

**FusionSolar**

# Physical Layout User Guide

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# Preface

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## Purpose





This document describes how to create a physical layout.


## Intended Audience

This document is intended for photovoltaic (PV) plant operating personnel and qualified electricians.

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
 NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

## Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in previous issues.

### 03 (2024-01-02)

Updated [Creating a Physical Layout on the FusionSolar App](#).

Updated [Manually Creating a Physical Layout on the FusionSolar App](#).

### 02 (2023-08-10)

Updated [Creating a Physical Layout on the FusionSolar App](#).

Updated [Manually Creating a Physical Layout on the FusionSolar App](#).

### 01 (2023-04-30)

This issue is the first official release.

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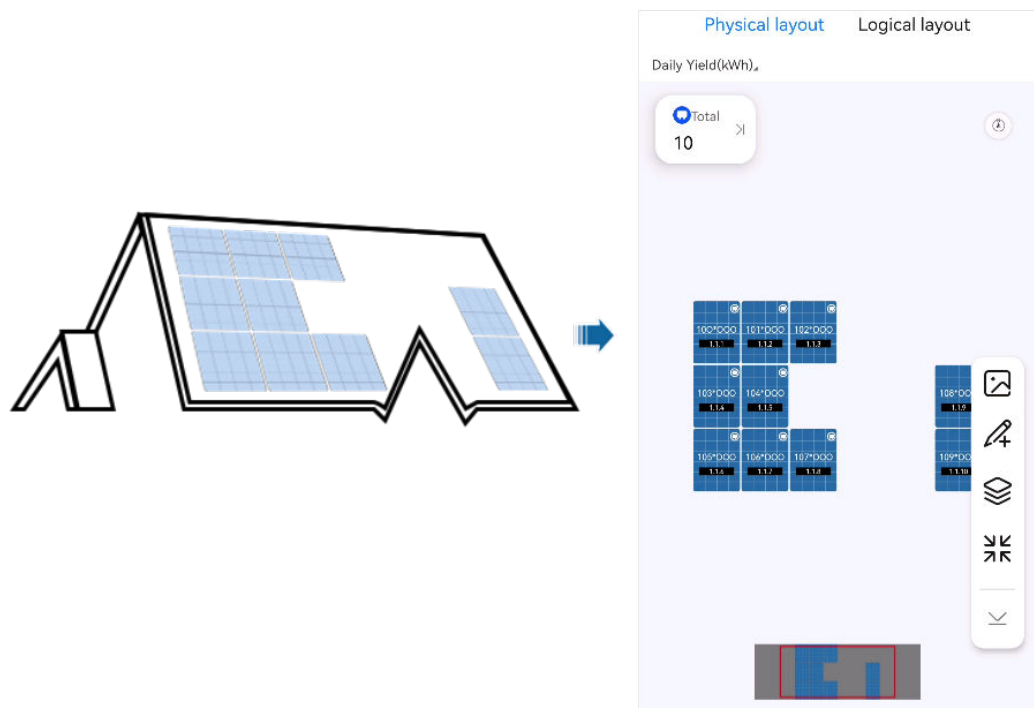
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# 1 Overview

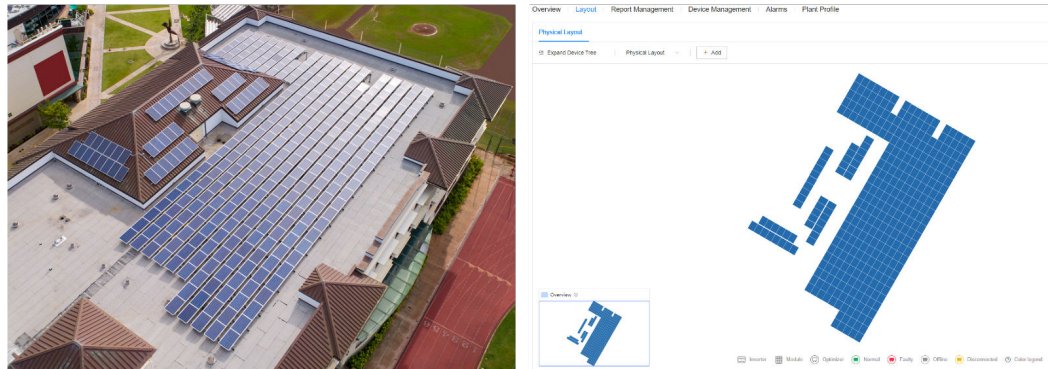
The Smart PV Optimizer is a DC to DC converter which implements maximum power point tracking (MPPT) of each PV module to improve the energy yield of the PV system. It enables module-level shutdown and monitoring.

If optimizers are configured for PV modules, you can view the physical location of each optimizer after creating a physical layout. If a PV module is faulty, you can quickly locate the faulty PV module based on the physical layout to rectify the fault. If a PV module without an optimizer is faulty, you need to check the PV modules one by one to locate the faulty one, which is time-consuming and inefficient.

**Figure 1-1** Viewing a physical layout on the FusionSolar App



**Figure 1-2** Viewing a physical layout on the FusionSolar SmartPVMS



# 2 Installing Smart PV Optimizers

Install the Smart PV Optimizers based on the model by referring to the corresponding quick guide and installation video.

**Table 2-1** Installing Smart PV Optimizers

Model	Quick Guide	Installation Video
MERC-(1300W, 1100W)-P	<a href="#">MERC-(1300W, 1100W)-P Smart PV Optimizer Quick Guide</a>	<a href="#">(Video) MERC-(1300W, 1100W)-P Smart PV Optimizer Installation Video</a>
SUN2000-(600W-P, 450W-P2)	<a href="#">SUN2000-(600W-P, 450W-P2) Smart PV Optimizer Quick Guide</a>	<a href="#">(Video) SUN2000-(600W-P, 450W-P2, 450W-P) Smart PV Optimizer Installation Video</a>
SUN2000-450W-P	<a href="#">SUN2000-450W-P Smart PV Optimizer Quick Guide</a>	



# 3 (Recommended) Creating a Physical Layout Using a Template

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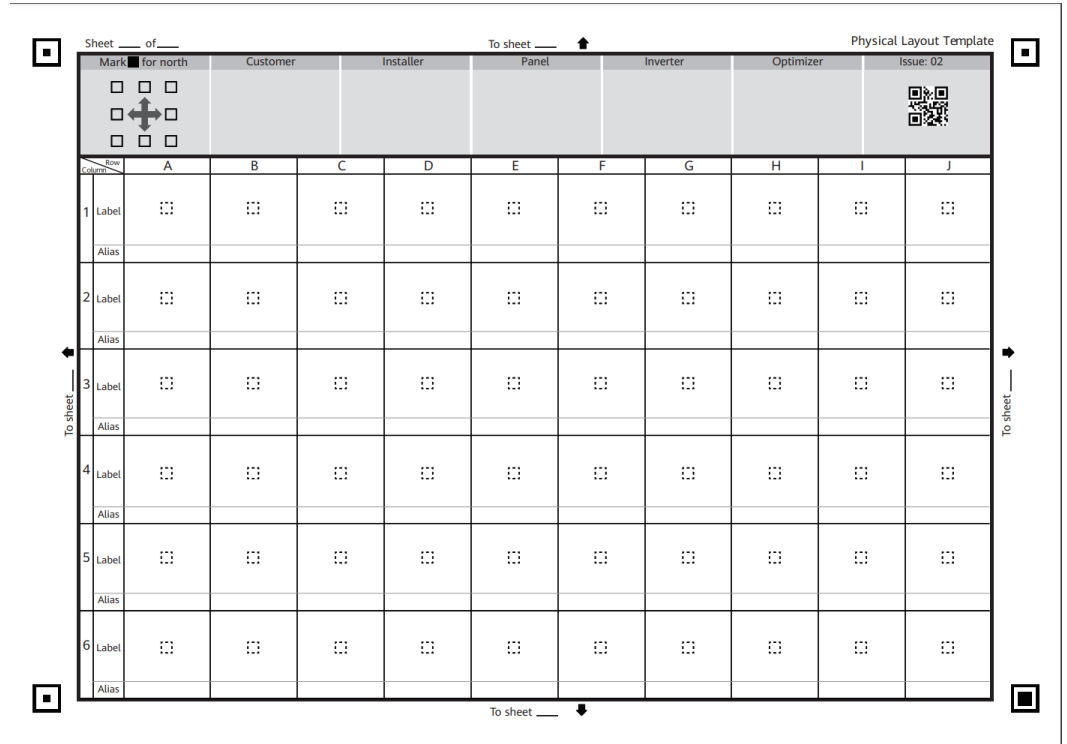
After an optimizer is installed, you can attach the optimizer SN label to the physical layout template and use the image recognition to quickly create a physical layout.

## 3.1 Obtaining a Physical Layout Template

Before creating a physical layout, you need to obtain a physical layout template for attaching optimizer labels.

You can obtain a physical layout template in either of the following ways:

- Method 1: Use the paper physical layout template delivered with the optimizers.
- Method 2: Log in to <https://solar.huawei.com>, choose **Download > Product Document > FusionSolar > Product > Smart PV Optimizer**, select the corresponding optimizer quick guide, and download and print the physical layout template.
- Method 3: Log in to <https://support.huawei.com/enterprise/en/index.html>, choose **FusionSolar > Smart PV Optimizer > SUN2000P** in the **Digital Power** module, select the corresponding optimizer quick guide, for example, [SUN2000-\(600W-P, 450W-P2\) Smart PV Optimizer Quick Guide](#), and download and print the physical layout template.



**NOTE**

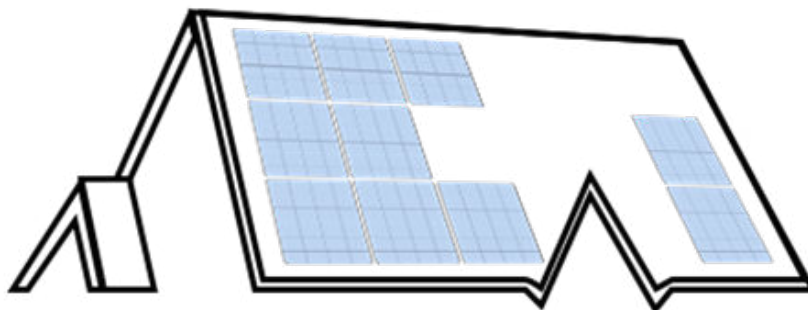
You are advised to use the A4 glossy paper to print templates, which facilitates re-attaching if the label is incorrectly attached.

### 3.2 Attaching Optimizer SN Labels

Remove the SN labels from optimizers and attach the SN labels to the corresponding positions in the physical layout template based on the optimizer positions.

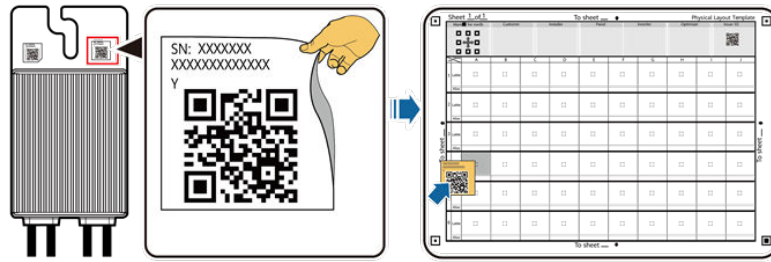
#### Attaching Optimizer Labels

The following rooftop is used as an example.

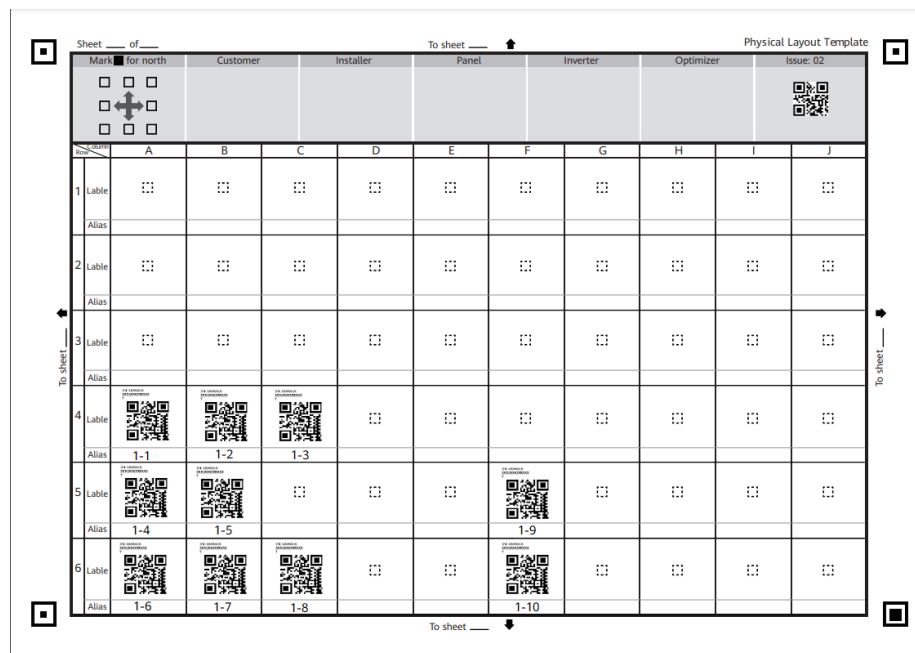


After determining the optimizer installation position, remove the SN label from an optimizer, attach the SN label to the corresponding position in the physical layout template based on the actual position of the optimizer, and fill in the optimizer

alias (you are advised to name the optimizer using the string number and position).



Physical layout template with labels attached



If there are a large number of optimizers, use multiple physical layout drawings and manually fill in the total number of pages of the drawings and the page No. of each drawing.



The following shows the marks on the physical layout drawing.

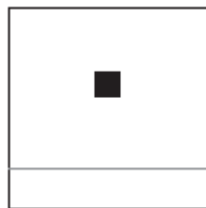
After attaching the optimizer labels, take a photo of the template and save it on your phone or PC.

## Precautions

- If there are no PV modules, you do not need to perform operations on the corresponding square cells.



- If PV modules are installed without optimizers, black the dotted boxes in the corresponding square cells.

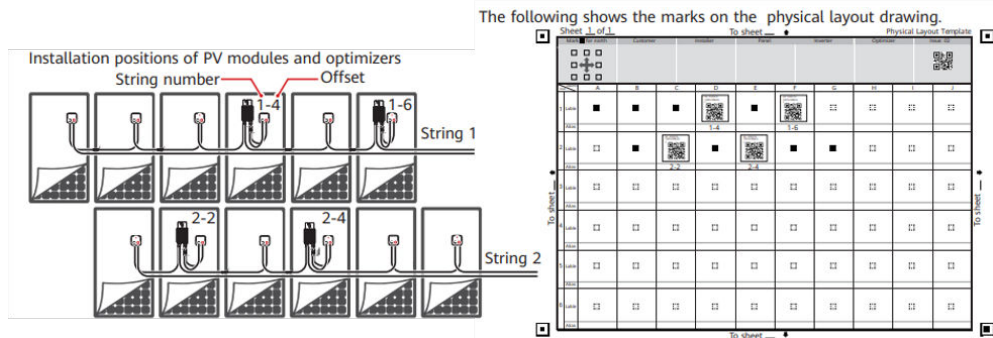


- If PV modules are installed with optimizers, remove the labels from the optimizers, attach the labels to the corresponding square cells, and enter the optimizer aliases (you are advised to name the optimizers using the string numbers and positions). Ensure that the QR code label is attached in a square cell and does not exceed the frame.



### Examples of correct QR code label attaching

**Figure 3-1** Attaching QR code labels to a single drawing



**Figure 3-2** Attaching QR code labels to multiple drawings



## Examples of incorrect QR code label attaching

Figure 3-3 QR code label exceeding the frame

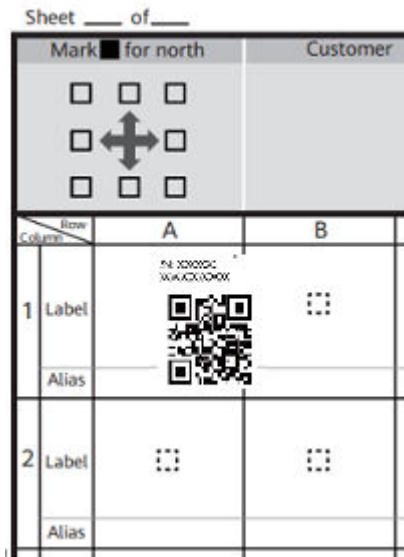
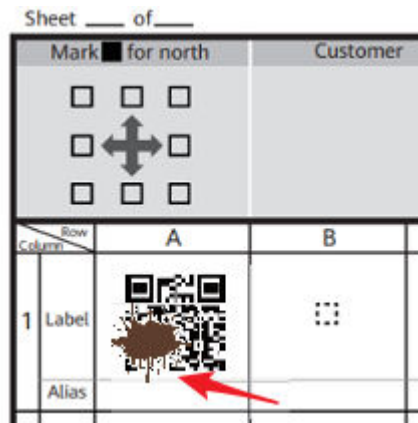
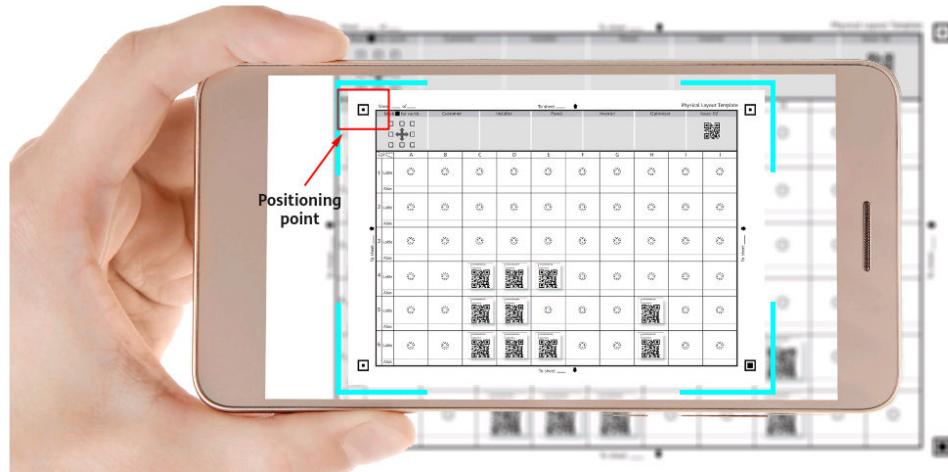


Figure 3-4 Contaminated QR code label



### 3.3 Taking a Photo of a Physical Layout Template

Take a photo of the physical layout drawing that has been arranged and save it for creating a physical layout through the management system or app.



Pay attention to the following when taking photos of the drawings:

- Place the templates on a flat table, keep the phone level with the templates, and take photos in landscape mode.
- Ensure that the four positioning points are within the photo.
- Ensure that the QR code label is attached in a square cell and does not exceed the frame.
- Ensure that the QR codes in the photo are clear and have no reflection or shadow. Otherwise, the recognition accuracy will be reduced.

## 3.4 Creating a Physical Layout

After taking a photo of a physical layout template, you can create a physical layout on the FusionSolar App (for details, see [3.4.1 Creating a Physical Layout on the FusionSolar App](#)), FusionSolar SmartPVMS (for details, see [3.4.2 Creating a Physical Layout on the FusionSolar SmartPVMS](#)), and local commissioning screen (for details, see [3.4.3 Creating a Physical Layout on the Device Commissioning Screen](#)).

### 3.4.1 Creating a Physical Layout on the FusionSolar App

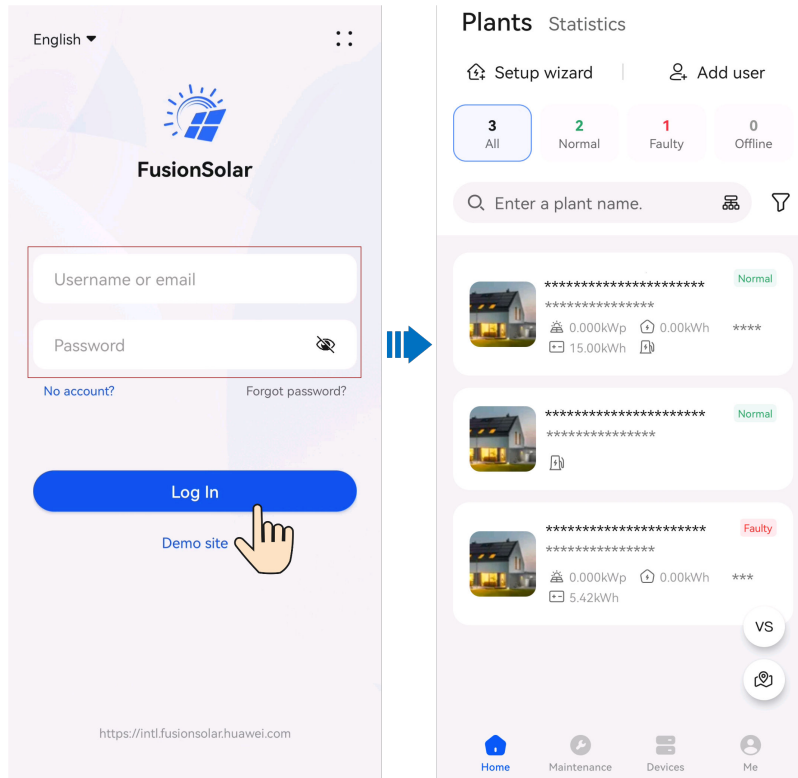
After an optimizer is installed, you can attach the optimizer SN label to the physical layout template and use the image recognition to quickly create a physical layout.


#### NOTE

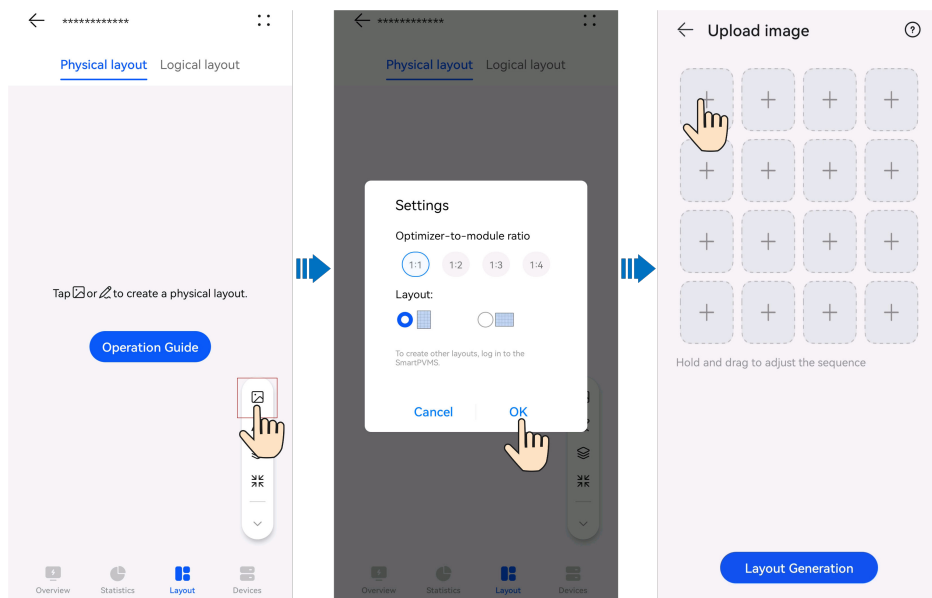
- If there are more than 16 photos of the physical layout templates, go to the FusionSolar SmartPVMS to upload the photos.
- A maximum of 200 PV modules can be added on the current tab page. If the number of PV modules exceeds 200, go to the FusionSolar SmartPVMS to create a physical layout.

## Procedure

1. On the app login screen, enter the installer account and password and tap **Log in**.



2. Choose **Home > Plants**. Tap the plant that has been connected to the optimizers.
3. , choose **Layout > Physical layout**, tap , and upload the physical layout drawing as prompted.

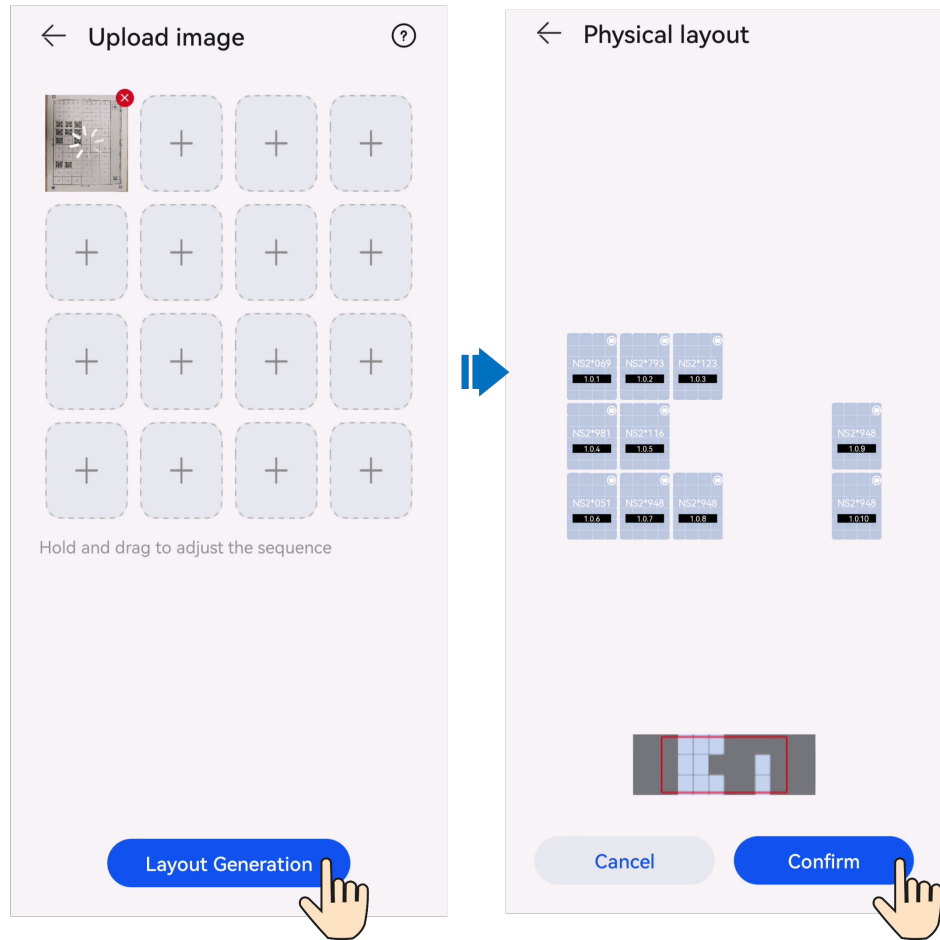


 **NOTE**

For the first identification, set **Optimizer-to-module ratio** and **Layout** based on the actual optimizer installation.

4. After all drawings are uploaded, tap **Layout Generation** to generate the physical layout, and confirm the identification result.





5. Tap **OK** to save the physical layout.

**NOTE**

- If some QR codes cannot be identified, manually bind optimizers and inverters by referring to [Binding Optimizers and Inverters](#).
- After a physical layout is generated, you can view the physical location, status, and energy yield of each optimizer. For details, see [5.1 Viewing a Physical Layout on the FusionSolar App](#).

### 3.4.2 Creating a Physical Layout on the FusionSolar SmartPVMS

After an optimizer is installed, you can attach the optimizer SN label to the physical layout template and use the image recognition to quickly create a physical layout.

#### Context

A large PV plant contains a large number of PV modules. If there is only one physical layout, it is difficult to find or locate PV modules. The system can classify PV modules by area using the tab management function (for details, see [Tab Management](#)). Specifically, you can manage PV modules of different areas (for example, on various rooftops) in the same plant by tab page, ensuring efficient optimizer search and locating.

Before creating a physical layout, you are advised to plan tabs based on the PV module areas and manage drawings using the drawing management function (for details, see [Drawing Management](#)).

## Prerequisites

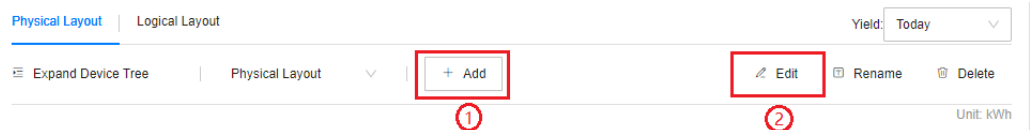
You have correctly attached the SN labels of the optimizers to a physical layout template, taken a photo of the template, and saved the photo.

## Creating a Physical Layout

1. Log in to the FusionSolar SmartPVMS using an installer account.
2. Choose **Monitoring** > **Monitoring** from the main menu.
3. In the navigation pane, choose a plant and click **Layout**.

### NOTE

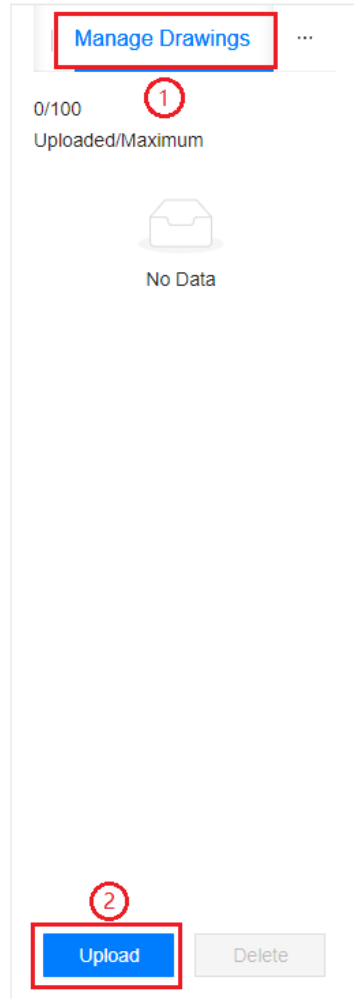
- By default, the **Physical Layout** tab has been created. If a large number of optimizers need to be managed, you can add more physical layout tabs to distribute the optimizers deployed on different rooftops among multiple physical layouts. For details, see [Tab Management](#).
  - A maximum of 10 tab pages can be added to a physical layout, and each tab page supports a maximum of 2400 PV modules.
4. Select a physical layout and click **Edit**. The **Physical Layout Configuration** page is displayed.



5. Click **Manage Drawings**, click **Upload**, and upload a physical layout template to the system.

### NOTE

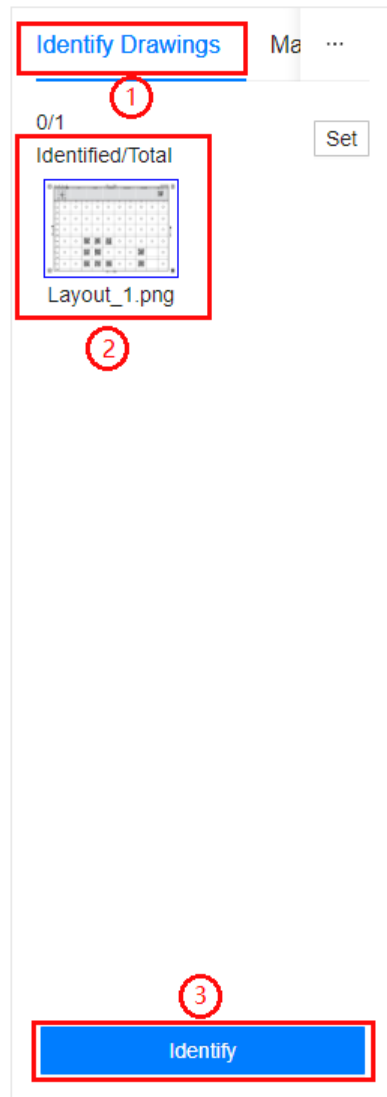
You can view and manage the uploaded drawings on the **Manage Drawings** tab page. For details, see [Drawing Management](#).



6. Click **Identify Drawings**, select the drawing to be added to the physical layout, click **Identify**, and complete drawing identification as prompted.

 **NOTE**

For the first identification, set **Layout position**, **Optimizer-to-module ratio**, and **Layout** based on the actual optimizer installation. This setting will be used for subsequent drawing identification. To change the settings, choose **Device List > Optimizer-to-module ratio** or choose **Identify Drawings > Set**.



7. **Optional:** If there are multiple drawings, select and identify them one by one, and drag the new PV modules to adjust their positions.

**NOTE**

If a PV module exists on the current tab page, the system adds the new PV module layout to the lower part of the current view by default. To change the position, click **Set**, select **Layout position** based on site requirements, and click **Identify** to add the new PV module to the canvas.

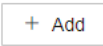

8. Click **Save** in the upper right corner to save the physical layout.

**NOTE**

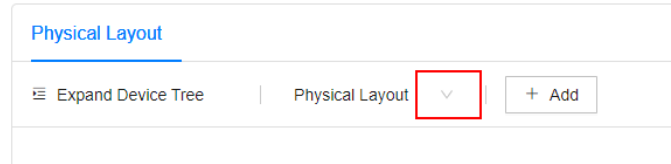
- If some QR codes cannot be identified, manually bind optimizers by referring to [7](#).
- After a physical layout is generated, you can view the physical location, status, and energy yield of each optimizer. For details, see [5.2 Viewing a Physical Layout on the FusionSolar SmartPVMS](#).





## Tab Management

On the **Physical Layout** tab page, manage the tabs.

- Adding a tab: Click  and add a tab as prompted.
- Viewing a tab: Click  and select a desired tab.

Overview | [Layout](#) | Report Management | Device Management

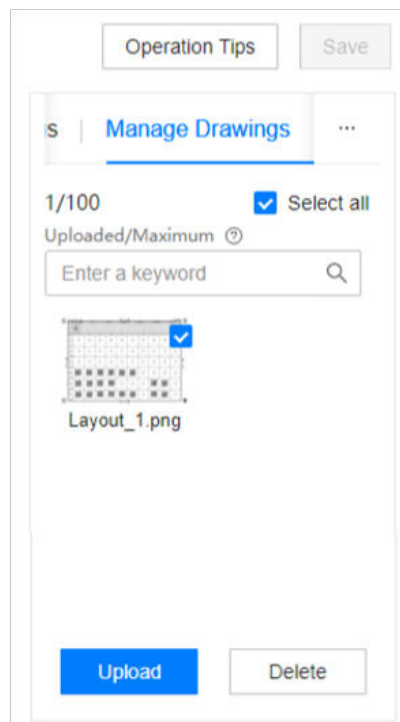


- Changing a tab name: Click , select a desired tab, click  **Rename**, and change the tab name as prompted.
- Deleting a tab: Click  to select a desired tab, click  **Delete**, and delete the tab as prompted.

## Drawing Management

Click the tab and click  **Edit**. In the **Manage Drawings** area, view and manage drawings.

- Uploading drawings: Click **Upload** and upload the drawing as prompted.
- Viewing drawings: Double-click a drawing to view its content.
- Deleting a drawing: Select a drawing and click **Delete** to delete the drawing as prompted.



### 3.4.3 Creating a Physical Layout on the Device Commissioning Screen

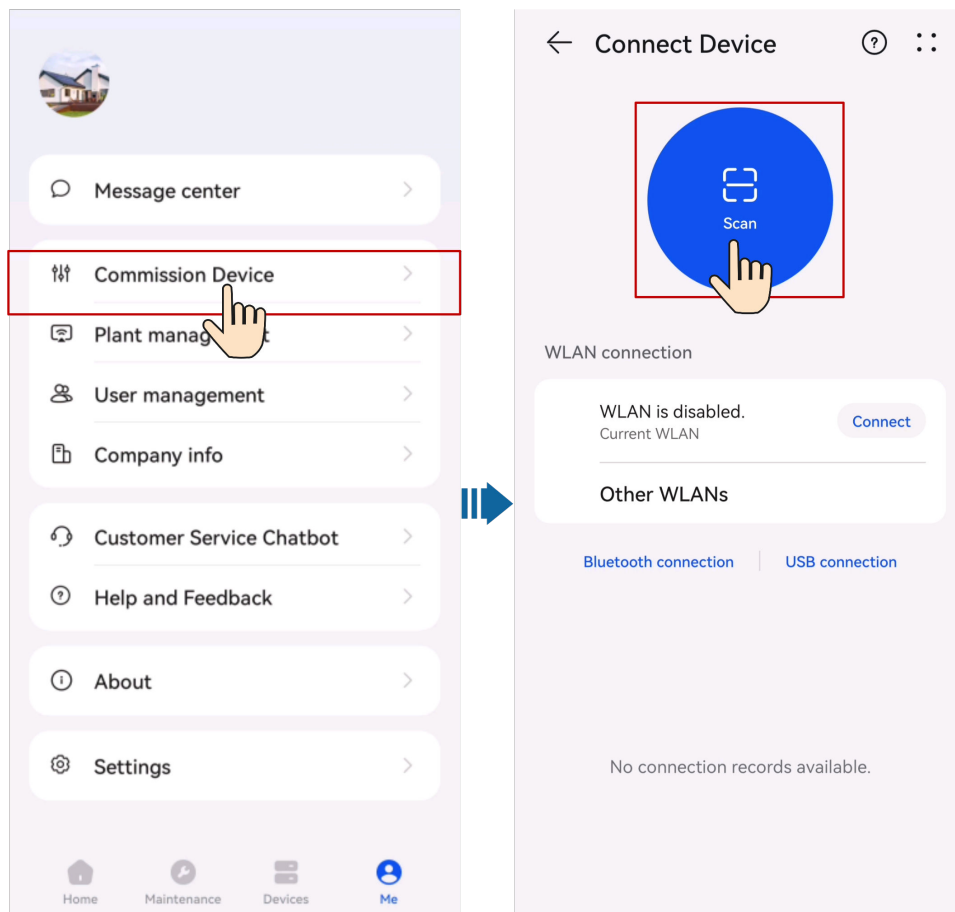
After an optimizer is installed, you can attach the optimizer SN label to the physical layout template and use the image recognition to quickly create a physical layout.

 **NOTE**

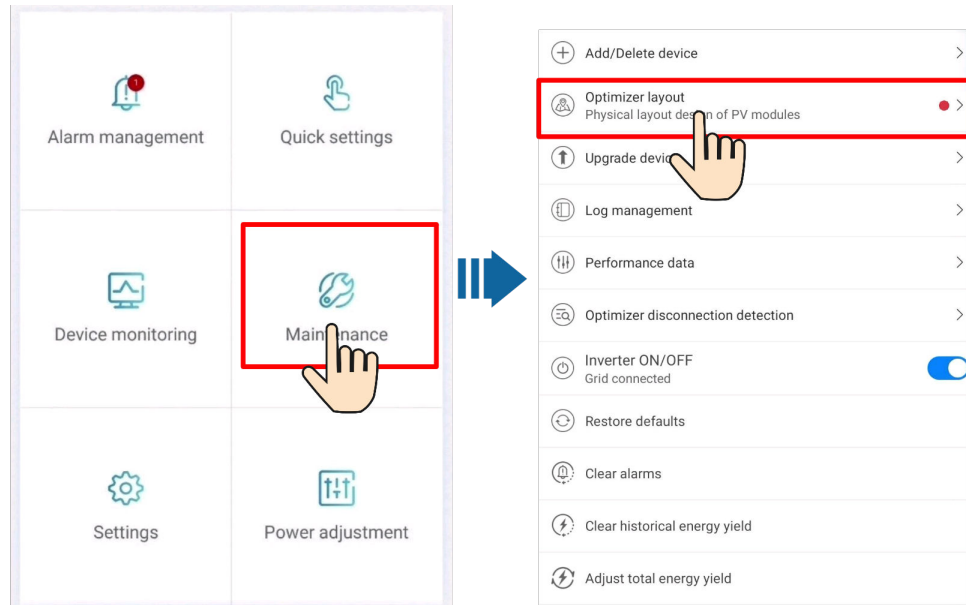
The physical layout of the MERC-(1300W, 1100W)-P optimizer cannot be created on the device commissioning screen.

#### Procedure

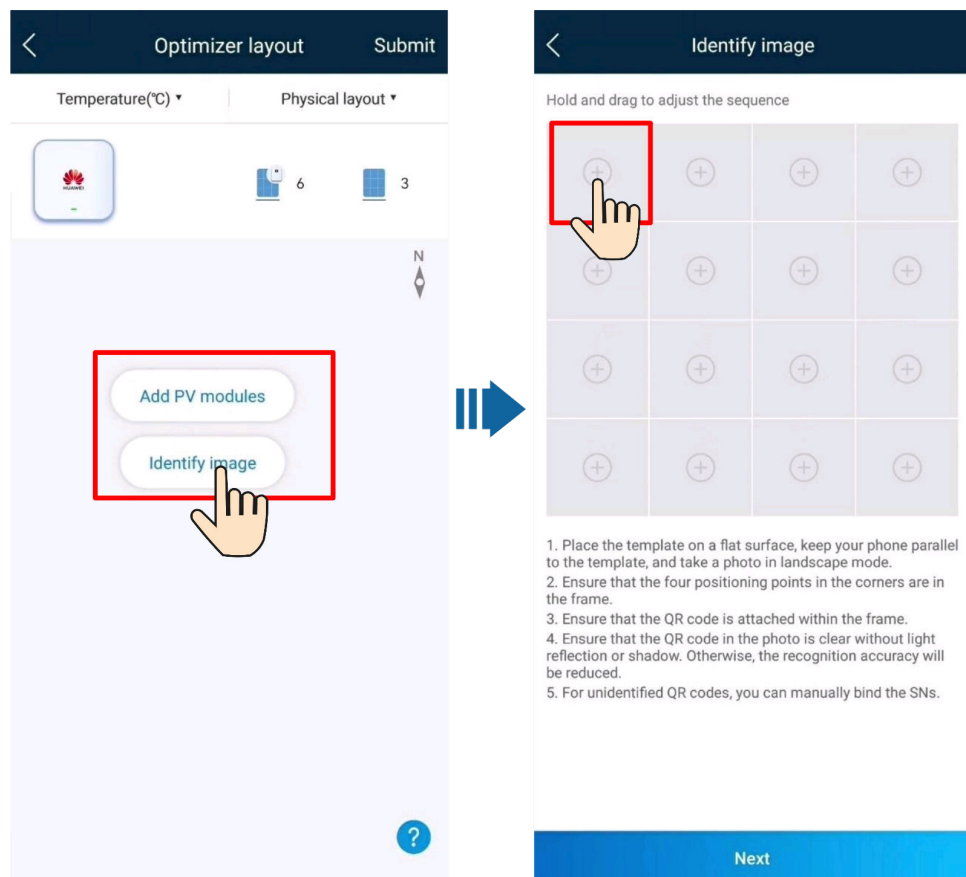
1. Choose **Me > Device Commissioning** on the FusionSolar app or use the SUN2000 app to connect to the inverter, and log in as an installer.



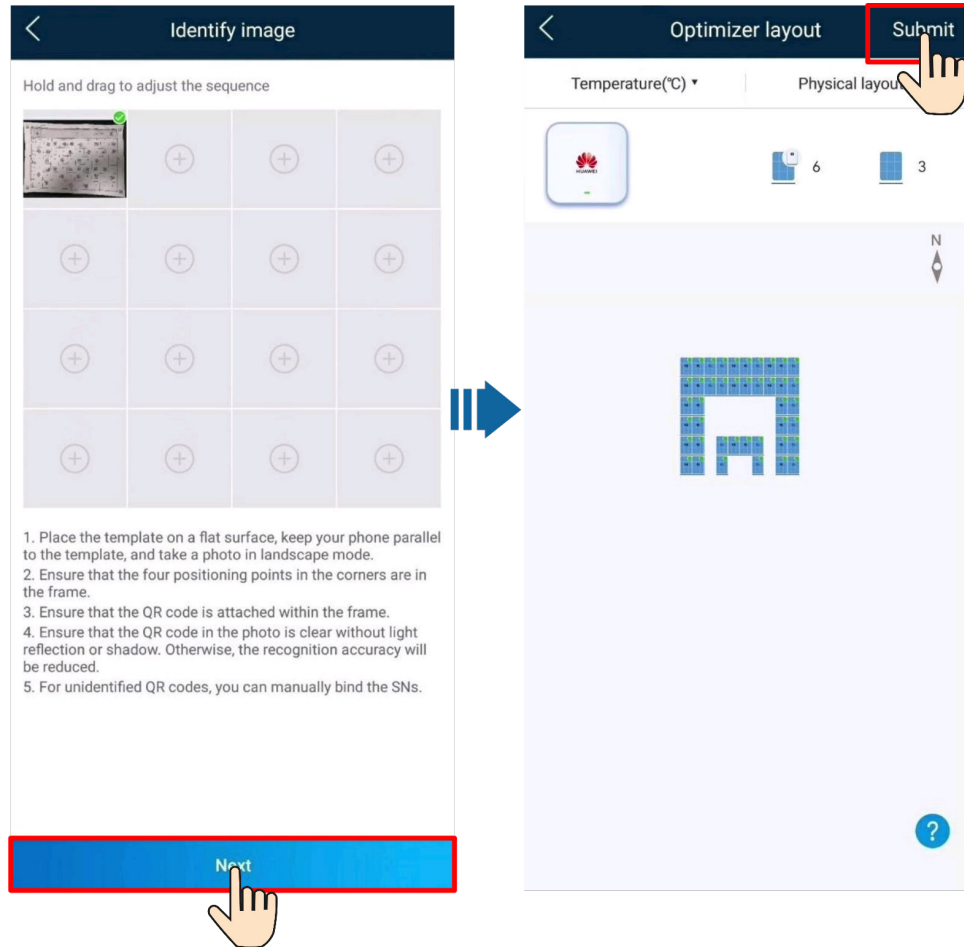
2. Choose **Maintenance > Optimizer layout**. The physical layout screen of the module is displayed.



3. Tap the blank area, tap **Identify image**, and upload the physical layout template as prompted.



4. After all drawings are uploaded, tap **Next** to generate the physical layout, and confirm the identification result.



5. Tap **Submit** to save the physical layout.

 **NOTE**

- If some QR codes cannot be identified, manually bind optimizers by referring to [4.3 Manually Creating a Physical Layout on the Device Commissioning Screen](#).
- After a physical layout is generated, you can view the physical location, status, and energy yield of each optimizer. For details, see [5.3 Viewing a Physical Layout on the Device Commissioning Screen](#).



# 4 Manually Creating a Physical Layout

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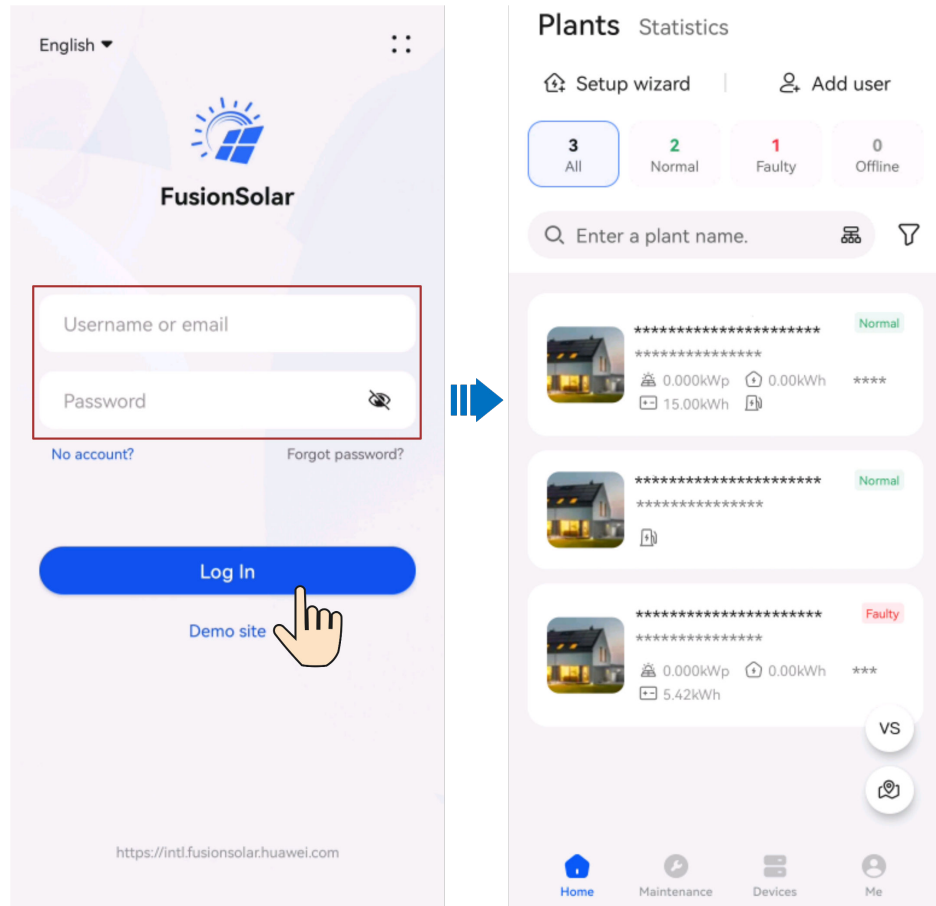
You manually create a physical layout by adding inverters and PV modules and binding optimizers on the FusionSolar App (for details, see [4.1 Manually Creating a Physical Layout on the FusionSolar App](#)), FusionSolar SmartPVMS (for details, see [4.2 Manually Creating a Physical Layout on the FusionSolar SmartPVMS](#)), and local commissioning screen (for details, see [4.3 Manually Creating a Physical Layout on the Device Commissioning Screen](#)).


## 4.1 Manually Creating a Physical Layout on the FusionSolar App

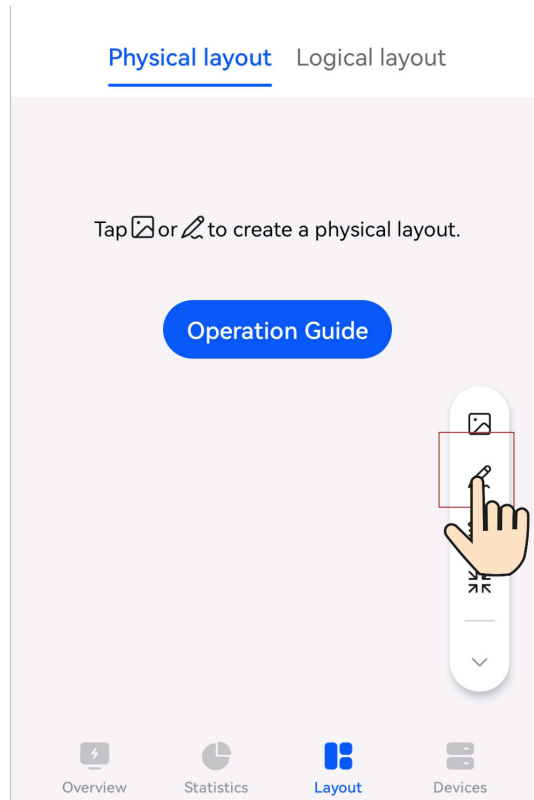
You can manually create a physical layout by adding inverters and PV modules and binding PV modules to optimizers.


### Adding Inverters and PV Modules

1. On the app login screen, enter the account and password and tap **Log In**.




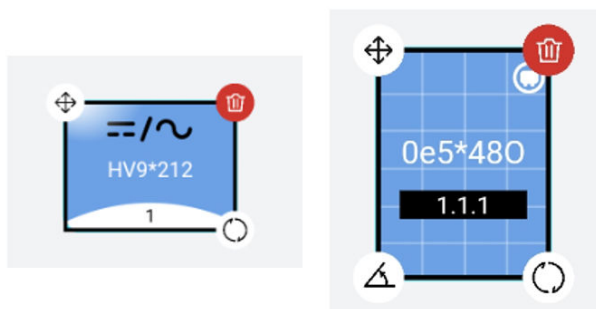
2. Choose **Home** > **Plants**. Tap the plant that has been connected to the optimizers.
3. Choose **Layout** > **Physical layout** and tap .








4. Tap the blank area to add inverters and PV modules.
5. Tap  to save the settings.

### Adjusting the Position and Angle of an Inverter or PV Module


Tap an inverter or PV module, adjust the position and angle of the inverter or PV module, and tap  to save the settings.

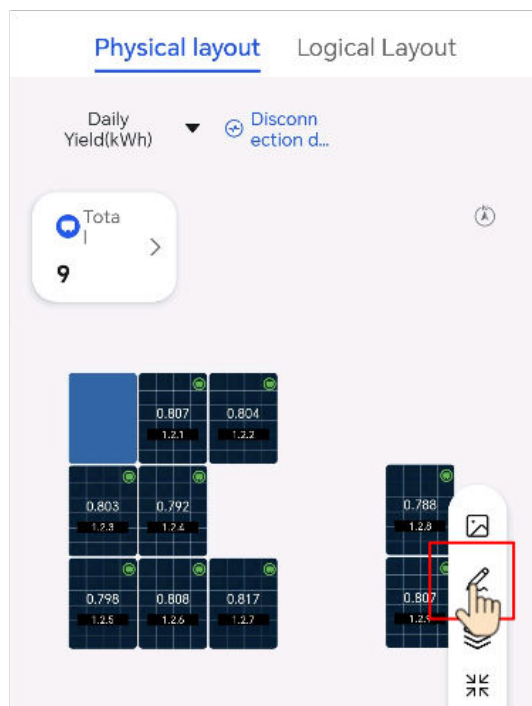



Function	Operation
Adjusting the position	Press and hold  to move an inverter or PV module to an appropriate position.
Adjusting the azimuth	Press and hold  to move or tap  to enter the azimuth.

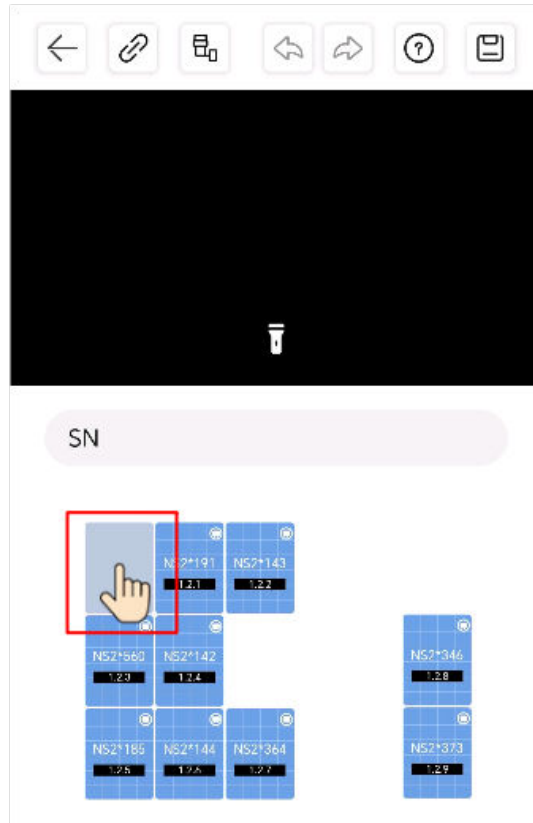
Function	Operation
Adjusting the tilt angle	Tap  and enter the tilt angle of a PV module.
Deleting an inverter or PV module	Tap  to delete an inverter or PV module.

## Binding Optimizers and Inverters

1. Tap a plant that has been connected to optimizers, choose **Layout > Physical layout**, and tap .



2. Click  to scan the SN label of an optimizer or inverter, or manually select the target optimizer or inverter to be bound.
  - Method 1: Scan the SN labels of the optimizer or inverter.  
Tap a PV module, scan the SN label of an optimizer to bind them together; or tap an inverter, scan the SN label of another inverter to bind them together.



**NOTE**




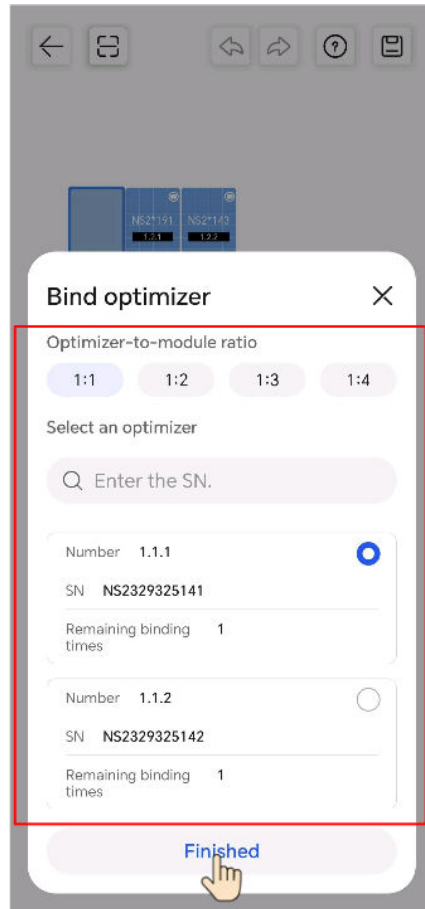
indicates the 1:1 scenario where one optimizer is bound to one PV module.




indicates the 1:2 scenario where one optimizer is bound to two PV modules and you need to tap two PV modules before scanning the SN label of an optimizer.

- Method 2: Manually select an optimizer or inverter.

Tap  and then tap a PV module to bind it to an optimizer; or tap an inverter to bind it to another inverter.



3. Tap  to save the settings.

## 4.2 Manually Creating a Physical Layout on the FusionSolar SmartPVMS

You can also manually create a physical layout by adding inverters and PV modules and binding optimizers.

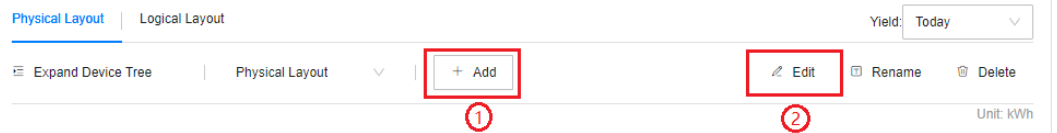
### Creating a Physical Layout

1. Choose **Monitoring** > **Monitoring** from the main menu.
2. In the navigation pane, select a PV plant, and click the **Layout** tab.

#### NOTE

By default, the **Physical Layout** tab has been created. If a large number of optimizers need to be managed, you can add more physical layout tabs to distribute the optimizers deployed on different rooftops among multiple physical layouts. For details about tab management, see [Tab Management](#).

3. Select a physical layout and click **Edit**. The **Physical Layout Configuration** page is displayed.

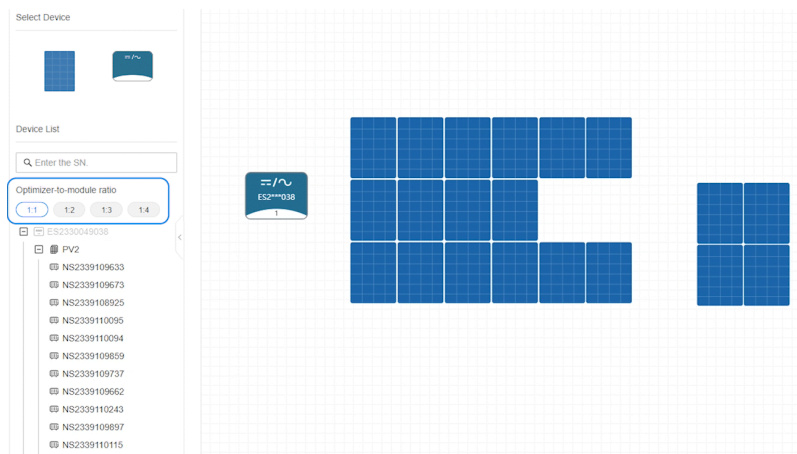


4. Drag diagram elements to the canvas on the right by referring to the layout drawing of the actual positions of inverters and PV modules, and set diagram element installation parameters based on site requirements.
5. Select a diagram element to move it based on the actual position of a module.
6. Binding an inverter: In the **Device List** area, drag an inverter to the inverter diagram element for binding.

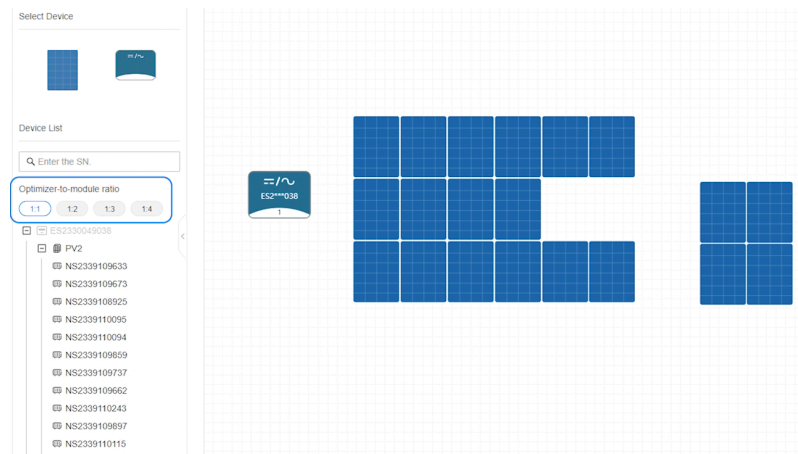


7. Binding optimizers: In the **Device List** area, set **Optimizer-to-module ratio** based on site requirements and drag the optimizers to the positions of the optimizer diagram elements for binding. When multiple modules share an optimizer (that is, 1+M), drag the optimizer to the first diagram element and click other modules to be bound to the optimizer in sequence.

**Figure 4-1** Binding optimizers



**Figure 4-2** Binding optimizers (1+2)



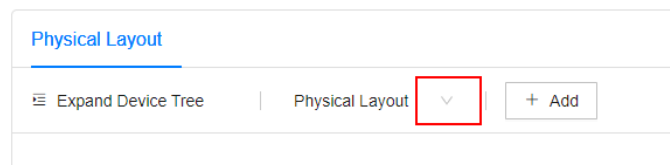
8. Click **Save** in the upper right corner to save the physical layout.

## Tab Management

On the **Physical Layout** tab page, manage the tabs.

- Adding a tab: Click  and add a tab as prompted.
- Viewing a tab: Click  and select a desired tab.

Overview | **Layout** | Report Management | Device Management



- Changing a tab name: Click , select a desired tab, click , and change the tab name as prompted.
- Deleting a tab: Click  to select a desired tab, click , and delete the tab as prompted.

## 4.3 Manually Creating a Physical Layout on the Device Commissioning Screen

You can also manually create a physical layout by adding inverters and PV modules and binding optimizers.

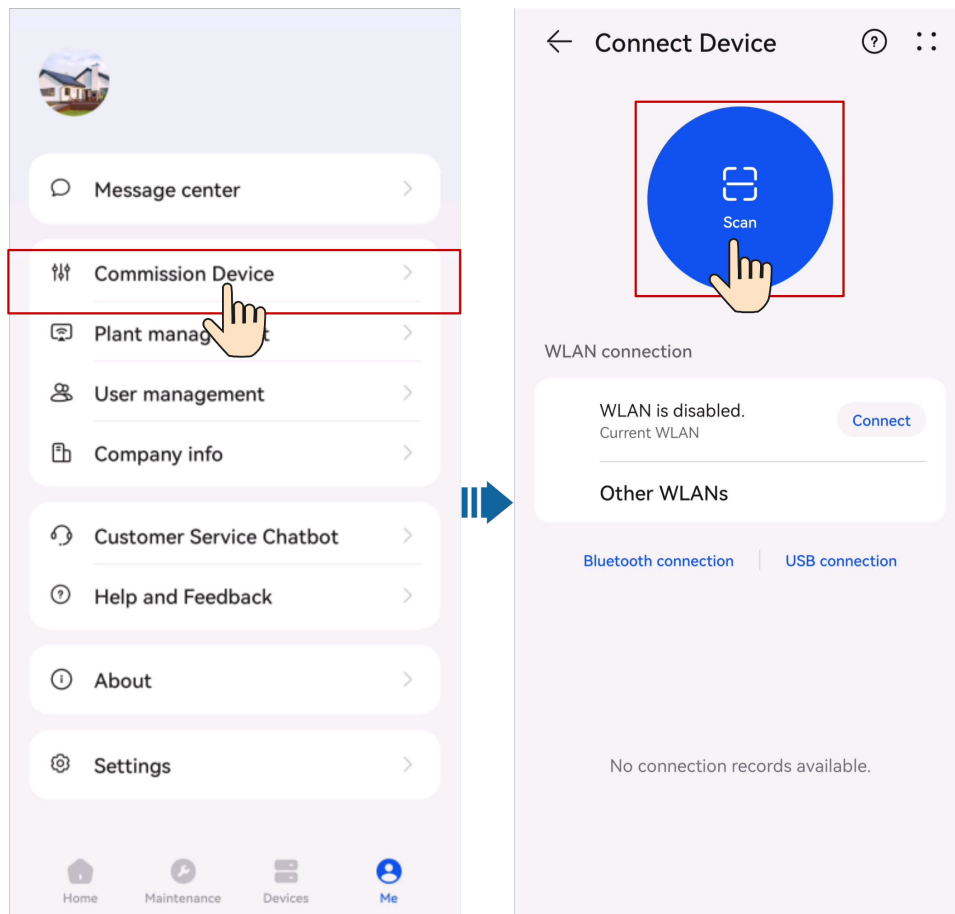
### NOTE

The physical layout of the MERC-(1300W, 1100W)-P optimizer cannot be created on the device commissioning screen.

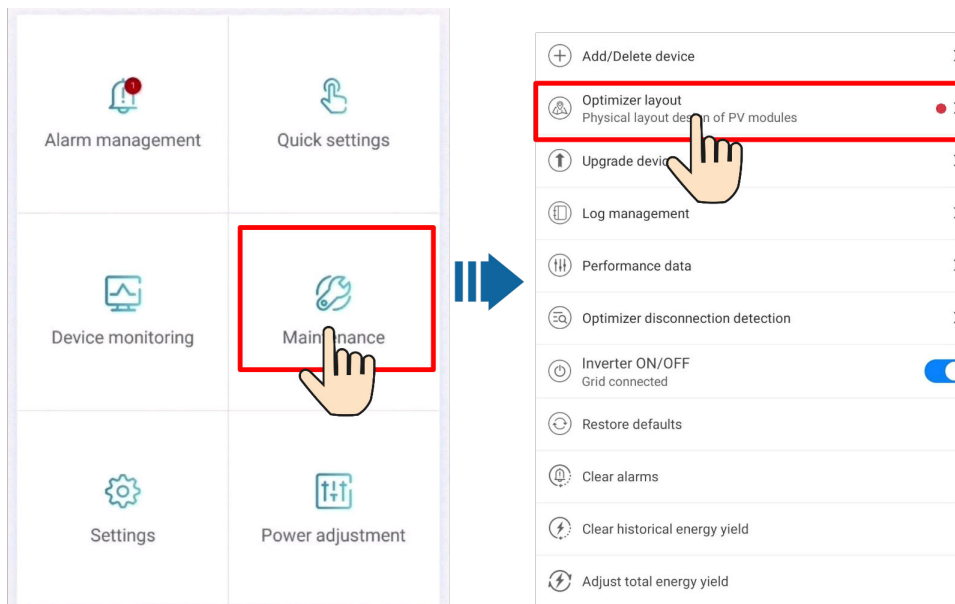
### Procedure

1. Choose **Me > Device Commissioning** on the FusionSolar app or use the SUN2000 app to connect to the inverter, and log in as an installer.

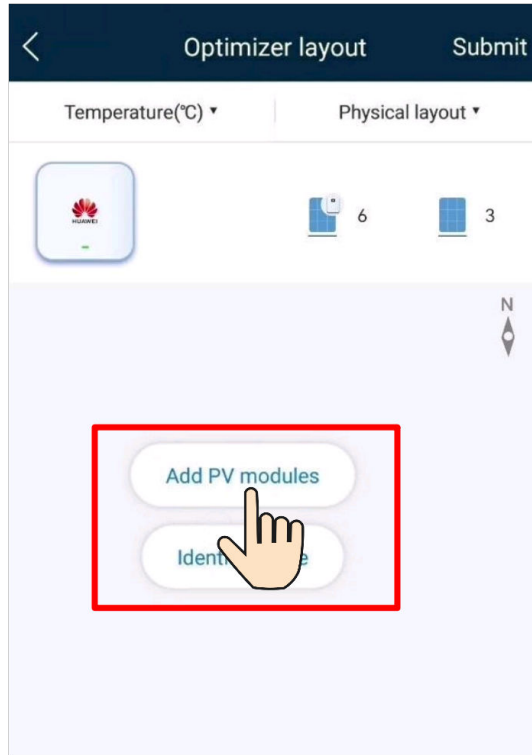




2. Choose **Maintenance** > **Optimizer layout**. The physical layout screen of the module is displayed.



3. Tap **Add PV modules**, and adjust the number and position of PV modules as prompted.



4. Tap the PV module to which you want to bind an optimizer, select the corresponding optimizer SN, and repeat the current steps to bind all optimizers.

 **NOTE**

You can tap the modules that have been bound to optimizers to view the optimizer states or unbind the optimizers.

5. Tap **Submit** to save the physical layout.

# 5 Viewing a Physical Layout

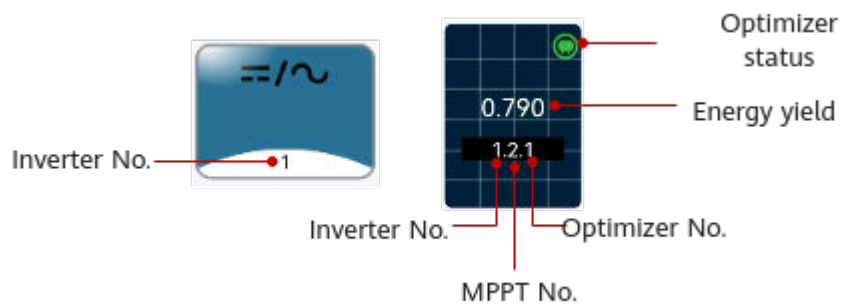
After a physical layout is generated, you can view the physical location, status, and energy yield of each optimizer. When a PV module is faulty, you can view the physical layout to quickly locate and rectify the fault.

## 5.1 Viewing a Physical Layout on the FusionSolar App

### Viewing a Physical Layout

1. On the **Home** screen, tap **Plants** and tap the desired plant.
2. Tap **Layout**.
3. On the **Physical layout** screen, view related information.
  - **Figure 5-1** shows the screen description.

**Figure 5-1** Screen description

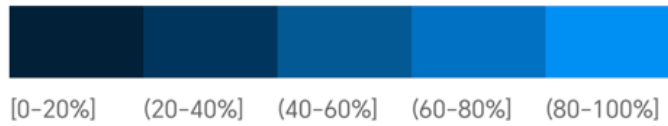


- Optimizer status

Icon				
Status	Normal	Faulty	Offline	Disconnecte d

- PV module color

The color of a PV module indicates the ratio of the optimizer output power to the rated optimizer power. The following figure shows the mapping.



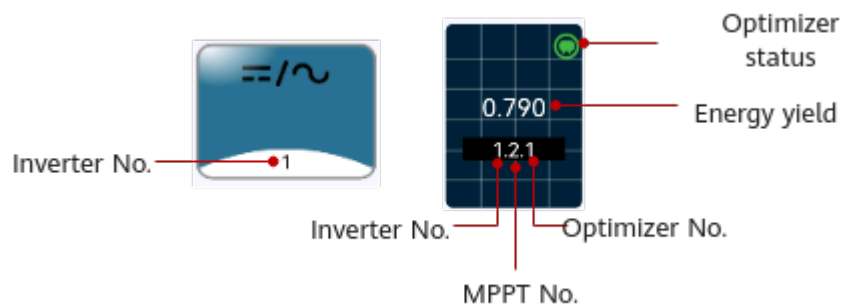
- Viewing details: Tap an optimizer to view information such as the energy yield, output power, and output voltage.
- Displaying energy yield in different dimensions: Tap **Daily Yield(kWh)** in the upper left corner to display the energy yield of the current day, current month, or current year, or accumulated energy yield.
- Zooming in, zooming out, or restoring the view: Press and hold the screen with two fingers to zoom in or zoom out the view. Tap to restore the view to the normal size.

## 5.2 Viewing a Physical Layout on the FusionSolar SmartPVMS

### Viewing a Physical Layout

1. Log in to the FusionSolar SmartPVMS using an installer account.
2. Choose **Monitoring > Monitoring** from the main menu.
3. In the navigation pane, select a PV plant, and click the **Layout** tab.
4. On the **Physical Layout** tab, click to select a layout and view related information.
  - **Figure 5-1** shows the screen description.

**Figure 5-2** Screen description









- Optimizer status

<b>Icon</b>				
<b>Status</b>	Normal	Faulty	Offline	Disconnecte d

- PV module color

The color of a PV module indicates the ratio of the optimizer output power to the rated optimizer power. The following figure shows the mapping.

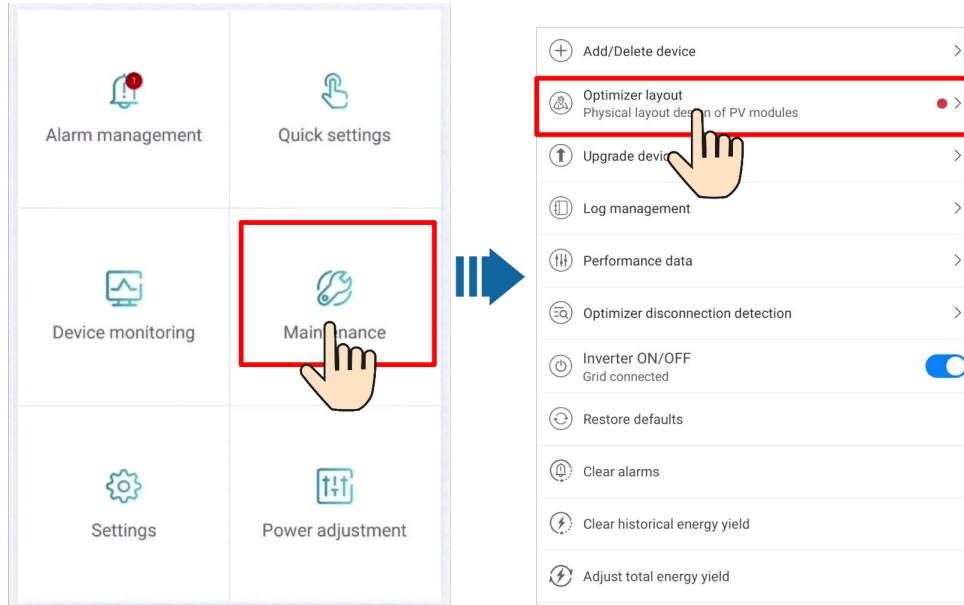


- Viewing details: Move the mouse pointer to an optimizer to view information such as the energy yield, output power, and output voltage.
- Viewing the energy yield: Click  next to **Yield** in the upper right corner to view the energy yield today, this month, and this year, and the total energy.
- Zooming in, zooming out, or restoring a layout: Click  and  in the lower right corner to zoom in or out the layout. Alternatively, click the layout and scroll the mouse wheel to zoom in or out. Click  to restore the layout.
- Viewing the connection between inverters and PV modules: Click  in the lower right corner. The PV modules connected to the same inverter are rendered in the same color.
- Clicking  in the upper left corner to display the device tree. Select an optimizer from the device tree and view its position in the layout.

## 5.3 Viewing a Physical Layout on the Device Commissioning Screen

### Viewing a Physical Layout

1. Choose **Me > Device Commissioning** on the FusionSolar App or use the SUN2000 App to connect to the inverter, and log in as an installer.
2. Choose **Maintenance > Optimizer layout**. The physical layout screen of the module is displayed.



3. On the current screen, view related information.

Optimizer status

<b>Icon</b>				
<b>Status</b>	Normal	Faulty	Offline	Disconnected

# 6 Identifying Faulty Optimizers

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MC4 terminals are used for connections between the inverter and PV strings and between adjacent PV modules. If the terminals are loose, in poor contact, or generate electric arcs, a disconnection fault occurs. A large number of PV modules are deployed on the rooftop, resulting in heavy troubleshooting workload and low efficiency. Fault points can be efficiently and accurately located based on disconnection detection and optimizer alarms on the FusionSolar App (for details, see [4.1 Manually Creating a Physical Layout on the FusionSolar App](#)), FusionSolar SmartPVMS (for details, see [4.2 Manually Creating a Physical Layout on the FusionSolar SmartPVMS](#)), and local commissioning screen (for details, see [4.3 Manually Creating a Physical Layout on the Device Commissioning Screen](#)), improving fault locating efficiency.

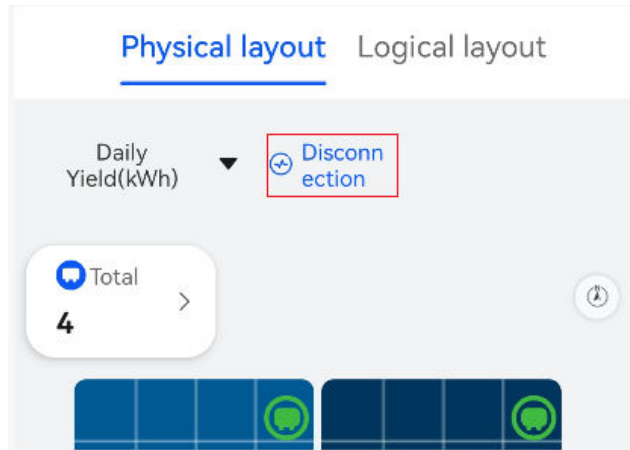
## 6.1 Identifying Faulty Optimizers on the FusionSolar App

### Identifying Faulty Optimizers Through Disconnection Detection

 NOTE

Only optimizers configured for all PV modules support disconnection detection.

1. Log in to the FusionSolar App using an installer account.
2. On the **Home** screen, tap **Plants** and tap the desired plant.
3. Tap **Layout**.
4. Tap **Disconnection**.
  - If multiple inverters are installed in the plant and all of them are equipped with optimizers, select the inverter to be detected in the dialog box that is displayed and tap **OK**.
  - If only one inverter in the plant is equipped with an optimizer, the detection task is directly executed after you tap **Disconnection**.



5. Quickly locate the faulty optimizer based on the physical layout diagram and rectify the fault based on the rectification suggestions.
6. After the disconnection fault is rectified, perform the disconnection detection again to ensure that the fault is rectified.

### Identifying Faulty Optimizers Based on Alarms

1. Log in to the FusionSolar App using an installer account.
2. Tap the **Maintenance** tab.
3. View the optimizer alarm information on the current screen and rectify the fault based on the handling suggestions. For details about alarms in optimizer scenarios, see [Common alarms and troubleshooting measures](#).

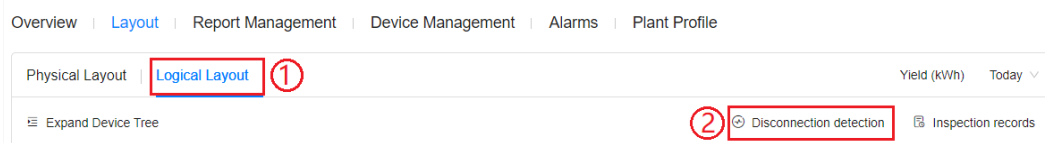
## 6.2 Identifying Faulty Optimizers on the FusionSolar SmartPVMS

### Identifying Faulty Optimizers Through Disconnection Detection

**NOTE**

Only optimizers configured for all PV modules support disconnection detection.

1. Log in to the FusionSolar SmartPVMS using an installer account.
2. Choose **Monitoring** > **Monitoring** from the main menu.
3. In the navigation pane, select a PV plant, and click the **Layout** tab.
4. On the **Logical Layout** tab, click **Disconnection detection**.
  - If multiple inverters are installed in the plant and all of them are equipped with optimizers, select the inverter to be detected in the dialog box that is displayed and click **OK**.
  - If only one inverter in the plant is equipped with an optimizer, the detection task is directly executed after you click **Disconnection detection**.






5. Quickly locate the faulty optimizer based on the physical layout diagram and rectify the fault based on the rectification suggestions.
6. After the disconnection fault is rectified, perform the disconnection detection again to ensure that the fault is rectified.

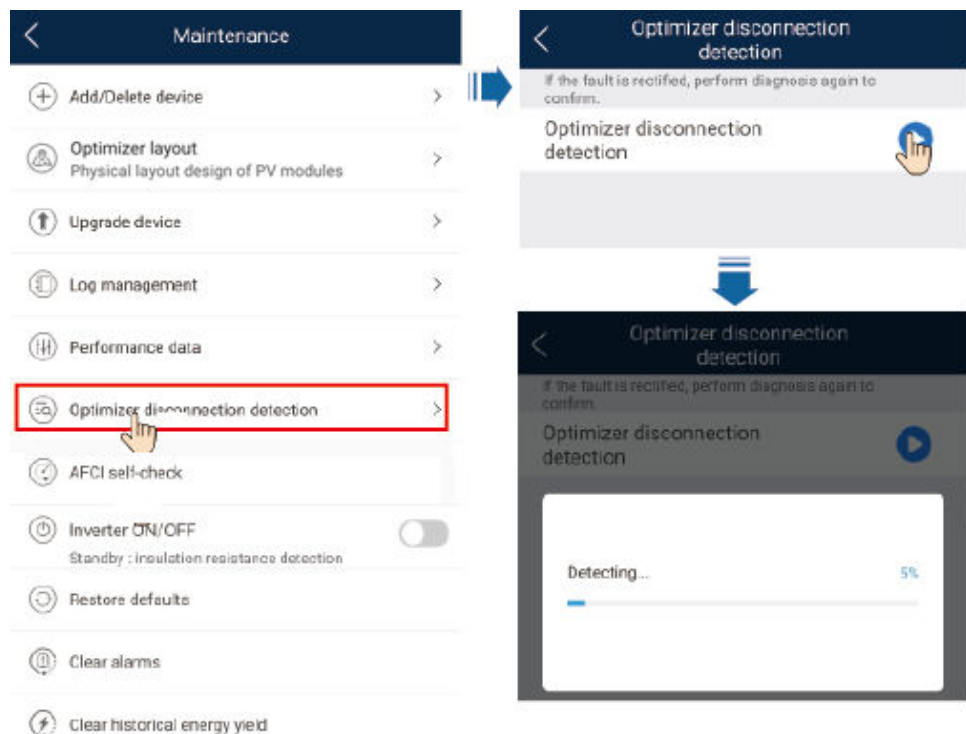
## Identifying Faulty Optimizers Based on Alarms

1. Log in to the FusionSolar SmartPVMS using an installer account.
2. Choose **Maintenance > Maintenance > Alarm Management** from the main menu.
3. View the optimizer alarm information on the current screen and rectify the fault based on the handling suggestions. For details about alarms in optimizer scenarios, see [Common alarms and troubleshooting measures](#).

## 6.3 Identifying Faulty Optimizers on the Device Commissioning Screen

### Identifying Faulty Optimizers Through Disconnection Detection

1. Choose **Me > Device Commissioning** on the FusionSolar App or use the SUN2000 App to connect to the inverter, and log in as an installer.
2. Choose **Maintenance**, choose **Maintenance > Optimizer disconnection detection**, and check that the optimizers have connected to the inverter.
3. Tap  to perform optimizer disconnection detection.



4. Quickly locate the faulty optimizer based on the physical layout diagram and rectify the fault based on the rectification suggestions.

5. After the disconnection fault is rectified, perform the disconnection detection again to ensure that the fault is rectified.

## Identifying Faulty Optimizers Based on Alarms

1. Choose **Me > Device Commissioning** on the FusionSolar App or use the SUN2000 App to connect to the inverter, and log in as an installer.
2. Select **Alarm**.
3. View the optimizer alarm information on the current screen and rectify the fault based on the handling suggestions. For details about alarms in optimizer scenarios, see [Common alarms and troubleshooting measures](#).

# 7 FAQ

## 7.1 Downloading and Installing the App

### NOTICE

- Mobile phone operating system: Android 8.0, iOS 11.0, or later versions (iSitePower-M does not support iOS. Please download the Android version.).
- To ensure the stability of each function, you are advised to use mobile phones running Android 8.0, iOS 13.0, or later versions. (For the mobile phones running iOS, iPhone 6 and later versions are supported, but iPhone SE is not supported.)
- Use mobile phones that support the access to the Internet.
- Use mobile phones that support the WLAN function.
- The router supports 2.4 GHz WLAN, and the WLAN signal reaches the device.
- The WPA, WPA2, or WPA/WPA2 encryption mode is recommended for routers. The Enterprise mode is not supported (such as airport WLAN and other public hotspots that require authentication). WEP and WPA TKIP are not recommended because they have serious security vulnerabilities. If the access fails in WEP mode, log in to the router and change the encryption mode of the router to WPA2 or WPA/WPA2.

### Procedure

Method 1: Download and install the app from the app store.

- Huawei mobile phone users: Search for **FusionSolar** in Huawei AppGallery.
- iPhone users: Search for **FusionSolar** in the App Store.
- Other mobile phone users: Select method 2.



Method 2: Scan the QR code to download and install the app.



 **NOTE**

Users who select method 2 can select the download method based on the mobile phone type.

- Huawei mobile phone users: Download from Huawei AppGallery.
- Non-Huawei phone users: Download on a browser.

When you select **Download via the Browser**, if a security warning message is displayed indicating that the app is from an external source, tap **ALLOW**.

## 7.2 Common Alarm Lists of Optimizers

### Navigation Path

- FusionSolar App
  - a. Log in to the FusionSolar app using an installer account.
  - b. Tap the **Maintenance** tab.
  - c. View the optimizer alarm information on the current screen and rectify the fault based on the handling suggestions.
- FusionSolar SmartPVMS
  - a. Log in to the SmartPVMS using an installer account.
  - b. Choose **Maintenance > Maintenance > Alarm Management** from the main menu.
  - c. View the optimizer alarm information on the current screen and rectify the fault based on the handling suggestions.
- Device Commissioning Screen
  - a. Choose **Me > Device Commissioning** on the FusionSolar app or use the SUN2000 app to connect to the inverter, and log in as an installer.
  - b. Select **Alarm**.

- c. View the optimizer alarm information on the current screen and rectify the fault based on the handling suggestions.

## Common Alarm Lists of Optimizers

**Table 7-1** Common alarm list of MERC-(1300W, 1100W)-P optimizers

Alarm Name	Cause	Suggestions
Input overvoltage	Optimizer input overvoltage occurred.	Check whether the open-circuit voltage of the PV module exceeds the maximum input voltage of the optimizer.
Overtemperature	The optimizer internal temperature is too high.	<ol style="list-style-type: none"> <li>1. Check the ventilation and ambient temperature at the optimizer installation position. If the ventilation is poor or the ambient temperature exceeds the upper threshold, improve the ventilation and heat dissipation.</li> <li>2. If the ventilation and ambient temperature are normal, contact your installer.</li> </ol>
Internal hardware fault	An internal fault occurred in an optimizer.	Contact your installer.
Output terminal overtemperature	The output terminal temperature of some optimizers is abnormal.	Contact your installer to replace the faulty optimizer and the optimizer connected to the short output cables of the faulty optimizer.
Output backfeed	Optimizer output backfeed occurred.	<ol style="list-style-type: none"> <li>1. Check whether PV modules are shaded when PV strings are connected in parallel.</li> <li>2. If the fault persists, contact your installer.</li> </ol>

Alarm Name	Cause	Suggestions
Abnormal output voltage	The optimizer output voltage is abnormal.	<ol style="list-style-type: none"> <li>1. When the sunlight is normal, perform optimizer search again.</li> <li>2. Check the voltage of the corresponding PV string. If the voltage is greater than 0 V, power off the system and check whether the extension cable of the abnormal optimizer is correctly connected.</li> <li>3. Check the voltage of the corresponding PV string. If the voltage is 0 V, power off the system and check the cable connection of the PV string. If there is an open circuit, rectify the cable connection of the PV string. If the polarity is incorrect, reconnect the PV string in the correct polarity. After the open circuit or reverse polarity is rectified, power on the system and perform an optimizer search again. If the alarm persists, check whether the extension cable of the abnormal optimizer is correctly connected.</li> <li>4. If the fault persists, contact your installer. Note: The polarity at both ends of the extension cable must be opposite (one end is a positive connector, and the other is a negative connector). To determine the PV string polarity, see "3 Installing the Optimizer Cables" in the optimizer quick guide.</li> </ol>
Upgrade failed	The optimizer software upgrade failed.	<ol style="list-style-type: none"> <li>1. When the sunlight is normal, perform the optimizer upgrade again.</li> <li>2. If the fault persists, contact your installer.</li> </ol>

**Table 7-2** Common alarm list of SUN2000-600W-P/SUN2000-450W-P/SUN2000-450W-P2 optimizers

Alarm Name	Cause	Suggestions
Input overvoltage	Optimizer input overvoltage occurred.	Check whether the open-circuit voltage of the PV module connected to the optimizer exceeds 80 V.

Alarm Name	Cause	Suggestions
Overtemperature	The optimizer internal temperature is too high.	<ol style="list-style-type: none"> <li>1. Check the ventilation and ambient temperature at the optimizer installation position. If the ventilation is poor or the ambient temperature exceeds the upper threshold, improve the ventilation and heat dissipation.</li> <li>2. If the ventilation and ambient temperature are normal, contact the installation contractor.</li> </ol>
Internal hardware fault	An internal fault occurred in an optimizer.	Contact the installation contractor.
Output backfeed	Optimizer output backfeed occurred.	<ol style="list-style-type: none"> <li>1. Check whether PV modules are shaded when PV strings are connected in parallel.</li> <li>2. If the fault persists, contact the installation contractor.</li> </ol>
Abnormal output voltage	The optimizer output voltage is abnormal.	<ol style="list-style-type: none"> <li>1. When the sunlight is normal, perform optimizer search again.</li> <li>2. Check whether the optimizer output extension cable is correctly prepared (positive connector at one end and negative connector at the other).</li> <li>3. Check whether the PV string is correctly connected to the inverter or whether there is a breakpoint in the PV string.</li> <li>4. If the fault persists, contact the installation contractor.</li> </ol>
Upgrade failed	The optimizer software upgrade failed.	<ol style="list-style-type: none"> <li>1. When the sunlight is normal, perform the optimizer upgrade again.</li> <li>2. If the fault persists, contact the installation contractor.</li> </ol>

 **NOTE**

Contact the service provider if all suggested measures listed above are completed and the fault still exists.