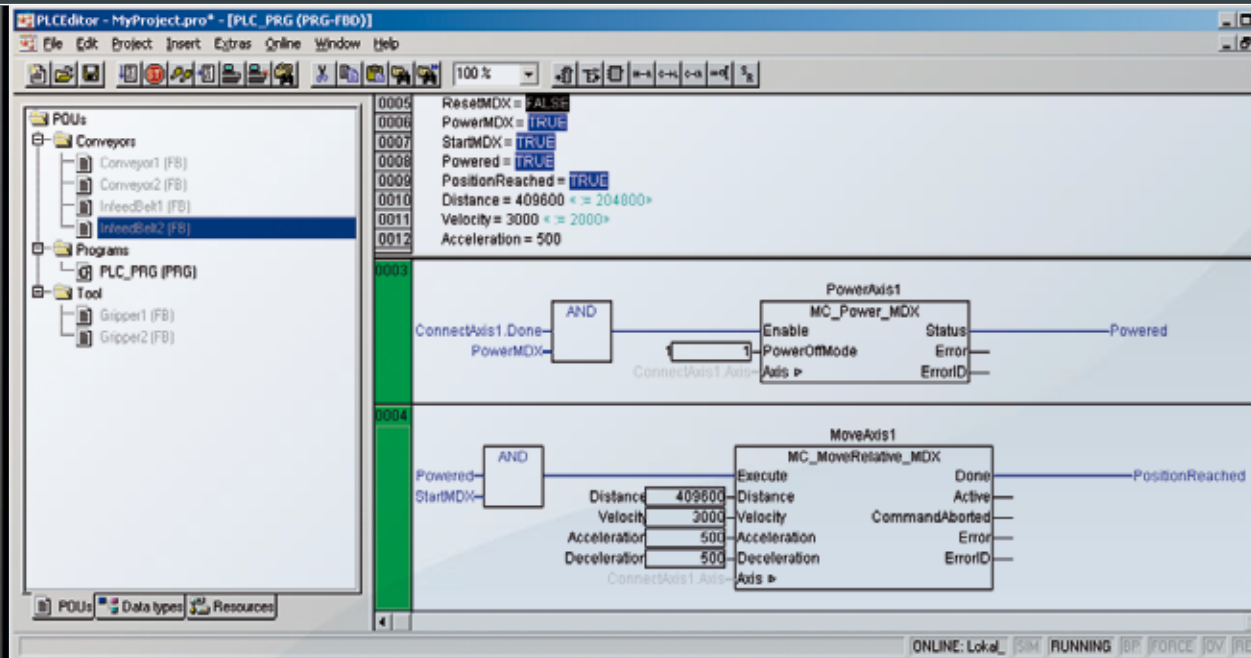


Free Programming of Applications with MOVI-PLC®

Control Technology



Freely programmable motion and logic controller MOVI-PLC®

SEW-EURODRIVE offers the freely programmable motion and logic controller MOVI-PLC® for solving complex tasks in a flexible manner. The scalable controllers are the ideal solution platform as they make for universal operation and functionality. Comprehensive interfaces are available for the external periphery and for visualization to fully automate complete machines.

For fast and simple startup, users can utilize preconfigured program modules for many applications. The standard programming languages FBD, LD, IL, and structured text ensure great flexibility.

Driving the world – with innovative drive solutions for all branches of industry and for every application. Products and systems from SEW-EURODRIVE for any application – worldwide. SEW-EURODRIVE products can be found in a variety of industries, e.g. automotive, building materials, food and beverage as well as metal-processing. The decision to use drive technology “made by SEW-EURODRIVE” stands for safety of functionality and investment.

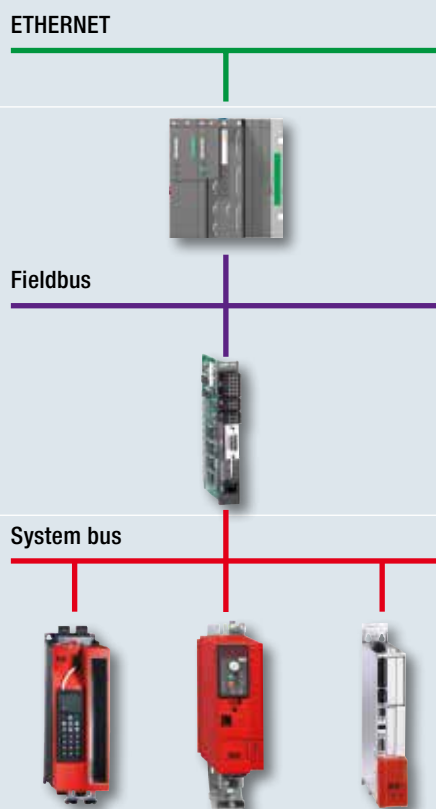




Perfect movement in any automation concept

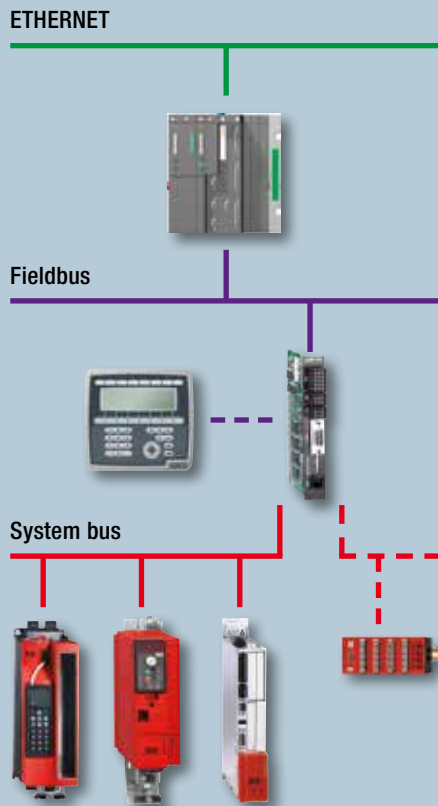
MOVI-PLC® always provides the drive functionality matching the specific application. It can be used whenever intelligent drive solutions are required, for example, when a number of drives have to perfectly interact. MOVI-PLC® controls this interaction in a simple and flexible manner.

The many fields of applications and types of MOVI-PLC® offer the perfect control topology for any requirement: motion control either modular with I/O system or as stand-alone component.



Motion Control

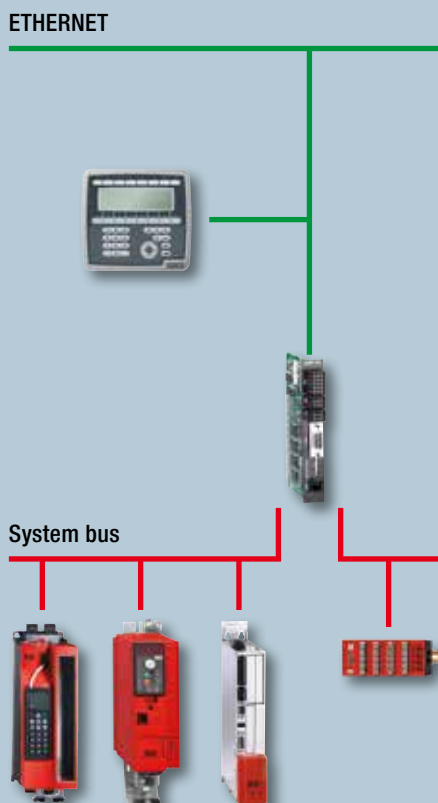
- Simple handling
- Preconfigured function modules efficiently implement the motion functions
- Coordination of several axes
- Connection via fast, synchronous system bus
- All motion control tasks are concentrated in one MOVI-PLC®



Modular

In practice it is often advantageous to process I/Os, which directly depend on the motion sequence, also in the MOVI-PLC®, for example in the form of cam switches or touch probe events. Following the advantages:

- MOVI-PLC® takes over motion control and the control of operating sequences of sub-processes
- Automation of independent machine modules
- Relieve the central PLC
- Reduced response times
- Increased performance
- Protection of corporate know-how
- Reduced effort when changing the central automation system



Stand-alone

As complete automation solution with all the required components, such as

- Drive
 - Drive electronics
 - Control
 - I/O system
 - Operator terminals for visualization and diagnostics,
- MOVI-PLC® assumes all the automation tasks from motion control to sequence control in a stand-alone manner.

Comprehensive engineering included: MOVITOOLS® MotionStudio

An intuitive software is the basic requirement when it comes to starting up all the components used in automation quickly and easily. This is why the MOVITOOLS® MotionStudio engineering software from SEW-EURODRIVE offers comprehensive graphical wizards for configuration and diagnostics, and lets users operate even complex applications in an easy manner.



- MOVITOOLS® MotionStudio covers the entire engineering: startup, parameterization, programming, control, diagnostics, communication and visualization
 - The SEW communication server allows for a free choice of the communication paths as it supports a broad variety of communication media and fieldbus systems
 - The integrated project management enables users to easily handle all the components related to the drive, control, and visualization of a machine or plant
 - MOVITOOLS® MotionStudio detects all the stations connected to the configured interfaces automatically and displays them as nodes in a device tree. The required tools can be selected and started quickly and easily in the context menu of each node.
- MOVITOOLS® MotionStudio can be used for any component:
 - Centrally with MOVIDRIVE® inverter, MOVITRAC® B frequency inverter and fieldbus gateways
 - Decentrally with the MOVIFIT® drive controller for innovative field installations or MOVIPRO®, or with MOVIMOT® gearmotors with integrated frequency inverter and field distributors
 - With multi-axis MOVIAxis® servo inverters

	Startup
	Parameterization
	Diagnostics and visualization
	Programming

Predefined or individually: Programming with MOVI-PLC®

The MOVI-PLC® motion and logic controller is characterized by convenient programming.

The motion control functionality can be accessed either

- directly via dedicated function blocks, or
- combined via universal program modules.

In this way, the application program can be created to suit the specific needs.

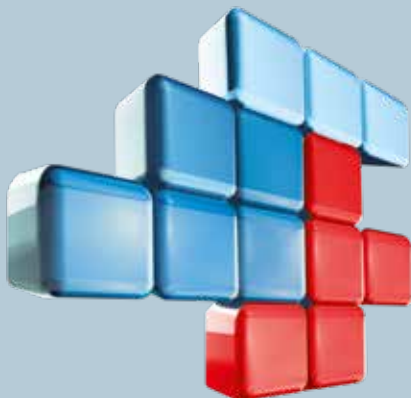
Function blocks



Versatile combinations and flexible use

Direct access to blocks that allow for a certain drive function provide the highest level of flexibility. The function blocks are clearly arranged in libraries according to their functions and inverter type. With some experience, users can flexibly combine these function blocks to create the optimum program.

Program modules



Optimally combined for efficient use

The program modules comprise bundled comprehensive drive functions. These can be simple functions like positioning, referencing or speed control, technology functions for controlling a cam or a synchronous operation, or functions for multi-axis interpolations of kinematics. Once these program modules have been integrated, the user merely has to concentrate on programming the most important processes of the respective application. The program modules provide the entire drive functionality via an interface. This makes the program modules ideal for PLC programmers who want to reduce the programming effort of the drive functionality.

Libraries

In addition to a library for standard IEC functions, MOVI-PLC® provides a library with function blocks with suitable drive functions for each type of inverter to allow for efficient programming.

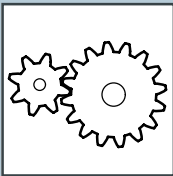
They include all single-axis motion control functions, such as speed control, positioning, referencing, touch probe, etc.



The known motion blocks certified to PLCopen are available as well.

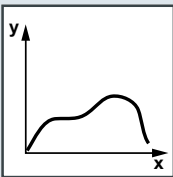
The following technology functions are available

MPLCTecGearMotion



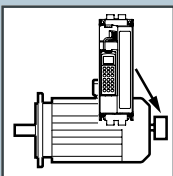
- Electronic gear unit (synchronous operation)
- Various engaging modes and trigger sources
- Master source can be switched
- Offset processing

MPLCTecCamMotion



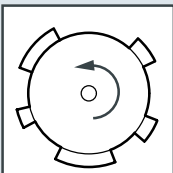
- Electronic cam
- Numerous trigger and master sources
- Switching between several curves possible
- Online curve calculation

MPLCTecVirtualEncoder



- Virtual encoder with jerk-limited travel profile
- Can be operated in different operating modes like a real drive
- Two separate virtual encoders possible
- As master value for synchronous operation and cam

MPLCTecCamSwitch



- Cam switch
- Three tracks with 4 cams each
- Encoder source can be selected
- 1 ms sampling time with delay time precontrol in a 100 µs resolution

Reduced time and workload: Program modules with comprehensive functionality

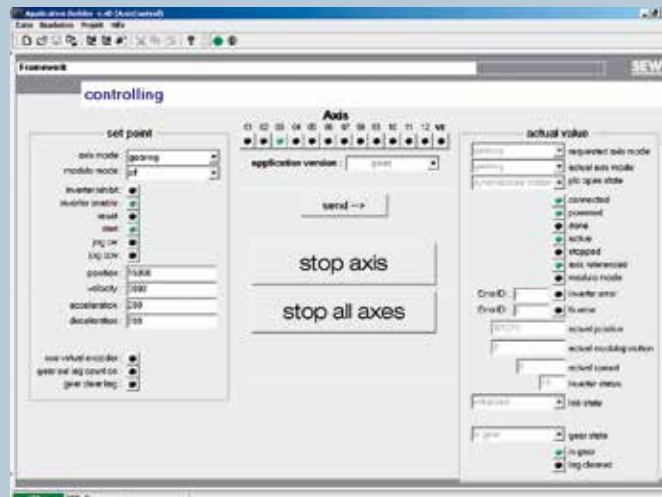
“AxisControl” program module

Program modules combine the function blocks of the libraries. They provide the user with powerful packages that contain comprehensive

drive functionalities and significantly reduce the programming effort.

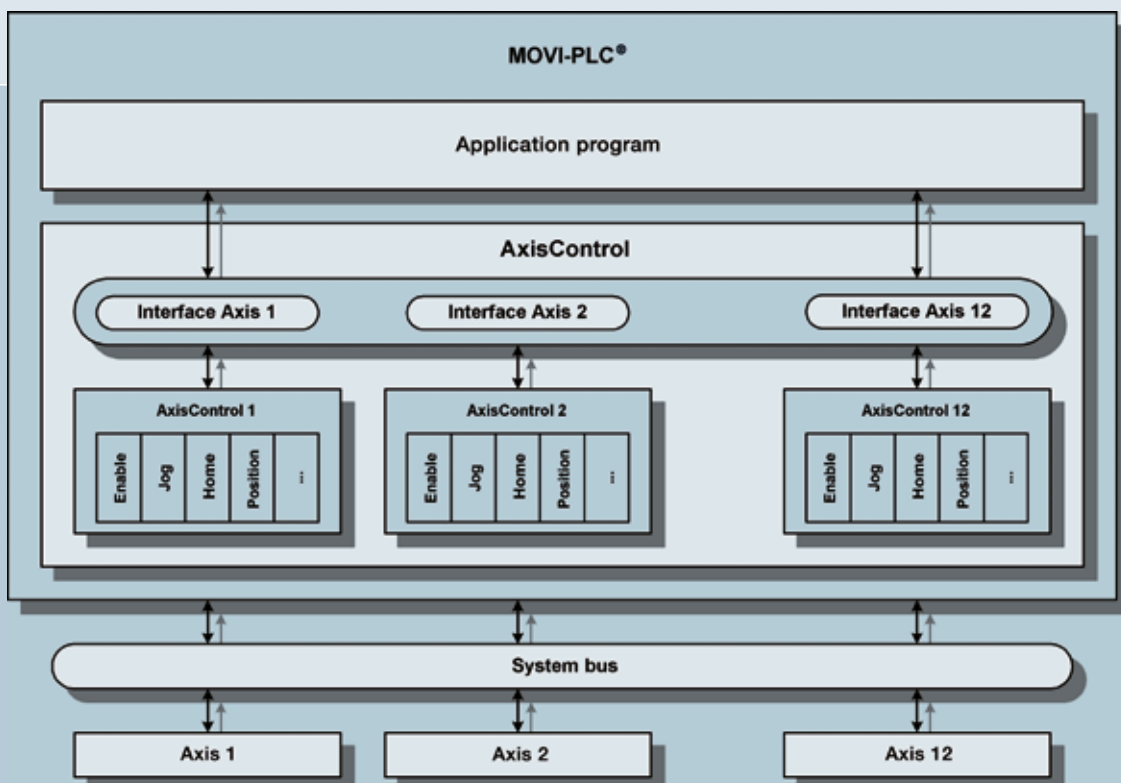
The “AxisControl” program module provides a wide range of drive functions. An axis can be controlled once the “AxisControl” program module matching the inverter has been integrated. Jog, referencing or positioning – the user does not have to activate any other function blocks. Instead, a simple interface can be accessed to start the function and transmit the parameters.

The “AxisControl” program module is a platform for comprehensive drive functionality providing the perfect basis for an application program. Users merely have to add the processes required in the application.



Only minor adjustments to the interface are required to provide users with a solution for various specific applications, such as flying saw or winder.

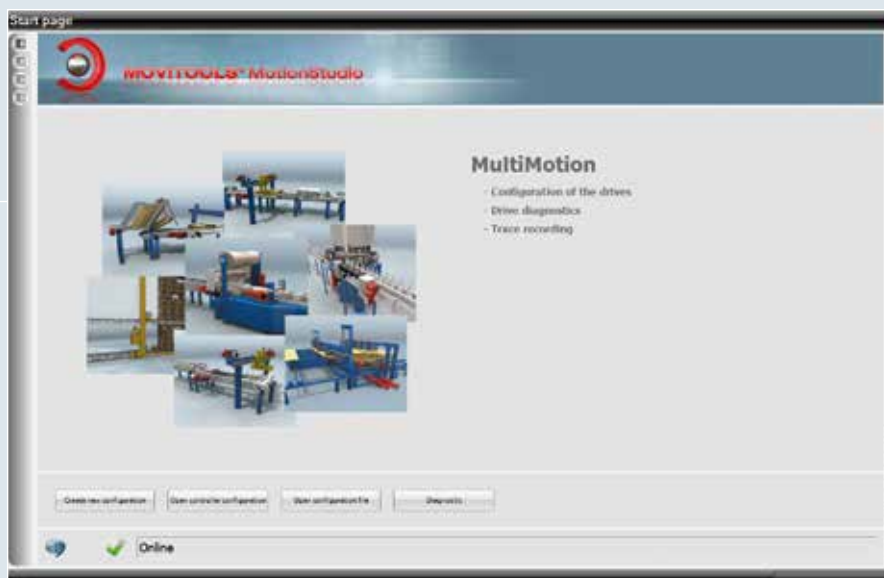
A user interface is available matching the “AxisControl” program module. It can be used to monitor and control the interface. In this way, each axis can be controlled once the program module has been integrated.



“MultiMotion” program module

“MultiMotion” offers comprehensive drive functions for up to 24 axes combined in a parameterizable program module. A graphical user

interface guides the user through the parameter setting process and allows for monitoring and controlling the configured functions.



The range covers functions from single-axis to technology functions, such as electronic cam and synchronization up to various interpolation mechanisms. A cam switch is also integrated as well as the processing of external encoder and touch probe functions.

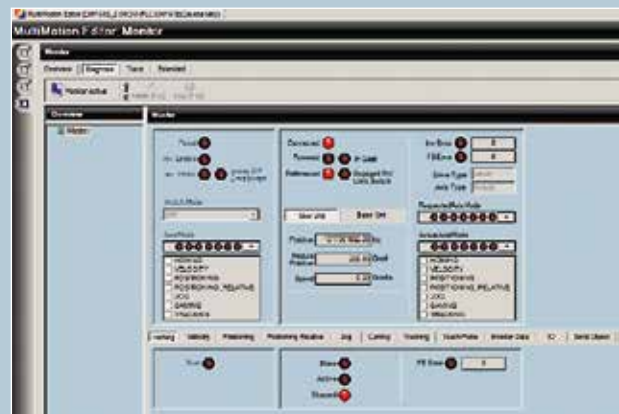
A defined data structure lets the programmer access the individual functions and change their configuration parameters even during runtime. This means curves can be changed on-the-fly and motion profiles can be modified.

“MultiMotion” is the ideal program module for applications where several axes are connected via synchronous operation or electronic cam. The functionality of the program module is independent of the drive electronics used (for

instance MOVIDRIVE® inverter or MOVIAxis® multi-axis servo inverter). No drive electronics is required for simulation as the result can be simulated at the desk using virtual axes.

Configuration wizard

All the relevant settings are entered conveniently using a graphical wizard.



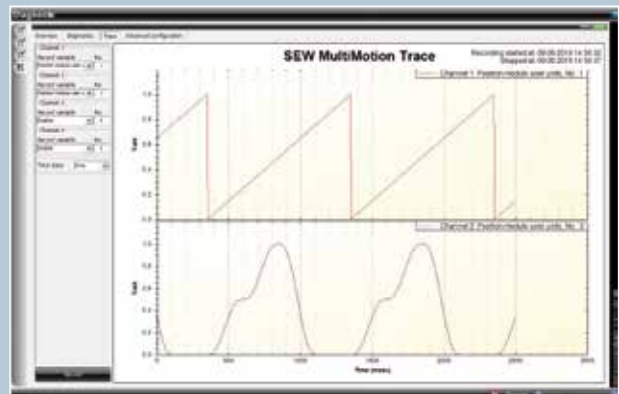
Diagnostics

Graphical diagnostics provides a quick overview of the present condition of an axis. The integrated control mode allows for starting up complex sequences, such as electronic cam, even without programming.



Trace

Any variable can be recorded for the duration of several minutes using an integrated trace function.



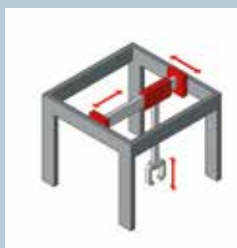
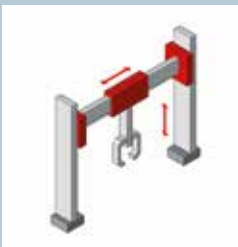
“AxisGroupControl Kinematics” program module

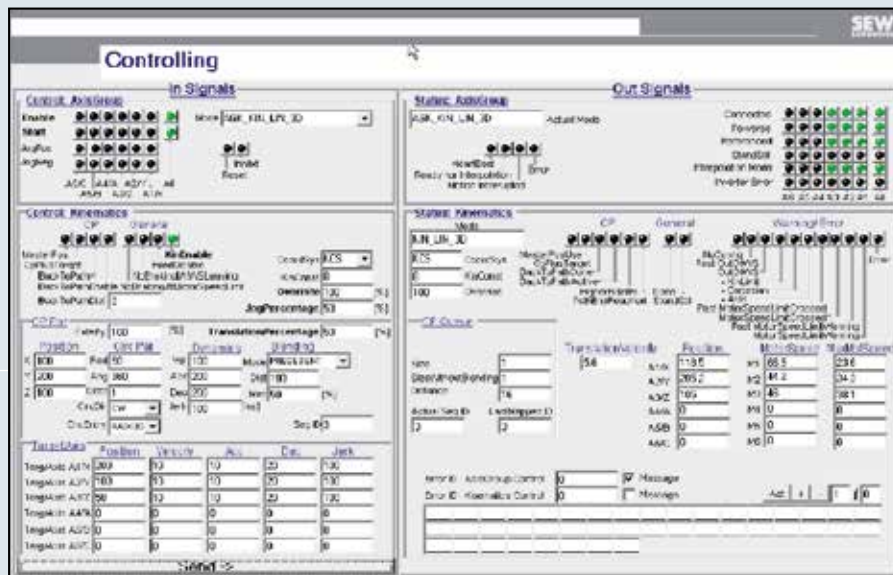
Machine controllers are increasingly taking over kinematics control of integrated handling or processing modules. The “AxisControl Kinemat-

ics” program module makes sophisticated path interpolation as easy as controlling single axes or technology functions.

As with “AxisControl”, the user addresses a simple interface that, apart from the kinematics functions, also supports the conventional single-axis functions such as referencing of the

involved axes. Several “AxisControl Kinematics” can be set up on one MOVI-PLC®, which means that several different paths can be controlled in different kinematics at the same time.





Functionality:

- The sequential program is created in IEC 61131-3, which means neither an additional specific robotics programming language is required nor another tool
 - Numerous sample programs are available – the simplest case merely requires to adjust the target coordinates and velocity settings
 - Path points and parameters are entered in the user program in various ways, e.g.:
 - during startup or machine operation via operator terminal (teach-in)
 - via calculation directly in the MOVI-PLC® program
 - data transmission from a higher-level PLC via process data interface (Profibus, DeviceNet, ProfiNet, EtherNet/IP™, Modbus TCP, UDP)
 - A graphical user interface with a display for monitoring and control simplifies startup
 - Convenient program sequence test using the 3D simulation integrated in MOVITOOLS® MotionStudio:
 - simultaneously with the real machine operation, or
 - in the office completely without drives with MOVI-PLC®
 - A list of standard kinematics is available
 - Specific customer kinematics can be integrated
 - Kinematics can be changed easily through configuration
 - “Continuous path” with automatic blending
 - “Target path types” with automatically limited path acceleration
 - Tracking of moving tools
- Requirements:**
- DHx41B advanced control card
 - MOVIDRIVE® or MOVIAXIS®
 - Encoder feedback

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