



## PRESS INFORMATION

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### LEM introduces open-loop Hall effect current transducers with digital outputs

**Key points:**

- **Compact open loop Hall effect current transducers with a digital output from a sigma-delta modulator**
- **12 bits effective resolution with 20 kHz bandwidth**
- **10 MHz clock frequency**
- **Same footprint and precision as LEM's successful HLSR and HO analog series**
- **Additional overcurrent detection output**

LEM announces digital output versions of HO and HLSR open-loop Hall effect current transducers with analog to digital (A/D) conversion performed by an on-board sigma-delta modulator, giving a 1-bit serial bitstream output. These new components for nominal current measurements of 10, 32, 50, 80, 100, 120, 150, 200, 250 A<sub>RMS</sub> in 3 different mechanical designs (PCB and panel mounting) provide up to 12 bit resolution with 20 kHz bandwidth. The single-bit output minimizes the connections required, enabling highly compact transducers, and the digital output allows the user to choose the filter used on the bitstream to optimize between resolution and response time, according to the application. Digital outputs are also intrinsically immune to noise in hostile environments.

For a typical transfer function the average bitstream density is 50% for zero primary current, and 10% or 90% for maximum currents in the negative or positive directions.

In the first samples available in one mode the clock is output from the sensor at 10MHz and both the clock and the data are single-ended signals with CMOS levels. Alternatively the output may be Manchester coded on 2 pins, meeting the RS422 standard. The footprints of these sensors are the same as the analogue HLSR and HO transducer families.

The new transducers can use a supply voltage of 3.3 V or 5 V and the operating temperature range is from -40°C to +105°C.

Several different filters may be used on a given bitstream. As an example: if a sinc3 filter is used with an over-sampling ratio (OSR) of 128 the effective resolution of a 50 A sensor is 12 bits, and the response time is about 38µs.

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Alternatively, a sinc2 filter with an OSR of 16 would give a response time of 4,6µs from the same bitstream, but the resolution would be reduced to 6 bits. Transducers in the HO family have additionally an Over-Current Detect (OCD) feature which measures the current level before the A/D converter. The response time of the OCD is 2us.

Future members of the family that are currently being developed will add 2 extra pins so both the clock and data may be differential signals that meet the RS422 and LVDS standards. Additionally, the transducer clock may be configured as an input in the range 5 – 12.5 MHz to allow a single clock to be used throughout the system. The single-ended and Manchester modes available today will still be supported.

### **LEM – At the heart of power electronics**

LEM is the 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 drives & welding, renewable energies & power supplies, traction, high precision, conventional and green cars businesses. LEM's strategy is to exploit the intrinsic strengths of its core business, and to develop opportunities in existing and new markets with new applications. LEM is a mid-size, global company. It has production plants in Beijing (China), Geneva (Switzerland), Machida (Japan) and Sofia (Bulgaria). With its regional sales offices close to its clients' locations, the company offers a seamless service around the globe. LEM is listed on the SIX Swiss Exchange since 1986; the company's ticker symbol is LEHN.

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