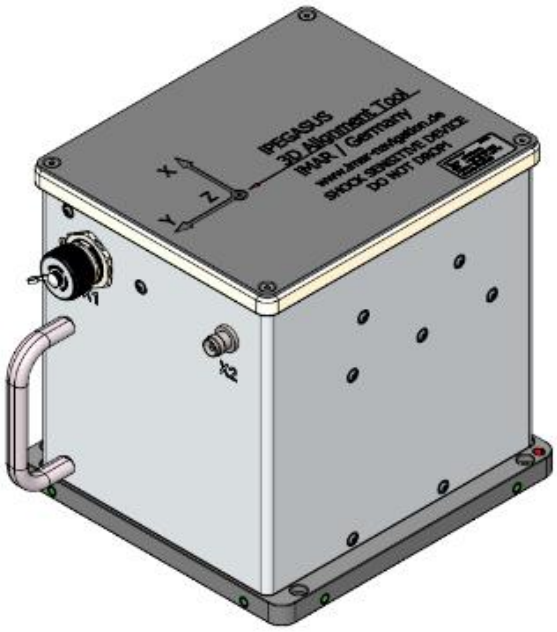
iPEGASUS-RQT-400x

Easy-to-use high precision Transfer Alignment System
3D spatial Alignment of Turntables, Antennas, Weapons, Fire Control Systems

With increasing quality requirements and the need for a continuous monitoring of quality, the surveying or aligning of machining centers and robots or the transfer alignment for mounting inertial navigation systems, fire control systems, guns, missile attack warning systems or the alignment of communication and radar antennas has gotten of significant importance during the last couple of years.



Therefore, iMAR provides **iPEGASUS**, a patented highly precise inertial based transfer alignment system, which provides a three dimensional attitude/ heading information relative to a reference orientation with an accuracy up to 0.01°.

The system works without external aid and is easy to handle for everybody in the workshop and in the lab, where only one single person is necessary for operation. No extensive education is required. Thus the measurement time for aligning or surveying is reduced dramatically compared to traditional laser or camera aided systems. **iPEGASUS** is a handy tool which generates up to 400 measurements per second, shows results on screen and plots a protocol in csv format designed for your application.

Using two **iPEGASUS-RQT-DIFF** in differential mode allows furthermore the transfer alignment of fire-control systems, guns and antennas even on moving naval vessels.

The **iPEGASUS** is in operation worldwide at weapon manufactureres and helicopter manufacturers like Rheinmetall, Oerlikon Contraves, Westland Agusta, Airbus, BAe Systems, UK MoD, German MoD (Naval Weapons), Turkish Armed Forces etc. as well as with antenna installers.

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Technical Data of iPEGASUS-RQT-4002, iPEGASUS-RQT-4003

Measured data	:	φ_X, φ_Y, φ_Z	(angles around space coordinate axes)
Measuring range	:	± 360 deg	(any rotations in space)
Resolution	:	300 µdeg	
Linearity error	:	< 0.001 %	(incertainity due to rotation, 1 σ)

	iPEGASUS-RQT-4002	**iPEGASUS-RQT-4003**	**remarks**
Measuring uncertainity	< 0.002 deg	< 0.004 deg	over 1 minute of measuring
	< 0.004 deg	< 0.006 deg	over 5 minutes of measuring
	< 0.005 deg	< 0.010 deg	over 10 minutes of measuring[1]
Angular Random walk	< 0.0025 deg/sqrt(hr)	< 0.005 deg/sqrt(hr)	
Random constant	< 0.007 deg/hr	< 0.01 deg/hr	
Data rate	1 ... 400 Hz [400 Hz / N with N = 1, 2, 3, …,400]; via UART RS232 (up to 460.8 kBd), Ethernet 100 Mbit/s, CAN (up to 1 Mbit/s)		
Data Output	in real-time, on file, as plot, Tablet output on request iPEGASUS Mode: • relative roll, pitch, yaw, directional cosine atrix, quaternion and rel. time (or absolute time with GNSS option) Navigation Mode (as option): • absolute roll, pitch, yaw, directional cosine matrix, quaternion, angular rate, acceleration, position, velocity, GNSS data, standard deviations, GPS time etc. (see iNAT-RQT-400x)		
SYNC / IO (PPT, Marker)	RS422 level for iPEGASUS-DIFF operational mode		
Odometer / VMS Input	Optocoupler input (4…30 V / 6 mA, RS422 level compatible), A/B lines (quadrature input) [optional; only required if the iPEGASUS shall be used also for inertial navigation purposes]		
GNSS engine	optional, if navigational mode is required (all constell., all frequencies)		
Power supply, connector	10...35 V, < 20 W; MIL-C-38999 III and TNC for GNSS antenna		
Self testing	automatically		
Mass, Size, Shock	approx. 6.2 kg; WxDxH ~275 x 200 x 206 mm^3 ; 15 g / 11 ms half sine		
Ingress Protection, Temp.	IP54; -20…+55 °C (operational)		
Export Control	These systems are only affected by standard European Dual-Use export regulations		

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[1] the measuring duration is not limited

Application Example:

Usage of iPEGASUS for calibration of kinematic chains
(Pictures: Surveying of turrets with Oerlikon-Contraves AG, Zurich)

- Automatical surveying of turrets in azimuth and elevation for quality assurance and calibration.
- Improvement of positioning accuracy of weapons due to the usage of the data of surveyingfor calibration purposes.
- Mobile and accurate determination of geometrical relations between gun and fire control system at air-force, army and navy appli-cations

Advantages of iPEGASUS (e.g. compared with conventional optical methods):

- Calibration or surveying can be done by workers without extensice education.
- No external equipment required (no mirrors, theodolites etc.). Therefore high mo-bility of the equipment. Very short time is needed for installation and surveying.
- **Very fast execution of measurements** – session done typically 10 times faster than with optical methds
- Direct communication with field computer. Open interface.
- Surveying also possible on moved vehicles with the use of two measuring heads in differential mode (iPEGASS-RQT-400x-DIFF).

Other application examples of iPEGASUS:

- Spatial alignment of missile approach protection sensors on aircrafts
- Transfer alignment between ship's inertial navigation system and radar antennas and weapon systems
- Transfer alignment between the rollers of a paper machinery