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Anexo A

Xsens

Output

3D orientation (Quaternions/Matrix/Euler angles)
3D acceleration
3D rate-of-turn
3D earth-magnetic field (normalized)
Temperature

Orientation performance

Dynamic Range:	all angles in 3D
Angular Resolution[1]:	0.05 deg
Static Accuracy (Roll/Pitch):	<0.5 deg
Static Accuracy[2] (Heading):	<1 deg
Dynamic Accuracy[3]:	2 deg RMS

Sensor performance

	rate of turn	acceleration	magnetic field	temperature
Dimensions	3 axes	3 axes	3 axes	-
Full Scale (standard)	± 300 deg/s	± 17 m/s²	± 750 mGauss	-55...+125 °C
Linearity	0.1% of FS	0.2% of FS	0.2% of FS	<1% of FS
Bias stability[4] (1σ)	5 deg/s	0.02 m/s²	0.5 mGauss	0.5 °C accuracy
Scale Factor stability[4] (1σ)	-	0.05%	0.5%	-
Noise density	0.1 deg/s/√Hz	0.001 m/s²/√Hz	0.5 mGauss (1σ)	-
Alignment error	0.1 deg	0.1 deg	0.1 deg	-
Bandwidth (standard)	40 Hz	30 Hz	10 Hz	-

Options

Full Scale	± 150 deg/s	± 100 m/s²
	± 900 deg/s	
	± 1200 deg/s	
Other options on request		

Interfacing

Max update rate:	512 Hz (calibrated sensor data)
	100 Hz (orientation data)
Digital interface:	RS-232, RS-422 and USB (external converter)
Analog interface (optional):	0 - 3.3V (Roll, Pitch, Heading)
Operating voltage:	4.5 - 15V
Power consumption:	360 mW (orientation output)

Housing

Dimensions:	58x58x22 mm (WxLxH)
Weight:	50 g
Ambient temperature operating range:	0 - 55 deg Celsius

Figura 109 – *"Datasheet"* Xsens

Anexo B

Gamin

1.5 TECHNICAL SPECIFICATIONS

Specifications are subject to change without notice.

1.5.1 Physical Characteristics

1.5.1.1 Size

61 mm in diameter and 19.5 mm in height

1.5.1.2 Weight

- GPS 18 unit only (no cable): 1.9 oz (53.9 g)
- GPS 18 USB: 3.5 oz (100.4 g)
- GPS 18 PC: 6.5 oz (184.6 g)
- GPS 18 LVC (3 meter cable): 3.9 oz (110.6 g)
- GPS 18 LVC-5m (5 meter cable): 5.7 oz (161.6 g)
- GPS 18-5Hz (5 meter cable): 5.7 oz (161.6 g)

1.5.1.3 Color

Black

1.5.1.4 Case Material

Polycarbonate thermoplastic that is waterproof to IEC 60529 IPX7 level (immersion in 1 meter of water for 30 minutes)

1.5.1.5 Cable Length

- GPS 18 USB: 2 meter
- GPS 18 PC: 2 meter
- GPS 18 LVC: 3 meter (Garmin Part Number 010-00321-05)
- GPS 18 LVC-5m: 5 meter (Garmin Part Number 010-00321-06)
- GPS 18-5Hz: 5 meter

Figura 110 – *"Datasheet"* GPS Parte 1

1.5.2 Electrical Characteristics

1.5.2.1 Input Voltage
- GPS 18 USB: 4.4–5.5 V
- GPS 18 PC: 8–30 V (Automotive supply from cigarette lighter jack)
- GPS 18 LVC: 4.0–5.5 V
- GPS 18-5Hz: 4.0–5.5 V

1.5.2.2 Input Current
- GPS 18 USB: 55 mA @ 5.0 V
- GPS 18 PC: 50 mA @ 13.8 V
- GPS 18 LVC: 60 mA @ 5.0 V
- GPS 18-5Hz: 65 mA @ 5.0 V

1.5.2.3 CMOS Serial Output Levels
- GPS 18 PC: 0 V to 5 V (Asynchronous Serial, TIA-232-F (RS-232) Compatible Polarity)
- GPS 18 LVC and GPS 18-5Hz: 0 V to Vin, between 4 and 5.5 V (Asynchronous Serial, TIA-232-F (RS-232) Compatible Polarity)

1.5.4 GPS Performance

1.5.4.1 Receiver
WAAS enabled; 12 parallel channel GPS receiver continuously tracks and uses up to 12 satellites (up to 11 with Measurement Pulse Output active) to compute and update your position.

1.5.4.2 Acquisition Times
- Reacquisition: Less than 2 seconds
- Warm: Approx. 15 seconds (all data known)
- Cold: Approx. 45 seconds (initial position, time, and almanac known; ephemeris unknown)
- AutoLocate™:   5 minutes (almanac known; initial position and time unknown)
- SkySearch: 5 minutes (no data known)

1.5.4.3 Update Rate
- GPS 18 USB, PC, and LVC: 1 record per second
- GPS 18-5Hz: 5 records per second

1.5.4.4 Accuracy
- GPS Standard Positioning Service (SPS)
  Position: < 15 meters, 95% typical
  Velocity: 0.1 knot RMS steady state
- WAAS
  Position: < 3 meters, 95% typical
  Velocity: 0.1 knot RMS steady state
- Measurement Pulse Output Time: ±1 microsecond at rising edge of the pulse
- Dynamics: 999 knots velocity (only limited at altitude greater than 60,000 feet), 6g dynamics

Figura 111 – *Datasheet* GPS Parte 2