iPEGASUS-LT

3D Transfer Alignment Tool and True North Reference for Machining Centers, Radar and Telecommunication Antennas and Weapons

The true-north related aligning of communication antennas (e.g. for installation of a 5G network), the surveying of machining centers and robots or the angle transfer between inertial navigation systems (INS), fire control systems, weapons and missile attack warning systems had been a time consuming task in the past.

To overcome these constraints, iMAR supplies **iPEGASUS-LT**, a precise inertial sensor based fast true-north determination and transfer alignment tool, which provides a precise three dimensional attitude/ heading information in real-time, relative or related to true north and horizon, and also under motion**. iPEGASUS-LT** offers these features at low weight and reasonable low cost.

iPEGASUS-LT provides both, absolute roll, pitch and heading as well as relative change of angles between two orientations. It comes with an integrated battery and hence allows wireless operation. An optional display shows the angular data in real-time and an UART RS422 and Ethernet interface allows data transmission with up to 100 Hz.

The absolute accuracy is 0.1 deg in roll and pitch and 0.15.deg true heading (against geographical north). This true north capability allows e.g. **the immediate alignment of directional beam antennas or multiple / redundant AHRS configurations**.

The relative accuracy (angular drift) is better than 0.1 deg / hour – therefore the operational phase after initial alignment is up to 45 minutes, before a new alignment at standstill is required again, which lasts less than 4 minutes.

iPEGASUS-LT works without external aid and is easy to handle for everybody - only one person is necessary for its operation. **iPEGASUS-LT** remarkably reduces the measurement time for aligning or surveying of objects, compared to traditional laser or camera aided systems. **iPEGASUS-LT** is a very small, lightweight handy tool.

iMAR's traditional **iPEGASUS** devices are the benchmark measurement tools in the market for more than 20 years. They are in operation worldwide at weapon and aircraft manufactureres like Rheinmetall, Oerlikon Contraves, Leonardo, Airbus, BAe Systems, UK MoD, German MoD (Naval Weapons), Turkish Armed Forces etc.

iPEGASUS-LT is the trendsetter in performing fast and precise 3D alignment with highest reliability (MTBF > 100'000 hrs) and economical cost.

Technical Data of iPEGASUS-LT (all values 1-sigma)

Measured Data	:	absolute angles:	Roll, Pitch, Yaw, resp. Elevation & Azimuth (heading in respect to true north)
		relative angles:	change of Roll, Pitch, Yaw against initial orientation
Measuring Range	:	± 360 deg	on each axis (any rotations in space)
		± 180 deg Roll, ± 90 deg Pitch, ± 180 deg Yaw (according to Eulerian Angle Definition)	
Resolution	:	< 100 µdeg all axes	
Linearity Error	:	< 0.0005 % (incertainity due to rotation)	
Alignment Time	:	240 sec (required standstill duration of iPEGASUS-LT without motion and rotation)[1]	
Measuring Incertainity	:	absolute:	< 0.08 deg Roll, Pitch; < 0.11 deg sec lat resp. 2 mil sec lat [2] True Heading
			Example: 0.23 deg True Heading @ latitude 60°; max. latitude: 85 deg
		relative:	0.002 deg / minute over up to 45 minutes (angular drift)
		The estimation of meas. uncertainty is displayed continuously.	
Mechanical Interface	:	integrated precision machined mounting plate with fitting holes	
Measurement Duration	:	up to 45 minutes since last alignment; then a new alignment is required (standstill for 240 s)	
Data Output Rate	:	up to 100 Hz data output rate via UART RS422	
Output	:	in real-time via UART and on integrated display	
		abs. roll / pitch / yaw; elevation / azimuth; time or	
		rel. roll / pitch / yaw against initial orientation	
Power supply	:	via cable or via internal chargeable battery for up to 4 hours operation (other on request)	
		10…34 V DC (or 235 V AC via external power converter for charging the internal battery)	
Mass, Size	:	approx. 2.9 kg, approx. 150 x 170 x 103 mm^3 (without connector)	
MTBF	:	> 100'000 hrs (without battery)	

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[1] any motion during alignment extends the alignment duration accordingly
[2] sec lat = 1 / cos(latitude)

Four holes for M6 screws and two fitting bores (for dowel pins Ø 6g6 x 12) are provided to apply the customer's flange to the iPEGASUS-LT.