HapticMASTER

The HapticMASTER is a 3 degrees of freedom, force-controlled haptic interface.

It provides the user with a crisp haptic sensation and the power to closely simulate the weight and force found in a wide variety of human tasks.

The programmable robot arm utilizes the admittance control (force control) paradigm, giving the device unique haptic specifications.

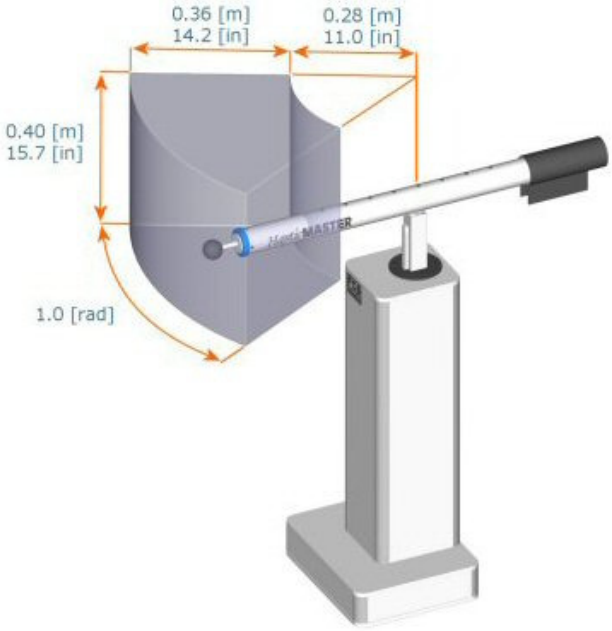
Specifications

General

Control type: Admittance (force control)
Active degrees of freedom: 3 (x,y,z)
Power requirement: 500 [W]
Voltage requirement: 90-264 [VAC]
Console height: 0.8 [m] 31.5 [in]

Haptic

Position resolution: < 4 X 10-6 [m] < 1.6 X 10-3 [in]
Force sensitivity: < 0.01 [N] < 2.25 X 10-3 [lbf]
Nominal output force: 100 [N] 22.5 [lbf]
Maximum output force: 250 [N] 56.2 [lbf]
Simulated equivalent inertia: 2 - oo [kg] 4.4 - oo [lb]
Maximum simulated stiffness: 5 X 104 [N/m] 285.5 [lbf/in]
Maximum velocity: 1.0 [m/s] 39.4 [in/s]
Maximum deceleration: 50 [m/s2] 39.4 [in/s]



End effectors

The HapticMASTER can be equipped with different end effectors, facilitating different applications.

Standard end effector

The passive end effector comprises a simple bal grip (figure). At the base of the grip a push button is placed which can be connected to

Passive end effector with 3DOF orientation measurement

Equipped with a universal clamp, this end effector can be used for applications requiring the measurement of 3 additional degrees of freedom.

All 3 rotational axes intersect in one point, also the location of the instrument tip. This provides the user with a natural and realistic simulation of the real-world usage of the

software applications. The standard end effector comes with the HapticMASTER.

instrument.

Gearshift end effector

The figure below shows the gearshift end effector. It is an example of a custom-built end effector for a specific application.

In fact, any self-made end effector below 3 kg can be mounted at the end of the HapticMASTER robot arm. Think of your real-world tools, where the HapticMASTER is used to simulate the forces between the tool tip and the environment.