

3D Guidance medSAFE™

Medically Compliant: Class 1, Type CF, Defib Proof 



Electronics unit with multiple sensor and transmitter options

Guide Medical Instruments with Passive DC Magnetic Sensors



Multiple transmitter options enable use in medical environments once unsuitable for magnetic tracking.

- ▶ Track multiple miniaturized sensors simultaneously.
- ▶ Localize in 3D without ionizing radiation.
- ▶ Guide flexible tools without line-of-sight restrictions.
- ▶ No "power-line" noise interference.
- ▶ Navigate catheters, probes, and scopes with low cost, disposable sensors.



medSAFE's miniaturized sensors are routinely deployed in medical instruments and catheters for safer and less intrusive tracking and localization. Here a 1.3 mm sensor is seen protruding from the working channel of a bronchoscope.

Sensors with sub-millimeter diameters are available to extend the reach of catheters and scopes deep into the periphery of organs and vessels.



 **Ascension**
Technology Corporation
Making Minimally Invasive Possible

PRECISE UNOBTRUSIVE AFFORDABLE

3D Guidance medSAFE

Technical

Sensor Configurations

Model 90 (0.9 mm), Model 130 (1.5 mm), Model 180 (2.0 mm), Model 800 (8.0 mm)

Degrees of Freedom

6 (Position and Orientation)

Update Rate

- Short & Mid-Range Transmitter up to 375 updates/second for each sensor
- 6DOF Flat (Metal-Immune) Transmitter up to 162 updates/second for each sensor

Translation Range

MODEL 90 SENSOR

- Mid-Range Transmitter: 36 cm (14 inches) in any direction

MODEL 130 SENSOR

- Mid-Range Transmitter: 46 cm (18 inches) in any direction
- Short-Range Transmitter: Contact Ascension for latest test results.

- Flat Transmitter: 46 cm (18 inches) in Z direction

MODEL 180 SENSOR

- Mid-Range Transmitter: 58 cm (23 inches) in any direction
- Short-Range Transmitter: Contact Ascension for latest test results.

- Flat Transmitter: 46 cm (13 inches) in Z direction

MODEL 800 SENSOR

- Mid-Range Transmitter: 78 cm (31 inches) in any direction
- Short-Range Transmitter: 46 cm (18 inches) in any direction

- Flat Transmitter: 46 cm (18 inches) in Z direction

Angular Range

All Attitude: $\pm 180^\circ$ Azimuth & Roll; $\pm 90^\circ$ Elevation

Static Accuracy*

Position: 1.4 mm (0.055 inch) RMS

Orientation: 0.5° RMS

*Higher accuracies achievable in smaller tracking volumes.

*Accuracies vary depending on specific transmitter-sensor configurations.

Static Resolution

Position: 0.5 mm (0.02 inch) @ 30.5 cm (12 inches)
Orientation: 0.1° @ 30.5 cm (12 inches)

Outputs

X, Y, Z positional coordinates, orientation angles, orientation matrix, or quaternions

Interface

RS-232, USB, Ethernet (factory option)

Data Format

Binary data records

Communication

Windows API and Drivers

Physical

Electronics Unit

27.9 cm (11 inches) x 27.3 cm (10.7 inches)
x 6.4 cm (2.5 inches)

Transmitters

3 Options: Short-Range (6.27 cm x 4.6 cm x 5.2 cm with 6.6 m cable); Mid-Range (9.6 cm cube with 6.6 m cable); Flat (Metal-Immune): Contact us.

Passive Sensors

MODEL 90: 0.9 mm (0.04 inch) x 7.25 mm (0.29 inch) with 2.0 m (6.6 ft) cable

MODEL 130: 1.5 mm (0.05 inch) x 7.7 mm (0.30 inch) with 2.0 m (6.6 ft) cable

MODEL 180: 2.0 mm (0.07 inch) x 9.9 mm (0.38 inch) with 2.0 m (6.6 ft) cable

MODEL 800: 8.0 mm (.31 inch) x 20.0 mm (0.78 inch) with 2.0 m (6.6 ft) cable

Model 180 & 130 only:

- Ascension Medi-Mag Cable, USP class 6 jacket material.
- USP class 6 sensor housing.
- Sensor assembly and cable materials are EtO and cold sterilant tolerant. Warning: Semiconductor devices in sensor connector are not gamma shielded and may be damaged or erased if exposed to gamma radiation and/or autoclaving.
- Sensors and cable assemblies are fragile components and must be sheathed and safeguarded prior to use in patients.

Power

100-240V ~ 50/60Hz

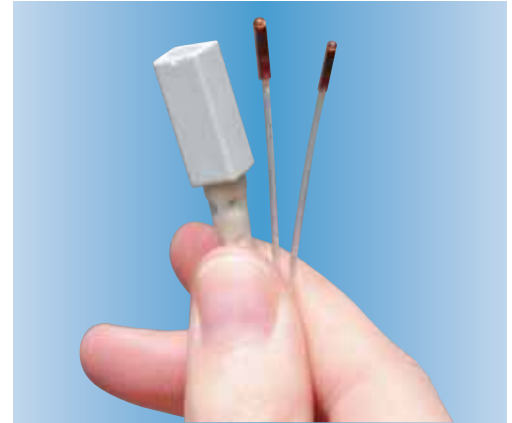
Operating Temperature

15°C to 35°C; 95% non-condensing humidity

Environment

Ferromagnetic objects and stray magnetic fields in the operation volume may degrade performance. Contact us for assistance in using our Optimization Tools to minimize metallic distortion and noise interference.

Interchangeable sensor sizes for full six degrees-of-freedom tracking



FEATURE

BENEFITS

Metal tolerant

80% less distortion due to non-magnetic conductive metals compared to AC magnetic trackers. Outputs unaffected by composite materials. Capable of driving errors induced by highly conductive metals (such as aluminum) to zero by adjusting measurement rate.

Advanced new magnetic technology and signal processing

Flat transmitter with ferrous metal shield negates distortions produced by procedural tables. Outputs immune to "power-line" noise sources.

Occlusion and drift free

Accuracy of measurements unaffected by insertion of sensors into human body.


Low cost sensors

Designed for disposability in volume applications.

Software support

XP/Pro and XP embedded compatible with SDK and sample programs. API with expert support facilitates incorporation into user applications. Fully integrated with partners' medical imaging software for 3D rendering and visualization of anatomical structures.

Regulatory Certifications

Medically Compliant: Class 1 Medical Device, Type CF, Defib Proof  (Applied Parts)

3D Guidance users must obtain and comply with all pertinent FDA/CE/IRB and international medical certifications prior to using this device in humans. Biomedical references in this document are examples of what medical practitioners can do with 3D Guidance after complying with all regulatory requirements. Users must comply with all pertinent electrical, safety and medical regulations prior to inserting sensors and cables into patients.

Notes on Accuracy

Accuracy is defined as the root mean square (RMS) deviation of a true-measurement of the magnetic center of a single sensor with respect to the magnetic center of a single transmitter measured over the specified translation range. Accuracy varies from one location to another over this range and will be degraded if there are interfering electromagnetic noise sources or metal in the operating environment, which have not been identified and minimized.

