CATU

Compact Airborne Timing Unit

The Brandywine Communications Compact Airborne Timing Unit is a robust time reference LRU designed for airborne environments.

The CATU processes time of day from an internal GPS receiver (either Commercial or Military), while generating precise dual 10MHz frequency references and dual UTC-aligned ICD-GPS-060B-compliant one-pulse-second signals (1PPS). In addition, the CATU LRU features IEEE 802.3ab (1GbE) Stratum 1 NTP Server functionality.

FEATURES

- **Ruggedized**
- **Flight Qualified**
- **Available with vibration-isolated OCXO or CSAC Oscillator options**
- **Gigabit Ethernet**
- **GNSS, SAASM, or M-Code supported**
- **Designed for GPS denied environments**

This versatile timing unit employs its GPS for basic disciplining of its internal Oven Controlled Crystal Oscillator (OCXO), and an - optional - Chip Scale Atomic Clock (CSAC), providing holdover capabilities in a GPS denied environment in excess of 20 hours. Complimented by a low phase noise, vibration compensated 10MHz reference output locked to the 1PPS ICD-GPS-060B compliant output, the Brandywine Communications Compact Airborne Timing Unit provides unparalleled availability of reliable TOD in highly demanding fixed, and rotary-wing applications.

A commercial version with GNSS Receiver is also available.

Applications

- Flight Test
- Field Applications
- Airborne Command Post
- AWACS
- ELINT Aircraft

Key Benefits

- Ruggedized Design
- Flight Qualified
- Vibration Isolated Compact Design
- GNSS, SAASM and M-Code Supported

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Specifications

Input

GPS Antenna Input

Signal Format:	GPS CA GPS P(Y) (optional)
Input Signal Level (at receiver RF connector)	
P(Y) on L1:	-153 dBW to -121 dBW
P(Y) on L2:	-153 dBW to -124 dBW
C/A on L1:	-150 dBW to -119 dBW
Minimum Operating Bandwidth at	
L1	1575.42 MHz ± 10.23 MHz
L2	1227.60 MHz ± 10.23 MHz
Input Impedance	50 ohm (nominal)
Input VSWR	2.5:1 maximum at center frequency of L1 and L2.

Power

No of Inputs	1
Voltage	28VDC per MIL-STD-704F
Rated Current Draw	1A
Interface	IS-GPS-154

10 MHz Phase Noise	
Offset (Hz)	Phase Noise (dBc/Hz)
1Hz	<-85
10Hz	<100
100Hz	<130
1kHz	<-145
10kHz	<-155
100kHz	<-155

Phase Noise

G sensitivity	$5x10^{-11}$/G
Vibration frequency range	10Hz-2000Hz
Allan Deviation	
1 second	$1x10^{-11}$
10 seconds	$1x10^{-11}$
100 seconds	$5x10^{11}$

Output

1PPS Outputs

Number of outputs	Two
Signal Format	Per ICD-GPS-060B
Rate	1 pulse per second
Rising Edge	On Time
Rise Time	<50 ns
Fall time	<100 ns
Pulse Width	20 µs ±5% default.
Amplitude	10 V ±10%
Coherency	1 PPS = $10MHz/10^6$

10 MHz Reference Frequency Output

Signal Format	Sinusoid
Frequency	10 MHz
Number of outputs	Two
Amplitude	13 dBm/$1V_{RMS}$
Harmonic Distortion	-30 dBc
Frequency Accuracy (Locked):	$1x10^{-12}$ avg. over 24 hours
Holdover	1 µs/24 hours

Ethernet Interface

Signal Type	Gigabit Ethernet (IEEE 802.3ab)
Formats Supported	NTPv4, SNMPv3, SSH

Physical

Dimension

Dimensions	7.29” x 4.52” x 2.36”
Weight	3 lbs. nominal
Connectors	
J1	Antenna, SMA
J2, J3	1PPS, SMA
J4, J5	10MHz, SMA
J6	D-Sub17 for KLIF, DS/101-232
J7	1 Gb Ethernet
Battery	MMCX
Antenna supply	5V @ 35 mA

Environmental

Operating Temp.	-40°C to +55°C
Altitude	41000 ft.
Humidity	95% non-condensing

Environmental Certifications

Tested to the following specifications:

MIL-STD-810F	
MIL-STD-461:	CS101, CS114, CS115, CS116

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