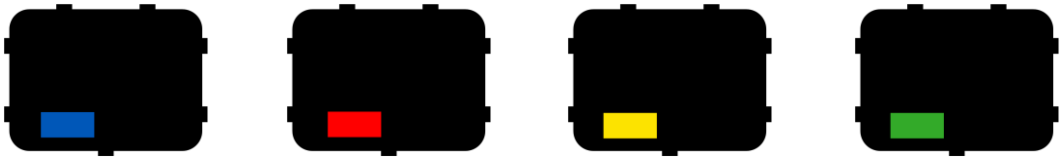
Please read these instructions carefully before installing

This will ensure an easy start and a great first customer experience with TS4 installation

INTERACTIVE

INSTALLATION AND SAFETY MANUAL

FOR TS4: SMART MODULES AND RETROFIT



Iris Hellas
Technology Innovations
www.irishellas.com

CLICK TO CONTINUE

It is highly recommended to view in full screen mode

THE INTERACTIVE MANUAL

This manual contains action buttons, designated to help you navigate around and find the most relevant information for your installation

	Next	Goes to the next page
	Back	Goes to the previous page
	Home	Goes to the product selection page

ON THIS SIDE:

You'll see clarification, additional information, and links for external pages

CLICK TO CONTINUE

READ THIS FIRST

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

LETHAL VOLTAGE MAY BE PRESENT IN ANY PV INSTALLATION

- This manual contains important instructions for installation and maintenance of the Tigo Energy® product models TS4-L, TS4-O, TS4-S, TS4-M, TS4-R-M, TS4-R-S, TS4-R-O, ES-GTWY-020, Cloud Connect, Cloud Connect Advanced and related Tigo Energy software applications.
- 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 Energy® System, please read all instructions and warning markings on the Tigo Energy products, appropriate sections of your inverter manual, photovoltaic (PV) module installation manual, and other available safety guides.
- Failure to adhere to these instructions may result in injury or death, damage to the system or voiding the factory warranty.
- 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 Energy® Module Maximizer™. The Module Maximizers and Smart Modules start in the “ON” state and their output voltage may be as high as the PV module open circuit voltage (Voc) when connected to the module. The installer should use the same caution when handling electrical cables from a PV module with or without the Tigo Energy Module Maximizer attached.
- Installation must be performed by trained professionals only. Tigo Energy 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 Energy Module Maximizers or Smart Modules to reduce the risk of contacting live circuitry. Do not attempt to install in inclement weather.
- Do not operate the Tigo Energy Module Maximizers or Smart Modules 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 Energy Module Maximizers or Smart Modules with damaged or substandard wiring or connectors. Tigo Energy Module Maximizers must be mounted on the high end of the PV module back-sheet or racking system, and in any case above ground.
- Do not connect or disconnect under load. Turning off the Inverter and/or the Tigo Energy 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.
- Service Personnel: Check the voltage of the array after activating the Tigo Energy® PV-Safe™ function on the MMU prior to performing service.
- Always assume Module Maximizers and Smart Modules are in “ON” state, or may turn on when restarting.

TS4 PLATFORM: BASE

This manual covers the installation steps for the Tigo TS4 family of products, both integrated and add-on versions.

Module integrated TS4

Add-on TS4-R

GUIDE:

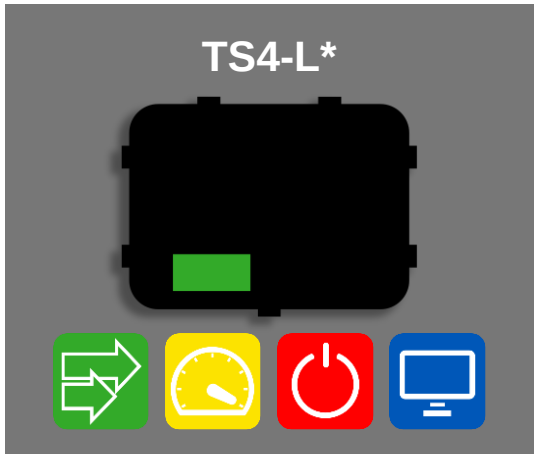
- Long Strings
- Optimization
- Rapid Shutdown
- Monitoring

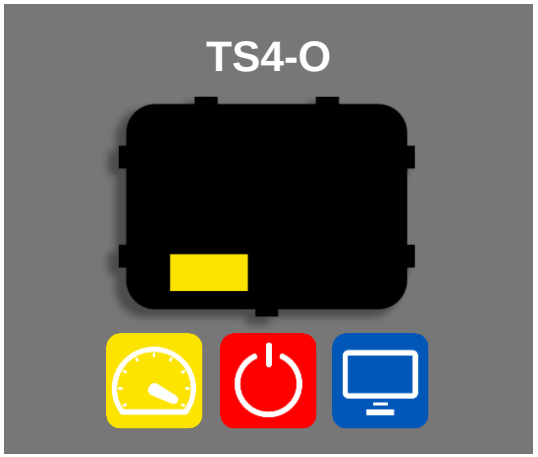
WHERE TO BUY:

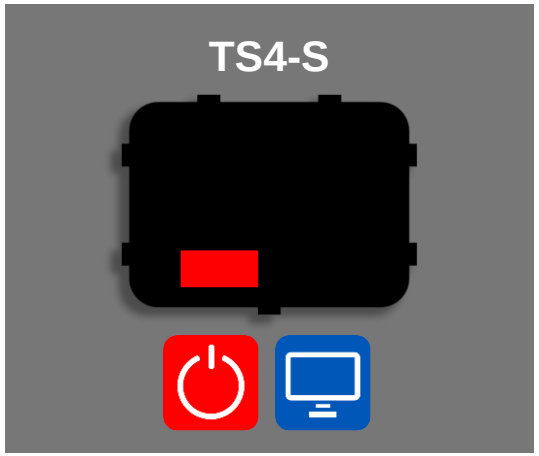
CLICK HERE

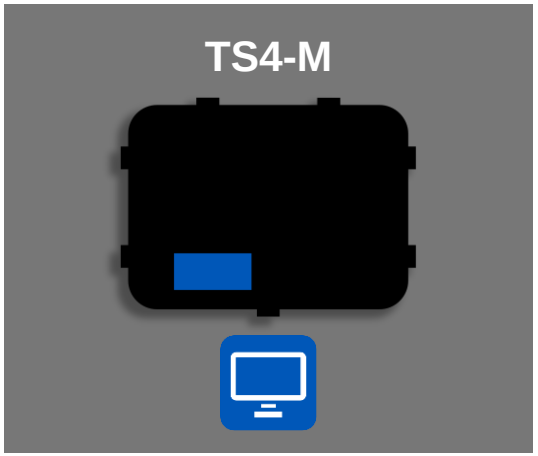
TS4 PLATFORM: COVER SELECTION

The TS4 covers contain your module level electronics:









*TS4-L is available only for the module-integrated TS4

GUIDE:

- Long Strings
- Optimization
- Rapid Shutdown
- Monitoring

WHERE TO BUY:

CLICK HERE

COMMUNICATION

The Cloud Connect is your data logger and safety control unit.

The Gateway is an antenna that communicates with your smart modules or add-on devices.

It is always recommended to install communication accessories, to utilize the full potential of your TS4, however it is only mandatory in order to enable monitoring and safety features, such as Rapid Shutdown.

Select your model of Cloud Connect:

Cloud Connect and Gateway

Cloud Connect Advanced and Gateway

ORDERING INFORMATION:

Cloud Connect Kit comes with:

1 Gateway

1 Power supply: 2 different options:

1. Wall Outlet
2. DIN Rail

Additional Gateways available separately

WHERE TO BUY:

CLICK HERE

REMINDER:

When using TS4-O and TS4 -L, Cloud Connect is only required where rapid shutdown and/or monitoring capabilities are needed

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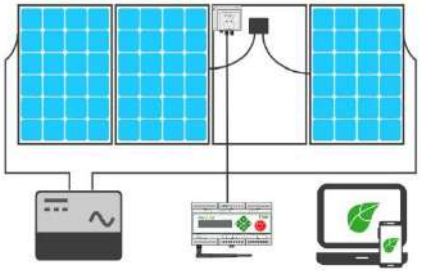
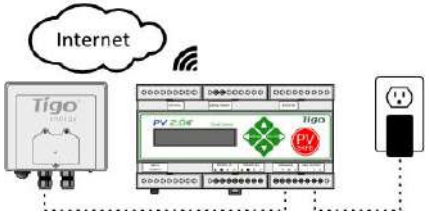
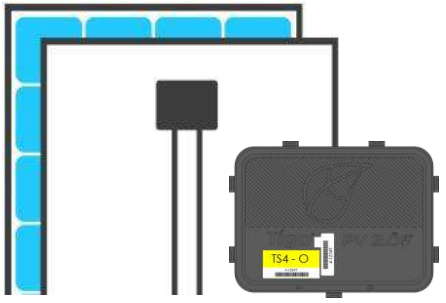
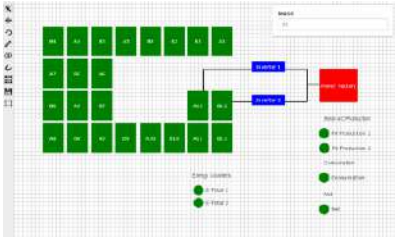
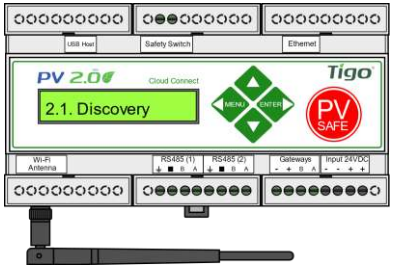
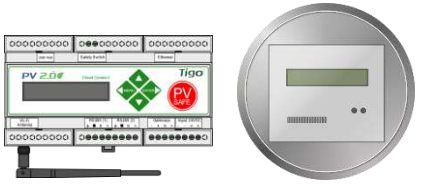
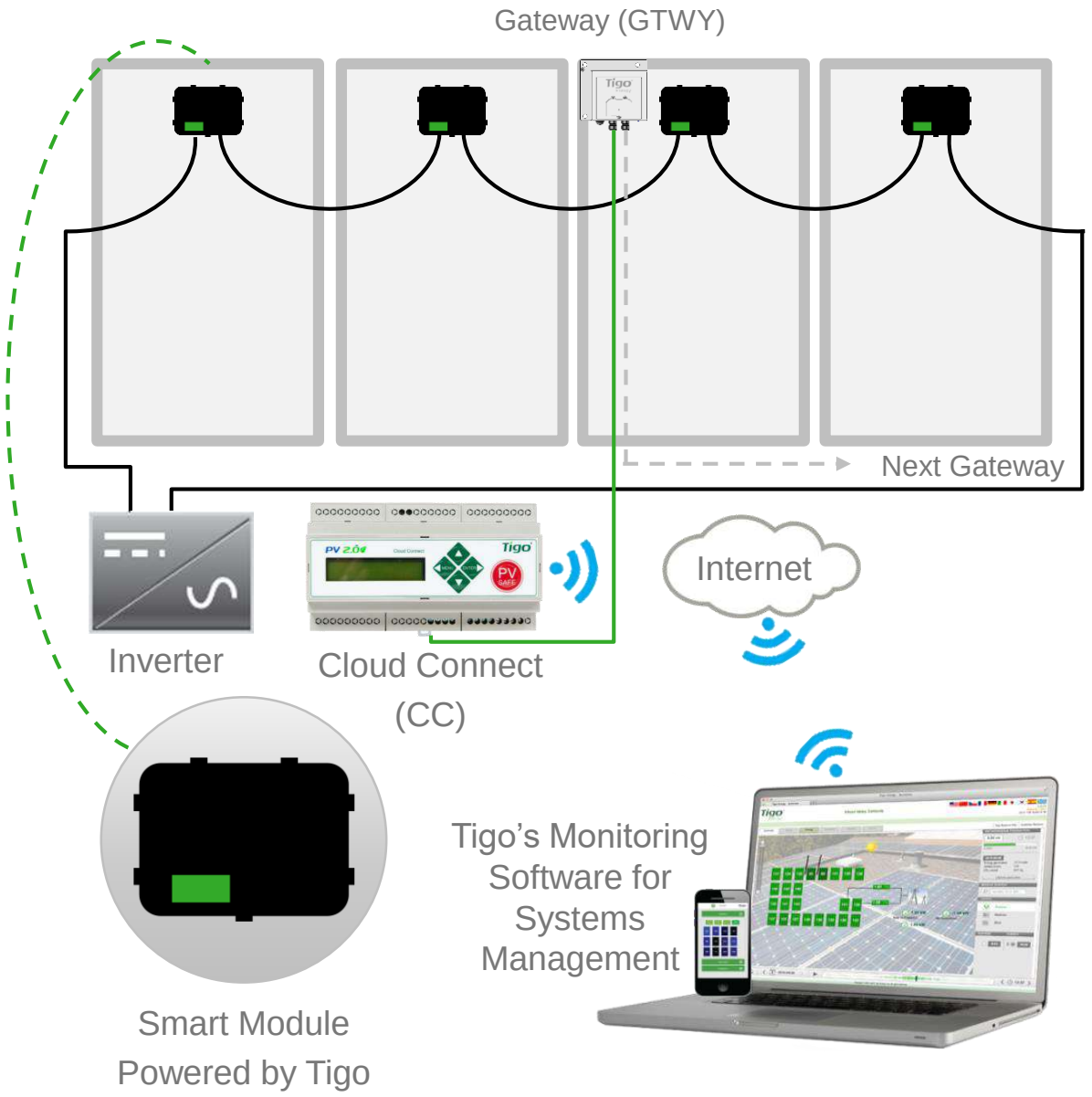
1. System Overview & Product Description	2. Installing Gateways	3. Installing Cloud Connect	4. Installing TS4-R
			
5. Online Configuration	6. Commissioning	7. Rapid Shutdown	8. Connecting Modbus Accessories
		PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN	

1. SYSTEM OVERVIEW: TS4-B (TS4 BASED MODULES)



DESIGN RULES:

1 CLOUD CONNECT:

- Up to 7 GTWYs and 360 PV modules
- All Smart Modules in the same string must be assigned to the same CC

1 GTWY:

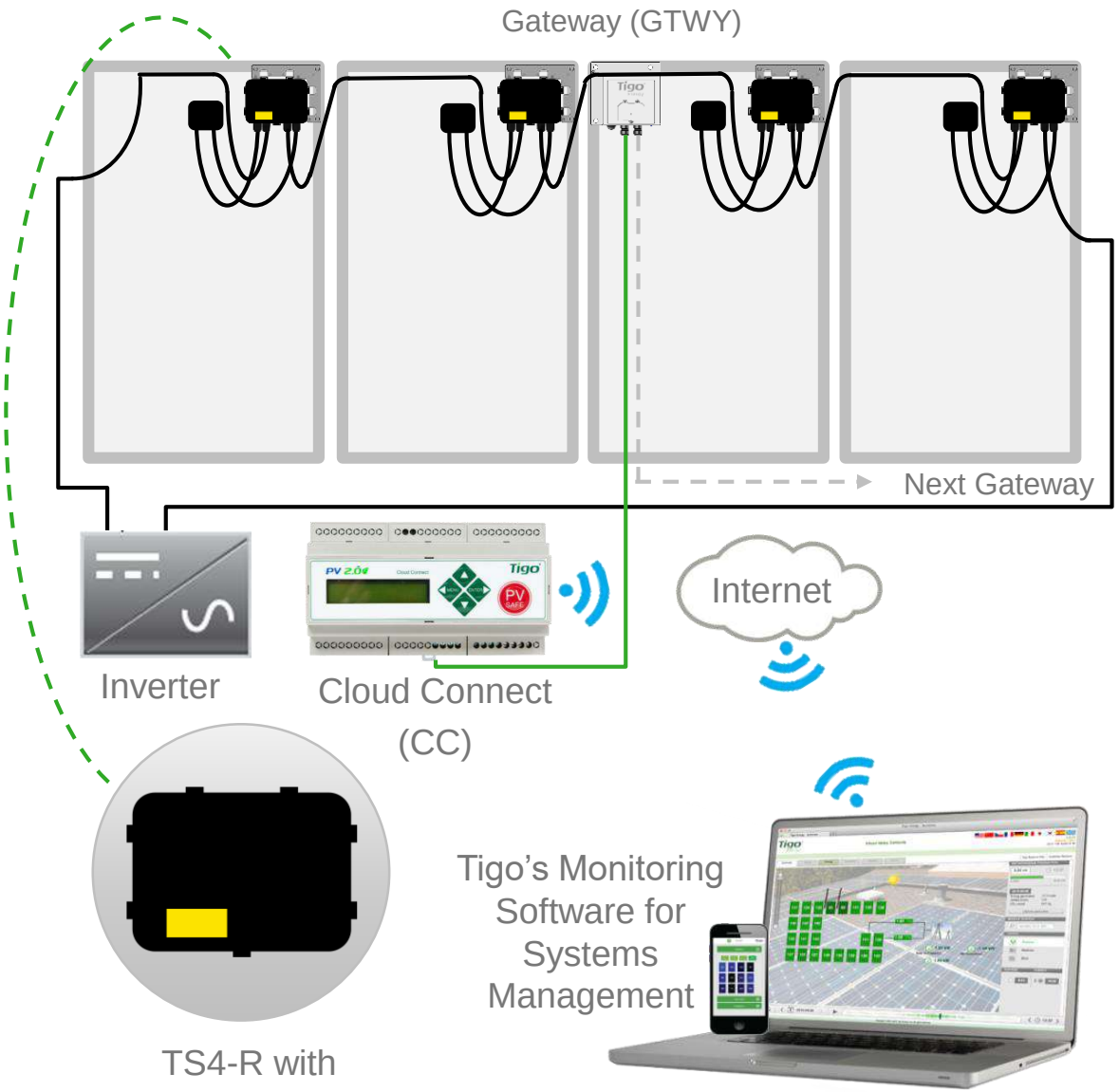
- Up to 120 PV modules
- Modules must be within 10m-15m (33-50 ft.) from the GW, depending on roof topology and material

For further information CLICK HERE

CC AND GTWY CALCULATOR:

For the number of CCs and GTWYs required for your project CLICK HERE

1. SYSTEM OVERVIEW: TS4-R



DESIGN RULES:

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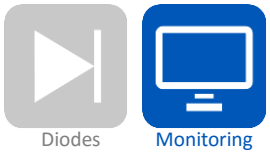
TS4-M: MONITORING: The TS4-M provides continuous system-wide monitoring for fleets to make customer support and fleet workflow on track



TS4-S: SAFETY: The TS4-S provides the necessary safety and monitoring services required by municipalities

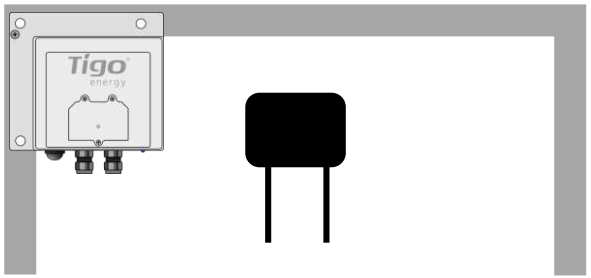
TS4-O: OPTIMIZATION: In addition to safety, monitoring, and PV2.0 synchronization, TS4-O optimizes each PV module when its performance is affected by shade or mismatch

TS4-L: LONG STRINGS: The TS4-L is the complete Smart Module solution. It is ideal for systems requiring fully optimized performance at the module level, monitoring, safety, and longer strings CLICK HERE to see the TS4-L string sizing info.

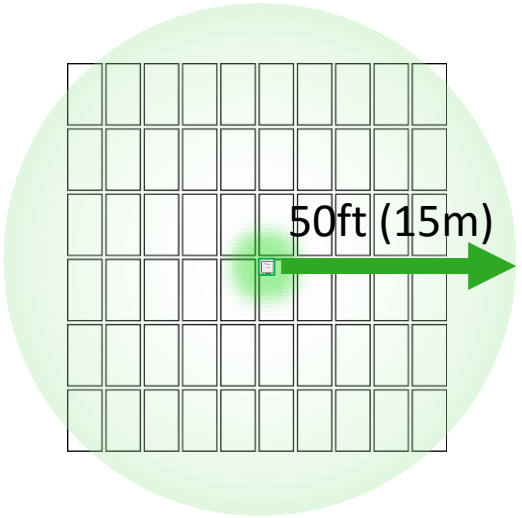
MORE INFORMATION:

Click here to learn more, watch a video and see the TS4 platform datasheet.

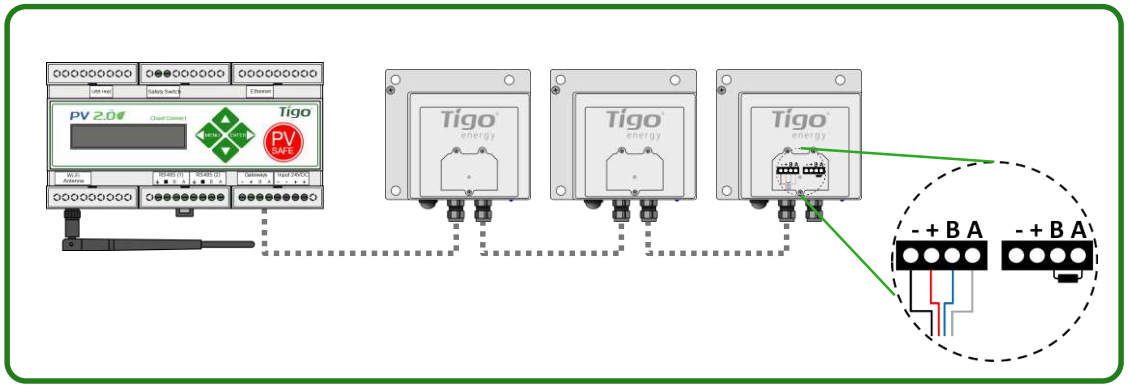
2. INSTALLING GATEWAYS (GTWY)



Gateway attaches to module frame using provided bracket



Locate Gateway near center of array or each sub-array



Connect multiple Gateways in series and leave terminating resistor only in final Gateway.

INSTALLATION:

1. Connect all GTWY cables before powering ON Cloud Connect
2. Mount GTWY on back of PV module using provided bracket, or bolt to the racking system
3. Powering ON Cloud Connect and preform GTWY test from the Tigo SMART App

RS-485 communication cable is recommended: 2 x twisted pair, sunlight resistant of direct burial.

MORE INFORMATION

- Gateway Hardware Guide
- Gateway Placement Guide
- Communication Cable Guide

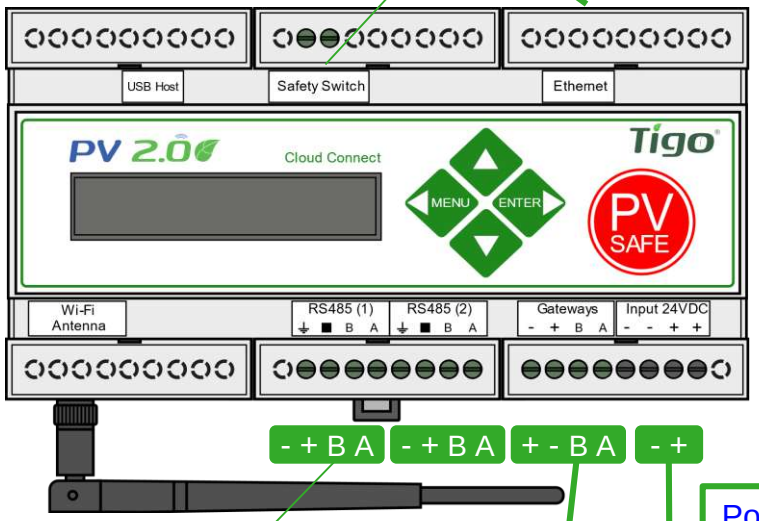
NOTE:

Gateway enclosure can be white or black

3. INSTALLING THE CLOUD CONNECT

OPTIONAL
Connect an External Switch for PV-OFF, click here for instructions

1
Network
Wired Ethernet and Wi-Fi connections



3
Power Supply
24Vdc input

RS485
for 3rd party Modbus devices

Wireless Capabilities
Use Wi-Fi for your Internet connection and for commissioning with a smartphone

2
Gateway
Plug in GTWY(s) cable after all the GTWY(s) are connected in series (next page)

For Rapid Shutdown, install on the same AC panel as the inverter

*In case CC is mounted in a metal enclosure, extend this antenna out of the box in order to use Wi-Fi as an Internet connection

WHERE TO PLACE:

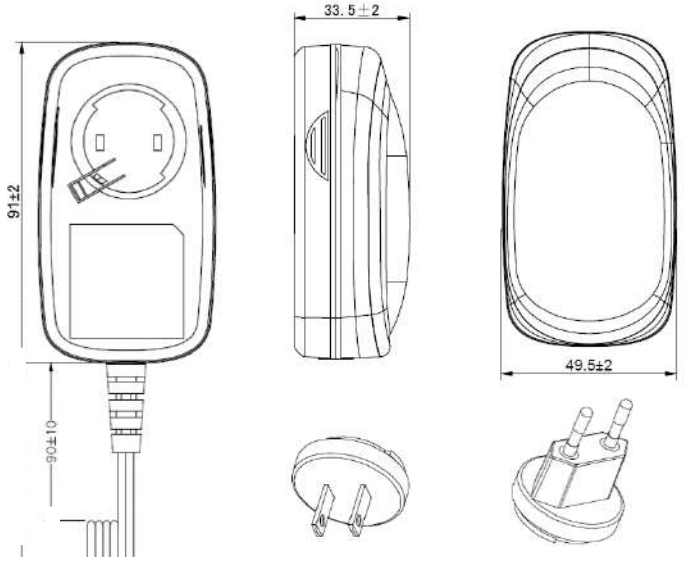
- On a wall or beam
- Next to the inverter
- **Out of direct sunlight**

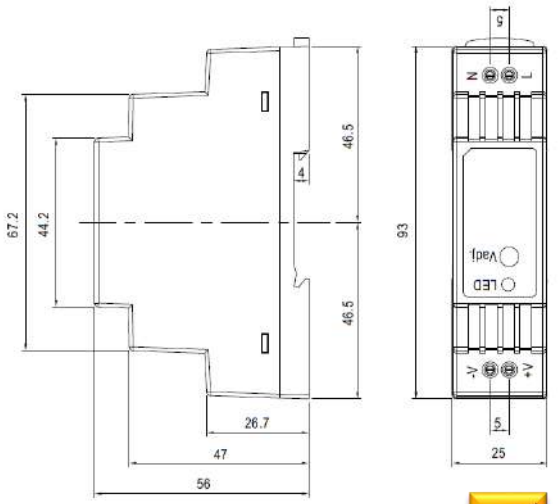
3 CONNECTIONS:

1. Internet connection, using one of the options:
    - Ethernet Port
    - Built in Wi-Fi
        - Wi-Fi connection is configured using the Tigo SMART app
2. Gateway
    - Connect using RS485 cable
3. Power supply

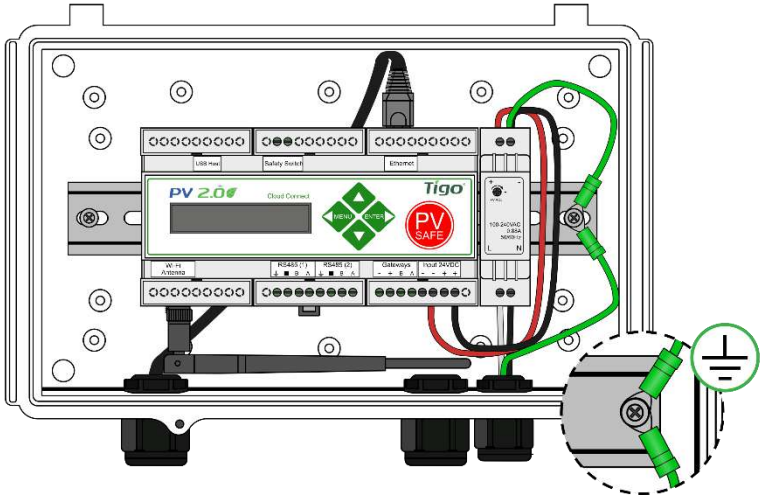
POWER SUPPLY OPTIONS

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



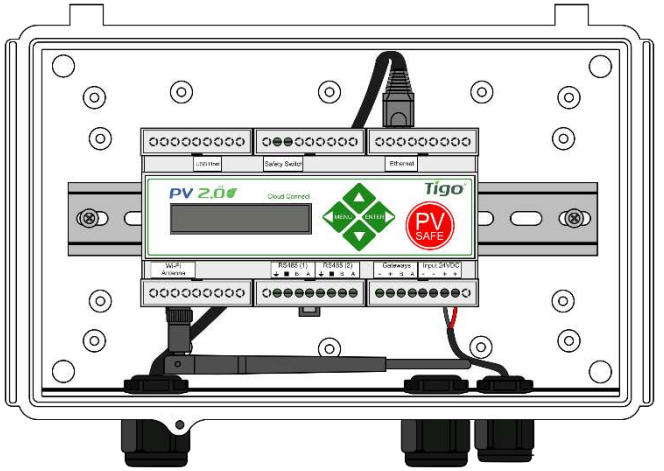


CLOUD CONNECT WIRING REFERENCE



Cloud Connect with DIN rail power supply

- Connect DC leads from power supply to Cloud Connect
- Connect AC and DC ground wires to DIN rail
- Connect AC power input to power supply



Cloud Connect with DC transformer

- Connect DC leads from power supply to Cloud Connect

Click here for the Cloud Connect installation quick start guide

MENU OPTIONS FOR THE CLOUD CONNECT

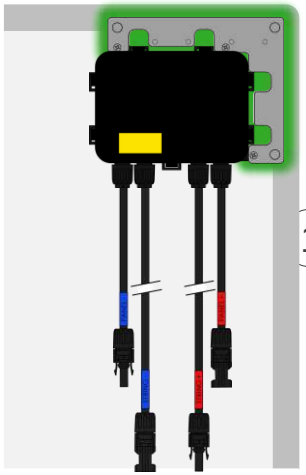
Use the LCD and buttons to navigate the different menu options

1. Status
    1. Modules
        1. Signal
        2. Voltage
        3. Power
    2. Date / time
    3. Unit ID
    4. Version
    5. Config (Tigo internal use only)
2. Control
    1. Discovery
    2. Modules ON
    3. Push data
    4. Restart
    5. Gateway test
    6. Replace Gateway
    7. HW test (Tigo internal use only)
3. Network
    1. Display IP
    2. Test
    3. Configure
    4. Set proxy
    5. Renew

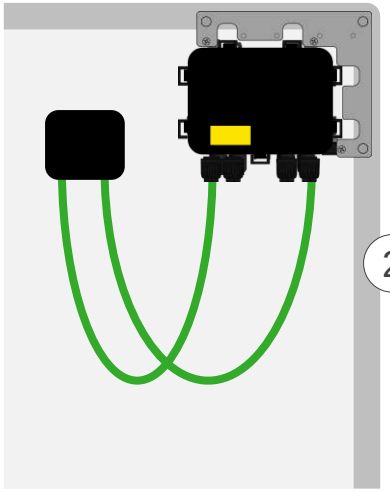
PV-Safe

Blue are used during standard installation process Green may be used to get additional information Orange should only be used when instructed by technical support red are additional control buttons or advanced settings. Detailed explanation of each function can be found here.

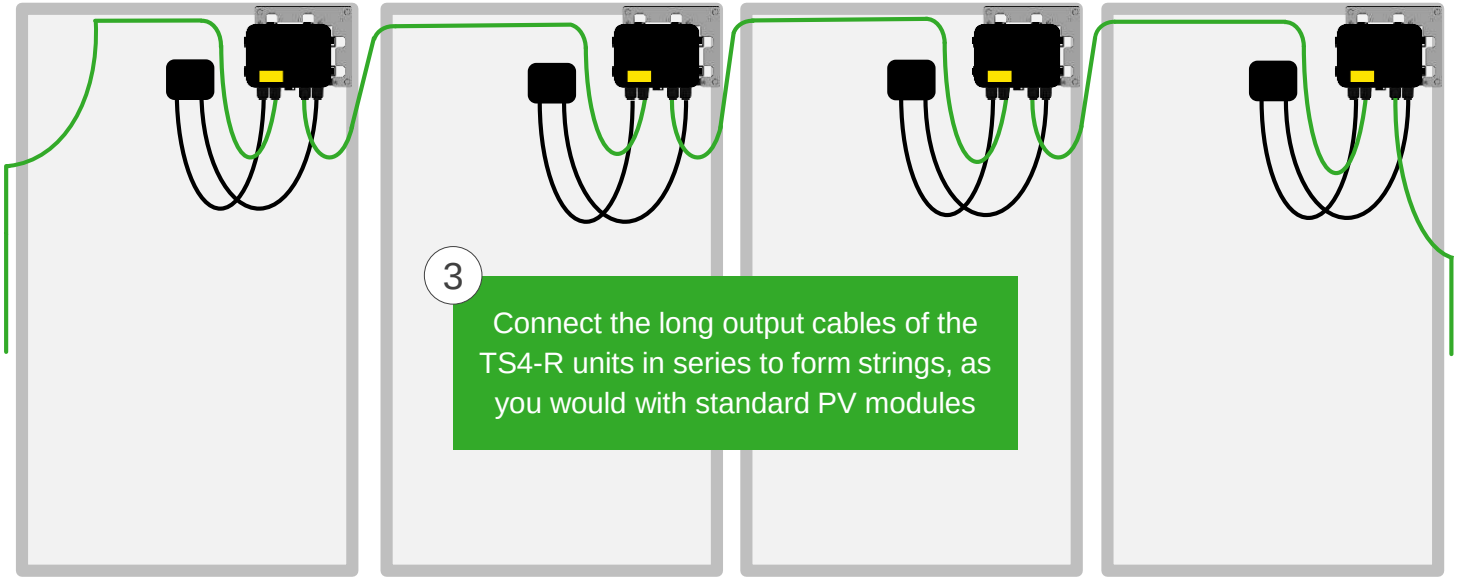
4. INSTALLING: TS4-R



1 Mount the TS4-R on the top right corner of the PV module



2 Connect the PV cables from the module to the short leads of the TS4-R



3 Connect the long output cables of the TS4-R units in series to form strings, as you would with standard PV modules

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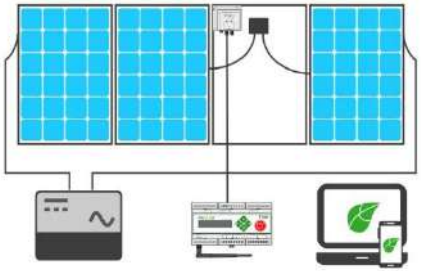		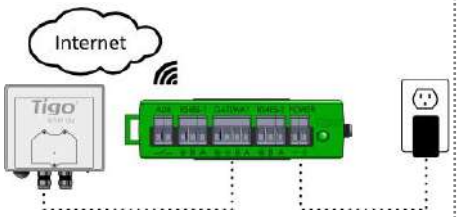	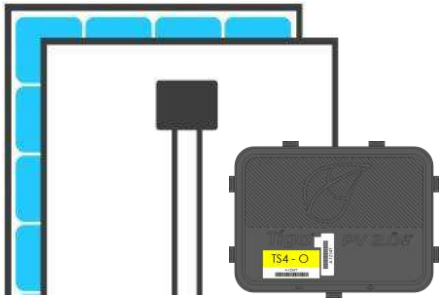
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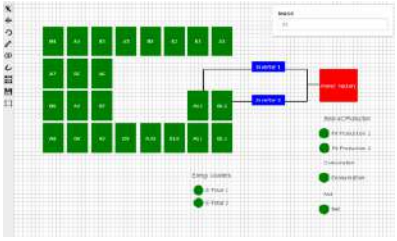
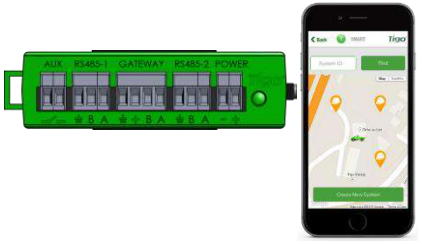
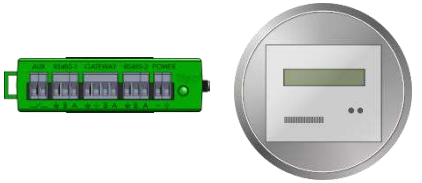
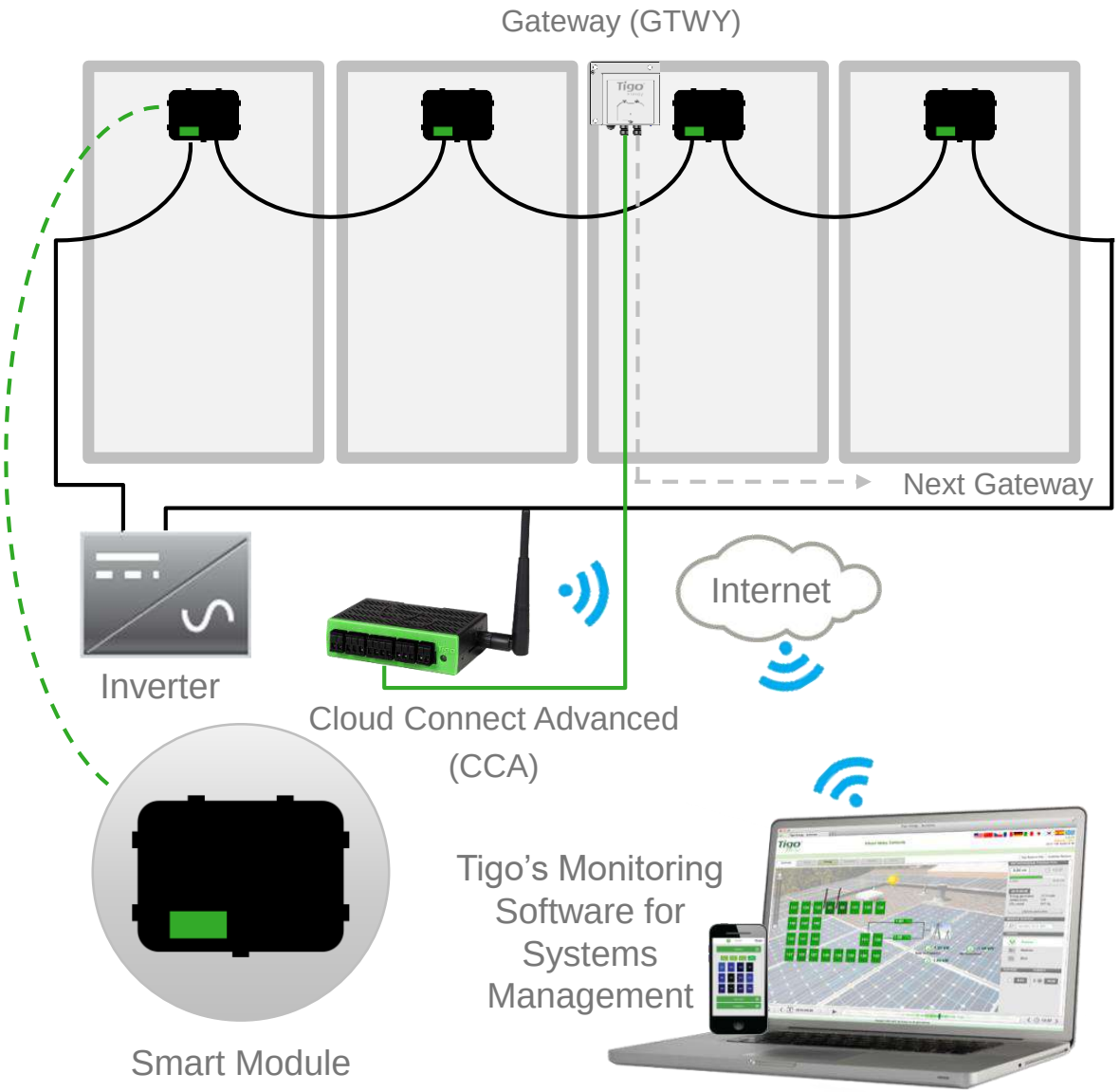
		PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN	

1. SYSTEM OVERVIEW: TS4-B (TS4 BASED MODULES)



DESIGN RULES:

1 CLOUD CONNECT ADVANCED:

- Up to 7 GTWYs and 360 PV modules
- All Smart Modules in the same string must be assigned to the same CCA

1 GTWY:

- Up to 120 PV modules
- Modules must be within 10m-15m (33-50 ft.) from the GW, depending on roof topology and material

For further information CLICK HERE

CCA AND GTWY CALCULATOR:

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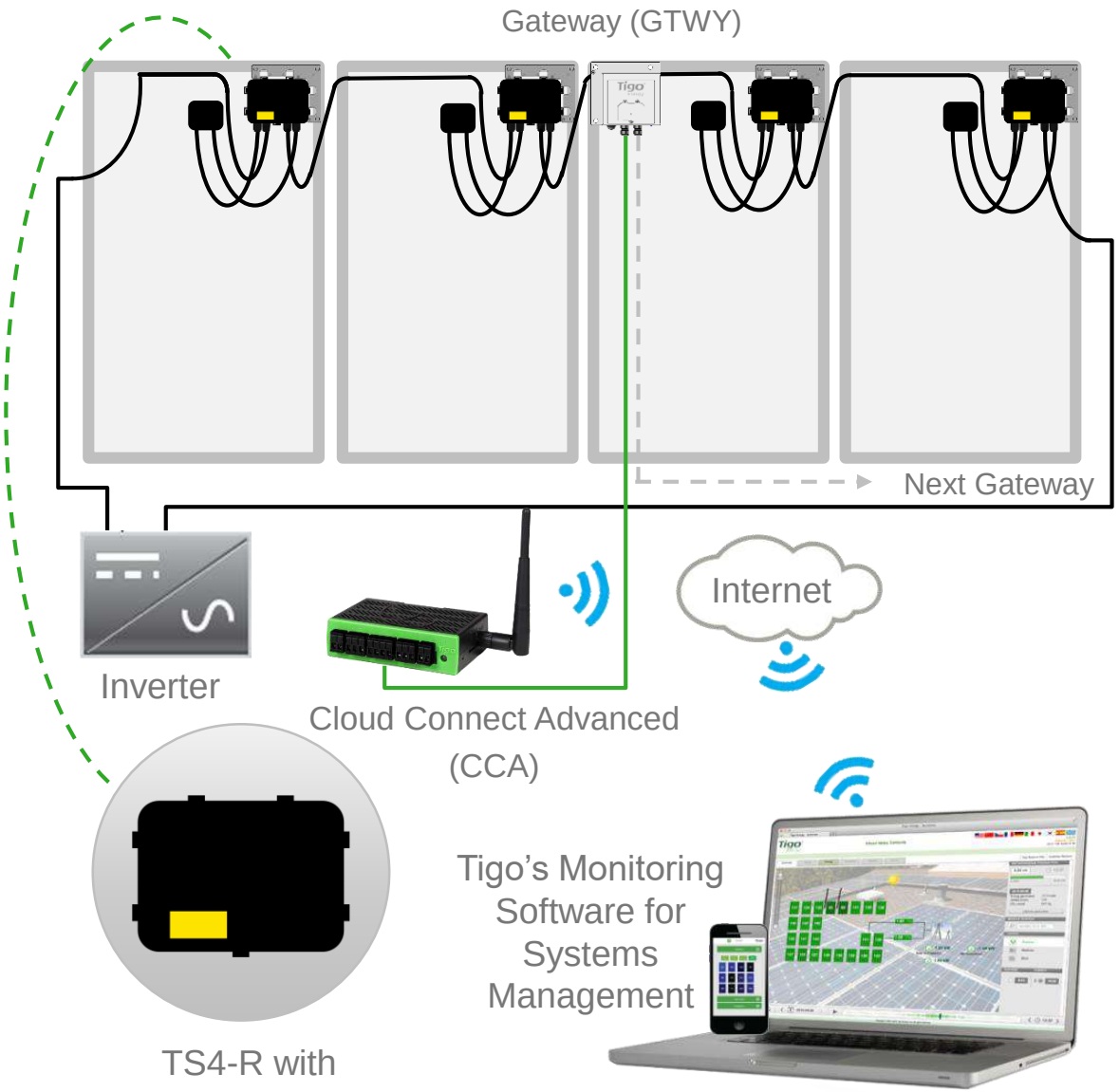

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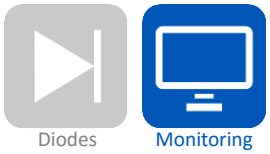


TS4-S: SAFETY: The TS4-S provides the necessary safety and monitoring services required by municipalities

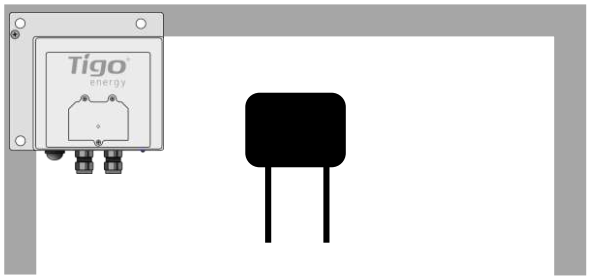
TS4-O: OPTIMIZATION: In addition to safety, monitoring, and PV2.0 synchronization, TS4-O optimizes each PV module when its performance is affected by shade or mismatch

TS4-L: LONG STRINGS: The TS4-L is the complete Smart Module solution. It is ideal for systems requiring fully optimized performance at the module level, monitoring, safety, and longer strings CLICK HERE to see the TS4-L string sizing info.

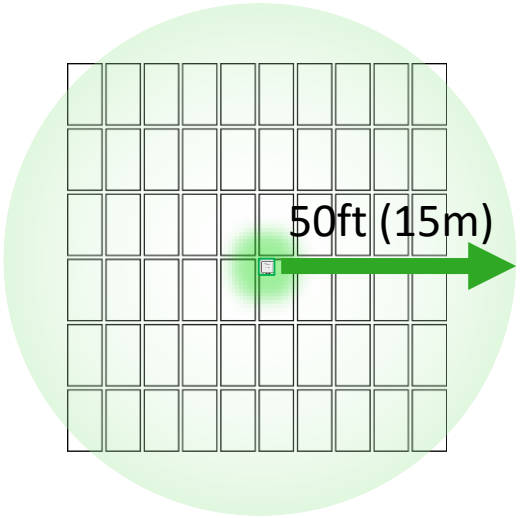
MORE INFORMATION:

Click here to learn more, watch a video and see the TS4 platform datasheet.

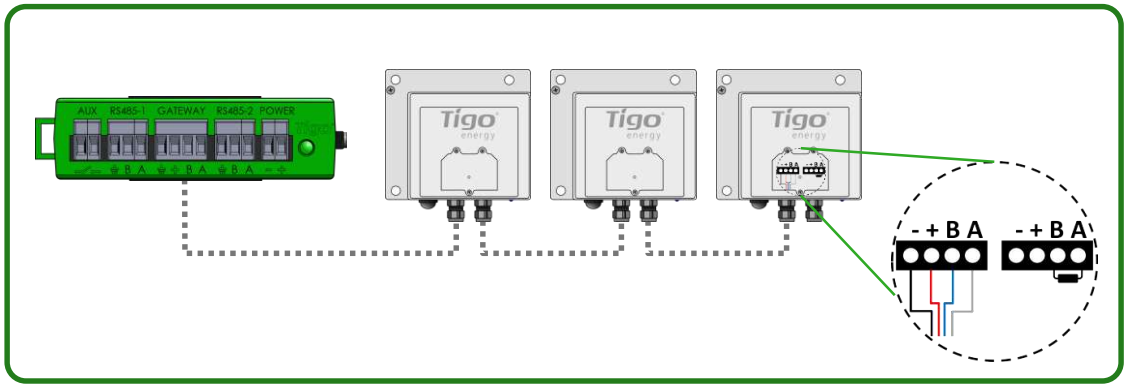
2. INSTALLING GATEWAYS (GTWY)



Gateway attaches to module frame using provided bracket



Locate Gateway near center of array or each sub-array



Connect multiple Gateways in series and leave terminating resistor only in final Gateway.

INSTALLATION:

1. Connect all GTWY cables before powering ON Cloud Connect
2. Mount GTWY on back of PV module using provided bracket, or bolt to the racking system
3. Powering ON Cloud Connect and preform GTWY test from the Tigo SMART App

RS-485 communication cable is recommended: 2 x twisted pair, sunlight resistant of direct burial.

MORE INFORMATION

- Gateway Hardware Guide
- Gateway Placement Guide
- Communication Cable Guide

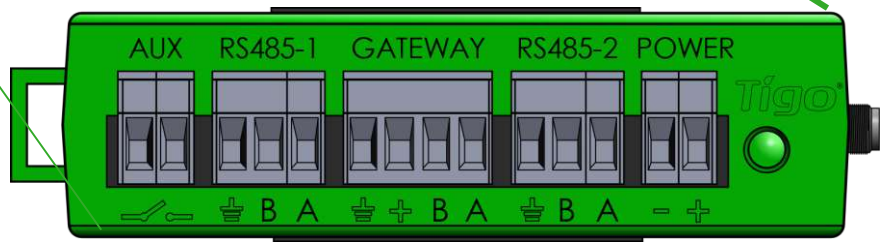
NOTE:

Gateway enclosure can be white or black

3. INSTALLING THE CLOUD CONNECT ADVANCED (CCA)

OPTIONAL
Connect an External Switch for PV-OFF, click here for instructions

Network
Wired Ethernet and Wi-Fi connections
1



G B A
- + B A
G B A
- +

RS485
For 3rd party devices

RS485
For 3rd party devices

Power Supply
24Vdc input
3

Wireless Capabilities
Use Wi-Fi for your Internet connection and for commissioning with a smartphone

Gateway
Plug in GTWY(s) cable after all the GTWY(s) are connected in series (next page)
2

For Rapid Shutdown, install on the same AC panel as the inverter

*In case CC is mounted in a metal enclosure, extend this antenna out of the box in order to use Wi-Fi as an Internet connection

WHERE TO PLACE:

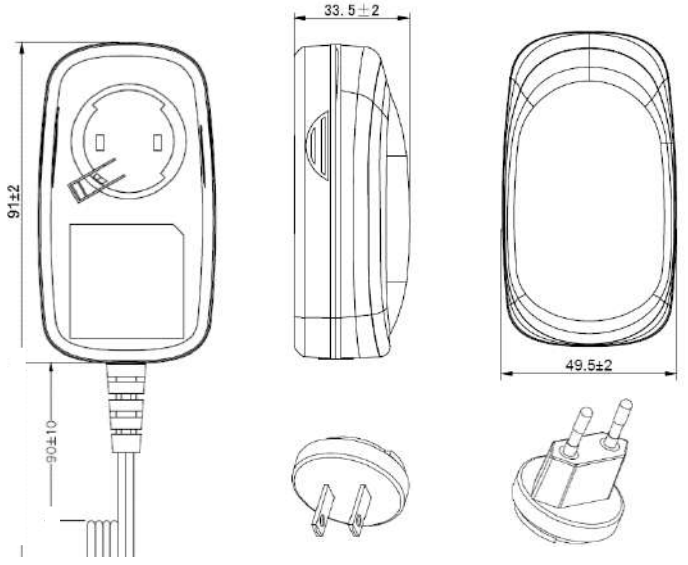
- On a wall or beam
- Next to the inverter
- **Out of direct sunlight**

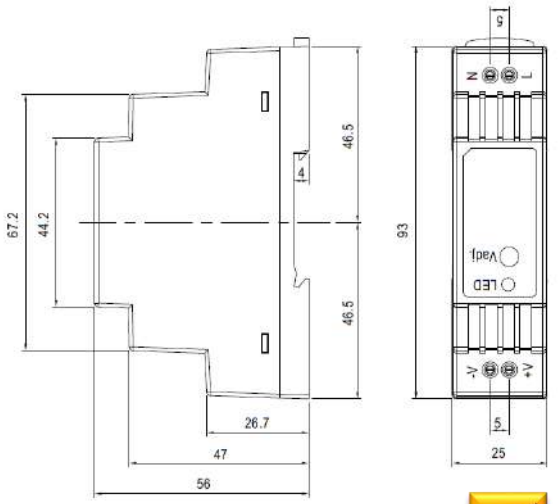
3 CONNECTIONS:

1. Internet connection, using one of the options:
    - Ethernet Port
    - Built in Wi-Fi
        - Wi-Fi connection is configured using the Tigo SMART app
2. Gateway
    - Connect using RS485 cable
3. Power supply

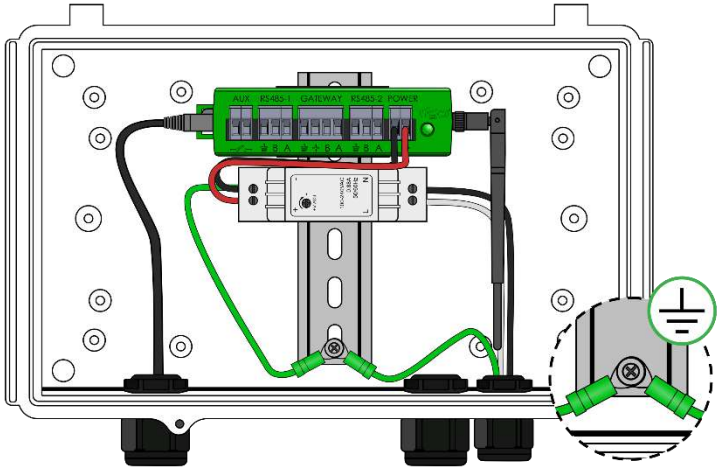
POWER SUPPLY OPTIONS

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



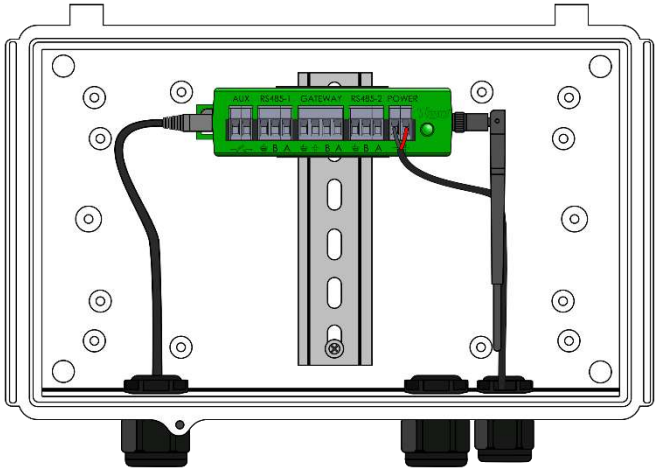


CLOUD CONNECT ADVANCED (CCA) WIRING REFERENCE



CCA with DIN rail power supply

- Connect DC leads from power supply to CCA
- Connect AC and DC ground wires to DIN rail
- Connect AC power input to power supply



CCA with DC transformer

- Connect DC leads from power supply to CCA

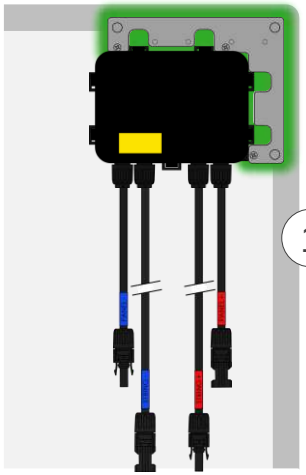
Click here for the Cloud Connect installation quick start guide

CCA LED STATUS INFORMATION

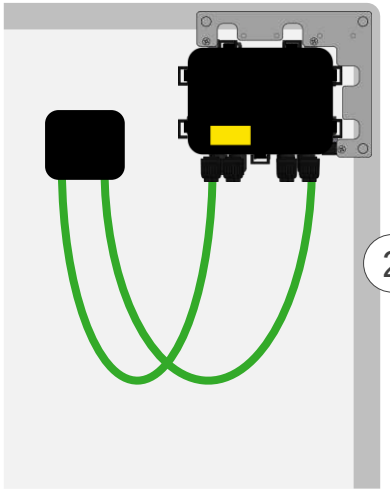
- Auto PV Safe
  - A blinking red and yellow LED indicates that the system automatically entered PV-Safe mode.
- User PV Safe
  - A blinking green and yellow LED indicates that PV-Safe mode was activated manually.
- SMART App activity
  - A blinking green LED indicates that the mobile app is connected to the CCA and is actively in use.
- Discovery
  - A blinking yellow LED indicates that the CCA is scanning for Gateways and smart modules (part of the commissioning process).

- Error
  - A solid red LED indicates that the Discovery process failed or that the CCA is not able to connect to the Tigo server. In case of errors, connect to the CCA using the mobile app for more details.
- Warrning
  - A solid yellow LED indicates that: Discovery has not been run, Discovery completed but did not find all expected Gateways or modules, or CCA is not able to upload data. Connect to the CCA using the mobile app for more details.
- System OK
  - A solid green LED indicates that Discovery is complete and found all expected Gateways and smart modules, and CCA is able to connect to the Tigo server.
- Power Off / No Status
  - An unlit LED indicates that the CCA is powered off.

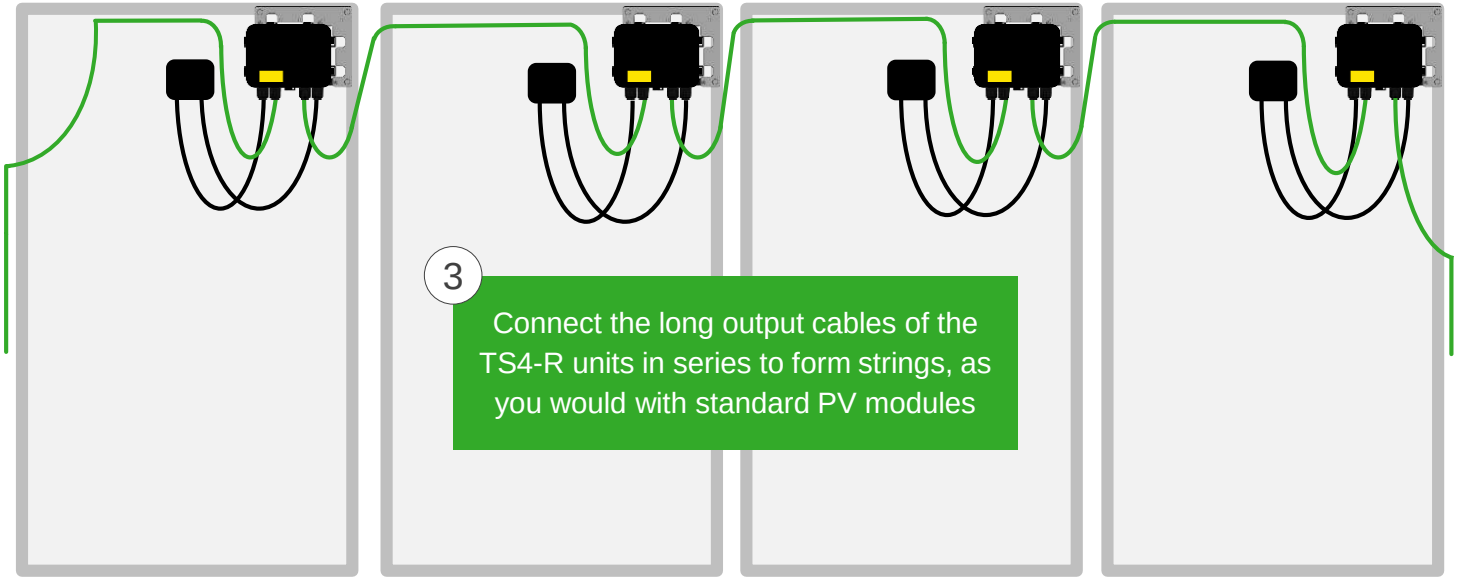
4. INSTALLING: TS4-R



1 Mount the TS4-R on the top right corner of the PV module

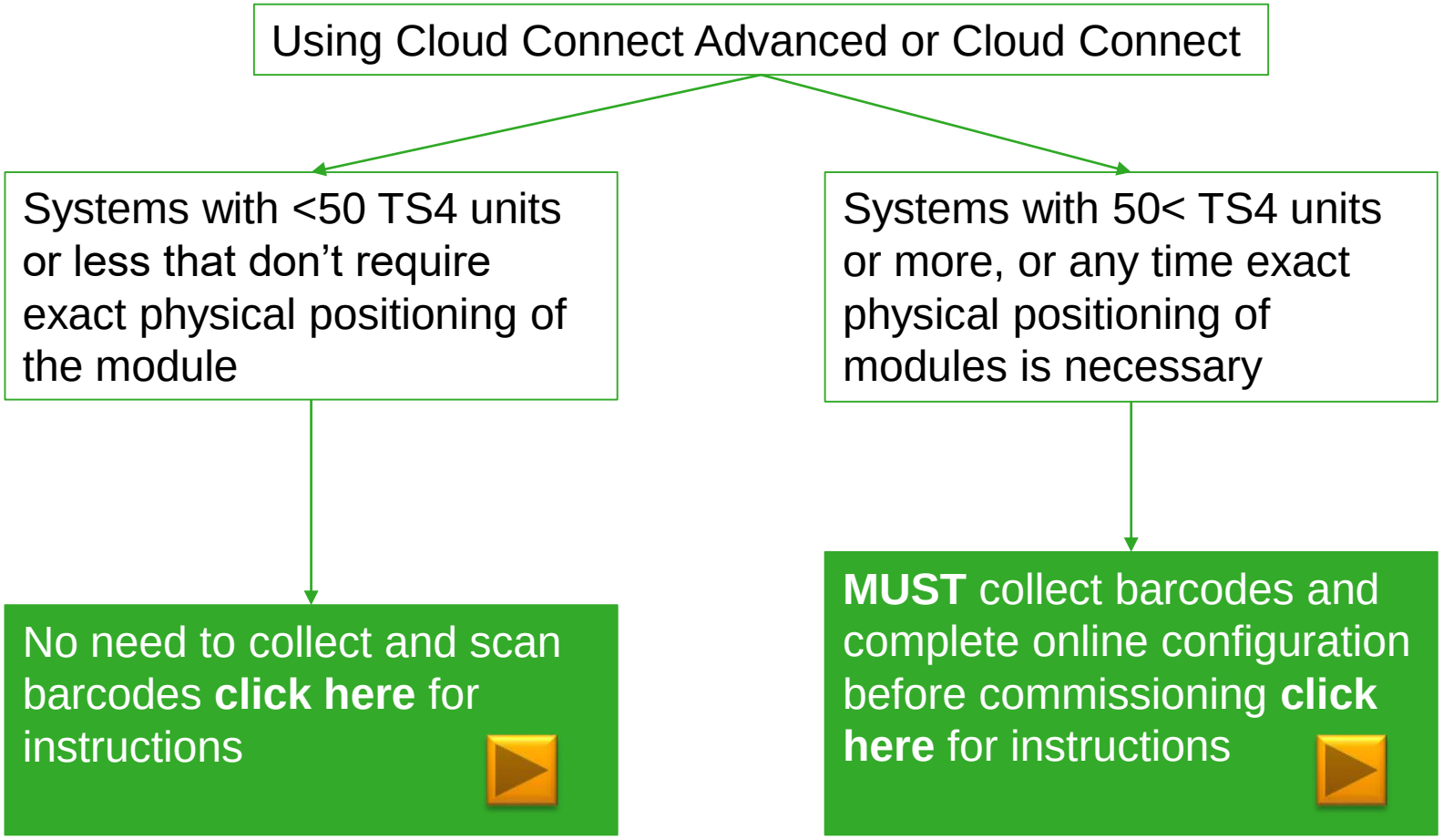


2 Connect the PV cables from the module to the short leads of the TS4-R

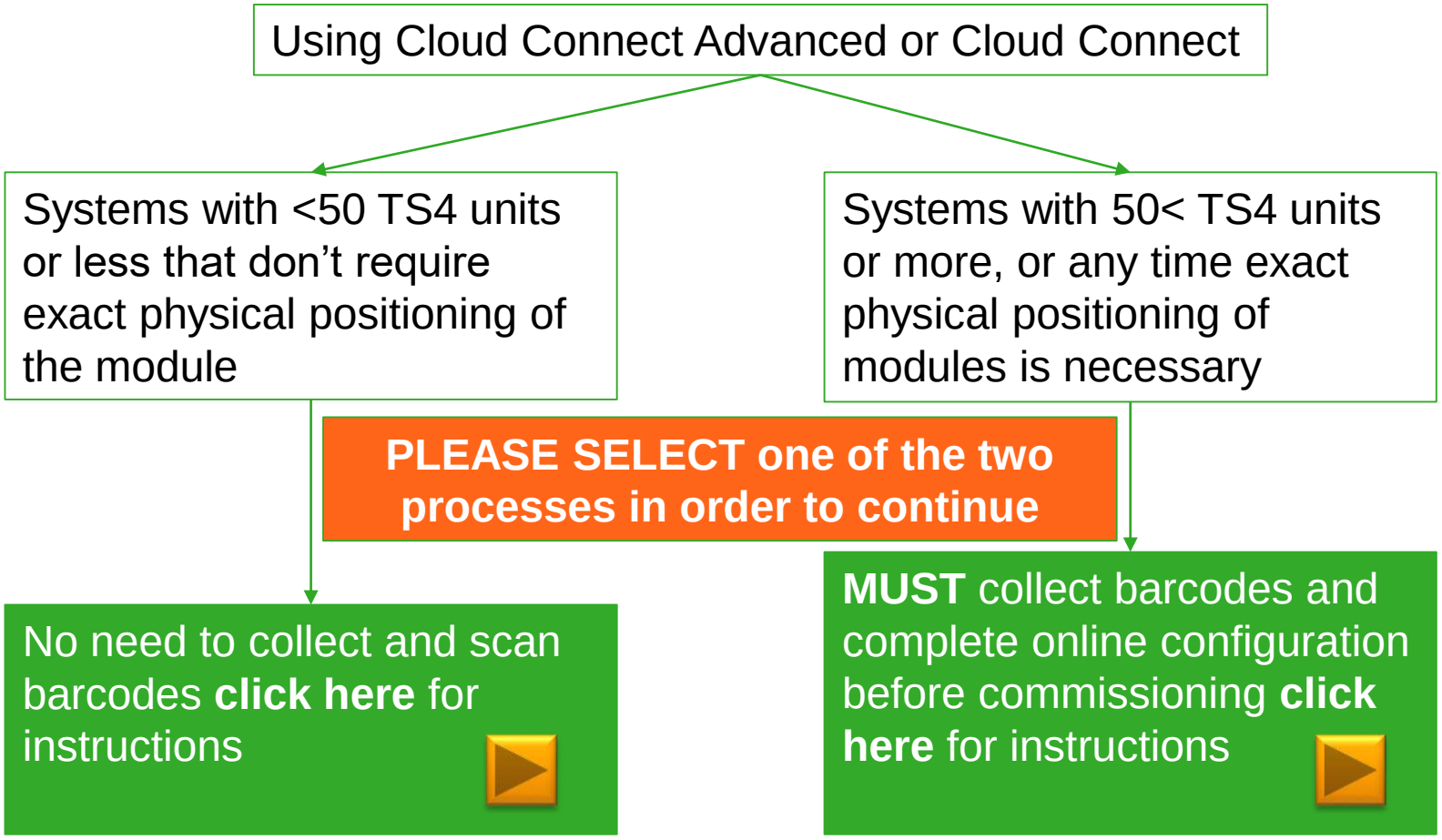


3 Connect the long output cables of the TS4-R units in series to form strings, as you would with standard PV modules

5. MAPPING AND CONFIGURATION OPTIONS

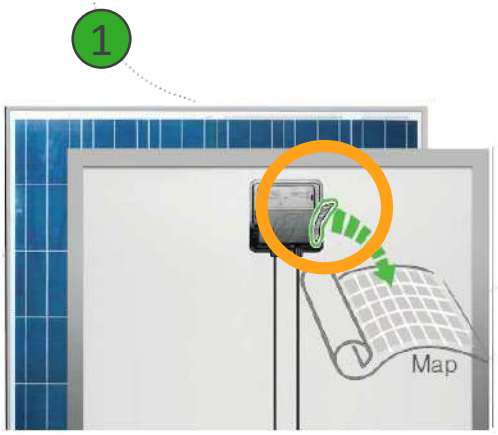


*If using CC (not CCA) you can do this via LCD and buttons, no smart phone needed

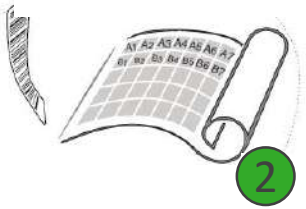


*If using CC (not CCA) you can do this via LCD and buttons, no smart phone needed

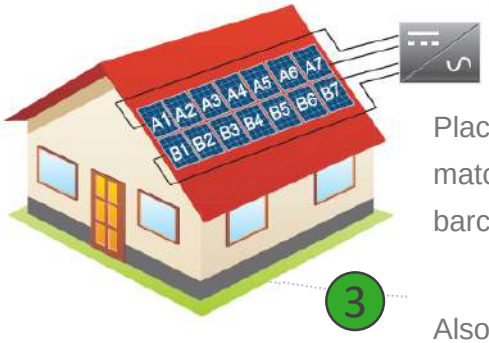
5. MAPPING



Remove 1 barcode sticker from the TS4 junction box or TS4-R add-on



Place the sticker on the map, string list or construction drawing, in the exact position you are going to place modules in the field or on the roof.



Place PV modules in a way matches the map you made using barcodes.

Also record the serial numbers of the GTWY(s)

TEMPLATES:

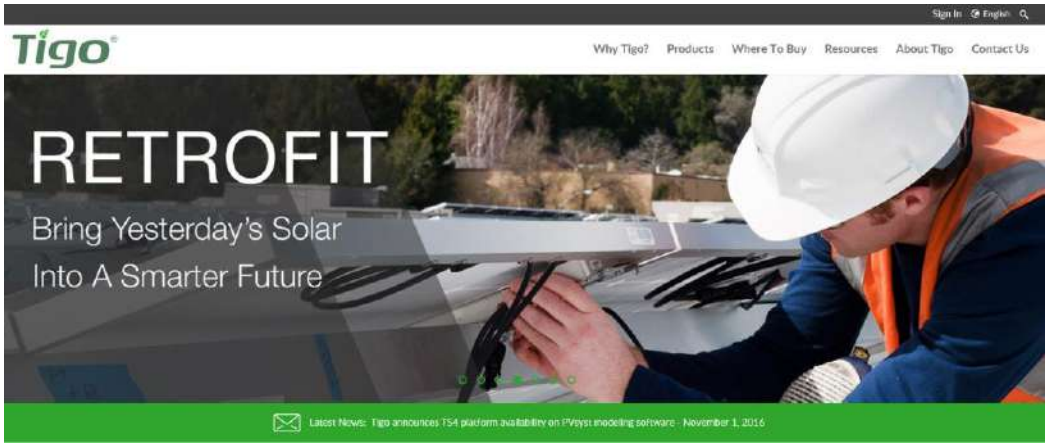
Create your site map using Tigo's string list template

To view and download, CLICK HERE

Another option is to first map your site online (see next page). At the end, you'll be able to download a physical map of your system to help map the barcodes

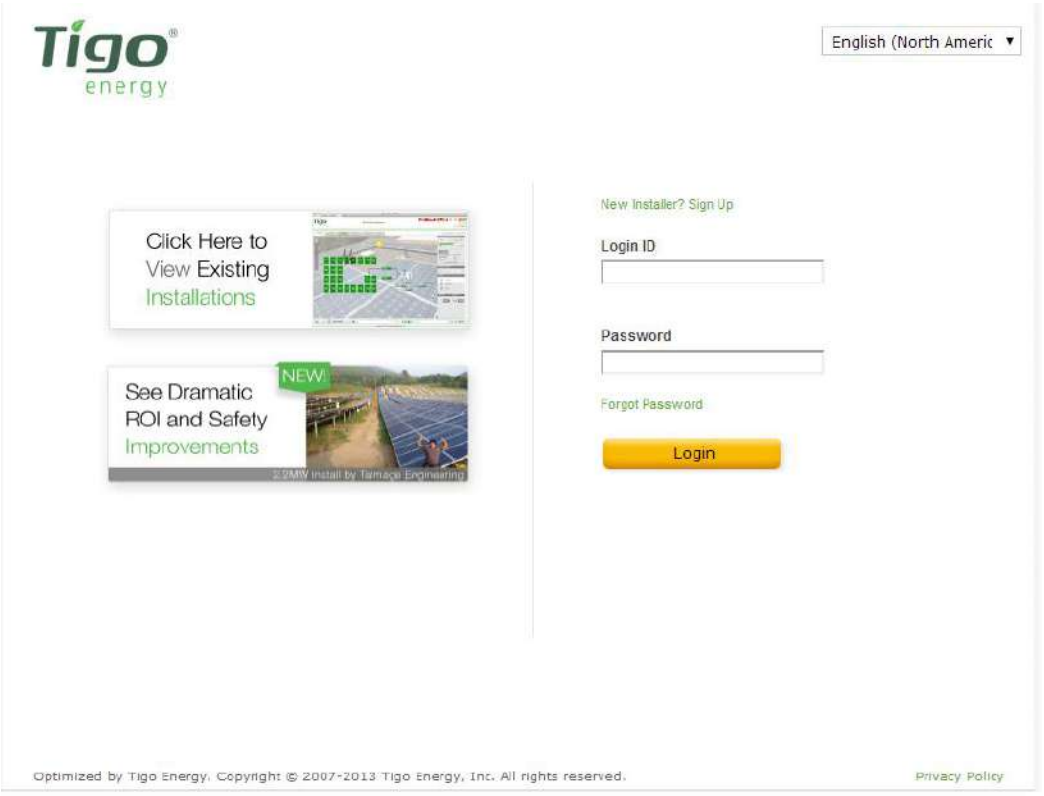
MAKE SURE you take the TS4 junction box's label or the TS4-R label, NOT the PV module's

To configure a system go to www.tigoenergy.com and select “Sign In”



LOGIN

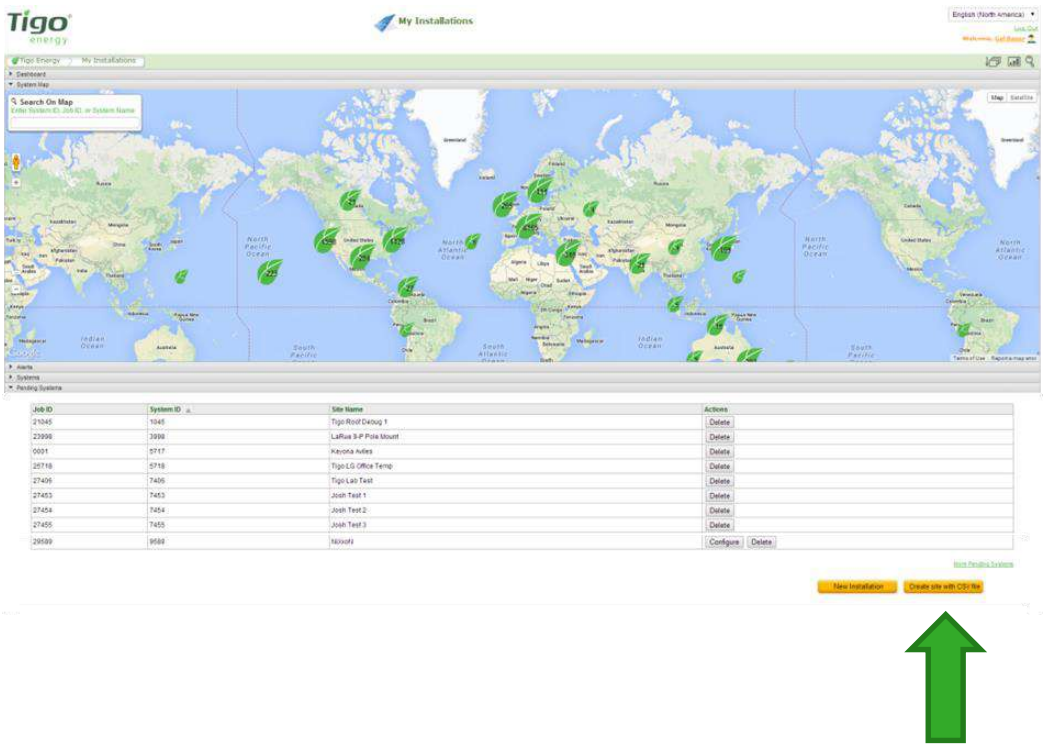
You can either use your existing Tigo account, or create a new one by pressing “New Installer” at the top



NEW INSTALLATION

Scroll to the bottom of the page to find the “New installation” button, and click it to begin.

Have your site map or string list with bar codes ready.



TIP: USE A BARCODE SCANNER

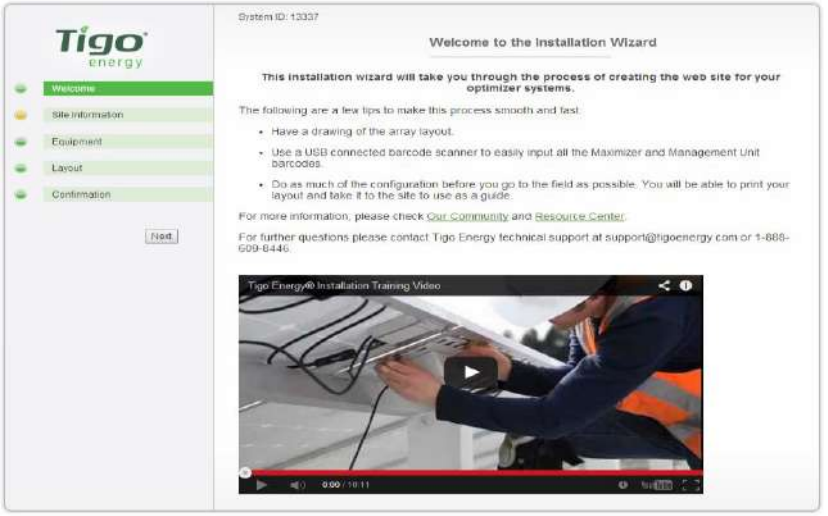
Use a barcode scanner to save time and avoid typos

Easy to use, simply plug and play

INSTALLATION WIZARD

Follow the instructions of the installation wizard

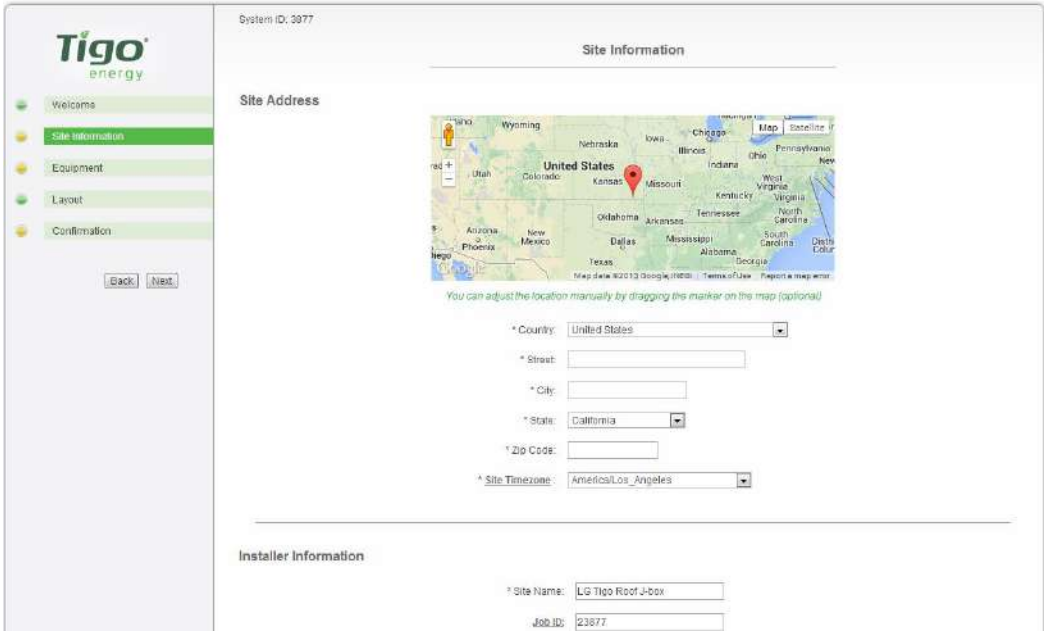
Click here for a detailed walk through



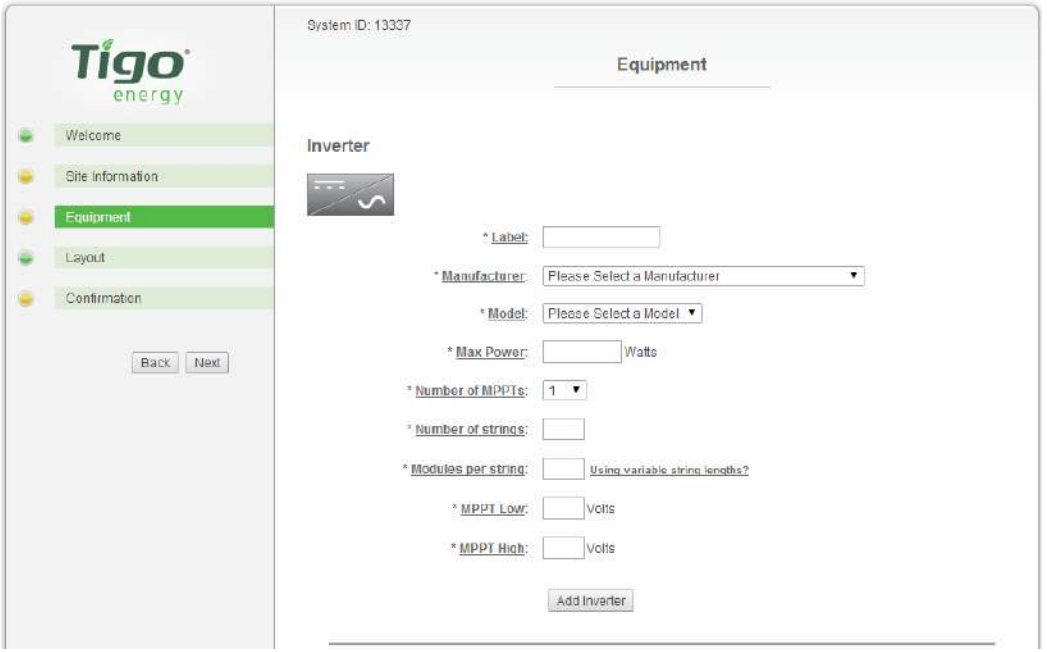
Enter site information:

- Address
- Site owner information
- 3rd party finance, if such exists

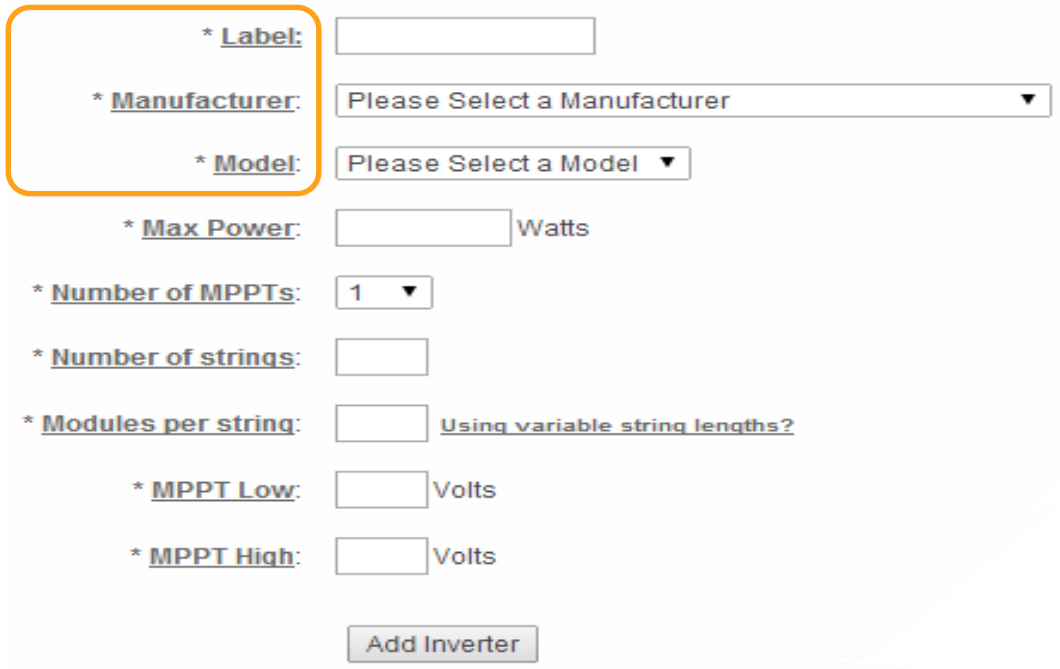
Click Next



Enter inverter information

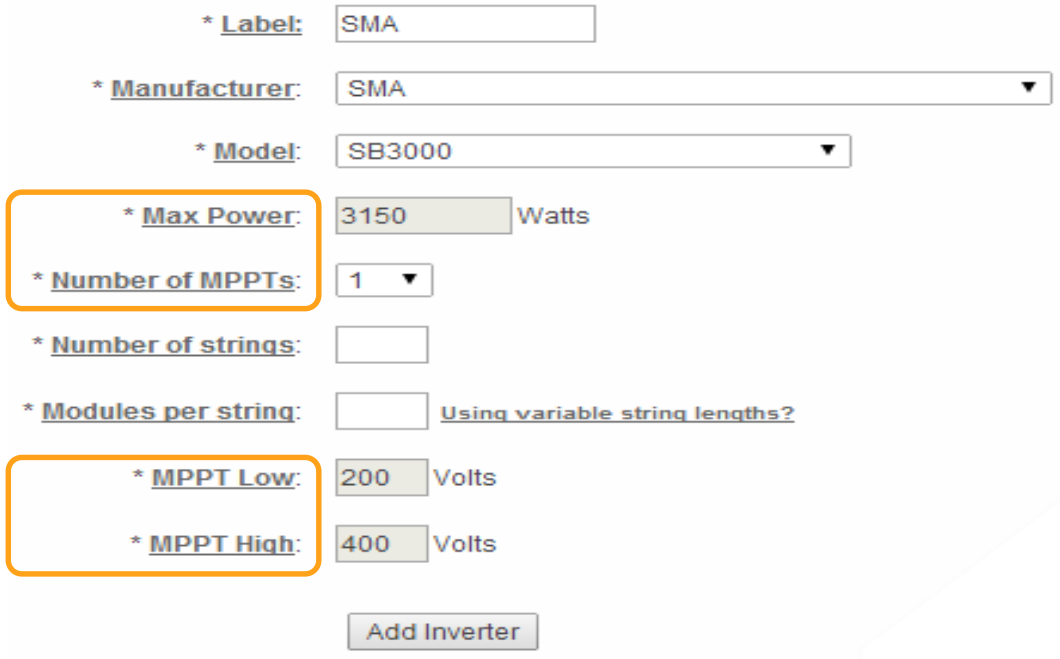


Enter inverter information



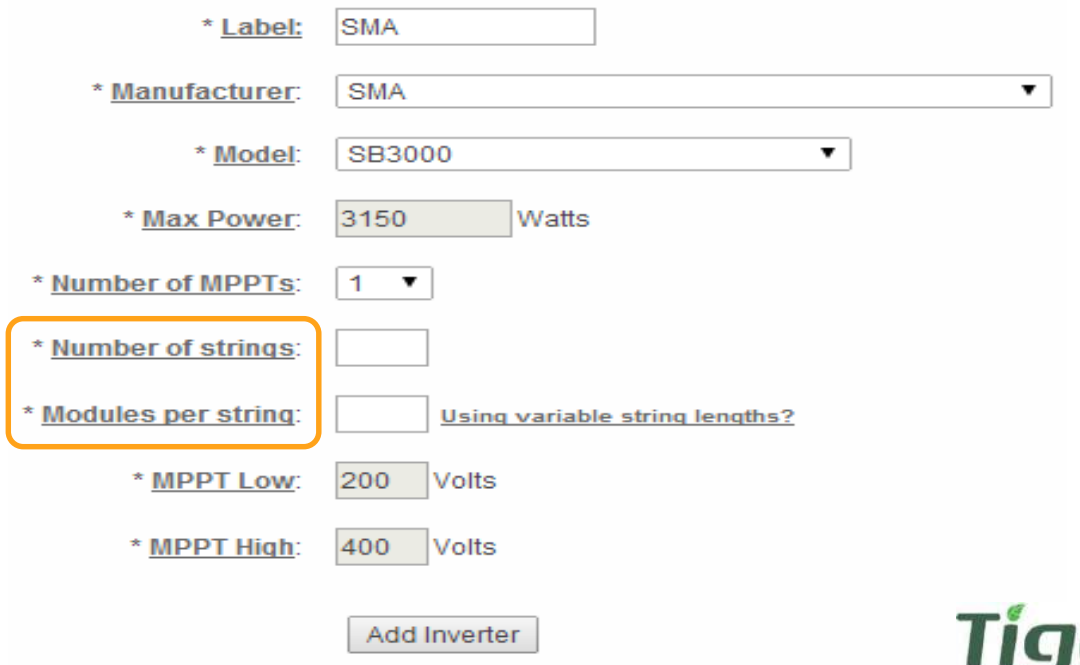
Enter inverter information

After choosing model the following will auto-fill

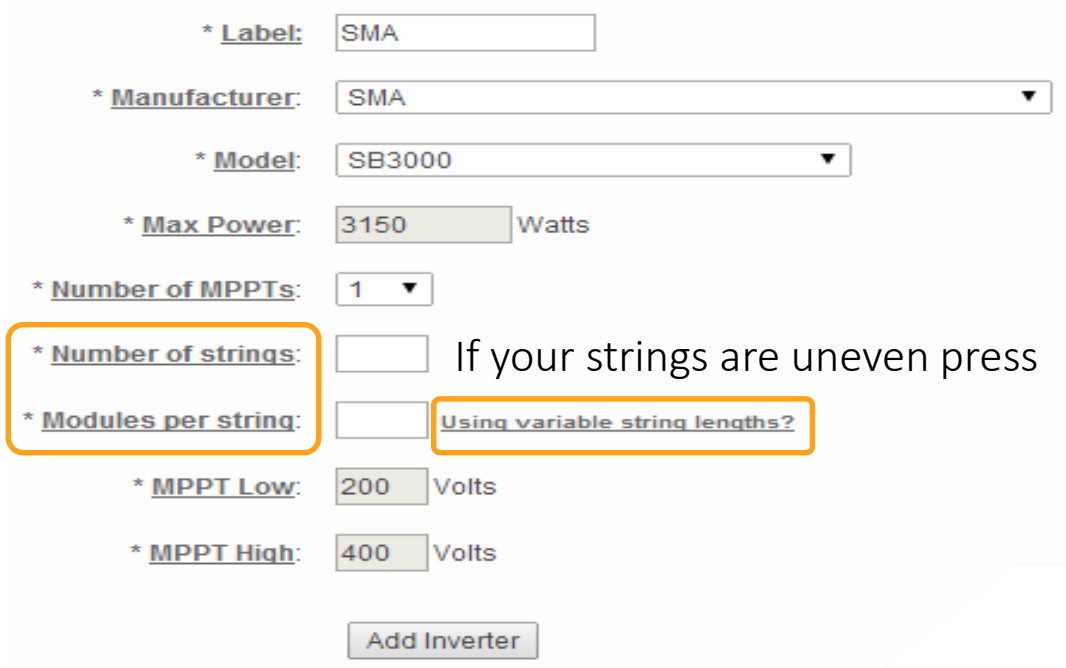


CONFIGURE THE SYSTEM

Enter string information per chosen inverter

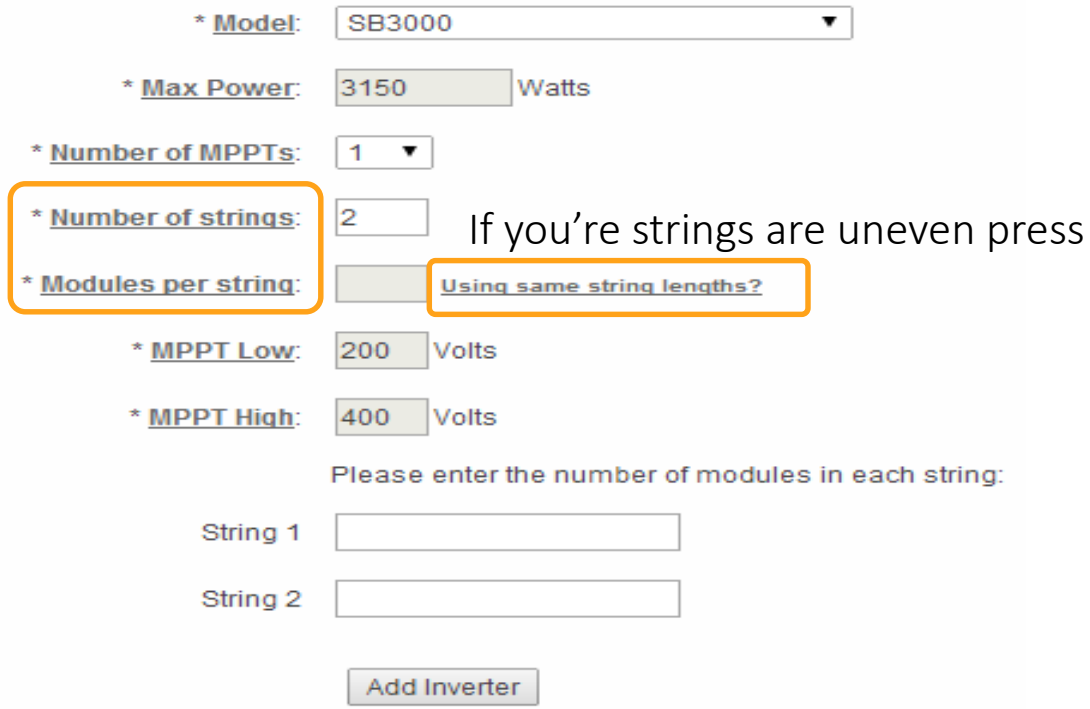


Enter string information per chosen inverter



CONFIGURE THE SYSTEM

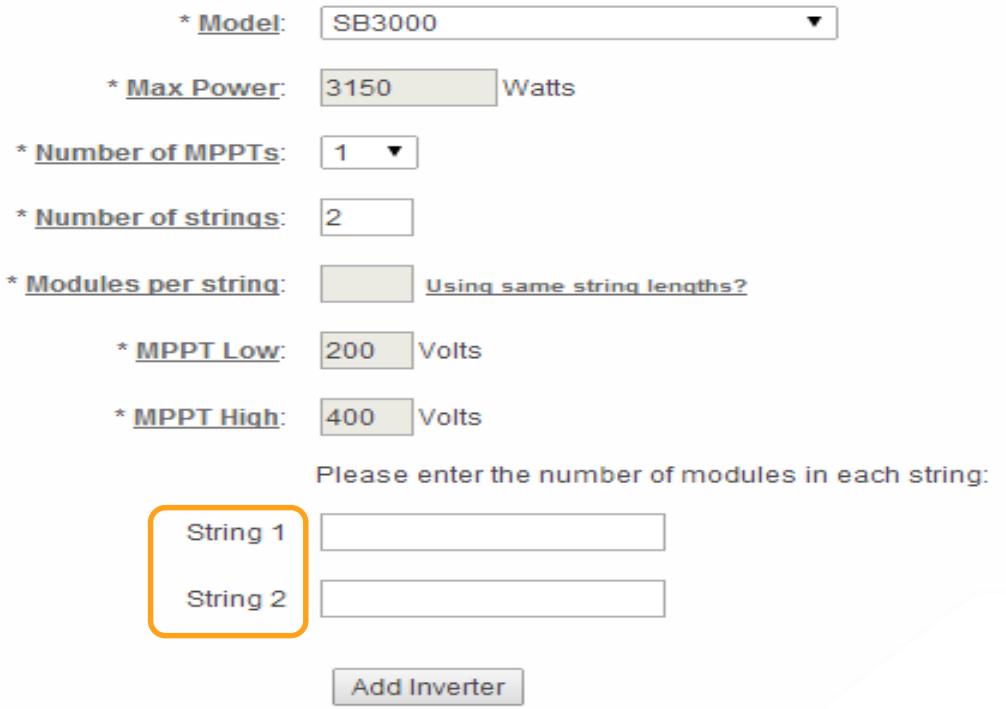
Enter string information per chosen inverter



If you're strings are uneven press

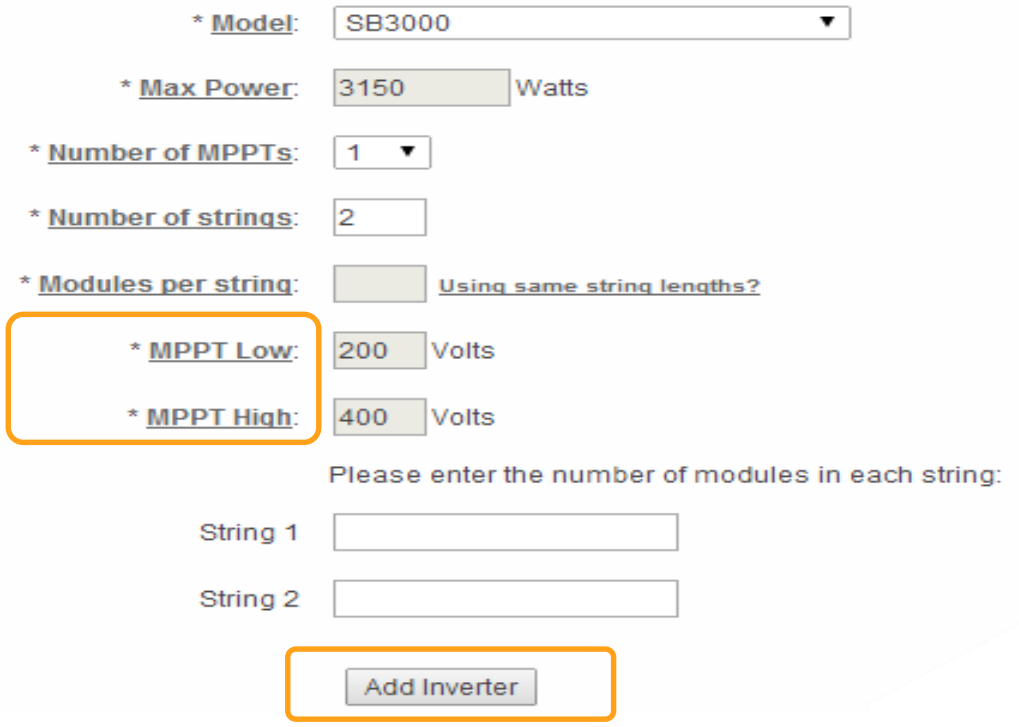
CONFIGURE THE SYSTEM

And fill the number of modules per string

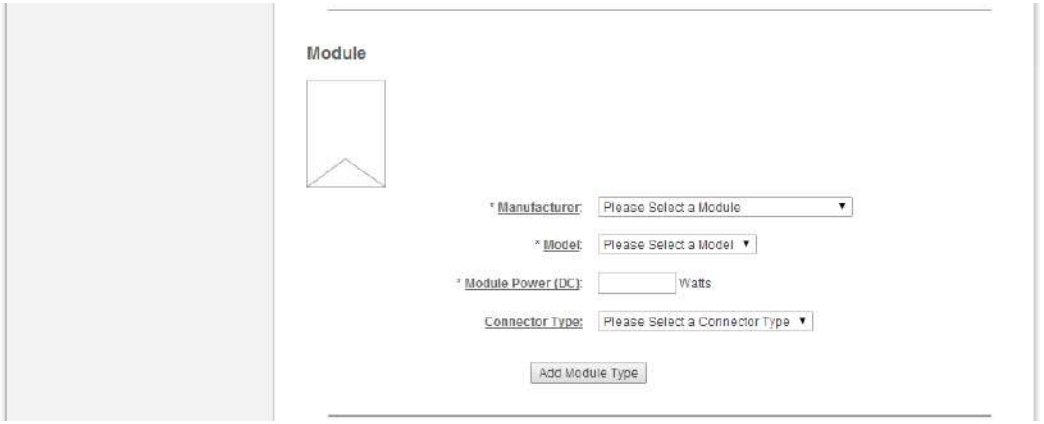


CONFIGURE THE SYSTEM

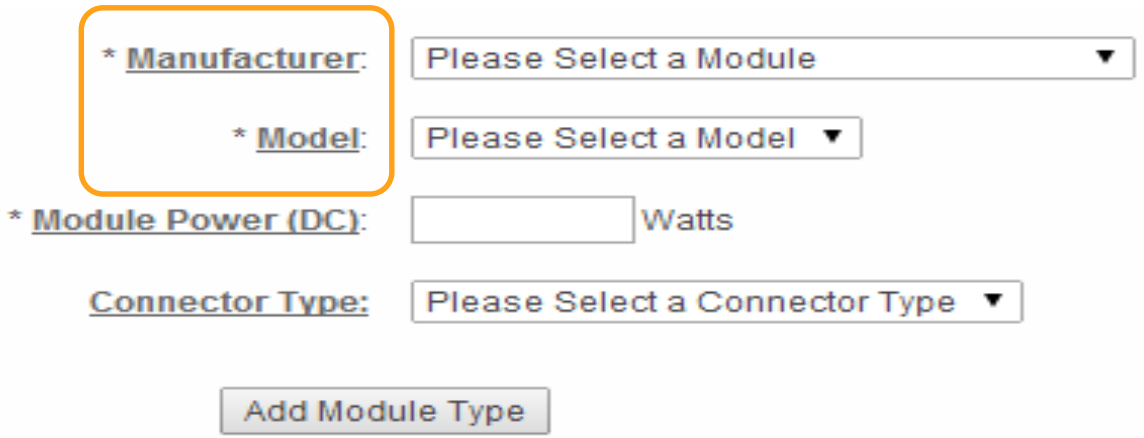
Once done, click “Add inverter” and scroll down to modules’ section.



Enter PV module information

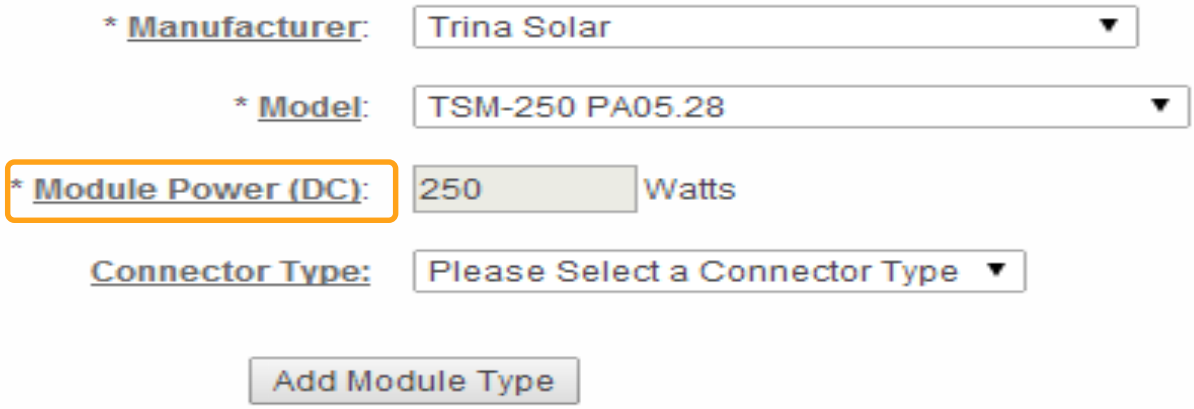


Enter PV module information

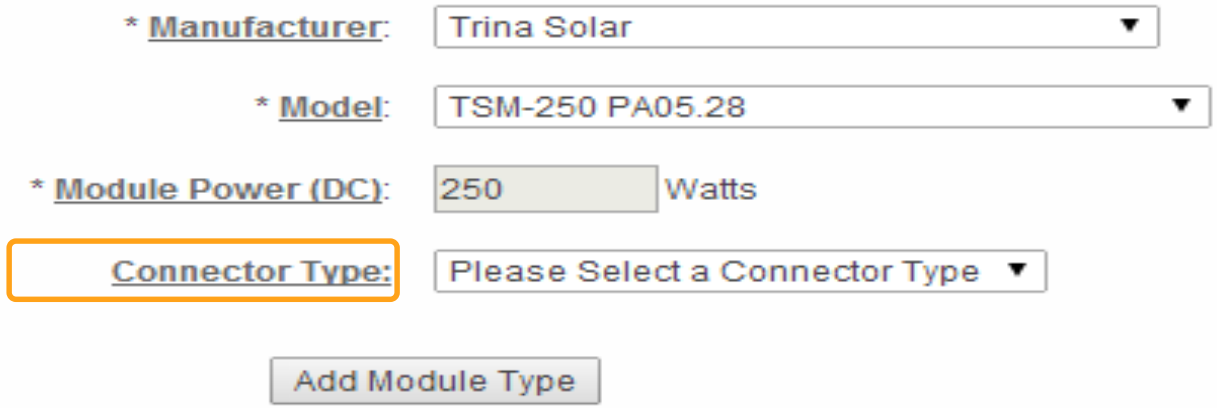


Enter PV module information

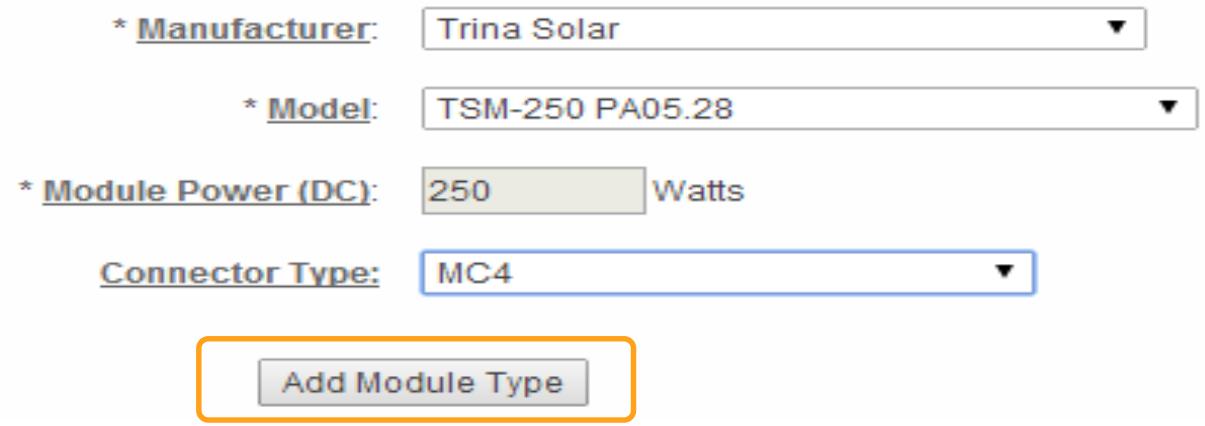
After choosing model the following will auto-fill



Select connector type

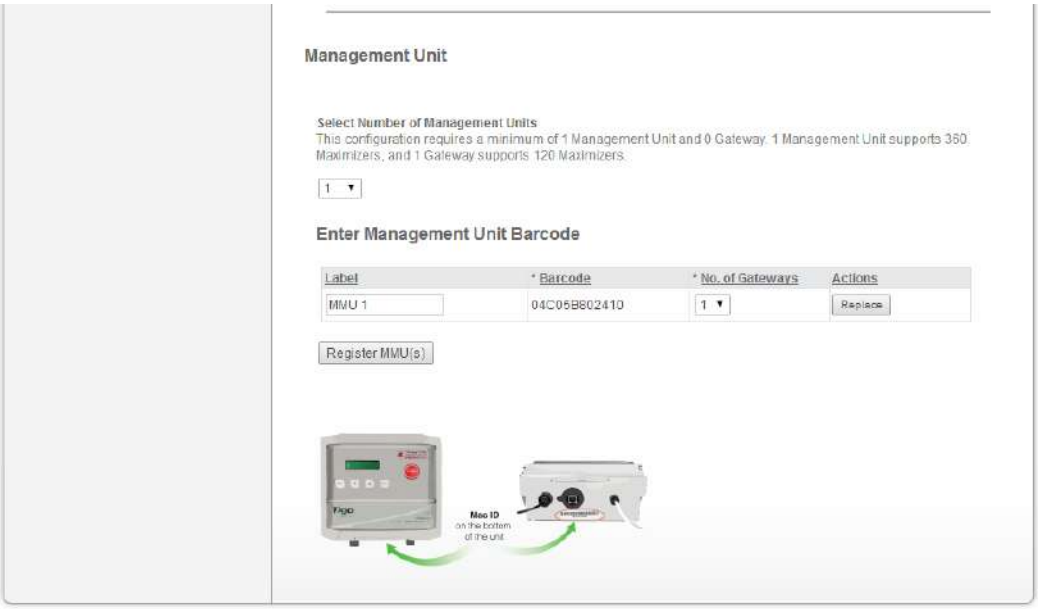


Once done, click ‘Add Module Type’ and scroll down to MMU section.



This section says Management Unit and refers to both Cloud Connect (CC) and Cloud Connect Advanced (CCA)

Enter CC or CCA information



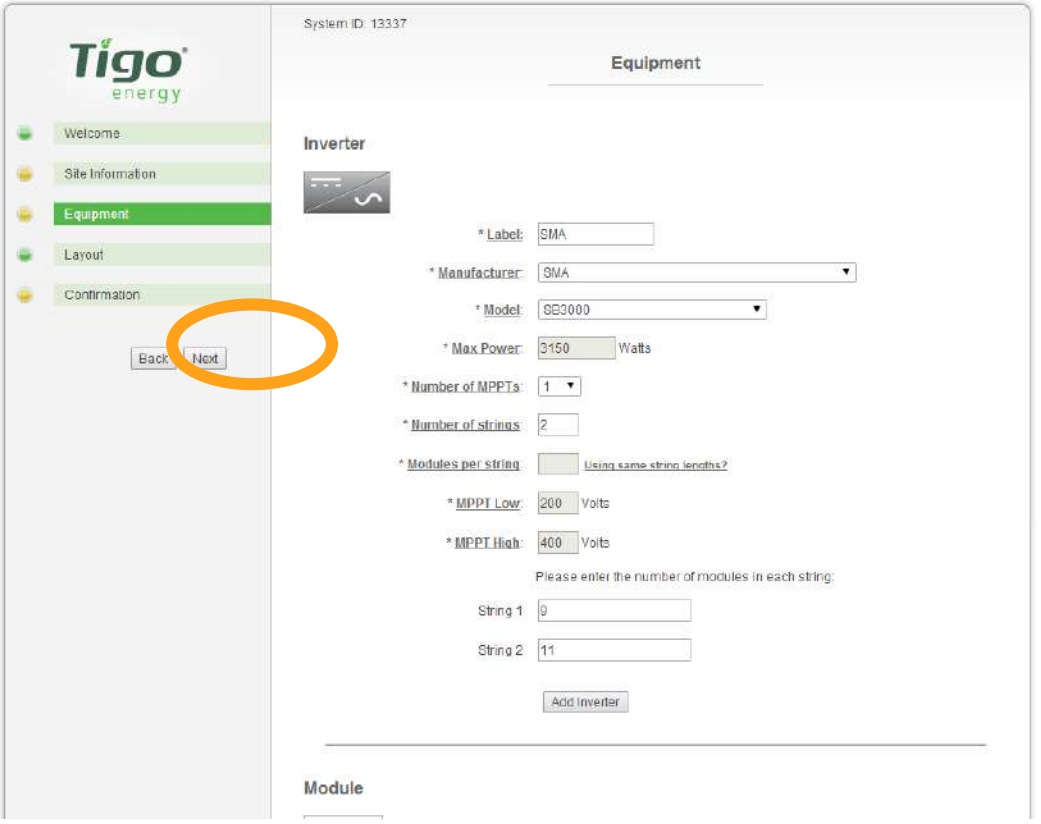
Tigo CCC and CCA have a 12 digit MAC IDs

The MAC ID of the unit is located on the right hand side of the CC or CCA

You can use your barcode scanner to insert the MAC ID

CONFIGURE THE SYSTEM

Once done, scroll back up and click ‘Next’ on the left

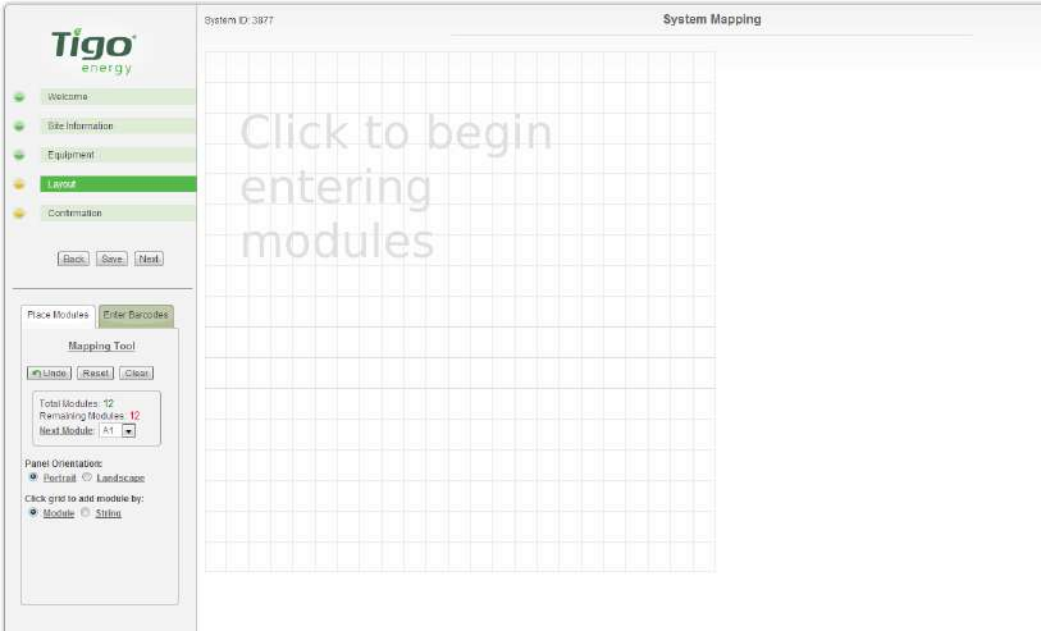


Keep on your maps the Gateway's MAC ID:

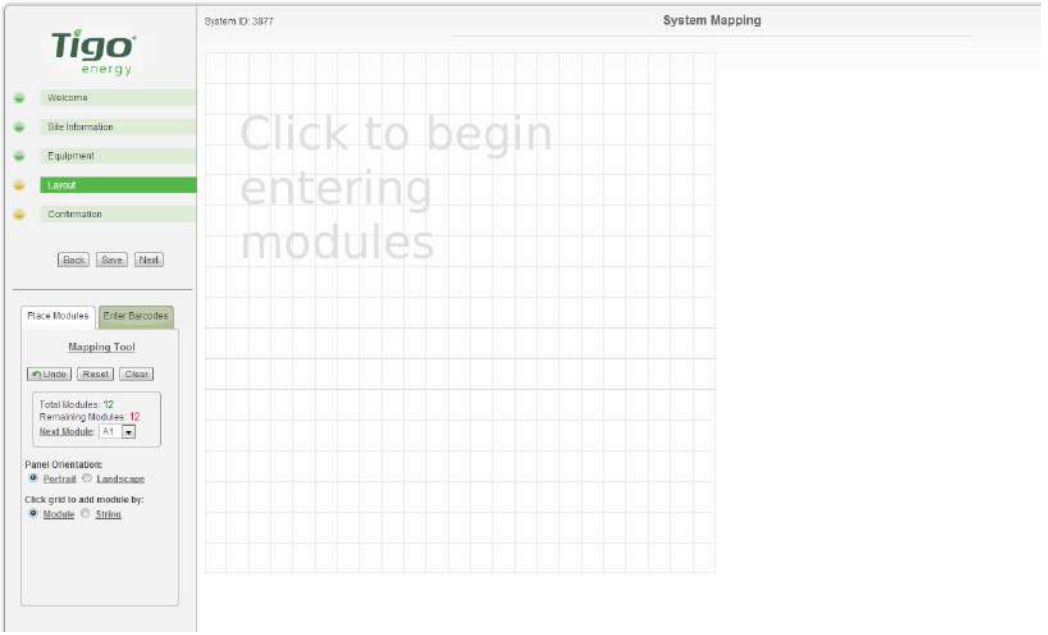
Tigo Gateways have 16 digit MAC IDs

Located on the on housing of gateway

Enter layout information

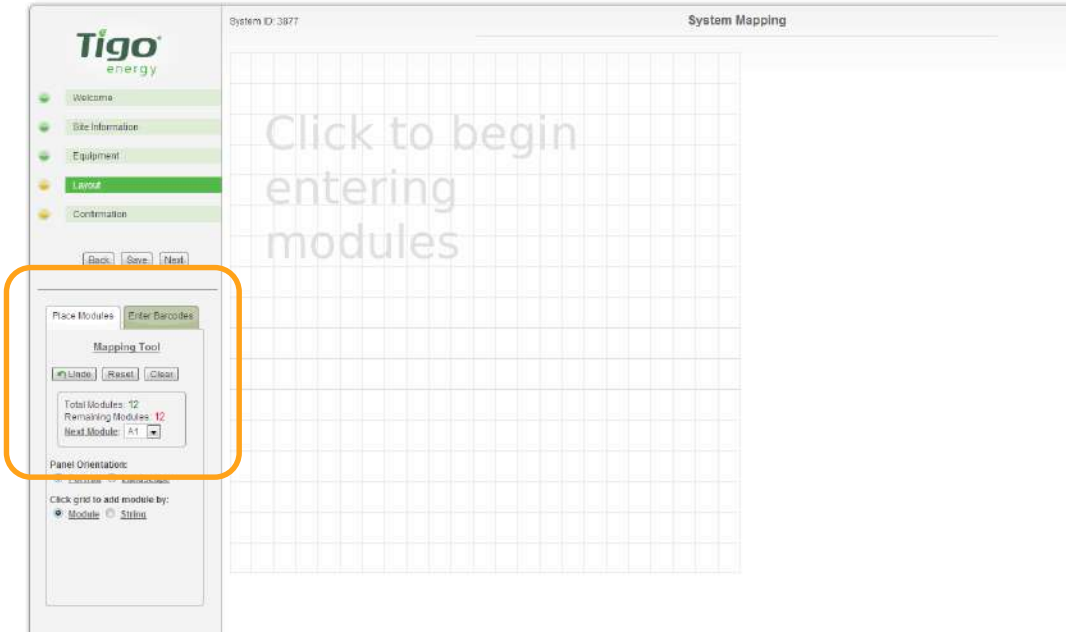


Click the grid to begin placing the modules as they appear on the roof

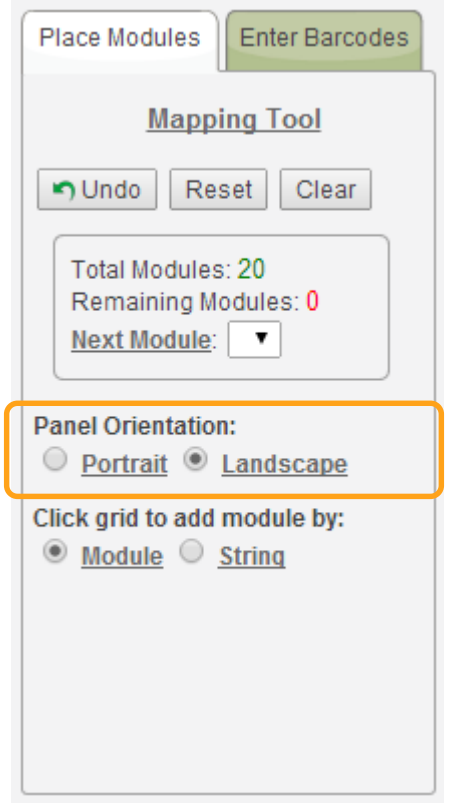


Click the grid to begin placing the modules as they appear on the roof

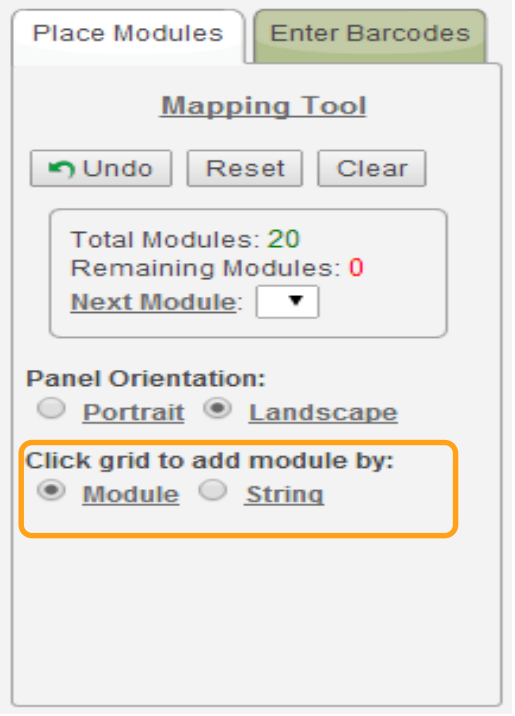
Use the bottom part to choose how to place the modules



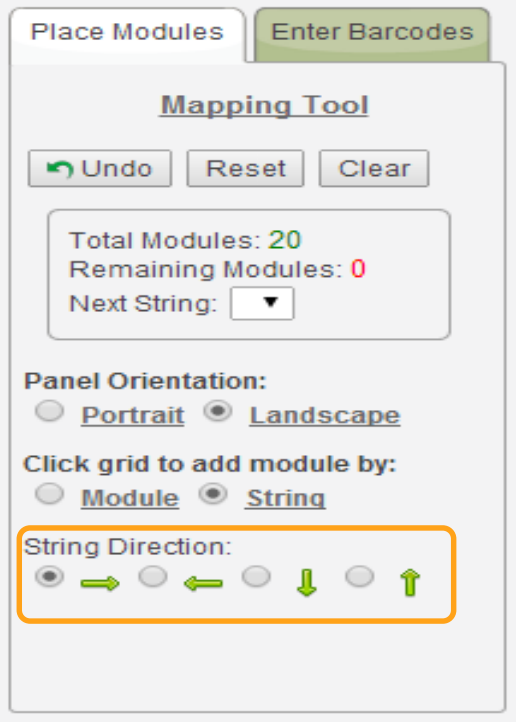
You can place the module in portrait or landscape



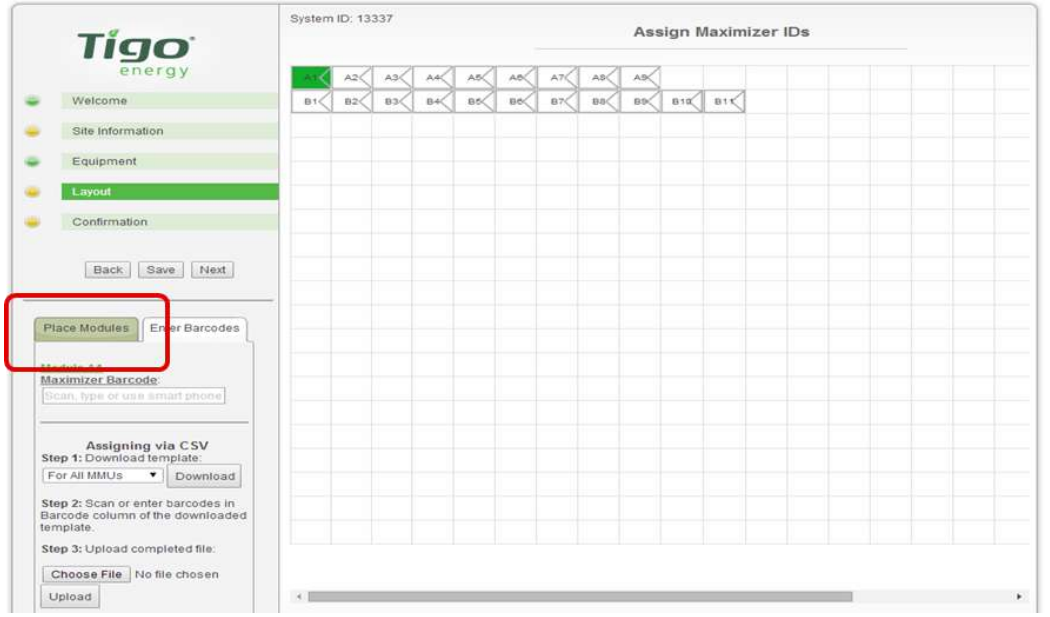
You can choose to place a single module per click, or a string at a click



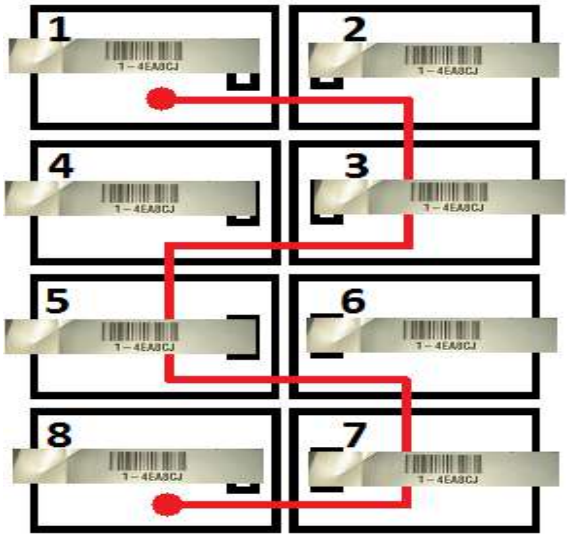
If you choose a string you'll get to choose the direction in which the modules will be placed



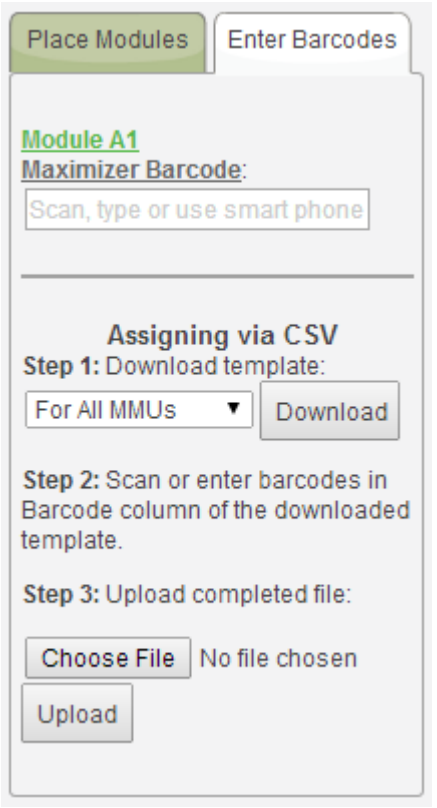
Once done with the physical layout it’s time to upload the barcodes



Map with barcodes from the installation site should show how the panels are wired

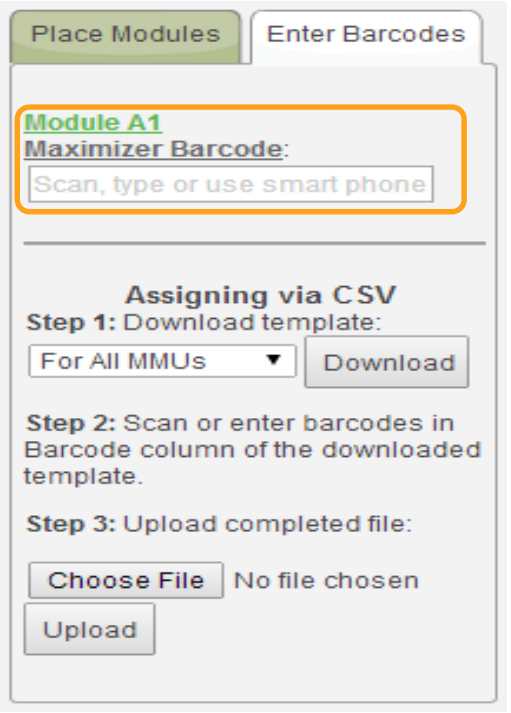


There are 2 ways to enter the barcodes:



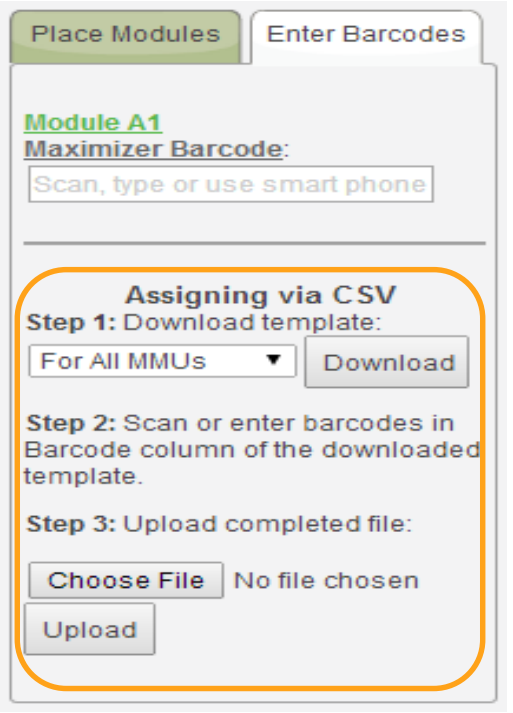
There are 2 ways to enter the barcodes:

1. By scanning or typing the barcodes in the upper section based on the map

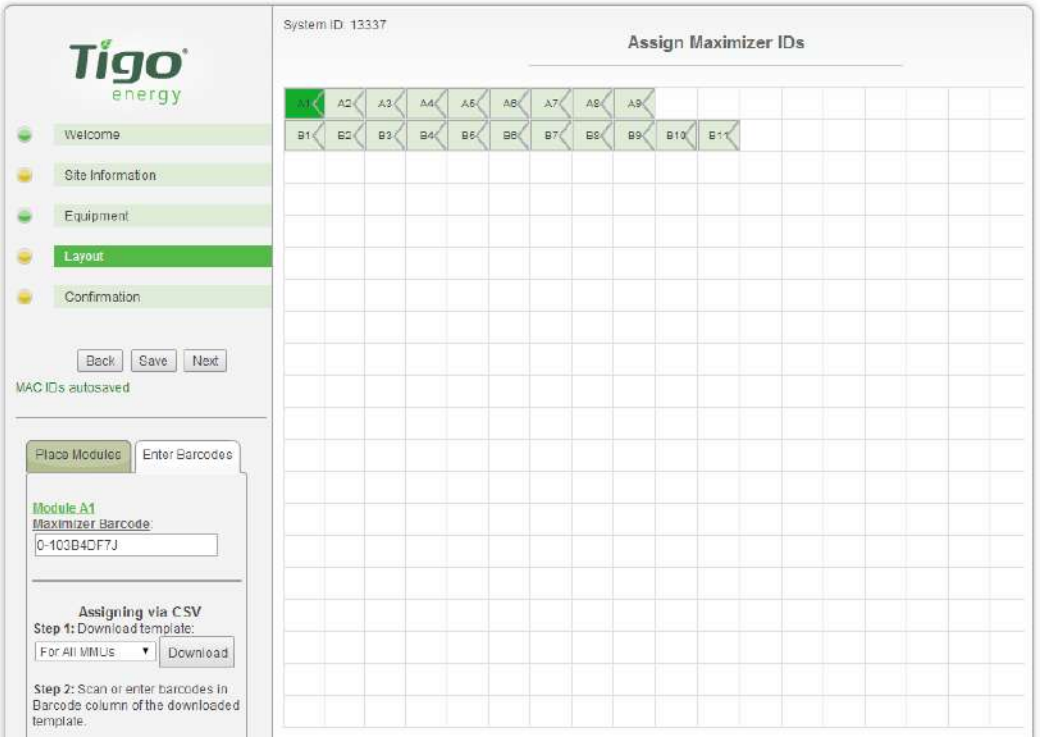


There are 2 ways to enter the barcodes:

2. By downloading a template, scanning barcodes into it while on site and later uploading it

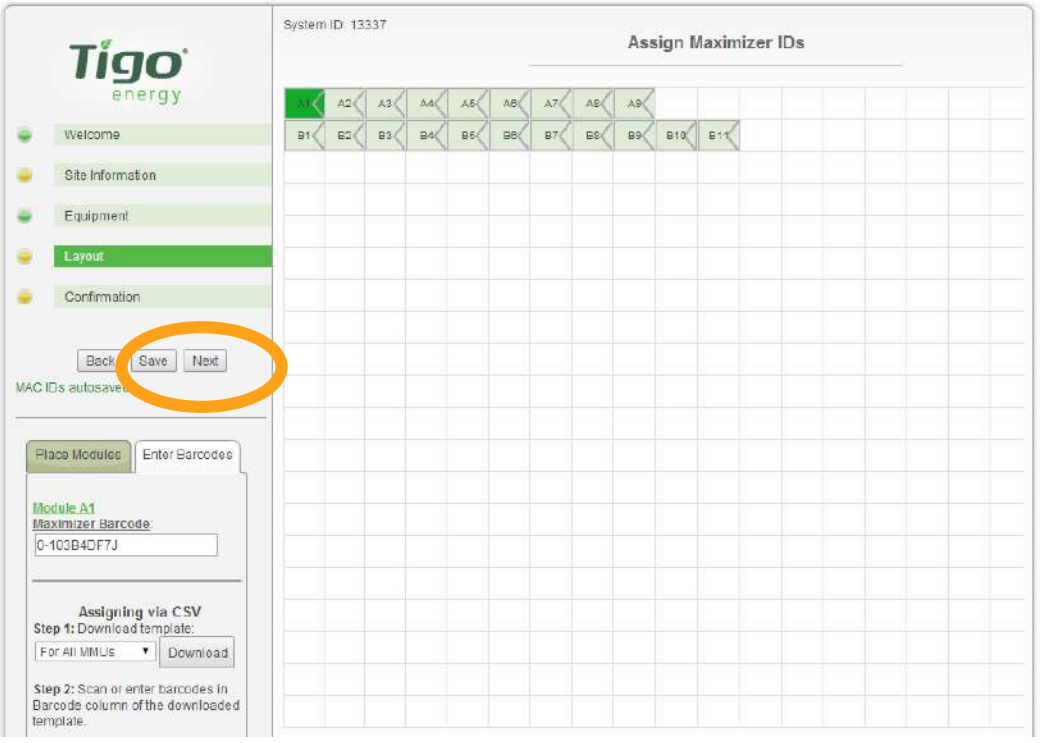


Once done uploading the barcodes you'll see the modules have all turned green

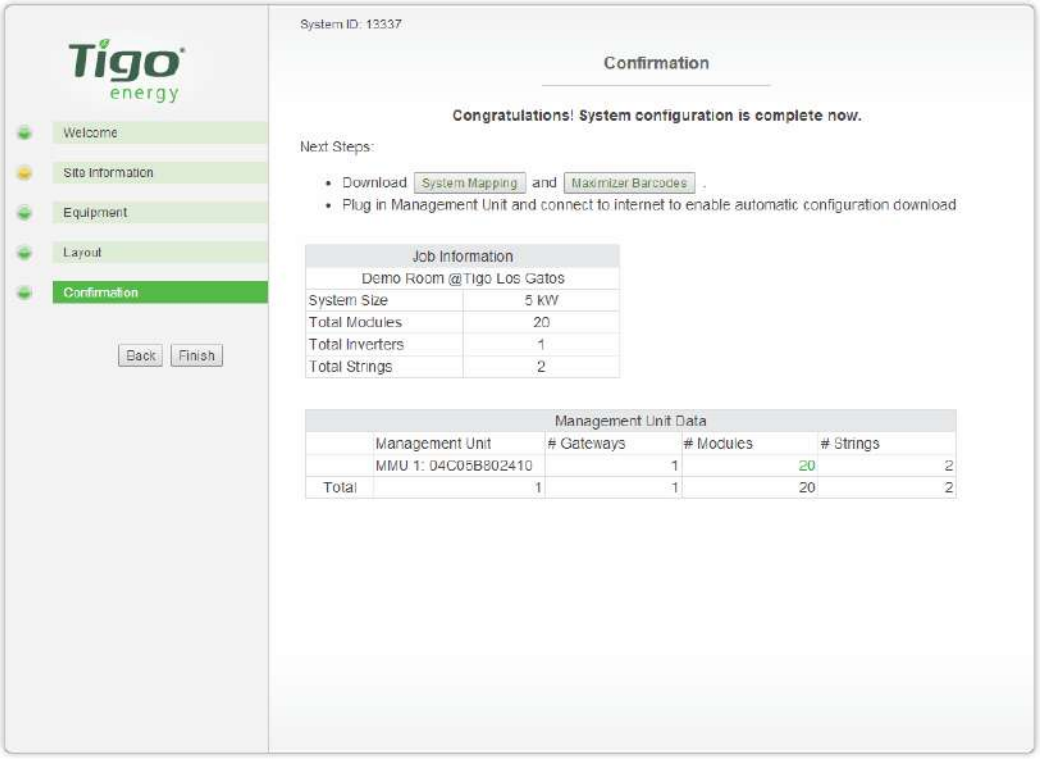


CONFIGURE THE SYSTEM

Press next

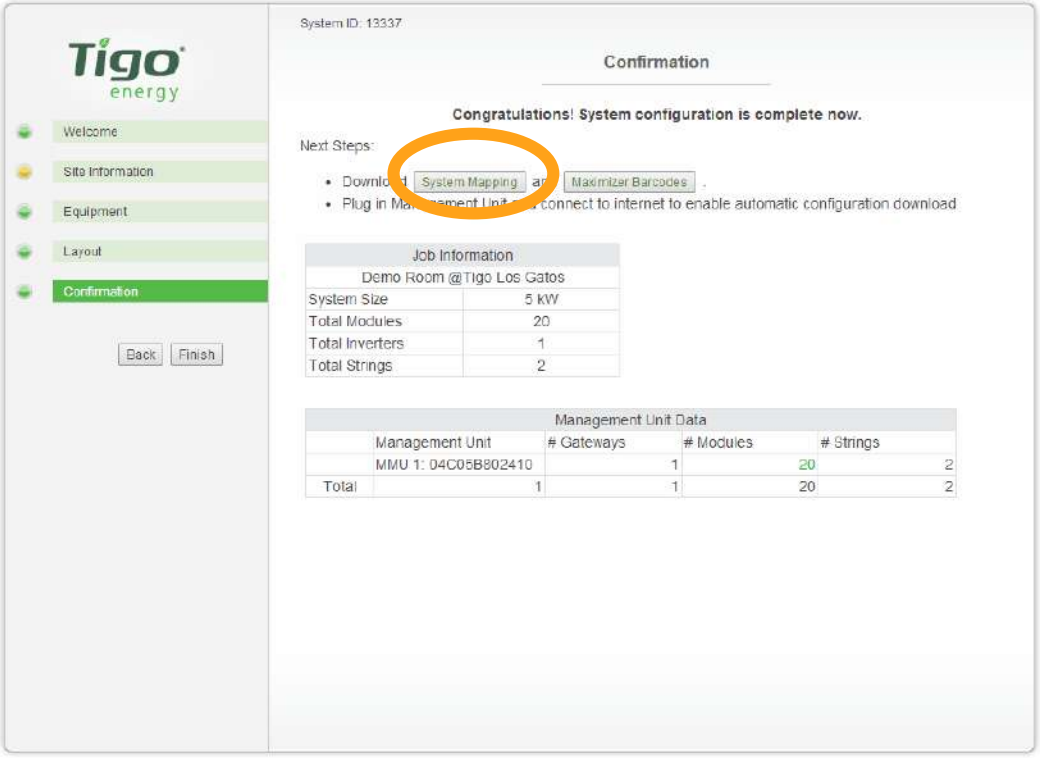


Review summary and confirm



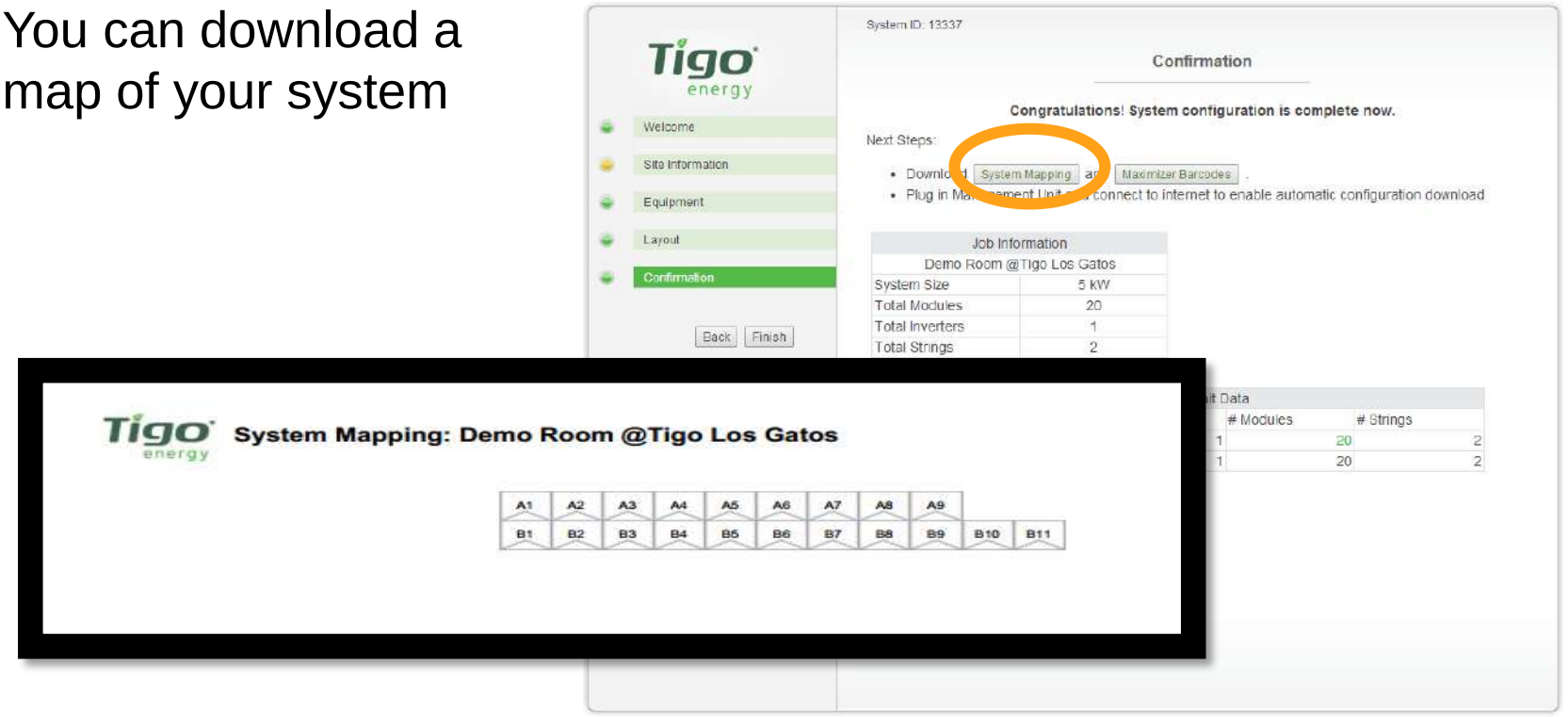
CONFIGURE THE SYSTEM

You can download a map of your system



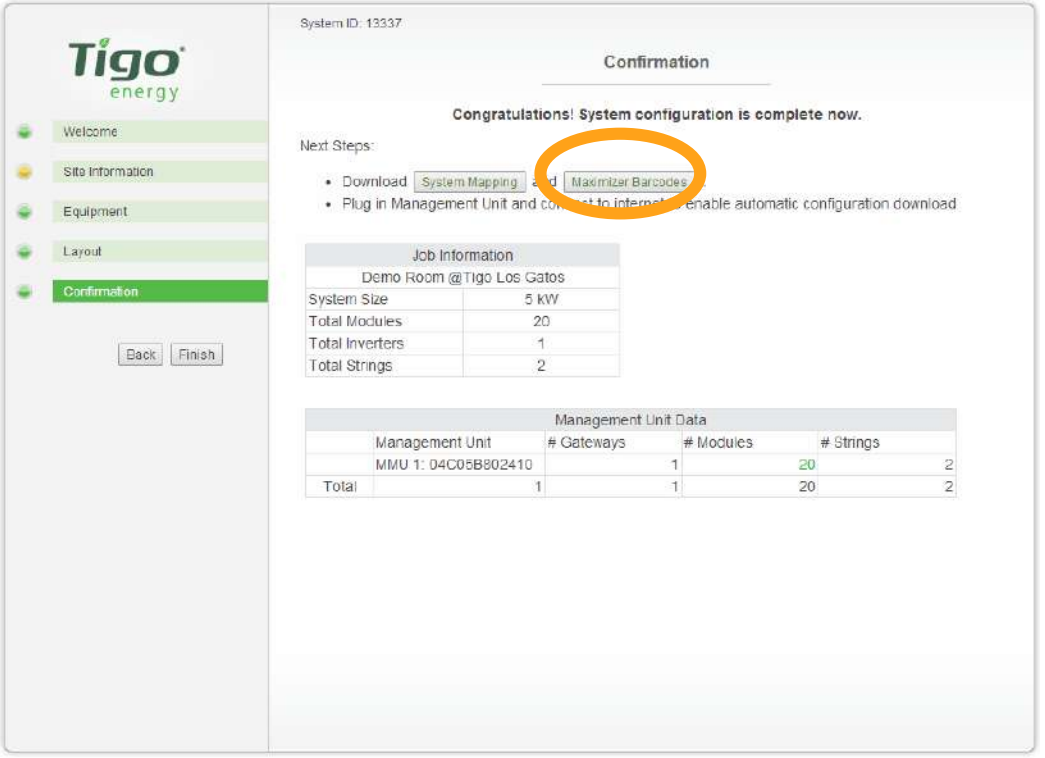
CONFIGURE THE SYSTEM

You can download a map of your system



CONFIGURE THE SYSTEM

And a table referencing of your map and barcodes



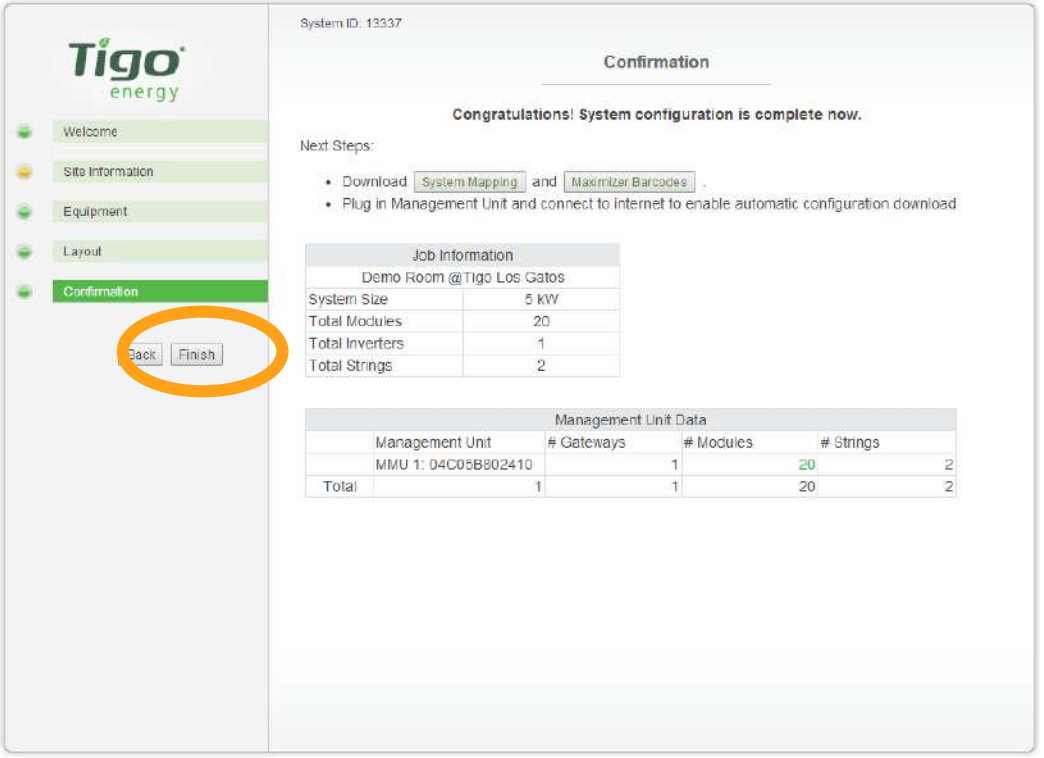
CONFIGURE THE SYSTEM

And a table referencing of your map and barcodes

CONFIGURE THE SYSTEM – DONE!

Once done, press Finish

Your system is now ready to be discovered!



6. COMMISSION

DOWNLOAD THE TIGO SMART APP

Go to the App Store or Google Play and search for ‘Tigo SMART’

Download the app and open it once the installation process is complete

Available on the App Store

GET IT ON Google Play

Using a Cloud Connect with LCD and buttons and wish to commission without the app? Click here

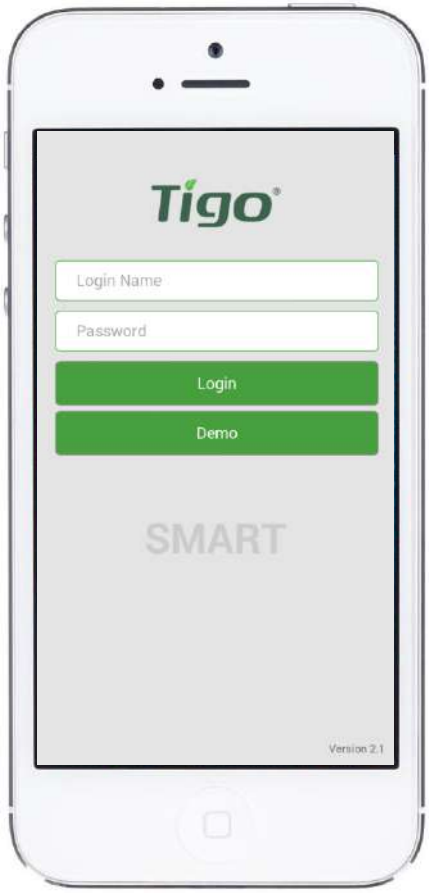
ENTER YOUR USERNAME AND

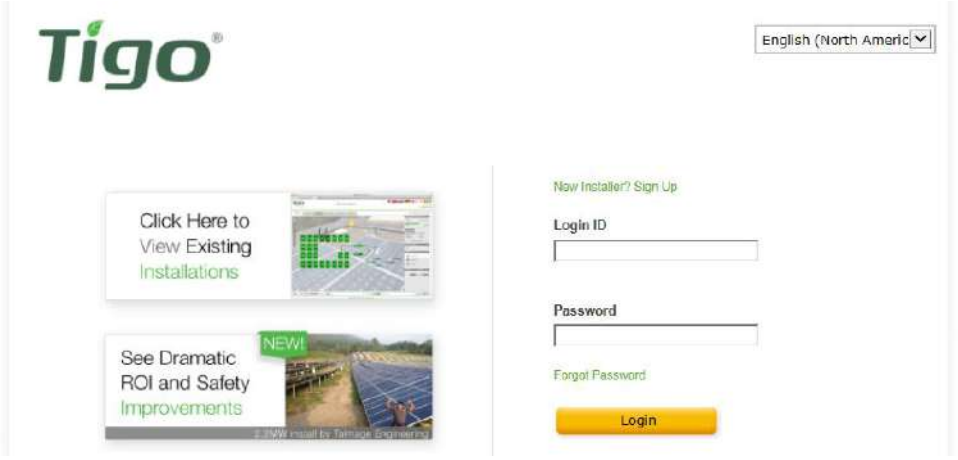
PASSWORD, AND PRESS ‘LOGIN’

Requires active mobile data connection

This is the same username and password created for the online configuration at:

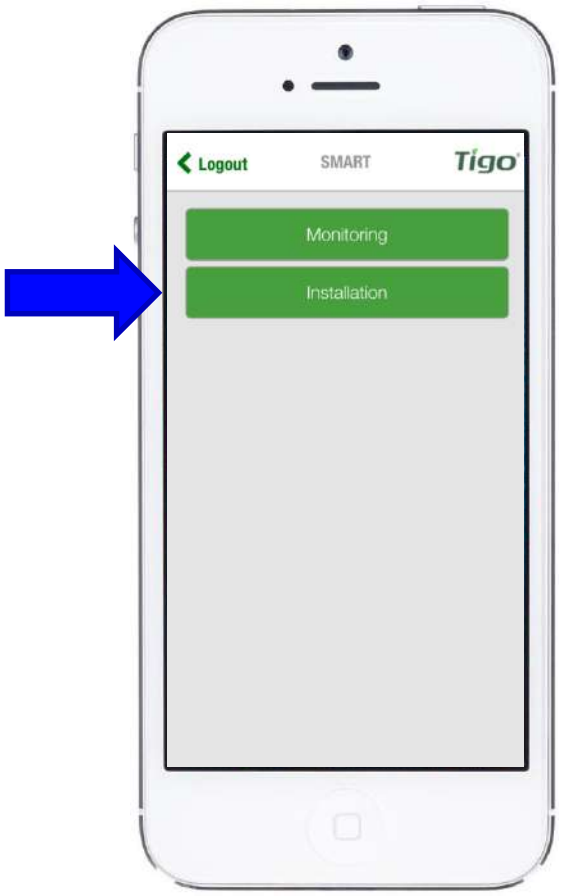
https://installations.tigoenergy.com/base/login/





PRESS ‘INSTALLATION’

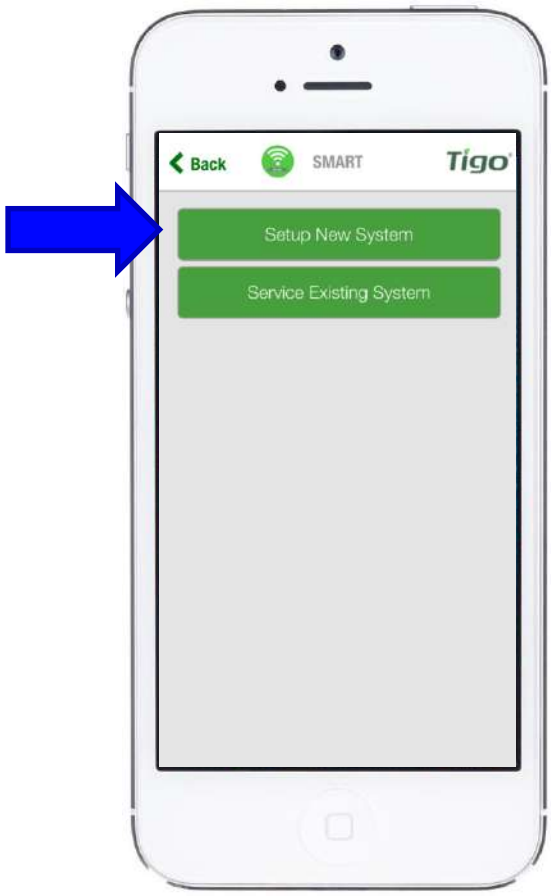
Requires active mobile data connection



SETUP NEW SYSTEM

Requires active mobile data connection

- To proceed with a new installation, select ‘Setup New System’
- Select ‘Service Existing System’ to service a Cloud Connect that has already been configured



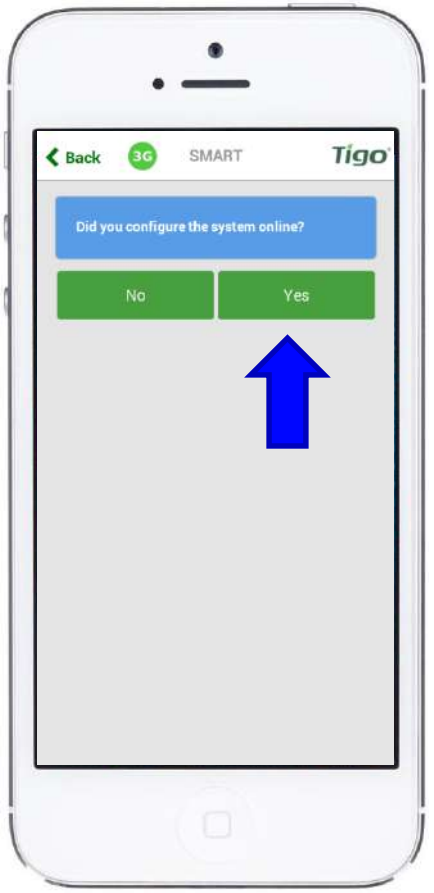
CONFIRM SYSTEM SIZE

Requires active mobile data connection

CONFIRM CONFIGURATION

Requires active mobile data connection

- Since you already scanned barcodes and configured the system online, select ‘Yes’ and then connect your Smartphone to the Cloud Connect hotspot to proceed

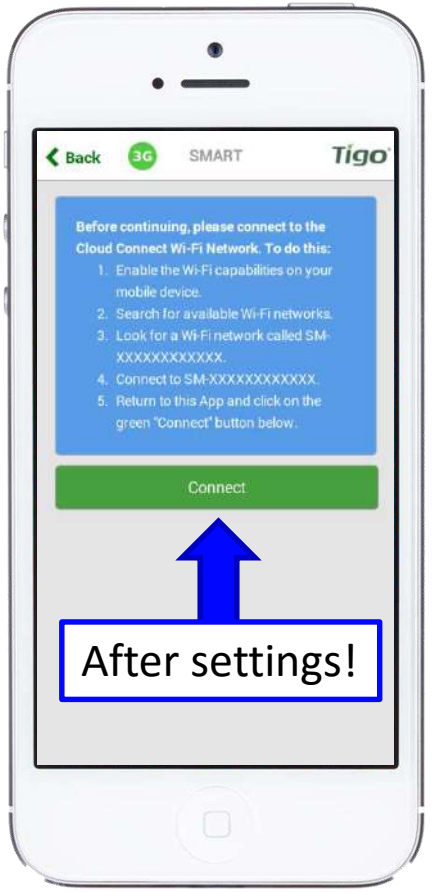


CONNECT YOUR SMARTPHONE TO THE

CLOUD CONNECT VIA WI-FI

Requires direct Wi-Fi connection to Cloud Connect

- Enable Wi-Fi in your Smartphone settings (requires to leave the app, but don't close it)
- Locate a Wi-Fi network named SM-XXXXXXXXXXX and connect to it
- Press 'Connect' to continue

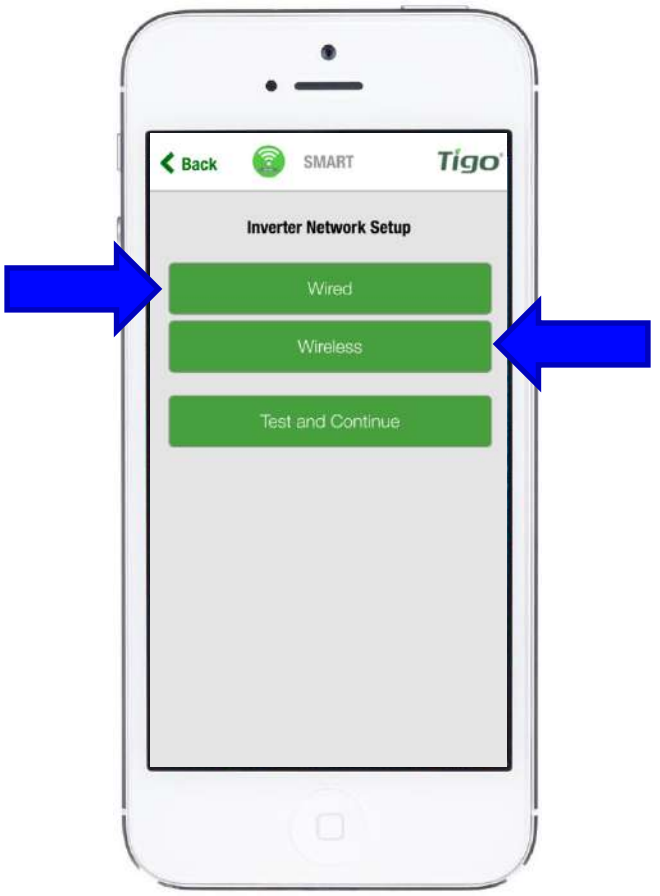


NEXT STEP: SETUP INTERNET

CONNECTION

Requires direct Wi-Fi connection to Cloud Connect

- Select your preferred method of connecting to the internet:
  - Wired: using Ethernet cable
  - Wireless: Using Wi-Fi

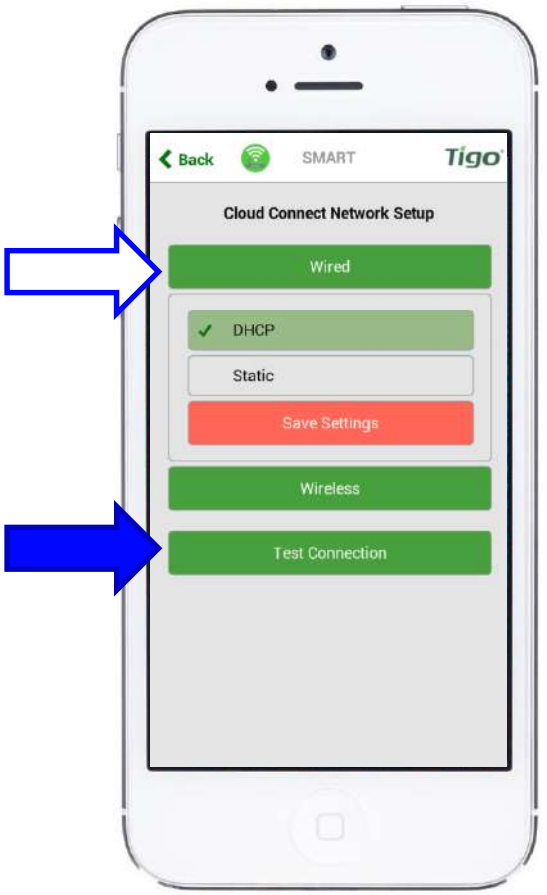


SELECTING WIRED INTERNET

CONNECTION

Requires direct Wi-Fi connection to Cloud Connect

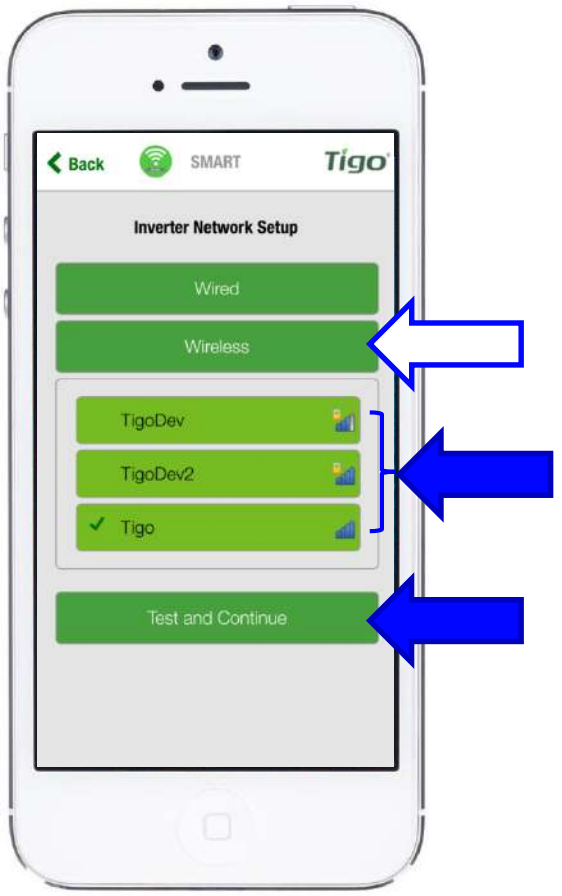
- Open up the following screen
- The app will look for an available internet connection automatically
- Scroll down and press ‘Test and Continue’
- Wired connections can be configured for Dynamic (DHCP) or Static IP in the app



SELECTING WIRELESS INTERNET CONNECTION

Requires direct Wi-Fi connection to Cloud Connect

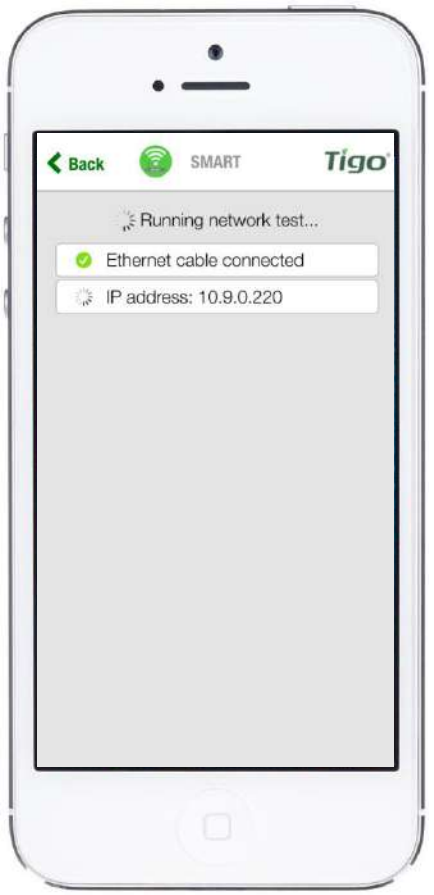
- Opens up a screen showing the available wireless Internet connections
- Make sure you have the name and password for the home network
  - Please note that WPS is not supported by the Cloud Connect
- After selecting a wireless network press ‘Test and Continue’



NETWORK TEST WILL RUN FOR SEVERAL SECONDS

Requires direct Wi-Fi connection to Cloud Connect

- The Network Test can diagnose problems with the Internet connection
- Please note that when the Cloud Connect is mounted inside a metal enclosure, it may not receive a Wi-Fi signal unless the antenna is mounted outside of the enclosure.
  - Extension cables for the Wi-Fi antenna and a matching cable gland can be purchased from Tigo, P.N. 006-90029-00.

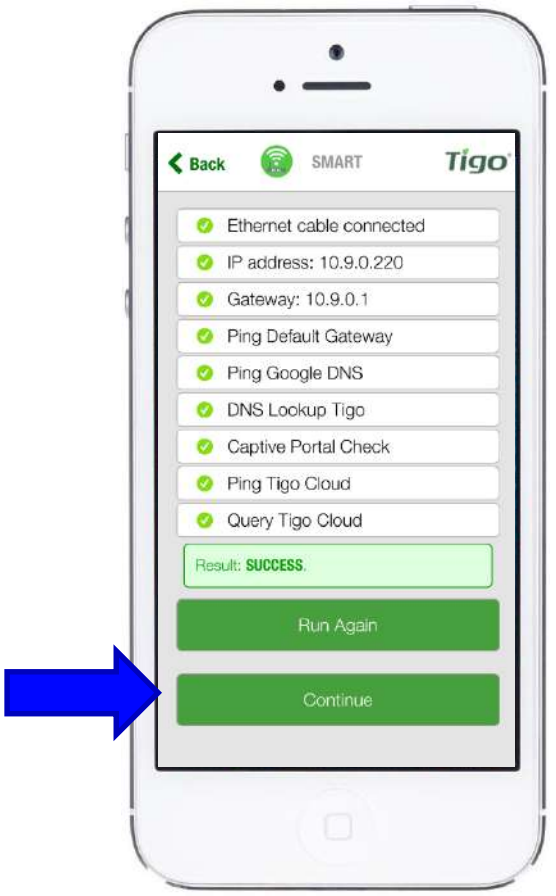


AND END UP WITH THE FOLLOWING

SCREEN

Requires direct Wi-Fi connection to Cloud Connect

Press ‘Continue’

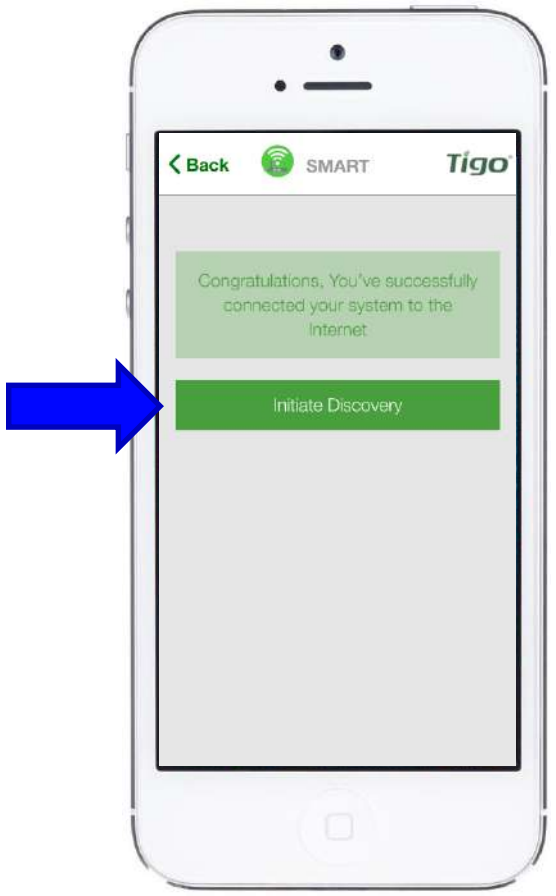


INITIATE DISCOVERY

Requires direct Wi-Fi connection to Cloud Connect

- To complete the configuration for an existing system ID, select the available Cloud Connect from a map of nearby systems* or select ‘Create New System’ to create a new system ID

*Map requires Location enabled on Smartphone



DISCOVERY OF GATEWAYS AND MODULES

Requires direct Wi-Fi connection to Cloud Connect

After the Gateways have been found, you can continue to view status while discovery is running in the background

ONCE DISCOVERY IS COMPLETE

Requires direct Wi-Fi connection to Cloud Connect

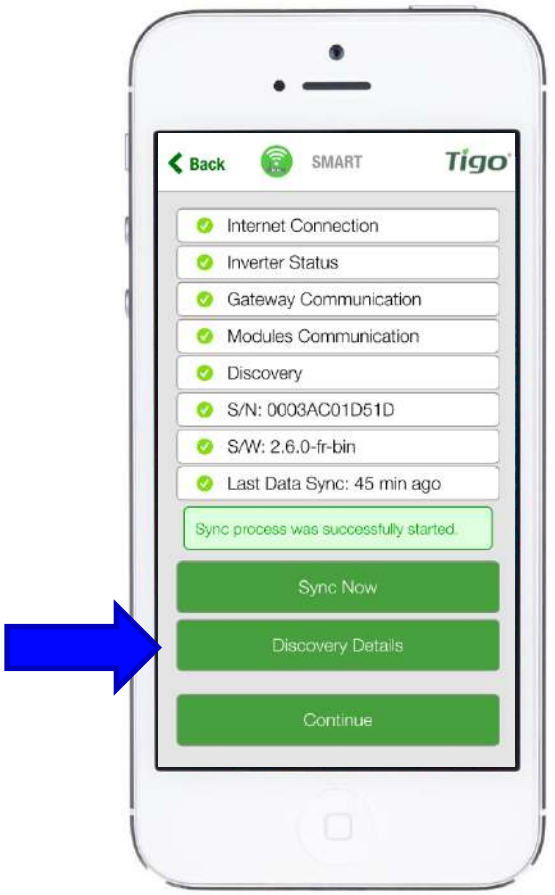
You'll see a confirmation that:

- Discovery Status: Complete
- All modules have been found (e.g. 40 of 40)
- All Gateways have been found (e.g. 1 of 1)

PRESSING CONTINUE GOES TO STATUS PAGE

Requires direct Wi-Fi connection to Cloud Connect

- At this point the configuration process is almost complete
- Sync now uploads all the information collected so far to the Tigo Cloud (this happens automatically as well)
- Press ‘Discovery Details’ to make sure discovery process has found all Smart Modules



DISCOVERY DETAILS

Requires direct Wi-Fi connection to Cloud Connect

- Once the Discovery process is complete, this screen will appear and display real time data collected from the Smart Modules, Gateways, and neighboring Smart Modules
- Expand the menus to view data

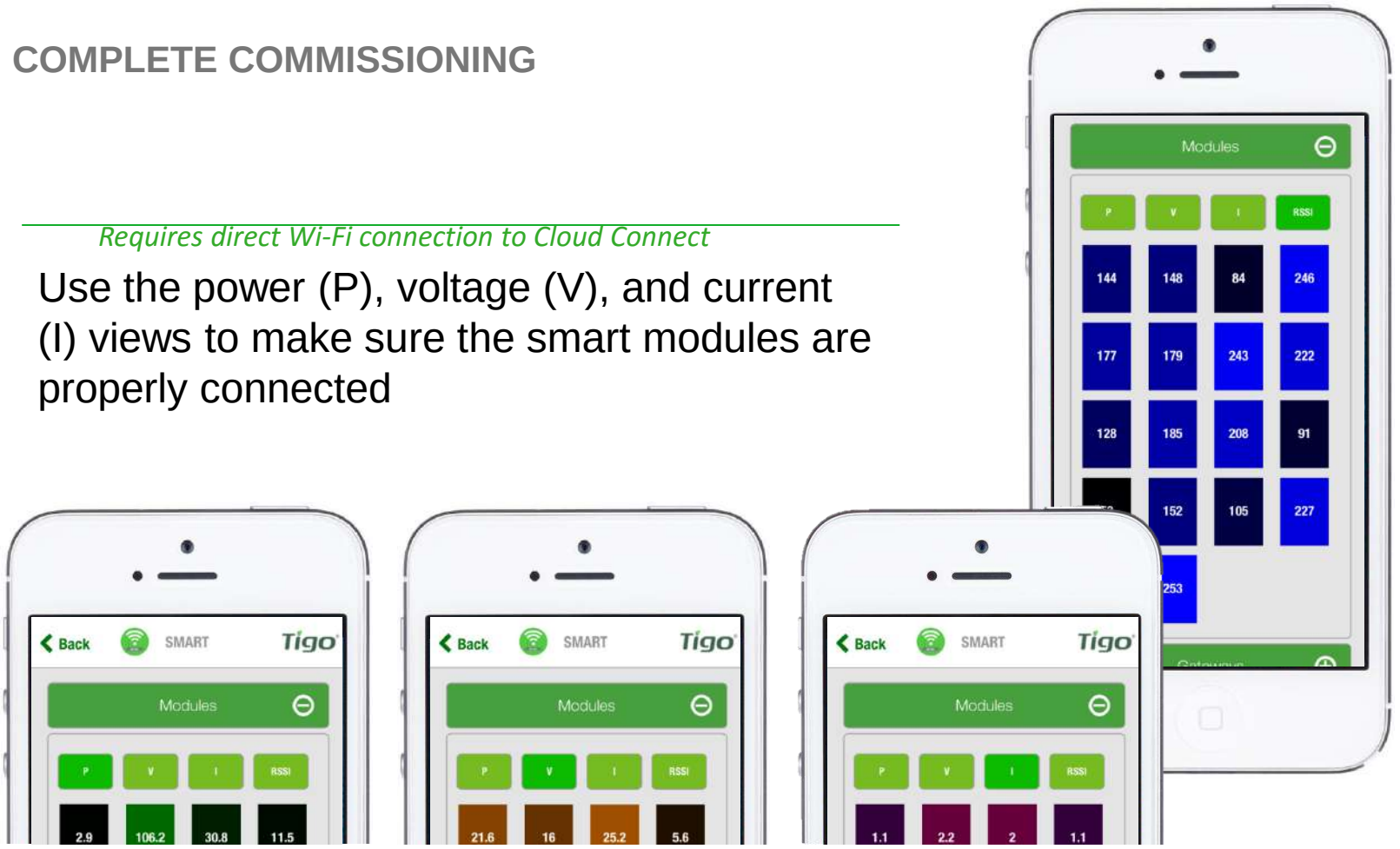
DISCOVERY DETAILS:

USE THE ‘MODULES’ SCREEN TO

COMPLETE COMMISSIONING

Requires direct Wi-Fi connection to Cloud Connect

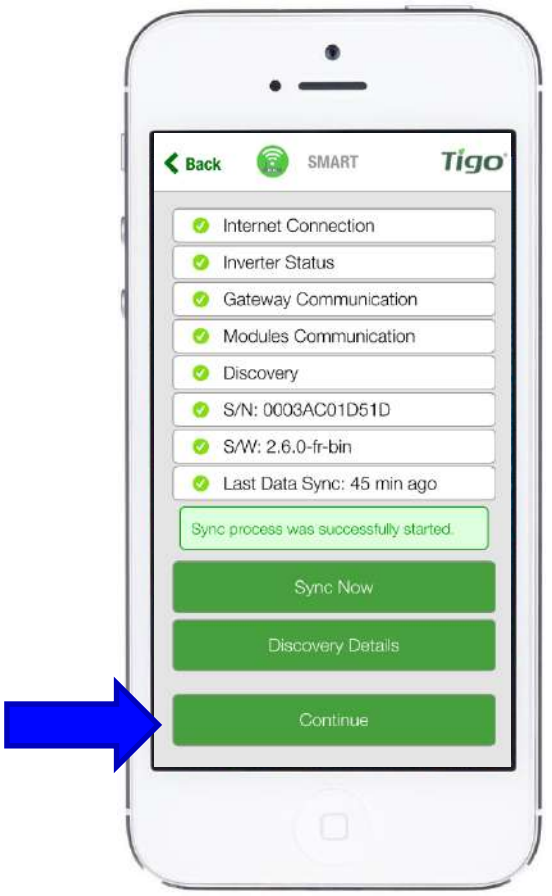
Use the power (P), voltage (V), and current (I) views to make sure the smart modules are properly connected



PRESSING ‘BACK’ WILL RETURN TO STATUS PAGE

Requires direct Wi-Fi connection to Cloud Connect

- Press ‘Continue’

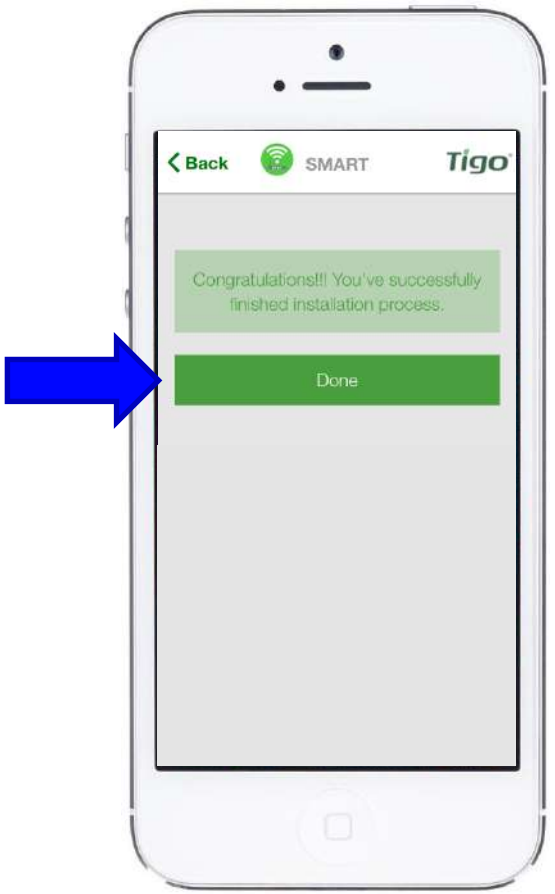


AND YOU'RE DONE!

TIGO EQUIPMENT COMMISSIONING

COMPLETE

- Once discovery completed, after pressing "Continue" you'll be prompted to the following screen
- Pressing "Done" will bring you to the "Installation" or "Monitoring" page. You may leave the app and close it at this point



MAPPING, CONFIGURATION AND COMMISSIONING SUMMARY

- Collect all TS4 barcodes, use a string list template or any other method to make sure your barcodes are well organized
- Complete the online configuration on a PC or MAC before attempting Discovery
- Perform a Network Test, Gateway Test, and Discovery for each Cloud Connect or Cloud Connect Advanced while on site
- View test results and Discovery progress using your app
- Once Discovery is complete, the Cloud Connect or Cloud Connect Advanced will begin sending data to the Tigo cloud

7. RAPID SHUTDOWN

TS4-L, TS4-O, and TS4-S with Cloud Connect/Cloud Connect and Gateway are a solution to meet NEC 2014 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.

Rapid Shutdown is activated by taking 2 simple actions.

To activate rapid shutdown (with most inverters order of actions doesn't matter):

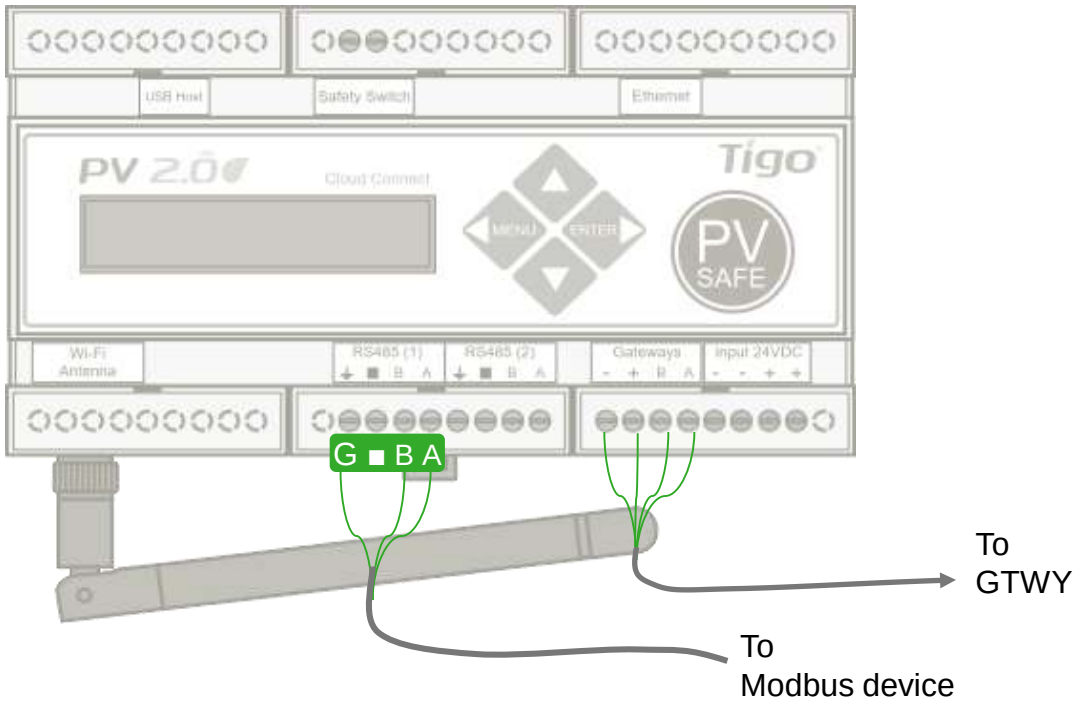
1. Switch off DC disconnect as well to disconnect capacitors.
2. Switch OFF AC main to deactivate system.

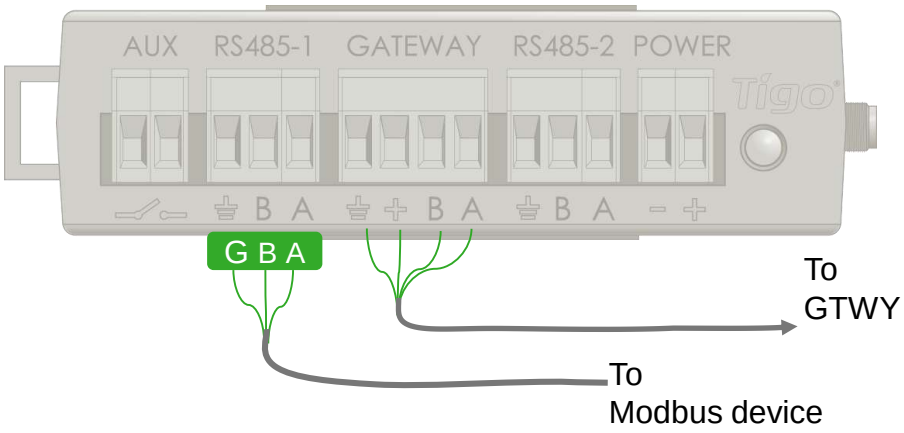
In the inverter's box you'll find 2 red labels to mark the Rapid Shutdown equipment. Place one sticker next to the inverter's DC switch and the other on the AC main breaker. **Both labels must be visible!**

Only a properly installed, configured, and tested system will perform Rapid Shutdown properly.

CLICK HERE for more info about Rapid Shutdown

8. CONNECTING MODBUS DEVICES (OPTIONAL)





INSTALLATION:

1. Verify device settings for AC meter, inverter, etc. in its own installation manual
2. Connect devices to RS-485 port on CC or CCA (note: similar devices can be connected in series)
3. Contact Tigo Tech Support to activate a connected device

1.408.402.0802 ext. 2
00800.CALL.TIGO(2255.8446)
support@tigoenergy.com

RECOMMENDED SETTINGS:

- 9600 baud rate
- 8 bits data
- 1 stop bit
- No parity

TECHNICAL SPECIFICATIONS – SMART MODULE WITH TS4-B BASE

TS4 COVERS

DIODES
TS4-D

MONITORING
TS4-M

SAFETY
TS4-S

OPTIMIZATION
TS4-O

LONG STRINGS
TS4-L

ELECTRICAL RATINGS

INPUT					
Rated DC Input Power	375W	475W	475W	475W	475W
Maximum V_{OC} @ STC	90V	75V	75V	75V	75V
Maximum Short Circuit Current (I_{SC})	12A	12A	12A	12A	12A
Minimum V_{MP}	N/A	16V	16V	16V	16V
Max Input Voltage @ Lowest Temp	N/A	90V	90V	90V	90V
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_{OC}
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 Capability (NEC 2014 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 Cloud Connect and Gateway

TECHNICAL SPECIFICATIONS – RETROFIT UNIT WITH TS4-R BASE

TS4-R

MONITORING
TS4-R-M

SAFETY
TS4-R-S

OPTIMIZATION
TS4-R-O

ELECTRICAL RATINGS

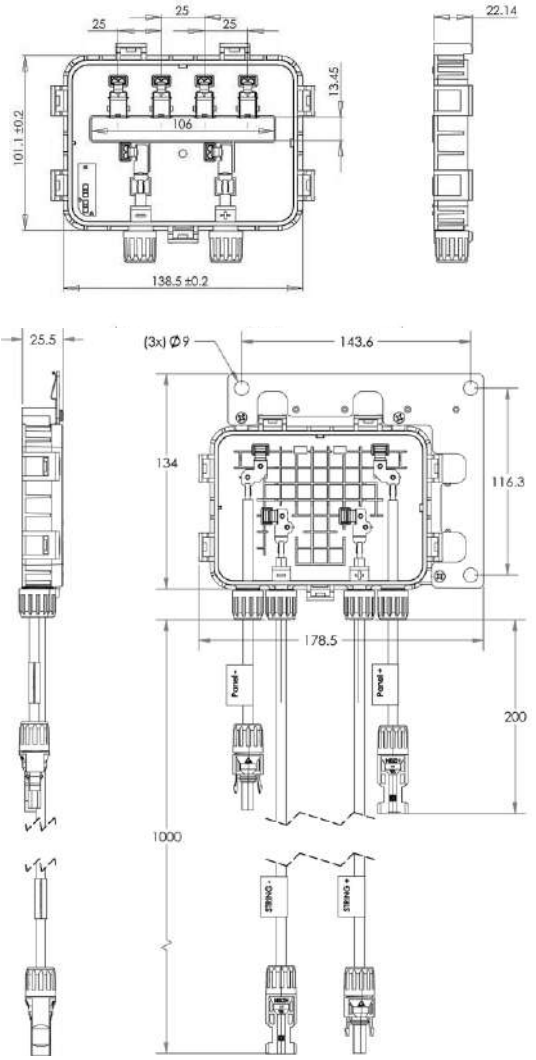
INPUT @ STC			
Rated DC Input Power	475W	475W	475W
Maximum V_{OC} @ STC	75V	75V	75V
Maximum Short Circuit Current (I_{SC})	12A	12A	12A
Minimum V_{MP}	16V	16V	16V
Maximum Input Voltage @ Lowest Temperature	90V	90V	90V
OUTPUT			
Output Power Range	0 - 475W	0 - 475W	0 - 475W
Output Voltage Range	0 – V_{OC}	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 Capability (NEC 2014 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-S or higher, installed with Cloud Connect and Gateway

MECHANICAL SPECIFICATIONS – TS4-B and TS4-R

Mechanical	
Operating Temperature Range	-40°C to +75°C (-40°F to +167°F)
Storage Temperature Range	-40°C to +75°C (-40°F to +167°F)
Cooling Method	Natural Convection
Dimensions (with cover)	152.5mm x 108mm x 25.3mm
Weight (base without cover)	270g
Outdoor Rating	IP67, NEMA 3R
Cabling	
Type	PV1-F, PV wire
Output Length	Standard 1.0m, other lengths on request
Cable Options	1000V rated 1500V rated
Cable Cross-Section	7.15 ± 0.25 mm (1000V) 6.4 ± 0.2mm, 7.05 ± 0.2mm (1500V)
Connectors	MC4, MC4 compatible, Amphenol, 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.

YOU'RE GOOD TO GO!

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

- Tigo Academy
- Resource Center

Or contact us at:

- Training@tigoenergy.com

GOOD LUCK!

Tigo Team