spectracom

DISCONTINUED PRODUCT
Contact Spectracom for Replacement Options

GPS Timing Board

Model TSAT-PC104

- **GPS-synchronized timecode generator**
- **GPS, IRIG-A, IRIG-B, NASA36 timecode reader**
- **IRIG-B timecode generator**
- **Time-Tag input**
- **Programmable periodic output (pulse/squarewave) and interrupt**
- **Programmable start/stop time output and interrupt**

The TSAT-PC104 is a complete system package that includes the GPS receiver/antenna (housed in a common enclosure), a 100-foot antenna cable, and a circuit card assembly for the PC104 bus.

The board synchronizes its on-board clock to Coordinated Universal Time (UTC). 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).

In the unlikely event that reception of the satellite signals is lost, the board continues to increment time ("freewheel"). When the signals are re-established, the board resumes synchronization automatically.

The GPS satellites provide Coordinated Universal Time (UTC) accurate to within one microsecond. They also provide position (longitude, latitude, and elevation).

A programmable time offset allows for compensation for cable delays.

PC104 Interface

The board occupies 16 consecutive addresses in I/O (not memory) space. Jumpers on the board allow for selection of base address and the interrupt level. All board functions can be used without interrupts, if desired.

TSAT-PC104 functions can be accessed using 8-bit transfers. In addition, the time can be read with four 16-bit transfers. Binary-coded decimal (BCD) format is used for setting and reading the time.

USA | 1565 Jefferson Road, Suite 460 | Rochester, NY 14623 | +1.585.321.5800 | sales@spectracomcorp.com
FRANCE | 3 Avenue du Canada | 91974 Les Ulis, Cedex | +33 (0)1 64 53 39 80 | sales@spectracom.fr
UK | 6A Beechwood | Chineham Park | Basingstoke, Hants, RG24 8WA | +44 (0)1256 303630 | info@spectracom.co.uk

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): 4.0 Vp-p typical (0 V–20 Vp-p)
Modulation Ratio (Adjustable): 3:1
Output Impedance: 600 Ohms
Settability: 1 µS

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 (1 µS resolution)
Propagation Delay Setting: Programmed over bus
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

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, 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 1 µS increments
Power-on Default Rate: 100 PPS (pulse)

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

I/O Addresses: 16 consecutive addresses
I/O Base Address: 003-3F0 (jumper selected)
Interrupt Level: IRQ 2–7, 10–12, 14, 15 (jumper selected)
Bus Speed: 16 MHz maximum
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 107 mm, L 168 mm
Power (from ISA bus):
+5 VDC @ 0.7 mA max
+12 VDC @ 175 mA max
–12 VDC @ 20 mA max
Operating Temperature: –30° to +70° C (–22° to +158° F)
Operating Temperature: –40° to +80° C (–40° to +176° F)
Connectors: BNC and DB15 depending on input/output

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')
Maximum Length: 92 m (300')
Cable Size: 9 mm (0.35") O.D.
Connector Size: 20 mm (0.8") (antenna end)
Industry standard DB-15 (board end and extension cable)

Drivers

Major operating systems are supported.

Ordering Information

Model TSAT-PC104 (+ option #)

Options

–HB1PPS: Extended frequency range for heartbeat output
–FXB: RS-422 driver for the heartbeat output (includes option –HB1PPS)
TRIM-CAB-D-D-100: 100' extension cable for GPS antenna
GPS Optic Isolator
–M: Sync to 1 PPS input instead of timecode
–LOR1: Three outputs (1MHz, 1 PPS, GND)

June 30, 2014 - TSAT-PC104(E)