

## THE ABSOLUTE BEST

The fastest, most accurate, scalable electromagnetic tracker available, LIBERTY™ represents a quantum leap in new technology. State-of-the-art Digital Signal Processor (DSP) electronics make it the perfect real-time solution for 6 Degree-of-Freedom (6DOF) needs. LIBERTY has speed, ease-of-use via an intuitive Graphical User Interface (GUI), scalability, distortion sensing, and improved signal-to-noise ratios which increase stability and resolution while providing consistent high quality data.

## FEATURES

### Update Rate

LIBERTY tracks objects at a speed of 240 updates per second, all sensors simultaneously. Latency is less than 4ms.

### Scalable

LIBERTY 240/8

Four sensor channels are available on the base product. The addition of a single circuit board inside the same chassis allows for a total of eight sensor channels.

LIBERTY 240/16

Four sensor channels are available on the base product. The system is then upgradeable to 8, 12, or 16 sensor channels within the same chassis by having additional circuit board(s) installed.

### Communications Interface

LIBERTY operates via both an RS-232 serial interface and USB.

### Distortion Sensing

Each sensor with LIBERTY is able to independently detect distortion within the environment, alerting the user to make appropriate changes if necessary.

### Multiple User Definable Profiles

The GUI allows four independent user-definable profiles for setting system parameters such as filtering, output formats, coordinate rotations and many more.

### Multiple Output Formats

User may select position in Cartesian coordinates (English or metric); orientation in direction cosines, Euler angles or quaternions.

### Angular Coverage

All-attitude.

### Drift-Free

Solid state electronics.

## THE FRONT-RUNNER IN ELECTROMAGNETIC TRACKING TECHNOLOGY

## THE PROFESSIONAL'S CHOICE

### The Front-Runner in Tracking Technology

LIBERTY incorporates an unprecedented speed of 240 updates per second per sensor. The system comes complete with distortion detection while providing the most accurate and consistent data. With the addition of the Polhemus stylus, LIBERTY becomes a highly accurate 3D digitizer.

### Easy, Intuitive User Interface

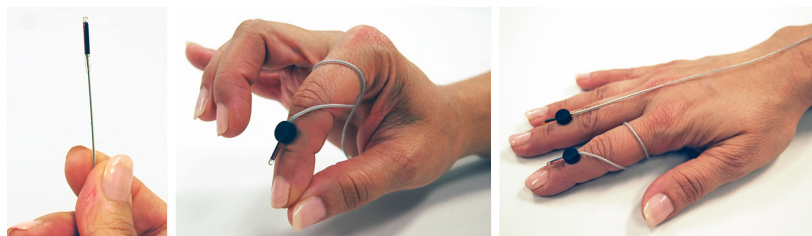
LIBERTY comes standard with a GUI for Microsoft Windows® and a comprehensive, easy to use Software Developers Kit (SDK). The GUI allows four independent user definable profiles for setting system parameters such as filtering, output formats, coordinate rotations and many more. This is a valuable feature for multiple applications or users. For visualization, an integrated motion box provides navigable points of view and can include text data. Additional features include a data record/playback component, plus the ability to quickly export data via Microsoft® "Named Pipe."

### A/C Magnetics: Increases Stability, Resolution, Speed and Range

Incorporating state of the art Digital Signal Processor (DSP) electronics in concert with A/C magnetics provides the user with improved signal-to-noise ratios which increase range, stability, resolution and speed. The system is essentially unaffected by facility power grids, and update rates are always maintained, allowing it to keep up with the voluminous rate of tracking data produced.



LIBERTY offers flexibility with multiple hardware options



Standard Micro Sensor 1.8™ and Micro Sensor 1.8 Extra Flex provide full 6DOF tracking and are available for use with the LIBERTY system

# LIBERTY

## COMPONENTS

LIBERTY includes a Systems Electronics Unit (SEU), one sensor and one source. Optional accessories include a longer range source, stylus and a variety of cable lengths for each sensor, stylus or source.

### System Electronics Unit

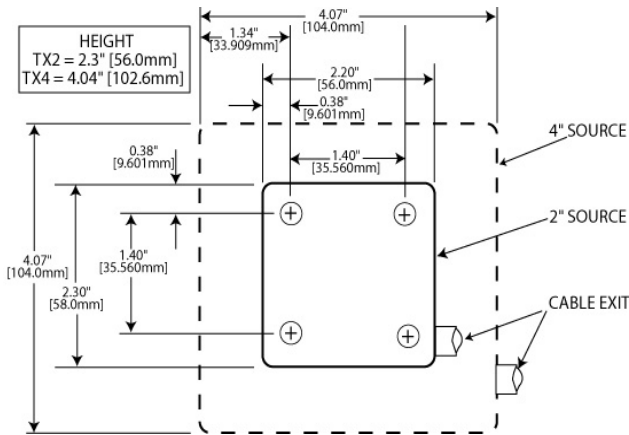
Contains the hardware and software necessary to generate and sense the magnetic fields, compute position and orientation, and interface with the host computer via RS-232 or USB. 12.2 in. (31 cm) L x 7 in. (17.8 cm) W x 8.5 in. (21.6 cm) H; weight 9 lbs. (4.1 kg)

### 240/12 and 240/16:

12.2 in. (31 cm) L x 7 in. (17.8 cm) W x 11 in. (27.94 cm) H; weight 11 lbs. (5 kg)

### Source

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

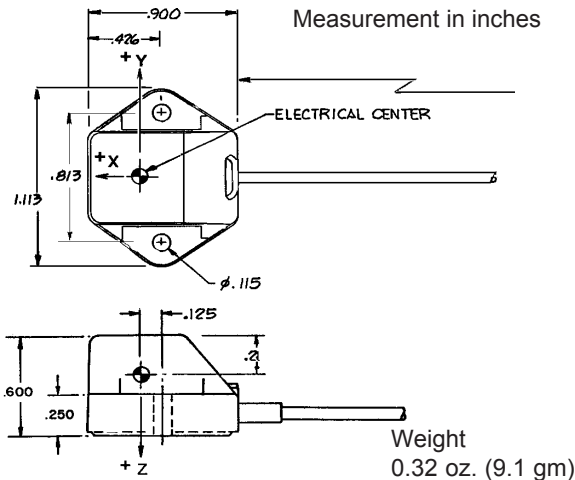


### Weight

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

### Sensor

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



**POLHEMUS**  
INNOVATION IN MOTION™

Polhemus is a Good Manufacturing Practices (GMP) Contract Manufacturer under U.S. FDA Regulations. We are not a manufacturer of Medical Devices. Polhemus systems are not certified for medical or bio-medical use. Any references to medical or bio-medical use are examples of what medical companies have done with the Products after they have obtained all necessary or appropriate medical certifications. The end user/OEM/VAR must comply with all pertinent FDA/CE regulations pertaining to the development and sale of medical devices and all other regulatory requirements.

## SPECIFICATIONS

### Update Rate

240 Hz per sensor, simultaneous samples

### Latency

3.5 milliseconds

### Number of Sensors

240/8 has 1 to 8 sensors, 240/16 has 1 to 16

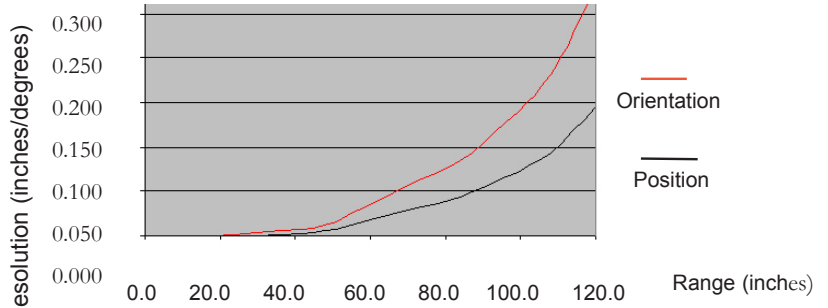
### Static Accuracy

0.03 in. RMS for X, Y, Z position; 0.15° RMS for sensor (RX2) orientation. (Non-standard, smaller sensors may reduce the specified range slightly)

### Interface

USB; RS232 to 115,200 Baud rate, both standard

### Range vs. Resolution



| Range (inches) | Position Resolution (inches) | Orientation Resolution (degrees) |
|----------------|------------------------------|----------------------------------|
| 12.0           | 0.00005                      | 0.0004                           |
| 24.0           | 0.0002                       | 0.0014                           |
| 36.0           | 0.001                        | 0.0048                           |
| 48.0           | 0.005                        | 0.0117                           |
| 72.0           | 0.031                        | 0.060                            |
| 120.0          | 0.145                        | 0.280                            |

### Multiple Systems

Provisions available to operate eight separate systems in same environment

### Data Format

Operator selectable ASCII or IEEE 754 binary; English/Metric Units

### External Event Marker

User input flag and output marker

### Output Sync Pulse

TTL frame sync output

### Software Tools

GUI and SDK included  
USB drivers for Microsoft Windows® XP/Vista/Win7 included (32-bit and 64-bit).  
Linux®- open-source application available

### Operating Temperature

0°C to 50°C at a relative humidity of 10% to 95%, noncondensing

### Power Requirements

100-240 VAC, 50 – 60 Hz, single phase, 50 W

### 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 source or sensor, may adversely affect the performance of the system.

[www.polhemus.com](http://www.polhemus.com)

40 Hercules Drive • PO Box 560 • Colchester, Vermont 05446-0560  
US and Canada 800.357.4777 • 802.655.3159 • fax 802.655.1439



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