

TCP-Ax - RUGGED TIME CODE PROCESSORS - FLIGHT QUALIFIED



**GPS / HaveQuick / IRIG-B / PTP Referenced
Time Code Processors with Programmable
HaveQuick / 1 PPS / IRIG-B and Video Insertion Output Capability**



AS9100D Certificate Number : C0210021-AS3



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Product Overview

The TCP-Ax range of advanced rugged Time Code Processors are extremely accurate and robust instruments that are easily configured with a PC via USB to synchronize with a wide variety of external time sources, including GPS, IRIG-B, IRIG-DCLS, 1PPS, Have Quick, and PTP (IEEE 1588).



Two size variants are offered, the TCP-AS (Standard - Top Right) and the TCP-AM (Miniature version - Bottom Right). The TCP-AS provides additional connectivity, backup power options (Li-Ion or super capacitor), and video insertion options (PAL & NTSC).

Ethernet options are provided with a built in SNTP web-server that provides a secure user friendly interface for configuring the unit and I/O functionality along with PTP & NTP functions. GPS options also provide an RS232 interface port with NMEA message output.



Each unit provides an IRIG-B (121-127) output along with five configurable and programmable digital output signal generators for 1PPS, GPS Have Quick, IRIG-DC, GPS Lock. In addition, four digital event capture inputs are provided that are accurate to within 100ns, making the TCP-Ax the ideal instrument for on board data capture, UTC referenced time stamping and timecode signal distribution.

All units are flight qualified and tested to MIL-STD 810F and 461E, CE102 and RE 102.

Key Feature Summary

Timing & Interfaces

- Time reference inputs - 16 Channel GPS, IRIG-B, Have Quick, PTP (IEEE 1588) Slave
- Simple setup using PC via USB port
- +/-12 hour time offset programmability with 1 second resolution
- Galileo capable option, with firmware change
- 4 User Selectable Event Capture Input accurate to 100ns
- Ethernet 10/100BaseT option : PTP (IEEE-1588) Master / Slave options + NTP Network Interface
- High stability disciplined hybrid OC/TCXO as standard
- Backup power options - Lithium Ion Battery or SuperCap
- Internal Real Time Clock Battery Backup
- Rugged compact design - meets MILSTD 810F / 461E, CE102 & RE 102
- Video Signal Time Stamp Insertion Option (TCP-AS)
- 9 - 36V DC Input - 1.5 watts consumption

Input Options

- 16 Channel GPS RF (50 Ohm Active or Passive antenna)
- Ethernet 10/100BaseT PTP IEEE 1588-2002/2008 (PTPv1/v2) Slave
- 5 Programmable Inputs (PPS, IRIG-DC, Have Quick, etc.)
- 4 channel event capture
- IRIG-B

Output Options

- IRIG-B
- 5 programmable outputs as 1PPS, IRIG-DC, Have Quick
- Ethernet 10/100BaseT IEEE 1588-2002/2008 (PTP v1/v2) Master (hardware support) or NTP Server
- RS232 NMEA Messages (Time & Location) with GPS option
- Video Overlay

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Specifications



Specifications - TCP-Ax	
Input Sync Options	Details
Std : IRIG-B	Accuracy within +/- 10 μ s of external source at initial synchronization
Std : GPS-HQII	Accuracy within +/- 200 ns of external source
Optional : GPS	16 Channel GPS Receiver Option - Galileo option available
Optional : PTP (IEEE-1588)	Slave option from PTP source - <i>See Network Interface Options below</i>
Inputs - Event Capture	
Std : Four Programmable Inputs	Event 1 to Event 4, De-bounced switch closure input, Logic level input (accuracy +/- 100 ns)
Outputs	
Std : IRIG Outputs	IRIG-B121...127 via BNC : 3.0 Vp-p (no load), 2.0 Vp-p (into 600 ohms)
Std : Five Programmable Outputs	Programmable Pulses 1 to 4, 1PPS, GPS On Time Mark, GPS Have Quick II, GPS Lock, IRIG-DC
Optional : IRIG Output Options	IRIG-A, IRIG-E, IRIG-H
Optional : NTP	NTP Server Master Clock from GPS reference option - <i>See Network Interface Options below</i>
Optional : PTP (IEEE-1588)	PTP Master Clock Mode from GPS reference option - <i>See Network Interface Options below</i>
Optional : RS-232 (with GPS)	NMEA messages (Time/Location) with GPS option Connector : Glenair - Pt No 801-011-07M7-10SA Mates with: Glenair Pt No: 801-008-16M7-10PA
Internal Time Base Accuracy	
Stability	1 ppm (@ 25 deg C)
Stability over temperature	1 ppm (-40 to +40 deg C)
Long Term Stability	1 ppm (1 year @ 25 deg C)
Calibration Range	+/- 8 ppm
Calibration Accuracy	+/- 15 ppb of external time source (@ 25 deg C) when disciplined
Time Offset	Programmable + / - 12 Hours - 1 second resolution
Network Interface Options	
Standard Physical Option	1 port : 10/100 Base T via RJ45 connector
Protocols	NTP Version 3 [RFC 1305] , IEEE-1588, SNTP compatible (RFC 2030) SNMP, IEEE802.3, UDP/IP, ICMP
Optional : Network Interfaces	4 options available : NTP Time Server, NTP Client, PTP Grandmaster, PTP Slave
Status LEDs	Power, IRIG-B, GPS status
Environmental	
Temperature	Operating : -40°C + 85°C Storage : -50°C + 95°C - (Non Li-Ion option)
Humidity	95 % non condensing
Power	9 - 36 V DC 1.5 Watts Connector : Glenair - Pt No 801-011-07M5-5SA Mates with: Glenair Pt No: 801-008-16M5-5PA
Physical	TCP-AS - 15.0 cm x 10.8 cm x 5.9 cm (5.9" x 4.3" x 2.3") Weight : 0.7 to 1.4 kg (1.5 to 3 lb) depending upon options TCP-AM - 14.9 cm x 10.3 cm x 3.7 cm (5.9" x 4.0" x 1.5") Weight : 0.5 kg (1 lb)
Compliance	Tested to MIL-STD 810F and 461E CE102 and RE 102
Options for TCP-AS only	TCP-AS only (Larger Variant)
Optional : Time Display	Optional time of day display LCD
Optional : Ruggedised 10/100BaseT Network Port	Optional Ruggedised 10/100BaseT Interface
Optional Clock Backup	Option 1 : Super Cap option (See temperature specs) Option 2 : Lithium Ion Battery Pack
Optional : Video Insertion	Features : PAL and NTSC video Input / Output - Auto detect video signal Programmable overlay position and content - Event markers (from event inputs) Options for 2 channels (front) + option for additional 2 channels (rear)