



Tigo[®]

Installation Manual

TS4-F, TS4-A-F, TS4-A-2F
and RSS Transmitter

IMPORTANT SAFETY INSTRUCTIONS

**LETHAL VOLTAGE MAY BE PRESENT IN ANY PV
INSTALLATION**



SAVE THESE INSTRUCTIONS

WARNING - THIS PHOTOVOLTAIC RAPID SHUTDOWN EQUIPMENT (PVRSE) DOES NOT PERFORM ALL OF THE FUNCTIONS OF A COMPLETE PHOTOVOLTAIC RAPID SHUTDOWN SYSTEM (PVRSS). THIS PVRSE MUST BE INSTALLED WITH OTHER EQUIPMENT TO FORM A COMPLETE PVRSS THAT MEETS THE REQUIREMENTS OF NEC (NFPA 70) SECTION 690.12 FOR CONTROLLED CONDUCTORS OUTSIDE THE ARRAY. OTHER EQUIPMENT INSTALLED IN OR ON THIS PV SYSTEM MAY ADVERSELY AFFECT THE OPERATION OF THE PVRSS. IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE THAT THE COMPLETED PV SYSTEM MEETS THE RAPID SHUTDOWN FUNCTIONAL REQUIREMENTS. THIS EQUIPMENT MUST BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

- This manual contains important instructions for installation and maintenance of the Tigo product models TS4-F, TS4-A-F, TS4-A-2F, and the RSS Transmitter.
- Risk of electric shock, do not remove cover, disassemble, or repair, no user serviceable parts inside. Refer servicing to qualified service personnel.
- Before installing or using the Tigo System, please read all instructions and warning markings on the Tigo products, appropriate sections of your inverter manual, photovoltaic (PV) module installation manual, and other available safety guides.
- All equipment shall be installed and operated in an environment within the ratings and limitations of the equipment as published in the installation manual.
- To reduce risk of fire and shock hazard, install this device with strict adherence to National Electric Code (NEC) ANSI/NFPA 70 and/or local electrical codes. When the photovoltaic array is exposed to light, it supplies a DC voltage to the Tigo TS4 units and the output voltage may be as high as the PV module open circuit voltage (V_{oc}) when connected to the module. The installer should use the same caution when handling electrical cables from a PV module with or without the TS4 units attached.
 - TS4-F, TS4-A-F, and TS4-A-2F are shipped in the OFF position and will measure 0.6V at the output when the keep-alive signal is not present.
- Installation must be performed by trained professionals only. Tigo does not assume liability for loss or damage resulting from improper handling, installation, or misuse of products.
- Remove all metallic jewelry prior to installing the Tigo TS4 units to reduce the risk of contacting live circuitry. Do not attempt to install in inclement weather.
- Do not operate the Tigo TS4 units if they have been physically damaged. Check existing cables and connectors, ensuring they are in good condition and appropriate in rating. Do not operate Tigo TS4 units with damaged or substandard wiring or connectors. Tigo TS4 units must be mounted on the high end of the PV module backsheet or racking system, and in any case above ground.
- Do not connect or disconnect under load. Turning off the inverter and/or the Tigo products may not reduce this risk. Internal capacitors within the inverter can remain charged for several minutes after disconnecting all power sources. Verify capacitors have discharged by measuring voltage across inverter terminals prior to disconnecting wiring if service is required. Wait 30 seconds after rapid shutdown activation before disconnecting DC cables or turning off DC disconnect.
- Mating connectors from different manufacturers cannot be mated with each other.

The transmitter control power supply **MUST** be on the same AC branch circuit as the inverter to meet rapid shutdown requirements.

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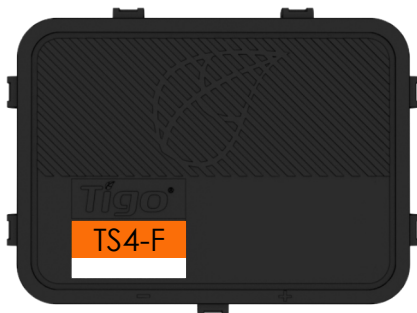
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TS4-F RAPID SHUTDOWN SYSTEM

Tigo's TS4-F (or TS4-A-F, TS4-A-2F) and RSS Transmitter are a UL-certified PVRSS (Photovoltaic Rapid Shutdown System) when installed together. The RSS Transmitter supplies a keep-alive signal along one of the DC homeruns of the string and the TS4-F units on each module will shut down when the Transmitter is switched off.

The TS4-F, TS4-A-F and TS4-A-2F can be used interchangeably in the same system.

Module-Level Power Electronics:



TS4-F

- NEC 2017 and 2020 690.12 rapid shutdown compliant
- Module-level deactivation
- PLC communication
- Plug & play, no configuration required

Transmitter:



RSS Transmitter

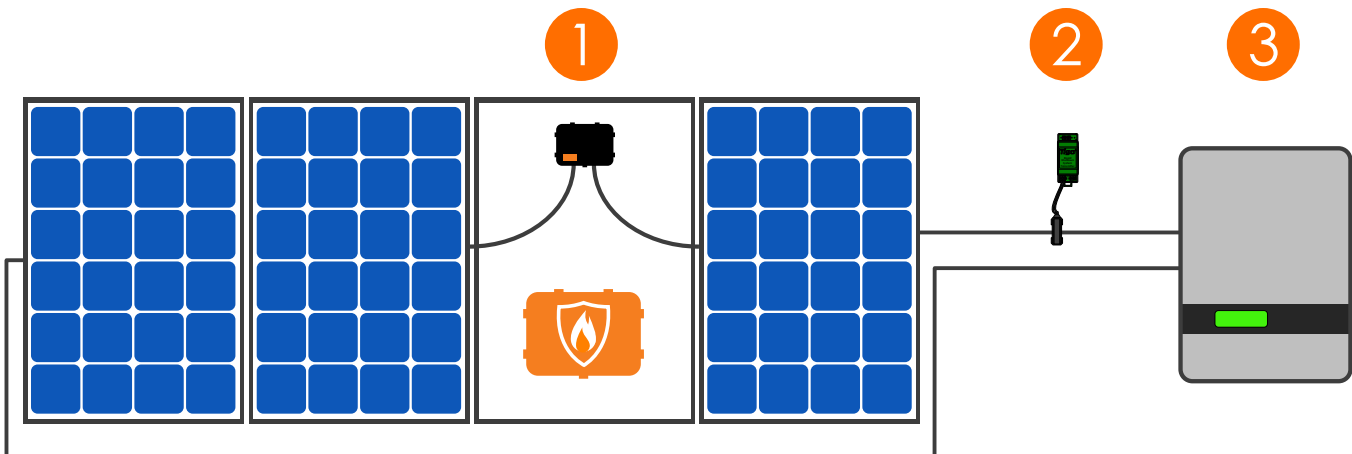
- Rapid Shutdown System Transmitter for rapid shutdown activation of TS4-F, TS4-A-F, or TS4-A-2F units
- The external device that provides a keep-alive signal to the TS4-F via Power Line Communication

SYSTEM OVERVIEW: TS4-F



TS4-F

- Module electronics are contained in the junction box, installed at the PV module factory.
- Connected in series like regular modules
- No additional wiring connections to make



1. Modules with integrated TS4-F
2. RSS Transmitter and RSS Core
3. UL PVRSS Listed Inverter

The TS4-F requires a Tigo RSS Transmitter or inverter with built-in transmitter for operation. The Tigo RSS Transmitter is installed in line with a solar PV inverter, as shown, and can be installed inside the inverter or external to it.

Method of Operation

All TS4-F units start in the OFF position and measure 0.6V at the output. When power is supplied to the RSS Transmitter, the TS4-F units turn ON and allow full PV module voltage.

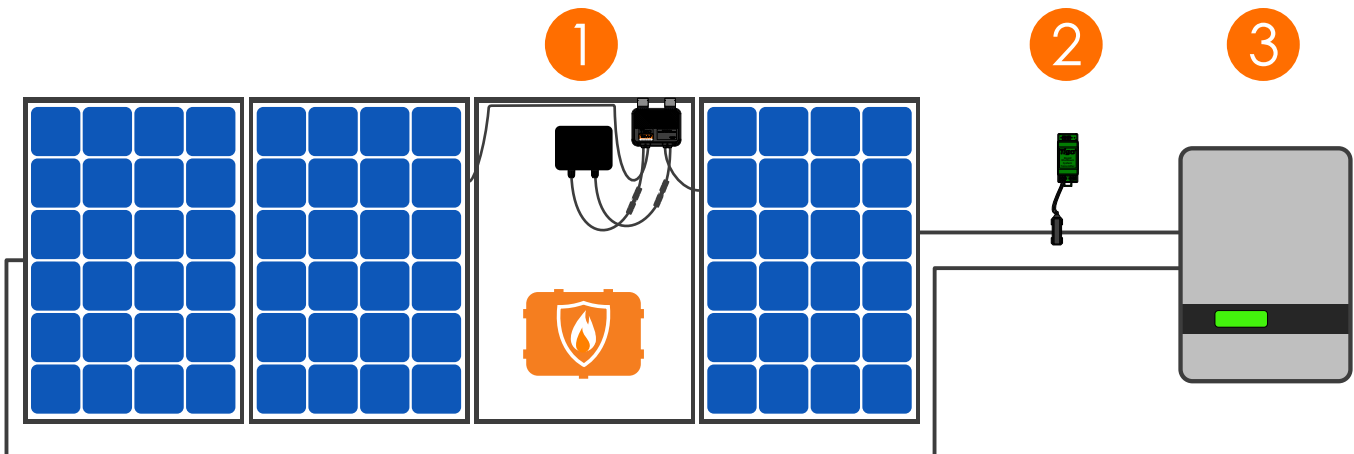
The units constantly receive a “keep-alive” signal from the transmitter over PLC. When power to the transmitter is cut, this keep-alive signal ceases, sending every TS4-F into shutdown mode with output reduced to 0.6V.

SYSTEM OVERVIEW: TS4-A-F



TS4-A-F

- Bracket clips to module frame without tools
- TS4-A outputs are connected in series to form a string
- No additional grounding required



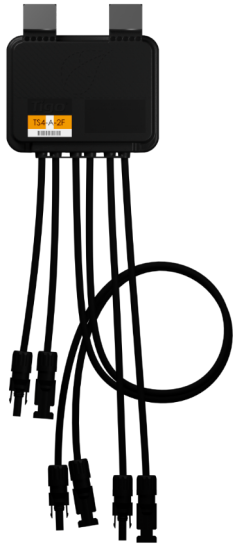
1. Modules with TS4-A-F add-on
2. RSS Transmitter and RSS Core
3. UL PVRSS Listed Inverter

Note: connect modules to TS4-A inputs before connecting outputs

The TS4-A-F requires a Tigo RSS Transmitter or inverter with built-in transmitter for operation.

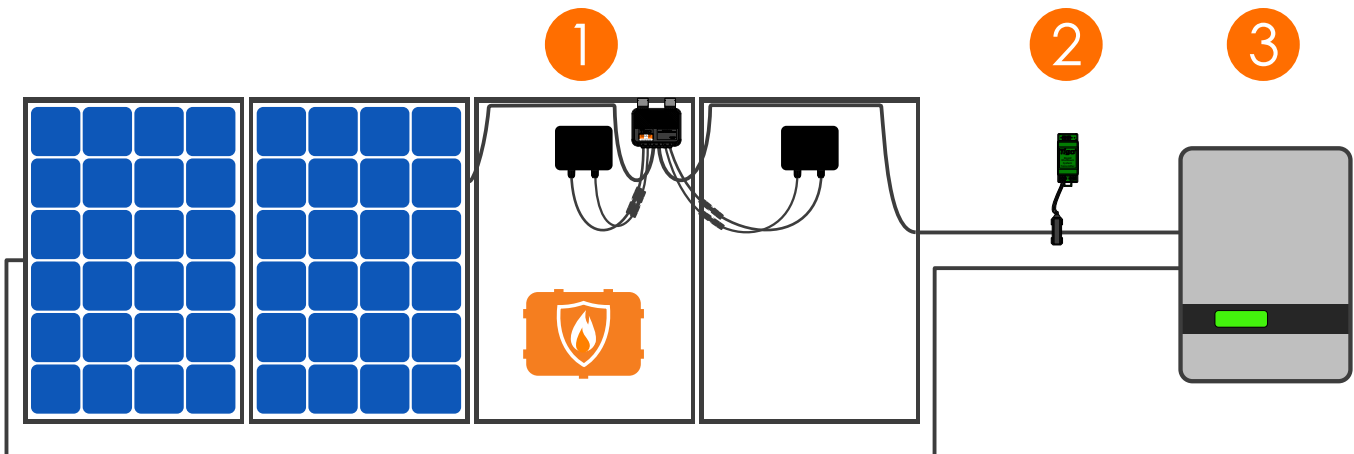
- TS4-A-F mounting is recommended on the upper right as shown, but can be placed elsewhere on the frame or bolted to the racking if needed.
- TS4-A-F cable glands must not be facing up.
- Allow clearance between PV module and mounting surface for air circulation around TS4-A-F.
- For installation on frameless modules, remove metal clips and bolt TS4-A to rail. Do not drill additional mounting holes in the frame or metal bracket.

SYSTEM OVERVIEW: TS4-A-2F



TS4-A-2F

- Bracket clips to module frame without tools
- TS4-A outputs are connected in series to form a string
- No additional grounding required
- Two individual module inputs



1. Modules with TS4-A-2F add-on
2. RSS Transmitter and RSS Core
3. UL PVRSS Listed Inverter

Note: connect modules to TS4-A inputs before connecting outputs

The TS4-A-2F requires a Tigo RSS Transmitter or inverter with built-in transmitter for operation.

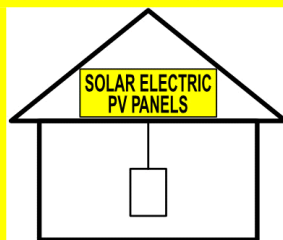
- TS4-A-2F mounting is recommended on the upper right as shown, but can be placed elsewhere on the frame or bolted to the racking if needed.
- TS4-A-2F cable glands must not be facing up.
- Allow clearance between PV module and mounting surface for air circulation around TS4-A-2F.
- For installation on frameless modules, remove metal clips and bolt TS4-A to rail. Do not drill additional mounting holes in the frame or metal bracket.

INSTALLATION NOTES

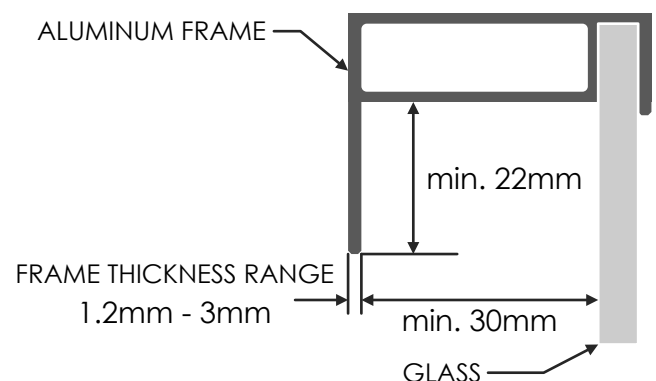
- TS4-F, TS4-A-F, and TS4-A-2F are shipped in the OFF position and will measure **0.6V** at the output when the keep-alive signal is not present.
- Failing to follow the sequence of installation steps may result in TS4 damage not covered under warranty.
- Connect all TS4-A-F or TS4-A-2F units to their respective modules **before** connecting their outputs in series.
- Install all TS4-F, TS4-A-F, or TS4-A-2F units **before** powering on the RSS Transmitter.
- Never modify or extend wires between RSS Transmitter and RSS Core.
- Never apply an external voltage source to a module or string equipped with TS4-F, TS4-A-F, or TS4-A-2F units.
 - If parallel string connections are needed, first connect the TS4-F, TS4-A-F, or TS4-A-2F to the PV modules, then connect all TS4-F, TS4-A-F, or TS4-A-2F outputs in series, and finally pass one side (+ **or** -) of the homeruns through the PLC transmitter to turn the system ON.
- If connecting TS4-A-2F to a single PV module:
 - Connect PV module to **Input 1**, connect **Input 2** cables together
- Place rapid shutdown system label no more than 1m (3ft) from initiator (AC disconnect) or service panel containing means of disconnection if not at same location.

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY



Place safety labels in proper location

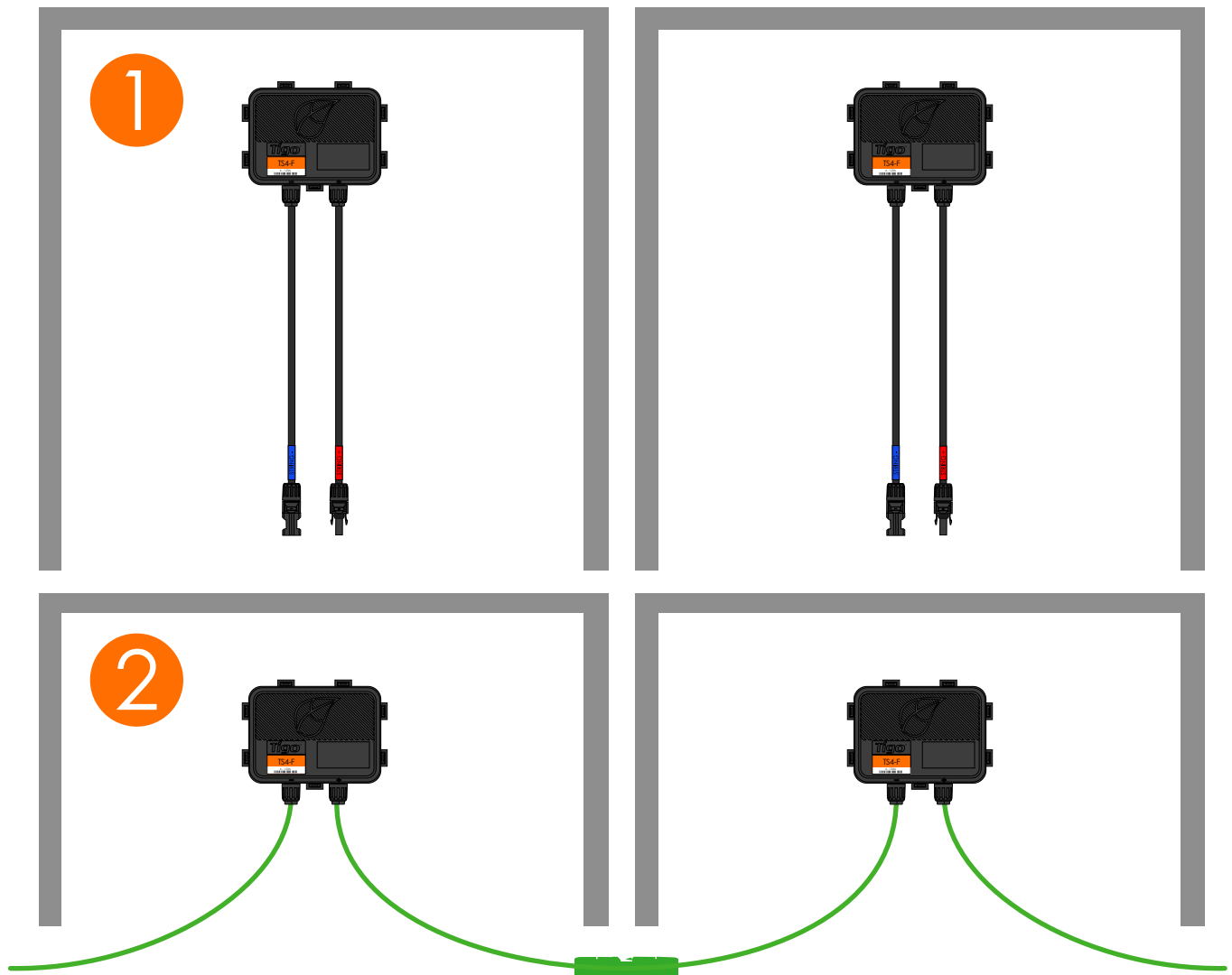


Module frame specifications for mounting TS4-A

TS4-F INSTALLATION

Smart modules with an integrated TS4 Junction box are installed and connected in series just like standard PV modules.

Connect modules with TS4-F in series before powering on the RSS Transmitter.



RSS Transmitter must be powered OFF during TS4-F installation.

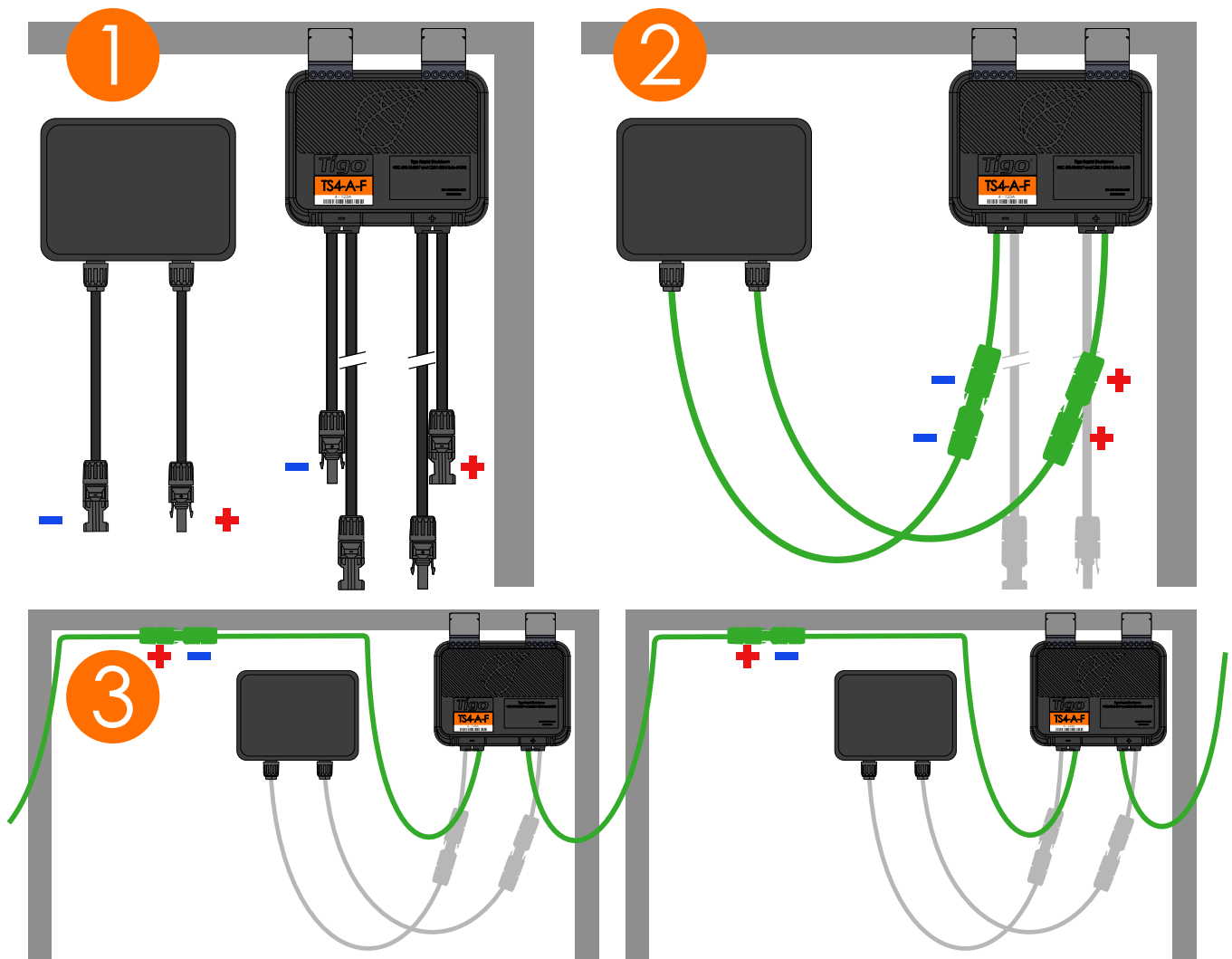
TS4-A-F INSTALLATION

Standard modules can be equipped with TS4-A-F add-on units as shown below.

Always connect modules to TS4-A inputs before connecting outputs.

Each TS4-A-F must have a PV module connected to its input before connecting the outputs of TS4-A-F units in series.

To disconnect TS4-A-F from a module, disconnect the TS4-A-F outputs from the string before disconnecting the TS4-A-F inputs from the module junction box.



RSS Transmitter must be powered OFF during TS4-A-F installation.

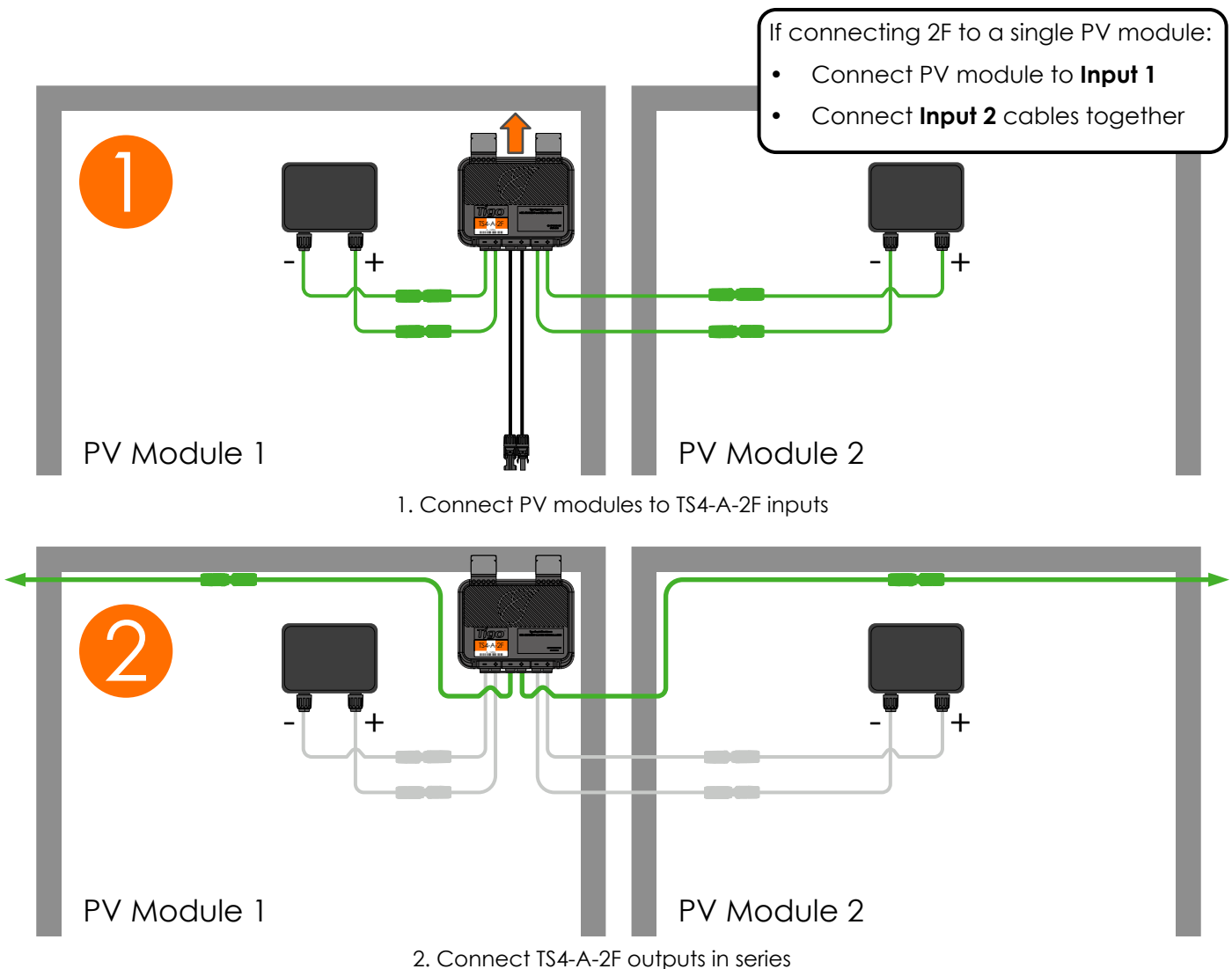
TS4-A-2F INSTALLATION

Standard modules can be equipped with TS4-A-2F add-on units as shown below.

Always connect modules to TS4-A inputs before connecting outputs.

Each TS4-A-2F must have a PV module connected to its inputs before connecting the outputs of TS4-A-2F units in series.

To disconnect TS4-A-2F from a module, disconnect the TS4-A-2F outputs from the string before disconnecting the TS4-A-2F inputs from the module junction box.



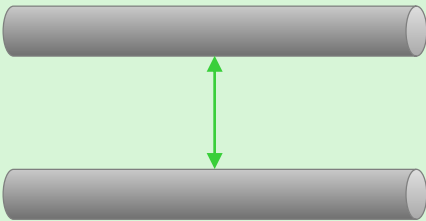
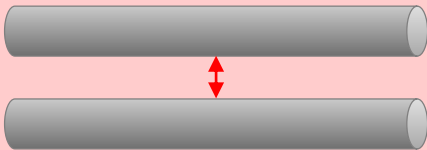
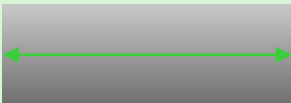


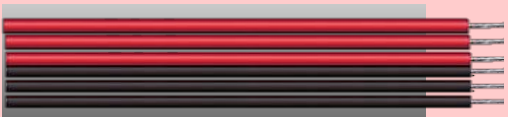


RSS Transmitter must be powered OFF during TS4-A-2F installation.

PV CONDUCTOR INSTALLATION - MULTI-TRANSMITTER SYSTEMS - REQUIRED PRACTICES

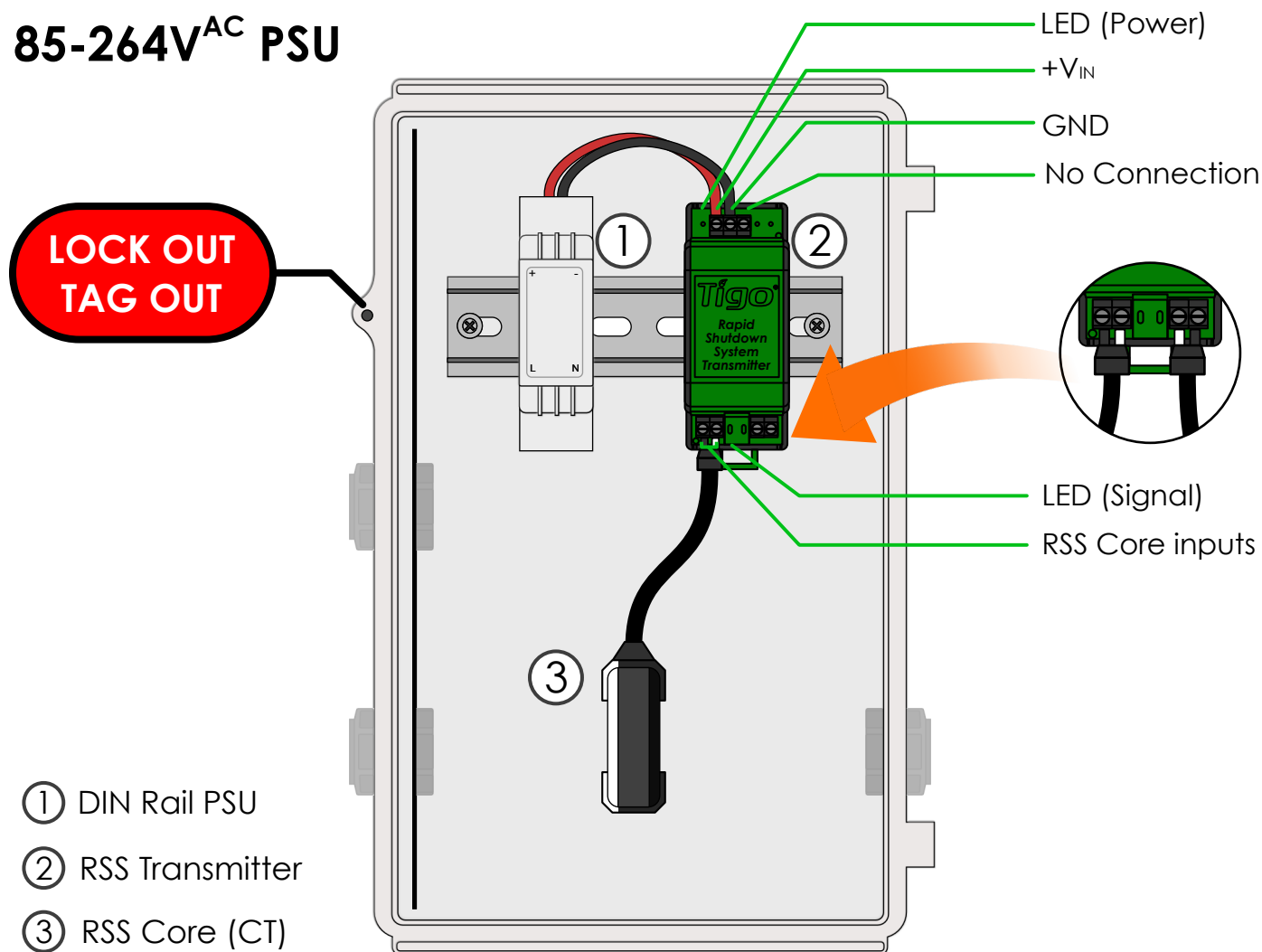
When installing a system with 2 or more transmitters it is mandatory to use the following best installation practices of PLC circuits to ensure a trouble-free installation.

These practices are required in multi-transmitter installations.

DO ✓	DO NOT ✗
 <p>Run positive and negative conductors from the same string and RSS transmitter together</p>	 <p>Do not separately run all positives together and all negatives together</p>
 <p>Keep conduits associated with different transmitters as far apart as possible</p>	 <p>Do not install conduits associated with different transmitters directly adjacent to each other</p>
 <p>Cable trays containing conductors from multiple transmitters should be as short as possible</p>	 <p>The longer the cable tray the higher chance of experiencing crosstalk between transmitters</p>
 <p>Once inside a cable tray keep strings (+) and (-) as close as possible to a twisted pair</p>	 <p>Do not segregate the positives and negatives of strings inside a cable tray</p>

RSS TRANSMITTER INSTALLATION – SINGLE RSS CORE

85-264V^{AC} PSU



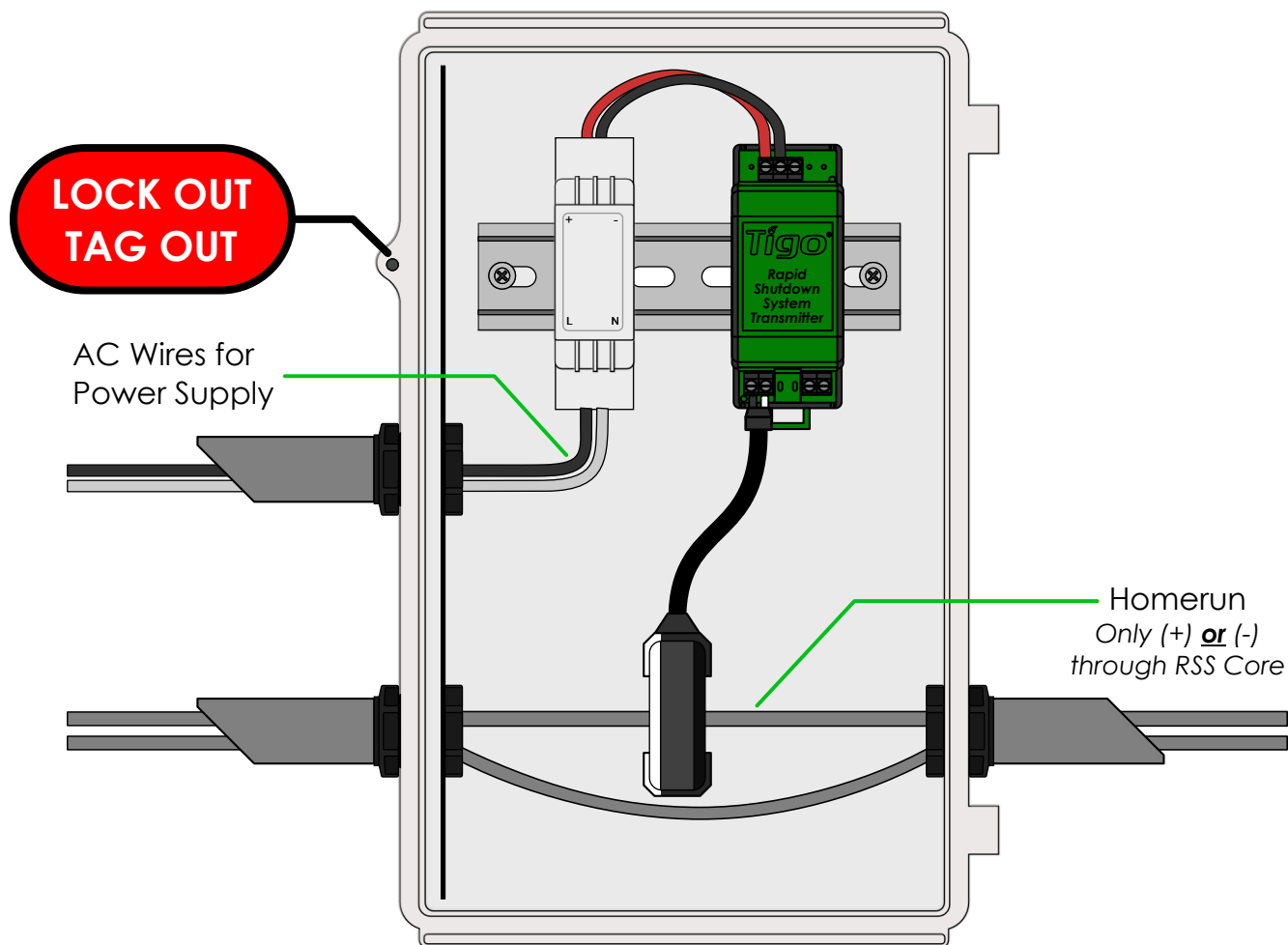
Transmitter power supply must be on same AC branch circuit as inverter to meet rapid shutdown requirements.

Note: Install TS4-F before powering on RSS Transmitter

- Drill holes in enclosure for conduit (see drilling guide for placement)
- Mount RSS Transmitter and power supply on DIN rail
- Connect DC leads from power supply ① to transmitter ②
- Connect RSS Core ③ to transmitter

Place rapid shutdown system label no more than 1m (3ft) from RSS Transmitter or AC disconnect if not at same location.

RSS TRANSMITTER WIRING – SINGLE RSS CORE



Note: Install TS4-F before powering on RSS Transmitter

- Pass either positive or negative homerun through RSS Core
- Connect wires to AC side of power supply

Max number of strings per RSS Core: **10**

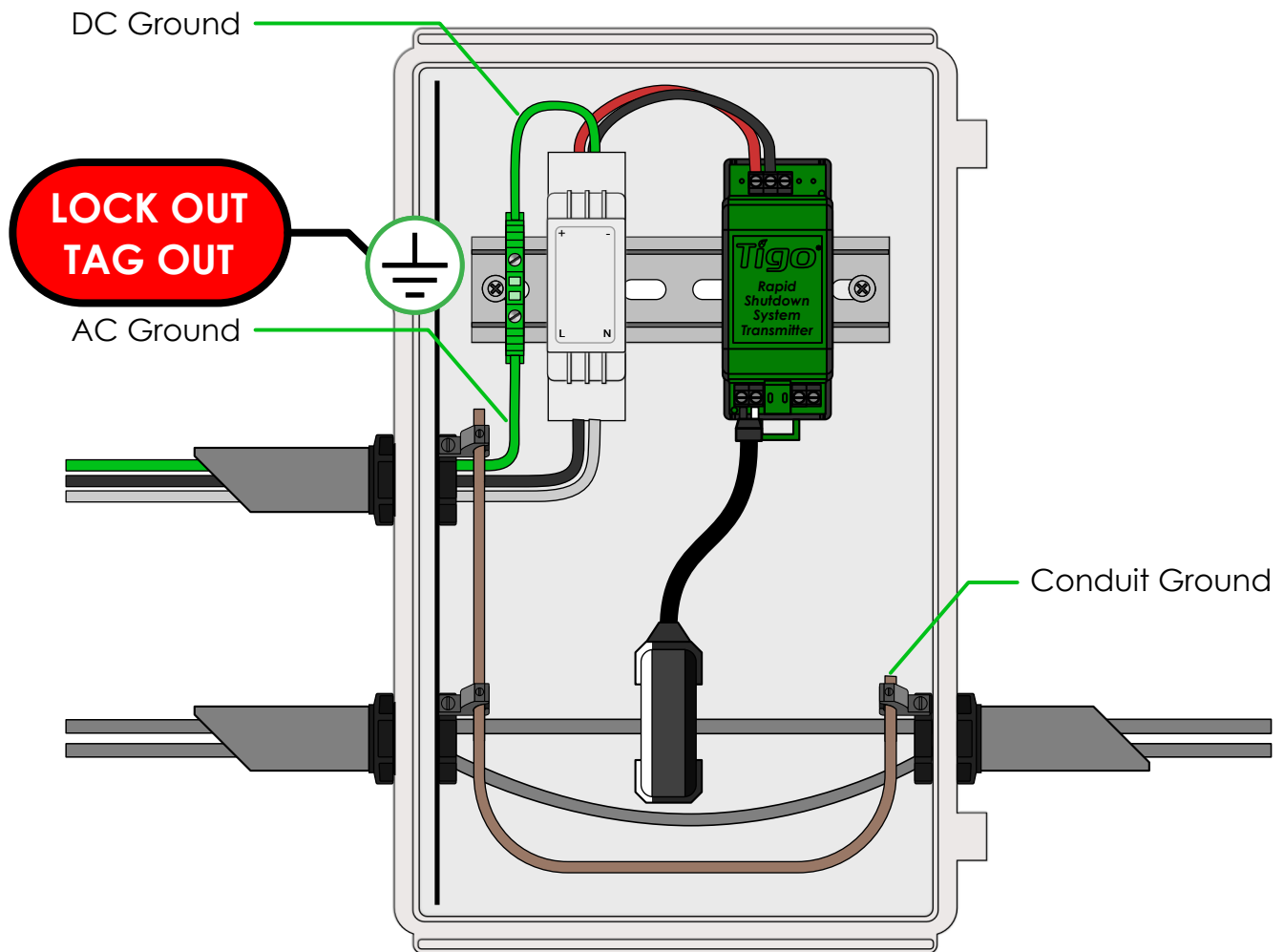
Max string length: **30 modules**

Max current per RSS Core: **100A**

Max cable length from inverter (+) to inverter (-): **1000ft (300m)**

For longer distances please contact Tigo

RSS TRANSMITTER GROUNDING – SINGLE RSS CORE

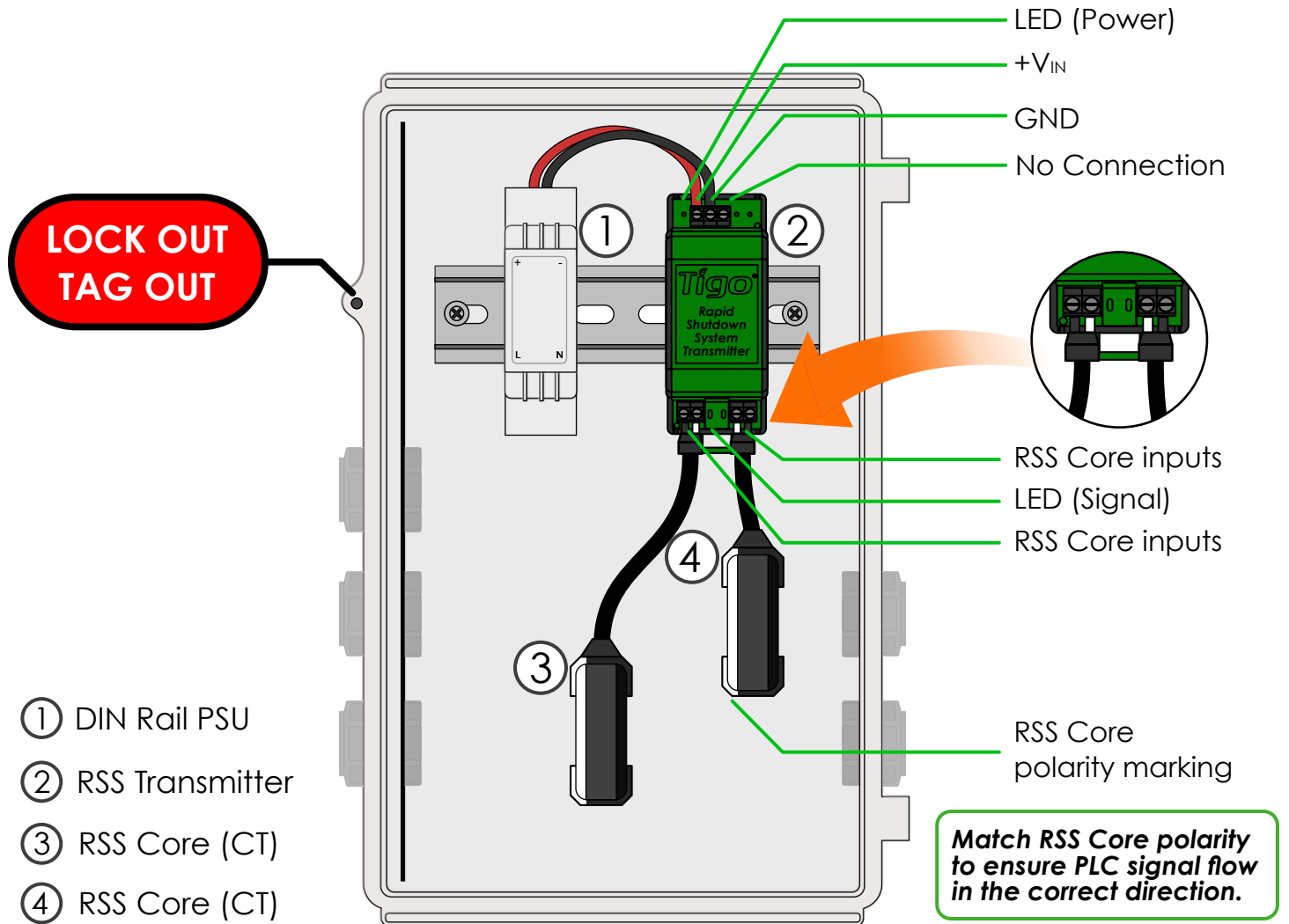


Note: Install TS4-F before powering on RSS Transmitter

- Connect AC and DC ground wires to DIN rail
- Ground all conduit connections
- Turn on AC power to Transmitter power supply to activate keep-alive signal and energize PV array

Warning: nonmetallic enclosure does not provide bonding between conduit connections. Use grounding type bushings and jumper wires.

RSS TRANSMITTER INSTALLATION – DUAL RSS CORE



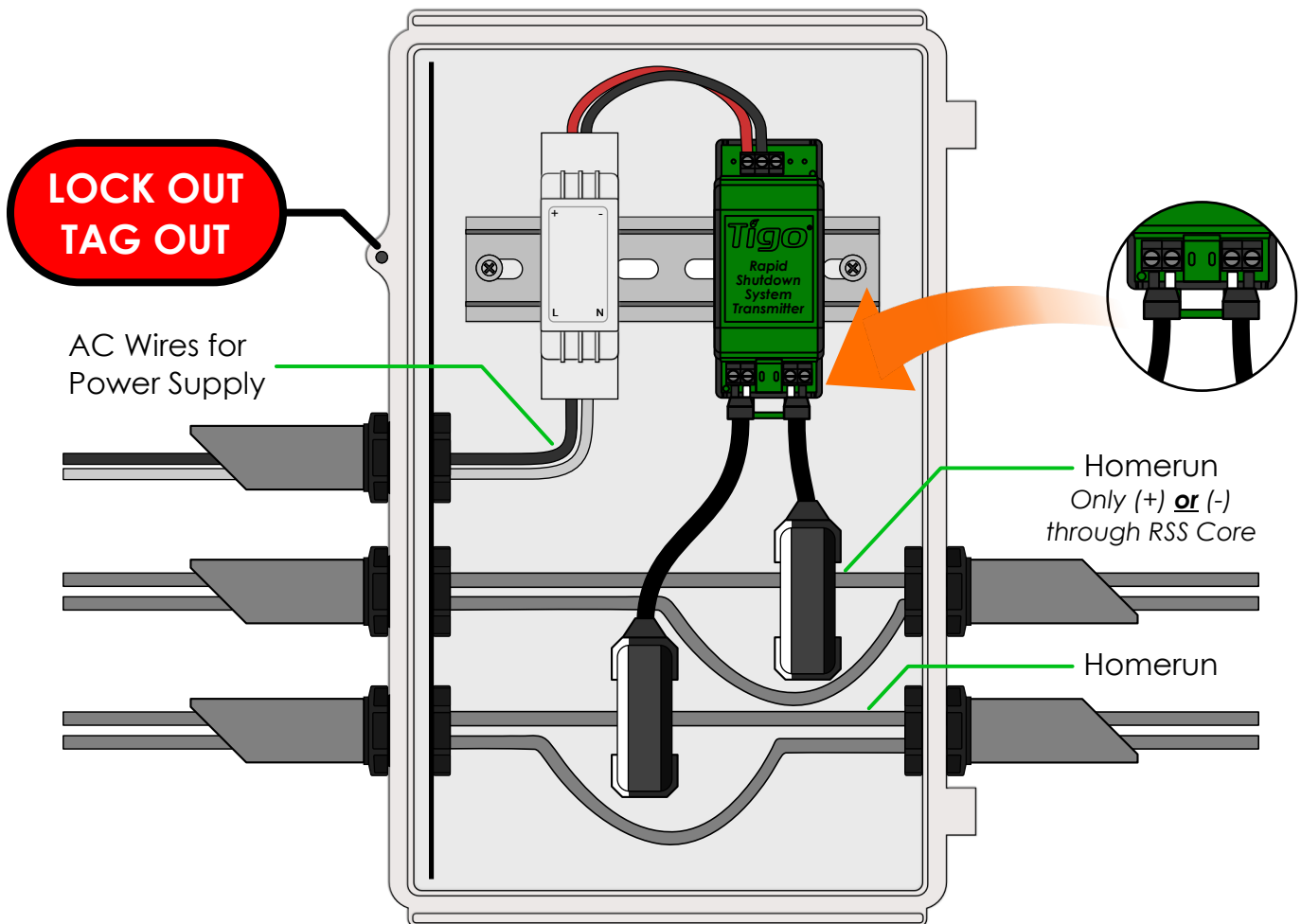
Transmitter power supply must be on same AC branch circuit as inverter to meet rapid shutdown requirements.

Note: Install TS4-F before powering on RSS Transmitter

- Drill holes in enclosure for conduit (see drilling guide for placement)
- Mount RSS Transmitter and power supply on DIN rail
- Connect DC leads from power supply ① to transmitter ②
- Connect RSS Core ③ and ④ to transmitter

Place rapid shutdown system label no more than 1m (3ft) from RSS Transmitter or AC disconnect if not at same location.

RSS TRANSMITTER WIRING – DUAL RSS CORE



Keep same polarity for all homeruns and RSS Cores throughout the installation

Note: Install TS4-F before powering on RSS Transmitter

- Pass either positive or negative homerun through RSS Cores
- Connect wires to AC side of power supply

Max number of strings per RSS Core: **10**

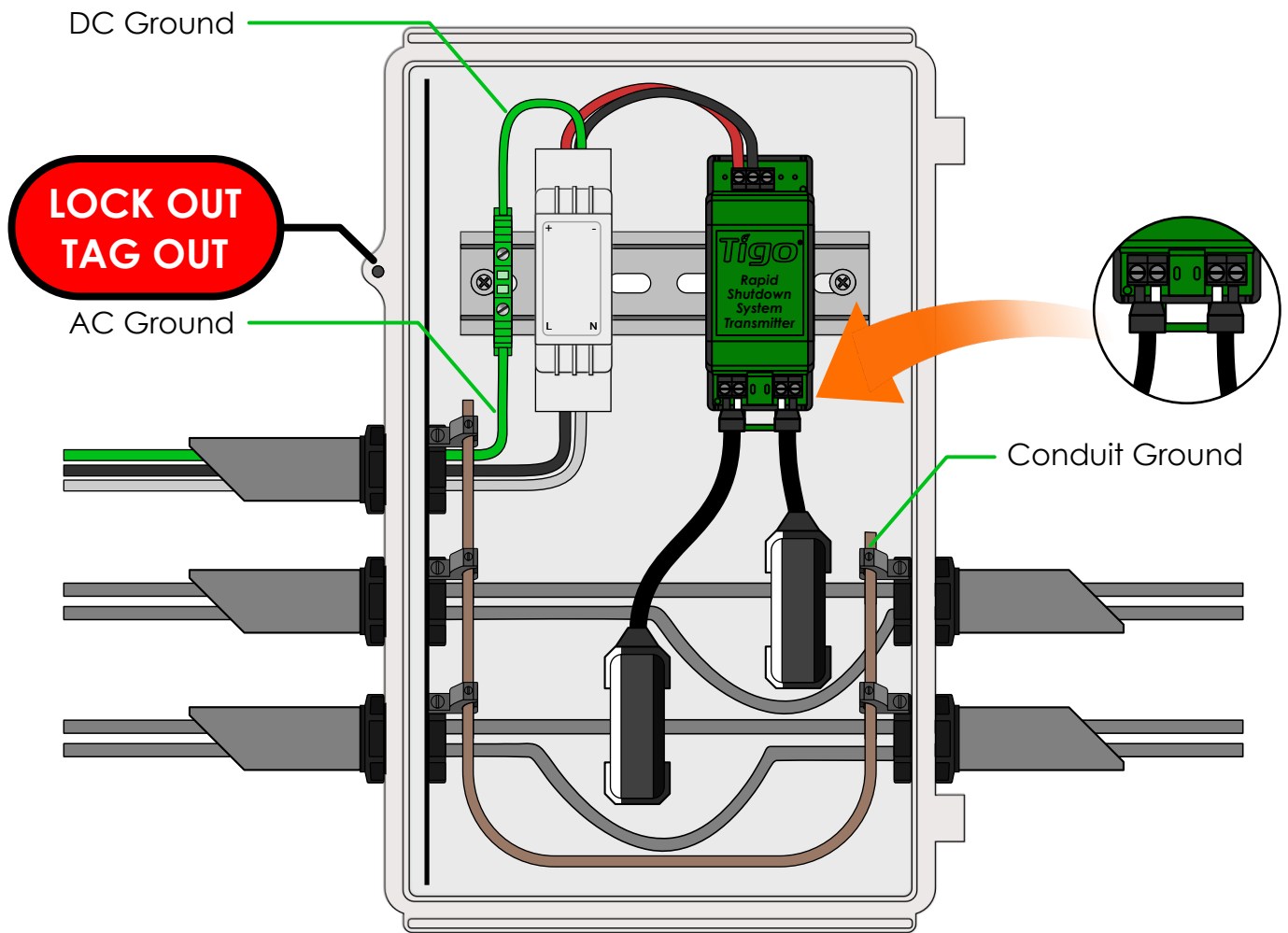
Max string length: **30 modules**

Max current per RSS Core: **100A**

Max cable length from inverter (+) to inverter (-): **1000ft (300m)**

For longer distances please contact Tigo

RSS TRANSMITTER GROUNDING – DUAL RSS CORE



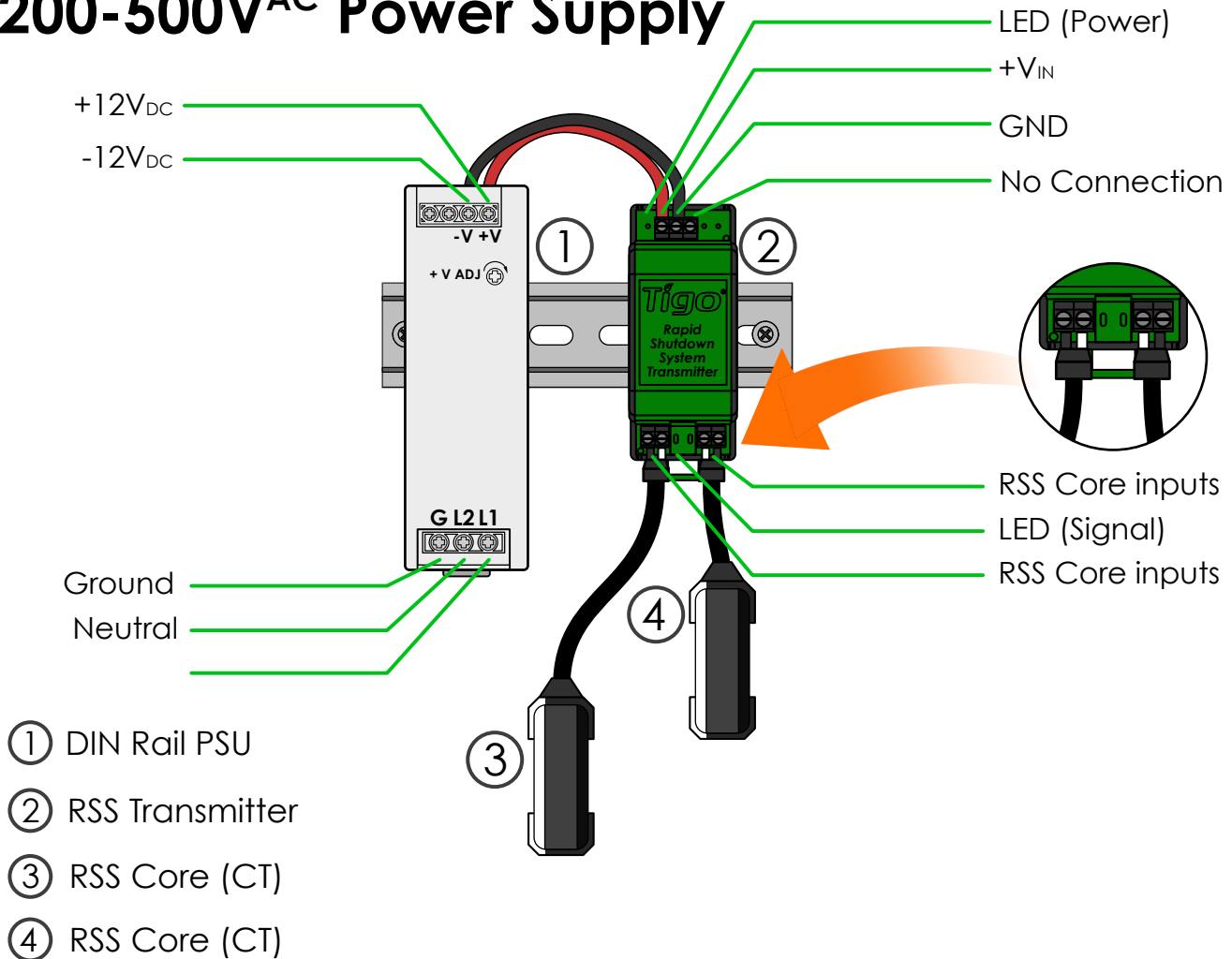
Note: Install TS4-F before powering on RSS Transmitter

- Connect AC and DC ground wires to DIN rail
- Ground all conduit connections
- Turn on AC power to Transmitter power supply to activate keep-alive signal

Warning: nonmetallic enclosure does not provide bonding between conduit connections. Use grounding type bushings and jumper wires.

RSS TRANSMITTER COMMERCIAL INSTALLATION

200-500V^{AC} Power Supply



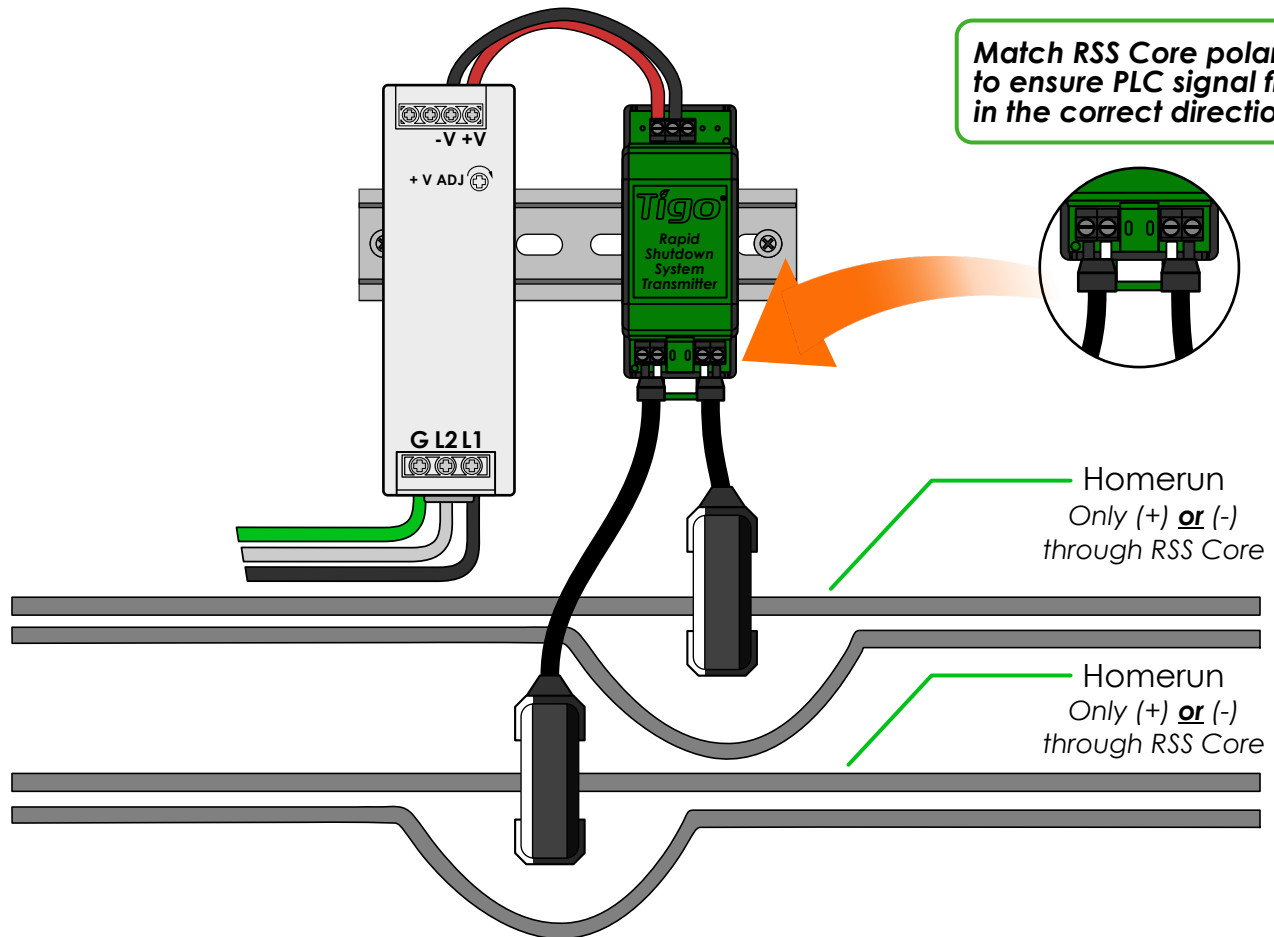
Transmitter power supply must be on same AC branch circuit as inverter to meet rapid shutdown requirements.

Note: Install TS4-F before powering on RSS Transmitter

- Mount RSS Transmitter and power supply on DIN rail
- Connect DC leads from power supply ① to transmitter ②
- Connect RSS Core ③ and ④ to transmitter

Place rapid shutdown system label no more than 1m (3ft) from RSS Transmitter or AC disconnect if not at same location.

RSS TRANSMITTER COMMERCIAL WIRING



Keep same polarity for all homeruns and RSS Cores throughout the installation

Note: Install TS4-F before powering on RSS Transmitter

- Pass either positive or negative homerun through RSS Cores
- Connect wires to AC side of power supply
- Turn on AC power to Transmitter power supply to activate keep-alive signal

Max number of strings per RSS Core: **10**

Max string length: **30 modules**

Max current per RSS Core: **150A**

Max cable length from inverter (+) to inverter (-): **1000ft (300m)**

For longer distances please contact Tigo



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Appendix

TS4-F, TS4-A-F, TS4-A-2F, RSS Transmitter

TECHNICAL SPECIFICATIONS – TS4-F

Electrical Ratings

TS4-F Fire Safety

Input

Rated DC Input Power	475W
Input Voltage	16 - 90V
Max Continuous Input Current (I_{MAX})	12.5A

Output

Output Power Range	0 - 475W
Output Voltage Range	0 – V_{OC}
Communication Type	Power Line Communication (PLC)
Rapid Shutdown UL Listed (NEC 2017 & 2020 690.12)	Yes
Impedance Matching Capability	No
Output Voltage Limit	No
Maximum System Voltage	1500V

Mechanical

Operating Temperature Range:	-40°C to +70°C (-40°F to +158°F), RH < 85%
Storage Temperature Range:	-40°C to +70°C (-40°F to +158°F), RH < 60%
Cooling Method	Natural Convection
Dimensions (with cover)	178.5mm x 134mm x 25.5mm
Weight (base and cover)	670g
Outdoor Rating	IP68, NEMA 3R

Cabling

Type	H1Z2Z2-K
Output Length	1.2m standard, other lengths available
Cable Options	1000V rated, 1500V rated
Cable Cross-Section	6.3 ± 0.3mm
Connectors	MC4, MC4 comparable
UV Resistance	500hr with UV light between 300-400nm @65C

Specify system voltage when ordering (1000V / 1500V) for appropriate cables & connectors.

Rapid shutdown activation requires RSS Transmitter.

TECHNICAL SPECIFICATIONS – TS4-A-F (500W)

Specifications

TS4-A-F Fire Safety

Environmental

Operating Temperature Range

-40°C to +85°C (-40°F to +185°F)

Outdoor Rating

IP68, NEMA 3R

Mechanical

Dimensions

W= 138.4mm, L= 139.7mm, H= 22.9mm

Weight

490g

Electrical

Input Voltage

16 - 90V

Maximum Continuous Input Current (I_{MAX})

15A

Maximum Power

500W

Output Cable Length

1.2m (standard), other lengths available

Connectors

MC4 (standard)

Communication Type

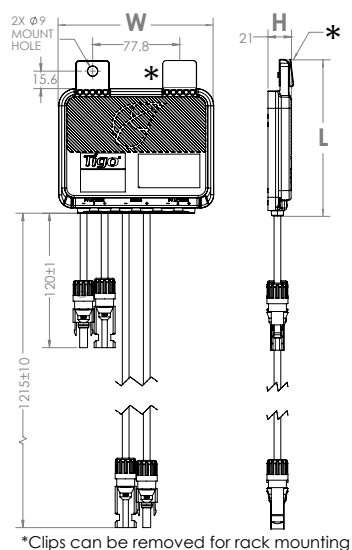
PLC

Maximum System Voltage

1500V

Rapid Shutdown UL Listed (NEC 2017 & 2020 690.12)

Yes



Specify system voltage when ordering (1000V / 1500V) for appropriate cables & connectors.

Rapid shutdown activation requires RSS Transmitter.

TECHNICAL SPECIFICATIONS – TS4-A-F (700W)

Specifications

TS4-A-F Fire Safety

Environmental

Operating Temperature Range

UL: -30°C to +75°C (-22°F to +167°F)

IEC: -40°C to +85°C (-40°F to +185°F)

Outdoor Rating

IP68, NEMA 3R

Mechanical

Dimensions

W= 138.4mm, L= 139.7mm, H= 22.9mm

Weight

490g

Electrical

Input Voltage

16 - 90V

Maximum Continuous Input Current (I_{MAX})

15A

Maximum Power

700W

Output Cable Length

1.2m (standard), other lengths available

Connectors

MC4 (standard)

Communication Type

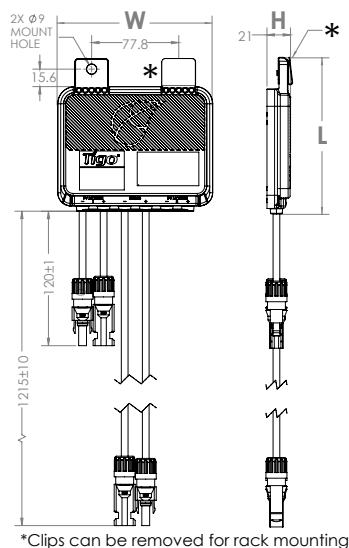
PLC

Maximum System Voltage

1500V

Rapid Shutdown UL Listed (NEC 2017 & 2020 690.12)

Yes



Specify system voltage when ordering (1000V / 1500V) for appropriate cables & connectors.

Rapid shutdown activation requires RSS Transmitter.

TECHNICAL SPECIFICATIONS – TS4-A-2F

Specifications

TS4-A-2F Fire Safety

Environmental

Operating Temperature Range -30°C to +70°C (-22°F to +158°F)

Outdoor Rating IP68, NEMA 3R

Mechanical

Dimensions 138.4mm x 139.7mm x 22.9mm

Weight 590g

Electrical

Voltage Range (per input)¹ 16 - 80V

Maximum Current (per input) 15A

Maximum Power (total) 1000W

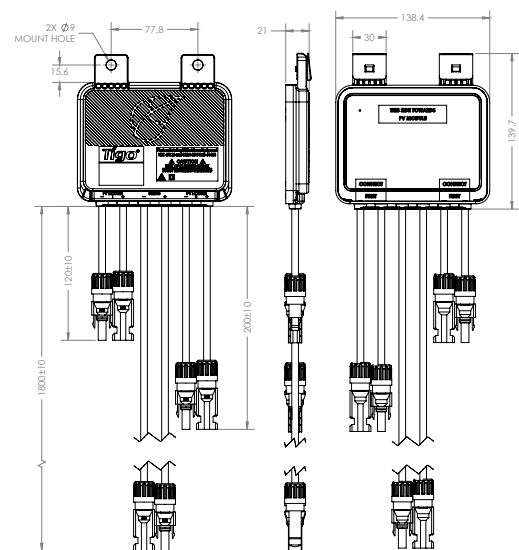
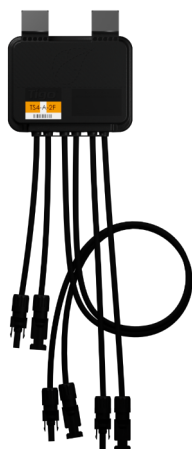
Output Cable Length 1.2m (portrait) or 2.2m (landscape)

Connectors MC4 (standard)

Communication Type PLC

Maximum System Voltage 1500V

Rapid Shutdown UL Listed (NEC 2017 & 2020 690.12) Yes



Specify system voltage when ordering (1000V / 1500V) for appropriate cables & connectors.

Rapid shutdown activation requires RSS Transmitter.

TECHNICAL SPECIFICATIONS – RSS TRANSMITTER

Electrical Ratings

RSS Transmitter

Input

Input Voltage	12V _{DC} (+/- 2%)
Input Current	1A
Average Supply Power	0.85W
Dimensions(Transmitter only)	90.2mm x 36.3mm x 57.7mm

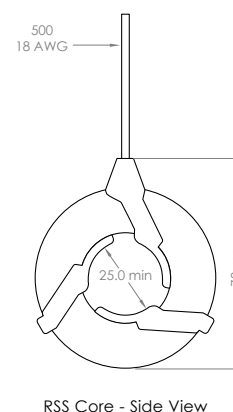
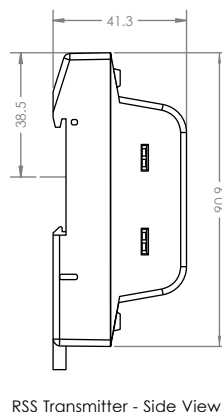
RSS Core

Maximum Current	150A per Core (Single Core: 150A, Dual Core: 300A)
Maximum MPPT String Voltage	1500V _{DC}
Internal Opening for Wires	~25mm
Outside Dimensions	59mm
Maximum Number of Strings per Core	10
Maximum String Length	30 modules

Environmental

Temperature	-40°C to 85°C
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Recommended max. torque 0.4 N/m for wiring (3.5 Lb/in),
Wire range: 14-22 AWG



TECHNICAL SPECIFICATIONS – RSS TRANSMITTER COMMERCIAL KIT

Electrical Ratings

RSS Transmitter

Input

Input Voltage	12V _{DC} (+/- 2%)
Input Current	1A
Average Supply Power	0.85W
Included Power Supply Rating	480/277V _{AC} input, 12V _{DC} output
Dimensions(Transmitter only)	90.2mm x 36.3mm x 57.7mm

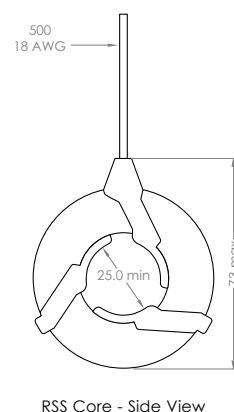
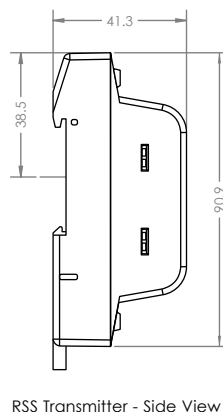
RSS Core

Maximum Current	150A per Core (includes 2 Cores for 300A)
Maximum MPPT String Voltage	1500V _{DC}
Internal Opening for Wires	~25mm
Outside Dimensions	59mm
Maximum Number of Strings per Core	10
Maximum String Length	30 modules

Environmental

Temperature	-40°C to 85°C
-------------	---------------

Recommended max. torque 0.4 N/m for wiring (3.5 Lb/in),
Wire range: 14-22 AWG



TECHNICAL SPECIFICATIONS – RSS TRANSMITTER OUTDOOR KIT

Electrical Ratings

RSS Transmitter

Input

Input Voltage	12V _{DC} (+/- 2%)
Input Current	1A
Average Supply Power	0.85W
Dimensions(Transmitter only)	90.2mm x 36.3mm x 57.7mm

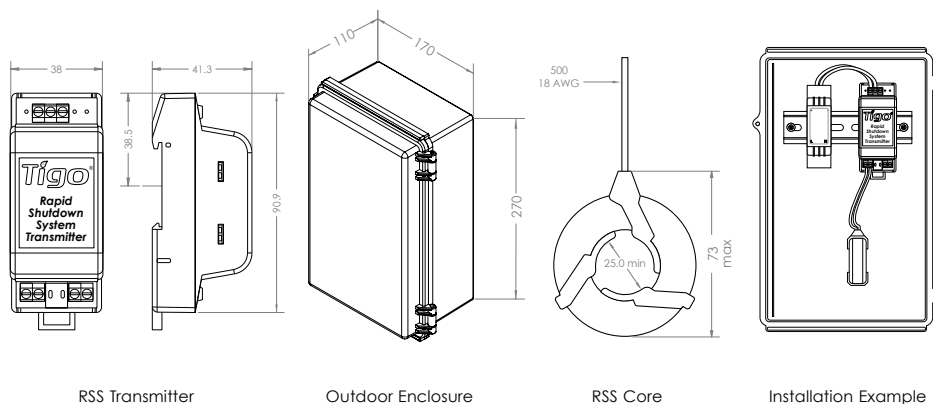
RSS Core

Maximum Current	100A per Core (Single Core: 100A, Dual Core: 200A) ¹
Maximum MPPT String Voltage	1500V _{DC}
Internal Opening for Wires	~25mm
Outside Dimensions	59mm
Maximum Number of Strings per Core	10
Maximum String Length	30 modules

Environmental

Temperature	-40°C to 85°C
-------------	---------------

Recommended max. torque 0.4 N/m for wiring (3.5 Lb/in),
Wire range: 14-22 AWG



¹ Rating of outdoor enclosure

TESTING RAPID SHUTDOWN

TS4-F (or TS4-A-F, TS4-A-2F) and an RSS Transmitter are a solution to meet NEC 2017 & 2020 690.12 Rapid Shutdown requirements.

TS4-F, TS4-A-F, and TS4-A-2F units automatically enter rapid shutdown mode when the RSS Transmitter is switched off and resume energy production when power is restored to the RSS Transmitter.

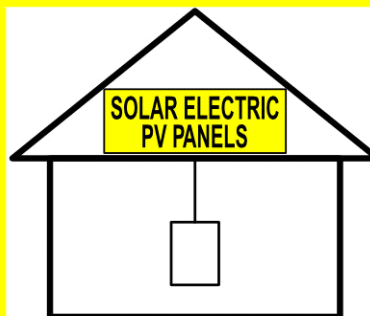
Wait 30 seconds after rapid shutdown activation before disconnecting DC cables or turning off DC disconnect.

Test your rapid shutdown system by switching off the AC power to the RSS Transmitter or inverter with built-in transmitter.

TS4-F, TS4-A-F, and TS4-A-2F units will reduce their output to 0.6V when the Transmitter is powered off.

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY



Place safety labels in proper location

The RSS Transmitter control power supply **MUST** be on the same AC branch circuit as the inverter to meet rapid shutdown requirements.

TROUBLESHOOTING

TS4-F/TS4-A-F/TS4-A-2F:

- Output voltage without active transmitter signal is **0.6V**
- Output voltage with active transmitter signal will be normal module V_{MP} or V_{OC}
- If output is 0V contact Tigo support

Check that the system conforms to the design rules for TS4-F:

- Up to 10 strings per RSS Core (CT)
- Up to 30 modules per string
- String length up to 1000ft (**total** cable length from + to -)
 - *For longer distances please contact Tigo*
- Homeruns through RSS Core must be the same polarity (all positive **or** all negative)
- Match RSS Core polarity markings to ensure PLC signal flow in the correct direction

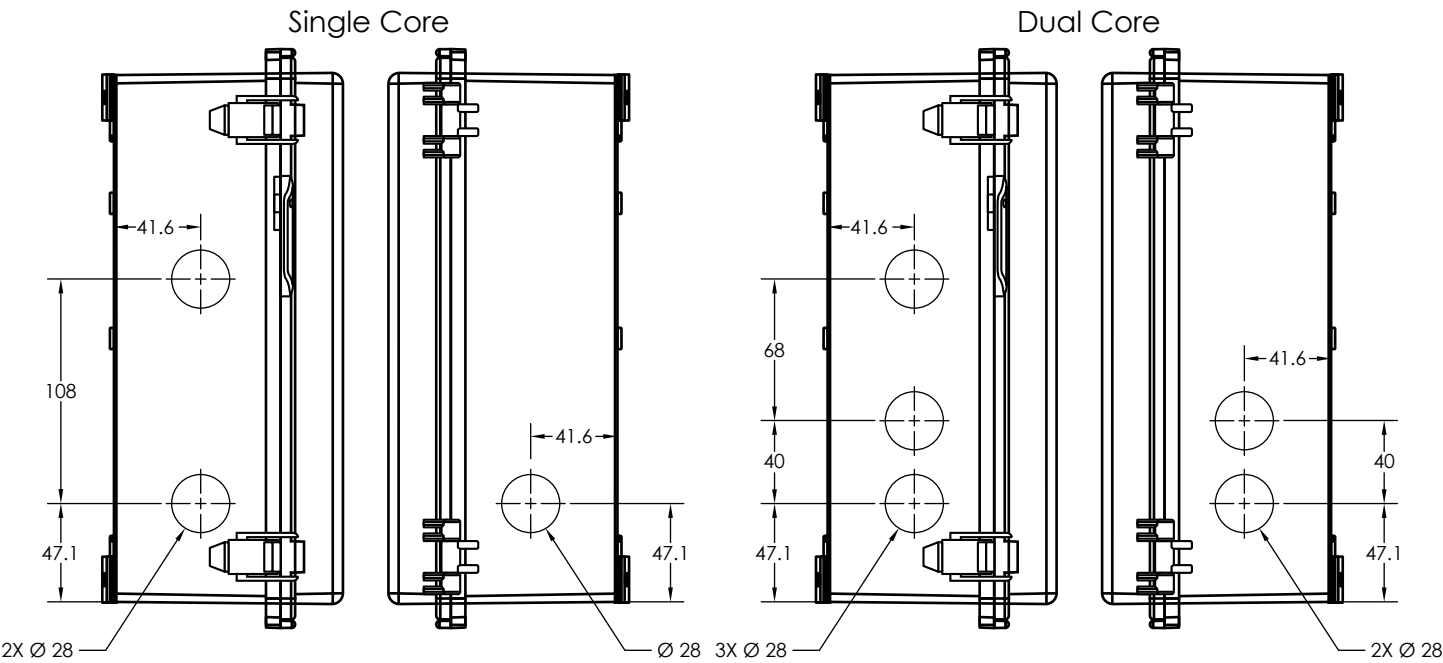
RSS Transmitter:

- Power LED should be lit and Signal LED should be blinking during operation
- Verify that RSS Core wiring and polarity are correct
- Power cycle RSS Transmitter if Signal LED is unlit
- While RSS Transmitter is powered off, string voltage should be
 - TS4-F/TS4-A-F: $0.6V \times \text{number of modules}$
 - TS4-A-2F: $0.6V \times \text{number of TS4s}$
- While RSS Transmitter is powered on, full string voltage should be present

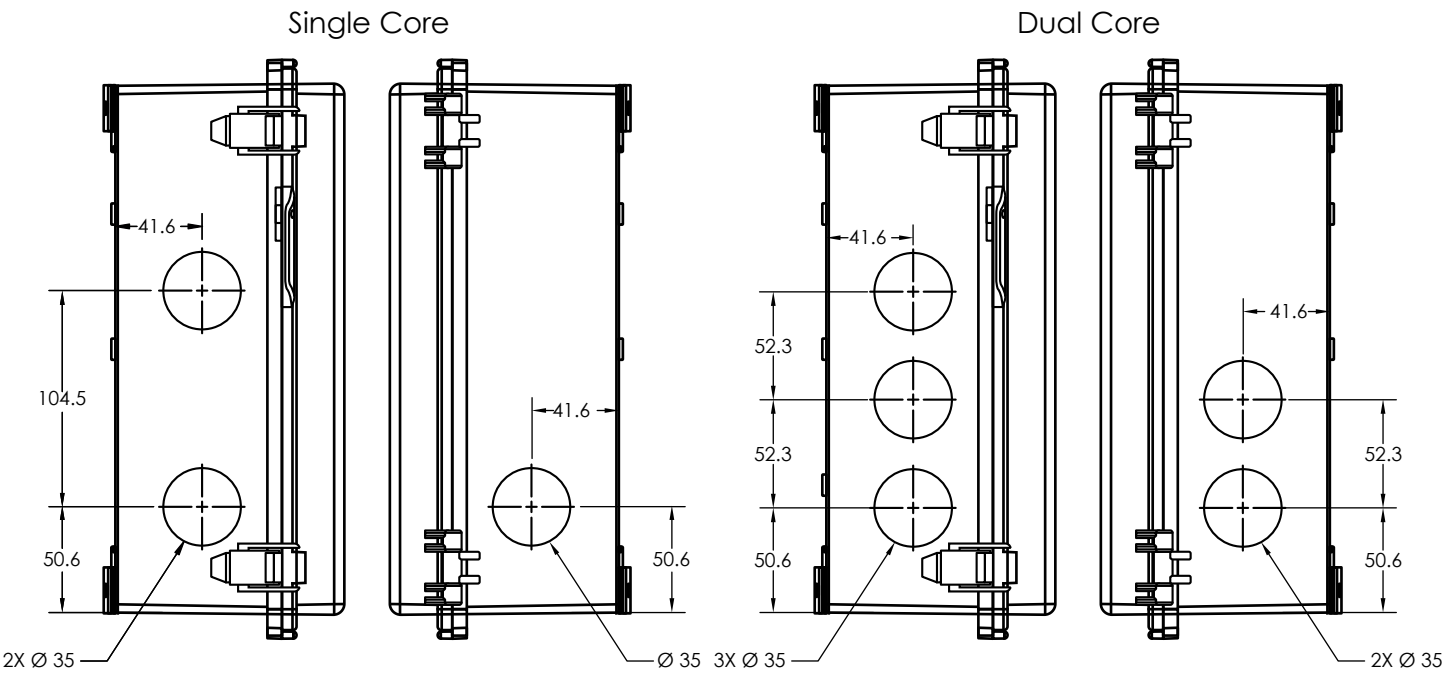
Test individual strings with active RSS Transmitter one at a time in case of unexpected voltage.

CONDUIT DRILLING GUIDE

Enclosure Drilling Guide for .75" Conduit



Enclosure Drilling Guide for 1" Conduit



*all dimensions in mm

MISCELLANEOUS

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.

INSTALLATION COMPLETE

Problems?

[TS4-F Troubleshooting Guide](#)

For more details on designing and installing solutions powered by Tigo, please visit:

[Tigo Academy](#)
[Resource Center](#)

Or contact us at:

training@tigoenergy.com



Installation Notes TS4-A-F / 2F

Additional notes prior to installation

In Australia installers may purchase a Dual Core RSS transmitter.

Please take note of the following recommendations in respect of using this product for installation of less than 10 home runs.



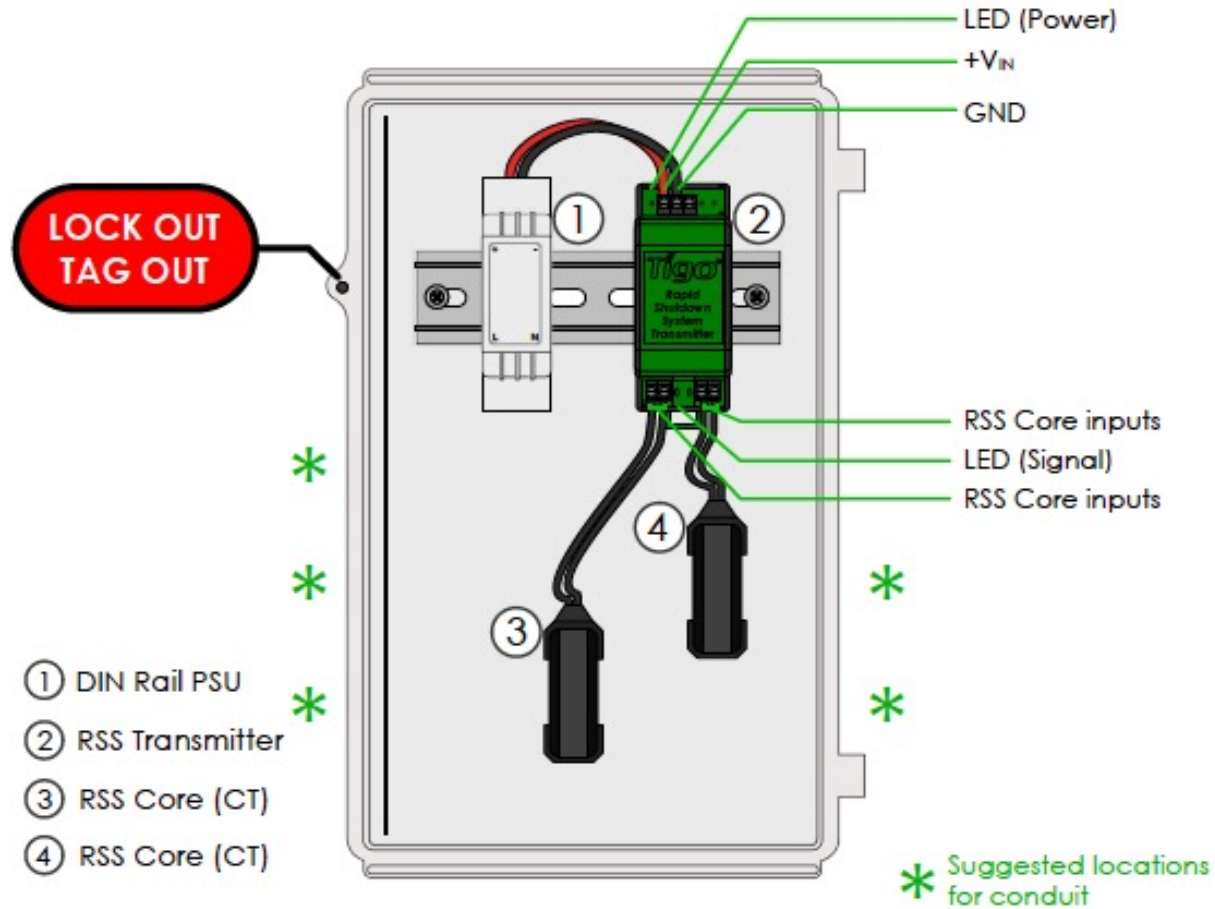
Transmitter:



RSS Transmitter

- Rapid Shutdown System Transmitter for rapid shutdown activation of TS4-F, TS4-A-F, or TS4-A-2F units
- The external device that provides a keep-alive signal to the TS4-F via Power Line Communication

RSS TRANSMITTER INSTALLATION – DUAL RSS CORE



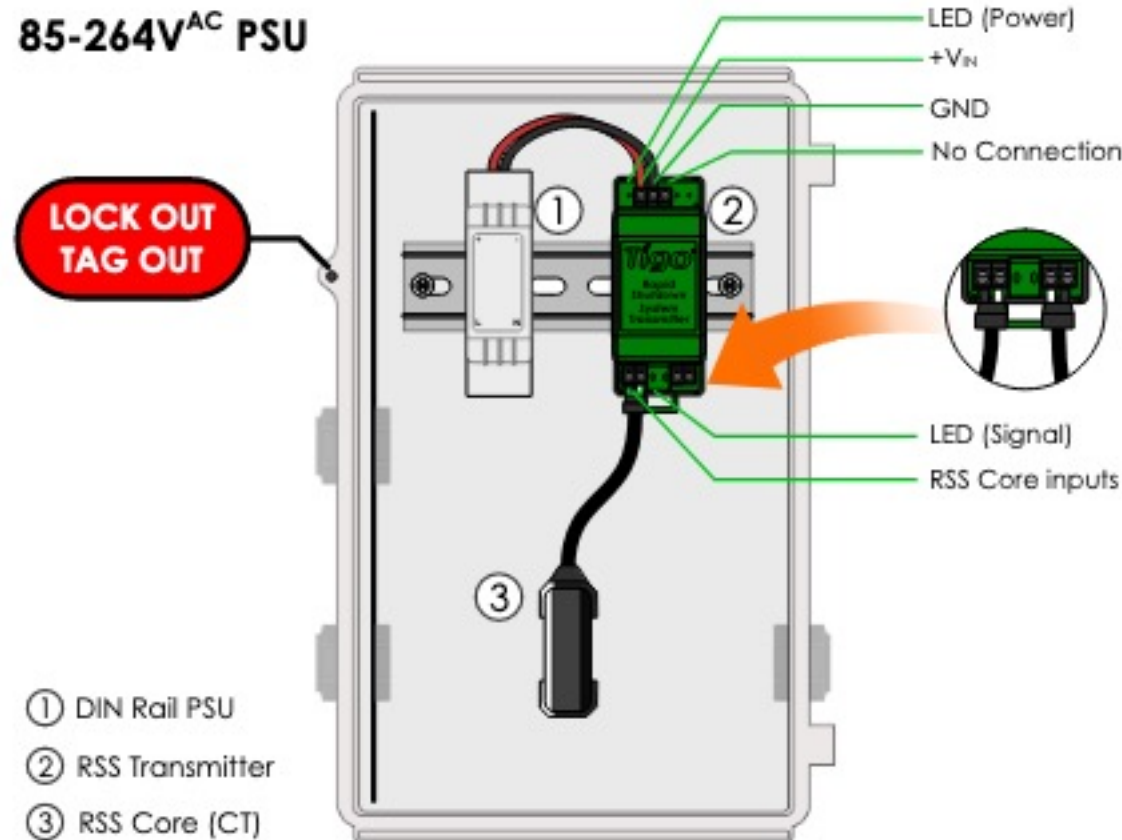
Transmitter power supply must be on same AC branch circuit as inverter to meet rapid shutdown requirements.

For 10 home runs or less, only one CT coil is required. (items 3 & 4 in the diagram)

To avoid possible interference, please remove the unused coil.

RSS TRANSMITTER INSTALLATION – SINGLE RSS CORE

85-264V^{AC} PSU



Please ensure the RSS core (CT) inputs are connected correctly.

Some earlier cores are marked + on one side and – on the other side

If you are using both CT cores. Ensure they are installed facing the same way. Please note instructions at the back of this presentation to confirm correct facing.

Some cores are colour coded. Please confirm correct placement by following

How to Check Dual Core Transmitter Polarity

The home runs should all be either all + or – when they pass through the coil..

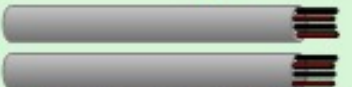



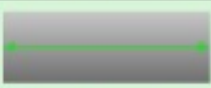
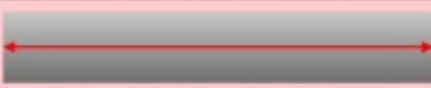


If you are using two coils, make sure all the home runs passing through both cores are either + or -

If you are using both cores which would be used for up to 20 home runs. Please contact Tigo who will assist with the cable management design. This is very important.

PV CONDUCTOR INSTALLATION - MULTI-TRANSMITTER SYSTEMS - REQUIRED PRACTICES

When installing a system with 2 or more transmitters it is mandatory to use the following best installation practices of PLC circuits to ensure a trouble-free installation.

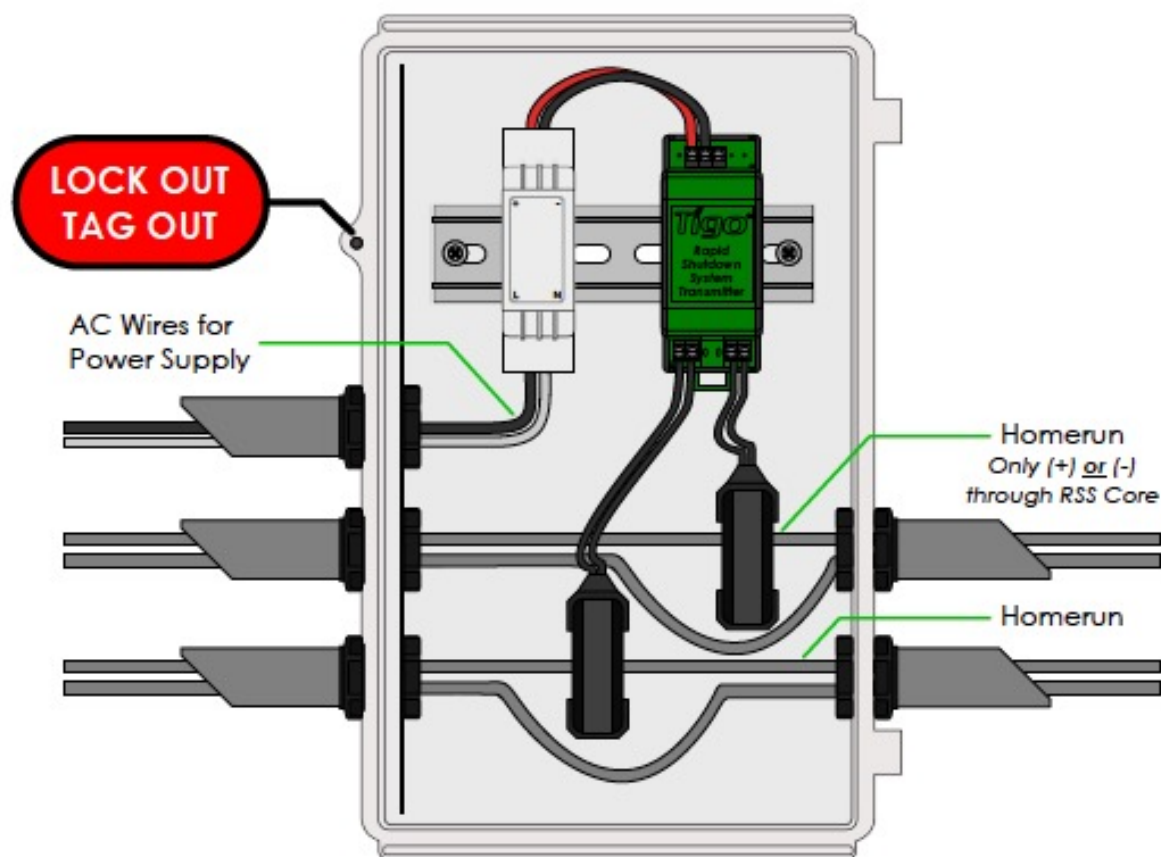
These practices are required in multi-transmitter installations.

DO ✓	DO NOT ✗
 <p>Run positive and negative conductors from the same string and RSS transmitter together</p>	 <p>Do not separately run all positives together and all negatives together</p>
 <p>Keep conduits associated with different transmitters as far apart as possible</p>	 <p>Do not install conduits associated with different transmitters directly adjacent to each other</p>
 <p>Cable trays containing conductors from multiple transmitters should be as short as possible</p>	 <p>The longer the cable tray the higher chance of experiencing crosstalk between transmitters</p>
 <p>Once inside a cable tray keep strings (+) and (-) as close as possible to a twisted pair</p>	 <p>Do not segregate the positives and negatives of strings inside a cable tray</p>

Distance between. Should be a minimum of 30 cms



RSS TRANSMITTER WIRING – DUAL RSS CORE



Keep same polarity for all homeruns and RSS Cores throughout the installation

Note: Install TS4-F before powering on RSS Transmitter

- Pass either positive or negative homerun through RSS Cores
- Connect wires to AC side of power supply

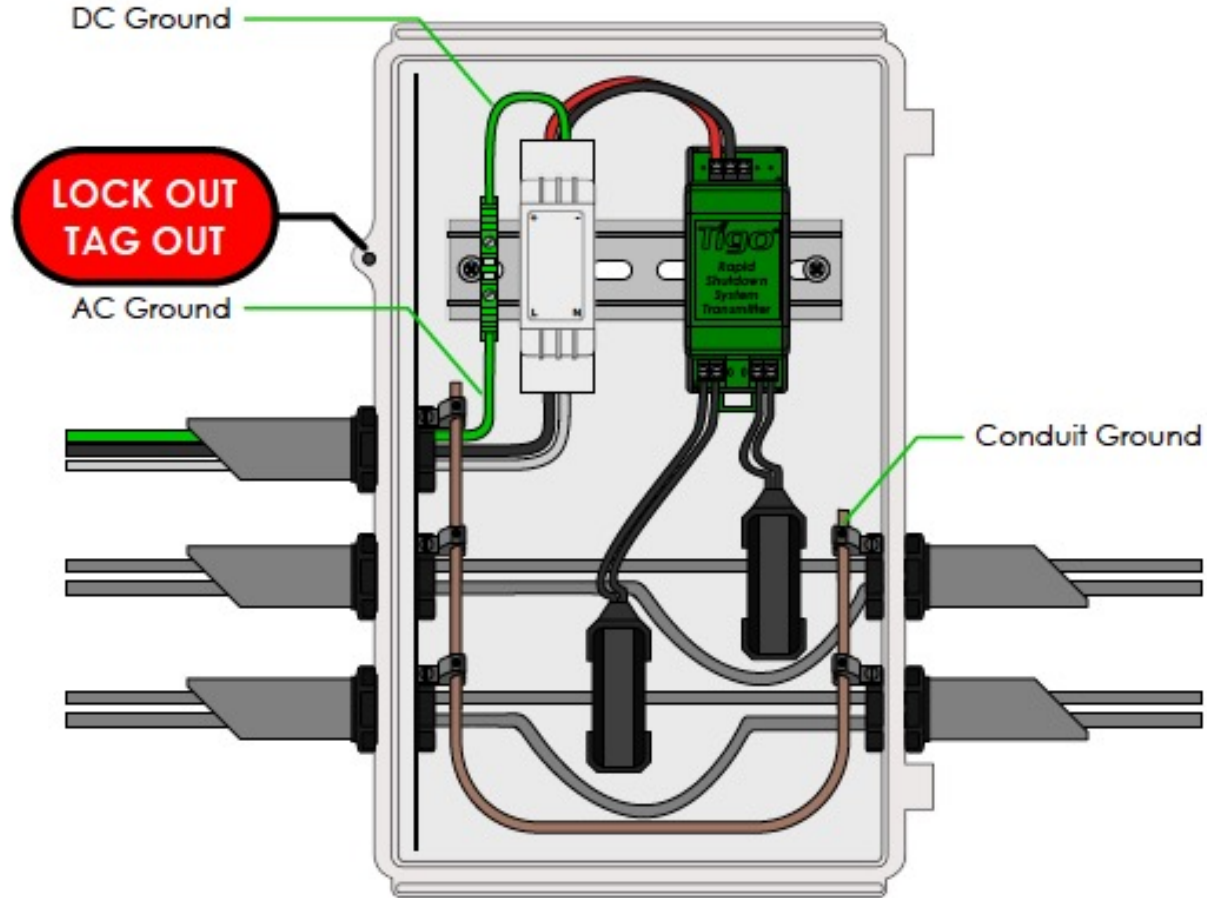
Max number of strings per RSS Core: **10**

Max string length: **30 modules**

Max current per RSS Core: **100A**

Max cable length from inverter (+) to inverter (-): **1000ft (300m)**

RSS TRANSMITTER GROUNDING – DUAL RSS CORE

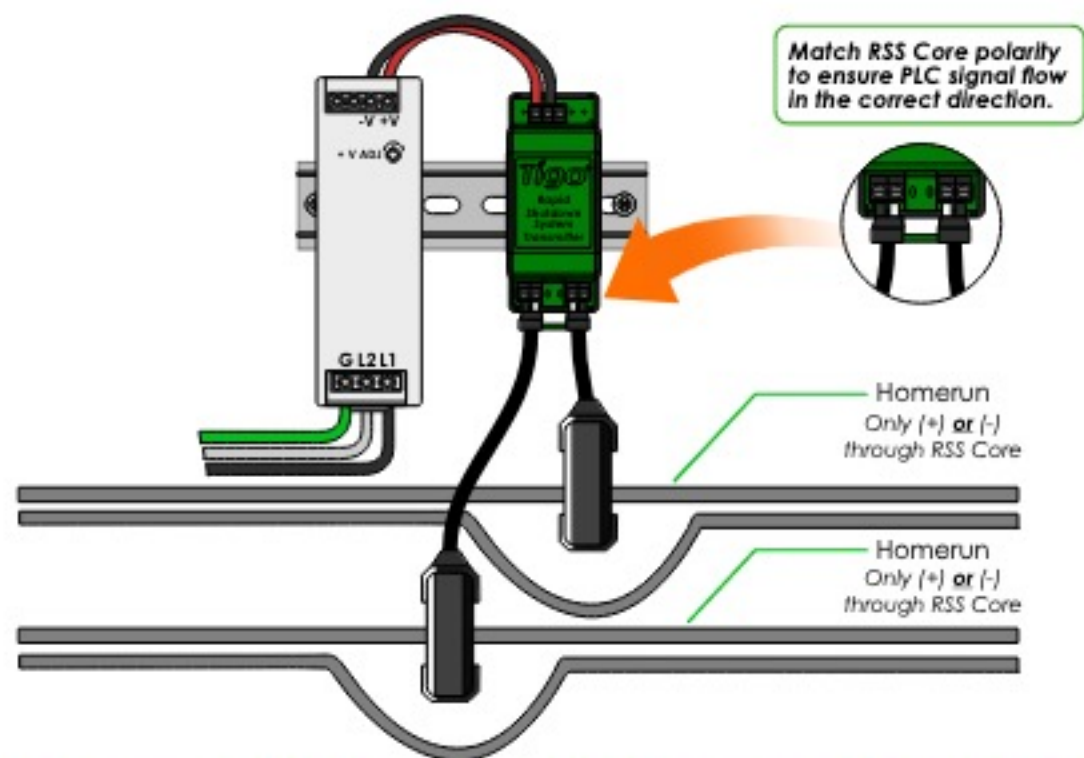


Note: Install TS4-F before powering on RSS Transmitter

- Connect AC and DC ground wires to DIN rail
- Ground all conduit connections
- Turn on AC power to Transmitter power supply to activate keep-alive signal

Warning: nonmetallic enclosure does not provide bonding between conduit connections. Use grounding type bushings and jumper wires.

RSS TRANSMITTER COMMERCIAL WIRING



Keep same polarity for all homeruns and RSS Cores throughout the installation

How to Check Dual Core Transmitter Polarity: Regardless of colour coding

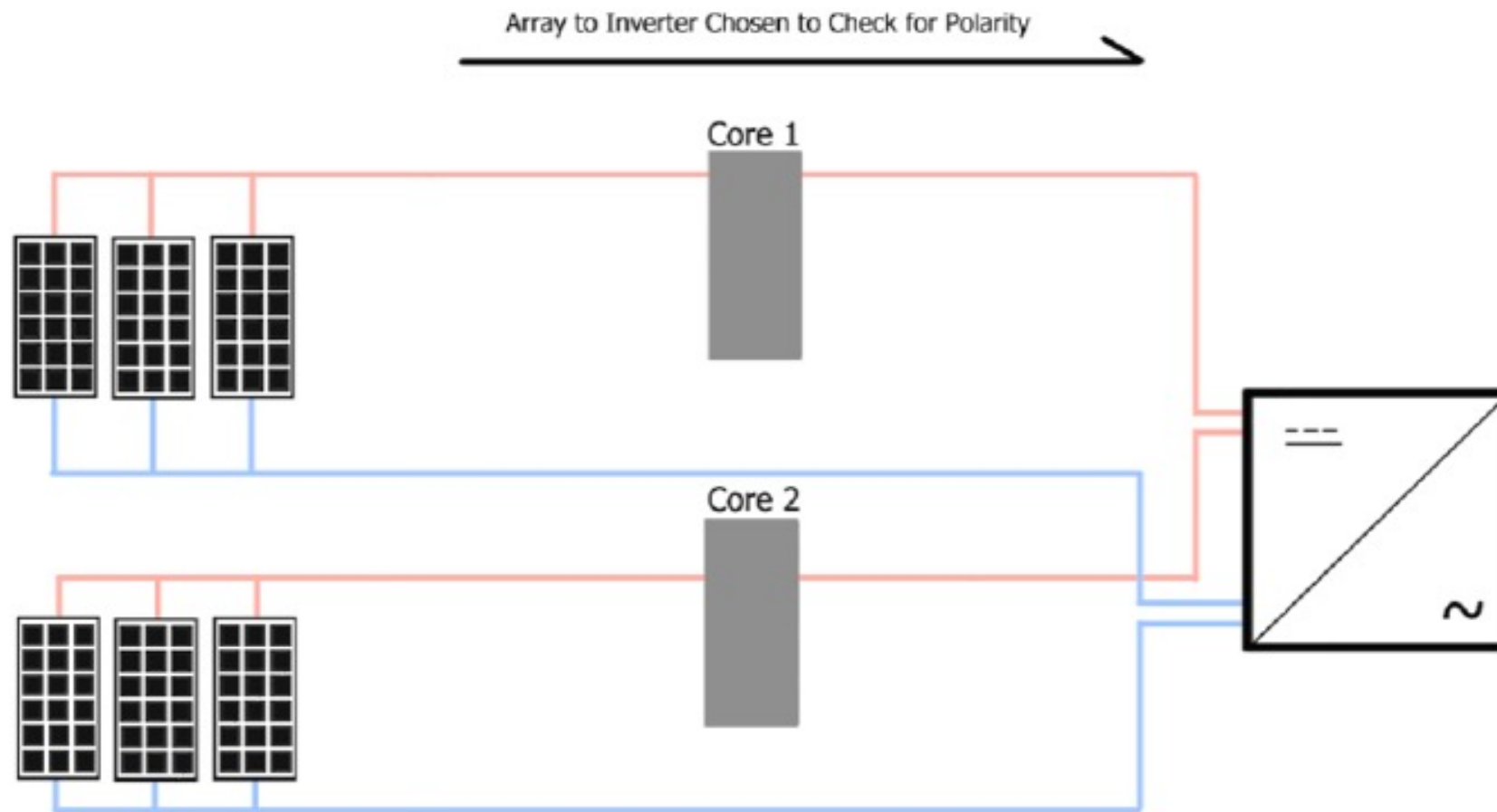
The [RSS Transmitter](#) induces an AC Power Line Communication (PLC) signal which TS4-F class units constantly receive and must hear in order to pass voltage. If the cores associated with a dual core transmitter have been reversed, resulting in reverse polarity, you will have no RSS signal EVEN if the RSS Transmitter is on.

Goal: Confirm both cores are in the same direction. **Tools you will need:**

- A multimeter
- A wire you can bend and is long enough it passes through both cores. A 12 to 16 gauge wire (4mm² to 1.5mm²) is often a good size as it is not so big it will not pass through packed cores, while still being big enough that it is easy to take measurement.

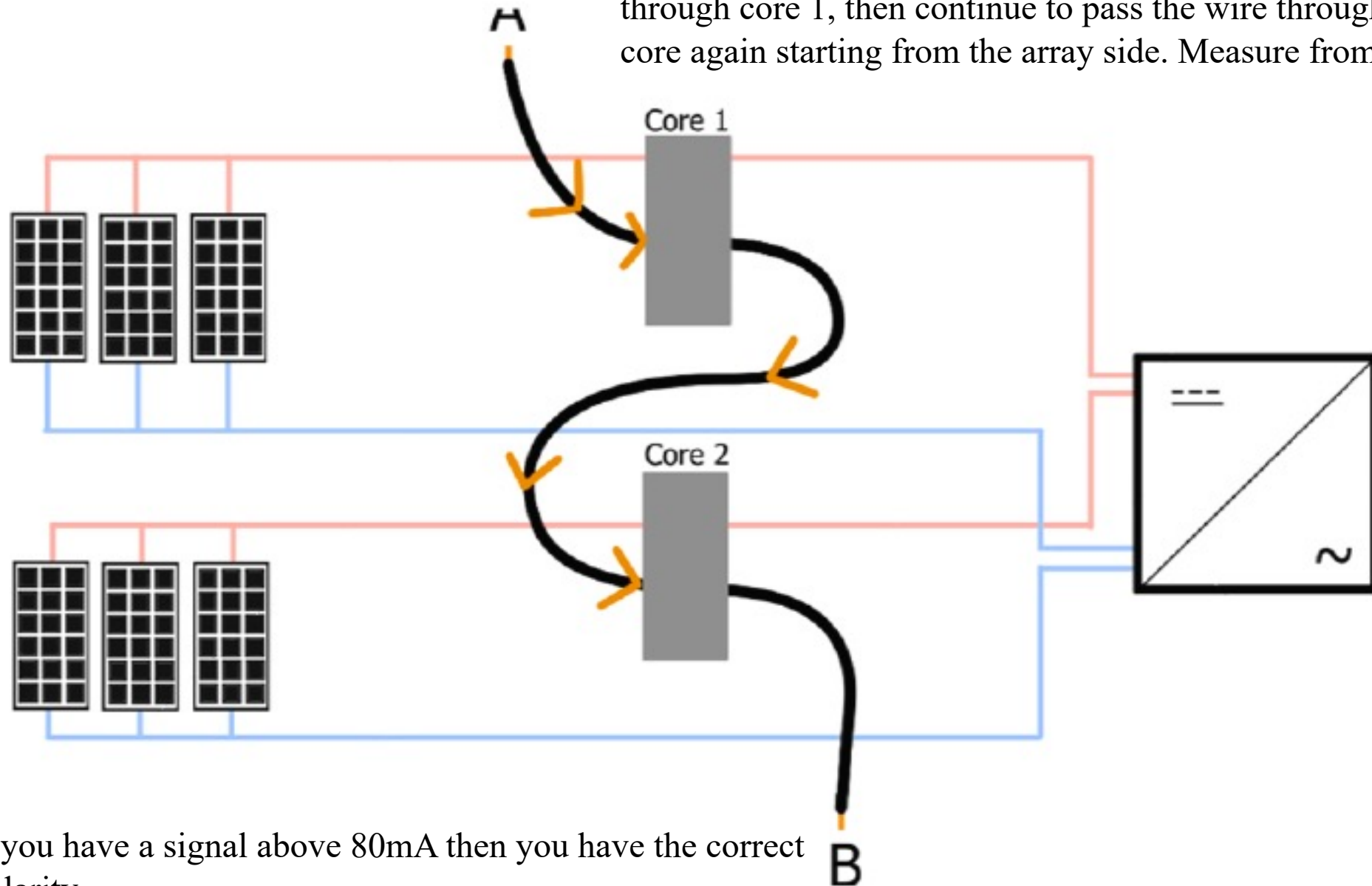
Instructions:

1. Some multimeter's have an auto-range function. Make sure to disable this function as it will not work properly since The RSS signal repeats at 1 second intervals.
2. Manually set the multimeter range to anywhere from 100mA to 1A (AC).
3. Confirm the transmitter is on. There should be steady blue light (indicates transmitter has power) at the top left of the transmitter, and a blinking green light (indicates signal is being induced) between the two cores terminals, on the transmitter.
4. Based on your system, define a direction for which you will be checking polarity. In this example we will be defining the direction as being from the array, through the core, and to the inverter.



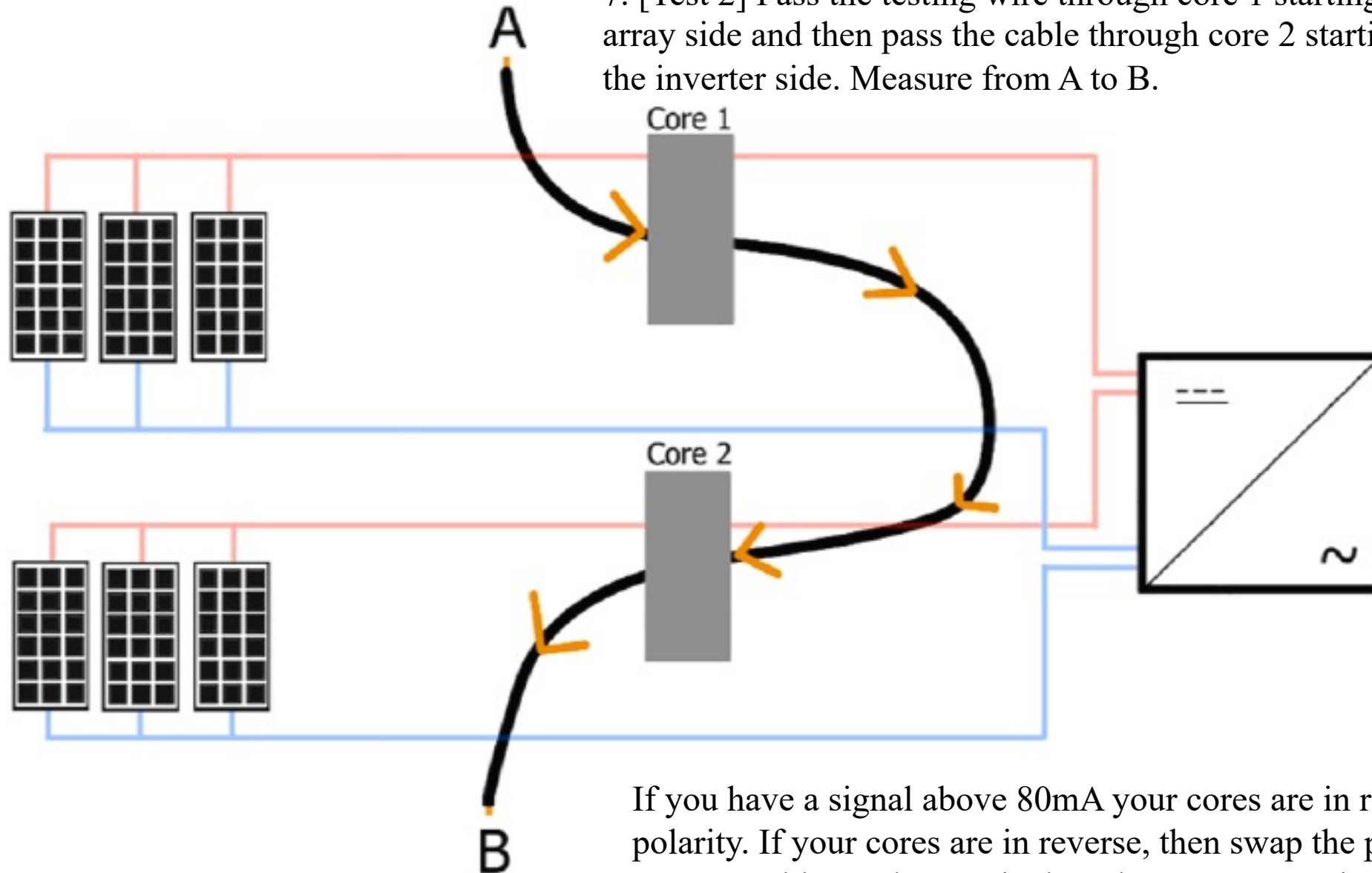
5. You will be doing two tests. compare the measurements in step 6 and 7. This will help you confirm in which direction you do or do not have an RSS signal.

6. [Test 1] Pass the testing wire starting from the array side, through core 1, then continue to pass the wire through the second core again starting from the array side. Measure from A to B.



If you have a signal above 80mA then you have the correct polarity.

7. [Test 2] Pass the testing wire through core 1 starting from the array side and then pass the cable through core 2 starting from the inverter side. Measure from A to B.



If you have a signal above 80mA your cores are in reverse polarity. If your cores are in reverse, then swap the position of core 2's cables at the terminal on the RSS Transmitter.



Important Links: Support / Resources

For product info:

Visit tigoenergy.com/products

For technical info:

Visit support.tigoenergy.com

For additional info and product selection assistance, use Tigo's online design tool at tigoenergy.com/design

Remember, we are here to help!

If you want us to verify your design, send it to training@tigoenergy.com and one of our expert Sales Engineers will assist you.



Tigo Community Forum



Great News!

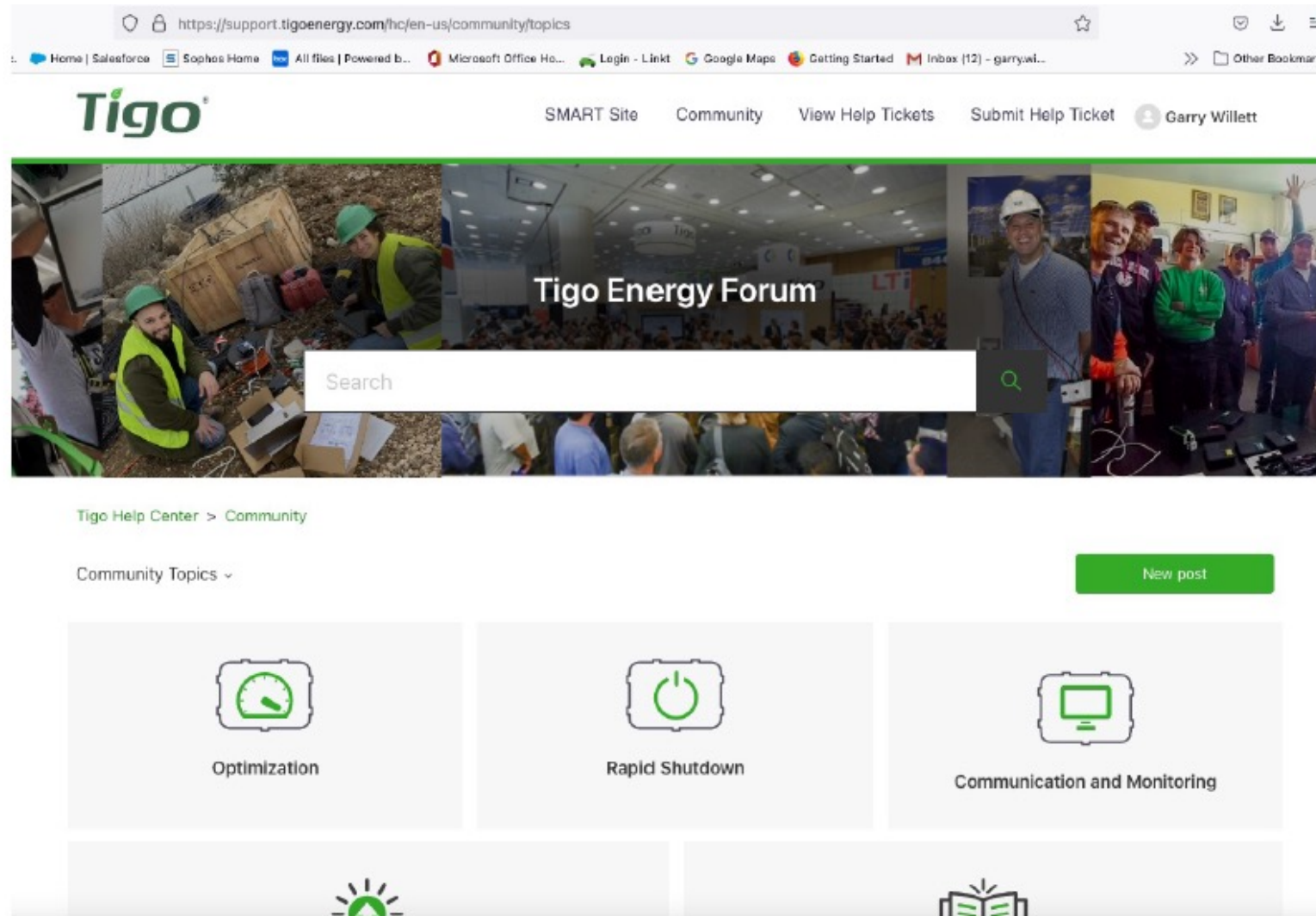
Installers can now ask questions in an open form. This is where you get to discuss topics with your peers.

We have all had questions from time to time and rather invent the wheel asking someone who has been there is the best way to find the answer. Assuming it's the correct one.

So, our Tigo engineers will be moderating the site and have input where necessary.

You can also ask questions directly to them.

The Community Forum is a great way to Learn and Share information. So, start posting today!



<https://support.tigoenergy.com/hc/en-us/community/topics>