

# MK31 IRS

INERTIAL REFERENCE SYSTEM

**The MK31 IRS Inertial Reference System utilises an IMU based on proven ring laser gyros and accelerometers.**

An inertial navigation algorithm provides heading and attitude data for platform stabilisation or motion compensation to meet the needs of a wide range of commercial and defence customers seeking a cost-effective and reliable solution for their control system requirements.



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The MK31 is easy to install, configure and use. With a settling time of less than 30 minutes at sea and less than 15 minutes at dockside, the unit can provide highly accurate heave, pitch, roll and heading data in even the most extreme sea conditions. It can handle rates of turn of up to 250 per second in any orientation due to a strapdown INS algorithm. The entire system is built on solid-state technology so no maintenance is needed to keep the MK31 fully operational.

### Features

- Innovative design incorporating state-of-the-art Honeywell GG1320 ring laser gyro elements
- Highly accurate heading, heave, roll and pitch in all dynamics
- Inertial position output
- Small, lightweight and versatile
- Less than 30 minutes settling time
- Dynamic turn rates of up to 250° per second
- Strapdown INS algorithm
- Real time heave filter algorithm
- No attitude limitations to motion, can be rotated full 360° in any orientation
- Maintenance free, due to the solid-state sensing elements
- Versatile RTU allows for numerous I/O's

### Benefits

- Fast and simple unit installation
- Intuitive and fast set-up, interface and software
- Worldwide support
- No moving parts
- RS232/RS422 output, multiple channels
- No temperature related system degradation
- Programmable 200Hz HDLC 307.2K Baud output channels



● MK31 IMU incorporating Honeywell GG1320 ring laser gyros

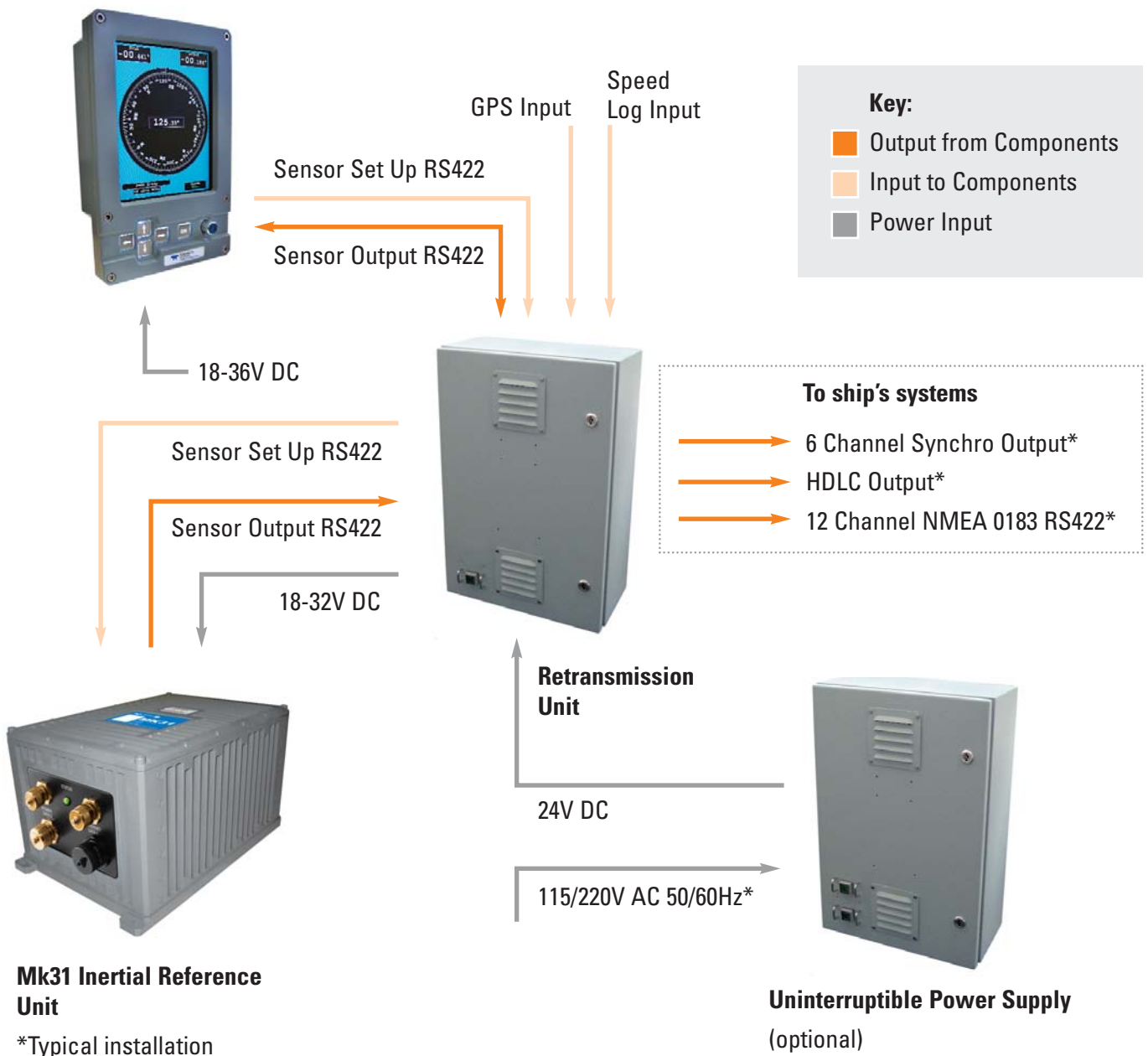
### Scope of Supply

Control Display Unit (CDU) – bulkhead mounted CDU running a real-time display of sensor outputs and status information. Software includes built-in test equipment facility, system set-up, configuration and analysis through a simplified menu structure.

Retransmission Unit (RTU) – custom-configurable for each application to satisfy the platform requirements. A rugged bulkhead mounted enclosure, the RTU is power via 24V DC and typically has 6 synchros, HNLC 307.2 200 Hz outputs and 12 RS422 NMEA0183 output channels.

Uninterruptible Power Supply (UPS) (optional)

### Control Display Unit



The MK31 IRS is a complete system and the individual components must be interconnected. If the CDU output commands are not received by the IRU within 60 seconds, the MK31 IRU is disabled.

\* Optional Outputs

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## TECHNICAL SPECIFICATIONS

<b>Heading</b>	Accuracy	6 arc mins RMS sec lat, 3 arc mins RMS sec lat (available to special order)
	Resolution	0.6 arc min (or as dictated by the O/P packet format)
	Follow-up Speed	250°/ second
	Settling Time (Full Accuracy)	15 minutes Dockside (stationary)
		30 minute At Sea (moving base)
	Data Latency	< 5 ms
<b>Position</b>	Free Inertial	5 NM/hour
<b>Roll and Pitch</b>	Accuracy	0.6 arc min RMS
	Resolution	< 0.6 arc min (or as dictated by the O/P packet format)
	Range	± 90°
	Limits	None
	Axis Alignment	< 0.3 arc min
	Data Latency	< 3 ms
<b>Heave</b>	Accuracy (real time)	5cm or 5% whichever is greater
	Bandwidth	0.05-10 Hz real time, 0.03-10 Hz delayed
	Range	± 99m
	Resolution	1cm
<b>Aiding</b>	GPS	NMEA0183 RS232 & RS422
	Speed Log	NMEA0183 RS232 & RS422
<b>Data Output Parameters</b>	Data Protocols	RS232 and RS422
	Data Output Rate	Up to 200 Hz
	Baud Rate	1200 – 38400
	Data Bits	7 or 8
	Stop Bits	1 or 2
	Parity	None, even or odd
	Data Output Formats	TSS1, TSS HHRP TSS1 + NMEA HDT, NMEAPRDID, BMT1, Polled, User Configurable, Bespoke formats available as required
<b>Ring Laser Gyro</b>	Type	Honeywell GG1320
	MTBF	> 300,000hrs
<b>Accelerometers</b>	Type	Honeywell Q-Flex
	MTBF	> 300,000hrs
<b>Environmental</b>	Ambient Operating Temperature	-10°C to +55°C operational, -20°C to +70°C storage
	Shock (survival)	10g
	Housing	IP65
<b>Physical</b>	Dimensions	165(w) x 290(d) x 160(h) mm (excluding connector and mounting bracket)
	Weight	13kg
<b>Electrical</b>	Power Requirement	18-32V DC, 35W max, reverse polarity protection
<b>Regulatory Approval</b>	CE Marked	
<b>Warranty</b>	12 months international warranty including parts and labour	
<b>Retransmission Unit (RTU)</b>	Dimensions	435(w) x 430(d) x 300(h) mm 400(w) x 400(d) x 200(h) mm (digital only)
	Weight	10 Kg
	Power Supply	18-36 V dc
	Digital Output	12x RS422 NMEA0183
	Synchro Output Options	115V/400Hz CX, 26V/400Hz CX 1:1, 36:1 maximum 6 channels, (typical installation other ratios available on request)
	Resolver output options	6.3V L-L, 1:1 and 4:1 maximum 6 channels (other ratios available on request)
<b>Control Display Unit (CDU)</b>	Dimensions	190 wide x 295 tall x 110 deep mm
	Weight	4.7Kg
	Display Type	LCD TFT 640x480 resolution. 175x130mm dimmable to extinction
	Signal Inputs	NMEA 0183
	Signal Outputs	NMEA 0183 RS422
	Power Supply	18-36V DC <15W
	Ports	1 x 25-way D-type
	Temperature Range	-25°C to 55°C (operating) -25°C to 70°C (storage)
<b>Uninterruptible Power Supply (UPS) (optional)</b>	Dimensions	435(w) x 430(d) x 300(h) mm
	Weight	32 Kg
	Input voltage	115/220V AC 50/60Hz 1 Phase
	Backup time	>30 minutes
	Alarm	Contact closure
<b>System Reliability</b>	Reliability	MTBF >10,000 hrs
	Maintainability	MTTR <0.5 hours

Due to continuous development, specifications may vary from those listed above.  
IMO Certificate of Type Approval pending.

WORLD LEADERS IN MARINE NAVIGATION



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