**Specifications for the**
**PHANTOM® Desktop™ and PHANTOM® Omni™ haptic devices**

The SensAble Technologies PHANTOM® product line of haptic devices makes it possible for users to touch and manipulate virtual objects. Different models in the PHANTOM product line meet the varying needs of both research and commercial customers. The PHANTOM Premium models are high-precision instruments and within the PHANTOM product line provide the largest workspaces and highest forces, and some offer 6DOF capabilities. The PHANTOM Desktop and PHANTOM Omni models offer affordable desktop solutions. Of the two devices, the PHANTOM Desktop device delivers higher fidelity, stronger forces, and lower friction, while the PHANTOM Omni device is the most cost-effective haptic device available today. Below is a comparison between the PHANTOM Desktop and the PHANTOM Omni haptic devices.

| Model | The PHANTOM Desktop Device | The PHANTOM Omni Device |
|---|---|---|
| **Force feedback workspace** | ~6.4 W x 4.8 H x 4.8 D in<br>> 160 W x 120 H x 120 D mm | ~6.4 W x 4.8 H x 2.8 D in<br>> 160 W x 120 H x 70 D mm |
| **Footprint**<br>Physical area the base of device occupies on the desk | 5 5/8 W x 7 1/4 D in<br>~143 W x 184 D mm | 6 5/8 W x 8 D in<br>~168 W x 203 D mm |
| **Weight (device only)** | 6 lb 5oz | 3 lb 15 oz |
| **Range of motion** | Hand movement pivoting at wrist | Hand movement pivoting at wrist |
| **Nominal position resolution** | > 1100 dpi<br>~ 0.023 mm | > 450 dpi<br>~ 0.055 mm |
| **Backdrive friction** | < 0.23 oz (0.06 N) | <1 oz (0.26 N) |
| **Maximum exertable force at nominal (orthogonal arms) position** | 1.8 lbf. (7.9 N) | 0.75 lbf. (3.3 N) |
| **Continuous exertable force (24 hrs.)** | 0.4 lbf. (1.75 N) | > 0.2 lbf. (0.88 N) |
| **Stiffness** | X axis > 10.8 lb/in (1.86 N/mm)<br>Y axis > 13.6 lb/in (2.35 N/mm)<br>Z axis > 8.6 lb/in (1.48 N/mm) | X axis > 7.3 lb/in (1.26 N/mm)<br>Y axis > 13.4 lb/in (2.31 N/mm)<br>Z axis > 5.9 lb/in (1.02 N/mm) |
| **Inertia (apparent mass at tip)** | ~0.101 lbm. (45 g) | ~0.101 lbm. (45 g) |
| **Force feedback** | x, y, z | x, y, z |
| **Position sensing**<br>**[Stylus gimbal]** | x, y, z (digital encoders)<br>[Pitch, roll, yaw (± 3% linearity potentiometers)] | x, y, z (digital encoders)<br>[Pitch, roll, yaw (± 5% linearity potentiometers)] |
| **Interface** | Parallel port | IEEE-1394 FireWire® port |
| **Supported platforms** | Intel-based PCs | Intel-based PCs |
| **GHOST® SDK compatibility** | Yes | No |
| **OpenHaptics™ toolkit compatibility** | Yes | Yes |
| **Applications** | Selected Types of Haptic Research<br>FreeForm® Modeling™ system<br>FreeForm® Modeling Plus™ system | Selected Types of Haptic Research<br>FreeForm® Concept™ system<br>ClayTools™ system |