

# **Acceleration Sensor MM5.10-R**



- Application 1: ±163°/s (roll rate/ yaw rate)
- ▶ Application 2: ±4.2 g (X, Y and Z acceleration)
- ▶ Weight w/o wire: 28 g
- Size: 34 x 34 x 16.5 mm
- Power supply: 7 to 18 V

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 CAN-signal output.

Application	
Application I	±163°/s (roll rate/yaw rate)
Application II	±4.2 g (X, Y and Z accelera- tion)
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 or 500 kbaud

# CAN Message

ByteValue0Yaw rate1Yaw rate1Reserved3Acc Y-axis5Yaw rate6Reserved7UnusedCAN ID 02 0x178ByteValue0Roll rate1Yaw rate2Reserved3Yaw rate5Yaw rate6Reserved3Yaw rate6Reserved7Unused6Reserved7Unused7Value6Reserved7Value7Value6Reserved7Value1Yalue1Yalue2Reserved3Yalue2Reserved3Yalue2Acc Z-axis3Yalue3Yalue3Yalue3Yalue4Yalue4Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue7Yalue<	CAN ID 01 0x174	
1Reserved3Acc Y-axis4Acc Y-axis5Unused6Reserved7UnusedCAN ID 02 0x178ByteValue0Roll rate112Reserved3Acc X-axis5Acc X-axis5Acc X-axis6Reserved7Unused6Reserved7Unused6Reserved7Unused6Reserved7Unused7Value7Value1Yalue1Acc X-axis1Acc X-axis1Acc X-axis1Acc X-axis1Acc X-axis1Acc X-axis1Acc X-axis1Acc X-axis1Acc X-axis3Acc X-axis <t< td=""><td>Byte</td><td>Value</td></t<>	Byte	Value
2Reserved3Acc Y-axis5Acc Y-axis5Inused6Reserved7UnusedCAN ID 02 0x178ByteValue0Roll rate1Acc X-axis3Acc X-axis5Acc X-axis5Inused6Reserved7Unused7Unused6Reserved7Unused7Value6Reserved7Unused7Value6Reserved7Value1Served1Acc X-axis5Served7Unused7Served7Served9Reserved1Acc X-axis3Served	0	Yaw rate
3Acc Y-axis5Reserved6Reserved7UnusedCAN ID 02 0x178ValueByteValue0Roll rate12Acc X-axis3Acc X-axis56Reserved7Unused7Unused1Yene9Value1Acc X-axis5Yene6Reserved7Unused7Value1Yene9Value1Acc X-axis1Served1Acc X-axis1Served1Served2Reserved3Served	1	
4Acc Y-axis5Reserved6Reserved7UnusedCAN ID 02 0x178ValueByteValue0Roll rate1-2Reserved3-4Acc X-axis5-6Reserved7Unused7Value1-9Value1-6Reserved7Unused1-9Value1-1-2Reserved3-	2	Reserved
5 Reserved   7 Unused   CAN ID 02 0x178   Byte Value   0 Roll rate   1 -   2 Reserved   3 -   4 Acc X-axis   5 -   6 Reserved   7 Unused   7 Unused   7 Value   1 -   2 Reserved   3 -   6 Reserved   7 Unused   7 Value   7 Value   7 Value   1 -   9 Value   1 -   2 Reserved   1 -   2 Reserved	3	
6Reserved7UnusedCAN ID 02 0x178ValueByteValue0Roll rate112Reserved3Acc X-axis516Reserved7UnusedPayleValue0Value1Value1Served1Served1Served1Reserved3Served3Served	4	Acc Y-axis
7UnusedCAN ID 02 0x178ValueByteValueORoll rate1Reserved3Acc X-axis5Acc X-axis6Reserved7Unused7ValueCAN ID 03 0x17CValue9Value1Reserved3Yalue1Reserved3Served	5	
CAN ID 02 0x178ByteValue0Roll rate112Reserved3Acc X-axis516Reserved7Unused7ValueCAN ID 03 0x17CValue9Value1Reserved3Yalue2Reserved3Reserved	6	Reserved
ByteValue0Roll rate1-2Reserved3-4Acc X-axis5-6Reserved7Unused7Value0Served1-9Value1-2Reserved3-	7	Unused
0Roll rate1Reserved2Reserved3Acc X-axis5Acc X-axis5Unused7UnusedKan D 03 0x17CByteValue0Reserved1Acc X-axis2Reserved3Acc X-axis	CAN ID 02 0x178	
12Reserved3Acc X-axis4Acc X-axis5-6Reserved7UnusedValueCAN ID 03 0x17CByteValue0Reserved1Acc X-axis2Reserved3Yalue	Byte	Value
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34Acc X-axis5Reserved6Reserved7UnusedCAN ID 03 0x17CValueByteValue0Reserved1Reserved2Reserved3Net Not Not Not Not Not Not Not Not Not No	1	
4Acc X-axis56Reserved7Unused7ValueCAN ID 03 0x17CValue1Reserved2Reserved3Served	2	Reserved
56Reserved7UnusedCAN ID 03 0x17CValueByteValue0Reserved1Reserved3Served	3	
6Reserved7UnusedCAN ID 03 0x17CValueByteValue0Reserved112Reserved3Value	4	Acc X-axis
7UnusedCAN ID 03 0x17CValueByteValue0Reserved1Reserved3Particular (Control on the second on th	5	
CAN ID 03 0x17CByteValue0Reserved123Reserved	6	Reserved
ByteValue0Reserved123Reserved	7	Unused
0Reserved172Reserved31	CAN ID 03 0x17C	
123	Byte	Value
2 Reserved 3	0	Reserved
3	1	
	2	Reserved
4 Acc Z-axis	3	
	4	Acc Z-axis

5	
6	Reserved
7	Unused

## Characteristic

Characteristic Application I	
Measuring range	± 160°/s
Over range limit	± 1,000°/s
Absolute physical resolution	0.1°/s
Cut-off frequency (-3 dB)	15 Hz; 30 Hz; 60 Hz
Characteristic Application II	
Measuring range	±4.2 g
Over range limit	±10 g
Absolute physical resolution	0.01 g
Cut-off frequency (-3 dB)	15 Hz; 30 Hz; 60 Hz

#### **Connectors and Wires**

Connector	ASX002-05PA-HE
Mating connector	ASX602-05SA-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 or 500 kbaud
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**

Mounting position: Connector opposite to driving direction. 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. Please note:

CAN ID0 0x0170 (Rx) is used for synchronization and configuration of the sensor (SYNC). Make sure that the CAN ID 0x170 is not used in your can network by any other device.

## Safety Note

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

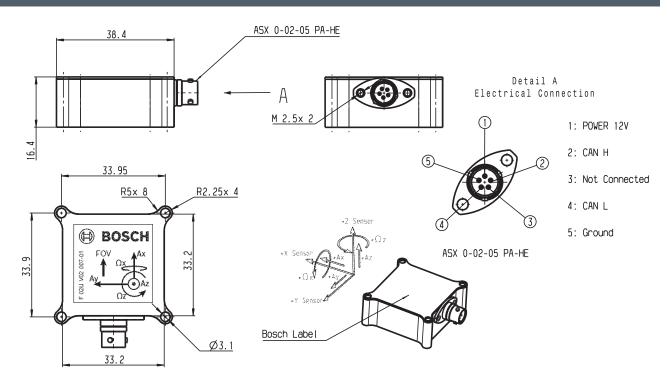
# Legal Restrictions

The sale of this product in Mexico is prohibited. Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

## **Ordering Information**

Acceleration Sensor MM5.10-R Order number F02U.V02.007-01

#### Dimensions



Represented by:

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