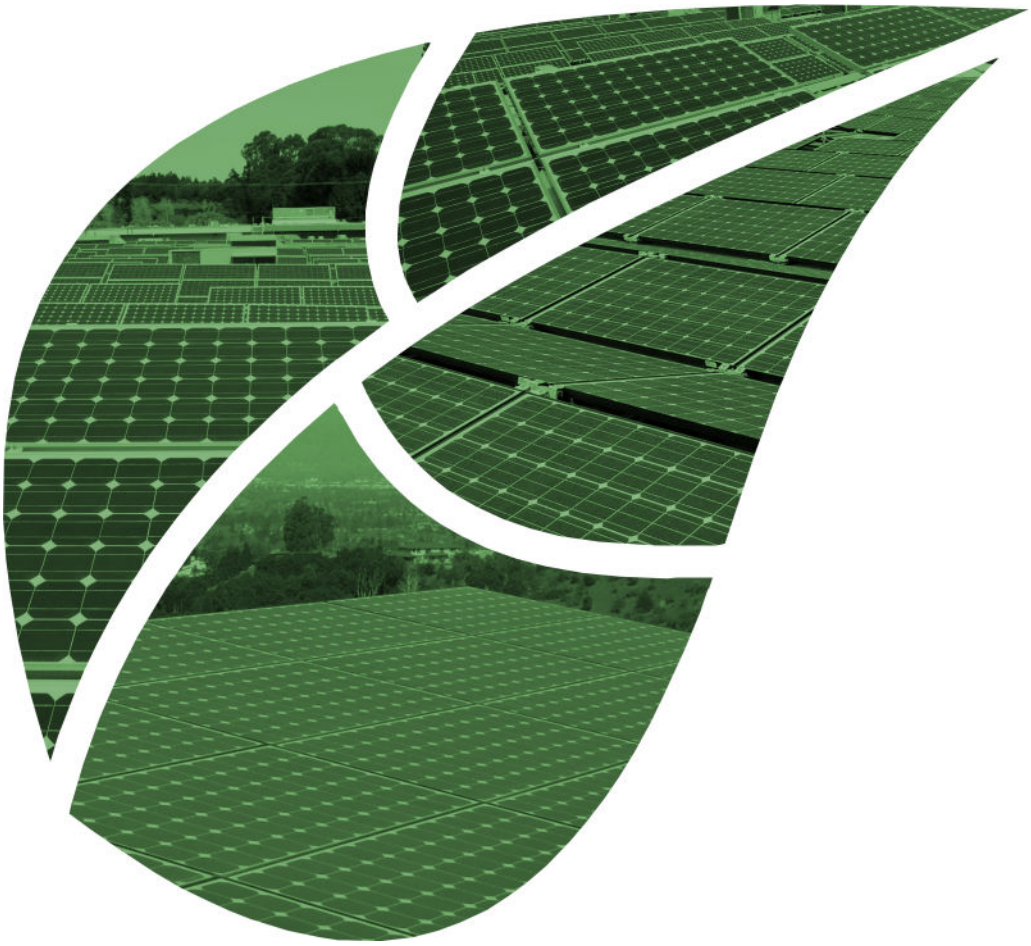
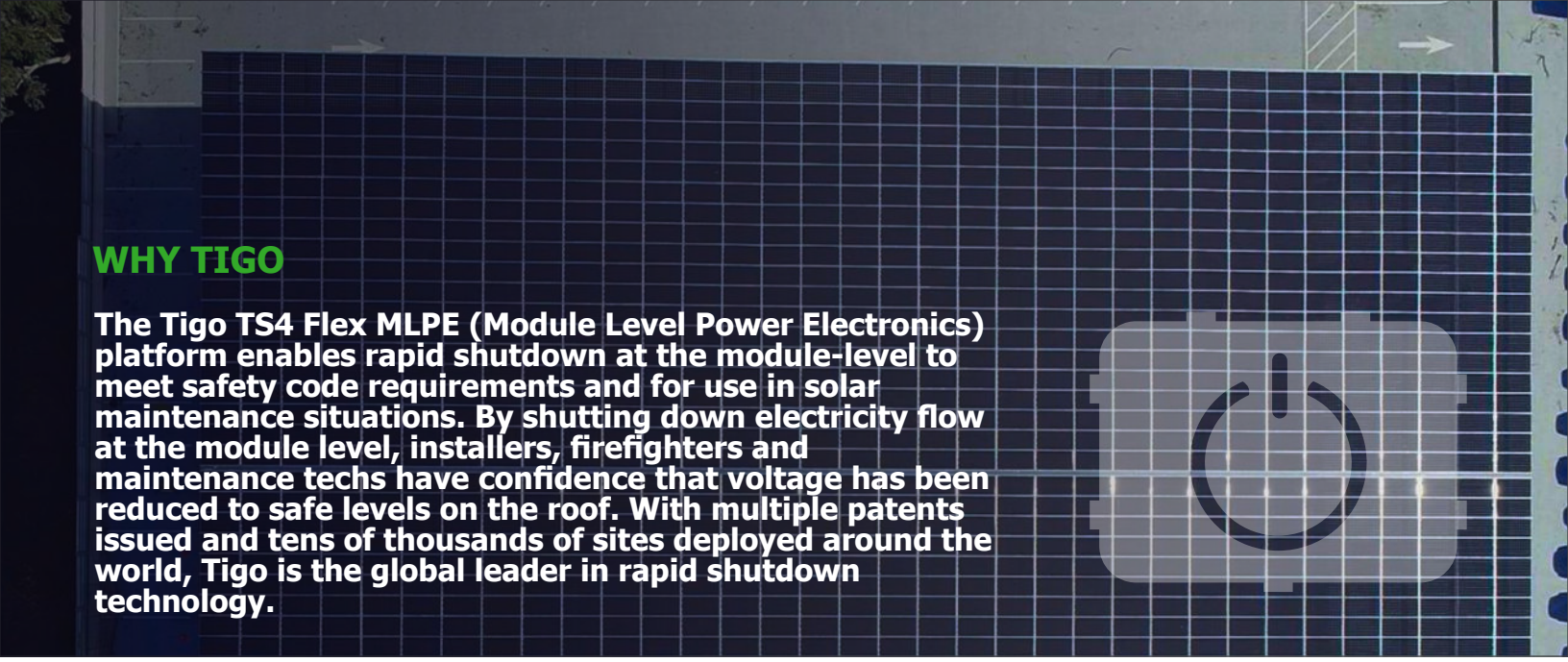
Tigo Energy

Rapid Shutdown Solutions

Meet safety requirements. Improve project ROI. Get multi-vendor flexibility from the leader in rapid shutdown technology.





WHY TIGO

The Tigo TS4 Flex MLPE (Module Level Power Electronics) platform enables rapid shutdown at the module-level to meet safety code requirements and for use in solar maintenance situations. By shutting down electricity flow at the module level, installers, firefighters and maintenance techs have confidence that voltage has been reduced to safe levels on the roof. With multiple patents issued and tens of thousands of sites deployed around the world, Tigo is the global leader in rapid shutdown technology.



HUNDREDS OF INVERTERS TO PAIR WITH

Tigo MLPE are certified with the largest inverter network

- Dozens of brands and hundreds of inverters are certified with Tigo MLPE
- Tigo Enhanced Partner inverters enable plug and play rapid shutdown
- For the complete list of inverters, visit: www.tigoenergy.com/ul-pvrss



THREE MLPE FEATURES TO CHOOSE FROM

Choose the features that maximize the ROI for your site

- **Rapid Shutdown** - enhance safety and meet code requirements.
- **Monitoring** - lower operational costs by gaining visibility into the performance of each module with Tigo Energy Intelligence (EI)
- **Optimization** - increase output, increase the capacity of the site by fitting more modules on a roof, and minimize the effects of mismatch.



MORE THAN A DECADE OF RELIABLE RESULTS

Tigo has industry-leading warranties and support

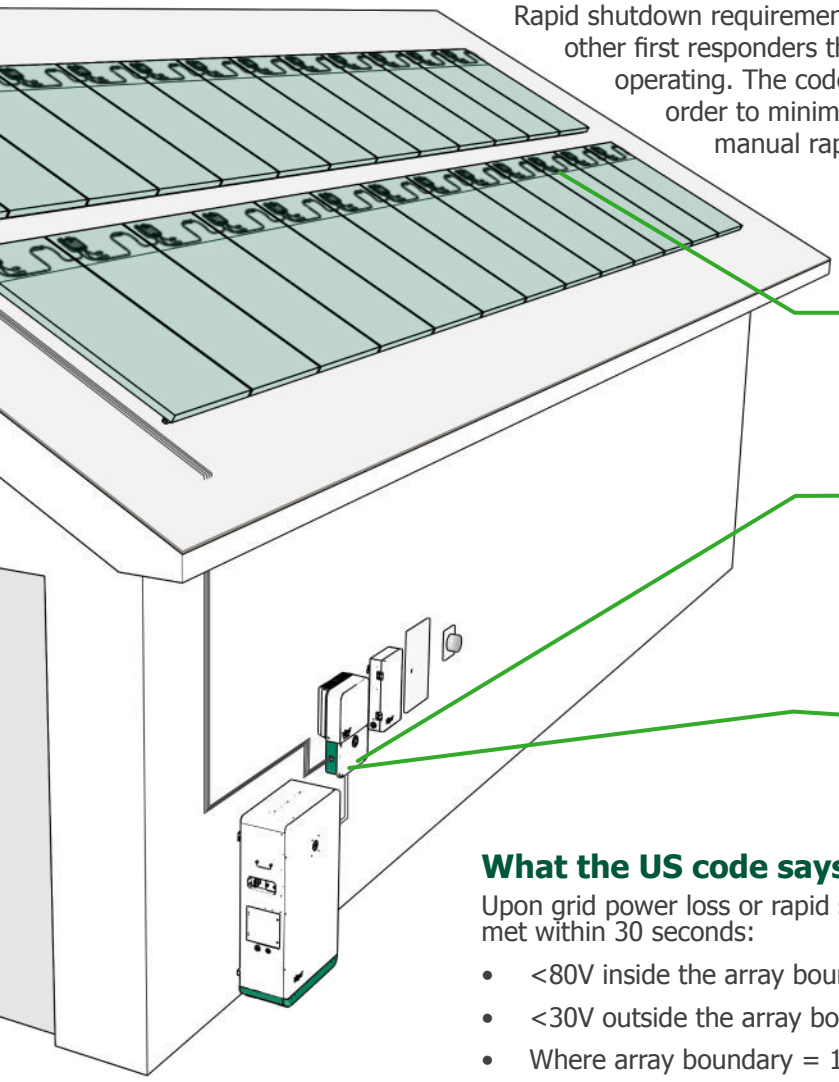
- Sales Engineers help you design the optimal site
- Tigo support picks up the phone
- Proven technology operating globally from residential to utility scale

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Rapid shutdown requirements, simplified



Rapid shutdown requirements have been enacted for the safety of firefighters and other first responders that access the roof where live solar modules may be operating. The code is specific about reducing the voltage of the array in order to minimize risk for these groups in the event of grid power loss or manual rapid shutdown so the roof can be accessed safely.

Components required



Rapid Shutdown Device (RSD)

Stops the voltage at the module level. May communicate over PLC (Powerline Communication) or wirelessly with initiator.



Rapid Shutdown Initiator

Initiates the rapid shutdown process when the keep-alive signal it transmits is no longer detected by the RSD



Certified inverter

Inverter must be certified with the Rapid Shutdown Device and Initiator. The Initiator is often located inside the inverter wirebox.

What the US code says

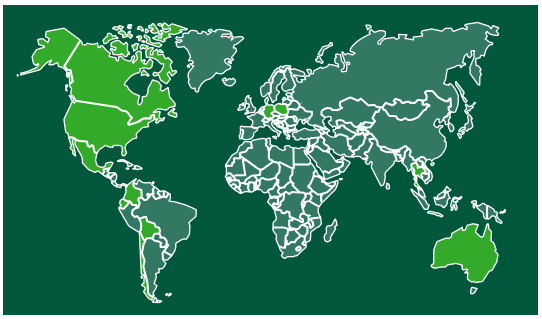
Upon grid power loss or rapid shutdown initiation, the following requirements must be met within 30 seconds:

- <80V inside the array boundary
- <30V outside the array boundary
- Where array boundary = 1ft on all sides of the modules

In addition, the code requires rapid shutdown equipment (PVRSE) and systems (PVRSS) be UL Listed by a Nationally Recognized Testing Laboratory for rapid shutdown.

- PVRSE: Equipment intended to initiate, disconnect, isolate or attenuate the controlled conductors of a PV system
- PVRSS: System consisting of PVRSE including Rapid Shutdown Device, Initiation Device, and Inverter

Rapid Shutdown requirements are spreading around the world



The Rapid shutdown requirements enacted by the US National Fire Protection Agency as part of the National Electrical Code are being replicated and enacted in countries throughout the world including Canada, Mexico, Philippines, Thailand, Poland, and more.

To watch a Tigo a webinar on rapid shutdown requirements around the world, visit: https://www.tigoenergy.com/webinars

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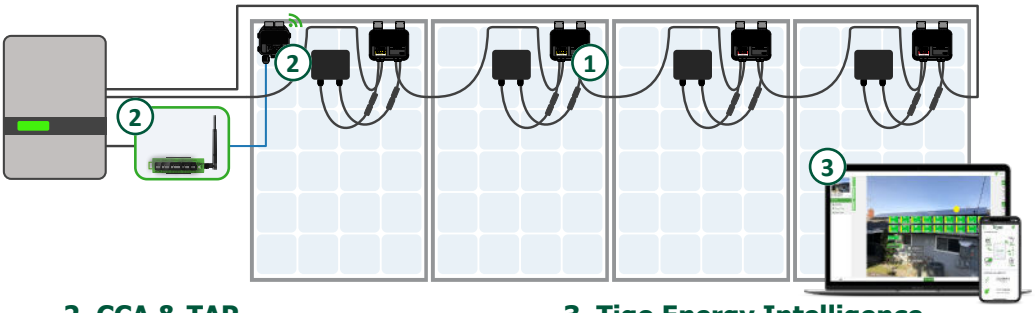
Rapid shutdown with Tigo TS4 Flex MLPE

Select the features you want with rapid shutdown, enabled by Tigo TS4 Flex MLPE

	 O	 S	 F	 2F
FEATURES	Rapid Shutdown Monitoring Optimization	Rapid Shutdown Monitoring	Rapid Shutdown	Rapid Shutdown
REQUIRED SEE SCHEMATIC BELOW	CCA & TAP (Wireless)	CCA & TAP (Wireless)	RSS Transmitter (PLC)	RSS Transmitter (PLC)
MODULES SERVED	1	1	1	2
OPTIONS	May selectively deploy with TS4-A-S	May selectively deploy with TS4-A-O	Works with TS4-A-2F on same strings	Works with TS4-A-F on same strings

SCHEMATIC: TS4-A-O, S

Monitoring enabled smart devices



1. TS4: O, S

Tigo TS4 units are connected to each module. Customers can selectively deploy any combination of the TS4-A-O, or S products to maximize returns for their particular site.

2. CCA & TAP

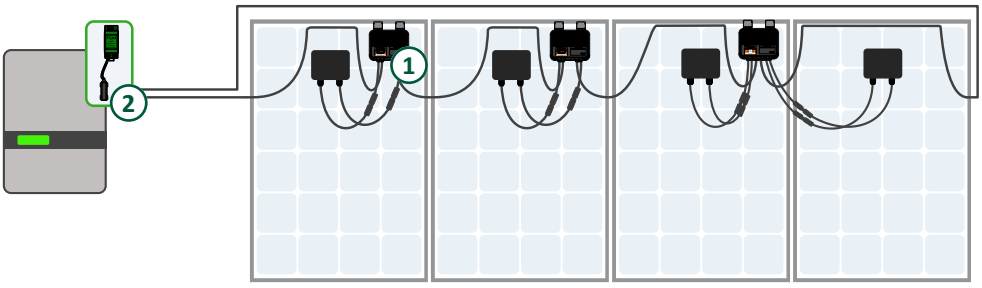
Tigo's Cloud Connect Advanced (CCA) is the data hub for TS4s and other devices (inverter, battery, etc.). It connects with an RS485 cable to the TAP which wirelessly communicates with TS4s.

3. Tigo Energy Intelligence

All of the module-level data, and any third party data connected to Tigo's CCA can be viewed in Tigo's Energy Intelligence monitoring system.

SCHEMATIC: TS4-A-F, 2F

Dedicated, reliable rapid shutdown devices



1. TS4: F or 2F

Tigo's Fire Safety line of TS4 are completely dedicated to the rapid shutdown function and communication via PLC with the RSS Transmitter.

2. Required: RSS Transmitter

The Tigo Rapid Shutdown System (RSS) Transmitter enables UL PVRSS certified rapid shutdown with TS4-A-F and 2F units to meet required safety codes.

3. Monitoring: Inverter

Tigo's TS4-A-F and -2F are dedicated rapid shutdown devices. Inverter monitoring may provide DC data at the string, MPPT or array level.

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Embrace solar freedom with Tigo Rapid Shutdown

Examples of customers using Tigo MLPE to meet code and maximize benefits



Rapid Shutdown + Monitoring + Optimization to maximize output

531 kW Commercial Rooftop | California, USA

TIGO EQUIPMENT USED





Rapid Shutdown + Monitoring to enhance safety & visibility

10 MW Floating Solar Array | Israel

TIGO EQUIPMENT USED





Rapid Shutdown to meet code requirements

75 kW Airport / Commercial Building | Oregon, USA

TIGO EQUIPMENT USED



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Additional Tigo product information



TS4-A-O (optimization)

Rapid shutdown, module level monitoring and optimization for modules up to 700W.

tigoenergy.com/product/ts4-a-o



TS4-A-F (fire safety)

Rapid shutdown dedicated device for modules up to 700W.

tigoenergy.com/product/ts4-a-f



TS4-A-S (safety)

Rapid shutdown and module level monitoring for modules up to 700W.

tigoenergy.com/product/ts4-a-s



TS4-A-2F (fire safety for 2 modules)

Rapid shutdown dedicated device for 2 modules, each up to 500W.

tigoenergy.com/product/ts4-a-2f



Cloud Connect Advanced (CCA)

Universal data-logger that connects to Tigo TS4-A-O and S via the Tigo Access Point (TAP).

tigoenergy.com/product/cloud-connect-advanced



RSS Transmitter

It completes the rapid shutdown system architecture when paired with Tigo's TS4 F/2F.

tigoenergy.com/product/rss-transmitter



Tigo Access Point (TAP)

The TAP wirelessly connects to Tigo TS4-A-O and S to enable monitoring and rapid shutdown.

tigoenergy.com/product/tigo-access-point

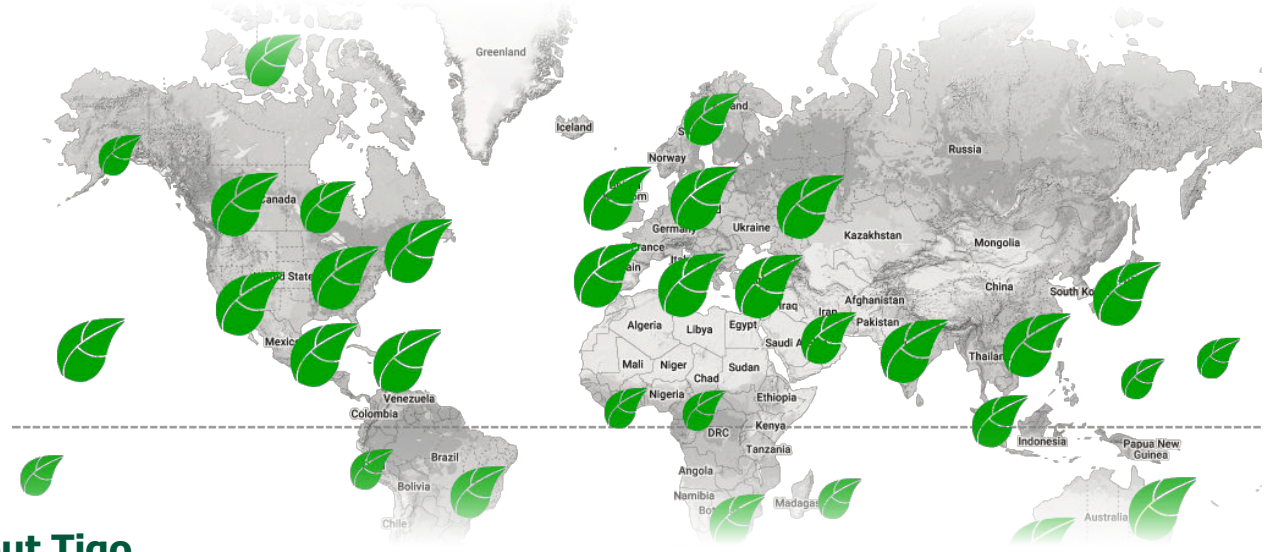
UL PVRSS Certified inverter list

View the hundreds of inverters that have been UL PVRSS certified with Tigo TS4 Flex MLPE.

tigoenergy.com/ul-pvrss

TRUSTED AROUND THE WORLD

Tigo monitors >1GWh of daily solar production on 7 continents



About Tigo

Tigo Energy, the worldwide leader in Flex MLPE (Module Level Power Electronics), designs innovative solar power conversion and storage products that provide customers more choice and flexibility. The Tigo TS4 platform increases solar production, decreases operating costs, and enhances safety. When combined with the Tigo Energy Intelligence (EI) platform, it delivers module, system, and fleet-level insights to maximize solar performance and minimize operating costs. Tigo was founded in Silicon Valley in 2007 to accelerate the adoption of solar energy, and its global team supports customers whose systems reliably produce gigawatt hours of safe solar energy on seven continents.

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