if the packet was correctly received. It provides single file transfer using 128-byte packets with CRC or checksum error detection.

Xmodem-1K

An expanded version of XMODEM. Like other backward-compatible XMODEM extensions, it was intended that a -1K transfer could be started with any implementation of XMODEM on the other end, backing off features as required.

It provides simple serial file transfer between a server and client across a point-to-point link using fixed-length packets. Each server packet contains 1024 bytes of file data and is individually acknowledged by the receiving client. One file can be sent per transmission, and the transmission must be restarted from the beginning if it fails.

xSTP

Spanning Tree Protocol (multiple variations) defined in MEF specification 17. See also “STP”.

Y.1731

The ITU-T OAM Recommendation. The x323x NIDs support both Link layer OAM (LOAM, per IEEE 802.3–2005 Clause 57) and Service layer OAM (SOAM, per IEEE 802.1AG and Y.1731).

Ymodem

A protocol for file transfers between modems. YMODEM was developed as the successor to XMODEM. The original YMODEM was much the same as XMODEM except that it sent the file name, size, and timestamp in a regular XMODEM block before actually transferring the file. It provides multiple file transfer using 1 Kbyte packets, and is similar to Xmodem in other aspects.

Zmodem

A file transfer protocol developed in 1986 to improve file transfer performance on an X.25 network. ZMODEM also offers restartable transfers, auto-start by the sender, an expanded 32-bit CRC, control character quoting, and sliding window support. It provides multiple file transfer, sending packets without waiting for acknowledgement, and permits an interrupted transfer to restart.

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