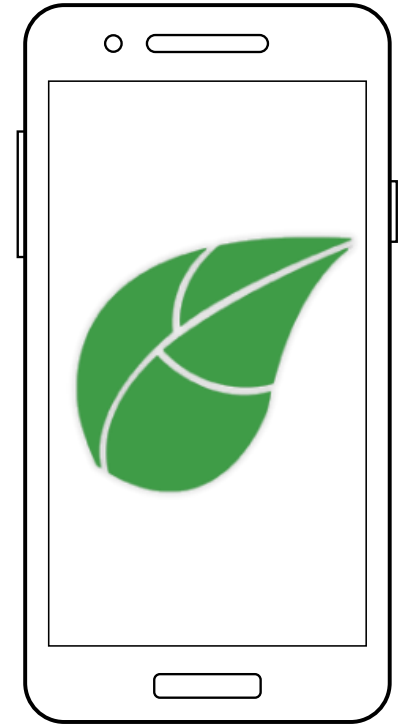# InstaGroup

App User Guide

TIGO SMART APP

Commissioning a new system using the Tigo App 3.0

Use the Tigo SMART app to:

- Create a system

- Input owner info

- Enter inverter & module types

- Configure layout and scan barcodes

- Configure network

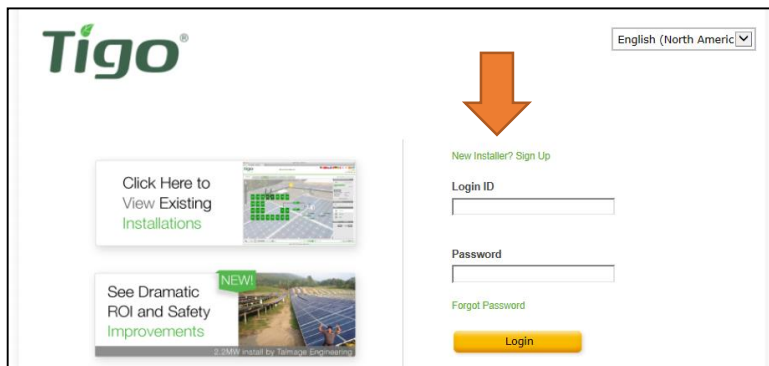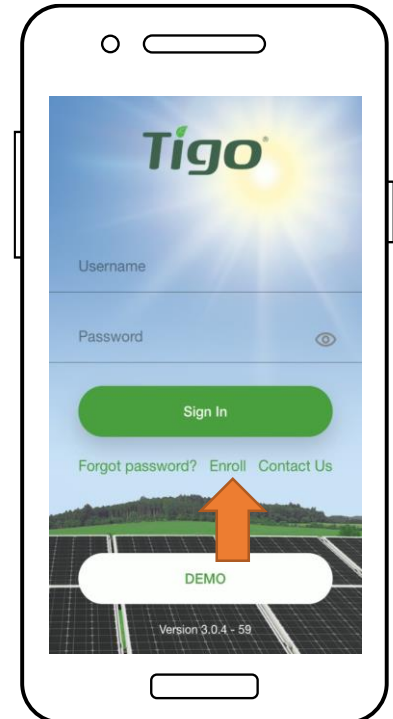- Commission Tigo hardware

- Monitor production

Install 'Tigo SMART' from the App Store or Google Play

GETTING STARTED

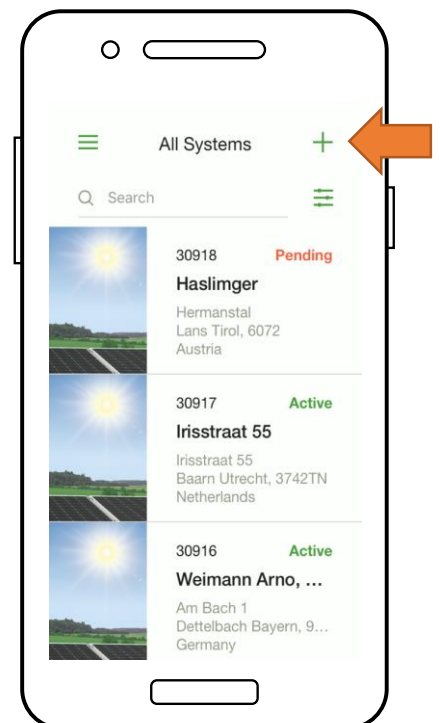*Requires active mobile data connection*

If you do not have an installer account, tap '**Enroll**' to create a new account. All system data can also be accessed and edited here: https://installations.tigoenergy.com

https://installations.tigoenergy.com/

To proceed with a new installation, tap '+' at the top right of the display

To service or monitor an existing system that has already been configured, tap on that system in your list

SELECT EQUIPMENT

Requires active mobile data connection

- Go to 'Select Equipment'

- Tap '**+**' at the top right of the display to add equipment

- Choose the inverter model, the number of MPPTs, and the associated CCA

- Select the manufacturer and model of the PV modules

  Note: If using an inverter or module not in the list, click the '**+**' sign at the top right corner
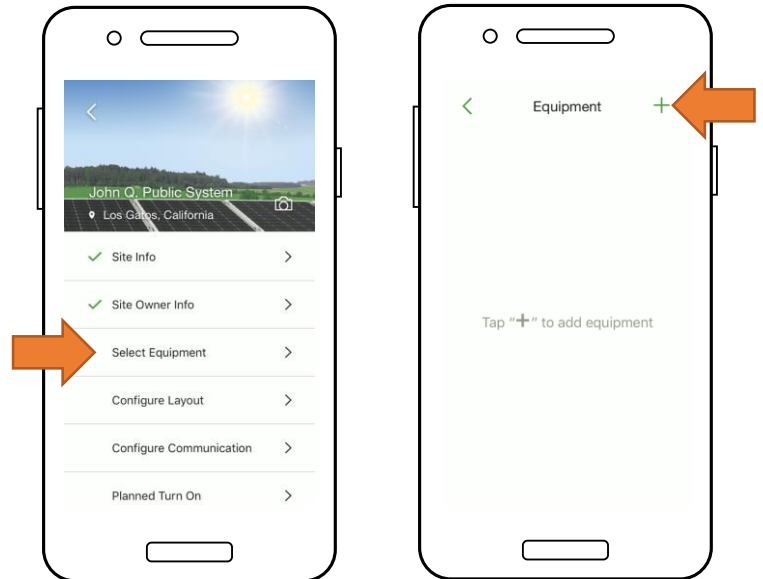
- Place the CCA by tapping on a position on the Layout grid

- Tap 'Place' next to an equipment type to place it on the grid

- Repeat for all CCAs and inverters
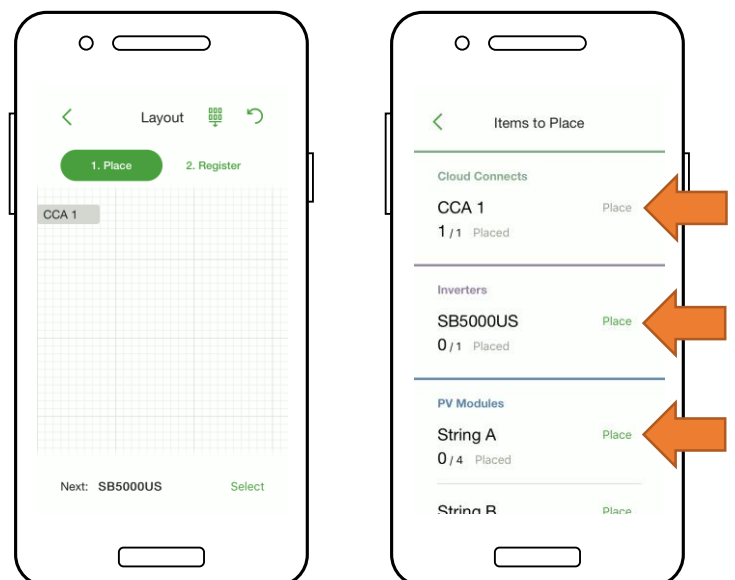
CONFIGURE MODULE LAYOUT

Requires active mobile data connection

- Place modules in the Layout grid according to their physical placement on site

- ⚠️ Note: Matching the physical map of the system is optional but improves its appearance in the monitoring portal and makes maintenance easier

- Tap and drag to change the position of a placed item

- Tap 'Register' to begin entering the TS4 barcodes
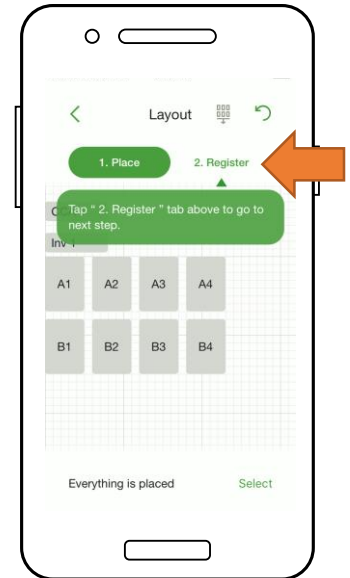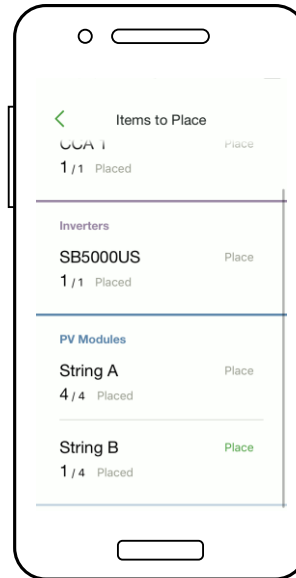
- Select a gray module in the layout to register it by typing or scanning in its TS4 barcode

- Register all TS4 barcodes

CONNECT CCA TO SMARTPHONE

No mobile data connection required

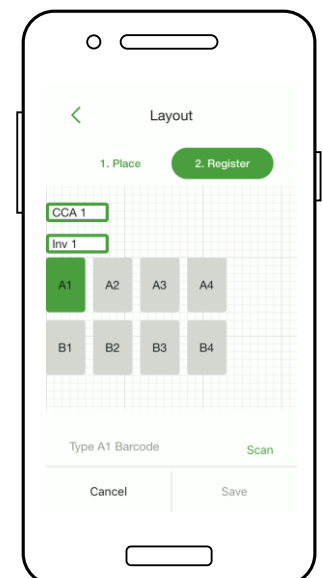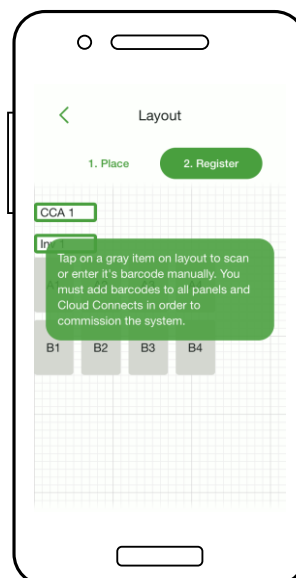You can use either a Wi-Fi or Bluetooth connection to connect the smartphone to the CCA

To connect the Smartphone to the CCA via **Bluetooth**, tap the serial number of the CCA you wish to connect with

- Note: Use the Tigo Smart App to pair with the CCA, instead of the phone's Bluetooth pairing screen

- Once connected to the CCA, tap 'Next' to continue
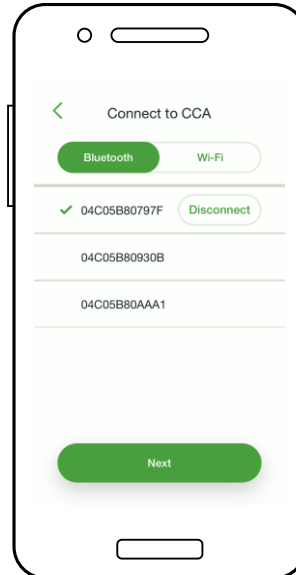
To connect the smartphone to the CCA via **Wi-Fi**, choose the CCA's Wi-Fi connection in the phone's settings

- Note: Using the Wi-Fi connection disconnects the smartphone from the local Wi-Fi

- Once connected to the CCA, tap 'Next' to continue
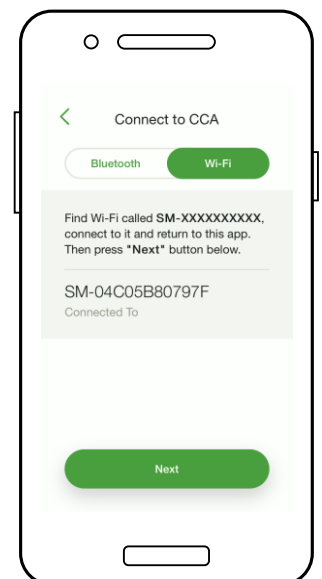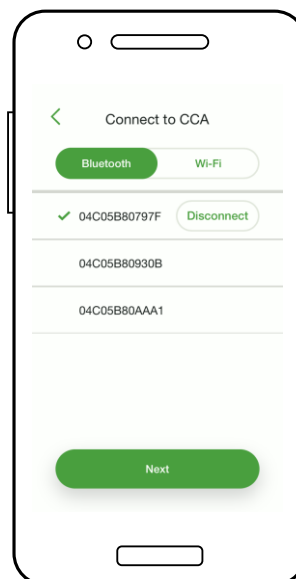
CONFIGURE NETWORK SETTINGS – CONNECT CCA TO INTERNET

Requires smartphone – CCA connection

- The Network Test checks the Internet connection of the CCA
- The test performs a series of checks that can be used for troubleshooting the network connection
- Tap 'Done' to continue
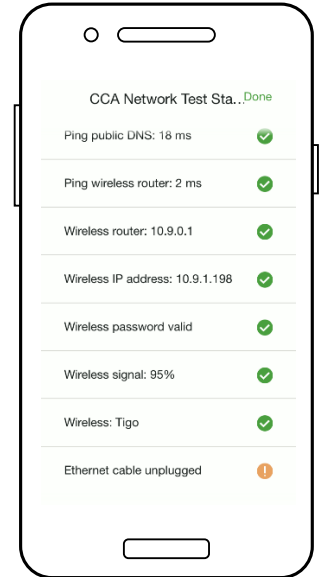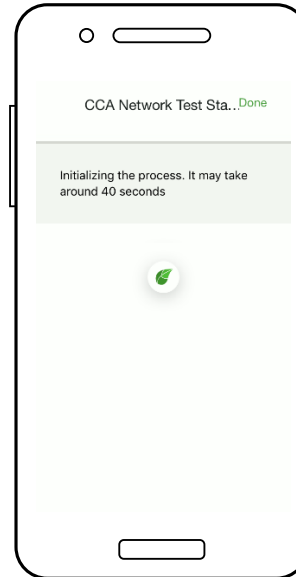
COMMISSION THE TS4 UNITS – RUN DISCOVERY

Requires smartphone – CCA connection

- Tap 'Next' in the 'CCA Network Settings' to go to 'Discovery'
- Note: Before starting Discovery, all site equipment and TS4 barcodes should be input into the app. Begin the process no later than an hour before sunset.
- Tap 'Start' to run Discovery

APPENDIX

TECHNICAL SPECIFICATIONS – SMART MODULE WITH TS4-B BASE

TS4 COVERS

ELECTRICAL RATINGS

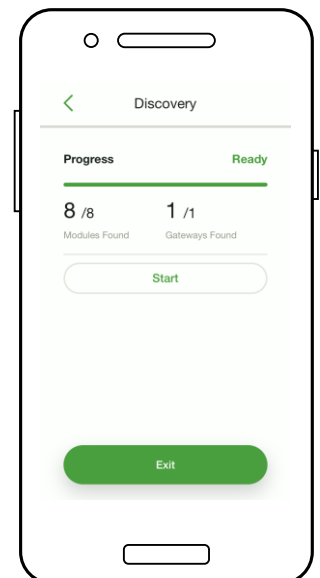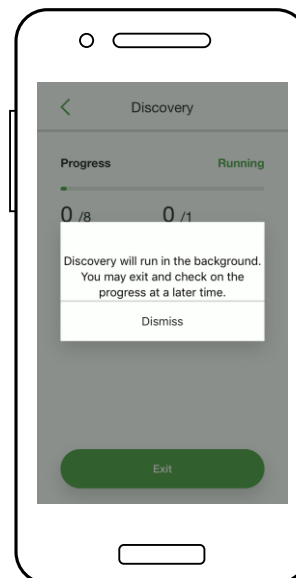|	DIODES TS4-D	MONITORING TS4-M	SAFETY TS4-S	OPTIMIZATION TS4-O	LONG STRINGS TS4-L
INPUT					
Rated DC Input Power		475W	475W	475W	475W
Maximum Input Voltage	N/A	90V	90V	90V	90V
Max Continuous Input Current (I_{MAX})	12.5A	12A	12A	12A	12A
Maximum V_{OC} @ STC		75V	75V	75V	75V
Minimum V_{MP}	N/A	16V	16V	16V	16V
OUTPUT					
Output Power Range	0 - 375W	0 - 475W	0 - 475W	0 - 475W	0 - 475W
Output Voltage Range	0 - V_{OC}	0 - V_{OC}	0 - V_{OC}	0 - V_{OC}	**0 - V_{MAX}**
Communication Type	N/A	802.15.4 2.4GHz	802.15.4 2.4GHz	802.15.4 2.4GHz	802.15.4 2.4GHz
Rapid Shutdown UL Listed (NEC 2014 & 2017 690.12)	Need additional RS device	Need additional RS device	Yes	Yes	Yes
Impedance Matching Capability	No	No	No	Yes	Yes
Output Voltage Limit	No	No	No	No	Yes
Maximum System Voltage	1500V	1500V	1500V	1500V	1500V

All TS4 covers are 1500V compatible. Specify system voltage when ordering (1000V / 1500V) for appropriate cables & connectors.

Rapid shutdown requires TS4-S or higher, installed with CCA and TAP.

TECHNICAL SPECIFICATIONS – RETROFIT UNIT WITH TS4-R BASE

TS4-R

ELECTRICAL RATINGS	MONITORING TS4-R-M	SAFETY TS4-R-S	OPTIMIZATION TS4-R-O
INPUT			
Rated DC Input Power	475W	475W	475W
Maximum Input Voltage	90V	90V	90V
Max Continuous Input Current (I_{MAX})	12A	12A	12A
Maximum V_{OC} @ STC	75V	75V	75V
Minimum V_{MP}	16V	16V	16V
OUTPUT			
Output Power Range	0 - 475W	0 - 475W	0 - 475W
Output Voltage Range	$0 – V_{OC}$	$0 - V_{OC}$	$0 - V_{OC}$
Communication Type	802.15.4 2.4GHz	802.15.4 2.4GHz	802.15.4 2.4GHz
Rapid Shutdown UL Listed (NEC 2014 & 2017 690.12)	Need additional RS device	Yes	Yes
Impedance Matching Capability	No	No	Yes
Output Voltage Limit	No	No	No
Maximum System Voltage	1500V	1500V	1500V

All TS4 covers are 1500V compatible. Specify system voltage when ordering (1000V / 1500V) for appropriate cables & connectors.

Rapid shutdown requires TS4-R-S or higher, installed with CCA and TAP.

TECHNICAL SPECIFICATIONS – RETROFIT DUO UNIT WITH TS4-R BASE

TS4-R-DUO

ELECTRICAL RATINGS

	MONITORING TS4-R-M-Duo	SAFETY TS4-R-S-Duo	OPTIMIZATION TS4-R-O-Duo
INPUT			
Maximum DC Input Power	700W	700W	700W
Total Max Input Voltage (V_{OC} @ Lowest Temperature	90V	90V	90V
Total PV Module V_{OC} @ STC[1]	75V	75V	75V
Max Continuous Input Current (I_{MAX})	12A	12A	12A
OUTPUT			
Output Power Range	0 - 700W	0 - 700W	0 - 700W
Output Voltage Range	0 – V_{OC}	0 - V_{OC}	0 - V_{OC}
Communication Type	802.15.4 2.4GHz	802.15.4 2.4GHz	802.15.4 2.4GHz
Rapid Shutdown UL Listed[2] (NEC 2014 & 2017* 690.12)	Need additional RS device	Yes	Yes
Impedance Matching Capability[3]	No	No	Yes
Output Voltage Limit	No	No	No
Maximum System Voltage	1500V	1500V	1500V

[1] Approximate V_{OC} of 90V at -40°C.
[2] Cloud Connect Advanced (CCA) and TAP/Gateway required for rapid shutdown compliance.
[3] Install TS4-R-X-Duo on strings of identical length with identical PV modules.

All TS4 covers are 1500V compatible. Specify system voltage when ordering (1000V / 1500V) for appropriate cables & connectors.

Rapid shutdown requires TS4-R-S-Duo or higher, installed with CCA and TAP.

TECHNICAL SPECIFICATIONS

MECHANICAL SPECIFICATIONS – TS4-B and TS4-R

Mechanical

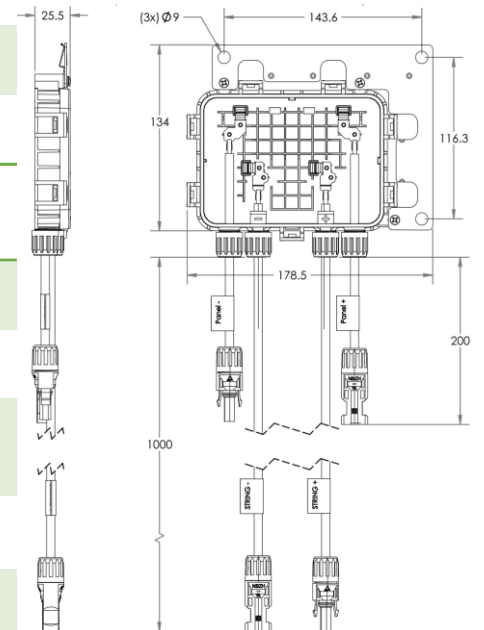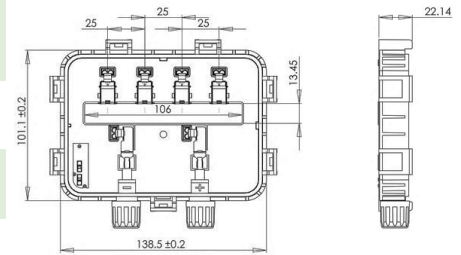|	
Operating Temperature Range	-40°C to +85°C (-40°F to +185°F)
Storage Temperature Range	-40°C to +85°C (-40°F to +185°F)
Cooling Method	Natural Convection
Dimensions (TS4-R with cover)	178.5mm x 134mm x 25.5mm
Weight (base without cover)	270g
Outdoor Rating	IP67/IP68, NEMA 3R

Cabling

|	
Type	H1Z2Z2-K
Output Cable Length	Standard 1.0m, other lengths on request
Rating Options	1000V rated 1500V rated
Cable Cross-Section	6.3 ± 0.3mm
Connectors	MC4, MC4 compatible, EVO2
UV Resistance	500hr with UV light between 300-400nm @ 65C
Maximum String Voltage	1500V UL/IEC[1]

[1] All TS4 covers are 1500V compatible. Specify max system voltage when ordering modules with TS4 bases for appropriate cables & connectors.

CCA POWER SUPPLY OPTIONS

Wall Outlet Plug (DC Transformer)		DIN Rail	
Tigo Power supply only P/N	983-00070-00	Tigo Power supply only P/N	983-00054-00
Tigo CC Kit P/N	333-00000-10	Tigo CC Kit P/N	333-00000-00
Manufacturer, P/N	Click, CPS024240100*	Manufacturer, P/N	Mean Well, DR-15-24
Input	85-264VAC 47Hz-63Hz	Input	100-240VAC 50Hz/60Hz
Output	24VDC 0.63A	Output	24VDC 1A
Temperature rating	0°C to +45°C	Temperature rating	-20°C to +60°C
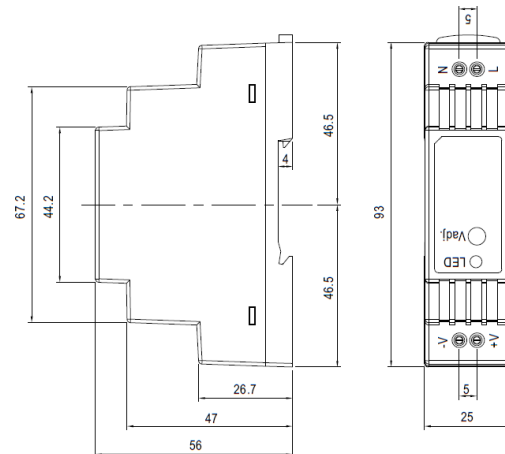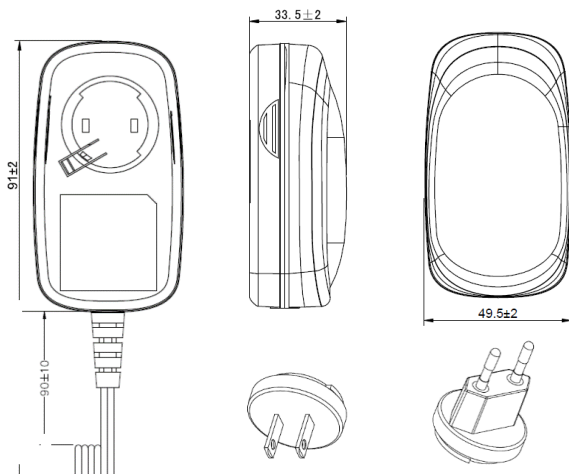
RAPID SHUTDOWN

TS4-L, TS4-O, and TS4-S with Cloud Connect/Cloud Connect Advanced and TAP are a solution to meet NEC 2014 & 2017 690.12 Rapid Shutdown requirements, when combined with a DC disconnect at the inverter.

> When Rapid Shutdown is initiated, the voltage across PV conductors will drop below 30V within 10 seconds at the module level.

To activate rapid shutdown:

1. Switch off DC disconnect to disconnect capacitors.

2. Switch OFF AC main to deactivate system.

> In the inverter's box you'll find 2 red labels to mark the Rapid Shutdown equipment. Place one sticker next to the inverter's DC switch and the other on the AC main breaker. **Both labels must be visible!**
>
> Only a properly installed, configured, and tested system will perform Rapid Shutdown properly.

[CLICK HERE](link) for more info about Rapid Shutdown

STRING LENGTH AND DESIGN WITH TS4

TS4-M: MONITORING:

Standard rules for string length and design.
Requires CCA and TAP for monitoring.

Diodes Monitoring

TS4-S: SAFETY:

Standard rules for string length and design.
Requires CCA and TAP for monitoring and rapid shutdown.

Diodes Monitoring Safety

TS4-O: OPTIMIZATION:

Standard rules for string length
Flexible design (mixed orientations, unequal length strings in parallel)
Tolerant of shade and mismatch

Diodes Monitoring Safety Optimization

TS4-L: LONG STRINGS:

Increased maximum string length, no derating for cold temperature
Flexible design (mixed orientations, unequal length strings in parallel)
Tolerant of shade and mismatch

Diodes Monitoring Safety Optimization Long Strings

STRING SIZING WITH TS4-L

TS4-L has a state of the art technology designed to reduce balance of system costs by allowing longer strings. This can reduce the number of strings by up to 30%, which directly correlates to a 30% reduction in combiner boxes, wiring, fuses, and hardware overhead costs, as well as reducing the labor requirement for installation.

By code:

Traditional String Design:				
Max. string Voc	÷	Temp corrected Voc	=	# of modules per string

Example Calculation (based on a 260W module):

Max. Voc for code: 600V
VMPP range: 190-510V
Module Voc: 38.2V
Module Vmp: 30.6V
Temp. Corrected Voc: 38.2 * 1.25 = 47.75V
Max. string: 600V ÷ 47.75V = **12 modules**

Smart Module String Design:				
Max. string Voc	÷	Reduced Voc	=	# of modules per string

Max. Voc for code: 600V
Inverter VMPP range: 190-510V
Reduced Voc: **35V**
Module Vmp: 30.6V
Temp. Corrected Voc: 35V * 1 = 35V
Max. string: 600V ÷ 35V = **17 modules**

By inverter:

| Verify maximum string length according to inverter parameters				
Inverter MPP Voltage Max	÷	Module Vmp	=	# of modules per string

Verify string Vmp limits by dividing inverter max MPP voltage range by the Smart Module's Vmp.
From the example above: 510V ÷ 30.6V = **16 modules per string by inverter**

In case of discrepancy between the code requirement and the inverter voltage requirement pick the lower number of the two. Therefore, this example results in a maximum of 16 panels per string, a 33% increase in string power, with a corresponding reduction in electrical BOS costs.
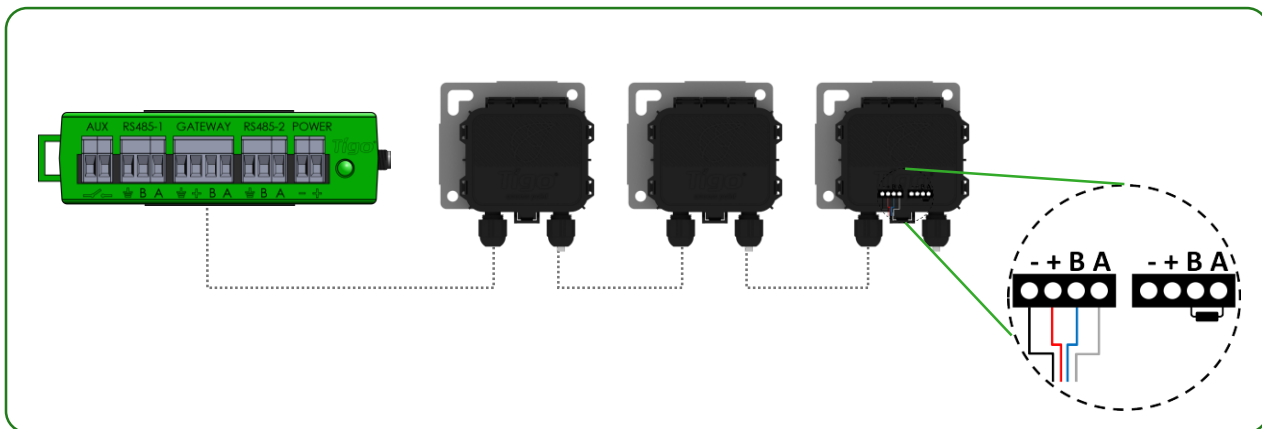
TAP PLACEMENT - LEGACY (non-UHD-Core TS4)

50ft (15m)
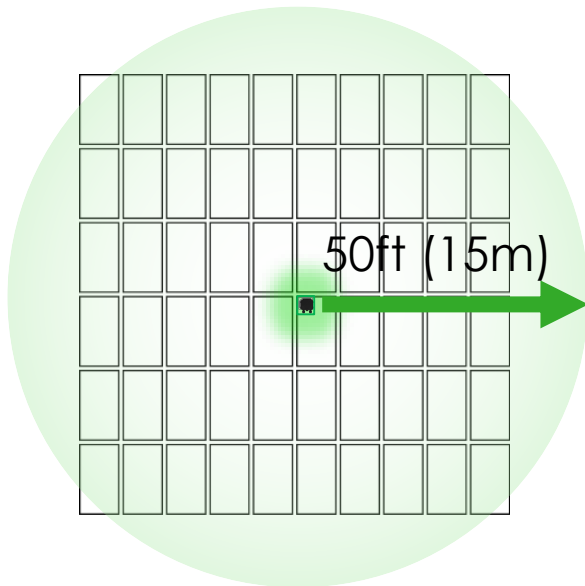
Place TAP near center of array or each sub-array
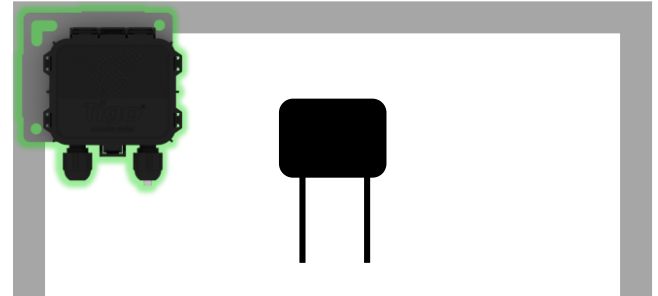
TAP attaches to module frame using built-in bracket. Mounting holes are also available in case of frameless modules.

Connect multiple TAP units in series and leave terminating resistor only in final TAP only.

Legacy configuration (same as Gateway):

- 120 TS4 units per TAP
- 360 TS4 units per CCA
- 7 TAPs per CCA
- 50ft (15m) radius

INSTALLATION COMPLETE

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

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

Or contact us at:

- training@tigoenergy.com