TS4-A-O/S/M with TAP and CCA

Quick Start Guide

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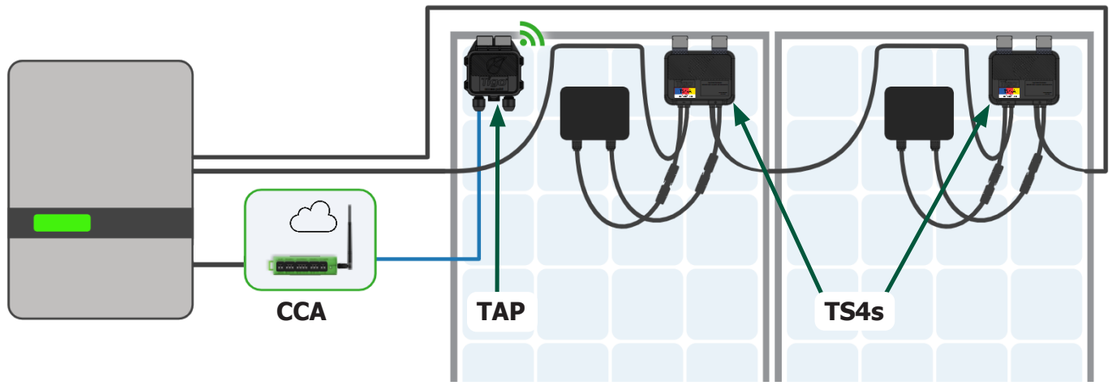
- All PVRSE components must be installed and maintained by qualified personnel in accordance with applicable electrical codes and instructions in the TS4-A with CCA and TAP Installation Manual.
- Improper installation may cause damage not covered by the warranty.
- Adhere to ANSI/NFPA 70 (North America) and local electrical code requirements.

- Do not install TS4s if they have been physically damaged or with damaged or substandard wiring or connectors.
- Do not connect or disconnect TS4s under load.
- When used as part of a PVRSS solution, all solar modules in the array must be equipped with TS4-A-O/S and TAP PVRSE with a permanent or temporary (for commissioning) CCA. Rapid shutdown is initiated upon AC power loss that stops power to the TAP.

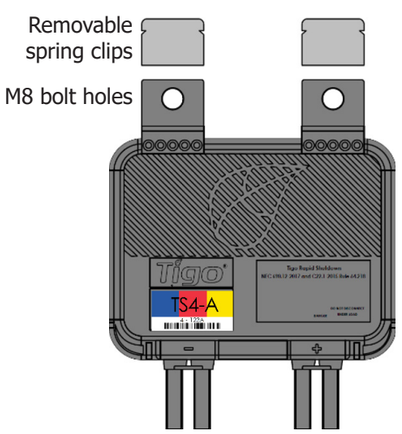
System Layout

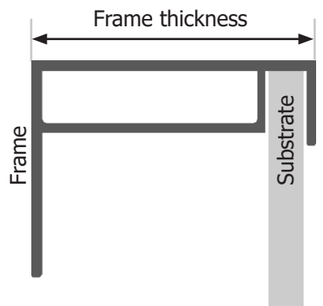


- The Cloud Connect Advanced (CCA) data logger/gateway connects to the cloud via Ethernet or WiFi and to other devices via Modbus.
- The CCA has a wired connection to the Tigo Access Point (TAP).
- The TAP communicates wirelessly with TS4-A-O/S/M MLPE via a mesh network.

TS4 Mounting Options

For frameless modules, use M8 bolts torqued to 10.2Nm.



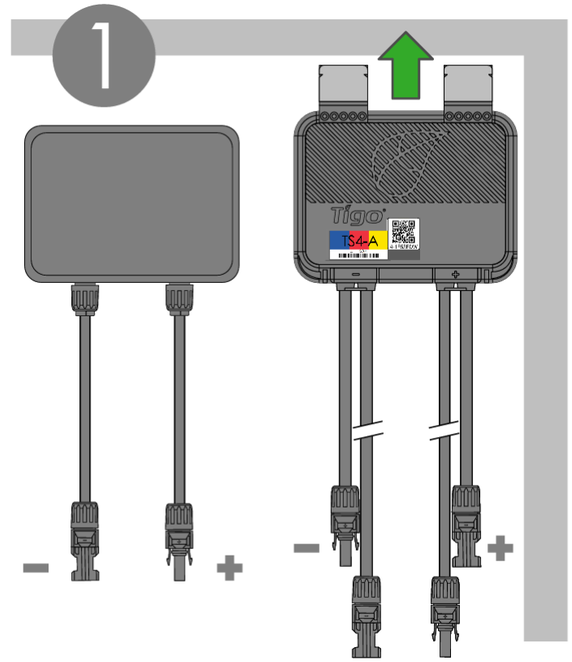


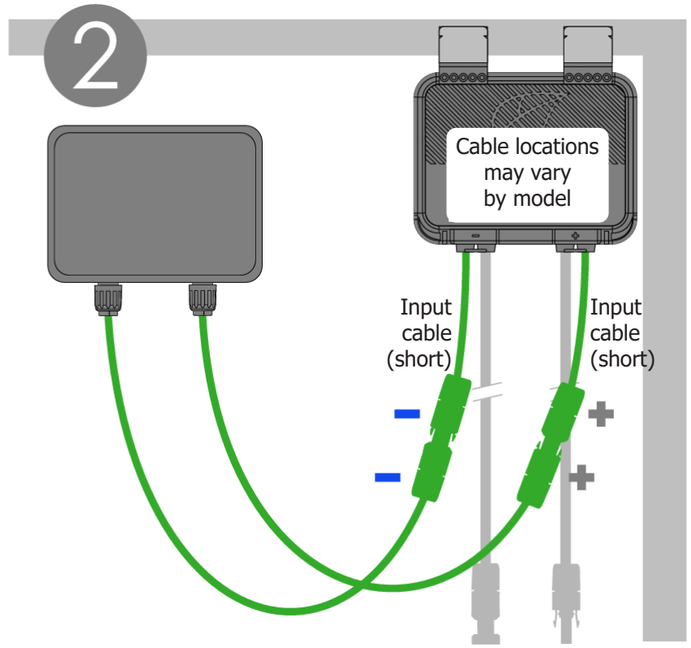
- If frame thickness is ≤35mm (1.4in), install with the TS4 label facing the PV module.
- No portion of the TS4 may be ≤12.7mm (.5in) from the module substrate.
- Check PV module instructions for restrictions on mounting devices under the module.

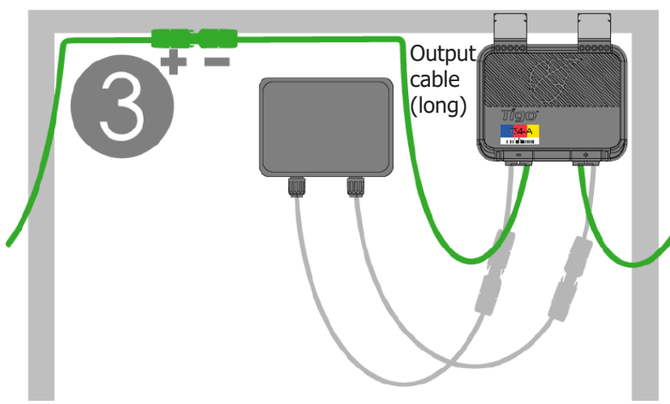
Install TS4s

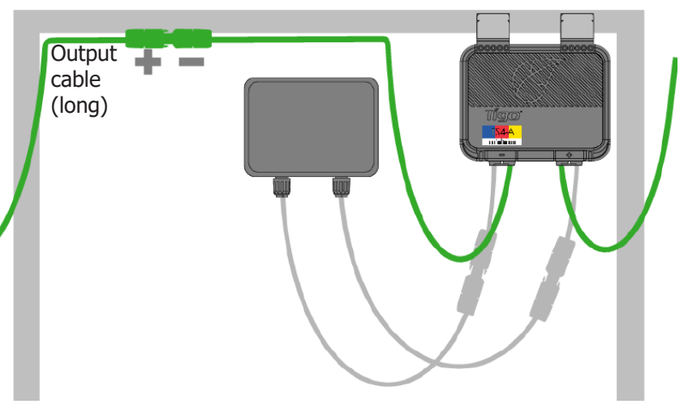
1. Save the QR/barcode sticker on a site map or string list.
2. Attach the TS4 to the top of the PV module frame. If frame thickness is ≤35mm (1.4in), install with the TS4 label facing the PV module.
3. Connect the short input cables to the PV module.
4. Connect the long output leads to the adjacent TS4.

- Always assume that TS4s are in an ON state.
- Ensure cable glands face down and cannot collect moisture.
- Disconnect TS4s from the array string before disconnecting from a PV module.
- ***Always connect short input cables before connecting long output cables.*** Failure to do so may void warranty.









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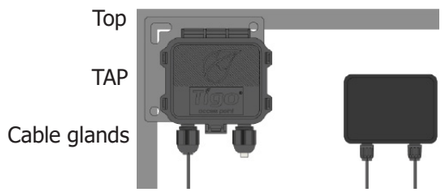
- All PVRSE components must be installed and maintained by qualified personnel in accordance with applicable electrical codes and instructions in the TS4-A with CCA and TAP Installation Manual.
- Improper installation may cause damage not covered by the warranty.
- Adhere to ANSI/NFPA 70 (North America) and local electrical code requirements.

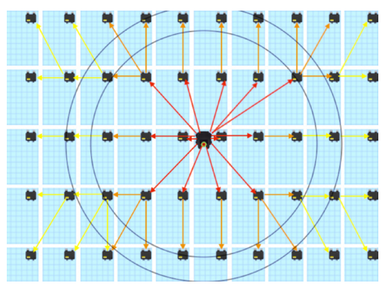
Install a TAP

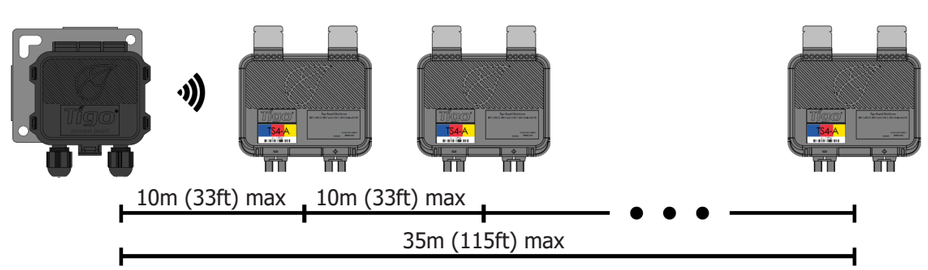
One TAP can communicate with up to 300 TS4s.

- Ensure the TAP is within 10m (33ft) of a TS4.
- Ensure the cable glands of the NEMA 4 TAP face down and cannot collect moisture.
- Make all TAP connections to the CCA before powering on the CCA.

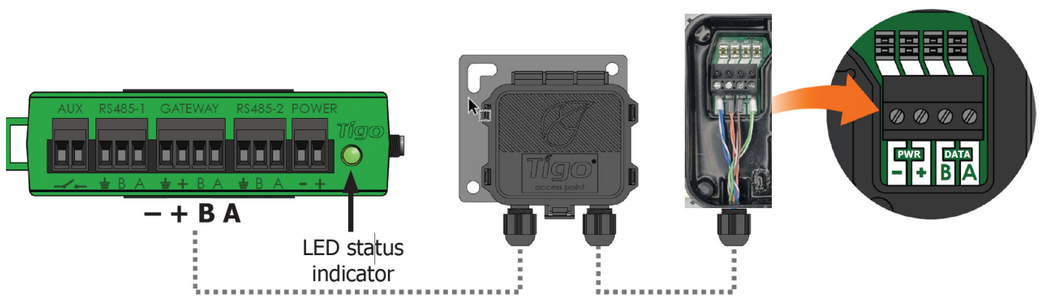


Locate the TAP centrally in an array.





Connect the TAP and CCA using 4-wire or CAT5/6 cables.



Wire schedule:

- Shielded if running next to PV conductors
- 20 – 18 AWG or CAT5/6 twisted pairs
- Solid core
- Cable outside diameter (OD) ≤9mm (.35in)

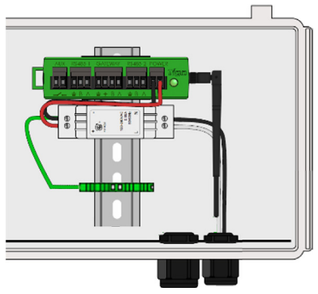
Install a CCA

Requires Ethernet or WiFi internet access. One CCA can communicate with up to 7 TAPs and up to 900 TS4s.

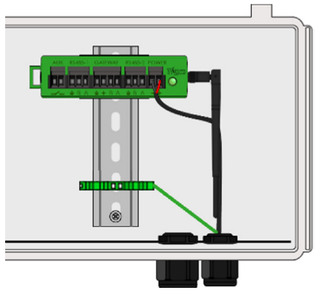
- The CCA must be on the same AC branch circuit as the inverter.
- Rapid shutdown occurs when an AC disconnect (inverter or switch) disconnects power to the CCA/TAP.
- Make all connections to TAPs before powering on the CCA.

1. Mount the CCA within a NEMA 1 (indoors) or NEMA 4 (outdoors) enclosure.
2. Connect TAP wires to the CCA GATEWAY port.
3. Connect a Tigo or 3rd-party power supply with $24V_{DC}$ output.

DIN-rail power supply



External power supply



CCA LED Status Indicator

LED Activity	State	Description
Solid green	System OK	The system is operating normally.
Blinking green/gray	EI app activity	The CCA is connected to the Tigo mobile EI app.
Blinking green/yellow	User PV-Off	The PV-Off mode was manually activated.
Blinking yellow/gray	Discovery	The CCA is scanning for TAPs/TS4s.
Solid yellow	Warning	Scanning is incomplete or the CCA cannot connect to the Tigo server.
Blinking red/yellow	Auto PV-Off	The PV-Off mode was automatically activated.
Solid red	Error	The CCA cannot find all TS4s or cannot connect to the Tigo server.

Testing/Commissioning

Download the Tigo Energy Intelligence (EI) mobile app to test and commission all TS4/TAP/CCA components. To remove a CCA post-commissioning, contact Tigo Support.

Specifications and Additional PVRSS UL 1741 Compliance Requirements

Model	Maximum Power	Maximum Input V	Maximum Input A	Maximum Input I_{SC}	Normal Operating Temperature Range	Maximum System V[1]
TS4-A-O	700W	80V	15A	15A	UL: -30 – 75°C (-22 – 167°F) IEC: -40 – 85°C (-40 – 185°F)	1000V/1500V
TS4-A-S	700W	80V	15A	15A	UL: -30 – 75°C (-22 – 167°F) IEC: -40 – 85°C (-40 – 185°F)	1000V/1500V
TS4-A-M[2]	500W	90V	15A	15A	UL: -30 – 75°C (-22 – 167°F) IEC: -40 – 85°C (-40 – 185°F)	1000V/1500V

TS4 PV conductors are 12 AWG.

TS4-A-O/S PVRSE WARNING – THIS PHOTOVOLTAIC RAPID SHUTDOWN EQUIPMENT (PVRSE) DOES NOT PERFORM ALL OF THE FUNCTIONS OF A COMPLETE PHOTOVOLTAIC RAPID SHUTDOWN SYSTEM (PVRSS).
The combination of TS4-A-O/S with TAP and CCA is certified as a UL 1741 photovoltaic rapid shutdown system (PVRSS) within a rapid shutdown time limit of 30s. The CCA data logger/gateway (P/N 346-00000-00) is powered from the same AC circuit as the rapid shutdown initiator (RSI) circuit. It provides a keep-alive signal to TS4 MLPE via a wired connection to a TAP and a wireless connection between the TAP and TS4s.
The installer must install signage complying with Section 690.56(C) of NEC NFPA 70 and indicating whether all conductors are controlled, or only conductors leaving the footprint of the array are controlled.
IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE THAT THE COMPLETED PV SYSTEM MEETS RAPID SHUT DOWN FUNCTIONAL REQUIREMENTS.
PVRSE must not be installed in readily accessible locations.

[1] Depending on connection method.
[2] Not a rapid shutdown system (PVRSS) component.

Resources

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