Model TSAT-PMC

GPS Timing Board with PMC Interface

Version 1.4

The TSAT-PMC provides high-accuracy timing functions on a plug-in board for the PMC bus. Its on-board clock is kept in sync to an external timecode input; the clock's time is also supplied as an IRIG-B output. The clock provides several timing functions, including a programmable periodic pulse rate output ("heartbeat"), a programmable start/stop output ("match"), a selectable frequency output ("oscillator out" at 1kHz, 1, 5, or 10MHz), and a time-stamping input ("time-tag").

A complete system package, the TSAT-PMC includes an externally-mounted GPS antenna and a 100-foot cable to connect the antenna to the board, and a circuit card assembly for the bus. It automatically syncs its on-board clock to the time transmitted by GPS satellites, which provide continuous time and position information accurate to within one microsecond, and available anywhere in the world. The board outputs a timecode signal, in IRIG-B format, that conveys the day, hours, minutes, and seconds. It also has a 1kHz carrier referenced to the on-board oscillator.

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

Features

- Complete GPS synchronized timecode reader/generator system
- IRIB-B timecode generator
- Time-tag TTL input
- 1MHz TTL output
- Programmable periodic output (pulse/squarewave) and interrupt capability
- Programmable start/stop time out and interrupt capability
- High-performance, 2.5ppm oscillator

Ordering Information

Model TSAT-PMC + Option #

Options

TRIM-CAB-D-D-100
100' extension cable for GPS antenna

Drivers

450-41-9x/00/ME/XP	Windows
450-41-NT	Win NT
450-42	Linux
450-43	VxWorks
450-44	LabView

GPS Optic Isolator

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Model TSAT-PMC

Accurate, User-programmable

Specifications

GPS Receiver/Antenna (externally mounted)

No. of Satellites
8

Acquisition Time
5 minutes typ, 15 minutes max (cold start)

Re-acquisition Time
<10 seconds

Frequency
1575MHz (receive only)
(L1 band, C/A code {SPS})

Sync to UTC
Within ±1.0uS max

Position
25m SEP (w/o SA) (82 feet)

Altitude
0m to +18,000m
(0' to +59,055')

Size
147mm Diam., 100mm H
(5.8" Diam., 3.9" H)

Pole Mount
1.00" I.D., 14 turns/inch straight (not tapered)

Operating Temp
–30° to +70°C (–22° to +158°F)

Storage Temp
–55° to +100°C (–67° to +212°F)

Waterproof
Submersion to 1m

Salt Fog
MIL-STD-202F, Method 101D Condition B

Antenna Cable

Length
30.5m ±0.2m (100' ±8")

Maximum Length
92m (300')

Cable Size
9mm (0.35") O.D.

Connector Size
20mm (0.79") O.D. (antenna end)

Connectors
Micro DB-15 to card
Micro DB-25 to a BNC break-out cable for timecode input and output, for time tag input, for heartbeat output, and for match output

General

Size
H 106.7 mm, L174.6 mm

Operating Temperature
0 to +70 C (–22 to +167 F)

Storage Temperature
–40 to +85 C (–40 to +185 F)

Connectors
BNCs and DB-15

Common Mode Voltage
Differential input, ±100V max

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

Timing Accuracy
Better than 100 ppm
(not suitable for tape playback)

Common Mode Voltage
Differential Input; ±100V max

IRIG-B Output

Code Format
IRIG-B (B122)

Amplitude
4.0Vp-p typical; 0V–10Vp-p, adjustable

Modulation Ratio
3:1 (adjustable)

Output Impedance
600 Ohms

Setability
1 uS

On-Board Clock

Resolution
1 uS

Range
366:23:59:59:999999

Propagation Delay Correction
–999 uS through +999 uS

Stability
Disciplined to timecode: $2x10^{-7}$
Undisciplined: $1x10^{-6}$

Match Output

Output Voltage
3.8V min at 6 mA (high)
0.3V max at –6 mA (low)

Setability
1uS

Time-tag Input

Input Voltage
-0.1V min, +0.4V max for logic 0
+2.2V min, +5.1V max for logic 1
Tags rising edge

Input Current
–600mA for logic 0
100mA for logic 1

Rise/Fall Time
150 nS max

Repetition Rate
2000 events per second max

Timing Resolution
1 uS

Heartbeat Output

Output Voltage
2.4V min at 2.5 mA (high)
0.4V max at –2.5 mA (low)

Wave Shape
Pulse

Pulse Width
100 nS, 330 nS, 1 uS, 1 mS

Pulse Polarity
Software selectable

Range
200 nS to 65.5 seconds

Power-on default rate
Off

Oscillator Output

Frequency
1kHz, 1MHz, 5MHz, 10MHz or OFF
(software selectable)

Type
RS-422

Differential Output Voltage
2.5Vp-p (1MHz), 1.8Vp-p (10MHz)
into 120 ohms

Timebase Accuracy
Same as on-board clock

Phase Noise

–100dBC/Hz at 10Hz offset
–130dBc/Hz at 100Hz offset
–145dBc/Hz at 1kHz offset
–150dBc/Hz at 10kHz offset

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