

# TS4 commissioning using inverters with integrated Cloud Connect



# Commissioning of PV Systems with TS4



The TS4 commissioning process may differ depending on the type of system.  
Only use one of the methods:

## External Cloud Connect Advanced (CCA)

- TS4 commissioning via Tigo Portal and Tigo Smart App
- Up to 7 gateways per CCA



## Integrated Cloud Connect functionality

- TS4 commissioning via integrated inverter WebUI
- Up to 3 gateways per inverter

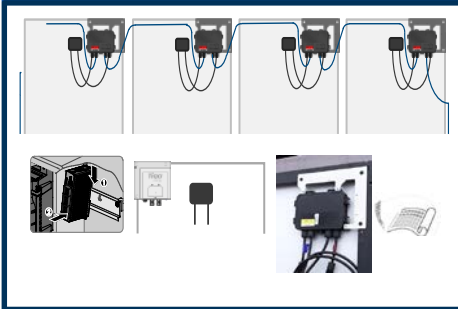


- Only use the inverter WebUI and Sunny Portal

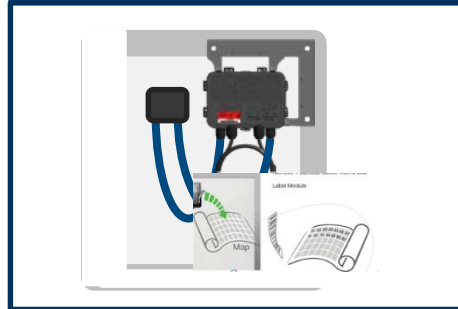
# TS4 commissioning with integrated Cloud Connect\*



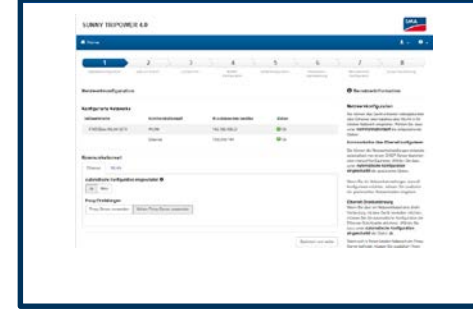
## 1. Installation of Gateways & TS4-R



## 2. Creation of layout plan



## 3. Commissioning via inverter WebUI



## 4. Registration of PV system in Sunny Portal

- Layout

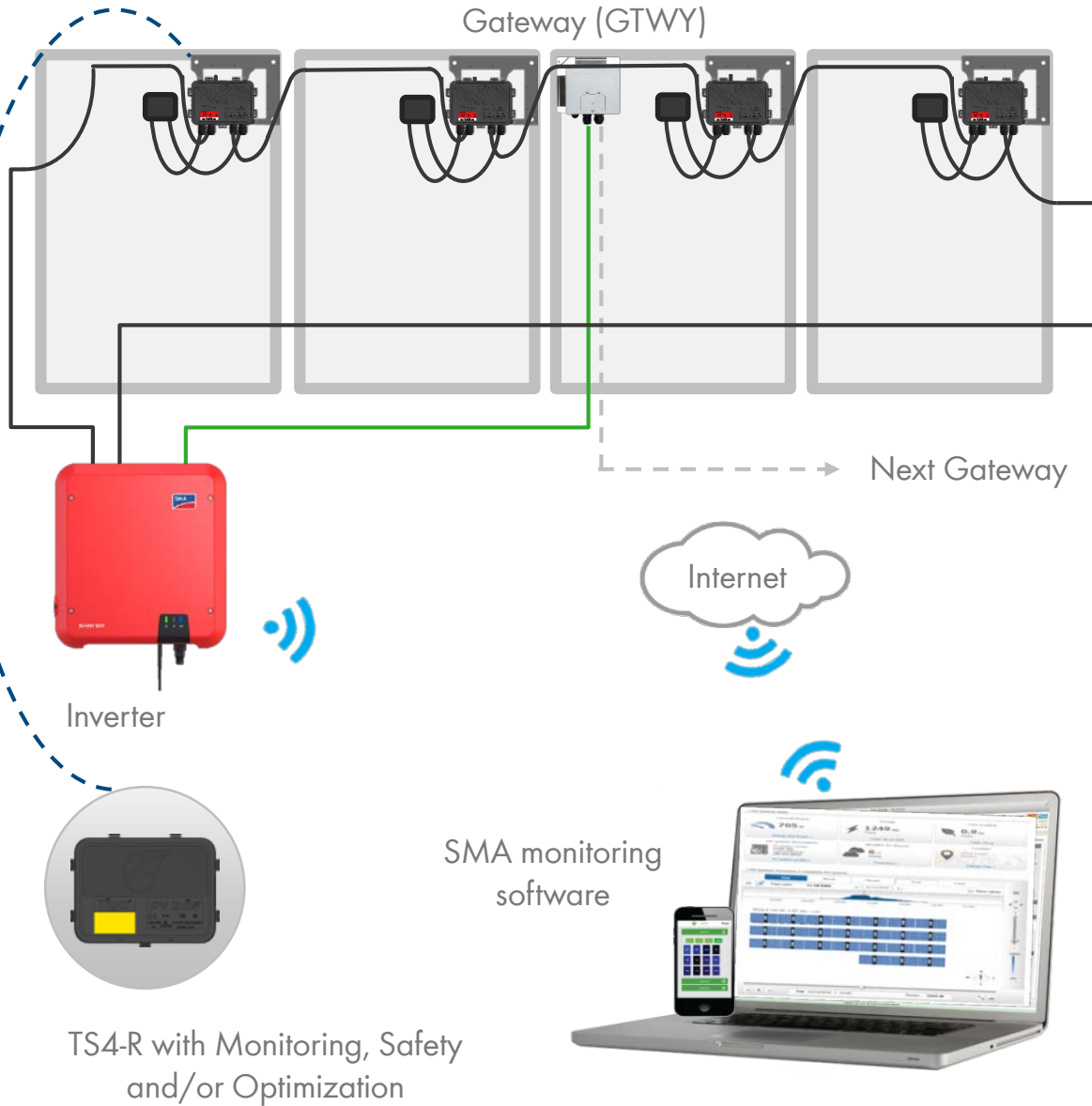


In the office

Onsite

\* Follow the instructions of a separate manual in case of an external Cloud Connect CCA

# SYSTEM OVERVIEW: with integrated Cloud Connect



## DESIGN RULES:

### 1 CLOUD CONNECT ADVANCED (CCA):

- Up to **3** GTWYs and 360 PV modules
- All smart modules in the same string must be assigned to the same CCA.

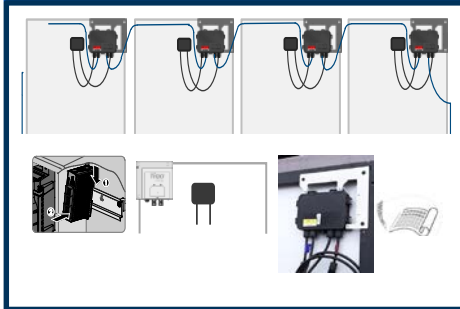
### 1 GATEWAY (GTWY):

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

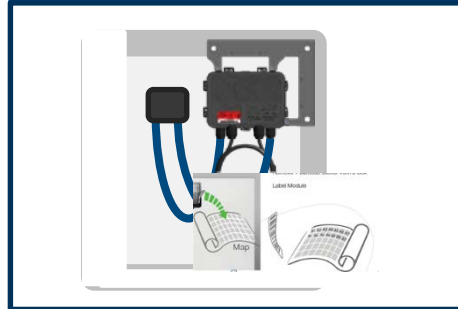
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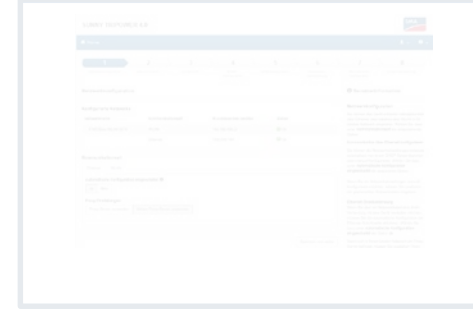
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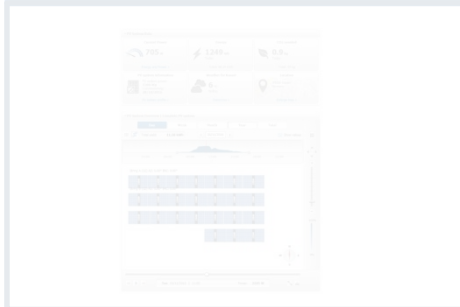


## 3. Commissioning via inverter WebUI



## 4. Registration of PV system in Sunny Portal

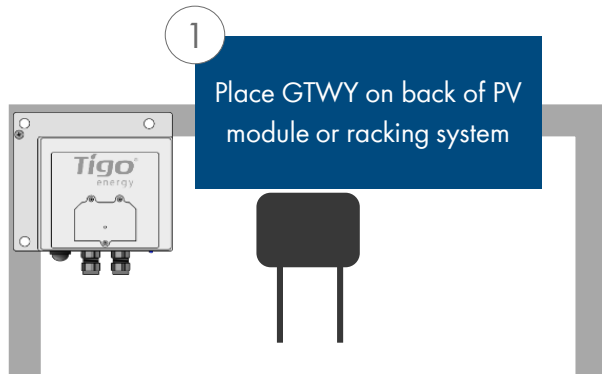
- Layout



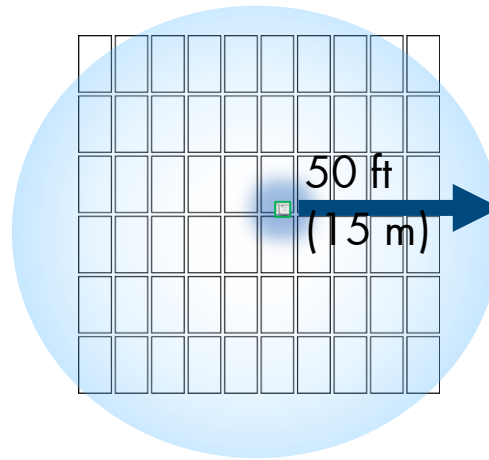
In the office

Onsite

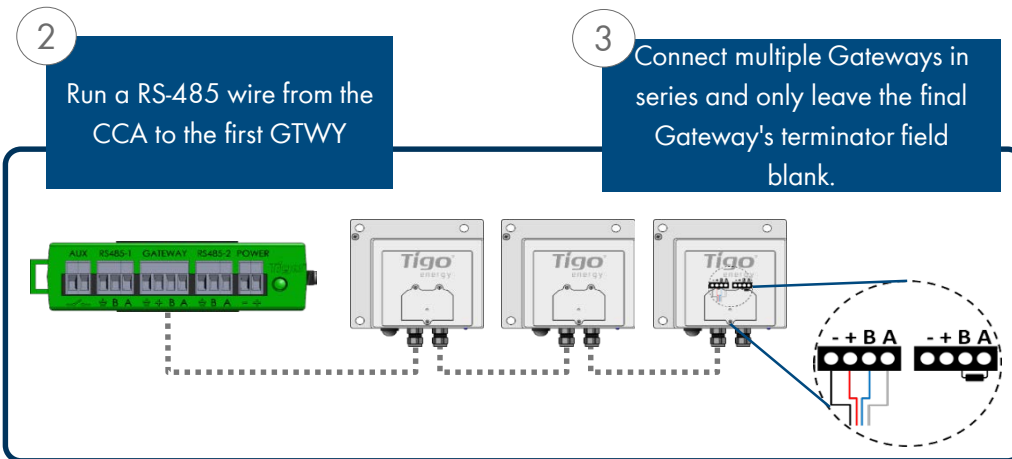
# Installing Gateways (GTWY)



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

## Additional information:

- [Gateway Hardware Guide](#)
- [Gateway Placement Guide](#)
- [Communication Cable Guide](#)

# Installing Gateways (GTWY)



## Color code of status LED of Gateway

### In the initial state, before "Discovery"

- LED is glowing blue



### During commissioning / "Discovery"

- LED flashes white



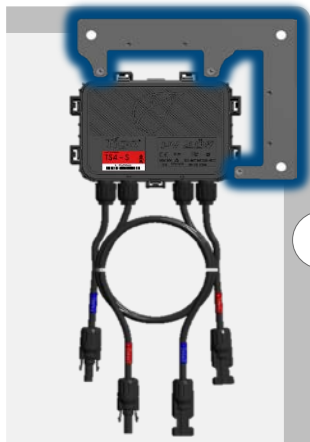
### After commissioning / "Discovery"

- Blue LED flashing every 2 seconds
- LED flashing rapidly yellow

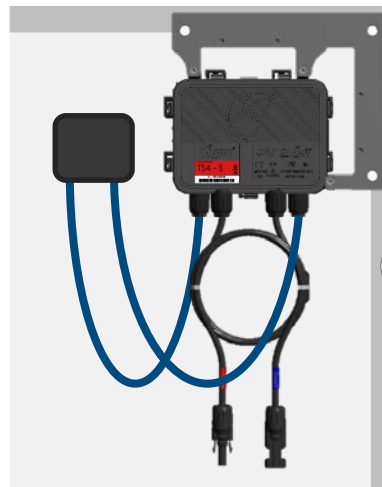


Status LED

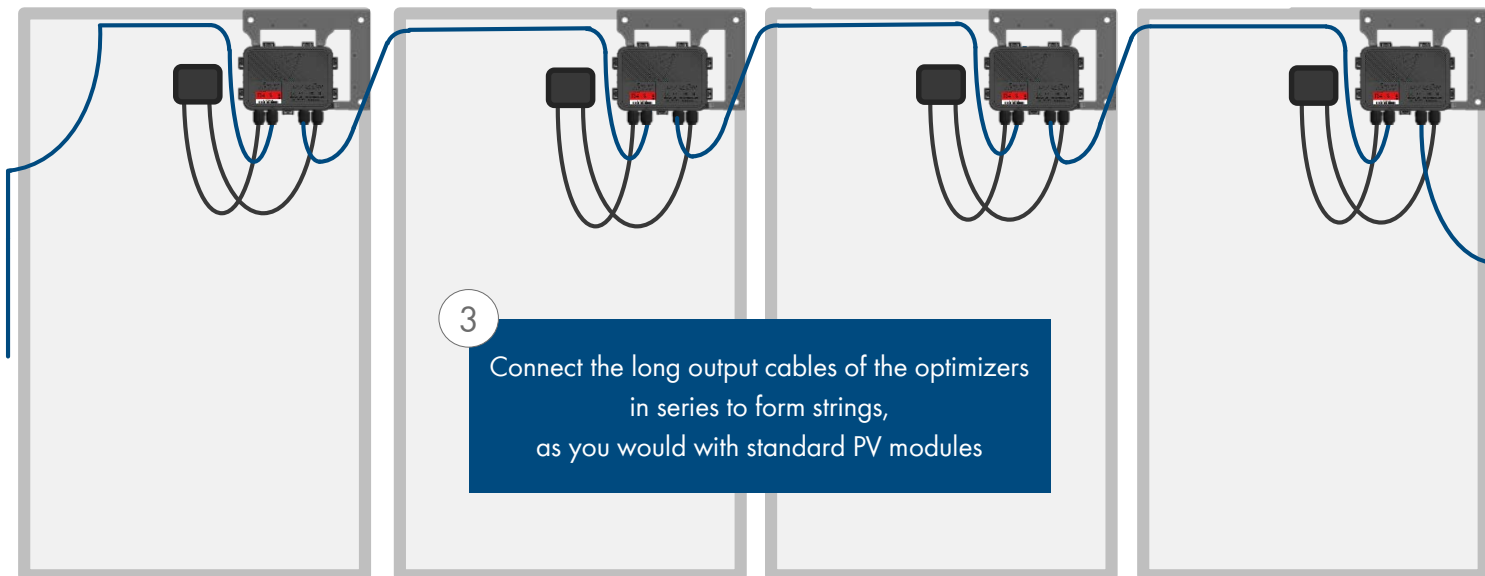
# Installation of TS4 and creation of layout plan (TS4-R)



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



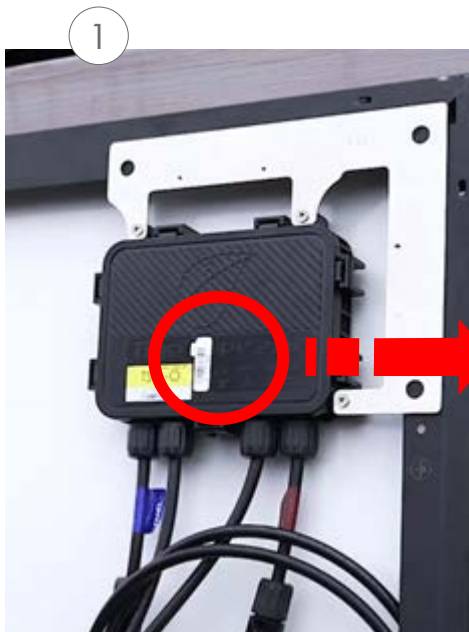
3 Connect the long output cables of the optimizers in series to form strings, as you would with standard PV modules



Observe the sequence of the action steps to avoid damaging the product.

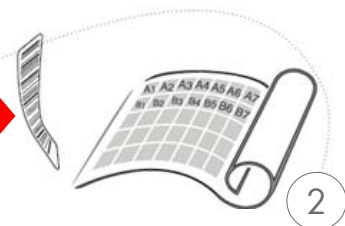


# Installation of TS4 and creation of layout plan (TS4-R)



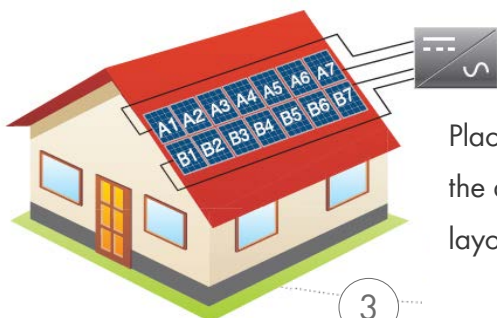
1

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



2

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



3

Place PV modules so that they match the alignment of the barcodes on the layout plan.

Also record the serial numbers of the GTWY(s)

## TEMPLATES:

Create your layout plan using Tigo's string list template. To view and download, [CLICK HERE](#).

Another option is to first create your layout plan 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 layout step and go straight to commissioning.

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

# Measurements during commissioning



All measurements can be carried out as usual during commissioning. Deviating from usual measurements, currents may only be measured via the operating-current monitoring system when using TS4 optimizers. This must be carried out during feed-in operation. Test-voltage specifications remain unaffected when using TS4 optimizers.

The following test measurements must be carried out when commissioning a PV system with TS4 optimizers:

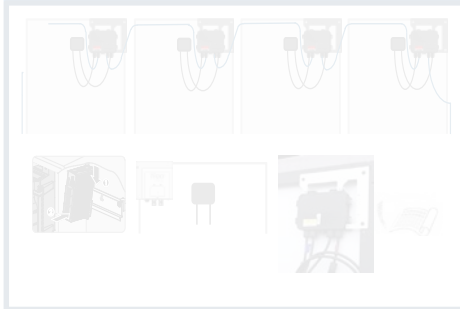
## **Recommended procedure:**

1. Carry out the following test measurements before commissioning TS4 communications:
  - Check polarity.
  - Check open-circuit voltage of string.
  - Check insulation resistance of DC circuit.
2. Commission entire system.
3. Carry out the following test measurements after commissioning TS4 communications:
  - Check string-circuit currents (during feed-in operation).
  - Measure insulation resistance of module string.
  - Carry out function test.

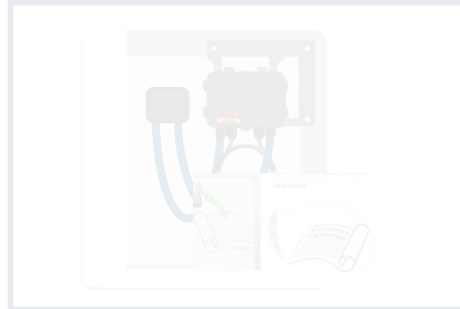
# TS4 commissioning with integrated Cloud Connect



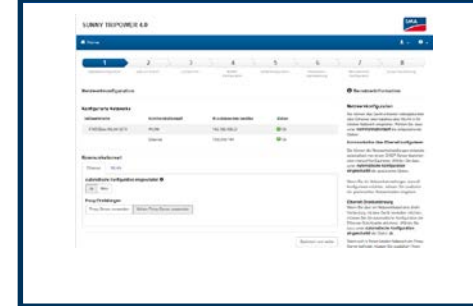
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## 2. Creation of layout plan

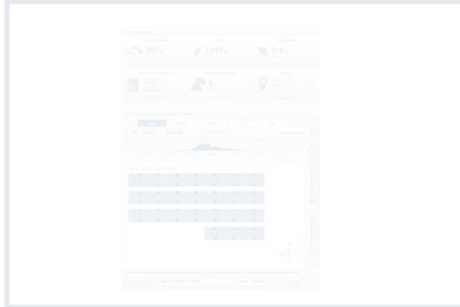


## 3. Commissioning via inverter WebUI



## 4. Registration of PV system in Sunny Portal

- Layout



In the office

Onsite

# Device configuration via inverter webserver with integrated Cloud Connect



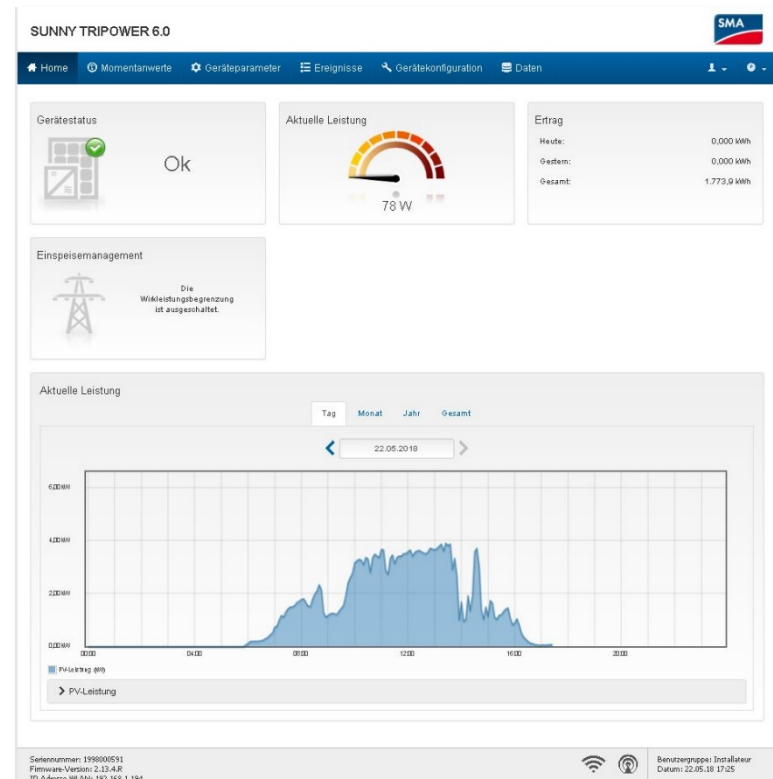
Login

Sprache

Benutzergruppe

Passwort

[Passwort vergessen?](#)




1. Select "Installer" user group and enter password.



2. Start the installation assistant.

# Device configuration via inverter webserver with integrated Cloud Connect\*



## SUNNY TRIPOWER 6.0



Home  

- 1 Netzwerkkonfiguration
- 2 Zeit und Datum
- 3 Ländernorm
- 4 RS485 Konfiguration
- 5 Netzsystemdienstleistung
- 6 Modultechnik-Konfiguration
- 7 Zusammenfassung

### Netzwerkkonfiguration

#### Konfigurierte Netzwerke

Netzwerkname	Kommunikationsart	IP-Adresse des Gerätes	Status
WiVoKa	WLAN	192.168.1.194	✔ Ok
	Ethernet		✘ Keine Verbindung

#### Kommunikationsart

Ethernet  WLAN

**Automatische Konfiguration eingeschaltet** ⓘ

Ja  Nein

**Proxy-Einstellungen**

Proxy-Server verwenden  Keinen Proxy-Server verwenden

#### Benutzerinformation

##### Netzwerkkonfiguration

Sie können das Gerät entweder kabelgebunden über Ethernet oder kabellos über WLAN in Ihr lokales Netzwerk integrieren. Wählen Sie dazu unter **Kommunikationsart** die entsprechende Option.

##### Kommunikation über Ethernet konfigurieren

Sie können die Netzwerkeinstellungen entweder automatisch von einem DHCP-Server beziehen oder manuell konfigurieren. Wählen Sie dazu unter **Automatische Konfiguration eingeschaltet** die gewünschte Option.

Wenn Sie die Netzwerkeinstellungen manuell konfigurieren möchten, müssen Sie zusätzlich die gewünschten Netzwerkdaten eingeben.

##### Ethernet-Direktverbindung

Wenn Sie über ein Netzwerk Kabel eine direkte Verbindung mit dem Gerät herstellen möchten, müssen Sie die automatische Konfiguration der Ethernet-Schnittstelle aktivieren. Wählen Sie dazu unter **Automatische Konfiguration eingeschaltet** die Option **Ja**.

Wenn sich in Ihrem lokalen Netzwerk ein Proxy-Server befindet, müssen Sie zusätzlich Proxy-Einstellungen vornehmen. Die Proxy-Einstellungen werden für die Verbindung zum Sunny Portal und für das Firmware-Update des Gerätes benötigt.

> Follow the instructions of the installation assistant.

\* The number of steps varies in terms of different inverter types

# Device configuration via inverter webserver with integrated Cloud Connect\*



- > When you reached the "RS485 configuration" step, select "Module technology" from the respective drop-down list.

**SUNNY TRIPOWER 4.0**

Home

1 Netzwerkkonfiguration 2 Zeit und Datum 3 Ländermom 4 **RS485 Konfiguration** 5 Zählerkonfiguration 6 Netzsystemdienstleistung 7 Modultechnik-Konfiguration 8 Zusammenfassung

**RS485 Konfiguration**

RS485-Schnittstelle

RS485

**Abschlusswiderstand RS485-Schnittstelle**

Ein

**Einsatzzweck RS485-Schnittstelle**

Modultechnik

**Speichern und weiter**

**Benutzerinformation**

**RS485 Konfiguration**

Auf dieser Seite wählen Sie aus, für welchen Einsatzzweck Sie die RS485 Schnittstelle nutzen möchten.

Wählen Sie den Eintrag **SMA Data**, wenn an der RS485-Schnittstelle ein RS485-Kommunikationsbus angeschlossen ist, über den der Wechselrichter mit SMA Kommunikationsprodukten verbunden ist.

Wählen Sie den Eintrag **Energiezähler** aus, wenn an der RS485-Schnittstelle ein Energiezähler angeschlossen ist.

Wählen Sie den Eintrag **Modultechnik** aus, wenn an der RS485-Schnittstelle das Gateway der TS4 Modultechnik angeschlossen ist.

Click **Module technology**

Select Terminator **On** (Default value)

Click **Save and next**

- > Continue to follow the instructions of the installation assistant

\* The number of steps varies in terms of different inverter types

# Device configuration via inverter webserver with integrated Cloud Connect\*



> Start configuration with the number of Gateways and click Continue to proceed.

SUNNY TRIPOWER 6.0

Home

1 2 3 4 5 6 7

Netzwerk-Konfiguration Zeit und Datum Ländername RS485 Konfiguration Netzsystemdienstleistung **Modultechnik-Konfiguration** Zusammenfassung

Modultechnik-Konfiguration

System-Konfiguration

Anzahl Gateways

0 (0 ... 3)

Zurück

String-Konfiguration

Wechselrichter-Eingang	Anzahl Strings	Bezeichnung	Anzahl PV-Module im String	Anzahl der TS4 im String
A	0	A_	0	0
B	0	B_	0	0

Zurück Weiter

Benutzerinformation

String-Konfiguration

Tragen Sie die Anzahl der Strings ein, die in dem jeweiligen Eingang angeschlossen sind und geben Sie die Anzahl der PV-Module sowie die Anzahl der TS4 im String ein. Anhand dieser Angaben kann im nächsten Schritt eine genaue Zuordnung der Seriennummern der TS4 in einem String erfolgen.

Seriennummer: 1998000591  
Firmware-Version: 2.13.5.R  
IP-Adresse WLAN: 192.168.1.194

Seriennummer: 1998000591  
Firmware-Version: 2.13.5.R  
IP-Adresse WLAN: 192.168.1.194

Benutzergruppe: Installateur  
Datum: 28.05.18 14:48

Step 1:  
Enter  
the **number** of the  
Gateways installed [1...3]

Configure strings for  
MPP tracker A and B  
in the **String  
configuration** area

Click **Continue** to  
proceed

> In the subsection "String configuration", enter the number of strings, PV modules per string and TS4s per string.

\* The number of steps varies in terms of different inverter types

# Device configuration via inverter webserver with integrated Cloud Connect\*



> In subsection "A" and "B", enter the TS4 serial numbers and click "Continue" to proceed.

**SUNNY TRIPOWER 6.0**

Home

1 Netzwerk-Konfiguration 2 Zeit und Datum 3 Ländernorm RS485 Konfiguration

**Modultechnik-Konfiguration**

System-Konfiguration String-Konfiguration A B Status

Bezeichnung	TS4 Seriennummer
AA1	4-000000
AA2	4-000000
AA3	4-000000

Die Anzahl der eingetragenen Seriennummern ist ...

4-000000  
4-000000  
4-000000

Suche starten

Weiter

Start search and wait (3 to 10 min)

Click Continue to proceed

Enter the **serial numbers** of the TS4 modules for the strings A and B

- > To conclude, start the search for the TS4 (This may take a few minutes).
- > Click "Continue" to proceed. When the Gateways and TS4s have been found, continue to follow the instructions of the installation assistant.

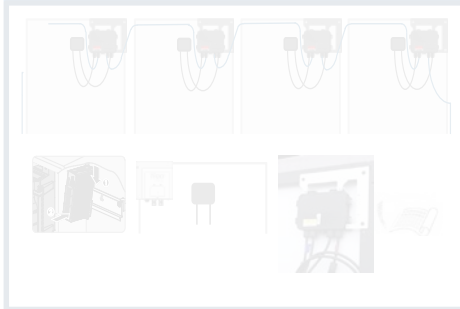
\* The number of steps varies in terms of different inverter types



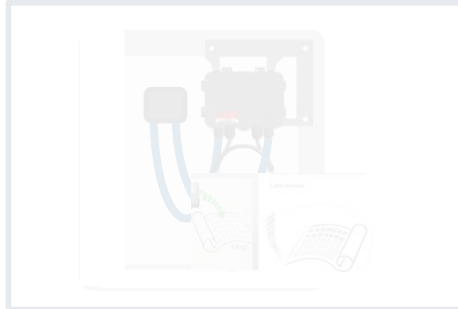
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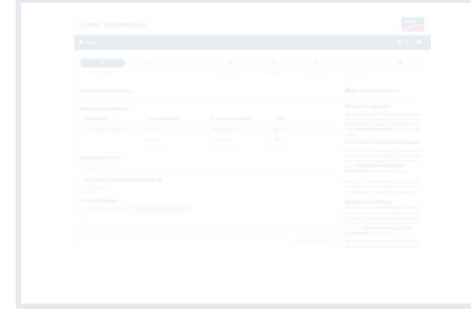
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## 2. Creation of layout plan



## 3. Commissioning via inverter WebUI



## 4. Registration of PV system in Sunny Portal

- Layout



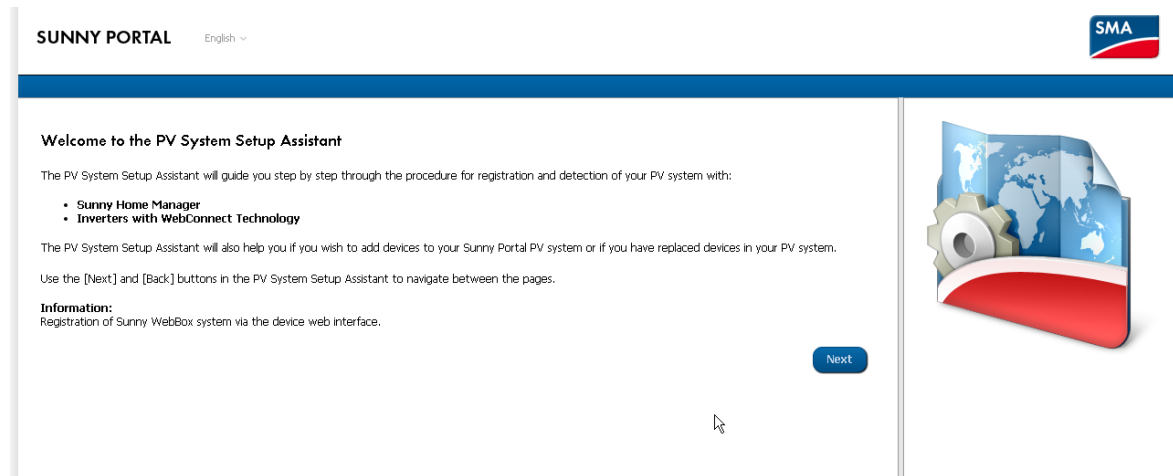
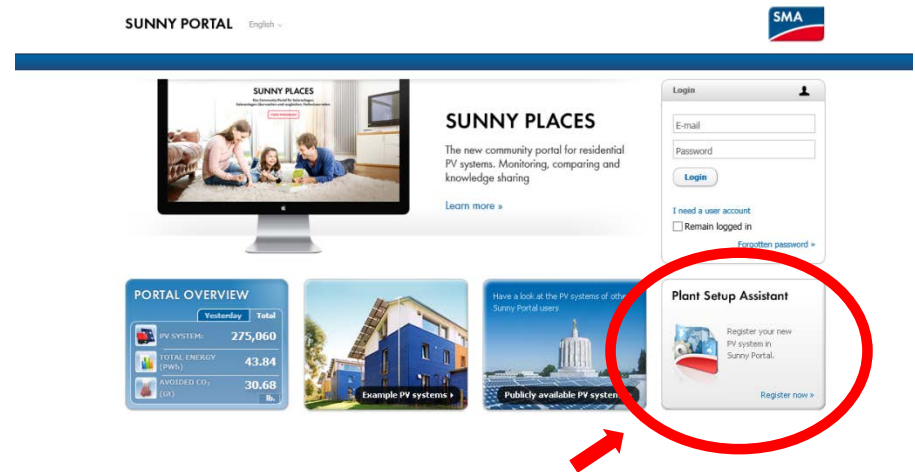
In the office

Onsite

# Registration of PV system in Sunny Portal



- > Go to [www.SunnyPortal.com](http://www.SunnyPortal.com).
- > Start the system setup assistant.
- > Follow the instructions of the system setup assistant.



# Registration of PV system in Sunny Portal



Login:

> Login or sign up.

SUNNY PORTAL English ▾

1 2 3 4 5 6 7 8

### User Registration

If you are not already registered in Sunny Portal, select "I am not yet registered".

I am not yet registered.

I am already registered in Sunny Portal.

[Forgotten Password?](#)

> Enter the system name.

> Enter the installer password of the inverter.

SUNNY PORTAL English ▾

1 2 3 4 5 6 7 8

### Select PV system

You can create a new PV system or select an existing PV system in order to replace or add devices.

#### Create a new PV system

PV System Properties	
PV System Name: *	<input type="text" value="Gref 14.11.2017"/>
PV System Password: *	<input type="password" value="*****"/>
Repeat Password: *	<input type="password" value="*****"/>

\* Mandatory field

**User**  
The PV system is created from unauthenticated devices. After the standard groups (use via Sunny Energy Manager) system in Sunny Portal "Installer" to

- If you create a system group, you must enter a password.
- If you create a system, you must enter the installer password.

**Add or replace**  
(Will only be possible if the system is not yet created)  
To replace or add devices, click the button "Add or replace" in the column of the system.  
To add devices, click the button "Add or replace" in the column of the system.

# Registration of PV system in Sunny Portal



Identifying the inverter:



> Enter inverters PIC & RID

SUNNY PORTAL English

1 2 3 4 5 6 7 8

### Select devices

Please enter the PIC and the RID in order to register the device. Select [Identify].  
For Sunny Home Manager: enter the serial number in the "PIC" field and the registration ID in the "RID" field.

<b>PIC *</b>	<b>RID *</b>		SBB.0-1SP-US-40	
003140000013643	YYPQWY			

\* Mandatory field

#### User Information

You will find the PIC and RID on the supplied label or on the type label.

**PIC (Product Identification Code):**  
Identification code for registering devices in Sunny Portal

**RID (Registration Identifier):**  
Registration ID for registering devices in Sunny Portal

SUNNY PORTAL English

1 2 3 4 5 6 7 8

### Select devices

Please enter the PIC and the RID in order to register the device. Select [Identify].  
For Sunny Home Manager: enter the serial number in the "PIC" field and the registration ID in the "RID" field.

<b>PIC *</b>	<b>RID *</b>	<input type="button" value="Identify"/>
<input type="text" value="003140000013643"/>	<input type="text" value="YYPQWY"/>	

\* Mandatory field

#### User Information

You will find the PIC and RID on the supplied label or on the type label.

**PIC (Product Identification Code):**  
Identification code for registering devices in Sunny Portal

**RID (Registration Identifier):**  
Registration ID for registering devices in Sunny Portal

# Registration of PV system in Sunny Portal



## System properties:

- > Enter system properties, such as address, time zone.
- > The number of TS4 components is adopted automatically in this system.

1 2 3 4 5 6 7 8

### Extended PV System Properties

**PV System Properties**

PV system power: \*  kWp

Specific Annual Yield: \*  kWh / kWp

Street/No: \*

Zip Code/City: \*

Country: \*

Time Zone: \*

Automatic updates: \*  Automatic update of all devices in the PV system

Sunny Places:  Approve system for Sunny Places

Please enter the operator's e-mail address so that he can use Sunny Places. The operator will then automatically be assigned the "standard user" role in the Sunny Portal and will receive an e-mail with more information on Sunny Places.

E-mail address of the operator: \*

TS4 components: There are TS4 components in the system

Number of components:

\* Mandatory field

Back Next

### User Information

**Nominal PV system power**  
The nominal PV system power is the sum of power of all PV modules.

**Information:** You must enter the nominal PV system power correctly to ensure limiting of active power feed-in to the correct value. If are changes to the installed nominal PV system power, you have to adjust this value.

**Specific annual yield**  
The specific annual yield indicates how many kilowatt hours yield you can expect per installed kWp in one year. Sunny Portal can calculate advance a monthly yield forecast using this the nominal PV system power and the information on your PV system location. You can obtain specific annual yield for your PV system location from your installer or from irradiation maps.

**Automatic updates**  
With the help of the automatic updates that Solar Technology AG makes available regularly you will ensure that your PV system is always the latest technological level and you will profit from our product improvements. It is possible to deactivate this function at a later date via the configuration of the individual devices.

**Sunny Places**  
Sunny Places is a solar network for owner-operators of residential PV systems. It allows display energy and performance data and to interact with the community. Enter the e-mail address of the PV system operator in the field "address of the operator". They will then automatically receive an invitation per e-mail with their login data. The use of Sunny Places is charge for PV system operators. The release data can be revoked at any time in Sunny Portal under "Configuration > System properties > release".

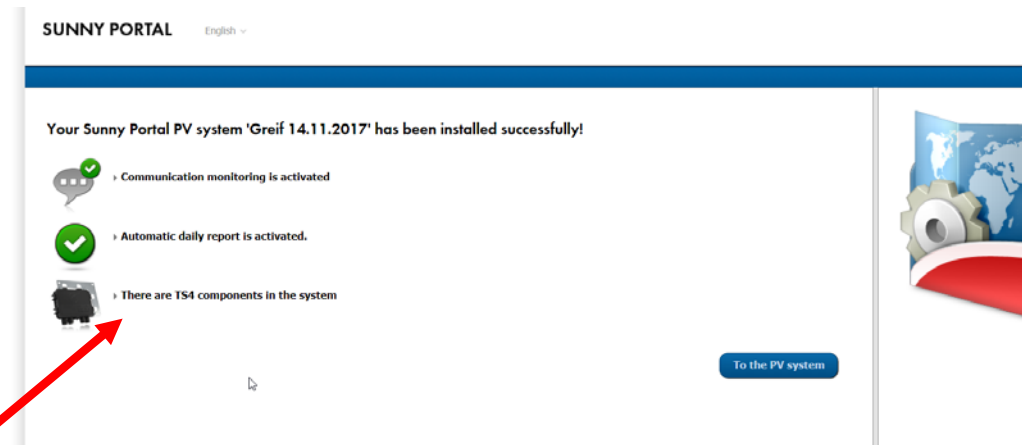
**SMA Smart Connected**  
SMA Smart Connected provides free automatic monitoring and analysis of your inverter via

# Registration of PV system in Sunny Portal



## Summary:

- > After the system assistant implemented and configured the system, the number of TS4 components found is listed in the summary section.
- > After clicking on "TS4 components", you can view more details.

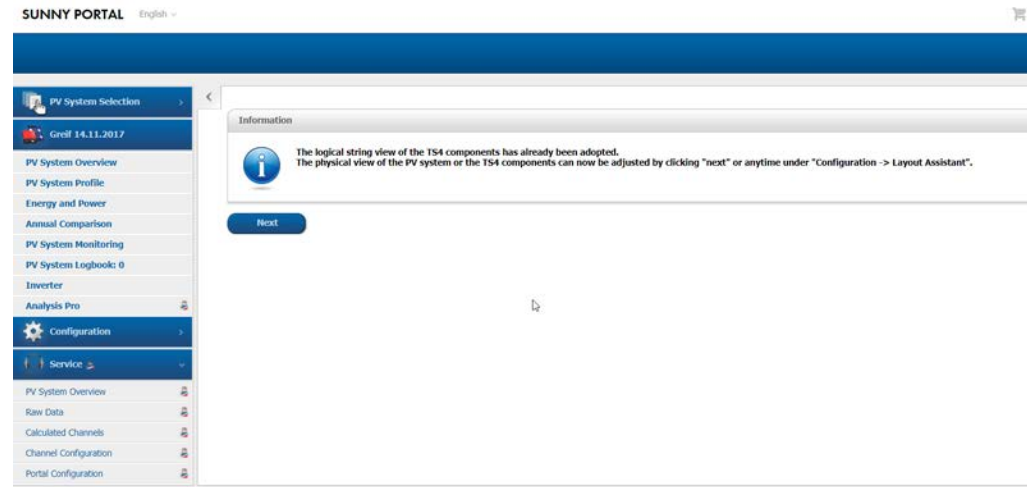


# Registration of PV system in Sunny Portal - Layout



## Physical layout

- > After you initially logged onto the PV system, you receive a recommendation to create the physical layout.
- > To open the layout assistant, click on "Next" or on the layout assistant in the configuration menu.
- > Create a physical layout.



ENERGY  
THAT  
CHANGES



SOCIAL MEDIA  
[www.SMA.de/Newsroom](http://www.SMA.de/Newsroom)

