

CLAIMS

What is claimed is:

1. A utility meter comprising:
 - a real-time clock (RTC) configured to keep time utilized for time stamps applicable to events that occur during alternating current (AC) power outages of the utility meter;
 - a supercapacitor configured to power the RTC;
 - a power supply configured to operate in an active mode responsive to an AC line voltage meeting a threshold and further configured, in the active mode, to charge the supercapacitor to power the RTC; and
 - a set of photodiodes configured to absorb energy from ambient light and to charge the supercapacitor to power the RTC;wherein the supercapacitor is configured to charge based on the power supply and based on the set of photodiodes.
2. The utility meter of claim 1, wherein the set of photodiodes comprises two or more photodiodes connected in series.
3. The utility meter of claim 2, further comprising a linear regulator connected to an output of the power supply, wherein an output of the linear regulator is connected to a supercapacitor charger to charge the supercapacitor, and wherein the set of photodiodes is connected to the supercapacitor charger to charge the supercapacitor.
4. The utility meter of claim 3, further comprising a Schottky diode connecting the set of photodiodes to the supercapacitor charger.
5. The utility meter of claim 1, further comprising a metrology electronics assembly configured to measure consumption of a resource, wherein the set of photodiodes is mounted on a side of the metrology electronic assembly on a printed circuit board of the utility meter.
6. The utility meter of claim 1, further comprising a cover over a printed circuit board of the utility meter, the cover defining an opening configured to allow the ambient light to reach the set of photodiodes.

7. The utility meter of claim 6, further comprising a lens fitted into the opening of the cover of the utility meter, the lens configured to focus light onto the set of photodiodes.
8. The utility meter of claim 1, wherein the supercapacitor is configured to power the RTC over two or more days during which the power supply is inactive.
9. The utility meter of claim 1, wherein the supercapacitor is configured to power one or more sensors while the power supply is inactive.
10. A method for powering a real-time clock (RTC) of a utility meter, the method comprising:
 - running, by the utility meter, an RTC configured to keep time utilized for time stamps applicable to events that occur during alternating current (AC) power outages of the utility meter;
 - charging, by a power supply of the utility meter when the power supply is active due to receiving a sufficient AC line voltage, a supercapacitor configured to power the RTC;
 - powering, by the supercapacitor, the RTC based on energy provided by the power supply;
 - charging, by a set of photodiodes, the supercapacitor based on energy absorbed from ambient light; and
 - powering, by the supercapacitor when the power supply is inactive, the RTC based on energy provided by the photodiodes.
11. The method of claim 10, wherein the set of photodiodes comprises two or more photodiodes connected in series.
12. The method of claim 11, wherein the utility meter comprises a linear regulator connected to an output of the power supply, wherein an output of the linear regulator is connected to a supercapacitor charger to charge the supercapacitor, and wherein the set of photodiodes is connected to the supercapacitor charger to charge the supercapacitor.
13. The method of claim 12, wherein the utility meter comprises a Schottky diode connecting the set of photodiodes to the supercapacitor charger.

14. The method of claim 10, further comprising measuring, by a metrology electronics assembly, consumption of a resource, wherein the set of photodiodes is mounted on a side of the metrology electronic assembly on a printed circuit board of the utility meter.
15. The method of claim 10, wherein the utility meter comprises a housing covering at least a portion of a printed circuit board of the utility meter, the housing defining an opening configured to allow the ambient light to reach the set of photodiodes.
16. The method of claim 15, wherein the utility meter comprises a lens fitted into the opening of the housing, the lens configured to focus light onto the set of photodiodes.
17. The method of claim 10, wherein the supercapacitor is configured to power the RTC over two or more days during which the power supply is inactive.
18. A method comprising:
installing in a device a real-time clock (RTC) configured to keep time utilized for time stamps applicable to events that occur during alternating current (AC) power outages of the device;
installing in the device a supercapacitor configured to power the RTC;
installing in the device a power supply configured to operate in an active mode responsive to an AC line voltage meeting a threshold and further configured, in the active mode, to charge the supercapacitor to power the RTC; and
installing in the device a set of photodiodes configured to absorb energy from ambient light and to charge the supercapacitor to power the RTC;
wherein the supercapacitor is configured to charge based on the power supply and based on the set of photodiodes; and
wherein the device is utilizable as a utility meter.
19. The method of claim 18, further comprising:
connecting an input of a linear regulator to an output of the power supply;
connecting an output of the linear regulator to an input of a supercapacitor charger to charge the supercapacitor; and
utilizing a Schottky diode to connect the set of photodiodes to the supercapacitor charger to charge the supercapacitor.

20. The method of claim 18, further comprising:
- mounting the set of photodiodes on a side of a metrology electronics assembly on a printed circuit board of the device;
 - fitting a lens into a housing of the device; and
 - installing the housing with the lens over the side of the metrology electronics assembly on the printed circuit board.