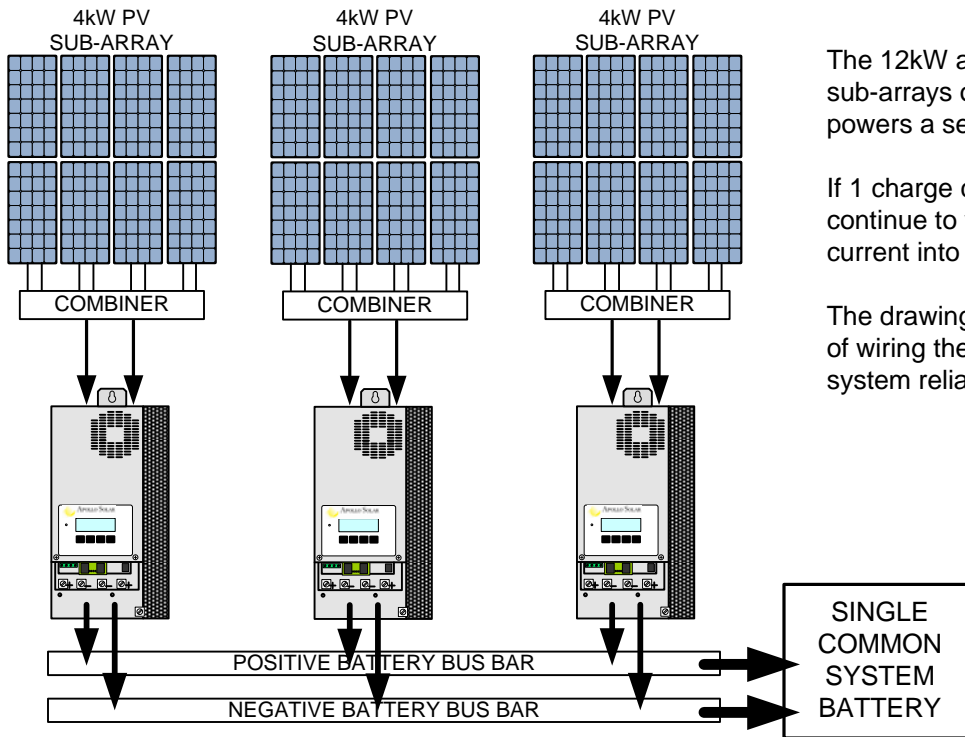


ENHANCING SYSTEM RELIABILITY WITH OFF-GRID PV CHARGE CONTROLLERS

TOTAL PV ARRAY = 12kW

TYPICAL SYSTEM



The 12kW array at the upper left is divided into 3 sub-arrays of 4kW each. Each 4kW sub-array powers a separate MPPT Charge Controller.

If 1 charge controller fails, the other 2 units will continue to work, producing 2/3 of the total current into the battery.

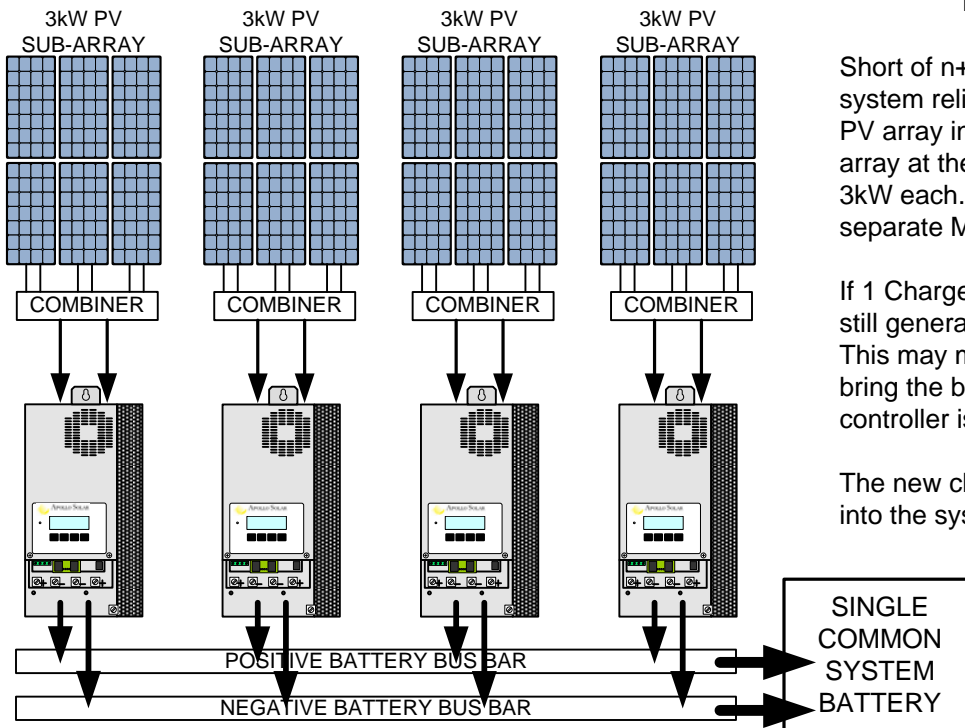
The drawing below shows an improved method of wiring the same size PV array for enhanced system reliability.

N+1 REDUNDANCY

It is NOT POSSIBLE to wire an MPPT charge controller in a truly N+1 redundant configuration since the MPPT front ends must each have a separate sub-array of PV modules.

TOTAL PV ARRAY = 12kW


ENHANCED RELIABILITY



Short of n+1 redundancy, a high degree of system reliability can be achieved by dividing the PV array into smaller units. The same 12kW array at the left is divided into 4 sub-arrays of 3kW each. Each 3kW sub-array powers a separate MPPT Charge Controller.

If 1 Charge Controller fails, the other 3 units can still generate $\frac{3}{4}$ of the current into the battery. This may mean that it will take 25% longer to bring the battery up to full charge until the charge controller is replaced.

The new charge controller can be hot swapped into the system by turning its circuit breakers off.

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ENHANCING PV SYSTEM RELIABILITY

T80 / T80HV BLOCK DIAGRAMS

10-JAN-2012

J. PFEIFER

REV 1

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