

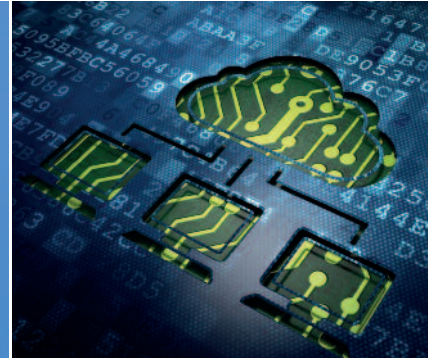
# Soft batteries for the Internet of Things

The power to become smart



**saft**

# Soft batteries: wherever and whenever power is critical

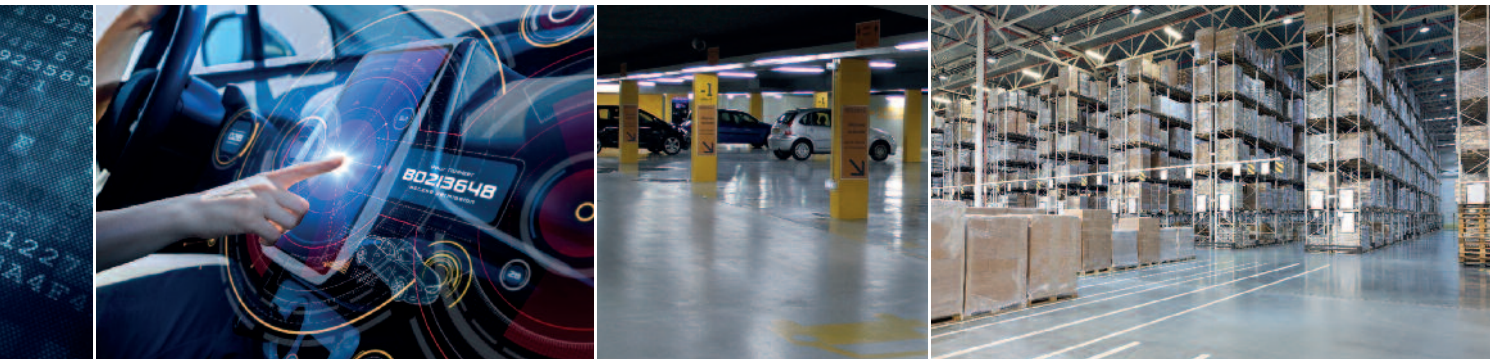


The Internet of Things (IoT) cannot function without an autonomous, reliable and long-life power source. Saft's high-tech, high-performance primary and rechargeable lithium batteries meet this requirement perfectly. Whether in industrial, commercial or residential applications, Saft batteries offer the performance, quality, longevity and autonomous operation required of any type of sensor application.

## Long life and reliability

Long life (10–20 years) is a must to meet the Total Cost of Ownership (TCO) expectations of most IoT applications – minimizing replacement and sensor servicing needs, 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 often sensitive and complex devices.





### Environment monitoring

- air quality monitoring
- natural disaster prevention
- forest fire prevention



### Smart utility

- water leak detection
- grid automation
- gas level and leakage detection



### Smart buildings

- lighting control
- energy management
- HVAC control



### Smart public services

- smart lighting
- waste management



### Smart agriculture

- Soil parameters monitoring
- Meteorology forecasting
- Animal tracking



### Industry

- temperature/vibration/monitoring
- supply chain optimization
- asset management



# Fit-and-forget solutions



Can small, autonomous batteries function reliably for 20 years or more into the future? The answer is yes, if you choose a supplier with the right experience, expertise and industrial quality.

Saft has already delivered batteries with 20-plus years' service life to power devices around the world. Our long-term customers can verify the reliability of our batteries made possible through strict qualification processes, endurance testing and field-proven performance.

20+  
years lifetime

**Long life**

Saft battery solutions energize your smart devices with an outstanding level of reliability to achieve the expected lifetime.

30+  
years of experience

**Field-proven**

Saft is the most experienced lithium primary battery provider for wireless applications.



700  
Wh/kg

**Compactness**

Saft's electrochemistries deliver more energy density than traditional cells.

0  
replacement cost

**Cost-effective**

Saft's fit & forget solutions offer the best TCO on the market to power connected objects throughout their field life.

200,000  
parts shipped daily for connected devices

**Mass production ready**

You benefit from Saft's global industrial base with production centers located in North America, Europe, and Asia.

## Solutions for every needs

	Cell reference	Technology	Nominal voltage	Nominal capacity	Size	Operating temperature range	Typical weight
<b>Primary lithium (non-rechargeable)</b>							
ENERGY	LS 14250	Li-SOCl <sub>2</sub>	3.6 V	1.2 Ah	1/2 AA	-60°C / +85°C	8.9 g
	LS 14500	Li-SOCl <sub>2</sub>	3.6 V	2.6 Ah	AA	-60°C / +85°C	16.7 g
	LS 17500	Li-SOCl <sub>2</sub>	3.6 V	3.6 Ah	A	-60°C / +85°C	21.9 g
	LS 26500	Li-SOCl <sub>2</sub>	3.6 V	7.7 Ah	C	-60°C / +85°C	48.0 g
	LS 33600	Li-SOCl <sub>2</sub>	3.6 V	17.0 Ah	D	-60°C / +85°C	90.0 g
HIGH PULSE	LSP 26500	Li-SOCl <sub>2</sub>	3.6 V	7.7 Ah	C	-30°C / +60°C	51.0 g
	LSP 33600	Li-SOCl <sub>2</sub>	3.6 V	17.0 Ah	D	-30°C / +60°C	93.0 g
POWER	LSH 14	Li-SOCl <sub>2</sub>	3.6 V	5.8 Ah	C	-60°C / +85°C	51.0 g
	LSH 20	Li-SOCl <sub>2</sub>	3.6 V	13.0 Ah	D	-60°C / +85°C	51.0 g
	LM 17500	Li-MnO <sub>2</sub>	3.0 V	3.0 Ah	A	-40°C / +85°C	28.0 g
	LM 26500	Li-MnO <sub>2</sub>	3.0 V	7.4 Ah	C	-40°C / +85°C	61.0 g
	LM 33600	Li-MnO <sub>2</sub>	3.0 V	13.4 Ah	D	-40°C / +85°C	113.0 g
ATEX	M 52 EX SV	Li-MnO <sub>2</sub>	3.0 V	5.6 Ah	C	-40°C / +72°C	58.0 g
	M 20 EX SV	Li-MnO <sub>2</sub>	3.0 V	12.4 Ah	D	-40°C / +72°C	115.0 g

	Cell reference	Technology	Nominal voltage	Max. continuous discharge current	Max. pulse discharge rate	Max. charge current	Cycle life (100% DoD, 20°C)	Discharge temperature range	Charge temperature range
<b>Rechargeable lithium</b>									
EXTENDED LIFE & TEMPERATURE	MP 174565 xtd	Li-ion	4.0 Ah	8.0 A	16.0 A	4.0 A	> 2000 cycles	-40°C / +85°C	-30°C / +85°C
	MP 176065 xtd	Li-ion	5.6 Ah	11.0 A	22.0 A	5.6 A	> 2000 cycles	-40°C / +85°C	-30°C / +85°C

## From single cells to complex systems



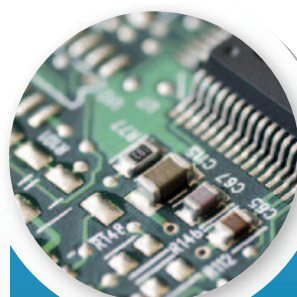
### Wide cell selection:

With a choice of primary electrochemistries, Saft can meet every power or energy need, and our rechargeable cells offer the perfect cycle life for backup applications.



### Customized packs:

Saft can offer complete power solutions tailored to your applications needs. We also provide 3D design files of our products, as well as battery integration notes, to support your design team.



### Smart battery design:

Saft enables unique State of Charge and State of Health feedback for both primary and rechargeable solutions to facilitate battery monitoring.



### Unique field service:

We can help your end-customers optimize their asset management by accurately measuring the remaining life of batteries deployed in the field – enabling them to base maintenance operations on real facts and further improve their battery expertise.

# Committed to end-to-end support



## Focused on innovation

Research and development are a constant for Saft: we invest almost one-tenth of our sales revenues in R&D, a clear testament to our ongoing, long-term commitment to innovation. Around 500 engineers and technicians are currently working on new materials, improved production processes, enhanced designs, cutting-edge systems and software. We are constantly looking for new, cost-competitive ways to meet our customers' specific application needs.

# 9.3%

of sales  
invested back  
into Research  
and Development

Saft provides a wide array of support and services, both before you buy and after, so you can be sure of having, a robust, reliable and well-maintained solution over an extended period of time.



Saft conforms to all major quality, safety and environmental standards

- Quality: ISO 9001, Saft World Class continuous program
- Transport: UN
- Environment: ISO 14001
- Safety: IEC, UL, OHSAS 18001



# Saft's greatest successes are those of our customers



## LifeWatch

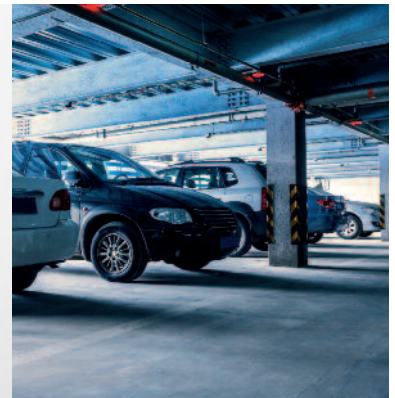
LifeWatch uses Saft's primary lithium cells in its LifeStar Ambulatory Cardiac Telemetry (ACT) ECG monitoring device. The small, lightweight sensor and chest electrodes transmit every heartbeat wirelessly to the ACT Cellular Phone Monitor for analysis. If arrhythmia is detected, this device automatically informs one of three LifeWatch Monitoring Centers for review and medical notification, if required. *"Quality and reliability are crucial for this critical heart monitoring device. We simply cannot leave the battery technology to chance, which is why we put our trust in Saft batteries."*

*Erik Leverenz, V.P. of Supply Chain - LifeWatch Services, Inc.*

## Urbiotica

Urbiotica is a leading developer of smart, sensor-based IoT solutions for capturing, processing and managing millions of data points from more than 11,000 devices installed worldwide. One major challenge for Urbiotica was to develop a new version of its U-SPOT outdoor parking sensor that offered greater coverage distance. More active electronic components had to be incorporated without compromising the 10-year product lifetime. *"Saft batteries specially designed for IoT applications have enabled us to double U-SPOT's coverage distance, while also increasing its autonomy to 12 years."*

*Josep Maria Torres, CEO - Urbiotica*



## Eurofyre

Saft primary lithium batteries power Eurofyre's new Wi-Fyre range of wireless fire alarm systems that co-exist seamlessly with hard-wired fire alarm systems, creating a hybrid system topology. This enables inaccessible or difficult to cable areas to be protected with minimal disruption and quick installation. *"Saft batteries are a perfect fit for Wi-Fyre as they are designed specifically for long-term (3- to 20-year) applications and optimized for base currents of a few  $\mu\text{A}$  with periodic pulses in the 5-150 mA range."*

*Jon Redfearn, Managing Director - Eurofyre*

## Eau de Paris

Eau de Paris is the public company tasked with providing water to 3 million daily users in the city of Paris, France. For more than 10 years, Saft has provided batteries for the various makes and models of Automatic Meter Reading (AMR) systems that serve 99% of Parisian buildings. Most recently, Saft designed and deployed a service to check the actual consumption of installed batteries. *"By performing laboratory analyses and then correlating the results with life expectancy data, Saft can accurately estimate the remaining service life of devices and equipment that are deployed across the fleet."*

*Olivier Roy, Project Manager - Eau de Paris*

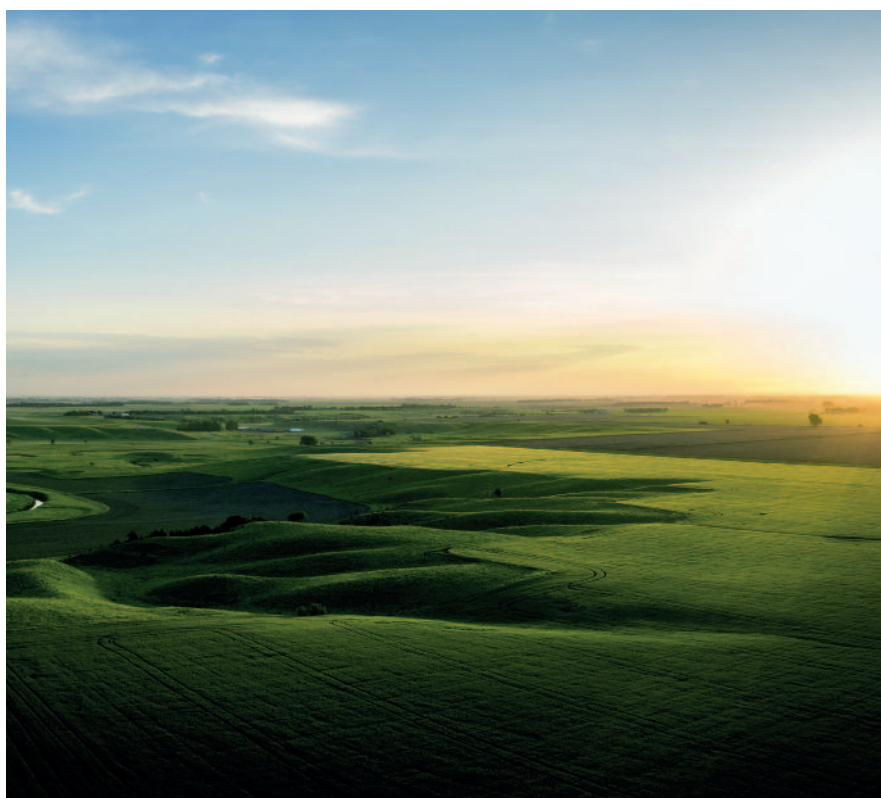


# Saft is committed to the highest standards of environmental stewardship

As part of this environmental commitment, Saft prioritises the use of recycled raw materials over virgin raw materials in all manufacturing processes. We also strive, year on year, to reduce air and water emissions from our plants, as well as minimizing water usage, reducing consumption of fossil energy consumption and associated CO<sub>2</sub> emissions, and ensuring that all our customers have access to recycling solutions for their

spent batteries. To facilitate the end-of-life collection and recycling of industrial batteries, including our nickel & lithium-based technologies, Saft has developed well-established partnerships with collection companies in most EU countries, in North America and in many other countries worldwide. This collection network receives spent batteries from our customers and dispatches them to fully approved recycling facilities, in compliance

with the laws governing trans-boundary waste shipments. This collection network is currently undergoing minor adaptations to meet the requirements of the EU batteries directive. A list of our battery collection points is available on our web site. In other countries, Saft will assist anyone using our batteries in finding environmentally sound recycling solutions. Please contact your sales representative for further information.



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Document N° 31105-2-0518  
Edition: May 2018

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