brandywine communications

NFS220
Network Ready GPS Time and Frequency Standard

NFS220 Networked Frequency Standard

The NFS220 is a precision time and frequency standard that uses the Global Positioning System (GPS).

It is designed for use in WI-FI, Wi-Max, satellite communications, telecommunications and military communication applications.

The NFS220 utilizes a high performance 16 channel GPS receiver. An automatic position-averaging feature enables the best use of GPS when operating in a fixed location.

The NFS220 is fitted with an internal back up oscillator that is continuously calibrated to GPS using an advanced algorithm, providing optimal frequency control of the oscillator. This ensures that the highest time and frequency accuracy is maintained if no satellites can be tracked, and ensures an ultra stable, low noise frequency reference

The basic NFS220 includes a precision OCXO frequency standard, while TCXO and Rubidium oscillators are optionally available to giving a variety of price and performance options. An option with a low noise OCXO phase locked to a rubidium is also available, combining the low noise characteristic with the OCXO with the long term stability of a rubidium.

The NFS220 provides “at a glance” status indication via front panel LED’s and can be integrated with other management systems using Ethernet and serial ports.

The NFS220 provides simple integration into military platforms by allowing synchronization from Have Quick time code, which is available on military SA-ASM GPS receivers such as the DAGR or PLGR. The NFS220 also generates Have Quick and 1PPS signals compatible with ICD-GPS-060.

The integrated Ethernet interface provides Network Time Protocol (NTP) synchronization of other connected computers.

In addition to NTP, the NFS220 Ethernet interface contains a built in web server that allows the NFS220 to be controlled using a standard web browser such as Internet Explorer. Simple Network Management Protocol (SNMP) allows easy integration of the NFS220 with industry standard network management systems.

The NFS220 provides three 1PPS time mark outputs. A unique feature allows precisely controlled delays to be inserted into these outputs to compensate for cable and other propagation delays. Compensation delay is independent for each output and has <1ns resolution.

FEATURES

- **16 Channel GPS Receiver or ICD-GPS-060 Have Quick/1PPS input references**
- **Choice of Disciplined Oscillator**
- **High Stability Time and Frequency outputs.**
- **1U 19” rack mount**
- **Network Interface for remote management and NTP server**
- **Three 1PPS outputs with propagation delay compensation**
- **Mutiple time code outputs (IRIG B, A, E, G)**
- **Four 10 MHz Sinewave outputs**
- **Have Quick time code**
- **Advanced Oscillator Control Algorithm**

Serial time code outputs are provided to allow time synchronization to be distributed to computers, displays, and other equipment requiring precision time. Two outputs are dedicated to Have Quick time code. Two outputs (one modulated, one DC level shift) may be user selected from IRIG A, IRIG B, IRIG E, IRIG G.

Four low phase noise 10 MHz sine wave outputs from the disciplined oscillator are provided. Signal amplitude is software settable.

All outputs are provided with activity detectors. Loss of any output is indicated by means of a individual front panel alarm LED as well as through the network interface or a discrete alarm output.

1153 Warner Ave . Tustin . CA . 92780 . USA
(714) 755 1050 . (714) 755 0175 (FAX) . www.brandywinecomm.com

NFS220 SPECIFICATIONS

Satellite Signal	GPS L_1 1575.42 MHz
Satellite Code	C/A 1.023 MHz
Receiver Type	Parallel 16 Channel. All-in-view satellites tracked continuously and simultaneously
Warm Start	<10 sec(Open Sky)
Autonomous Start	<60 seconds Cold Start (Open Sky)
Cold Start Requirement	Automatic: No input of time or position required
Position Accuracy	2.4 m horizontal, 5 m altitude with respect to WGS84 after 24 hour position averaging
Timing Accuracy (tracking satellites)	± 100 ns. absolute UTC Std Deviation 15ns (OCXO)
Timing Accuracy (holdover mode, ± 5ºC)	< 15 μsec/day (OCXO) <1 μsec /day (Rb2)
Frequency stability (tracking satellites)	See tables below

Oscillator Option	Stability -10-60 °C	Allan Variance					
		1s	10s	100s	1000s	10000s	1 day
TCXO	$2.5x10^{-6}$	$1x10^{-7}$	$1x10^{-7}$	$1x10^{-7}$	$5x10^{-8}$	$2x10^{-9}$	$1x10^{-11}$
OCXO*	$3x10^{-9}$	$2x10^{-11}$	$4x10^{-11}$	$8x10^{-11}$	$1x10^{-11}$	$5x10^{-12}$	$5x10^{-12}$
Rb1	$7x10^{-10}$	$3x10^{-11}$	$1.6x10^{-11}$	$8x10^{-12}$			$<5x10^{-12}$
Rb2	$4x10^{-10}$	$1x10^{-11}$	$3x10^{-12}$	$1x10^{-12}$			$<5x10^{-12}$
Rb/OCXO	$4x10^{-10}$	$8x10^{-12}$	$1x10^{-11}$	$3x10^{-12}$			$<5x10^{-12}$

Oscillator Option		10 MHz Phase Noise dBc					
		1Hz	10Hz	100Hz	1kHz	10kHz	100kHz
OCXO*		-90	-120	-140	-150	-150	--155
Rb1		-67	-85	-114	-130	-140	-140
Rb2		-80	-100	-130	-140	-150	-150
Rb/OCXO		-90	-120	-140	-150	-150	--155

1PPS Output		
	Connector	BNC (2) DB9 (1)
	Level	0-5V or 0-10V into 50Ω link selectable by user
	On Time	Rising Edge
Network Interface		
	Interface Type	10BaseT
	Protocols	TCP/IP, UDP, NTPv3, HTTP, SNMP v1
Serial Interface		
	Type	RS232 and RS422
	Baud rate	9600, N,8,1
Sine Wave Outputs		
	No of Outputs	4
	Connector	BNC
	Frequency	10MHz
	Level	0 -13dBm into 50 ohm Software settable
Time Code 1 Output		(Modulated)
	Connector	BNC
	Code Type	IRIG A135, B125, E115, G145 software selected
	Control Functions	IEEE 1344
	Level	3 V p-p into 600 ohm (DCLS)
Time Code 2 Output		
	Connector	DB9
	Code Type	IRIG A005, B005, E005, G005
	Selection	same as modulated code
	Levels	DC level Shift (0-5V)
Time Code 3,4 Output		
	Connector	BNC (1) DB9 (1)
	Code Type	Have Quick per ICD-GPS-060
	Levels	0-5V
Alarm Status		Voltage free relay changeover contacts
Status Indicator LED's		Power Tracking Satellites Valid Time Holdover/12hr Holdover alarm Output Good/Fail (8 leds)
Environmental		
	Temperature	Instrument: -10 to +50 °C Antenna: -40 to +85 °C
	Humidity	95% non condensing
	Power	85-265VAC 50/60Hz
	Optional	12VDC, 24VDC, -48VDC, 125VDC
Dimensions		19" rack mount 1.75" (1U) height, $7^{1/2}$" depth 17" Width, $3^{1/2}$lb Nom.
Weight		11 lb. typical
EMC Emission		To EN55022 as EN55024 FCC Part 15B, Class A
EMC Immunity		To EN 50082-1 as EN61000-4-2 ESD, IEC 801-3 HF Field, IEC 801-4 Burst

Ordering Information
P/N: 091000001 Base Unit – includes OCXO

UNITRONIX Pty Ltd
PO Box 486, Morisset NSW 2264
NSW: Tel: 61 2 4977 3511 Fax: 61 2 4977 3522
WA: Tel: 61 8 9455 2424 Fax: 61 8 9455 2458
unitsyd@unitronix.com.au www.unitronix.com.au