LANTRONIX®

x6310 ION POTS Media Converters

POTS 2-Wire Copper-to-Fiber

Install Guide

Part Number 33818
Revision A March 2022

Intellectual Property

Warranty

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

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Disclaimer

Revision History

Date	Rev.	Comments
3/7/22	A	Initial Lantronix release at FW Version 2.0.0 Bootloader v 0.1.10, Hardware 1.0.0, FPGA rev 1.0.1. IONMM FW v 1.5.0 or above is required.

Contents

1   Product Description

Lantronix x6310 Series ION POTS Media Converters are used to connect central-office voice grade signals to distant POTS equipment over fiber using standard telephone signaling. They allow legacy analog phone lines to be extended over fiber, for both permanent installations as well as temporary job-site installations.

The **C6310** installs in an ION chassis. The **S6310** is a stand-alone media converter.

Both modules provide an interface between a twisted pair RJ-11 port and a fiber port, allowing users to connect central-office voice grade signals to distant Plain Old Telephone equipment (POTS) utilizing standard telephone signaling. Two units are required to implement an end to end system. The first unit connects to a telephone line or PBX and is configured to act as a telephone (FXO Mode) and can detect ringing voltages. The second unit is the reciprocal unit and is configured to have the ability to act as a Central Office and connects to a telephone device (FXS Mode).

Ordering Information

Model #	Description
C6310-3340	Chassis card media converter; twisted Pair (RJ-11) (5 km/3.1 mi.) to open SFP Slot. Fiber Type, Optical Wavelength, Transmission Distance, and Link Budget all based on selected SFP module. Must be used in pairs.
S6310-3340	Stand-alone media converter; twisted Pair (RJ-11) (5 km/3.1 mi.) to Open SFP Slot. Fiber Type, Optical Wavelength, Transmission Distance, and Link Budget all based on selected SFP module. Power Supply Included. To order the corresponding country specific power supply, add the extension to the end of the SKU; e.g., S6310-3340-NA = North America, LA = Latin America, EU = Europe, UK = United Kingdom, SA = South Africa, JP = Japan, OZ = Australia, BR = Brazil. Must be used in pairs.
Optional Accessories (Order Separately)	
SPS-UA12DHT	Industrial Power Supply option (sold separately). Input: 90 ~ 264 VAC; Output: 12 VDC, 1.3A, 18 Watts. See the SPS-UA12DHT webpage.
SFP Modules	Supports any standard 1GbE SFP modules. Optional Accessories (sold separately). Note: Fiber Type, Optical Wavelength, Transmission Distance, and Link Budget all based on selected SFP module.

Related Documentation

ION system and related manuals are listed below.
1. ION Management Module (IONMM and IONMM-232) User Guide, 33457
2. ION219-A 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. SPS-2460-xx User Guide, 33455
8. Release Notes (version specific)

x6310 Features

- Audio transmission of voice grade signals
- Supports ringing at distant end
- Supports Caller ID
- Configurable worldwide country formats
- Must be deployed in pairs:
  - ION chassis card and stand-alone unit
  - ION chassis card and ION chassis card
  - Stand-alone unit and stand-alone unit
- Single product configurable to FXO Mode or FXS Mode
- Automatic Ring Down supported when both converters are configured to FXS Mode
- SFP based product:
  - Uses Gigabit Ethernet SFP Modules
  - Lantronix offers a wide variety of SFP modules to support multimode or single-mode fiber, as well as dual or single strand fiber installations
- SNMP Management supported when installed in a managed ION chassis
- Supports remote management of paired unit, in-band, over the fiber
- Electrical interface is provided through an RJ-11 female connector
- Field upgradeable firmware
- Only supports analog POTS lines
- Compatible with traditional telephone modems

x6310 Specifications

Standards	FCC Part 68 ETSI ES 203-021 (TBR21) ISED CS-03
Analog Port	RJ11 Connector
FXS Mode	Impedance: 600 ohms REN: 1.0 Ring Cadence: 25 Hz
FXO Mode	Impedance: 600 ohms Battery Source: 48 VDC +/- 5V Ringing Supply: 90Vp-p Ring Frequency: 16-65 Hz
DIP Switches	DIP switches to set the Emulation Mode and Region Codes: SW1 Up = FXO; Down = FXS SW2 Up = Normal; Down = FXS Reversed SW3 Up = U-Law; Down = A-Law SW4 not used SW5 – SW8 Country Code Select

Status LEDs	Pwr: On = power is on FL: On = fiber link is up ACTC: On = Off -Hook, Blink = Ringing, Off = On-Hook
Dimensions	Width: 0.86" (22 mm) x Depth: 6.5" (165 mm) x Height: 3.4" (86 mm)
Power Consumption	2.0 Watts without the SFP
Power Supply	S6310: External AC/DC provided; 12 VDC, 1.25A Output; Unregulated, UL Listed
Environment	Environment specs are dependent on the chassis chosen Operating Temp: 0 to 50 degrees C Storage Temp: -40 to +85 degrees C Humidity: 5% to 95% (non-condensing) Altitude: 0 - 10,000 ft.
Weight	1 lb. [0.45 kg]
Compliance	Emissions: EN55032 Class A, FCC Part 15 Class A Immunity: EN55024 Safety: CE Mark
Warranty	Lifetime

C6310 Product Views

S6310 Product Views

Package Contents

Unpack the contents of the x6310 package and verify them against the checklist below. Contact your sales representative if any item is missing or damaged. See the ION x6310 webpage for optional accessories, features, specifications, ordering information, etc.

- ☐ One C6310 Slide-In-Card in Anti-static bag **or** one S6310 Stand-alone Converter
- ☐ One Insert Card
- ☐ Four Rubber Feet (S6310 only)

Optional accessories may be packaged separately.

Application Examples

FXO Setup

Central Office (CO/PSTN or PBX)	**Copper**	ION Chassis with C6310 or Stand-alone S6310 in FXO mode	**Fiber**	ION Chassis with C6310 or Standalone S6310 In FXS mode	**Copper**	Analog Phone

FXS and FXS-R Setup

Analog Phone	**Copper**	ION Chassis with C6310 or Standalone S6310 FXS mode	**Fiber**	ION Chassis with C6310 or Standalone S6310 In FXS-R mode	**Copper**	Analog Phone
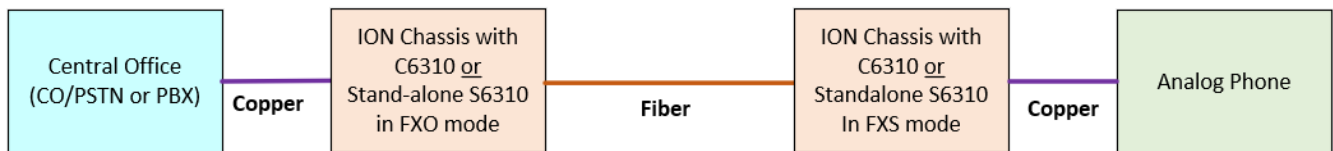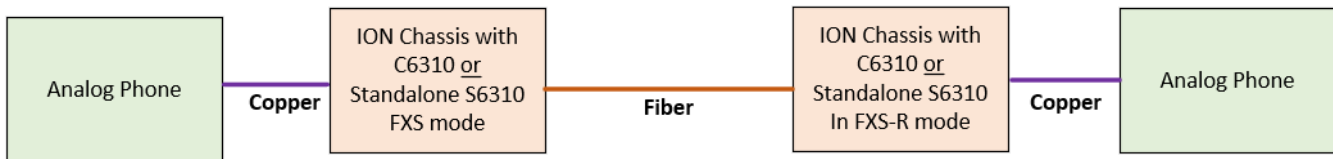
2   Installation

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when setting the jumpers. Failure to observe this caution could result in damage to or failure of the module.

PC Board Layout

The PCB is shown below.

3-Up LED (Green, Green-Yellow, Green-Yellow)

SFP Cage

RJ-11 Connector

DIP Switch SW1

DIP Switch SW8

DIP Switch Settings

SW1: UP=FXO, DOWN=FXS

SW2: UP=Normal, DOWN=FXS-R

SW3: UP=µ-Law (North America and Japan), DOWN=A-Law (Europe and other countries)

SW4: Not used

SW5-SW8: Country code select:

- Must be set when in FXO mode and attached to a CO-PSTN
- For FXS and FXS-R modes set to region 1 (All UP)

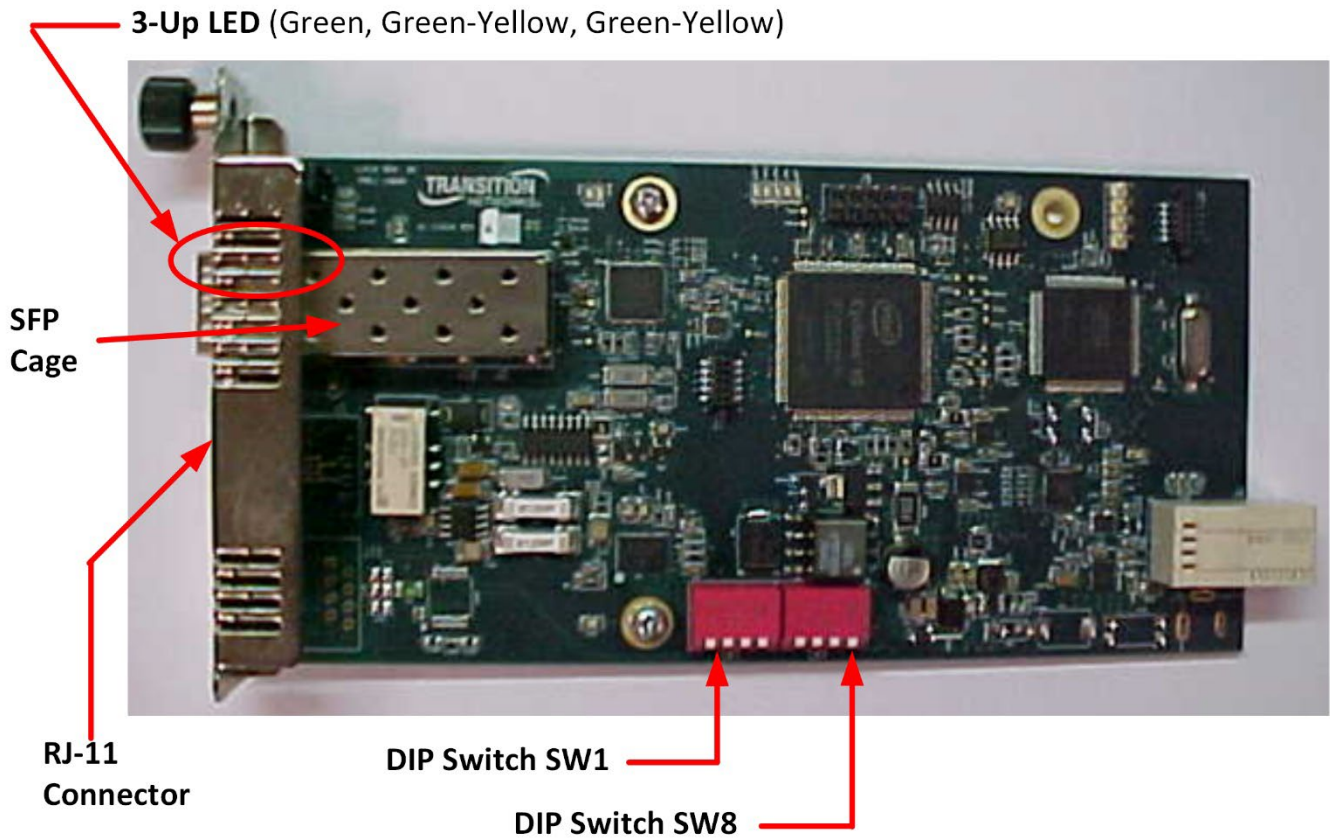| Region	SW5 - SW8 UP=1, DOWN=0	Country
1	1111	Argentina, Canada, Chile, Colombia, Ecuador, El Salvador, Guam, Hong Kong, India, Indonesia, Kazakhstan, Kuwait, Macao, Mexico, Peru, Russia, Saudi Arabia, Singapore, Taiwan, UAE, USA, Yemen
2	1110	TBR21: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, Vietnam
3	1101	Austria, Bahrain, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Finland, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Luxembourg, Malta, Morocco, Netherlands, Nigeria, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland
4	1100	United Kingdom
5	1011	Japan
6	1010	Australia
7	1001	Brazil
8	1000	South Korea
9	0111	Jordan, Malaysia, Oman, Pakistan, Philippines, Thailand
10	0110	New Zealand
11	0101	China
12	0100	Bulgaria
13	0011	South Africa

Installing the Chassis Model (C6310)

The C6310 is a slide-in module that can only be installed in a Lantronix ION chassis (ION001-x, ION106-x, and ION219-x). This section describes how to install the C6310 in the ION chassis.

⚠️ **Caution**: Failure to wear a grounding device and observe electrostatic discharge precautions when installing the C6310 could result in damage or failure of the module.
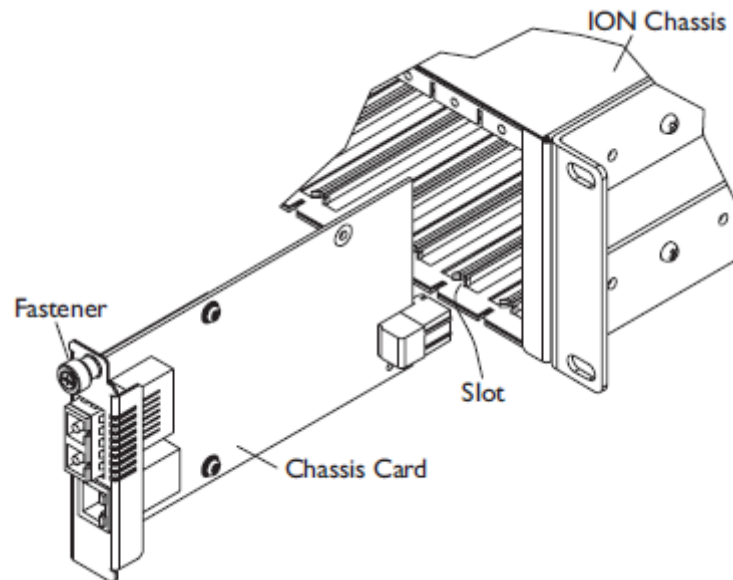
Chassis Installation

Important: The C6310 slide-in cards are "hot swappable" devices and can be removed and installed with chassis power on.

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

Installing SFPs

The ION x6310 lets you install a Gigabit Ethernet Small Form-Factor Pluggable (SFP) device of your choice in order to make a fiber connection. See the Lantronix SFP page for models, safety precautions, and warnings specific to your SFP model. See the related SFP manual for more information.

Note: Do not remove and replace the SFP modules more often than necessary; excessive SFP removing and replacing can shorten the SFPs useful life.
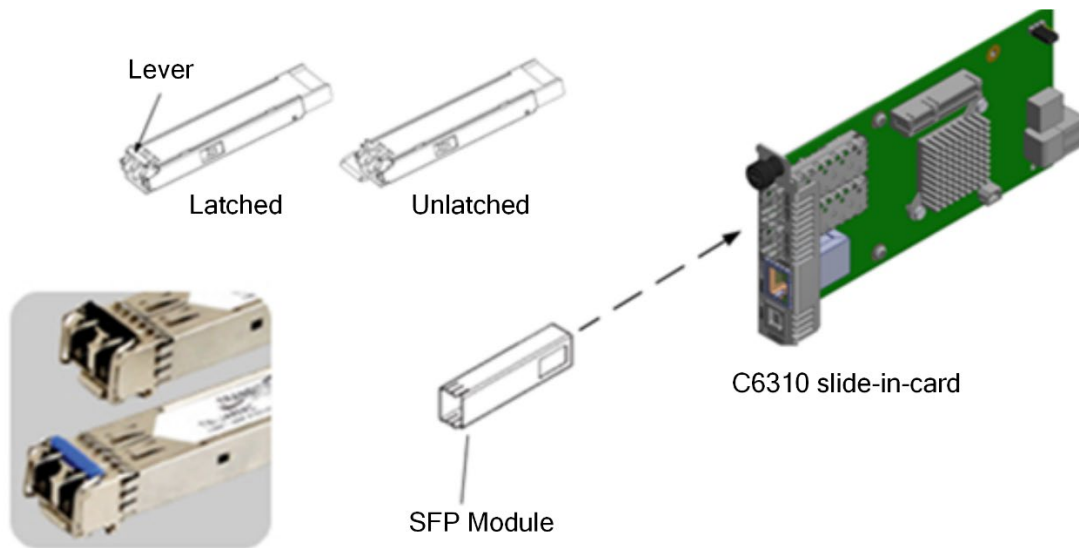
SFP Installation

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

Removing SFPs

Caution: Be careful when removing the SFP from a device. Some SFP transceiver module temperatures may exceed 160°F (70°C) and be too hot to touch with bare hands.

POTS Module Configurations

The x6310 Series is a stand-alone or ION chassis media converter that provides an interface between a twisted pair RJ-11 port and a fiber port, allowing users to connect central-office voice grade signals to distant Plain Old Telephone equipment (POTS) utilizing standard telephone signaling. The x6310 is configurable to FXS Mode or FXO Mode.

Standard Configuration

In a standard configuration, the FXO Mode converter connects to the Central Office (CO) or PBX while the FXS Mode converter connects to the analog phone.

Install Fiber Cable

1. Locate a fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to FXS Mode module 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 FXS Mode module 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 Copper Cable

1. Locate a copper cable with male RJ-11C connectors installed at both ends.
2. Connect the copper cable to the FXO Mode module as described:
   - Connect the RJ-11C connector at one end of the cable to the RJ-11C port.
   - Connect the RJ-11C connector at the other end of the cable to the RJ-11C telephone line wall jack or FXS.
3. Connect the copper cables to the FXO Mode module as described:
   - Connect the RJ-11C connector at one end of the cable to the RJ-11C port.
   - Connect the RJ-11C connector at the other end of the cable to the RJ-11C port on the telephone terminal equipment or FXO.

Automatic Ring-down Configuration

Automatic Ring Down (ARD) is a dedicated, point-to-point voice system. When one telephone is taken off-hook, the other telephone rings without the need to dial. Two modules connected via the fiber ports (a telephone device at each end) is the requirement for this configuration. Automatic Ring Down is supported when both converters are configured to FXO Mode. Automatic Ring Down is also supported when both converters are configured to FXS Mode. **Note**: Both modules MUST be configured for Automatic Ring-Down.

Install Fiber Cable

1. Locate or build fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to the first FXO Mode module 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 second FXO Mode module 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 Copper Cable

1. Locate or build copper cables with male RJ-11C connectors installed at both ends.
2. Connect the copper cables to both FXO Mode modules as described:
   - Connect the RJ-11C cable connector to the RJ-11C port on the FXO Mode module.
   - Connect the other end of the cable to the RJ-11C port on the analog phone telephone terminal equipment (FXO Mode module).
3. Connect the copper cables to the second (FXO Mode) module as described in step 2.

3   Operation

Power the S6310 Module

Note: The external AC power supply provided with this product is UL listed by the power supply's manufacturer. See the [SPS-UA12DHT webpage.](SPS-UA12DHT)

Loop-Start Operation

Loop-start service ('Plain Old Telephone Service' or POTS) is the primary analog signaling method used between telephone switches such as the Central Office (CO) and a telephone device. Loop-Start provides a way to indicate on-hook and off-hook conditions, which facilitates outgoing and incoming calls in a voice network.

When a customer wants to make an outgoing call, the customer takes a telephone device off-hook. This action completes the loop, which signals the CO that a customer desires to use the telephone line. To signal the customer of an incoming call, the CO applies a ring voltage to alert the customer.

The three states of the Loop-Start signaling protocol are described below:

Idle State (On-hook)

1. The CO applies a battery voltage to the ring lead and monitors the tip-ring current for closure of the tip-ring.
2. The telephone device draws less than 10 µA of current from the line.

Telephone In-use (Off-hook)

1. The customer takes the telephone device off-hook, drawing a minimum of 20 mA of current.
2. The CO senses the tip-ring current and issues a dial tone on the line.
3. Communication can now begin.

Central Office (CO) Rings the Telephone

1. The CO places an AC pulse-ringer voltage on top of the -48VDC ring lead signal.
2. The telephone device uses the AC pulse-ringer voltage to operate the ringer, which alerts the customer of an incoming telephone call.
3. The customer takes the phone off-hook, which closes the tip-ring connection and allows the tip-ring current to flow.
4. The CO senses the DC current level and connects the call to the telephone line.
5. Communication can now begin.

Copper Cable—Category 1

ISO/IEC 11801; TIA/EIA 568-B Standards
Cable types: Shielded (STP) or unshielded (UTP) twisted pair is acceptable.
Maximum Cable Length: 5 km (3.1 mi)

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

Software Installation and Operation

Remote Management

The C6310 slide-in card (SIC) can remotely manage the stand-alone (SA) S6310. For example, a local C6310 converter (that is installed in a managed Lantronix ION System chassis) is connected via fiber, to a remote S6310 converter. The ION x6310 can be managed with SNMP, the ION Command Line Interface (CLI) or the ION Web GUI.

For CLI see CLI Commands on page 16.

For Web UI see Web UI Operation on page 19.

The C6310 is manageable in the ION chassis, while the SA cannot be managed on its own. Management of the remote converter (SA or SIC), in band, over the fiber, by the local chassis based managed converter is supported.

The x6310 converters can be deployed as follows:
- SA to SA   No Management of local or remote
- Card to SA   Local SIC manages remote SA
- Card to Card   Local SIC manages remote SIC

Note: See the IONMM User Guide for information on how to Install the USB Driver, Configure HyperTerminal, Starting a USB Session in HyperTerminal, Terminating a USB Connection from HyperTerminal, Access via an Ethernet Network, Starting a Telnet Session, Terminating a Telnet Session, and Initial Setup with a Static IP Address via the CLI.

Firmware Upgrade (C6310 SIC Only)

The C6310 firmware can be upgraded in the field. See the IONMM User Guide for details.

CLI Commands

General

This section describes the Command Line Interface (CLI) commands available for x6310 operations. These commands are for experienced network administrators who are responsible for configuring and maintaining the ION system.

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

Note: CLI commands are case sensitive. Enter the CLI commands as shown. 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 $\boxed{\text{Tab} \leftarrow}$ key or the **?** key to show available commands in a category of commands after entering a part of the command.

For example, use the $\boxed{\text{Tab} \leftarrow}$ 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
```

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.

Commands Effect on Stored Files

Note: Certain CLI commands affect important stored files. Doing a reboot, restart or upgrade of the C6310, a power restart of the chassis, or a reset to factory defaults will remove temporary files (e.g., configuration backup files, Syslog file). A Factory Reset also removes the permanent settings (e.g., configuration files, HTTPS certification file, SSH key). The following CLI commands can cause a loss of files:

- reboot : warm start the system.
- reset : reset factory configuration.

See the specific command description for additional information.

Command: **show card info**

Description: Display card information.

Syntax: **show card info** <cr>

Parameters: None

Example:

```
ION219-TestLab C1|S18|L1D>go s=11 l1d
ION219-TestLab C1|S11|L1D>show card info
System name:
Uptime:             22:38:12
MAC:                00-c0-f2-8f-81-40
Number of ports:    2
Serial number:      4545
Config mode:        software
Software:           2.0.0
Bootloader:         0.1.10
Hardware:           1.0.0
FPGA rev:           1.0.1
ION219-TestLab C1|S11|L1D>
```

Command: **show pots status**

Description: Display device's current POTS status.

Syntax: **show pots status** <cr>

Parameters: None

Example:

```
ION219-TestLab C1|S11|L1D>show pots status
C6310 Emulation Mode:          FXO
C6310 Country Code:            Region 1 (USA)
ION219-TestLab C1|S11|L1D>
```

Command: **show pots port status**

Description: Display current POTS port status.

Syntax: **show pots port status** <cr>

Parameters: None

Example:

```
ION219-TestLab C1|S11|L1D>go c=1 s=11 l1p=1
ION219-TestLab C1|S11|L1P1>show pots port status
POTS Hook Status:                 OnHook
ION219-TestLab C1|S11|L1P1>
```

Command: **show ether config**

Description: Display current ethernet configuration.

Syntax: **show ether config** <cr>

Parameters: None

Example:

```
ION219-TestLab C1|S11|L1P1>show ether config
Port-13340
TP port:
-------------------------------------------------
Link operation status:        up
Port mode:                    RJ-11
ION219-TestLab C1|S11|L1P1>go c=1 s=11 l1p=2
ION219-TestLab C1|S11|L1P2>show ether config
Port-23340
FIBER port:
-------------------------------------------------
Link operation status:        up
Port mode:                    SFP Slot
Speed:                        1Gb

ION219-TestLab C1|S11|L1P2>
```

Command: **show system information**

Description: Display current system information.

Syntax: **show system information** <cr>

Parameters: None

Example:

```
ION219-TestLab C1|S11|L1D>show system information
system descr:                     The C6310 of the Transition networks ION
 (Chassis Generation III) platform products
system objectID:                  1.3.6.1.4.1.868.2.5.1313818912
system uptime:                    22:39:50
system contact:
system name:
system location:
ION219-TestLab C1|S11|L1D>
```

Web UI Operation

Starting the Web Interface

The ION system supports the current version of most popular web browsers (e.g., Firefox, Edge, Chrome). A Web session can be used to connect to and set up the C6310 via the IONMM.

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

To sign in to the C6310 via the Web:

1. Open a web browser.
2. In the address (URL) block, type the IP address of the C6310 (the default address 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 a User Name of up to 64 characters; the default is **ION** (all upper case letters).
5. Type the Password (the default is **private** all lower case letters).
6. Click the Sign in button or press the Enter key. 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 C6310. The C6310 MAIN screen displays.
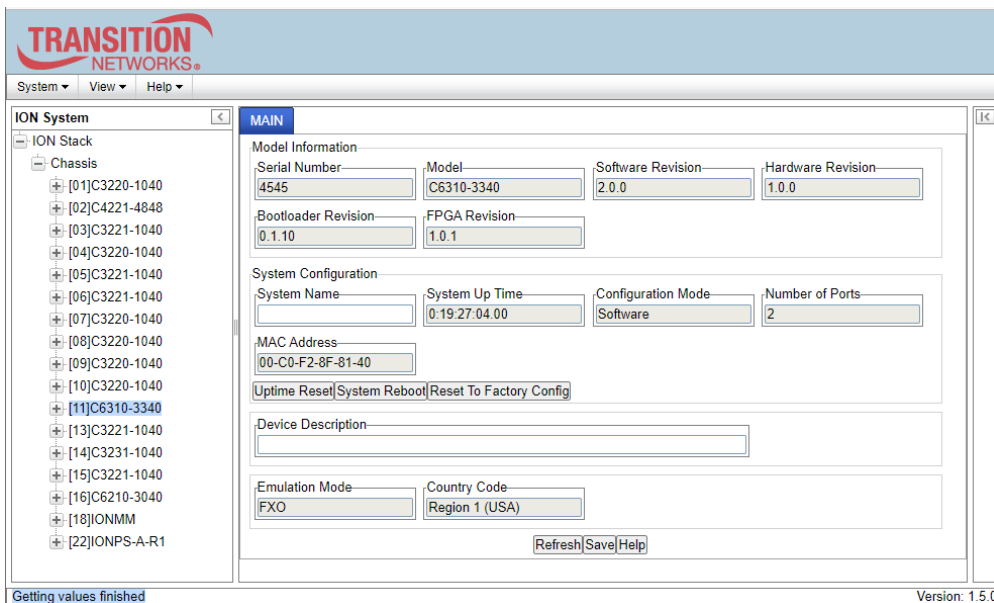
10. You can configure the C6310 device and ports. See the following section for configuration information.
11. Click the plus sign [+] next to C6310 to unfold the C6310 ports.

Note that the ION system supports up to three levels of device discovery (two remote and one local).

Continue with the "Setting Up the IP Configuration" section in the IONMM User Guide.

Terminating the Web Interface

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

1. Click System.
2. Click Sign out. The ION sign in screen displays.

C6310 MAIN Tab

The chassis device (C6310) MAIN tab parameters are shown and described below. Note that read-only parameters are greyed out.

Parameter descriptions:

Model Information

Serial Number: The device serial number (e.g., 4545).

Model: The device model # (e.g., C6310-3340).

Software Revision: The current version of device software (e.g., 2.0.0).

Hardware Revision: The current version of device hardware (e.g., 1.0.0).

Bootloader Revision: The current device bootloader version (e.g., 0.1.10).

FPGA Revision: The current device Field Programmable Gate Array version (e.g., 1.0.1).

System Configuration

System Name: Field to enter a descriptive name for the device.

System Up Time: The amount of time that the device has been running in days:hours:minutes:seconds:tenths of a second format (e.g., 1:19:41:41.00).

Configuration Mode: The current operating mode of the device (i.e., Software or Hardware). The default is Software mode.

Number of Ports: The number of ports supported by this device (e.g., 2).

MAC Address: The device's MAC address in the format 11-22-33-44-55-66.

Buttons (Model Information section):

Uptime Reset: Click to reset (zero out) the System Up Time field.

System Reboot: Click to reboot the device.

Reset to Factory Config: Click to reset the device to its factory default settings.

Device Description: Entry field for optional descriptive text. The default is a blank field.

Emulation Mode: Displays the emulation mode as set by hardware DIP Switch (FXS, FXS-R, or FXO).

> **FXS**: Foreign exchange station mode of operation. This unit connects to a telephone line or PBX and acts as a telephone (FXS Mode module) and can detect ringing voltages.
>
> **FXS-R**: FXS-Reverse mode of operation. FXS is "Line mode" and FXS-R is "Line mode reversed".
> If one phone is connected directly to the local C6310, and another phone is connected directly to the remote S6310, one must be in FXS mode and the other must be in FXS-R mode.
>
> **FXO**: Foreign exchange office mode of operation. This unit is the reciprocal unit acting as a Central Office (CO) connected to a telephone device (FXO Mode module).

Country Code: Displays the region selected via DIP switch. The default is Region 1 (USA). See "8-Position DIP Switch" on page 10.

Buttons:

Refresh: Click to update the page data.

Save: Click to save any parameter changes to the running-config file.

Help: Click to display the related online Help page.

C6310 POTS Port 1 MAIN Tab

The chassis device (C6310) POTS Port 1 MAIN tab parameters are shown and described below. Note that read-only parameters are greyed out.

Parameter descriptions:

Circuit ID : Entry field for the port circuit ID.

Port Configuration

Hook Status : The current Hook status (OnHook or OffHook).

Connector Type : The current type of connector (RJ-11).

Buttons:

Refresh: Click to update the page data.

Save: Click to save any parameter changes to the running-config file.

Help: Click to display the related online Help page.

C6310 Fiber Port 2 MAIN Tab

The chassis device (C6310) Fiber Port 2 MAIN tab parameters are shown and described below. Note that read-only parameters are greyed out.

Parameter descriptions:

Circuit ID : Entry field for the port circuit ID.

Port Configuration

Link Status : The current Link status (Up or Down).

Connector Type : The current type of connector (SFP Slot).

Fiber Speed : The current speed of Fiber Port 2 (e.g., 1Gb).

Buttons:

Refresh: Click to update the page data.

Save: Click to save any parameter changes to the running-config file.

Help: Click to display the related online Help page.

Remote S6310 Fiber Port 2 MAIN Tab

The standalone device (S6310) MAIN tab parameters are shown and described below. Note that read-only parameters are greyed out.

Parameter descriptions:

<u>Model Information</u>

Serial Number: The device serial number (e.g., 8787).

Model: The device model # (S6310-3340).

Software Revision: The current version of device software (e.g., 2.0.0).

Hardware Revision: The current version of device hardware (e.g., 1.0.0).

Bootloader Revision: The current device bootloader version (e.g., 0.1.10).

FPGA Revision: The current device Field Programmable Gate Array version (e.g., 1.0.1).

<u>System Configuration</u>

System Name: Field to enter a descriptive name for the device.

System Up Time: The amount of time that the device has been running in days:hours:minutes:seconds:tenths of a second format (e.g., 1:19:41:41.00).

Configuration Mode: The current operating mode of the device (i.e., Software or Hardware). The default is Software mode.

Number of Ports: The number of ports supported by this device (e.g., 2).

MAC Address: The device's MAC address in the format 11-22-33-44-55-66.

Device Description: Entry field for optional descriptive text. The default is a blank field.

Emulation Mode: Displays the emulation mode as set by hardware DIP Switch (FXS, FXS-R, or FXO).

> **FXS**: Foreign exchange station mode of operation. This unit connects to a telephone line or PBX and acts as a telephone (FXS Mode module) and can detect ringing voltages.

> **FXS-R**: FXS-Reverse mode of operation. FXS is "Line mode" and FXS-R is "Line mode reversed".
> If one phone is connected directly to the local C6310, and another phone is connected directly to the remote S6310, one must be in FXS mode and the other must be in FXS-R mode.

> **FXO**: Foreign exchange office mode of operation. This unit is the reciprocal unit acting as a Central Office (CO) connected to a telephone device (FXO Mode module).

Country Code: Displays the region selected via DIP switch. The default is Region 1 (USA). See "8-Position DIP Switch" on page 10.

Buttons :

Uptime Reset: Click to reset (zero out) the System Up Time field.

System Reboot: Click to reboot the device.

Reset to Factory Config: Click to change the device's configuration back to its factory default settings.

Refresh: Click to update the page data.

Save: Click to save any parameter changes to the running-config file.

Help: Click to display the related online Help page.

Remote S6310 Fiber Port 2 MAIN Tab

The Port 2 MAIN tab parameters are shown and described below. Note that read-only parameters are greyed out.
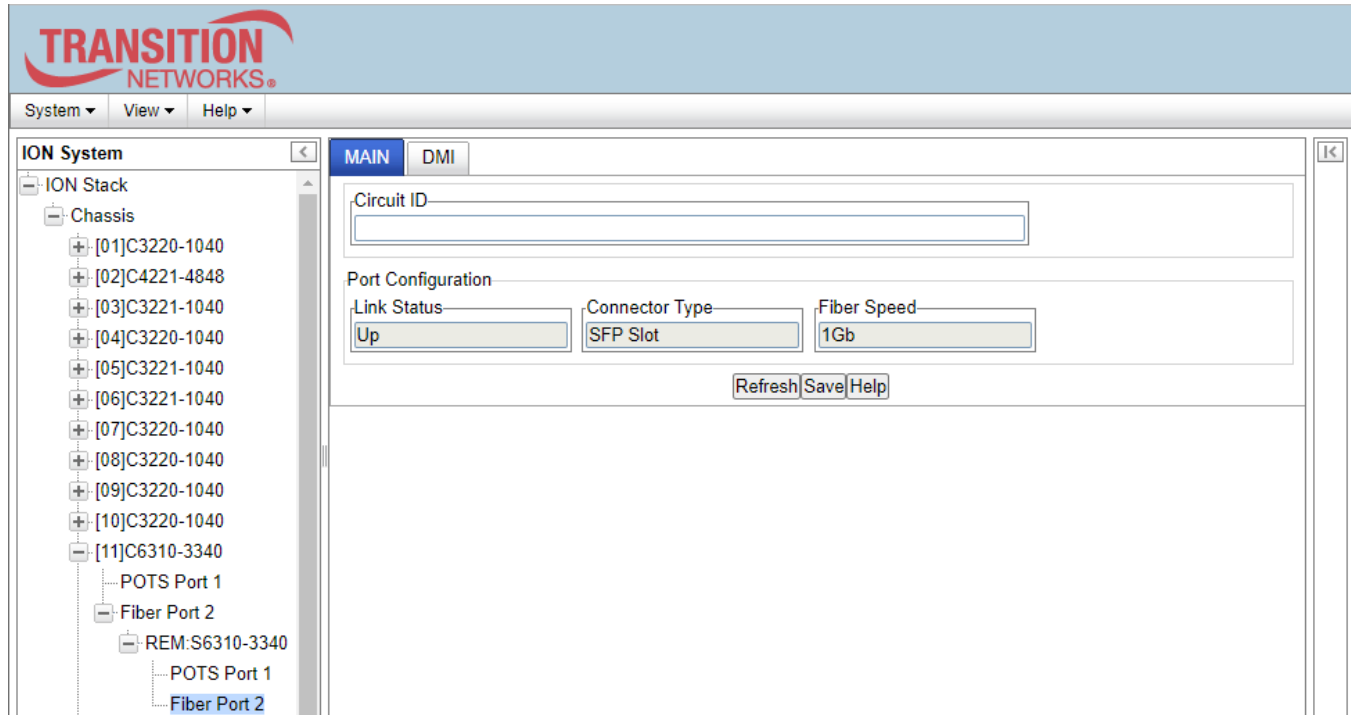
Parameter descriptions:

Circuit ID: Entry field for the port circuit ID.

Link Status: The current port link status (Up or Down).

Connector Type: The current port connector type (SFP Slot).

Fiber Speed: The current port Fiber speed (e.g., 1Gb).

Buttons:

Refresh: Click to update the page data.

Save: Click to save any parameter changes to the running-config file.

Help: Click to display the related online Help page.

Remote S6310 Fiber Port 2 DMI Tab

This page lets you view and configure port-level parameters the Diagnostic Monitoring Interface for the fiber interface. The DMI (Diagnostic Monitoring Interface) function displays NID diagnostic / maintenance information such as fiber interface characteristics, diagnostic monitoring parameters, and supported fiber media lengths. **Note**: If the message "*ALARM: Receive power is below specified threshold. Fiber trap intrusion may be in progress.*" displays, follow your organization's policy and procedure for intrusion detection.

DMI can be configured in the NID using either the CLI or Web method. The Fiber Port 2 DMI tab parameters are shown and described below. Note that read-only parameters are greyed out.
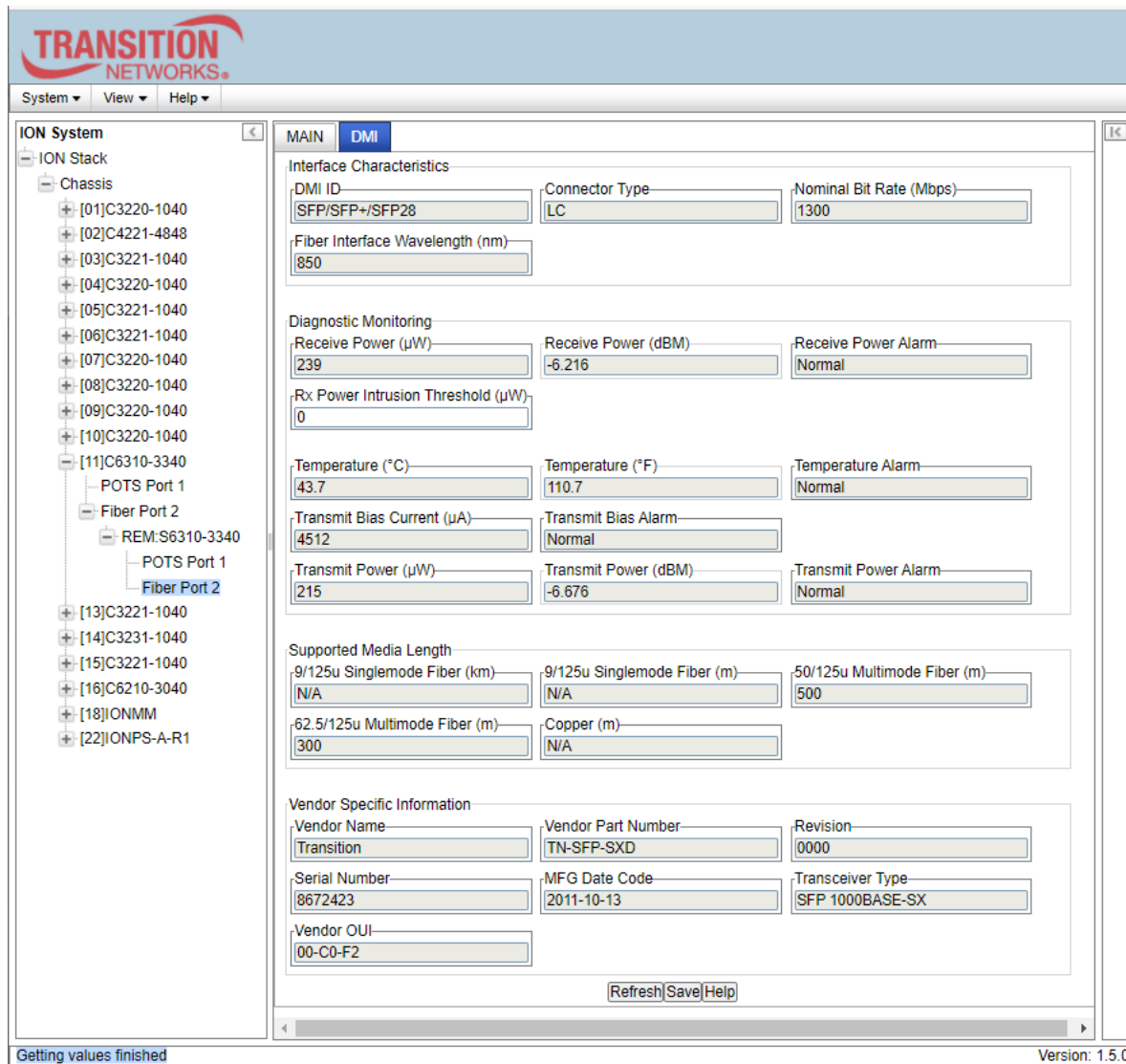
The Interface Characteristics, Diagnostic Monitoring, and Supported Media Length information sections display. See the table below for individual field / parameter descriptions.

1. Change the "**Rx Power Intrusion Threshold**" setting as desired. The default is 0 uW. The valid range is 0 - 65,535 uW (microwatts).

2. You can click the **Refresh** button to update the information displayed.

3. Click the **Save** button to save the updated information.

DMI Parameter descriptions:

Parameter	Associated MIB variable	Description
Interface Characteristics		
DMI ID	ionDMIId(8)	Specifies the physical DMI device ID from the standard; for example: SFP/SFP+/SFP28, SG, Optical pigtail, SFP, 300-pin XBI , XENPAK, XFP, XFF, XFP-E, XPAK, X2, DWDM-SFP/SFP+, QSFP, QSFP+, CXP, Copper Pigtail, RJ45 (Registered Jack), No separable connector, etc.
Connector Type	ionDMIConnectorType(1)	The external optical or electrical cable connector provided as the interface. For example: LC, SC, Dual BNC coax connectors, DB9 for RS232 and RS485, RJ-11, unshielded twisted pair, SC fiber, 1550nm 40km, SC fiber, 1 x 9, 125km Gigiabit, ST Single-Fiber 155Mbps, LC Multimode Fiber, SFP cage, Single-Fiber Multimode, SC Multimode (long haul), LC Singlemode (long haul), XFP slot, SFP+ slot, etc. See below.
Nominal Bit Rate (Mbps)	ionDMIBitRate(2)	Bitrate in units of 100Mbps (for example: 10500, or 10.G Gbps) (measured rate).
Fiber Interface Wavelength (nm)	ionDMILaserWavelength(9)	The Nominal transmitter output wavelength at room temperature (measured wavelength). The unit of measure is nanometers (for example: 1550 nm or 850 nm).
Diagnostic Monitoring		
Receive Power (uW)	ionDMIRxPowerLevel(16)	Receive power (measured power measurement) on local fiber measured in microwatts (for example: 11 µW).
Receive Power (dBM)	ionDMIRxPowerLevel(16)	Receive power (measured signal strength) on local fiber measured in dBM (decibels relative to one milliwatt) which defines signal strength. For example: -19.586 dBM.
Receive Power Alarm	ionDMIRxPowerAlarm(17)	Alarm status for receive power on local fiber: Normal -1, Not Supported - 2, Low Warn - 3, High Warn - 4, Low Alarm - 6 High Alarm - 7
Rx Power Intrusion Threshold (uW)	ionDMIRxPwrLvlPreset(18)	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 (0-10). The message displays: *ALARM: Receive power is below specified threshold. Fiber trap intrusion may be in progress*. **Note**: C4110 port 2 DMI data is not shown if there is no SFP in port 1. Without an SFP in port 1, the port 2 DMI will display "*The DMI feature is not supported on the current port.*". When an SFP is inserted into port 1, the port 2 DMI displays as expected. To recover, insert an SFP in Port 1 and click the **Refresh** button.

Parameter	Associated MIB variable	Description
Temperature (ºC)	ionDMITemperature(10)	Measured temperature of fiber transceiver in tenths of degrees C (Celsius). For example: 30.1(ºC).
Temperature (ºF)	ionDMITemperature(10)	Measured Temperature of fiber transceiver in tenths of degrees F (Fahrenheit). For example: 86.2 ºF.
Temperature Alarm	ionDMITempAlarm(11)	Alarm status for temperature of fiber transceiver. An *ionDMITemperatureEvt* event is sent when there is a warning or alarm on DMI temperature. Normal -1, Not Supported - 2, Low Warn - 3, High Warn - 4, Low Alarm - 6 High Alarm - 7
Transmit Bias Current (uA)	ionDMITxBiasCurrent(12)	Measured transmit bias current on local fiber interface, in µA (microamperes). For example, 5936 µA (microamps).
Transmit Bias Alarm	ionDMITxBiasAlarm(13)	Alarm status for transmit bias current on local fiber interface. Normal -1, Not Supported - 2, Low Warn - 3, High Warn - 4, Low Alarm - 6 High Alarm - 7
Transmit Power (uW)	ionDMITxPowerLevel(14)	Measured transmit power on local fiber measured in microwatts. For example, 240 µW (microwatts).
Transmit Power (dBM)	ionDMITxPowerLevel(14)	Transmit power on local fiber measured in dBM (decibels relative to one milliwatt) which defines signal strength. For example: -2.291 dBM.
Transmit Power Alarm	ionDMITxPowerAlarm(15)	Alarm status for transmit power on local fiber. Normal -1, Not Supported - 2, Low Warn - 3, High Warn - 4, Low Alarm - 6 High Alarm - 7

Supported Media Length		
9/125u Singlemode Fiber (km)	ionDMILenFor9x125umKM(3)	Specifies the link length that is supported by the transceiver while operating in single mode (SM) fiber. The unit of measure is kilometers (km). For example, 8Km.
9/125u Singlemode Fiber (m)	ionDMILenFor9x125umM(4)	Specifies the link length that is supported by the transceiver while operating in single mode (SM) fiber. The unit of measure is meters (m). For example, 80m.
50/125u Multimode	ionDMILenFor50x125um10M(5)	Specifies the link length that is supported by the transceiver while operating in 50 micron Multimode (MM)

Fiber (m)		fiber. The value is in meters.
62.5/125u Multimode Fiber (m)	ionDMILenFor625x125um10M(6)	Specifies the link length that is supported by the transceiver while operating in 62.5 micron Multimode (MM) fiber. The value is in meters.
Copper (m)	ionDMILenForCopper(7)	Specifies the link length that is supported by the transceiver while operating in copper cable. The value is in meters.
Vendor Specific Information		
Vendor Name	ionDMIInfoEntry 19	A 16-character field that contains ASCII characters. The full name of the corporation, a commonly accepted abbreviation of the name of the corporation, the SCSI company code for the corporation, or the stock exchange code for the corporation. For example: Transition or other.
Vendor Part Number	ionDMIInfoEntry 20	A 16-byte field that contains ASCII characters, defining the vendor part number or product name. A value of all zeroes in the 16-byte field indicates that the vendor PN is unspecified. For example, TN-SFP-LX1, TN-SFP-BXD, TN-SFP-OC3M, TN-SFP-OC3S, TN-10GSFP-SR or similar. For the TN-DWDM-SFP-xxxx, the xxxx indicates the center wavelength (e.g., for a TN-DWDM-SFP-5012, the 5012 indicates 1550.12 nm center wavelength laser support).
Revision	ionDMIInfoEntry 21	A 4-byte field that contains ASCII characters, defining the vendor product revision number. A value of all zeroes in the 4-byte field indicates that the vendor revision is unspecified. For example, 2.0.
Serial Number	ionDMIInfoEntry 22	A 16 character field that contains ASCII characters, defining the vendor's serial number for the transceiver. A value of all zeroes in the 16-byte field indicates that the vendor SN is unspecified. For example: TWDW34Z001, 8800022, 102201102, or similar.
MFG Date Code	ionDMIInfoEntry 23	An 8-byte field that contains the Vendor's date code in ASCII characters: 84-85 ASCII code, two low order digits of year (00 = 2000). 86-87 ASCII code, digits of month (01 = Jan through 12 = Dec). 88-89 ASCII code, day of month (01-31). 90-91 ASCII code, vendor specific lot code, may be blank. For example 2016-07-30.
Transceiver Type	tnDMIInfoEntry xx	The SFP transceiver type. For example: None, Not Supported, SFP 100FX, SFP 1000BASE-T, SFP 1000BASE-CX, SFP 1000BASE-SX, SFP 1000BASE-LX, SFP 1000BASE-X, SFP 2G5, SFP 5G, or SFP 10G.
Vendor OUI	tnDMIInfoEntry 25	The vendor Organizationally Unique Identifier field (Vendor OUI) is a 3-byte field that contains the IEEE Company Identifier for the vendor (e.g., 00-C0-F2). A value of all zeroes in the 3-byte field indicates that the Vendor OUI is unspecified.

Buttons:

Refresh: Click to update the page data.

Save: Click to save any parameter changes to the running-config file.

Help: Click to display the related online Help page.

4   Troubleshooting

Basic Troubleshooting

If a device fails, isolate and correct the fault by answering the following questions and taking the indicated actions.

1.   Is the Pwr (power) LED lit?

   NO

   • Make sure the power adapter is the proper type for the module for voltage and frequency.
   • Make sure the power adapter is properly installed in the module and in the AC wall outlet correctly.
   • Make sure the external power source is active.
   • Contact Technical Support.

   YES

   • Proceed to step 2.

2.   Is the FL (Fiber Link) LED lit?

   NO

   • Check the fiber cables for proper connection.
   • Verify that the TX and RX cables on the first module are connected to the RX and TX ports, respectively, on the second module.
   • Contact Technical Support.

   YES

   • Proceed to step 3.

3.   Is the ACTC (activity) LED On, Off, or Blinking?

   NO

   • Ensure that the local unit is off-hook.
   • Contact Technical Support.

   YES

   • Contact Technical Support.

4.   Are the Link status LEDs lit?

   NO

   • Check for power and verify the links.

   YES

   • Proceed to step 5.

5.   Are the DIP switch settings correct?

   NO

   • See 8-Position DIP Switch on page 10.

   YES

   • Proceed to step 6.

6. Make sure that the function you are trying to use is supported. See the related Features section.

7. If you are configuring a feature via the web GUI, try using the CLI, and vice versa.

8. Try resetting to factory defaults and/or a system reset.

9. Verify the install procedures were performed correctly as described in previous sections of this manual.
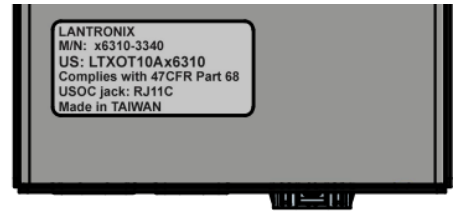
10. Check the device firmware version. Keep your products current by downloading the latest firmware. You must log in or create an account to download firmware.

11. If you still cannot resolve the problem, record model and system information and contact Technical Support.

Box Labels and Device Labels

The labels can provide information that can help the Tech Support Specialist.

LANTRONIX
M/N: x6310-3340
US: LTXOT10Ax6310
Complies with 47CFR Part 68
USOC jack: RJ11C
Made in TAIWAN

LANTRONIX
M/N: x6310-3340
US: LTXOT10Ax6310
Complies with 47CFR Part 68
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LANTRONIX
M/N: x6310-3340
US: LTXOT10Ax6310
Complies with 47CFR Part 68
USOC jack: RJ11C
Made in TAIWAN

C6310-3340
5546474
Firmware Rev:X.X.X

Tech Support (24-hr) + 1 (800) 260-1312
Country of Origin: TW + 1 (952) 358-3601

PRODUCT

C6310-3340
5546474
FW Rev:X.XX

Country of Origin: TW

BOX

S6310-3340
5546474
Firmware Rev:X.X.X

Tech Support (24-hr) + 1 (800) 260-1312
Country of Origin: TW + 1 (952) 358-3601

PRODUCT

S6310-3340
5546474
FW Rev:X.XX

Country of Origin: TW

BOX

5   Consumer Information

ACTA Compliance

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the Administrative Council for Terminal Attachments (ACTA). On the side of the face plate is a label that contains, among other information, a product identifier in the following format: "US: alphanumeric characters." If requested, this number must be provided to the telephone company. See https://www.part68.org/

Plug and Jack

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details. See https://rj45s.com/ANSI_TIA-1096-A.html.

Ringer Equivalence Number (REN)

The Ringer Equivalence Number (REN) (listed on the bottom label) is used to determine the number of devices that may be connected to a telephone line. Excessive ringer loading on a telephone line may result in the devices not ringing properly in response to an incoming call. In most, but not in all areas, the sum of the RENs should not exceed five. To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. See https://www.fcc.gov/sites/default/files/part-68-faqs.pdf.

Harm to the Telephone Network

If the x6310 causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary. See ftp://ftp.fcc.gov/pub/Bureaus/Common_Carrier/News_Releases/2000/nrc0027a.txt

Changes to the Telephone Company's Network

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the x6310. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

Problems with the Equipment

If trouble is experienced with the x6310, for repair or warranty information, contact Lantronix. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Repairs to the Equipment

Aside from the jumper settings, the x6310 is not intended to be serviced by the user. If the equipment requires repair, contact Technical Support.

Party Lines

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission, or corporation commission for information.

Alarm Dialing Equipment

If your facility has specially wired alarm equipment connected to the telephone line, ensure the installation of the x6310 does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

Industry Canada Requirement

The Ringer Equivalence Number (REN) is an indication of the maximum number of devices allowed to be connected to a telephone interface. The termination on an interface can consist of any combination of devices subject only to the requirement that the sum of the RENs of all devices does not exceed five. This product meets the applicable Industry Canada technical specifications.

L'indice d'équivalence de la sonnerie (IES) sert à indiquer le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5. Le présent materiel est conforme aux specifications techniques applicables d'Industrie Canada.

Industry Canada Representative

Richardson Technical Services, Inc.
Suite 304,131 Wurtemburg Street
Ottawa, Ontario, Canada
telephone: 613 562-3827
fax: 613 562-9377

6   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.

For additional information on Part 68 rules, see the FCC web page http://www.fcc.gov/wcb/iatd/part_68.html. For information on ACTA standards, methods of Terminal Equipment approval, labeling requirements, filing procedures and the ACTA database of approved TE, visit the ACTA web site, http://www.part68.org. (In particular see http://www.part68.org/documents/ACTA-02-08-08-03B-TSB129A.pdf, the TIA/EIA Telecommunications System Bulletin on Terminal Equipment Approval.) A list of TCBs that have been accredited by National Institute of Standards and Technology (NIST) can be viewed at http://ts.nist.gov/ts/htdocs/210/gsig/tcb-program.htm.

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.

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 ist der Benutzer für Gegenmaßnahmen verantwortlich.

Attention !

Ceci est un produit de Classe A. Dans un environment domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilsateur de prende les measures spécifiques appropriées.

In accordance with European Union Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003, 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.

TBR21 / ETSI ES 203-021

TBR21 is a European telecommunications standard published by ETSI and is the standard to which all telephone equipment must adhere to be allowed connection to Europe's public switched telephone network. It is somewhat equivalent to the US part 68 standard. TBR-21 has been replaced by the new ETSI standard ES 203-021.

ICES-003

Class A (non-residential): see https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf00020.html.

Declaration of Conformity

Manufacture's Name : Lantronix, Inc.
Manufacturer's Address : 7535 Irvine Center Drive, Suite100, Irvine, CA 92618, USA

Declares that the products: S6310, C6310

Conform to the following Product Regulations:

FCC Part 15 Class A, EN 55032:2012, EN 55024:2010
Directive 2014/30/EU, Directive 2015/863/EU
Low-Voltage Directive 2014/35/EU
IEC /EN 60950-1:2006+A2:2013
2011/65/EU EN 50581:2012

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 Standards(s).

Place : Minnetonka, Minnesota

Date : Jan 19, 2022

Signature : *Fathi Hakam*

Full Name : Fathi Hakam

Position : Vice President of Engineering

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 Technical Support Specialist.

1. Select the ION system **MAIN** tab. (From the CLI, use the show commands needed to gather the information requested below or as request by the Tech Support Specialist.

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

Serial Number: _____   Model: _____

Software Revision: _____   Hardware Revision: _____

Bootloader Revision: _____   FPGA Revision: _____

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

Configuration Mode: _____   Emulation Mode: _____

Country Code: _____   LED Status: _____

DIP Switch Settings: _____

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., changing switch mode, rebooting, etc.):
_____
_____
_____

The serial # and revision # of each involved Lantronix product in the network: _____
_____
_____

Describe 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: _____

Lantronix Corporate Headquarters

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Irvine, CA 92618, USA
Toll Free: 800-526-8766
Phone: 949-453-3990
Fax: 949-453-3995

Technical Support
+1.952.358.3601, 1.800.260.1312, or techsupport@transition.com

Sales Offices
For a current list of our domestic and international sales offices, go to the Lantronix web site at
www.lantronix.com/about/contact.