

# PLS2 SHUNT ADAPTOR

The PLS2 shunt adaptor is designed for use with PL series solar charge controllers. It allows the controller to measure charge or load currents which do not go through the controller. This allows inverter or generator currents to be included in the controller's display. Note: The Amp hour reading and SOC will not be meaningful unless **ALL** the currents in the system are measured.

## Description

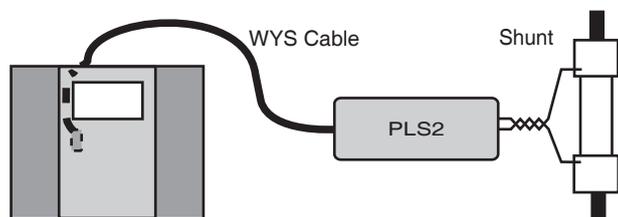
The PLS2 shunt adaptor measures the current in a current shunt and converts that measurement into a digital form. This data is then sent to the PL controller.

## New features

The PLS2 is bi-directional. This means it can report net load current or net charge current from a single shunt. In many systems, one PLS2 can be used where two PLSs were required. Because the PLS2 is bi-directional, a load/charge setting is not required. Two PLS2s can be used in one system, but their readings cannot be displayed separately. In a two PLS2 system, one PLS2 (the slave) sends its reading to the other PLS2 (the master). The master adds this to its own reading and sends total charge and load data back to the PL. This allows you to measure the currents in two different shunts. As a bonus, any flow opposite to what's assumed will be measured correctly. For example, inverters driving reactive loads often return current to the battery during part of each cycle. This current was ignored by old PLSs but is counted properly by PLS2s.

## Installation

The shunt can be installed in either the positive or the negative wire. The PLS2 is supplied in a clip together powder coated aluminium box. The base of the box has two 5.5mm diameter mounting holes spaced 50mm apart. The part containing the circuit board clips onto this base. It can be mounted in any attitude. The box is 75L x 38W x 30H mm. Mount as close to the shunt as practical, (Preferably within 100mm). Twist the two wires to the shunt around each other to reduce the pick up of interference.



Connecting the PLS to a PL20 or 40. For a PL60 use a WZS cable

## Set-up

It is necessary to select the correct shunt size and mode:

### - Size Selection

Three shunt sizes can be handled directly. These are 100mV/100A, 50mV/100A and 75mV/200A.

To connect to a 100mV/100A shunt, connect one wire to the terminal labelled 0 and the other to the terminal marked C. Similarly, use 0 and B for 50mV/100A, or 0 and A for 75/200. Other sizes may be handled by the use of a resistive divider. The shunt should be arranged so that the end connected to the "0" terminal is more positive for charge information and more negative for load information. If you get this wrong, there will be no damage, simply swap the wires to the shunt.

### - Mode selection

Each PLS2 must operate in either master or slave mode. This selection is made using the two pins beside the green terminal block. If they are left connected, the PLS2 will run as a master. If the jumper is removed, the PLS2 will run as a slave. If only one PLS2 is installed it must be set to master. If two PLS2s are installed one must be a master and one must be a slave. If a PLS2 is installed with a PLS, the PLS2 must be set to master. The PLS will send either charge or load information according to its link setting. The PLS2 will send the opposite, eg. if the PLS is set to Load, the PLS2 will act like a PLS set to Charge.

## PL Connection

There are three types of cable used with PL accessories.

"WYS" cable connects a PL20/PL40 to a single PLS2 (or accessory.)

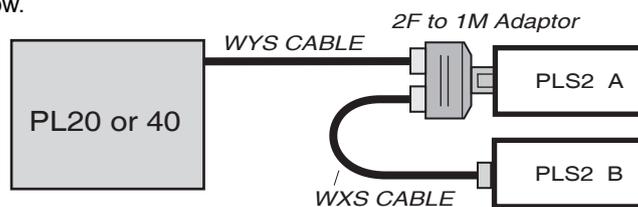
"WZS" cable connects a PL60 to a single PLS2 (or accessory).

"WXS" connects accessories together and is used to connect a second PLS2 (or accessory).

When using a WYS cable the phone plug end connects to the PLS2 and the 8 way connector plugs onto the 8 way pin header under the lid of the PL controller. Run the cable beside the display on the PL and then out from under the lid at the cut out tab. Do not allow the cable to touch any part of the PL heatsink. One socket of the header plug is blocked up - this matches the cut off pin on the circuit board header. The cables may all be extended if required up to a maximum run for the system of 100 metres.

You can order custom length cables, with the preferred method being a custom length WXS (extension) cable connected to a standard WYS or WZS cable via an in-line joiner (PLJ), or a custom length WXS cable connected between the PLS2 and any PL accessory (eg. PLM).

To connect two shunt adaptors to a PL controller. Use a US standard (RJ12 6P6C) double adaptor and a WXS cable as shown below.

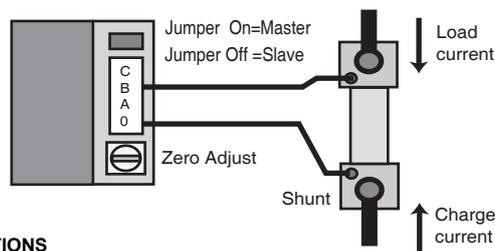


On the PL screen, the current read by the adaptor is added to the internal current. You can long push to get beyond this screen, the adaptor current can then be seen separately as CEXT or LEXT (external charge or load).

*Note: Some very early PL20 controllers will not work with PLS2s. This early version of the PL20 can be identified by the fact that it has no current limit setting in the REG menu or that the serial number is to the right of the push button. If you need to use a shunt adaptor with one of these early PL20s you will need to use a PLS.*

## Zero adjustment

The small trimpot beside the green terminal block is to allow the user to adjust the PLS2 so that zero current reads as zero on the PL screen. This is preset in the factory. Do not adjust it unless you have to. Allow 5 minutes for the zero to stabilise before adjusting. Adjust slowly until the reading just goes to zero.



## SPECIFICATIONS

|          |                          |                |                        |
|----------|--------------------------|----------------|------------------------|
| Range    | +/- 250A                 | DC Isolation   | 500V                   |
|          | 0 - 25.0 A in 0.1A steps | Temperature    | -20 to +70°C           |
|          | 25 - 250 A in 1A steps   | Supply current | 5mA (from PL supply)   |
|          | Automatic range change   | Supply voltage | 10 - 100V              |
| Accuracy | +/-1% or 1 digit         | Shunt sizes    | 1mΩ, 0.5mΩ and 0.375mΩ |