



CCA/TAP Communication And TS4 MLPE Troubleshooting Guide

A comprehensive guide for InstaGroup technicians to diagnose and resolve communication issues between the Tigo TS4s, the Cloud Connect Advanced (CCA) and Tigo Access Point (TAP) components in solar monitoring systems.



System Approach

1. The CCA and TAP work together to transfer module-level data to the Tigo EI Portal and App
 - a. The CCA is hardwired to the TAP.
 - b. The CCA is located at ground level; the TAP is mounted to a module in the center of the array.
 - c. Multiple TAPs may be required depending on site obstructions or roof planes.
2. The CCA sends a rapid shutdown (RSD) “keep-alive” signal to the TAP.
 - a. This signal is active after system commissioning.
 - b. The TAP transmits the keep-alive signal to the TS4s.
 - c. The TS4s will allow full module voltage to pass if they detect the keep-alive signal
 - d. If the CCA is deenergized, the keep-alive signal stops, and the TS4s will go into rapid shutdown mode
 - e. While in RSD mode, the output of each TS4 is 0V.
3. Each TS4 is connected to a single module



TAP Placement Considerations

Signal Obstruction Issues

Communication problems can occur even with perfect wiring if TAP placement doesn't account for the following considerations.

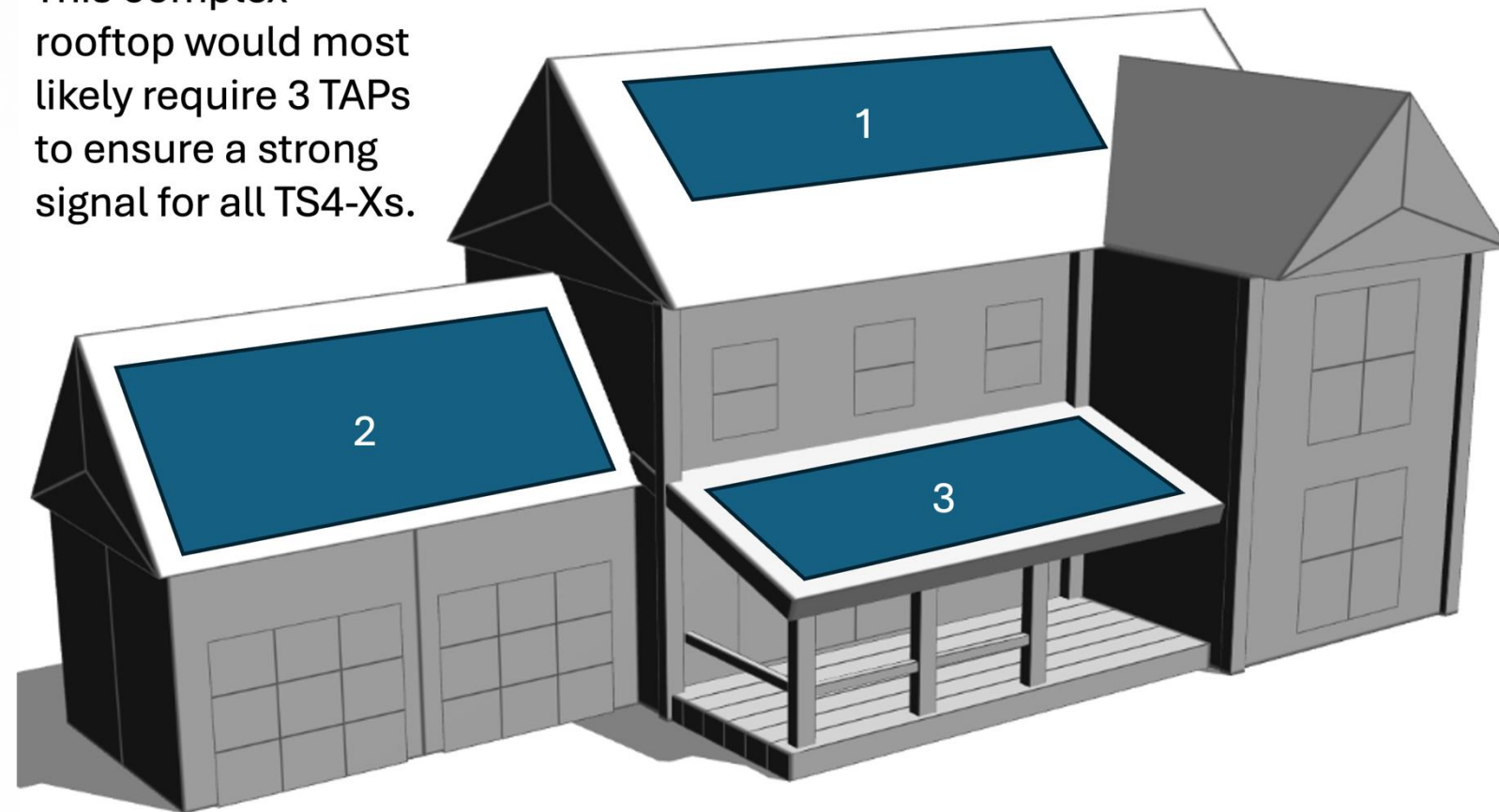
TAP Placement Considerations

Multiple Roof Levels or Planes

- Physical barriers between sections of the array can block TAP radio signals
- TAP signals cannot jump over roof sides
- Do not install TAPs in the attic!



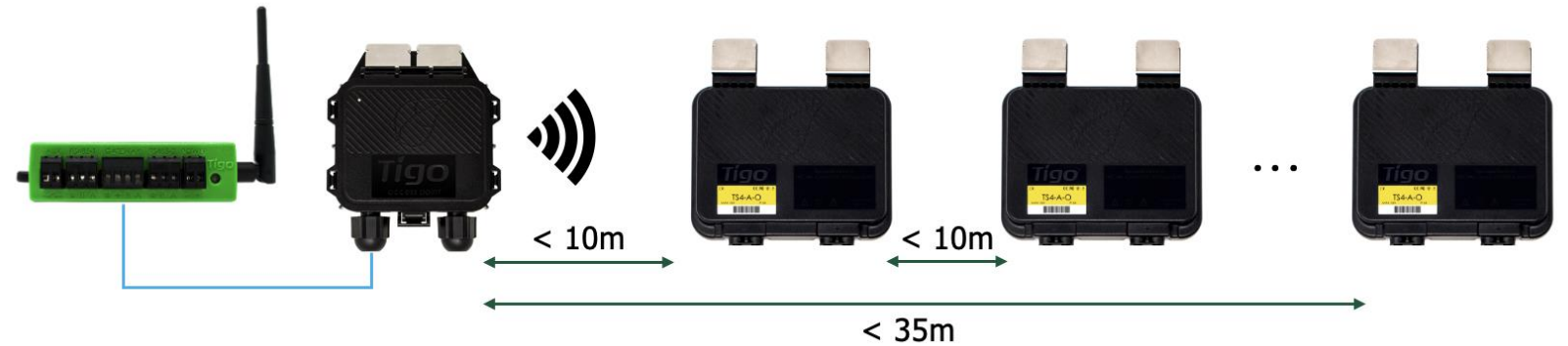
This complex rooftop would most likely require 3 TAPs to ensure a strong signal for all TS4-Xs.



TAP Placement Considerations

Range Limitations

- Some TS4 units may be outside effective signal range
- Place TAP in center of array for maximum coverage
- Maximum range to single TAP = 10m
- Maximum signal hopping range to the furthest TS4 = 35



Most Common CCA/TAP Issues

1. TS4s Not Detected/Intermittent Production

Symptoms

- Grey modules on EI App or Portal
- Missing TS4s on EI Ap or Portal
- EI App shows low RSSI values (<80)
- Low production from inverter

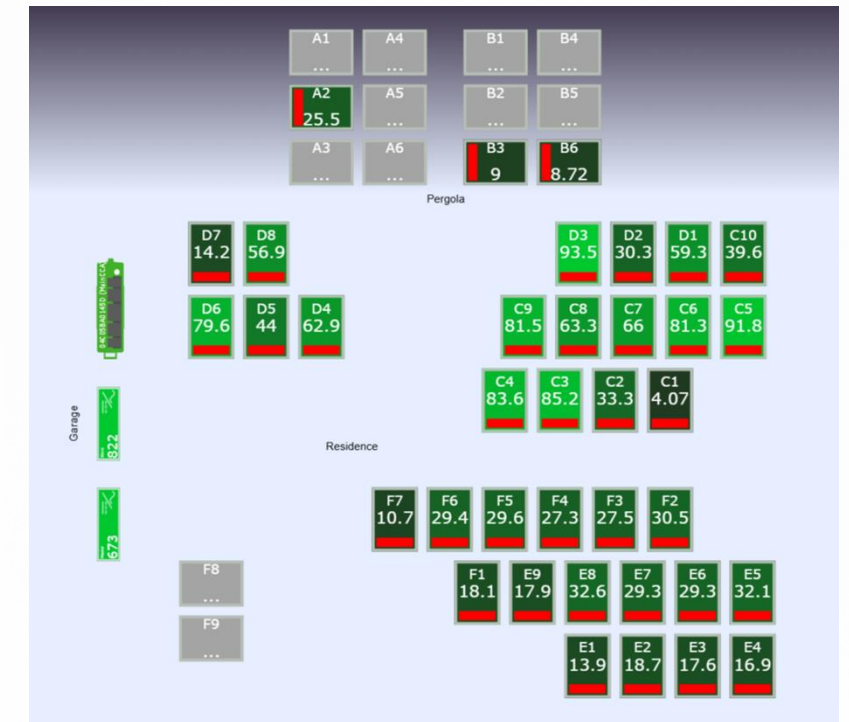
Root Causes

- Excessive distance between TAP and TS4 units
- Roof obstructions blocking RF signal
- Incorrect TAP placement (wrong tilt/azimuth or behind structures)
- RF interference from nearby equipment

Resolution Steps:

1. Review TAP placement and ensure it's central to module layout.
2. Relocate TAP to improve line-of-sight with TS4s.
3. Add an additional TAP for large or multi-level arrays.
4. Verify that nearby equipment is not causing RF interference.

Visual Indicator of Issues



Grey modules = no communication

2. TAP Not Detected

Symptoms

- Grey modules on EI App or Portal
- Missing TS4s on EI App or Portal
- Missing TAPs on EI App or Portal
- Low production from inverter

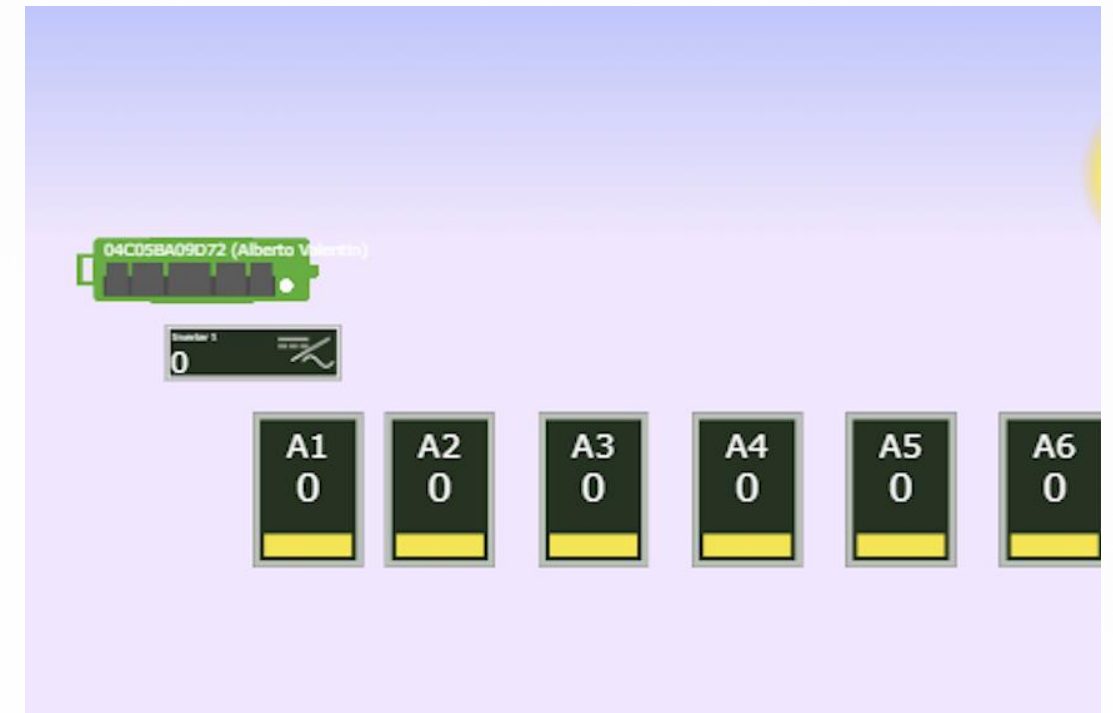
Root Causes

- RS485 wiring misconfiguration or loose connections
- Missing or incorrect terminator on the last TAP
- TAP powered off or damaged

Resolution Steps:

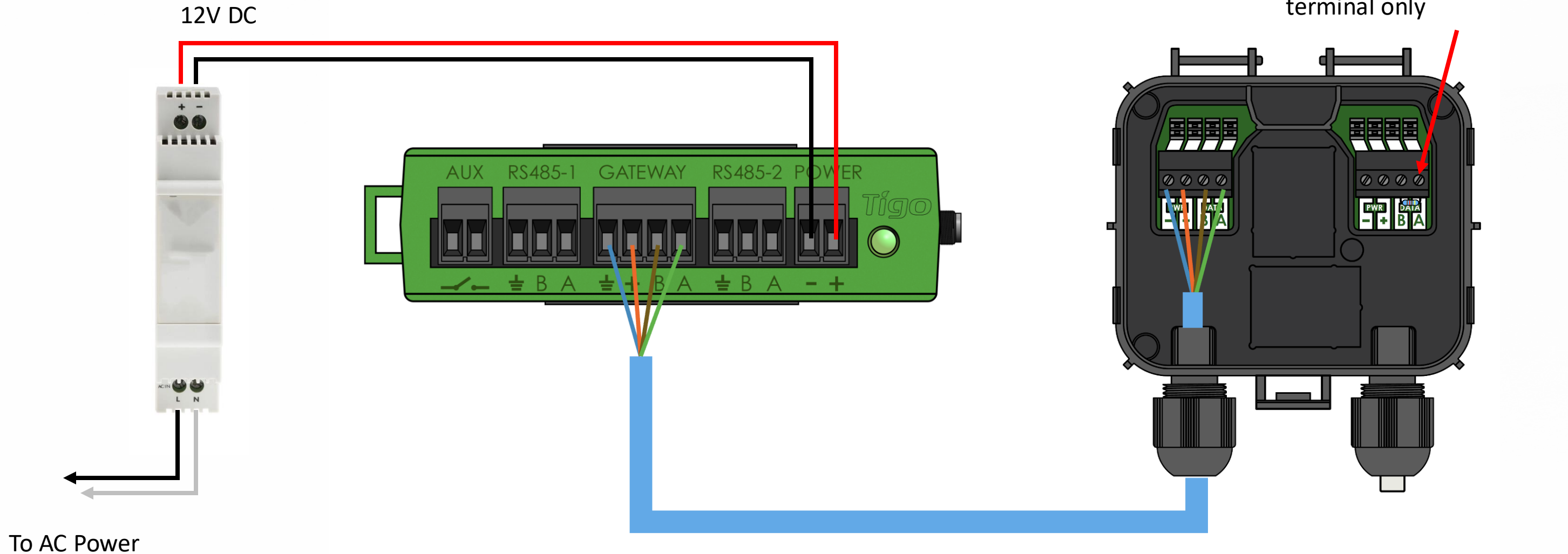
1. Check RS485 wire color match at TAP and CCA.
2. Perform a pull test on TAP terminals.
3. Ensure terminator is installed on the final TAP.
4. Confirm TAP has power (check LED, if available).
5. If still undetected, swap TAP with known working unit.

Visual Indicator of Issues



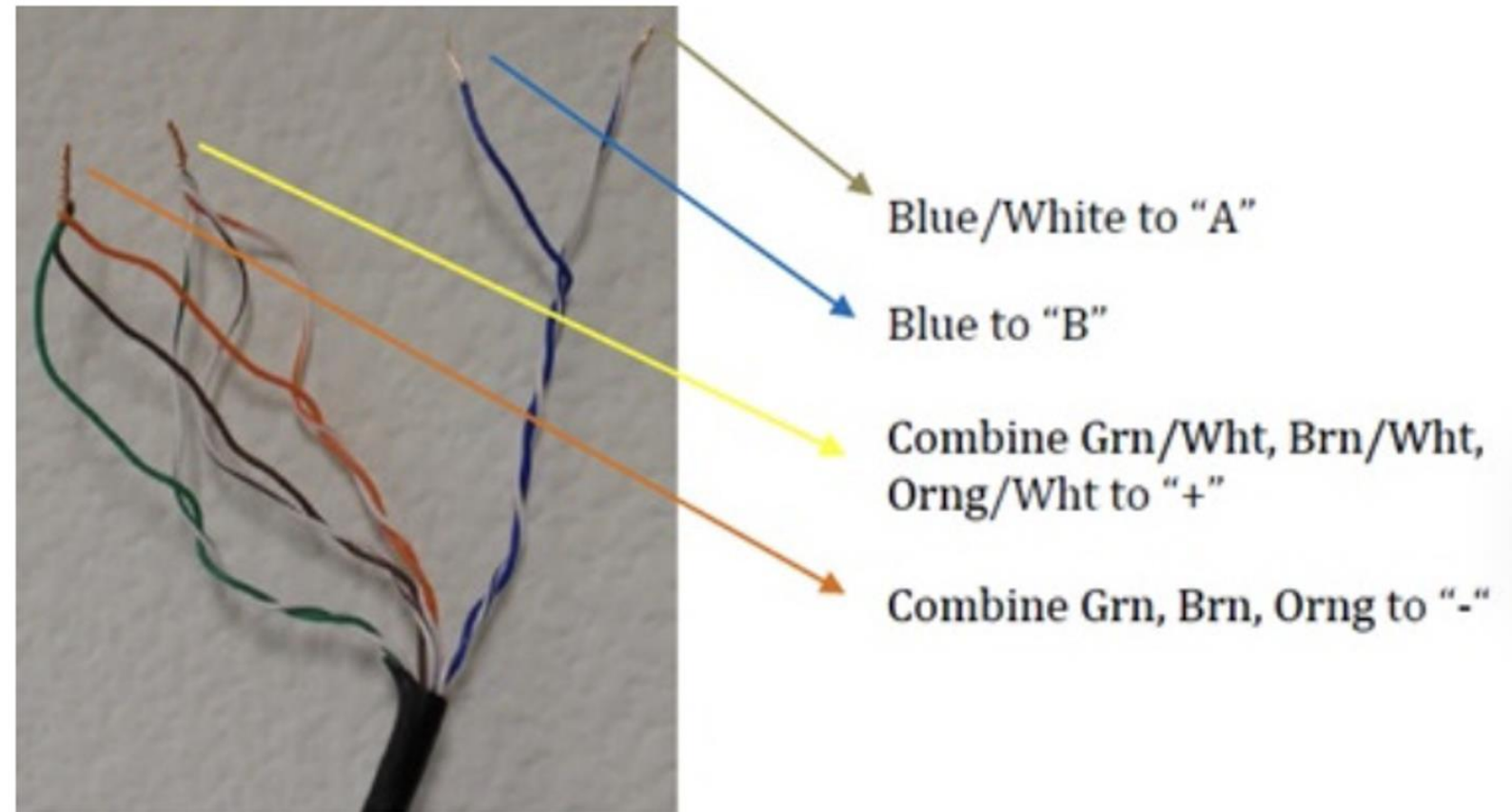
Black modules = no TAP detection of TS4s

Properly Wired CCA to TAP



Multiple TAP Wiring Considerations (CAT5/6)

- Ensure wiring colors are the same from left to right on all TAPs and the CCA
- If using CAT5/6 you must use the wire pairing in this image
- If not, there is not enough power to adequately reach the furthest TAPS



3. Intermittent Communication

Symptoms

- System goes online/offline randomly, or some modules stop reporting then come back.

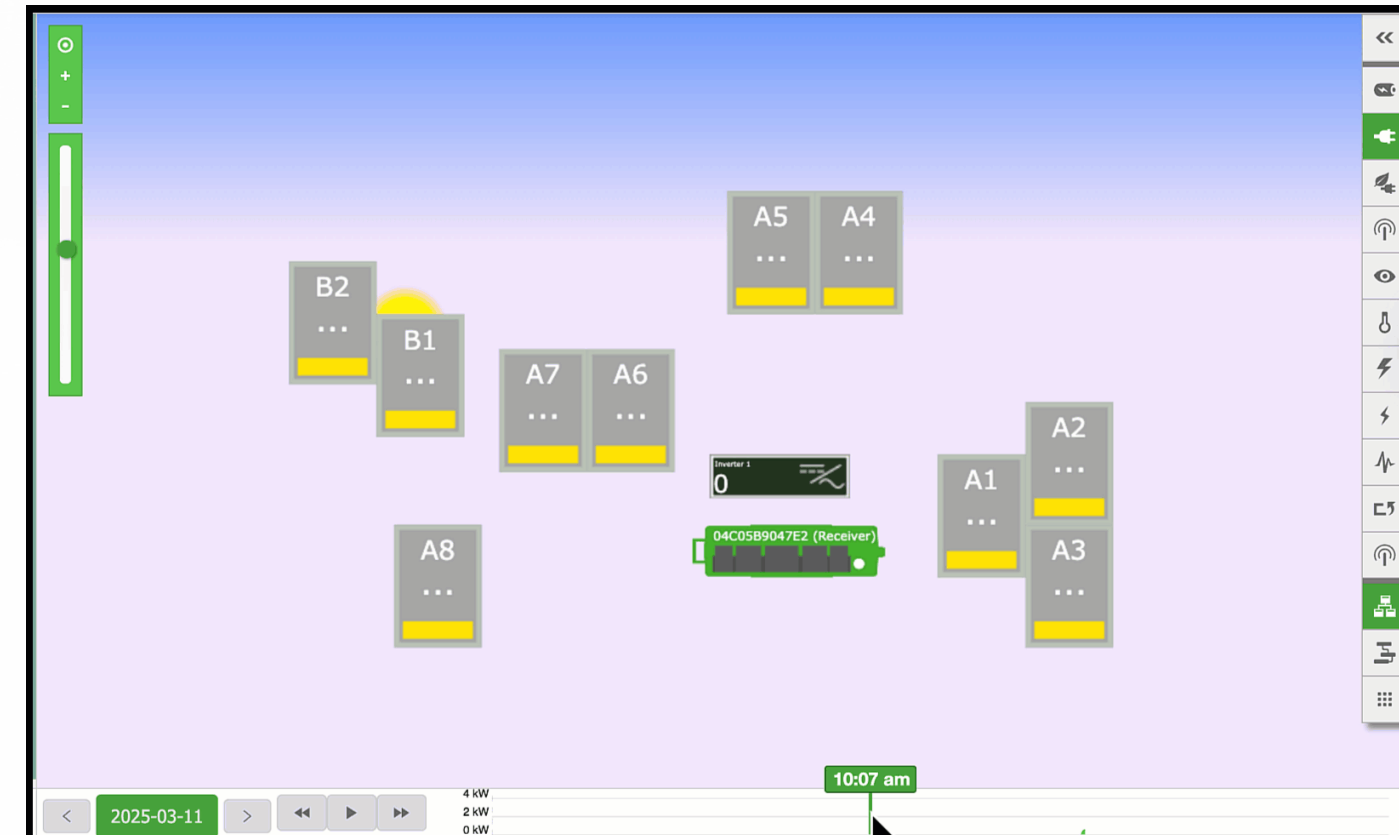
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4. Confirm TAP has power (check LED, if available).
5. If still undetected, swap TAP with known working unit.

Visual Indicator of Issues



Sliding the timer reveals a time of day when there was brief production

4. No Module Level Data

Symptoms

- Portal shows inverter data, but no individual module readings appear.

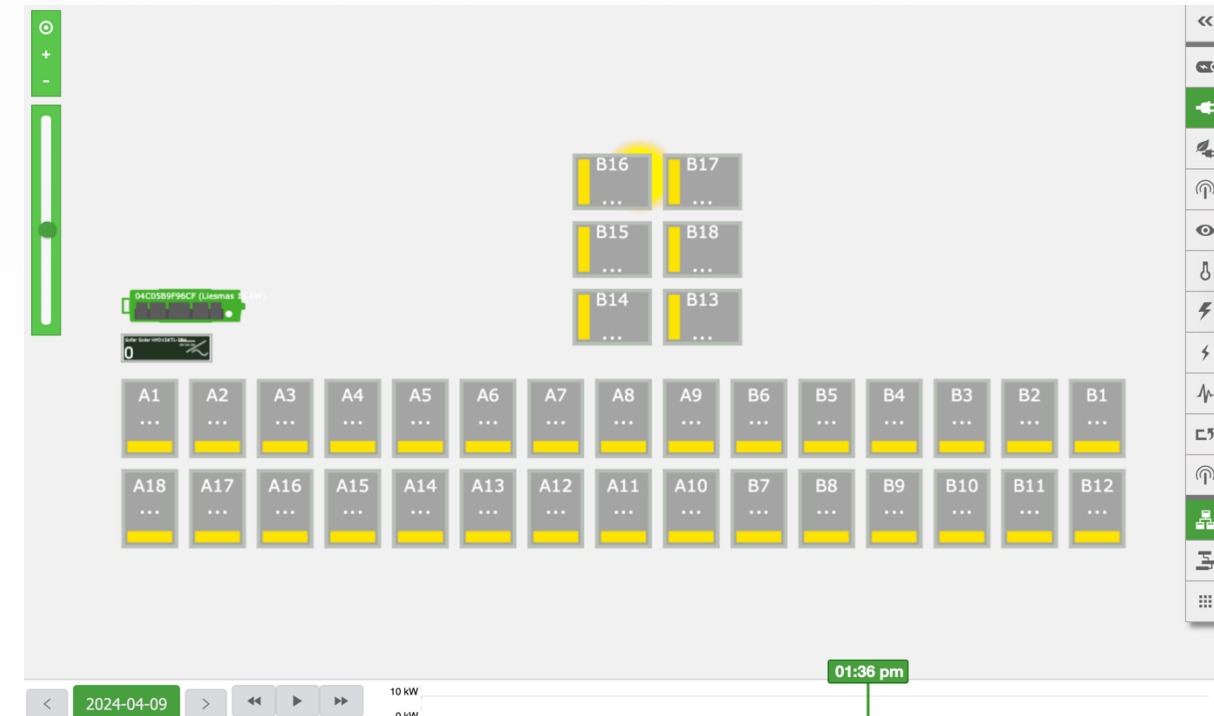
Root Causes

- System not yet commissioned in EI App
- TAP not communicating with TS4s
- TS4s are unpaired or incorrectly installed
- CCA firmware outdated or misconfigured

Resolution Steps:

1. Ensure system is fully commissioned using the EI App.
2. Confirm TAP is visible and communicating.
3. Check TS4 serial numbers for correctness and pairing.
4. Reboot the CCA.
5. Update firmware via EI App if needed.

Visual Indicator of Issues



5. System not updating in EI Portal or App

Symptoms

- System data appears outdated, frozen, or not synced with real-time performance.

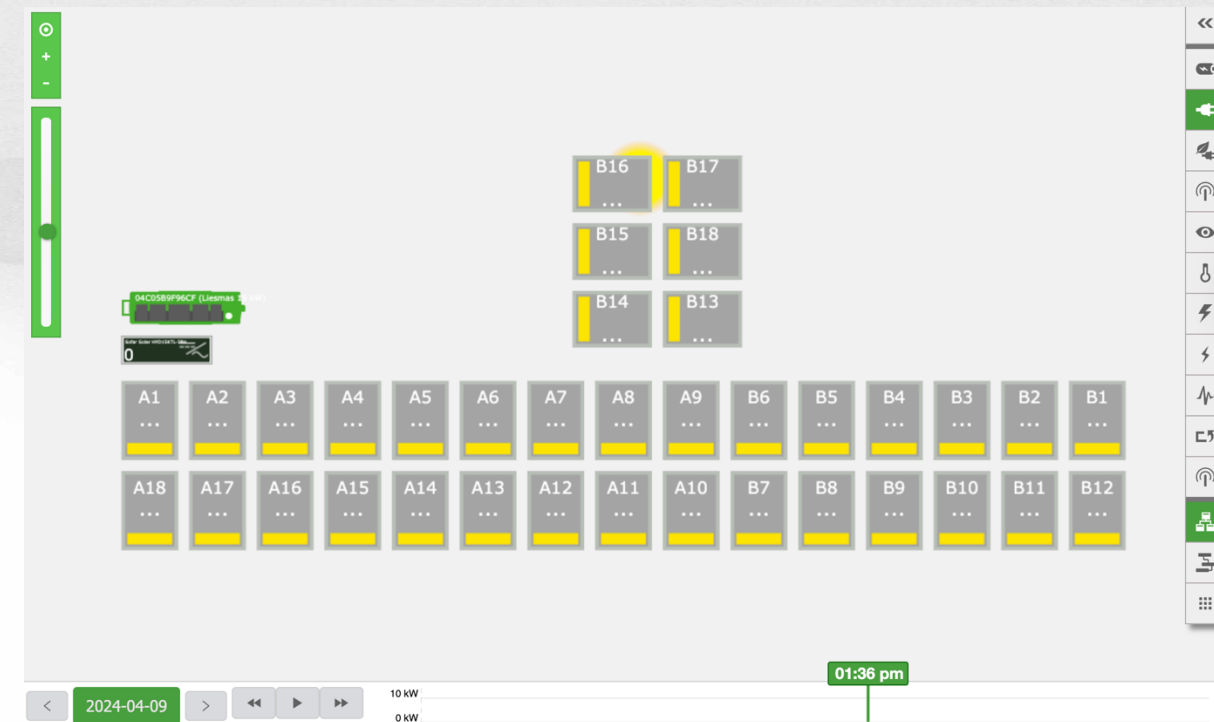
Root Causes

- CCA lost internet connection (Wi-Fi or Ethernet)
- DNS/firewall blocks communication to Tigo servers
- CCA rebooted improperly or frozen
- Portal-side data sync delay

Resolution Steps:

1. Check CCA internet connectivity (router, IP address, signal strength).
2. Reboot the CCA (power cycle).
3. Confirm port 443 is open for outbound traffic.
4. Check the last upload time on the portal.
5. If unresolved, re-link CCA in the EI App.

Visual Indicator of Issues



6. CCA does not power on

Symptoms

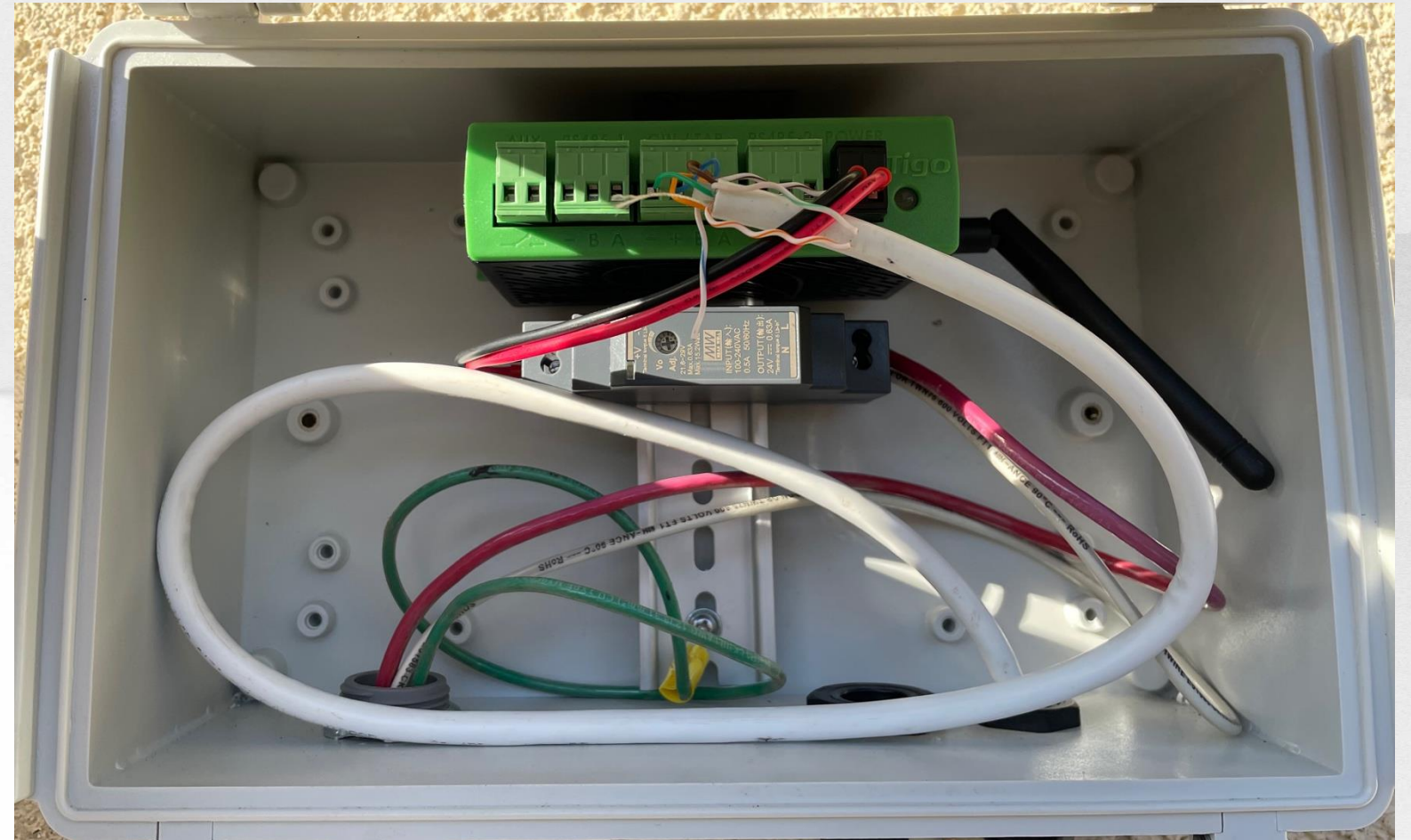
- CCA LEDs are dark
- No PV production

Root Causes

- CCA power supply is wrong voltage (24V)
- AC power to the CCA is not on

Resolution Steps:

1. Verify 24V power supply
2. Verify AC breaker to CCA is turned on



Troubleshooting revealed all CCA to TAPs wiring was correct. 24VDC power supply verified. The AC breaker that supplied 120V to the power supply was not turned on.

Most Common TS4-O Issues

- These are the most common reasons a TS4-O may appear faulty.
- A suspect TS4-O will usually appear as a black module on the EI App and Portal.
- These faults will almost always result in a TS4 replacement.

1. Water ingress

Root Causes:

- TS4s are stored outside with the cables exposed to rain or moisture
- TS4s are mounted to the module with the glad seals facing upward

Resolution Steps:

1. Replace the TS4
2. Future installs must adhere to handling requirements



2. Improper Connector Use

Root Causes

- Bad crimps
- Improper connector torque
- Connectors not completed as per manufacturer's directions
- Imposter "compatible" MC4 connectors do not mate properly and can cause connector hotspots

Resolution Steps:

1. Replace the TS4
2. Future installs must adhere to proper connector requirements



Cap screws not tightened enough

2. Improper Connector Use

Different connector types



2. Improper Connector Use

Overtorqued



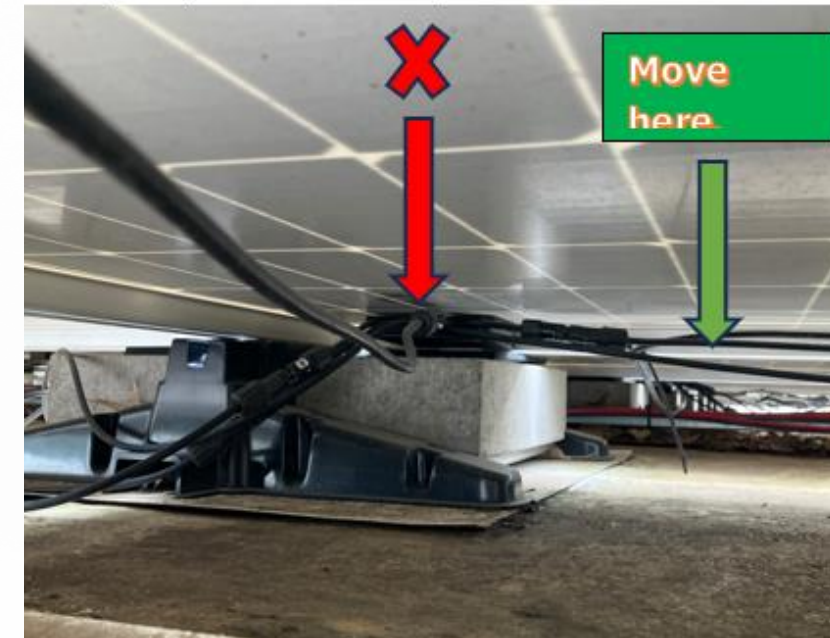
3. Improper TS4 Mounting

Root Causes

- Lack of airflow around TS4 (minimum 1.27 cm)
- TS4 mounted on module made it too close to backsheet
- TS4 mounted too close to ballast, rails, etc.

Resolution Steps:

1. Replace the TS4
2. If TS4 is too close to the module backsheet, flip the unit and remount with the label facing towards the module.
3. Do not have a tight bend radius on TS4 connectors
4. Future installs must adhere to proper mounting requirements



4. Electrical Shock (array side)

Symptoms

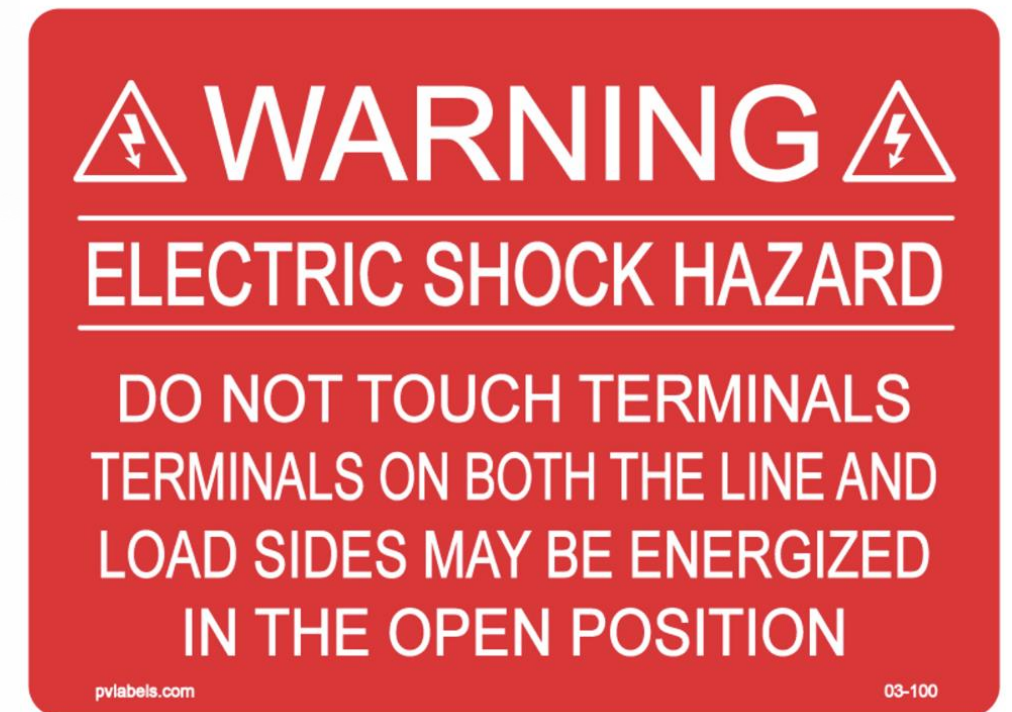
- Installer feels an electrical shock when connecting TS4-O to module or when preparing string homerun to the inverter.
- Installer is shocked when performing system troubleshooting

Root Causes

- Installer did not realize the TS4-O passes full module voltage as soon as it is connected to the module, or when it is not in RSD mode.

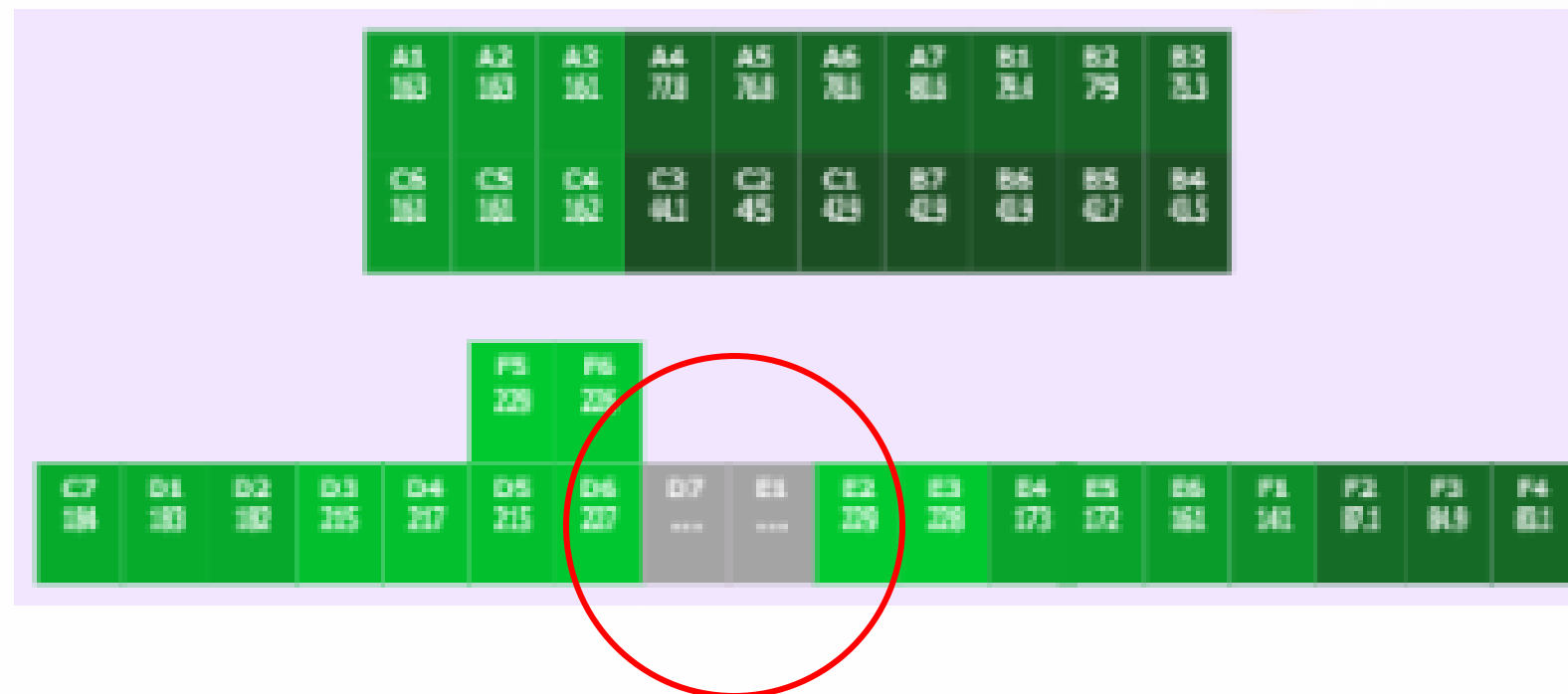
Resolution Steps:

1. Use proper electrical safety PPE and procedures when working around lethal voltage
2. Once the system is commissioned, the TS4s will go into RSD and pass 0V when the CCA is deenergized.
3. Turn off the CCA and the inverter DC disconnect when troubleshooting a TS4-O system.



TS4 Switch Failure

- The switch that isolates the module from the string may become faulty.
- Error message appears on EI App/Portal stating a switch failure.
- **Gray modules** could be an indicator of a switch failure.
- This fault requires an RMA replacement



Ground-Level Diagnostics: CCA Inspection

1 Perform Terminal Pull Test

Gently pull on wires to verify proper connection tightness.
Verify terminal screws are not clamped onto the wire insulation.

2 Verify Wire Sizing

Ensure wire gauge matches connector specifications (ferrule may be required if undersized, particularly for CAT5/6 connections)

3 Check Power Connections

Verify CCA power supply and connection.
Ensure DC power supply breaker is on!

4 Confirm Router Connection

Verify CCA green light is solid.
Ensure proper network connectivity



Properly installed CCA in IP68 Enclosure



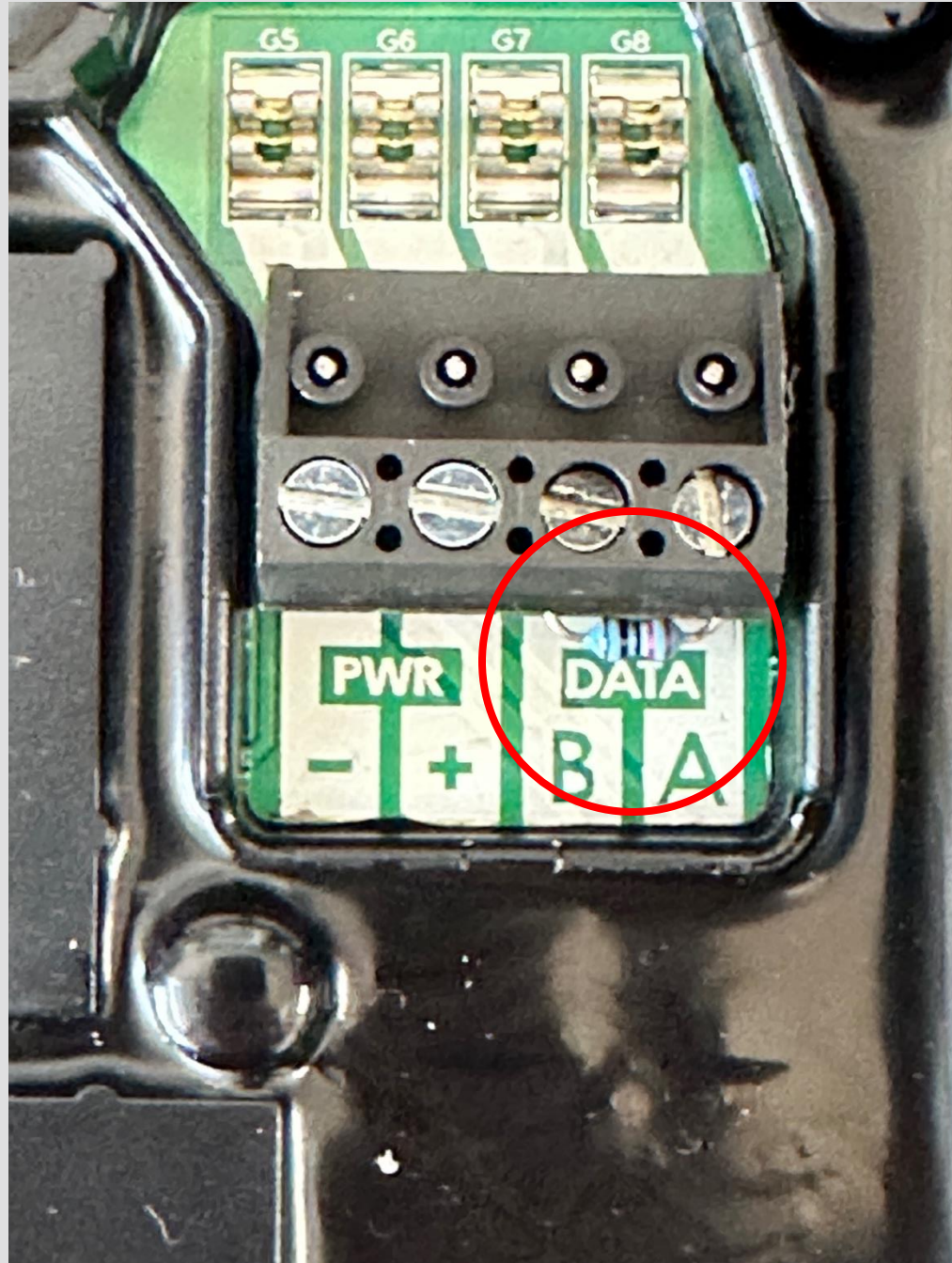
Roof-Level Diagnostics: TAP Inspection

Wiring Color Verification

RS485 connector wire colors should match TAP terminal colors in the same left-to-right sequence (refer to quick start guide diagrams)

Terminal Connection Check

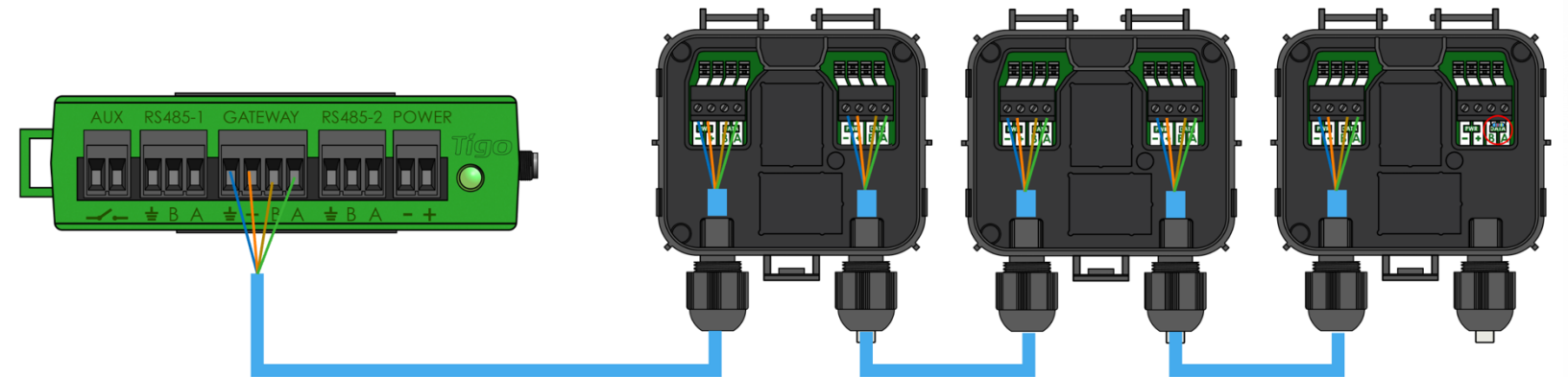
Perform pull test on TAP terminals to verify secure connections



Roof-Level Diagnostics: TAP Inspection

Terminator Installation

Confirm 120 Ohm terminator is installed only on the last TAP's right terminal block

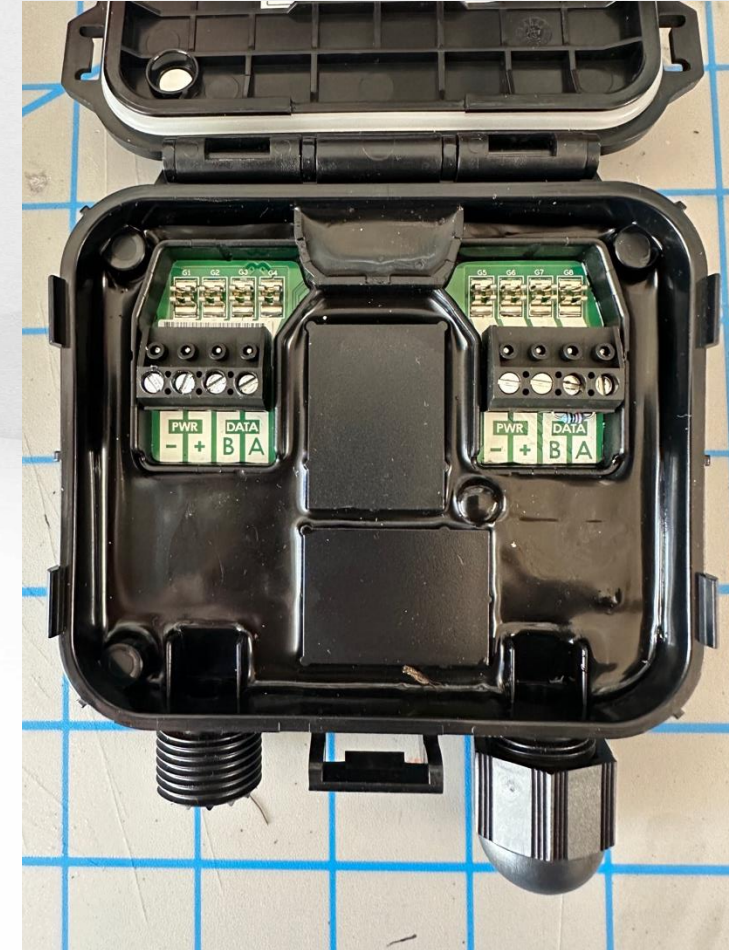


TAP Environmental Issues

Moisture Inspection

- Check for water infiltration inside TAP housing
- Verify cover is properly sealed
- Ensure gland seals on bottom are correctly oriented (not pointing upward)

Moisture is a common cause of intermittent communication failures and component damage.



⊗ Warning: Improperly sealed TAP enclosures can lead to water damage and system failure.

Final Considerations & Next Steps

Component Failure

While uncommon, TS4, TAP, or CCA hardware failures can occur as a last possibility after all connection and placement issues are ruled out.

- ❏ Always exhaust all other troubleshooting options before assuming component failure.

Next Steps

- Follow the methodical process outlined in this guide
- Document successful fixes for your team
- Contact Tigo support with detailed troubleshooting history if issues persist
- Consider preventative design approaches for future installations

Remember: Most communication issues stem from installation errors rather than faulty components.