

Module Embedded Power Optimizer Service Procedure – Application Note

This application note specifies service procedures for the SolarEdge Module-Embedded power optimizer, also known as the SolarEdge smart junction box. This power optimizer is available as a component of Smart PV modules available from various module providers.

This document provides information about the two functionality modes of the OPJ300-LV module-embedded power optimizer, and describes how to switch between these modes when servicing a malfunctioning embedded power optimizer.

**NOTE:**

This application note applies only to the second generation module-embedded power optimizers, which includes a Pass-Through connector (see Figure 2). The following are part numbers of power optimizers that *do not* include a Pass-Through connector: OPJ300-LV-S1XD, OPJ300-LV-S1XE or PB250-CSI.



Figure 1: OPJ300-LV power optimizer

OPJ300-LV “Pass-Through” and “Optimization” Modes

The OPJ300-LV has a Pass-Through capability allowing it to bypass the power optimization electronics. Once the OPJ300-LV is switched to the “Pass-Through” mode, the power optimizer functions as a regular junction box. The internal bypass diodes remain active in “Pass-Through” mode, similar to a standard junction box.

This capability can be used in case of a failure of the electronics in the embedded power optimizer. In such a case, the embedded power optimizer functionality can be switched from Optimization mode to Pass-Through mode in order to keep on the power production, while adding an external power optimizer.

The OPJ300-LV power optimizer mode of operation is set by the Pass-Through connector. There are two connector types:

- Type 1, shown in Figure 2, with or without a plastic spacer adjacent to the connector. This connector type should be replaced with Type 2, described below.

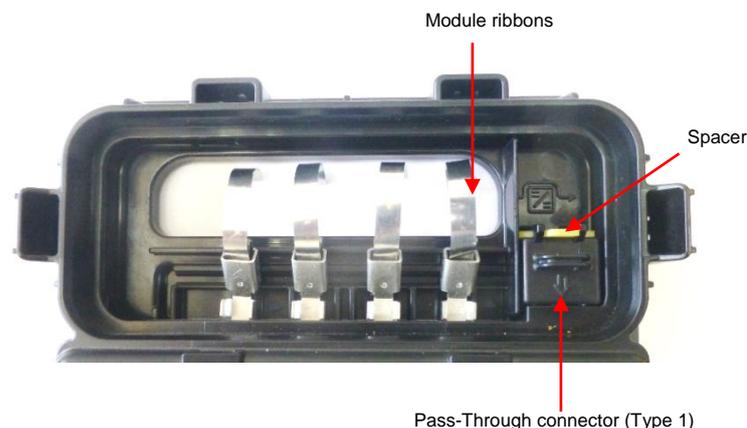


Figure 2: The Pass-Through connector – Type 1 (to be replaced)

- Type 2, shown in Figure 3. This Pass-Through connector should replace Type 1. It consists of different jumpers for Optimization mode and Pass-Through mode:
 - One jumper for Pass-through mode
 - Two jumpers for Optimization mode

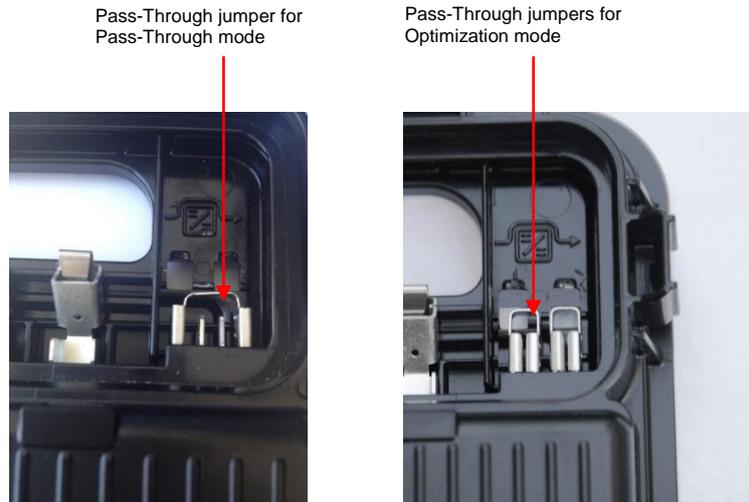


Figure 3: The Pass-Through connector – Type 2



NOTE:

In every instance of switching an optimizer from Optimization mode to Pass-Through mode, type 1 connector should be replaced with type 2 connector.

Service Procedure

The service procedure includes the following steps:

1. Removing Type 1 Pass-Through connector, or removing the Optimization mode jumpers in the Type 2 connector.
2. Inserting a Pass-Through mode jumper for shifting to the Pass-Through mode (power optimizer inactive).
3. Connecting an add-on (external) optimizer between the output of the module and the solar system. This optimizer will perform the optimization, communications and safety functions that were originally carried out by the failed smart junction box.

Replacing the Pass-Through Connector

1. Identify the type of Pass-Through connector (Type 1 or 2). Depending on the Pass-through connector type, proceed as follows:
 - Removing Type 1 connector:
 - a. Insert a flat screwdriver into the connector's plastic loop, as shown in Figure 4.
 - b. Carefully tilt the screwdriver to release the connector from the holding clamps and pull the connector out. If the connector is not fully released, insert the screwdriver under the connector and push slightly, until the connector is out.

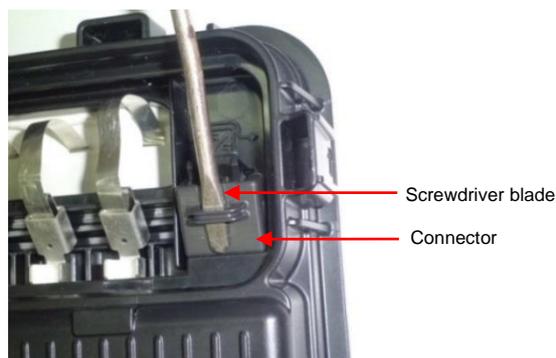


Figure 4: Pulling out the PassThrough connector Type 1

- c. Discard the connector, and the spacer (if present).

- d. Use a diagonal cutter to cut the two plastic clips that held the connector in place (Figure 5)



Figure 5: Cutting the type 1 connector plastic clips

- Removing Type 2 connector jumpers:
 - a. Use long-nose pliers to pull out the two jumpers.
 - b. For each jumper, pull about 1mm at a time from the right and left sides, until the jumper is released, taking care not to damage the enclosure, or the power optimizer pins.
 - c. Discard the jumpers.
- 2. Insert a Pass-Through mode jumper. This jumper is wider than the Optimization mode jumpers, and connects between the leftmost and rightmost pins (see Figure 6):
 - a. Position the jumper in place and push lightly.
 - b. Use long-nose pliers to push 1mm down from each side until the jumper covers the pins.
 - c. Verify that the jumper is fully in position.



Figure 6: Inserting the Pass-Through mode jumper

3. Close the embedded power optimizer cover. Verify that the sealing rubber is correctly in position and that all 4 plastic clips are in position (see Figure 7).



Figure 7: Closing the power optimizer cover

Checking the Power Optimizer

Expose the module to the sunlight, and verify Voc across the output, as stated in the module's datasheet. If the voltage is not as expected, replace the module.

Mounting a Replacement Add-on Power Optimizer

1. Mount the replacement add-on optimizer as described in the *SolarEdge Installation Guide*.
2. Connect the outputs of the OPJ300-LV to the inputs of the replacement add-on power optimizer (see Figure 8).

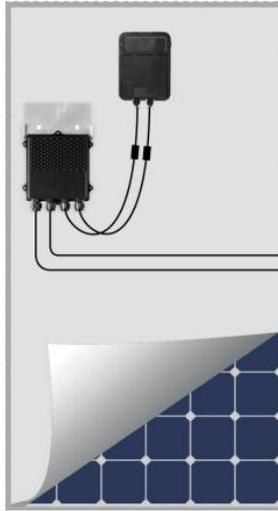


Figure 8: Installed junction box and add-on optimizer

3. Use a voltmeter to check that the voltage from the add-on optimizer is 1V.
4. Connect the outputs of the replacement add-on power optimizer in the string.
5. Perform pairing as described in the *SolarEdge Installation Guide*.