



# Timecode Reader/Generator

## Model TPRO-PCI-U2



- **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; optional 1PPS input**
- **$\pm 1\mu\text{s}$  accuracy to input**
- **Zero latency time reads**
- **Freewheel capability**
- **IRIG-B timecode generator**
- **External event time capture/interrupt**
- **Programmable frequency output/interrupt**
- **Programmable alarm output/interrupt**

The TPRO-PCI-U2 is a synchronized timecode reader/generator card. 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 TPRO-PCI-U2 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  $\mu\text{s}$  data access. Universal signaling allows the unit to function in either 5.0V or 3.3 volt backplanes.

The 10 MHz oscillator, central to the TPRO-PCI-U2 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 TPRO-PCI-U2 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 TPRO-PCI-U2 functionality is the ability to generate interrupts. With one of the many available Spectracom 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**

**FXB**

**HB1PPS**

### 1PPS Sync Input (Option M)

**Input Voltage**  
2.4 V min, 16.0 V max (high)

**Rise/Fall Time**  
500 nS max

**Trigger Edge**  
Rising

**1PPS Accuracy**  
Must be 100 ppm or better

### 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:  $2 \times 10^{-7}$   
Undisciplined:  $1 \times 10^{-6}$

### 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 μS

### 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 1 μS 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 us 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

### Agency Approvals



### Drivers

Linux\* 64/32 bit, Windows 64/32 bit,  
Solaris 10

\*Contact Sales for specific kernel versions.

## Ordering Information

TPRO-PCI-U-2 Timecode  
Reader/Generator (+ option #)

### Option

–CC: Conformal Coating