

# Orion INS

## Inertial Navigation Systems

### Providing outstanding performance in all sea conditions

Orion INS has been specifically designed for the demanding hydrographic survey, offshore construction and ROV operations markets.

Orion incorporates three single axis ring laser elements and three highly accurate accelerometers. These specific components, widely used in many of the world's commercial aircraft, were chosen for Orion because of availability, accuracy and their very high mean time between failures. These core elements enabled the TSS research and development team to design this high specification Inertial Navigation System which is configured and controlled by the latest easy-to-use interface - OrionView.



Surface



Subsea

#### PRODUCT FEATURES AND BENEFITS

- 0.1° heading with single GPS antenna aiding
- Heave 5cm or 5% of range - whichever is greater
- 0.01° roll and pitch accuracy
- Speed and inertial position outputs
- Latitude and speed corrected
- Full IMO approval
- RLG MTBF of 300,000 hours
- IMU raw data outputs
- Three configurable I/O channels
- Easy set-up using OrionView software



**TELEDYNE TSS**  
Everywhereyoulook™

Orion IMU incorporating  
Honeywell GG1320 ring  
laser gyros

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The Orion INS is aimed at meeting the needs of users in the offshore subsea construction and survey industries who need a dependable and competitively priced reference system. It can provide precise attitude, heading and heave data and is suitable for a wide range of applications such as supporting multibeam sonar surveys or the construction of major seabed installations. The subsea version is available rated to 6000m while the surface model can be used in the most extreme conditions to provide users with the valuable benefit of minimal downtime.

Dependability has been built-in by TSS with the painstaking selection of components and software developed to meet the demands and expectations of its users. TSS engineers dedicated two years to the creation of a software algorithm that exceeds industry expectations for performance and reliability. It is a development of an existing marine algorithm that has been refined by TSS over 20 years of successful use in the most demanding applications offshore.

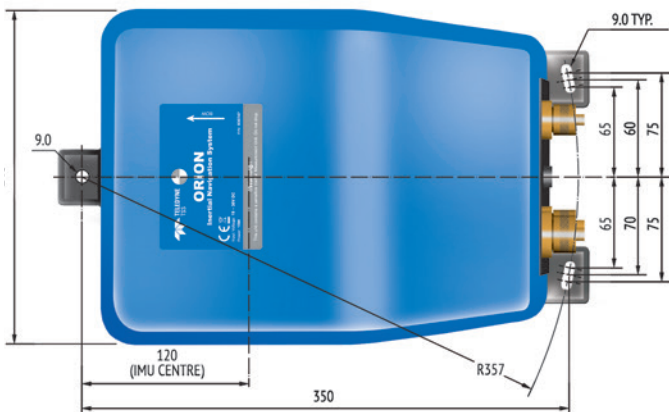
The algorithm processes the data generated by three separate ring laser gyros (RLG) that have been selected for their dependability and accuracy. They can be used at operating temperatures ranging from -10°C to +55°C and require a settle time of less than 15 minutes.



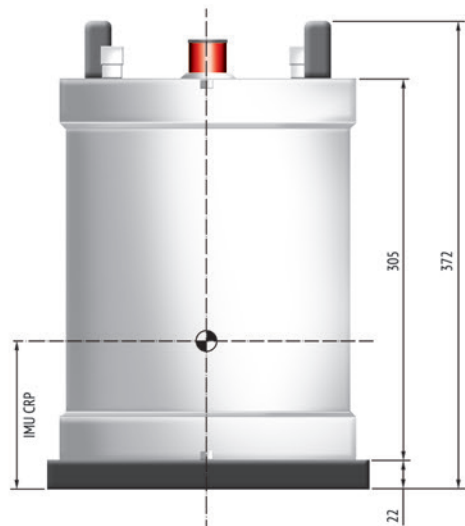
Manufactured in the USA, the RLGs are widely used in the aviation industry and consequently offer users the reassurance that comes from working with proven advanced technology. The accelerometers employed within the Orion are equally highly regarded and are built into the new Orion at Teledyne TSS' advanced UK workshops where quality control is maintained to the highest standards possible. The Orion system consequently offers a MTBF (Mean Time Between Failure) of 30,000 hours while its key individual components are rated at 300,000 hours MTBF.

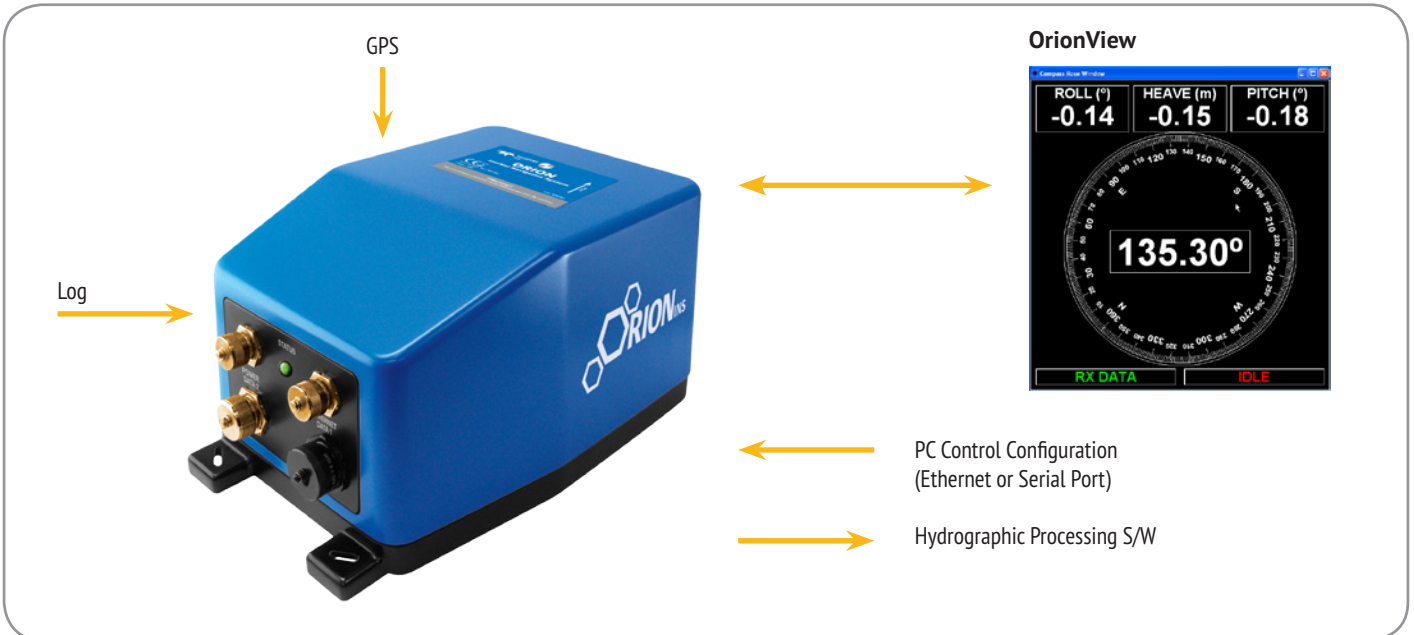
The performance of the Orion's components and software means that users will benefit from heading resolutions accurate to 0.025 through a range of ±90°. Heave measurements are accurate to 5cm or 5% over ranges to ±99m and free inertial positioning is a feature.

### Mounting arrangements - Surface version housing dimensions



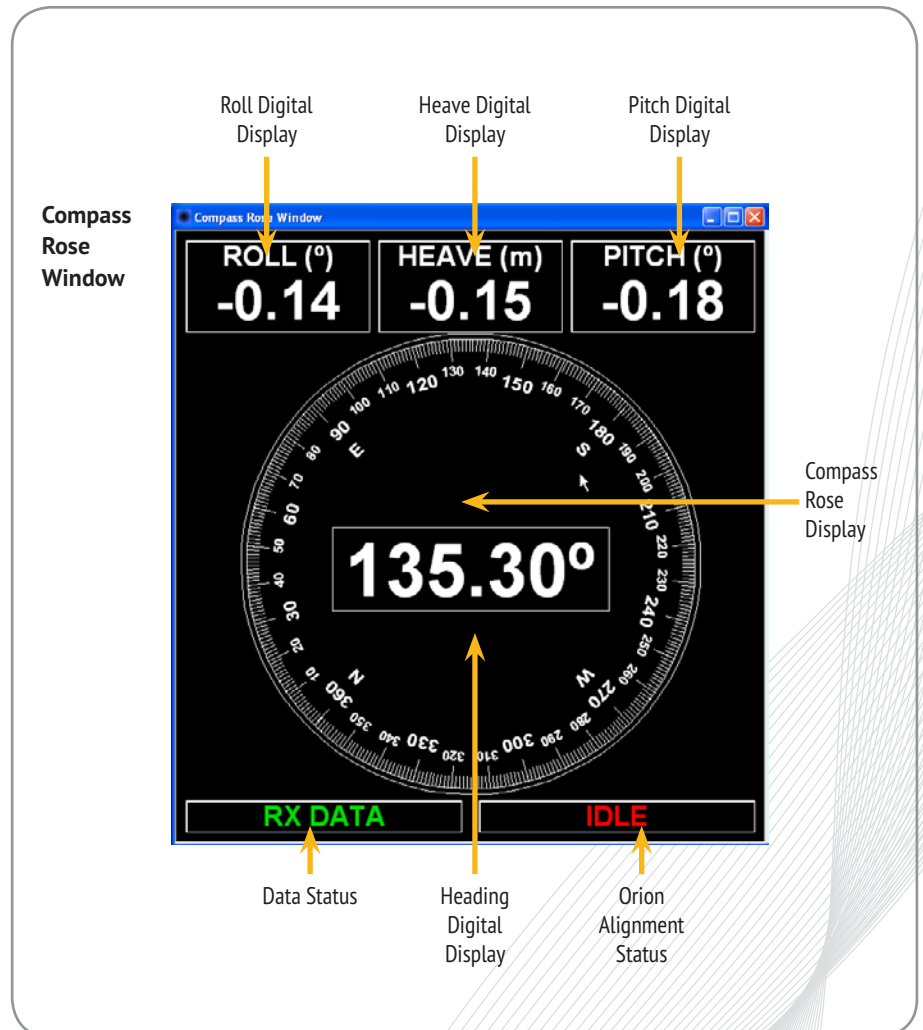
### Subsea mounting arrangement - Vertical





### OrionView

The Orion customer package includes OrionView for Windows™, a graphical user interface designed to operate on Microsoft Windows™ XP or later. It can be used to configure the Orion operating parameters and display transmitted data from all connected channels. Alternatively, the Orion can be configured using any terminal emulation program available on a connected PC, i.e. Hyper Terminal.

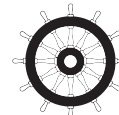


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## TECHNICAL SPECIFICATIONS

Performance	Heading accuracy		0.1° secant latitude RMS
	Roll & pitch accuracy		0.01° RMS
	Heave accuracy		5cm or 5% (whichever is greater)
	Alignment time		<30 minutes
	Angular rate		~200°/s
	Operating latitude		±80°
Position	Free inertial drift		<5 nm/hour
	DVL aiding		N/A
	GPS aiding		NMEA 0183 GGA and VTG
	USBL & LBL aiding		N/A
Power	Power supply		18 - 36Vdc
	Power consumption		20W
Interface	Digital interface		3 configurable I/O channels
	Data protocols		RS232 / RS422
	Data formats		TSS proprietary and Industry Standard
Physical Characteristics	Dimensions	Surface	180mm (h) x 240mm (w) x 380mm (d)
		Subsea	375mm (h) x 235mm (ø) including connectors
	Weight in air	Surface	13kg
		Subsea	21kg
	Weight in water	Surface	N/A
		Subsea	16.2kg
	Rating	Surface	IP65
		Subsea	3000m
Environmental and EMC	Operating temperature		-15°C to +55°C
	Storage temperature		-30°C to +70°C
	Environmental		Meets or exceeds IEC 60945
	EMC		Meets or exceeds IEC 60945
	MTBF		>30,000 hours (system); >300,000 hours (RLGs and Accelerometers)
	Shock (survival)		10g peak
Options			N/A
Compliance	Standards		IMO A424(XI), IMO A821(19), IMO A694(17), MSC 191(79), ISO 8728, ISO 16328, IEC 60945, IEC 62288, IEC 61162, US Coast Guard MRS, Marine Equipment Directive
	Export	UK	ECCN 7A003d (US re-export licence required)
		USA	ECCN 7003d
Warranty			12 months international warranty including parts and labour



COMPANY WITH  
MANAGEMENT SYSTEMS  
CERTIFIED BY DNV  
= ISO 9001 =  
= ISO 14001 =  
= OHSAS 18001 =

**CE** Specifications subject to change without notice.  
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