Timing is Everything!

Reliance on GPS Assured Positioning, Navigation, and Timing (PNT)

GPSDO (GPS Disciplined Oscillator) provides a cost effective and precise means for Assured Positioning, Navigation, and Timing (PNT).

bliley technologies

#BlileyTakesYouFurther

Atlas Series

Low cost GPSDO (GPS Disciplined Oscillator) solutions for Assured PNT applications

assured timing

#BlileyOnBoard

Global Positioning System (GPS) provides:

- Positioning: latitude, longitude, and altitude
- Navigation: velocity (speed and direction)
- Timing: precise time (nanosecond, 10-9 seconds)

GPS precision timing is used for synchronization and many critical infrastructure systems including the 5G communication networks, electric grid, financial institutions, and IT. The GPS space-based signals are low-power and unencrypted, making them vulnerable to intentional and unintentional disruptions called **GPS Denied** environment.

Bliley addresses these GPS vulnerabilities through complementary and alternative timing technologies to provide Assured PNT. Bliley's Assured PNT product lines the **Atlas Series** and **Kronos Series** provide resilient timing data, hamper jamming and spoofing, and are a complementary timing source that can be used for time validation.

Bliley is excited to take your Assured PNT applications further!

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Atlas Series

Low cost GPSDO (GPS Disciplined Oscillator) solutions for Assured PNT applications

specification

	atlas standard	atlas LG Low-G	atlas X low time error ** COMING SOON **
frequency range	10 mhz	10 mhz	10 mhz
holdover stability*	>1.5 us	>1.5 us	<1.5 us
supply voltage	3.3 or 5 vdc	3.3 or 5 vdc	3.3 or 5 vdc
power	0.25 W	0.25 W	0.25 W
operating temp	-40 to 85 °C	-40 to 85 °C	-40 to 85 °C
outputs	1PPS/ RF	1PPS/ RF	1PPS/ RF
time error**	N/A	N/A	< 1.5 us
g-force acceleration	<0.5 ppb/ g	< 0.15 ppb/ g	< 0.15 ppb/ g

* Over 24 hours at 25 °C

** Accumulated time error (PPS output) over 24 hours

Drop-in!

The Bliley Atlas Series product is designed to drop-in to the Chip Scale Atomic Clock (CSAC) footprint with pin-to-pin compatibility.

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Atlas Series

Low cost GPSDO (GPS Disciplined Oscillator) solutions for Assured PNT applications

Atlas GPSDO

The Bliley **Atlas Series** is a GPS Disciplined Oscillator (GPSDO) built with Bliley **Achilles Series** Low Power OCXOs. These units are designed to provide precision time and frequency using GPS signals. By combining the short-term stability of OCXOs with the long-term stability of GPS, Bliley can offer a very stable time and frequency reference across all time domains. Bliley's PNT solutions are a lower cost precision timing source where atomic devices are cost-prohibitive.

The standalone Atlas unit is ideal for applications with a 1PPS and is a pin-to-pin drop-in compatibility with the Chip Scale Atomic Clocks (CSACs). The low-profile small form-factor and low-power consumption provide a lower cost precision timing solution. The **Atlas Series** is available with a Low-G, Low Noise, and Low Power options.

Atlas GPSDO w/ Integrated GNSS Receiver

The Atlas IG is a version of the Atlas GPSDO, but with a fully integrated GNSS Receiver.

gps disciplined oscillator

Atlas Series

Atlas IG Series

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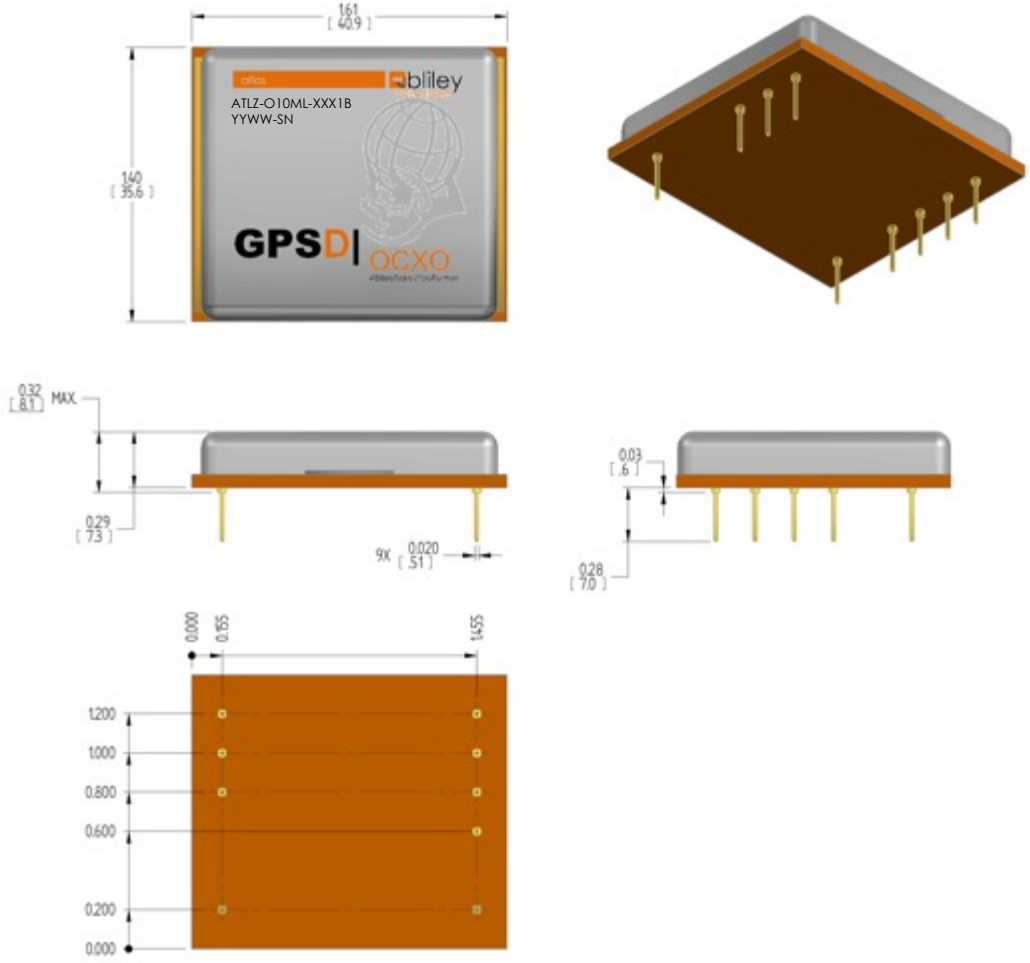
Atlas Series

Low cost GPSDO (GPS Disciplined Oscillator) solutions for Assured PNT applications



dimensions

PIN	FUNCTION
1	N.C.
4	BITE
5	Tx
6	Rx
7	Supply Voltage
8	Ground
9	1PPS Input
10	1PPS Output
12	RF Output

Tolerances (mm) .X = ± 0.5, .XX = ±0.2 unless otherwise specified

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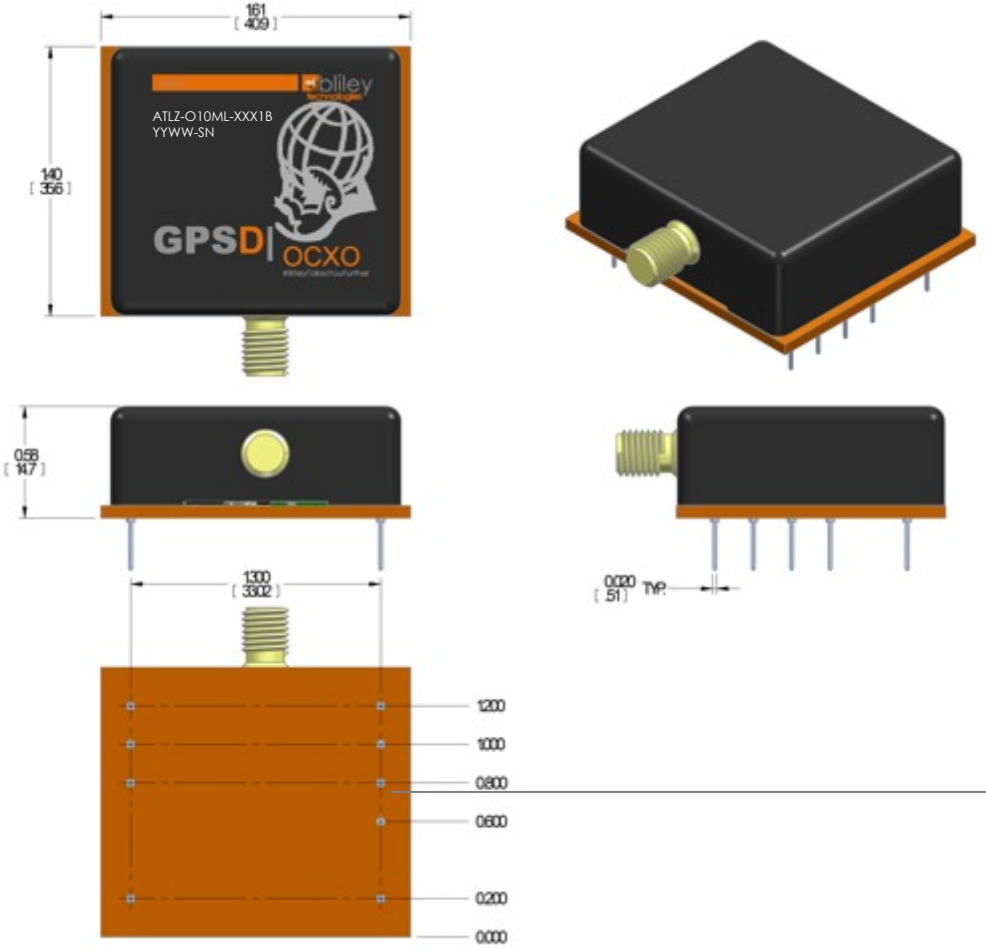
Atlas IG Series

Low cost GPSDO (GPS Disciplined Oscillator) w/ GNSS Integrated Receiver solutions for Assured PNT applications

dimensions



PIN	FUNCTION
1	N.C.
4	BITE
5	Tx
6	Rx
7	Supply Voltage
8	Ground
9	1PPS Input
10	1PPS Output
12	RF Output
SMA	GNSS Antenna

Tolerances (mm) .X = ± 0.5, .XX = ±0.2 unless otherwise specified

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Kronos Series

Bliley can provide you a fully integrated Disciplined Atomic Clock solution

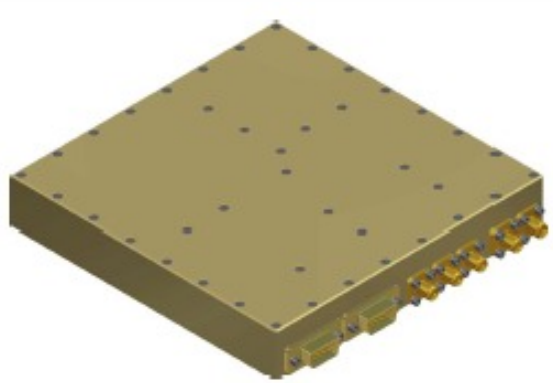
disciplined rubidium oscillator

Kronos DRO

The Bliley **Kronos Series** is our custom RF or Timing product solutions derived from your specification or needs. The Disciplined Rubidium Oscillator (DRO) built with Bliley's G-Compensated **Poseidon Series** and Bliley's **Atlas Series** GPS disciplining algorithms are designed to provide precision time and frequency without GPS for complete missions using precision disciplining from either a Rubidium for Chip Scale atomic clock. Product benefits are as follows:

- Superior Phase Noise on the output driven by the OCXO Quartz Crystal
- Superior Dynamic ADEV and Phase Noise
- System locks in less than 30 min
- 1PPS output(s)
- 10MHz output(s)
- Frequency Stability +/ - 50 ppt
- Short-term stability of the OCXO and long-term stability of the atomic clock
- Full custom packaging can be provided (if needed)

Do you have a critical timing challenge for Bliley, request a proposal!



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Kronos Series

Bliley can provide you a fully integrated Disciplined Atomic Clock solution

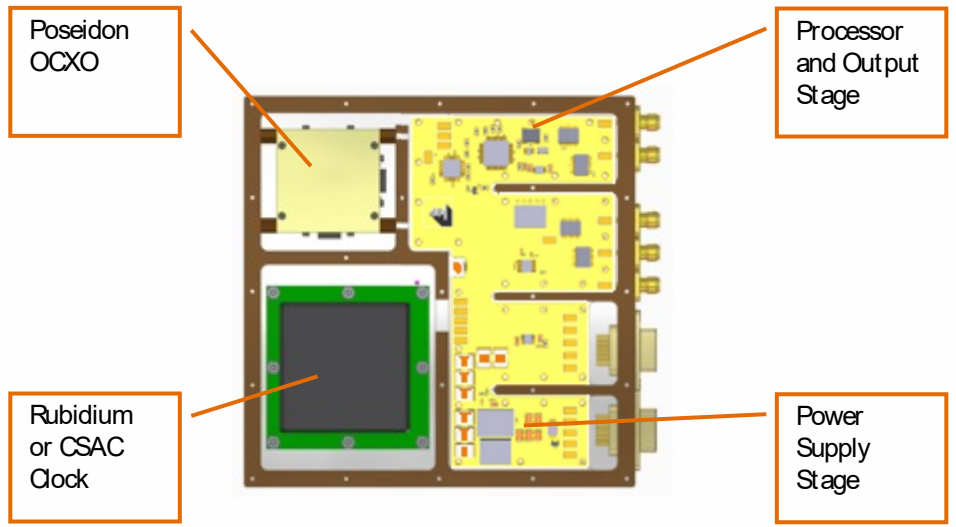
specifications

Kronos DRO

The Bliley **Kronos Series** Disciplined Rubidium Oscillator (DRO) following specifications are derived from a standard system, other requirements can be considered and implemented into this product line:

- Superior Phase Noise: -100 dBc/ Hz @ 1Hz, -125 dBc/ Hz @ 10Hz
- Superior Dynamic Phase Noise: -120 dBc/ Hz @ 10Hz, -165 dBc/ Hz @ 100 KHz
- Superior Dynamic ADEV: <1.4E-11 Hz @1 Sec, <3.0E-11 Hz @ 10 Sec
- Power Supply Isolated and regulated from high voltage Aircraft supply input
- System stability in less than 10 min
- 1PPS output(s)
- 10MHz output(s)
- Frequency Stability +/ - 50 ppt
- Command and Telemetry interface
- Full custom packaging can be provided (if needed)

Do you have a critical timing challenge for Bliley, request a proposal!



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Kronos Series

Bliley can provide you a fully integrated Disciplined Atomic Clock solution

gps disciplined oscillator

Kronos GPSDO with L-Band Multiplexer

The Bliley **Kronos Series** leverages Bliley's **Atlas Series** GPSDO with L-Band multiplexer provides a precision reference oscillator incorporates Bliley's **Apollo Series** Low Noises,, Low-G OCXO with a bias tee and diplexer function for both the Receive (Rx) and Transmit (Tx) chains of an antenna system. The following benefits:

- Compact size 2.5"x3.0"x1.75"
- GPSDO stability +/ -50 ppt while locked to GPS
- Low-G OCXO < 0.05 ppb/ G worst axis

Do you have a critical timing challenge for Bliley, request a proposal!

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Kronos Series

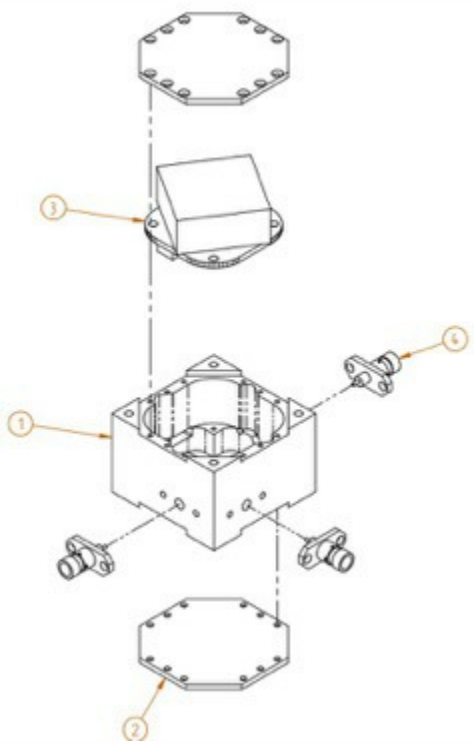
Bliley can provide you a fully integrated Disciplined Atomic Clock solution

re-clocking oscillator

Kronos 100MHz PLL

The Bliley **Kronos Series** re-clocking module allows you to lock a Bliley **Apollo Series** Low Noise, Low-G acceleration OCXO to your onboard 10MHz reference. The following benefits are:

- Very small footprint 1.5”x1.5”x1.0”
- Weight = 110 grams
- Two (2) 100MHz Sine outputs (SMA connectors)
- Phase Locked 100MHz to 10MHz Reference
- Output Amplitude > 3dBm
- VSWR < 1.65:1
- ADEV 1.0E-11 @ 1 second, 3.0E-10 @ 10 seconds
- Output Static Phase Noise -100 dBc/ Hz @10Hz, -130 dBc/ Hz @100Hz
- One (1) 10MHz Sine reference signal in (SMA connector)
- Load Impedance 50 Ohms
- Lock Detect output
- Power Consumption < 4.2W
- Supply Voltage 12 Vdc
- Operating Temperature -40 to 70 °C



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Hyperion Series

Bliley can provide you a fully integrated RF synthesized Local Oscillator (LO) solution

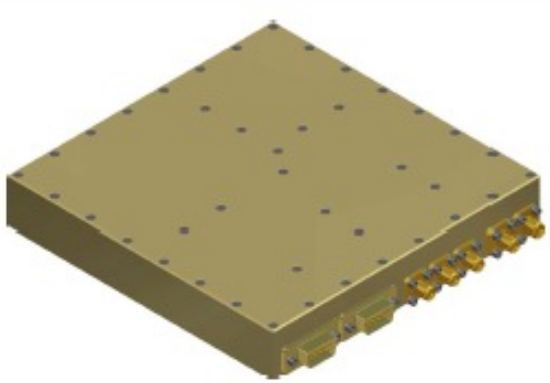
local oscillator

Hyperion LO - RF Synthesizer

The Bliley **Hyperion Series** Local Oscillator (LO) RF synthesizer incorporates Bliley's **Apollo Series** Low Noise, Low-G OCXO or **Achilles Series** Low Power, Low Noise Log-G OCXO. Precision frequency control outputs synthesized to your custom frequency and output needs. Hyperion offer both fixed and controlled swept frequency ranges. The following benefits are:

- Very customizable
- Multiple Synthesized frequencies ranging from Low Frequency to X-Band Frequency
- Rapid Sweep Frequencies leveraging DDS with a 500 MHz sweep range
- Ruggedized for High Shock and Vibration environments

Request a proposal from Bliley!



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quality and reliability is our priority

- AS9100D/ISO9001
- RoHS Compliant Product
- REACH Compliant
- Environmental and Qualification testing to MIL-STD-883B, MIL-STD-202 and MIL-O-55310
- Actively pursuing qualification with DLA/DSCC for MIL-PRF-55310
- Product Screening and Qualification Programs
  - Device Screening
  - Element Evaluation on passive and active devices
- Other Specification Guidelines
  - J-STD-001 Class 3 and IPC-A-610
  - IPC-7711 and IPC-7721 for Rework and authorized repair operations

AS9100:2016
ISO 9001:2015
CERTIFIED

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