CLAIMS

1. A system for connecting batteries in an electrical circuit, comprising:

a first logic switch connected to a positive node of a first energy storage unit;

a second logic switch connected to a negative node of the first energy storage unit;

a third logic switch connected to a positive node of a second energy storage unit;

a fourth logic switch connected to a negative node of the second energy storage unit;

a fifth logic switch connected to a positive node of an output device;

a sixth logic switch connected to a negative node of the output device;

a printed circuit board with a control unit that regulates a cycle comprising a first phase and a second phase,

wherein during the first phase, the first, third, and fifth logic switches are connected to form a first circuit configuration and the second, fourth and sixth logic switches are connected to form a second circuit configuration, wherein the first and second circuit configurations form a parallel connection between the first and second energy storage units and the output device;

wherein during the second phase, the first and fourth logic switches are connected to form a third circuit configuration and the second and sixth logic switches are connected to form a fourth circuit configuration that forms a series connection between the energy storage units and the output device, and the third and fifth logic switches are connected to form a fifth circuit configuration;

wherein the frequency between the first phase and the second phase is adjustable;

wherein the control unit is configured to alter a relative duration of the first phase independent of a duration of the second phase, such that the first phase comprises 0% to 100% of the cycle, and the second phase comprises the remainder of the cycle; and

wherein an output of the output device is determined based on the relative duration of the first phase and the duration of the second phase.

2. A system for connecting batteries in an electrical circuit, comprising:

a first logic switch connected to a positive node of a first energy storage unit;

a second logic switch connected to a negative node of the first energy storage unit;

a third logic switch connected to a positive node of a second energy storage unit;

a fourth logic switch connected to a negative node of the second energy storage unit;

a fifth logic switch connected to a positive node of an output device;

a sixth logic switch connected to a negative node of the output device;

a seventh logic switch connected to a positive node of a power source;

an eighth logic switch connected to a negative node of the power source;

a printed circuit board with a control unit that regulates a cycle comprising a first phase and a second phase,

wherein during the first phase, the first, third and seventh logic switches are connected to form a first circuit configuration and the second, fourth and eighth logic switches are connected to form a second circuit configuration to form a parallel connection between the energy storage units and the power source;

wherein during the second phase, the first and fourth logic switches are connected to form a third circuit configuration and the second and sixth logic switches are connected to form a fourth circuit configuration to form a series connection between the energy storage units and the output device such that the output is isolated from the power source, and the third and fifth logic switches are connected to form a fifth circuit configuration;

wherein the frequency between the first phase and second phase is adjustable;

wherein the control unit is configured to alter a relative duration of the first phase independent of a duration of the second phase, such that the first phase comprises 0% to 100% of the cycle, and the second phase comprises the remainder of the cycle; and

wherein the output device produces a duty cycle determined based on the relative duration of the first phase relative to the second phase.

3. The system of claim 1, wherein the control unit further comprises an input and output comparator configured to compare an input and output of each energy storage unit, and wherein the control unit is configured to operate the switches to configure the energy storage units in series or parallel based on the input and output of each energy storage unit, and wherein each energy storage unit comprises one or more batteries.

4. The system of claim 2, wherein the control unit is configured to:
detect a voltage from the power source or a voltage required by the output, and
alter the relative duration of the phases based on the detected voltage.

5. The system of claim 2, wherein the output comprises an associated load voltage, wherein the load voltage is shifted from the power source, and wherein the load voltage is configured to be lowered by a plurality of additional storage units which are coupled to the output in series.

6. The system of claim 1, further comprising a plurality of energy storage units connected to the printed circuit board, wherein a positive node and a negative node of each of the plurality of energy storage units are switchably connected to the printed circuit board.

7. The system of claim 1, wherein the control unit converts an input voltage to a lower output voltage.

8. The system of claim 1, wherein during the first phase, the first and second energy storage units are connected in parallel to the output device and during the second phase, the first and second energy storage units are connected in series to the output device, wherein the relative duration of each phase determines a voltage of the output and an amperage required to balance a plurality of batteries in the first and second energy storage units.

9. The system of claim 1, wherein the control unit is a computer programmable software code.

10. The system of claim 2, wherein the power source is a renewable direct current source.

11. The system of claim 1 wherein the first and second energy storage units are a plurality of individual cells within a non-rechargeable battery.

12. The system of claim 1, wherein the control unit is one of a programmable mechanical, electronic, PCB or integrated circuit chip.

13. The system of claim 8, wherein the control unit converts a sine waveform AC input into a DC input to charge the plurality of batteries in a synchronous charging method matching the incoming AC sine waveform to identify and match a quantity of the plurality of batteries that may be charged at timings identified using the control unit.