3D Guidance®

For your **medical simulation system**, integrate the 3D electromagnetic tracking technology trusted in clinical image-guided surgery and interventional use – the 3D Guidance® product suite from Ascension Technology (an NDI company).

Ascension
Technology Corporation
an NDI company

Real-World Tracking Technology for Your Most Realistic Simulator

Build an incredibly true-to-life medical simulator with the tracking technology trusted in clinical use. As part of the 3D Guidance® product suite, the driveBAY™ and trakSTAR™ electromagnetic tracking systems provide highly accurate real-time unobstructed tracking of miniaturized sensors embedded into medical tools.

Each system uses an electromagnetic transmitter that establishes a tracking volume. Sensors are tracked in six degrees of freedom (6DOF), both inside and outside a phantom. Up to sixteen (16) sensors of different sizes can be tracked at once, enabling two or more probes, scopes, needles, catheters, etc., to be used together in the simulation environment. Low latency and fast update rates allow the most subtle of tool movements to be instantly tracked and visualized within the simulation interface.

The driveBAY and trakSTAR share the same accuracy, reliability, and versatility. The trakSTAR is a desktop unit that connects directly into a main power source, whereas the compact driveBAY fits inside the drive bay of a computer or mobile cart. The ready-to-use configuration supports easy and cost-effective integration into phantoms, ultrasound simulators, interventional simulators, surgical rehearsal theatres, and other medical trainers. The tracking volume, measurement rate, sensors, and software interface can also be adapted to your unique system requirements.

Applications

Arthroscopic Surgery

- Visualize the position and orientation of probes, graspers, punches, and shavers within a virtual joint for training of precise tool placement, and development of visual-spatial dexterity.

Laparoscopic Surgery

- Track the approach, angle, and movement of laparoscopic instruments within virtual and/or lifelike organs for training various surgical techniques across various medical procedures.

Interventional Radiology

- Simulate vascular, oncological, neurological and other interventional procedures by tracking ultrasound transducers, needles, and catheters in combination with ultrasound, CT, and MRI images.

Obstetrics

- Attach sensors to gloves and to the pelvic phantom to visualize and track hand position and movement in relation to the cervix and fetus during the different stages of childbirth.

GI Endoscopy and Bronchoscopy

- Localize and guide rigid and flexible scopes through virtual bronchial airways, intestinal loops, and other anatomical tracts to develop user hand-eye coordination and scope maneuvering skills.

Lumbar Puncture and Epidural

- Track the position and trajectory of the needle inside the phantom to replicate safe epidural needle injection and catheter placement, as well as lumbar puncture and cerebrospinal fluid collection.

Benefits of Integration

- Dynamic 6DOF electromagnetic tracking technology
- Two transmitter sizes and customizable tracking volumes
- No line-of-sight needed between sensors and transmitter
- Supports simultaneous tracking of up to 16 sensors
- Low latency and fast updates for tight software synchronization
- Industry-best integration expertise and support

System Components and Principles of Operation

Sensors

The 6DOF sensors come in a variety of sizes including the general purpose reference sensor that consists of an 8 mm square cross-section down to 0.56 mm diameter cylindrical sensor for use in the smallest tools.

Electronics Unit

Integrate the 3D Guidance® driveBAY™ or trakSTAR™ electromagnetic tracking unit into your medical and surgical simulation system for 6DOF tracking of sensors with no line-of-sight requirements.

trakSTAR™

A desktop electronics unit with integrated power supply which can track up to four 6DOF sensors simultaneously.

driveBAY™

The tracking electronics fit into the drive bay of a PC chassis and tracks up to four 6DOF sensors simultaneously. The unit uses the power provided by the PC power supply and no additional power supply is required.

Mid-Range Transmitters

The Mid-Range Transmitter (MRT) offers a flexible set-up that can be integrated into most applications where the tracking volume needs to cover a larger anatomical region.

Short-Range Transmitters

The Short-Range Transmitter (SRT) provides a solution for the smaller difficult to access regions. The SRT may be mounted on imaging devices for a dynamic tracking solution.

Technical Specifications

	trakSTAR™	driveBAY™
		
Accuracy		
	1.4 mm RMS, 0.5 degrees RMS	1.4 mm RMS, 0.5 degrees RMS
Performance		
NUMBER OF SENSORS	Four (4) 6DOF per unit	Four (4) 6DOF per unit
MEASUREMENT RATE	80 Hz default, user-configurable from 20-255 Hz	80 Hz default, user-configurable from 20-255 Hz
Dimensions & Weight		
DIMENSIONS	290 mm x 184 mm x 64 mm	180 mm x 147 mm x 41 mm (Fits a 5.25-inch PC drive bay)
WEIGHT	1.31 kg	0.84 kg
Power & Interface		
POWER	100-240 VAC, 50/60 Hz	Molex Power Connector; +12 V: 1.6 A nominal, 2.9 A maximum; +5V: 600 mA nominal
INTERFACE	USB, RS-232	USB

	Mid-Range Transmitter	Short-Range Transmitter
Max. Tracking Distance		
MODEL 800 SENSOR ON POSITIVE X-AXIS	660 mm - Normal Mode 1800 mm - Expanded Volume Mode* *reduced specifications with optimized system settings	410 mm
Dimensions & Weight		
DIMENSIONS	96 mm x 96 mm x 96 mm	64 mm x 46 mm x 52 mm
WEIGHT	2.3 kg	0.29 kg