



# Mobile Powerwall Unit (MPU) On-Site Guide

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### **MOBILE POWERWALL UNIT (MPU) OVERVIEW**

The Mobile Powerwall Unit, or MPU, is a fully portable Powerwall + PV solution that enable homes and small facilities to locally generate, store, and utilize energy without requiring a grid connection. MPUs are generally deployed to natural disaster sites to provide emergency power during long grid outages. Each MPU is built on a pallet for easy shipping; the included components depend on the MPU variant as outlined below.

#### MPU 1

#### **Components:**

- (2) Powerwall 2 units
- (1) Backup Gateway 1
- (1) Third party solar inverter





**Backup Gateway 1** 



Third Party Solar Inverter

Powerwall 2

#### MPU 2

#### **Components:**

- (2) Powerwall 2 units
- (1) Backup Gateway 2
- (1) Tesla Solar Inverter

### **MOBILE POWERWALL UNIT (MPU) OVERVIEW**





Backup Gateway 2



**Tesla Solar Inverter** 

Powerwall 2

### MPU 3

#### **Components:**

- (2) Powerwall 3 units
- (1) Gateway 3





Gateway 3

Powerwall 3



**NOTE:** Future variants of MPU 3 will include Powerwall 3 Expansion units.

WARNING: Never make or break PV connections under load.

#### **Required Tools**

- PPE
  - Cut resistant gloves
  - Safety Glasses (ANSI Z87 rated)
- Tape measure
- 9/16" socket
- Drill and/or socket wrench
- Small Philips and flat drivers
- Wire strippers and cutters
- MC4 extension cables
- Multimeter
- 12VDC source & 2-pin jump connector
- Grounding hardware (split bolts, ground rod clamps)
- Zip ties
- Hex key set

#### Step 1: Plan PV Stringing

• Each PV string must be made up of the same type of solar panel

**NOTE:** This rule is always true for Tesla Solar Inverter and Powerwall 3, and should be assumed true for commercial solar inverters unless those inverter specifications explicitly state otherwise.

- · Consider the inverter specifications:
  - Tesla Solar Inverter and Powerwall 3 both have a nominal input voltage of 450 VDC with a DC input voltage range of 60 - 550 VDC
  - String voltage should be calculated so that it does not exceed 550 VDC, but should preferably not exceed 500 VDC
  - String Calculation Example 1:

Power Tolerance Voltage at Pmax (Vmp) Current at Pmax (Imp) Open-Circuit Voltage (Voc) Short-Circuit Current (Isc)	x) 380 W 0 ~ +5 W 40.2 V 9.47 A 48.5 V 9.97 A	Voc & Isc Tolerance Maximum System Voltage Maximum Series Fuse Rating Operating Temperature Protection Class Bifaciality Module Fire Portogeneous	±3% 1500 V 20A -40°C ~ +85° Class II ≥75%
WARNING-ELECTRICAL HAZ This module produces electri exposed to light. Follow all ap electrical safety precautions.	ARD city when oplicable	Avertissement-électrique Dang Ce module produit de l'électric à la lumière. Suivez toutes les applicables à la sécurité électr	jer ité en expos précautions ique.

- This panel has an Open Circuit Voltage (V<sub>OC</sub>) of 48.5 VDC
- Maximum number of panels per string = 450 VDC
- 450 VDC / 48.5 VDC = 9.27 panels per string
- **10 panels per string** provides a string voltage of 485 VDC, which is less than 500 VDC, and is therefore acceptable
- String Calculation Example 2:

DIFICIAL SPONSOR THE WORLD CUP	yinglisolar.com
PHOTOVOLTAIC MODULE IS R 1000W/m <sup>2</sup> SOLAR IRRADIAN MODULE TYPE: YL250P-29b RATED VOLTAGE: 29.8 VOLTS RATED CURRENT: 8.39 AMPS FIRE RATING: CLASS C MAX.SERIES OVERCURRENT. ULTESTED TO A DESIGN LOAD BYPASS DIODE DETAIL FOUND SERIAL NUMBER LOCATED ON	ATED AT AM1.5G SOLAR SPECTRUM, CE, AND 25°C CELL TEMPERATURE RATED POWER: 250.0 WATTS OPEN-CIRCUIT VOLTAGE: 37.6 VOLTS SHORT-CIRCUIT CURRENT: 8.92 AMPS MAX .SYSTEM VOLTAGE: 1000 VOLTS PROTECTIVE DEVICE RATING: 15 AMPS OF ±50 PSF. IN INSTALLATION AND USER MANUAL, N THE FRONT SIDE OF THE MODULE.
 DO NOT CONNECT OR DISCO	NNECT UNDER LOAD!

- This panel has an Open Circuit Voltage (V<sub>OC</sub>) of 37.6 VDC
- Maximum number of panels per string = 450 VDC
- 450 VDC / 37.6 VDC = 11.96 panels per string
- 12 panels per string provides a string voltage of 451.2 VDC, which is less than 500 VDC, and is therefore acceptable
- · Plan the solar panel layout for the available area
  - Identify 500 ft<sup>2</sup> of dry, flat land that will ideally not be subjected to flooding
  - For optimal racking usage, arrange panels in a 5 x 6 panel array (other configurations will use more ground mounts)
  - Be aware of traffic patterns near where the solar panels will be arranged, and prepare the area as needed with barriers/cones

#### Step 2: Lay Out Solar Racking and Panels

**NOTE:** See the UNIRAC Install Manual (download RM10 EVO Install Manual from Product Support Documents) for complete racking installation instructions.

Don't overtighten the racking equipment



CAUTION: Overtightening racking equipment may lead to cracked panels.

• For a 5 x 6 panel array, 42 bays and 144 clips/bolts are required

**NOTE:** Bolts and clips are not needed for the front or rear-most rows

#### Step 3: Connect Solar Panels in String



- 1. Connect the solar panels for the designated string in series, connecting the male MC4 connector of one panel to the female MC4 connector of the next panel.
- 2. Connect either end of the string to the inverter.

**CAUTION:** Do not connect the MC4 connectors at either end of the string directly to each other. This will result in permanent damage to the PV array.

Important notes on connecting solar panels:

- Older SMA inverters only have one MPPT, and all strings must have the same number of panels and be of the same type
- · Inspect connectors as panels are being set to ensure they are secure and in good condition
- · Use MC4 extension cables for longer home runs if needed
- · Measure the open-circuit voltage of each string
  - Open circuit voltage should be approximately V<sub>OC</sub> \* # of panels (e.g. 45V \* 10 = 450V)
- Ground the PV array
- Connect the racking/frames of the array to a local earth electrode or to an earth terminal block in MPU breaker panel

#### Step 4: Ground the MPU

- If a local ground grid is available, utilize 10 AWG ground wire to ground the MPU to the local ground grid
- If a local ground grid is not available, ground the MPU using a grounding rod per local requirements (typically driving an 8 ft ground rod into soil)
- Connect the earth terminal block of the MPU breaker panel to an earth electrode or terminal block in breaker
  panel on site



#### **Step 5: Connect Strings to Solar Inverter**



**WARNING:** Never make or break PV connections under load. Always confirm the solar inverter / Powerwall 3 is powered OFF and is not connected to AC power, and there is no voltage on the PV inputs before connecting / disconnecting wiring.

- 1. Confirm the inverter is powered OFF:
  - For Tesla Solar Inverter, confirm the Solar Inverter breaker is open (OFF).
  - For Powerwall 3, confirm the switch on the left side of the unit is OFF, then confirm the Powerwall 3 breaker is open (OFF).
  - For older third party solar inverters, confirm the DC disconnect is open (OFF), then confirm the inverter breaker is open (OFF).
- 2. Label each string by either placing bands of tape of the string (1 band of tape = String 1), or by placing number tape on the string



- 3. Connect the strings to the inverter:
  - For **Tesla Solar Inverter**, connect each string's conductors to the appropriate positive and negative terminals (e.g. connect String 1 to MPPT 1+ and 1-):



**NOTE:** Where the DC input current exceeds an MPPT rating of 13 A, jumpers can be used to allow a single MPPT to intake strings with a total DC input current of up to 26 A. 4-inch MPPT paralleling jumpers are included in the Solar Inverter accessory bag. See the *Tesla Solar Inverter installation manual* for more information.



 For **Powerwall 3**, connect each string's conductors to the appropriate positive and negative terminals (e.g. connect String 1 to MPPT 1+ and 1-), noting that the order of the PV conductors depends on the Powerwall 3 variant:



All other Powerwall 3 units

**NOTE:** Where the DC input current exceeds an MPPT rating of 13 A, jumpers can be used to allow a single MPPT to intake strings with a total DC input current of up to 26 A. Jumpers are included in the Powerwall 3 accessory bag. See the *Powerwall 3 installation manual* for more information.



NOTE: When the Powerwall 3 product label lists 15 A I<sub>MP</sub>, jumpers can be used to parallel MPPT to double the total PV input current capacity to 30 A.

#### • For other third party inverters, connect the PV strings per the manufacturer's instructions.

#### Turn the MPU ON

- 1. For MPU variant 1 with an SMA inverter, turn the DC disconnect ON. The inverter screen and LEDs should turn on when DC power is provided.
- 2. Turn all Powerwall breakers ON, then turn the Powerwall switches ON.

### JUMP START MPU 1 OR MPU 2

#### **Required Tools:**

• Hand crank dynamo generator (included with MPU 1 and MPU 2)

NOTE: For MPU 3 (built with Powerwall 3), the system does not need a jump start. Simply turn both Powerwall 3 units ON.

1. Set the toggle switch on the hand crank generator to 12V.

**CAUTION:** Setting the hand crank generator to another voltage could damage the MPU.





2. Open the Backup Gateway enclosure and remove the deadfront.



3. Using 22 - 18 AWG (0.3 - 0.75 mm<sup>1</sup>) 2-conductor wire, create a jump start cable and connect it to the Gateway **Jump** terminals.



4. Connect the jump start wiring from the Gateway to the hand crank generator, landing the red wire on the left and the black wire on the right.



5. Turn both Powerwall 2 units ON.

**NOTE:** When viewing Powerwall 2 from the front, the switch is always on the right side of the unit.



6. Turn the hand crank generator fast for at least 20 seconds, or until the green LED strip on each Powerwall begins flashing. Wait 5-10 minutes for the MPU to boot up; it can then begin to push power.



Ensure the Tesla One app has been installed on the mobile device being used to perform device setup. Navigate to *tesla.com/teslaone* if needed to automatically open the app store and install Tesla One.

📝 NOTI

**NOTE:** It may take up to 5 minutes after turning the MPU on to connect to the TEG / TeslaPW network

1. Launch the Tesla One app and log in with your Partner Portal account.

**NOTE:** If unable to log in with a Partner account, contact the Partner Portal admin from your company. They may need to create a user account for you in the User Management feature in Partner Portal. No specific role is required.

2. Select the Inside Tesla dropdown menu in the top left corner. Select Installs from the menu.





3. Select More > Tesla Device Setup > Scan QR Code.



- 4. Scan the QR code label:
  - MPU 1: Scan the QR code label on the inside of the Backup Gateway door



• MPU 2: Scan the QR code label on the Backup Gateway 2 deadfront



• MPU 3: Scan the QR code label on the Powerwall 3 Tesla Asset Controller (TACO)



5. When prompted to join the TEG / TeslaPW Wi-Fi network, select Join.

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# CONNECT TO MPU IN TESLA ONE AND CONFIRM PV OUTPUT

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6. When the landing page is displayed, you have successfully connected to the MPU.

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7. If the MPU is not already connected to a Wi-Fi network:

a. Select Networking > Wi-Fi



b. Select the Starlink Mini network (or another Wi-Fi network if the MPU does not have a Starlink Mini).

**NOTE:** Scan the Tesla\_Disaster\_Relief QR code on the MPU to connect to the Starlink network.



8. Verify PV production on the landing page.

**NOTE:** For SMA solar inverters (MPU 1 only), compare the PV production numbers in Tesla One with the production numbers on the inverter screen to confirm they match.

### **UPDATE THE MPU LOCATION**

**NOTE:** This step requires that the user have access to the MPU in the Tesla mobile app. Contact *Disaster\_Relief\_Monitoring@tesla.com* if access has not already been granted.

1. Open the Tesla mobile app.



- 2. Select the hamburger menu in the top right corner of the screen, then select My Products.
- 3. Select the MPU from the product list.



4. Select **Settings** > **My Home Info**, then select **Edit** to change the location pin to the current location.



### ADD USERS TO ACCESS THE MPU IN THE TESLA APP

#### Device Owner: Add User(s)

As an owner of the MPU in the Tesla mobile app, follow the instructions in *Adding a User to Your Energy System* to add other users in your organization as owners of the MPU. This will allow them to monitor energy production and usage, and manage the MPU's settings in the app.

**NOTE:** This step requires owner access to the MPU in the Tesla mobile app. Contact *Disaster\_Relief\_Monitoring@tesla.com* if access has not already been granted to someone in the organization.

Figure 1. Scan for Instructions to Add Users to MPU



#### **Device User: Accept Invite**

Once a user has been granted access to the MPU, they will receive an invitation via email. Accept the invitation to see the MPU in the Tesla mobile app.

# ADD USERS TO ACCESS THE MPU IN THE TESLA APP



## **REVISION HISTORY**

Revision	Date	Description
1.0	June 19, 2025	Initial publication