



OceanPlanet Energy
Bruce Schwab Energy Systems
72 Front St. Suite 15, Bath, ME 04530
Ph: 207-370-9112, Fax: 207-442-7100

Email: bruce@oceanplanetenergy.com Web: www.oceanplanetenergy.com Skype: Oceanplanet

May 27, 2015

We did some testing today with the Wmarine10 controller, to see how the **Solara Power-M 120** did in partial shading vs the **Solbian SP125**. Questions we wanted to answer:

- 1) Would the WMarine10 function with the Solara with a series string hard-shaded and produce 1/2 power, as we have seen with the Solbian panels.
- 2) If not, would this be an advantage due to the bypass diodes in the Solbian.
- 3) Compare the output of the 120W Solara to the 125W Solbian
- 4) Find out if there is a difference from shading cells in the "first" series string (neg. side) vs the 2nd (+ side), using the WMarine10.

Testing time 2-2:30pm, sun quite high, panels horizontal. Test done with K2 lithium 19.2Ah battery, with resistive load applied as noted.

Test 1) Solara Power-M 120 with WMarine10:

Solara full sun: 4.7 (battery 13.5V)
Shade 1 string one: 3.6
Shade two string one: 2.4
Shade 3 string one: 2.4
Shade one cell string two: 3.4
Shade two cells string two: 0.9

(Note: apparently when two cells shaded, sometime the WMarine10 has trouble "switching" from buck to boost mode, and could take time. This was seen also when shading two cells in string one.)

Shade one string: two middle: 3.4
Shade two string: 2 middle 2.4
Shade three string two: 2.3

Shade 4+ cells on either string: 2.3
Shade both strings: 4 cells 0.2
Max current with load on battery: 5.4 (Battery 12.8V)

Test 2) Solbian SP125 w/WMarine10:

Solbian full sun: 6.0 (Battery 13.5V)
Shade string one: 4.3
Shade two string one: 2.8
Shade three string one: 2.8
Shade string two one cell: 4.3
Shade two string two: 2.8

Shade 4+ cells on either string: 2.8
Both strings shaded, 4 cells: 0.2
Full power under load: 6.4 (Battery: 12.8V)



OceanPlanet Energy
Bruce Schwab Energy Systems
72 Front St. Suite 15, Bath, ME 04530
Ph: 207-370-9112, Fax: 207-442-7100

Email: bruce@oceanplanetenergy.com *Web:* www.oceanplanetenergy.com *Skype:* Oceanplanet

Summary:

1) WMarine10 works with the Solara the same as with the Solbian. That is, if one string is hard-shaded, then it will operate as if connected to only 1/2 of the panel and still produce power. So evidently no advantage to Solbian for having the embedded bypass diodes. This was a surprise to me, as I thought the Solara would not work as well without the bypass diodes. Point to Solara. Also a strong selling point for the WMarine10 in applications where the shading can be arranged to generally be on one series string or the other. However in other tests vs. the Genasun GV10, it is 5-10% less power if panel is in clear sun.

2) The Solbian 125W was clearly more powerful (in the tested conditions, using the WMarine10) than the 120W Solara. Point to Solbian.