INSTALLATION GUIDE

Cloud Connect Advanced (CCA) and Tigo Access Point (TAP)

Overview

This document describes how to properly install the Tigo Cloud Connect Advanced (CCA) and Tigo Access Point (TAP) as part of an overall solution with Tigo TS4 Flex MLPE (Module Level Power Electronics). This document includes the following sections to enable a successful deployment:

- Pre-installation Checklist
- Tigo Equipment Overview
- System Design
- Communication Cables
- TAP Installation
- CCA Installation
- Commissioning
- Additional Resources

CCA & TAP Videos

Videos available

Much of the material covered in this document is available via the following videos, accessible at the QR code on the left:

- Top 5 installation Tips for the CCA and TAP
- CCA and TAP overview
- CCA to TAP connection
- Commissioning the CCA
- …and more

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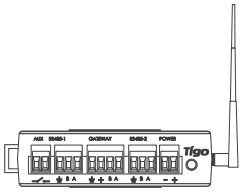
Pre-installation checklist

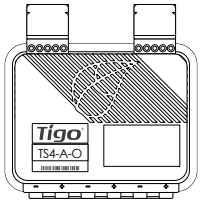
To install a Tigo Access Point (TAP) and Cloud Connect Advanced (CCA), you need the following tools and materials:

Tigo Equipment:



Cloud Connect Advanced (CCA)

Tigo Access Point (TAP)



Tigo TS4-A-O/S/M or TS4-X-O/S

Additional equipment

- **Enclosure:** A NEMA-rated enclosure suitable for the environment (NEMA 1 minimum for indoors, NEMA 4 minimum for outdoors) to mount the CCA in.
- **Mounting Bracket:** DIN rail mountable bracket for the Cloud Connect Advanced (CCA) and power supply
- **Power Supply:** A 24VDC, 1A output power supply to the CCA is recommended. For systems with 2 TAPs or fewer, a power supply with 12V DC, 1A output may be used.
- **Communication Cable:** A four-wire communication cable such as shielded RS-485 to connect the TAP(s) to the CCA. Tigo recommends the OmniCable #A21804 or a similar RS-485 4-wire shielded cable.
- **Inverter:** Compatible inverter with the TS4's being used in the project
- **Ferrules:** highly recommended to ensure a tight wire connection to TAP, especially with CAT5/6 cables

Other

- **A map or layout** of the modules in the system is required to create a successful Tigo Access Point (TAP) design that will communicate with all modules in a system.
- **Ethernet or WiFi for internet access**. A strong internet connection is required to begin commissioning
- **The Tigo Energy Intelligence (EI) mobile app**, available for Apple and Android devices, is needed to test and commission all TS4/TAP/CCA components

Tools

- Appropriate Personal Protective Equipment (PPE)
- Flathead screwdriver
- Wire stripper/crimper combination tool or similar

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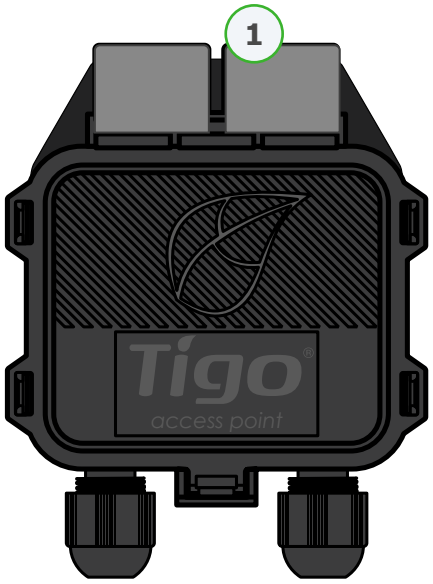
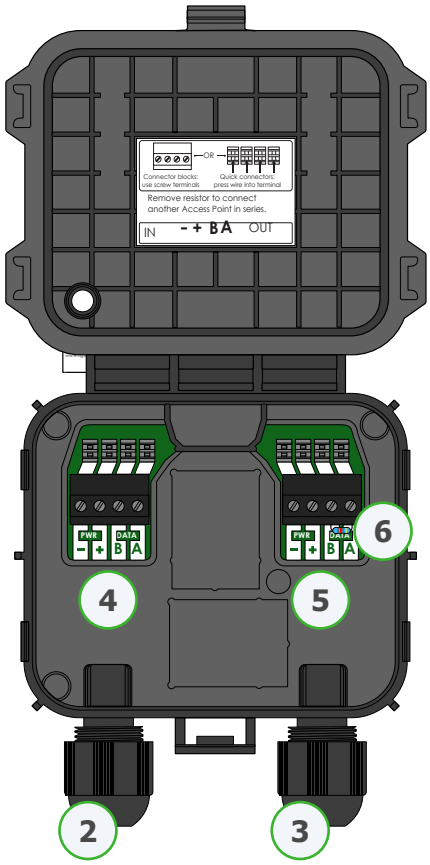
Tigo Equipment Overview

Tigo Access Point

Wireless mesh communication device to manage TS4 units. Installs on the module frame and connects to the CCA via a communication cable.

1. **Mounting Clips:** used to attach the TAP to the solar module
2. **Input:** communication cable entry from CCA
3. **Output:** communication cable exit to next TAP
4. **CCA Input:** Connect the 4 wires of the communication cable, respecting the terminal order: PWR -/+; DATA B/A
5. **TAP Output:** Daisy-chain multiple TAPs (if applicable) with same wiring order on the left terminal
6. **Data Terminator:** 120 Ohm resistor. Leave in last TAP.

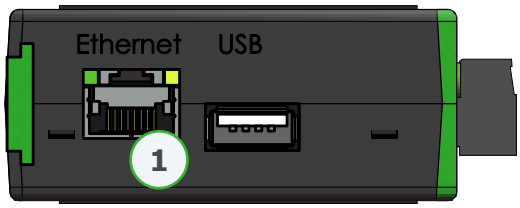


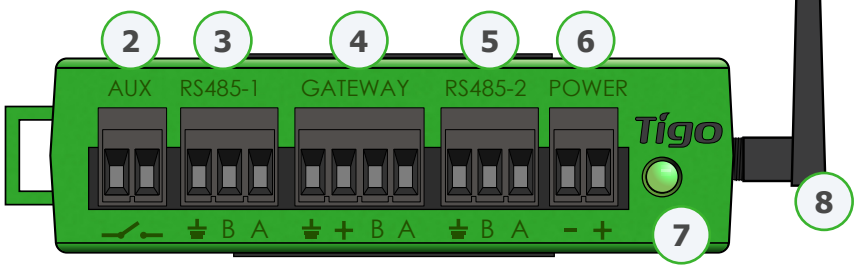


Cloud Connect Advanced (CCA)

Central data-logger and control system that is connected to the internet and can support up to 7 TAP's. Site information can be seen in the in the Tigo Energy Intelligence portal.

1. **Ethernet.** Direct connection to router
2. **Aux Port:** Used to connect an external normally open switch for rapid shutdown
3. **RS485-1:** Used to connect MODBUS devices for data transfer to the EI Portal
4. **Gateway.** Tigo Access Point (TAP) 4-wire connection
5. **RS485-2.** Used to connect MODBUS devices for data transfer to the EI Portal
6. **Power.** Input for 24V DC
7. **Status LED.** Refer to LED codes on last page of this quick start guide
8. **WiFi Antenna.** Used for wireless communication to customer's router





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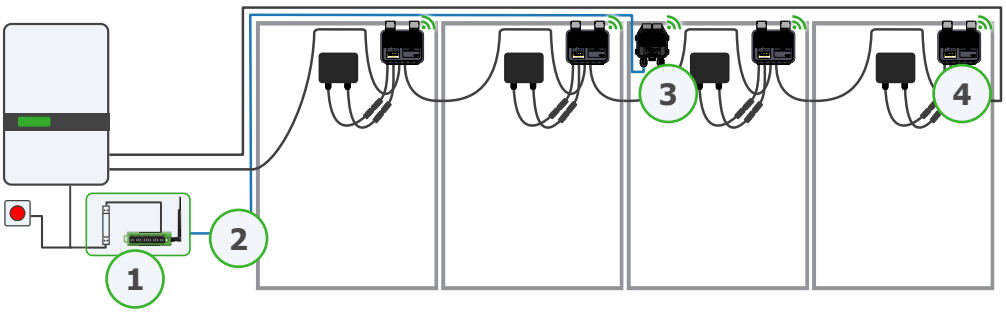
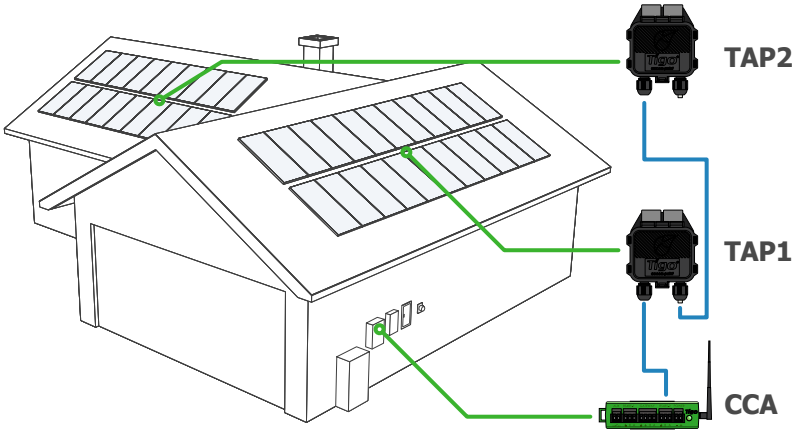
System Design

CCA and TAP layout

1. **CCA:** co-located with inverter
2. **Communication cable:** CCA to TAP
3. **TAP:** mounted under a group of modules in the middle of array
4. **TS4-A-O/S/M or TS4-X-O/S:** on each module





TAP Placement

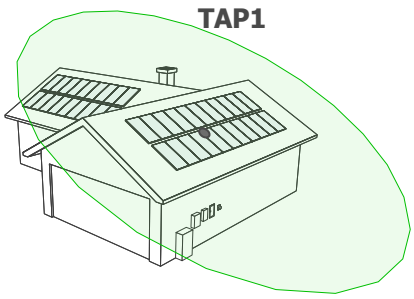
Position TAPs in the center of each array to maximize coverage.

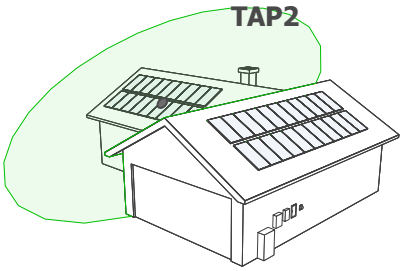
Account for obstacles that may block line of sight by placing TAPs around obstructions or use more TAPs.

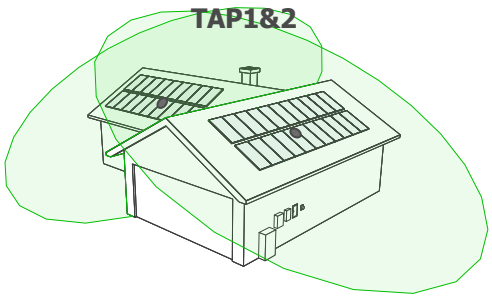
A height change of more than 3 feet (1m) is considered an obstruction.

Do not place the TAP inside an attic or object that is not the module or racking.

Details: [Placement and Layout Requirements]



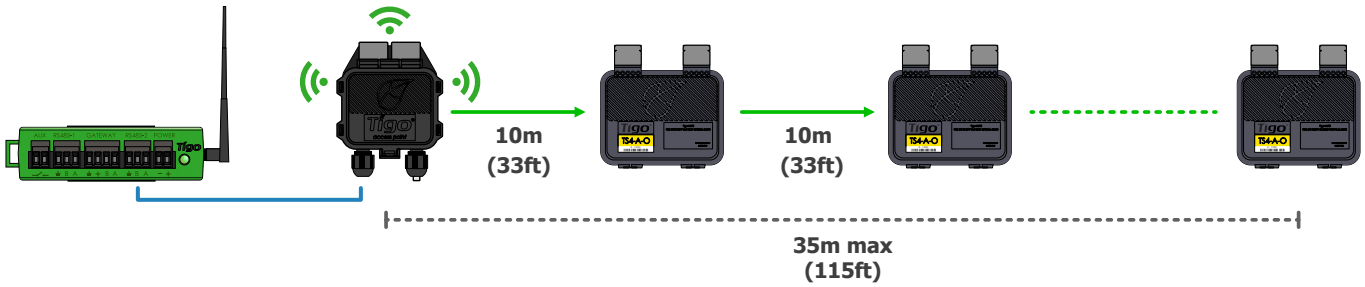




Distance limitations

If the distance between TAP and TS4 or TS4's exceeds the limits described below, use multiple TAP's

For distance limitations related to the communication cable between the CCA and TAP, refer to the next page.



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Communication Cables

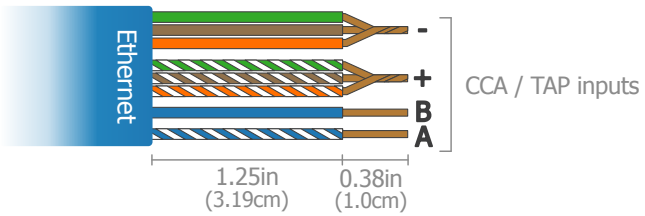
Ethernet cable (of any Category) may be used for residential systems with 2 TAPs (or less). An RS-485 communication cable is required for 3 TAPs or more or for wiring greater than 100 feet from the CCA to the most distant TAP. For detailed information, review the TAP Communication Cable Guide

Residential applications

Ethernet cable for sites with 2 TAPs or less (for sites with 3+ TAP's, see Commercial Applications below)

Ethernet communication cable is only advisable for systems with a maximum of 2 TAPs and less than 100 feet (30 meters) from the CCA to the farthest TAP.

Connect the twisted pair wires as shown in the image on the right to ensure strong signal strength to the TAPs.



Commercial applications

Recommended communication cable: RS485 4 wire shielded cable

Tigo recommends the OmniCable #A21804 or similar. The total wire distance (combined with the number of TAPS per CCA) greatly affects the TAP(s) voltage and current requirements.

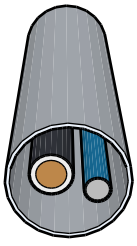
The following table provides the maximum length recommendations per cable type and number of TAPs. Wire sizes are listed in American Wire Gauge (AWG) and Millimeters (mm). Wire Lengths are listed in Feet (ft) and Meters (m).

Wire gauge	Number of TAPs						
	1	2	3	4	5	6	7
18 AWG 0.82mm	2,604ft 793m	2,604ft 793m	1,817ft 553m	1,363ft 415m	1,090ft 332m	908ft 276m	716ft 218m
20 AWG 0.52mm	2,604ft 793m	1,714ft 522m	1,143ft 348m	857ft 261m	686ft 209m	571ft 174m	456ft 136m
22 AWG 0.33mm	2,156ft 657m	1,078ft 328m	719ft 219m	539ft 164m	431ft 131m	359ft 109m	287ft 87m

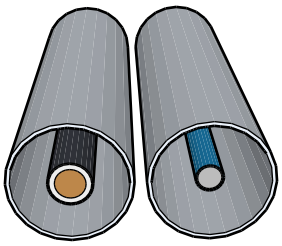
Max communication cable length from CCA to last TAP

Communication cable management

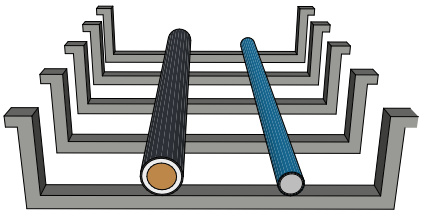
GOOD INSTALLATIONS



Shared conduit
Cable must be rated for the same voltage as the DC home-run (600V or 1000V) - refer to NEC 300.3(C).

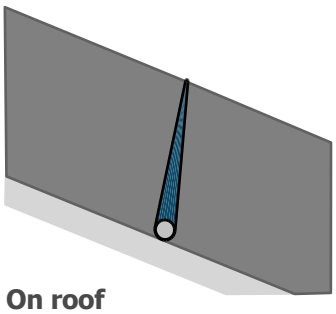


Separate conduit
Ok to run in separate conduit.



Cable tray
Communication cable must be rated for outdoors and supported at intervals not to exceed 300 mm (12 in) and secured at intervals not to exceed 1.4 m (4.5ft).

BAD INSTALLATION



On roof
Not allowed - cable likely to be damaged or wear over time.

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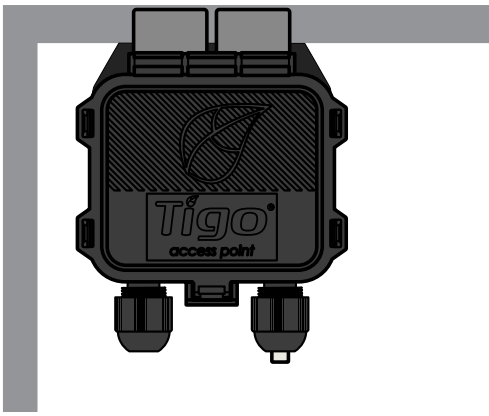
TAP Installation

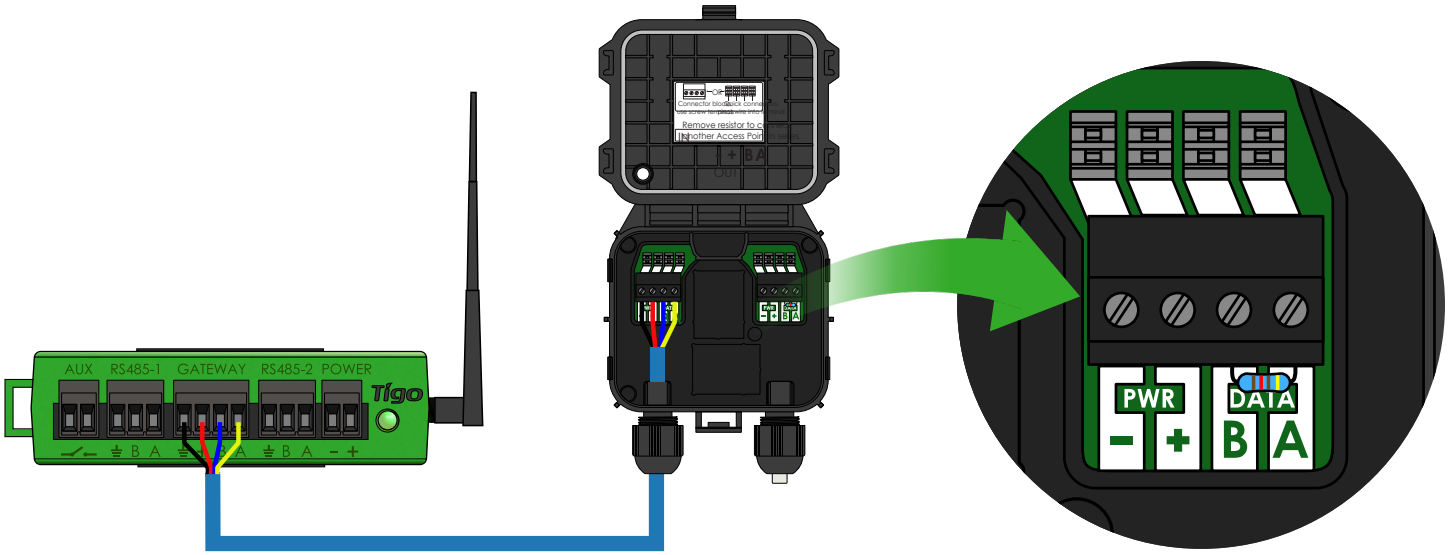
Mount the TAP



- Attach the TAP to the PV module frame using its metal mounting bracket.
- The TAP should be mounted with the label side outward, away from the module.
- For frameless modules, remove the clips and mount directly to the rail.
- Ensure the cable glands face down and cannot collect moisture.

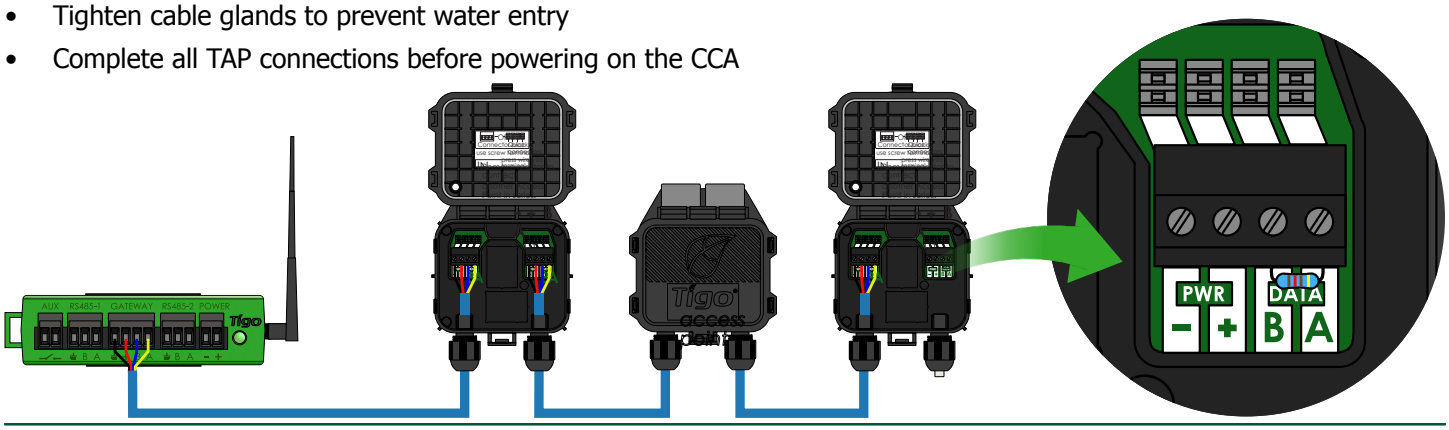
Connect TAP to communication cable

- Run the communication cable from the CCA GATEWAY terminal to the TAP (or first TAP in a series if using multiple)
- Connect the cable wires to the left side of the TAP using either the quick-connect or the terminal block.
- The wire color sequence on the CCA GATEWAY terminal should match the TAP terminals from left to right.



Connect additional TAP's (if required)

- If connecting to another TAP, use the right-side terminals after removing the pre-installed 120Ω terminating resistor.
- At the last TAP, leave the terminating resistor in the right-side terminal block.
- Ensure wires are securely connected, using ferrules on wire ends
- Tighten cable glands to prevent water entry
- Complete all TAP connections before powering on the CCA



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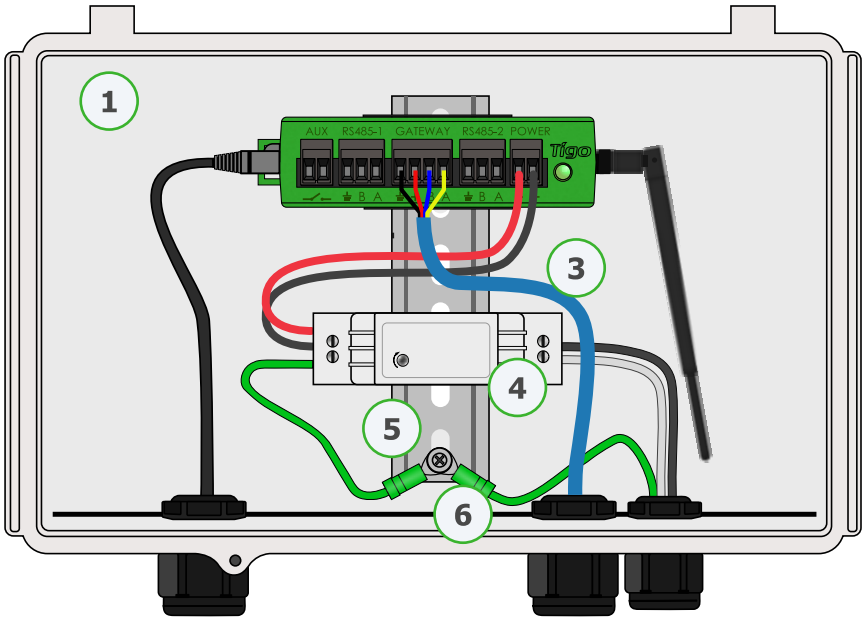
CCA Installation

1. **Enclosure:** NEMA rated for environment
2. **Ethernet:** for wired internet. Otherwise, antenna is used for wireless
3. **Output:** communication cable to TAP
4. **Power Supply:** 24V/1A (12V ok for residential systems with 2 or fewer TAP's)
5. **Din-rail:** For CCA and power supply
6. **Grounding:** Proper ground installation



Mount CCA to enclosure

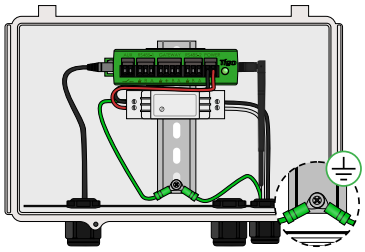
- Mount the CCA to a DIN-rail within a NEMA-rated enclosure suitable for the environment.
- Install the CCA near the inverter with access to AC power and the internet

Connect TAP cables to CCA:

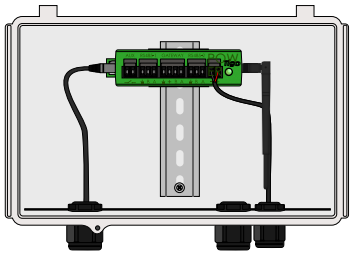
- Connect the TAP communication cables to the CCA GATEWAY port.
- Connect the power supply's DC output leads to the CCA power terminals. Ensure the power supply is 24V/1A (For systems with 2 or fewer TAPs, a power supply with 12V/1A output is acceptable)
- Ensure all connections are made before powering on the CCA.

Ground the CCA

The CCA is not solidly grounded. You must ground the CCA using one of these two methods.



Method 1: If using a DIN rail mounted power supply, connect a ground wire (included in the CCA Kit) between the negative terminal on the power supply and the grounding DIN terminal (included in the CCA kit).



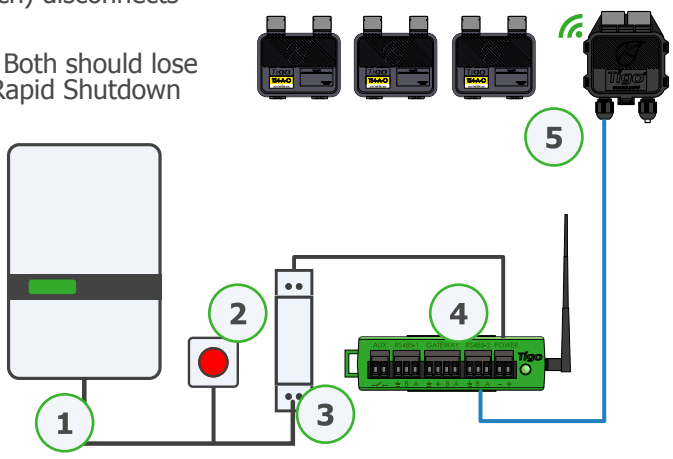
Method 2: If using a third-party external power supply, connect the power supply grounding terminal to the DIN rail grounding terminal.

Ensure proper wiring for Rapid Shutdown

Rapid shutdown occurs when an AC disconnect (inverter or switch) disconnects power to the CCA/TAP.

The CCA must be on the same AC branch circuit as the inverter. Both should lose AC power simultaneously for code-compliant UL-PVRSS (UL PV Rapid Shutdown System) operation.

1. **AC Power:** Same circuit for inverter, CCA
2. **E-stop button:** to manually initiate rapid shutdown
3. **Power supply**
4. **CCA**
5. **TAP & TS4:** Perform the rapid shutdown function



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Commissioning

Make sure to build a layout of TS4's as they are installed. This means removing the QR codes and placing them on a physical layout that is similar to the modules. This will be used for the layout monitoring during commissioning

After completing the physical installation and connections, use the Tigo Energy Intelligence (EI) mobile app to test and commission all system components

Note the LED status indicator on the CCA to verify its state during operation, configuration, and troubleshooting

For detailed commissioning instructions, visit our Commissioning the Cloud Connect Advanced (CCA) - Getting Started Guide

By following these steps, you can ensure a successful installation of your Tigo TAP and CCA system. Remember to consult Tigo's resources and technical support team for any specific questions or additional assistance

Additional Resources

For further support and documentation, visit the Tigo Energy Help Center, where you can access videos, articles, and technical resources for all Tigo products.

Tigo Green Glove service is available free of charge to assist with system layout and design, installation, commissioning and more.