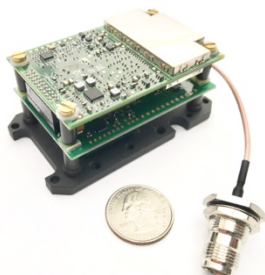




- ITAR-free
- Small size
- 1 deg/hr level IMU
- High precision GNSS receiver
- Affordable price

OEM Version Of GPS-Aided Inertial Navigation System **“INS-B-OEM”**

The **Inertial Labs GPS-Aided Inertial Navigation System (INS-B-OEM)** is OEM version of new generation, fully-integrated, combined GPS, GLONASS, GALILEO and BEIDOU GNSS and high-performance strapdown system, that determines position, velocity and absolute orientation (Heading, Pitch and Roll) for any device on which it is mounted. Horizontal and Vertical Position, Velocity and Orientation are determined with high accuracy for both motionless and dynamic applications.



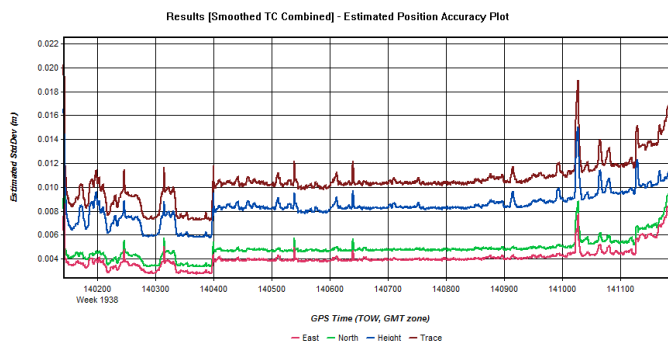
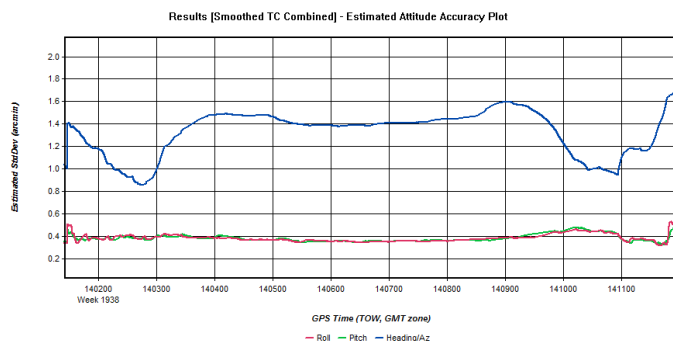
The Inertial Labs **INS-B-OEM** utilizes advanced single antenna GNSS receiver, barometer, 3-axes each of calibrated in full operational temperature range Magnetometers, Advanced MEMS Accelerometers and Gyroscopes to provide accurate Position, Velocity, Heading, Pitch and Roll of the device under measure. **INS-B-OEM** contains Inertial Labs new on-board sensors fusion filter, state of the art navigation and guidance algorithms and calibration software.

KEY FEATURES, BENEFITS & FUNCTIONALITY

- Commercially exportable GPS-Aided Inertial Navigation System
- 85 x 47 x 36 mm size and 115 gram weight
- High precision IMU (1 deg/hr gyroscopes and 5 micro g accelerometers Bias in-run stability)
- GPS, GLONASS, GALILEO, BEIDOU, SBAS, DGPS, RTK supported signals
- Compatibility with LiDARs (Velodyne, RIEGL, FARO)
- Up to 200 Hz IMU, 50 Hz GNSS positions and 20 Hz GNSS measurements data rate
- Advanced, extendable, embedded Kalman Filter based sensor fusion algorithms
- State-of-the-art algorithms for different dynamic motions of Vessels, Ships, Helicopters, UAV, UUV, UGV, AGV, ROV, Gimbals and Land Vehicles
- Implemented ZUPT, GNSS tracking angle features
- Full temperature calibration of all sensing elements, Environmentally sealed (IP67)

INS-B-OEM performance during GNSS outages

Outage duration	Positioning mode	Position accuracy (meters, RMS)		Velocity accuracy (meters/sec, RMS)		Attitude accuracy (degree, RMS)	
		Horizontal	Vertical	Horizontal	Vertical	Pitch, Roll	Heading
0 sec	RTK	0.01 + 1ppm	0.02 + 1ppm	0.02	0.01	0.015	0.08
	SP	1.2	1.0	0.03	0.02	0.1	0.1
	PP	0.005	0.01	0.02	0.01	0.006	0.03
60 sec	RTK	7	2	0.3	0.1	0.05	0.15
	SP	8	3	0.3	0.1	0.05	0.5
	PP	0.3	0.2	0.03	0.05	0.01	0.1



INS-B-OEM Specifications

	Parameter	Units	INS-B-OEM
	Output signals		Positions, Heading, Pitch & Roll, Velocity, Accelerations, Angular rates, Barometric data, Pulse Per Second
	Update rate	Hz	1 ... 200 (user settable)
	Start-up time	sec	<1
Navigation	Positions, Velocity and Timestamps	Units	INS-B-OEM
	Horizontal position accuracy (GPS L1), RMS	meters	1.5
	Horizontal position accuracy (GPS L1/L2), RMS	meters	1.2
	Horizontal position accuracy (SBAS), RMS ⁽¹⁾	meters	0.6
	Horizontal position accuracy (DGPS), RMS	meters	0.4
	Horizontal position accuracy (post processing) ⁽²⁾	meters	<0.005
	Horizontal position accuracy (RTK), RMS	meters	0.01 + 1 ppm
	Vertical position accuracy, RMS	meters	<1
	Velocity accuracy, RMS	meters/sec	0.03
	PPS timestamps accuracy	nano sec	20
Orientation	Heading	Units	INS-B-OEM
	Range	deg	0 to 360
	Static Accuracy ⁽³⁾	deg	1
	Dynamic accuracy (GNSS) ⁽⁶⁾	deg RMS	0.1
	Post processing accuracy ⁽²⁾	deg RMS	0.03
	Pitch and Roll	Units	INS-B-OEM
	Range: Pitch, Roll	deg	±90, ±180
	Angular Resolution	deg	0.01
	Static Accuracy in whole Temperature Range	deg	0.05
	Dynamic Accuracy ⁽⁶⁾	deg RMS	0.1
	Post processing accuracy ⁽²⁾	deg RMS	0.006
GNSS	GNSS receiver	Units	INS-B-OEM
	Number of GNSS Antennas		Single
	Supported GNSS signals & corrections (optional)		GPS L1/L2/L5 GLONASS L1/L2 BeiDou B1/B2/B3 GALILEO E1/E5 SBAS DGPS RTK
	Channel configuration ⁽⁴⁾		120 Channels
	GNSS Positions data rate ⁽⁵⁾	Hz	20, 50
	GNSS Measurements (raw) data rate	Hz	20
	Velocity accuracy, RMS	meters/sec	<0.03
	Initialization time	Sec	<50 (cold start), <30 (warm start), <10 (hot start)
	Time accuracy (clock drift) ⁽⁷⁾	nano sec	20
	Gyroscopes	Units	INS-B-OEM
IMU	Measurement range	deg/sec	±450
	Bias in-run stability (RMS, Allan Variance)	deg/hr	1
	Angular Random Walk (ARW)	deg/√hr	0.2
	Accelerometers	Units	INS-B-OEM
	Measurement range	g	±8 ±15
	Bias in-run stability (RMS, Allan Variance)	mg	0.005 0.02
	Velocity Random Walk (VRW)	m/sec/√hr	0.015 0.035
General	Environment	Units	INS-B-OEM
	Operating temperature	deg C	-40 to +70
	Storage temperature	deg C	-50 to +85
	MTBF	hours	55,500
	Electrical	Units	INS-B-OEM
	Supply voltage	V DC	9 - 36
	Power consumption	Watts	3
	Output Interface (options)	-	RS-232/RS-422
	Output data format	-	Binary, TSS-1, NMEA 0183 ASCII characters
	Physical	Units	INS-B-OEM
	Size	mm	85 x 47 x 36
	Weight	gram	115

⁽¹⁾ GPS only

⁽²⁾ RMS, incremental error growth from steady state accuracy. Post-processing results using third party software.

⁽³⁾ calibrated in whole operational temperature range, in homogeneous magnetic environment, for latitude up to ±65 deg

⁽⁴⁾ tracks up to 60 L1/L2 satellites

⁽⁵⁾ 50 Hz while tracking up to 20 satellites. 20 Hz position update rate for Basic model of INS

⁽⁶⁾ dynamic accuracy may depend on type of motion

⁽⁷⁾ time accuracy does not include biases due to RF or antenna delay

Power and interface harness

1,2	POWER IN	RED
3,4	GROUND	BLACK
16	Rx232 - Rx1	BLUE
18	Rx232 - Tx1	ORANGE
12	Rx232 - Rx2	WHITE
14	Rx232 - Tx2	GREEN
15	Rx232 - Rx3	YELLOW
17	Rx232 - Tx3	BROWN
10	GPS	PURPLE
8	GNSS EV2	WT/RED

RS422 version

21	RS422-A	BLUE
22	RS422-B	ORANGE
19	RS422-Y	WT/GREEN
20	RS422-Z	YL/GREEN

Ethernet version

23	ETHTx+	BLUE
24	ETHTx-	ORANGE
25	ETHRX+	WT/GREEN
26	ETHRX-	YL/GREEN

The names of the signals are given relative to the device.
I.e. the Rx pin is the input pin of the INS, Tx is the output one.
RS422-A and RS422-B pair is used by device for data receive
RS422-Y and RS422-Z pair is used by device for data transmit

See note 1

Technical drawing of the power and interface harness assembly. The drawing shows a rectangular metal housing with four mounting screws. A cable bundle enters from the top right. Labels include: 'D4 - 4 places' pointing to the cable entry point, 'See note 1' pointing to the top screw, 'See note 2' pointing to the bottom screw, and 'See note 3' pointing to the cable bundle. Dimensions shown are 47.7 mm (total width), 34.3 mm (width of the main body), and 79.6 mm (height).

Ribbon cable connector

Technical drawing of the ribbon cable connector. It shows a side view of the connector with two rows of pins labeled 1 through 26. Dimensions shown are 36.6 mm (width) and 85.5 mm (length).

InertialLabs

INS-B-OEM assembly drawings

TECHNICAL DRAWING

REV/2.0

REVISION

DATE

09/25/2017

1 OF 1

DRAWING

Main electrical parameters

Supply voltage	9 to 34 VDC
Power consumption	1000 mW
Output Interface	3 x RS-232 (optional RS422)
Output data format	Binary, TSS-1, NMEA 0183 ASCII characters

Note 1: TNC Female Bulkhead to MCX Plug Right Angle Cables
150mm length RG174 Coax

Note 2: 26 lines ribbon cable converted to open end wires

Note 3: 26 AWG stranded wires by Alpha Wire for main harness (250mm)

Note 4: Weight 115g