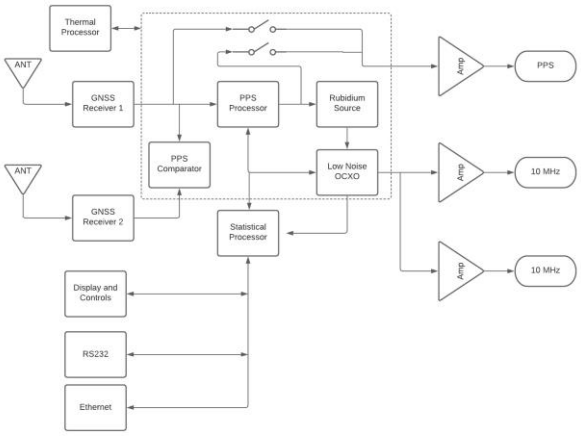
	Company Datasheet #	NR9000 Kronos1
	Revision #:	D
	Date:	040522

NR9000-Kronos1

High Stability 10MHz 10 Channel GNSS Locked, Low Noise Rubidium Option with Networking



Networking

SNMP-NTP option

Typical Phase Noise

Offset Frequency (Hz)
Typical (dBc / Hz)

10	-130
100	-155
1K	-160
10k	-160

High Stability

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

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

Technical Specifications

Output	10 MHz,1.0 Vrms ±0.2, into 50 Ohms, 10 channels, Sine	
Harmonic Distortion	< -30 dBc	
Rubidium Atomic		
Accuracy at shipment	+/-5.0E-11	
Warm-up time	<15 minutes	
Time of lock	<5 min -130 dBm	
Time to achieve accuracy	<±1E-9<20 minutes	
Aging - monthly	<±5E-11	
Aging - yearly	<±1.0E-9	
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	2.5E-12	
10	3.1E-12	
100	2.0E-12	
1000	2.5E-12	
10000	3E-13	
Standard Phase Noise		
1 Hz	-100	
10 Hz	-127	
100 Hz	-153	
1000 Hz	-160	
Remote interface & control		
Protocol	RS232 NMEA-0183	
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	184 channel receiver	
	L-1 Band	L2/ESb/B2i Band
Frequency	1559-1606	1197-1249 MHz
Impedance	50 Ohm	50 Ohm
Gain	Typ 3.5 dBic (Zenith)	Typ 0 to 2 dBic (Zenith)
Axial Rotation	Max 2 dB (Zenith)	Max 2 dB (Zenith)
Polarization	RHCP	RHCP
LNA Gain	Typ 28 +-3 dB	28 +- 3 dB
LNA Noise Figure	Max 2.8 dB	Max 3.2 dB
Output VSWR	Max 2.0	Max 2.0 dB
Cable Insertion Loss	Typ 6.6 dB	Typ 6.6 dB

Environmental and Mechanical

Operating temperature	0 to 50C non-condensing
Storage temperature	-40 to 70C
Height	1RU (~1.73)
Width	19 inch
Depth	12 inch
AC input	90 to 250 VAC, 50/60hz, less than 10 watts
Weight	≈5.5lbs