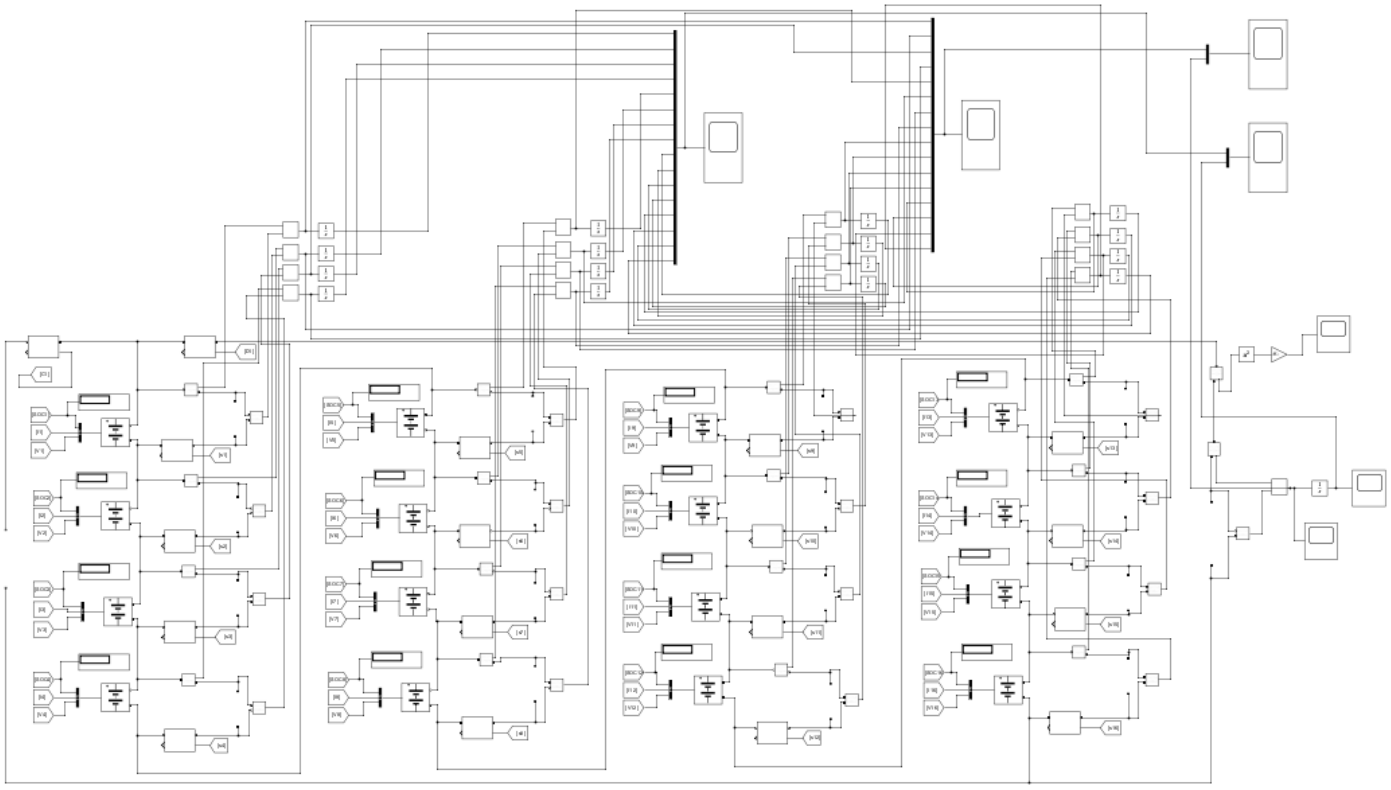
Simulation of 16S1P configuration of Passive Cell Balancing and Charging and Discharging by Min Balancing Set Point Strategies

Circuit Diagram of 16S1P Configuration :



Cell 1 – Cell 4 **Cell 5 – Cell 8** **Cell 9 – Cell 12** **Cell 13 – Cell 16**

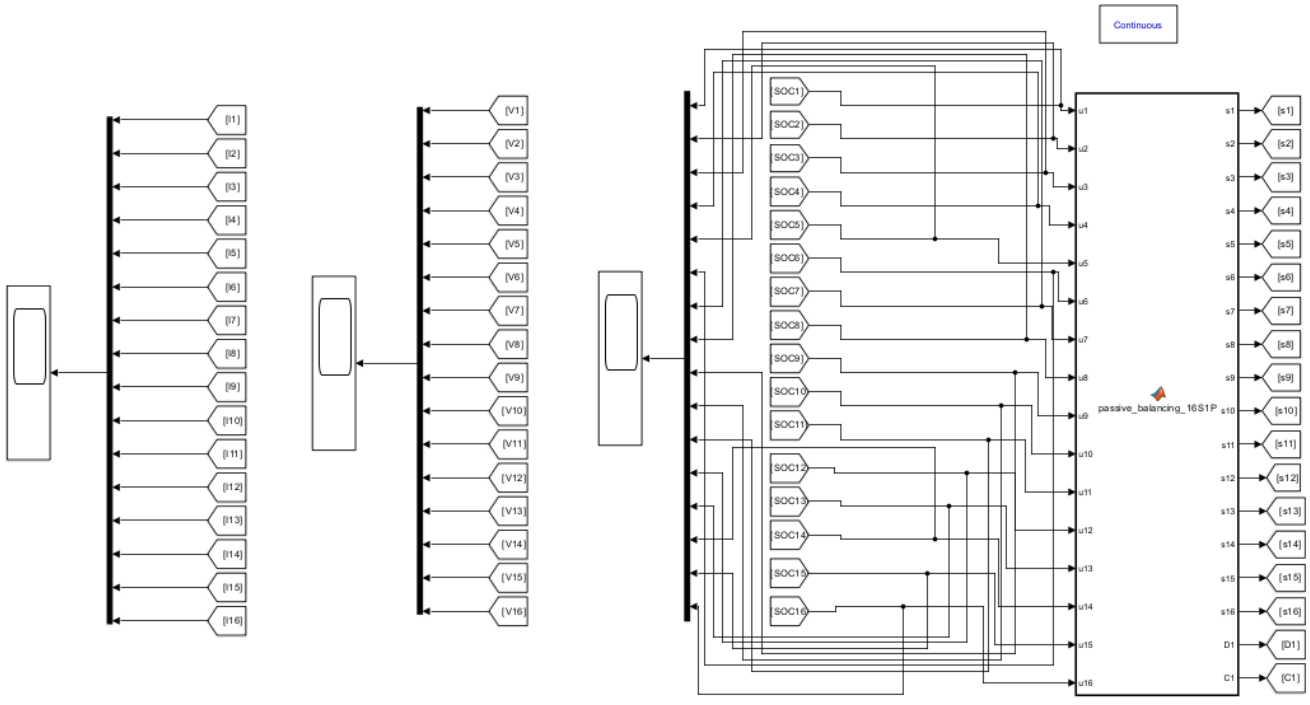


Fig 1 : *Circuit Diagram of 16S1P configuration*

Fig 1 represent the circuit diagram of 16S1P configuration of passive cell balancing. In which 16 Li-ion cells are conneted in series and make a battery pack. The cells are controlled by mosfet switches and energy dissipated by resistors which are connected to each cells. All the specification values of cells and circuit diagram are given in **Table B**.

Specification Table B : For 16S1P Configuration

Specification	Notation	Value
Nominal Voltage	V	3.3V
Nominal Capacity	C	2.6 Ah
Cut-off-Voltage	v	2.5V
Internal Resistance	R_{in}	0.013 ohm
Shunt Resistance	R_{sh}	1.3 ohm
Load Resistance	R_l	20.3 ohm
Voltage Source	V_s	60 V
Cell 1, Cell 2,……., Cell 16	$SoC_1, SoC_2, \ldots\ldots\ldots SoC_{16}$	**70%, 69%, 68%, 67%, 66%, 65%, 64%, 63%, 62%, 61%, 60%, 59%, 58%, 57%, 56%, 55%**
Min SoC	SoC_{Min}	55%
Mean SoC	$SoC_{Mean} = \frac{SoC_1+SoC_2+\cdots SoC_{16}}{16}$	62.5%

Table B: *Specifications of cells used in 16S1P configuration*