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## Steering Effort Sensor **CLSx** - Top accuracy with ultra slim shape



*Ultra slim sensor body design for seamless integration with minimal extension of steering column*

*All functions of the steering wheel are preserved*

*Steering torque range  $\pm 100$  Nm or  $\pm 200$  Nm*

*Steering angle range  $\pm 1.475^\circ$*

*Rotational velocity range  $\pm 1000^\circ/\text{sec}$*

*Acceleration in x,y,z direction (optional)*

*Rotational acceleration (optional)*

*Data output: CAN and analog*

*Online monitoring of all channels in physical values (OLED display)*

The innovative steering effort sensor **CLSx** sets new standards in size of the housing as well as in resolution and accuracy of measurement values. The sensor is placed between steering column and original steering wheel of the vehicle, preserving all steering wheel functions.

The **CLSx** captures precisely the parameters torque, steering angle and rotational velocity. Optionally, it also acquires acceleration in the center of the steering column (x, y and z direction) as well as rotational acceleration.

Measurement data are digitized for a highly fail-safe data transfer, with a resolution of 16 bits (internally: 24 bits). Together with its innovative, ultra slim sensor body design, this leads to an unprecedented precision of torque measurement of 0.1% FS.



**Technical Data**

Sensor	
<b>Steering Torque</b>	
Measuring Principle	Temperature compensated strain gauge application
Measurement Range	±100 Nm or ±200 Nm (choose when ordering)
Accuracy	0,1 % FS
Bandwidth	0 ... 800 Hz
<b>Steering Angle</b>	
Measuring Principle	Incremental angle encoder
Measurement Range	±1.475°
Accuracy	0,045°
Bandwidth	0 ... 800 Hz
<b>Rotational Velocity</b>	
Measuring Principle	Calculated from angle
Measurement Range	CAN: ±1.000°/s
Bandwidth	0 ... 800 Hz
<b>Acceleration (optional)</b>	
x, y and z	up to 5g
Rotational acceleration	±10.000°/sec <sup>2</sup>
<b>General Data</b>	
Sensor height	approx. 30mm (w/o adapters)
Sensor weight	approx. 0.6kg (w/o adapters)
Overload	>100% of specified torque
Mech. breaking torque	> 500 Nm
Adaption	special adaption sets for any car or truck manufacturer available
Working temperature	-20°C ... +80 °C
<b>Control Unit</b>	
Power supply	9 ...36 V DC
CAN-Output	freely configurable
Analog output	freely configurable, output range max. ±10V
Auto zero	with push-button for torque and angle at the panel or by remote control

**F**or data output and parametrization, the receiver and control unit offers both analog and digital interfaces (CAN, Ethernet). At the OLED display integrated in the control unit, all measurement values are displayed in physical dimensions. Autozero of torque and angle can be set directly at the control unit or by remote switch.

For convenient parametrization and data acquisition the system can be controlled by CAEMAX's powerful software package **RemusLAB!**



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