The Global Leader in Resilient PNT

Timecode & GPS Reader/Generator

Model TSAT-PCI-U-2

- Driver compatibility with all earlier versions of TSAT-PCI
- PCI local bus operation
- PCI-X compatible
- Universal PCI bus signaling (3.3V and 5.0V/33 or 66 MHz)
- Autodetects IRIG-A, B, or NASA36 time code inputs
- GPS synchronization
- ±1µs accuracy to input
- Zero latency time reads
- Freewheel capability
- IRIG-B timecode generator
- External event time capture/interrupt

The TSAT-PCI-U-2 has the equivalent features as the model TSAT-PCI-66U GPS synchronized timecode reader/generator package, including the GPS receiver and antenna, but includes driver mapping compatibility with all previous generations of the TSAT-PCI. If you do not need backwards compatibility with legacy software, then we recommend the model TSAT-CPI-66U.

When configured as a timecode unit, the input timecode format (IRIG-B, IRIG-A, or NASA36) is automatically detected and synchronization to the input timecode is automatic, enabled/disabled through the PCI bus.

The board can synchronize to an external 1PPS in lieu of an incoming timecode. The TSATPCI-U-2 provides precise, zero-latency time via the PCI bus on 33 and 66 MHz systems. With a 32-bit data interface, the unit offers better than 1 µs data access. Universal signaling allows the unit to function in either 5.0V or 3.3V backplanes.

The 10 MHz oscillator, central to the TSAT-PCI-U-2 timing functions, permits the board to increment time (“freewheel”) based on the last known reference in the absence of an input source. When the timing reference is reestablished, the board synchronizes automatically.

The TSAT-PCI-U-2 may be used as an IRIG-B timecode generator. The user simply sets the initial time through the PCI bus. A propagation delay offset may be specified to compensate for cable delays. Other features include multiple event time-tag TTL inputs, a programmable periodic pulse or “heartbeat,” and a programmable “alarm” start/stop time output.

Key to the TSAT-PCI-U-2 functionality is the ability to generate interrupts. With one of the many available Orolia driver packages, the user may configure the card using interrupt-driven algorithms that support our customers’ unique applications. The software packages include a demonstration program to exercise the board’s functionality, as well as a clock utility to synchronize the host system.

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: 2.6 Vp-p typical
Modulation Ratio: 3:1
Output Impedance: 600 Ohms
DCLOBNC
FXA
HB1PPS

On-Board Clock

Resolution: 1 µS
Range: 366:23:59:59:999999
Date Format: Integer (001–366)
Propagation Delay Correction: –1000 µS through +8999 µS
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 µSV

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 µS to 21.845 mS in 1µS steps (1 MHz to 45.7771 Hz)
Power-on Default Rate: 100 PPS (Pulse)

Time Match Output

Output Voltage:
High: 3.8 V min at 6 mA
Low: 0.4 V max at –6 mA
Settability: 1 µS

Bus Interface

PCI Local Bus
3.0 compliant
PCI-X compatible
32-bit data interface better than 1 µs data access

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 µS 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)

Agency Approvals

RoHS CE

Drivers

Linux* 64/32 bit, Windows 64/32 bit, Solaris 10
*Contact Sales for specifi c kernel versions.

Ordering Information

TSAT-PCI-U-2 Timecode & GPS Reader/Generator (+ option #)

Option

–CC: Conformal Coating
Contact factory for extended GPS cable length options.

CA05R-1515-0050:
50' extension cable for GPS antenna/receiver

GPS Optic Isolator

21 September, 2018 - TSAT-PCI-U-2(F)
Specifications subject to change or improvement without notice