ALTAI
Super WiFi

Altai C2s Dual-Band 2x2 802.11ac WiFi AP/Bridge

Installation Guide

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Federal Communication Commission (FCC) – USA

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules; these limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:
  • Reorient or relocate the receiving antenna.
  • Increase the separation between the equipment and receiver.
  • Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  • Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of FCC Rules. Operation is subject to the following conditions. (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation.
This device should not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC Radiation Exposure Statement: The user is advised to keep a distance of at least 45cm from the device when it is in operation.

European Conformity (CE) – EU

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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Warning

C2s may require professional installation depending on the deployment scenario.

Only use the power adaptor supplied with C2s. Using a different power adaptor might damage C2s.

Install a lightning arrestor to protect the AP for lightning dissipation during rainstorms. Lightning arrestors are mounted outside the structure and must be grounded by means of a ground wire to the nearest ground rod or item that is grounded.

Disclaimer

All specifications are subject to change without prior notice. Altai Technologies assumes no responsibilities for any inaccuracies in this document or for any obligation to update information in this document. This document is provided for information purposes only. Altai Technologies reserves the right to change, modify, transfer, or otherwise revise this publication without notice.

Table of contents

1. Introduction

This guide is designed to provide the information needed to mount Altai C2s Super WiFi AP/Bridge at the site location.

The document is applicable for hardware platform C2s and the following model.

Product Name: **C2s Dual-Band 2x2 802.ac WiFi AP/Bridge**

Model Number: **C2-2221-000**

It is assumed in this document that a site survey has been performed before the site installation. The appropriate antenna pole and AP locations have been selected. It is a good practice to have a document which consists of a map and drawing illustrating the AP and poles locations. A planning on IP network is also an important issue for network planning.

The user may need to refer the following document during C2s installation and Configuration.

[1] C2s Dual-band 2x2 802.11ac Wi-Fi AP/Bridge Configuration Guide
[2] C2s Dual-band 2x2 802.11ac Wi-Fi AP/Bridge Data Sheet

2. Field Installation

2.1. Unpack the shipment

Check the equipment and the installation kits against the packing list to ensure that the equipment part numbers, parts, and the ancillary equipment included in the shipment match what is specified on the packing list. The shipment consists of a C2s Super WiFi AP/Bridge and an installation kit in the container. If there is any difference from the packing list, you may need to contact the sales representative.

Inspect the equipment to see if there is any shipping damage. If it does have any damage, you can contact the sales representative for repair or replacement.
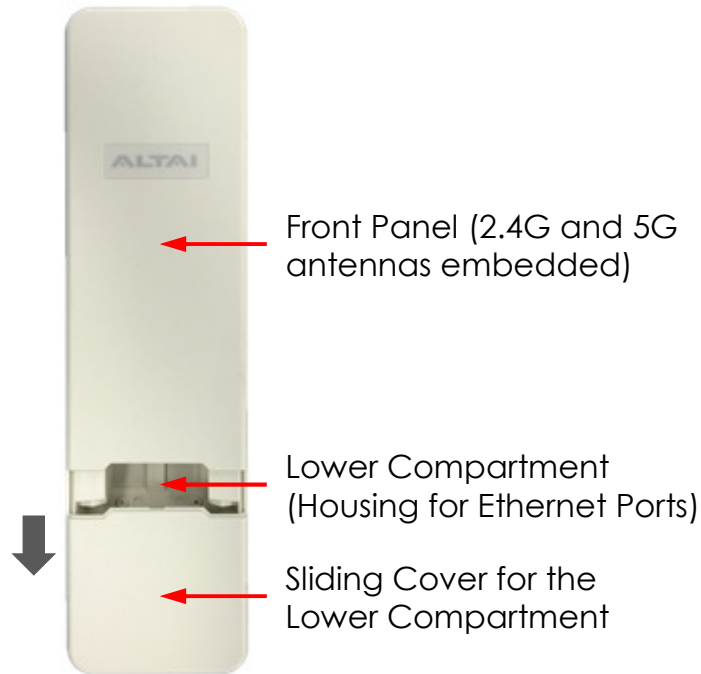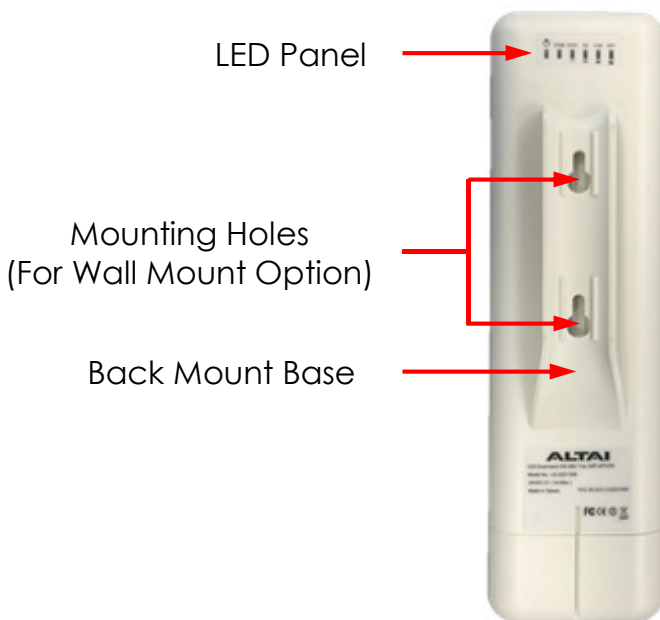
C2s standard package contents include:
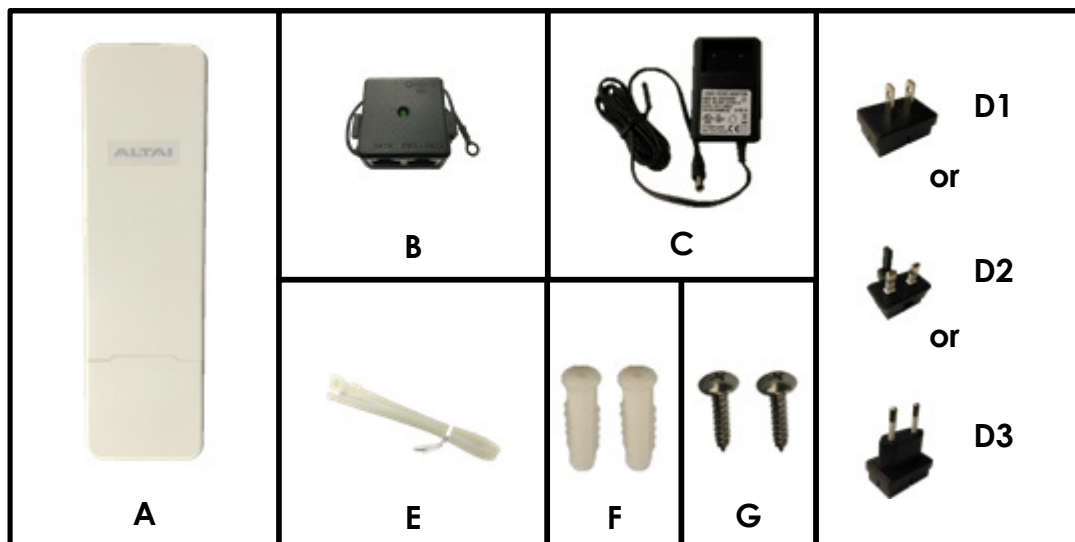
A.	C2s Main Unit	x 1
B.	DC Injector	x 1
C.	AC Adapter	x 1
D1.	US Plug	x 1
D2.	UK Plug	x 1
D3.	EU Plug	x 1
E.	Cable Tie	x 2
F.	Mounting Screw	x 2
G.	Mounting Anchor	x 2

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2.2. Hardware Overview

Front View

Front Panel (2.4G and 5G antennas embedded)

Lower Compartment (Housing for Ethernet Ports)

Sliding Cover for the Lower Compartment

Back View

Side View

LED Panel

Mounting Holes (For Wall Mount Option)

Mounting Slots (For Pole Mount Option)

Back Mount Base

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LED Panel

2.4G/5G Radio WiFi
(AP/STA/Repeater/Bridge Mode)

Solid Green:
1. AP Mode on but with no Clients Associated
2. STA/Repeater Mode on but not connected to AP
3. Bridge Mode on but not connected to Remote Peer

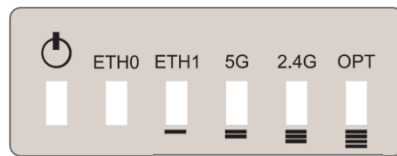Flashing Green: AP Mode with at least one Client Associated for Data Transmitting/Receiving

Off: Radio Disabled

**LAN (Ethernet 0/1)**

Solid Blue/Green: LAN Connected
(Blue for 1Gbps; Green for 100/10Mbps)

Flashing Blue/Green: Data Transmitting/Receiving

Off: LAN Disconnected

ETH0 ETH1 5G 2.4G OPT

Power

Solid Yellow: Power on

Flashing Yellow: AP Booting Up

Off: No Power

Received Signal Strength
(Station/Repeater/Bridge

	SNR (Default)	SS1	SS2	SS3	SS4
1 (Weakest)	x < 20dB	○	○	○	○
2	20dB < x < 25dB	☼	○	○	○
3	25dB < x < 30dB	●	○	○	○
4	30dB < x < 35dB	●	☼	○	○
5	35dB < x < 40dB	●	●	○	○
6	40dB < x < 45dB	●	●	☼	○
7	45dB < x < 50dB	●	●	●	○
8	50dB < x < 55dB	●	●	●	☼
9 (Strongest)	55dB < x	●	●	●	●

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Ethernet Ports and Reset Button
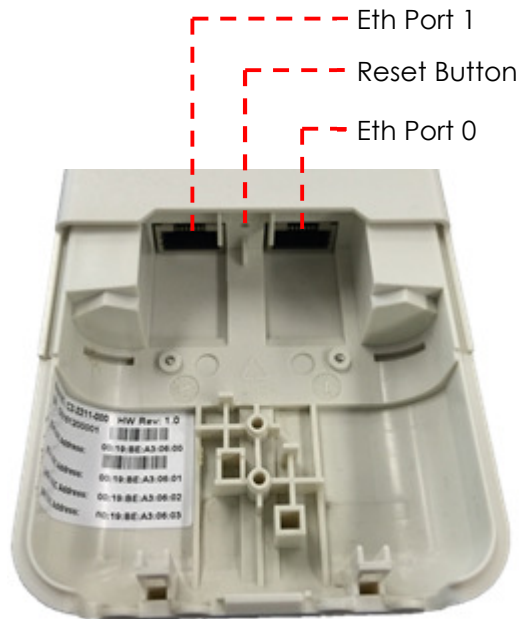
ETH0/PoE IN:
It is used to connect to power source (see the Power Options in the following section) and provides 10/100/1000 Mbps network interface for LAN connection.
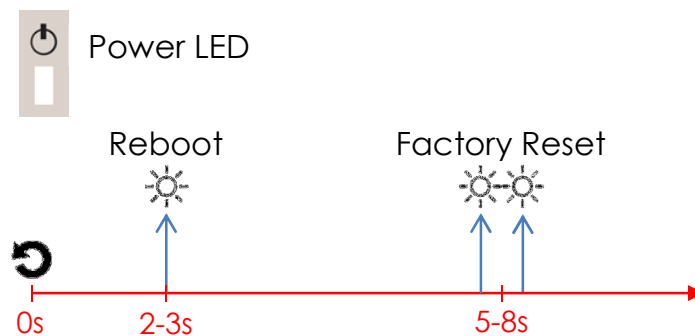
ETH1:
It provides 10/100/1000 Mbps network interface for LAN connection with peripherals.

Reset Button:
It serves two functions for C2s operation:
- Reboot: Press and hold the Reset Button for *2-3 seconds until the Power LED blink once*.
- Factory Reset: Press and hold the Reset Button for *5-8 seconds until the Power LED blink twice consecutively*.


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2.3. Preparation for Installing C2s

Before installation, please prepare the following tools:

1) Needle-Nose Pliers (for cable feed-through)
2) Screw Driver (for wall mount)
3) RJ45 Shielded Connector Crimper
4) STP CAT5e/6 Straight Cable x 2
5) Waterproof Sealing Tapes and Electrical Tapes
6) Grounding Cable
7) An 802.3at to Passive PoE Adapter (Optional and ordered separately when using with 802.3at-compliant PoE switch or PoE injector)
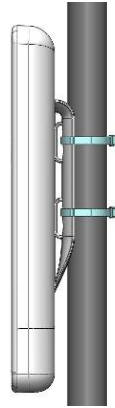
2.4. Cable Feed-Through

1. Prepare a pair of needle-nose pliers.
2. Follow the instructions on the drawing below to cut a feed-through hole for ETH0 Port cabling.
3. Cut another hole with pliers for ETH1 Port cabling if necessary.

For ETH0 Port Cabling

For ETH1 Port Cabling

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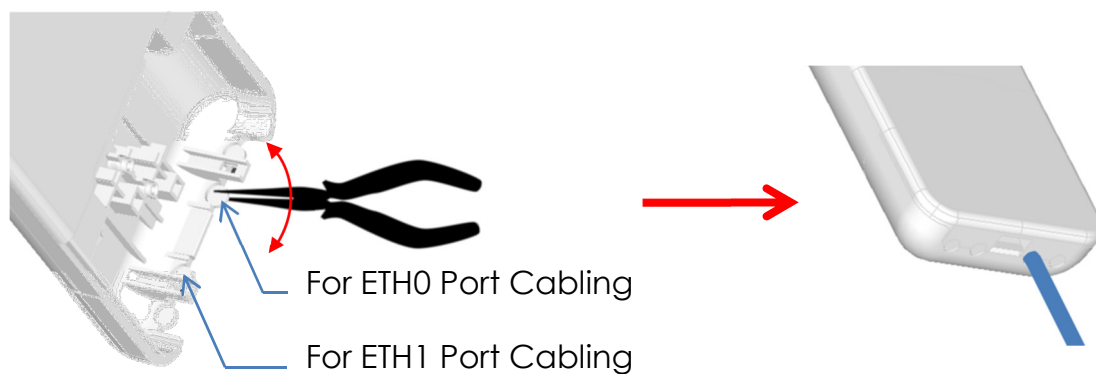
2.5. Mounting Options

Option 1: Pole Mount

1. Orient the device to point to the target coverage area (for AP mode) or to the target AP (for Station mode).
2. Loop two cable ties through the slots on the back of the device and then wrap them around the pole.
3. Tighten the cable ties to ensure the device is firmly in place.

Option 2: Wall Mount

(a) Mounting Anchor
(b) Mounting Screw
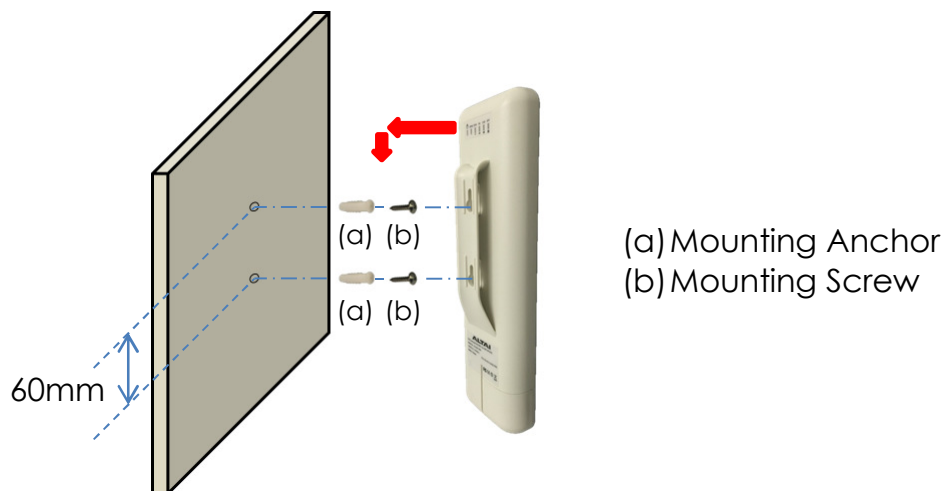
60mm

1. Using the back mount base as reference, mark the location of the mounting holes on a flat wall surface.
2. Drill mounting holes on the marked locations. The two holes should be 60mm (2.3 inches) apart.
3. Fasten the device to the wall using the mounting anchors and screws provided.

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## 2.6. Power Options and Cable Connection Instructions

Option 1: AC Adapter and DC Injector
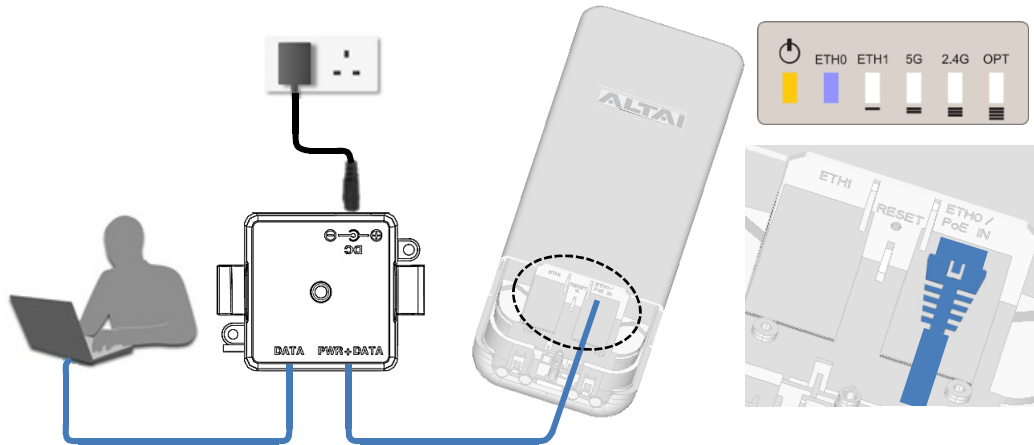
1. Connect C2s ETH0 port to a DC injector's "PWR+DATA" port with an Ethernet Cable.
2. Connect a computer to the DC injector's "DATA" port with another Ethernet Cable.
3. Connect the AC power adapter to the DC injector and plug it into a power socket.
4. Make sure the Power LED light is yellow and ETH 0 LED light is blue/green.

Option 2: 802.3at-compliant PoE switch / PoE Injector

1. Connect C2s ETH0 port to an 802.3at to Passive PoE Adapter's "PWR+DATA" port with an Ethernet Cable.
2. Connect a port of an 802.3at PoE Switch to the PoE Adapter "802.3at" port with another Ethernet Cable.
3. Make sure the Power LED light is yellow and the ETH0 LED light is blue/green.
4. Connect a computer to the switch.

802.3at-Compliant PoE Switch

802.3at to Passive PoE Adapter (Separately ordered)

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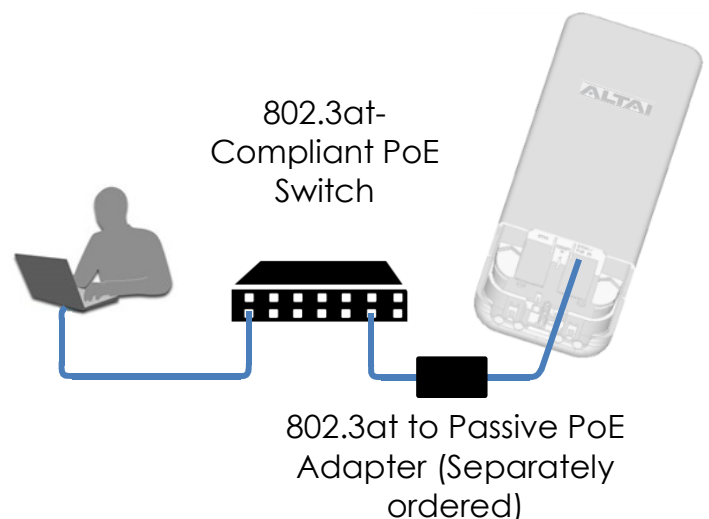
2.7. C2s Waterproof Protection

Especially for outdoor installation, proper sealing can enhance the protection for the C2s unit against water Ingress. Both the LAN cable and the unit should be wrapped.

1. Wrap the cable with a layer of rubber tape. Start from 8cm below the connector. Wrap a loop and overlap a half. Continue until it reaches the RJ45 connector.

~8cm

Wrap the rubber tape on the Ethernet cable from 8cm below up to the RJ45 connector
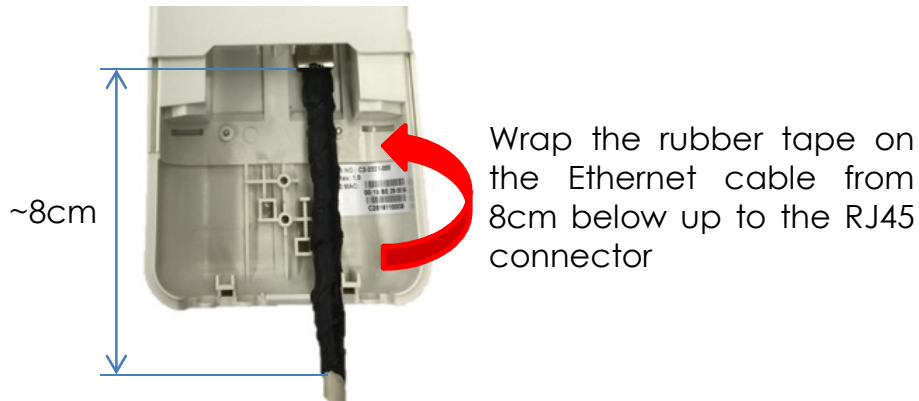
2. Put the cover back onto the lower compartment and there should be a part of Ethernet cable left with rubber tape applied.

3. Wrap the C2s unit with a layer of rubber tape. Start from 1cm above the cover. Wrap a loop and overlap a half. Continue until it reaches the bottom. The bottom should be completely sealed by the rubber tape.

Apply the rubber tape on the C2s lower compartment in a top-down manner.

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4. Wrap the C2s unit with a layer of electrical tape. Start from 1cm above the rubber tape wrapping. Wrap a loop and overlap a half. Continue until the electrical tape totally covers the rubber tape including the cable section.

Apply the electrical tape on the C2s down to the cable.

5. Typical pole-mount setup with finished wrapping is shown below.

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3. Electrical and Lightning Protection

3.1. Surge Protector

It is strongly advised the C2s unit be installed with surge protector (ordered separately), especially for outdoor deployment, to protect it against electrical surge. The surge protector should be grounded properly and installed as close to the C2s unit as possible in order to prevent the C2s from the electrical damage.

3.2. Lightning Protection System

The C2s unit should be installed with a lightning rod and protected by relevant lightning protection system to avoid any potential electrical damage caused by lightning.

3.3. LAN Cable for Outdoor Installation

STP cable with shielded connectors is required to protect the C2s against ESD. Follow the instruction to crimp the cable:

1. Cut about 4cm of the wire coating.
2. Untwist eight wires with the order from left to right: Orange White, Orange, White Green, Blue, White Blue, Green, White Brown, Brown. The order will be the same on both sides.
3. Straighten eight wires and cut the wire with only 2cm extension
4. Insert the wires into an RJ45 modular jack. The hook should face down. All eight wires should touch the top of the jack.
5. The foil and the shield of RJ45 connector should have direct contact.
6. Insert the modular jack into the crimping tool. Press down on the tool firmly.

Typical Electrical and Lightning Protection Installation is shown below: