

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_{rms} 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_{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-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.

PTS-SAASM Specifications

1 PPS Output

Connector SMA
 Type 5V_{0-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 <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 L₁, L₂ 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 <120 seconds with Almanac, CV loaded
 Warm start Accuracy maintained in spoofing environment up to 10db> satellite signals
 Anti-spoofing Operates with 34dB J/S at both L₁ and L₂
 Jamming Automatic. No input of time or position required.
 Cold Start Requirement DS102 (KYK-13)
 CV Fill compatibility ±100 ns. Absolute UTC
 Std Deviation 20 ns

Timing Accuracy

Tracking satellites One microsecond/day
 Holdover Mode

Frequency Stability

Tracking satellites See table below
 Holdover Mode <5x10⁻¹¹/month after 30 days aging
 Aging ± 1x10⁻¹⁰ to 50°C
 Temperature

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 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

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