Figure 18: Ground wire attached to base enclosure

15. Identify the RJ45 connector labeled JP2 inside the Citel suppressor. JP2 is the port that connects to the XTEN-2000.
16. Feed the Cat6 DSC's RJ45 connector through the black gasket in the surge suppressor.

Note: It is recommended to remove the gasket in order to insert the RJ45 connector.

17. Mate the RJ45 connector to JP2.
18. Repeat steps 15 and 16 for the Cat6 cable that connects to the PSE. It should connect to JP1.
19. Slide the black gasket back into place.

Note: Ensure both RJ45 connectors are fully mated and latched.

20. Double check that the nut on the surge suppressor's grounding stud is tight.
21. Close the surge suppressor door and tighten the latching screw.
22. Mate the Cat6 DSC to the bulkhead RJ45 connector on the bottom of the XTEN2000.

Note: Before connecting the DSC, make sure the end of the plastic locking tab on the RJ45 is inside the body of the connector. If the locking tab is not inside, it can snap off when the coupling nut is tightened. Also, ensure the strain relief nut is not tight and that the Cat6 cable is free to move.

Note: Make sure you align the mating halves of the RJ45 connectors before inserting the connector.

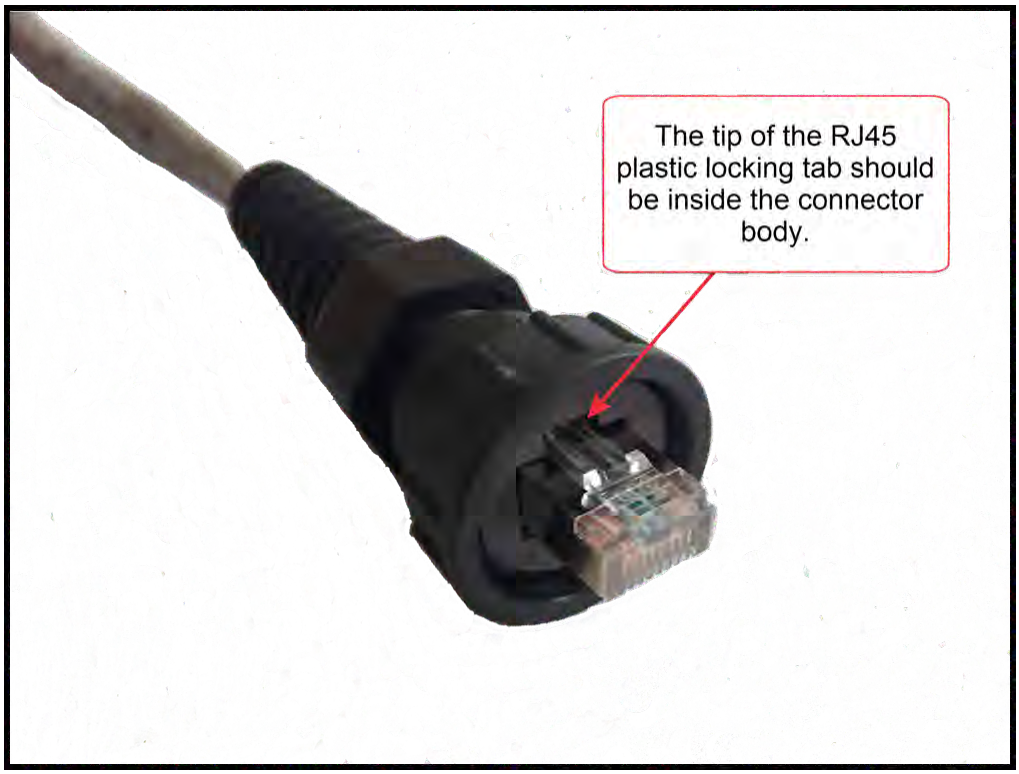

Figure 19: RJ45 locking tab

23. Align the DSC connector with the bulkhead connector of the XTEN-2000, and slide the DSC connector's RJ45 into the mating bulkhead connector on the surge module.

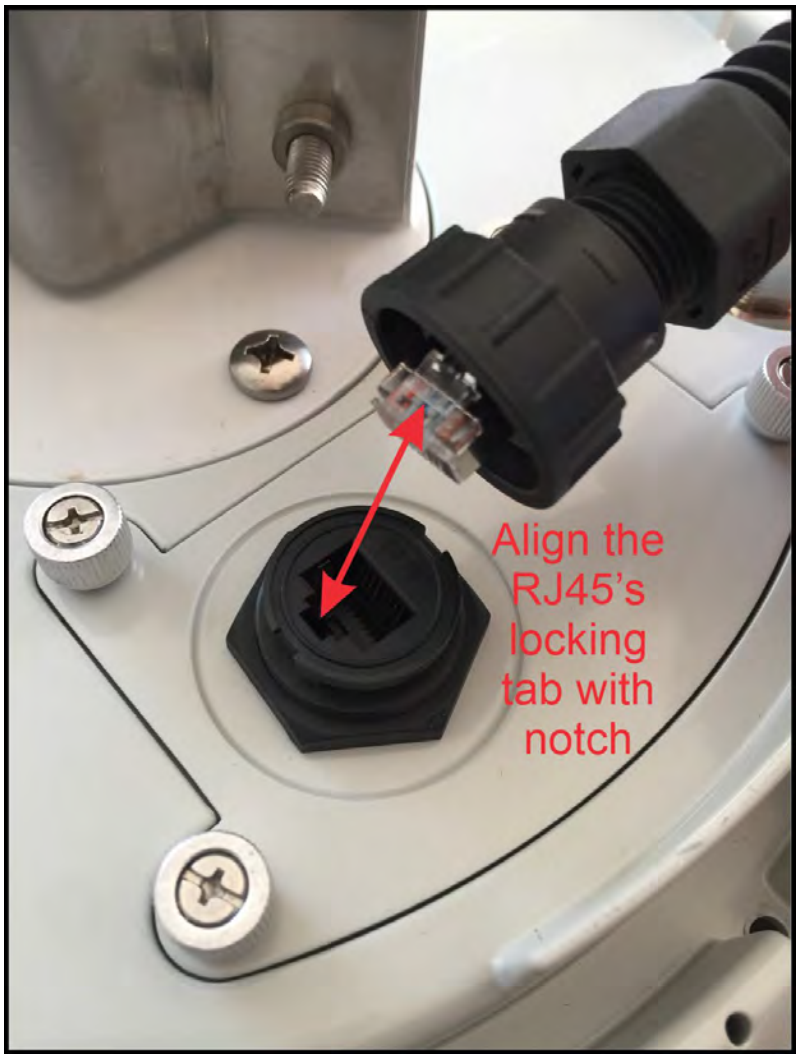

Figure 20: Align the locking tab with the notch

24. Then slide the connector body and coupling nut down to engage with the bulkhead connector. The strain relief should be loose at this point.
25. Turn the coupling nut clockwise to lock the connector in place.
26. After that, tighten the strain relief nut to compress the rubber seal against the cable.

Note: The coupling nut should turn approximately 180 degrees, and stop when fully mated.

27. Also ensure that the surge module's four panel fasteners are secure and fully threaded.

Preparing the DC + Fiber Optic model

Prepare the DC Cable

1. Solder cable to the DC Connector (Outdoor rated cable, 3 wires 22 AWG minimum) (maximum jacket diameter 0.375'').
2. Slide the screw nut, gasket, clamp ring, seal and sealing nut on the cable.
3. Finish Cable Unit side.

Pinout	
Pin 1	V-
Pin 2	V+
Pin 3	Ground Hearth

Figure 21: Fiber Optic cable soldered to the DC Connector.

Figure 22: Fiber optic cable with screw nut, gasket, clamp ring, seal and sealing nut.

Figure 23: Assembled Fiber Optic cable.

Prepare the Fiber Optic Cable

1. Verify gasket is in place.
2. Place the seal on the Fiber Optic cable (LC Duplex fiber cable). The seal has 1 cut on each side to slide the fiber optic cable in.
3. Slide the clamp ring from the front of the cable. Then, slide the bayonet nut and seal nut from the back of the cable.

Figure 24: Fiber Optic cable with gasket.

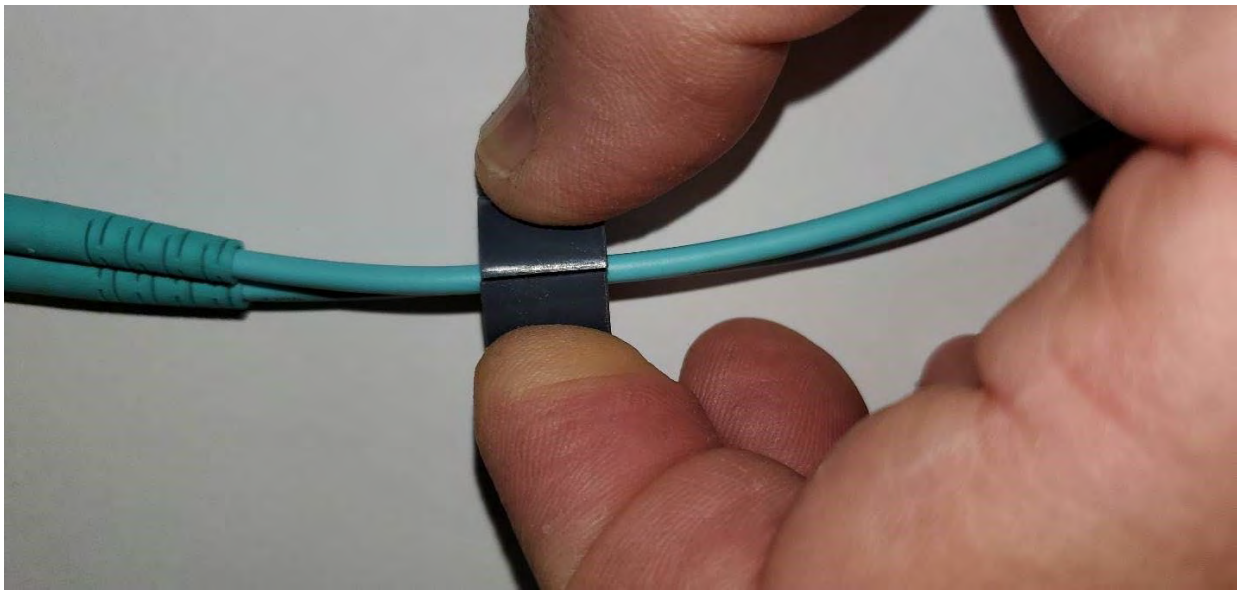

Figure 25: Fiber Optic cable with seal.

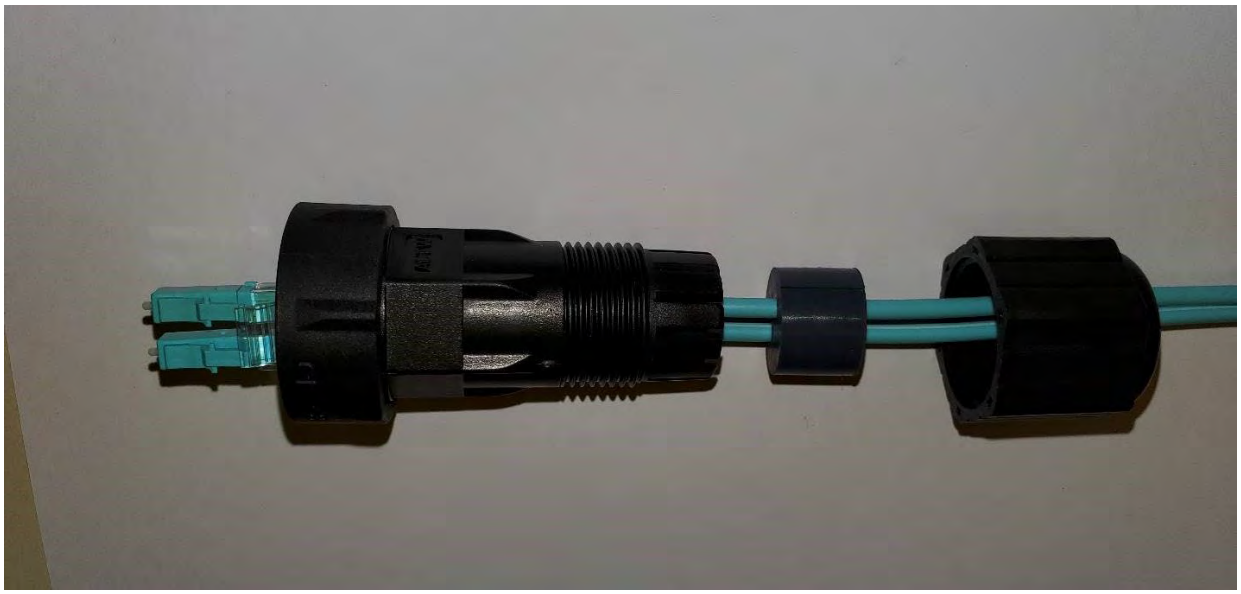

Figure 26: Fiber Optic cable with clamp ring, bayonet nut, and seal nut.

Install and Secure Cable

1. Connect the fiber cable in the fiber optic female connector on the bottom of the unit until it clicks into place.

Figure 27: Connecting the Fiber Optic Cable to the female connector.

2. Secure the bayonet nuts to the female connector.

Figure 28: Fiber Optic cable with bayonet nuts attached and secured.

3. Gently push the sealing grommet in place.

Figure 29: Fiber Optic cable with sealing grommets in place.

4. Finish the fiber cable connection by placing the sealing nut on the connector

Figure 30: Fiber Optic cable connected to unit with sealing nut.

5. Connect the DC connector to the 3-pin connector on the surge suppressor door on the bottom of the unit. Hand-tighten the connector to the male connector on the unit.

Figure 31: Bottom of unit showing DC connector and 3-pin connector on the surge suppressor door.

Setting the configuration

Each XTEN-2000-x is shipped from the factory with its configuration set to factory default values. Prior to deployment and installation, certain operating parameters may need to be configured. For details on parameters and setting the configuration, see the following applications and manuals:

- Administrator Guide for SecureMesh WAN and NEMS
- Command Line Interface Reference

The XTEN-2000-x can be configured using a Telnet connection either through the RJ45 port (on the media converter for the XTEN-2000-F), or through a wireless link via the internal WiFi radio. The following section outlines the Telnet connection through the RJ45 port. The basic Telnet setup is shown in Figure 21. Use the Cat5 or Cat6 Ethernet cables to connect the PSE to the XTEN-2000-x and the test computer.

1. Plug one Ethernet cable into the data port on the PSE. Plug the other end of the cable into the test computer's wired network port.

2. Then plug a second Ethernet cable into the data/power port on the PSE. Plug the other end of the cable into the RJ45 port on the XTEN-2000 or on the media converter.
3. Apply input power to the PSE, or to the media converter and the DC input of the XTEN-2000-F, and wait approximately 120 seconds for the XTEN-2000-x to fully boot before attempting to connect via Telnet. See (Figures 32)

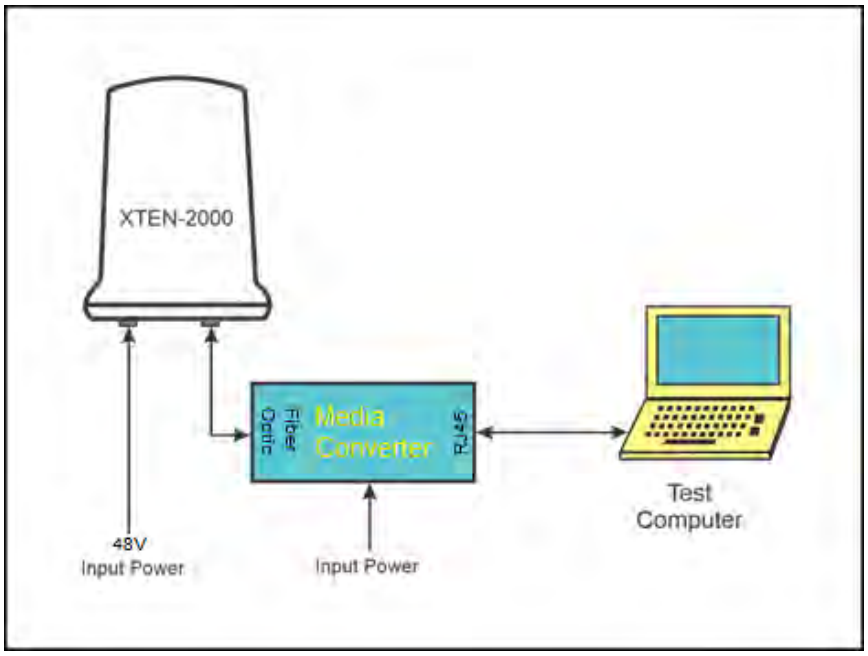

Figure 32: XTEN-2000 media converter and test computer.

Extender parameters

1. Using TeraTerm, SecureCRT, or a similar terminal emulator program, establish a Telnet session to the Extender using its configured IP address. The default IP address is 192.168.0.2.
2. When prompted, enter the CLI password. The default password is ***public***.
3. Refer to the Command Line Reference (CLI) Guide for a list of parameters that can be configured.

Chapter 4. Mount the extender

This chapter describes the steps to mount the XTEN-2000-x on a pole or tower.

Attach the extender to a pole or tower

Prepare the mounting location on the pole or tower, then mount the XTEN-2000-x using the following instructions as a general guideline. These steps detail the use of Trilliant part numbers DK-0029A, HM-0242A, and HM-0288A.

1. Mount the extension arm on the utility pole or tower with either bolts or bands (for concrete poles) (see Figure 33).

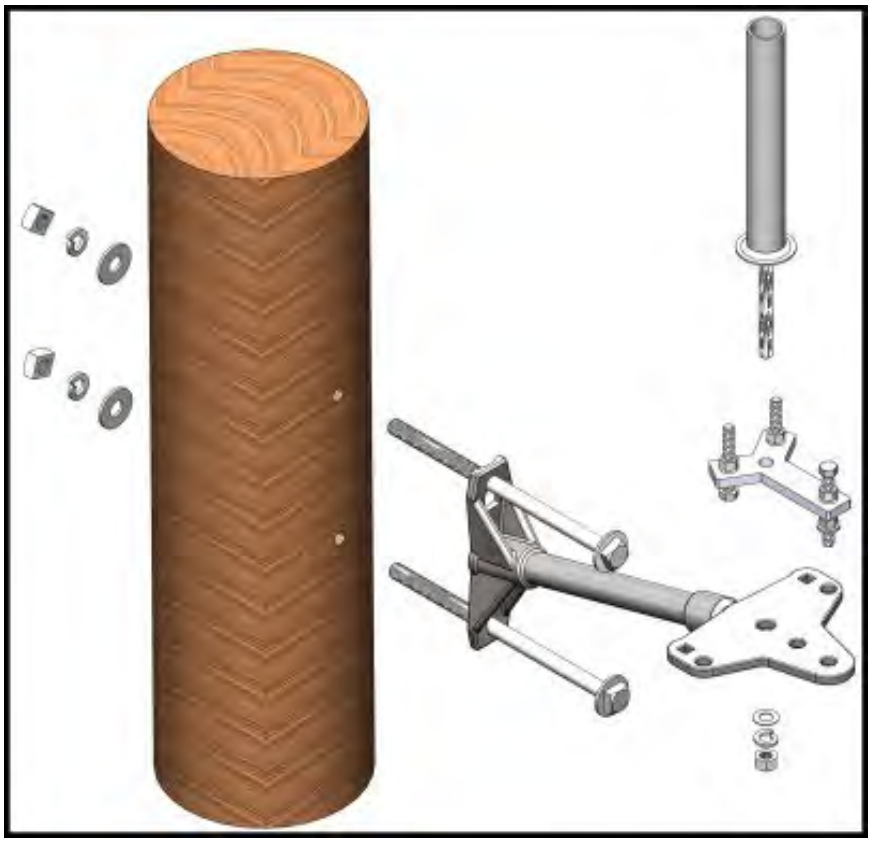

Figure 33: Typical hardware for mounting the XTEN-2000-x on a pole or tower

2. Place the Y-shaped, adjustable leveling bracket on the outer end of the extension arm (see Figure 34).
    - At the ends of the “Y,” place the heads of the bolts on the extension arm.

- Place the threaded end of the bolt with the solder nut through the outermost hole in the extension arm.
- Align the center holes for the mounting pole.

Figure 34: Leveling bracket on the extension arm

3. Place the magnetic level near the center hole on the adjustable leveling bracket.

Figure 35: Magnetic level on adjustable leveling bracket

4. Adjust the three bolts until the bracket is level.
5. Place the vertical mounting pole through both center holes (see Figure 36).

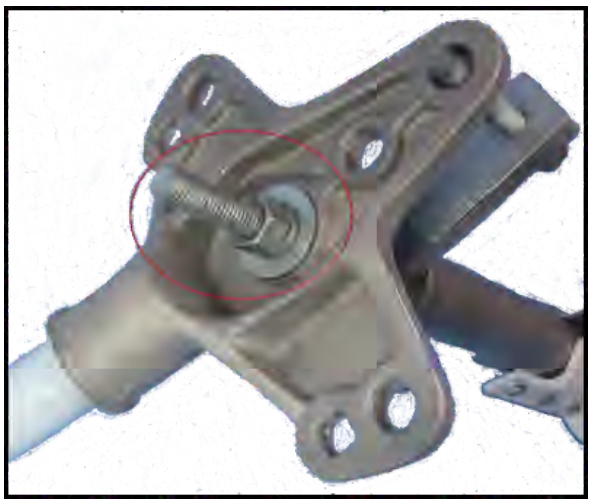

Figure 36: Nut and washers on mounting pole; extension arm, and leveling bracket

6. Secure the XTEN-2000-x mounting pole with washers and a nut.
7. Attach the XTEN-2000-x to the vertical pole using the pole clamp mount and bracket, and follow the steps in Chapter 3, Preparing the surge suppressor.

Figure 37: Typical installation: XTEN-2000-x mounted on pole

Chapter 5. Commission the extender

This chapter provides the steps to connect power to the XTEN-2000-x and prepare it for normal operation.

LED indicators

The XTEN-2000-x has four multi-colored LEDs on the enclosure base. When the XTEN-2000 is powered up by the PSE, or the XTEN-2000-F by 48 VDC, a power-on sequence starts automatically.

The STATUS, LAN, WAN, and RSSI LEDs change color as the XTEN-2000-x progress through the boot up sequence. The boot up sequence can take up to 120

Figure 38: LED faceplate

When power is first applied, the STATUS, LAN, WAN, and RSSI LEDs are all illuminated white for about one second. Then, one at a time in sequence, the LEDs change from white to blue. After all the LEDs are blue, they change one at a time in sequence to green. Once the XTEN-2000-x has fully booted, the STATUS LED should be illuminated in green.

Note: At this time, the LAN, WAN, and RSSI LEDs might be on or off, depending on the functional state of the XTEN-2000-x.

As the XTEN-2000-x searches for a neighboring SecureMesh relay node, the WAN and RSSI LEDs begin to flash, and may change color.

If a client device is connected to the XTEN-2000-x, and there is a valid Ethernet link, the LAN LED displays in yellow and occasionally blinks. Refer to Tables 4-7 for a full description of LED functionality and device status.

When an active wireless link to another node is established, the WAN LED displays in solid blue. The RSSI LED changes color and blinks, depending on the receive strength level from the neighboring node. Refer to Table 7 for more details.

Note: The default configuration of the XTEN-2000-x turns all four LEDs off after 120 minutes. This feature can be disabled by using the ***set prov LED*** command via the CLI interface.

Startup in cold conditions

In extremely cold conditions, the XTEN-2000-x radio module must self-warm before the device can be used. This process may take several minutes, depending on the environment.

While waiting for the unit to warm up, all LEDs will display in solid green except for the WAN LED. The WAN LED should flash from green to yellow. After the radio warms up to the acceptable temperature, the XTEN-2000-x will start the normal boot process, and the LEDs change from white to blue and then to green.

Table 4: STATUS function for normal operating mode

Function	Color(s)	LED State	Condition/Status
STATUS	Green or red	Off	Power is off.
		On green	Power is on; normal operation.
		On green WAN LED flashes from green to yellow.	Cold threshold cycling from off to on. Set Cold and Heater Off threshold to these temperatures: Cold threshold (from -10 to -20 °C) Heater off threshold (from 0 to -20 °C)

Table 5: LAN function for normal operating mode

Function	Color(s)	LED State	Condition/Status
LAN	Amber	Off	Ethernet port is not connected.
		On/steady flashing Or amber flash at variable rate proportional to LAN activity.	Ethernet is connected with LAN activity.

Table 6: WAN function for normal operating mode

Function	Color(s)	LED State	Condition/Status
WAN	Blue or red	Off	Disconnected from parent device; offline.

	Flashing blue at 0.33 Hz or once every 3 seconds.	Non-operational state. Acquiring link to parent device.
	Flashing blue at 1 Hz or once every second.	Pre-authorization state.
	Flashing blue at 4 Hz or 4 times every second.	Standby operational state. Acquiring link to parent device.
	On solid blue	Parent device connected. Active link established.
	On red	Provisioning or authorization failure.

Table 7: RSSI function for normal operating mode

Function	Color(s)	LED State	Condition/Status
RSSI	Amber or green	Both amber and green off	No links
		Flashing amber at 1 Hz	LRRSSI is 9 or lower.
		On amber	LRSSI is 10 - 19.
		Flashing green at 1 Hz	LRSSI is 20 - 29.
		On green	LRSSI is 30 or larger.

Accessing the CLI using WiFi

The CLI interface is also provided by an internal WiFi module. The module enables a WiFi connection using a Service Set Identifier/Pre-Shared Key (SSID/PSK). After establishing a connection via WiFi, a Telnet connection can be opened by using a preconfigured IP address as described in the following tables (Table 8, Table 9, Table 10, and Table 11).

Use the following list of commands to configure the Serial to WiFi parameters manually, to change the active configuration, and or the persistent configuration.

Note: Changing the active configuration will cause the Serial to WiFi module to reset.

Steps

Use the following steps to access the CLI using WiFi.

Note: These steps assume that you are connecting to a XTEN-2000-x configured with factory default WiFi settings.

1. From a client WiFi device, search for the SSID of the extender, the factory-assigned MAC address. The password/Pre-Shared Key (PSK) is **Trilliantxxxxxx**, where xxxxxx are the last 6 characters of the MAC address.

   Example:

   - SSID: 000ADBDA0175
   - PSK: TrilliantDA0175

2. Wait for the WiFi connection to be established.
3. Use a telnet client, like PuTTY, to connect to the default IP address of192.168.4.1.
4. When prompted, enter the CLI password. The default password is ***public***.

Table 8: show wifi

Command	Description
`show wifi`	Shows the current WiFi configuration and status information.

Configuration	Description
Interface	Indicates whether the WiFi interface is enabled or disabled.
SSID	Indicates the string of alphanumeric character that specifies.
PSK	Indicates the string of plain-English passphrase characters that specifies the Pre-Shared Key which must be between 8 and 63 characters long.
IP address	Indicates the IP address to which the Telnet session must be established over the WiFi interface in order to access the CLI of the unit.
Subnet mask	Indicates the IP address mask of the WiFi interface.
Gateway	Indicates the IP address of the gateway of the WiFi interface.
Channel	Indicates the channel of the WiFi interface which is a string of numeric characters in between 1 and 13 inclusively (channels 12 and 13 are region dependent).
Timeout	Indicates the Telnet client timeout in minutes. 0 indicates timeout feature disabled.
Status	Description
User	Indicates whether a user is presently connected to the WiFi interface.
Uptime (in seconds)	Indicates the number of seconds since a present user connected to the WiFi interface.

Firmware version	Indicates the firmware version of the WiFi module.
Synopsis	`show wifi [config | status]`

Table 9: show prov wifi

Command	Description
`show prov wifi`	Shows the flash WiFi settings.
Configuration	**Description**
Interface	Indicates whether the WiFi interface is enabled or disabled.
SSID	Indicates the string of alphanumeric character that specifies the Service Set IDentifier which can be at most 32 characters long.
PSK	Indicates the string of plain-English passphrase characters that specifies the Pre-Shared Key which must be between 8 and 63 characters long.
IP address	Indicates the IP address to which the Telnet session must be established over the WiFi interface in order to access the CLI of the unit.
Subnet mask	Indicates the IP address mask of the WiFi interface.
Gateway	Indicates the IP address of the gateway of the WIFI interface.
Channel	Indicates the channel of the WiFi interface which is a string of numeric characters in between 1 and 13 inclusively (channels 12 and 13 are region dependent).
Timeout	Indicates the Telnet client timeout in minutes. 0 indicates timeout feature disabled.

Synopsis	`show prov wifi`

Table 10: set wifi

Command	Description
`set wifi`	Sets the current WiFi settings. New settings are not stored in flash memory.
Configuration	**Description**
Interface	Indicates whether the WiFi interface is enabled or disabled.
SSID	Indicates the string of alphanumeric character that specifies the Service Set IDentifier which can be at most 32 characters long.
PSK	Indicates the string of plain-English passphrase characters that specifies the Pre-Shared Key which must be between 8 and 63 characters long.
IP address	Indicates the IP address to which the Telnet session must be established over the WiFi interface in order to access the CLI of the unit.
Subnet mask	Indicates the IP address mask of the WiFi interface.
Gateway	Indicates the IP address of the gateway of the WiFi interface.
Channel	Indicates the channel of the WiFi interface which is a string of numeric characters in between 1 and 13 inclusively (channels 12 and 13 are region dependent).
Timeout	Indicates the Telnet client timeout in minutes. 0 indicates timeout feature disabled.

Synopsis	`set wifi`

Table 11: set prov wifi

Command	Description
`set prov wifi`	Sets the flash Wifi settings. New settings are stored in flash memory, and require a reboot/power cycle to become active.
Configuration	**Description**
Interface	Indicates whether the WiFi interface is enabled or disabled.
SSID	Indicates the string of alphanumeric character that specifies the Service Set IDentifier which can be at most 32 characters long.
PSK	Indicates the string of plain-English passphrase characters that specifies the Pre-Shared Key which must be between 8 and 63 characters long.
IP address	Indicates the IP address to which the Telnet session must be established over the WiFi interface in order to access the CLI of the unit.
Subnet mask	Indicates the IP address mask of the WiFi interface.
Gateway	Indicates the IP address of the gateway of the WiFi interface.
Channel	Indicates the channel of the WiFi interface which is a string of numeric characters in between 1 and 13 inclusively (channels 12 and 13 are region dependent).
Timeout	Indicates the Telnet client timeout in minutes. 0 indicates timeout feature disabled.

Synopsis	`set prov wifi`

Chapter 6. Specifications

This chapter provides reference information for the XTEN-2000-x.

Pinouts

The following table lists the signals and pins for a RJ45 connector.

Table 12: RJ45 pins and/or signals

Pin	Assignment
1	Ethernet data (A+) Power2 (+)
2	Ethernet data (A-) Power2 (+)
3	Ethernet data (B+) Power2 (-)
4	Ethernet data (C+) Power (+)
5	Ethernet data (C-) Power (+)
6	Ethernet data (B-) Power2 (-)
7	Ethernet data (D+) Power (-)
8	Ethernet data (D-) Power (-)