

GPS Timing Board

Model TSAT-PCI-U



- **IRIG-A, IRIG-B, NASA36 timecode reader**
- **IRIG-B timecode generator**
- **Time-Tag input**
- **Programmable periodic output (pulse/squarewave) and interrupt capability**
- **Programmable start/stop time output and interrupt capability**
- **Freewheel capability**
- **3.3V and 5.0V compliant**

The TSAT-PCI-U is a complete GPS synchronized timecode reader/generator system package that includes a circuit card assembly for the PCI bus and a GPS receiver/antenna, which is housed in a common corrosion resistant, waterproof enclosure.

The board synchronizes its on-board clock to Coordinated Universal Time (UTC). Other features include a time-tag TTL input, a programmable "heartbeat" pulse or squarewave output (with interrupt capability), and a programmable "match" start/stop time output (with interrupt capability).

In the unlikely event that the reception of the satellite signals is lost, the board continues to increment time ("freewheel"). When the signals are re-established, the board resumes synchronization automatically.

The GPS satellites provide Coordinated Universal Time (UTC) accurate to within one microsecond. They also provide position with longitude, latitude, and elevation.

A programmable time offset allows for compensation for cable delays.



Specifications

Timecode Input

Code Format (Autodetect)

IRIG-A (A132), IRIG-B (B122), NASA36

Amplitude

1.2 Vp-p min, 8.0 Vp-p max

Polarity

Detected Automatically

Modulation Ratio

2:1 min, 3:1 typ, 4:1 max

Input Impedance

>10K Ohms

Input Time Accuracy

Better than 100 ppm
(not suitable for tape playback)

Common Mode voltage

Differential input, ± 100 V max

Timecode Output

Code Format

IRIG-B (B122)

Amplitude (Adjustable)

2.6 Vp-p typical

Modulation Ratio (Adjustable)

3:1

Output Impedance

600 Ohms

On-Board Clock

Resolution

1 μ S

Range

366:23:59:59:999999

Date Format

Integer (001–366)

Propagation Delay Correction

–1000 μ S through +8999 μ S

Propagation Delay Setting

Programmed over bus

Synchronization Time

<20 seconds

Stability

Disciplined to timecode: 2×10^{-7}

Undisciplined: 1×10^{-6}

Time-Tag Input

Input Voltage

–0.5 V min, +0.8 V max for logic 0
+2.0 V min, +5.5 V max for logic 1

Tags rising edge

Input Current

<5 mA for logic 0 and logic 1

Rise/Fall Time

500 nS max

Repetition Rate

1000 events per second maximum

Timing Resolution

1 μ S

Heartbeat Output

Output Voltage

High: 3.8 V min at 6 mA
Low: 0.4 V max at –6 mA

Wave Shape

Pulse or squarewave (programmable)

Pulse Width

150 nS min, 450 nS max

Pulse Polarity

Negative

Squarewave

45%–55%

Timing

Falling Edge on-time

Range

1.000 μ S to 21.845 mS in 1 μ S steps
(1 MHz to 45.7771 Hz)

Power-on Default Rate

100 PPS (Pulse)

Match Output

Output Voltage

High: 3.8 V min at 6 mA
Low: 0.4 V max at –6 mA

Settability

1 μ S

Bus Interface

PCI Local Bus

2.3 compliant
PCI-X compatible

General

Size

H 106.7 mm, L 175.26 mm

Power (from bus)

+5 Vdc @ 425 mA max
+12 Vdc @ 225 mA max
–12 Vdc @ 50 mA max

Operating Temperature

–30° to +70° C (–22° to +156° F)

Storage Temperature

–40 to +80 C (–40 to +176 F)

Connectors

BNC and DB-15

GPS Receiver/Antenna

Number of Satellites

12

Acquisition Time

<50 seconds

Reacquisition Time

<2 seconds

Frequency

1575 MHz (receive only)
(L1 band, C/A code [SPS])

Sync to UTC

Within ± 1.0 μ S max

Position

Horizontal: <9 m
Altitude: <18 m

Size

95 mm Dia., 72.5 mm H
(3.74" Dia., 2.85" H)

Pole Mount

1.00" I.D., 14 turns/inch straight (not tapered)

Operating Temperature

–40° to +85° C (–40° to +185° F)

Storage Temperature

–55° to +105° C (–67° to +221° F)

Antenna Cable

Length

30.5 m ± 0.2 m (100' ± 8 ")

Maximum Length

92 m (300')

Cable Size

9 mm (0.35") O.D.

Connector Size

20 mm (0.79") (antenna end)
46 mm (1.80") (board end and extension cable)

Options

–HB1PPS

Extended frequency range for heartbeat output

–FXA

RS-422 driver for the heartbeat output
(includes option –HB1PPS)

–GPS Optic Isolator

Drivers

Major operating systems are supported.

Ordering Information

Model TSAT-PCI-U (+ option #)

Contact factory for extended GPS cable length options.