

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 |
| 2Reserved3Acc X-axis4Acc X-axis5Acc X-axis6Reserved7Unused7ValueByteValue0Reserved1Acc X-axis2Reserved3Acc X-axis | 0 | Roll rate |
| 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.

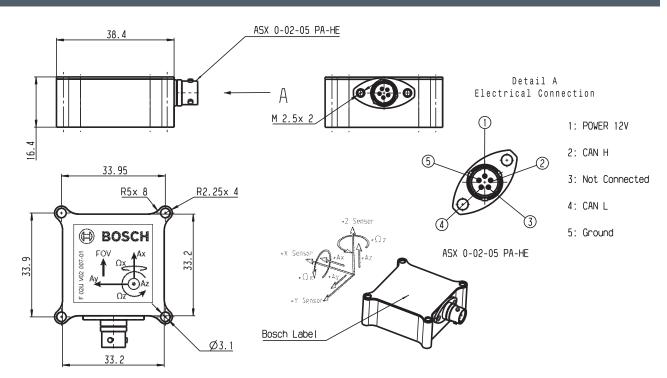
Legal Restrictions

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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