Hexapod-Simulation Software

Due to their parallel kinematic structure, Hexapods necessitate a particularly complex control system. The position coordinates, for example, are given in virtual Cartesian axes which are then converted into positioning commands for the individual actuators by the controller. PI supplies special software that allow the 6-axes positioners to be more convenient in operation and easier to integrate.

Determining the work space

The limits of the work space vary depending on the current position of the Hexapod (translation and rotation coordinates) and the current coordinates of the pivot point. A special software tool included with each PI Hexapod calculates these limits and displays them graphically.

Checking the permissible load

As with any multiaxis positioning system, the load limit of the Hexapod varies as a function of a number of factors such as orientation of the Hexapod, size and position of the payload, current position (translation and rotation coordinates) of the Hexapod platform, and forces and moments acting on the platform.

The Hexapod software package includes a PI simulation tool that calculates all forces and moments and compares them individually against the specified load limits of the corresponding Hexapod mechanics.

Preventing collisions with PIVeriMove

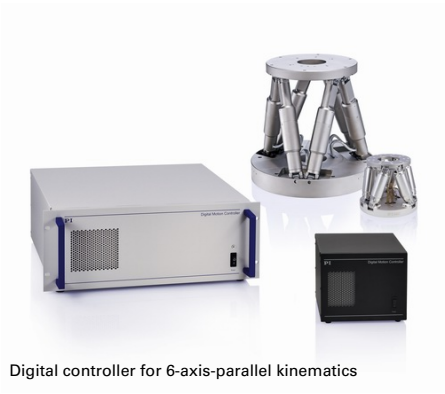
Another proprietary PI simulation software tool enables offline graphical configuration and simulation of the Hexapod motion in the application environment. CAD data of objects can be imported or approximated with simple shapes such as cylinders and cuboids. PIV eriMove then checks restrictions in the work space. Implemented in the controller firmware or the application software, this prevents the Hexapod from approaching positions where the platform, struts, or the mounted load would collide with the surroundings.

Emulation: The Hexapod system as a virtual machine

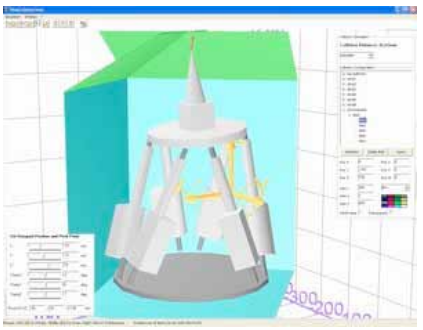
A virtual machine that can be installed on the customer's host PC is available to emulate a complete Hexapod systems (mechanics, controller and even peripherals). Application programs can then be developed and pre-tested, different load scenarios can be simulated and the work space can be determined before the system arrives, saving significant cost and development time.

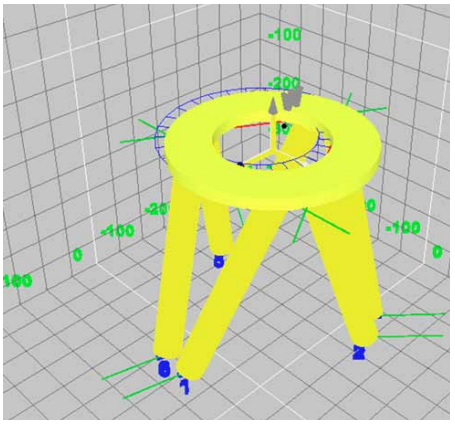
HexaApp: PI Hexapod control via iPhone, iPad or iPod

The Hexapod system can also be controlled wirelessly from mobile Apple iOS devices. A corresponding app enables command control of touchscreen, motion sensors or via a command input window.

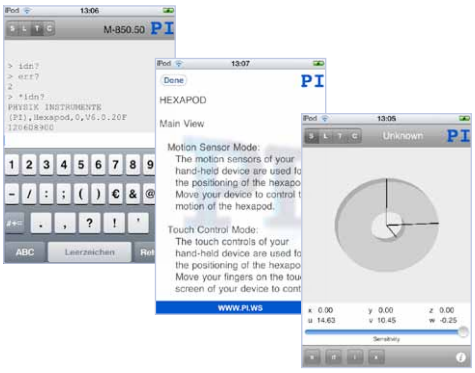


Digital controller for 6-axis-parallel kinematics



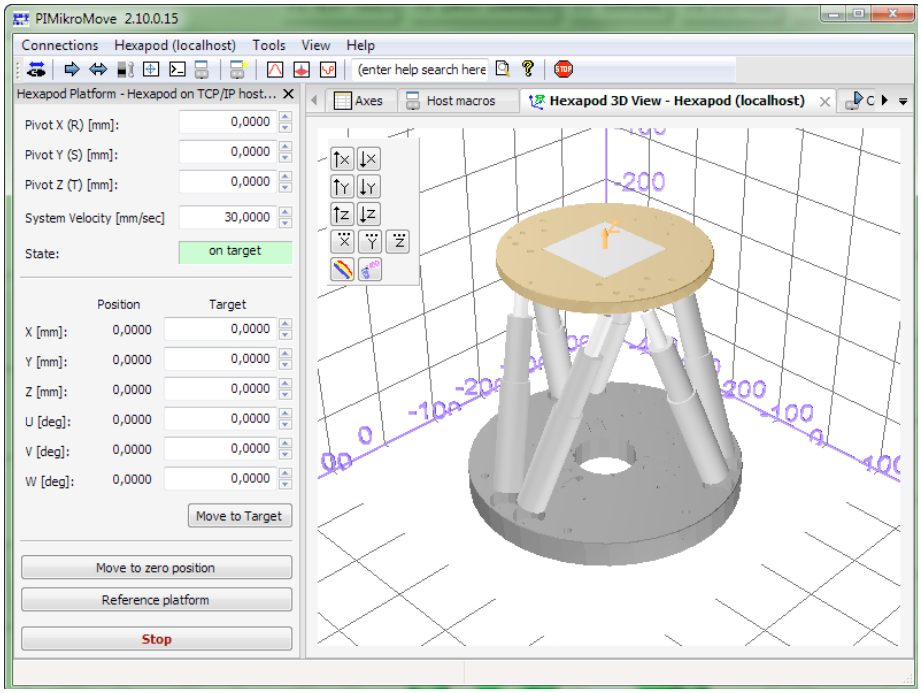


The simulation software graphically displays the position and the available work space of the Hexapod model



Software from PI

EFFECTIVE AND COMFORTABLE SOLUTIONS



Optimizing system behavior

When the mechanical properties of a positioning system are changed, e.g., by applying a different load, motion control parameters often need to be adapted. PI software provides tools for optimization of the system response and stability. Different parameter sets can be saved for later recall, also accessible from custom application programs.

PIMikroMove software ensures rapid start-up

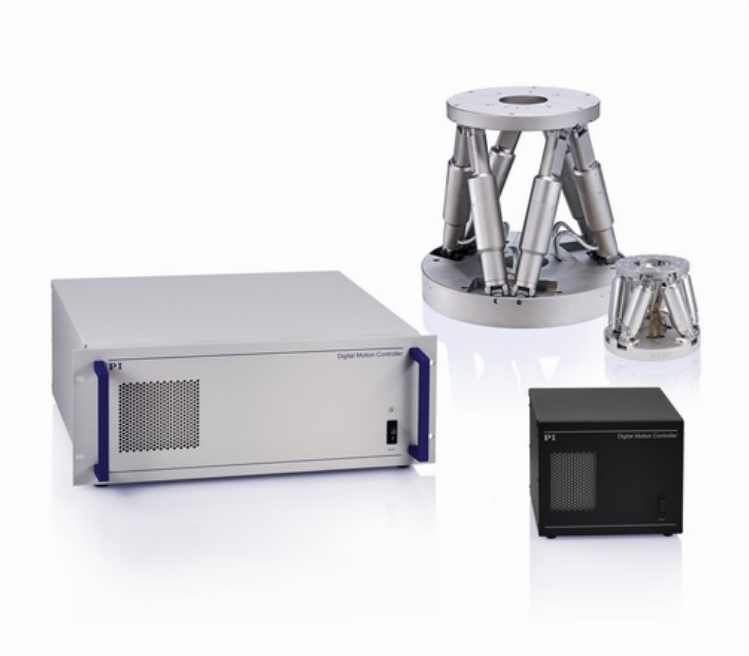
PIMikroMove is PI's convenient graphical user interface for any type of digital controller and positioning system, regardless of whether piezoelectric, linear motors, or classical electrical motor drives are used and independent of the configuration and number of axes.

All connected controllers and axes are displayed and controlled consistently with the same graphical interface. Two or more independent axes can be controlled by the position pad using a mouse or joystick; Hexapod six-axis positioning systems are also displayed graphically.

Macro programs simplify repetitive tasks for example in automated processes. The macros are created as GCS command sets that can be executed directly on the controller, e.g., as a start-up macro that allows stand-alone operation; they can also be processed by the host PC.

Scan and align algorithms can record analog values, e.g., the output of a power meter as a function of position for later evaluation with external software. They can also automatically find the global maximum of, for example, the coupling efficiency of optical devices.

Depending on the specific controller, PIMikroMove supports a number of additional functions. A data recorder can record system parameters and other variables during motion for later analysis.



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