



**DC Voltage Measuring Amplifier for Strain Gauge Sensors**

**Type LCV**

- Level of Protection IP67
- High Accuracy
- Design-Independent
- Low Temperature Drift
- Direct Connection to PLC
- 12V - 28 V DC Supply
- Reduced Perturbations
- Integrable in Large Sensors
- Many Output Versions



**DESCRIPTION:**

The LCV was designed for the adaption between SG-Sensor and evaluation. The interference-prone SG-Signals are raised to standardized output levels at the sensor, directly. By this, the noise immunity and the accuracy of measurement is decisively increased.

The LCV is connected between the supply line of sensor and signal acquisition (e.g. PLC). The robust tube-housing with high level of protection also allows application in rough environments. A screw clamp is sufficient for fastening. At large sensors, a circuit board module can be integrated.

The supply of 12...28 V DC is suitable for automotive and industrial applications. High flexibility is ensured by the analog output versions.

For very slow measurements; a 50 Hz- 3 dB filter can be pre-configured as an option.

An optional external control switch allows to activate the 100 % calibration control in the sensor (if available, see data sheet) with a control signal, externally. By this, the calibration and the subsequent calibration can be checked at any time.

**Scope of Delivery**

If the LCV is ordered with a Lorenz-Sensor, it will be mounted and calibrated together exactly.

If the LCV is ordered without a sensor, a not calibrated assembly set (amplifier module, tube-housing, screw connection) is delivered. All output versions can be configured by solder jumpers. In option, the amplifier module can be pre-calibrated to a value, determined by the customer. At initiation the zero point still needs to be adjusted, only.

**TECHNICAL DATA:**

Type	LCV-U10	LCV-U5	LCV-I0	LCV-I4	LCV-I10	LCV-I12
Output	0...±10V	0...±5V	0...20mA	4...20mA	10±10mA	12±8mA
Art. No.	100430	100626	101177	100432	100956	101018

**Evaluation Side**

Supply	Supply voltage	12...28 V DC
	Ripple	<10%
	Current consumption	max. 70 mA
Signal Output Voltage	Output signal U-Out	0 ...±10 V max.: 2 mA
	Ripple	<10 mV
	Gain drift	<0.015%/10 K
	Zero point drift	<0.015%/10 K
	Linearity	<0.02%
	Output resistance	<1 Ω
	Cut-off frequency	1 kHz -3 dB
Signal Output Current	Output signal I-Out	0...20 mA at 0...400 Ω
	Ripple at 400 Ω	<10 mV
	Gain drift	<0.02%/10 K
	Zero point drift	<0.02%/10 K
	Linearity	<0.02%
General	Cable length for evaluation	U5/ U10: 3 m (max.10 m) I0/ I4/ I10/ I12 3 m (max.100 m)

**Sensor Side**

Supply	Sensor supply	5.00 V 20 mA short-circuit resistance
	TC Excitation voltage	<25 ppm/K
Signal Input	Sensor sensitivity	0.35...3.5 mV/V
	Input resistance	10 <sup>9</sup> Ω
General	Cable length to sensor	1 m (max. 3 m)

**Miscellaneous**

Nominal Temperature Range	+10...+50 °C
Service Temperature Range	0...+60 °C
Storage Temperature Range	-10...+70 °C
Dimensions (Ø x L)	25 x 115 mm (incl. Screw joint)
Level of Protection	IP 67

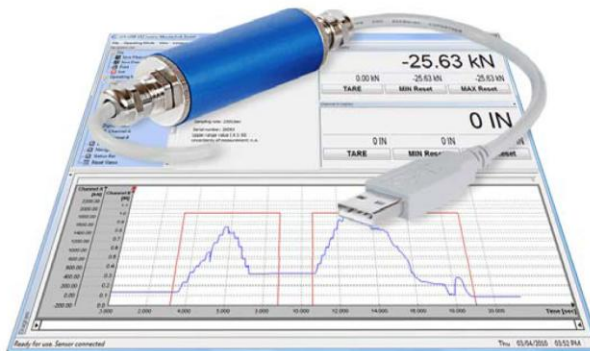
Options	Art. No.	Function
LCV/50Hz	100563	Filter 50 Hz -3 dB
LCV/sensitivity	110564	mV/V calibrated characteristic value
LCV/range	110565	kOhm range resistance
LCV/KE	103760	External control (5V...28V=On)



**USB-Sensor-Interface with Configuration and Evaluation Software**

**LCV-USB2**

- Supply of the Measuring System via PC USB Port
- Fast Measurement of up to 5000 Measurements/s
- Up to 16 bit Resolution
- Input Ranges for mV, V and mA
- Integrable in large Sensors as Board
- Adjustment and Control Signal Switch via Software
- High Level of Protection IP67



**DESCRIPTION**

The sensor interface LCV-USB2 is connected between sensor and PC. By this, analog sensor signals are digitized with up to 16 bit resolution. By the measuring rate of up to 5000 measurements/s, high dynamic measuring tasks are realizable. The measured values are transferred to the PC via the USB interface and are visualized by the software. If a control signal is integrated in the sensor, an automatic adjustment can be carried out, which is checkable at any time (monitoring of the measuring chain).

Following output signals can be digitally converted and comfortably be displayed and evaluated by the corresponding evaluation software.

- USB2-SG      Excitation 4 V ≤20 mA  
                  Input Range: ±3 mV/V
- USB2-U5/U10    Excitation 12 V ≤80 mA  
                  Input Range: ±5 V/±10 V
- USB2-I20      Excitation 12 V ≤80 mA  
                  Input Range: 0/4...20 mA  
                  (Option: 10±10 mA/12±8 mA)

Many commercially available sensors e.g. force, torque, displacement or pressure sensors can be used with the LCV-USB2. The sensor parameters can be stored in the LCV-USB2. After a one-time parameterization, each sensor is recognized automatically by the software. Thus, the measurement can be immediately started after the connection of the sensor through the USB-connector. The robust metal housing with high protection level allows fast fixation by screw-clamps or cable ties. The board module can also be integrated in larger sensors.

**TECHNICAL DATA**

Type	LCV-USB2-SG	LCV-USB2-U5	LCV-USB2-U10	LCV-USB2-I20
Art.-No.	112311	112312	112705	112313
Input Range	±3 mV/V	±5 V	±10 V	0/4...20 mA

Supply	from USB	4...6 V DC ≤350 mA
Excitation	SG U5/U10 I20	4 V ≤20 mA 12 V ≤80 mA 12 V ≤80 mA
Measured Values	SG U5/U10 I20	±3 mV/V = ±30,000 digits ±5 V/±10 V = ±25,000 digits 0...20 mA = 0...+20,000 digits
Resolution	SG U5 U10 I20	1 mV/V = 10,000 digits 1 V = 5000 digits 1 V = 2500 digits 1 mA = 1000 digits
Zero Point	SG/U5/U10/I20	0 digits
Output Format		16bit signed int.
Input Resistance	SG U5/U10 I20 burden	>1 MΩ >1 MΩ 62 Ω
Measuring Rate		max. 5000 meas./s
Temperature Drift		4 Bit/10 K
Linearity Error		±32 digits
Accuracy		±32 digits

**Miscellaneous**

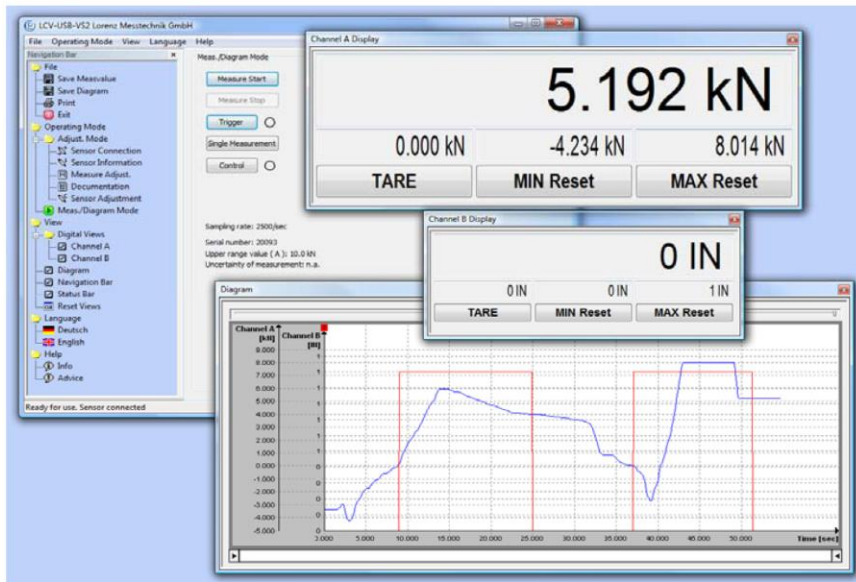
Cable Length LCV-USB2-Evaluation	2 m
Cable Length LCV-USB2-Sensor	1m (max.3 m)
Nominal Temperature Range	+10...+40 °C
Service Temperature Range	0...+50 °C
Storage Temperature Range	-10...+70 °C
Dimensions (Ø x L)	25 x 115 mm (incl. screw joint)
Level of Protection	IP67

Art.-No.	Options	Description
110564	mV/V	mV/V adjusted sensitivity
110120	LCV-USB2/TR-EXT	Digital input at channel B

**Configuration and Evaluation Software**

**LCV-USB-VS2**

- Comfortable Configuration and Evaluation Software
- Graphical Presentation of up to 2 Input Channels<sup>1</sup> max.
- Automatic Scaling of Y-axis
- Simultaneous Storage of up to 2 Input Values<sup>1</sup>
- Automatic Storage Function of the Measured Values as CSV- and BMP-File



**DESCRIPTION**

Configuration and evaluation software for easy analysis and graphical presentation on a PC.

The software for the LCV-USB2 allows direct read-in of measured data into a text file in CSV-Format through the USB-Port of a PC. This enables further analyses with a commercially available spreadsheet program at any time.

**TECHNICAL DATA**

Type	<b>LCV-USB-VS2</b> <sup>234</sup>
Interface	USB (for operation with LCV-USB2)
Protocol	Lorenz standard protocol
System requirements	ex Win2000 <sup>105</sup> Single-Core ex 2.0 GHz (without diagram) Dual-Core ex 1.8 GHz (with diagram)

Conversion in physical variables	✓
Simultaneous measurement	1 Sensor (optional add. 1 digital input)
Graphical presentation of the measured variables	✓
Automatic or manual storage in a CSV- and BMP-file	✓
Print-out of the diagram with date and definable headline	✓
Scaling function of the input variable to any display value with unit	✓
Resettable minimum value memory for any measured variable	✓
Resettable maximum value memory for any measured variable	✓
Variable average determination	✓
Tare for each measured value	✓