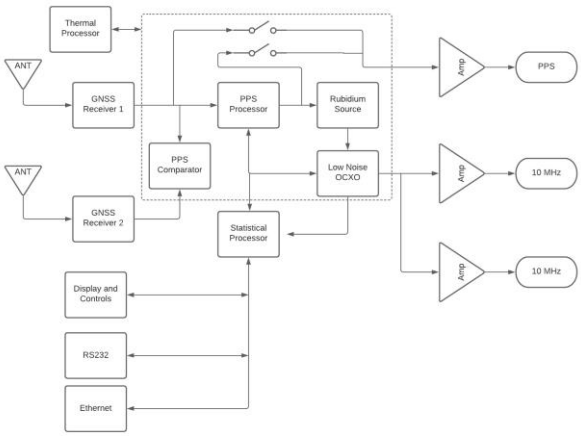
	Company Datasheet #	NR9000 Kronos1
	Revision #:	B
	Date:	021321

NR9000-Kronos1-Audio

High Stability 10MHz 10 Channel GNSS Locked, Low Noise Rubidium



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. 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. 10 1 Vpp 75 ohm outputs.

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

Technical Specifications

Output	10 MHz,1.0 Vpp ±0.2, into 75 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
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
Connector	DB-9
Location	Rear panel
Protocol	Bit plus stop
Standard Baud Rates	Selectable 4800, 9600, 19200, 38400, 57600 or 115200 bps
Master GNSS receiver 184 Channels	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)	
GNSS receiver- Dual-Time Base	GPS L1 C/A, GLONASS L1OF, QZSS L1 C/A, SBAS L1 C/A (Ready): Galileo E1B/E1C, QZSS L1S	
Channels	26 channels (GPS, GLONASS, QZSS, SBAS)	
Sensitivity		
GPS	Tracking: -161 dBm	
	Hot Start: -161 dBm	
	Warm Start: -147 dBm	
	Cold Start: -147 dBm	
	Reacquisition: -161 dBm	
GLONASS		
	Tracking: -157 dBm	
	Hot Start: -157 dBm	
	Warm Start: -143 dBm	
	Cold Start: -143 dBm	
	Reacquisition: -157 dBm	
	With Novus recommended antenna	
Master 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
Dual-Time Antenna with LNA	26 Channel Receiver	
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
Depth	12 inch
AC input	90 to 250 VAC, 50/60hz, less than 10 watts
Weight	≈5.5lbs