Saft – Reliable energy for the internet of things

A wide range of energy solutions for sensing devices

saft

Saft – The fit and forget energy solution for the internet of things

Wireless sensors are increasingly becoming a vital part of the Internet of Things. Underperformance or failure of the energy source of these wireless sensors can result in increased operating costs, loss of function, and even safety concerns. They demand robust, flexible and extremely reliable batteries, capable of facing potentially harsh and uncontrolled environmental conditions.

Saft offers a wide range of primary and rechargeable lithium batteries ideally suited to meet the needs of wireless sensor network applications. Whether industrial, commercial, or residential, Saft's batteries offer the performance, quality, longevity, and autonomous operation required of any type of sensor application.

Saft batteries, the power behind the internet of things

The dependable reporting of strain, vibration, shock, temperature, humidity, flow, current or voltage all depends largely upon the sensor and its energy source. Long life in the application (5-20 years) is necessary to meet the "total cost of ownership" expectations of most building wide installations, lowering replacements and sensor servicing requirements while increasing reliability and user confidence. Saft's expertise in electrochemistry, combined with our reputation for quality, service, and overall value, make our products the clear choice for these sensitive and complex devices.

Li-ion

- Wide temperature range (application lifetime)
- Light-weight
- Extended autonomy
- Long cycle-life (600 to 1000+ cycles), depending on conditions

Li-SOCl$_2$

- High operating voltage, stable during most of the application lifetime
- Lowest self-discharge for extended shelf life and operating life
- Some of the highest nominal capacities on the market today

Li-MnO$_2$

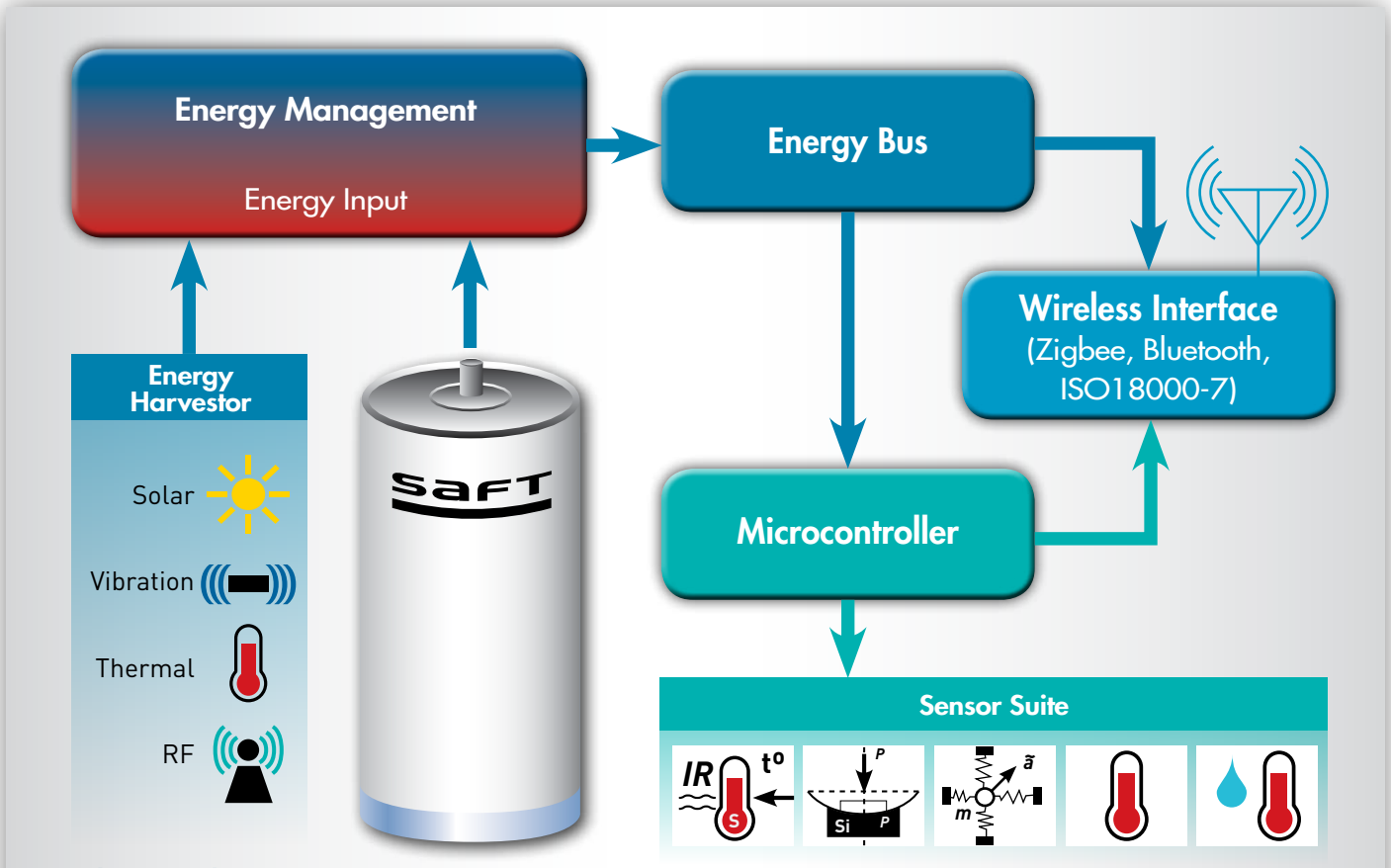
- High voltage, stable throughout the application lifetime
- Safe and reliable high-power performance in potentially explosive atmospheres ATEX (C- and D-size EX cells)
- High capacities at high currents

Li-SO$_2$

- Unrivaled pulse capability
- Low self-discharge for extended shelf life
- Well controlled passivation with limited voltage delay

Robust technology for sophisticated wireless sensor networks

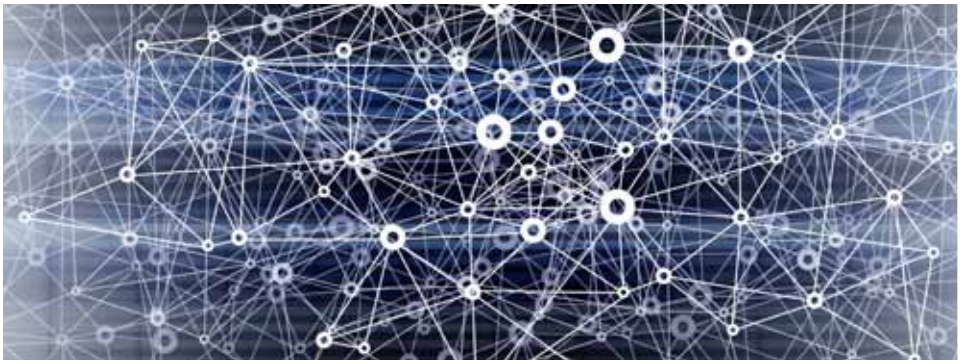
The data gathered from sensors embedded into buildings or building services today, play an important role in energy management, planned maintenance, obsolescence planning, and where immediate intervention is required, alarms and alerts. All of the systems and networks analyzing this data depend on the reliability of the basic sensors (and the energy that powers them).



Independent System Diagram

The energy storage must be able to deliver energy over the designed system lifetime of the sensor, withstanding the same environment of heat, cold, vibration, shock, etc.

Products ideally suited to power wireless autonomous devices



The right battery for the right job

Factors such as temperature, voltage, current, and lifetime are all considerations when choosing the right battery for a WSN application. Saft's breadth of technologies and depth of understanding of application requirements means we can help you match the right technology to your specific sensor application.

Sensor Type	Role	Battery Requirements	Battery Type
Data Centers 	Detect air flow and movement; Monitoring hot and cold spots in order to best manage the heat generated by their critical computer resources.	Wide temperature range operation; Long life	C, D, AA or ½ AA size Li-$SOCL_2$ batteries
Industrial 	Monitor and report on various aspects of industrial plants. Commonly used in industries such as Oil & Gas, chemical process manufacturing, mining, minerals and metals.	Wide operating temperature range, especially at high temperatures	R14 (C size) or an R20 (D size) Li-$SOCl_2$ cell or cells
Commercial 	Detect air movement, hot and cold spots in order to best manage the heat generating critical computer resources. Used in internal environments such as commercial offices, shopping malls, museums and entertainment complexes.	Robust technology; Long life; Wide operating temperature range *Innovations in power management integrated circuits can allow for a combination of harvested energy and primary energy storage.*	C, D, AA and ½ AA Li-$SOCl_2$ cells
Home Area Network 	Monitor heating controls, lighting (dimming and switching), external lighting, controlling windows, shutters, garage doors and gates, as well as critical safety devices such as smoke detectors, CO_2 detectors, water leak and flood detectors, and security systems.	Reliability is key since home safety depends on the operation of these sensors. They are often installed in roof spaces and basements, and under-floor areas that are not easily accessible. Some are installed outside the temperature controlled indoor environment and have a greater requirement for autonomous operation, thus a more capable battery product is required.	Li-$SOCl_2$ bobbin, Li-CFx:MnO_2

Sensor Type	Role	Battery Requirements	Battery Type
Gas meters 	Leak detection, theft detection, automatic actuation of a valve or solenoid to stop the flow of product in the case of a pre-payment system.	Activities take place in an uncontrolled environment with no intervention. Some may require an Intrinsically Safe battery which conforms to the ATEX norm (IEC 60079).	Li-MnO_2, Li-$SOCl_2$, or even a primary / hybrid layer capacitor depending on the application.
Underground sensing & communication 	Measurement While Drilling (MWD), Logging While Drilling (LWD) is conducted in extreme environments of pressure and temperature; Sensor operation (geo location, pressure, vibration temperature, magnetic flux, gamma ray) surface telemetry and data logging.	These applications require a highly reliable battery that is able to withstand very high temperatures.	High temperature Li-$SOCL_2$ spiral cells
Radar speed sensors 	Play an important physiological and sensitisation role in road safety. Almost exclusively powered by solar or off-peak grid energy.	Long life, daily cycling (cyclo-floating), and a broad temperature range of operation is required, (+65°C to -30°C) is typical.	Li-ion (NMC)
Ultrasonic flow measurement & communications 	Sensor and communications operations under extreme and uncontrolled conditions. Operation in hazardous environments (ATEX).	Predictable autonomy (5 to 15 years) under all environmental conditions including valve or solenoid actuation.	Li-$SOCl_2$ spiral, Li-MnO_2, HLC
Remote telemetry units 	Making data available for monitoring and research.	Require good energy management and capable energy storage to power them autonomously; 10 to 20 years or longer between maintenance intervals in an open uncontrolled environment.	Combination of harvesting energy and primary energy storage (Li-$SOCl_2$ spiral, Li-MnO_2, Li-ion (NMC))

Proven success in real customer applications



Alta Industrial Automation: Solar Battery

AIA is utilizing a Saft rechargeable lithium-ion battery in their Solar Battery product line for Class 1 Div 2 hazardous environments and extreme temperature operation. AIA's Solar Battery solutions provide power, data acquisition and wireless internet communication to simplify installation, maintenance and support of remote hazardous environment sensors.

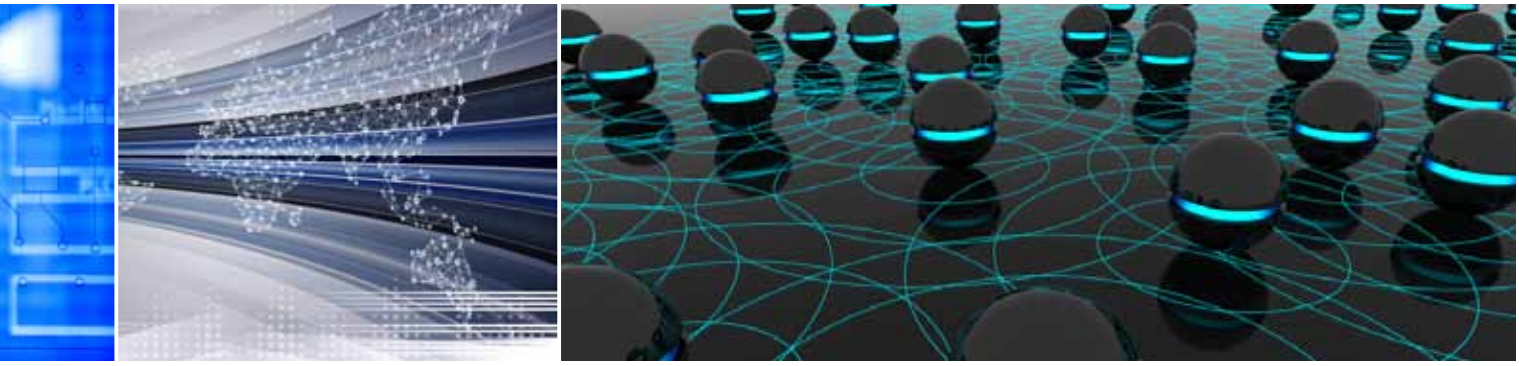
"Our solar system, combined with the Saft rechargeable lithium-ion battery, allows AIA customers to achieve end-to-end monitoring and control of their fixed or mobile assets in extreme climatic conditions," said Gary Allbee, president, AIA. "Our customers can now quickly and conveniently connect their assets online to the internet and perform operational updates through our eTrackData™ server solution."

"With the AIA Solar Battery installed, we have substantial operating cost savings, and we no longer deal with battery exchange and disposal. More importantly, in the most harsh low temperature conditions, our data collection and process is more reliable with the Solar Battery as our primary power source," reported Peter A. Hebert, Corrosion Technologist with Taqa North Ltd.

"This program extends Saft's experience in providing intrinsically safe, high-performance batteries for the oil and gas industry," said Thomas Alcide, general manager of Saft's Specialty Battery Group and president, Saft America Inc. "We are excited to be able to demonstrate our innovative power solution with AIA."

AIA has seen substantial operating cost savings, due in part to the elimination of battery exchange and disposal. More importantly, their data collection and process is more reliable even in the harshest low temperature conditions.

Gary Allbee, President,
Alta Industrial Automation Ltd.
www.aialtd.com/products/solar-powered-solutions/



Sensile Technologies makes Saft batteries the primary choice for smart telemetry devices

Saft primary lithium cells power SENTS™ sensing and telemetry solutions for up to 10 years at remote oil and gas storage sites. Ensuring that petrochemical tanks never run dry.

The remote location of storage tanks presents a considerable challenge in making accurate measurements of stock levels. Sensile Technologies has met this challenge with the development of its SENTS™ devices, comprising a level sensor and telemetry unit, which detects the level in the tank and sends the details by either SMS (short message service) or GPRS (general packet radio service) to a central monitoring system. This provides the operator with an immediate, real-time, overview of stock levels.

The main requirement for the Saft's batteries in this application is to provide up to 10 years of reliable, autonomous power for sensors operating at exposed outdoor oil and gas sites where safety is paramount.

The ideal solution is provided by Saft's LS17500X lithium-thionyl chloride (Li-SOCl2) cell, which is a very stable primary cell chemistry with the following characteristics:

Designed and built for long-term duty in applications such as utility metering, safety and wireless systems, the LS17500X is the ideal battery for remote monitoring and telemetry of tank levels of highly flammable liquids and gases in the petrochemical industry.

Saft LS17500X batteries provide:

- 10-year battery life with one SMS per week and level monitoring of multiple tanks.
- Reliable operation at temperatures as low as -60°C
- Low maintenance – no need for battery replacement during life of sensors.

Sensile Technologies anticipates that the long-life SENTS™ devices will be popular with customers looking to optimize stocks and deliveries, reduce logistic costs and monitor accurately consumption levels.

"The long life, safety and reliability of the Saft batteries means that maintenance and replacement costs are kept to a minimum, also benefitting the environment".

Jean-Marc Uehlinger, Sensile Technologies Operational Director.

Saft is committed to the highest standards of environmental stewardship

As part of its environmental commitment, Saft gives priority to recycled raw materials over virgin raw materials, reduces its plants' air and water releases year after year, minimizes water usage, reduces fossil energy consumption and associated CO2 emissions, and ensures that its customers have recycling solutions for their spent batteries.

Regarding industrial batteries, Saft has had partnerships for many years with collection companies in most EU countries, in North America and in other countries. This collection network receives and dispatches our customers' batteries at the end of their lives to fully approved recycling facilities, in compliance with the laws governing trans-boundary waste shipments.

Saft has selected a recycling process for industrial lithium-ion cells with very high recycling efficiency. A list of our current collection points is available on our web site. In other countries, Saft assists users of its batteries in finding environmentally sound recycling solutions. Please contact your sales representative for further information.

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