

Lean Angle Sensor LAS-1

490 €

This sensor is designed to measure the acceleration and the rate of turn in two axis (yaw rate Ω_z , roll rate Ω_x , lateral acceleration a_y and longitudinal acceleration a_z).

An internal diagnosis indicates too high vibrations or turning rates.

In combination with a MS 5 ECU and its algorithm a very precise lean angle of motorcycles can be calculated.

The main feature and benefit of this sensor is its wide measuring range, the standardized 1 Mbaud CAN-signal output and the combination of high quality production part and robust design.



| Application | |
|-----------------------------|------------------------------------|
| Application I | ± 163 °/s (roll rate/yaw rate) |
| Application II | ± 4.1 g (X and Y acceleration) |
| Operating temperature range | -20 ... 85 °C |

| Electrical Data | |
|-------------------|------------|
| Power supply | 7 ... 18 V |
| Max input current | 200 mA |
| Power up time | < 150 ms |

| Connectors and Wires | |
|----------------------|-------------------|
| Connector | AMP 114-18063-076 |
| Mating connector | F 02U B00 240-01 |
| Pin 1 | GND |
| Pin 2 | CANL |
| Pin 3 | CANH |
| Pin 4 | UBAT |

| Mechanical Data | |
|-----------------|-----------------|
| Weight w/o wire | 96 g |
| Size | 33 x 98 x 91 mm |

| Characteristic Application I | |
|------------------------------|-----------------|
| Measuring range | ± 160 °/s |
| Overrange limit | $\pm 1,000$ °/s |
| Absolute resolution | 0.1 °/s |
| Cut-off frequency (-3 dB) | 15 Hz |

| Characteristic Application II | |
|-------------------------------|-------------|
| Measuring range | ± 4.1 g |
| Overrange limit | ± 10 g |
| Absolute resolution | 0.01 g |
| Cut-off frequency (-3 dB) | 15 Hz |

CAN Parameters

| | |
|--|--|
| Byte order | Little endian, high-byte/low-byte, Intel |
| CAN speed | 1 Mbaud |
| CAN refresh rate | 10 ms |
| Identifier length | 11 bit |
| Bit mask | signed |
| Offset (all signals) | 0x8000 hex |
| Quantisation Yaw Rate | 0.005 [°/s/digit] |
| Quantisation Roll Rate | 0.005 [°/s/digit] |
| Quantisation Acc X-Axis | 0.0001274 [g/digit] |
| Quantisation Acc Y-Axis | 0.0001274 [g/digit] |
| Conversion formula | |
| Yaw rate [°/s] = (Hex-value - 8000 h) * 0.005 [°/s/digit] | |
| Roll rate [°/s] = (Hex-value - 8000 h) * 0.005 [°/s/digit] | |

Application Hint

Important: In order not to exceed the maximum vibration level, the mount should be damped and not resonate.

For measuring the yaw and roll rate the LAS-1 can be connected directly to most control units and data logging systems.

The lean angle of motorcycles can be calculated in a MS 5 with motorcycle functionality.

Please avoid abrupt temperature changes.

For mounting please use only the integrated fixing holes.

Please ensure that the environmental conditions do not exceed the sensor specifications.

Please find further application hints in the offer drawing (<http://www.bosch-motorsport.com>).

Part Number

Lean Angle Sensor LAS-1

F 02U V00 657-01

CAN Message
CAN_ID_01 0x174

| Byte | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------|----------|---|----------|----------|-------|---|-----------|--------|
| Value | Yaw Rate | | Yaw_STAT | Reserved | Acc Y | | AccY_STAT | Unused |

CAN_ID_02 0x178

| Byte | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------|-----------|---|-----------|----------|-------|---|-----------|--------|
| Value | Roll Rate | | Roll_STAT | Reserved | Acc X | | AccX_STAT | Unused |

Bit combination of sensor status
Yaw_STAT, Roll_STAT, AccY_STAT and AccX_STAT:

xx00 xxxx = signal in specification

xx01 xxxx = sensor not available

xx10 xxxx = signal failure

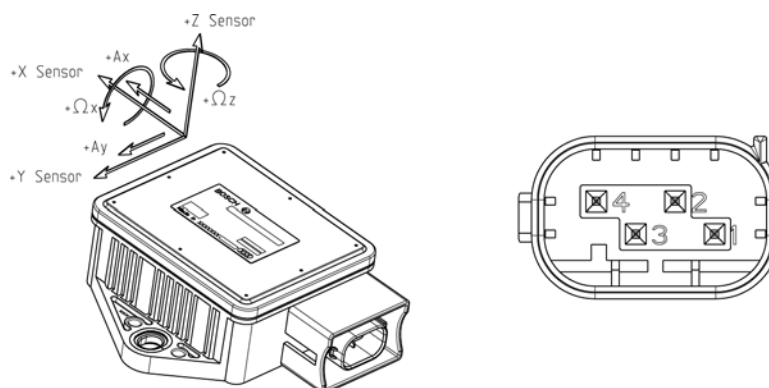
xx11 xxxx = reserved

x1xx xxxx = initialisation is running

x0xx xxxx = initialisation is ready

1xxx xxxx = reserved

0xxx xxxx = reserved





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