

## Network Ready Portable Timing Unit Model PTU



Model PTU Portable Time Unit – SPS C/A code version

The Portable Timing Unit (PTU) is low cost, battery operated, transportable timing system that is designed to provide precise time of day at point of use. The PTU may be automatically synchronized by means of either GPS signals, or an serial time code such as IRIG B or Have Quick. Operation of the unit can be monitored via an Ethernet interface, or by means of front panel indicators and displays. Outputs are 1PPS, Have Quick, IRIG B Time Code and Network Time Protocol (NTP).

The unit is mounted in a rugged, weather proof case that may be easily transported to the point of use. When AC power is available, the PTU's built-in power supply will automatically charge the internal batteries.

### Reference Input Sources

The PTU is extremely flexible in its ability to synchronize to a variety of timing sources. Available references are:

- 16 channel GPS SPS receiver (standard)
- 12 channel GB-GRAM SAASM GPS receiver (optional)
- IRIG B Time Code (standard)
- HaveQuick/1PPS from external GPS receiver (standard)

Once synchronized to the selected reference, the PTU will use the reference to continuously calibrate its internal oscillator so that accurate time can be maintained in the absence the reference. Front panel LEDs indicate the reference type in use, and whether time is valid. The PTU can be configured to always use a particular reference source, or automatically select whatever source is available.

### Time Keeping

The internal time of the PTU is maintained by a high precision oscillator. Selection of the oscillator type will determine the accuracy of the PTU when its reference, (such as GPS) is not available. Available internal oscillator options are

- Temperature Compensated Crystal Oscillator (TCXO) -option
- Oven Controlled Crystal Oscillator (OCXO) standard
- Atomic Rubidium Oscillator - option

### Network Interface

The PTU incorporates an Ethernet connection that provides a convenient means of monitoring status of the instrument via a computer and simple web browser. This interface is also used to provide NTP synchronization, firmware updates and Browser based setup features.

### Output Signals

The PTU provides a variety of timing signal outputs, giving maximum application flexibility

- 1PPS 1 Pulse Per Second Signal Time Mark
- Have Quick Time Code
- IRIG B Time Code
- NTP

### Internal Battery Backup

The PTU contains an internal 7Ah battery that will operate the system in the event prime power is lost. The battery charge is monitored and maintained whenever prime power is applied to the PTU. Status is indicated by front panel LED's. Battery life is dependent upon the oscillator configuration selected and the ambient temperature, but 5 hours is typical for the OCXO version.

### Time Display

An 11 digit display indicates Years, Days, Hours, Minutes and Seconds. The illumination of the display is controlled by a front panel switch to conserve battery life.

### External Event Input

The PTU includes an external event input that will latch the time of external events applied as pulses to this input. The time tags are stored in an internal memory and may be displayed and retrieved using the network interface.

### Weatherproof Enclosure

The PTU is housed in a sturdy weatherproof enclosure that is suitable for outdoor use in all weather conditions.

## Typical Portable Timing Unit Applications

- Flight Test
- Military Test Ranges
- Portable Standby Clock
- Aircraft Mission System Hot Start
- Communications System Hot Start

## PTU SPECIFICATIONS

Satellite Signal	GPS L <sub>1</sub> 1575.42 MHz	IRIG Time Code Input	
Satellite Code	C/A 1.023 MHz	Connector	BNC
Receiver Type	Parallel 16 Channel. All-in-view satellites tracked continuously and simultaneously	Code Type	B120, B122, B123, B125
		Control Functions	IEEE 1344 supported
Warm Start	<10 sec(Open Sky)	Impedance	600 ohm
Autonomous Start	<60 seconds Cold Start (Open Sky)	Level	1-6Vp-p
Cold Start Requirement	Automatic: No input of time or position required	External Event Input	
Position Accuracy	2.4 m horizontal, 5 m altitude with respect to WGS84 after 24 hour position averaging	Trigger	Rising Edge triggered
Timing Accuracy (tracking satellites)	± 50 ns. absolute UTC	Isolation	Optical
Timing Accuracy (holdover mode, ± 5°C)	Std Deviation 15ns (OCXO) < 20ms/day (TCXO) < 50 µsec/day (OCXO) < 5 µsec /day (Rb)	Impedance	5K
1PPS Output		Max no. of Event	Last 100 events are stored
Connector	BNC	Max Repetition Rate	> 500 µsec between events
Level	0-5V or 0-10V into 50Ω link selectable by user	Battery Life at 25 +/- 15°C	24 hours (TCXO) 5 hours (OCXO) 3 hours (Rb)
On Time	Rising Edge	Battery Charging	-20 °C to 50°C
Network Interface		Temperature	
Interface Type	10BaseT	Environmental	
Protocols	TCP/IP, UDP, NTPv3, HTTP, SNMP v1, DHCP	Temperature	Instrument: -40 to +60 °C Rb1 Option: -10 to +50 °C Rb2 Option: -20 to +60 °C
Serial Interface		Humidity	95%
Type	RS232	Sealing	IP54, NEMA 3
Baud rate	9600, N,8,1	Power	85-265VAC 50/60Hz
Content	User configurable, broadcast 1/sec	Dimensions	12VDC
IRIG Time Code Output		Weight	6" W, 8 "H, 12"D
Connector	BNC	EMC Emission	11 lb. typical
Code Type	B125, standard IRIG A135, E115, G145 optional	EMC Immunity	EN55022 FCC Chapter 15 Part B EN55024
Control Functions	IEEE 1344	Ordering Information	
Level	3 V p-p into 600 ohm	001-5001 Portable Time Unit, OCXO, Standard Positioning Service	
Have Quick Output		001-5002 Portable Time Unit, Rubidium, Standard Positioning Service	
Connector	BNC	001-5003 Portable Time Unit, OCXO, Precise Positioning Service+	
Code Type	Have Quick II per ICD-GPS-060	001-5005 Portable Time Unit, Rubidium, Precise Positioning Service+	
Levels	0-5V	001-5006 Portable Time Unit, TCXO, Standard Positioning Service	
Alarm Status	Voltage free relay changeover contacts	001-5007 Portable Time Unit, TCXO, Precise Positioning Service+	
Status Indicator LED's	Power ,GPS Locked, Time Valid, IRIG, Have Quick, Fault, Battery Charge, Battery Low		
1PPS Input			
Connector	BNC		
Level	2.5V to 5V		
Impedance	50Ω		
Have Quick Input			
Connector	BNC		
Code Type	Have Quick II per ICD-GPS-060		

+ Purchase requires approval from USAF GPS Wing

©Brandywine Communications 2008