spectracom



Timecode Reader/Generator Model TPRO-PC104



- IRIG-A, IRIG-B, NASA36 timecode reader
- IRIG-B timecode generator
- IRIG-B output
- Time-Tag input
- Freewheel capability
- Programmable start/stop time output and interrupt capability



The TPRO-PC104 performs timing and synchronization functions referenced to an input timecode signal, synchronizing its on-board clock to this timecode and providing its clock time as an IRIG-B output. Other features include a time-tag TTL input, programmable "heartbeat" pulse or squarewave output (with interrupt capability), and programmable "match" start/stop time output (with interrupt capability).

The board continues to increment time ("freewheel") in the absence of an input timecode. It can serve as an IRIG-B timecode generator after inital time is set via the 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 ISA bus. A propagation delay offset may be specified to compensate for cable delays.

An automatic gain control (AGC) circuit permits a wide range of input timecode 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. One-pulse-per-second (1 PPS) input synchronization is also available (Option "-M"). In this case, the initial time is programmed via the ISA bus and the board begins counting on the next 1 PPS pulse.

PC104 Interface

The board occupies 16 consecutive addresses in I/O (not memory) space. Base address and interrupt level are selected using jumpers. All board functions can be used without interrupts and can be accessed using 8-bit transfers. The time can also be read using four 16-bit transfers. Binary-coded decimal (BCD) format is used for setting and reading the time.



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: $1 \ \mu$ S Range: 366:23:59:59:999999Date Format: Integer (001–366) Propagation Delay Correction: $-1000 \ \mu$ S through +8999 μ S Propagation Delay Setting: Programmed over PC104 bus Stability: Disciplined to timecode: $2 \ x \ 10^{-7}$

Undisciplined: 1 x 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 1 Rise/Fall Time: 500 nS max Repetition Rate: 1000 events per second maximum Timing Resolution: 1 µS

1 PPS Sync Input (Option -M only)

Input Voltage: 2.4 V min, 16.0 V max (high) Rise/Fall Time: 500 nS max Trigger Edge: Rising 1 PPS Accuracy: Must be 100 ppm or better

Heartbeat Output

Output Voltage: High: 3.8 V min at 32 mA (source) Low: 0.4 V max at -645 mA (sink) Wave Shape: Pulse or squarewave (programmable) Pulse Width: 150 nS min, 450 nS max Pulse Polarity: Negative Squarewave: 45% to 55% Timing: Falling edge on-time (pulse or squarewave) Range: 1.000 µS to 21.845 µS in µS increments (1 MHz to 45.7771 Hz) Power-on Default Rate: 100 PPS (pulse)

Match Output

Output Voltage: High: 3.8 V min at 32 mA (source) Low: 0.4 V max at –64 mA (sink) Settability: 1 µS

Bus Interface

I/O Address: 16 consecutive addresses
I/O Base Address: 0000–0FF00 (jumper selected)
Interrupt Level: IRQ 2–7, 10–12, 14, 15 (jumper selected)
Time Between Accesses: 100 µS minimum
Necessary Accesses:
4 (read time, 16-bit mode)
14 (read time, 8-bit FIFO mode)

12 (read time-tag, 8-bit FIFO mode)

- 11 (set time, heartbeat, or match)
- DMA Transfers: None

General

Size: H 95.89 mm, L 90.17 mm Power (from ISA bus): +5 Vdc @ 0.7 mA max +12 Vdc @ 175 mA max -12 Vdc @ 20 mA max Concreting Temperature: 30° to +

Operating Temperature: -30° to $+70^{\circ}$ C (-22° to $+158^{\circ}$ F) Storage Temperature: -40° to $+80^{\circ}$ C (-40° to $+176^{\circ}$ F) Connectors: BNC and DB15 depending on input/output

Drivers

Major operating systems are supported.

Ordering Information

Model TPRO-PC104 (+option #)

Options

- -M: Sync to 1 PPS input instead of timecode
- -HB1PPS: 1 PPS heart beat output
- -FXB: RS-422 driver for heart beat output (includes -HB1PPS)
- -LOR1: Three outputs (1MHz, 1 PPS, GND)