

IMU Sensor



The Vemcon IMU Sensors are optimised for taking precise measurement of dynamic movements.

At a glance / USP

- High precision even during dynamic movements
- Great for active driver assistance functions
- Compact dimensions and robust construction especially for heavy-duty use
- Fast and easy calibration and parameterization
- Device variants suitable for safety critical application (ISO13849: PL_c and PL_d)¹⁾ available
- For each application the necessary precision available (D-DP-DPS)

Technical data – electrical ratings

General data

Resolution position sensor:	<0.01 °
Angle accuracy position sensor ²⁾ :	<0.4° (Typical 0.1 °)
Default transmission interval (J1939)	50 ms
Supply voltage range	9...35 V

Technical data – mechanical ratings

Temperature range	-35 °C - +80 °C
Simple cabling due to 2x M12 for passing trough CAN signals	
Hermetically sealed (IP67)	

1) Only with DPS-Variant available

2) At room temperature; accuracy can differ significantly in dynamic operation



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Dynamic³⁾		
Performance	Acceleration Sensor (3axes)	Angular Rate Sensor (3-axes)
Measuring Range	±16 g	±250 °/s
Offset-Instability	±80 mg	
Noise Density	400 µg/√Hz	0.005 (°/s)/√Hz
Resolution	16 bit	16 bit
Non-Linearity	0.5 %	0.2 %
Data Rate (Raw Data)	1 kHz	1 kHz

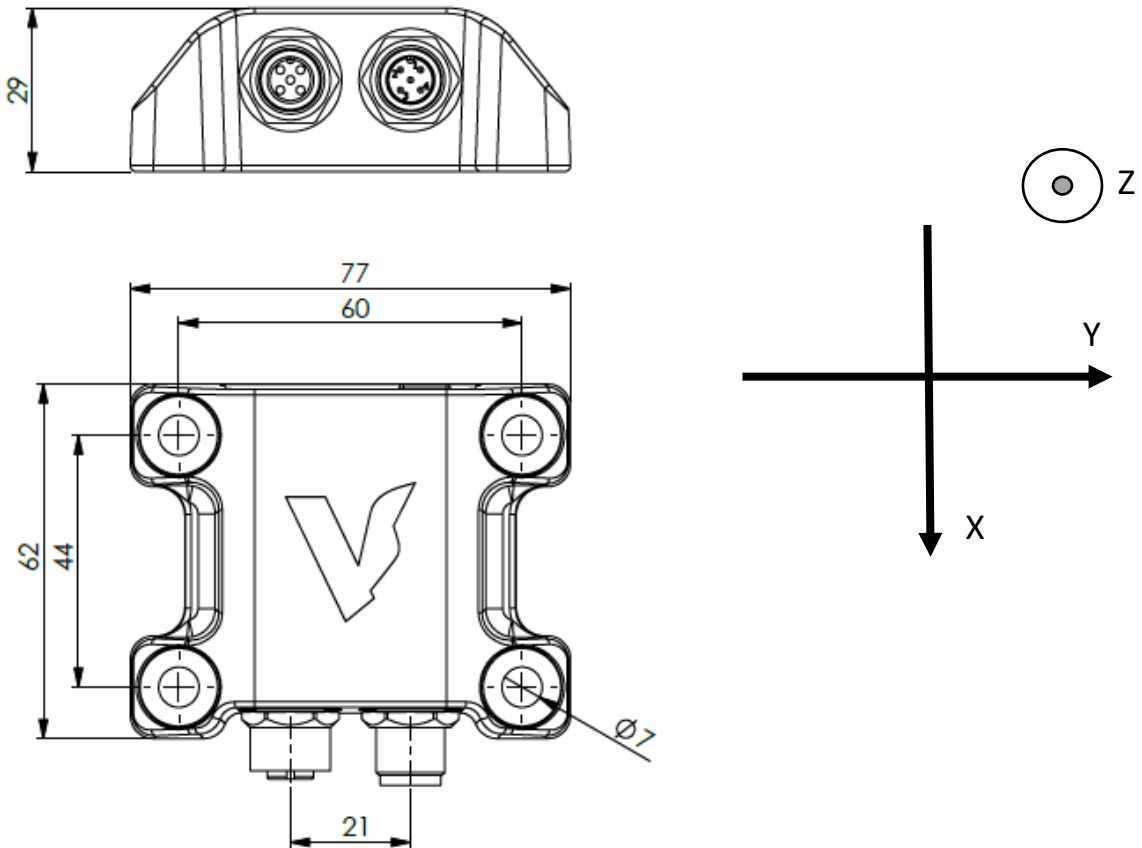
Dynamic Performance and Dynamic Performance Safety³⁾		
Dynamic Performance and Dynamic Performance Safety	Acceleration Sensor (3axes)	Angular Rate Sensor (3-axes)
Measuring Range	±6 g	±125 °/s
Offset-Instability	±18 mg	2 °/h
Noise Density	270 µg/√Hz	0.008 (°/s)/√Hz
Resolution	16 bit	16 bit
Non-Linearity	±5 mg (at -1 g to 1 g)	±0.5 %
Data Rate (Raw Data)	2.3 kHz	2.3 kHz

Variant overview			
	Dynamic (D)	Dynamic Performance (DP)	Dynamic Performance Safety (DPS)
Microcontroller	ARM Cortex M0 32bit 48MHz	ARM Cortex M4F 32bit, 180MHz	2x ARM Cortex M4F 32bit, 180MHz
Acceleration Sensor	3-axes, high accuracy	Additional 3-axes, extreme high accuracy	Like DP
Angular Rate Sensor	3-axes, high accuracy	Additional 1-axis, extreme high accuracy	Like DP
Performance Level	-	Compliant to DIN EN ISO 13849-1/2, PI_c category 2 ⁴⁾	Compliant to DIN EN ISO 13849-1/2, PI_d category 3

3) Raw sensor performance before calibration

4) Only with special DP-Variant available

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CAN-Protocol – J1939

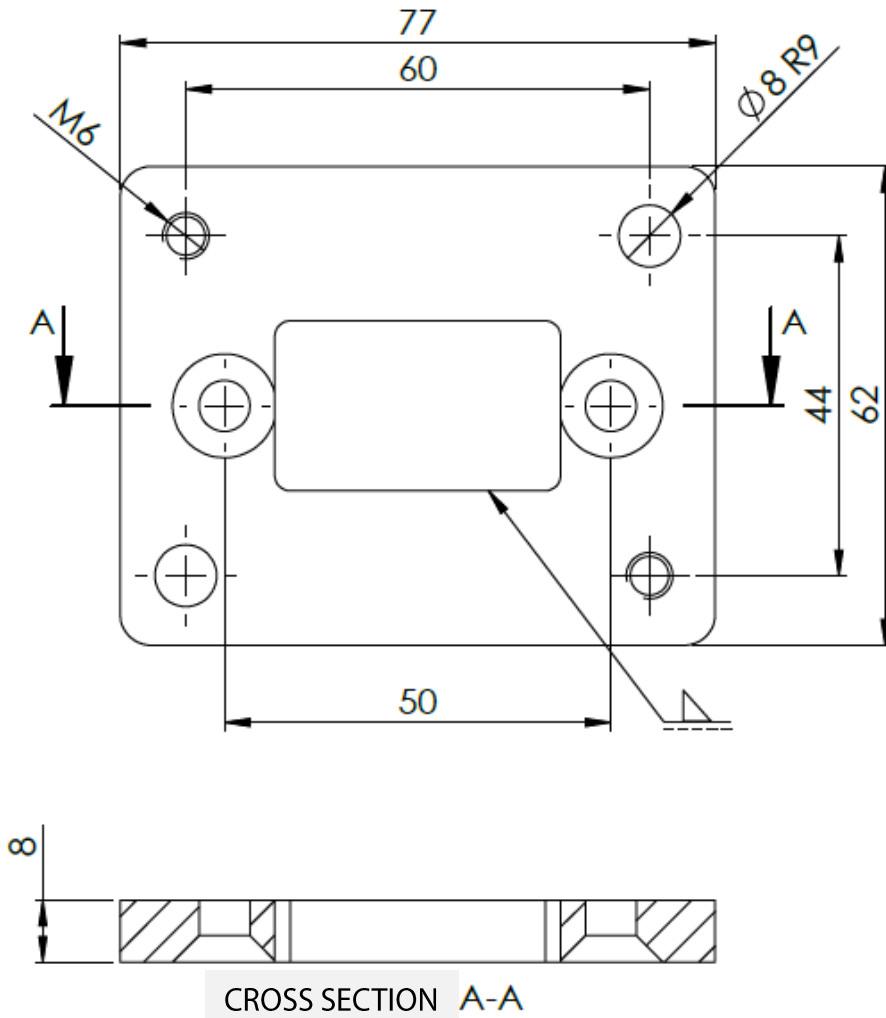
CAN-Baudrate	250 kBaud
Interval Between Cycles	50 ms
Default source address:	0xE2

See also: IMU J1939 Specification document.

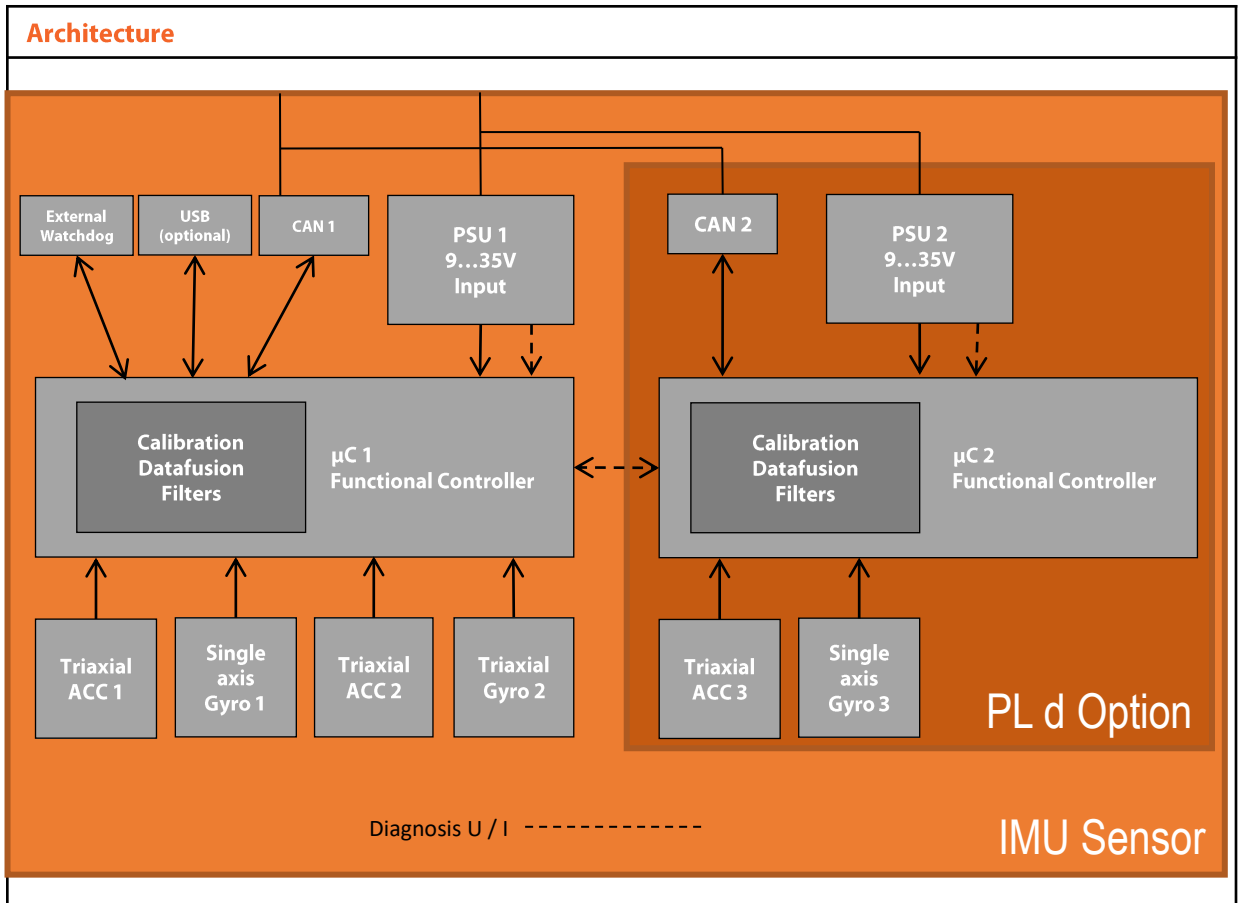
More/Customer-specific CAN protocols on request.

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Connecting plate:



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Application Possibilities

- Automating work functions
- Limitation of motion range
- Active end position damping
- Linearization of speed over the entire angle range