

MK2E2 Inertial Measurement Unit - Two-Pager Datasheet

1. Features

- Low-Drift Gyroscopes ($0.5^\circ/\text{hr}$)
- Precision Optical Gyroscope on z-axis
- Low-Drift Accelerometers ($< 15 \mu g$)
- Interface: RS-422 or CAN-FD
- Power Usage: 2 W
- Voltage Range: +12 VDC to +34 VDC
- Body Dimensions: 78 x 63 x 36 mm
- Temperature Range: -40°C to $+85^\circ\text{C}$
- IP57 Rating (IP67 in certification)

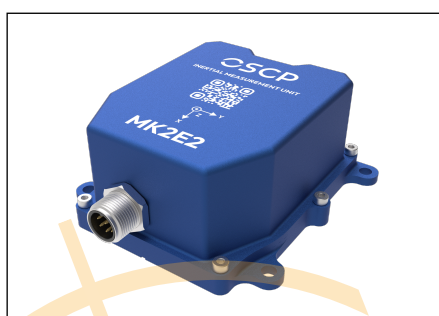


Figure 1: OSCP-MK2E2 Unit Illustration

2. Description

OSCP is developing a family of Optical Gyro-based Inertial Measurement Units (IMUs) featuring 11 degrees of freedom (DoF), including 1-axis Optical Gyroscope, 3-axis MEMS Gyroscopes, 3-axis MEMS Accelerometers, 3-axis TMR Magnetometers and 2-axis MEMS Inclinerometers. The MK2E2 is designed for demanding applications including autonomous heavy machinery, precision agriculture, construction, aerospace, defence, UAVs, marine navigation, and machinery health monitoring. The optical gyroscope enhances stability, making MK2E2 exceptionally resilient to challenges such as thermal drift, mechanical vibrations, and EMI, ensuring precise inertial sensing.

3. Functional Block Diagram

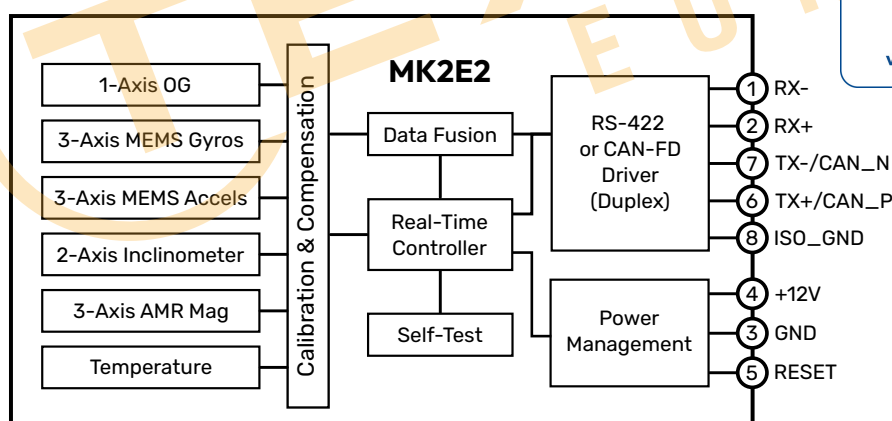


Figure 2: OSCP-MK2E2 Functional Block Diagram

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4. Key Specifications

! Important Disclaimers

- Some specifications are still in a preliminary state and are subject to refinement.
- **All specifications are no longer guaranteed if the unit is opened.**

Parameter	Min.	Typical	Max.	Unit	Case Temperature T_c
x-axis, y-axis, z-axis MEMS Gyroscopes					
Dynamic Range (Selectable)	± 125	$\pm 250, \pm 500, \pm 1000$	$\pm 2000, \pm 4000$	$^{\circ}/\text{sec}$	
In-Run Bias Stability	0.5	< 1.0		$^{\circ}/\text{hr}$	$T_c = +25^{\circ}\text{C}$
Angle Random Walk		0.06		$^{\circ} / \sqrt{\text{hr}}$	$T_c = +25^{\circ}\text{C}$
z-axis Optical Gyroscope					
Dynamic Range		± 250		$^{\circ}/\text{sec}$	
In-Run Bias Stability	0.5	< 1.0		$^{\circ}/\text{hr}$	$T_c = +25^{\circ}\text{C}$
Angle Random Walk		0.03		$^{\circ} / \sqrt{\text{hr}}$	$T_c = +25^{\circ}\text{C}$
x-axis, y-axis & z-axis MEMS Accelerometers					
Dynamic Range (Selectable)	± 2	$\pm 4, \pm 8$	± 16	g	
In-Run Bias Stability		15		μg	$T_c = +25^{\circ}\text{C}$
Velocity Random Walk		0.008		$m/\text{sec}/\sqrt{\text{hr}}$	$T_c = +25^{\circ}\text{C}$
x-axis, y-axis & z-axis TMR Magnetometers					
Dynamic Range		± 20		G	
x-axis & y-axis MEMS Inclinometers					
Dynamic Range (Selectable)	± 0.5	$\pm 1.0, \pm 2.0$	± 3.0	g	$T_c = +25^{\circ}\text{C}$
Timings					
Output Data Rate	0	100	500	Hz	
Electrical & Mechanical					
Communication Protocol		RS-422 or CAN-FD			
Operating Voltage	12		34	V	$-40^{\circ}\text{C} \leq T_c \leq +85^{\circ}\text{C}$
Power Consumption		2		W	$-40^{\circ}\text{C} \leq T_c \leq +85^{\circ}\text{C}$
Operating Temperature	-40		$+85$	$^{\circ}\text{C}$	
Dimensions with Flanges			78 x 80 x 36	mm	
Weight			230	g	

5. Certifications & Environmental Testing

Table 2: Results from an independent ISO/IEC 17025-accredited laboratory

Category	Result
Ingress Protection	
Rating	IP57 - IEC 60529:2019 (IP67 in certification)
Electromagnetic Compatibility	
Emissions	EN 55032 Class A, FCC Part 15, ICES-003
Immunity	EN 55035 / CISPR 35
Vibration & Shock	
Sine sweep	20 – 2000 Hz up to 8 g peak, all three axes
Shock	Half-sine up to 40 g peak, 11 ms, all three axes

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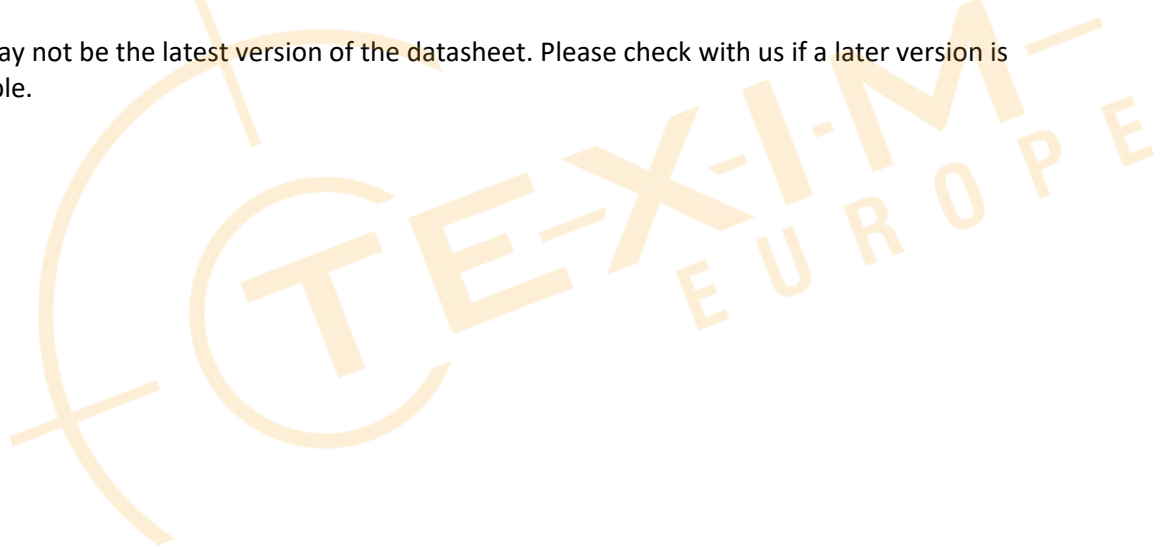
It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application.

Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time.

All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts.

Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.





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