

InterSense IS-1200 VisTracker™

Vision-Inertial Self Tracking System



- Wide-area, wearable, 6-DOF hybrid tracking and navigation system
- Designed for precision augmented reality and mobile computing applications
- RMS Accuracy of 0.1° in orientation and 3.0 mm in position
- Patent pending circular data matrix fiducials provide up to 32,000 unique position references
- 180 Hz update rate with adjustable motion prediction
- Interfaces via Ethernet (TCP or UDP broadcast), shared memory, USB, or RS-232
- Compatible to applications supporting InterSense's standard API

InterSense's VisTracker offers unprecedented performance for a mobile tracking product. The VisTracker is a vision-based, inertial, self tracking system that utilizes InterSense's latest advancements in our inertial sensor fusion technology. The VisTracker comes with one InertiaCam™; software to generate position referencing fiducials; the InterSense Sensor Fusion Server (SFServer) software for a Windows Host PC; a Windows augmented reality set-up, testing & demo program; and the InterSense SDK.

The InertiaCam integrates 6 MEMS inertial sensors with a DSP vision sensor interfacing to either a Windows PC or optional Wearable Sensor Fusion Processor. The InertiaCam automatically identifies fiducials that are position mapped in the tracking environment using advanced image processing algorithms. Operating over a wide range of natural lighting conditions, the VisTracker can be configured to track in both small and large volumes. The VisTracker's small size and low power consumption make it ideal for use with mobile applications.

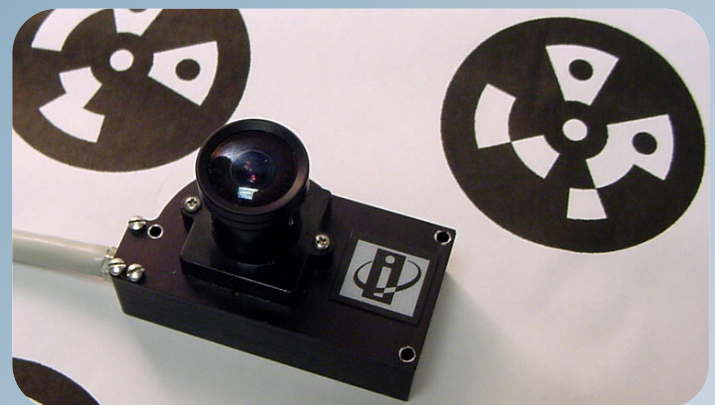
VisTracker Performance Specifications

Degrees of Freedom	6 (Yaw, Pitch, Roll, X, Y, and Z)
Maximum Angular Rate	1000° per second
Maximum Linear Acceleration	4.0 G
Orientation Accuracy*	0.1° RMS
Position Accuracy*	3.0 mm RMS
Minimum Latency	2 ms (with prediction off)
Prediction (inertial-based)	Adjustable 0 to 50 milliseconds
Optimum fiducial density	1 to 2 fiducials per m ² at 2 m distance from InertiaCam
Minimum fiducial density	0.5 per m ² at 2 m distance from InertiaCam
Maximum InertiaCams	Unlimited over tracking area defined by fiducial set
InertiaCam I/O to Windows PC	USB (bus powered) or RS-232 (externally powered)
SFServer Software I/O	Shared Memory or Internal Ethernet
Update Rate	180 Hz
Host O/S Compatibility	Windows PC (2k/XP) for SFServer Windows, Linux, IRIX or Mac OS X if using Optional Wearable Sensor Fusion Processor
Windows Support Software	Passive Fiducial Planning & Printing Program Augmented Reality Set-up, Test & Demo Program
InterSense Library Support	.dll for Windows 98/2k/NT/XP .so for Linux and SGI IRIX .dylib for Mac OS X

Optional Wearable Sensor Fusion Processor (not shown)

Maximum InertiaCam Trackers	2 per Wearable Processor
Host Interface	Ethernet (UDP or TCP) or RS-232
Update Rate	180 Hz
Size	12.3 cm x 13.3 cm x 4.7 cm
Weight	700 grams
Power	12 W with input of 6 to 9 VDC plus 1.8 W per InertiaCam

* Measured 2 m below a square array of 16 precisely positioned fiducials. Actual accuracy achieved is affected by distance from fiducials, density, and the accuracy with which fiducial locations can be calibrated.



InertiaCam and Fiducials

InertiaCam Specifications

Inertial core	6 MEMS inertial sensors
Vision Core	Integrated "smart camera" with on-board DSP
Optical Performance	Fixed focus lens with 80° or 109° diagonal FOV Calibrated for use with visible or IR wavelengths
Position Referencing System	Circular data fiducials with 32,000 unique barcodes
Tracking Range	up to 10 m from fiducials per 10 cm of fiducials diameter
Acquisition Range	up to 2.5 m from fiducials per 10 cm of fiducials diameter
Sensor Head Size	48 mm x 29 mm x 15 mm
InertiaCam Electronics Size	32 mm x 92 mm x 26 mm
Cable Length to Sensor Head	1 m from InertiaCam Electronics
Weight	Sensor Head 35 gm, InertiaCam Electronics 85 gm
Power	< 2 W

Specifications are subject to change without notice.

InterSense, Inc.

36 Crosby Drive, Suite 150 • Bedford, MA 01730

+1 781 541 6330 • FAX +1 781 541 6329 • info@intersense.com

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www.intersense.com