NFS-220

Network Ready GPS Time and Frequency Standard

The NFS-220 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 NFS-220 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 NFS-220 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 NFS-220 includes a precision OCXO frequency standard, while a Rubidium oscillator is optionally available to giving a variety of price and performance options.

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

The NFS-220 provides "at a glance" status indication via front panel LED's and can be integrated with other management systems using Ethernet and serial ports.

Applications

- Satellite Ground Stations
- Small to Medium Sized Corporate Networks
- Telecommunications
- Wi-Max
- Military Communications

Key Benefits

- Low Phase Noise 10 MHz Outputs
- Multiple Output signal formats for maximum flexibility
- Built-in propagation delay compensation
- Compact 1U Chassis

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Specifications

GPS Receiver

Satellite Signal	GPS L1 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

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	10 BaseT
Protocols	TCP/IP, UDP, NTPv3, HTTP, SNMP v1

Serial Interface

Type	RS232 and RS422
Baud Rate	9600, N, 8, 1

Sine Wave Output

No of Outputs	4
Connector	BNC
Frequency	10MHz
Level	0 -13dBm into 50 ohm, Software settable

Time Code 1 Output

Connector Type	BNC
Code Type	IRIG A135, B125, E115, G145 software selected
Control Functions	IEEE 1344
Output Level	3 V p-p into 600 ohm (DCL)

Time Code 2 Output

Connector Type	DB9
Code Type	IRIG A005, B005, E005, G005
Selection	Same as modulated code
Levels	DC level Shift (0-5V)

Time Code 2 Output

Connector Type	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 Type	BNC (1), DB9 (1)
Code Type	Have Quick per ICD-GPS-060
Levels	0-5V

Alarm Status

Alarm Status	Voltage free relay, changeover contacts

Status Indicator LEDs

Status Indicator LED's	Power, Tracking Satellites, Valid Time, Holdover/12hr Holdover alarm, Output Good/Fail (8 LEDs)

Power

AC Power (Standard)	85-265VAC 50/60Hz
DC Power Options	12V, 24V

Physical

Dimensions	19" rack mount, 1.75" (1U) height, 7.5" depth
Weight	11 lb. typical

Environmental

Temperature	
Instrument	-10 to +50 °C
Antenna	-40 to +85 °C
Humidity	95% Non-condensing
EMC Emmission	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
Product Safety	EN 60950-1/A12:2011

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

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

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