

# Compact Desktop Rubidium Frequency Reference

## Features

- Compact light weight portable for a wide range of application
- Sine wave or CMOS/TTL output
- Accuracy of  $5 \times 10^{-11}$
- Compact light weight portable for a wide range of application
- Available 1 to 8 outputs
- Two years warranty

## Description

Compact simple to install, atomic frequency reference for use as a general purpose 10MHz rubidium frequency standard. This frequency standard benefits from having Quartzlock's SMAC (Sub Miniature Atomic Clock) technology. The E10-X incorporates the latest high stability and low drift designs. It can be configured to frequencies from 1 to 100MHz outputs presented on the front or rear panel.



E10-X: Standard configuration



E10-X configured with option 09

## Applications

- Frequency Calibration
- Telecom Network Synchronization
- Broadcast – Radio & TV & Satellite Communications
- Microwave Test Bench or Test Solution
- Production Test Reference for instrumentation
- HDTV

## Related frequency reference products

- **A10-M**: Low Noise 1U 19" rack mount Rubidium Frequency standard up to 12 output, 1 to 100MHz
- **A1000** : Low Noise 2U 19" rack mount Rubidium Frequency standard up to 24 output, 1 to 100MHz
- **E10-LN**: Low phase noise Rubidium oscillator module
- **E10-Y**: Low Phase Noise Desktop Rubidium frequency reference, 1 to 8 outputs
- **E10-P** : Portable Desktop & Bench top Frequency reference 1 to 4 outputs

## E10-X Specification

| Outputs <i>See options</i>                                 |  |
|--|--|
| 10MHz  | +10dBm into 50 Ohms, 0.7V <sub>rms</sub><br>(Specify for 75Ω load) |
| Connector  | BNC (Standard), SMA (specify)                                      |
| No. outputs  | 1-8  |
| Frequency Stability <i>Allan Deviation</i>                 |  |
|  | <b>Options A</b>   |
| Frequency  | <b>10MHz</b>   |
| $\tau = 1s$  | $\leq 8 \times 10^{-11}$   |
| $\tau = 10s$   | $\leq 3 \times 10^{-11}$   |
| $\tau = 100s$  | $\leq 8 \times 10^{-12}$   |
| Phase Noise (SSB)  |  |
|  | <b>Options A</b>   |
| Frequency  | <b>10MHz</b>   |
| 1Hz  | -67 dBc  |
| 10Hz   | -95 dBc  |
| 100Hz  | -125 dBc   |
| 1 kHz  | -135 dBc   |
| 10KHz  | -145 dBc   |
| Harmonics  |  |
|  | <b>Options C</b>   |
|  | <b>10MHz</b>   |
|  | <-40dBc  |
|  | <b>10MHz</b>   |
|  | <-45dBc  |
| Spurious   |  |
| 100 KHz BW   | <-100dBc   |
| Aging (After 30 days)                                      |  |
| Frequency  | <b>10MHz</b>   |
| <i>Per day</i>   | $5 \times 10^{-12}$  |
| <i>Per Month</i>   | $5 \times 10^{-11}$  |
| <i>Per Year</i>  | $5 \times 10^{-10}$  |
| Frequency accuracy   |  |
| Accuracy at shipping                                       | $5 \times 10^{-11}$  |
| Frequency retrace  |  |
| After 1 hours of continues operation                       | $8 \times 10^{-11}$  |
| Frequency Adjustment                                       |  |
|  | <b>Optional</b>  |
| Mechanical POT   | $\pm 2 \times 10^{-9}$ Control voltage 0 to +5V                    |
| Warm up time   |  |
| <6 minutes, time to lock                                   |  |
| <7 minutes to $1 \times 10^{-10}$ at room temperature 25°C |  |

| Environmental                       |  |   |
|-------------------------------------|--|---|
| <i>Temperature :</i>                | Operating  | -40°C +65°C                                   |
|                                     | Storage  | -40°C +80°C                                   |
| <i>Temp stability :</i>             |  | -20°C +60°C < $1 \times 10^{-9}$              |
|                                     | Standard   | -20°C +60°C < $0.3 \times 10^{-9}$            |
|                                     | <b>Option E</b>                                      | -30°C +65°C $0.5 \times 10^{-9}$              |
|                                     | <b>Option F</b>                                      | -50°C +65°C $0.7 \times 10^{-9}$              |
| <i>Relative humidity :</i>          | 90% non-condensing                                   |   |
| <i>Magnetic Field sensitivity :</i> | $3 \times 10^{-11}$ Gauss                            |   |
| <i>Atmospheric pressure :</i>       | -60m –4000m < $2 \times 10^{-11}$ Per mbar           |   |
| <i>Approximate MTBF :</i>           | 100,000 Hrs, Stationary                              |   |
| <i>Dimensions :</i>                 | 122 x 105 x 60mm LWH                                 |   |
| <i>Weight:</i>                      | Without battery                                      | >600gms                                       |
|                                     | With internal battery                                | >700gms                                       |
| Power supply                        |  |   |
|                                     | Standard   | <b>Option X</b>                               |
| <i>DC power:</i>                    | External +12 to +15V                                 | +5.5V or +3.3V                                |
| <i>Power consumption:</i>           | 18W at start (25°C),<br>8W at steady state           | 5.2W at start (25°C),<br>1.6W at steady state |
| Built-in options                    |  |   |
| <b>Option 02:</b>                   | Output 2048kHz                                       |   |
| <b>Option 03:</b>                   | Output 1544kHz                                       |   |
| <b>Option 04:</b>                   | 13MHz Output   |   |
| <b>Option 05:</b>                   | CMOS/TTL Output                                      |   |
| <b>Option 06:</b>                   | 1PPS Output  |   |
| <b>Option 07:</b>                   | 10.24MHz Output                                      |   |
| <b>Option 08:</b>                   | 10.23MHz Output                                      |   |
| <b>Option 09:</b>                   | Increase 2, 4, 6 or 8 output distribution card       |   |
| <b>Option 10:</b>                   | 26MHz Output   |   |
| <b>Option 11:</b>                   | 1MHz Output  |   |
| <b>Option 12:</b>                   | 5MHz Output  |   |
| <b>Option 18:</b>                   | Extend warranty to 3 years                           |   |
| <b>Option 20:</b>                   | External synch input. 1PPS, 5MHz or 10MHz            |   |
| <b>Option 21:</b>                   | 2 x 1PPS Output                                      |   |
| <b>Option 42:</b>                   | Low Phase Noise 10MHz output                         |   |
| <b>Option 52:</b>                   | Rack Mount 19" 1U                                    |   |
| <b>Option 53:</b>                   | Rack Mount 19" 2U                                    |   |
| <b>Option 75:</b>                   | Add internal battery, up to 4 hours of battery life. |   |

**Included with shipment:** Calibration certificate, Certificate of Conformance, product test sheet and 24 month warranty.

Contact us to configure this product to meet your requirement.  
**Designed and manufactured in the U.K.**

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