

## Tank level management

**Tank level monitoring is one in a row of AMR applications that require a reliable battery, capable of providing a service life of ten years and more.**



These applications typically have a low background current of a few microamperes. However, for communication with a network system via GSM, RF, or satellite, they require infrequent high current pulses.

The PulsesPlus battery is the suitable power source for such applications. It combines a bobbin-type 3.6Volt lithium/thionyl chloride (LTC) cell with a patented high rate, low impedance HLC (hybrid layer capacitor). This hybrid system delivers high current pulses with an excellent safety margin. The Hybrid Layer Capacitor is charged by the battery. It has low output impedance and thus can readily deliver the pulses. It is recharged by the battery in advance of the next pulse, thus eliminating passivation effects.

A tank level management system can revolutionise how suppliers of oil or liquid petroleum gas (LPG) manage logistics. Accurate tank level information facilitates delivery scheduling, resulting in reduced distribution costs and greater efficiency.

End customers will benefit from improved service, with fewer disruptions for unnecessary deliveries, yet ensuring that they will not run out of fuel. A tank monitoring system can be installed in tanks of both commercial and residential customers. The units are independently powered by a battery, which - depending on the design - can last for three to 10 years.

A typical GSM tank level monitor transmits data once per day by means of a short message (8s). During transmission, the circuit draws 2A pulses from the battery at a duty cycle of 1:7(577 $\mu$ s every 4.615ms).

The average current during transmission is typically 250mA. For the sensor and microprocessor, a basic current of 100 $\mu$ A is needed.

The voltage must not fall below 3.2Volts. To cope with these requirements, a PulsesPlus battery is necessary. For the design of the correct battery size and life, it is necessary to consider the influence of the application conditions on the battery parameters. In this case, a battery combining a D-size cell with an HLC-1550 is the correct choice and will yield a service life of 10 years.