

Orion & OrionPLUS INS

INERTIAL NAVIGATION SYSTEMS

Providing outstanding performance in all sea conditions.

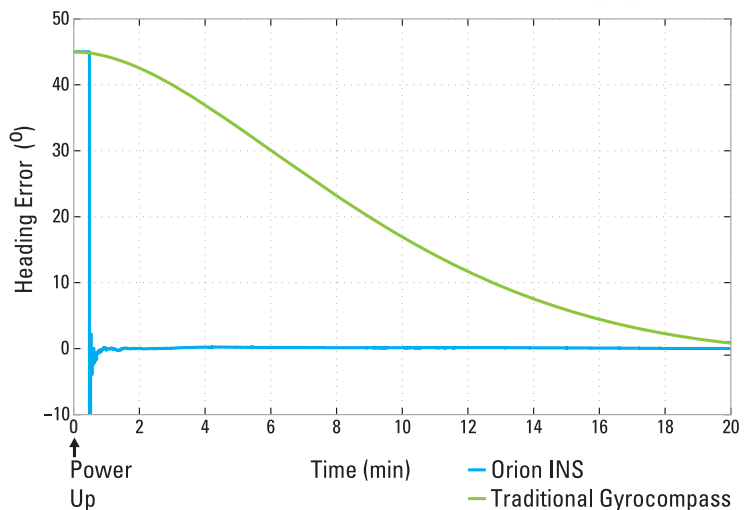
The Orion product range has been designed specifically for the demanding hydrographic survey, offshore construction and ROV operations markets.

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 meantime 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.



- ▀ 0.1° heading with single GPS antenna aiding
- ▀ Heave 5cm or 5% of range whichever is greater
- ▀ 0.01° roll, pitch (0.005° OrionPLUS)
- ▀ Speed and position outputs
- ▀ Latitude and speed corrected
- ▀ IMU raw data outputs
- ▀ RLG MTBF of 300,000 hours
- ▀ Three configurable I/O Channels
- ▀ Easy set-up using OrionView software
- ▀ Surface and subsea options (aluminium or titanium)

Gyrocompass Settle Times



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Orion 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 3000 metres while the surface model can be used in the most extreme sea 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 have dedicated the past two years to the creation of a software algorithm that will exceed 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 will process the data generated by three separate ring laser gyros (RLG) that have been chosen for their dependability and accuracy. They can be used at operating temperatures ranging from -15°C to +55°C and require a settling time of less than 30 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 TSS International's advanced UK workshops where quality control is maintained to the highest standards possible.

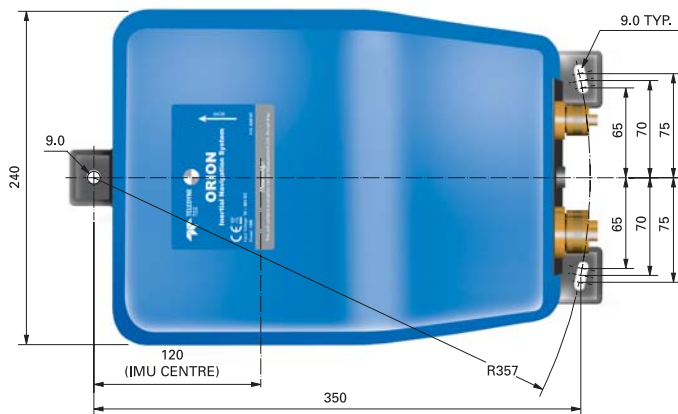
The new Orion system consequently offers a MTBF (Mean Time Between Failure) of 30,000 hours while its key individual components are rated at 300,000 hours MTBF.

Orion IMU incorporating Honeywell GG1320 ring laser gyros

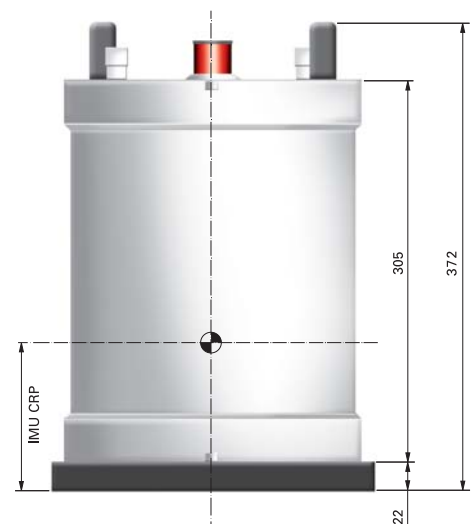


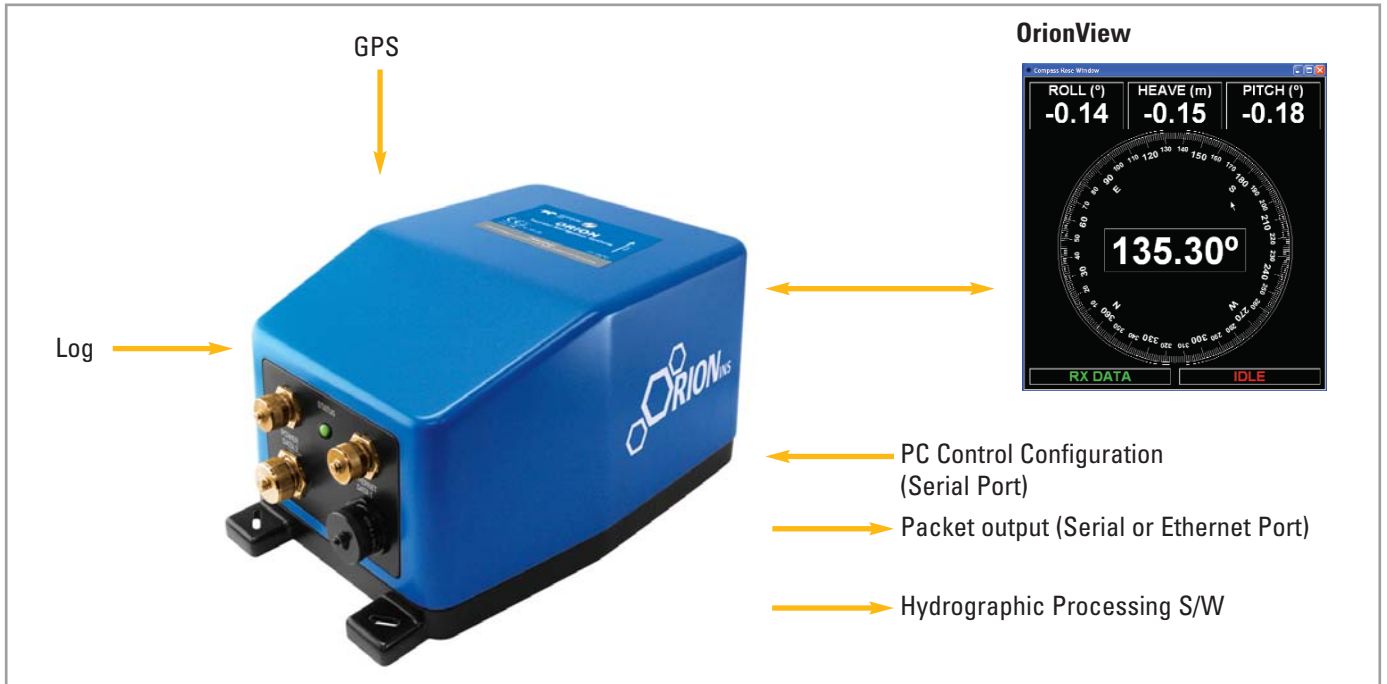
The performance of the Orion's components and software means that users will benefit from heading resolutions accurate to 0.01°. Roll and pitch measurements to within 0.025° (0.01° OrionPLUS) through a range of ± 90°. Heave measurements are accurate to 5 cm or 5 per cent over ranges to ± 99 m and free inertial positioning remains accurate to 5 NM/hour.

Mounting arrangements - Surface version housing dimensions



Sub-sea mounting arrangement - Vertical

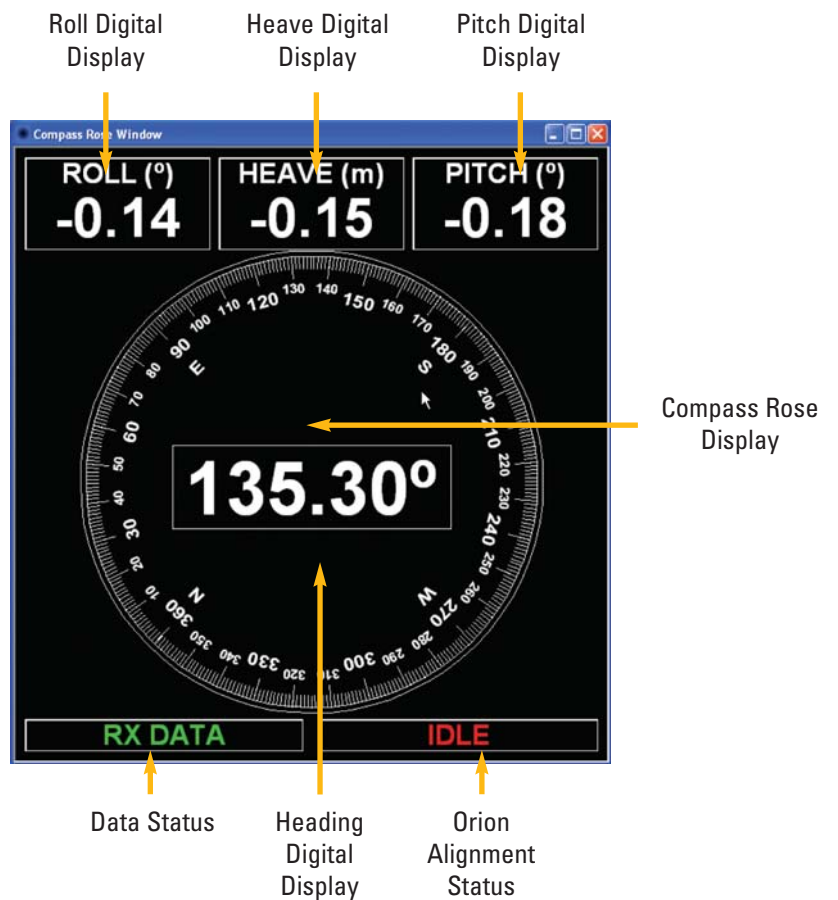




Compass Rose Window

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

Heading	Dynamic Accuracy - GPS Aided	0.1° secant latitude RMS
	Dynamic Accuracy - Unaided	0.15° secant latitude RMS
	Resolution	0.01° (or as dictated by the O/P packet format)
	Settling time	30 minutes or less
	Heading Data Latency	<3 ms
Roll and Pitch	Range	±90°
	Static Accuracy	0.01° (0.005 OrionPLUS)
	Resolution	0.01°
	Limits	None
	Axis alignment	<0.005°
	Data Latency	<3 ms
Heave	Accuracy	5cm or 5% whichever is greater
	Bandwidth	0.05-10Hz
	Range	±99 m
	Resolution	1cm
Position	Free Inertial	<5nm/h free inertial
Data Parameters	Serial Outputs	3 configurable I/O Channels
	Data Protocols	RS232 and RS422
	Data output rate	Up to 200Hz
	Baud Rate	1200 – 115,200
	Data Bits	7 or 8
	Stop Bits	1 or 2
	Parity	None, even or odd
	Data output formats	TSS1, TSS HHRP, TSS1 + NMEA HDT, TSS1 with remote heave, TSS3, Simrad EM1000, Simrad EM1000 with remote heave, Simrad EM3000, Simrad EM3000 with Remote Heave, Atlas, NMEA PRDID, BMT1, Polled, GGA, VTG, User Configurable.
Raw Data Output	Rates & Accelerations	Fully corrected at 100 Hz
Aiding	GPS	NMEA 0183 GGA and VTG
	PPS	Rising or falling edge
	Log	NMEA 0183 VBW
Environmental	Ambient operating temperature	-15°C to +55°C operational, -30°C to +70°C storage
	Shock (survival)	10g
	Housing: Surface Subsea 3000m Subsea 3000m	IP65 rated Cast Aluminium Aluminium Titanium
Physical	Dimensions: Surface	380mm (l) x 240mm (w) x 180mm (h) (including connectors)
	Subsea 3000m (aluminium)	242mm (d) x 390mm (h) (including connector)
	Subsea 3000m (titanium)	229mm (d) x 366.5mm (including handles)
	Weight: Surface 3000m	13Kg
Subsea 3000m (aluminium)	20Kg in air; 6.5Kg in water	
Subsea 3000m (titanium)	26Kg in air; 12.8Kg in water	
Electrical	Power requirement	18-36V DC 20W
Regulatory Approval	Type approved to marine equipment directive	
MTBF	System	>30,000 hours
	RLGs and Accelerometers	>300,000 hours
Warranty	12 months international warranty including parts and labour.	

Due to continuous development, specifications may vary from those listed above.



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