Haptic Devices

Haptic devices that add the sense of Touch
to your digital world

TOUCH 3D STYLUS
Geomagic® Touch™
Geomagic® Touch™ X

3D SOLUTIONS

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MANUFACTURING*THE*FUTURE

Haptic devices that add the sense of Touch to your digital world

3D Systems haptic devices provide true three-dimensional navigation and force feedback integrating a sense of touch into the Geomagic Freeform® and Geomagic® Sculpt™ 3D modeling systems as well as research and commercial applications. Each 3D Systems haptic device can accurately measure the 3D spatial position (along the x-, y- and z-axis) and the orientation (roll, pitch and yaw) of its handheld stylus. The devices use motors to create forces that push back on the user's hand to simulate touch and interaction with virtual objects. Depending on the model, Geomagic Phantom Premium devices provide either 3- or 6-Degrees-of-Freedom (DOF) force feedback.

Intuitive Interaction

When haptics are used in the Geomagic design and virtual sculpting environments, designers can interact and feel the shape of the 3D data almost as if they were designing in physical clay. This enables far more intuitive 3D design with interactive clay sculpting tools that perform just like the real world. These patented Geomagic haptic devices ingeniously use motors to create forces that push back on the designer's hand to simulate touch when the cursor interacts with the 3D model in virtual space.

Touch to create and simulate

3D Systems haptic devices are used in every industry that requires accurate but organic designs, using the sense of touch to build designs faster and with precision.

Designers in the following industries turn to Geomagic software and haptic devices to successfully create their designs:

- Medical and surgery
- Toy and action figurine manufacturing
- Jewelry design
- Artwork and sculpting
- Automotive parts and products
- Bakewear and cookery molds and dies
- Architectural hardware products
- Forensic reconstruction
- Shoe design and manufacturing
- Medals and coins
- 3D Game development

Geomagic Freeform & Freeform Plus

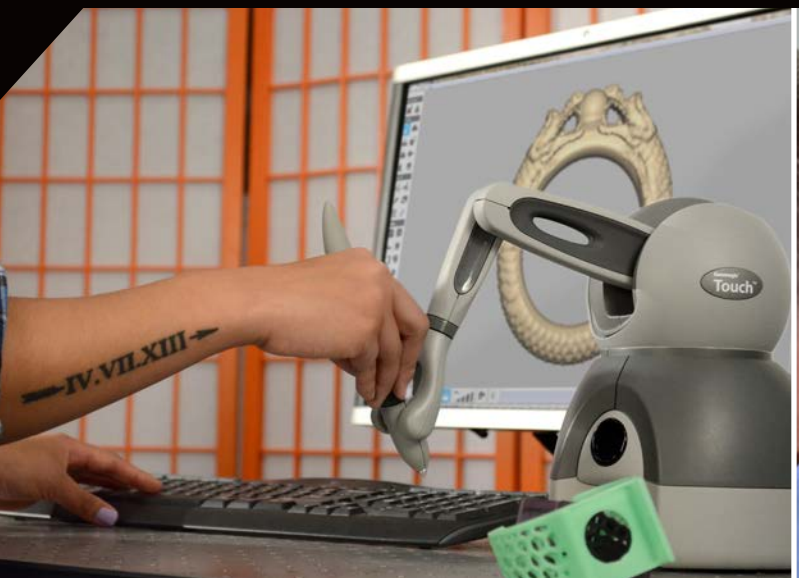
Geomagic Freeform is an industry-leading, multi-purpose 3D sculpting design platform. This enables you to create complex, sculptural, production-ready 3D models and quickly prepare them for 3D printing, or mold and die manufacturing. The software comes in 2 modes - Geomagic Freeform and Geomagic Freeform Plus and works exclusively with Touch haptic devices.

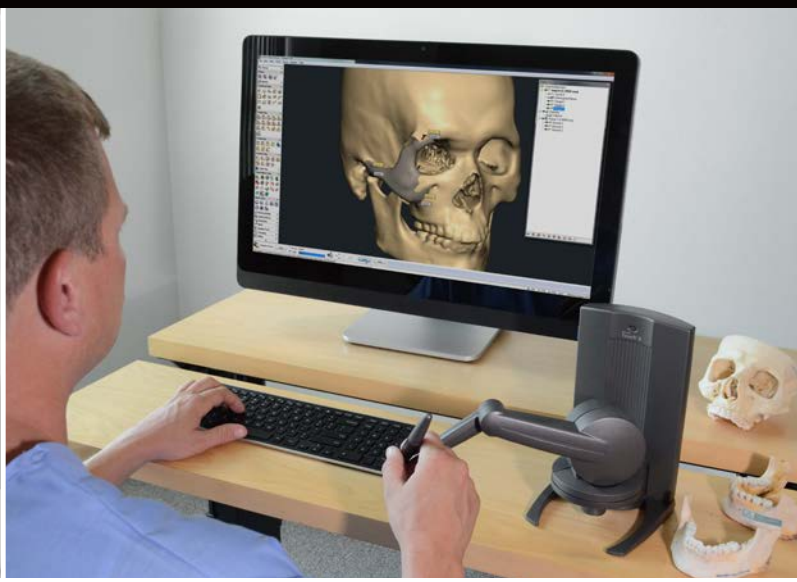
Geomagic Sculpt

Geomagic® Sculpt is an entry-level, fast, accurate virtual sculpting software platform that enables you to easily create free-flowing organic designs for products, sculptures, jewelry and artwork that can simply not be achieved in CAD. Geomagic Sculpt operates with both a standard mouse or with a Geomagic haptic device for a true sense of touch, while working as the most intuitive way to create functional and beautiful products for 3D printing and manufacturing.

Other commercial, scientific and research applications include:

- Robotic Control
- Virtual Assembly
- 3D Modeling
- Teleoperation
- Rehabilitation
- Collision Detection
- Training and Skills Assessment
- Applications for the Visually Impaired
- Entertainment and Virtual Reality
- Molecular Modeling
- Nano Manipulation





TOUCH 3D STYLUS

This entry-level touch haptic device works with 3D Systems' Cubify Sculpt software as well as the Geomagic Sculpt and Freeform products. With a generous active workspace and USB connectivity, this device represents the latest generation of 3D Systems haptic devices.

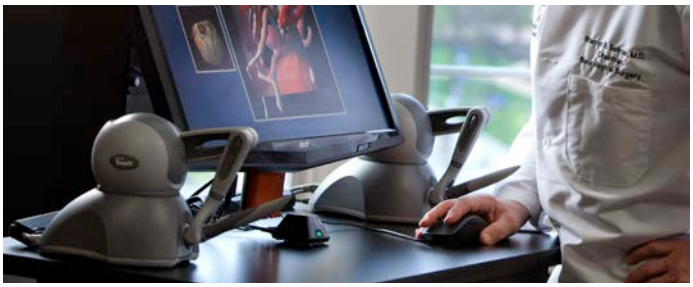
Geomagic® Touch™

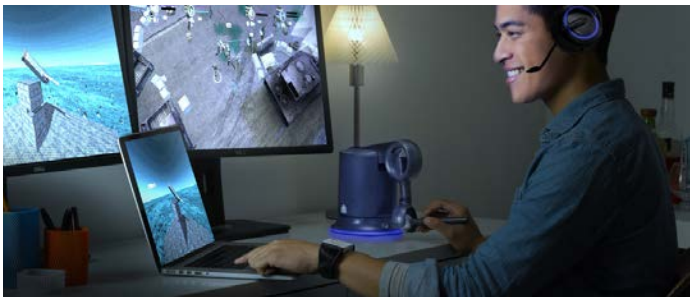
With a greater accuracy than the 3D Stylus, the Geomagic Touch offers the ability to sculpt more precisely inside the Geomagic sculpting products. With Ethernet connectivity this system offers robustness and stability for more complex projects and designs.

Geomagic® Touch™ X

With an accuracy up to 1100dpi, the Touch X delivers the very best for professional designers and artists in terms of accuracy and ability to develop fine details. This system delivers optimal stiffness and a high exertable force to assist with the design process for the very best in Freeform design and production.

OpenHaptics





3D Systems Phantom Haptics

These higher-level haptic systems are widely used by research institutions, medical system companies, university departments and scientists for many types of research that need force-feedback in a virtual environment. Look for the Phantom Haptic brochure for more information.

3D Systems Open Haptics Software toolkit

From 3D game developers to molecular researchers, developing a new software product with a sense of Touch is made straightforward with the 3D Systems haptic devices plus the OpenHaptics Software toolkit. This toolkit delivers the ability to integrate a haptic device into a 3D application with tools such as 3D navigation, material properties, polygonal object support, device control, sensor readings and more.

The OpenHaptics toolkit is available at no charge for development/ non-commercial use. For commercial or OEM use, a commercial OEM contract is required and fees apply. The online Developer Support Center is available to customers at no charge.

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3D Systems Haptic Device Specifications

	Touch 3D Stylus	Geomagic® Touch™	Geomagic® Touch™ X
Workspace	10.45 W x 9.5 H x 3.5 D in	~6.4 W x 4.8 H x 2.8 D in > 160 W x 120 H x 70 D mm	~6.4 W x 4.8 H x 4.8 D in > 160 W x 120 H x 120 D mm
Range of motion	Hand movement pivoting at wrist	Hand movement pivoting at wrist	Hand movement pivoting at wrist
Nominal position resolution	Approx 0.084 mm	> 450 dpi ~0.055 mm	> 1100 dpi ~0.023 mm
Maximum exertable force and torque at nominal position (orthogonal arms)	3.4 N	0.75 lbf/3.3 N	1.8 lbf/7.9 N
Stiffness	-	x-axis > 7.3 lb/in (1.26 N/mm) y-axis > 13.4 lb/in (2.31 N/mm) z-axis > 5.9 lb/in (1.02 N/mm)	x-axis > 10.8 lb/in (1.86 N/mm) y-axis > 13.6 lb/in (2.35 N/mm) z-axis > 8.6 lb/in (1.48 N/mm)
Force feedback (6 Degrees of Freedom)	x, y, z	x, y, z	x, y, z
Position sensing/input (6 Degrees of Freedom)	x, y, z (digital encoders)	x, y, z (digital encoders)	x, y, z (digital encoders)
[Stylus gimbal]	[Roll, pitch, yaw (± 5% linearity potentiometers)]	[Roll, pitch, yaw (± 5% linearity potentiometers)]	[Roll, pitch, yaw (± 3% linearity potentiometers)]
Interface	USB 2.0	RJ45 Compliant Ethernet Port	RJ45 Compliant Ethernet Port

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About 3D Systems

3D Systems is a leading provider of 3D content-to-print solutions including 3D printers, print materials and on-demand custom parts services for professionals and consumers alike. The company also provides CAD, reverse engineering and inspection software tools and consumer 3D printers, apps and services. Its expertly integrated solutions replace and complement traditional methods and reduce the time and cost of designing new products by printing real parts directly from digital input. These solutions are used to rapidly design, create, communicate, prototype or produce real parts, empowering customers to create and make with confidence.

Specifications subject to change without notice.