

Dual Antenna, GPS-Aided Inertial Navigation Systems

INS-D-OEM
INS-DL-OEM



- Position accuracy = 0.5 cm (PPK) / 1 cm (RTK)
- Heading accuracy = 0.03 deg (PPK) / 0.05 deg (RTK)
- Pitch & Roll accuracy = 0.006 deg (PPK) / 0.08 deg (RTK)
- High precision dual antenna GNSS receiver
- Ideal solution for accurate point clouds
- Small Size, light weight
- Affordable price
- Compatible with LIDAR, Optical camera
- Applications: flight control, remote sensing, photogrammetry





GPS-Aided INS-D/DL-OEM Datasheet Rev. 3.0

The **Inertial Labs GPS-Aided Inertial Navigation System (INS-D/DL-OEM)** is OEM version of new generation, dual GNSS antenna, 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, Dual Antenna Heading, Pitch & Roll are determined with high accuracy for both motionless and dynamic applications.



The Inertial Labs **INS-D/DL-OEM** utilizes advanced dual antenna GNSS receiver, 3-axes each of calibrated in full operational temperature range Advanced MEMS Accelerometers and new generation of tactical grade MEMS Gyroscopes to provide accurate Position, Velocity, Heading, Pitch and Roll of the device under measure.

INS-D/DL-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 Dual Antenna GPS-Aided Inertial Navigation System
- 85 x 47 x 36 mm size and 150 (or 160) grams in mass. Full temperature calibration of all sensing elements
- Industrial & Tactical-grade IMU (1 3 deg/hr gyroscopes Bias in-run stability)
- GPS, GLONASS, BEIDOU, SBAS, DGPS, RTK supported signals
- Up to 0.05 deg Heading and 0.08 deg Pitch & Roll accuracy
- Compatibility with LiDARs and Optical Cameras for remote sensing applications
- Up to 200 Hz INS, up to 2000 Hz IMU, up to 100 Hz GNSS positions and 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

INS-D-OEM and INS-DL-OEM performance during GNSS outages

Model	Outage	Mode		accuracy s, RMS)	Velocity a (meters/se	-	Attitude accuracy (degree, RMS)		
	duration		Horizontal	Vertical	Horizontal	Vertical	Pitch, Roll	Heading*	
Σ	0 sec	RTK	0.01 + 1ppm	0.02 + 1ppm	0.02	0.01	0.015	0.05	
		SP	1.2	1.0	0.03	0.02	0.08	0.08	
INS-D-OEM		PP	0.005	0.01	0.02	0.01	0.006	0.03	
Q-	60 sec	RTK	7	2	0.3	0.1	0.05	0.08	
		SP	8	3	0.3	0.1	0.1	0.1	
		PP	0.3	0.2	0.03	0.05	0.01	0.05	
_		RTK	0.01 + 1ppm	0.02 + 1ppm	0.03	0.02	0.09	0.06	
INS-DL-OEM	0 sec	SP	1.2	1.0	0.04	0.03	0.1	0.09	
		PP	0.009	0.015	0.025	0.02	0.009	0.035	
\Box	60 sec	RTK	8	3	0.4	0.3	0.06	0.09	
NS.		SP	9	4	0.45	0.5	0.15	0.15	
		PP	0.45	0.35	0.04	0.065	0.025	0.07	

^{* 2} meters baseline



INS-D-OEM & INS-DL-OEM Specifications

	Parameter	Units	برما	INS-DL-OEM	nna	High	INS-D-OEM precision dual an	ntenna	
	Input signals		Marine application: DVL (Doppler Velocity Log) Land application: Odometer, Wheel sensor, Encoder, DMI Aerial application: Wind sensor, Air Speed Sensor, Doppler shift from locator (for long-term GPS denied) All: External Stand Alone Magnetic Compass (SAMC/AHRS)						
General	Output signals		Horizonta Barometr Direct AT	al and Vertical Pos ic data, PPS _ITINS message	with Position, He	Pitch & Roll, Velocity, Accelerations, Angular rates, teading, Pitch & Roll to COBHAM AVIATOR UAV 200 tt Controllers as NMEA messages			
	Main features			Affordable price ual antenna Head 1 cm RTK position		High precision dual antenna Heading, 1 cm RTK position, Tactical-grade IMU			
	Data rate (INS) Data rate (IMU) Start-up time	Hz Hz sec	Up to 200 (user settable) Up to 2000 (user settable) <1			Up to 200 (user settable) Up to 2000 (user settable) <1			
	·								
	Positions, Velocity and Timestamps	Units		INS-DL-OEM		INS-D-OEM			
_	Horizontal position accuracy (SP, L1), RMS Horizontal position accuracy (SP, L1/L2), RMS	meters meters		1.5 1.2		1.5			
Navigation	Horizontal position accuracy (SP, L1/L2), RMS (SP, L1/L2), RMS (SP, L1/L2), RMS (1)	meters		0.6		1.2 0.6			
₩	Horizontal position accuracy (DGPS), RMS	meters	0.4				0.4		
<u>e</u>	Horizontal position accuracy (post processing) (2)	meters	0.005				0.005		
.5,	Horizontal position accuracy (RTK), RMS	meters		0.01 + 1 ppm			0.01 + 1 ppm		
é	Vertical position accuracy (SP), RMS Vertical position accuracy (RTK), RMS	meters meters	<2 0.02 + 1 ppm			<1 0.02 + 1 ppm			
Z	Verdeal position decuracy (KTK), KHS Velocity accuracy, RMS	meters/sec	0.02 + 1 ppm 0.03				0.02 1 1 ppm		
	PPS timestamps accuracy	nano sec		20			20		
	Heading	Units		INS-DL-OEM			INS-D-OEM		
	Range	deg		0 to 360			0 to 360		
=	Static Accuracy (3)	deg RMS	0.15 (1 meter base line)			0.15 (1 meter base line)			
Orientation	Dynamic accuracy (GNSS) (6)	deg RMS	0.08 (2 meters baseline)			0.08 (2 meters baseline)			
at	Post processing accuracy (2) Pitch and Roll	deg RMS Units	0.03 INS-DL-OEM			0.03 INS-D-OEM			
=	Range: Pitch, Roll	deg	±90, ±180			±90, ±180			
ā	Angular Resolution	deg	0.01				0.01		
<u>.</u>	Static Accuracy in whole Temperature Range	deg		0.05		0.05			
0	Dynamic Accuracy (6)	deg RMS		0.03		0.03			
	Post processing accuracy (2)	deg RMS	0.01			0.006			
	GNSS receiver	Units		INS-DL-OEM			INS-D-OEM		
	Number of GNSS Antennas			Dual			Dual	DNIACC L1 C/A L2	
(0	Supported GNSS signals & corrections (optional)		GALII	LONASS L1/L2, B .EO E1/E5, QZSS SBAS, DGPS, RTF	L1/L5,	Galileo E1, E5 Al L5; SBAS L1, L5	5; BeiDou B1I, B1C ltBOC, E5a, E5b, E6 ; QZSS L1 C/A, L1C	C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L-	
SS			GALII	EO E1/E5, QZSS SBAS, DGPS, RTI	L1/L5,	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5	5; BeiDou B1I, B1C tBOC, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels;	C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L-	
SSNI	Channel configuration ⁽⁴⁾	Hz	GALII	EO E1/E5, QZSS SBAS, DGPS, RTH 435 Channels	L1/L5,	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5	5; BeiDou B1I, B1C tBOC, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 555 Channels	C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L-	
GNSS		Hz	GALII	EO E1/E5, QZSS SBAS, DGPS, RTI	L1/L5, (C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1I, B1C tBOC, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels;	C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L- DGPS;	
GNSS	Channel configuration ⁽⁴⁾ GNSS Positions data rate ⁽⁵⁾ RTK corrections GNSS Measurements (raw) data rate	Hz	GALII	EO E1/E5, QZSS SBAS, DGPS, RTH 435 Channels 20 RTCM 2.3/3.0/3.2	L1/L5, (C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1I, B1C tBOC, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; l 555 Channels Up to 100 TCM 2.1/2.3/3.0/3 Up to 100	C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L- DGPS;	
GNSS	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS	Hz meters/sec	GALII	EO E1/E5, QZSS SBAS, DGPS, RTH 435 Channels 20 RTCM 2.3/3.0/3.2 20 <0.04	L1/L5, <	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1I, B1C tBOC, E5a, E5b, E6; ; QZSS L1 C/A, L1C up to 5 channels; I 555 Channels Up to 100 CTCM 2.1/2.3/3.0/3 Up to 100 <0.03	C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L- DGPS;	
GNSS	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time	Hz meters/sec Sec	GALII	EO E1/E5, QZSS SBAS, DGPS, RTH 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h	L1/L5, <	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1T, B1C ttBOC, E5a, E5b, Ef ; QZSS L1 C/A, L1C up to 5 channels; Up to 100 :TCM 2.1/2.3/3.0/3 Up to 100 <0.03 cold start), 20 (hot	C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L- DGPS;	
GNSS	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (clock drift) (7)	Hz meters/sec Sec nano sec	GALII	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3.: 20 <0.04 old start), <30 (h	L1/L5, <	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1f, B1C BOC, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 cTCM 2.1/2.3/3.0/3 Up to 100 <0.03 cold start), 20 (hot 20	C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L- DGPS;	
GNSS	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (clock drift) (7) Gyroscopes	Hz meters/sec Sec	GALII	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3. 20 <0.04 old start), <30 (h 20 INS-DL-OEM	L1/L5, <	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1T, B1C BOC, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 <tcm (hot="" 100="" 2.1="" 2.3="" 20="" 3="" 3.0="" <0.03="" cold="" ins-d-oem<="" start),="" td="" to="" up=""><td>C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L- DGPS;</td></tcm>	C, B2I, B2a, B3I; 6; NavIC (IRNSS) C, L2C, L5, L6; L- DGPS;	
GNSS	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (clock drift) (7) Gyroscopes Type	Hz meters/sec Sec nano sec Units	<50 (c	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade	L1/L5,	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B11, B1C tROC, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; I 555 Channels Up to 100 CTCM 2.1/2.3/3.0/3 Up to 100 <0.03 cold start), 20 (hot 20 INS-D-OEM	., B21, B2a, B31; 6; NavIC (IRNS); ., L2C, L5, L6; L- DGPS; 1	
SSND	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (clock drift) (7) Gyroscopes	Hz meters/sec Sec nano sec	<50 (c	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3. 20 <0.04 old start), <30 (h 20 INS-DL-OEM	L1/L5,	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1T, B1C BOC, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 <tcm (hot="" 100="" 2.1="" 2.3="" 20="" 3="" 3.0="" <0.03="" cold="" ins-d-oem<="" start),="" td="" to="" up=""><td>., B2I, B2a, B3I; 6; NavIC (IRNS) 6; L2C, L5, L6; L- DGPS; 1</td></tcm>	., B2I, B2a, B3I; 6; NavIC (IRNS) 6; L2C, L5, L6; L- DGPS; 1	
GNSS	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range	Hz meters/sec Sec nano sec Units	<50 (c	LEO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 bld start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20	L1/L5,	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1I, B1C ttBOC, E5a, E5b, E6; ç (2SS L1 C/A, L1C up to 5 channels; I 555 Channels Up to 100 ctCM 2.1/2.3/3.0/3 Up to 100 <0.03 cold start), 20 (hot 20 INS-D-OEM Tactical-grade c450 / ±950 / ±200	., B21, B2a, B31; 6; NavIC (IRNS); ., L2C, L5, L6; L- DGPS; 1	
GNSS	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg/\hr	<50 (c	LEO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3.; 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3	L1/L5,	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1T, B1C B1C, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 c1CM 2.1/2.3/3.0/3 Up to 100 c0.03 cold start), 20 (hot 20 INS-D-OEM Tactical-grade c450 / ±950 / ±200	., B21, B2a, B3I; 6; NavIC (IRNSS) ., L2C, L5, L6; L- DGPS; 1	
<u> </u>	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr	<50 (c	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3.: 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM	L1/L5,	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1T, B1C B1C, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 .TCM 2.1/2.3/3.0/3 Up to 100 .O.03 cold start), 20 (hot 20 INS-D-OEM Tactical-grade -450 / ±950 / ±200 1 .SOL2 INS-D-OEM	., B21, B2a, B3I; 6; NavIC (IRNSS) ., L2C, L5, L6; L- DGPS; 1	
IMU GNSS	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/rhr deg/rhr Units	<50 (c	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM Industrial-grade findustrial-grade findustrial-grade	2 2 oot start)	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1T, B1C BOC, ESA, ESA, ESA, EG ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 <1.03 cold start), 20 (hot 20 INS-D-OEM Tactical-grade <0.2 INS-D-OEM Tactical-grade Tactical-grade Tactical-grade	., B21, B2a, B31; 65, Nav1C (IRNS); ., L2C, L5, L6; L- DGPS; 1 start)	
	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg/\hr	<50 (c	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3.: 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM	L1/L5,	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band	5; BeiDou B1T, B1C B1C, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 .TCM 2.1/2.3/3.0/3 Up to 100 .O.03 cold start), 20 (hot 20 INS-D-OEM Tactical-grade -450 / ±950 / ±200 1 .SOL2 INS-D-OEM	., B2I, B2a, B3I; 6; NavIC (IRNS) 6; L2C, L5, L6; L- DGPS; 1	
	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS)	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg//hr Units	<50 (co ±8 q 0.01 0.7	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±2C 3 <50 <0.3 INS-DL-OEM Industrial-grade ±15 g 0.03 11	2 2 ot start) 000 ±40 q 0.05 1.5	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band R 39 (c	5; BeiDou B1T, B1C B1C, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 <0.03 cold start), 20 (hot 20 INS-D-OEM Tactical-grade <0.2 INS-D-OEM Tactical-grade 1 30 <0.2 INS-D-OEM Tactical-grade 20 0.2 INS-D-OEM Tactical-grade 0.02 INS-D-OEM Tactical-grade 1 0.02 0.07		
<u> </u>	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Measurement range Measurement range (RMS) Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias error over temperature range	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/yhr Units q mg mg	48 g 0.01 0.7 1.5	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM Industrial-grade ±15 q 0.03 1.1 2.0	L1/L5, (2 2 000 start) 000 ±40 g 0.05 1.5 2.5	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band R 39 (c) ±8 q 0.005 0.5 1.0	5; BeiDou B1T, B1C tBOC, ESa, ESb, E6 ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 .TCM 2.1/2.3/3.0/3 Up to 100 .TOM 2.0.03 .cold start), 20 (hot 20 INS-D-OEM Tactical-grade .450 / ±950 / ±200 1		
<u> </u>	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) GMEASUREMENT (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg/yhr Units q mg mg mg m/s/v/hr	<50 (co ±8 q 0.01 0.7	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM Industrial-grade ±15 q 0.03 1.11 2.0 0.045	2 2 ot start) 000 ±40 q 0.05 1.5	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band R 39 (c	\$; BeiDou B1T, B1C B2C, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 555 Channels Up to 100 <tcm (hot="" 0.02="" 0.035<="" 0.7="" 1.3="" 100="" 2.1="" 2.3="" 20="" 3="" 3.0="" 450="" <0.03="" <0.2="" cold="" ins-d-oem="" q="" start),="" tactical-grade="" td="" to="" up="" ±15="" ±200="" ±950=""><td></td></tcm>		
<u> </u>	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Measurement range Measurement range (RMS) Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias error over temperature range	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/yhr Units q mg mg	48 g 0.01 0.7 1.5	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM Industrial-grade ±15 q 0.03 1.1 2.0	L1/L5, (2 2 000 start) 000 ±40 g 0.05 1.5 2.5	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band R 39 (c) ±8 q 0.005 0.5 1.0	5; BeiDou B1T, B1C tBOC, ESa, ESb, E6 ; QZSS L1 C/A, L1C up to 5 channels; 1 555 Channels Up to 100 .TCM 2.1/2.3/3.0/3 Up to 100 .TOM 2.0.03 .cold start), 20 (hot 20 INS-D-OEM Tactical-grade .450 / ±950 / ±200 1		
IMI	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg//hr deg//hr Units q mg mg mg ms/s//hr Units deg C	48 g 0.01 0.7 1.5	### 15 G ## 10	L1/L5, (2 2 000 start) 000 ±40 g 0.05 1.5 2.5	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band R 39 (c) ±8 q 0.005 0.5 1.0	5; BeiDou B1T, B1C B1C, B1C, B1C, B1C, B1C CV2SS L1 C/A, L1C up to 5 channels; 555 Channels Up to 100 CTCM 2.1/2.3/3.0/3 Up to 100 <0.03 cold start), 20 (hot 20 INS-D-OEM Tactical-grade -450 / ±950 / ±200 1 <30 <0.2 INS-D-OEM Tactical-grade ±15 q 0.02 0.7 1.3 0.035 INS-D-OEM -40 to +75		
IMI	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment Operating temperature Storage temperature	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr Units g mg mg my s/y/hr Units deg C deg C	48 g 0.01 0.7 1.5	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 3 <50 <0.3 INS-DL-OEM Industrial-grade ±15 q 0.03 1.1 2.0 0.045 INS-DL-OEM INS-DL-OEM Industrial-grade 15 q 0.03 1.1 2.0 0.045 INS-DL-OEM	L1/L5, (2 2 000 start) 000 ±40 g 0.05 1.5 2.5	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band R 39 (c) ±8 q 0.005 0.5 1.0	\$; BeiDou B1Ī, B1C B1C, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 555 Channels Up to 100 <0.03 cold start), 20 (hot 20 INS-D-OEM Tactical-grade <450 / ±950 / ±200 1		
IMI	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment Operating temperature Storage temperature MTBF	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg/yhr Units q mq mg mg deg/sec deg/hr deg/rhr deg/rhr deg/rhr deg/rhr deg/chr deg/chr deg/chr	48 g 0.01 0.7 1.5	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM Industrial-grade ±15 q 0.03 1.1.1 2.0 0.045 INS-DL-OEM -40 to +75 -50 to +85 -55,500	L1/L5, (2 2 000 start) 000 ±40 g 0.05 1.5 2.5	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band R 39 (c) ±8 q 0.005 0.5 1.0	5; BeiDou B1T, B1C B2C, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 555 Channels Up to 100 <tcm (hot="" +75="" +85="" -40="" -50="" 0.02="" 0.035="" 0.7="" 1="" 1.3="" 100="" 2.1="" 2.3="" 20="" 3="" 3.0="" 450="" 55,500<="" <0.03="" <0.2="" <30="" cold="" ins-d-oem="" q="" start),="" tactical-grade="" td="" to="" up="" ±15="" ±200="" ±950=""><td></td></tcm>		
IMI	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment Operating temperature Storage temperature MTBF	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg//hr Units q mg mg mg mg c deg C deg C hours Units	48 g 0.01 0.7 1.5	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 <0.04 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 <0.3 INS-DL-OEM Industrial-grade ±15 q 0.03 1.1.1 2.0 0.045 INS-DL-OEM INS-DL-OEM INS-DL-OEM	L1/L5, (2 2 000 start) 000 ±40 g 0.05 1.5 2.5	C/A, L2P, L3, L Galileo E1, E5 Al L5; SBAS L1, L5 Band R 39 (c) ±8 q 0.005 0.5 1.0	5; BeiDou B1T, B1C B1C, B1C, B1C, B1C, B1C, B1C, B1C, B1C,		
IMI	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment Operating temperature Storage temperature MTBF	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg/yhr Units q mq mg mg deg/sec deg/hr deg/rhr deg/rhr deg/rhr deg/rhr deg/chr deg/chr deg/chr	#8 q 0.01 0.7 1.5 0.02	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM Industrial-grade ±15 q 0.03 1.1.1 2.0 0.045 INS-DL-OEM -40 to +75 -50 to +85 -55,500	2 2 ot start) 000 ±40 q 40.05 1.5 2.5 0.06	### CAN	5; BeiDou B1T, B1C B2C, E5a, E5b, E6 ; QZSS L1 C/A, L1C up to 5 channels; 555 Channels Up to 100 <tcm (hot="" +75="" +85="" -40="" -50="" 0.02="" 0.035="" 0.7="" 1="" 1.3="" 100="" 2.1="" 2.3="" 20="" 3="" 3.0="" 450="" 55,500<="" <0.03="" <0.2="" <30="" cold="" ins-d-oem="" q="" start),="" tactical-grade="" td="" to="" up="" ±15="" ±200="" ±950=""><td></td></tcm>		
IMI	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment Operating temperature Storage temperature MTBF	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg//hr Units q mg mg mg Company deg C deg C hours Units V DC Watts	\$\delta \text{48 q} \\ 0.01 \\ 0.7 \\ 1.5 \\ 0.02 \\ \text{55 RS}\$	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3.: 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM Industrial-grade 1.1 2.0 0.045 INS-DL-OEM -40 to +75 -50 to +85 -55,500 INS-DL-OEM 9 - 36 (6 with data logg 2-32 or RS-422, 6	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	### ### ### ### ### ### ### ### ### ##	5; BeiDou B1T, B1C B1C, B1C, B1C, B1C, B1C, B1C, B1C, B1C,		
IMI	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment Operating temperature Storage temperature MTBF	Hz meters/sec Sec nano sec Units deg/sec dea/hr deg/hr deg/yhr Units g mg mg mg company mg mg company my mg mg my my my mg my	#8 q 0.01 0.7 1.5 0.02	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 old start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / +950 / +2C 3 3 <50 <0.3 INS-DL-OEM Industrial-grade ±15 q 0.3 INS-DL-OEM Industrial-grade ±15 q -0.3 INS-DL-OEM Industrial-grade 50 / +2C Industrial-grade 50 / +2C Industrial-grade 50 / +2C Industrial-grade 50 / -2C INS-DL-OEM INS-DL-OEM INS-DL-OEM 9-36 (6 with data logq 2-32 or RS-422, c Ethernet (optiona	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	## CAN CASE OF	5; BeiDou B1T, B1C B1C, B1C, B1C, B1C, B1C CVSS L1 C/A, L1C up to 5 channels; 555 Channels Up to 100 CVCM 2.1/2.3/3.0/3 UNS-D-OEM Tactical-grade ±15 q 0.02 0.7 1.3 0.035 INS-D-OEM -40 to +75 -50 to +85 55,500 INS-D-OEM -9 36 (6 with data logge 6-232 or RS-422, C Ethernet (optional)		
IMI	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment Operating temperature Storage temperature Storage temperature MTBF Electrical Supply voltage Power consumption Output Interface (options)	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg/yhr Units g mg mg mg deg C deg C hours Units	#8 q 0.01 0.7 1.5 0.02	### ACT ACT ### ACT	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	## CAN CASE OF	5; BeiDou B1T, B1C B1C, B1C, B1C, B1C, B1C, B1C, B1C, B1C,		
) NWI pui	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment Operating temperature Storage temperature MTBF Electrical Supply voltage Power consumption Output Interface (options) Output data format	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg/hr Units q mq mg mg m/s/v/hr Units deg C deg C hours Units - Units	#8 q 0.01 0.7 1.5 0.02	EO E1/E5, QZSS SBAS, DGPS, RTI 435 Channels 20 RTCM 2.3/3.0/3 20 <0.04 0ld start), <30 (h 20 INS-DL-OEM Industrial-grade 450 / ±950 / ±20 3 <50 <0.3 INS-DL-OEM 1.1 2.0 0.045 INS-DL-OEM 40 to +75 -50 to +85 55,500 INS-DL-OEM 40 to +75 -50 to +85 (6 with data logg 2-32 or RS-422, 0 ins-DL-OEM 2-232 or RS-422, 0 ins-DL-OEM 3-24, 0 ins-DL-OEM 4-25, 0 ins-DL-OEM 4-26, 0 ins-DL-OEM 4-36, 0 ins-DL-OEM	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	## CAN CASE OF	5; BeiDou B1T, B1C B1C, B1C, B1C, B1C, B1C, B1C, B1C, B1C,		
IMI	Channel configuration (4) GNSS Positions data rate (5) RTK corrections GNSS Measurements (raw) data rate Velocity accuracy, RMS Initialization time Time accuracy (dock drift) (7) Gyroscopes Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Angular Random Walk Accelerometers Type Measurement range Bias in-run stability (RMS, Allan Variance) Bias error over temperature range (RMS) Bias one-year repeatability Velocity Random Walk Environment Operating temperature Storage temperature Storage temperature MTBF Electrical Supply voltage Power consumption Output Interface (options)	Hz meters/sec Sec nano sec Units deg/sec deg/hr deg/hr deg/yhr Units g mg mg mg deg C deg C hours Units	#8 q 0.01 0.7 1.5 0.02	### ACT ACT ### ACT	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	## CAN CASE OF	5; BeiDou B1T, B1C B1C, B1C, B1C, B1C, B1C, B1C, B1C, B1C,		

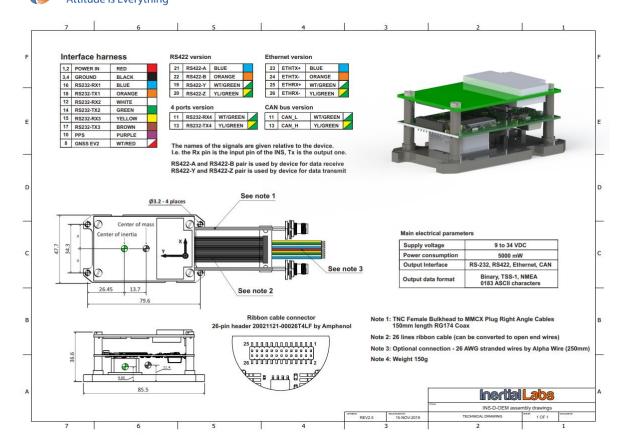
⁽i) GPS only; (ii) RMS, incremental error growth from steady state accuracy. Post-processing results using third party software; (iii) 2 meters base line between two GNSS antennas; (iii) tracks up to 60 L1/L2 satellites;

^{(9) 50} Hz while tracking up to 20 satellites. 20 Hz position update rate for Basic model of INS; (9) dynamic accuracy may depend on type of motion; (7) time accuracy does not include biases due to RF or antenna delay



INS-D/DL-OEM electrical and mechanical interface drawing Color codes are given for mating connector option 1: CCA-025-I18R152 by NorComp LT. GREEN 12 RS232-RX3 PINK/BLACK 24 POWER IN 11 RS232-RX1 10 RS232-TX3 WHITE 23 GROUND GREEN/BLACK 9 RS232-TX1 GRAY 22 GROUND YELLOW/BLACK 21 GROUND ORANGE/BLACK 8 RS422-TX+ VIOLET RS422-TX-BLUE 20 GROUND RED/BLACK 6 RS422-RX+ GREEN VIOLET/WHITE GROUND 5 RS422-RX-YELLOW 18 **GNSS EV2** BLUE/WHITE 4 ETH-TX+ ORANGE 17 GNSS PPS GREEN/WHITE 16 RS232-RX4 RED ORANGE/WHITE 3 ETH-TX-2 ETH-RX+ 15 RS232-RX2 RED/WHITE 14 1 ETH-RX-BLACK RS232-TX4 BROWN/WHITE 13 RS232-TX2 BLACK/WHITE Option 1: CCA-025-I18R152 by NorCo Option 2: MDM-25SH003B by ITT The names of the signals are given relative to the device. ore information refer to cable drawings by Inertial Labs) **⊕**Ø **e** Center of mas Center of inertia See note 1 Ø3.2 - 4 places 21.8 18 Main electrical para Supply voltage 9 to 34 VDC RS-232, RS422, Ethernet, CAN tor MDSM-25PE-Z10-VR17 thead, 150mm length RG178 Coax Note 1: TNC Female Bul Note 2: Weight 160g **Inertial Labs** 1 POWER IN RED 1 POWER IN 1 POWER IN 1 POWER IN 2 GROUND 3 GNSS EV2 4 GNSS PPS 5 RS232-RX2 6 RS232-TX2 7 RS232-RX4 2 GROUND 3 GNSS EV2 BLACK BLACK BLACK 3 GNSS EV2 GNSS EV2 PURPLE PURPLE PURPLE 4 GNSS PPS 5 RS232-RX2 6 RS232-TX2 4 GNSS PPS GREY GREY GNSS PPS GREY 6 RS232-TX2 7 RS232-RX4 (CAN L) YELLOW 7 RS232-RX4 (CAN L) YELLOW RS232-RX4 (CAN L) YELLOW 8 RS232-TX4 (9 RS232-TX3 10 RS232-TX3 11 ETHR-TX+ 14 ETHR-TX-8 RS232-TX4 (CAN_H) 8 RS232-TX4 (CAN 9 RS232-RX3 WHITE 9 RS232-RX3 PURPLE PURPLE 10 RS232-TX3 11 RS422-TX+ GREEN GREEN GREEN WHITE ORANGE 14 RS422-TX-ORANGE ORANGE WHITE WHITE Note 1: PPS and EV2 conductors are twisted Note 2: RS232-RX1 and RS232-TX1 conductors are tv Note 3: NC and NC conductors are twisted Note 4: RS422-RX+ and RS422-RX- conductors are tv Note 5: RS422-TX+ and RS422-TX- conductors are twisted Note 6: ETHR-TX+ and ETHR-TX- conductors are twisted Note 7: ETHR-RX+ and ETHR-RX- conductors are twisted Note 8: 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. Cable side: 14-pin connector M80-4601405 by Harwin (Length is 500mm) 47.7 Ø Ø3.2 - 4 places 13.7 Supply voltage 9 to 34 VDC Device side: 14-pin connector M80-5401442 by Harwin RS-232, RS422, Ethernet, CAN Output Interface Output data format **Inertial Labs** 85.5

GPS-Aided INS-D/DL-OEM Datasheet Rev. 3.0



Part number structure:

Model	Gyroscope	Accel	Calibration	Connector	Encoder	Data Logger	GNSS receiver	Version	Interface
INS-D-OEM	G450	A8	TGA	C4	E (option)	S64	07720	VD4	1
	G950	A15	TMGA (Optional)	C6			WOR	VD42	2
	G2000	A40		C8				VD43	3
								VD49	4
									5
									11
									22
									145
									245

									-
Model	Gyroscope	Accel	Calibration	Connector	Encoder	Data Logger	GNSS receiver	Version	Interface
INS-DL-OEM	G450	A8	TGA	C4	E (option)	S64	B482	VD9	1
	G950	A15	TMGA (Optional)	C6			WOR		2
	G2000	A40		C8					3
									4
									5
									11
									22
									145
									245

Example: INS-DL-OEM-G450-A15-TGA-C6E-B482-VD9.1

- INS-D-OEM: Dual Antenna GPS-Aided Inertial Navigation System
- INS-DL-OEM: Low cost Dual Antenna GPS-Aided Inertial Navigation System
- G450: Gyroscopes measurement range = ±450 deg/sec
- G950: Gyroscopes measurement range = \pm 950 deg/sec
- G2000: Gyroscopes measurement range = ± 2000 deg/sec
- A8: Accelerometers measurement range = ± 8 g \rightarrow recommended for applications with low level of operational vibrations
- A15: Accelerometers measurement range ±15 g -> recommended for applications with medium level of operational vibrations
- A40: Accelerometers measurement range ±40 g -> recommended for high dynamic applications or/and with high level of vibration



GPS-Aided INS-D/DL-OEM Datasheet Rev. 3.0

- TGA: Gyroscopes and Accelerometers
- TMGA: Magnetometers, Gyroscopes and Accelerometers
- C4: Aluminum Base Plate 26 pin header and ribbon cable (20021121-00026T4LF by Amphenol) (with available interfaces of: RS-232, RS-422, Ethernet and CAN)
- C6: Aluminum Base Plate 14 pin screw-lock connector (M80-5401442 by Harwin) (with available interfaces of: RS-232 and CAN, RS-422 and CAN, or Ethernet and CAN)
- C8: Aluminum Base Plate 25 pin enclosed cable with screw lock connector (CCA-025-I36R152 by NorComp) (with available interfaces of: RS-232, RS-422, Ethernet and CAN)
- E: Encoder support
- S64: 64GB embedded Data Logger (optional)
- O7720: Novatel OEM7720 dual antenna GNSS receiver (INS-D only)
- B482: Inertial Labs B482 dual antenna GNSS receiver (INS-DL only)
- WOR: without GNSS receiver
- VD4: GPS L1/L2, Dual antenna Heading, SBAS, DGPS, 20 Hz positions (INS-D only)
- VD42: GPS L1/L2, GLONASS L1/L2, Dual GNSS Heading, SBAS, DGPS, RTK, 20 Hz measurements, 20 Hz positions (INS-D-OEM only)
- VD43: GPS L1/L2, GLONASS L1/L2, Dual antenna Heading, SBAS, DGPS, 20 Hz positions (INS-D-OEM only)
- VD49: GPS L1/L2, GLONASS L1/L2, NavIC (IRNSS), Dual antenna Heading, SBAS, DGPS, 20 Hz positions; 20 Hz GNSS measurements (INS-D-OEM only)
- VD9: GPS L1/L2, GLONASS L1/L2, BEIDOU B1/B2, GALILEO E1/E5, QZSS L1/L5, DGPS, RTK, Dual GNSS Heading, 20 Hz measurements, 20 Hz positions (INS-DL-OEM only)
- VX.1: RS-232 interface
- VX.2: RS-422 interface
- VX.3: RS-485 interface (temporary is not available)
- VX.4: CAN interface
- VX.5: Ethernet interface
- VX.11: two RS-232 interfaces (only available for C4 and C8 connectors)
- VX.22: two RS-422 interfaces (only available for C4 and C8 connectors)
- VX.145: RS-232, CAN and Ethernet interfaces (with optional Encoder support) (only available for C4 and C8 connectors)
- VX.245: RS-422, CAN and Ethernet interfaces (without Encoder support) (only available for C4 and C8 connectors)