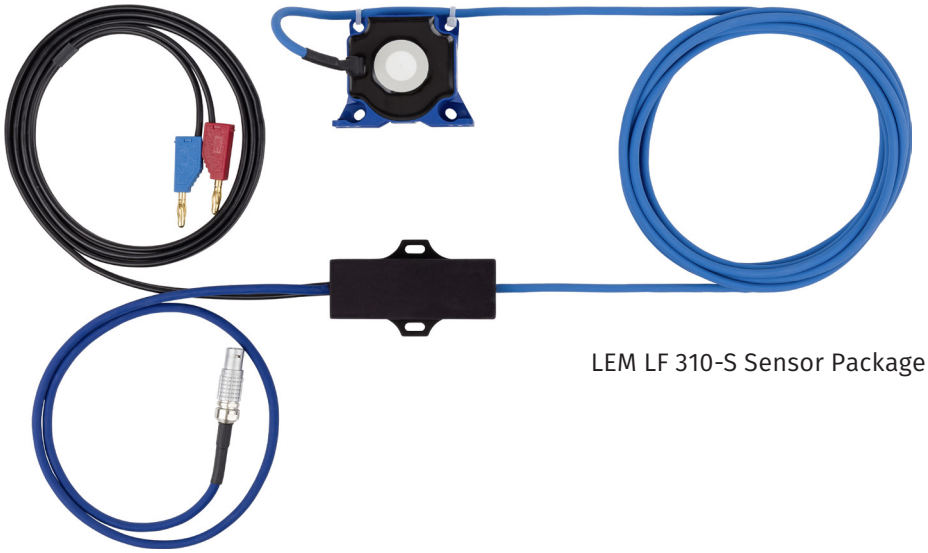
# LEM Sensor Package

## Type LF 210-S/SP3 | LF 310-S | LF 1010-S



LEM LF 310-S Sensor Package

## Product description

The CSM LEM Sensor Packages combined with a measurement module such as an AD4 IG1000 allow very precise measurements of electrical currents up to ±1,250 A (max. 800 $A_{rms}$ continuously) with signal frequencies up to 200 kHz (LEM LF 1010-S).

An AD4 IG1000 MiniModule can measure up to four electrical currents synchronously. Alternatively, up to four voltages can be measured synchronously. It is therefore also possible to measure electrical power.

The applied current transducer ensures galvanic isolation between test object and measurement system and is thus suitable for high-voltage applications.

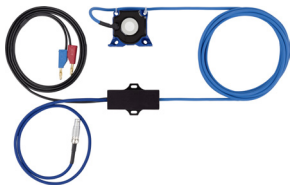
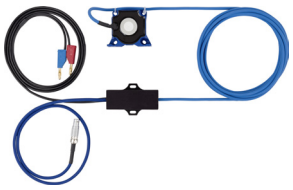
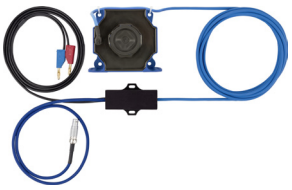
## Keyfeatures

- Precise measurements on electrical components in vehicles for the optimization of power and fuel consumption
- Ready-to-use solution for current measurements up to ±1,250 A with sensor LEM LF 1010-S
- Prepared for TEDS support according to IEEE 1451.4
- High accuracy and frequency bandwidth (200 kHz) even at ±1,250 A measurement current (LEM LF 1010-S)
- Fast and synchronous (< 1 µs) current measurements (e.g. of all three phases)
- Possible use in 48 V on-board supply systems and high-voltage environments

## Shipping content

- LEM Sensor Package
  - Sensor LEM LF 210-S/SP3 | LEM LF 310-S | LEM LF 1010-S
  - Signal conditioning
  - Cabling (ready to be connected)

## Technical data

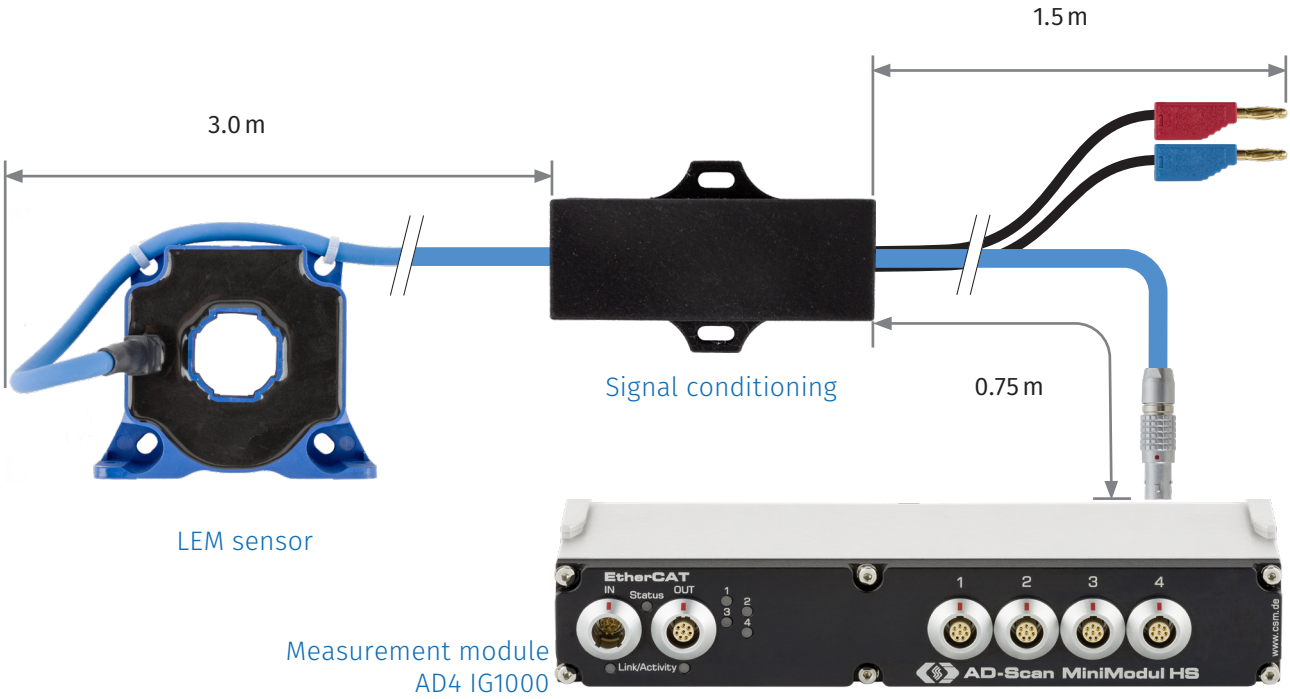
| Type designation | LEM LF 210-S/SP3 Sensor Package | LEM LF 310-S Sensor Package | LEM LF 1010-S Sensor Package |
|---|---|---|---|
| **Technical data valid as of revision** | B002 | | |
| |  |  |  |
| **Notice** | technical data of LEM sensor according to manufacturer specification: | | |
| | https://s.csm.de/lf210-s | https://s.csm.de/lf310-s | https://s.csm.de/lf1010-s |
| **Nominal current** (for continuous operation) | up to 100 $A_{rms}$ See section "Product variants" | max. 300 $A_{rms}$ | max. 800 $A_{rms}$ |
| **Measurement range** | up to ±200 A See section "Product variants" | ±500 A | ±1,250 A |
| **Threshold frequency** | 100 kHz | 100 kHz | 200 kHz |
| **Measurement uncertainty** | | | |
| Internal shunt | max. ±0.02 % of measured value, 5 ppm/K | | |
| LEM sensor | details see LEM Specification | | |
| **TEDS support** | prepared according to IEEE 1451.4 | | |
| **Power supply** | externally powered via $U_{Bat}$ of the vehicle with active reverse polarity protection | | |
| Minimum | 9 V DC | | |
| Maximum | 36 V DC | | |
| **Power consumption** | | | |
| Minimum | 1.5 W | 1.5 W | 1.8 W |
| | at 0 A ("idle") | | |
| Maximum | 5.1 W | 6.0 W | 6.0 W |
| **Output voltage** | ±5 V at measurement range | | |
| **Recommended measurement range** | ±5 V (AD4 IG1000 MiniModule) | | |
| **Housing** | | | |
| Protection class | IP67 (potted) | | |
| Dimensions (w × h × d) | approx. 50 × 25 × 85 mm | | |
| **Connectors** | signal conditioning only See section "Connection scheme" | | |
| Power supply | banana plugs | | |
| Output (to module) | LEMO 1B, 8-pole, code G | | |
| **Operating and storage conditions** | signal conditioning only See section "Connection scheme" | | |
| Operating temperature range | -40 °C to +85 °C | | |

| Type designation | LEM LF 210-S/SP3 Sensor Package | LEM LF 310-S Sensor Package | LEM LF 1010-S Sensor Package |
|---|---|---|---|
| **Cable lengths** | | | |
| To power supply | 1.5 m | | |
| To LEM sensor | 3.0 m | | |
| To measurement module | 0.75 m | | |

## Product variants (LEM LF 210-S/SP3 Sensor Package)

| **Name suffix** | _200 | _100 | _50 | _20 | _10 | _5 |
|---|---|---|---|---|---|---|
| **Nominal current** (for continuous operation) | max. 100 $A_{rms}$ | max. 100 A | max. 50 A | max. 20 A | max. 10 A | max. 5 A |
| **Measurement range** | ±200 A | ±100 A | ±50 A | ±20 A | ±10 A | ±5 A |

## Connection scheme (LEM LF 310-S Sensor Package)



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