

# Activate Busbar Current Management — Application Note

This Application Note describes Busbar Current Management (BCM) compatibility with SolarEdge systems and how to activate it.

## Revision history


- Version 1.1, November 2024: In Firmware 4.22, the activation process underwent modifications, now encompassing calibration and automatic testing of the CTs' connectivity, as part of the BCM activation process.
- Version 1.0, August 2024: Initial release

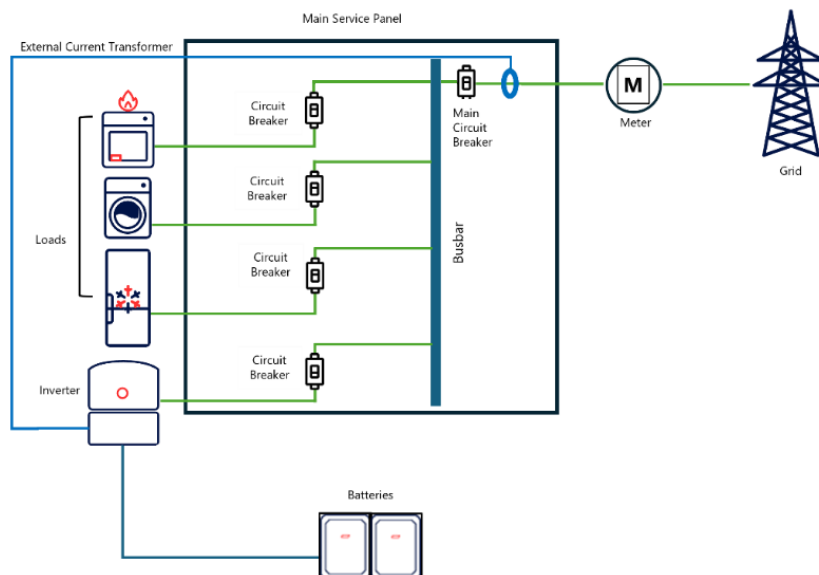
## Overview

The BCM system uses a Power Control System (PCS) to monitor the current flow into the main busbar to prevent it from exceeding its maximum capacity rating. The current transformers (CT) measure the current between the utility source and the renewable energy sources. Based on these measurements, the inverter adjusts its production level to ensure the total current on the busbar does not exceed its rating. This maintains safe load balancing on the monitored busbar.


## Busbar connection diagram


This diagram illustrates the connections among the PV system, the grid, and the residential main panel


 **WARNING!** The PV and Main Panel breakers must be placed at opposite ends of the Main Panel Busbar.




## IMPORTANT SAFETY INSTRUCTIONS


 **WARNING!** Configuration of the power control settings system or changes to settings shall be made by qualified personnel only. To become PCS certified, see [PCS Certification Overview- NA Technical](#). Incorrect configuration or setting of the power control settings may result in unsafe conditions.


 **WARNING!** The controlled current settings shall not exceed the busbar rating or conductor ampacity of any PCS controlled busbar or conductor.

 **WARNING!** The maximum operating currents in controlled busbars or conductors are limited by the settings of the Power Control System (PCS) and may be lower than the sum of the currents of the connected controlled power sources. The settings of the PCS controlled currents may be used for calculation of the design currents used in the relevant sections of NEC Article 690 and 705.

## INSTRUCTIONS DE SÉCURITÉ IMPORTANTES

 **AVERTISSEMENT!** La configuration du système sur le contrôle des puissances ou les modifications des réglages ne doivent être effectuées que par du personnel qualifié. Une configuration ou un réglage incorrect des paramètres de contrôle de puissance peut entraîner des conditions dangereuses.

 **AVERTISSEMENT!** Les réglages du courant ne doivent pas dépasser l'intensité nominale du jeu de barres ou l'ampacité du conducteur de tout jeu de barres ou conducteur contrôlé par le PCS.

 **AVERTISSEMENT!** This Les courants de fonctionnement maximaux dans les barres ou les conducteurs contrôlés sont limités par les réglages du système de contrôle de la puissance (PCS) et peuvent être inférieurs à la somme des courants des sources de puissance contrôlées connectées. Les réglages des courants contrôlés par le PCS peuvent être utilisés pour le calcul des courants de conception utilisés dans les sections pertinentes des articles 690 et 705 du NEC.

## Before you begin

Before activating the BCM, you must comply with the following requirements:

- Only qualified personnel are permitted to set or change the settings of the BCM.
- The maximum PCS operating current settings cannot exceed the busbar rating or conductor ampacity of any PCS controlled busbar or conductor.
- You must use the following SolarEdge Current transformer: SECT-SPL-225A-T-20.

## Supported configurations

The following lists the supported configurations and requirements for activation of the Busbar Current Management:

- Single Home Hub Inverter with up to three batteries and no Backup System (BUI)<sup>1</sup>
- Inverters equipped with firmware version 4.22 or higher.
- Inverters equipped with compatible meters (see the relevant part numbers below)
- Current transformer: SECT-SPL-225A-T-20 (included in the PCS kit for an inverter without a compatible PCS meter)

## Activate Busbar Current Management

This section includes the required steps to install and configure BCM in an electrical system. To activate the BCM, the inverter must have a PCS certified meter. The following inverter models include a built-in PCS meter and do not require a PCS meter replacement.

- SExxxxH-USMNUxx75
- SExxxxH-USMNFxx75
- USExxxxH-USMNBL75

### Step 1: Install PCS Meter (required for inverters without a built-in PCS meter)

Install the PCS meter according to the guidelines in the PCS kit: FLD-MTR-3PC05-PIE-CT. For details, see [Replacing the Built-in Meter in SolarEdge Inverts for PCS Busbar Current Management](#).

### Step 2: Install the current transformers (CT)

1. Turn OFF and isolate all sources feeding the panel before you attach the CTs.
2. Place the CTs around the conductor. It is recommended to secure them with a zip tie to prevent accidental opening.

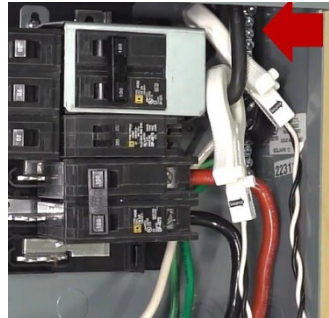
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<sup>1</sup> Multiple inverters and backup units (BUI) will be supported in a future release.

3. Position the CTs with the **arrows pointing to the grid** for import/export measurement as shown in the figure below.

**NOTE**


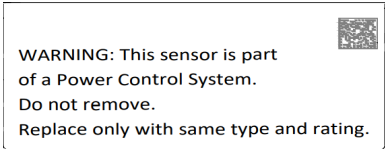
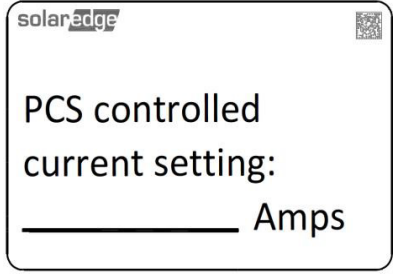
Do not proceed until you have performed a visual check for miswiring and CTs pointing in the wrong direction. Failure to do so can result in overcurrent in the busbar.



**CT Installation with arrows on CTs pointing to the grid**

**Step 3: Add labels**

The labels are provided with Busbar Current Management supporting inverters and the meter replacement kit. Add the labels based on the information in the table below.

Label	Labels text/icon	Where	
Inverter's label	The maximum operating current of this system may be controlled electronically. Refer to manufacturer's instructions for more information	On the Inverter cover	 <p>The maximum operating current of this system may be controlled electronically. Refer to manufacturer's instructions for more information.</p>
CT orientation label	Arrow indicating the orientation of the sensor	On each CT	Each CT comes with a manufacturer's label.
CT Busbar Current Management label	WARNING: This sensor is part of a Power Control System. Do not remove. Replace only with same type and rating	On each CT	 <p>WARNING: This sensor is part of a Power Control System. Do not remove. Replace only with same type and rating.</p>
Busbar Current Management label	In compliance with the NEC, make sure to clearly label with indelible ink the Maximum current setpoint	On the main panel or panel being monitored by PCS	<p>Enter the value on the label. The value is equal to 80% of the busbar rating.</p>  <p>PCS controlled current setting: _____ Amps</p> <p>For example: PCS controlled current setting: _____80_Amps</p>



**CAUTION**

Verify the following:

- The ratings for the busbars and the main circuit breakers are correctly labeled on the equipment.
- You entered the correct values in SetApp.

Failure to do so can result in injury or damage to the property.

### Step 4: Activate PCS with SetApp

Launch SetApp, go to **Commissioning > Power Control Energy Manager > Limit Control > Busbar Current Management** and follow the app instructions to activate the BCM.

The application takes you through the following steps: Calibration, CT connectivity test, and Settings definition.

1. Calibrate the meter by connecting the full wiring circuit and CTs to the meter but keep them disconnected from the actual conductors it will measure.



#### WARNING!

Do not handle or disconnect CTs inside an energized panel.



#### NOTE

- The CT calibration occurs by default on the first time the BCM is activated.
- The installer can calibrate the CTs after the initial activation by running the BCM activation process from the start.

2. Follow the SetApp instructions to run the CT connectivity tests.

The CT connectivity test allows you to detect incorrect CT direction and line miswiring.

3. Define the system settings

- a. Indicate if the site includes **Additional Generation** sources.
- b. Set the parameters for the following:

Parameter	Definition
<b>Main circuit breaker current rating</b>	The Busbar and main circuit breaker ratings can differ. The main circuit breaker rating can be equal to or lower than the Busbar rating.
<b>Busbar current rating</b>	Maximal rating is 200A.
<b>Advanced Settings (optional)</b>	You can configure the PCS setpoint and fail-safe values to accommodate other unmonitored systems.  For example, setting the Busbar Current Management fail-safe value to zero ensures compliance with NEC 705.12 (B) during fail-safe mode when other sources are present.

#### NOTE



- You must be qualified to calculate the fail-safe value.
- By default, the system automatically calculates the setpoint and fail-safe values, with the setpoint being 80% of the Busbar and the fail-safe value determined by the 120% rule.

If the PCS activation process is not completed successfully, the BCM is not activated.

## Appendix: Fail-safe mode and system alerts

### Fail-safe mode

After the Busbar Current Management feature is activated, if any abnormal conditions or setpoint violations are detected, the system switches to a fail-safe mode. Fail-safe Conditions are defined as the following:

- Internal system error
- Connectivity issue (short or open circuit) with the current transformer(s)
- Connectivity loss with the energy meter
- Setpoint violation

During fail-safe mode operation, the site production level is lowered to a level which complies with NEC705.12 (B)(3)(2). The production level is determined according to the rating of the Busbar and the MCB as follows:

$$\text{Back feed current} \leq ((120\% \text{ of busbar rating}) - \text{Ampacity of the overcurrent protection device protecting the busbar}) / 125\%$$

#### **Example:**

100A rated busbar with 100A main circuit breaker:

$$(1.2 * 100 - 100) / 1.25 = 16$$

In the above example, the maximum failsafe mode for the inverter is limited to 16A.

You can manually configure a lower setpoint value to accommodate for other systems not monitored or controlled by the PCS. For example, the Busbar Current Management failsafe value can be set to zero to maintain compliance with NEC 705.12 (B) during failsafe mode when other sources are present. You must be qualified to calculate the failsafe value.

## System alerts

The table below describes system alerts in the Busbar Current Management.

Alert	Alert description	Alert troubleshooting
Restricted production due to busbar current level	To prevent the busbar from overcurrent, the system is operating in a limited production mode.	<ul style="list-style-type: none"> <li>■ To return to normal production mode, reduce the energy consumption on-site.</li> </ul>
Meter communication failure while active Busbar Current Management	Communication failure with the energy meter. Production level is restricted to limit current on the Busbar.	<ul style="list-style-type: none"> <li>■ Check the connectivity between the inverter and the meter.</li> <li>■ Check if the connecting cables are disconnected or damaged.</li> <li>■ If the problem remains, contact SolarEdge Support.</li> </ul>
Current transformer (CT) communication failure while active Busbar Current Management	Open circuit/Short circuit CT loss of the CT connected to L1 or L2.	<ul style="list-style-type: none"> <li>■ Check that the meter is connected to the CTs.</li> <li>■ Check if the connecting cables are disconnected or damaged.</li> <li>■ If the problem remains, contact <a href="#">SolarEdge Support</a>.</li> </ul>
Busbar Current Management built-in test failure	System production is restricted, due to Busbar Current Management built-in test failure.	Power Off and ON the inverter. If the problem remains, contact SolarEdge Support.