POLHEMUS
INNOVATION IN MOTION™

FASTRAK

THE INDUSTRY STANDARD

The most accurate electromagnetic motion tracking system available, FASTRAK® is the perfect solution for accurately computing position and orientation through space. With real-time, 6 Degrees-of-Freedom (6DOF) tracking and virtually no latency, this award-winning system is ideal for head, hand, and instrument tracking, as well as biomedical motion and limb rotation, graphic and cursor control, stereotaxic localization, telerobotics, digitizing, and pointing. FASTRAK has been the workhorse of the industry since its introduction.

▶ FEATURES

▷ Real Time
Virtually no latency. Digital Signal Processing (DSP) technology provides 4ms latency updated at 120 Hz. Data is transmitted via USB or RS-232 to the host at up to 115.2 K Baud.

▷ Improved Accuracy and Resolution
Accuracy of 0.03 inches RMS with a resolution of 0.0002 inches per inch makes this the most precise device of its kind.

▷ Range
Standard operational range is 4 to 6 feet; 10 foot range is obtainable. The optional TX4 or Long Ranger® transmitters allow significantly longer ranges of operation.

▷ Multiple Receiver Operation
Permits measurement of up to 4 receivers on a single system and up to 16 receivers at a time, utilizing four synchronized systems.

▷ Reliable
The pioneer of 3D position/orientation measuring devices, in business since 1970. Real-time self-calibration ensures the unit never needs adjustment.

▷ Multiple Output Formats
Position in Cartesian coordinates (inches or centimeters); orientation in direction cosines, Euler angles, or quaternions.

▷ Angular Coverage
The receivers are all-attitude with no limits.

▷ Drift-Free
Solid state electronics

Two Solutions in One
FASTRAK is a 3D digitizer and a quad receiver motion tracker, making it perfect for a wide range of applications requiring high resolution, accuracy, and range. By computing the position and orientation of a small receiver as it moves through space, it provides dynamic, real-time measurements of position (X, Y, and Z Cartesian coordinates) and orientation (azimuth, elevation, and roll).

Up to Four Sensors
FASTRAK comes standard with Windows® 2000/XP/Vista® GUI. With a single transmitter, FASTRAK accepts data from up to four receivers. And with no change in the update rate, you can connect up to four systems, allowing you to measure multiple points simultaneously. Because FASTRAK uses patented low-frequency magnetic transducing technology, there's no need to maintain a clear line-of-sight between receivers and transmitters.

A/C Magnetics
Quiet and stable, the system is essentially unaffected by facility power grids. Update rates are always maintained, as A/C magnetics offer the best signal-to-noise ratios and incorporate sophisticated digital signal processing capabilities. In addition, adaptive filtering is available as a standard feature.

▶ APPLICATIONS

Limited only by your imagination!

▶ COMPONENTS

The FASTRAK system includes a System Electronics Unit (SEU), a power supply, one receiver, and one transmitter. You can easily expand the system's capabilities by adding up to three additional receivers.
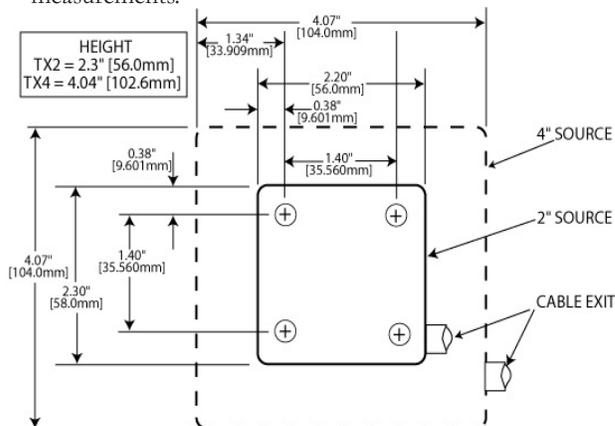
System Electronics Unit

Contains the hardware and software necessary to generate and sense the magnetic fields, compute position and orientation, and interface with the host computer via USB, RS-232 or optional RS-422.
10.2 in. (25.9 cm) L x 11.5 in. (29.2 cm) W x 2.3 in. (5.8 cm) H

Source

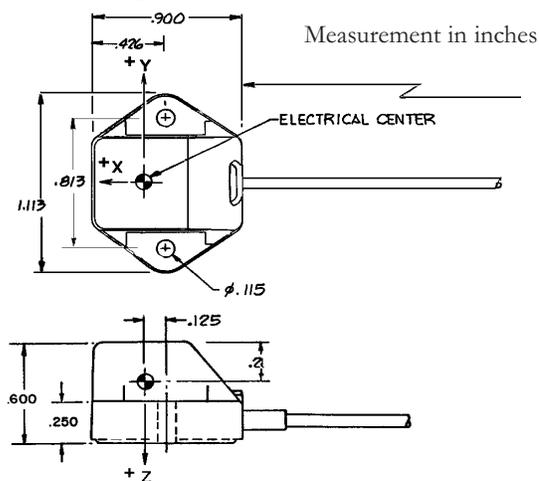The source is the system's reference frame for sensor measurements.

Weight
TX2: 8.8 oz. (250 gm) **Thread size** 1/4" x 20
TX4: 1.60 lbs. (726gm) **Thread size** 1/4" x 20

Sensor

A lightweight, small cube, the sensor's position and orientation is precisely measured as it is moved.

Measurement in inches

Weight
0.32 oz. (9.1 gm)

▶ SPECIFICATIONS

Update Rate

120 updates/second divided by the number of receivers

Latency

4 milliseconds

Static Accuracy

0.03 inches RMS for the X, Y, or Z position; 0.15° RMS for receiver orientation. The system will provide the specified performance when the receivers are within 30 inches of the transmitter. Operation over a range of up to 10 feet is possible with slightly reduced performance.

Interface

USB; RS-232 with selectable baud rates up to 115.2 K (optional RS-422)

Resolution vs. Range
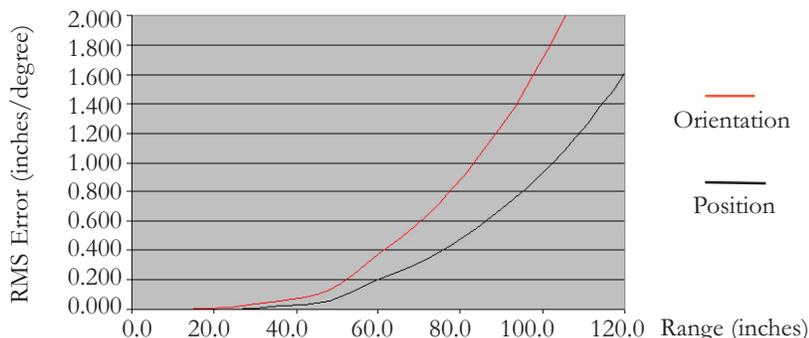
Range (inches)	Position Resolution (inches)	Orientation Resolution (degrees)
12.0	0.00023	0.0026
24.0	0.0030	0.0147
36.0	0.019	0.0558
48.0	0.055	0.1266
72.0	0.346	0.369
120.0	1.605	2.960

Multiple Systems

Multiple systems can be cascaded with no change in update rate.

Sync Input

TTL and CRT

Software Tools

GUI included
USB drivers for Windows® XP/Vista® included
Linux®- contact factory

Operating Temperature

10ºC to 40ºC at a relative humidity of 10% to 95%, noncondensing

Power Requirements

25 W, 100-240 VAC, 47-63 Hz

Regulatory

FCC Part 15, class A
CE: EN61326-1: 1997/A1:1998/A2:2001/A3:2003 emission
EN61326-1: 1997/A1:1998/A2:2001/A3:2003 Immunity

* Large metallic objects, such as desks or cabinets, located near the transmitter or receiver, may adversely affect the performance of the system.

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▶ ▶ POLHEMUS
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