YOST LABS

MOTION & ABSOLUTE ORIENTATION

sensors for today's and tomorrow's most exciting products

Yost Labs' 3-SpaceLE™ sensor is a surface-mountable, miniature, high-precision, high reliability, Attitude and Heading Reference System (AHRS) / Inertial Measurement Unit (IMU), designed to bring aerospace-grade inertial tracking to the consumer electronics market.

3-SpaceLE sensors with Yost Labs' QGRAD™ fusion firmware (firmware that includes a new dynamic stability algorithm to maintain ultra high accuracy under all conditions) have established new benchmarks for low latency, high accuracy and dynamic stability. 3-SpaceLE integrates accelerometers, gyros, and magnetometers to output fully fused orientations faster than sensors running a Kalman filter—providing the responsiveness needed for applications such as HMD tracking, drone stabilization, biomechanics analysis, and real-time robotic control. This impressive performance is the result of a decade of sensor fusion R&D.

QGRAD™		10x more efficient
Kalman Filter		

Made in USA. Patents: 8498827, 8682610, 9255799, 9354058. Additional patents pending.

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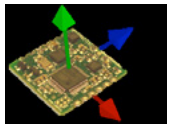
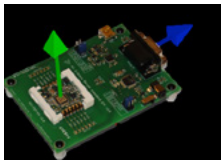
3-Space LE inertial sensors

3-Space LE AHRS/IMU SMT Sensor



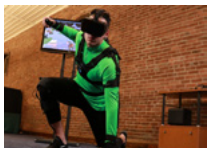
- USB 2.0, UART serial, SPI, I2C
- 15 x 16.5 x 2 mm, < 1 gram
- Easily integrated
- Power consumption: 31mA

3-Space LE AHRS/IMU Development Kit[3]



- Comes with 1 3-SpaceLE sensor
- Socket accepts 3-SpaceLE sensor without soldering
- USB 2.0, RS-232, and Serial SPI interface
- Break out pads for all 3-SpaceLE sensor pins
- Jumper configurable power options allow USB power, external adapter power, pin-pad power
- Jumper configurable RS232 communication routing
- Mounting standoffs ease mechanical fastening

PrioVR™ Dev Kit



- 19 sensor full-body suit with hand controllers
- Ultra-low latency wired sensors to a central hub
- Wireless from hub to USB base-station
- USD $1,200 MSRP

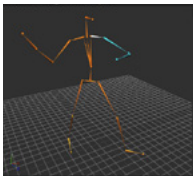
Application Programming Interface (API)

- Open source API makes integration quick and easy
- Native support for Python (2.5x and 3.x) and C/C++
- Support for any language that can import Microsoft Windows Dynamic Link Libraries (.dll)

Sensor Suite & Drivers

- Realtime interactive 3D display of orientation
- Realtime display of sensor data in strip-chart format
- Sensor data capture to file
- Access to calibration and performance features
- Access to all sensor configuration parameters
- Data terminal for ASCII communication and debugging

MoCap Studio™



- Open source application for configuring sensors and recording motion capture sessions
- Real-time 3D display of full body motion
- Supports real-time streaming and threaded orientation data recording
- Records data as keyframes, making editing easy
- Supports FBX and BVH (Biovision Hierarchy) file formats

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1. Specifications and prices are subject to change
2. Average value when calibrated
3. We are here to help with integration and optimizing sensor settings for your application. Price includes up to 5 hours of engineering phone support.

Specifications[1]

Weight	1.2 grams
Supply voltage	+3.3v ~ +6.0v
Power consumption	31mA @ 3.3v and full performance
Communication interfaces	USB 2.0, SPI, Asynchronous Serial
Filter update rate	up to 200Hz with QGRAD AHRS
Orientation output	absolute & relative quaternion
Other output	raw sensor data, normalized sensor data, calibrated sensor data, temperature
SPI clock rate	6 MHz max
Serial baud rate	1,200~921,600 selectable, default: 115,200
Shock survivability	5000g
Temperature range	-40C ~ 85C (-40F ~ 185F)
Orientation range	360° about all axes
Orientation accuracy	±1.5° for dynamic conditons & all orientatons
Orientation resolution[2]	<0.08°
Orientation repeatability[2]	0.085° for all orientations
Accelerometer scale	±2g / ±4g / ±8g / ±16g selectable
Accel resoluton	16 bit
Accel noise density	90μg/√Hz
Accel sensitvity[2]	0.000061g/digit-0.000488g/digit
Accelerometer temperature sensitvity	±0.008%/°C
Gyro scale	±125/±245/±500/±1000/±2000 °/sec selectable
Gyro resoluton	16 bit
Gyro noise density	0.007°/sec/√Hz
Gyro bias stability[2]	4.5°/hr for all axes@ 25°C
Gyro sensitvity	0.004375°/sec/digit for ±125°/sec 0.070000°/sec/digit for ±2000°/sec
Gyro non-linearity[2]	0.2% full-scale
Gyro temp sensitivity[2]	±0.012%/°C
Compass scale	±1000 μT
Compass resoluton	16 bit
Compass sensitivity	0.10 μT/digit
Compass non-linearity	±0.1%/°C

Quantity	Price/Unit[1]
Evaluation kit (includes 1 sensor)[3]	$150
1-99 sensors	$60
100-499	$48
500-999	$42
1,000-9,999	$38
10,000+	quote

About Yost Labs, Inc.: We are a fast growing private company based in historic Portsmouth, Ohio. With over a decade of experience in low-latency inertial sensor innovation, we enable motion tracking in many of today's and tomorrow's most exciting products. We make virtual reality interactive. We stabilize drones and navigate autonomous cars. We measure human motion for athletic performance and rehabilitation. We tell you where you are heading and how fast you are getting there. Yost Labs' innovation has been recognized with numerous patents with additional patents pending. Our customers and value-added resellers include the US Navy, US Air Force, NASA, US Army Corps of Engineers and over 1,000 leading technology firms and academic institutions around the world.