

LIBERTY

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 six-degree-of-freedom 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.

THE FORERUNNER IN ELECTROMAGNETIC TRACKING TECHNOLOGY

THE PROFESSIONAL'S CHOICE

The Forerunner 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 Windows 2000/XP GUI 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.

APPLICATIONS

Biomechanical and Sports Analysis

With an update rate of 240 Hz per sensor, LIBERTY can collect real-time relative data from the speed of a golf swing, an athlete's fast-paced movement or down-to-minute differences of movement and rotations for gait or limb movement analysis.

Virtual Reality

From the beginning, Polhemus 3SPACE® systems have been the selected choice for Virtual Reality head and body tracking. LIBERTY does it all in real time.

Head Mounted Displays

Virtually eliminating all latency, LIBERTY is the highest quality solution for military, VR and simulation applications.

Dimensional Archiving and Anatomical Measurements

With the use of the Polhemus stylus, you can collect actual dimensions of artifacts, archaeological items and museum sculptures, or compile measurements of anatomical features, body volumes, joint relationships or body contours.

Haptic or Tactile Research

LIBERTY provides highly accurate position and orientation which makes it the perfect tool for use with today's extremely sensitive haptic or tactile devices.

LIBERTY

TECHNICAL SUMMARY

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

I/O Ports

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

Static Accuracy

0.03 in. RMS for X, Y or Z position; 0.15° RMS for sensor orientation

Resolution

0.00015 in. (0.038 mm) at 12 in. (30 cm) range; 0.0012° orientation

Range

36 in. (90 cm) at above specifications; useful operation in excess of 72 in. (180 cm)

Multiple Systems

Provision available to operate two separate systems in same environment

Angular Coverage

All-attitude

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

Physical Characteristics

SEU w/power supply:

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)

Field Source:

Standard TX2:

2.3 in. (5.8 cm) L x 2.2 in. (5.6 cm) W x 2.2 in. (5.6 cm) H; weight 8.8 oz. (250 gm)

TX4: 4.07 in. (10.4cm) L x 4.07 in. (10.4cm) W x 4.04 in. (10.3cm) H 1.60 lbs. (726gm)

Long Ranger: Source is 18 inches in diameter

Sensor:

0.9 in. (22.9 mm) L x 1.1 in. (27.9 mm) W x 0.6 in. (15.2 mm) H;

weight 0.8 oz. (23 gm)

Power Requirements

85-264 VAC, 47 – 440 Hz, single phase, 50 W

Regulatory

FCC Part 15, class A

CE: EN50081-1, class A, emissions

EN50082-1, class 2, immunity

EN61010, safety



COMPONENTS

LIBERTY includes a System 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.

Source

The source contains electromagnetic coils enclosed in a molded plastic shell that emit magnetic fields. The source is the system's reference frame for sensor measurements.

Sensor

The sensor contains electromagnetic coils enclosed in a molded plastic shell that detect the magnetic fields emitted by the source. A lightweight, small cube, the sensor's position and orientation is precisely measured as it is moved. The sensor is a completely passive device, having no active voltage applied to it.

The systems are not certified for medical or bio-medical use. Any reference to medical or bio-medical use are examples of what medical companies have done with the systems after obtaining all necessary or appropriate medical certifications. The end user/OEM must comply with all pertinent FDS/CE and all other regulatory requirements.

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