

# Time and Frequency GPS SAASM Modular Time Code Processor Model: 9000S



## Application - Defense (Military) • SatCom

- Range Timing
- Communications Networks
- Satellite Ground Stations
- Test and Measurement Systems

## Features

- Integral SAASM Based GPS Receiver
- Precise Time and Frequency Processing
- Front Panel and Remote Set Up and Status
- Wide Variety of Plug - In Modules
- GPS, Time Code, VHF Synchronizing Options
- Built in Fault Location and Isolation
- RS-232 and Network Interface



## Description:

The Model 9000S incorporates an integral SAASM based GPS receiver and utilizes the Precise Positioning Service (PPS) of GPS, providing direct P(Y) code acquisition, all SAASM capabilities, and increased timing accuracy when the receiver is properly keyed. Like the standard Model 9000, it can be customized for a wide variety of timing applications using available rear - panel plug in modules. For synchronizer redundancy, a secondary synchronizer such as a time code reader can be added with GPS SAASM acting as primary. Incorporated are proven microprocessor and field programmable gate array designs for time keeping, oscillator discipline, signal generation, and fault location/isolation.

All modules may be inserted into any module location within the Model 9000S main frame. As an integral function of this versatile unit, intelligent main logic and modules provide automatic module recognition and set up. The Model 9000S senses module function and location, reporting this information to the front panel display. This report, along with fault/status and unit serial number is available to remote computers via rear panel interfaces. Faults are isolated down to the module level.

The Model 9000S Main Frame contains a microprocessor controlled main logic assembly with disciplined crystal oscillator, a GPS SAASM Synchronizer, front panel displays and keypad, power supply, and a passive backplane assembly. A menu system directs the operator to all available setup and status request modes. Functional modules plug into the rear of the main frame and interface with the backplane assembly. Always included with the main frame is the Model 9003 Auxiliary I/O module. This module provides a means of external synchronization, 1 PPS output, and a RS-232 I/O. Remote interfaces provide basically the same functionality as the front panel key pad and displays. Adding any of the wide variety of functional modules increases the versatility of this instrument.

Two versions of the Model 9000S main frames are available, differing primarily in height and the number of plug-in modules they can accept. The Model 9000S -1U has a 1.75 inch panel height and accepts six module positions. The required auxiliary I/O module occupies one position, leaving five positions available for other modules. The Model 9000S-2U has a 3.5 inch panel height and accepts twelve modules. The required auxiliary I/O module occupies one position, leaving eleven positions available for other modules.

**Notice: U.S. Government policy restricts the sale of Precise Position Service (PPS) equipment to those authorized by the Department of Defense. Non-U.S. authorized users must purchase PPS equipment through the Foreign Military Sales (FMS) process.**

Specifications subject to change without notice.

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## Specifications:

Internal Oscillator:	1 PPS accuracy is < 100ns while disciplined
OCXO, SC-Type	Holdover, frequency domain, $2 \times 10^{-10}$ /day (first week) Holdover, time domain, 8 - 15 $\mu$ sec/day (first day) Temperature stability, $\pm 1 \times 10^{-8}$ $^{\circ}$ C to +60 $^{\circ}$ C
Module Positions:	Eleven available (2U), Five available (1U)
Power:	100 - 240 VAC, 48 - 440 Hz, 80 watts maximum
Dimensions:	(2U) 3.50 inches high, 19 inches wide, 18 inches deep (1U) 1.75 inches high, 19 inches wide, 18 inches deep
Finish:	Anodized aluminum
Operating Temperature:	-10 $^{\circ}$ C to + 60 $^{\circ}$ C
Humidity:	95% relative, non-condensing, with modules

## Model 9000S Modules

Modules receive reference frequencies, pulse rates, and time from the Model 9000S main frame, main logic. The main logic contains an OCXO (a rubidium oscillator is available as an option) disciplined by the synchronizing source. A minor scaler divides the OCXO output to required rates and frequencies. A time accumulator is typically and automatically set by the synchronizing source, but can be manually set by the front panel key pad.

All modules are "intelligent" and interact with the Model 9000S Main Frame providing fault status and accepting control and set up commands. As timing requirements change, simply determine a suitable module type, order, and plug into any available Model 9000S module slot. No hardware or software field changes are required. The following is a listing of currently available modules. Consult factory for your particular timing function need not shown.

## Synchronizers

Integral GPS SAASM Synchronizer

Antenna Connector: "TNC" type female  
Note: Unless otherwise specified, the Model 9001S is supplied with an L1/L2 antenna and 50 feet of RG58 coaxial cable. Other cable lengths and types are available.

Key Load Interface: Accepts KYK-13, KOI-18, and AN/CYZ-10 standard key loaders 6 pin IAW J1 defined in ICD-GPS-154

Key Fill: DS-102

Model 9002 IRIG-A, IRIG-B, and IRIG-G Reader and Synchronizer

Model 9017 VHF Receiver/Synchronizer

## Input / Output

Model 9003-7 Auxiliary I/O with RS232 I/O, External Standard Input 1 PPS Output, and 10/100 Base-T Interlace

## Parallel Code Generators

Model 9012 Parallel and Group Binary

## Serial Time Code Generators

Model 9005 Dual Time Code Generator, Various popular time codes and HAVEQUICK with both modulated and DC level shift outputs

Model 9013 Slow Code Generator, Seven rate formats, in DC level shift

## Rate Generators

Model 9009 Sine wave Rate Generator, 1 KHz - 10MHz

Model 9011 Telecom Generator, T1 or E1, Clock or Framed

Model 9014 Digital Rate Generator, Selectable, 1 PPS - 5MPPS

Model 9021 Digital Frequency Synthesizer, 1 Hz to 50 MHz in 1 Hz steps

## Distribution

Model 9006 4-Channel Digital Driver (TTL levels)

Model 9007 4-Channel RS-422 Driver

Model 9008-1 4-Channel Linear Driver, DC - 10 MHz

Model 9008-3 4-Channel Linear Driver, 100 Hz - 10 KHz (600 $\Omega$  output transformers)

## Miscellaneous

Model 9010 Dual RS-232 Serial Time Output

Model 9016 Time Tag and Event Trigger

Model 9018 Rubidium Oscillator

Specifications subject to change without notice.

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