

# Acceleration Sensor MM5.10-R

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- ▶ 2-axis rotation rate (yaw rate, roll rate)
- ▶ 3-axis accelerometer (X, Y, Z)
- ▶ 1 Mbaud or 500 kbaud CAN-output
- ▶ Aluminum housing
- ▶ Integrated motorsport connector

The MM5.10-R was designed to measure the physical effects of rotational and linear acceleration. In order to achieve this, the sensor includes MEMS measuring elements connected to an appropriate integrated circuit. A rotational acceleration around the integrated sensing elements generates a Coriolis force which changes the internal capacity of the micro machined sensing parts. Furthermore, a pure surface micro machined element is used to measure the vehicle lineal acceleration in all 3 axes. This combination of rotational and linear acceleration sensors enables a precise measurement of the vehicle dynamics.

The main features and benefits of this sensor are the aluminum compact housing, the combination of 3 linear and 2 rotational accelerometers and its high speed 1 Mbaud/s CAN-signal output.

## Application

Application I	$\pm 163^\circ/\text{s}$ (roll rate/yaw rate)
Application II	$\pm 4.2 \text{ g}$ (X, Y and Z acceleration)
Operating temperature range	-20 to 85°C

## Technical Specifications

### Mechanical Data

Weight w/o wire	28 g
Size	34 x 34 x 16.5 mm

### Electrical Data

Power supply	7 to 18 V
Max input current	90 mA
CAN speed	1 Mbaud/s or 500 kbaud/s

### CAN Message

#### CAN ID 01 0x174

Byte	Value
0	Yaw rate
1	
2	Reserved
3	
4	Acc Y-axis
5	

6	Reserved
7	Unused
<b>CAN ID 02 0x178</b>	
Byte	Value
0	Roll rate
1	
2	Reserved
3	
4	Acc X-axis
5	
6	Reserved
7	Unused
<b>CAN ID 02 0x17C</b>	
Byte	Value
0	Reserved
1	
2	Reserved
3	
4	Acc Z-axis
5	
6	Reserved
7	Unused
<b>Characteristic</b>	
<b>Characteristic Application I</b>	
Measuring range	$\pm 160^\circ/\text{s}$
Over range limit	$\pm 1,000^\circ/\text{s}$
Absolute physical resolution	0.1°/s
Cut-off frequency (-3 dB)	15 Hz; 30 Hz; 60 Hz
<b>Characteristic Application II</b>	
Measuring range	$\pm 4.2 \text{ g}$
Over range limit	$\pm 10 \text{ g}$
Absolute physical resolution	0.01 g
Cut-off frequency (-3 dB)	15 Hz; 30 Hz; 60 Hz
<b>Connectors and Wires</b>	
Connector	ASX 0-02-05PA-HE
Mating connector	ASX 6-02-05SA-HE

Pin 1	UBat
Pin 2	CANH
Pin 3	Not connected
Pin 4	CANL
Pin 5	Gnd
Sleeve	DR-25

**CAN Parameters**

Byte order	LSB (Intel)
CAN speed	1 Mbaud/s or 500 kbaud/s
Bit mask	unsigned
Offset (all signals)	0x8000 hex
Quantization Yaw Rate	0.005 [°/s/digit]
Quantization Roll Rate	0.005 [°/s/digit]
Quantization Acc X-axis	0.0001274 [g/digit]
Quantization Acc Y-axis	0.0001274 [g/digit]
Quantization Acc Z-axis	0.0001274 [g/digit]

**Installation Notes**

The MM5.10-R can be connected directly to most control units and data logging systems.

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 at our homepage and calibration sheet.

Please deliver the calibration sheet with your order placement.

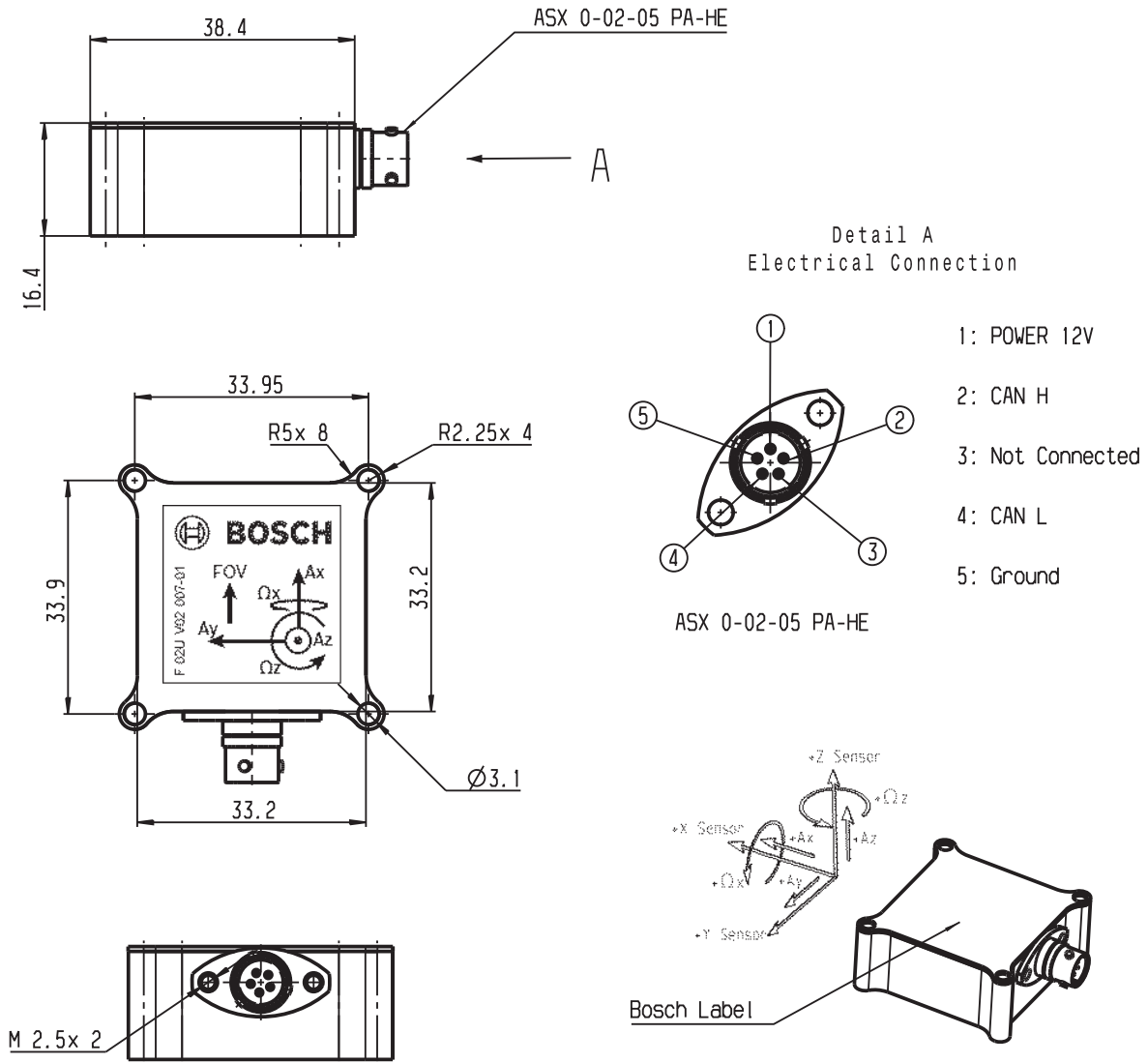
**Safety Note**

The sensor is not intended to be used for safety related applications without appropriate measures for signal validation in the application system.

**Ordering Information**

**Acceleration Sensor MM5.10-R**  
Order number **F 02U V02 007-01**

Dimensions



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