brandywine communications

NFS220 PLUS
Network Ready GPS Time and Frequency Standard

NFS220 PLUS Networked Frequency Standard

The NFS220 Plus is a precision time and frequency standard that uses the Global Positioning System (GPS). This unit is designed for use in WI-FI, Wi-Max, satellite communications, telecommunications and military communication applications.

This GPS frequency standard utilizes a high performance 16 channel GPS receiver with a high visibility time of year display. An automatic position-averaging feature enables the best use of GPS when operating in a fixed location.

The NFS220 Plus 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 Plus includes a precision OCXO frequency standard, while TCXO and Rubidium oscillators are also 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 Plus provides "at a glance" status indication via front panel LED's as well as a large time, day and year display. This unit can be integrated with other management systems using Ethernet and serial ports.

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

The NFS220 Plus 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**

- **High Visibility Time of Year Display**

- **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.

NFS220 PLUS 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 (Modulated)
Time Code 1 Output
   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

Display — Day of year through seconds .56" display characters

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