

## PTS-SAASM

### Network Ready Precision Time System

- GPS Disciplined Atomic Clock
- Network Time Server
- Dual Redundant Version Available
- Complete Remote Network Control using Standard Web Browser
- SA-ASM GPS Receiver
- 10MHz, 1PPS IRIG B, Serial and Time Codes
- Timing Accuracy < 40ns<sub>rms</sub> to UTC



The PTS-SAASM is a state of the art frequency instrument offering a wide range of features and time and frequency outputs accurate to < 40ns<sub>rms</sub> to UTC (USNO) and 1x10<sup>-12</sup> 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-SAASM 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-SAASM 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.

A low cost rack adapter is available (not shown).

The PTS-SAASM utilizes a 12 channel P(Y) code SAASM GPS receiver. It may also be disciplined to an external 1PPS/HaveQuick time code source.

A 100baseT 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-SAASM, 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-SAASM Specifications

### 1 PPS Output

Connector SMA  
 Type 5V<sub>0-pk</sub>, 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 <25 dBc  
 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 19 inch Rack Mount, 3.48" (2U)  
 adapter height, 15.80" depth in rack  
 Weight 5.5 pounds, typical

### P(Y) Code GPS Receiver Specification

Receiver Type GRAM SA-ASM receiver  
 Satellite Signal GPS L<sub>1</sub>, L<sub>2</sub> 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<sub>1</sub> and L<sub>2</sub>  
 Cold Start Requirement Automatic. No input of time or position required.  
 CV Fill compatibility DS102 (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<sup>-11</sup>/month after 30 days aging  
 Temperature ± 1x10<sup>-10</sup> 0 to 50°C

OSCILLATOR STABILITY/ °C	AVERAGING TIME					
	1S	10S	100S	1kS	10kS	1 DAY
2X10 <sup>-12</sup>	2X10 <sup>-11</sup>	1X10 <sup>-11</sup>	2X10 <sup>-12</sup>	1X10 <sup>-12</sup>	1X10 <sup>-12</sup>	1X10 <sup>-12</sup>

### Ethernet Interface

Type 100BaseT  
 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