

Optical Inertial Reference Unit OIRU-500





Optical Inertial Reference Unit (OIRU-500)

BlueHalo has designed and built Optical Inertial Reference Units (OIRUs) for over 15 years. These devices are used to reduce jitter and provide pointing accuracy in Directed Energy Weapon (DEW) systems, long range Laser Communications (Laser Comm), and other optical imaging and scanning systems. The OIRU-500 is delivered on a Firm Fixed Price (FFP) contract with a set delivery schedule and no Non-Recurring Engineering (NRE).

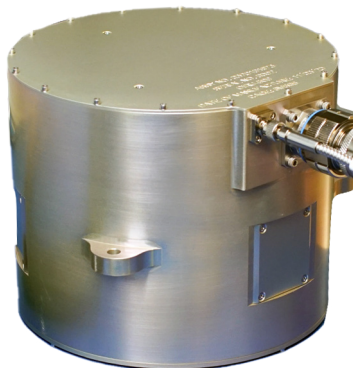
Features

BlueHalo's OIRUs provide an inertially stabilized collimated optical beam with extremely low residual jitter when subject to typical ground, sea, air, or space vibration environments. BlueHalo's OIRU-500 was designed, built and delivered to the High Energy Laser Joint Technology Office (HEL JTO) under a development contract. This device demonstrated stabilized jitter performance (<500 nrad, 1-1000 Hz) in a simulated operational environment. All BlueHalo OIRUs come with a separate digital controller.

Benefits

BlueHalo OIRUs are competitively priced to reduce program costs. Our OIRUs provide an optical reference beam (laser) for use as a precisely controlled "virtual star" to enable the removal of jitter on the optical line of sight. A stabilized optical line-of-sight system incorporating a BlueHalo OIRU is designed to reject broadband jitter. This reduces system complexity and cost by eliminating the need to mitigate vibration at every source.

Jitter reduction enables DEW systems to place more energy on target, and extend the engagement ranges ensuring a greater probability of mission success. Jitter reduction enables precise pointing and stabilization of the Laser Comm beam to be transmitted to the receive terminal. Jitter reduction also allows the reduction in Size, Weight, Power and Cost (SWaP-C) of the system while maintaining equivalent performance.



Specifications for the OIRU-500

Performance	
Jitter (1-1,000 Hz)	500 nrad
Gyro Drift	2.2 mrad at 20 minutes
Accuracy	<5 μ rad/mrad
Acceleration	2 rad/s ²
Position Resolution	<1 μ rad
Bandwidth (Open Loop Crossover)	>100 Hz
Phase Margin	35 deg
Gain Margin	10 dB
Base Motion Rejection (1-1,000 Hz)	>40 dB
Inertial Instruments	
Angular Rate Sensor (ARS)	ARS-16 - 3 each
Gyro	KVH DSP-1750D FOG - 3 each
Mechanical/Electrical	
Mechanism Size	7.0" \varnothing x 5.0" in length
Mechanism Mass	10 lbs.
Beam Diameter	0.394 (10 mm) (Other options available.)
Beam Wavelength	635 nm (Other options available.)
Beam Power	2.5 mW
Digital Controller Size	10" x 10" x 3"
External Command/Status Interface	Ethernet, Serial (232, 422), SpaceWire, SPI, CAN
Input Voltage	28 VDC
Peak Power	30 W
Cable Length	<20 feet
Environmental	
Temperature Range (Operating)	-20 to +50 °C
Humidity (Operating)	0 to 80% (non-condensing)
Vibration (Non-operating)	2.5 g RMS (0-2000 Hz)
Shock (Non-operating)	20 g (10 msec pulse)

Specifications subject to change without notice.