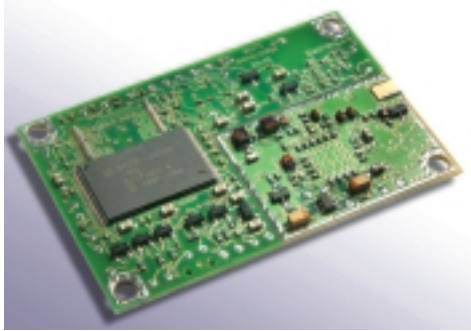


# M12+ TIMING ONCORE™ RECEIVER



## THE CORRECT CHOICE TOWARDS PROVIDING CARRIER-GRADE TIMING RELIABILITY

### Key Features of the M12+ Timing Oncore

- 3 Volt operation
- 12 Channel simultaneous operation
- Fully calibrated to UTC at USNO
- Performance using clock granularity message
  - < 2nS 1 Sigma average
  - < 12nS 6 Sigma average
- Performance not using clock granularity message
  - < 10nS 1 Sigma average
  - < 60nS 6 Sigma average
- 185mW Power consumption
- Small 40 \* 60 \* 10 mm form factor
- 200 Seconds typical cold start TTF
- 50 Seconds typical warm start TTF
- 25 Seconds typical hot start TTF
- <1s internal reacquisition
- Position hold mode for improved accuracy
- Automatic site survey for position hold
- Advanced T-RAIM features
- Antenna current sense detection

There's only one name for quality  
and performance in GPS technology.



The M12+ Timing Oncore is the newest member of the successful Oncore family, built on Motorola's strong legacy and experience in this specialized market.

### Reliable timing

The M12+ Timing Oncore represents Motorola's continued commitment to the GPS accurate timing market. Developed specifically for timing applications, the M12+ Timing Oncore receiver reflects Motorola's high standard for performance in timing and frequency stabilization.

### Advanced T-RAIM features

Utilizing Motorola's Time RAIM (receiver autonomous integrity monitoring) algorithm, the M12+ Timing Oncore helps ensure the validity and reliability of GPS measurements.

### Highly accurate

Extensive testing of the M12+ Timing Oncore at the internationally recognized USNO laboratory confirms a high level of performance as indicated by the 6 Sigma timing averages. A complete test report is available on request.

### Clock granularity message

Using the M12+ Timing Oncore's clock granularity software output, the 1 PPS output can be resolved to within nanoseconds of UTC time immediately, reducing noise and accelerating host clock disciplining process.

### Motorola Matching Oncore Timing2000 Antenna

- 25dB Active Antenna
- 5 Volt operation
- 26mA typical current consumption
- High strength direct mount
- <1.5dB typical noise figure
- 40dB minimum filtering at  $\pm 50$ MHz



## M12+ Timing Oncore Receiver Technical Specifications



From Motorola, the leader in GPS technology

The Oncore family of GPS receivers demonstrates Motorola's quest for product and service excellence, and is further evidenced by our QS-9000 certification and Six Sigma quality achievements. Understand Motorola's reliability, responsive support and long-term commitment and you understand why Oncore is the receiver of choice. *After all, it's not where you are, it's where you're going.*

<b>GENERAL CHARACTERISTICS</b>	Receiver Architecture	12 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
<b>PERFORMANCE CHARACTERISTICS</b>	Dynamics	Velocity: 1000 knots (515 m/s) > 1000 knots (515 m/s); at altitudes < 60,000 ft. (18,000m) Acceleration: 4g Jerk: 5 m/s <sup>3</sup> Vibration: 7.7G per Military Standard 810E
	Acquisition Time (Time To First Fix, TTFF)	200s TTFF-cold (with current almanac, position, time and ephemeris) 50s TTFF-warm (with current almanac, position, and time) 25s TTFF-hot (No stored information) (Tested at -30 to +85°C) < 1.0s internal reacquisition (typical)
	Positioning Accuracy	100 meters 2dRMS with SA as per DoD specification Less than 25 m SEP without SA
	Timing Accuracy (1 Pulse per second or, 100 PPS)	Performance using clock granularity message* < 2nS 1 Sigma average < 12nS 6 Sigma average
	Position hold mode active	Performance not using clock granularity message* < 10nS 1 Sigma average < 60nS 6 Sigma average
	Antenna Requirements	Active antenna module powered by receiver module 18dB to 36dB external antenna gain measured at input to receiver 3 V or 5 V Antenna power provided via header connector
	Datum	WGS-84 Default One user definable datum
	<b>SERIAL COMMUNICATION</b>	Output Messages
<b>ELECTRICAL CHARACTERISTICS</b>	Power Requirements	2.85 to 3.15 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
	Power Consumption	<185mW @ 3 V without antenna
<b>PHYSICAL CHARACTERISTICS</b>	Dimensions	40.0 x 60.0 x 10.0 mm (1.57 x 2.36 x 0.39 in.)
	Weight	Receiver 25 g (0.9 oz.) Active Antenna Module < 40 g
	Connectors	Data/power: 10 pin (2 x 5) unshrouded header on 0.050 in. centers (available in right angle or straight configuration) RF: right angle MMCX (subminiature snap-on)
	Antenna to Receiver Interconnection	Single coaxial cable Antenna sense circuit
<b>ENVIRONMENTAL CHARACTERISTICS</b>	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)
<b>MISCELLANEOUS</b>	Standard Features	Motorola Binary Protocol Position hold with automatic site survey Clock Granularity Error Message T-RAIM (Timing Receiver Autonomous Integrity Monitoring)
	Optional Features	Lithium battery backup
<b>NOTE</b>	All specifications typical and quoted at 25°C unless otherwise specified	

\*USNO test report available on request.



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