4 CELL (LFP) Dynamic Cell Balancer and Monitor
Connection and operation

CONNECTION INSTRUCTIONS

Use a separate wire pair to each cell. DO NOT SHARE CONNECTIONS by using only 5 wires.

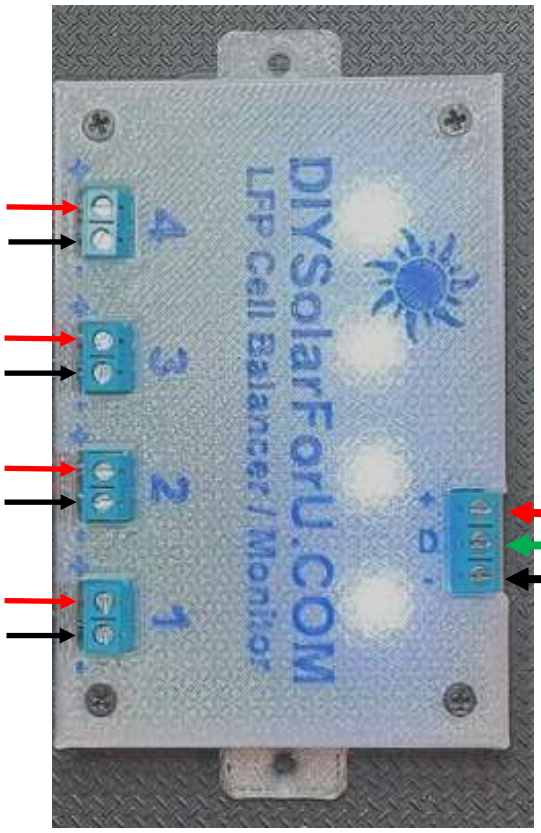
** IMPORTANT **
Connect Balancer end FIRST then connect to Battery CELL

DO NOT CONNECT MORE THAN ONE CELL PER INPUT—damage will occur.

#22 to #16 wire size up to 10 feet long. #18 AWG Alarm Wire is a popular choice.

Cell wiring order is up to user. Top = 1 or Bottom = 1

LED Blinks at connection for 0.5 seconds to indicate proper connection. No Blink = reversed



OPERATION

LED On = Cell is full
Balancing is occurring

LED OFF = Cell is between 3.00 and 3.55 volts

LED Blinks every 4 seconds
Cell is below 3.00 volts

NOTE: Slight variation in brightness or slight flicker is NORMAL.

Data Connection from System Master Unit (coming Soon)
Positive Power
DATA line
Negative Power

More than 4 cells requires a daisy chain parallel connection to each unit on the data side.

All 3 wires required for DATA

How Cell Balancing Works with LFP / LiFePO4 Batteries

Cell Balancing is important to keep the battery pack healthy and give many charge and discharge cycles because if a cell falls below 2.00 or above 3.80 damage can occur to the cell. Cell Balancing is a critical part of any BMS or "Battery Management System". Protecting against over-charge and over-discharge are the other two functions and are handled by other system components.

The DC to AC Power Inverter will almost always have a low voltage cutoff that protects against over discharge. A good quality charge controller such as ours will protect against over-charge so that leaves cell balancing function to complete the BMS system.

Balance occurs at the top of charge when the cell voltage quickly rises above 3.45 volts. At 3.55 volts the cell is basically full. Above 3.55 volts some current is bled off and the LED lights to allow the other cells to catch up. On a well balanced pack all cells will reach this at nearly the same point during charging. It ensures that all cells will even out at full charge and helps protect against cell overvoltage above 3.80 volts.

Dynamic balancing allows for variations in float voltage of the charger from 14.20 to 14.60 volts on a 12 volt system while still achieving equal cell voltages at top of charge and LED on indication when the cell is nearly full and balancing active.
Same applies for 8, 12, and 16 cell systems (24, 36, and 48 volts).

If a cell goes below 3.00 volts the LED will blink every 4 seconds to indicate that a cell is near 0% charge and is an early warning your DC to AC Inverter is about to cut off. Duty cycle is very low so average battery drain remains under 600 uA in this state.

With the System Monitor Unit (Coming Soon) detailed information is available thru the DATA link including actual cell voltage from 2.50 to 4.50 volts. When DATA is linked to the charge controllers thru the system monitor additional over-voltage protection is enabled by trimming the charge voltage if a cell goes over 3.70 volts. Faster Cell Balancing is also achieved by data handshaking.

Between 3.00 and 3.55 Volts monitor draws only 170uA and under 800uA when DATA is active. This ensures virtually no impact on battery run time from adding the cell balancer to the system.

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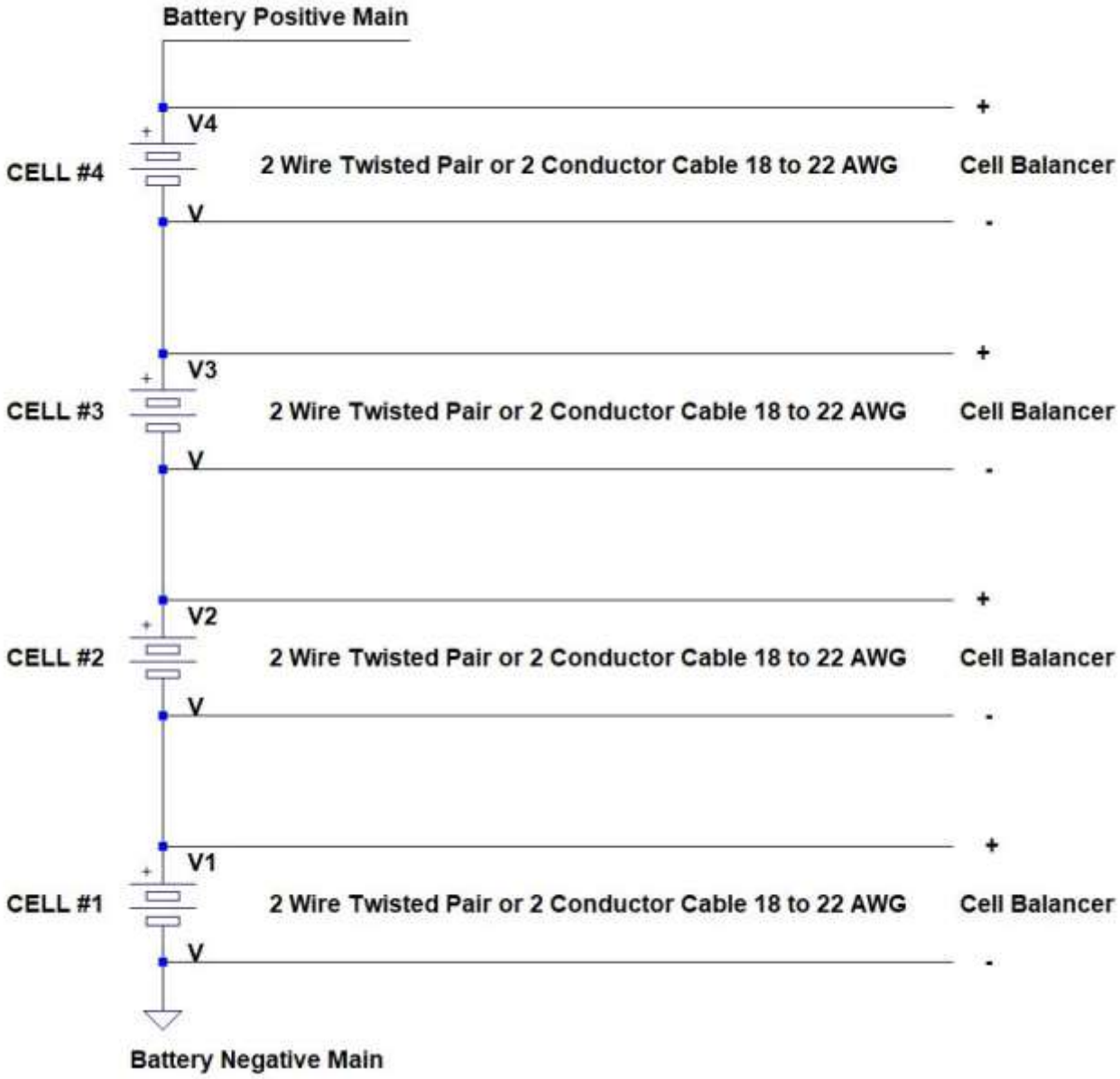
Wiring Diagram — 4 Cell Example Shown



Each Cell Balancer Input gets wired with 2 conductors directly to the cell. Do not share the in between cell lines as this will result in errors in the voltage read.