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M12M TIMING ONCORE[™] RECEIVER

Preliminary Specification



12 Channel simultaneous operation Fully calibrated to UTC at USNO Performance using clock granularity message < 2nS 1 Sigma average < 6nS 6 Sigma average Performance not using clock granularity message < 10nS 1 Sigma average < 20nS 6 Sigma average 155mW Power consumption

M12M Timing OncoreTM Receiver is a 12 channel precise GPS timing module that gives you up to nano seconds accuracy of time synchronization. Features included precise, programmable, one-pulse-per-second (1PPS) or 100 pulse-per-second (100PPS) outputs. Built with cost effective in mind, you can equip your stationary applications with precise GPS or UTC time synchronization at an affordable cost. M12M Timing also incorporates the Timing RAIM (Receiver autonomous integrity monitoring) algorithm to ensure validity and reliable GPS measurements.

Design to work in tough conditions, M12M undergoes various drop and temperature test before rolling out into the market.

Accurate Timing

Extensive testing of M12M Timing OncoreTM, ensures a high level of performance accuracy of 2 nano seconds.

Automatic Site Survey mode

Averages a total of 10,000 valid 2D and 3D position fixes to determine precise position, simplifies system installation for static timing applications.

Fast timing update

Using position-hold Modes, M12M enables fast time resolution rather than positioning update.

RF Jamming Immunity

Provide up to 10dBm of immunity, utilizing the Adaptive Tracking Loops algorithm built in the firmware.

Clock granularity message

Utilizing M12M Timing OncoreTM's clock granularity software output, 1 PPS output can be resolved within only 2 nano seconds of UTC time immediately, reducing noise and accelerating host clock disciplining process.



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General Characteristics –	Receiver Architecture	12 parallel channel L1 1575.42 MHz C/A code (1 023 MHz chip rate)
		Code plus carrier tracking (carrier aided tracking)
	Tracking Capability	12 simultaneous satellite vehicles
	Dynamics	Velocity: 1000 knots (515 m/s) > 1000 knots (515 m/s): at
Characteristics	Dynamios	altitudes < 60.000 ft (18000 m)
		Acceleration: 4g
		Jerk: 5 m/s ³
		Vibration: 7.7g per Military Standard 810E
	Acquisition Time	< 15 s typical TTFF-hot (with current almanac, position, time an
	(Time To First Fix, TTFF)	ephemeris)
		< 40 s typical TTFF-warm (with current almanac, position, time)
	(Tested at -40°C to +85°C)	< 150 s typical I I FF-cold (No stored information)
	Desitioning Assumption	< 1.0 s Internal reacquisition (typical)
	Positioning Accuracy	< 5 m, 1 - Sigma
		< 10 III, 2-Sigilia Performance using clock granularity message:
	1 Pulse Per Second (PPS) or	2 ns 1-sigma
	100 PPS	< 6 ns. 6-sigma
		Performance not using clock granularity message:
		< 10 ns, 1-sigma
		< 20 ns, 6-sigma
	Datum	WGS-84 default
		One user definable datum
Antenna	Antenna Requirements	Active antenna module powered by receiver module (80mA mat
		10dB to 50dB external antenna gain measured at receiver input 3 Vdc or 5 Vdc antenna power provided via header connector
Serial	Output Messages	Latitude, longitude, height, velocity, heading, time
Communication		Motorola binary protocol at 9600 baud
		NMEA 0183 (GGA, GLL, GSA, GSV, RMC, VTG, ZDA)
		Software selectable output rate (continuous or poll)
		TTL interface (0 to 3 V)
Electrical Characteristics	Power Requirements	2.8 Vdc to 3.3 Vdc; 50 mVp-p ripple (max)
	"Keep-Alive" BATT Power	External 2.2 Vdc to 3.2 Vdc, 5 uA typical @ 2.7 Vdc @ 25°C
<u>.</u>	Power Consumption	155 mW @ 3 V without antenna
Physical _ Characteristics _ _	Dimensions	40.0 x 60.0 x 13.0 mm (1.57 x 2.36 x 0.53 in.)
		Receiver 12.5 g
	Connectors	Data/power: 10 pin (2x5) unsnrouded header on 0.050 in.
		RE: right angle MMCX
	Antenna to Receiver	Single coaxial cable (with power on center conductor to support
	Interconnection	active antenna)
		Antenna sense circuit
Environmental _ Characteristics _ _	Operating Temperature	-40°C to +85°C
	Storage Temperature	-40°C to +105°C
	Humidity	95% over dry bulb range of +38°C to +85°C
	Altitude	18,000 m (60,000 ft.) maximum
		> 18,000 m (60,000 ft.) for velocities
		< 515 m/s (1000 knots)
Miscellaneous	Standard Features	Position hold with automatic site survey
		Clock granularity error message
		T-RAIM (Timing Receiver Autonomous Integrity Monitoring)
	Ontional Features	Lithium battery backup

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