

iPEGASUS-LT

3D Transfer Alignment Tool and True North Reference for Mining, Tunneling, Radar and Telecommunication Antennas and Weapons

The true-north related alignment of communication antennas (e.g. for installation of a 5G network), tunneling and mining machines 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.

With **iPEGASUS-LT** a precise inertial sensor system is available, providing instant measurements of true-north, roll and pitch at standstill and under motion. Additional it provides all features of a transfer alignment tool, which provides a precise three dimensional attitude/ heading information in real-time, relative between two orientations or related absolute to true north and horizon. **iPEGASUS-LT** offers all these features at low weight and reasonable low cost, and very easy to use.

iPEGASUS-LT comes with an **integrated battery** and hence allows wireless operation for more than 4 hours. An optional display shows the angular data in real-time and an UART RS422 and Ethernet interface enable 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 align**

ment of directional beam antennas or multiple / redundant AHRS configurations or mining machines.

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. After 4 minutes alignment **iPEGASUS-LT** is ready for use.



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 the alignment or surveying of objects, compared to traditional laser or camera aided systems. **iPEGASUS-LT** is a very small, light-weight and handy tool.

iMAR's traditional **iPEGASUS** devices have been 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	:	arbitrary rotations on each axis (any rotations in space)	
			± 180 deg Roll, ± 90 deg Pitch, ± 180 deg Yaw (according to Eulerian Angle Definition)
Resolution	:		< 100 μ deg all axes
Linearity Error	:		< 0.0005 % (incertainty due to rotation)
Alignment Time	:		240 sec (required standstill duration of iPEGASUS-LT without motion and rotation) ¹
Measuring Incertainty	:	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
			See operator manual to operate iPEASUS-LT even with higher accuracy.
		relative:	0.002 deg / minute over up to 45 minutes (angular drift) The estimation of measurement 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; option: Bluetooth
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. 2.75 kg, approx. 150 x 170 x 103 mm ³ (without connector); version with optional handle available
MTBF	:		> 100'000 hrs (without battery)

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¹ any motion during alignment extends the alignment duration accordingly

² sec lat = $1 / \cos(\text{latitude})$



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

