

iNAV-RQH-AIRSURV

Inertial Navigation System for Advanced Airborne Applications

iNAV-RQH is an INS product family for inertial navigation, gyro compassing and dynamically motion measurement with ring laser gyros that covers applications, which require highest accuracy, reliability and an open interface to the user.

- high performance inertial navigation and surveying system for airborne applications
- RLG technolog with very low angular random walk and high angular resolution
- high bandwidth, fast response
- integrated time synchronisation module and GPS
- Interfaces: Ethernet TCP/IP, CAN, RS232, DGPS

The derivation iNAV-RQH-AIRSURV for advanced airborne applications consists of three high precision ring laser gyroscopes (Dig-Gyro), three servo accelerometers (Q-Flex), a



iNAV-RQH-AIRSURV on a Transall C-160, integrated in the German Airforce' Synthetic Aperture Radar (DOSAR)

powerful strapdown processor and an open and flexible interface, which can be customized.

As an option the modular designed system provides interfaces to (D)GPS, external triggers and external I/Os for e.g. laser altimeter or

camera platform control. Possible outputs are Ethernet, RS232/422 or analog as well as internal data storage on hard-disk or on silicon-disk. Furthermore application specific inter-



faces can be realized on request (e.g. ARINC 429).

Due to the modular hardware and software architecture special adaptation of housing and mechanical dimensions to customer's requirements is also possible even if only small quantities shall be purchased. Data processing (strap-down algorithms, global or local navigation, north-seeking, north keeping or motion monitoring and control) inside of the iNAV-RQH-AIRSURV is as well possible as data transmission of pure or corrected raw data.

A key feature is its high available data rate of up to 1000 Hz and its unique resolution (0.001 degree in roll/pitch/yaw) as well as superior accuracy e.g. for stabilisation

tasks. As an option special designed algorithms processed in parallel HPST² mode allow to output most stable angular and position information during definable time windows e.g. for SAR or LIDAR applications (HPST² = High Precision Short Time Tracking Mode) also under difficult motion conditions.

Technical Data of iNAV-RQH-AIRSURV (different classes of accuracy available):

Data Output:	Heading, Roll, Pitch, Angular Velocity, Velocity (body and world), Position, Raw data, internal status information, tbd	
Range:	± 500 deg/s (no angle limitation)	± 10 g (option 2/5/25 g)
True Heading:	$< 0.025 / 0.05 / 0.1$ deg sec(lat); 0.01 deg with DGPS (motion dep.)	
Attitude Accuracy:	$< 0.02 / 0.025 / 0.03$ deg (< 0.005 deg with DGPS)	
Position Accuracy:	0.2...3 nm/hr (unaided); < 0.3 m DGPS postproc (0.003 deg/ \sqrt{h})	
Velocity Accuracy:	2 mm/s (aided with integrated L1/L2 RTK DGPS receiver)	
Alignment Time:	< 15 minutes	
Drift (unaided) / Offset:	$< 0.002 / 0.003 / 0.01$ deg/h	< 60 μ g
Random Walk:	$< 0.0018 / 0.003 / 0.01$ deg/ \sqrt{h}	< 8 μ g/sqrt(Hz)
Resolution:	0.0003 deg (1,13"), 0.001 deg/s	< 1 μ g
Linearity Error:	< 10 ppm	< 20 μ g/g ² (< 60 ppm)
Data Output Rate:	1...1000 Hz (optional 2000 Hz)	
Data Latency:	< 2 ms	
Output (options):	RS232/422, Ethernet, ARINC-429, motor control output for 3D gimbaled platform stabilisation	
Inputs:	(D)GPS (option: GPS/GLONASS integrated) , event trigger (option)	
Synchronization:	Input for pulse-per-second [PPS] (if available)	
Power:	11...34 V DC	
Temperature:	-20...+65 °C (operating, -40...71°C opt.), -40...+85 °C (not operating)	
Rel. Humidity:	8...100 %, IP67	
Magnetic. Insens.:	< 500 μ Tesla (5 Gauss)	
MTBF / MTTR:	$> 35,000$ hrs (estimated for surveying applications) / < 30 minutes	
Shock:	25 g, 11 ms ; 60 g, 5 ms (operating)	
Weight:	9.8 kg (depends on housing; light weight version on request)	
Size:	IMU: approx. 299 x 213 x 179 mm (other on request)	

iMAR is working more than 10 years in the manufacturing and development of inertial navigation and guidance systems for all application areas. All systems manufactured by iMAR are maintained at iMAR in Europe / Germany.

iMAR is being licensed by Honeywell Inc. to use their latest high reliable basic ring laser gyros (Dig-Gyro GG1320) in its own advanced inertial navigation and guidance systems for industrial and defence applications.



Please do not hesitate to contact us for further information or for a demonstration.

iMAR GmbH • Im Reihersbruch 3 • D-66386 St. Ingbert / Germany

Phone: +49-(0)-6894-9657-0 • Fax: +49-(0)-6894-9657-22

<http://www.imar-navigation.de> • sales@imar-navigation.de