

Motion Control Software from PI

Effective and Comfortable Solutions

Parallel Kinematics

UP TO 6 DEGREES OF FREEDOM

Nanopositioning

SUB-NANOMETER RESOLUTION



Drive Technology

DC, STEPPER, PIEZO, MAGNETIC

Micropositioning

LONG TRAVEL RANGES

All digital controllers made by PI are accompanied by a comprehensive software package. PI supports users as well as programmers with detailed online help and manuals which ease initiation of the inexperienced but still answer the detailed questions of the professional. Updated software and drivers are always available to PI customers free of charge via the Internet.

PI software covers all aspects of the application from the easy start-up to convenient system operation via a graphical interface and fast and comprehensive integration in customer written application programs.

Universal Command Set Simplifies Commissioning and Programming

PI developed the PI General Command Set (GCS) that is used to control all nano- and micro-positioning systems regardless of the drives and motion controllers used. GCS with its many preprogrammed functions accelerates the orientation phase and the application development process significantly while reducing the chance of errors, because the commands for all supported devices are identical in syntax and function.

Supported Operating Systems

- Windows XP (SP3)
- Windows VISTA
- Windows 7 32/64 bit
- Linux 32/64 bit
- Windows 8 32/64 bit

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. For a multi-axis application, various controllers can be used and commands can still be issued via PIMikroMove in the same window. 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.

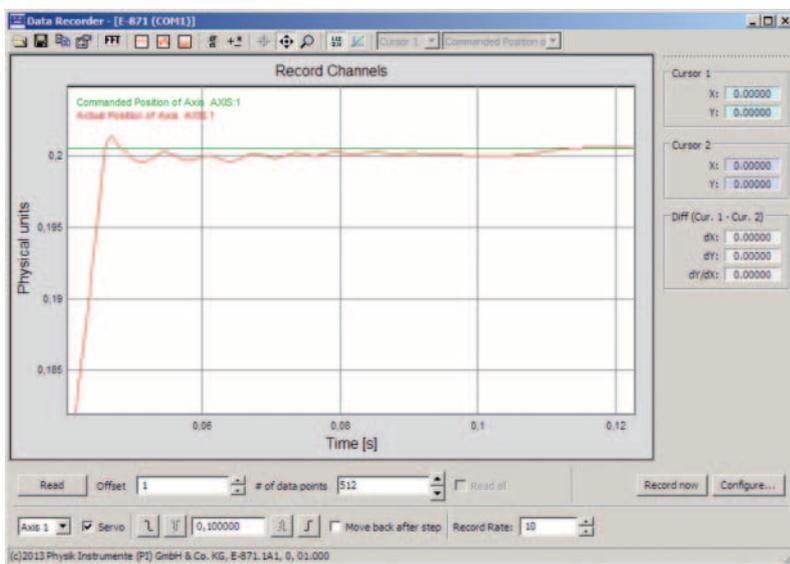
Scan and align algorithms can record analog values, e.g. the output of a power meter as a

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.

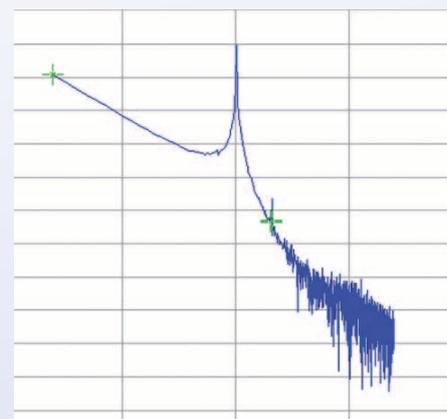
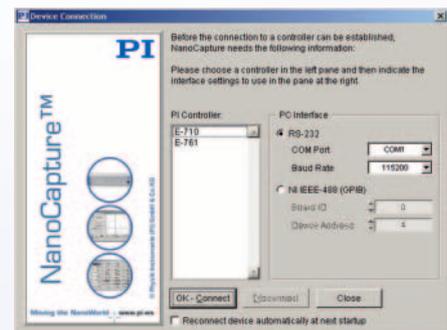
Depending on the specific controller, PIMikroMove supports a number of additional functions. A data recorder can record system parameters and other variables during motion for later analysis.

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.



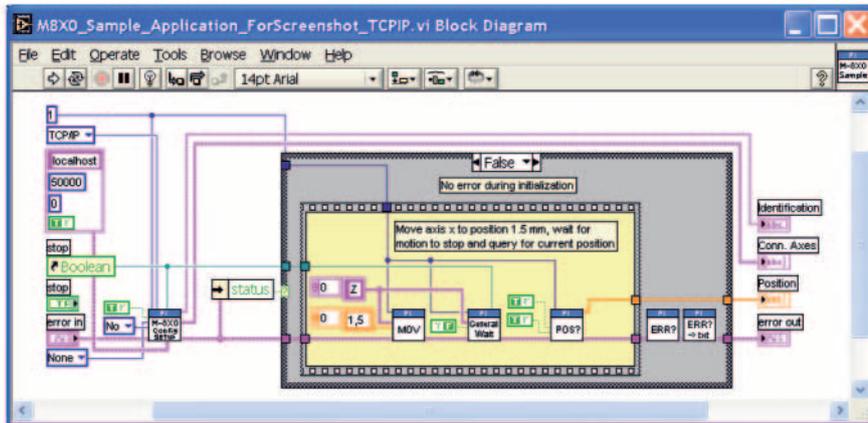
The flexibly configurable data recorder records data, such as position, sensor signal or output voltage in relation to time



Convenient operation and performance optimization with PI software: The parameter setting tool shows the frequency response of a nanopositioning stage in Bode plot

Motion Control Software from PI

Fast Integration of PI Controllers in Third-Party Programming Languages and Software Environments



Currently, many applications are produced in LabVIEW, e.g. in measuring and control technology and automation engineering. PI provides complete LabVIEW drivers sets to facilitate programming. A controller-specific Configuration_Setup VI is integrated at the start of the LabVIEW application and includes all system information and initiation steps required for start-up. The application itself is implemented with controller-independent VIs.

In case of a controller change or upgrade, it is usually only necessary to exchange the Configuration_Setup VI, whereas the application-specific code remains identical due to the consistent GCS command set structure.

The driver set includes many specific programming examples, e.g. comprehensive scan and align routines that can be used as template for customer-specific programs. Moreover, the open source code of many VIs allows for rapid adaptation to the user needs.

Flexible Integration in Text-Based Programming Languages

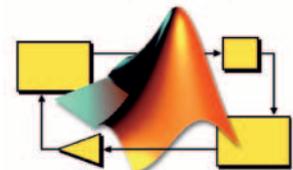
The integration of PI positioning systems in text-based programming languages under Microsoft Windows or Linux is simplified by program libraries and exemplary codes.

These libraries support all common programming languages and all PI positioning systems, allowing the PI GCS command set functions to be integrated seamlessly in external programs.

Third-Party Software Packages

Drivers for the PI GCS commands have now been integrated in many third-party software packages. This allows for the seamless integration of PI positioning systems in software suites such as MetaMorph, μ Manager, MATLAB and ScanImage. Moreover, EPICS and TANGO drivers are available for integration into experiments of large-scale research facilities. The drivers for μ Manager, MATLAB and a large part of the EPICS drivers are being developed and serviced in-house by PI.

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Supported Languages and Software Environments

- C, C++, Python, Visual C++, Visual Basic, Delphi
- LabVIEW, MATLAB, μ Manager, EPICS, TANGO, MetaMorph
- and all programming environments that support the loading of DLLs



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