



Life Energy Motion

Press Release

LEM launches new Leakage Current Sensor for Electric Vehicle Charging Stations

Geneva, Switzerland, March 2021 – LEM (SIX: LEHN), a leading global company in electrical measurement for industry and automotive applications, launches the CDSR, a new leakage current sensor based on its open-loop Fluxgate Technology. The CDSR is innovative, extremely compact and safe, allowing manufacturers to optimize the electronic design of their charger products.

With a worldwide total of only 7.3 million EV charging points, of which 6.5 million were private in 2019, the lack of an extensive charging infrastructure is a key impediment to the growth of the global electric vehicle market. To support the massive deployment of EVs, driven by ambitious policies to phase out sales of internal combustion engine (ICE) vehicles, the charging infrastructure must increase by thirteen times.

Due to this high expected demand, manufacturers of electric chargers must develop solutions that are competitive, affordable and capable of being industrialized at high volume. As well as being easy to install for the end user, they must meet many standard criteria, both for safety and robustness of the product.

Since 2016, IEC standards and more specifically IEC 62955 / IEC 62752, require the detection of a Direct Leakage current at 6 mA DC to avoid the home Residual Current Device (RCD) Type A being ineffective. This effect, called “the blinding effect”, appears when an EV develops an insulation fault.

EV architecture integrates a battery pack, powered by Direct Current (DC), which can generate a leakage current that can deactivate a home RCD. To protect the RCD and avoid the need to install an RCD type B in the electrical panel of home EV owners, EV chargers include a device to detect the DC leakage current. This detection is the role of the CDSR.

The CDSR has been developed to meet market demand for a residential and commercial charging station, offering a version for single-phase architecture and another for three-phase topology. With a maximum current per phase of 32A rms, the CDSR can be integrated into AC chargers from 3.7 kW to 22kW.

Following the trend towards digital electronics, the CDSR provides not only an analog communication output but also a Serial Peripheral Interface (SPI), enabling simple interfacing of hardware. The CDSR operates from a +3.3VDC supply and has a typical current consumption of just 50 mA when measuring 150 mA as a maximum primary residual current.





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The ratio-metric behaviour of the CDSR ensures it can resist power supply drift and maintain a stable output measurement.

Extremely robust, the CDSR can operate inside all EV chargers. It has an operating temperature between -40°C to 85°C, can withstand acceleration forces up to 10G while maintaining nominal performance, and has a very high level of insulation between its primary and measurement circuits, thanks to long creepage and clearance distances (13.2 mm).

Designed to ensure a high level of safety, the CDSR provides a default detection output signal with a reaction time below 200µs. Combined with an independent test winding, charger manufacturers can test the performance of the sensor in real time to guarantee maximum safety.

The CDSR provides an essential component of the electrification world, making charging infrastructure more affordable, safer, and reliable for the future. This new technology, developed by the experienced LEM Geneva R&D team, opens the door to new horizons using DC systems to reduce CO₂ footprint.

LEM – Life Energy Motion

A leading company in electrical measurement, LEM engineers the best solutions for energy and mobility, ensuring that our customers' systems are optimized, reliable and safe.

Our 1,500 people in over 15 countries transform technology potential into powerful answers. We develop and recruit the best global talent, working at the forefront of mega trends such as renewable energy, mobility, automation and digitization.

With innovative electrical solutions, we are helping our customers and society accelerate the transition to a sustainable future.

Listed on the SIX Swiss Exchange since 1986, the company's ticker symbol is LEHN.
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