



LEM Corporate Backgrounder

At the heart of power Electronics

There is an increasing demand for the monitoring of electrical current, voltage and power in modern electronic equipment. LEM is a market leader in providing innovative and high quality solutions for measuring electrical parameters. Its core products – current and voltage transducers – are used in a broad range of applications in industrial, traction, automation and automotive markets.

LEM is a Swiss company, with annual revenue of over CHF 185.5 million, and is listed on the Swiss SIX stock exchange. The company employs around 1'100 people in locations across the world.

Meeting the Need

By monitoring current and voltage, electronic systems can optimise the use and regulation of power; ensure safe operation; and identify problems before they cause equipment to fail.

LEM's strategy is to exploit the intrinsic strengths of its core business, and develop opportunities in new markets with new applications. Recent innovations from LEM have been developed for applications ranging from renewable power generation – where LEM transducers monitor the output from solar panels and wind turbines – to automotive systems, where LEM transducers help optimise the power consumption from the battery and are used in motor controls for braking and steering systems.

Key Applications

The first LEM products were developed for locomotives and trolley busses. Whilst traction and trackside applications remain important, they have been overtaken by other applications now represent a larger share of LEM's business.

Process automation requires monitoring of electrical power, to minimise the use of power, optimise the control of motors, enhance safety and detect problems before they cause system faults.

LEM transducers are an important component in a diverse range of industrial applications, from variable speed motor drives to uninterruptible power supplies for computers. Innovative energy applications such as micro-turbines, solar and wind turbines also provide rapidly expanding opportunities.

The increasing complexity of electronic systems in automobiles demands intelligent battery management and monitoring of current and voltage in the motor controls for braking and steering systems. LEM transducers help car manufacturers maximise safety and efficiency in these new systems.



Increasing Intelligence, Reducing Size

Customers demand both the increasing of intelligence and also the continual miniaturisation of transducers. LEM is recognised as a market leader in reducing the size of its transducers whilst adding sophisticated features to enhance the performance and aid application integration. Process control and automation place particular demands on the need for increased intelligence, and LEM has formed a division within the industrial segment that is dedicated to developing these macro components. LEM's unique manufacturing systems and in-house development of custom mixed-signal silicon chips also give the company an unmatched capability to meet the challenging requirements of customers across the wide range of power electronics applications.

Broad Range of Technologies

LEM offers a wide variety of transducers based upon different technologies that meet the range of application requirements of LEM's customers. The technologies used by LEM to create transducers are summarised below:

- Hall effect transducers, which include closed-loop, open-loop and Eta™ transducers
- Fluxgate transducers
- Air-core transducers, including Rogowski and PRiME™ technologies
- Other voltage transducers, including the AV product family as well as devices based upon Hall effect and Fluxgate technologies

The product and technology that best meets the demands of an application will depend on a variety of requirements, predominantly the electrical requirements, mechanical requirements, thermal conditions and the environment in which the transducer is to be used. More complex applications may introduce other criteria, such as electromagnetic interference, mechanical disturbance (vibration, shock, etc), special isolation or compliance with industry-specific standards. Although the requirements of most applications are met with standard devices from LEM's comprehensive portfolio, LEM also develops customised products to meet the specific needs of customers with specific demanding requirements.

High Quality Manufacturing

For high-volume products, LEM's automated production lines include custom-developed equipment that optimise quality, with failure rates as low as 1 ppm. In-house six-sigma training and support for employees to study for the Swiss Association for Quality (SAQ) diploma create a culture of quality, and all production follows the OHSAS 18001 model. Every LEM plant is certified to recognised standards, with LEM's certifications including ISO 9001, TS 16949, ISO 14001 and IRIS.

For specialised, custom and low-volume devices, LEM's manual production facilities apply the same high-quality standards to the development of unique solutions for the most demanding challenges.

LEM's commitment to quality is demonstrated by the five-year guarantee offered on all of the company's products, something that is almost unique in the industry.



Global Presence

LEM is a mid-size, global company with approximately 1'100 employees worldwide. It has production plants in Geneva (Switzerland), Copenhagen (Denmark), Machida (Japan), Beijing (China), and adaptation centres in Milwaukee (USA) and Tver (Russia). LEM has ten regional sales offices, offering a seamless service worldwide to customers across the globe.

History

Liaisons Electroniques-Mecaniques (LEM) SA was founded in 1972 by Jean-Pierre Etter. The company initially had a capitalisation of 200,000 CHF and just 17 shareholders. The following year, the first 300 A current transducers were developed and used in Swiss trolley buses. In 1985 the company was floated on the Geneva stock-exchange. LEM grew both organically and through the acquisition of a number of other companies. In 2005 the Instruments business was sold to Danaher Corp., allowing LEM to concentrate on the core transducer business.