

# MOOG SIMODONT DENTAL TRAINER

Haptic technology and high fidelity



At any given moment, in training centers around the world, a Moog simulation solution is at work providing an unsurpassed level of performance, fidelity and reliability.

Simodont Dental Trainer combines Moog's expertise in haptic technology and ACTA's (Academic Centre for Dentistry in Amsterdam) experience in dental education to simulate dental procedures for training purposes.

Haptics is the science of creating a realistic sense of touch in a virtual environment. For a few decades, Moog has been creating solutions in flight and automotive simulation that effectively apply this technology.

Simodont® courseware is developed by ACTA. It provides multiple dental procedures that can be practised in a virtual environment that feels realistic through high fidelity force feedback.

Dental students receiving training can develop their psychometrically validated skills faster than ever as pathological dental conditions are incorporated within the system.

This high fidelity Dental Trainer has been designed specially to teach dental students how to drill and manipulate instruments in a realistic manner. Hand instruments are simulated as well as dental burrs for removal of tooth decay, filling cavities or crown and bridge procedures.



## ADVANTAGES

- High fidelity Dental Trainer for optimum training quality
- Drilling and hand instruments with realistic force feedback
- Unprecedented stiffness, mechanical robustness and stability
- Crisp and light motion
- Simodont Courseware interface (ACTA)
- Realistic experience through high performance visual and audio rendering
- Right and Left hand operation with drill and mirror

## APPLICATIONS

Dental trainer including:

- Manual dexterity exercises with automatic evaluation
- Selection of virtual patient profiles
- Diagnosis and treatment planning
- Pre-clinical cavity preparation
- Operative procedures
- Crown and bridge preparation

# SPECIFICATIONS

The basis of our products for haptics and robotics is our patented "admittance control" technology which allows for the most precise of movements in training, operational or assembly situations. Our high performance range of products helps solve real-world problems in new ways. The core systems we offer to the marketplace are:

The Moog Haptic Master, Moog Simodont Dental Trainer, rehabilitation devices and diagnostic units .

The Moog Simodont Dental Trainer provides high-end dental simulation and is a complete, proven training system for dental schools.



## KEY FEATURES

- Advanced control technology: a unique admittance control paradigm using a force sensor for high fidelity feel
- Reliability: proven technology and control algorithm allowing the full spectrum of movement from very high to very delicate forces

<b>Dedicated Trainer</b>	The dental trainer is a high-quality, high fidelity simulator for teaching dental students how to drill in a dedicated environment. The unprecedented realism of the visual, haptic and audio experience gives optimal transfer from the trainer to actual practice.
<b>Interface</b>	Simodont Courseware created by the ACTA institute supports a full, modern dental curriculum. The courseware is open and different types of courseware can be easily interfaced to the trainer.
<b>Central Management</b>	Exercises for a number of training stations can be monitored and replayed on a central instructor station.
<b>Haptic Burr and hand instruments</b>	The haptics is based on the patented Moog admittance control paradigm. The use of a force sensor in the drill hand piece allows unusually crisp and realistic rendering of drill and contact forces. The hardness of the enamel is faithfully replicated and easily distinguished from dentin and dental pulp. Vibration from the drill hand piece are felt by the user and reflected on screen, as are the forces on the tip of the burr and the hand instruments. A library of hand piece and burr shapes is available.

<b>Dental Mirror</b>	A dental mirror handle allows the realistic inspection of the teeth from all sides. The image "seen" in the visual display, the dental mirror and its mirror image are true to size, and form a natural and realistic part of the visual scene.
<b>Visual Display</b>	The very sharp, true to size, collocated visual display approaches the acuity limits of the human eye. Projection and mirror technology allow the full resolution, full stereo image to be seen "in" the physical workspace of the hand piece.
<b>Audio</b>	A realistic model of the behavior of the drill speed under the control of the foot pedal and the force exerted by the student on the drill drives a built in sound module which faithfully renders the sound of an air rotor or other types of drills.
<b>Tooth Library</b>	A growing library of scans of real teeth is available for use in the exercises. Like courseware, tooth scans from various sources can be added to increase the variety and the realism of the simulator.
<b>Footpedal</b>	A real foot pedal is used to control the speed of the virtual drill.

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