TR-2S INS OEM

GNSS-Aided Inertial Navigation System

Key Features

- All GNSS Constellations
- Spoofing & Jamming Detection
- Fast Acquisition Channels

- Full attitude determination
- Small Size
- Light weight

The TR-2S INS is a small, advanced OEM GNSS-aided Inertial Navigation System that combines two complementary technologies: GNSS and INS. The footprint is suitable for any application requiring precise, uninterrupted navigation and attitude within a compact size. Patented anti-spoofing and jamming detection enhances resilience, complemented by a comprehensive suite of interfaces for various applications.

Accelerometers and gyroscopes are fully calibrated, temperature-compensated, and mathematically aligned to an orthogonal coordinate system.

JAVAD

Tracking	Total Channels	874
	GPS	L1 C/A, L1C, P1, P2, L2C, L5
	GLONASS	L1 C/A, P1, P2, L2 C/A, L3
	Galileo	E1, E5, E5A, E5B, E6
	BeiDou	B1, B1C, B2B, B2, B2A, B3
	QZSS	L1C C/A, L1C, L2C, L5, L6, L1S, L1Sb, L5S
	SBAS	L1, L5
	NavIC	L1, L5, S
	L-Band	1525-1560 Mhz

Performance*		Horizontal (m)	Vertical (m)
	Standalone	1.000	1.500
	SBAS	0.500	0.850
	DGPS	0.250	0.500
	RTK	0.008 + 1 ppm	0.015 + 1 ppm
	Network RTK	0.008 + 0.5 ppm	0.015 + 1 ppm
	Static / Fast Static	0.003 + 0.1 ppm	0.004 + 0.4 ppm

GNSS+INS Accuracy (RMS)**	Outage (s)	Position Mode	Position Accuracy		Attitude Accuracy	
			Horizontal (m)	Vertical (m)	Heading (deg)	Pitch/Roll (deg)
	0	Stand Alone	< 1	< 1.5	< 0.1	< 0.05
		RTK	< 0.008	< 0.015		
	60	Stand Alone	< 8	< 4	< 0.15	< 0.09
		RTK	< 7	< 2		

Time to First Fix	Cold Start	< 35 s
	Warm Start	< 5 s
	Reacquisition	< 1 s
	RTK Initialization	2 - 6 s

Output Rate	Position	up to 200 Hz
	Measurements	up to 200 Hz

Wired I/O	Main Connector	25-pin micro D-SUB connector with screw lock (MDSM-25PE-Z10-VR17 by ITT Cannon)
	GNSS Antenna	1 x MMCX, +5 VDC Ports (0.16A max)
	Serial	1 x RS232 up to 460.8 kbps 1 x RS232/RS422 up to 460.8 kbps
	USB	1 x USB 2.0 Full Speed. Up to 3.0 Mbps UART
	CAN	1 x CAN 2.0
	Event Marker	1 x Event Marker
	1PPS	1 x 1PPS output synchronized to GPS or UTC

Storage	Internal Memory	Up to 16 GB

Power	Input	+5.5 to +36 VDC
	Power Consumption	2.8 W typical

IMU performance (KERNEL-110)	Gyroscope performance	Technology	MEMS		
		Dynamic range	± 2000 °/s		
		Bias in-run stability	2 °/hr		
		Noise. Angular Random Walk (ARW)	0.3 °/√hr		
	Accelerometer performance	Technology	MEMS		
			Kernel 110-08	Kernel 110-15	Kernel 110-40
		Dynamic range	± 8g	± 15g	± 40g
		Bias in-run stability	0.1mg	0.03mg	0.05mg
		Noise. Angular Random Walk (ARW)	0.02m/s/√hr	0.045m/s/√hr	0.06m/s/√hr
Physical	Dimensions	45 x 75 x 32 mm			
	Weight	90g			
Environmental	Operating Temperature	-40°C to +80°C			
	Storage Temperature	-40°C to +85°C			
	Shock & Vibration	MIL-STD-810G ISO-9022-31-06 Shock, Severity 5 IEC 60068-2-6 Sine Vibration			

*GNSS performance is dependent on signal quality, satellite geometry, ionospheric and tropospheric conditions, baseline length, multipath effects and RF interference.
**Performance may degrade under unmitigated vibration or significant temperature variation; unit-to-unit variation may occur.

Specifications may be changed without notice.