



Timecode Reader/Generator

Model TPRO-PCI



- 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

The TPRO-PCI performs timing and synchronization functions referenced to an input timecode signal. The board synchronizes its on-board clock to the incoming timecode. The on-board clock's time is also provided as an IRIG-B output. 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).

The board continues to increment time ("freewheel") in the absence of an input timecode. Thus, the board can be used as an IRIG-B timecode generator by setting the initial time via the PCI bus.

The input timecode format (IRIG-B, IRIG-A, or NASA36) is automatically detected. Synchronization to the input timecode is also automatic and can be enabled/disabled via the PCI bus. A propagation delay offset may be specified to compensate for cable delays.

The timecode input is an amplitude modulated sine wave. An automatic gain control (AGC) circuit permits a wide range of input amplitudes. The timecode input is differential; the board does not reference this signal to ground. A single-ended input (referenced to ground) is also acceptable.

The board can be ordered with option "-M" to synchronize to a one-pulse-per-second (1 PPS) input instead of an incoming timecode. In this case, the initial time is programmed via the PCI bus and the board begins counting on the next 1 PPS pulse.



Specifications

Timecode Input

Code Format (Autodetect)
IRIG-A (A132), IRIG-B (B122), NASA36

Amplitude
1.2Vp-p min, 8.0Vp-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, $\pm 100V$ max

IRIG-B Output

Code Format
IRIG-B (B122)

Amplitude (Adjustable)
2.6Vp-p typical

Modulation Ratio (Adjustable)
3:1

Output Impedance
600 Ohms

Time-Tag Input

Input Voltage
-0.5V min, +0.8V max for logic 0
+2.0V min, +5.5V 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

On-Board Clock

Resolution
1 μ S
Range
366:23:59:999999

Date Format
Integer (001-366)

Propagation Delay Correction
-1000 μ S through +8999 μ S

Propagation Delay Setting
Programmed over PCI bus

Synchronization Time
<20 seconds

Stability
Disciplined to timecode: 2×10^{-7}
Undisciplined: 1×10^{-6}

Heartbeat Output

Output Voltage
3.8V min at 6 mA (high)
0.4V max at -6 mA (low)

Wave Shape
Pulse or squarewave

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

Power-on Default Rate
100 PPS (Pulse)

Match Output

Output Voltage
3.8V min at 6 mA (high)
0.4V max at -6 mA (low)

Settability
1 μ S

General

PCI Local Bus
2.2 compliant

Size
H 106.7 mm, L 174.6 mm

Power (from PCI bus)
+5Vdc @ 425 mA max
+12Vdc @ 225 mA max
-12Vdc @ 50 mA max

Operating Temperature
-30° to +70° C (-22° to +156° F)

Storage Temperature
-40° to +80° C (-40° to +176° F)

Connectors
BNCs for timecode input and output
DB15 (socket) for timecode input, output, heartbeat output, match output, time-tag input, and 1 PPS input.

1PPS Sync Input (Option -M only)

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

Rise/Fall Time
500 nS max

Trigger Edge
Rising

1PPS Accuracy
Must be 100 ppm or better

Ordering Information

Model TPRO-PCI (+ option #)

Options

-M
Sync to external 1 PPS

-HB1PPS
1 PPS extended frequency range for heartbeat output

-FXB
RS-422 Driver for the heartbeat output (includes option -HB1PPS)

-HDRV
Provides RS-422 Driver for the heartbeat output

-LOR1
Three outputs on three-pin header (1MHz, 1 PPS, GND)

-DCLOBNC
Provides DC shift-level output; eliminates the modulated IRIG-B output

Drivers

All major operating systems are supported.