



# 8100

## Ruggedized Rubidium Oscillator

### KEY FEATURES

- Superior Shock and Vibration Performance Characteristics
- 48-Hour Holdover
- Aging  $<5.0E-11$  per Month
- Single PWB With Surface Mount Technology
- Superior Ease of System Integration
- Meets GSM Frequency Requirements

The Symmetricom 8100 is an enhanced version of our popular commercial LPRO rubidium oscillator. This ruggedized COTS rubidium oscillator is ideal for use in tactical applications where shock, vibration sensitivity, excess relative humidity and other environmental effects are a challenge. Designed for ease of integration into frequency and timing systems, the Symmetricom 8100 offers a low profile and single circuit board construction that uses surface mount technology. The circuit board is conformal-coated for increased moisture resistance, and special precautions are taken for improved shock and vibration tolerance. The height and footprint easily meet the requirements for 1U VME applications. Use of both a filtered D-Connector for I/O signals and an outer mu-metal cover minimizes EMI emissions and susceptibility. For ease of integration, the Symmetricom 8100 only needs one input supply voltage and will allow direct plug-in into another circuit board.

The long life rubidium lamp and extended crystal control range of the 8100 helps extend operating periods, minimize maintenance and gives acceptable performance of more than a decade. By design, the Symmetricom 8100 provides a stable frequency with good short and long-term stability, and excellent spur performance. A 5V CMOS-compatible alarm signal derived from the basic physics operation indicates when output frequency is outside roughly  $+5E-8$  of absolute frequency offset. The low temperature coefficient and excellent frequency stability extend holdover performance.

Suitable applications include shipboard, airborne, navigation timing, range timing and other tactical applications that need the performance level associated with rubidium technology in a commercial off the shelf (COTS) package.



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# 8100 Specifications

## ELECTRICAL SPECIFICATIONS

- RF output
  - Output: 10MHz Sinewave
  - Amplitude: 7.0 - 9.5dBm
  - Output impedance: 50Ω @ 10 MHz
  - Harmonic signals: ≤-40dBc
  - Non-harmonic signals: ≤-80dBc
- Short term stability
  - τ = 1 s <2.5E-11
  - τ = 10 s <8.0E-12
  - τ = 100 s <2.5E-12
- Phase noise (SSB)
  - 1 Hz -75dBc
  - 10 Hz -89dBc
  - 100 Hz -128dBc
  - 1000Hz -140dBc
  - 10kHz -147dBc
- Aging monthly (after 1 month): <5.0E-11/month
- 10 years: <1.0E-9
- Frequency accuracy at shipment: ±5E-11 (25° C)
- Frequency retrace: <±2.5E-11  
(after 24 hrs. power on @ 25° C & up to 48 hrs power off)
- Frequency control
  - Internal trim range (trimpot): ±1.5E-9
  - External trim range (electronic): ±1.5E-9 (0V to +5V)
- Warm-up
 

	<b>(at -20° C)</b>	<b>(at 25° C)</b>
Time to lock:	<8.7 min	<5.4 min
Time to <1.0E-9:	<10.2 min	<7.3 min
Time to <4.0E-10:	<12.7 min	<10.6 min
Max. input (Amps) @ 24 V:	<1.45 amps	<1.43 amps
- Input voltage range: +19 TO 32 Vdc
- Voltage sensitivity: .72E-11/V (over input voltage range)
- Input power, quiescent: +24Vdc <13W@25° C  
+19Vdc <7W@65° C
- Status monitor
  - Analog: VCXO volts, lamp volts  
(20 kΩ impedance, filtered)
  - Digital: LOCK monitor: 5V CMOS load
  - Lock: 0.2V (CMOS Low)
  - Unlock: >2.5V (CMOS High)

## ENVIRONMENTAL & SPECIFICATIONS

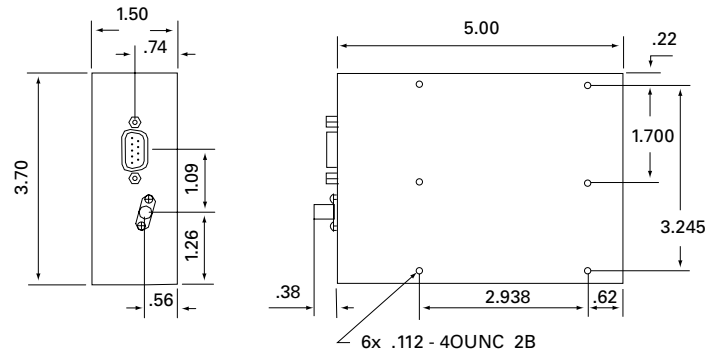
- Operating temperature: -25° C baseplate to +70° C BP  
0° C to +50° C
- Temperature coefficient
  - |y (70° C)-y(-25° C)| <6.0E-10
  - |y (50° C)-y(0° C)| <3.0E-10
- Storage temperature: -55° C to +85° C
- Altitude
  - Operating: -200' to 70,000' (-60.96 m to 21,336 m)
  - Non-operating: -200'to 70,000' (-60.96 m to 21,336 m)
- Magnetic field sensitivity, dc (±2 GAUSS) ±4E-11/GAUSS
- Relative humidity: 0 to 95% RH per MIL-STD-810, Method 507.1, Procedure II
- Vibration
  - Non-operating: Mil Std 202 Method 214 Test Cond. 1-3 Gís RMS Random
- EMI: Compliant to FCC Part 15 Class B (conducted and radiated emissions) and complies with EN55022B emissions (radiated and conducted) and EN50082-1 (immunity)
- MTBF: Per Bellcore TR-NWT-00332, (Ground Fixed, Controlled)
 

Amb. Temp	20° C	25° C	30° C	40° C	50° C	60° C
MTBF (hrs)	81,000	351,000	320,000	253,000	189,000	134,000

 (RELEX software V5.1, part stress, MET 1 case 3)

## PHYSICAL SPECIFICATIONS

- Weight: 1.10 lbs. (0.49 Kg) maximum
  - Size: 3.7" x 5.0" x 1.5" H  
(9.39 cm x 12.7 cm x 3.81 cm)
  - Warranty: 1 year
  - Extended warranty: Consult factory
- Note: Consult factory for application support, test reports or special requirements.



Outline Dimensions



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