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PTS

Network Ready Precision Time System

PTS shown with C/A code and SA-ASM GPS in rack mount case

- GPS Disciplined Atomic Clock
- Full Remote Network Control Using Standard Web Browser
- Optional SA-ASM GPS Receiver
- Timing Accuracy <40ns $_{rms}$ to UTC
- NTP Network Time Server
- Dual redundant system in 19 Inch rack mount
- Low Cost
- 10MHz, 1PPS, IRIG B, serial and BCD time code outputs

The PTS is a state of the art frequency instrument offering a wide range of features and time and frequency outputs accurate to <40ns $_{rms}$ to UTC(USNO) and 1x10^{-12} respectively.

This new generation of network appliance is economical and reliable and offers complete remote control and monitoring via a web-browser based interface.

The PTS can be used in either a single or dual redundant configuration and in conjunction with one of Brandywine Communications range of Distribution Amplifiers, such as the FTSU-100.

Applications for the popular PTS include central time and frequency systems, satellite earth stations, military communication systems, and high availability network time servers.

An extremely accurate internal Rubidium oscillator is used as the internal time base that drives all the time and frequency outputs. This Rubidium oscillator is disciplined using an advanced control algorithm, ensuring superior holdover performance. The time constants of this algorithm are user-adjustable to suit specific applications.

The PTS is available both with standard C/A code and optional P(Y) code SA-ASM GPS receiver. It may also be disciplined to an external 1PPS/HaveQuick time code source.

A 10baseT Ethernet port is provided which is used both for monitoring and control of the instrument and for Network Time Protocol. This interface supports both fixed and dynamic IP address assignment via DHCP.

In addition to configuring the PTS, the built-in web browser provides information on GPS, internal monitoring of time errors, and internal parameters of the atomic oscillator. The user may set thresholds of any monitored parameter to trigger an alarm.

A precision 1PPS time mark is available for synchronizing or calibrating other equipment and the IRIG B serial time code allows synchronization to be distributed to other computers, displays and related equipment requiring precise time.

An ASCII serial port outputs any user-selected time of day message at a 1/sec rate for synchronizing other equipment. The same output port may also be configured to output 50 bit/sec BCD time code in accordance with ICD-GPS-060.

A high stability 10MHz sine wave output provides an ultra-stable, low phase noise frequency reference derived from an SC cut crystal that is locked to the rubidium reference.

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PTS Specifications

1 PPS Output

Connector	SMA
Type	5V $_{0\text{-}pk}$, 10 microseconds wide
On Time	Rising edge

Serial Interface

Port Function	Setup and Control
Connector	DB9
Type	RS232
Baud Rate	300-115,200 (Default 115k N, 8, 1)

Sine Wave Output

Number of outputs	1
Connector	SMA
Frequency	10 MHz
Level	2.5 Vpp into 50 Ohms
Harmonic Distortion	<25dBc
Phase Noise (SSB)	<-130 dBc/Hz (10Hz) typical <-140 dBc/Hz (100Hz) typical <-150 dBc/Hz (1000 Hz) typical

Time Code Output 1

Number of Outputs	1	
Code Format (link sel)	IRIG B 1kHz or	DC level
Level	2.2 Vpp 600 Ohms	HCMOS
Connector	SMA	

Time Code Output 2

Number of outputs	1
Code format	50 bit BCD ICD-GPS-060 or ASCII
Level (link selectable)	RS-232 (4,800, N, 8, 1) or BCD
Connector	DB-9
ASCII format	1/sec user-programmable string

Fault Alarm Status

Output Type	HCMOS level
Output polarity	User programmable
Connector	DB-9

Environmental

Temperature	
Instrument	0 to + 50°C
Antenna	-40 to +85°C
Humidity	To 95% non-condensing
Power	110/230 Vac
Optional Power	24 Vdc, -48 Vdc, 125 Vdc
Dimensions	3.25" x 7.25"x 15.8"
With rack mount adapter	19 inch Rack Mount, 3.48" (2U) height, 15.80" depth in rack
Weight	5.5 pounds, typical

GPS C/A Code Receiver Specification

Receiver type	12 channel C/A code, L1

P(Y) Code GPS Receiver Specification Option)

Receiver Type	GRAM SA-ASM receiver
Satellite Signal	GPS L_1, L_2 Dual Frequency
Satellite Code	C/A, P(Y)
Receiver Type	Parallel 12 Channel 12 all-in-view receiver
Position Accuracy	16m SEP in SA/AS environment with respect to WGS-84 with CV loaded
Warm start	<120 seconds with Almanac, CV loaded
Anti-spoofing	Accuracy maintained in spoofing environment up to 10db> satellite signals
Jamming	Operates with 34dB J/S at both L_1 and L_2
Cold Start Requirement	Automatic. No input of time or position required.
CV Fill compatibility	Via KYK-13

Timing Accuracy

Tracking satellites	±100 ns. Absolute UTC Std Deviation 20 ns
Holdover Mode	One microsecond/day

Frequency Stability

Tracking satellites	See table below
Holdover Mode	
Aging	$<5x10^{-11}$/month after 30 days aging
Temperature	$\pm$ $1x10^{-10}$ 0 to 50°C

OSCILLATOR STABILITY/ °C	AVERAGING TIME					
	1S	10S	100S	1kS	10kS	1 DAY
$2X10^{-12}$	$2X10^{-11}$	$1X10^{-11}$	$2X10^{-12}$	$1X10^{-12}$	$1X10^{-12}$	$1X10^{-12}$

Ethernet Interface

Type	10BaseT (100 base T optional)
Connector	RJ45
Protocols Supported	NTP (RFC1305), SNTP, Daytime
Web Browser	5 pages Status, GPS, Configuration, Alarms, Charts
IP selection	Static or Dynamic via DHCP
Protocols	Daytime, Telnet, FTP, DHCP, Time

Other Brandywine Communications Products

FTSU-100 Frequency Synthesizer Distribution Amplifier

Time/message displays

Video Time/message inserters
Timing plug in's for CPCI, PCI, PC104, VME, PMC and ISA platforms
Time and Frequency distribution
Low Cost Network Time Servers

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