



Timecode Reader/Generator

Model TPRO-cPCI



- **IRIG-A, IRIG-B, NASA36 timecode reader**
- **IRIG-B timecode generator**
- **Time-Tag input**
- **Freewheel capability**
- **Programmable periodic output (pulse/squarewave) and interrupt capability**
- **Programmable start/stop time output and interrupt capability**
- **High-performance, 2.5 ppm oscillator**

The TPRO-cPCI provides high-accuracy timing functions on a plug-in board for the Compact PCI computer bus. The board has an on-board clock, which is kept in sync to an external timecode input. Several timing functions are derived from the on-board clock, including a programmable periodic pulse rate output ("heartbeat"), a programmable start/stop output ("match"), a selectable frequency output ("oscillator out," 1 kHz, 1, 5, or 10 MHz), and a time-stamping input ("time-tag").

The TPRO-cPCI obtains time from an input timecode, which can be formatted as IRIG-A, IRIG-B, or NASA36. The board automatically detects which format is being used. An AGC circuit on the time code input accommodates a wide range of input amplitudes. The timecode conveys the day, hour, minute, and second. The on-board 10 MHz oscillator is disciplined to the time code input carrier frequency. The board's IRIG-B timecode output is in-sync with the incoming timecode.

The TPRO-cPCI can be used as a stand-alone timecode generator. The computer programs the day, hour, minute, and second. The board then continues to count from that time, using the on-board oscillator as the timebase reference. This is called "freewheeling."

The host computer communicates to the board through a set of memory-mapped registers. When the computer boots up, the board identifies itself to the Compact PCI bus by specifying the unique Subsystem Vendor ID. The host computer can then read the instantaneous time and command the board to set time, and/or to provide an interrupt at a periodic rate, at a specified time, and/or when a time-tag event occurs.



Specifications

Timecode Input

Code Format (Autodetect)

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

Amplitude: 1.2 V_{p-p} min, 8.0 V_{p-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 25 ppm
(not suitable for tape playback)

Common Mode Voltage:

Differential input, ± 100 V max

Timecode Output

Code Format (Autodetect): IRIG-B (B122)

Amplitude (Adjustable)

4.0 V_{p-p} typical (0 V–20 V_{p-p})

into ≥ 600 Ohm load

Modulation Ratio (Adjustable): 3:1

Output Impedance: 50 Ohms

On-Board Clock

Resolution: 1 μS

Range: 366:23:59:59:999999

Propagation Delay Correction:

–999 μS through +999 μS

(1 μS resolution)

Stability:

Disciplined to timecode: 2×10^{-7}

Undisciplined: 1×10^{-6}

Accuracy:

IRIG-A time code: 10 μS max

IRIG-B, NASA36 time code: 15 μS max

Oscillator Output

Frequency

1 kHz, 1 MHz, 5 MHz, 10 MHz or Off

(software selectable)

Type: RS-422

Differential Output Voltage:

2.5 V_{p-p} (1 MHz)

1.8 V_{p-p} (10MHz) into 120 Ohms

Timebase Accuracy: Same as on-board clock

Time-Tag Input

Input Voltage:

–0.1 V min, +0.4 V max for logic 0

+2.2 V min, +5.1 V max for logic 1

Tags rising edge

Input Current:

–600 μA for logic 0

100 μA for logic 1

Rise/Fall Time: 150 nS max

Repetition Rate:

2000 events per second maximum

Timing Resolution: 1 μS

Heartbeat Output

Output Voltage:

High: 2.4 V min at 2.5 mA

Low: 0.4 V max at –2.5 mA

Wave Shape: Pulse

Pulse Width: 100 nS, 330 nS, 1 μS, 1 ms

Pulse Polarity: Software selectable

Range:

200 nS to 65.5 seconds

Power-on Default Rate: Off

Match Output

Output Voltage

High: 3.8 V min at 6 mA

Low: 0.3 V max at –6 mA

Settability: 1 μS

In-Sync Flag Output

Type:

Open Collector

External Pullup

Voltage:

+27 VDC max

Current: –20 mA max

Polarity: Conducts to ground when board is synced to GPS or time-code.

Bus Interface

Interface: PICMG 2.0 compliant

I/O Address: 64 bytes

General

Size: H 106.7 mm, L 175.26 mm

Power (from cPCI bus):

+5 VDC @ 425 mA max

+12 VDC @ 225 mA max

–12 VDC @ 50 mA max

Operating Temperature:

5° to +50° C (41° to +122° F)

Storage Temperature:

–40° to +85° C (–40° to +185° F)

Connectors: DB15 input/output

Drivers

Major operating systems are supported.

Ordering Information

Model TPRO-cPCI

Options

–6U: 6U bracket (no charge)