Installation Guide for SecureMesh® CONN-2000

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Trilliant Holdings, Inc.
401 Harrison Oaks Blvd., Suite 300
Cary, North Carolina 27513

TOC

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General Company and Solution Information: https;//trilliant.com

Trilliant Headquarters: Tel:+1 919.495.6111

Solution and Customer Support Portal: https://support.trilliant.com/

Note: Make all requests for Solution support or RMA processing through the web portal. If you do not have a Support Portal login and password, or need your credentials reset, contact Trilliant Support using the email address below.

E-mail: support@trilliant.com

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Chapter 1. Safety and Compliance

Before installing the CONN-2000, read the instructions in this document.

This chapter includes information on safety and compliance, the US FCC statement, and guidance on password protection.

Safety Information

The caution statements, warning conventions, and warning messages in this section apply to this product and manual.

Trilliant strongly urges that you always follow all locally-approved safety procedures and safety instructions when working around high voltage lines and equipment.

The instructions in this manual are not intended as a substitute for proper training in or adequate experience with safely operating the described equipment. Only competent technicians who are familiar with this equipment should install or service it. A competent technician:

- Is thoroughly familiar with these instructions.
- Is trained in industry-accepted high- and low-voltage safe operating practices and procedures.
- Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.
- Is trained in the care and use of protective equipment such as flash clothing, safety glasses, face shields, hardhats, rubber gloves, hot sticks, and so on.

The following are important safety instructions. To safely install and operate this equipment, be sure to read, understand, and follow all caution and warning notices and instructions marked on the product or included in the documentation.

Warning: Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high- and low-voltage lines and equipment.

Warning: This device is designed to be operated in accordance with normal safe operating procedures. These instructions are not intended to supersede or replace existing safety and operating procedures. Read all instructions before installing.

Warning: This device should be installed and serviced only by personnel familiar with good safety practices when handling electrical equipment.

Compliance Notices

This device complies with requirements for the United States, Canada, Europe, and other countries.

Table 1: Compliance Requirements

Compliance Standard	Description
EMC Compatiblity	• FCC Part 15 Class A • Industry Canada ICES-003/NMB-003 Class A • EN 301 489-1, EN 301 489-17

Compliance Standard	Description
	• EN 55032, EN 55035
Radio Operation Certifications	• FCC Part 15, Subpart C and Subpart E • Industry Canada RSS-Gen, RSS-247 • EN 301 893, EN 300 328 • Various worldwide approvals
FCC and Industry Canada Device IDs	• FCC ID: TMB-CONN2000 • IC: 6028A-CONN2000
Safety	• UL 62368-1, UL 60950-22 • CSA C22 2 No. 62368-1, CSA C22.2 No. 60950-22 • EN 62368-1, EN 60950-22
RF Safety	• FCC Part 2.1091 • EN 62311 • Industry Canada RSS-102
Climatic	• Thermal: IEC 60068-2-1 /-2 /-14 • Humidity: IEC 60068-2-30 • Salt spray IEC 60068-2-11
Mechanical Vibration and Shock	• IEC 60068-2-6 • IEC 60068-2-27
Enclosure	• NEMA 4X • IP66 / IP67

Compliance Standard	Description
	• Outdoor UV-stabilized plastic
Environmental	• RoHS Compliant

Modification Statement

Trilliant has not approved any changes or modifications to this device by the user. Any changes or modifications not expressly approved by Trilliant could void the user's authority to operate the equipment.

Trilliant n'approuve aucune modification apportée à l'appareil par l'utilisateur, quelle qu'en soit la nature. Tous changements ou modifications qui ne sont pas approuvés par Trilliant peuvent annuler le droit d'utilisation de l'appareil par l'utilisateur.

Interference Statement

This device complies with Part 15 of the FCC Rules and Industry Canada license-exempt RSS standard(s). The operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

FCC Class A Digital Device Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Wireless Notice

To satisfy FCC and Industry Canada Radio Frequency (RF) Exposure requirements for mobile and base station transmission devices, a separation distance of 65 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended.

Pour satisfaire les requis d'Industrie Canada sur les expositions aux radiofréquences pour les appareils mobiles et les stations de transmission, une distance de 65 cm ou plus doit être maintenue entre l'antenne de cet appareil et les personnes durant l'opération. Pour assurer la conformité, les opérations à des distances inférieures ne sont pas recommandées.

WEEE

The following sections includes information on the collection and disposal of old equipment, and disposal information for countries outside of the European Union. WEEE denotes Waste Electrical and Electronic Equipment Directive.

Disposal of Old Equipment

Figure 1: Symbol for Used Electrical and Electronic Products

This symbol on the products, packaging, and or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.

For proper treatment, recovery, and recycling of old products, please dispose them at applicable collection points, in accordance with your national legislation and the Directives 2012/19/EU.

By disposing of these products correctly, you will help to save valuable resources, and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

For more information about collection and recycling of old products, please contact your local municipality, your waste disposal service, or the point of sale where you purchased the items.

Countries Outside the European Union

This symbol is only valid in the European Union. If you wish to discard these items, contact your local authorities or dealer and ask for the correct method of disposal.

EU and EFTA Compliance Notices

This equipment may be operated in the countries that comprise the member countries of the European Union and the European Free Trade Association. These countries, listed in the following paragraph, are referred to as The European Community throughout this document:

AUSTRIA, BELGIUM, BULGARIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, MALTA, NETHERLANDS, POLAND, PORTUGAL, ROMANIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, UNITED KINGDOM, ICELAND, LICHTENSTEIN, NORWAY, and SWITZERLAND.

Password Protection

To keep the password for each CONN-2000 secure, never:

- Write any passwords on the installed hardware or the computer used to configure the hardware.
- Store written passwords on a desk, with tools, or in the service vehicle.
- Store passwords electronically or send any passwords in an unencrypted file or email.

Chapter 2. Overview

This chapter describes what the SecureMesh CONN-2000 does, the kit and parts, and supplies needed to install it.

Description

The CONN-2000 is the Smart Distribution end node element of the SecureMesh Wide Area Network (WAN). It provides Layer 2 Ethernet transport at air data rates up to 270 Mbps.

As an endpoint of the SecureMesh WAN, the CONN-2000 provides a 10/100/1000Base-T Ethernet port for client devices to directly support distribution automation, substation monitoring, video surveillance, or work-force management applications. The WAN supports bidirectional communications between client devices and the head end; either end can initiate communication. In addition, it supports peer-to-peer communications without routing traffic through the head end.

After the device is installed, its auto-discovery and auto-provisioning features establish a link with the parent device within radio range, an Extender, Extender Bridge, or Gateway.

Kit and Parts

The kit includes the following parts for the CONN-2000 model.

- Adjustable mounting L-bracket
- Necessary fasteners for attaching the L-bracket to the enclosure
- U-bolt for pole attachment, for supporting pole diameters of 1 - 2 in.

Additional Installation Parts

The installation requires the following additional parts and supplies, and are not included in the kit.

- Ethernet surge suppressor: Citel: 521-R0655-01
- IEEE802.3af compliant Power over Ethernet (PoE) injector: Tycon TP POE 48GD (Trilliant part # 409-0080-00)
- For mounting the CONN-2000 on horizontal and vertical poles with an outside diameter between 2 and 9 inches:
  - Wall mounting accessory bracket: HM-0395A
  - Worm-type hose clamp, 1/2 inches in width. The diameter should be large enough to accommodate the pole and arrestor's flange. See Figure 8.
- Self-fusing rubber insulation and sealing tape, such as Scotch® 130C or 2228 rubber mastic tape
- Electrical tape
  - Preferred: CAT5e cable (or better), 4 pairs, 100 Ohm, 26 AWG minimum shielded (F/ UTP), 6.5 mm maximum OD, outdoor rated, UV protection
- Exacto knife
- Ground wire,10 AWG or larger, long enough to connect the device to the primary ground point on the structure where the CONN-2000 is mounted
- Shielded RJ45 plug: L-Com TDS8PC5
- Ring crimp lug #10 ring 10 AWG wire: TE-2-36161-4
- Cable ties or hook-and-loop wraps
- RTV silicone

Replacement Parts

The device is not field-serviceable. If it is damaged, or a hardware fault or failure occurs, replace the device. If faulty, the PoE injector can be replaced separately.

Chapter 3. Prepare for Installation

This chapter provides information on preparing the CONN-2000 for installation.

Tools

Before beginning the installation, gather the following tools:

- 10 mm nut driver or socket wrench
- 13 mm nut driver or socket wrench
- An adjustable open-end wrench, like a Crescent wrench
- #2 size Phillips screwdriver
- #2 size flat screwdriver
- RJ45 crimp tool HTS 2700 (or suitable)
- For configuration: a computer or laptop with a terminal emulation program and a network interface card

Location Requirements

The location must meet all of the following access guidelines.

- Conforms to all local electrical codes and ordinances
- Either owned by the utility, or where the utility has access rights
- Provides adequate power
- If needed, space to use a bucket truck
- Allows access for normal maintenance

The location must meet all of the following radio guidelines:

- High enough above ground level for line-of-sight access to the target device.

Note: Radio performance and coverage typically improves as the height increases.

- The radio signals to and from the CONN-2000, within the Fresnal zone, will not be obstructed.
- Any nearby structures do not block line of sight radio coverage.
- Clear of thick trees or brush at installation site. The site must be maintained free of trees in the foreseeable future.

Note: Foliage in the line-of-sight to other devices can degrade radio performance.

Grounding Requirements

These requirements identify the primary ground point for the device location.

Warning: A proper ground protects both the CONN-2000 and the equipment connected. Ground protection is essential if it is installed on a tall structure or in an area where lightning occurs. It is highly recommended to use an Ethernet surge suppressor device.

The techniques described here are general guidelines and do not constitute a comprehensive guide covering all installation scenarios.

For maximum protection, and if lightning is a threat in your area, consult a specialist in lightning and transient protection who is familiar with your operating environment.

Guidelines

To ensure optimal reliability, properly ground the surge suppressors. Use a 10 AWG or larger wire to connect it to the ground point on the structure. Figure 2 shows a typical installation with ground wires at the surge suppressors (see #2 and #4 Figure 2; both needing grounding or earthing. Your installation may vary.

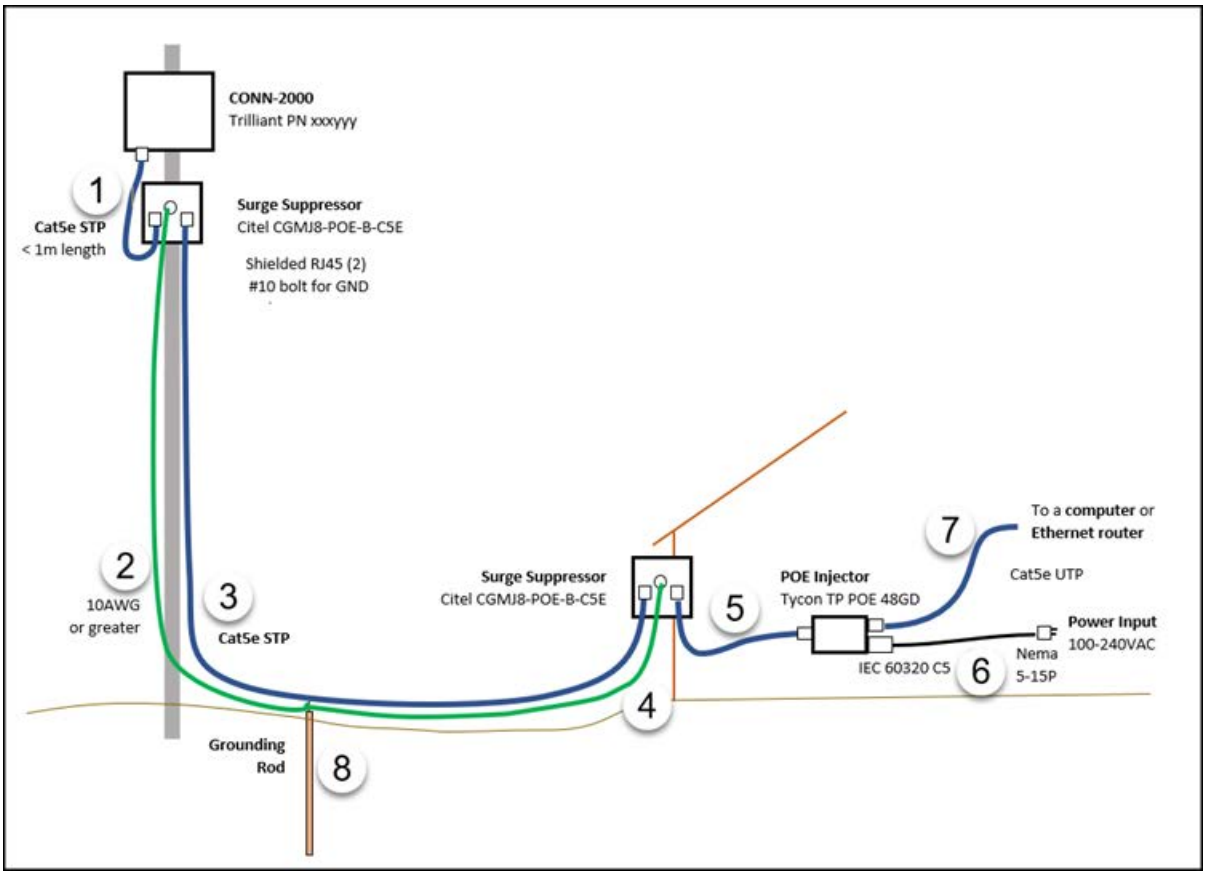

Figure 2: Typical System Cabling Diagram for the CONN-2000 Mounted on a Utility Pole

Note: In some cases, the metal utility pole may be a good earth ground, and can be used instead of a driven ground rod. Ground the surge suppressor using the green 10 AWG wire to the conductive pole in these cases.

The three most common earth ground points include the following:

1. The primary ground point or down lead provided by the existing ground system at the site, such as a part of the utility pole structure (see Figure 2).
2. A copper-clad ground rod, 10 ft (3 m) or longer, driven into the earth. At a tower with multiple legs, there typically is one ground rod at each leg and a ground wire loop that connects the rods.
3. A cold water pipe that is well-connected to earth.

Additional Information

Ensure that the ground connections can retain low impedance and integrity over time and with exposure to the elements. Use an antioxidant compound and wrap all connections with a product such as Scotch® 130C or 2228 Rubber Mastic Tape.

You can use multiple lightning arrestors; one near the CONN-2000, and second one at the facility entrance or wall. Ground all surge suppressors using one driven grounding rod.

Checklist

To confirm that the device is adequately protected from power surges and lightning, check the following items:

Table 2: Grounding Checklist

Status	Checklist Item	Description
	Lighting and Surge Suppression Devices	Install all lightning and surge suppression devices in accordance with UL96A installation requirements for lightning protection systems and the NFPA 780 standard for lightning protection.
	Ground System	Verify that all points of the ground system are tied together with less than 5 Ω resistance between any two points.
	Ground Wires	Connect ground wires from the CONN-2000 and the

Status	Checklist Item	Description
		surge suppressor to the ground system on the utility pole or building. Use a 10 AWG or larger down-lead.
	Outdoor Ethernet Cable	When installing the outdoor Ethernet cable, use the UV-protected, STP, CAT5e (or better) cable that includes a properly terminated drain wire. • In Figure 2 cable segments #5 and #7 do not need to be shielded. • For increased protection, run the CAT5e (or better) cable through a grounded metallic conduit installed on the mounting pole or tower.

Connector Components

Figure 3 through Figure 5 show the accessory parts of the CONN-2000 kit. Figure 6 displays additional PoE injectors that are sold separately.

L-Bracket

One adjustable L-bracket part, as displayed below.

Figure 3: Adjustable L-bracket

Ethernet Cable Gland

One Ethernet cable gland. In Figure 4 it is shown dismantled, with all parts.

Figure 4: Dismantled Ethernet Cable Gland

Trilliant Pole-mounting Kit

The pole-mounting kit comes in a box, as shown in Figure 5 below.

The following stainless steel parts are included in the pole-mounting kit:

1. Qty. 2 M6 flat washers
2. Qty. 4 M6 x 10 mm hex head bolts
3. Qty. 2 M6 self-locking nuts
4. Qty. 4 M6 size lock washers
5. U-bolt for pole mounting
6. Gripper bracket

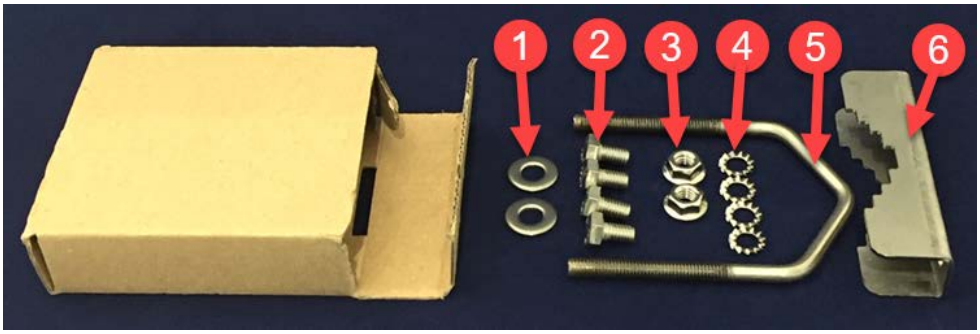

Figure 5: Pole-mounting Kit

PoE Power Injector

The CONN-2000 is powered using the standard 802.3af PoE. You can use either:

1. A standalone PoE injector sold separately by Trilliant, or
2. An existing standard PoE switch, if available, at the location.

Note: Ensure that the PoE unit is 802.3af compliant, or has a higher capacity.

Figure 6: Tycon PN TP POE-48GD PoE Injector

Accessory Mounting Bracket

For horizontal and vertical poles with an outside diameter between 2 and 9 inches, and accessory bracket is available. The accessory bracket is designed to fit with the L-bracket, and attach using a band strap. This is not included in the kit.

Figure 7: Accessory Mounting Bracket

Band Strap or Hose Clamp

Use the band strap or hose clamp together with the accessory bracket. This is a standard part carried by many installation contractors, and is not supplied in the CONN-2000 kit.

Figure 8: Band Strap Example

Prepare the Surge Suppressor

Trilliant recommends installing a surge suppressor on the RJ45 port, near the device. In many installations, a second surge suppressor may be used at the facility entrance.

1. If a connector cover is present on the cable, remove it.
2. With a sharp tool such as an Exacto knife, make a small hole like an “x” in the black gasket of the suppressor.

Note: Ensure the hole is only large enough for the wires to feed through, and is snug. If the hole is not snug, ants or small bugs might enter and create a nest, which can cause future issues.

Figure 9: Citel Surge Suppressor with Gasket and Cables

Attach the Surge Suppressor

Prepare the mounting location at the site, then mount the CONN-2000.

1. Check that the mounting pole is level and plumb. Follow the conventions for the site.

2. If used, mount the ground clamp on the pole, just below the surge suppressor.
3. Mount the surge protector with two hose clamps.

The surge suppressor is designed to attach to a vertical pole that could vary in diameter. The suppressor attaches using two standard hose clamps that fit inside the grooved sections at the top and bottom of the housing.

Figure 10: Surge Suppressor Mounted with Ground Clamp

Chapter 4. Mount the Connector

This chapter includes the steps to mount the CONN-2000 to a pole, and examples.

Attach the Connector to a Pole

1. Attach the L-bracket to the CONN-2000, using the four hex head bolts and lock washers supplied in the hardware kit (see Figure 3 and Figure 5).
2. Affix the U-bolt and serrated gripper for the CONN-2000 through the slots in the fixed part of the adjustable L-bracket, as shown in Figure 11.
3. Mount this assembly on to the pole, as shown in Figure 12. Ensure the serrated edge of the gripper bracket is against the pole.

Figure 11: The Adjustable Bracket

4. Align the device with the target using line of site methods. Adjust the angle of the device as needed to face the target. Refer to Figure 11, Figure 12, and Figure 13.
5. Cable the system as appropriate. Refer to Figure 2 for guidance.

6. Ensure there is a drip loop between the surge suppressor and the CONN-2000.
    - Keep the length of cable #1 (see Figure 2) to a minimum while forming a drip loop between the CONN-2000 and the surge suppressor.
7. Attach the ground wire from the surge protector to the ground clamp or the site ground point.

Note: The maximum allowable total Ethernet cable length should not exceed 330 ft. (100 m).

Examples of the Mounted Connector

See Figure 12, Figure 13, and Figure 14 for examples of the CONN-2000 mounted on a pole.

Figure 12: The CONN-2000 Mounted on a Pole (side view one)

Figure 13: The CONN-2000 Mounted on a Pole, (side view two)

Figure 14: CONN-2000 Mounted on a Pole with an Accessory Mounting Bracket and a Band Strap

Chapter 5. Power Up the Connector

This chapter covers the steps to provide power to the CONN-2000 and prepare it for normal operation.

Functions on the Connector Face

Before you begin powering on the device, review the functions on the CONN face, as shown. The numbers in Figure 15 correspond to the descriptions in Table 3 below.

Figure 15: The CONN-2000 with the Attached Ethernet Cable Gland

Table 3: CONN-2000 Part Number and Name

Number	Part Name
1	Breather Vent
2	RJ45 Connector and Gland Nut
3	Power Indicator
4	LAN Active Indicator
5	WAN Active Indicator
6	RSSI Indicator
7	Reset Push Button

Configuration and Startup

When the CONN-2000 receives power, the power-on sequence starts automatically. The Status, LAN, WAN, and RSSI LEDs indicate the progress through the sequence.

For details on how to automatically provision and then start the device, see the Administrator Guide for SecureMesh WAN and NEMS.

See LEDs for the four LED functions and explanations.

Applying Power through the PoE Injector

Figure 2 shows a typical cabling setup for the CONN-2000. When AC power gets applied to the PoE injector, it delivers power to the CONN-2000.

In order to complete the power-up sequence and link to the wireless network, the device must have access to the signal from a Gateway, Extender, or Extender Bridge. The power-on sequence can take up to 30 seconds, depending on how quickly the device acquires the signal and links to the parent device.

- Power-on mode: Upon connecting to the power supply, the Status, LAN, WAN, and RSSI LEDs flash white in unison. Then, one at a time in sequence, the LEDs flash from blue to green.
- When the Status and RSSI LEDs are steady and green, the device is linking to the wireless network and actively communicating, or it is already linked. See Table 4 for more information on each status.

Cold Conditions

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

While waiting for the unit to warm up, all LEDs should be solid green except for the WAN LED. The WAN LED should flash from green to yellow. The red LED should cycle on to off, and the green LED is always on. In addition, status messages display on the console as the device is warming.

- The Cold threshold should be set from -10 to -20 °C
- The Heater Off threshold should be set from 0 to -10 °C

Fine Tuning the Alignment

The CONN-2000 has a signal strength mode that can be used to fine tune the angular alignment of the device during installation. Enter the mode and use the LEDs as a signal strength indicator; slowly adjust the angles to optimize the signal strength.

Example Scenario

1. Press the reset button for less than two seconds to enter into alignment mode.
2. Observe the signal strength displayed by the LED pattern.
3. Slowly adjust the CONN-2000 mounting angles to maximize the signal strength displayed by the LEDs.
    - If the LEDs indicate more blue or green, then the signal strength is stronger.
    - If the LEDs indicate more yellow, then the signal strength is weaker.

Additional Information

- When the device is set up and is functioning normally, the signal may fluctuate. Feedback from other outdoor devices may hinder a good connection.
- Alignment mode times out after 20 minutes, and the LEDs revert back to normal operation. This does not impact the link establishment in any way. All active links are maintained.

Warning: After two hours, the LED indicators stop displaying, as if in sleep mode. The antenna is not shut off. This function can be reprogrammed to display the LED indicators so they do not stop displaying.

CONN-2000 Antenna Alignment

LRSSI	Status LED	LAN LED	WAN LED	RSSI LED
x ≤ 5		OFF	OFF	OFF
6 ≤ x < 9			OFF	OFF
9 ≤ x < 12				OFF
12 ≤ x <15				
15 ≤ x < 18			OFF	OFF
18 ≤ x < 21				OFF
21 ≤ x < 24				
24 ≤ x < 27			OFF	OFF
27 ≤ x < 30				OFF
30 ≤ x				

Figure 16: Antenna Alignment and Signal Strength

LEDs

There are four LED functions; Status, LAN, WAN, and RSSI (Receive Signal Strength Indicator). Table 4 lists the function, colors, device states and status that the LEDs indicate.

Table 4: LED Functions 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; red should cycle from on to off.	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)
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.

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.
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.

Reset Functions

You can find the reset button on the Trilliant logo, on the front of the device, as shown in Figure 17.

Figure 17: The Reset Button

The reset button has different capabilities, such as:

- Turn on/off the antenna alignment mode
- Reboot the device
- Reset the CONN-2000 to factory defaults

If it fails to communicate with other devices, press the reset button.

To keep all current values for all parameters and reboot, press the reset button for 5 - 15 seconds.

To complete the actions in the following table, press and release the reset button for the particular amount of time denoted.

Table 5: Reset Switch Actions

Action	Amount of Time to Press and Release the Reset Switch	Notes
Add to antenna alignment	Press for < 2 seconds	The power LED turns amber to indicate the adjustment mode.

Action	Amount of Time to Press and Release the Reset Switch	Notes
		The other three LEDs indicate RSSI level in 3 dB steps.
Remove from antenna alignment	Press for < 2 seconds and release	
Reboot	Press for 5 - 15 seconds	
Reset to factory defaults and reboot	Press for 30+ seconds	

Accessing the CLI using WiFi

The CLI interface to the CONN-2000 is provided by an internal WiFi module. The module enables a WiFi connection to the CONN-2000 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 pre-configured IP address as described in the following tables (Table 6, Table 7, Table 8, and Table 9).

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.

Table 6: 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.

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

Table 7: 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.

Command	Description
Synopsis	`show prov wifi`

Table 8: set wifi

Command	Description
`set wifi`	Sets the current 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	`set wifi`

Table 9: set prov wifi

Command	Description
`set prov wifi`	Sets 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	`set prov wifi`

Steps

Use the following steps to access the CLI using WiFi.

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

1. From a client WiFi device, search for an SSID with the default value of "Trilliant."
2. Connect to the Trilliant SSID using this security key: `Trilli@ant:<Device_MAC_Address>`
   - Example: `Trilli@nt:000adb123456`
3. Wait for the WiFi connection to be established.
4. Use a telnet client, like PuTTY, to connect to the default IP address of: 192.168.4.1.
5. You can now log into the CLI as normal.

Chapter 6. Specifications and Pinout

This chapter provides reference information for the CONN-2000, including specifications and pinout standard.

Specifications

When planning for an installation, use the following specifications:

- Dimensions 11.0 in. (28 cm) H x 11 in. (28.0 cm) W x 6.8 in.
- Weight 3.7 lb. (1.68 kg)

Pinout

This product uses 802.3af/at standards.

The device can be powered by any compliant Power over Ethernet (PoE).

Note: Prior generation WAN products used a passive POE power supply. Trilliant recommends using only an 802.3af/at compliant power supply with this product.

Table 10 lists the signals and pins for the RJ45 connector, located between the CONN-2000 and the PoE.

Table 10: Signals and Pins for the RJ45 Connector

PIN	Cable Pairing	10/100base-T	1000base-T
1	Orange/White	TRP1(+)	TRP1(+)
2	Orange	TRP1(-)	TRP1(-)
3	Green/White	TRP2(+)	TRP2(+)
4	Blue	PoE(+)	TRP3(+) / PoE(+)
5	Blue/White	PoE(+)	TRP3(-) / PoE(-)
6	Green	TRP2(-)	TRP2(-)
7	Brown/White	PoE(-)	TRP4(+) / PoE(-)
8	Brown	PoE(-)	TRP4(+) / PoE(-)
Shield	Oveall Shield	Earthed in Arrestor	Earthed in Arrestor
Note: 10/100baseT supports automatic MDI crossover			

Appendix A. RJ45 Cable Assembly

This appendix provides information on the RJ45 cable assembly. Use the steps below to prepare the RJ45 cable to be inserted into the plug housing and then crimp.

Assembly Steps

1. Prepare the end of the cable by first stripping back the outer jacket to expose one of the conductors.

Figure 18: The Stripped Outer Jacket

2. Fold back the shielded braid and drain wire, so that they lay flat over the outer jacket.
3. (Optional): If the cable has a foil shield, it can be folded back over the braid. Otherwise it can be trimmed away.
4. (Optional): For cables with a foil shield, ensure that when the shield is folded back over the outer jacket, its conductive side comes in contact with the plug's grounding clip.

Note: When crimped, the grounding clip must form a 360 degree contact with either the braid and or the foil.

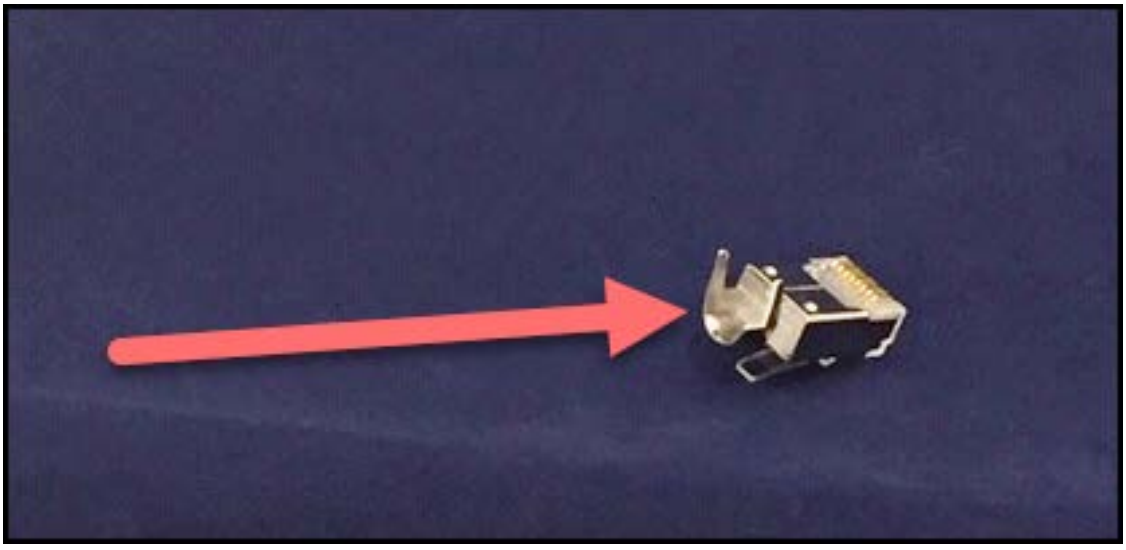

Figure 19: The Plug's Grounding Clip

5. Ensure the pairs of the conductors are ordered as they should be. Then slide them onto the conductor spacer.

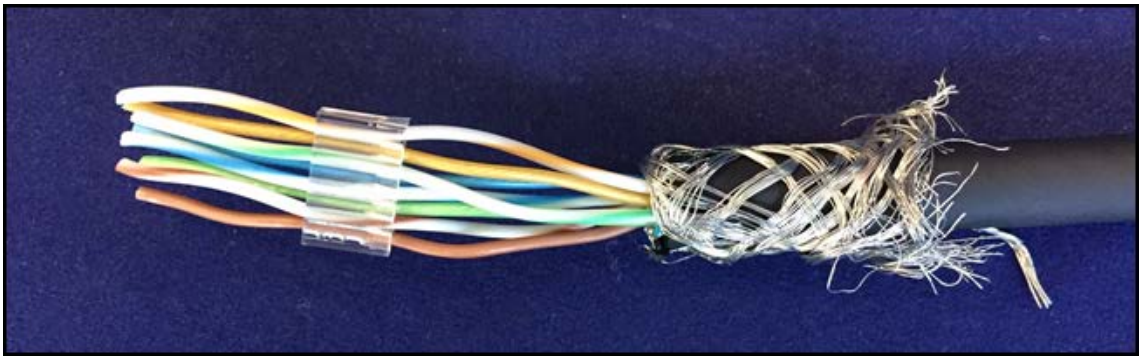

Figure 20: The Pairs of the Conductors on the Conductor Spacer

6. Trim the conductors so that the tips are exposed to the jacket at 0.6 in.
7. Twist and fold back the braid and drain the wires.
8. Align the wires to insert them into the plug housing.

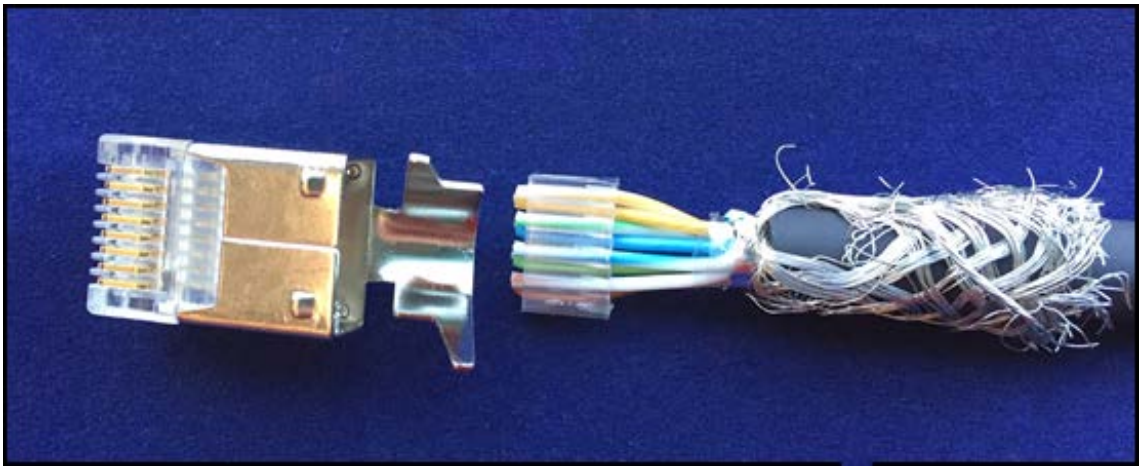

Figure 21: Aligning the Wires to Insert into the Plug Housing

9. Insert the wires into the plug housing with the flange of spacers facing up.
10. Then crimp the wires using the HTS2700 tool.
    a. Place the braid and drain wires on the back side of the cables in the strain relief saddle.
    b. Straighten the strain relief to form a straight exit path.

Figure 22: Crimping the Cable Strain

11. The RJ45 cable assembly is complete.

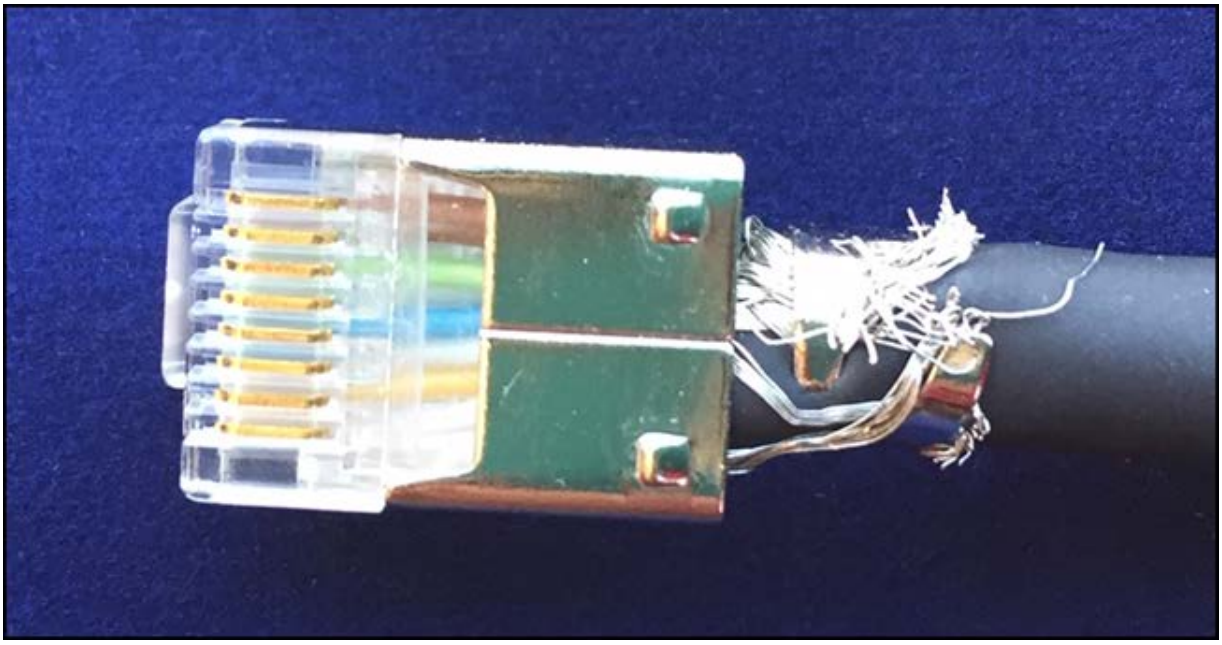

Figure 23: The Completed RJ45 Cable Assembly

Glossary

E

EFTA

European Free Trade Association

EMC

Electromagnetic Compatibility

EU

European Union

F

FCC

Fedral Communications Commission

P

PoE

Power over Ethernet

R

RF

Radio Frequency

W

WAN

Wide Area Network

WEEE

Waste Electrical and Electronic Equipment Directive

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