Smarter Power for Smart Meters

Tom Larsen, Strategic Market Development Manager, Palladium Energy

Since the smart grid was first implemented in Italy in 2005, municipal governments in American cities, such as Austin, TX and Boulder, CO have started switching to smart meters in order to save energy, reduce costs and increase reliability and transparency. Fueled by government tax breaks and incentives such as the American Recovery and Reinvestment Act of 2009, it's estimated that by 2015, 18 percent of the world's meters will be converted to smart meters for a total of 250 million smart meters worldwide.

Smart meters differ from traditional electrical meters by offering added functionality such as real-time usage reads, power outage notifications and power quality monitoring. The meters also reflect service providers' ability to implement varying prices for consumption based on the time of day and the season. Typically, these meters allow consumers to reduce energy consumption by 10 to 15 percent.

But even in the smart grid, power outages are inevitable. Therefore, a smart meter must contain reliable backup power in electric smart meters or independent power in gas or water smart meters in order to maintain its real time clock (RTC) and avoid disruption in the grid's unique two-way communication. Lithium Thionyl Chloride ($Li\text{-}SOCl_2$) is one of the ideal chemistries for smart meters because it can operate in a range of global climates with solid reliability and minimal maintenance.

$Li\text{-}SOCl_2$ cells are cylindrical in shape and light-weight due to their metallic lithium anode. In addition, the cell's liquid cathode is comprised of a porous carbon current collector filled with Thionyl Chloride. With a voltage of 3.6 V, $Li\text{-}SOCL_2$ batteries are available in ½ AA to D format, and feature bobbin construction for extended discharge as well as spiral electrodes for power applications such as smart meters.

Key Specifications for $Li\text{-}SOCl_2$:
• Operating temperatures from 40 degrees below zero to 85 degrees Celsius
• Inherent long life – up to 20 years without replacement
• End-of-life indicators built into the smart battery design
• High energy density – 3.6V\19Ah
• Low self discharge – less than 1 percent per year

In addition topowering energy saving devices, $Li\text{-}SOCl_2$ batteries are a green technology due to their extended life, and are environmentally friendly if disposed of properly.