



F.A.R.O.

**Single & Dual Antenna GPS-Aided
Inertial Navigation Systems**
INS



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Single and Dual Antenna GPS-Aided INS Specifications

	Parameter	Units	INS-B (Basic)	INS-P (Professional)	INS-D (Dual Antenna)
	Output signals		Positions, Heading, GNSS Heading (D model), Pitch & Roll, Heave (D model), Velocity, Accelerations, Angular rates, Barometric data, Pulse Per Second (PPS)		
	Update rate	Hz	1 ... 200 (user settable)	1 ... 200 (user settable)	1 ... 200 (user settable)
	Start-up time	sec	<1	<1	<1
Navigation	Positions, Velocity and Timestamps	Units	INS-B	INS-P	INS-D
	Horizontal position accuracy (GPS L1), RMS	meters	1.5	1.5	1.5
	Horizontal position accuracy (GPS L1 & L2), RMS	meters	1.2	1.2	1.2
	Horizontal position accuracy (SBAS), RMS ⁽¹⁾	meters	0.6	0.6	0.6
	Horizontal position accuracy (DGPS), RMS	meters	0.4	0.4	0.4
	Horizontal position accuracy (post processing) ⁽²⁾	meters	0.05	0.05	0.05
	Horizontal position accuracy (RTK), RMS	meters	0.01 + 1 ppm	0.01 + 1 ppm	0.01 + 1 ppm
	Vertical position accuracy, RMS	meters	<1	<1	<1
	Velocity accuracy, RMS	meters/sec	0.03	0.03	0.03
	PPS timestamps accuracy	milliseconds	<5	<5	<5
Orientation	Heading	Units	INS-B	INS-P	INS-D
	Range	deg	0 to 360	0 to 360	0 to 360
	Static Accuracy ⁽³⁾	deg	1	0.2	0.2
	Dynamic Accuracy ⁽⁶⁾	deg RMS	1.5	0.4	0.4
	Dual antenna GNSS Heading accuracy	deg RMS	-	-	0.08 (2 meters baseline)
	Post processing accuracy ⁽¹⁾	deg RMS	0.5	0.1	0.1
	Pitch and Roll	Units	INS-B	INS-P	INS-D
	Range: Pitch, Roll	deg	±90, ±180	±90, ±180	±90, ±180
	Angular Resolution	deg	0.01	0.01	0.01
	Static Accuracy in whole Temperature Range	deg	0.05	0.05	0.05
GNSS	Heave	Units	INS-B	INS-P	INS-D
	Measurement range	meters	-	-	±300
	Resolution	meters	-	-	0.01
	Accuracy, RMS	% (meters)	-	-	5 (0.05)
	GNSS receiver	Units	INS-B	INS-P	INS-D
	Number of Antennas		Single	Single	Dual
	Supported navigation signals		L1 & L2 GPS, GLONASS, GALILEO, BEIDOU, SBAS, DGPS, RTK		
	Channel configuration ⁽⁴⁾		120 Channels		
	GNSS Positions data rate ⁽⁵⁾	Hz	20, 50		
	GNSS Measurements (raw) data rate	Hz	20		
Sensors	Single antenna Heading accuracy, RMS ⁽⁶⁾	degree	0.1		
	Dual antenna Heading accuracy, RMS	degree	0.08 (2 meters baseline)		
	Velocity accuracy, RMS	meters/sec	0.03		
	Initialization time	Sec	<50 (cold start), <30 (hot start)		
	Time accuracy (clock drift) ⁽⁷⁾	nano sec	20		
	Gyroscopes	Units	INS-B	INS-P	INS-D
	Measurement range	deg/sec	±450	±450	±450
	Bias in-run stability (RMS, Allan Variance)	deg/hr	1	1	1
	Noise density	deg/sec/Hz	0.004	0.004	0.004
	Accelerometers	Units	INS-B	INS-P	INS-D
General	Measurement range	g	±8	±8	±8
	Bias in-run stability (RMS, Allan Variance)	mg	0.005	0.005	0.005
	Noise density	mg/√Hz	0.015	0.015	0.015
	Magnetometers	Units	INS-B	INS-P	INS-D
	Measurement range	Gauss	±2	±1.6	±2
	Bias in-run stability, RMS	nT	4	0.2	4
	Noise density, PSD	nT/√Hz	10	0.3	10
	Pressure	Units	INS-B	INS-P	INS-D
	Measurement range	hPa	300 – 1100	300 – 1100	300 – 1100
	Bias in-run stability (RMS, Allan Variance)	Pa	2	2	2
Environment	Noise density	Pa/√Hz	0.8	0.8	0.8
	Operating temperature	deg C	INS-B	INS-P	INS-D
	Operating temperature	deg C	-40 to +70	-40 to +70	-40 to +70
	Storage temperature	deg C	-50 to +85	-50 to +85	-50 to +85
	MTBF	hours	55,500	55,500	55,500
	Electrical	Units	INS-B	INS-P	INS-D
	Supply voltage	V DC	9 to 36	9 to 36	9 to 36
	Power consumption	Watts	1	1.4	2.6
	Output Interface	-	RS-232, RS-422, RS-485	RS-232, RS-422, RS-485	RS-232, RS-422, RS-485
	Output data format	-	Binary, TSS-1, NMEA 0183 ASCII characters	Binary, TSS-1, NMEA 0183 ASCII characters	Binary, TSS-1, NMEA 0183 ASCII characters
Physical	Physical	Units	INS-B	INS-P	INS-D
	Size	mm	120 x 50 x 53	120 x 50 x 53	120 x 50 x 53
	Weight	gram	220	280	320