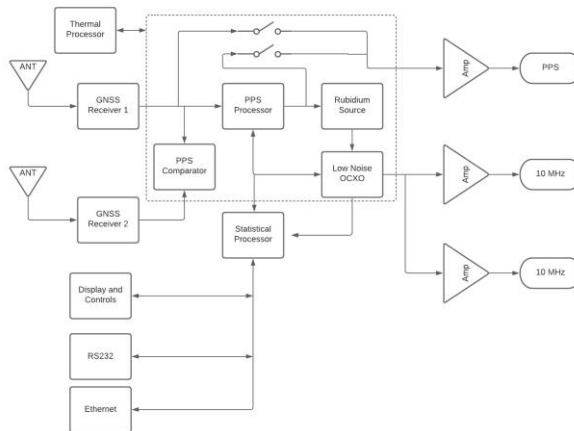
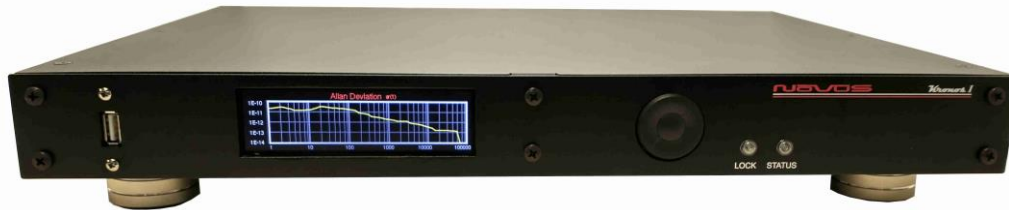


Company Datasheet #	NR9000 Kronos1
Revision #:	B
Date:	042022

NR9000-Kronos1

High Stability 10MHz 10 Channel GNSS Locked Reference with with Rubidium Holdover and Networking



10 Channel GNSS locked reference featuring high stability. The entire timing assembly is in a thermally isolated case operating at a constant temperature. Thermal gradients are minimized and component variation with temperature are dramatically reduced. The unit also features a PPS source with a standard deviation of under 5 ns. Pulse to pulse jitter is well under 200ps. In addition to output amplitudes and internal critical measurements, the unit reports a continuous calculation of Allan Deviation. Various phase noise options are available. requirements. Dual power source options for AC and DC power. Data Logging of performance

Networking

SNMP option

Standard Phase Noise

Offset Frequency (Hz)	Typical (dBc / Hz)
10	-130
100	-150
1K	-155
10k	-160

High Stability

Allan deviation E-13
PPS Jitter < 5ns @ 1 sigma

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Technical Specifications

Output	10 MHz, 1.0 Vrms ± 0.2 , into 50 Ohms, 10 channels, Sine BNC
Harmonic Distortion	< -30 dBc
Rubidium Atomic	
Accuracy at shipment	$\pm 5.0E-11$
Warm-up time	<15 minutes
Time of lock	<5 min -130 dBm
Time to achieve accuracy	$< \pm 1E-9$ <20 minutes
Aging - monthly	$< \pm 5E-11$
Retrace	$< \pm 1.0E-10$ after 1 Hour
Temp Stability	< 1 ppb over the range 0 to 50 C
PPS	
Amplitude for 1PPS	3.3 Vdc CMOS (5 Vdc option) ± 100 ma
Pulse width for 1PPS	Programmable 1 to 500ms in 1 ms steps
Rise time for 1PPS	<10 ns (faster edge available)
Jitter	GNSS-PPS < 10ns
Connector	SMA
Load Impedance	50 Ohm
Location	rear
Typical Allan Deviation	
1	4E-12
10	6E-12
100	3E-12
1000	2E-12
10000	3E-13
Standard Phase Noise	
1 Hz	-105
10 Hz	-130
100 Hz	-155
1000 Hz	-160
Remote interface & control	
Protocol	RS232 NMEA-0183

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Connector	DB-9
Location	Rear panel
Protocol	Bit plus stop
Standard Baud Rates	Selectable 4800, 9600, 19200, 38400, 57600 or 115200 bps
SNMP (option)	
Remote monitoring & control	Internet
Parameters monitored Locally – present on remote interface for monitoring	Output amplitude, all power supplies, GNSS lock status, number of satellites, Built-In test status,
Transaction/decodable commands	English format
Single monitoring command	Updated every second
Connector	RJ-11
GNSS receiver	GPS, BeiDou, Galileo, and GLONASS reception
Cold Start Acquisition	< 30 seconds
Sensitivity	
Tracking	-167 dBm
Reacquisition	-160 dBm
Cold Start	-148 dBm
Hot Start	-157 dBm
Signals Supported	
GPS	L1C/A (1575.42 MHz), L2C (1227.60 MHz)
GLONASS	L1OF (1602 MHz + k*562.5 kHz, k = -7,..., 5, 6), 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)
Antenna with LNA	
Antenna power	3.5 Vdc, < 20 ma (on center conductor) (factory configurable to 5 Vdc)
Frequency	1574-1607 MHz
Nominal Gain	2 dBic
Amplifier gain	26 dB
Noise Figure	< 2.0 dB
Out of Band rejection	Fo±50MHz=60 dBc, Fo±60 MHz
DC current	<25 ma@3.5 Vdc

Environmental and Mechanical

Operating temperature	0 to 50C non-condensing
Storage temperature	-40 to 70C
Height	1RU (~1.73)
Width	19 inch



Company Datasheet #	NR9000 Kronos1
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Depth	12 inch	
AC input	90 to 250 VAC, 50/60hz, less than 10 watts	
Weight	≈5.5lbs	

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