SMA POWER+ SOLUTION – TS4



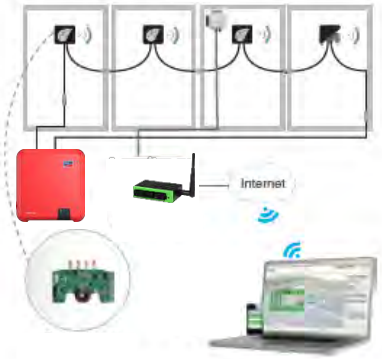
DISCLAIMER

IMPORTANT LEGAL NOTICE

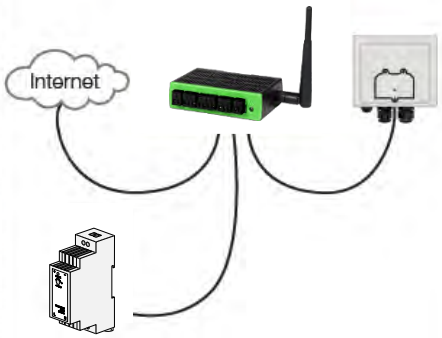
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QUICK INSTALLATION GUIDE

1. System Overview
In Office Preparation



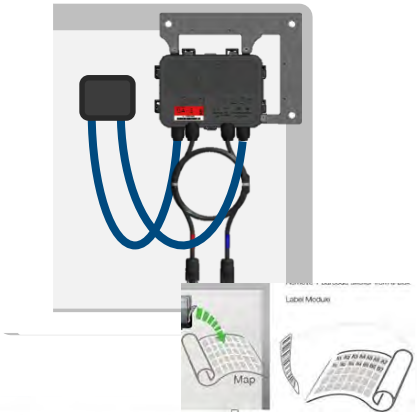
2. Installing Cloud Connect Advanced (CCA)



3. Installing Gateways (GTWY)



4. Installing and Mapping TS4-R



5. Configuring the System Online



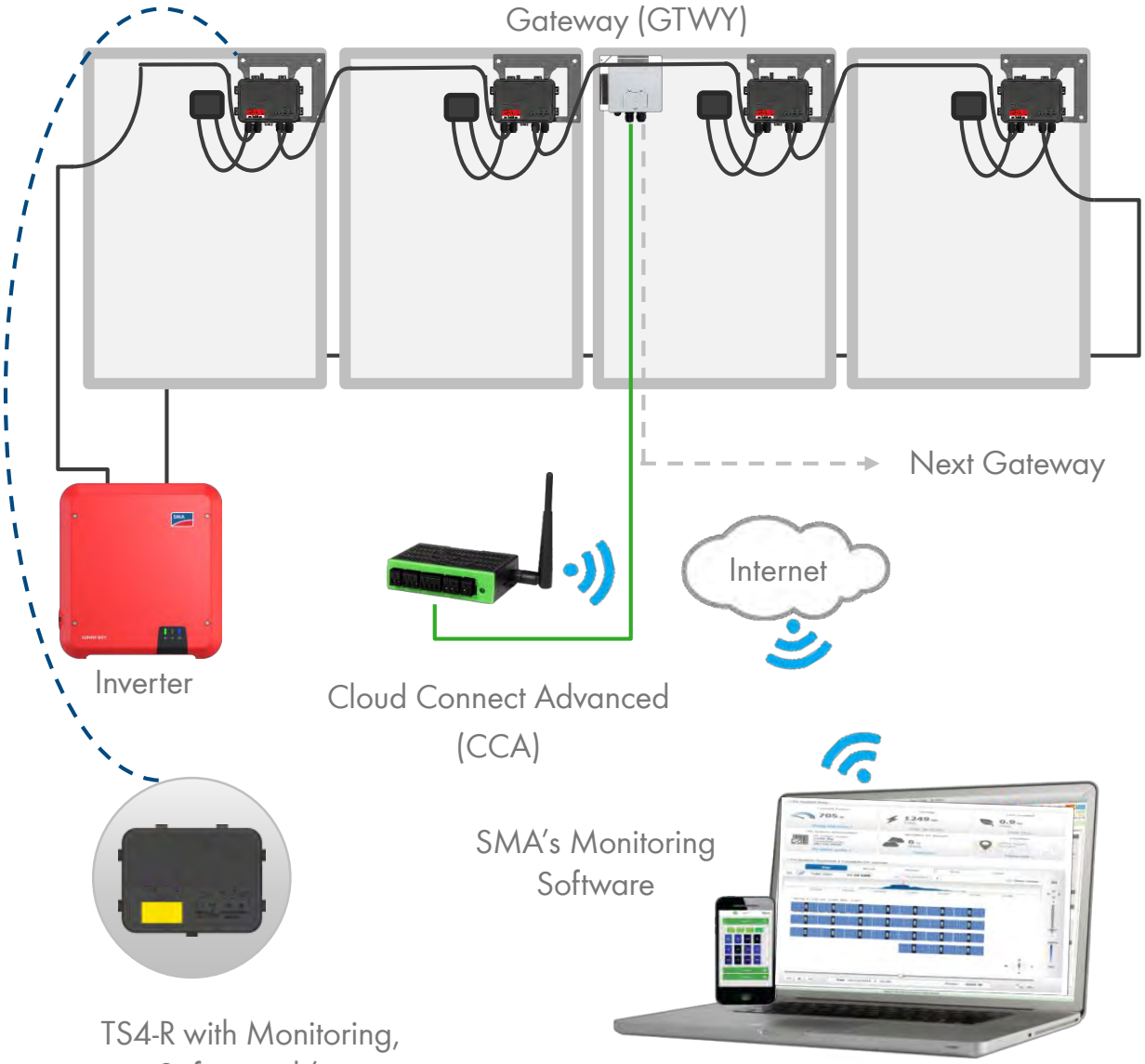
6. Commissioning



7. Registration Sunny Portal



1. SYSTEM OVERVIEW: TS4-R



DESIGN RULES:

1 CLOUD CONNECT ADVANCED (CCA):

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

1 GATEWAY (GTWY):

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

For further information CLICK HERE

CCA AND GTWY CALCULATOR:

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

1. SYSTEM OVERVIEW & PRODUCT DESCRIPTION

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

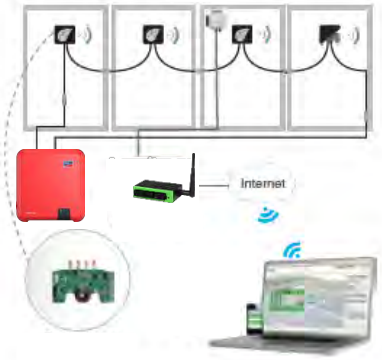




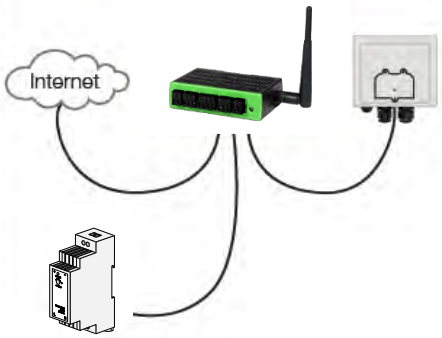
ELECTRICAL INSTALLATION (STEP 2 – STEP 4)

QUICK INSTALLATION GUIDE

1. System Overview
In Office Preparation



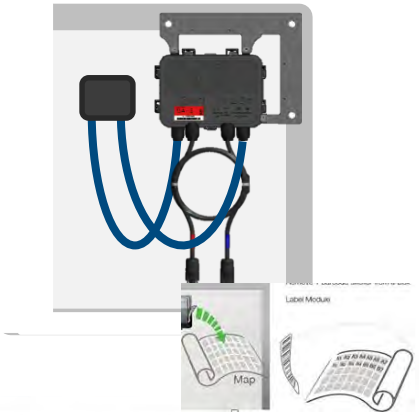
2. Installing Cloud Connect Advanced (CCA)



3. Installing Gateways (GTWY)



4. Installing and Mapping TS4-R



5. Configuring the System Online



6. Commissioning



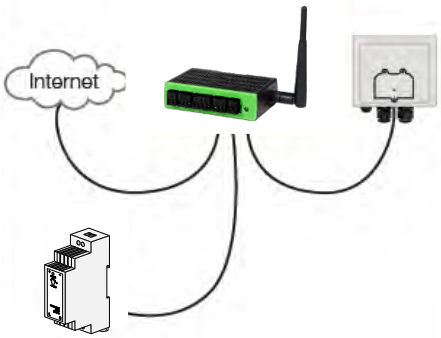
7. Registration Sunny Portal



QUICK INSTALLATION GUIDE

1. System Overview In Office Preparation

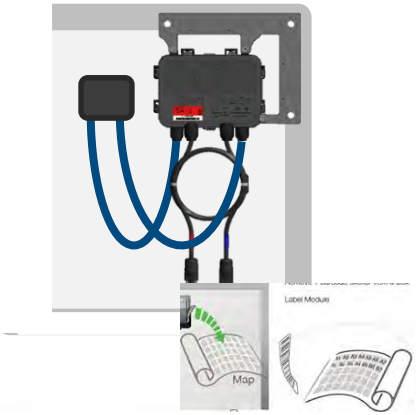
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4. Installing and Mapping TS4-R

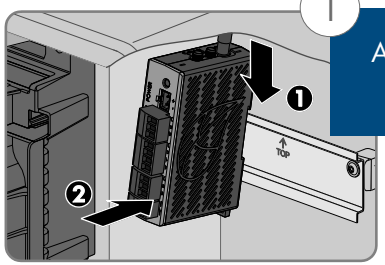


5. Configuring the System Online

6. Commissioning

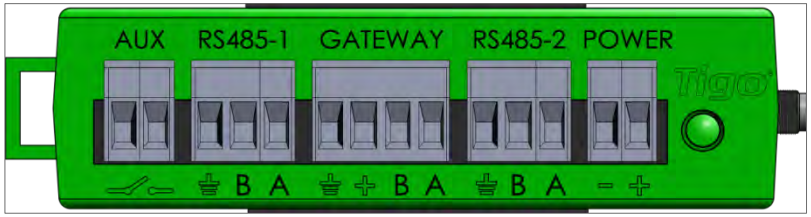
7. Registration Sunny Portal

2. INSTALLING THE CLOUD CONNECT ADVANCED (CCA)



1 Attach CCA and power supply to DIN rail

2 Connect GTWY and power cables



2a Network
Wired Ethernet and WLAN connections

- + B A

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

- +

2b Power Supply
24Vdc input

Wireless Capabilities
Use WLAN for your Internet connection and for commissioning with a smartphone

WHERE TO PLACE:

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

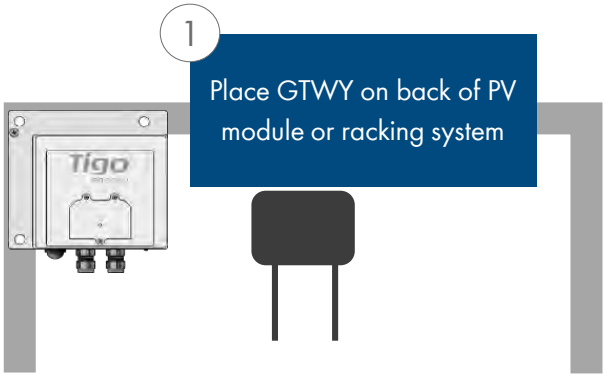
3 CONNECTIONS:

1. Internet connection, using one of the options:
   - Ethernet Port
   - Built in WLAN
     - WLAN connection is configured using the Tigo SMART app
2. Power supply:
   - DIN Rail Power Supply
3. Gateway (GTWY)
   - More on RS485 cables in the next page

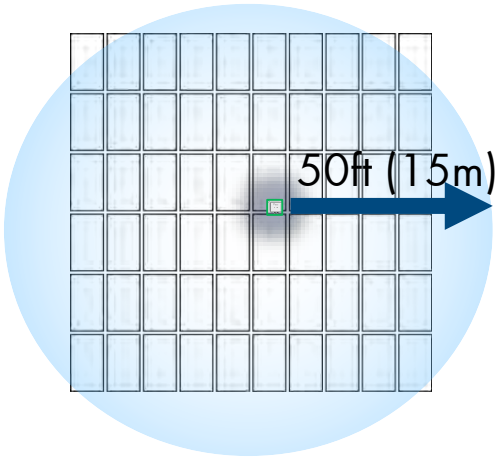
Complete CCA menu options in step 6 “Commissioning”

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

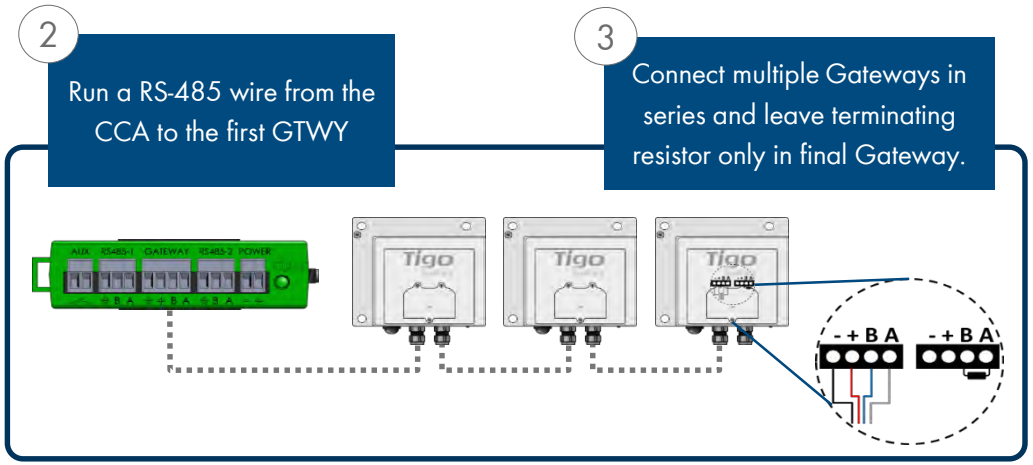
3. INSTALLING GATEWAYS (GTWY)



Gateway attaches to module frame using provided bracket



Locate Gateway near center of array or each sub-array



Installation:

1. Connect all GTWY cables before powering on Cloud Connect
2. Install GTWY on back of PV module using provided bracket or bolt to the racking system
3. Power on Cloud Connect Advanced and perform Gateway test from Tigo SMART App

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

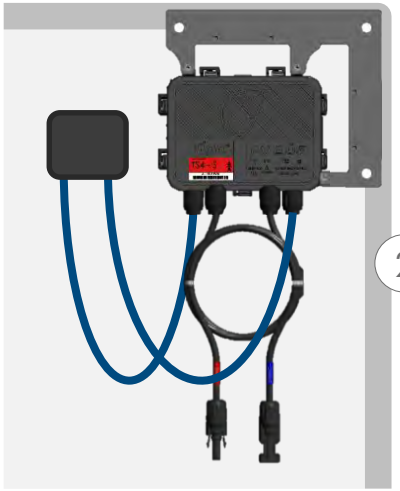
More Information:

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

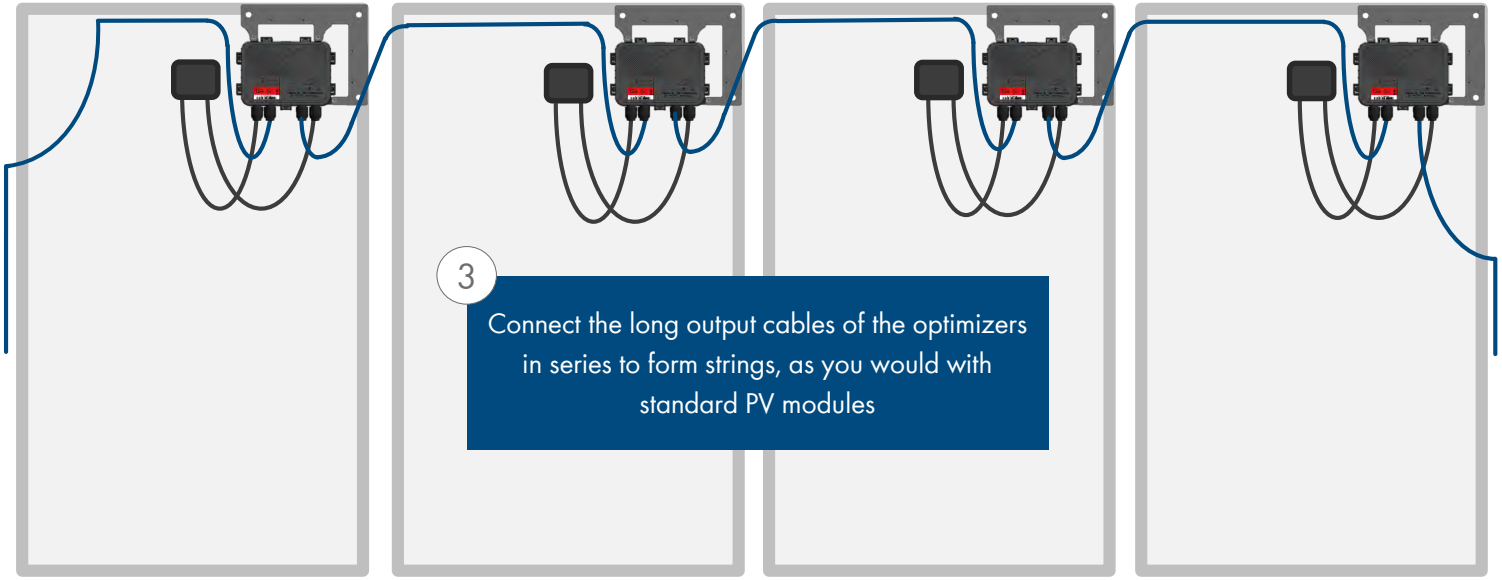
4. INSTALLING & MAPPING: TS4-R



1 Mount the optimizer on the top right corner of the PV module



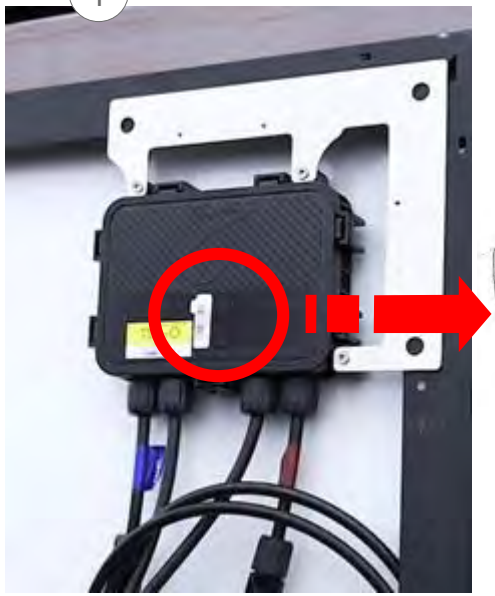
2 Connect the PV cables from the module to the short leads of the TS4-R



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

4. INSTALLING & MAPPING: TS4-R

1

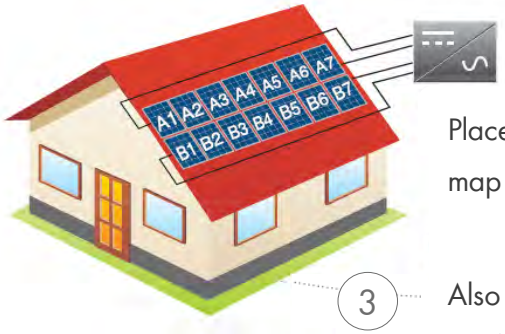


Remove 1 barcode sticker from the TS4 junction box or add-on



2

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.

3

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

NOTE:

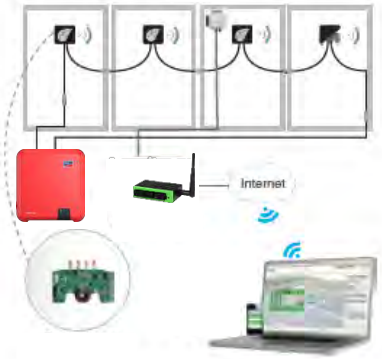
If you're installing 50 modules or less and don't need an exact physical position you may skip the mapping step and go straight to commissioning

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

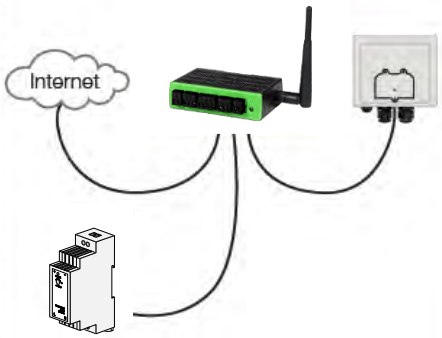
COMMISSIONING (STEP 5 – STEP 6)

QUICK INSTALLATION GUIDE

1. System Overview
In Office Preparation



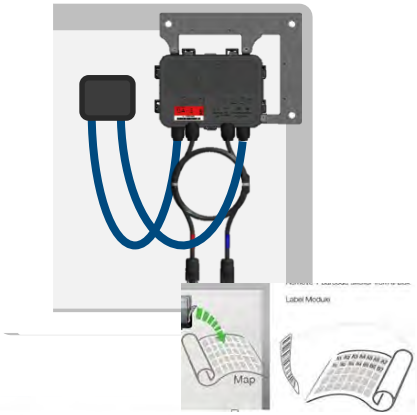
2. Installing Cloud Connect Advanced (CCA)



3. Installing Gateways (GTWY)



4. Installing and Mapping TS4-R



5. Configuring the System Online



6. Commissioning



7. Registration Sunny Portal



QUICK INSTALLATION GUIDE

1. System Overview
In Office Preparation

2. Installing Cloud Connect
Advanced (CCA)

3. Installing Gateways (GTWY)

4. Installing and Mapping TS4-R

5. Configuring the
System Online



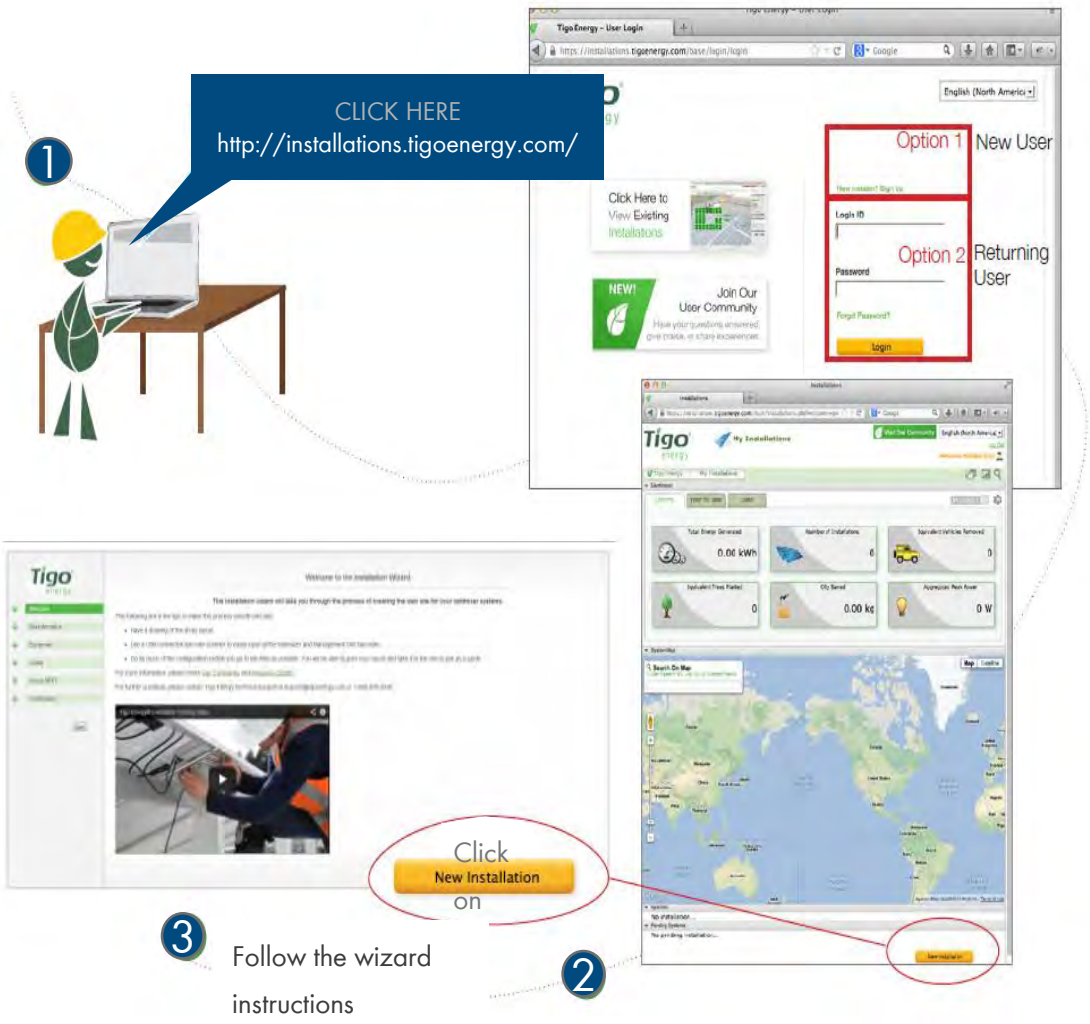
6. Commissioning



7. Registration Sunny Portal

5. CONFIGURE SYSTEM ONLINE

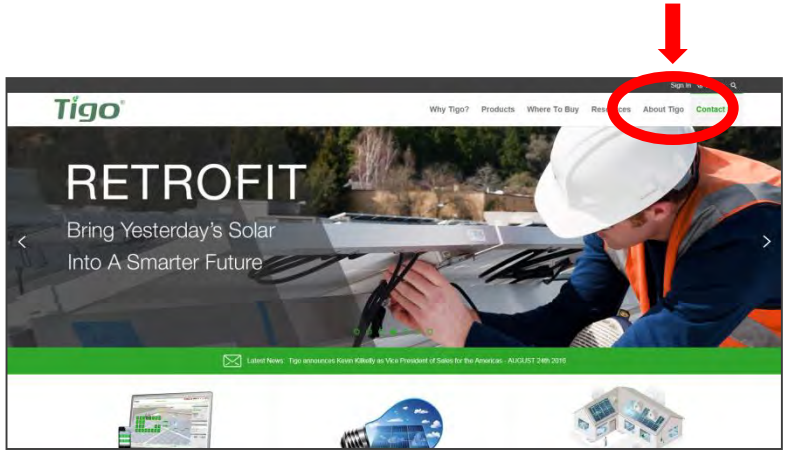
- Go to www.Tigoenergy.com
- Create Installer account (if not already existing)
- To begin online configuration process enter installation details, such as location and equipment type*
  - For large sites, create a system map and use it for organized barcode collection process
  - Sites with 50 panels or less do not require a map in case physical position isn't mandatory



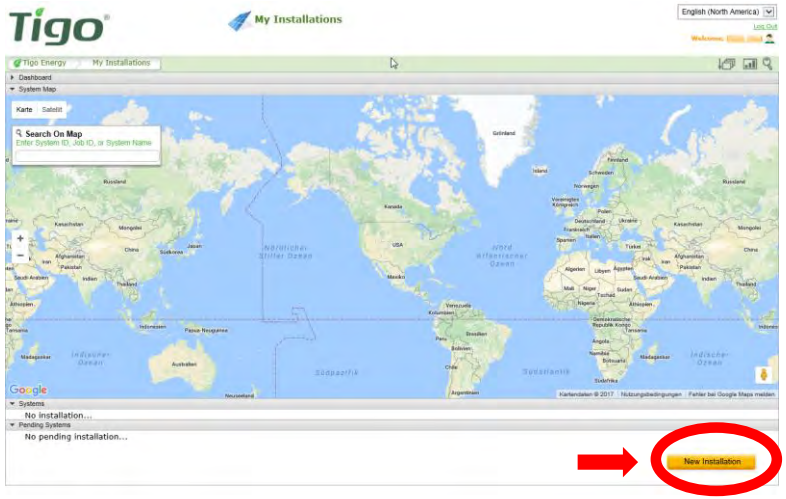
* For smart module systems with less than 50 panels, this step can be done after the physical installation via the Tigo APP

5. CONFIGURE SYSTEM ONLINE

- To configure a system online, log in to tigoenergy.com with your installer account
- You can also create an installer account here if this is your first installation



- Click "New Installation" to begin*
- Have your site map or string list with bar codes ready



* For smart module systems with less than 50 panels, this step can be done after the physical installation via the Tigo APP

5. CONFIGURE SYSTEM ONLINE

Follow the steps on the installation wizzard*:

- After completing the first step, the installation becomes a Pending System and you can continue from the last step completed



- Pending systems are listed on your "My Installations" page below the map

- Enter site information:
  - Address
  - Site owner information
  - 3rd party finance if applicable

- Click "next" to proceed



* For smart module systems with less than 50 panels, this step can be done after the physical installation via the Tigo APP

6. COMMISSIONING

To Commission the system use your smartphone, download the Tigo SMART app and follow its instructions.



To commission the Tigo equipment there are 3 simple steps that need to be completed:

1. NETWORK TEST
2. GATEWAY TEST
3. DISCOVERY



For systems with multiple Cloud Connect Advanced units, these tests need to be performed on each individual Cloud Connect Advance .

Network and Gateway tests can run at the same time on different CCAs. However, Discovery must be initiated on Cloud Connect Advanced one by one, making sure GTWY discovery stage is complete before moving to the next one.

This may take several minutes to several hours depending on the size of the system.

Note:

The discovery process can be initiated for sites with more than 50 Smart Modules only after the online configuration of the system has been completed and downloaded by the Cloud Connect.

This step requires an Internet connection.

6. COMMISSIONING

⇨ Look for the Tigo SMART APP

Requires active mobile data connection

- 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

Available on the Android Market

6. COMMISSIONING

⇨ Smart Phone Connectivity

During the setup process, you'll see in the guide one of two messages Use your phone's settings to toggle between WLAN networks:

Requires active mobile data connection

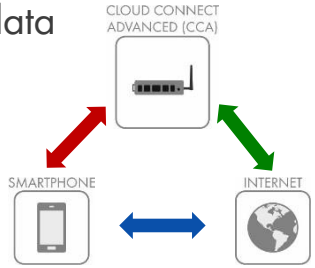
This message implies that the phone should be connected to the Internet and have mobile data enabled

Or

Requires direct WLAN connection to Cloud Connect

This message implies that the phone should be connected to the Cloud Connect using WLAN. The Cloud Connect's WLAN network can be identified by its format: SM-XXXXXXXXXXX

Connection between Cloud Connect Advanced and Internet



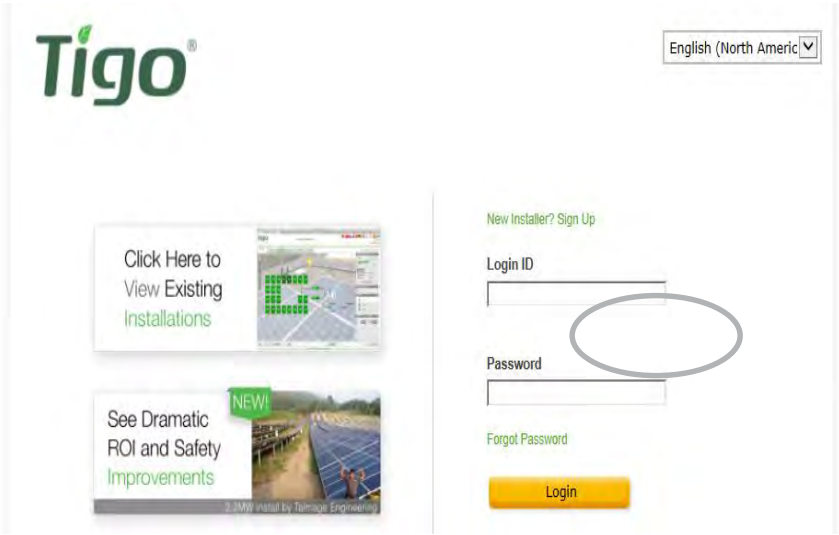
6. COMMISSIONING

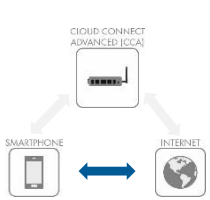
⇨ Enter Your Username and Password, and press [Login]

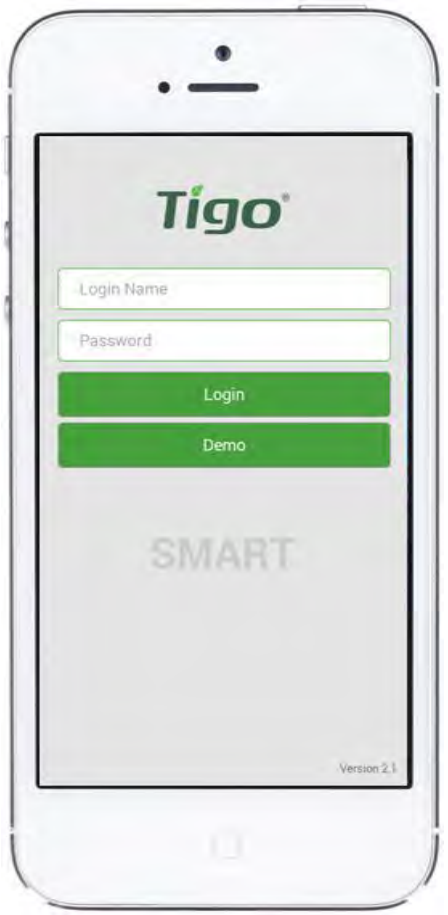
Requires active mobile data connection

If you do not have one, create a new account here:

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







* Log in before connecting to Cloud Connect via WLAN

6. COMMISSIONING

⇨ Press [Installation]

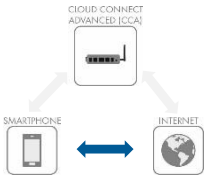
Requires active mobile data connection

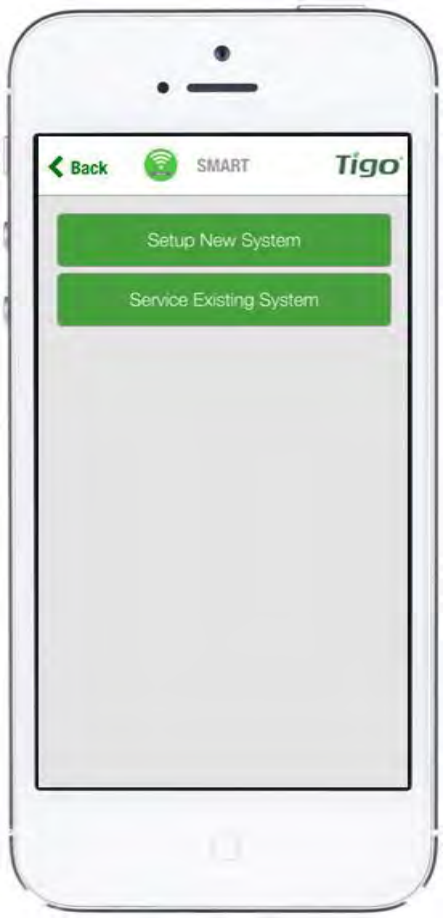


6. COMMISSIONING

⇨ [Setup New System] or [Service Existing System]

Requires active mobile data connection





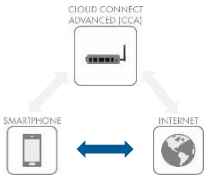
- To proceed with a new installation, select [Setup New System]

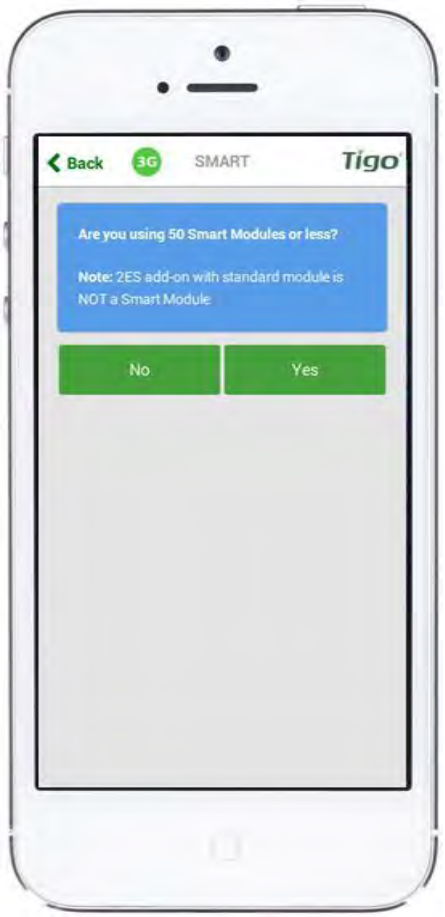
- Select [Service Existing System] to service a Cloud Connect that has already been configured

6. COMMISSIONING

⇨ Confirm System Size

Requires active mobile data connection





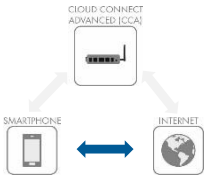
- Systems using fewer than 50 Smart Modules are eligible for automatic configuration – no barcodes needed!

- Selecting [No] will provide a link to the Tigo Energy website and allows you to proceed to Setup Internet Connection

6. COMMISSIONING

⇨ Confirm Configuration

Requires active mobile data connection





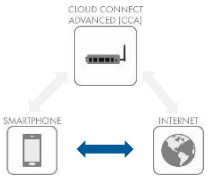
- If the system has already been configured online, select [Yes] and then connect your Smartphone to the Cloud Connect hotspot to proceed

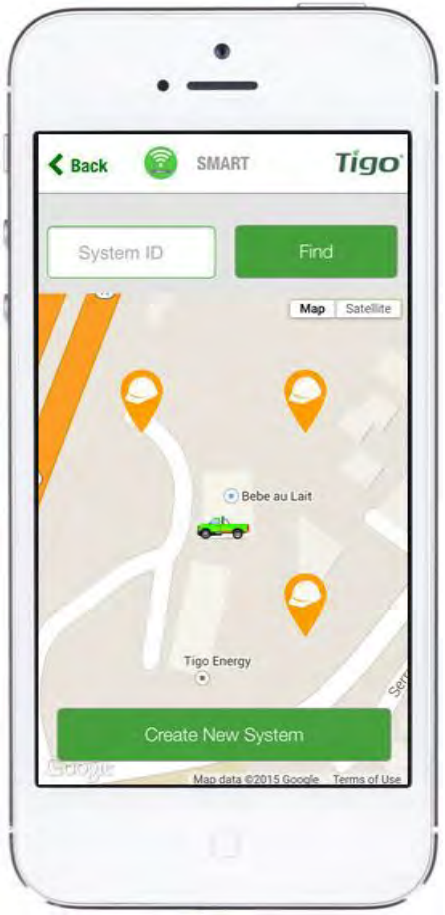
- Selecting [No] will provide options for creating a new system

6. COMMISSIONING

⇨ Press [Create New System]

Requires active mobile data connection





To complete the configuration for an existing system ID

- select the available Cloud Connect Advanced from a map of nearby systems*

Or

- select [Create New System] to create a new system ID

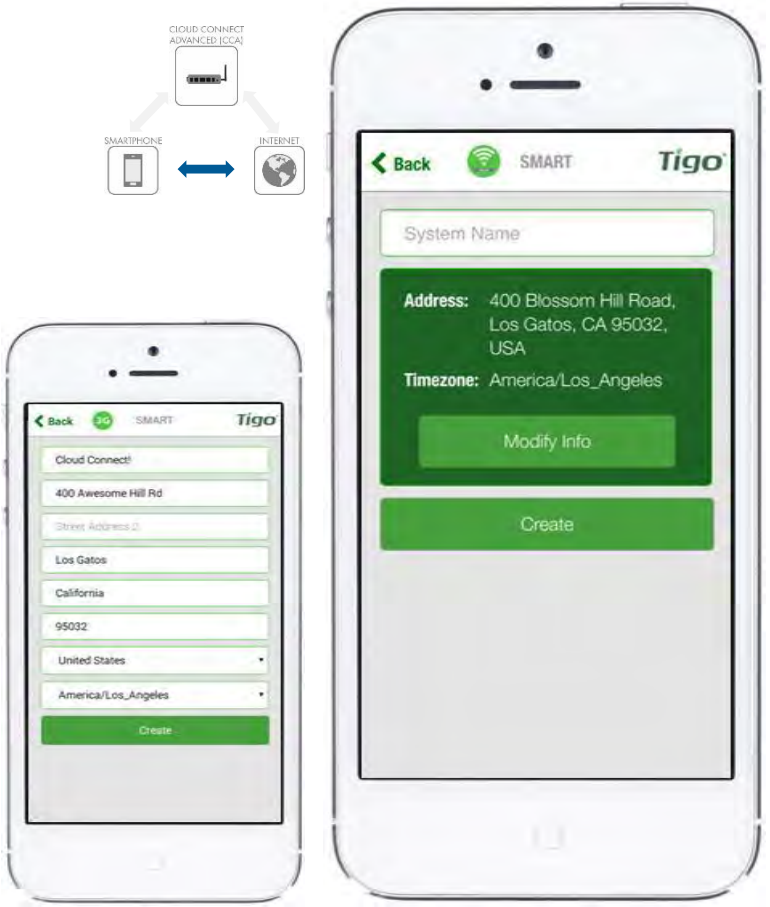
*Map requires Location enabled on Smartphone

6. COMMISSIONING

⇨ Enter system name and verify address and time zone

Requires active mobile data connection

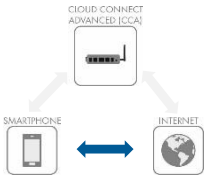
- If either the address or the time zone is incorrect, press [Modify Info] and enter the details
- Once done, press [Create]



6. COMMISSIONING

⇨ Enter the number of gateways and number of smart modules

Requires active mobile data connection





Reminder:

- Systems with more than 50 Smart Modules must be configured online

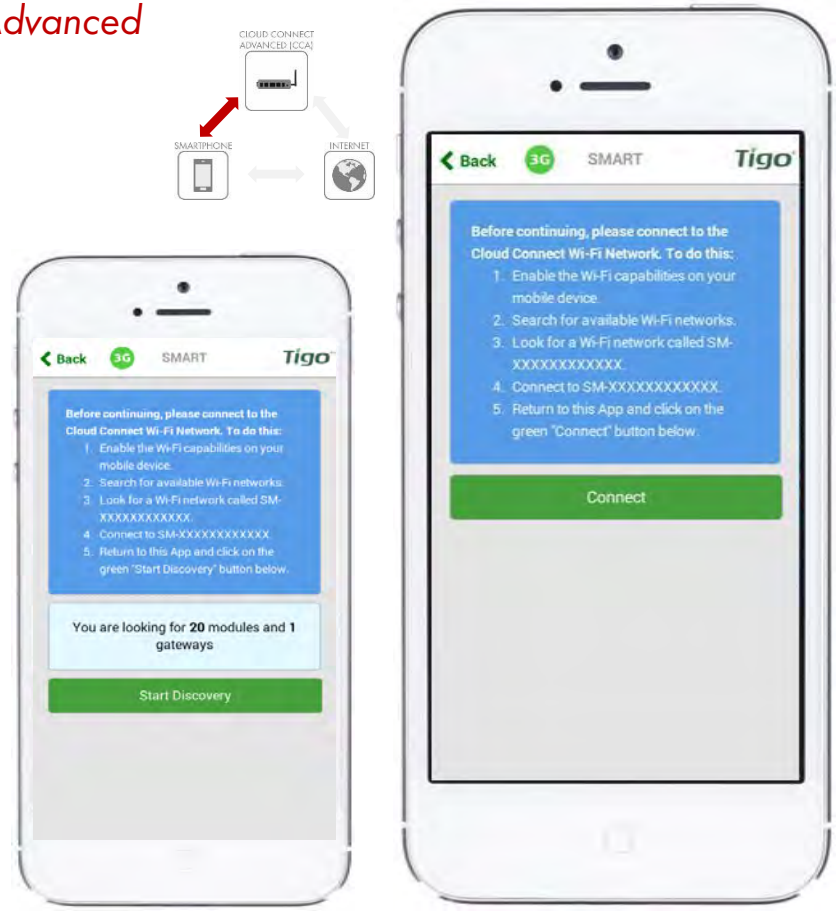
- Network Test and Discovery can be run from the Tigo SMART app once the system is configured

6. COMMISSIONING

⇨ Connect your smartphone to the cloud connect advanced via WLAN

Requires direct WLAN connection to Cloud Connect Advanced

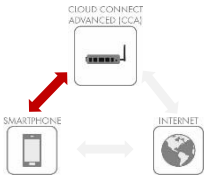
- Enable WLAN in your Smartphone settings
- Locate a WLAN network named SM-XXXXXXXXXXX and connect to it
- Return to the app and press [Start Discovery]

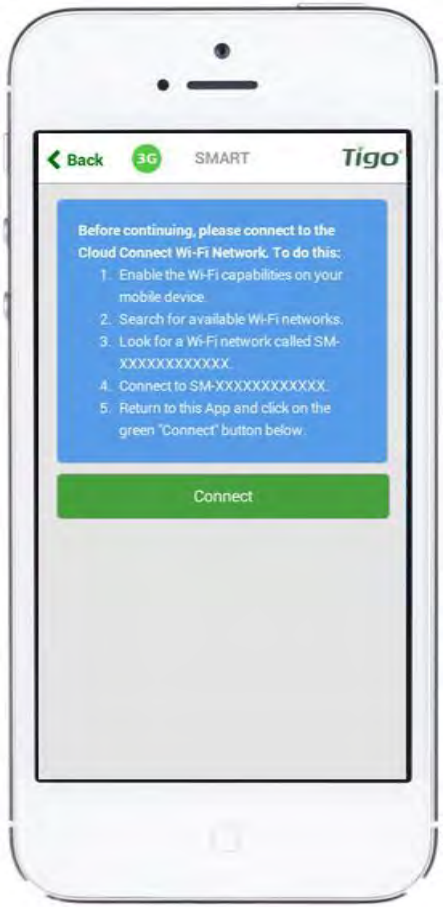


6. COMMISSIONING

⇨ Connect your smartphone to the cloud connect advanced via WLAN (existing systems)

Requires direct WLAN connection to Cloud Connect Advanced



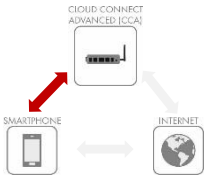


- Enable WLAN in your Smartphone settings
- Locate a WLAN network named SM-XXXXXXXXXXX and connect to it
- Press [Connect] to continue

6. COMMISSIONING

⇨ Main Menu - Options

Requires direct WLAN connection to Cloud Connect Advanced





Available Commands:

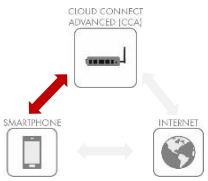
- **Discovery** – Scan for Gateways and Smart Modules
- **Gateway Test** – Perform a test on the Gateway connection
- **Internet Setup** – Configure and test an Ethernet or WLAN connection
- **Status** – View system status and Discovery results

App version 2.2.2

6. COMMISSIONING

⇨ Discovery Process

Requires direct WLAN connection to Cloud Connect Advanced



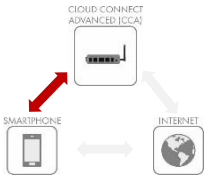


- Press [Discovery]
- Enter number of Gateways and smart modules
- Press [Start] to begin Discovery
- Status shows a progress bar with the option to view more details

6. COMMISSIONING

⇨ Discovery Process

Requires direct WLAN connection to Cloud Connect Advanced



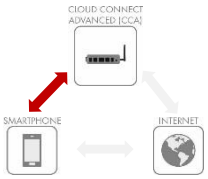


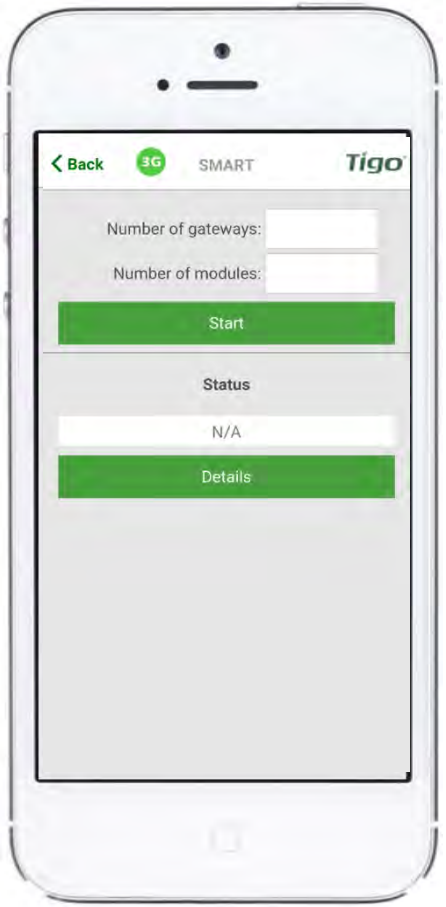
- Press [Discovery]
- Enter number of Gateways and smart modules
- Press [Start] to begin Discovery
- Status shows a progress bar with the option to view more details

6. COMMISSIONING

⇨ Discovery Process

Requires direct WLAN connection to Cloud Connect Advanced

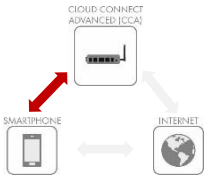




- Press [Discovery]
- Enter number of Gateways and smart modules (if not prepared already online)
- Press [Start] to begin Discovery
- Status shows a progress bar with the option to view more details

6. COMMISSIONING
⇨ Discovery of Gateways and Modules

Requires direct WLAN connection to Cloud Connect Advanced



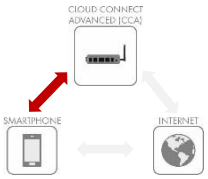


After the Gateways have been found, you can continue with the configuration process while discovery is running in the background

6. COMMISSIONING

⇨ Once Discovery is Complete

Requires direct WLAN connection to Cloud Connect Advanced





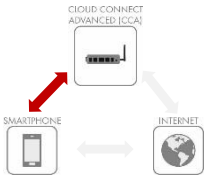
You'll see a confirmation that:

- Discovery Status: Complete
- All modules have been found (e.g. 18 of 18)
- All Gateways have been found (e.g. 1 of 1)

6. COMMISSIONING

⇨ Perform Gateway Test

Requires direct WLAN connection to Cloud Connect Advanced





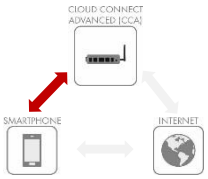
- Press [Gateway Test]
- Run Gateway Test
- Wait while Cloud Connect scans for Gateways
- View results of test

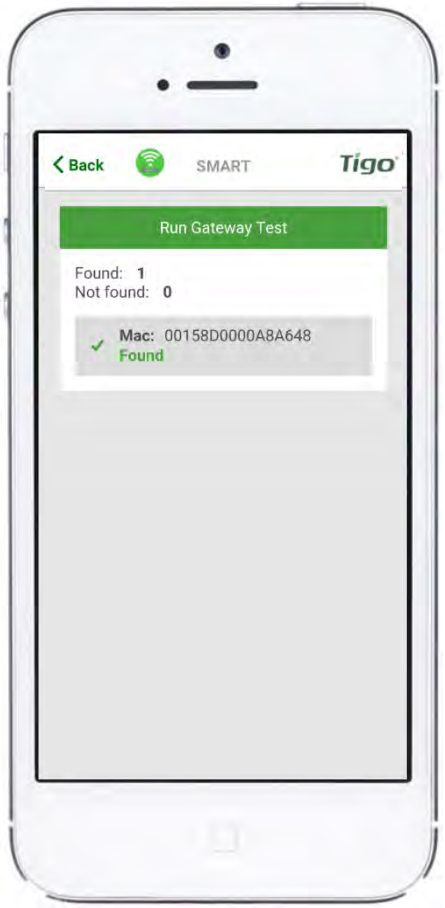
App version 2.2.2

6. COMMISSIONING

⇨ Perform Gateway Test

Requires direct WLAN connection to Cloud Connect Advanced





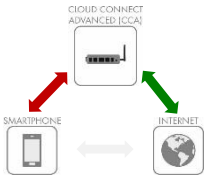
- Press [Gateway Test]
- Run Gateway Test
- Wait while Cloud Connect scans for Gateways
- View results of test

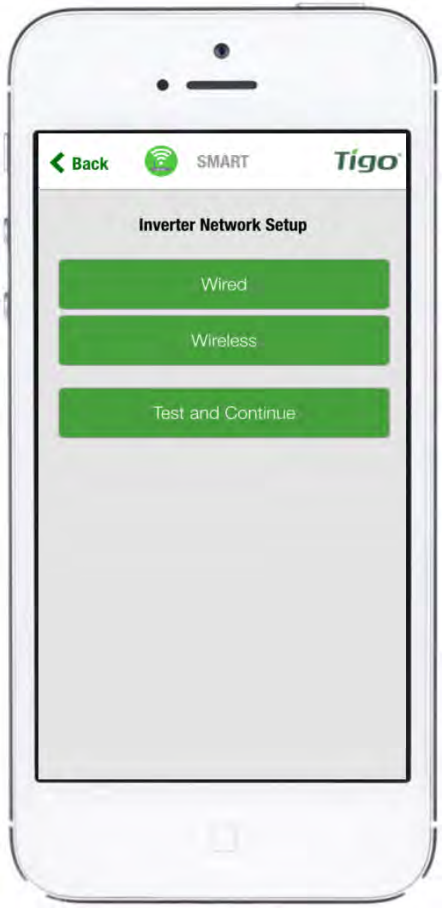
App version 2.2.2

6. COMMISSIONING

⇨ Next Step: Setup Internet Connection

Requires direct WLAN connection to Cloud Connect Advanced





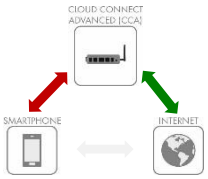
Note: This can run in parallel to Discovery

- Select your preferred method of connecting to the Internet:
  - Wired: using Ethernet cable
  - Wireless: Using WLAN

6. COMMISSIONING

⇨ Selecting Wired Internet Connection

Requires direct WLAN connection to Cloud Connect Advanced



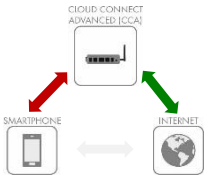


- Open up the following screen
- The app will look for an available Internet connection automatically
- Scroll down and press [Test and Continue]
- Wired connections can be configured for Dynamic (DHCP) or Static IP in the app

6. COMMISSIONING

⇨ Selecting Wireless Internet Connection

Requires direct WLAN connection to Cloud Connect Advanced



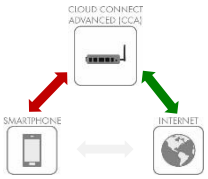


- Opens up a screen showing the available wireless Internet connections
- Make sure you have the name and password for the home network
  > Please note that WPS is not supported by the Cloud Connect
- After selecting a wireless network press [Test and Continue]

6. COMMISSIONING

⇨ Network Test Will Run for Several Seconds

Requires direct WLAN connection to Cloud Connect Advanced



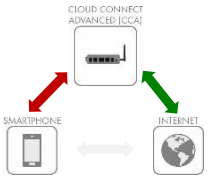


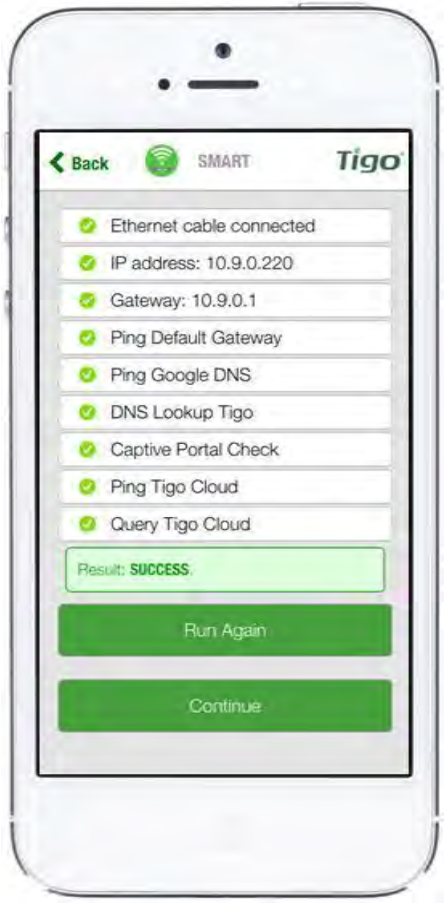
- The Network Test can diagnose problems with the Internet connection
- Please note that when the Cloud Connect Advanced is mounted inside a metal enclosure, it may not receive a WLAN signal unless the antenna is mounted outside of the enclosure.

6. COMMISSIONING

⇨ And End Up with the Following Screen

Requires direct WLAN connection to Cloud Connect Advanced

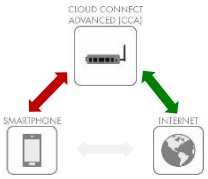


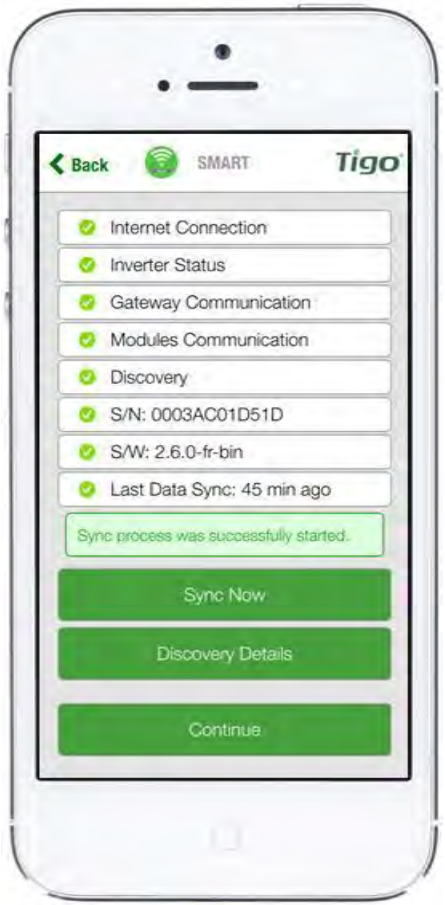


- Press [Continue]

6. COMMISSIONING
⇨ Network Test Complete

Requires direct WLAN connection to Cloud Connect Advanced





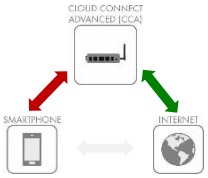
- At this point the configuration process is almost complete

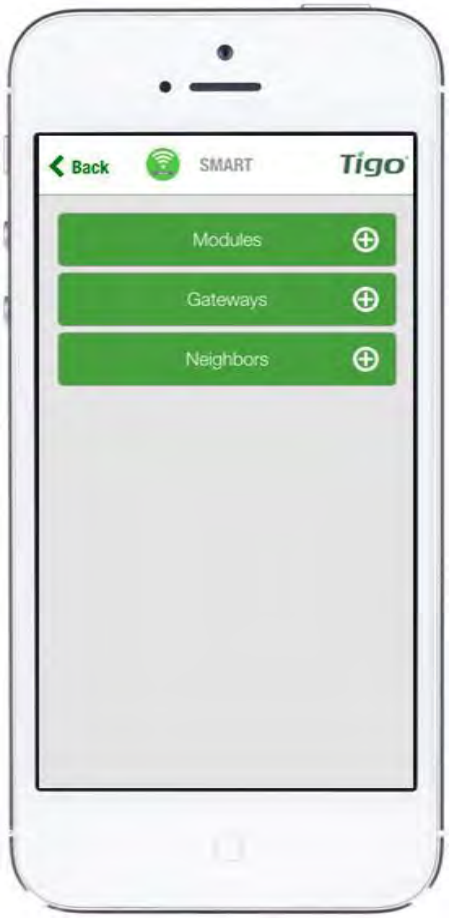
- Press [Discovery Details] to make sure discovery process has found all Smart Modules

6. COMMISSIONING

⇨ Discovery Details

Requires direct WLAN connection to Cloud Connect Advanced





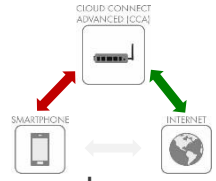
- Once the Discovery process is complete, this screen will appear and display real time data collected from the Smart Modules, Gateways, and neighboring Smart Modules

- Expand the menus to view data

6. COMMISSIONING

⇨ Use the [Modules] Screen to Complete Commissioning

Requires direct WLAN connection to Cloud Connect Advanced



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



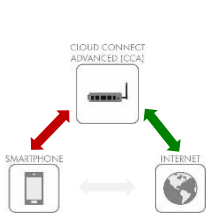


6. COMMISSIONING

⇨ Pressing [Back] will return to this page

Requires direct WLAN connection to Cloud Connect Advanced

- Press [Continue]

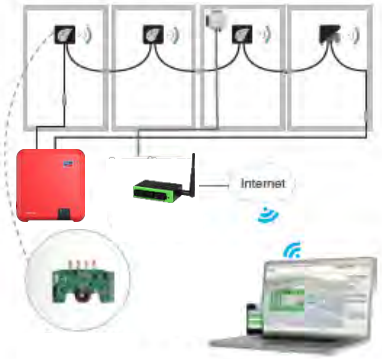




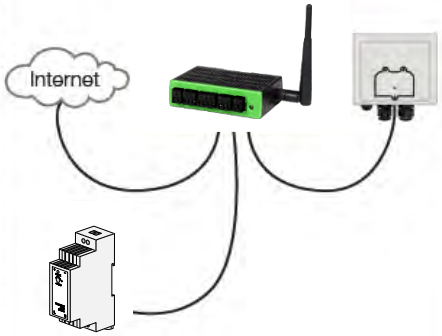
REGISTRATION SUNNY PORTAL (STEP 7)

QUICK INSTALLATION GUIDE

1. System Overview In Office Preparation



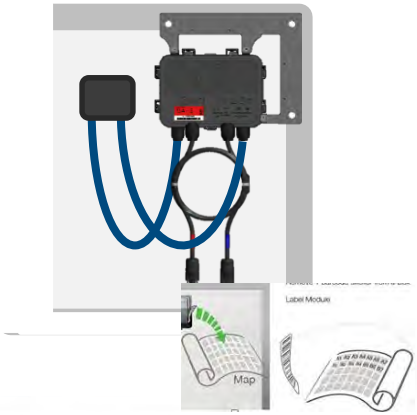
2. Installing Cloud Connect Advanced (CCA)



3. Installing Gateways (GTWY)



4. Installing and Mapping TS4-R



5. Configuring the System Online



6. Commissioning



7. Registration Sunny Portal



QUICK INSTALLATION GUIDE

1. System Overview
In Office Preparation

2. Installing Cloud Connect Advanced (CCA)

3. Installing Gateways (GTWY)

4. Installing and Mapping TS4-R

5. Configuring the System Online

6. Commissioning

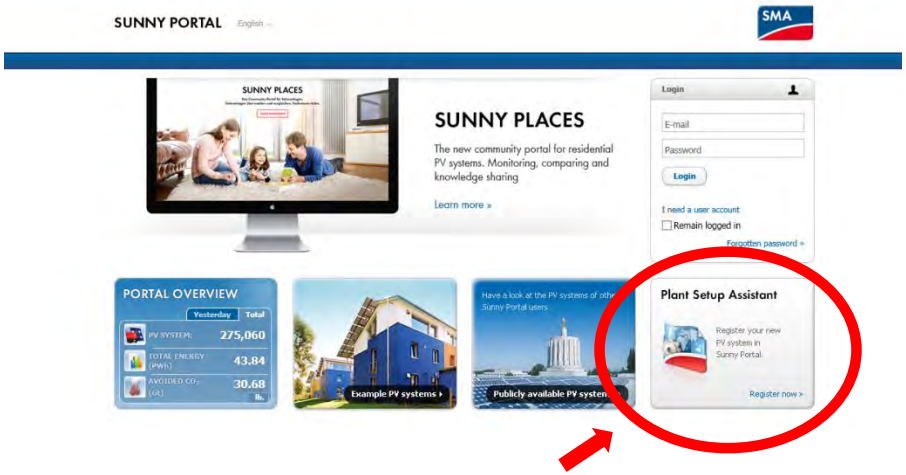
7. Registration Sunny Portal

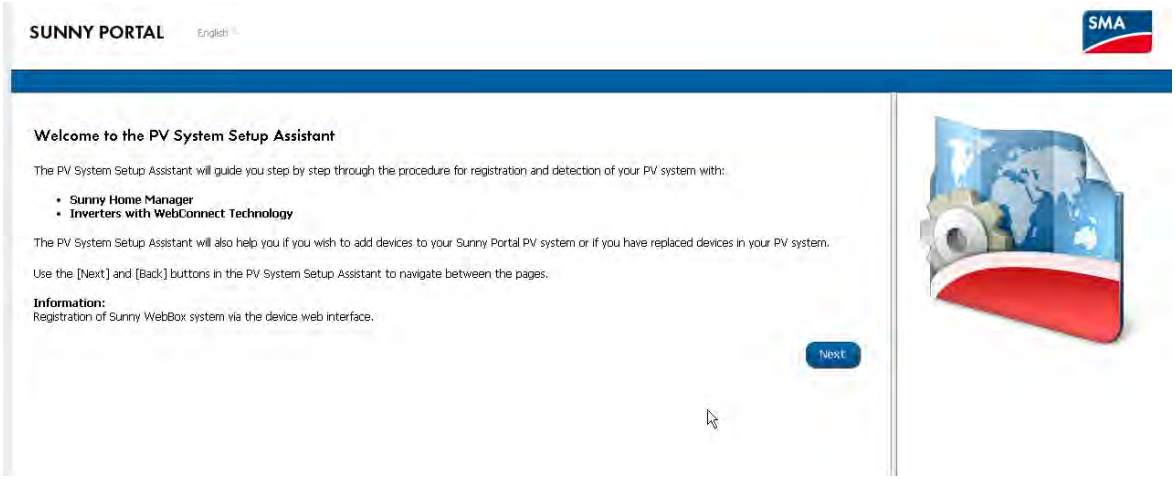


7. REGISTRATION SUNNY PORTAL –
Plant setup assistant

Plant Setup Assistant

- Start commissioning at Sunny Portal via *Plant Setup Assistant*
  - ➢ For Sunny Home Manager Systems
  - ➢ For WebConnect Systems

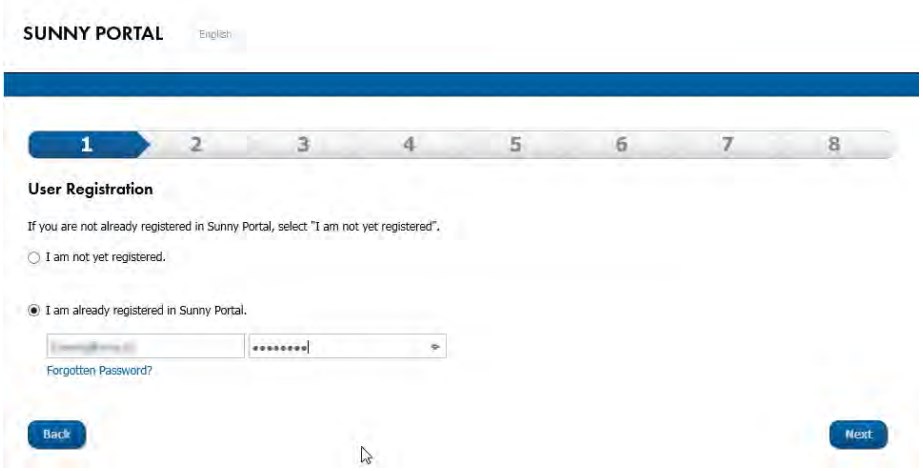


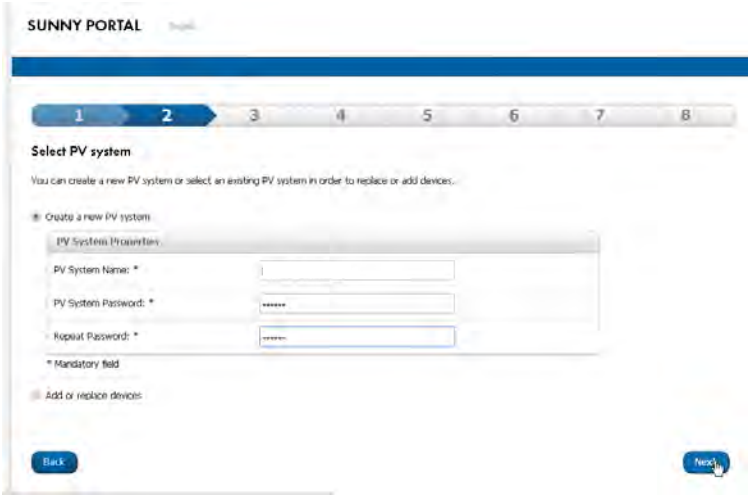


7. REGISTRATION SUNNY PORTAL –
Plant Setup assistant

Plant Setup Assistant

- Login / User Registration
- Enter PV System name and Speedwire Installer password

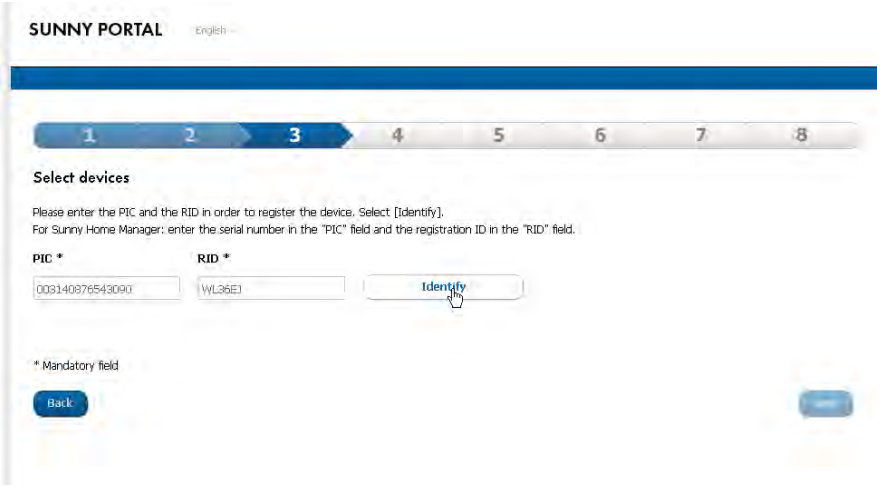


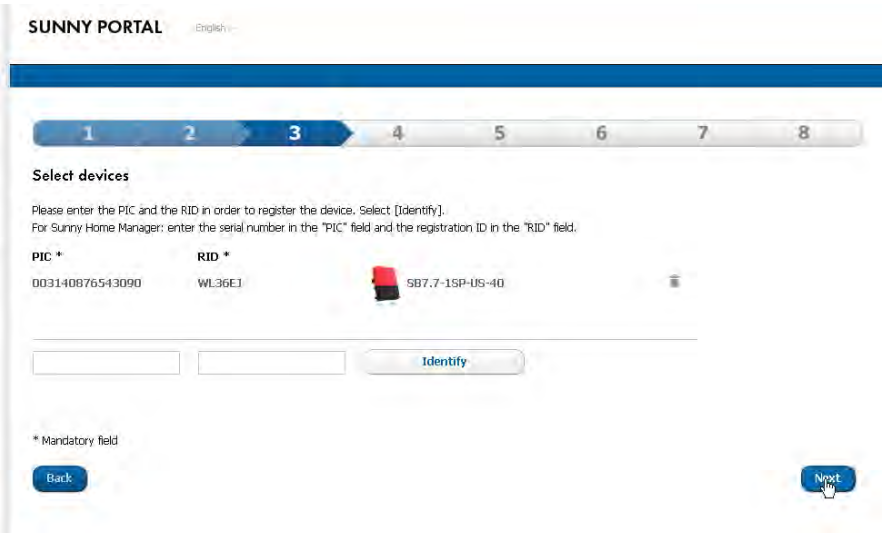


7. REGISTRATION SUNNY PORTAL –
Plant Setup assistant

Plant Setup Assistant

- Enter inverters PIC & RID
- (repeat for systems with multiple inverters)

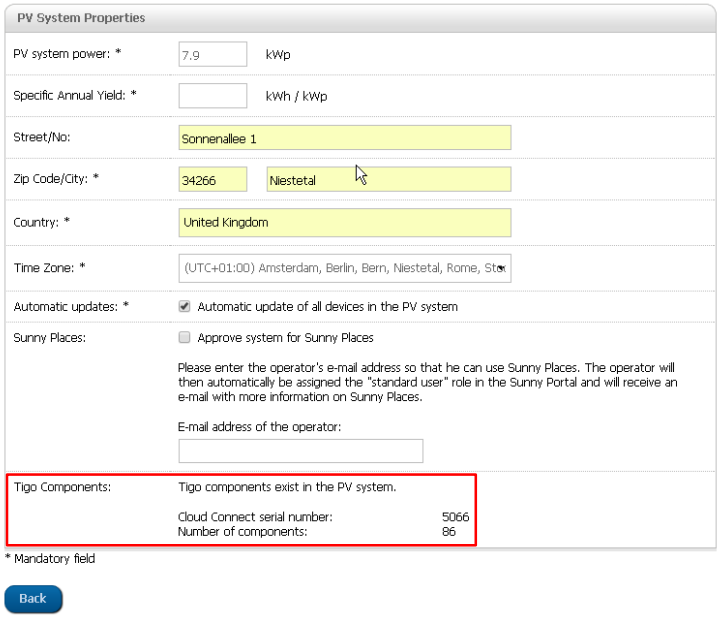


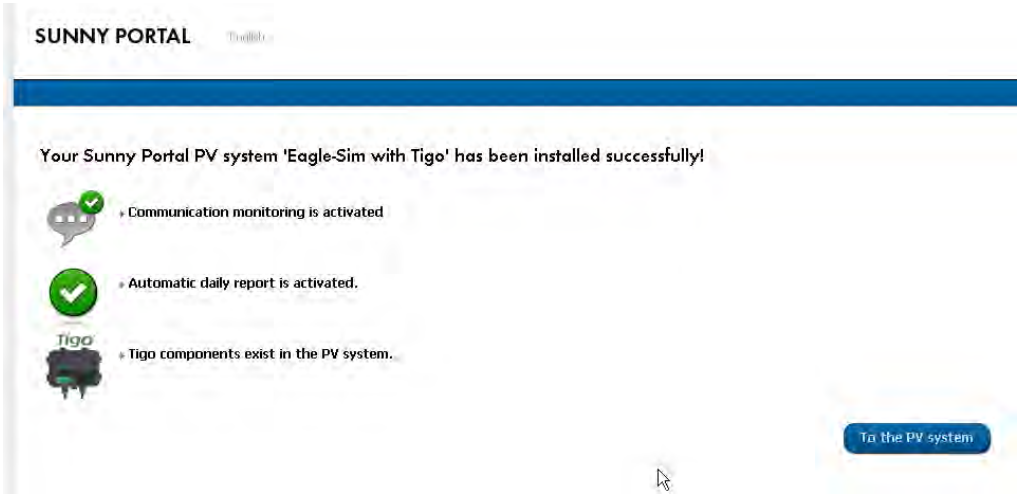


7. REGISTRATION SUNNY PORTAL –
Plant Setup assistant

Plant Setup Assistant

- In background Sunny Portal searches a Tigo system with an inverter with same serial ID
- For systems with multiple inverters, searches one by one until a system is found
- Search result is shown on PV System Properties page

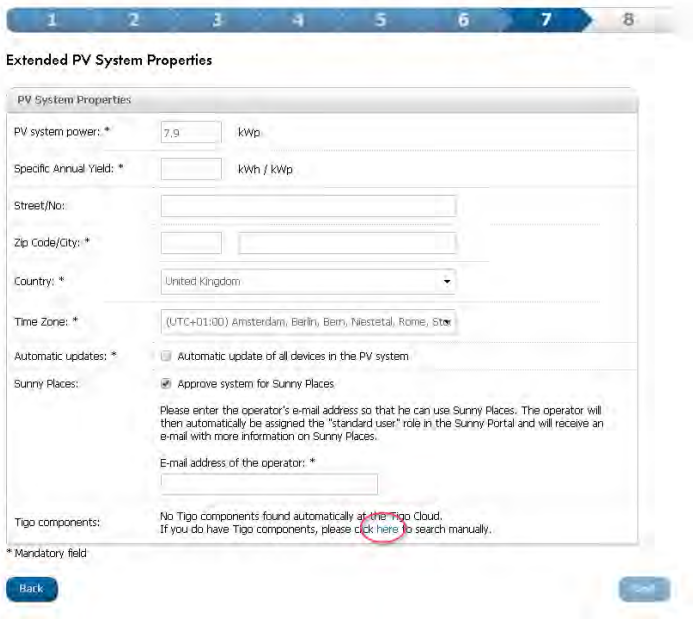


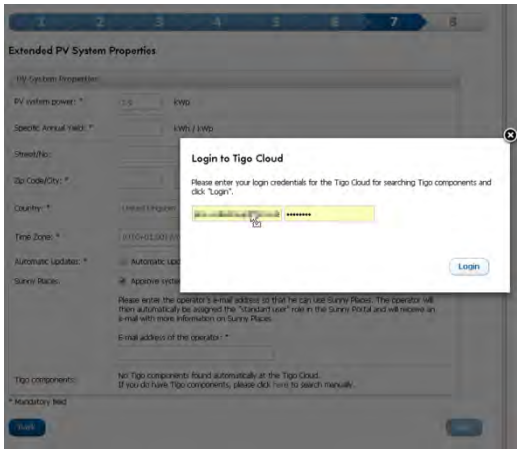


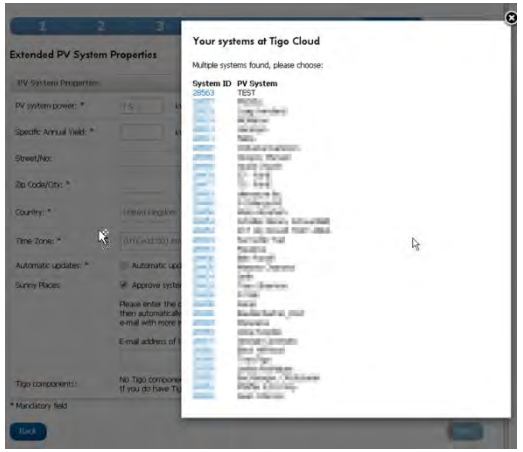
7. REGISTRATION SUNNY PORTAL –
Plant Setup assistant

Plant Setup Assistant

- If no Tigo system found, user can search with Tigo User Account
- User enters Tigo Username and password
- Users chooses tigo system via dialog ➔ only Tigo Systems with SMA inverters are listed







7. REGISTRATION SUNNY PORTAL – commissioning in already existing PV

PV System Properties

- Tigo commissioning in already existing PV systems is available on page „PV System propetires“, tab „parameters“
- Searches first for Tigo system with same inverter serials (like Plant Setup Assistent)
- If no system found, search with Tigo User Credentials will be available (like Plant Setup Assistent)

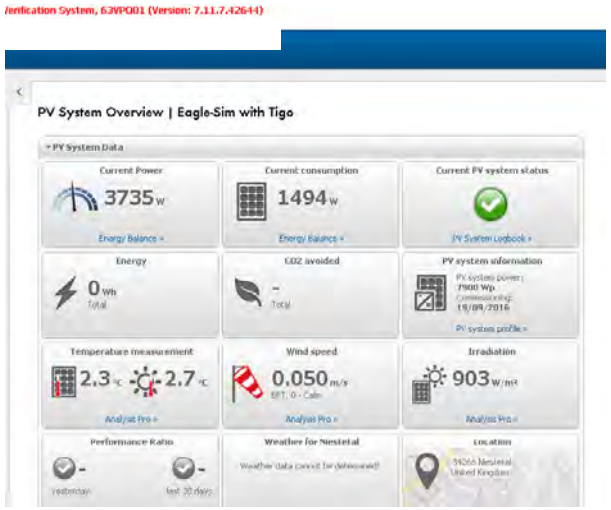


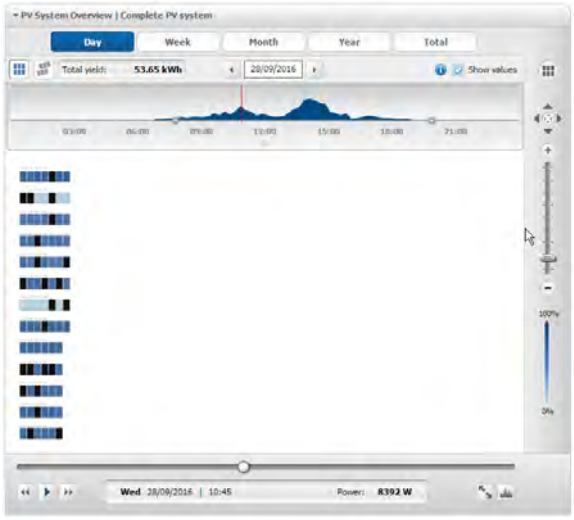


7. SUNNY PORTAL – VISUALIZATION

Panel Level Monitoring

- On page „PV System Overview“, the PLM (Panel Level Monitoring) view is shown below the widgets
- Layout is currently copied from Tigo Cloud. Configuration at SP is disabled.
- Copying data from Tigo cloud is frequently copied. May take up to 30 minutes until data is initially shown





7. SUNNY PORTAL – VISUALIZATION

Analysis Pro

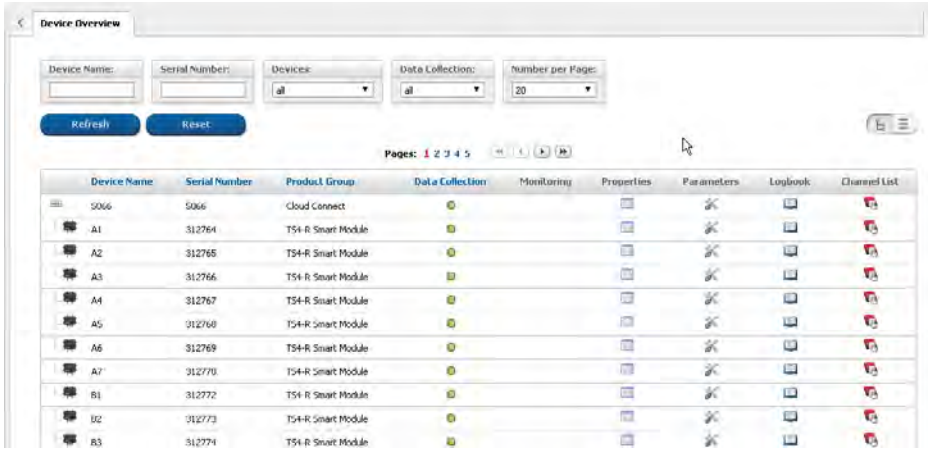
- Optimizer's DC-Power and DC-Voltage is available at Page *Analysis Pro*



7. SUNNY PORTAL – VISUALIZATION

Device Overview

- Cloud Connect and optimizers are listed in the Device Overview



ENERGY
THAT
CHANGES

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