



Rapid Shutdown Solutions

for project developers and asset owners

Meeting safety requirements and hazard controls
with the only UL-certified multivendor solution.



www.tigoenergy.com

Installing on 7 Continents

Tigo is a Silicon Valley company founded in 2007 by a team of experienced technologists. Combining a unique systems-level approach with expertise in semiconductors, power electronics, and solar energy, the Tigo team developed the first-generation Smart Module Optimizer technology for the solar industry.

Vision

Tigo's vision is to leverage integrated and add-on Flex MLPE (flexible module-level power electronics) and communications technology to drive the cost of solar electricity down. By partnering with tier 1 module and inverter manufacturers in the industry, Tigo can focus on its key innovation with the smartest TS4 modular platform and leverage the broader ecosystem.

Safety

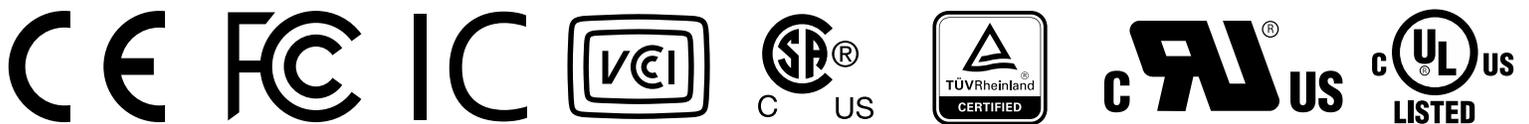
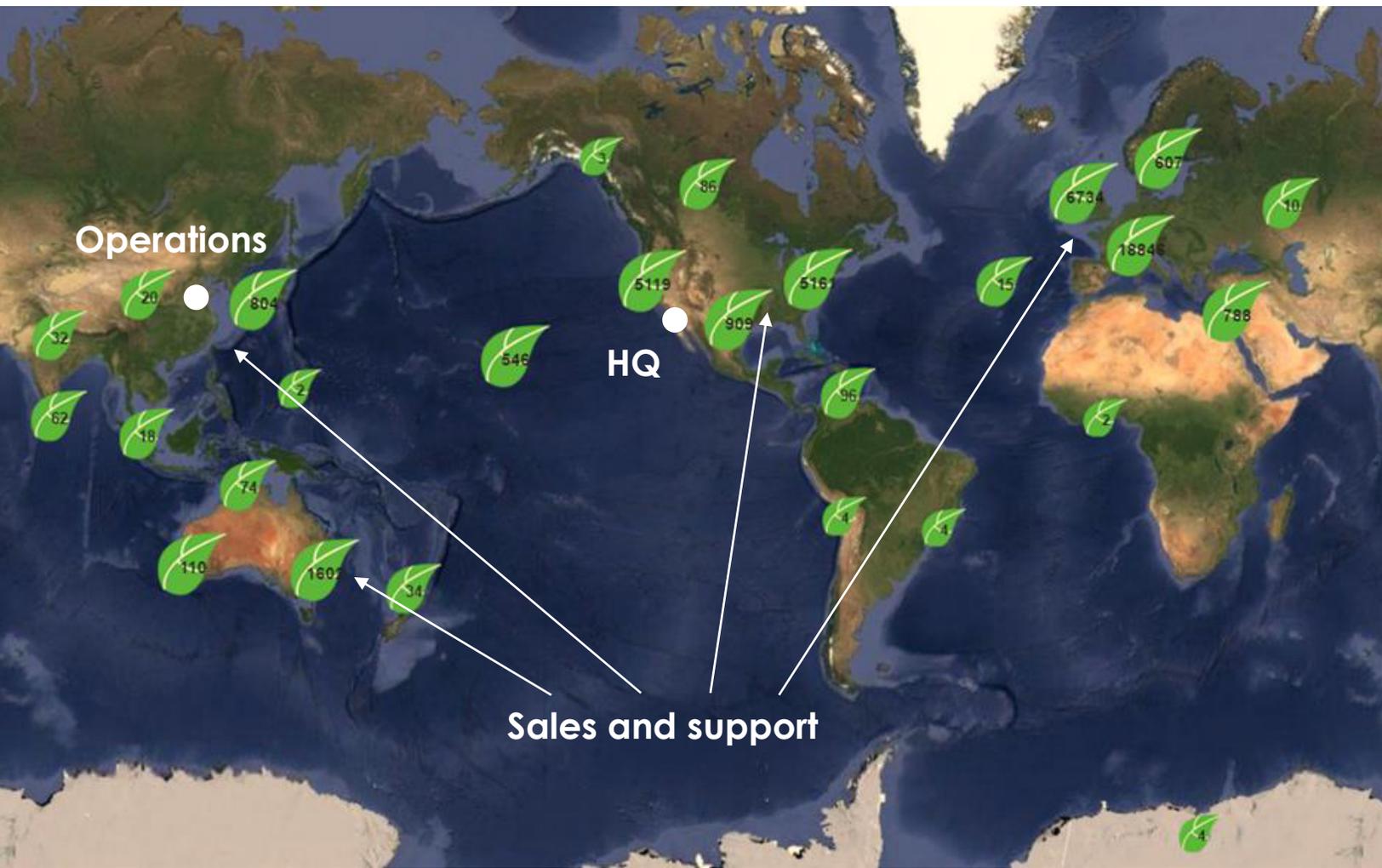
Safety requirements and hazard controls are on the rise for PV systems across the globe. From design regulations to installation best practices, installers are being held to a higher standard for safety as the solar market progresses. Solar equipment - including MLPE - is helping to meet those standards.

Although the USA currently has the strictest solar electric codes, other countries are quickly following with similar requirements to protect solar assets and system owners. Tigo is the only UL-certified multivendor module-level rapid shutdown solution that meets the latest requirements.

Geography

As of 2020, Tigo has deployed over 3M units at over 30,000 sites worldwide.

Tigo has operations in the USA, across Europe, Latin America, Japan, China, Australia and the Middle East, and products installed in all 7 continents. Tigo products are certified with major certification organizations recognized around the world including UL, TÜV, CSA, JET, and more.



Reliable MLPE for Array Security

To provide the best asset management for residential and commercial PV systems, Tigo offers a module-level safety solution. This function can be used for ordinary maintenance operations, as well as in emergency situations, intensifying the safety of the system. This revolutionary disconnect provides installers, firefighters, and maintenance techs absolute certainty that no high voltage is present.

Module-level Disconnect

Tigo's TS4 system includes an advanced safety feature to shut down a PV array at the module-level, the safest way to de-energize a PV system. When shutdown mode is activated, the Tigo system disconnects the PV module from the string, leaving it with zero power output. This can be used for emergency situations or scheduled maintenance and can be activated manually or automatically.

Risk Mitigation

Catastrophic events and natural disasters cause power losses at solar plants. Assessing the downtime and costs to repair are often difficult calculations and provide unrealistic estimates over the lifetime of the system. While module-level monitoring cannot prevent these problems, it significantly reduces their impact. Problems can be spotted sooner and remotely diagnosed.

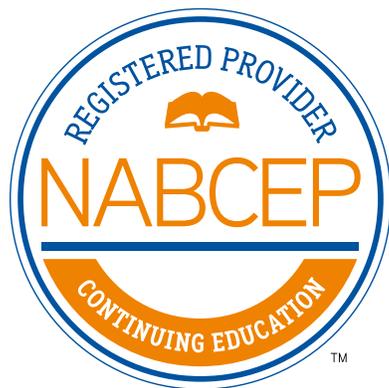
Minimizing the downtime and costs associated with troubleshooting an issue also reduces the uncertainty in cashflow of the PV system. This greater confidence can be translated to approximately 5% lower standard deviation, allowing financiers to reduce 1% of the cost of capital for a PV plant.

Dual-certified MLPE

Tigo's MLPE is dual-certified with UL & IEC to work with integrated module & inverter partners. These certifications are listed with 40+ module manufacturers & 15 inverter manufacturers, currently shipping worldwide.

Training

To learn more about Tigo Energy, and how to design a smart module system using our TS4 platform for rapid shutdown compliance, take our online safety course. This course will take you through the following:



- An introduction to the NEC 690.12 requirements and how the TS4 platform is used as part of a rapid shutdown solution
- Design and installation using TS4-F for rapid shutdown compliance
- Design and installation using TS4-S for rapid shutdown compliance plus module-level wireless communication
- Planning a communication layout for monitoring and rapid shutdown control using the CCA and TAP

There is a quiz at the end, and upon successful completion you'll be granted a course completion certificate which US installers can use towards NABCEP (North American Board of Certified Energy Practitioners) continuing education credits.

Cost-effective Rapid Shutdown

FIRE SAFETY

TS4-F, TS4-A-F, TS4-A-2F

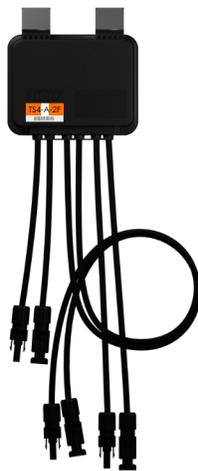


Fire Safety

- NEC 690.12 rapid shutdown compliant
- Module-level deactivation
- Automatic or manual shutdown
- PLC signaling



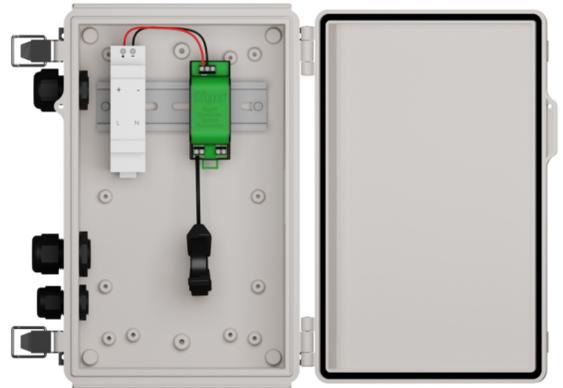
TS4-A-F
Add-on Unit



TS4-A-2F
Add-on Unit



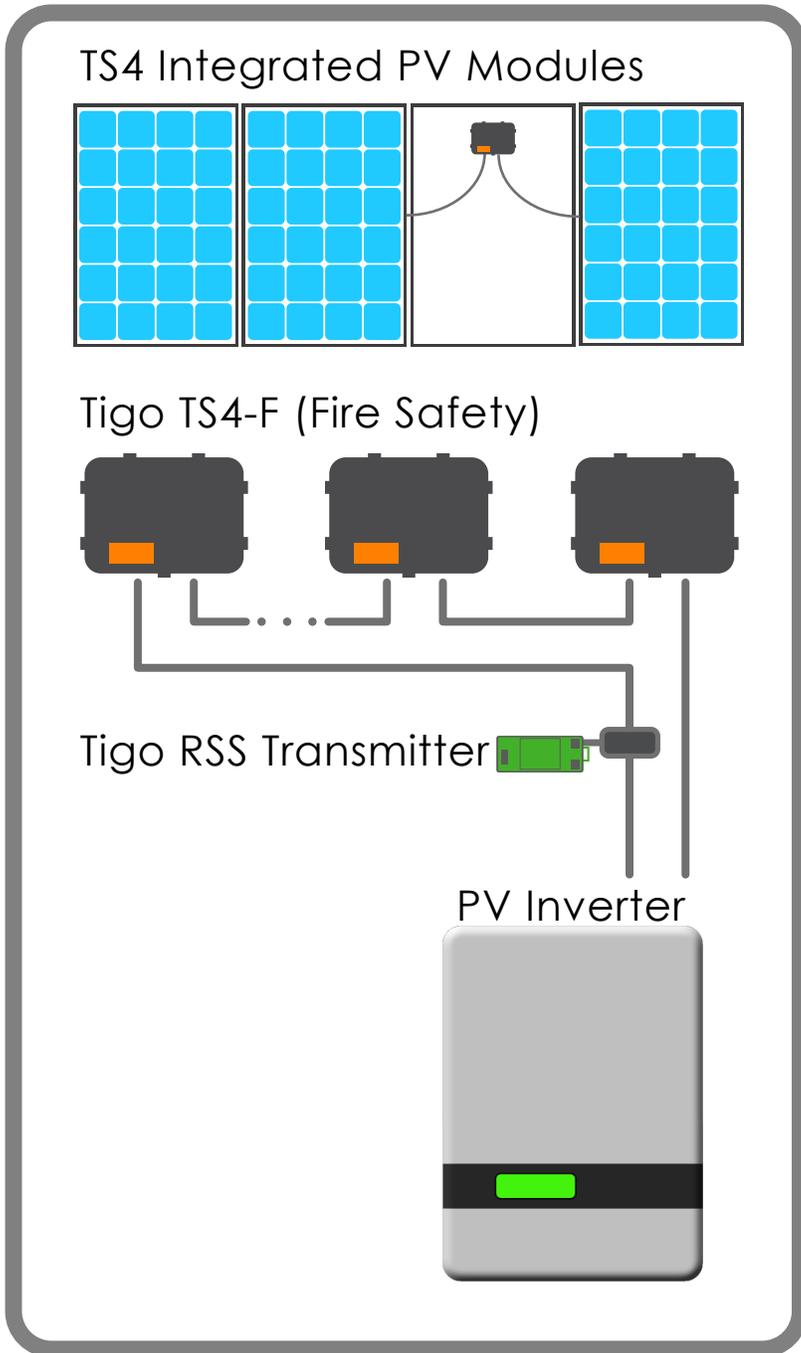
RSS Transmitter
with RSS Core



RSS Transmitter
in Outdoor Kit

TS4-F (Fire Safety) is a specialized rapid shutdown solution available as an integrated modular junction box base (TS4-F) or add-on unit (TS4-A-F, TS4-A-2F). Rapid shutdown activation is controlled by power-line communication (PLC) with an RSS Transmitter.

The RSS (Rapid Shutdown System) Transmitter completes the cost-effective rapid shutdown system architecture when paired with Tigo's UL-certified TS4-F (integrated), TS4-A-F (add-on), and/or TS4-A-2F (dual add-on) solutions. The RSS Transmitter sends a signal to the TS4-F units to keep PV modules connected while powered on and supplying energy. TS4-F 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. This solution complies with the USA's NEC 690.12 specifications. Available with residential and commercial options.



RSS Signal Detector for testing PLC communication strength

Rapid Shutdown with Monitoring

OPTIMIZATION

TS4-O



Monitoring



Safety



Optimization

- Shade and mismatch tolerance
- Enhanced energy yield
- Greater design flexibility

- Maximized roof usage
- Plus all the benefits of Safety and Monitoring

SAFETY

TS4-S



Monitoring



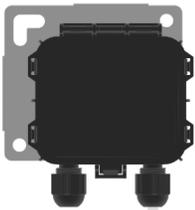
Safety

- NEC 690.12 rapid shutdown compliant
- Module-level deactivation

- Automatic or manual shutdown
- Plus all the benefits of Monitoring



Cloud Connect Advanced (CCA) is a universal data logger that enables module-level data collection and transmission for real-time analysis. The CCA is part of Tigo's SMART communication platform which is supported by all major inverter and module manufacturers worldwide.



Tigo Access Point (TAP) improves the data management of your solar system through seamless communication with Tigo TS4 smart modules and TS4-A add-on units. TAP significantly improves the level of security with module-level deactivation. When combined with a CCA, the TAP offers unsurpassed insights into your PV system.

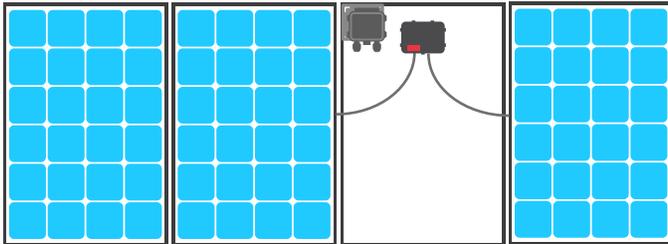


Safety



Optimization

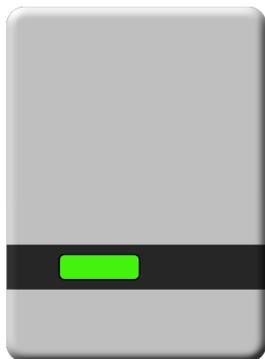
TS4 Integrated PV Modules



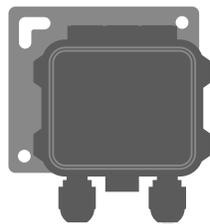
Tigo TS4 Platform



PV Inverter



Tigo Access Point (TAP)



Cloud Connect Advanced (CCA)



Tigo SMART App and Monitoring Platform



Tigo Cloud



Multivendor Solution

Tigo is the only UL-certified multivendor module-level rapid shutdown solution. The installer has the freedom to choose functions based on their needs and the needs of their customers.

Modules

Tigo's TS4 MLPE modular platform has been certified by Underwriters Laboratories (UL) and Nationally Recognized Testing Laboratories (NRTL) for fully complying with the USA's National Electric Code (NEC) 690.12 Rapid Shutdown regulations with specific PV modules. Tigo's TS4 Platform was successfully tested with multiple PV modules as stated by the certification's UL Product Spec. Visit the websites of Tigo's PV module partners to see how they are compliant with UL's RSS module-level deactivation regulations when using Tigo's TS4-F (Fire Safety), TS4-S (Safety), or TS4-O (Optimization).

Inverters

Tigo's TS4 platform is the only UL-certified MLPE RSS solution with multiple inverters from various inverter manufacturers. Visit the [UL website](#) to see a full list of commercial & residential inverter partners and system ratings with Tigo's TS4-F, TS4-S, and TS4-O.



Module Partners



Inverter Partners



Ordering Information

TS4-F: Rapid Shutdown only

Part Number	TS4-A Add-on
458-00252-32	TS4-A-F (Fire Safety), 1500V UL / 1000V TÜV, 1.2M Cable, MC4
484-00252-12	TS4-A-2F (Fire Safety), 1500V UL, 1.2M Cable, MC4
484-00252-22	TS4-A-2F (Fire Safety), 1500V UL, 2.2M Cable, MC4
Part Number	RSS Transmitter (Power Line Communication for TS4-F Rapid Shutdown Control)
490-00000-10	Single Core (150A) RSS DIN Rail Transmitter (no PS or enclosure)
490-00000-20	Dual Core (300A) RSS DIN Rail Transmitter (no PS or enclosure)
492-00000-10	Single Core RSS DIN Rail Transmitter Kit, 120/240V _{AC} PS, Outdoor Enclosure
492-00000-20	Dual Core RSS DIN Rail Transmitter Kit, 120/240V _{AC} PS, Outdoor Enclosure
493-00000-20	Commercial Dual Core RSS DIN Rail Transmitter, 480/277V _{AC} PS (no enclosure)
400-00900-00	RSS Signal Detector (includes 4 x AA batteries)

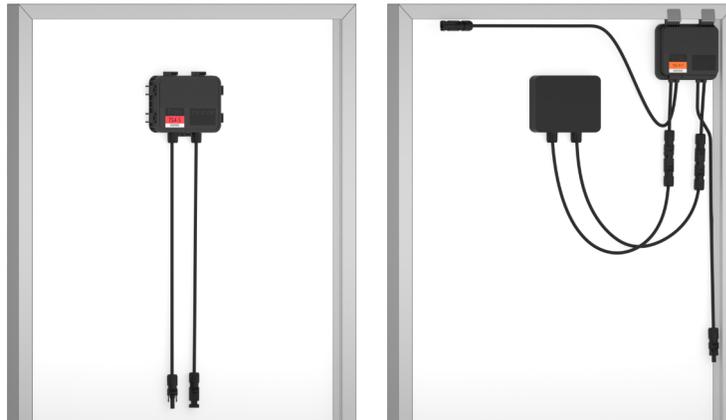
Flex MLPE: Rapid Shutdown and More

Part Number	TS4-A Add-on
451-00252-32	TS4-A-O (Optimization), 1500V UL / 1000V TÜV, 1.2M Cable, MC4
456-00252-32	TS4-A-S (Safety), 1500V UL / 1000V TÜV, 1.2M Cable, MC4
Part Number	CCA & TAP (Wireless Datalogging and Rapid Shutdown Control)
346-00000-00	Cloud Connect Advanced (CCA), standalone
158-00000-02	Tigo Access Point (TAP)
348-00000-52	CCA Kit, TAP, DIN Rail power supply, Outdoor Enclosure

For additional cable & connector availability contact sales@tigoenergy.com



TS4 integrated and TS4-A add-on



Tigo Access Point (TAP), Cloud Connect Advanced (CCA), and Outdoor Enclosure



RSS Transmitter, RSS Signal Detector, RSS Transmitter Outdoor Kit



For sales info:

sales@tigoenergy.com or 1.408.402.0802

For technical information:

<http://support.tigoenergy.com>

For product info:

Visit www.tigoenergy.com/products

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

