# NR8003

## GNSS-Locked Frequency Reference
## 5 channels are independently user-selectable for 10MHz, PPS, Square Wave (10Hz – 50MHz), or (IRIG-B, IRIG-AM, STANAG, or Have Quick)
## Features user-selectable 3.3V or 5.0V CMOS levels





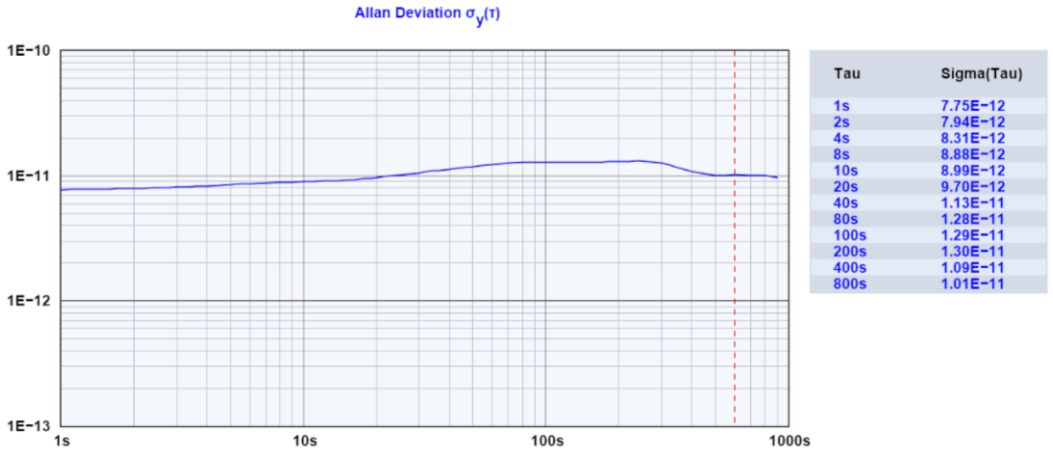


**Key Features:**

- **Ultra-low phase noise**
- **PPS accuracy 5ns @ 1 sigma**
- **DC powered (12 Vdc)**
- **Benchtop or Rackmount hardware**
- **5 channels: Independently user-selectable for 10MHz Sine, 1PPS, Square Wave (10Hz – 50MHz), or (IRIG-B DCLS, IRIG-AM, STANAG, or Have Quick)**
- **USB serial out with NMEA**

## Technical Specifications

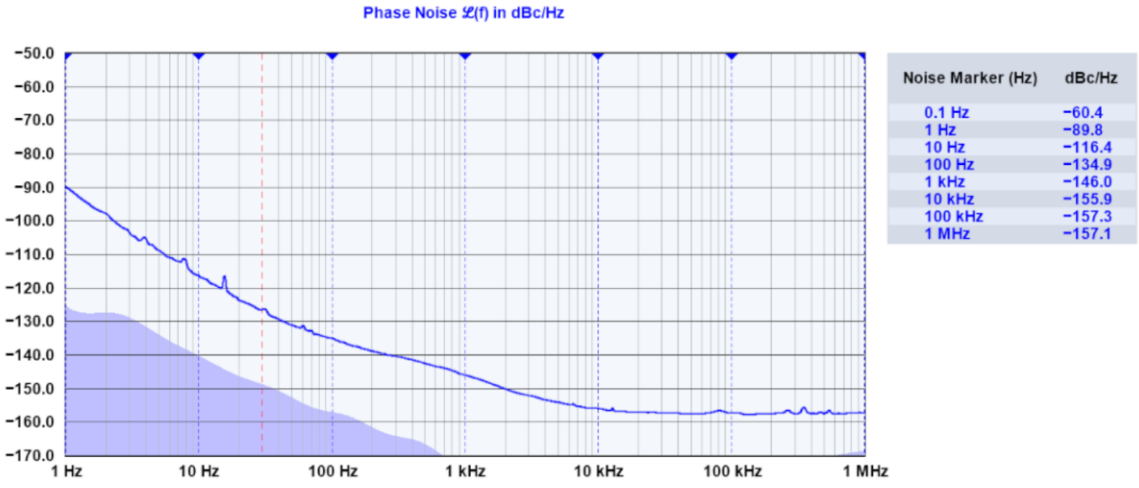
| **Reference Frequency Output** | |
|---|---|
| 10.0 MHz Sine | 1 Vrms ±0.2, into 50 Ohms |
| First year frequency stability | +/-40 ppb (unlocked) |
| Temperature stability | +/-100 ppb (unlocked) |
| Locked stability | 2E-11 |
| Representative Plot | |




| Tau | Sigma(Tau) |
|---|---|
| 1s | 7.75E-12 |
| 2s | 7.94E-12 |
| 4s | 8.31E-12 |
| 8s | 8.88E-12 |
| 10s | 8.99E-12 |
| 20s | 9.70E-12 |
| 40s | 1.13E-11 |
| 80s | 1.28E-11 |
| 100s | 1.29E-11 |
| 200s | 1.30E-11 |
| 400s | 1.09E-11 |
| 800s | 1.01E-11 |

| Trace | | Notes | Input Freq | ADEV at 600s | Duration | Elapsed | Acquired | Instrument |
|---|---|---|---|---|---|---|---|---|
| NR8003 | CH1 | | 10.0 MHz | 1.02E-11 | 1h | 1h | 360000 pts | Microchip 53100A |

| **10.0 MHz Phase Noise** | (dBc/Hz) |
|---|---|
| 1 Hz | - 85 |
| 10 Hz | -110 |
| 100 Hz | -130 |
| 1 kHz | -140 |
| 10 kHz | -150 |
| 100 kHz | -155 |
| Representative Plot | |

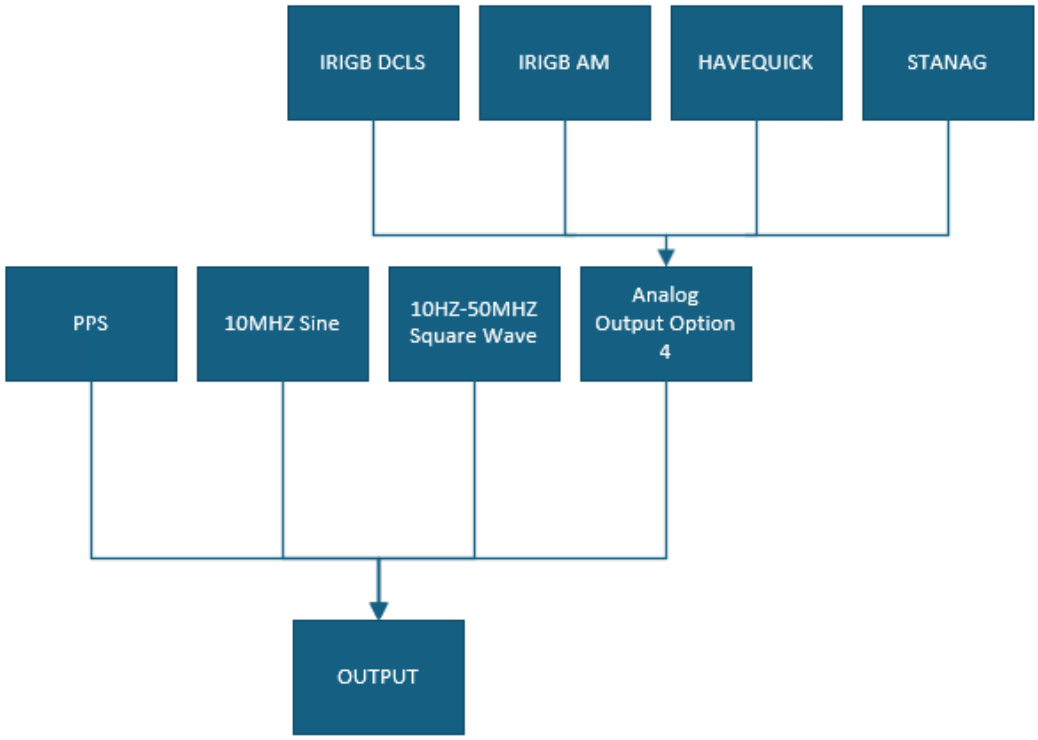



| Noise Marker (Hz) | dBc/Hz |
|---|---|
| 0.1 Hz | -60.4 |
| 1 Hz | -89.8 |
| 10 Hz | -116.4 |
| 100 Hz | -134.9 |
| 1 kHz | -146.0 |
| 10 kHz | -155.9 |
| 100 kHz | -157.3 |
| 1 MHz | -157.1 |

| Trace | | Notes | Input Freq | dBc/Hz at 30 Hz | Duration | Elapsed | Acquired | Instrument |
|---|---|---|---|---|---|---|---|---|
| NR8003 | CH1 | | 10.0 MHz | -126.3 | 1h | 1h | 360000 pts | Microchip 53100A |

| PPS Output | |
|---|---|
| Amplitude | User-selectable 3.3 VDC or 5.0VDC CMOS |
| Accuracy | 5ns 1 sigma |
| Pulse width | Programmable 1 to 500ms in 1 µsec steps |
| Rise time | <5 ns |
| Load Impedance | 50 Ohm |
| Connector | BNC |

## Signal Selection Options:




| GNSS receiver | |
|---|---|
| Constellations | |
| GPS | L1C/A (1575.42 MHz), L2C (1227.60 MHz) |
| GLONASS | L1OF (1602 MHz + k*562.5 kHz, k = –7,..., 5, 6)<br>L2OF (1246 MHz + k*437.5 kHz, k = –7,..., 5, 6) |
| Galileo | E1-B/C (1575.42 MHz), E5b (1207.140 MHz) |
| BeiDou | B1I (1561.098 MHz), B2I (1207.140 MHz) |
| Sensitivity (with Novus recommended antenna) | |
| Tracking | -167 dBm |
| Reacquisition | -160 dBm |
| Cold Start | -148 dBm |
| Hot Start | -157 dBm |

| Front panel Indicators and Control | |
|---|---|
| System status display | Channel status, system status - front panel display LCD color |
| 5 button selector switches | Round momentary switch assembly, up, down, left, right, enter. Selects active display mode, system status. |
| **Remote interface** | |
| Rear Panel Serial Port | USB Mini-B to serial interface for system status and system configuration 115200 baud default |
| Standard Serial Baud Rates | Selectable baud rate 19200, 38400, 57600 or 115200 (default), 8 data bits, 1 stop bit, no parity, no flow control |
| | |
| **Power** | |
| DC input | +12VDC @ 2A AC to DC Adapter, 25W Power Supply (9 to 24V) |

## Environmental and Mechanical

| Mechanical | |
|---|---|
| Height | 1.77” (45mm) 1RU EIA 19” rack compatible |
| Width | 7.97” (202.4mm) |
| Depth | 8.0” (203.2mm) |
| Weight | 3.0 lbs. |
| **Environmental** | |
| Operating temperature | -10 to 65°C |
| Storage temperature | -40 to 70°C |
| Humidity | 0% - 90% RH non-condensing |
| Agency Certifications | UL / FCC Part 15 |
| EU compliance | RoHS, REACH, WEEE |
| EMC Compliance Emissions/Immunity | CISPR 32 Emissions<br>CISPR 35 Immunity<br>IEC 61000-4-2 ESD<br>IEC 61000-4-3 Radiated<br>IEC 61000-4-4 Transient/burst immunity<br>IEC 61000-4-5 Surge immunity<br>IEC 61000-4-6 Immunity to conducted |
| Safety | UL 62368-1 |

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### Revision History

| Date | Nature of Changes | Approved By |
|---|---|---|

| | | |
|---|---|---|
| 260522 | Initial release. | Daniel Longo |
| 260923 | Update to representative plots and addition of GPS data | Daniel Longo |

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