

NFS 220 Network Ready GPS Time And Frequency Standard



NFS-220 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 a Rubidium oscillator is 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

- **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**
- **Multiple time code outputs (IRIG B, A, E, G) Four 10 MHz Sine wave 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.

NFS 220 Specifications

Satellite Signal
Satellite Code
Receiver Type

GPS L1 1575.42 MHz
C/A 1.023 MHz
Parallel 16 Channel. All-

Status Indicator LED's

Changeover contacts
Power
Tracking Satellites
Valid Time

Warm Start
Autonomous Start

Cold Start Requirement

Position Accuracy

<10 sec (Open Sky)
<60 seconds Cold Start
(Open Sky)
Automatic: No input of
time or position required
2.4 m horizontal, 5 m
altitude with respect to
WGS84 after 24 hour

Environmental
Temperature

Humidity
Power
Optional

Holdover/12hr Holdover alarm
Output Good/Fail (8 leds)

Timing Accuracy
(tracking satellites)

position averaging
 ± 100 ns. Absolute UTC
Std Deviation 15ns
(OCXO)

Dimensions

Instrument: -10 to +50 °C
Antenna: -40 to +85 °C
95% non condensing
85-265VAC 50/60Hz
12VDC, 24VDC, -48VDC,
125VDC

Timing Accuracy
(holdover mode, $\pm 5^\circ\text{C}$)

< 15 $\mu\text{sec/day}$ (OCXO)
<1 $\mu\text{sec/day}$ (Rb2)

Weight
EMC Emission

19" rack mount
1.75" (1U) height, 7 $\frac{1}{2}$ " depth
17" Width, 3 $\frac{1}{2}$ "b Nom.
11 lb. typical

Frequency stability
tracking satellites

See tables below

EMC Immunity

To EN55022 as EN55024
FCC Part 15B, Class A
To EN 50082-1 as
EN61000-4-2 ESD, IEC
801-3 HF Field, IEC 801-4
Burst
EN 60950-1/A12:2011

Oscillator Option	Stability -10-60 °C	Allan Variance					
		1s	10s	100s	1000s	10000s	1 day
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
Level

On Time
Rising Edge

Network Interface

Interface Type
Protocols

Serial Interface

Type
Baud rate

Sine Wave Outputs

No of Outputs
Connector
Frequency
Level

Time Code 1 Output

Connector
Code Type

Control Functions

Level
(DCL)

IEEE 1344
3 V p-p into 600 ohm

Time Code 2 Output

Connector
Code Type

Selection
Levels

Time Code 3,4 Output

Connector
Code Type

Levels

Alarm Status

Voltage free relay

© Brandywine Communications 2020
Updated 10/06/2020