

Model TSAT-S

Version 1.3

GPS-based Time Reference System



The TSAT-S is a complete system package that includes the GPS Receiver/Antenna, a 100-foot antenna cable, and a circuit card assembly for the S-bus. The board synchronizes its on-board clock to Coordinated Universal Time (UTC). A time-tag TTL input is also provided.

GPS satellites provide Coordinated Universal Time (UTC) accurate to within one microsecond.

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 automatically resumes synchronization.

A programmable time offset allows for compensation for cable delays, and provides position with longitude, latitude, and elevation.

Features

GPS synchronized timecode generator

GPS, IRIG-A, IRIG-B, NASA36 timecode reader

IRIG-B output

Time-Tag input

Ordering Information

Model TSAT-S (+ option #)

Options

– HB1PPS

Extended frequency range for heartbeat output

–TRIM-CAB-D-D-100

Extension cable for antenna

–GPS Optic Isolator

Drivers

All major operating systems are supported.



Model TSAT-S

Complete Package, Accurate, User-programmable

Specifications

GPS Receiver/Antenna

Number of Satellites

8

Acquisition Time (cold start)

5 min typ, 15 min max

Re-acquisition Time

<10 seconds

Frequency

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

Sync to UTC

Within ± 1.0 μ S max
(antenna in stationary position)

Position

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

Altitude

-400 m to +18,000 m
(-1,132' to +59,055')

Size

147 mm Diam, 100 mm H (5.8" Dia, 3.9" H)

Pole Mount

1.00" I.D., 14 turns/inch straight

Operating Temp

-30 to +70 C (-22 to +156 F)

Storage Temp

-55 to +100 C (-67 to +212 F)

Waterproof

Submersion to 1 m

Salt Fog

MIL-STD-202F
Method 101D
Condition B

Antenna Cable

Length

30.5 m \pm 0.2 m (100' \pm 8")

Maximum Length

92 m (300')

Cable Size

9 mm (0.35") O.D.

Connector Size

20 mm (0.79") O.D. (antenna end)
46 mm (1.80") O.D. (board end & extension cable)

General

Size

L 150 mm, W 84 mm, H 21 mm

Power (from bus)

+5Vdc @ 0.4 Amps max
+12Vdc @ 100 mA max
-12Vdc @ 20 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;
DB-15 (socket) for timecode input and output,
heartbeat output, match output, time-tag input,
and 1 PPS input

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, ± 100 V 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 μ A for logic 0 or logic 1

Rise/Fall Time

500 nS max

Repetition Rate

1000 events per second max

Timing Resolution

1 μ S

On-board Clock

Resolution

1 μ S

Range

366:23:59:59:999999

Date Format

Integer (001-366)

Propagation Delay Correction

-1000 μ S through +8999 μ S

Propagation Delay Setting

Programmed

Synchronization Time

<20 seconds

Stability

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

S-Bus Interface

Offset 8000 Time (lower 32 bits)

Offset 8004 Time (upper 32 bits)

Offset 8008 Command Register

Offset 8009 Software Event Trigger

Offset 800A FIFO (read only)

Offset 800B Status Register

Offset 800C (reserved)

Offset 800D Software Reset

Offset 800E (reserved)

Time Between Accesses

100 μ S min

Necessary Accesses

2 (read time, 32-bit mode)

14 (read time, 8-bit FIFO mode)

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

11 (set time)



KSI Corporation 380 Foothill Road, Suite 102 Bridgewater, New Jersey 08807
Toll-free Phone (866) KSI-KSI3 Toll-free Fax (866) 593-2080 E-mail: info@ksi-corporation.com
www.ksi-corporation.com