

# Acceleration Sensor MM7.10



- ▶ Application 1:  $\pm 163^\circ/\text{s}$  (roll / pitch / yaw rate)
- ▶ Application 2:  $\pm 4.2 \text{ g}$  (X, Y and Z acceleration)
- ▶ Weight w/o wire: 35 g
- ▶ Size: 80 x 56 x 23.3 mm
- ▶ Power supply: 8 to 16 V

The MM7.10 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 linear acceleration in all 3 axis. This combination of rotational and linear acceleration sensors enables a precise measurement of the vehicle dynamics.

The main feature and benefit of this sensor is the combination of 3 linear and 3 rotational accelerometers and its high speed 1 Mbaud CAN-signal output.

## Application

Application I	$\pm 163^\circ/\text{s}$ (roll / pitch / 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	35 g
Size	80 x 56 x 23.3 mm

### Electrical Data

Power supply	8 to 16 V
--------------	-----------

Max input current	100 mA at 7 V 50 mA at 14 V
CAN speed	1 Mbaud or 500 kbaud

## CAN Message

CAN ID 01 0x174	
Byte	Value
0	Yaw rate
1	
2	Reserved
3	
4	Acc Y-axis
5	
6	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
CAN ID 03 0x17C	
Byte	Value
0	Pitch rate
1	

2	Reserved
3	
4	Acc Z-axis
5	
6	Reserved
7	Unused

**Characteristic**

**Characteristic Application I**

Measuring range	± 163°/s
Over range limit	± 1,000°/s
Absolute physical resolution	0.1°/s
Cut-off frequency (-3 dB)	15 Hz; 30 Hz; 70 Hz

**Characteristic Application II**

Measuring range	±4.2 g
Over range limit	±20 g
Absolute physical resolution	0.01 g
Cut-off frequency (-3 dB)	15 Hz; 30 Hz; 70 Hz

**Connectors and Wires**

<b>Connector (1)</b>	<b>AMP 114-18063-076</b>
Mating connector (1)	F02U.B00.435-01
Pin 1	Gnd
Pin 2	CANL
Pin 3	CANH
Pin 4	UBat
<b>Connector (2)</b>	<b>ASL606-05PC-HE</b>
Mating connector (2)	ASL006-05SC-HE
Pin 1	UBat
Pin 2	Gnd
Pin 3	CANH
Pin 4	CANL
Pin 5	Not connected
Sleeve	DR-25
<b>Wire with open end (3)</b>	
Red wire	UBat
Black wire	Gnd
White wire	CANH
Blue wire	CANL
Wire size with open end (3)	4 x AWG24
Wire length L	15 to 100 cm

**CAN Parameters**

Byte order	LSB (Intel)
CAN speed	1 Mbaud or 500 kbaud
Bit mask	unsigned
Offset (all signals)	0x8000 hex
Quantization Roll Rate	0.005 [°/s/digit]

Quantization Pitch Rate	0.005 [°/s/digit]
Quantization Yaw 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: The MM7.10 must not be mounted with connector pointing upwards. Other than this Bosch has no restrictions for the mounting orientation. We recommend to align the sensor coordinate system to the vehicle coordinate system as this is the orientation that most systems will require and thus no mathematical transformation is needed.

The MM7.10 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 ID 04 0x7DC, RX1 0x7DF and RX2 0x7D4 are used for configuration of the sensor (SYNC). Make sure that the CAN ID 04 0x7DC, RX1 0x7DF and RX2 0x7D4 are not used in your CAN network by any other device.

CAN DBC file on request

Standards considered on request

**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**

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

**Ordering Information**

**Acceleration Sensor MM7.10**

Without wire (1)

Order number **F02U.V03.092-01**

**Acceleration Sensor MM7.10**

Wire with motorsport connector (2)

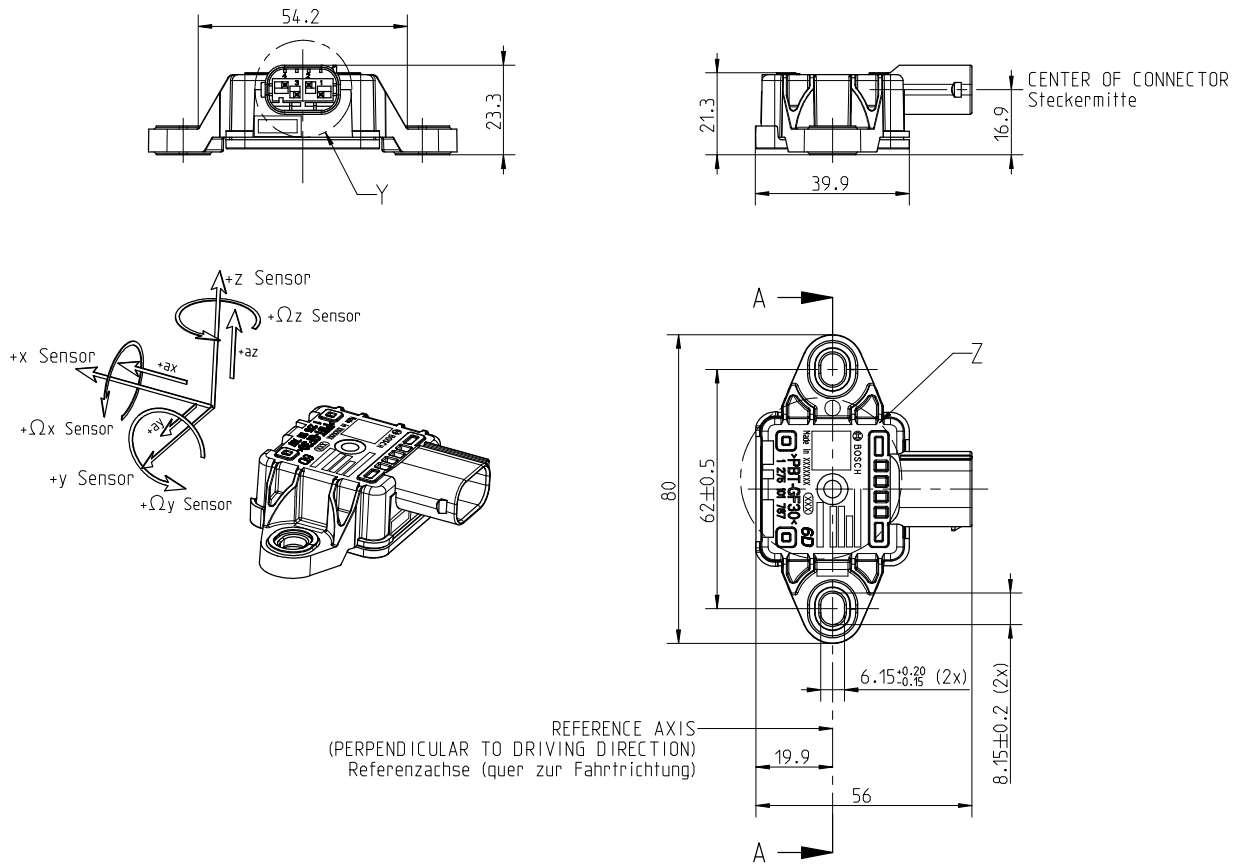
Order number **F02U.V03.092-02**

**Acceleration Sensor MM7.10**

Wire with open end (3)

Order number **F02U.V03.092-90**

Dimensions



Represented by:

**Europe:**  
 Bosch Engineering GmbH  
 Motorsport  
 Robert-Bosch-Allee 1  
 74232 Abstatt  
 Germany  
 Tel.: +49 7062 911 9101  
 Fax: +49 7062 911 79104  
 motorsport@bosch.com  
 www.bosch-motorsport.de

**North America:**  
 Bosch Engineering North America  
 Motorsport  
 38000 Hills Tech Drive  
 Farmington Hills, MI 48331-3417  
 United States of America  
 Tel.: +1 248 876 2977  
 Fax: +1 248 876 7373  
 motorsport@bosch.com  
 www.bosch-motorsport.com

**Asia-Pacific:**  
 Bosch Engineering Japan K.K.  
 Motorsports Department  
 1-9-32 Nakagawa Chuo, Tsuzuki-ku  
 Yokohama City  
 Kanagawa Prefecture 224-8601  
 Japan  
 Tel.: +81 45 605 3032  
 Fax: +81 45 605 3059  
 www.bosch-motorsport.jp

**Australia, New Zealand and South Africa:**  
 Robert Bosch Pty. Ltd  
 Motorsport  
 1555 Centre Road  
 Clayton, Victoria, 3168  
 Australia  
 Tel.: +61 (3) 9541 3901  
 motor.sport@au.bosch.com