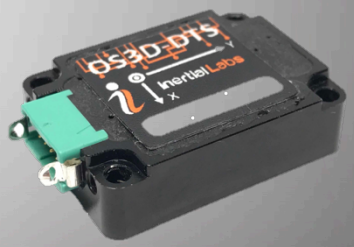
Inertial Labs
Attitude is Everything

OS3D-DTS

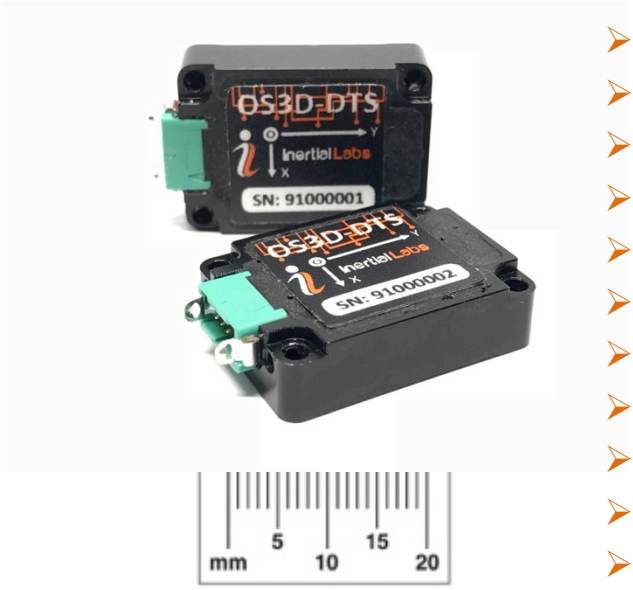
MINIATURE IMU



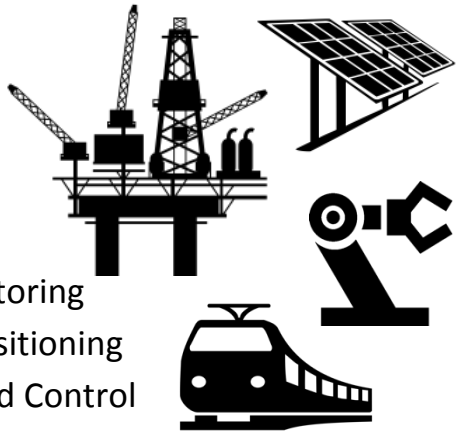
& DIGITAL TILT SENSOR DTS

The **Inertial Labs OS3D-DTS** is an ultra high accuracy, miniature MEMS Inertial Measurement Unit (IMU) and dual axis MEMS Digital Tilt Sensor, designed for test & measurement, industrial, manufacturing, R&D, aerospace static and dynamic applications.

OS3D-DTS includes tri-axial MEMS Gyroscopes and tri-axial high precision MEMS Accelerometers. The **OS3D-DTS** also comes equipped with an onboard processor and embedded inclination and tilt algorithms allowing for direct integration into systems without interfacing a PC.



Applications



- High-precision Geotech
- Precision Tilt Measuring
- Pavement Profiling Rigs
- Vehicle Wheel Alignment
- Oil & Gas, Riser Tilt Monitoring
- Platform Leveling and Positioning
- Industrial Automation and Control
- Robotics and Electro Optical Systems
- Construction & Agricultural Equipment
- Railway Track Alignment & Maintenance
- Solar Tracking, Mobile Cranes and Radars

KEY FEATURES AND FUNCTIONALITY

- Advanced MEMS Gyroscopes and Accelerometers
- 0.01 deg Pitch & Roll resolution
- 0.05 deg Pitch & Roll accuracy
- -40degC…+85degC operational temperature range
- Robust and Rugged Enclosure
- High Shock and Vibration Tolerance
- Affordable price
- Fully calibrated in operational temperature range
- Real-time Pitch and Roll orientation information
- Small size, lightweight and low power consumption
- Environmentally sealed (IP67)

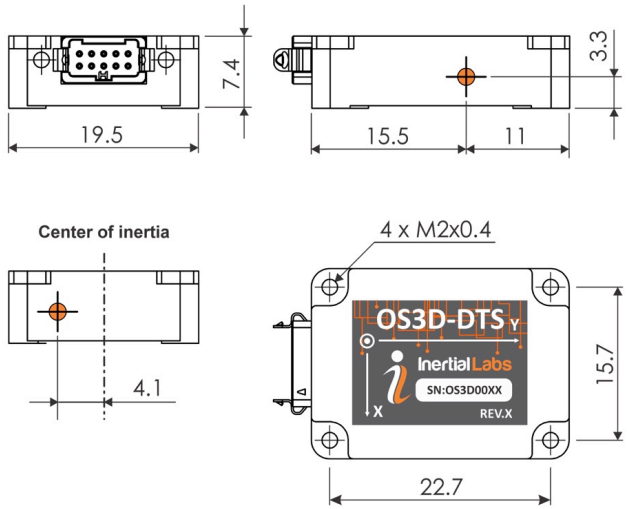
OS3D-DTS Specifications

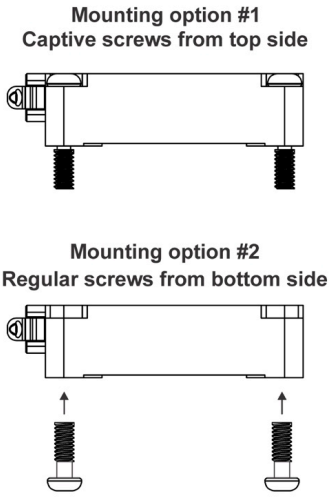
Parameter	Units	Value			
Output signals		Pitch, Roll, Accelerations, Angular rates			
Start-up time	sec	<1			
Pitch & Roll		Using ±8 g dynamic range accelerometer		Using ±15 g / ±40 g dynamic rage accelerometer	
Range: Pitch	deg	±90		±90	
Range: Roll	deg	±180		±180	
Angular Resolution	deg	0.01		0.03	
Static Accuracy, RMS	deg	0.05		0.07	
Dynamic Accuracy, RMS	deg	0.08		0.1	
Sensors		Gyroscopes	Accelerometers		
Measurement range		±1864 deg/s	±8 g	±15 g	±40 g
Bandwidth		up to 200 Hz	up to 200 Hz	up to 200 Hz	up to 200 Hz
Bias in-run Stability (Allan Variance)		<8 deg/hr	0.01 mg	0.03 mg	0.05 mg
Bias instability (in temp. range, RMS)		0.2 deg/sec	0.7 mg	1.1 mg	1.5 mg
Bias one-year repeatability		0.5 deg/sec	1.5 mg	2.0 mg	2.5 mg
Scale Factor Accuracy		500 ppm	500 ppm	700 ppm	850 ppm
SF one-year repeatability		1000 ppm	800 ppm	1400 ppm	1700 ppm
Random Walk		0.36 deg/√hr	0.02 m/sec/√hr	0.045 m/sec/√hr	0.06 m/sec/√hr
Power Spectral Density		0.006 deg/√Hz	0.034 mg/√Hz	0.08 mg/√Hz	0.1 mg/√Hz
Non-linearity		0.05 %	0.05 %	0.05 %	0.05 %
Axis misalignment		0.1 mrad	0.1 mrad	0.1 mrad	0.15 mrad
Environment					
Operating temperature range	deg C	-40 to +85			
Storage temperature range	deg C	-45 to +90			
MTBF (G_M +65degC)	hours	100,000			
Environmentally sealed		IP67			
Electrical					
Supply voltage	V DC	5V to 25V			
Current consumption	mA, V	24 mA, 5V / 5 mA, 25V			
Power Consumption	W	125 mW (typical)			
Connector type	-	G125-MV11005L1P by HARWIN			
Output Interface	-	RS-232 or RS-422			
Baud Rate	bps	Up to 3M (RS422) Up to 1M (RS232)			
Internal update rate	Hz	up to 1000			
Output update rate (auto transmit)	Hz	up to 2000			
Physical					
Size	mm	26.5 × 19.5 × 7.4			
Weight	gram	9			

OS3D-DTS part number structure: OS3D-DTS-GXXXX-AXX-TGA-CX-VXX.X

Model	Gyroscopes range	Accelerometers range	Temperature calibration	Type of enclosure	Version	Type of interface
OS3D-DTS	G500 G1864	A8 A15 A40	TGA	C1 C0	V10 V11	VX.1 VX.2
Digital Tilt Sensor	±500 deg/s ±1864 deg/s	±8 g ±15 g ±40 g	Gyroscopes & Accelerometers	C1: Aluminum C0: OEM	V10: filters-on V11: filters-off	VX.1: RS-232 VX.2: RS-422

OS3D-DTS mechanical interface drawing

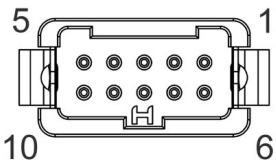




Note 1: All dimensions are in millimeters.
Note 2: All dimensions within this drawing are subject to change without notice. Customers should obtain final drawings before designing any interface hardware.

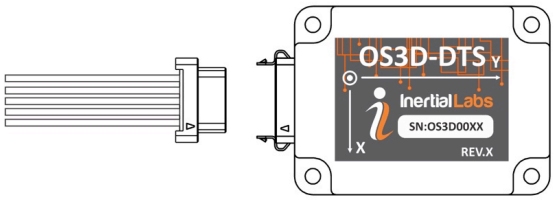
OS3D-DTS electrical interface description

G125-MV11005L1P by HARWIN
G125-MV11005L0P by HARWIN

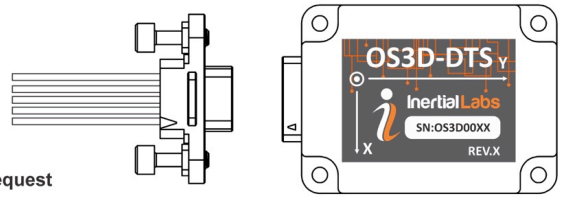


1	POWER	Power Supply Input (Note 3)
2	RS232-Tx	RS232 Transmitter Output (Note 2)
3	RS232-Rx	RS232 Receiver Input (Note 2)
4	RS422-A	RS-422 Non-Inverting Input
5	RS422-B	RS-422 Inverting Input
6	GROUND	Power Supply Return
7	TOV	3V3 TTL Time of validity output
8	EXTRIG	3V3 TTL External trigger input
9	RS442-Y	RS-422 Non-Inverting Output
10	RS422-Z	RS-422 Inverting Output

Mating option #1 - connector with latches - G125-FC11005L0-0150L



Mating option #2 - screw-lock connector - G125-2241096F1 (Note 1)



Note 1: Screw-lock is available upon customer request
Note 2: 3V3 TTL UART is available upon customer request
Note 3: The supply voltage range is 4V-15V for Rev.1 and 5V-25V for Rev.2. Check the label of the sensor.