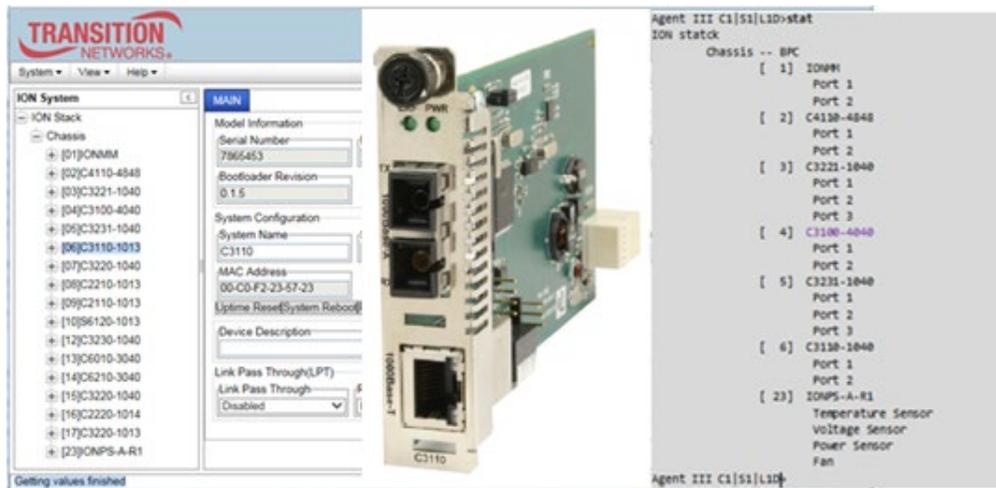# LANTRONIX®



# ION C3110

## Slide-In-Card

ION Gigabit Ethernet Media Converter Module

1000Base-T to 1000Base-SX/LX

# User Guide

**Part Number 33417**
**Revision B August 2023**

## Intellectual Property

## Warranty

For details on the Lantronix warranty policy, go to http://www.lantronix.com/support/warranty.

## Contacts

**Lantronix Corporate Headquarters**
48 Discovery, Suite 250
Irvine, CA 92618, USA
Toll Free: 800-526-8766
Phone: 949-453-3990
Fax: 949-453-3995

**Technical Support**

Online: https://www.lantronix.com/technical-support/

**Sales Offices**

For a current list of our domestic and international sales offices, go to www.lantronix.com/about/contact.

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## Revision History

| Rev | Date | Description |
|-----|------|-------------|
| A | 5/6/10 | Initial release at ION C3110 Software v 1.2.2. |
| B | 8/30/23 | Revised for ION C3110 Software v 2.0.0 and update format and contact info. Initial Lantronix re-brand at SW v 2.0.3. |

## Cautions and Warnings

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 in this manual where appropriate.

### ⚠ Cautions

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

**Caution**: When handling chassis Network Interface Devices (NIDs) 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 NIDs in areas where strong electromagnetic fields (EMF) exist. Failure to observe this caution could result in poor NID 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 ION210-A chassis. Failure to observe this caution could result in poor performance or damage to the equipment.

### ⚠ 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.

# Table of Contents

# Section 1: Introduction

The purpose of this manual is to provide information necessary to install, configure, and use the ION C3110 from Lantronix.

## Product Overview

The ION C3110 provides an interface between 1000Base-T ports and 1000Base-SX/LX ports allowing users to integrate fiber optic cabling into 1000Base-T copper environments.

## Model Numbers

| SKU | Description |
| --- | --- |
| C3110-1013 | 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-SX 850nm multimode (SC) [62.5/125 µm fiber: 220 m/722 ft.] [50/125 µm fiber: 550 m/1804 ft.] Link Budget: 8.5 dB |
| C3110-1039 | 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-SX 850nm multimode (LC) via SFP [62.5/125 µm fiber: 220 m/722 ft.] Link Budget: 8.0 dB [50/125 µm fiber: 550 m/1804 ft.] Link Budget: 8.0 dB |
| C3110-1014 | 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-LX 1310nm single mode (SC) [10 km/6.2 mi.] Link Budget: 10.5 dB |
| C3110-1040 | 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-X SFP Slot (empty) |

*Typical maximum cable distances. Actual distance is dependent upon the physical characteristics of the network installation.

**DMI Model (C3110-1040)**

The Diagnostic Monitoring Interface (DMI) model allows diagnosing problems within the network. DMI devices have four functions: 1) Transmit power, 2) Receive power, 3) Transmit bias current, and 4) Temperature. Within each function, the device will send a trap; i.e., error whenever a high or low warning event, or high or low alarm event occurs (for a total of 16 traps). In addition, if both the local and remote devices are DMI models, the device will distinguish whether the trap event is from a local or a remote device.

**DMI Supported SFPs**

Sold separately, the DMI supported SFP transceiver modules for port two are compatible with the C3110-1040 devices and are available from Lantronix. Third-party Multi-Source Agreement (MSA) compliant Small Form Factor Pluggables (SFPs) can also be used in the C3110-1040. See the Lantronix SFP product page for SFP details.

## Related Documents

ION system manuals are listed below.

1. ION Management Module (IONMM and ION C3110) User Guide, 33457
2. ION219-x 19-Slot Chassis Installation Guide, 33412
3. ION106-x Six Slot Chassis User Guide, 33658
4. ION002-AD User Guide, 33612
5. ION001-A Install Guide, 33419
6. ION Systems CLI Reference Manual, 33461
7. ION System x3230 Remotely Managed NID User Guide, 33342
8. ION x222x & x32xx Multiport NIDs Installation Guide, 33433

Note: Some Documentation may have Transition Networks named or pictured. Transition Networks was acquired by Lantronix in August 2021.

# Section 2: Installation

**CAUTION**: Wear a grounding device and observe electrostatic discharge precautions when setting the jumper, the 6-position switch, and installing the C3110 SIC into the ION chassis. Failure to observe this caution could result in damage to the SIC.

## PCB Layout

The C3110 PCB layout is shown below. Two-position Jumper J4 is circled in pink. Six-position DIP Switch SW1 is circled in red. Note that PCB layouts and labeling may vary by revision.
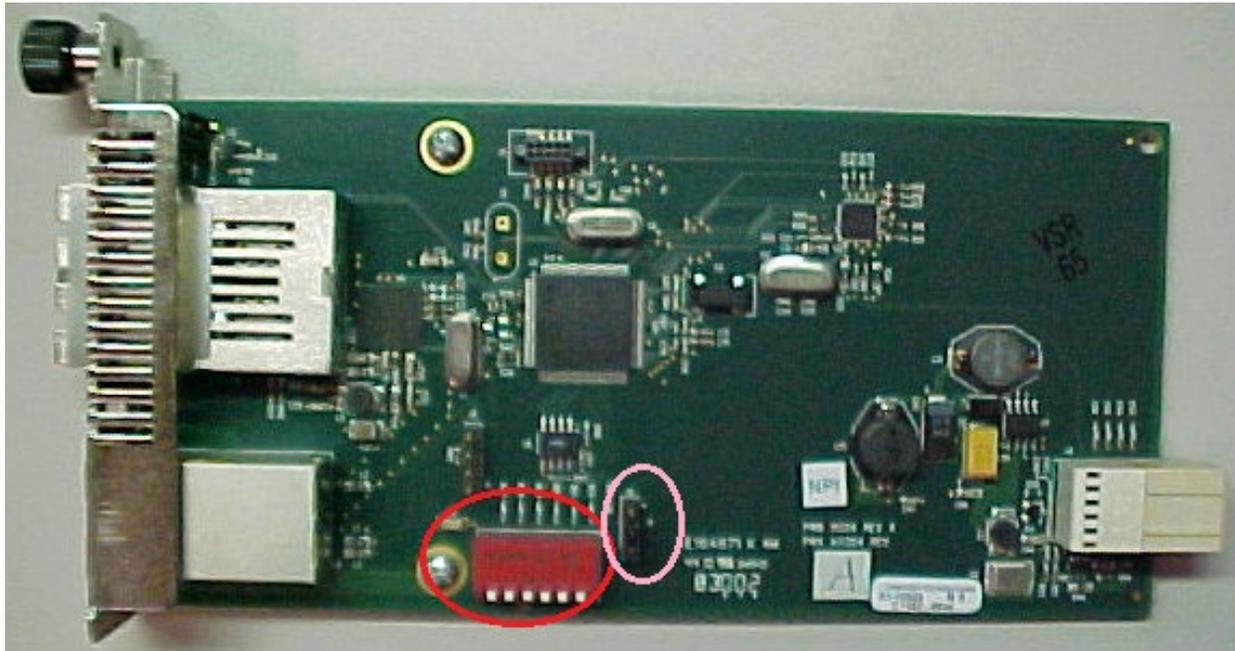


## Set the Two-position Jumper J4

- The jumper is located on the SIC circuit board, connector J4.
- Use a small needle-nosed pliers or similar device to set the jumper.
- Refer to the illustration on the right for hardware/software jumper positioning.

**Hardware**: The ION mode of operation is determined by the six-position switch settings. The default setting is Hardware Mode.

**Software**: The ION mode of operation is determined by the most recently saved on-board microprocessor settings.
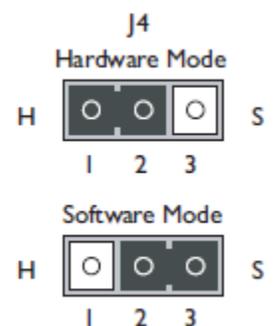
## Set the Six-position DIP Switch SW1

- The six-position switch is located on the side of the SIC.
- Use a small flat-blade screwdriver to set the DIP switches.
- All switches are shown in the default position (OPEN).
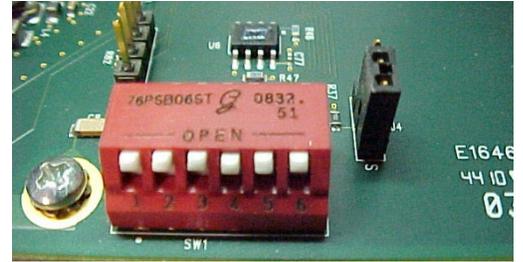
**Note**: Switch positions 2 and 3 function together to configure the C3110 for Pause conditions.

**SW1 Remote Fiber Fault Detection (Fiber RFD)**

OPEN    Fiber RFD Disabled.

closed   Fiber RFD Enabled.

**SW2 & SW3** work in combination to set **Pause**:

10 sw position 2 OPEN and 3 closed: Symmetric Pause.

01 sw position 2 closed and 3 OPEN: Asymmetric Pause.

11 sw positions 2 and 3 OPEN: Pause is OFF (default position).

00 sw positions 2 and 3 closed: Symmetric and Asymmetric Pause.

**SW4 Transparent Link Pass-Through**

OPEN    Enable Link Pass-Through.

closed   Disable Link Pass-Through.

**SW5 Fiber Auto-Negotiation**

OPEN    Disable Auto-Negotiation for the fiber link (default setting).

closed   Enable Auto-Negotiation for the fiber link.

**SW6 Loop Back**

OPEN    Disable RX/TX signal loop back (default setting).

closed   Enable RX/TX signal loop back.

1. Remote Fiber Fault Detect
2. Pause (symmetric)
3. Pause (asymmetric)
4. Link PassThrough
5. Auto-Negotiation
6. Loop Back
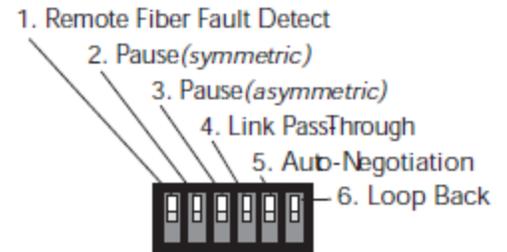
**Install Mode**: During installation set DIP switch 4 DOWN; leave all other switches in the UP position (default). This disables Transparent Link Pass-Through and Auto-Negotiation, allowing individual copper and fiber links to be established (both copper port LEDs will turn ON with each device-to-device connection) independent of having a complete end-to-end connection.

**Operation Mode**: After installation is complete (all copper and fiber ports connected and linked), set all switches to the UP position (default).

**Remote Fault Detection**: Remote fiber fault detect (RFD) monitors the status of the fiber link. Enable RFD in the remote converter only. **CAUTION**: If RFD is enabled in the device at each end of the link, a link pass-through event will put the converters into an unrecoverable state (unable to establish a link).

**Fiber Auto-Negotiation**: Fiber Auto-Negotiation allows the fiber interface to detect and then advertise the supported features of the remote device—active only when a fiber cable is connected to a device with a negotiating port. The process is as follows:
1.  The fiber interface detects the supported features of the remote partner.
2.  These abilities are passed to the twisted-pair interface and advertised.
3.  Once the twisted-pair interface has a link at the highest common capability, it passes the result to the fiber interface.
4.  The fiber interfaces then start advertising these capabilities. At this point, the link between the fiber and the negotiating port is complete.

If the C3110 is connected via fiber to another C3110, both SICs must have the Fiber Auto-Negotiation setting disabled (switch 5 UP).
**Note**: Link Pass-Through (switch position 4 enabled) cannot be turned OFF (disabled) when Fiber Auto-Negotiation is ON (enabled).

## Install the Slide-In-Card

**IMPORTANT**: Slots in the ION chassis without a slide-in-card installed MUST have a protective plate covering the empty slot for Class A compliance. To install the C3110 SIC:

1. Locate an empty slot on the ION chassis.
2. Carefully slide the slide-in-module into the slot, aligning it with the slot guides.
3. Ensure that the slide-in-module is firmly seated inside the chassis.
4. Push in and rotate the panel fastener screw shown below clockwise to secure the module to the chassis front.
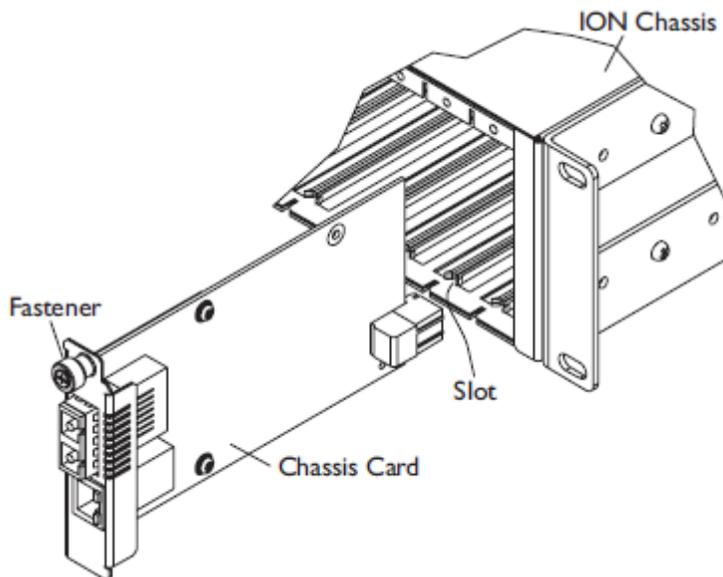


## Install the Fiber Cable

1. Locate a 1000Base-SX/LX compliant fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cable to the C3110 SIC as described:
   • Connect the male TX cable connector to the female TX port.
   • Connect the male RX cable connector to the female RX port.
3. Connect the fiber cables to the other device (another SIC, hub, etc.) as described:
   • Connect the male TX cable connector to the female RX port.
   • Connect the male RX cable connector to the female TX port.

## Install the Copper Cable

1. Locate a 1000Base-T compliant copper cables with male, RJ-45 connectors installed at both ends.
2. Connect the RJ-45 connector at one end of the cable to the RJ-45 port on the C3110 SIC.
3. Connect the RJ-45 connector at the other end of the cable to the RJ-45 port on the other device (switch, workstation, etc.).
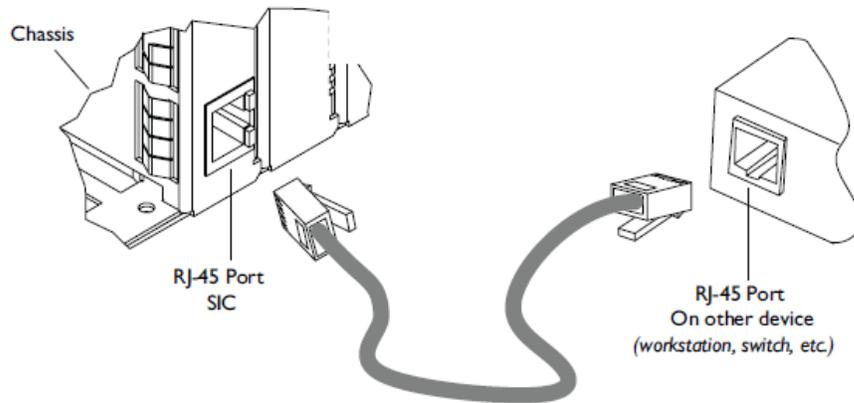


## Status LEDs

Use the status LEDs to monitor C3110 operation in the network.

**PWR** (Power)      ON = Connected to external AC power
**LKF** (Fiber Link) ON = Fiber Connection; Blinking = fiber activity
**TP LED 1**         ON Green = TP Link; Blinking = TP activity
**TP LED 2**         ON Green = Full duplex
                     OFF = Half duplex,
                     Blinking = if collision occurs
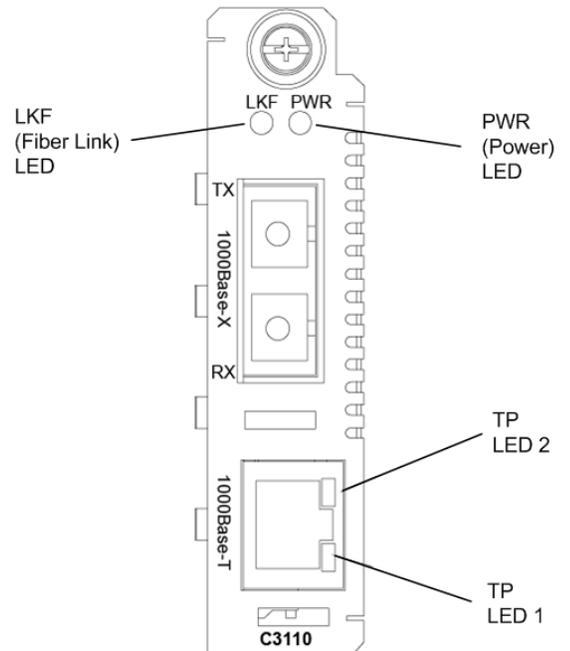
# Feature Descriptions

## Remote-Fault Detect (RFD)

Remote-Fault Detect monitors the status of the fiber link. When enabled, remote fault detection turns off the converter's fiber transmission when the fiber receiver goes down. RFD should only be enabled in the remote converter; if enabled in both, a link pass-through event will cause an unrecoverable condition between the converters.

## Pause

The pause feature can improve network performance by allowing one end of the link to signal the other to discontinue frame transmission for a set period of time to relieve buffer congestion. The pause feature can be set to one of four settings:

- Disable (i.e., no pause)
- Symmetrical pause
- Asymmetric TX (transmit) pause
- Asymmetric RX (receive) pause

Enable the pause feature if it is present on ALL network devices attached to the SIC(s); otherwise, disable this feature.

## Link Pass-Through

The Link Pass-Through feature allows the SIC to monitor both the fiber and copper RX (receive) ports for loss of signal. Refer to the illustration below. For example, in the event of a loss of an RX signal (1), the SIC will automatically disable the fiber TX (transmit) signal (2), thus, "passing through" the link loss (3). The far-end device is automatically notified of the link loss (4), which prevents the loss of valuable data unknowingly transmitted over an invalid link.
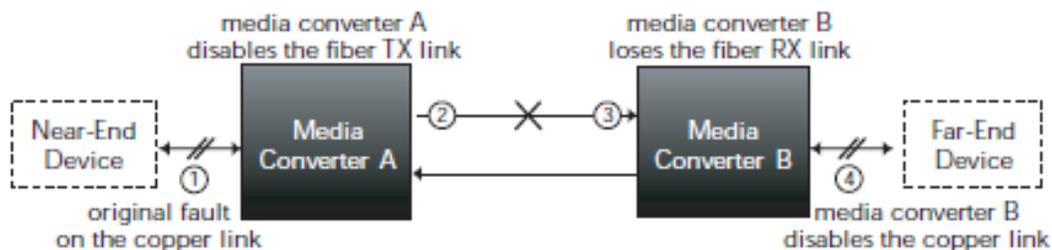


## AutoCross (*always on*)

The AutoCross feature allows either straight-through (MDI) or crossover (MDI-X) cables to be used when connecting to 10Base-T, 100Base-TX, or 1000Base-T devices, such as hubs, transceivers, or network interface cards (NICs). AutoCross
determines the characteristics of the cable connection and automatically configures the unit to link up to its companion device regardless of the cable configuration.

**Auto-Negotiation**

Auto-Negotiation enables automatic configuration to achieve the best possible mode of operation over a link between devices. A device with this feature enabled will broadcast its speed (10Mbs, 100Mbs, etc.) and duplex (half/full) capabilities to another device with this feature, then negotiate the best mode of operation between them—no user intervention required.

**Fiber Auto-Negotiation**

Fiber Auto-Negotiation allows the fiber interface to detect and then advertise the support capabilities of the remote device. This only occurs when a fiber cable is connected to a device with a negotiating port.

**Loop Back**

This diagnostic feature enables the SIC to loop back the signal from the RX port to the TX port for testing and troubleshooting purposes. Test signals from a bit-error test unit can then be inserted into either the copper or fiber link to test a particular segment.

This type of diagnostic test can only be performed from the local to the remote device with loop back enabled on the remote device.

**SNMP**

Use SNMP at an attached terminal or at a remote location to monitor the SIC by monitoring:

- Copper and fiber link/receive status
- Hardware switch settings
- Receive error count

Also, use SNMP to enter network commands that:

- Enable/disable Remote Fault Fiber Detection
- Enable/disable Link Pass-Through
- Enable/disable Auto-Negotiation
- Symmetric pause
- Asymmetric TX (transmit) pause
- Asymmetric RX (receive) pause
- Disable pause

See the following sections for applicable commands and web interface usage.

**Diagnostic Monitoring Interface (DMI)**

The following DMI port screen and explanation table contains brief definitions of the DMI support offered on Lantronix SFP optical interfaces.



| Variable Name | Description |
|---|---|
| DMI Rx Power | Measured Receive optical power in microwatts and in decibels relative to 1mW. |
| DMI Rx Power Alarm | Alarm status of measured Receive optical power. |
| DMI Temp | Internally measured temperature of transceiver in degrees C and degrees F. |
| DMI Temp Alarm | Alarm status for internally measured temperature of transceiver. |
| DMI Bias Current | Measured transmit bias current in microamperes. |
| DMI Bias Alarm | Alarm status for measured transmit bias current for the interface. |
| DMI Tx Power | Measured transmit power, in microwatts and in decibels relative to 1mW. |
| DMI Tx Power Alarm | Alarm status of measured transmit power. |
| Rx Power Intrusion Threshold | Instructs the converter to stop passing traffic when the receive power drops below the new threshold. This feature is sometimes referred to as 'Intrusion Detection, since tapping into a fiber to intercept traffic leads to a reduction in receive power. This value can be entered in microwatts or in decibels relative to 1mW. |

**Note**: DMI is not available on all devices.

For further information, see the following sections.

# Section 3: Managing the C3110

The ION C3110 can be accessed by using an Ethernet network connection. The network connection can be via a Telnet session or a Web graphical user interface (GUI).

## Using the Console Port

The ION C3110 can be connected to a local management station (PC) through a serial interface using the RJ-45 port. The ION C3110 is controlled by entering command line interface (CLI) commands at a local management station. Using the RJ-45 port requires the following:

- Personal computer (PC)
- Terminal emulator program (e.g., HyperTerminal) on the PC
- USB driver installed on the PC
- Configured COM port

## Operating Systems Supported

The following USB drivers are available:

| Windows® 7 | Windows 8 (32 bit) | Windows 10 (32 bit) |
|---|---|---|
| Windows 7 x64 | Windows 8 (64-bit) | Windows 10 (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

**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 with the *Windows XP* operating system, do the following.

1. Extract the driver (provided on the website) and place it in an accessible folder on the local drive of the PC.
2. Connect the ION C3110 to the USB port on the PC. 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.
9. Click **Next**. Installation of the driver begins.
10. When the finished installing screen displays, click **Finish**.

The USB driver installation is complete. You must now configure the COM port to be used by the terminal emulator.

# Configuring HyperTerminal

After the USB driver has been installed you must set up the terminal emulator software (e.g., HyperTerminal) to use the USB COM port.

1.  On the desktop, right-click on **My Computer**.

2.  Select **Manage**. The Computer Management window displays.

3.  Click **Device Manager**.  The Device Manager window displays.

4.  In the right panel, expand the list for **Ports (COM & LPT)**. Note the USB COM port number. You will need to provide this information in step 8 below.

5.  Launch the HyperTerminal software.

    a) Click **Start**.
    b) Select: **All Programs>Accessories>Communications**.
    c) Click **HyperTerminal**.

    The Connection Description window displays.

6.  Type in a name and select an icon that will be used for this connection.

7.  Click **OK**. The Connect To window displays.

8.  From the drop-down list in the **Connect using** field, select the COM port noted in step 4.

9.  Click **OK**. The Port Settings window displays.

10. Set the COM port properties as follows:

    *   Bits per second:     **115200**
    *   Data bits:           **8**
    *   Parity:              **None**
    *   Stop bits:           **1**
    *   Flow control:        **None**

11. Click **OK**.  A blank HyperTerm window displays.

12. In the HyperTerm window, select **File>Properties**.

13. Click the **Settings** tab.

14. In the **Emulation** field, select **VT100**.

15. Click **ASCII Setup**.

16. Check that **Wrap lines that exceed terminal width** is selected.

17. Click **OK** twice.

18. Login (see "Starting a USB Session" below).

## Starting a Terminal Session

The following procedure describes how to access the ION C3110 via a USB connection.

1.  Start the terminal emulator program (e.g., HyperTerminal).

2.  After the emulator screen displays, press **Enter**.

    The login prompt displays. **Note:** if a "*Login incorrect*" message displays, ignore it.

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

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

4.  Press **Enter**. The HyperTerminal password prompt displays.



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

6.  Press **Enter**. The command line prompt displays.

You can now enter commands to set up the various configurations for the ION C3110. For a description of all available CLI commands see the *ION Systems CLI Reference Manual, 33461*.

## Using an Ethernet Network

The ION C3110 can be managed remotely through the Ethernet network via either a Telnet session or a Web interface. Before this is possible you must set up the IP configuration for the ION C3110.

**Important**: It is recommended that you initially set up the IP configuration through the serial interface (USB connection). See "Setting Up the IP Configuration" section on page 28. Otherwise, in order to communicate with the ION C3110 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 ION C3110 (see "Appendix B: Factory Default Settings" in the ION C3110 User Guide).

Make note of the original settings for the PC as you will need them after setting the IP configuration for the ION C3110.

## Starting a Telnet Session

The ION C3110 can be controlled from a remote management station via a Telnet session over an Ethernet connection. The ION C3110 is controlled and configured through CLI commands. The following describes the procedure to connect to and access the ION C3110 via a Telnet session.

1. Click **Start**.

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

3. Click **Command Prompt**. The command line window displays.

4. At the command line type: **telnet** <xx>  where xx = the IP address of the ION C3110.

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

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.
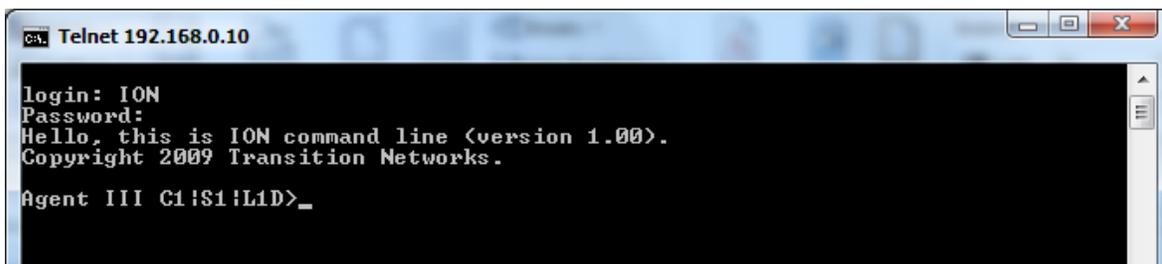


You can now enter commands to set up the various configurations for the ION C3110. For a description of all available CLI commands see the *ION Systems CLI Reference Manual, 33461*.

## Web Browsers Supported

The ION system supports current versions of most current web browsers (e.g., Mozilla Firefox, Google Chrome, Opera, Safari, Internet Explorer).

## Starting the Web Interface

The ION C3110 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 cannot be modified.

A Web session can be used to connect to and set up the ION C3110.

**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 ION C3110 via the Web:

1. Open a web browser.
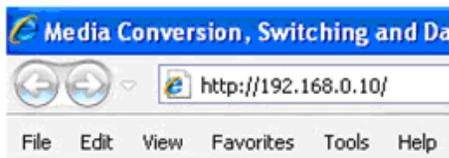


2. In the address (URL) block, type the IP address of the ION C3110 (the default is 192.168.0.10).

3. Click **Go** or press **Enter**. The ION System Sign in screen displays.



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

4. Type the User Name (the default is **ION**). **Note**: the System name is case sensitive.

5. Type the Password (the default is **private**). **Note:** the password is case sensitive.

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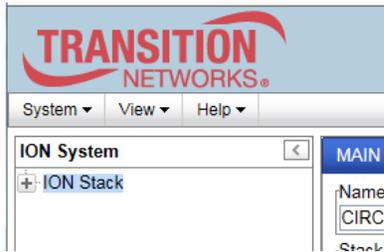


7.  Click the plus sign [**+**] next to **ION Stack**. This unfolds "ION Stack" node in the left tree view and will refresh device status.

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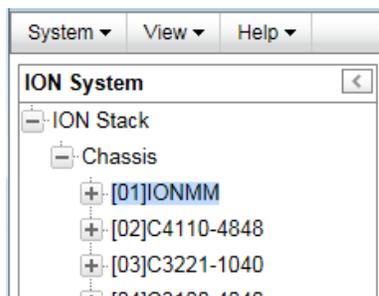


9.  Click **C3110**. The **MAIN** tab screen displays.
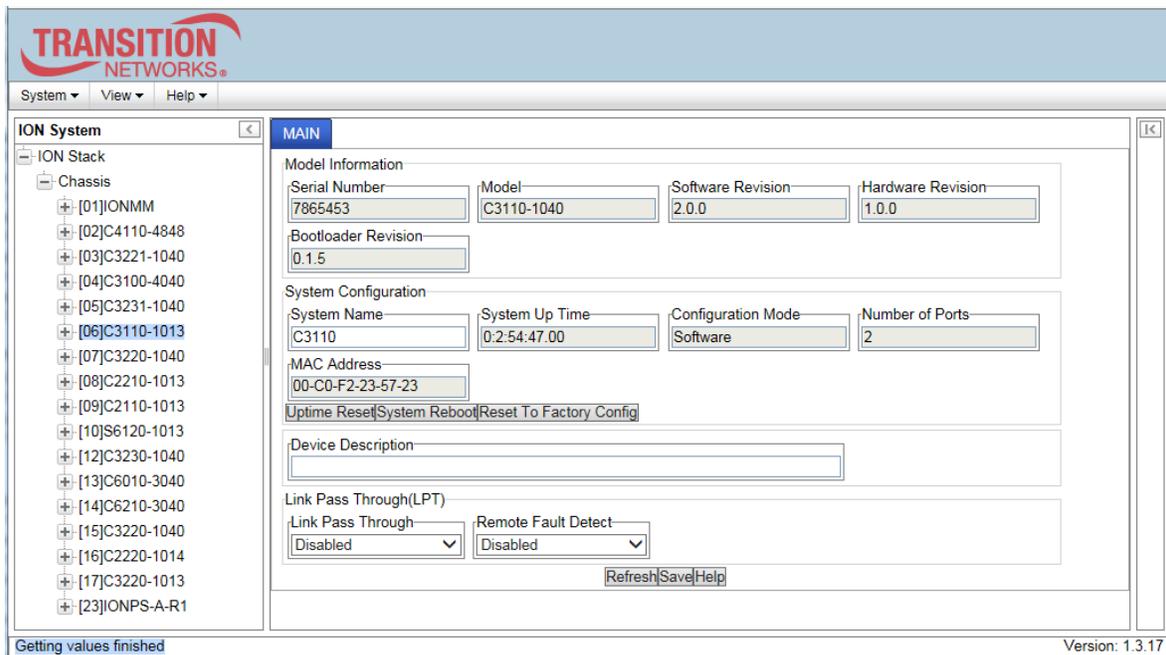


10. You can use the various tabs to configure the system. For configuration information, see the following section.

# Section 4: Web UI Operation

The manageable C3110 features are available when used in an ION Platform chassis along with an ION Management Module (IONMM).

**1.** Navigate to the C3110 MAIN tab and view and/or edit the parameters as described below.



**Parameter Descriptions (C3110 MAIN tab)**
**Serial Number**: Displays the ION serial number string for the C3110 physical entity (e.g., 5219475).
**Model**: Displays the ION model name identifier string for the C3110 physical entity (e.g., C3110-1040).
**Software Revision**: Displays the ION software revision string for the C3110 physical entity (e.g., 2.0.0).
**Hardware Revision**: Displays the ION hardware revision string for the C3110 physical entity (e.g., 1.0.0).
**Bootloader Revision**: Displays the ION bootloader revision string for the C3110 physical entity (e.g., 1.2.0).

**System Name**: Lets you enter a name string for this device, to uniquely identity the device for your location.
**System Up Time**: Displays the device's uptime if supported, 0 otherwise. 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.
**Configuration Mode**: Displays the configuration mode of the device. The device may have a hardware jumper or DIP 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 all configurations are controlled by management.
**Number of Ports**: The number of ports on this device (e.g., 2).
**MAC Address**: The MAC address defined for this device (e.g., 00-C0-F2-42-00-DE).

**Uptime Reset**: Button to Reset the device's system uptime.

**System Reboot**: Button to Reinitialize the system and reset all the system states. All configuration data is saved during a reboot. Displays a prompt asking "*Are you sure?*".

**Reset To Factory Config**: Button to Reset entire system configuration to original settings as it was shipped from the factory. Deletes all current configuration details and load the factory defaults.

**Device Description**: Enter an optional ASCII text string up to 63 bytes that overrides the default Circuit ID, which is the vlan-module-port in binary format. At the card level it is displayed as "Device Description", MIB variable is "sysName" in "system" public mib, oid: 1.3.6.1.2.1.1.5.

**2.** Navigate to the C3110 Port 1 MAIN tab and view and/or edit the parameters as described below.
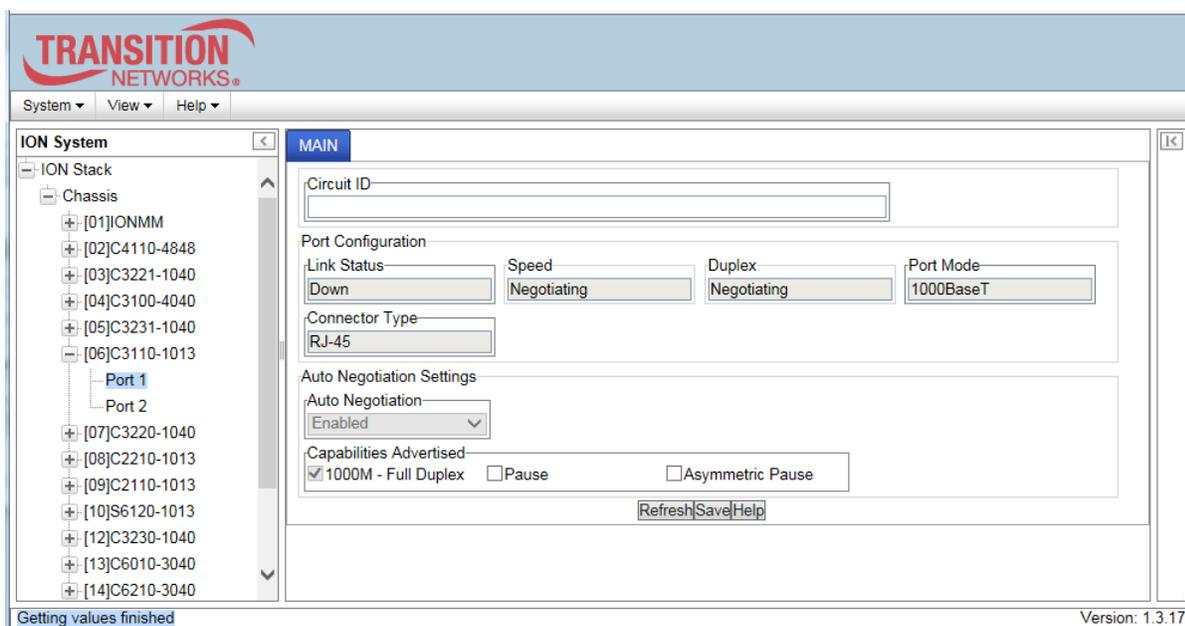


**Parameter Descriptions (C3110 Port 1 MAIN tab)**

**Circuit ID**: Enter an optional ASCII text string up to 63 bytes that overrides the default Circuit ID, which is the vlan-module-port in binary format. At the card level it is displayed as "Device Description", MIB variable is "sysName" in "system" public mib, oid: 1.3.6.1.2.1.1.5.

**Link Pass Through(LPT)**:  Link Pass Through (LPT) is a troubleshooting feature that allows the media converter to monitor both the fiber and copper RX ports for loss of signal. At the Link Pass Through dropdown, select either 'Enabled' or 'Disabled'. If enabled, 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.

**Remote Fault  Detect**: Remote Fault Detect (RFD) is a troubleshooting feature used on Gigabit Ethernet copper-to-fiber media converters and NIDs. Select 'Enabled' or 'Disabled'. The default is 'Disabled'. 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.

**3.** Navigate to the C3110 Port 2 MAIN tab and view and/or edit the parameters as described below.
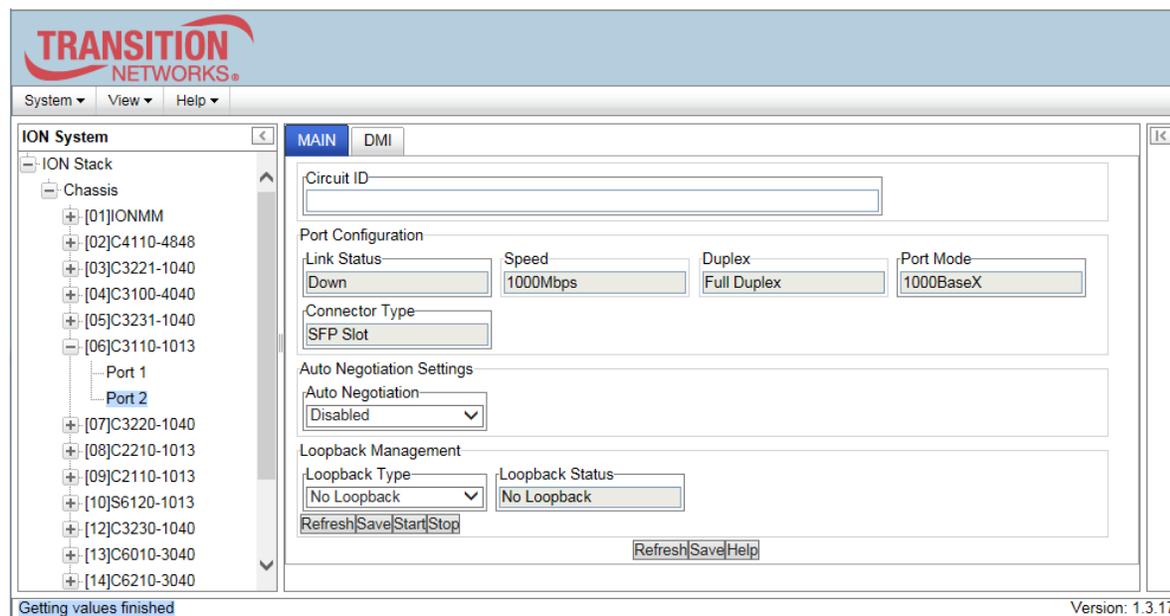


**Parameter Descriptions (C3110 Port 2 MAIN tab)**

**Circuit ID**: Enter an optional Circuit ID - an ASCII text string of up to 63 bytes that overrides the default Circuit ID, which is the vlan-module-port in binary format (optional). At the port level it is displayed as "Circuit ID", MIB variable is "ifAlias" in "ifXTable" public mib, oid: 1.3.6.1.2.1.31.1.1.1.18.

**Link Status**: The current operational state of the interface. The Testing state indicates that no operational packets can be passed.  If 'Admin Status' is Down then 'Link Status' should 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; it should change to Dormant if the interface is waiting for external actions (such as a serial line waiting for an incoming connection); it should remain in the Down state if and only if there is a fault that prevents it from going to the Up state; it should remain in the NotPresent state if the interface has missing (typically, hardware) components.

**Speed**: The interface speed. When 'Auto Negotiation' is enabled, it is 'Negotiating', otherwise '1000Mbps' displays.

**Duplex**: The interface duplex. When 'Auto Negotiation' is enabled, it is 'Negotiating', otherwise, 'Full Duplex' displays.

**Force Speed**:  When 'Auto Negotiation' is disabled, this can be used to set the interface speed.

**Force Duplex**: When 'Auto Negotiation' is disabled, this can be used to set the interface duplex mode (half duplex or full duplex).

**AutoCross Mode**: If this Ethernet interface supports MDI/MDIX Autocross, then the mode can be set. Lantronix recommends leaving AutoCross in default mode (Auto). The Auto Cross feature detects and configures the twisted-pair copper port on the NID for the correct straight-through (MDI) or crossover (MDI-X) configuration. This feature allows either MDI or MDI-X cable to connect the SIC to devices such as hubs, transceivers, or network interface cards (NICs). (This feature does not require operator intervention.)

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 NIDs. AutoCross determines the characteristics of the connection and configures the NIDs to link up automatically. This occurs regardless of the cable configuration (MDI or MDI-X).

**Port Mode**: Displays the Ethernet PHY mode of this interface (e.g., '1000BaseT' or '1000BaseX').

**Connector Type**: Displays the port's type of physical connector (e.g., 'SC Multimode Fiber' or 'RJ-45').

**Auto Negotiation**: The Auto-Negotiation feature allows the C3110 to configure itself to achieve the best possible mode of operation over a link, automatically. The C3110 broadcasts its speed (10 Mbps, 100 Mbps, or 1000 Mbps) and duplex capabilities (full or half) to the other devices and negotiates the best mode of operation. Auto-Negotiation allows quick and easy installation because the optimal link is established automatically. No user intervention is required to determine the best mode of operation. Disabling the Auto Negotiation feature allows forcing the connection to the desired speed and duplex mode of operation.

Setting this field to 'Enabled' causes the interface which has the auto-negotiation signaling ability to be enabled. If the value of this field is 'Disabled', then the interface will act as it would if it had no auto-negotiation signaling. Under these conditions, an IEEE 802.3 MAU will immediately be forced to the state indicated by the value of the object ifMauDefaultType.

**Capabilities Advertised**: The set of capabilities advertised by the local auto-negotiation entity. With Auto Negotiation set to Enabled, the Capabilities Advertised checkbox is displayed for '1000M - Full Duplex', 'Pause', and 'Asymmetric Pause'. This field does not display if Auto Negotiation is set to Disabled.

**Loopback Type**: Loopback Management 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). In the Loopback Type field, select the operating mode:

   * No Loopback – disables LOAM loopback testing (default setting). Displays after a PHY Layer loopback is terminated by pressing the Stop button.
   * PHY Layer – when selected, initiates the loopback when the Start button is pressed.

**Loopback Status**: Loopback Management 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).

This field displays the loopback status for this interface when enabled. The only two possible values for a SET operation are Initiate Loopback and Terminate Loopback. All other values are read-only to show the status of the loopback operation (No Loopback, Local in Loopback). The default is No Loopback.

**Start**: Press this button to begin the loopback function.

**Stop**: Press this button to end the loopback function.

**4.** Navigate to the C3110 Port 2 DMI tab and view and/or edit the parameters as described below.
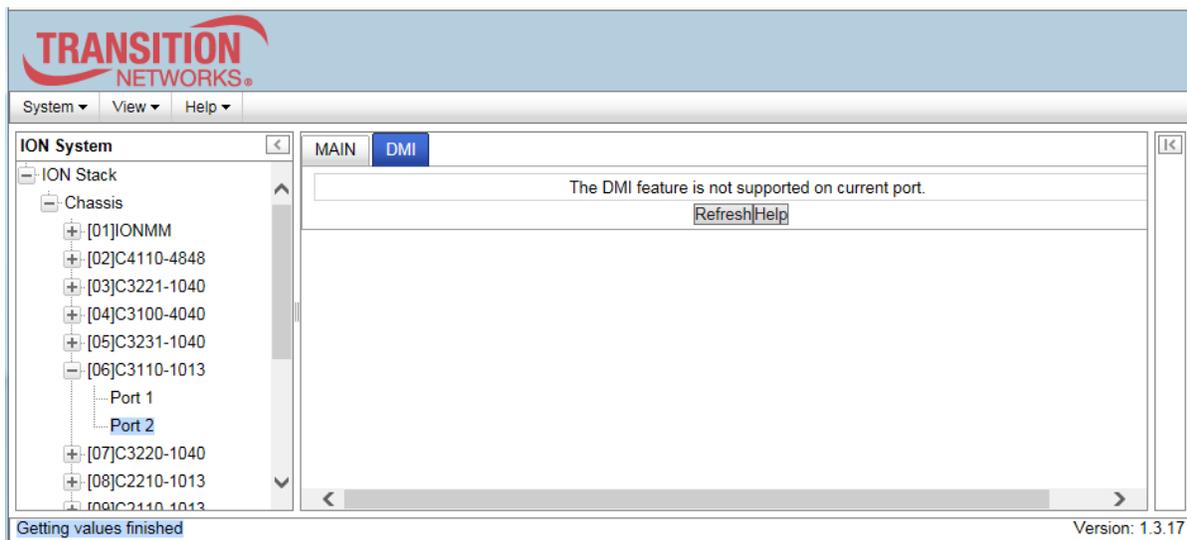


**Parameter Descriptions (C3110 Port 2 DMI tab)**

NID models with Diagnostic Monitoring Interface (DMI) support allow diagnosing problems within the network. The DMI function displays C3110 diagnostic / maintenance information such as fiber interface characteristics, diagnostic monitoring parameters, and supported fiber media lengths. All DMI events will trigger notification. Intrusion detection, based on Rx Power level, is available for triggering any drop in the Rx power. DMI devices have four functions: 1) Transmit power, 2) Receive power, 3) Transmit bias current, and 4) 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). If both the local and remote NIDs are DMI models, the DMI device will indicate whether the trap event is from a local or remote device.

The C3110 > DMI tab > Interface Characteristics, Diagnostic Monitoring, and Supported Media Length section's fields are explained below.

**DMI ID**: Specifies the physical device from SFF-8472 Rev 9.5 Standard:

  * Unknown or unspecified - 00h.
  * GBIC - 01h.
  * Module/connector soldered to motherboard - 02h.
  * SFP - 03h.
  * Reserved - 04-7Fh.
  * Vendor specific - 80-FFh.

**Connector Type**: Displays the current Connector Type; the external optical or electrical cable connector provided as the interface. Can be LC, MT-RJ LC, RJ-45, SC, SC Multimode Fiber, ST, VF-45, or unknown, where:

  * MT-RJ = Media Termination - Recommended Jack for Duplex
   multimode connections.
  * LC = Lucent Connector or Local Connector for High-density connections, SFP transceivers.
  * RJ-45 = single-line jack for digital transmission over ordinary phone wire, either untwisted or twisted pair (UTP or TP).
  * SC = Subscriber Connector for Datacomm and Telecomm uses.
  * SC Multimode Fiber = Subscriber Connector (or 'square connector' or 'Standard Connector') over multimode fiber for Datacomm / Telecomm (e.g., GBIC).
  * ST = BFOC Straight Tip / Bayonet Fiber Optic Connector for Multimode - rarely Single mode (APC not possible).
  * VF-45 = Snap connector for Datacomm uses.

**Nominal Bit Rate (Mbps)**: The Bitrate in units of 100Mbps (e.g., 1300, or 1.3 Gbps).

**Fiber Interface Wavelength (nm)**: The Nominal transmitter output wavelength at room temperature. The units in nm (nanometers).

**Receive Power (uW)**: The Receive power on the local fiber measured in microwatts (uW).

**Receive Power (dBM)**: The Receive power on the local fiber measured in dBM (e.g., -6.126 dBM). (Where dBM is the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW). A 1 mW signal has a level of 0 dBm. Signals weaker than 1 mW have negative dBm values; signals stronger than 1 mW have positive dBm values.)

**Receive Power Alarm**: The Alarm status for the receive power on the local fiber: dmi_alarm_type = Normal, Not Supported, Low Warn, High Warn, No Alarm, Low Alarm, or HighAlarm.

**Rx Power Intrusion Threshold (uW)**: 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. The message "ALARM: Receive power is below specified threshold. Fiber trap intrusion may be in progress." displays at that time.

**Temperature (°C)**: The Temperature of the fiber transceiver in degrees Celsius (°C).

**Temperature (°F)**: The Temperature of the fiber transceiver in degrees Fahrenheit (°F).

**Temperature Alarm**: The Alarm status for temperature of the fiber transceiver. An ionDMITemperatureEvt event is sent when there is a warning or alarm on DMI temperature. Where dmi_alarm_type = Normal, Not Supported, Low Warn, High Warn, No Alarm, Low Alarm, or High Alarm.

**Transmit Bias Current (uA)**: Transmit bias current on local fiber interface, in microamperes (uA).

**Transmit Bias Alarm**: The Alarm status for the transmit bias current on the local fiber interface; either:

  *Normal - transmit bias current is OK.
  *Not Supported - feature not supported.
  *Low Warn - transmit bias current may be too low.
  *High Warn - transmit bias current may be too high.
  *No – transmit bias current is not reported.
  *Low Alarm - transmit bias current is too low and an Alarm is generated.
  *High Alarm - transmit bias current is too high and an Alarm is generated.

**Transmit Power (uW)**: The Transmit power on the local fiber, measured in microwatts (uW).

**Transmit Power (dBM)**: The Transmit power on the local fiber, measured in dBM (e.g., -6.126 dBM). (Where dBM is the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW). A 1 mW signal has a level of 0 dBm. Signals weaker than 1 mW have negative dBm values; signals stronger than 1 mW have positive dBm values.)

**Transmit Power Alarm**: The Alarm status for transmit power on the local fiber; either dmi_alarm_type = Normal, Not Supported, Low Warn, High Warn, No Alarm, Low Alarm, or High Alarm.

**9/125u Singlemode Fiber (m)**: The Supported Media Length in units of meters; otherwise N/A if not a 9/125u Singlemode Fiber connection. Specifies the link length that is supported by the transceiver while operating in single mode fiber.

**50/125u Multimode Fiber (m)**: The Supported Media Length in units of meters (e.g., 500 m); otherwise N/A if not a 50/125u Multimode Fiber connection. Specifies the link length that is supported by the transceiver while operating on 50 micron multi-mode fiber.

**62.5/125u Multimode Fiber (m)**: The Supported Media Length in units of meters (e.g., 300 m); otherwise N/A if not a 62.5/125u Multimode Fiber connection. Specifies the link length that is supported by the transceiver while operating in 62.5 micron multi-mode fiber.

**Copper (m)**: The Supported Media Length in units of meters (e.g., 300 m); otherwise N/A if not a copper (UTP) connection. Specifies the link length that is supported by the transceiver while operating on copper cable. The value is in units of meters; otherwise N/A if not a copper connection.

# Section 5: CLI Operation

## General

This section describes the USB and Telnet command line interface (CLI) commands available for ION C3110 operation in an ION System chassis. This manual is for experienced network administrators who are responsible for configuring and maintaining the ION system.

CLI offers the most comprehensive set of management features. CLI is used during the initial setup, configuration, and troubleshooting, but can also be used for day-to-day management (device management, firmware upgrades, managing security features, etc.).

CLI commands are case sensitive. Enter the CLI commands as shown in this document.  In order to execute the commands described in this manual, you must press the Enter key after the command has been entered.

## Command Line Editing

This section describes how to enter CLI commands. A CLI command is a series of keywords and arguments. Keywords identify a command, and arguments specify configuration parameters.

**Display Similar Commands**

At the command line, you can use the   key or the ? key to show available commands in a category of commands after entering a part of the command. For example, use the   key to enter part of the command (show ether in this example) to display all of the available commands that start with show ether.  The commands display in a single row.

```
C1|S7|L1D>show ether <tab key>
config      loopback    security    statistics  tdr
```

Use the **?** key after a partial CLI command entry to display all of the available commands that start with show ether, but in a single column:

```
C1|S7|L1D>show ether ?
  config
  loopback
  security
  statistics
  tdr
```

**Partial Keyword Lookup**

If you terminate a partial keyword with a question mark, alternatives that match the initial letters are provided. (Remember to not leave a space between the command and question mark.) For example "s?" shows all the keywords starting with "s."

**Recall Commands**

To recall recently-entered commands from the command history, perform one of the optional actions below:

Ctrl-P or Up arrow (↑) key: Recall commands in the history buffer, beginning with the most recent command. Repeat the key sequence to recall successively older commands.

Ctrl-N or Down arrow (↓) key: Return to more recent commands in the history buffer after recalling commands with Ctrl-P or the Up arrow key. Repeat the key sequence to recall successively more recent commands.

**Login via CLI**:

Example: Telnet login

```
login: ION
Password:
Hello, this is ION command line (version 1.00).
Copyright 2009 Transition Networks.
```

# System Commands

The following are basic system level commands. These commands are used to show configuration / mode, show help, reboot the system, reset the configuration, and other basic functions.

**Password for Login / Access**

*Syntax*:          Password: **private**

*Description*:      The default device CLI password. CLI entry requires a successful password entry.

*Example*:

```
Password:
Login incorrect
login: ION
Password:private

Hello, this is ION command line (version 1.00).
Copyright 2009 Transition Networks.

AgentIII C1|S1|L1D>
```

In order to control the NIDs via a USB interface, the command line prompt must be showing the location of the module to be managed. Use the procedure below to access the NID and login via USB connection.

1. Start the terminal emulator program (e.g., HyperTerminal).
2. When the emulator screen displays, press **Enter**. The login prompt displays. If your system uses a security protocol (e.g., RADIUS, SSH, etc.), you must enter the login and password required by that protocol.
3. Type **ION** (all upper case) and press **Enter**. The password prompt displays. If a "Login incorrect" message displays, ignore it.
4. Type your password. The default is **private** (all lower case).
5. Press **Enter**. The HyperTerminal command line prompt displays (C1|S3|L1D>).
6. Enter CLI commands to set up, configure, operate, and maintain the NID.


**Log Out (Quit)**

*Syntax* :          **q**(uit)

*Description*:      Exit the current mode and return to the previous mode.

*Example* :

```
C1|S3|L1D>q
login:
```

**Note**: The NID 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 log out.

**Clear the Screen**

*Syntax:* **cls**

*Description:* Clears the screen.

**Go Back to IONMM**

*Syntax:* **home**

*Description:* Sets the command prompt back to the location of the IONMM.

*Example*:          If the IONMM card is in chassis 1/slot 1 and the following command was entered.

```
C1|S13|L0AP1|L1P2|L2D>home
The new command line prompt would be
C1|S1|L1D/>
```

**Go to Another Location**

*Syntax:* **go** [**c=**<vv>] [**s=**<ww>] [**l1ap=**<xx>] [**l2ap=**<yy>] <zz>

*Description:* Defines the location (card or port) where subsequent commands are destined for. This information will appear on the command prompt line as the location where the command will be executed.

where:

vv        =        optional; number (1–16) of the chassis where the card/port is located

ww        =        optional; number (1–32) of the slot in the chassis where the card/port is located. **Note:** if the chassis parameter (c=) is specified you must specify a slot number.

xx        =        optional; port number (1–16) on a level 1 device that is used to attach to a level 1 device.

yy        =        optional; port number (1–16) on a level 2 device that is used to attach to a level 2 device.

zz        =        mandatory; specifies the port or device where subsequent commands are destined for. Valid choice are:

- **l1d** – indicates the level 1 device
- **l1p=**<port#> – port number (1–16) on a level 1 device
- **l2d** – indicates the level 2 device
- **l2p=**<port#> – port number (1–16) on a level 2 device
- **l3d** – indicates the level 3 device
- **l3p=**<port#> – port number (1–16) on a level 3device

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


*Example 1*:        The following command would cause all subsequent commands to be executed for the device in slot 5 of chassis 1.

```
C1|S1|L1D>go s=5 l1d
The new command prompt would be:
C1|S5|L1D>
```

*Example 2*:        The following would cause all subsequent commands to be executed for port 2 on the device in slot 5.

```
C1|S5|L1D>go l1p=2
```
The new command prompt would be:
```
C1|S5|L1P2>
```

*Example 3*:        The following would cause all subsequent commands to be executed for a remote device connected to port 2 of a chassis-resident module in slot 5.

```
C1|S5|L1D>go l1ap=2 l2d
```
The new command prompt would be:
```
C1|S5|L1AP2|L2D>
```

**Help**

*Syntax:* **?**

*Description:* Display help for CLI commands by typing a question mark (**?**). Typing a **?** at the command line prompt displays a list of base commands (show, set, etc.).

To display a list of the options for a particular command or parameter, type the command/parameter then a space then **?**. See "Appendix A" on page 139 for a complete **list** command listing.

*Examples*:

The following will display a list of all base commands.

```
C1|S2|L1D>?
While the following will display a list of all the entries for the set commands that start
with the letter "l".
C1|S15|L1P1>set l ?
  l2cp
  loam
  lpt
```

The following displays a list of all the entries for the **set lpt** commands:

```
C1|S15|L1P1>set lpt ?
  monitor-port
state
```

The following displays a list of the valid values for the **set lpt state** command:

```
C1|S15|L1P1>set lpt state ?
  disable
  enable
  notSupported
C1|S15|L1P1>
```

By typing a ? after each parameter in a command string you can see what the options are, either for what the next parameter is or for what options must be specified following an equal sign.

**Link Pass Through**

*Syntax:* **set lpt**

*Description*: Set and display the Link Pass Through (LPT) state.

*Example:*
```
Agent III C1|S6|L1D>set lpt state enable
Agent III C1|S6|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:       0
Remote fault detect state:            disable
Agent III C1|S6|L1D>
```

Note that you cannot set link pass through monitor port on this card.


**List**

*Syntax:* **list**

*Description:* Displays all available command line commands. Note that this displays a long list.

*Example (partial list)*:
```
C1|S7|L1D>list
cat [OPTION] [FILE]
cd [DIR]
clear ether all counters
cls
go [c=CHASSIS] [s=SLOT] [l1ap=PORT] [l2ap=PORT] (l1p=PORT|l2p=PORT|l3p=PORT|l1d|l2d|l3d)
home
list
:
:
show rmon statistics
show timezone
show upgrade firmware file (IONMM command)
start ether tdr test
stat
upgrade module
C1|S5|L1D>
```

**Process Snapshot**

*Syntax*:            ps

*Description:* Displays a snapshot of the current memory processes. For example:

```
C1|S16|L1P1>ps
PID  Uid     VmSize Stat Command
    1 root       308 S    init
    2 root           SWN [ksoftirqd/0]
    3 root           SW  [watchdog/0]
    4 root           SW< [events/0]
    5 root           SW< [khelper]
    6 root           SW< [kthread]
   36 root           SW< [kblockd/0]
   39 root           SW< [khubd]
   52 root           SW  [pdflush]
   53 root           SW  [pdflush]
   54 root           SW< [kswapd0]
   55 root           SW< [aio/0]
  650 root           SW  [mtdblockd]
  680 root           SW< [spi_gpio.0]
  693 root           SWN [jffs2_gcd_mtd4]
  698 root           SWN [jffs2_gcd_mtd7]
  699 root           SWN [jffs2_gcd_mtd8]
  715 root       272 S    syslogd –m 0 –L –O /var/log/sys.log –l 6 –s 200 –b 3
  719 root       328 S    upgradeManager –d –l 1
  729 root     15968 S    snmpd –Lsd –c /agent3/conf/snmp/snmpd.conf
  730 root       240 S <  bpd_linux
  735 root       240 S    pure-ftpd (SERVER)
  738 root      1092 S    entityManager –Lsd
  740 root      2448 S    subagent
  741 root      1960 S    upgradeSubAgent
  742 root       244 S    xxdp
  743 root       324 S    agent_pm
  747 root       216 S    init
  748 root      1960 S    upgradeSubAgent
  749 root      1960 S    upgradeSubAgent
 4601 root       288 R    ps
C1|S16|L1P1>
```

**Show Current Directory**

*Syntax:*          **pwd**

*Description*:      Displays the current directory.

*Example*:

```
C1|S7|L1D>pwd
/
```

**Change Modes (Quit)**

*Syntax :*         **quit**

*Description*:      Exit the current mode and return to the previous mode (i.e., the CLI command line prompt). Note that the C3110 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 log out.

*Example*:

```
C1|S7|L1D>quit
login:
```

**Reboot**

*Syntax:* **reboot**

*Description:* Performs a reboot ("Warm start the system") of the device in the command line prompt. After a C3110 reboot via CLI while connected via USB port, you must disconnect and then reconnect USB cable for the console to become accessible again.

*Example*:

```
C1|S7|L1D>reboot
Warning: this command will restart system, connection will be lost and please login again!
C1|S7|L1D>
```

⚠️ **Warning:** doing a reboot or restart of the C3110 may cause some configuration backup files to be lost and the USB or Telnet session to drop. 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).

**Reset Factory Configuration**

*Syntax:* **reset factory**

*Description:* Resets a card to its factory default configuration.

**Warning:** Resetting a C3110 to factory restarts the device and drops the Telnet or HyperTerminal connection. Doing a reset to factory removes temporary files (e.g. configuration backup files, Syslog file) and also removes the permanent settings (e.g., configuration files).

*Example*:

```
Agent III C1|S6|L1D>reset ?
  all
  factory
  uptime
Agent III C1|S6|L1D>reset uptime ?
  <cr>
Agent III C1|S6|L1D>reset uptime
Agent III C1|S6|L1D>reset factory ?
  <cr>
Agent III C1|S6|L1D>reset factory
Warning: this command will restart the specified card, connection will be lost!
Agent III C1|S6|L1D>reset all ?
  ports
Agent III C1|S6|L1D>reset all ports ?
  counters
Agent III C1|S6|L1D>reset all ports counters ?
  <cr>
Agent III C1|S6|L1D>reset all ports counters
Error: Cannot reset all ports' counters on this cards!
Agent III C1|S6|L1D>
```

**Set System Name**

*Syntax*:                       **set system name**=NAME

*Description*:              Defines the identifying name of the device. The name can be alphabetic,
numeric or a combination, but with <u>no</u> space characters within the name text.
Note that numbers, upper/lower case characters, and special characters
(~!@#$%^&*()_+") <u>are</u> allowed.

*Example*:
```
Agent III C1|S6|L1D>set system name ?
  NAME
Agent III C1|S6|L1D>set system name ION CHASSIS-1
% Unknown command.
Agent III C1|S6|L1D>set system name IONCHASSIS1
Agent III C1|S6|L1D>
```

The CLI prompt (>) displays an editable name prefix based on the "System Name" field. You can add or modify the System Name via the CLI.  For example, if the name was "lab", the IONMM "System Name" is carried through to every prompt/card that you are logged into (e.g., lab C1|S3|L1D>, lab C1|S5|L1D>, lab C1|S8|L1D>, etc.).

If you don't enter a name in the "System Name" field, the CLI prompt default remains (e.g., C1|S3|L1D>, C1|S5|L1D>, C1|S8|L1D>, etc.). So if you enter  "Agent" in the System Name field, the CLI prompt would display as Agent C1|S3|L1D>,  Agent C1|S5|L1D>, Agent C1|S8|L1D>, etc., but the module name in the Stack and other places in the ION Web interface would still show IONMM.

The system name default is C3110-1040 (case sensitive – all capitals). The **show system information** command displays the system name and other system descriptive information.


**Reset Device Uptime**

*Syntax*:                       **reset uptime**

*Description*:              Resets the C3110 Up Time counter to zero, and immediately begins to
increment.

*Example*:
```
C1|S13|L1P2>reset uptime
C1|S13|L1P2>
```

Use the **show card info** command to display the current system uptime.

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

**Show Card Information**

*Syntax:* **show card info**

*Description:* Displays the system information for the IONMM or slide-in module.

*Example:*        Switch to C3110 card in slot 6 and show card info:

```
Agent III C1|S1|L1D>go c=1 s=6 l1d
Agent III C1|S6|L1D>show card info
System name:        C3110
Uptime:             03:20:57
MAC:                00-c0-f2-23-57-23
Port number:        2
Serial number:      7865453
Config mode:        software
Software:           2.0.0
Bootloader:         0.1.5
Hardware:           1.0.0
Agent III C1|S6|L1D>
```

**Note**: This command does not function for the Power Supply.


**Show Card Type**

*Syntax:* **show cardtype**

*Description:* Displays the device's card type (model number).

*Example 1*:       (C3110 in slot 8):

```
C1|S8|L1D>show cardtype
Card type:                  C3110-1013
C1|S8|L1D>
```

*Example 2*:       (IONMM in slot 1):

```
C1|S1|L1D>show cardtype
Card type:                  IONMM
```

*Example 3*:       (IONPS-A power supply in slot 22):

```
C1|S22|L1D>show cardtype
Card type:                  IONPS-A
```

**Show Chassis Information**

*Syntax:* **stat**

*Description:* Displays information about all slide-in modules installed in the chassis and all standalone modules connected to the slide-in modules (remotes), and their ports.

*Example*:

```
Agent III C1|S1|L1D>stat
ION statck
       Chassis -- BPC
               [  1]  IONMM
                       Port 1
                       Port 2
               [  2]  C4110-4848
                       Port 1
                       Port 2
               [  3]  C3221-1040
                       Port 1
                       Port 2
                       Port 3
               [  4]  C3100-4040
                       Port 1
                       Port 2
               [  5]  C3231-1040
                       Port 1
                       Port 2
                       Port 3
               [  6]  C3110-1040
                       Port 1
                       Port 2
               [ 23]  IONPS-A-R1
                      Temperature Sensor
                      Voltage Sensor
                      Power Sensor
                      Fan
Agent III C1|S1|L1D>
```

**Set Circuit ID**

*Syntax*:                              **set circuit-ID**=<xx>

*Description*:        Lets you define an ASCII text string up to 63 bytes and override the default Circuit ID, which is *vlan-module-port* in binary format, for a device and/or device ports.

Use the **show circuit-ID** command to display the Circuit ID information for a device or port.

*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>

**Note**: the dash ("**-**") is required, and the letters "ID" must be upper-case. The C3110 supports the Circuit ID, a company-specific identifier assigned by the user to identify the converter and individual ports in any manner the user chooses. In the ION system, the 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.


**Show Circuit ID**

*Syntax*:                              **show circuit-ID**

*Description*:                        Displays the current Circuit ID for the device or port. Use the **show circuit-ID** command to display the current Circuit ID information defined for a device or port.

*Example:*
```
C1|S5|L1D>set circuit-ID=xx
C1|S5|L1D>show circuit-ID
Circuit-ID:         xx
C1|S5|L1D>
```
**Note**: the dash ("**-**") is required, and the letters "ID" must be upper-case (in capital letters).


**Set Debug Level**

*Syntax*:              **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).

*Description*:        Defines the system debug level.

*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>
```

### DMI Commands

The following commands are used for Diagnostic Monitoring Interface (DMI) operations.

Note: These commands can only be entered for a fiber port that supports DMI. Not all C3110 models or SFP models support DMI. SFP models that support DMI have a "D" at the end of the model number. If you enter a DMI command on a C3110 model that does not support DMI, the message "*The DMI feature is not supported on current port.*" displays.

### Show DMI Configuration

Syntax:          **show dmi info**

Description:     Displays the configuration of the Diagnostic Monitoring Interface (DMI).

Example:

```
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

Agent III C1|S6|L1D>show dmi info
Error: this command should be executed on a port!
Agent III C1|S6|L1D>go l1p=1
Agent III C1|S6|L1P1>show dmi info
Error: DMI is only supported on FIBER port!
Agent III C1|S6|L1P1>go l1p=2
Agent III C1|S6|L1P2>show dmi info
Error: No DMI support on this port!
Agent III C1|S6|L1P2>
```

**Set DMI Receive Power Preset Level**

Syntax:              **set dmi rx–power–preset–level**=<xx>

Description:    Defines the lowAlarm threshold for RxPowerAlarm. If a non-zero value (in microwatts) is specified, the module will stop passing traffic when the receive power drops below the new threshold. This feature is sometimes referred to as Intrusion Detection, since tapping into a fiber to intercept traffic leads to a reduction in receive power.

Sets the Diagnostic Monitoring Interface (DMI) receive preset power level, where:

xx = Pwr-val: A preset level for Rx Power on the Fiber port (1-100).

Example:
```
C1|S3|L1P2>set dmi rx-power-preset-level=110
C1|S3|L1P2>show dmi info
Diagnostic monitoring interface information:
-----------------------------------------------------------------------
DMI connect type:                                    LC
DMI bit rate:                                        13*100Mbps
DMI link length(single mode fiber, 100m):            N/A
DMI link length(50 micron multi-mode fiber, 10m):    50*10m
DMI link length(62.5 micron multi-mode fiber, 10m):  30*10m
DMI link length(copper cable, m):                    N/A
DMI indentifier:                                     SFP
DMI laser wavelength:                                850*nm
DMI temperature:                                     40.9*C
DMI temperature alarm setting:                       normal
DMI bias current:                                    4752*uA
DMI bias current alarm setting:                      normal
DMI Tx power:                                        254*uW
DMI Tx power:                                        normal
DMI Rx power:                                        0*uW
DMI Rx power:                                        normal
DMI Rx power preset level:                           110*uW
C1|S3|L1P2>

Agent III C1|S6|L1P2>set dmi rx-power-preset-level=110
Error: No DMI support on this port!
Agent III C1|S6|L1P2>go l1p=1
Agent III C1|S6|L1P1>set dmi rx-power-preset-level=110
Error: DMI is only supported on FIBER port!
Agent III C1|S6|L1P1>
```

**Ethernet Port Commands**

The following commands are used for Ethernet port operations. The functions of some of the Ethernet port commands below depend on the type of port, as shown in the "Port Type" column in the table below.

**Note**: These commands can only be entered at the port level - when the last part of the command line prompt indicates the location is a port (e.g., L1P1>). In the table below, an asterisk * indicates Read only (ON) capability.

**Clear Ethernet Port Counters**

*Syntax:* **clear ether all counters**

*Description:* Clears the Ethernet port counters on a C3110. The port's counts (RMON statistics counters, dot3 counters, etc.) are reset to zero.

*Example*:
```
C1|S5|L1D>go l1p=1
C1|S5|L1P1>clear ether all counters
C1|S5|L1P1>go l1p=2
C1|S5|L1P2>clear ether all counters
C1|S5|L1P2>
```
**Note**: Use the **show ether statistics** command to display the current Ethernet port counter information.

**Clear All Ports Counters**

*Syntax*:          **reset all ports counters**

*Description*:     Resets all counters on all ports of the specified Ethernet device. The device's counts (RMON statistics counters, dot3 counters, etc.) are reset to zero and begin incrementing immediately.

*Example*:
```
C1|S5|L1D>reset all ports counters
C1|S5|L1D>
```
**Note**: Use the **show ether config** command to show the current Link operation status.

**Set Ethernet Port Admin Status**

*Syntax:* **set ether admin state={up | down}**

*Description:* Specifies whether or not the Ethernet port is available for use.

*Example*:
```
C1|S3|L1P2>set ether admin state ?
  down
  up
C1|S5|L1P2>set ether admin state up
C1|S5|L1P2>
```
**Note**: Use the **show ether config** command to show the current Link operation status.

**Set Ethernet Port Advertisement Capability**

*Syntax:* **set ether adv–cap=**<xx>

*Description:* Specifies the linking capability to be auto-negotiated for this Ethernet port.
The auto-negotiate feature must be enabled for this command to have any affect (see "Set Ethernet Port Auto-Negotiation Status" on page 31). In addition to the speed and duplex function, the port also advertises whether it supports pause frames (see "Set Ethernet Port Pause Frames" on page 33).
Where: xx = valid choices:

- **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 (for example, use the command **adv-cap=10TFD+100TFDl+1000THD**).

*Example*:

```
C1|S8|L1P2>set ether adv-cap ?
STR_ETHER_ADV_CAPABILITY  A combination of 10THD,10TFD,100TFD, 100THD,1000THD and 1000TFD for
copper port, like 10TFD+100TFD+100THD+1000TFD; and N/A for none capability;
Cannot set this attribute for fiber port
C1|S8|L1P2>set ether adv-cap 10THD,10TFD
Cannot set advertisement capability on this port!
C1|S8|L1P2>go l1p=1
C1|S7|L1P1>set ether adv-cap ?
  STR_ETHER_ADV_CAPABILITY  A combination of 10THD,10TFD,100TFD, 100THD,1000THD and 1000TFD
for copper port, like 10TFD+100TFD+100THD+1000TFD; and N/A for none capability;
Cannot set this attribute for fiber port
C1|S7|L1P1>set ether adv-cap N/A
C1|S7|L1P1>set ether adv-cap 10THD
C1|S7|L1P1>set ether adv-cap 10TFD
C1|S7|L1P1>set ether adv-cap 100TFD
C1|S7|L1P1>
```

**Set Ethernet Port AutoCross**

Syntax:             **set ether autocross=<xx>**
Description:      Defines whether the cabling for this Ethernet port is cross-over or straight through, or whether the system will automatically adjust as needed. Lantronix recommends leaving AutoCross in default mode (auto). Where: xx = valid choices are:

  • auto – automatically correct errors in cable selection (default – recommended)
  • mdi – transmit pair on one end of the cable is connected to the receive pair on the other end
  • mdi-x – straight through cable (transmit to transmit/receive to receive)

Example:

```
C1|S5|L1P2>set ether autocross mdi
Cannot set autocross on Fiber port!
C1|S5|L1P2>go l1p=1
C1|S5|L1P1>set ether autocross mdi

Agent III C1|S6|L1P1>set ether autocross mdi
Error: Cannot set autocross on this port!
Agent III C1|S6|L1P1>go l1p=2
Agent III C1|S6|L1P2>set ether autocross mdi
Error: Cannot set autocross on this port!
Agent III C1|S6|L1P2>
```

Note: This command is only applicable on a copper port (port 1).

Use the **show ether config** command to display the current auto-negotiation state.

**Set Ethernet Port Filter 802.1Q Tagged Non-Management Frames**

Syntax:             set ether filter–unknown–unicast={disable | enable}
Description:      Defines whether 802.1Q tagged non-management frames can be transmitted/received through the Ethernet port.

802.1Q-compliant switch ports can be configured to transmit tagged or untagged frames. A tag field containing VLAN (and/or 802.1p priority) information can be inserted into an Ethernet frame. If a port has an 802.1Q-compliant device attached (such as another switch), these tagged frames can carry VLAN membership information between switches, thus letting a VLAN span multiple switches.

Example:

C1|S5|L1P2>set ether filter-unknown-multicast=enable
C1|S5|L1P2>set ether filter-unknown-unicast=disable
C1|S5|L1P2>

**Set Ethernet Port Filter 802.1Q Untagged Non-Management Frames**

Syntax:          **set ether filter–unknown–multicast** ={disable | enable}
Description:     Defines whether 802.1Q untagged non-management frames can be transmitted  or received through the Ethernet port. 802.1Q-compliant switch ports can be configured to transmit tagged or untagged frames. It is important to ensure ports with non-802.1Q-compliant devices attached are configured to transmit untagged frames. Many NICs for PCs and printers are not 802.1Q-compliant. If they receive a tagged frame, they will not understand the VLAN tag and will drop the frame.
Example:

```
C1|S5|L1P2>set ether filter-unknown-multicast=disable
C1|S5|L1P2>set ether filter-unknown-unicast=enable
C1|S5|L1P2>
```

**Set Ethernet Port Pause Frames**

Syntax:          **set ether pause**=<xx>
Description:     Defines whether the Ethernet port supports pause frames (data pacing). Pause frames are used as a method of 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 that are defined by IEEE 802.3x and use MAC control frames to carry the pause commands. Only stations configured for full duplex operation can send pause frames.
Where: xx = pause type; 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
• pause (the port will advertise it has pause capability)
• spause (symmetric; the port will advertise that it can transmit and receive pause frames)
Example:

```
C1|S8|L1P1>set ether pause ?
STR_ETHER_PAUSE  If no pause capability, setting nopause; other-wise, for copper port , use a
combination of pause and apause, like pause+apause or pause or apause; for fiber port, use a
com-bination of apause and spause, like apause+spause or spause or apause
C1|S8|L1P1>set ether pause=nopause
C1|S8|L1P1>set ether pause=apause
C1|S8|L1P1>set ether pause=bpause
Invalid pause value!
C1|S8|L1P1>set ether pause=spause
Invalid pause value!
C1|S8|L1P1>set ether pause=pause
C1|S8|L1P1>
```

Note : Use the show ether config command to display the current pause capability and pause setting.

**Set Ethernet Port Source MAC Address Lock**

Syntax:            **set ether src–addr–lock**={true | false}

Description:      Defines whether or not there is a source MAC address lock for the Ethernet port.
In its most basic form, 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.

Example:

```
C1|S5|L1P2>set ether src-addr-lock true
C1|S5|L1P2>set ether src-addr-lock action ?
all
discard
discardandnotify
shutdown
C1|S5|L1P2>set ether src-addr-lock action=discard
C1|S5|L1P2>set ether src-addr-lock action=discardandnotify
C1|S5|L1P2>set ether src-addr-lock action=shutdown
C1|S5|L1P2>set ether src-addr-lock action=all
C1|S5|L1P2>show ether security config
Ethernet port security configuration:
--------------------------------------------------------------
Source MAC address lock:        disable
Source MAC address lock action:    discard
Filter unknown dest unicast:       enable
Filter unknown dest multicast:     enable
C1|S8|L1P1>
```

**Set Ethernet Port Speed**

Syntax:            **set ether speed**={10M | 100M | 1000M}

Description:      Defines the transmission speed to be used on the Ethernet copper port.  If Auto-
negotiation is enabled, you cannot set the port speed.

Example (copper port):

```
C1|S16|L1P1>set ether speed ?
  1000M
  100M
  10M
C1|S16|L1P1>set ether speed 1000M
Fail to set Ethernet port speed!
C1|S16|L1P1>set ether speed 100M
C1|S16|L1P1>set ether speed 10M
```

This command does not work on a fiber port.

**Note**: Use the show ether config command to display the current speed setting of an Ethernet port.

**Set Ethernet Port Source MAC Address Lock Action**

Syntax:                        **set ether src–addr–lock action**=<xx>

Description:          Defines the action to be taken when the MAC address lock feature is enabled through the Set Ethernet Port Source MAC Address Lock Action command.

Description:          Set Ethernet Port Source MAC Address Lock command, where:   xx = valid choices are:

• discard (discard any transmissions received on the port)

• discardandnotify (discard any transmissions received on the port and send an SNMP trap to the trap server)

• shutdown (disables the port)

• all

Example:

```
C1|S5|L1P2>set ether src-addr-lock enable
C1|S5|L1P2>set ether src-addr-lock action ?
all
discard
discardandnotify
shutdown
C1|S5|L1P2>set ether src-addr-lock action=discard
C1|S5|L1P2>set ether src-addr-lock action=discardandnotify
C1|S5|L1P2>set ether src-addr-lock action=shutdown
C1|S5|L1P2>set ether src-addr-lock action=all
C1|S5|L1P2>show ether security config
Ethernet port security configuration:
----------------------------------------------------------------
Source MAC address lock:          disable
Source MAC address lock action:   discard
Filter unknown dest unicast:      enable
Filter unknown dest multicast:    enable
C1|S5|L1P2>
```

**Show Ethernet Port Configuration**

Syntax:              **show ether config**

Description:         Displays the Ethernet port configurations on a slide-in module. Different ports
capabilities vary, so the display content will vary according to the model and port type.

Example 1:           An example for a TP Port (copper port) is shown below.

```
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>
Example 2:      An example of a Fiber port is shown below.
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>
```

## Serial File Transfer Protocol (X/Y/Zmodem) Commands

Use the serial (get / put / upgrade) protocol commands to transfer a file over a serial line ((xmodem / xmodem-1k / ymodem / zmodem). These commands can only be entered at the device level (e.g., when the command line prompt is C1|S8|L1D> or similar).  These commands function similar to the TFTP download function; technical support can download configuration files and firmware files through the C3110 USB port by entering the corresponding CLI commands.

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

You can use HyperTerminal to send and receive text and data files to a remote computer. The status of the transfer is displayed in the HyperTerminal window during the transfer. The remote computer you are connected to must be using the same transfer protocol as your computer when sending or receiving files (xmodem, xmodem-1k, ymodem, or zmodem). File transfer information is usually provided once you sign into the remote system or is sent via an email from an administrator running the remote system. You can have just one connection open for each HyperTerminal session. However,; you can start multiple HyperTerminal sessions, opening a new connection for each session, as long as each connection uses a different communication port.

### Serial Get Protocol
Syntax:        **serial get protocol**={xmodem|xmodem-1k|ymodem|zmodem}
Meaning:    Sends a request to servers / local file system to download content for a subsequent put
        command.
Example:
```
C1|S1|L1D>serial ?
  get
  put
  upgrade
C1|S1|L1D>serial get protocol ?
  xmodem
  xmodem-1k
  ymodem
  zmodem
C1|S1|L1D>serial get protocol zmodem file xxxx
Warning: the input file name will be ignored when using ymodem/zmodem to re-trieve 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
  B B0  B B0  B B0  B B0  B B0
file transfer failed!
C1|S1|L1D>
```

**Serial Put Protocol**

Syntax:        **serial put protocol**=xxx

Meaning:     Sends a request to servers / local file system to upload content.

Example:

```
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**

Command: **Serial Upgrade Protocol**

Syntax:        **serial upgrade protocol**=xxx

Meaning:     Performs a firmware upgrade over the selected serial line.

Example:

```
C1|S1|L1D>serial upgrade protocol ?
  xmodem
  xmodem-1k
  ymodem
  zmodem
C1|S1|L1D>serial upgrade protocol zmodem file xxxx
now start to transfer the file  ...

**B000000063f694ceive.**B000000063f694

CCCCCCCCCCCCBB0BBBB0BBBB0BBBB0BB0BB0BB0BB0
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.

Message: Zmodem with Crash Recovery file receive for IONMM

ZMODEM timing is receiver driven.  The transmitter should not time out at all, except to abort the program if no headers are received for an extended period of time (e.g., one minute). Accurate crash recovery requires that the receiver's copy of the file match the sender's copy up to the point where the transfer was cut off. If you don't call back instantly the file may change, and simply resuming the transfer will corrupt the file. If this is a concern, choose a program that verifies the accuracy of Crash Recovery.

The X-Y-ZMODEM group of protocols allows you to transfer any kind of data on a disk drive. There are a number of technical differences between the protocols in this group, but the only thing you really need to be concerned about is to select them in reverse alphabetical order. If the system you are connecting with

will allow you to use ZMODEM, then use it. If ZMODEM isn't available, use one of the YMODEM protocols. If XMODEM is the only protocol available, use XMODEM. If other protocols are available, it is still usually best to use one of the X-Y-Z protocols.

With HTPE, for Zmodem downloads, start the download on the host and HTPE will start to receive. For downloads with other protocols, start the download on the host and then tell HTPE which file transfer protocol to use to receive. For HTPE uploads, you must tell the host to start to receive and which file transfer protocol to use, then tell HTPE what file to send using which protocol. Any of these file protocols will timeout if one side starts and doesn't get an acknowledgment from the other side after a certain period of time.

# Section 6: Specifications

The C3110 specifications are provided below.

## Cable Specifications

The physical characteristics must meet or exceed IEEE 802.3™ specifications.

**Fiber cable specifications**

| | |
|---|---|
| Bit Error Rate: | <10-9 |
| Single mode fiber (recommended): | 9 µm |
| Multimode fiber (recommended): | 62.5/125 µm |
| Multimode fiber (optional): | 100/140, 85/140, 50/125 µm |

| | |
|---|---|
| C3110-1013 | 110 850 nm multimode |
| Fiber Optic Transmitter Power: | min: -9.5 dBm   max: -4.0 dBm |
| Fiber Optic Receiver Sensitivity: | min: -17.0 dBm  max: 0.0 dBm |
| Link Budget: | 8.5 dB |

| | |
|---|---|
| C3110-1014 | 1310 nm single mode |
| Fiber-optic Transmitter Power: | min: -9.5 dBm   max: -3.0 dBm |
| Fiber-optic Receiver Sensitivity: | min: -20.0 dBm  max: -3.0 dBm |
| Link Budget: | 10.5 dB |

**Copper cable**

(Category 5 -- minimum requirement)

- Gauge = 24 to 22 AWG; Attenuation = 22.0 dB /100m @ 100 MHz
- Straight-through OR crossover cable may be used.
- Shielded twisted-pair (STP) OR unshielded twisted-pair (UTP) may be used
- All pin pairs (1&2, 3&6, 4&5, 7&8) are active in a gigabit network.
- Use only dedicated wire pairs for the active pins; e.g., blue/white & white/blue, orange/white & white/orange, etc.
- Do not use flat or silver satin wire.

## Technical Specifications

For Lantronix' Model C3110 or equivalent.

| | |
|---|---|
| Data Rate / Delay: | 1000 Mbps/300 nsec |
| Dimensions: | 3.4" x 0.86" x 6.5" (86mm x 22mm x 165mm) |
| Shipping Weight: | 1lb (453.6 g) approximately |
| Power Consumption: | 3.6W; 300mA @ 12VDC |
| Packet Size: | 10 Kbytes (maximum) |
| MTBF* | greater than 250,000 MIL-HDBK-217F hours |
| | greater than 667,500 Bellcore hours |
| Environment Tmra*: | See ION chassis specifications |
| Storage Temp: | -25 to 65°C (-13 to 149°F ) |
| Humidity: | 10% to 90%, non-condensing |
| Compliance: | CISPR/EN55022 Class A, FCC Class A, CE Mark, EN55024, |
| | NDAA Compliant, TAA Compliant |
| Warranty: | Lifetime |

*Manufacturer's rated ambient temperature: Tmra range for the C3110 depends on the Lantronix ION chassis in which the C3110 will be installed.

The fiber optic transmitters on this device meet Class I Laser safety requirements per IEC-825/CDRH standards and comply with 21 CFR1040.10 and 21CFR1040.11.

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

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

# Section 7: Troubleshooting, Compliance, and Support

## Troubleshooting

If the SIC fails, isolate and correct the fault by determining the answers to the following questions and then taking the indicated action:

**1.** Is the **PWR** (power) LED lit?

NO

• Is the SIC inserted properly into the chassis?

• Is the power cord installed properly in the chassis and at the external power source and does the external power source provide power?

• Contact Tech Support.

YES

• Proceed to step 2.

**2.** Is the **RXC** (copper link) LED lit?

NO

• Check the twisted-pair copper cables for proper connection.

• Contact Tech Support.

YES

• Proceed to step 3.

**3.** Is the **LKF** (fiber link) LED lit?

NO

• Check the fiber cables for proper connection.

• Verify that the TX and RX cables on the C3110 are connected to the RX and TX ports, respectively, on the other device.

• If the converter is connected to another C3110 via fiber, make sure that the Auto-Negotiation (DIP switch 5) is disabled (UP) in hardware mode, or disabled via software in software mode.

• Contact Tech Support.

YES

• Proceed to step 4.

**4.** Is the **RXC** (copper receive) LED flashing?

NO

• If there is activity on the 1000Base-T port, disconnect and reconnect the twisted-pair copper cable to restart the initialization process.

• Restart the workstation to restart the initialization process.

• Contact Tech Support.

YES

• Contact Tech Support.

# 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 Lantronix Technical Support Specialist.

1.  Select the C3110 **MAIN** tab. (From the CLI, use the commands needed to gather the information requested below. This could include commands such as **stat**, **show card info**, **show slot info**, **show ether config**, **show port vlan tag config**, or others as request by the TN Support Specialist.
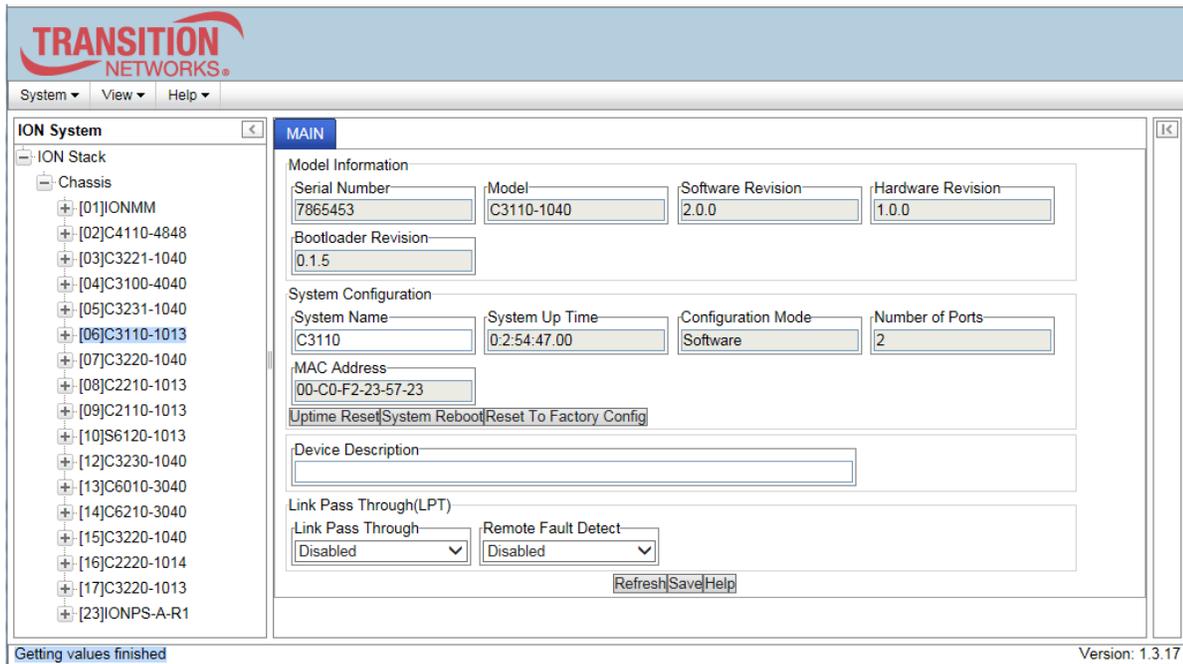


2.  Record the **Model Information** for your system.

Serial Number: _____        Model: _____

Software Revision: _____        Hardware Revision: _____

Bootloader Revision: _____

3.  Record the **System Configuration** information for your system.

System Uptime: _____        Configuration Mode: _____

Number of Ports: _____        MAC Address: _____

Device Description: _____

4.  Provide additional Model and System information to your Technical Support Specialist:

Your Lantronix service contract number: _____

A description of the failure: _____
_____
_____

A description of any action(s) already taken to resolve the problem (e.g., change switch mode, reboot, etc.):
_____
_____
_____

The serial and revision numbers of all involved Lantronix 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: _____

# Compliance Information

**FCC regulations**

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 the user's own expense.

**Canadian regulations**

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out on the radio interference regulations of the Canadian Department of Communications.
Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

**European regulations**

**Warning**: This is a Class A product. In a domestic environment this product may 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 is 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, Lantronix 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 EGMitgliedstaaten 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

Manufacture's Name: Lantronics, Inc.
Manufacture's Address: 48 Discovery, Suite 250, Irvine, California 92618 USA

Declares that the product(s): C3110 Series SICs: C3110-1013, C3110-1039, C3110-1024, C3110-1014, C3110-1040, C3110-1029-A1, C3110-1029-A2

Conform to the following Product Regulations:

EMC Directive 2004/108/EC; EN 55022:2006+A1:2007 Class A

EN55024:1998+A1:2001+A2:2003; EN61000-2-3; EN61000-3-3; CFR Title 47 Part 15 Subpart B Class A. Low Voltage Directive: 2006/95/EC; IEC 60950-12005; DFR Title 21 Section 1040.10 Class I.

With the technical construction on file at the above address, this product carries the CE Mark

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Place: Irvine, California

Date: June 23, 2023

Signature: *Eric Bass*

Full Name: Eric Bass
Position: Vice President of Engineering