

OWISoft 3

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OWISoft control software

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1 Introduction

1.1 OWISoft Overview

Windows System Requirements

Operating Systems

- Windows XP (32 bit, SP3)
- Windows Vista (32/64 bit)
- Windows 7 (32/64 bit)
- Windows 8.x (32/64 bit)
- Windows 10 (32/64 bit)

Recommended Minimum Hardware for Better Performance

- 1.3 GHz or faster processor
- 512 MB RAM (recommended: 1 GB RAM or greater)
- 1GB available hard-disk space
- 1024 x 768 screen resolution (recommended: 1280 x 800 or higher)

Supported Hardware (OWIS GmbH)

- PS 90 (firmware version 7.6 and higher)
- PS 30 (firmware version 5.0 and higher)
- PS 35 (firmware version 5.3 and higher)
- PS 10 (firmware version 2.8 and higher)

Interfaces

The PS 90 is connected via Ethernet, USB or RS232 to the computer. The PS 35 is connected via USB or RS232 to the computer. The PS 30 is a plug-in card (PCI bus). The PS 10 is connected via USB to the computer. Optionally, the PS 90 can be controlled via Ethernet (Anybus module "Modbus/TCP"). Before the first start-up, you have to make sure that the interfaces and the drivers (for example, USB driver or PCI driver) are installed. The software is a part of the setup file (Setup.exe). With the driver installation a virtual serial port is installed. The application software can access this interface in the same way as it would access a standard serial port (COM). Optionally, the PS 90 can be accessed directly via USB interface (WinUSB driver).

Software

The software tool OWISoft allows the configuration and operation of several OWIS® control units of the type PS 90, PS 35, PS 30, PS 10. It offers a comfortable readout of the relevant parameters from OWISid, a chip integrated in the positioning stages. A user-friendly modern and intuitive interface with a ribbon simplifies the configuration of the OWIS® positioning systems. The hardware configuration is created by using the integrated hardware configuration wizard automatically. The settings can be stored. All relevant parameters for linear and rotative OWIS® positioning units are stored in the program database. They can be called, modified and then operated by the control unit. The ribbon replaces the menus and toolbars of the OWISoft main window. It provides quicker access to the functions and allows for easier future additions and customizations. Beside the ribbon and status bar, the docking windows are important elements in the OWISoft user interface (Chain, Program, Properties, Watch, File view, Output). Each individual docking window in the user interface can be hidden or displayed in the View category (ribbon). Several docking windows can be moved, placed on top of each other and be represented as tabs. The clearly arranged property grid enables you to modify the configuration for the function keys, to define global variables, to send direct commands to the control unit. A simple motion sequence for one or more axes can be set in a table (Chain), coordinate sequences are defined and executed (e.g. two-dimensional pattern or three-dimensional grid). You can create, test and process complex motion sequences in a script language (Program). Using a program script you can extend the possibilities of the application or automate certain operational sequences. Path control (linear or circular interpolation) and dual position-control loop are possible with PS 90, PS 30 und PS 35. Trigger control is possible with PS 90 (V 8.0 and higher). The demo configuration is used in product demonstration (without hardware).

Software features

- Maximum number of axes which can be controlled is 50.
- Maximum number of axes per control unit is 32.
- Maximum number of controls of the same type is 10.
- Maximum number of control units is 50 (at least one axis per control unit).
- Number of function keys is 50 (global definition, F1-F50).
- Number of variables is 100 (global definition, var1-var100).
- Number of script files (OWP) is not limited.
- Number of text files with axis parameters (OWD) is not limited.

The control is axis-based. That is, if the control units are connected (see chapter 3.1) and the axes defined, each axis is only called with its identifier everywhere in the program. The axis name has to be composed of alphanumeric characters and may consist of 4 characters maximum ("ax1", "ax2", "ax50", etc.). In order to distinguish between several control units of the same type, the software generates a control unit index (for example, "PS90-1" is generated). With the control units PS 90, PS 30, PS 35, PS 10 this index will be defined through the order of their initialization (connection). The control unit first connected has the smaller index.

The software works with several parameters, which define the state and characteristics of an axis. The parameters which describe position and speed of the axis have the following measuring units (data type in brackets):

Position – Inc (long integer), mm (double), μm (double), deg (double), mrad (double);

Speed – Hz (double), mm/s (double), $\mu\text{m/s}$ (double), deg/s (double), mrad/s (double).

For these two parameters you can define an output format to be used with each value output. When having double precision values, the format is determined by the decimal places specification (0-9). The other parameters do not have measuring units.

The numbers, time and date values are presented in Windows format. By default, OWISoft (like Excel) uses the system separators that are defined in the regional settings in Control Panel (decimal and thousands separators).

File types

The parameters are stored in a configuration file with the extension "owi". This file type is registered in the Windows registry as file type of the OWISoft application. Double-clicking such a file starts the program automatically and loads the selected file name as a parameter into the command line. The function "Drag & Drop" is activated. If application is opened, a file with the extension "owi" can be dragged from Windows Explorer into the application window.

The software works with two further file types: "owc", "owp". These are text files, which store the configurations of the chain as well as the program script. You find further information in the sections describing these work areas.

Language of the GUI

The program supports 2 languages: German and English. The Sprache / Language menu item switches to the appropriate user interface. The language menu is situated in the upper-right corner of the ribbon (tab bar). If no language is selected, the German interface is displayed.

1.2 MDI application

The program is a MDI application (MDI = Multiple Document Interface). The MDI specification requires a main frame for applications. It has a title bar including system menu and maximize/minimize buttons, a menu bar and a frame; the user can resize the application window with. Its application window is used not directly, but for displaying of any desired number of document views.

Document windows are quite similar to normal windows: They have a title bar with the usual four icons, a size changing frame, and scrollbars, possibly. There is no own menu bar: All functions are handled using the menu in the main frame.

You only have one of these document views active and in the foreground, this being indicated through an emphasized title bar. All document windows are cut off at the borders of the main frame, which determines the maximum size of each window; the system does not accept moving a document window beyond the borders of the main frame.

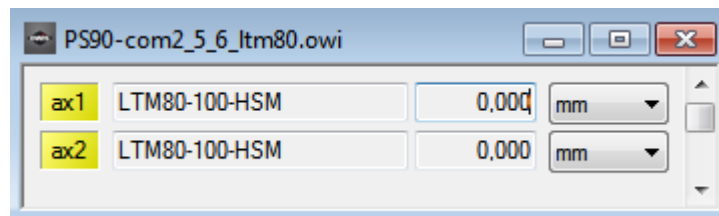
Specific features:

- The Windows Manager contains a list of document windows that are currently open in the application. The user can manually control the state of the document windows by using this dialog box. You can display this dialog box with **Windows** command (**View** tab, Windows).
- Document windows can be reduced and are displayed as icon at the lower edge of the frame.
- If a document window is set on maximum size, its title bar disappears. This title bar usually displays the name of the respective document, which should appear in the title bar of the main frame together with the application name. The icon for the system menu of the document window will disappear. 3 other icons (minimize, maximize, close) are the last points in the tab bar of the ribbon.
- The option buttons of the Windows Manager enable activating of the document windows directly and their display as “overlapped”, “tile vertical” and “tile horizontal”.
- A new window (view) can be opened for the active document with **New Window** command (**View** tab, Windows). For several views the name is appended with an index (e.g. view1 – “name:1”, view2 – “name:2” etc.).

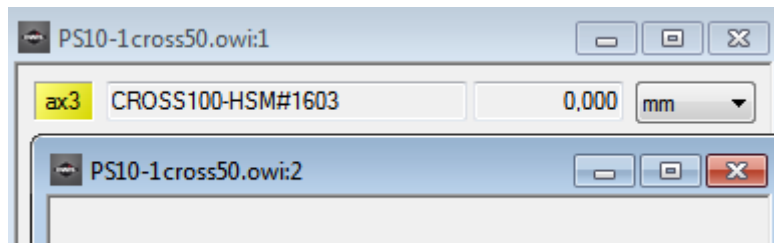
The MDI application has one (or several) document type(s). One (or several) view(s) can be defined for each document. This is based on the Document-View architecture. The Document contains the application data, enables loading, saving and reading of data. The View contains the presentation of the data, enables correct displaying when data size changed and data updated.

The main frame is responsible for loading resources (ribbon, docking windows and status bar) and for loading pre-set values from the registry database.

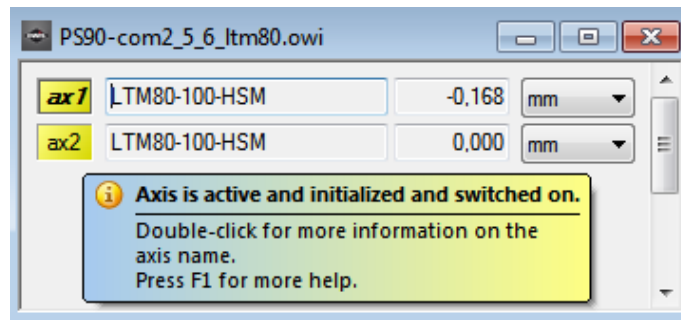
The OWISoft application uses only one document type. For each control unit the program provides a document with one (or several) appropriate view(s). In the view the current positions for the defined axes of the control unit are displayed (view1 – 1-9 axes, view2 – 10-18 axes, view3 – 19-27 axes, view4 – 28-32 axes). The document manages the axis parameters and the values of the interface configuration. These data are stored in a configuration file of the type “owi”. If data have been changed, you can store them when leaving the application. The Application Button is situated in the upper-left corner of the ribbon and is used to quickly perform the usual file operations (Application Button, File menu). After the program start there is at first no control unit connected.



If the control unit is connected and the axis (axes) is (are) defined, then a view is displayed, in which the axis positions are indicated. The output for each axis consists of four elements: axis name, assigned positioning unit, current position, measuring unit. If no axis is still defined, then a tip “no axis selected” is displayed in the view.

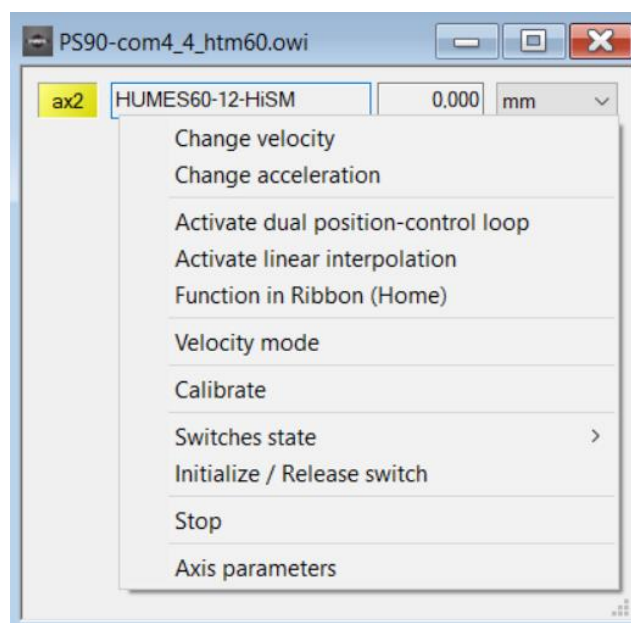


The function “Traffic light” (axis state indication) includes an additional QuickInfo. When a user moves the mouse pointer over the axis name, a window that contains tooltip text (QuickInfo) appears for a specified amount of time. The background colour and the QuickInfo of the axis name (green, yellow, red + magenta) change according to the axis state: Green – axis is moving, Yellow – axis stands still and is ready to go, Red – axis stands still and is not ready to go (switched off, error etc.), Magenta – axis works in velocity mode (or hybrid mode) with way measuring system (dual position-control loop, phase 3). The tooltip text describes the actual axis state. The name of the axis with activated limit switch is printed in italics.



A double click on the axis name displays the **Axis state** dialog box for the selected control unit (the active window). The according axis is selected.

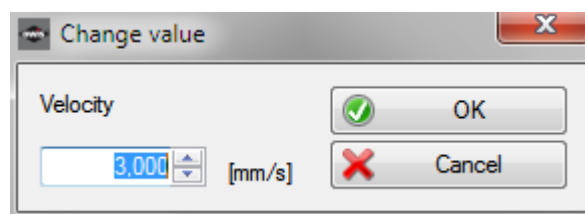
For the **Positioning unit** and **Position** text boxes the pop-up menus are defined. Pop-up menus are menus specific for context that can be displayed when the user clicks the right mouse button over a control. The functions are executed for the according axis.



Positioning unit, functions of the pop-up menu

Change velocity - display and select velocity.

A click displays the **Change value** dialog box. The physical units for velocity and speed output data are identical. Here you can change the positioning velocity for the trapezoidal or S-curve profile (**OK** button).



Change acceleration - display and select acceleration.

A click displays the **Change value** dialog box. The physical units for acceleration and speed output data are identical (Hz – internal values). Here you can change the acceleration and deceleration values for the trapezoidal or S-curve profile (**OK** button).

Activate dual position-control loop – activate (checked) or deactivate dual position-control loop.

A dual position-control loop is possible only with a linear measuring system. The axis moves to a new target position or a distance either in the trapezoidal or S-curve profile with dual position-control loop, if the hardware is available and the option is activated. The setting is valid for all work areas. If the function is not available with the selected control unit, it is grayed out.

Activate linear interpolation - activate (checked) or deactivate linear interpolation.

The axis goes to a new target position or a distance either in the trapezoidal or S-curve profile with linear interpolation, if the option is activated. If this option is activated with several axes of the same control unit, such axes go synchronically with linear interpolation. The setting is valid for all work areas. If the function is not available with the selected control unit, it is grayed out.

Please note that an axis moves to a new target position or a distance either with dual position-control loop or with linear interpolation or without both (standard positioning). If an option is activated, the other option is automatically deactivated. If none of the both is selected, the standard positioning is activated.

Function in Ribbon (Home) - activate (checked) or deactivate function in the Ribbon (Home tab).

You can start or stop the movement of selected axes in the Home tab. You can confirm the axis selection here (automatic selection).

Velocity mode - start velocity mode.

A click displays the **Select speed for positioning** dialog box. The physical units for velocity and speed output data are identical. Here you can change the target velocity and start the velocity mode (**Set & start** button).

Calibrate - start reference run (calibration).

The type of reference run is predefined (see **Axis parameters** dialog box, type of reference run).

Switches state - display limit switch state (pop-up menu).

MINSTP - limit switch MINSTP is active (checked).

MINDEC - limit switch MINDEC is active (checked).

MAXDEC - limit switch MAXDEC is active (checked).

MAXSTP - limit switch MAXSTP is active (checked).

S-MIN - software limit for negative direction is active (checked).

S-MAX - software limit for positive direction is active (checked).

Initialize / Release switch - initialize axis, after that release active limit switches.

Stop - stop positioning.

Axis parameters - display and change axis parameters.

A click displays the **Define axis parameters for the control unit** dialog box. The according axis is selected. Here you can change and set the parameters individually or in groups (see **Axis parameters** dialog box).

Position, functions of the pop-up menu

Home position - display value of home position.

The physical units for home position and position output data are identical.

Stage range - display possible travel distance.

The physical units for travel and position output data are identical. The travel measurement (available travel) can be executed (Ribbon, Home tab). Alternatively, one can take over this value from the OWIS® database (standard travel).

Digits - select number of decimal places (pop-up menu).

These values define position output data format, which is used for each value output (double values). The current setting is checked.

Change position - display and select actual position of the axis counter.

A click displays the **Change value** dialog box. The physical units for axis position and position output data are identical. Here you can change the position value (**OK** button).

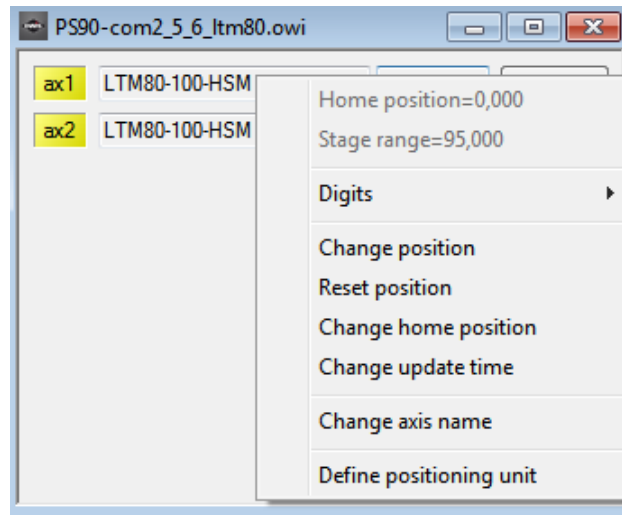
Reset position - set position counter of the axis to zero.

Change home position - change value of home position.

A click displays the **Change value** dialog box. The physical units for home position and position output data are identical. Here you can change the position value (**OK** button).

Change update time - display and select update time.

The position value and axis state are updated continuously (update time, default=73 ms), and independently of the other program sections. The update can be disabled (value=0). A click displays the **Change value** dialog box. Here you can change the time value (**OK** button).



Change axis name - change axis name.

The axis name has to be composed of alphanumeric characters and may consist of 4 characters maximum ("ax1", "ax2", "ax50", etc.). A click displays the **Change name** dialog box. Here you can change the axis name (**OK** button).

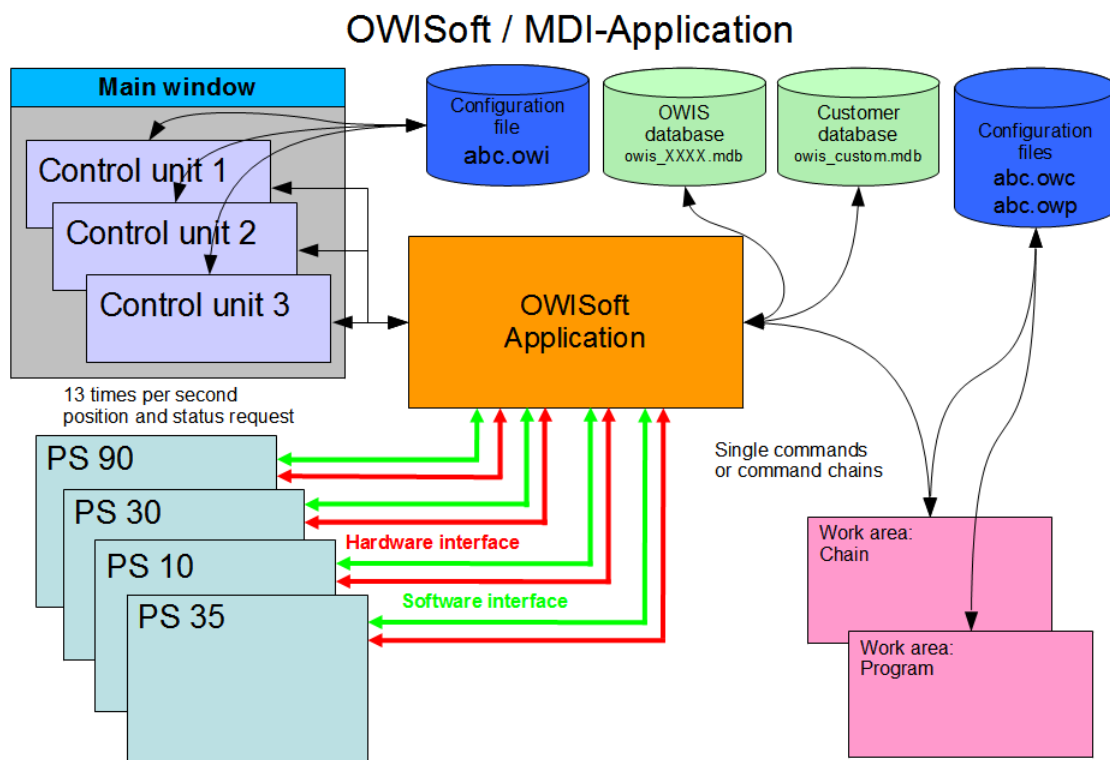
Define positioning unit - define positioning unit.

A click displays the **Define positioning unit** dialog box. The according axis is selected.

Combo box **Unit** - select measuring unit.

These values define position and speed output data format, which is used for each value output (see **Define positioning unit** dialog box).

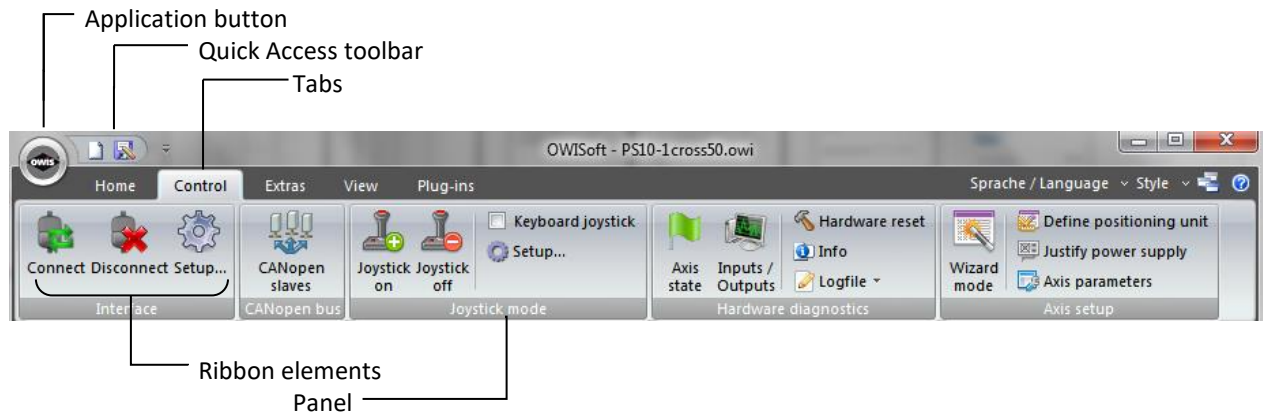
The position value and axis state are updated continuously (several times per second, adjustable), and independently of the other program sections. **OWISoft** structure can be schematically shown as follows:



If the view is being closed, the control unit connection and the interface will be closed as well. The application prompts you to save configuration file for a control unit with unsaved changes.

2 User interface

2.1 Ribbon



A ribbon is a user interface (UI) element that organizes commands into logical groups. These groups appear on separate tabs in a strip across the top of the window. The ribbon replaces the menu bar and toolbars. A ribbon can significantly improve application usability.

2.1.1 File Tab (Application Button)

New

Keys **Ctrl+N**.

Connects to a new control unit, creates a new configuration (setup wizard).

Open

Keys **Ctrl+O**.

Opens an existing configuration file, loads settings and connects to the control unit.

Save

Keys **Ctrl+S**.

Saves the settings of the active control unit.

Save as

Saves the settings of the active control unit with a new name.

Send

Opens a new e-mail and inserts a copy of the configuration file as an attachment.

Options

Changes program options.

Exit

Quits the application; prompts you to save configuration files.

2.1.2 Home Tab (8 panels)

Clipboard (1)

Paste

Keys **Ctrl+V**.

Removes the selection in a control element of the selected work area (Chain – Table, Program – Editor) and inserts a copy of the clipboard contents.

Cut

Keys **Ctrl+X**.

Removes the current selection in a control element of the selected work area (Chain – Table, Program – Editor) and puts it on the clipboard.

Copy

Keys **Ctrl+C**.

Copies the selection in a control element of the selected work area (Chain – Table, Program – Editor) into the clipboard.

Select All

Keys **Ctrl+A**.

Selects the whole content of the control element in the selected work area (Chain – Table, Program – Editor).

Edit (2)

Find

Keys **Ctrl+F**.

Finds the specified text in a control element of the selected work area (Chain – Table, Program – Editor).

Replace

Keys **Ctrl+H**.

Replaces specific text with different text in a control element of the selected work area (Chain – Table, Program – Editor).

Go to

Keys **Ctrl+G**.

Navigates to a specified line in a control element of the selected work area (Chain – Table, Program – Editor).

Stop axis (3)

Stop axis

Stops the movement of an axis, the calibration and the travel measurement.

Stop selection

Stops the movement of the axes (selection), the calibration and the travel measurement. The axes belong to the selected control unit (the active window).

Stop All

Stops the movement of all axes, breaks chain execution, program execution and execution of a script file.

Move relative (4)

Start axis

Starts an axis, the defined value is interpreted as travel distance.

Start selection

Starts the axes (selection), the defined values are interpreted as travel distances. The axes belong to the selected control unit (the active window).

Start All

Starts all axes, the defined values are interpreted as travel distances.

Move absolute (5)

Start axis

Starts an axis, the defined value is interpreted as target position.

Start selection

Starts the axes (selection), the defined values are interpreted as target positions. The axes belong to the selected control unit (the active window).

Start All

Starts all axes, the defined values are interpreted as target positions.

Move to home position (6)

Start axis

Starts an axis, the saved home position is interpreted as target position.

Start selection

Starts the axes (selection), the saved home positions are interpreted as target positions. The axes belong to the selected control unit (the active window).

Start All

Starts all axes, the saved home positions are interpreted as target positions.

Calibrate (7)

Start axis

Starts the calibration of an axis.

Start selection

Starts the calibration of the axes (selection). The axes belong to the selected control unit (the active window).

Start All

Starts the calibration of all axes.

Measure range (8)

Start axis

Starts the travel measurement of an axis.

Start selection

Starts the travel measurement of the axes (selection). The axes belong to the selected control unit (the active window).

Start All

Starts the travel measurement of all axes.

2.1.3 Control Tab (5 panels)

Interface (1)

Connect

Connects to the selected control unit (the active window).

Disconnect

Disconnects from the selected control unit (the active window).

Setup

Displays the **Interface Setup** dialog box for the selected control unit (the active window).

CANopen bus (2)

CANopen slaves

Displays the **Configuration of the CANopen bus** dialog box for the selected control unit (the active window). If this command is grayed the networking with a CANopen bus is not possible for the selected control unit.

Joystick mode (3)

Joystick on

Switches the joystick mode for the selected control unit (the active window) on.

Joystick off

Switches the joystick mode for the selected control unit (the active window) off.

Keyboard joystick

Activates or deactivates a simulation of the joystick mode for the selected control unit (the active window). If the option is not selected, the joystick mode is switched on. If the option is selected, a simulation of the joystick mode is switched on. The simulation uses the configuration of the joystick axes: assignment and velocity for joystick mode. During the joystick mode simulation the velocity mode is started. With the arrow keys (left, right) pressed the axis X is moved. With the arrow keys (up, down) pressed the axis Y is moved. When one of these keys is pressed the maximum joystick velocity is used. When the key is released the velocity value is reduced to zero (movement is finished). A joystick axis without assignment cannot be moved. The axis X is always active with PS 10. Therefore axis X belongs to master during the joystick simulation, axis Y – slave1.

Setup

Displays the **Joystick control** dialog box for the selected control unit (the active window).

Hardware diagnostics (4)

Axis state

Displays the **Axis state** dialog box for the selected control unit (the active window).

Inputs / Outputs

Displays the **Inputs and outputs** dialog box for the selected control unit (the active window).

Hardware reset

Resets the selected control unit (the active window) to initial state.

Info

Displays the **Info** dialog box for the selected control unit (the active window).

Logging (short protocol)

Activates the logging (short version) of the interface communication for the selected control unit (the active window).

Logging (long protocol)

Activates the logging (long version) of the interface communication for the selected control unit (the active window).

Disable logging

Deactivates the logging of the interface communication for the selected control unit (the active window).

Show communication

Shows interface communication for the selected control unit (the active window) in the output window (2 – direct commands).

Axis setup (5)

Wizard mode

Displays the **Axis configuration** dialog box for the selected control unit (the active window). An automatic axis configuration is possible here.

Define positioning unit

Displays the **Define positioning unit** dialog box for the selected control unit (the active window).

Justify power supply

Displays the **Justify power supply** dialog box for the selected control unit (the active window).

Axis parameters

Displays the **Define axis parameters for the control unit** dialog box for the selected control unit (the active window).

2.1.4 Extras Tab (3 panels)

Continuous-path control (1)

Start continuous-path control

Starts continuous-path control for the selected control unit (the active window).
Before you start a procedure, enter the range (start line / end line).

Stop continuous-path control

Stops execution of continuous-path control for the selected control unit (the active window).

Circular interpolation

Displays the **Calculate circular interpolation** dialog box for the selected control unit (the active window), in which you can create a configuration of the circular interpolation.

Setup

Displays the **Continuous-path control** dialog box for the selected control unit (the active window).

Trigger control (2)

Triggering on

Switches the triggering for the selected control unit (the active window) on.

Triggering off

Switches the triggering for the selected control unit (the active window) off.

Setup

Displays the **Trigger control** dialog box for the selected control unit (the active window).

Function keys (3)

Save configuration

Saves the configuration of function keys in REG format.

Load configuration

Loads a new configuration of function keys in REG format.

Fxx

Executes a function of the function key (macro, application, script file).

2.1.5 View Tab (3 panels)

Show/Hide (1)

Chain

Shows or hides the **Chain** work area.

Program

Shows or hides the **Program** work area.

Output

Shows or hides the **Output** window.

Properties

Shows or hides the **Properties** window.

Watch

Shows or hides the **Watch** window.

File view

Shows or hides the **File** view.

Status bar

Shows or hides the status bar.

Window (2)

Windows

Manages the currently opened windows.

New Window

Opens another window for the active control unit.

Layout (3)

Save window layout

Saves the custom configuration.

Apply window layout

Loads the custom configuration.

Save configuration

Saves the custom configuration in REG format.

Load configuration

Loads a new custom configuration in REG format.

Reset window layout

Reset program layout to the default settings.

2.1.6 Plug-ins Tab (x panels)

This place is reserved for future program extensions (plug-ins).

2.1.7 Options (Tab Bar)

Sprache / Language

Deutsch

Switches to German user interface.

English

Switches to English user interface.

Style

Office 2007 (Blue Style)

Chooses one of the visual style themes.

Office 2007 (Silver Style)

Chooses one of the visual style themes.

Office 2007 (Aqua Style)

Chooses one of the visual style themes.

Visual Studio 2008

Chooses one of the visual style themes.

Windows 7

Chooses one of the visual style themes.

Clone

Opens another OWISoft window.

OWISoft help

Shows the directory of available help subjects (index of topics).

You can also get help by clicking **F1**.

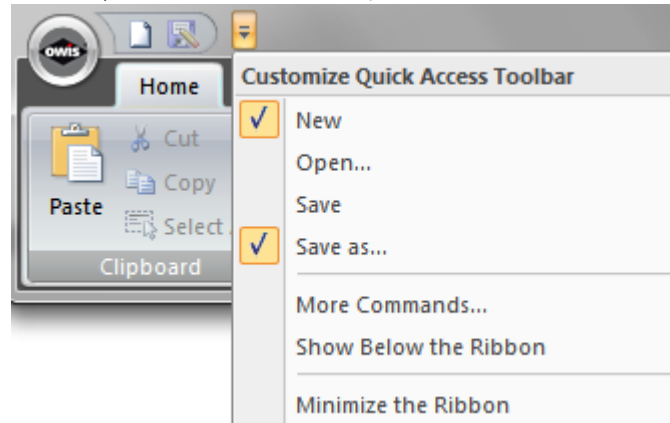
Shift+F1 opens context help.

2.1.8 Quick Access Toolbar

The Quick Access Toolbar is a customizable toolbar that contains a set of commands that are independent of the tab on the ribbon that is currently displayed. You can move the Quick Access Toolbar from one of the two possible locations, and you can add buttons that represent commands to the Quick Access Toolbar.

Add a command to the Quick Access Toolbar

1. On the ribbon, click the appropriate tab or group to display the command that you want to add to the Quick Access Toolbar.
2. Right-click the command, and then click **Add to Quick Access Toolbar** on the shortcut menu.



Add a command to the Quick Access Toolbar that is not on the ribbon

1. Click **Customize the Quick Access Toolbar > More Commands**.
2. In the **Choose commands from** list, click **Commands Not in the Ribbon**.
3. Find the command in the list, and then click **Add**.

Remove a command from the Quick Access Toolbar

- Right-click the command you want to remove from the Quick Access Toolbar, and then click **Remove from Quick Access Toolbar** on the shortcut menu.

Change the order of the commands on the Quick Access Toolbar

1. Right-click the Quick Access Toolbar, and then click **Customize the Quick Access Toolbar** on the shortcut menu.
2. Under **Customize Quick Access Toolbar**, click the command you want to move, and then click the **Move Up** or **Move Down** arrow.

Group the commands by adding a separator between the commands

You can group the commands by using the separator to make the Quick Access Toolbar appear to have sections.

1. Right-click the Quick Access Toolbar, and then click **Customize the Quick Access Toolbar** on the shortcut menu.
2. In the **Choose commands from** list, click **Popular Commands**.
3. Click **<Separator>**, and then click **Add**.
4. To place the separator where you want it, click the **Move Up** or **Move Down** arrow.

Move the Quick Access Toolbar

1. Click **Customize Quick Access Toolbar**.
2. In the list, click **Show Below the Ribbon** or **Show Above the Ribbon**.

Minimize or expand the ribbon

1. Click **Customize Quick Access Toolbar**.
2. In the list, click **Minimize the Ribbon**. Shortcut: Ctrl+F1.

Customize the Quick Access Toolbar by using the Options command

You can add, remove, and change the order of the commands on the Quick Access Toolbar by using the **Options** command.

1. Click the **File** tab.
2. Click **Options**.
3. Click the **Customize** tab.
4. Make the changes you want.

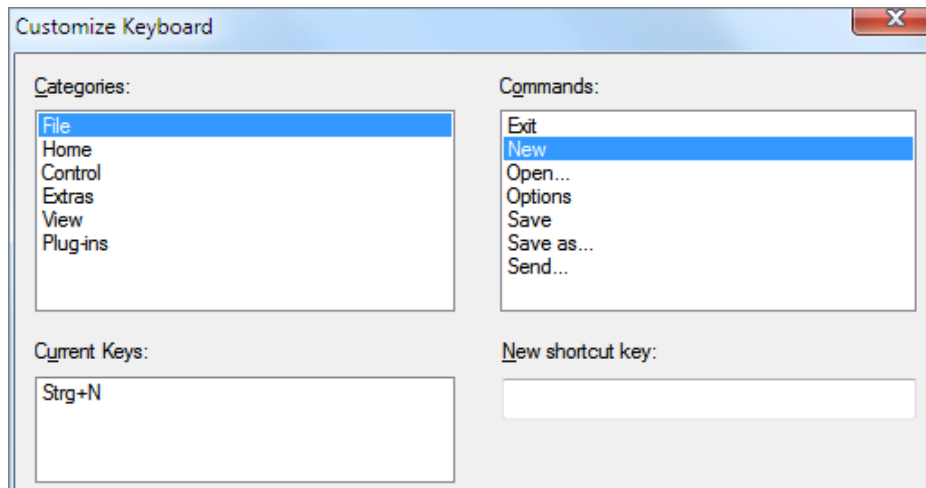
Reset the Quick Access Toolbar to the default settings

1. Right-click the Quick Access Toolbar, and then click **Customize the Quick Access Toolbar** on the shortcut menu.
2. In the **Customize the Quick Access Toolbar** window, click **Reset**.

Customize keyboard shortcuts

You can customize keyboard shortcuts (or shortcut keys) by assigning them to a command (menu in the Ribbon). You can also remove keyboard shortcuts.

1. Click the **File** tab.
2. Click **Options**.
3. Click the **Customize** tab.
4. Click the **Customize**.
5. Make the changes you want (**Customize Keyboard** dialog box).



1. In the **Categories** box, select the category that contains the command or other item that you want to assign a keyboard shortcut to or remove a keyboard shortcut from.
2. In the **Commands** box, select the name of the command or other item that you want to assign a keyboard shortcut to or remove a keyboard shortcut from. Any keyboard shortcuts that are currently assigned to that command or other item appear in the **Current Keys** box, or in the box with the label **Assigned to**.

Assign a keyboard shortcut

Begin keyboard shortcuts with CTRL or a function key.

1. In the **New shortcut key** box, press the combination of keys that you want to assign. For example, press CTRL plus the key that you want to use.
2. Look at **Current Keys** (or currently assigned to) to see whether the combination of keys is already assigned to a command or other item. If the combination is already assigned, type a different combination.
3. Select **Assign**.

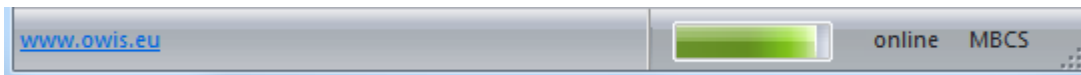
Remove a keyboard shortcut

1. In the **Current Keys** box, select the keyboard shortcut that you want to remove.
2. Select **Remove**.

Reset keyboard shortcuts

You restore the keyboard shortcut assignments to their original settings by selecting **Reset All**.

2.2 Status bar



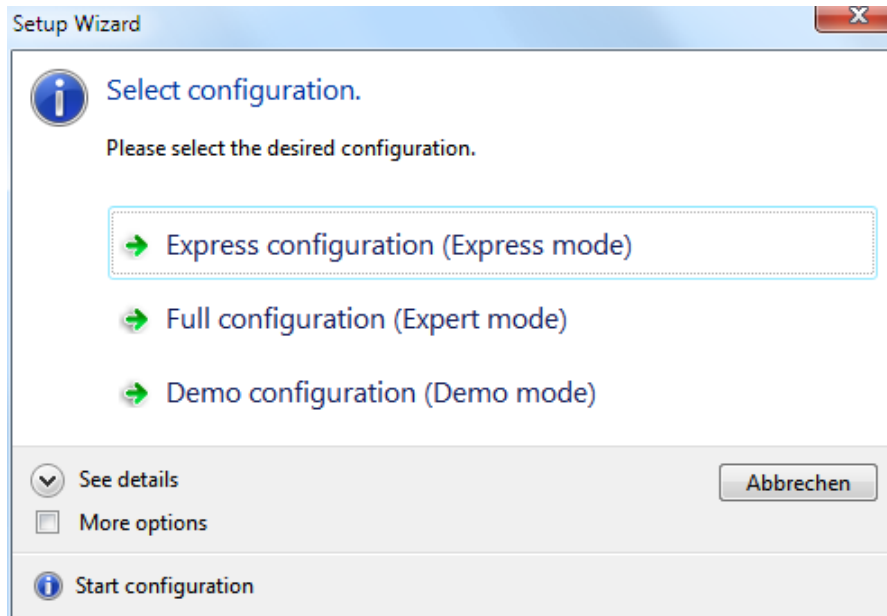
The status bar displays information at the bottom of the main program window about the current activity or mode. To display or hide the status bar, use the **Status bar** check box in the Ribbon (**View** tab).

Indicator	Description
Link	Visit OWIS® home page.
Progress	Data transfer is activated.
State	The selected control unit is connected (online) with OWISoft or disconnected.
Character set	The application is created with the specified character set (MBCS or Unicode).

3 Dialog boxes

3.1 Setup Wizard

Click the **New** menu (**File** tab in the Ribbon or Quick Access Toolbar) to start the setup wizard. The hardware configuration is created by using the integrated hardware configuration wizard automatically in only 3 steps.



Step 1 (select configuration)

Select the desired configuration:

Express configuration (Express mode),

Full configuration (Expert mode),

Demo configuration (Demo mode).

More options

Activate the configuration with serial number. It can only be used for defined hardware.

Step 2 (select interface)

The Express Mode detects connected control unit and the required axes are configured automatically (with OWISid). In the Expert Mode, the interface to control unit is selected, the axis configuration is load and saved from text file or in the dialog box (with or without OWISid). The demo configuration is used for product demonstration (without hardware).

Debug mode

Activate debug mode for communication.

Step 3 (define axes, change axis configuration)

Select the desired number of axes. Select the desired configuration:

full axis configuration - identify positioning unit, set axis parameters;

limited axis configuration - identify positioning unit, read axis parameters;

demo configuration (3 axes).

More options

If the axes cannot be configured automatically, the axis configuration is load and saved from text file or in the dialog box (without OWISid).

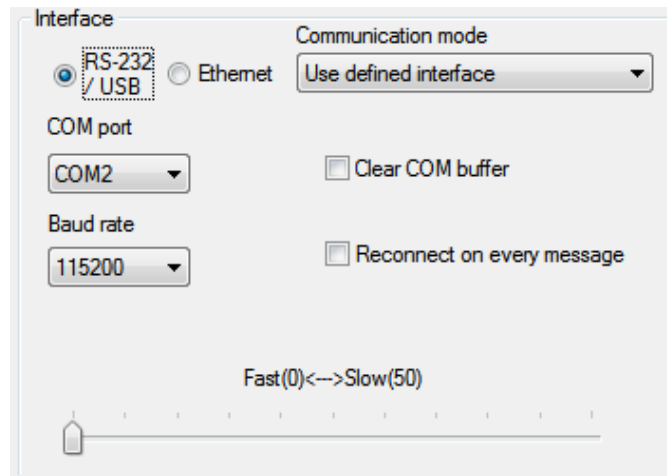
More options (Expert mode)

Define more axes (PS 10: CANopen bus). Confirm the selected axes.

3.2 Interface Setup

Click the **Control** tab (Ribbon), and then click **Setup** menu in the Interface panel to display the **Interface Setup** dialog box. Here an interface configuration will be defined (serial, USB or Ethernet interface/Com-Server). For the control unit PS 90 one can select an Ethernet interface (LAN port or Modbus/TCP).

Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).



Radio buttons **RS-232/USB, Ethernet** - select interface for communication.

Serial interface (communication via USB or serial port)

The application software can access this interface such as an USB interface (WinUSB driver, only for PS 90) or a conventional standard serial port (COM). The parameters for Baudrate, Parity, Databits and Stopbits are predefined (115200 or 9600, no parity, 8 databits, 1 stopbit). The software handshake character is CR.

Ethernet interface (communication via LAN port or Com-Server)

As Com-Server the OWIS® software tool "OWISerialServer.exe" may be used (..\OWISoft\OWIStools\OWISerialServer). The application software can access this interface via Windows TCP socket (LAN - port=8777, Com-Server - port=1200):

special communication for OWIS® software (command + delay),

common communication via LAN port (command).

The software handshake character is CR.

Ethernet interface (communication via Modbus/TCP Anybus-module, only for PS 90)

The application software can access this interface via Modbus/TCP socket (port=502).

Combo box **Communication mode** - select mode for communication.

4 modes are available:

Find control unit automatically (1),

Find control unit with serial number (2),

Use defined interface (3),

Show dialog box at startup (4).

RS-232/USB

Combo box **COM port** - select serial interface (COM1, COM2 etc.).

PS 90

Combo box **Baud rate** - define request mode for communication (115200).

256000 – fast read (all bytes, fast check);

57600 – fast read (all bytes, slow check);

all other values (115200,9600,19200,38400) - standard read (byte-by-byte).

PS 30, PS 35, PS 10

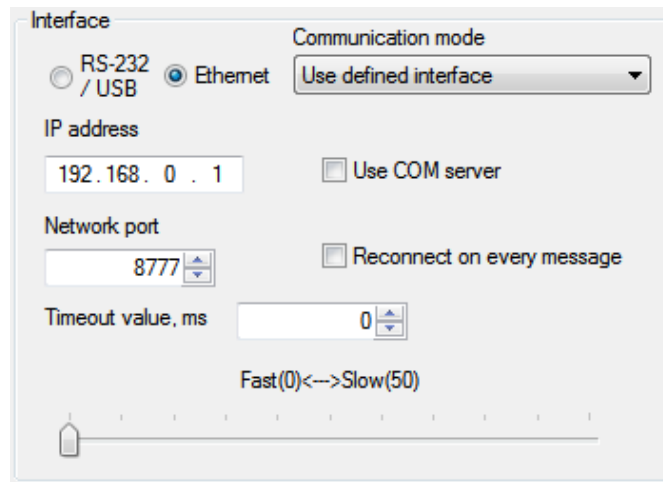
Combo box **Baud rate** - define request mode for communication (9600).

115200 – fast read (all bytes, fast check);

19200 – fast read (all bytes, slow check);

all other values (9600,38400,57600,256000) - standard read (byte-by-byte).

- Check box **...COM buffer** - clear COM buffer.
- Check box **Reconnect...** - reconnect for every message.
- In case of the communication's problem a delay value can be defined with a slider control (values between 0 and 50 ms).



Ethernet

- Text box **IP address** - define network address or local IP address.
- Text box **Port number** - define port number, default=8777, Com-Sever=1200, Modbus/TCP=502.
- Check box **...COM server** - special communication for OWIS software.
- Check box **Reconnect...** - reconnect for every message (Com-Server option).
- Text box with spin button **Timeout value** - system value or timeout value in ms for Modbus/TCP, default=0, Modbus/TCP=100.

LAN port or Com-Server

- 5 – reconnect for every message (option 1);
- 6 – special communication for OWIS software (option 2);
- 7 – activate both options (options 1 and 2);
- all other values (0) – deactivate both options (options 1 and 2).

Modbus/TCP

- 5 – activate reconnect for every message (timeout=100 ms);
- all other values – deactivate reconnect, timeout value.
- In case of the communication's problem a delay value can be defined with a slider control (values between 0 and 50 ms).

! Note: One can configure the Ethernet interface (LAN port or Modbus/TCP) with the following tools: "Anybus IPconfig" (..\OWISoft\Application\system) and "PS90 IPconfig" (..\OWISoft\ OWISools). "Anybus IPconfig" configures the TCP/IP network settings of an Anybus module (Modbus/TCP). This utility has the ability to scan the Ethernet network for connected Anybus products (a control unit with Anybus module). Please note: the settings are lost after a reboot of the control unit. "PS90 IPconfig" configures the TCP/IP network settings of the LAN port or an Anybus module (Modbus/TCP). This utility needs a USB connection for the configuration. Please note: the settings are saved and available after a reboot of the control unit.

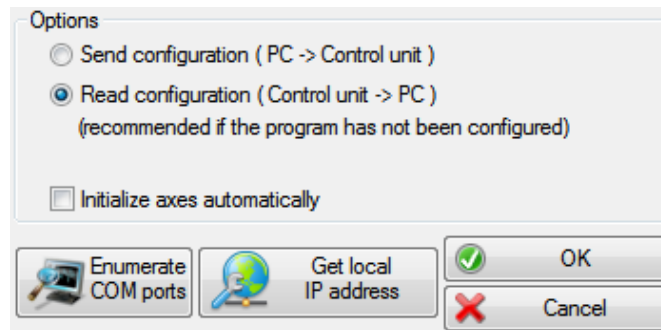
If the control unit is switched on and attached to a PC, you can test the selected interface configuration (**OK** button). With the communication mode 1,2 (find automatically, find serial number) one can search for the control unit without parameter entry.

Serial interface (communication via USB or serial port)

- First found control unit is connected (1),
- control unit with specified serial number is connected (2).

Ethernet interface (communication via LAN port or Com-Server)

Control unit is connected via LAN port and port number 8777 (1), control unit is connected to the Com-Server (local application) by the first found local IP address and port number 1200 (2).



With the Enumerate COM ports button the content of the COM port combo box is updated. With the Get local IP address button the first found local IP address is loaded.

! Note: Before initial operation, please make sure that the interfaces are available and the drivers are installed.

In the Options group box you can define whether the control settings are to be sent to a control unit or read from a control unit when loading the configuration file, and whether the defined axes are initialized automatically during this, and whether the defined axes are switched-off automatically when closing the configuration file.

Using the **Cancel** button you can close the dialog box without changing the configuration.

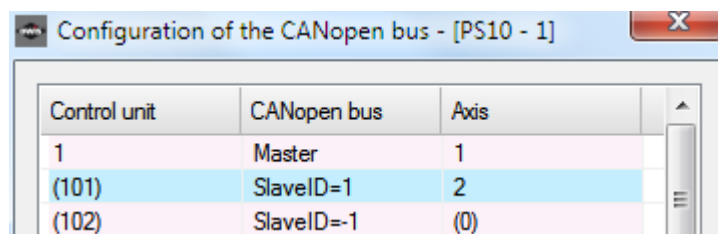
3.3 Configuration of the CANopen bus

This dialog box displays the configuration of the CANopen bus for the selected control unit (the active window). Only for PS 10.

Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).

The application can be used with PS10 as well as with PS10-32. This is valid for single PS10(PS10-32) control unit (master) or for several PS10-32 units which are networked with a CANopen bus (master + slaves).

The first PS10-32 is connected to a PC via USB (master), and all other units can be linked among each other via CANopen bus (max. 31 slaves). The application provides up to 31 slave units. A communication is controlled by the master. Commands that are not intended for the master are sent on to the subsequent units. The reply of the slave control unit will be received by the master and returned via USB to a PC. The slave ID (parameter) should be set in the slave control unit for correct work of the CANopen bus.

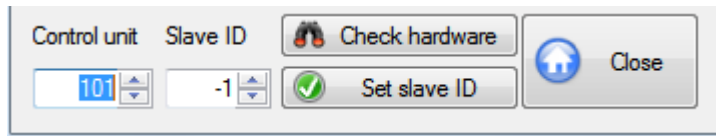


The image shows a dialog box titled "Configuration of the CANopen bus - [PS10 - 1]". It contains a table with three columns: "Control unit", "CANopen bus", and "Axis".

Control unit	CANopen bus	Axis
1	Master	1
(101)	SlaveID=1	2
(102)	SlaveID=-1	(0)

From several linked up PS10-32 the software makes a virtual control unit which has several axes and can access on the hardware of the single units. The axis assignment: axis1 belongs to master(1), axis2 – slave1(101), axis2 – slave2(102) etc.

The software needs an assigned bus address (slave ID) for every slave unit for the management. With the functions for single axes one can select it by the axis number or the control unit index. With the functions for the control unit (joystick, I/O) one can determine it by the control unit index.



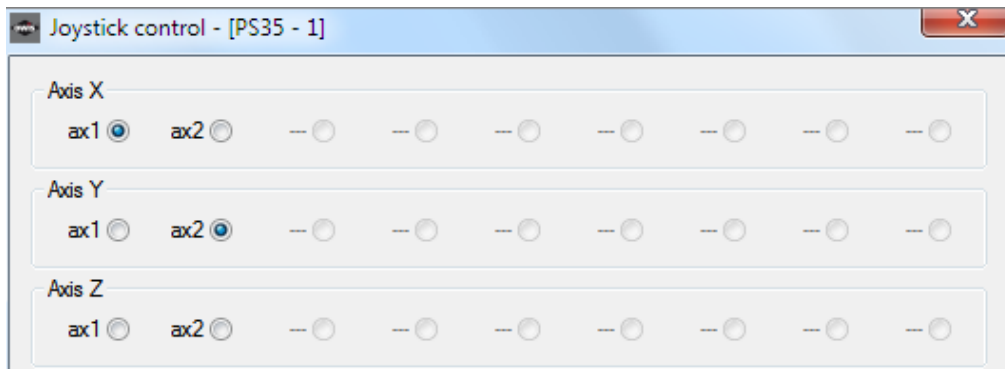
Text box with spin button **Control unit** - select control unit.
 Text box with spin button **Slave ID** - select slave ID.
 Every slave unit needs an own slave ID (0-99). If the value is -1, the slave unit is deactivated.

With the **Check hardware** button you can check the hardware configuration.
 With the **Set slave ID** button you can save the configuration.
 With the **Close** button you can close the dialog box any time.

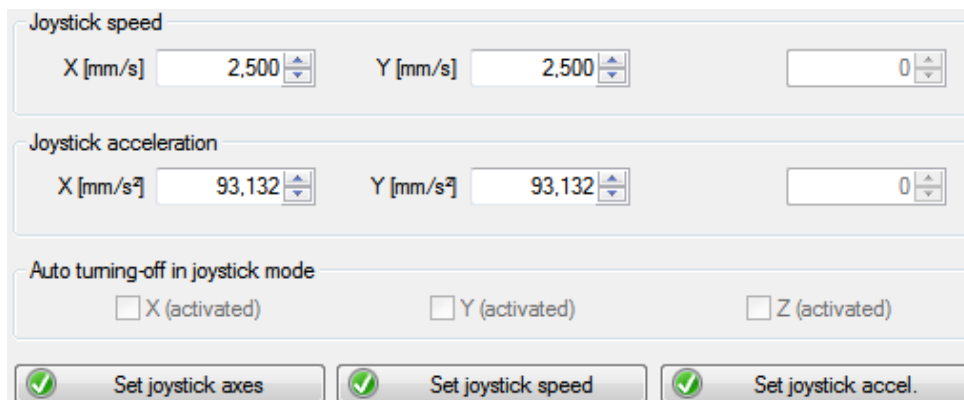
3.4 Joystick control

Using the **Joystick control** dialog box you can configure the joystick for the selected control unit (the active window), if this control unit can have a joystick. With PS 10 you can select whether a joystick configuration of the master or the slave unit is displayed.

Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).



Radio buttons **Axis X** - select joystick axis X.
 The axis X is always active with PS 10.
 Radio buttons **Axis Y** - select joystick axis Y (only for PS 90, PS 30, PS 35).
 Radio buttons **Axis Z** - select joystick axis Z (only for PS 90, PS 30, PS 35).
 The radio buttons for the axes, which were not activated, are grayed out and do not have any name. The labels for the activated axes contain the axes names (see **Setup Wizard** dialog box).
 Clicking the **Set joystick axes** button you confirm the axes configuration.



Text boxes with spin button **Joystick speed** - select maximum speed of an axis for the joystick mode.
 The text box for the axis, which was not activated, is grayed out and has no name. The activated axes already have their names (X, Y, Z) consisting of measuring unit entry. The measuring units are defined in the Define

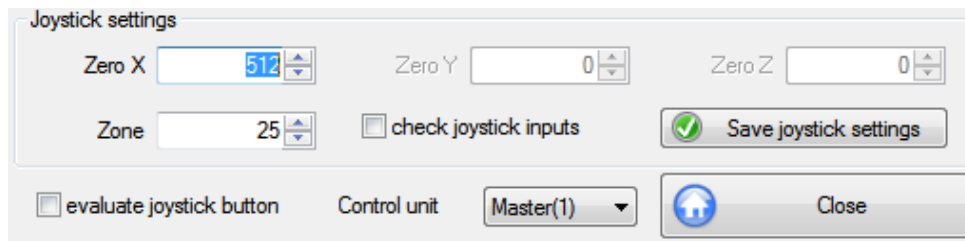
positioning unit dialog box. Using the **Set joystick speed** button, you can save the new speed value. The sign defines the positioning direction of the joystick. If you would like to know more about the joystick speed, please see the manual for the corresponding control unit.

Text boxes with spin button **Joystick acceleration** - select acceleration of an axis for the joystick mode (only for PS 90, PS 30, PS 35).

The text box for the axis, which was not activated, is grayed out and has no name. The activated axes already have their names (X, Y, Z) consisting of measuring unit entry. The measuring units are defined in the **Define positioning unit** dialog box. Using the **Set joystick accel** button, you can save the new acceleration value.

Check box **Auto turning-off...** - activate or deactivate auto turning-off in joystick mode (only for PS 90).

An axis with dc motor will be switched off in joystick mode, if the joystick is in zero point (no joystick excursion). The joystick mode restarts by tilting the joystick.



Text box with spin button **X-Null** - select zero point of the joystick axis X.

Text box with spin button **Y-Null** - select zero point of the joystick axis Y (only for PS 90, PS 30, PS 35).

Text box with spin button **Z-Null** - select zero point of the joystick axis Z (only for PS 90, PS 30, PS 35).

Text box with spin button **Zone** - select inactive zone of the joystick.

Check box **...joystick inputs** - check analog inputs (1,2,3).

This option is used for the adjustment of the joystick zero points. If it is activated, the current values of analog inputs are displayed in the controls.

Clicking the **Save joystick settings** button you confirm the settings.

Check box **...joystick button** - activate or deactivate an evaluation of the joystick button.

Combo box **Control unit** - select control unit (only for PS 10).

The axis assignment: axis1 belongs to master(1), axis2 – slave1(101), axis2 – slave2(102) etc. To work with the axes 2,3..., the software needs an assigned bus address (slave ID) for suitable slave unit (**Control** tab, CANopen bus).

Click on the **Close** button to close the dialog box anytime.

You cannot check whether a joystick is attached to the control unit or not. You can activate or deactivate the joystick mode using the **Control Joystick on** menu or the **Control Joystick off** menu. Herewith you may, for example, move to certain positions under optical control (for example, microscope). Such positions can be defined using the teach-in mode.

3.5 Axis state

In this dialog box the state information for an axis and its power amplifier are displayed for the selected control unit (the active window).

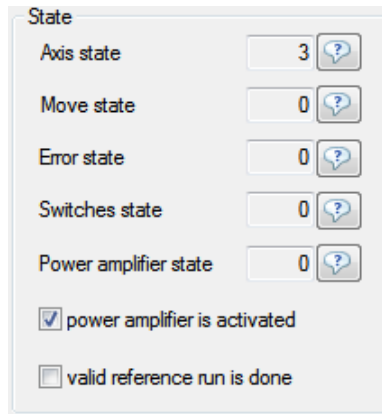
Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).

Text box with spin button **Axis** - select control unit axis.

The axis assignment for PS 10: axis1 belongs to master(1), axis2 – slave1(101), axis2 – slave2(102) etc. To work with the axes 2,3..., the software needs an assigned bus address (slave ID) for suitable slave unit (**Control** tab, CANopen bus). With the **Update** button the status information is updated.

State

- Text box **Axis state** - display axis state (as number).
Click the “?” button for more information. A dialog box appears with the state description.
- Text box **Move state** - display move state (as number).
Click the “?” button for more information. A dialog box appears with the state description.
- Text box **Error state** - display error state (as number).
Click the “?” button for more information. A dialog box appears with the state description.
- Text box **Switches state** - display limit switch state (as number).
Click the “?” button for more information. A dialog box appears with the state description.



The screenshot shows a dialog box titled "State" with the following elements:

- Axis state: Input field with value "3" and a "?" button.
- Move state: Input field with value "0" and a "?" button.
- Error state: Input field with value "0" and a "?" button.
- Switches state: Input field with value "0" and a "?" button.
- Power amplifier state: Input field with value "0" and a "?" button.
- power amplifier is activated: Checked checkbox.
- valid reference run is done: Unchecked checkbox.

Control unit PS 90, PS 10

- Text box **Power amplifier state** - display power amplifier state (as number).
Click the “?” button for more information. A dialog box appears with the state description.
- Check box **power amplifier...** - display power amplifier (enable) state.
- Check box **valid reference run...** - display validity of an axis reference run.

With the **Release** button the axis is released for the control.

With the **Unrelease** button the axis is excluded from the control (unreleased).

With the **Initialize** button the axis is initialized and switched on.

With the **Switch off** button the axis is switched off.

With the **Switch on** button the axis is switched on.

With the **Velocity mode** button you can start velocity mode of an axis.

A click displays the **Select speed for positioning** dialog box. The physical units for velocity and speed output data are identical. Here you can change the target velocity and start the velocity mode (**Set & start** button).

With the **Release switch** button you can release active limit switches of an axis.

With the **Stop** button you can immediately interrupt each positioning process.

With the **Export parameters** button you can read out the axis parameters and save them into a text file (OWD,TXT). With the **Import parameters** button you can load the axis parameters from a text file (OWD,TXT) and save them.

Control unit PS 90

With the **Save axis parameters to FLASH** button you can save axis parameters in the control unit backup memory. With the **Reload axis parameters from FLASH** button you can load axis parameters from the control unit backup memory.

Control unit PS 30, PS 35

With the **Save axis parameters to FRAM** button you can save axis parameters in the control unit backup memory. With the **Reload axis parameters from FRAM** button you can load axis parameters from the control unit backup memory.

Control unit PS 10

With the **Save axis parameters to EEPROM** button you can save axis parameters in the control unit backup memory.

Using the **Close** button you can close the dialog box any time.

3.6 Inputs and outputs

In this dialog box the state of the inputs and outputs are displayed for the selected control unit (the active window). With PS 10 you can select whether inputs and outputs of the master or the slave unit are displayed. Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).

The control unit PS 90 is equipped with 16 digital inputs, 16 digital outputs, 8 analog inputs, 8 analog outputs and 4 PWM outputs. The digital inputs (1...8) are TTL inputs. The digital inputs (9...16) are SPS inputs. The digital outputs (1...8) are TTL outputs. The digital outputs (9...16) are SPS outputs.

The control unit PS 30 is equipped with 8 digital inputs, 5 digital outputs, 8 analog inputs and 2 PWM outputs. The digital inputs (1...8) are TTL inputs. The digital outputs (1...5) are TTL outputs.

The control unit PS 35 is equipped with 8 digital inputs, 5 digital outputs, 8 analog inputs and 2 PWM outputs. The digital inputs (1...8) are TTL inputs. The digital outputs (1...5) are TTL outputs.

The control unit PS 10 is equipped with 4 digital inputs, 5 digital outputs, 4 analog inputs and 2 PWM outputs. The digital inputs (1...4) are TTL inputs. The digital outputs (1...4) are SPS outputs. The digital output (5) is a TTL output.

If the function (input or output) is not available or not released with the selected control unit, the corresponding control is grayed.

TTL inputs

Check boxes **1...8** - show state of the TTL inputs.

TTL/SPS inputs

Check boxes **1...8** - show state of the SPS inputs (only for PS 90).

The input level of the SPS inputs can be switch to TTL.

Control unit PS 90

Combo box **Input mode** - select level of the SPS inputs.

With it the current level of the SPS inputs is defined. The digital inputs (1...8) are TTL inputs. The digital inputs (9...16) are SPS inputs whose input level can be switch to TTL.

Control unit PS 10

Combo box **Output mode** - select output mode for the digital outputs.

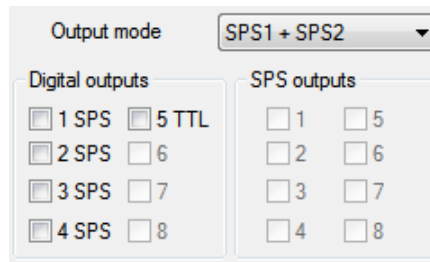
With it the output mode for the digital outputs 1 and 2 is defined. These outputs can work as digital SPS outputs or as PWM outputs alternatively.

TTL outputs

Check boxes **1...8** - show and change state of the TTL outputs (only for PS 90, PS 30, PS 35).

SPS outputs

Check boxes **1...8** - show and change state of the SPS outputs (only for PS 90).



Digital outputs

Check boxes **1...5**

- show and change state of the SPS/TTL outputs (only for PS 10).

Analog inputs

Text boxes

- show values of the analog inputs.

The analog inputs can measure voltage between 0 and 4.092V with the PS 90 directly and convert it with 10-bit resolution (0...1023). The analog inputs can measure voltage between 0 and 5V with the PS 30, PS 35 and the PS 10 directly and convert it with 10-bit resolution (0...1023).

Analog outputs

Text boxes with spin button **Channel 1...8**

- show and change values of the analog outputs (only for PS 90).

The analog outputs can generate voltage between 0 and 4.092V which are defined with 10-bit resolution (0...1023).

PWM outputs

Text boxes with spin button **Channel 1...4**

- show and change values of the PWM outputs (in percent).

Combo box **Control unit**

- select control unit (only for PS 10).

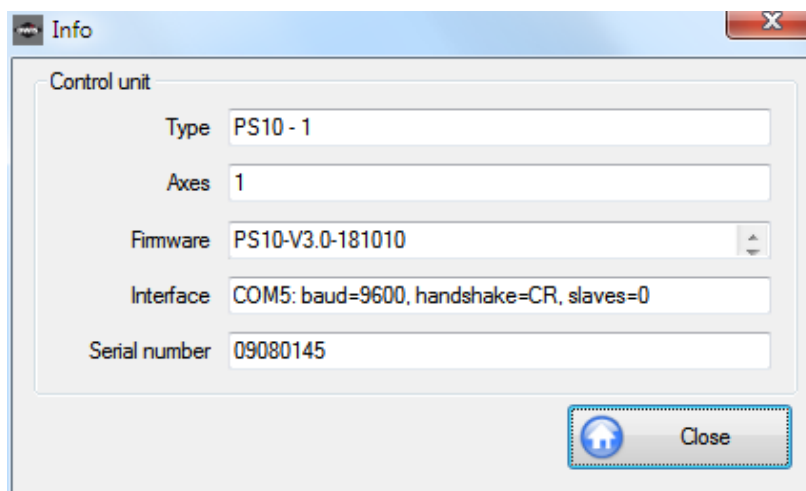
The axis assignment: axis1 belongs to master(1), axis2 – slave1(101), axis2 – slave2(102) etc. To work with the axes 2,3..., the software needs an assigned bus address (slave ID) for suitable slave unit (**Control** tab, CANopen bus).

Using the **Apply** button you can set values for the analog and PWM outputs.

Using the **Close** button you can close the dialog box any time.

3.7 Info

The **Info** dialog box displays the control unit type, the axes number, the version string and the interface configuration for the selected control unit (the active window).



Control unit type and index are displayed in the **Type** text box (see chapter 1.1, Software features).

Text box **Axes**

- display number of active control unit axes.

Text box **Firmware**

- display firmware version.

Text box **Interface** - display interface configuration.

The configuration is displayed as string. The individual parameters are separated through a comma. The first parameter is the interface type (RS-232, USB, TCP/Ethernet).

Text box **Serial number** - display serial number of the control unit.

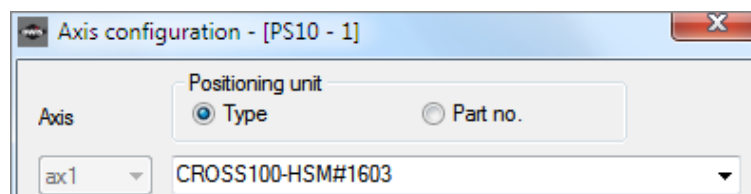
This data is specific for each control unit.

Click on the **Close** button to close the dialog box anytime.

3.8 Wizard for an axis configuration

In this dialog box an axis configuration is possible for the selected control unit (the active window). Every axis can be prepared for the work (configured) automatically.

Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).

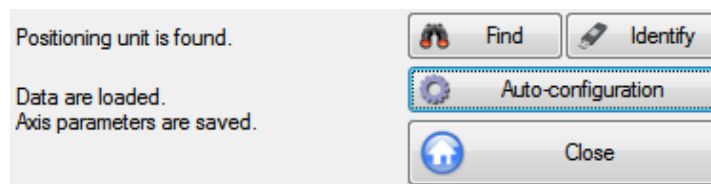


Combo box **Axis** - axis identifier is selected automatically.

The parameters are specially defined for each control unit axis. The selected axes (see chapter 3.1) are configured consecutively. If no axis is still defined, then you can confirm the selected axes manually (manual selection). This is valid only for the axes released in control unit.

Combo box **Positioning unit** - select positioning unit.

In order to simplify the setting you can select a suitable positioning unit from the defined OWIS® database. To the search the type name (pre-setting) or the article number (part no.) can be used. After the string input the positioning unit can be selected in the list element of the combo box. The searching process can be also started with the **Find** button or with the **Identify** button (OWISid). If the function is not available with the selected control unit or the corresponding hardware component was not found, the control is deactivated.



Button **Auto-configuration** - configure axis automatically.

After the selection the data saved in the OWIS® database are used for the axis configuration. When a profile with the same name (type name) is found in the customer database, then this profile will be used for the axis configuration. A customer-specific configuration is thus possible.

Using the **Close** button you can close the dialog box any time.

3.9 Define positioning unit

Define the positioning unit for the selected control unit (the active window) using this dialog box. Additionally, you can define an output format for position and speed values, which the application will be going to use for each value output, then.

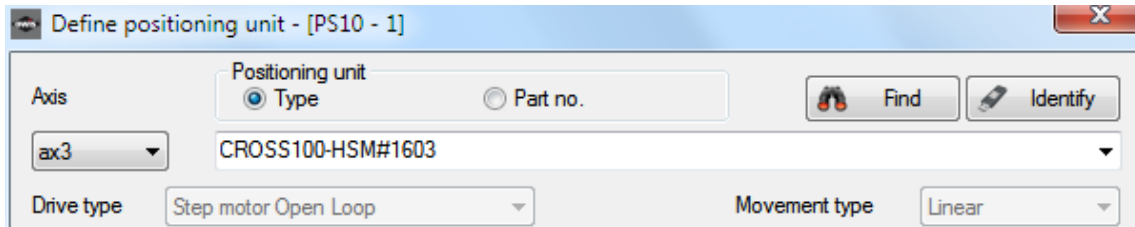
For positioning units you can use different measurement systems. First of all increments (Inc), secondly - depending on the drive system: mm, μm or degrees (deg), mrad. In the first case, the values required are sent directly to the appropriate control unit (each control unit works internally with increments only). In the second case, the values required are converted first into increments and sent then to the appropriate control unit. If

you intend to position in mm, e.g., please define at first the mechanical parameters of the stage (they are used for internal calculation) for the appropriate axis. For simplification, the mechanical data (spindle pitch, gear reduction, number of encoder lines and number of full steps) are stored in the OWIS® database. If your stage is equipped with a linear measuring system, you can define its optical resolution.

Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).

Combo box **Axis** - select axis identifier.

The parameters are specially defined for each control unit axis.



Combo box **Positioning unit** - select positioning unit.

In order to simplify the setting you can select a suitable positioning unit from the defined OWIS® database. To search the type name (pre-setting) or the article number (part no.) can be used. After the string input the positioning unit can be selected in the list element of the combo box. The searching process can be also started with the **Find** button. After the selection the data saved in the database can any time be changed by means of following controls, if required or necessary. With the **Apply** button you can save the configuration for the selected axis (only with **Type** option).

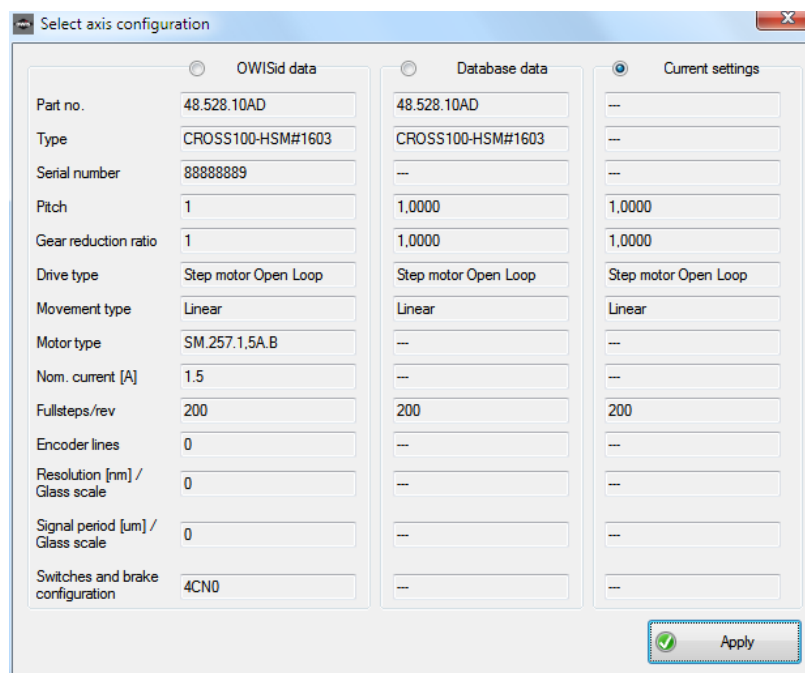
Button **Identify** - identify OWISid, display ID data.

If the function is not available with the selected control unit or the corresponding hardware component was not found, the control is deactivated.

In order to simplify the setting you can identify a positioning unit which is equipped with an OWISid (hardware). After the successful recognition a dialog box is displayed.

The following data are displayed: OWISid data, the corresponding configuration from the OWIS® database and current settings. The desired configuration is selected with radio buttons (OWISid – as data source; database – as data source; keep current settings). With the **Apply** button you can close the dialog box.

The selected data can any time be changed by means of following controls, if required or necessary. With the **Apply** button you can save the configuration for the selected axis (only with **Type** option).



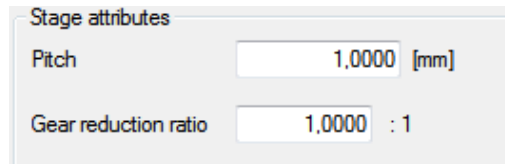
Combo box **Drive type** - select type of drive.

Here one determines whether the axis is controlled in the Closed-Loop mode (DC-Brush, BLDC, Stepper-Closed-Loop) or in the Open-Loop mode. For the control unit PS 30 or PS 35 only two types are possible: DC-Brush and Stepper-Open-Loop. For the control unit PS 10 only two types are possible: DC-Brush and Stepper-Open-Loop. The drive type is defined by OWIS GmbH. It is adjusted for an according hardware configuration.

Combo box **Movement type** - select type of movement.

For the positioning unit assumed from the database the drive type and the movement type are predefined. One cannot change them. The controls are grayed out.

The **Stage attributes** section defines mechanical parameters.



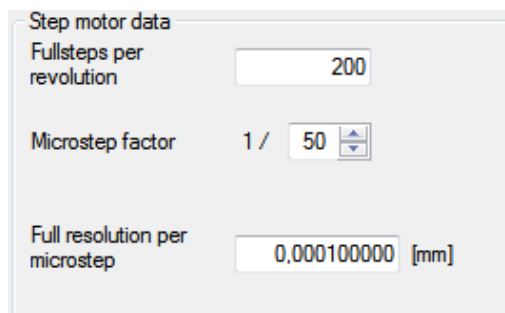
Text box **Pitch** - select spindle pitch.

In the OWIS® database the values for the pitch are stored in m (for linear measuring stages) or in degrees (for rotary measuring stages). If these values are loaded, they are converted according to the definition of the measuring unit for the output (default: mm – for linear stages, deg – for rotary stages).

Text box **Gear reduction ratio** - select gear reduction.

The data are mechanical parameters and valid for all control unit types.

The **Step motor data** section defines parameters of the step motors.



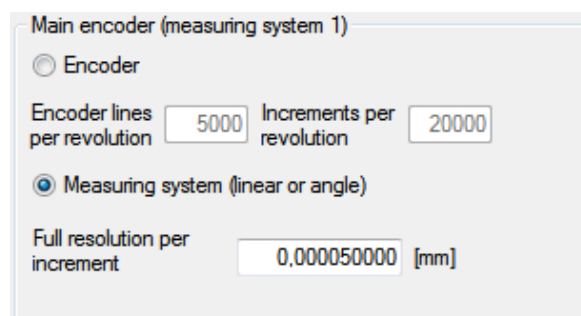
Text box **Fullsteps per revolution** - select number of fullsteps per revolution.

Text box **Microstep factor** - select number of microsteps per fullstep.

Text box **Full resolution...** - display calculated resolution per microstep.

These data are drive-specific and apply only to control unit types, which can control step motors. The physical units for resolution and position output data are identical.

The **Main encoder** section defines the first measuring system used. This measuring system is available for the axes in the Closed-Loop mode. Only one measuring system can be activated: **Encoder** and **Measuring system (linear or angle)** radio buttons. The appropriate controls are activated and the others are deactivated.



Text box **Encoder lines...** - select number of encoder lines.

Text box **Increments per revolution** - display number of increments per revolution.
 Text box **Full resolution...** - display calculated resolution per increment.

These data describe the selected measuring system. If a measuring system is not applicable with the selected control unit, the corresponding radio button is grayed out. The physical units for resolution and position output data are identical.

The **Dual encoder** section defines the second measuring system used. This is optional equipment, and can be used with all axes for dual position-control loop (PS 90, PS 30). Only one measuring system can be activated: **Measuring system (linear or angle)** and **Encoder** radio buttons. The appropriate controls are activated and the others are deactivated. One can take over the parameters for dual position-control loop from the OWIS® database (e.g., "LIMES124N-80-HiSM-IMS").

Text box **Encoder lines...** - select number of encoder lines per revolution.
 Text box **Increments per revolution** - display number of increments per revolution.
 Text box **Full resolution...** - display calculated resolution per increment.

These data describe the selected measuring system. If a measuring system is not applicable with the selected control unit, the corresponding radio button is grayed out. The physical units for resolution and position output data are identical.

Combo box **Unit** - select measuring unit.
 Text box with spin button **Digits** - select number of decimal places.

These values define position and speed output data format, which is used for each value output. The following measuring units (data type in brackets) are possible:

- Position - Inc (long integer), mm (double), μ m (double), deg (double), mrad (double);
- Speed - Hz (double), mm/s (double), μ m/s (double), deg/s (double), mrad/s (double).

The decimal places (0–9) determine the output format for the double precision values. The acceleration values are used the speed output data format. An exception is the setting "Hz". In this case the internal values are used as measuring unit.

Text box **Home position** - display value of home position.
 Text box **Stage range** - display possible travel distance.

The home position can be changed (view for the control unit, Position text box, pop-up menu). The travel range

is loaded from the OWIS® database or measured. A travel measurement (Ribbon, Home tab) is only possible with linear or rotary stages, which are equipped with limit switches at both ends or with a single switch (rotary stage). The measuring unit for home position and travel is identical to the one of the position outputs.

Use the **Apply** button in order to set the parameters for the selected axis (only with **Type** option). With the **Close** button you can close the dialog box any time.

Stage data / OWIS® database

Axis identifiers, all the parameters which are defined in the dialog box, and types of the corresponding positioning unit are stored in the special configuration file (OWI) for each control unit.

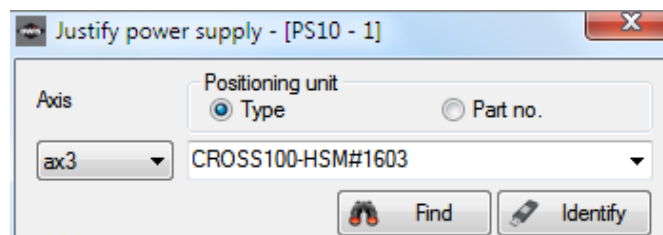
In the OWIS® database, only the mechanical data are supplied. The output format is not stored there. If you do not know which data apply to your positioning units, please select the units "Inc" for the position outputs and "Hz" for the speed outputs. In this case the remaining mechanical data, for example, pitch, will not be considered.

! Should you not find the type designation of your positioning unit in the **Positioning unit** combo box, because it concerns a customized product, we recommend to select a similar positioning unit as basic adjustment and to change the corresponding parameters manually afterwards.

3.10 Justify power supply

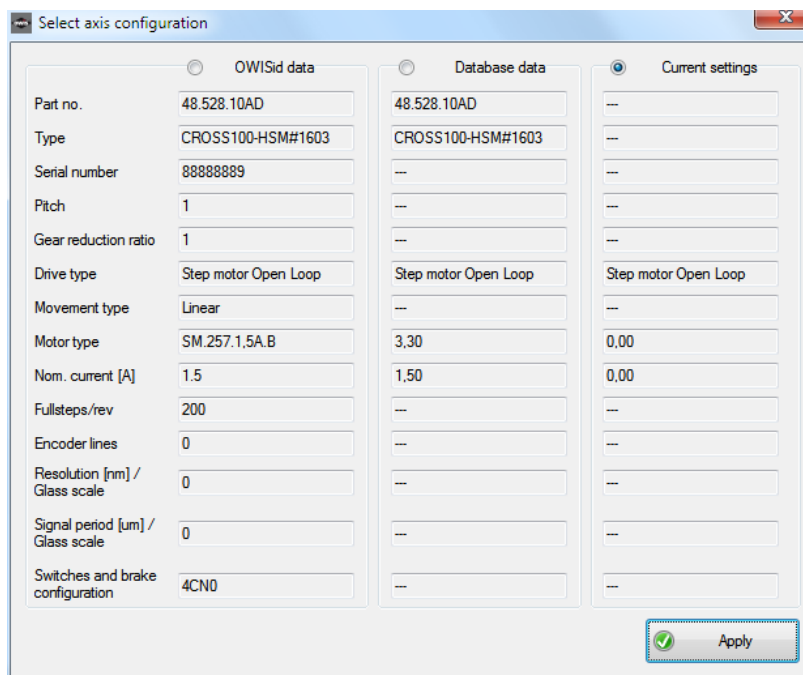
This dialog box displays the motor power supply for the selected control unit (the active window).

Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).



Combo box **Axis** - select axis identifier.

The power supply is specially defined for each control unit axis.



Combo box **Positioning unit** - select positioning unit.

In order to simplify the setting you can select a suitable positioning unit from the defined OWIS® database. To search the type name (pre-setting) or the article number (part no.) can be used. After the string input the positioning unit can be selected in the list element of the combo box. The searching process can be also started with the **Find** button. After the selection the data saved in the database can be changed by means of following controls any time, if required or necessary. If the selected control unit does not have this function, the corresponding control is grayed or faded out. With the **Set** button you can save the configuration for the selected axis.

Button **Identify** - identify OWISid, display ID data.

If the function is not available with the selected control unit or the corresponding hardware component was not found, the control is deactivated.

In order to simplify the setting you can identify a positioning unit which is equipped with an OWISid (hardware). After the successful recognition a dialog box is displayed.

The following data are displayed: OWISid data, the corresponding configuration from the OWIS® database and current settings. The desired configuration is selected with radio buttons (OWISid – as data source; database – as data source; keep current settings). With the **Apply** button you can close the dialog box.

The selected data can any time be changed by means of following controls, if required or necessary. With the **Set** button you can save the configuration for the selected axis.

Text box **Nom. voltage** - display value of the nominal voltage in mV.

Text box **Nom. current** - display value of the nominal current in mA.

Combo box **Current level** - select maximum current of a power amplifier.

This data is specific for each control unit.

Control unit PS 90

For step motor axes (Open Loop) it is a maximum adjustable current (low – 2.4A, high – 5.45A). For dc servo motor axes (DC-Brush) the maximum current limiting is defined (12A). For BLDC and step motor axes (Closed-Loop) the maximum current limiting is defined (3A).

Control units PS 30, PS 35

For step motor axes (Open Loop) it is a maximum adjustable current (low – 1.2A, high – 3.3A). For dc servo motor axes (DC-Brush) it is a maximum current limiting (low – 2.4A, high – 6.6A). The actual current limiting is defined in the hardware.

Control unit PS 10

For step motor axes (Open Loop) it is a maximum adjustable current (low – 1.2A, high – 3.3A). For dc servo motor axes (DC-Brush) it is a maximum current limiting (low – 2.4A, high – 6.6A).

Text box with spin button **Hold current** - select value for the hold current (in percent of maximum current).

These values are valid only for the step motor axes (Open Loop).

Text box with spin button **Drive current** - select value for the drive current (in percent of maximum current).

These values are valid for the step motor axes (Open Loop). With the control unit PS 10 a current limiting can be defined with this value for dc servo motor axes. With the control unit PS 90 a current limiting can be defined with this value for the axes in the Closed-Loop mode (DC-Brush, BLDC, Stepper-Closed-Loop).

Use the **Set** button in order to set the current values for the selected axis.

Use the **Motor...** button to switch the power supply on or off for the selected axis. This button operates like a check box. The button state and the heading indicate whether the motor is switched on or off. The appropriate axis is completely initialized and afterwards is switched on.

With the **Close** button you can close the dialog box any time.

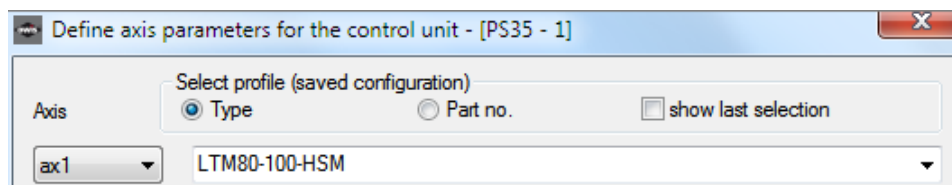
All selected parameters as well as all axis identifiers are saved in a separate configuration file (OWI) for each control unit.

3.11 Axis parameters

In this dialog box the specific axis parameters are displayed for the selected control unit (the active window), such as limit switch configurations, positioning speeds and acceleration values, as well as PID feedback control loop parameters or special parameters of the control unit. They will be read out from the control unit. Here you can change and save these parameters in the control unit.

The axis parameters are combined to a profile (configuration) and saved as such in the OWIS® database or in the customer database. In the dialog box you can update or delete existing profiles and create new ones. All changes are saved into the customer database (owis_custom.mdb).

Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).

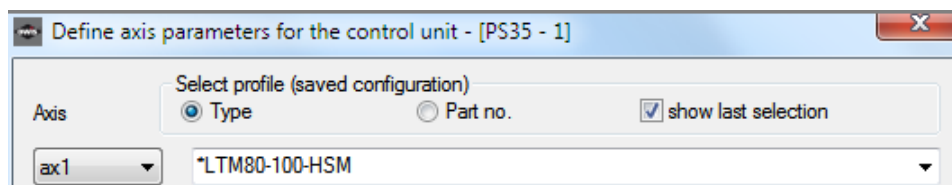


Combo box **Axis** - select axis identifier.

The parameters will be separately defined for each control unit axis. After the selection the parameters are indicated for the suitable axis (controls are updated).

Combo box **Select profile** - select profile.

In order to simplify the setting you can select a suitable profile (positioning unit) from the defined OWIS® database (or customer database). To the search the type name (pre-setting) or the article number (part no.) can be used. After the string input the positioning unit (profile) can be selected in the list element of the combo box. The list shows the profiles (*) from the customer database at the top. The searching process can be also started with the **Find** button. After the selection the data saved in the database can be changed by means of following controls any time, if required or necessary. The parameters are divided into six groups. On the tabs (Speed values, PID control loop, Limit switches, Auxiliary, Dual position-control loop, Linear interpolation) you can select the parameter group and change the settings. If the selected control unit does not have this function, the corresponding control is grayed out. With the **Set parameters** button you can save the changed parameters (background colour Green) for the selected axis. This is valid only for the selected tab.



Button **Identify** - identify OWISid, display ID data.

If the function is not available with the selected control unit or the corresponding hardware component was not found, the control is deactivated.

In order to simplify the setting you can identify a positioning unit which is equipped with an OWISid (hardware). After the successful recognition a dialog box is displayed.

The following data are displayed: OWISid data, the corresponding configuration from the OWIS® database and current settings. The desired configuration is selected with radio buttons (OWISid – as data source; database – as data source; keep current settings). With the **Apply** button you can close the dialog box.

The selected data can any time be changed by means of following controls, if required or necessary. With the **Set parameters** button you can save the changed parameters (background colour Green) for the selected axis. This is valid only for the selected tab.

	OWISid data	Database data	Current settings
Part no.	48.528.10AD	48.528.10AD	---
Type	CROSS100-HSM#1603	CROSS100-HSM#1603	---
Serial number	88888889	---	---
Pitch	1	---	---
Gear reduction ratio	1	---	---
Drive type	Step motor Open Loop	Step motor Open Loop	Step motor Open Loop
Movement type	Linear	---	---
Motor type	SM.257.1.5A.B	---	---
Nom. current [A]	1.5	---	---
Fullsteps/rev	200	---	---
Encoder lines	0	---	---
Resolution [nm]/ Glass scale	0	---	---
Signal period [um]/ Glass scale	0	---	---
Switches and brake configuration	4CND	---	---

In the following section (**Speed values** tab) the parameters for velocity and acceleration for the selected axis are indicated. They can be also changed. This data is specific for each control unit. If the function is not available with the selected control unit, the corresponding control is deactivated.

Positioning

Text box with spin button **Velocity** - display and select velocity.

The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. All parameters for velocity in the selected tab are read out once more and indicated (measuring unit “[xxx]”). A next double click (or profile selection) resets the indication of the velocity.

Text box with spin button **Acceleration** - display and select acceleration.

The physical units for acceleration and speed output data are identical (Hz – internal values).

Text box with spin button **Deceleration** - display and select deceleration (only for PS 90, PS 30, PS 35).

The physical units for deceleration and speed output data are identical (Hz – internal values).

Text box with spin button **Jerk** - display and select maximum jerk for S-curve profile (only for PS 90, PS 30, PS 35).

Reference run

Text box with spin button **Fast velocity** - display and select fast velocity for reference run (limit switch approach velocity).

Text box with spin button **Slow velocity** - display and select slow velocity for reference run (limit switch release velocity).

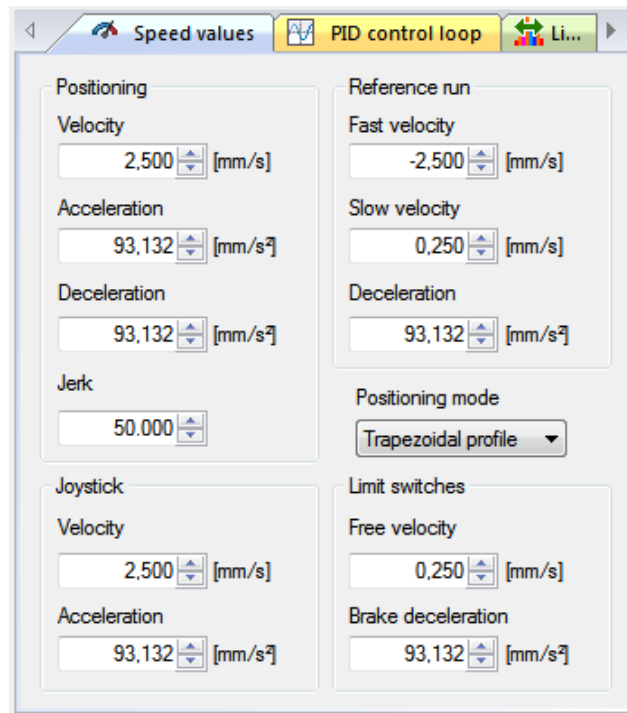
The sign defines the positioning direction. The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. All parameters for velocity in the selected tab are read out once more and indicated (measuring unit “[xxx]”). A next double click (or profile selection) resets the indication of the velocity.

Text box with spin button **Deceleration** - display and select deceleration for reference run.

The physical units for deceleration and speed output data are identical (Hz – internal values).



Note: A counterclockwise motor rotation at plan view to the second shaft end, or a slide motion of a linear measuring stage away from the motor is defined as positive direction.



Combo box **Positioning mode** - select positioning mode (only for PS 90, PS 30, PS 35).
The setting determines whether an axis goes in the trapezoidal or S-curve profile.

Joystick

Text box with spin button **Velocity** - display and select maximum velocity for joystick mode.
The sign defines the positioning direction. The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. All parameters for velocity in the selected tab are read out once more and indicated (measuring unit "[xxx]"). A next double click (or profile selection) resets the indication of the velocity.

Text box with spin button **Acceleration** - display and select acceleration for joystick mode
(only for PS 90, PS 30, PS 35).

The physical units for acceleration and speed output data are identical (Hz – internal values).

Limit switches

Text box with spin button **Free velocity** - display and select velocity for limit switch release.
The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. All parameters for velocity in the selected tab are read out once more and indicated (measuring unit "[xxx]"). A next double click (or profile selection) resets the indication of the velocity.

Text box with spin button **Brake deceleration** - display and select deceleration for brake switches
(only for PS 90, PS 30, PS 35).

The physical units for deceleration and speed output data are identical (Hz – internal values).

With the **Set parameters** button you save the changed parameters (background colour Green) for the selected axis. This is valid only for the selected tab.

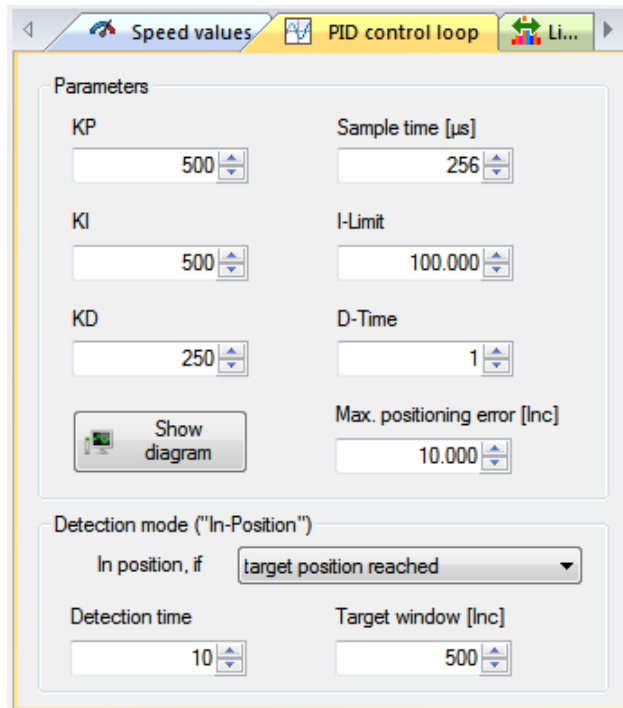
In the following section (**PID control loop** tab) the parameters of the PID control loop for the selected axis are indicated. They can be also changed. The PID control loop data are available in Closed-Loop mode. With the control unit PS 90 the PID power control can be defined for the step motor axes (Open-Loop). For other control units the corresponding controls are deactivated.

Parameters

Text box with spin button **KP** - display and select proportional term of PID control loop.

Text box with spin button **KI** - display and select integral term of PID control loop.

- Text box with spin button **KD** - display and select differential term of PID control loop.
- Text box with spin button **Sample time** - display and select sample time in microseconds.
- Text box with spin button **I-Limit** - display and select integral term limitation.
- Text box with spin button **D-Time** - display and select time of the D parameter in sample time cycles.
- Text box with spin button **Max. positioning error** - display and select maximum position error in increments.



PID power control (PS 90, Stepper-Open-Loop)

- Text box with spin button **KP** - display and select proportional term of power control loop.
- Text box with spin button **KI, fast drive** - display and select integral term of power control loop, fast drive.
- Text box with spin button **KI, slow drive** - display and select integral term of power control loop, slow drive.
- Text box with spin button **KD** - display and select differential term of power control loop.

Detection mode

Combo box **Detection mode** - select detection mode.

This setting determines when an axis positioning is finished.

Text box with spin button **Detection time** - display and select detection time of an axis for movement end (values in sample time cycles).

This setting determines when an axis positioning is finished.

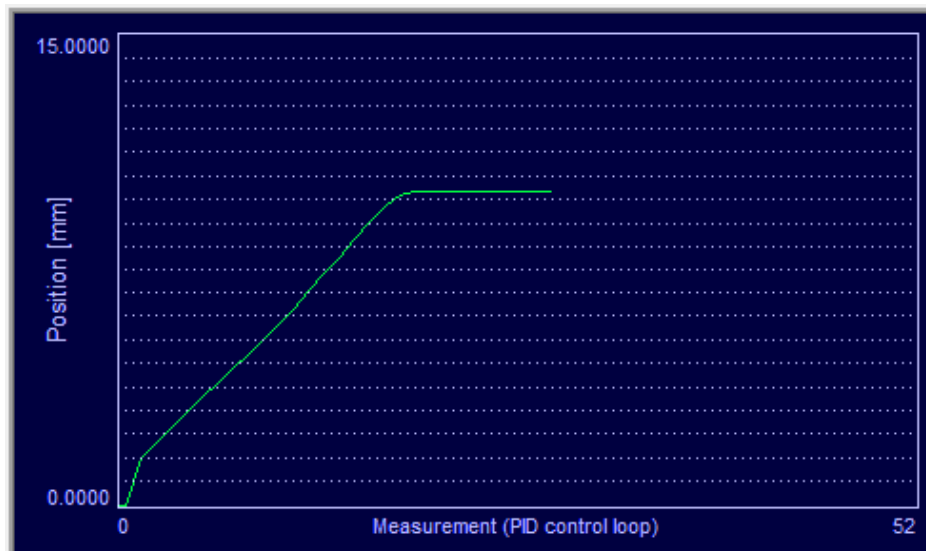
Text box with spin button **Target window** - display and select target window of an axis for movement end (values in encoder counts).

This setting determines when an axis positioning is finished.

These data refer to the control units PS 90, PS 30, PS 35 (Closed-Loop mode). For other control units, corresponding controls are deactivated.

With the **Set parameters** button you save the changed parameters (background colour Green) for the selected axis. This is valid only for the selected tab.

With the **Show diagram** button you can display diagram window. You can test the parameters of PID control loop by means of short-distance run. Please select a certain distance and start a test run. During the test run current position values and current position error are stored in a program list. The stored data are shown in the diagram window graphically. After the renewed short-distance run or reference run the stored data are cleared.



The X axis of the diagram is the measuring points (0 to N). If not all points of the measurement can be shown in the diagram, only last measured points are indicated (X to N). The number of the representable measuring points can be changed with the scale for the X axis (X scale). The Y axis of the diagram is the measured position values or the measured position error.

<input checked="" type="radio"/> Position [mm]	Maximum value	<input type="text" value="15,0000"/>	<input type="checkbox"/> show help lines
<input type="radio"/> Positioning error [Inc]	Minimum value	<input type="text" value="0,0000"/>	

Radio buttons **Position...** - select values for the Y axis.

The measuring unit of the position is the same as for the position output for the assigned axis. The values of the position error are displayed in increments.

Text box with spin button **Maximum value** - select maximum value of the Y axis.

With representation of the position error the scale of the Y axis can be changed with this value.

Text box with spin button **Minimum value** - select minimum value of the Y axis.

Check box **show help lines** - display and hide help lines of the diagram.

With representation of the position values these are two horizontal and one vertical line: start position, target position and the measuring point in which of the positioning was finished. After it the readjustment is active.

With representation of the position error this is one vertical line: the measuring point in which of the positioning was finished. After it the readjustment is active.

X scale			
<input type="radio"/> x 1	<input checked="" type="radio"/> x 2	<input type="radio"/> x 4	<input type="radio"/> x 8

Radio buttons **x 1, x 2, x 4, x 8** - select scale of the X axis.

With it the number of the representable measuring points is reduced or raised.

With the **Update** button you can display the diagram once more. After every change of the configuration this button should be clicked to update the representation.

With the **Export data** button the diagram data can be saved into a text file (..\data\pid_data_export.txt).

With the **Close** button you can close the dialog box any time.

In the following section (**Limit switches** tab) the limit switch configuration for the selected axis is indicated. It can be also changed. This data is specific for each control unit. If the function is not available with the selected control unit, the corresponding control is grayed or faded out. You find the complete description of the limit switch configuration in the operating instruction manual for the corresponding control unit. Here a short description of the limit switches:

MINSTP - hardware limit switch (Limit switch), motor-side;

MINDEC - software limit switch (Brake switch), motor-side;

MAXDEC - software limit switch (Brake switch), motor-opposite side;
 MAXSTP - hardware limit switch (Limit switch), motor-opposite side.

Limit switches

Check box **MINSTP** - activate or deactivate limit switch MINSTP.
 Check box **MINDEC** - activate or deactivate limit switch MINDEC.
 Check box **MAXDEC** - activate or deactivate limit switch MAXDEC.
 Check box **MAXSTP** - activate or deactivate limit switch MAXSTP.

Radio buttons **Low, High** - select polarity of corresponding limit switch (high active – NC contact to ground, low active – NO contact to ground).

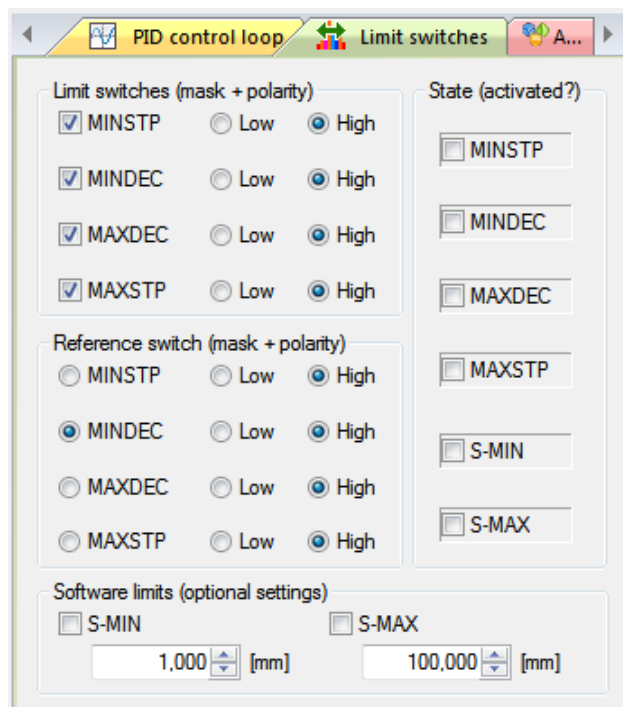
Reference switch (software definable)

Radio buttons **MINSTP...** - define reference switch.
 Radio buttons **Low, High** - select reference switch polarity (high active – NC contact to ground, low active – NO contact to ground).

Software limits (software definable)

Check box **S-MIN** - define software limit switch for negative direction (available / not available).
 Text box with spin button - display and select position for software limit switch.
 Check box **S-MAX** - define software limit switch for positive direction (available / not available).
 Text box with spin button - display and select position for software limit switch.

These limit switches are evaluated only after a valid reference run. The limit position monitoring behaves with the exceeding software limit like the suitable DEC switch (MINDEC, MAXDEC). If a software switch is activated, only the movement is stopped, the motor is still switched on.



To check the test run you can use the controls indicating the current limit switch state.
 Check box **MIN...** - display state of corresponding limit switch.
 Check box **MAX...** - display state of corresponding limit switch.
 Check box **S-MIN** - display state of the software limit for negative direction.
 Check box **S-MAX** - display state of the software limit for positive direction.

With the **Set parameters** button you save the limit switch configuration and the changed parameters (background colour Green) for the selected axis. Then the limit switch configuration and state are read out again and the controls are updated. This is valid only for the selected tab.

In the following section (**Auxiliary** tab) the additional parameters for the selected axis are indicated. They can be also changed. This data is specific for the control units. If the function is not available with the selected control unit or irrelevant for the defined motor type, the corresponding control is grayed out.

Power amplifier

Combo box **PWM frequency** - select PWM frequency of the power amplifier (in Hz).

Text box with spin button **Maximum output** - display and select maximum output value of servo loop in percent.

The maximum value of an axis which is given to the servo amplifier can be set with this setting. Max. valid value – 99%.

These values are valid only for the BLDC and step motor axes:

Text box with spin button **Phase init. Time** - display and select phases initialization time (in sample time cycles)

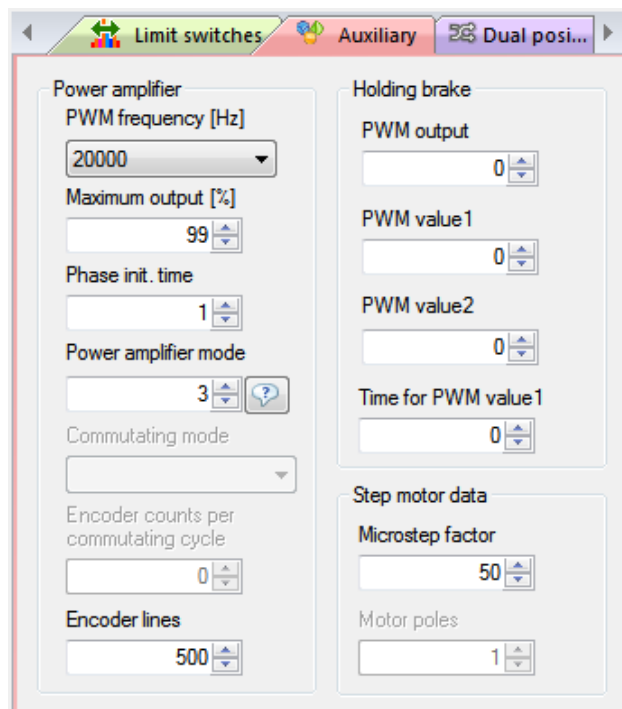
These values are valid only for the BLDC and step motor axes (Closed-Loop):

Text box with spin button **Phase init. amplitude** - display and select phases initialization amplitude (in percent).

Control unit PS 30, PS 35 (Stepper-Open-Loop)

Text box with spin button **Power amplifier mode** - display and select power amplifier mode (time constant for de-energizing as number).

The value “0” corresponds to 0% (slow), 1 - 15%, 2 - 48%, 3 - 100% (fast). You find a description of the configuration for the power amplifier mode in the manual for the corresponding control unit.



Control unit PS 10

Text box with spin button **Power amplifier mode** - display and select power amplifier mode (as bit pattern).

The bits 0,1 define time constant for de-energizing (Stepper-Open-Loop). The value “0” corresponds to 0% (slow), 1 - 15%, 2 - 48%, 3 - 100% (fast). You find a description of the configuration for the power amplifier mode in the manual for the corresponding control unit.

These values are valid only for the BLDC:

Combo box **Commutating mode** - select commutating mode.

These values are valid only for the BLDC and step motor axes (Closed-Loop):

Text box with spin button **Encoder counts...** - display and select encoder counts for commutating cycle.

Text box with spin button **Encoder lines** - display and select encoder lines.

Holding brake

These values are used only for a holding brake configuration:

Text box with spin button **PWM output** - display and select allocation of the holding brake.

This is a number of the assigned PWM output (0 - no allocation).

Text box with spin button **PWM value1** - display and select the first PWM value of the holding brake.

This value is used for attracting at a control of the holding brake.

Text box with spin button **PWM value2** - display and select the second PWM value of the holding brake.

This value is used for holding at a control of the holding brake.

Text box with spin button **Time for PWM value1** - display and select time for the first PWM value of the holding brake.

At a control of the holding brake this value determines, how long the brake is attracted.

Step motor data

These values are valid only for the step motor axes:

Text box with spin button **Microstep factor** - display and select microstep resolution (microsteps per full step).

Text box with spin button **Motor poles** - display and select motor poles.

With the **Set parameters** button you save the changed parameters (background colour Green) for the selected axis. This is valid only for the selected tab.

In the following section (**Dual position-control loop** tab) the additional parameters for dual position-control loop for the selected axis are indicated. They can be also changed. This data is specific for the control units PS 90, PS 30. If the function is not available with the selected control unit or irrelevant for the defined motor type, the corresponding control is grayed.

With the control unit PS 35 a special function is implemented here. The LCD display of the control unit can be configured (two factors for calculation and display mode).

Configuration

Check box **...dual position-control loop** - activate or deactivate dual position-control loop.

A dual position-control loop is possible only with a way measuring system which is connected to the second encoder input (Dual encoder). The axis goes to a new target position or a distance either in the trapezoidal or S-curve profile with dual position-control loop, if the hardware is available and the option is activated. The setting is valid for this dialog box and for all work areas.

Please note that an axis goes to a new target position or a distance either with dual position-control loop or with linear interpolation or without both (standard positioning). If an option is activated, the other option is automatically deactivated. If none of the both is selected, the standard positioning is activated. The settings are applied after being saved.

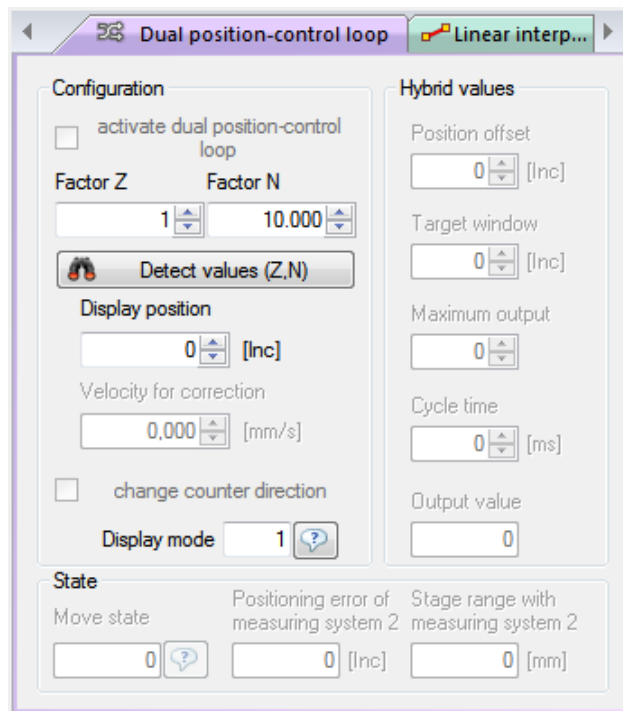
Text box with spin button **Factor Z** - display and select factor Z (numerator) of an axis with dual position-control loop.

A dual position-control loop is possible only with a way measuring system which is connected to the second encoder input (Dual encoder). This factor is used as a numerator for the conversion of the actor resolution in the resolution of the way measuring system for positioning with dual position-control loop.

Text box with spin button **Factor N** - display and select factor N (denominator) of an axis with dual position-control loop.

A dual position-control loop is possible only with a way measuring system which is connected to the second encoder input (Dual encoder). This factor is used as a denominator for the conversion of the actor resolution in the resolution of the way measuring system for positioning with dual position-control loop.

With the **Detect values (Z,N)** button the factors Z,N can be detected. They are dependent on the configuration of the positioning unit in the **Define positioning unit** dialog box (see chapter 3.9).



Control unit PS 35

Text box with spin button **Factor Z** - display and select factor Z (numerator) of an axis.

Text box with spin button **Factor N** - display and select factor N (denominator) of an axis.

This data is specific for the control unit. The factor Z is used as a numerator for the calculation of the resolution for LCD display. The factor N is used as a denominator for the calculation of the resolution for LCD display. The display counter (increments) is converted with the certain setting. For example, the configuration "Z=1, N=10000, Type=1" corresponds to the position output in mm with the resolution 0.0001 mm/Inc.

Text box with spin button **Display position** - show and select position of an axis in the display.

The values are in increments.

Text box **Display mode** - select display mode (as index) of an axis.

The following values are possible:

0 – position output in increments (no conversion),

1 – position output in mm,

2 – position output in μm ,

3 – position output in degrees (deg),

4 – position output in mrad.

With the **Detect values (Z,N)** button the factors Z,N and a display mode can be detected. They are dependent on the configuration of the positioning unit in the **Define positioning unit** dialog box (see chapter 3.9).

Text box with spin button **Target window** - display and select target window of an axis for movement end with dual position-control loop.

The values are in increments of a way measuring system.

Text box with spin button **Velocity...** - display and select velocity of an axis for correction with dual position-control loop.

The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. The parameter for velocity in the selected tab is read out once more and indicated (measuring unit "[xxx]"). A next double click (or profile selection) resets the indication of the velocity.

Check box **...counter direction** - change counter direction of a way measuring system of an axis (reversed or not reversed).

Text box **Positioning mode** - select positioning mode (as index) of an axis with dual position-control loop.

If you do not know the type, you can click the "?" button. A dialog box appears with descriptions of all types of the positioning mode. A dual position-control loop is possible only with a way measuring system which is connected to the second encoder input (Dual encoder). Please note that the dual position-control loop of an

axis remains active in the positioning mode 2,3,7,9, if the position is reached (phase 3 active). In this state only a further positioning with a dual position-control loop is possible. To use another positioning type (e.g., reference run), you can break the dual position-control loop with the **Stop** button or deactivate this option (standard positioning activated).

Control unit PS 90

Hybrid values

These values are valid only for the positioning with mode 6,7,8,9 (hybrid mode, phase 3):

Text box with spin button **Position offset** - display and select signed offset to target position of an axis with dual position-control loop.

The values are in increments of a way measuring system.

Text box with spin button **Target window** - display and select target window of an axis for finish of the hybrid positioning with dual position-control loop.

The values are in increments of a way measuring system.

Text box with spin button **Maximum output** - display and select maximum hybrid output value of an axis.

Text box with spin button **Cycle time** - display and select cycle time of the hybrid positioning of an axis with dual position-control loop.

Text box **Output value** - display current hybrid output value of an axis.

The hybrid component can be connected to an analog output. The analog outputs can generate voltage between 0 and 4.095V which are defined with 12-bit resolution (0...4095).

To check the test run you can use the following controls ("State").

Text box **Move state** - display move state of an axis with dual position-control loop.

Text box **Positioning error...** - display current positioning error of a way measuring system.

The values are in increments of a way measuring system.

Text box **Stage range...** - display stage range of an axis.

After the valid reference run with mode 6 or 7 it returns the ascertained stage range. The measuring unit of the stage range is the same as for the position output for the assigned axis.

With the **Set parameters** button you save the changed parameters (background colour Green) for the selected axis. This is valid only for the selected tab.

In the following section (**Linear interpolation** tab) the additional parameters for linear interpolation for the selected axis are indicated. They can be also changed. This data is specific for the control units PS 90, PS 30 and PS 35. If the function is not available with the selected control unit or irrelevant for the defined motor type, the corresponding control is grayed.

Configuration

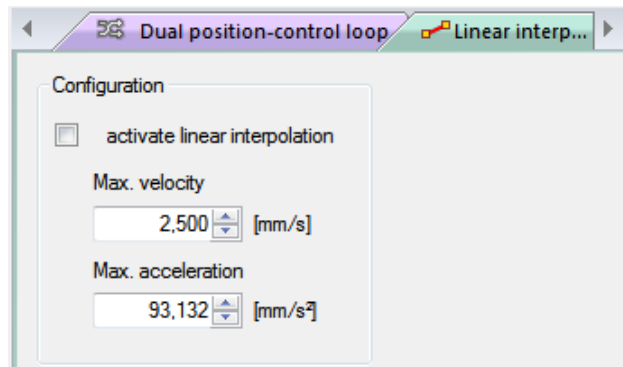
Check box **...linear interpolation** - activate or deactivate linear interpolation.

The axis goes to a new target position or a distance either in the trapezoidal or S-curve profile with linear interpolation, if the option is activated. If this option is activated with several axes of the same control unit, such axes go synchronically with linear interpolation. The setting is valid for this dialog box and for all work areas.

Please note that an axis goes to a new target position or a distance either with dual position-control loop or with linear interpolation or without both (standard positioning). If an option is activated, the other option is automatically deactivated. If none of the both is selected, the standard positioning is activated. The settings are applied after being saved.

Text box with spin button **Max. velocity** - display and select maximum velocity of an axis with linear interpolation.

The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. The parameter for velocity in the selected tab is read out once more and indicated (measuring unit "[xxx]"). A next double click (or profile selection) resets the indication of the velocity.



Text box with spin button **Max. acceleration** - display and select maximum acceleration of an axis with linear interpolation.

The physical units for acceleration and speed output data are identical (Hz – internal values).

With the **Set parameters** button you save the changed parameters (background colour Green) for the selected axis. This is valid only for the selected tab.

With the parameter transfer the suitable values are sent to the control unit. Then the axis parameters are read out again and the controls are updated. Only the values assumed by the control unit are showed here. You can find the allowed value ranges for the parameters in the operating instructions of the control units. If the application has no connection to the control unit, the null value is showed in the controls.

You can test the adjusted axis parameters by means of reference run or short-distance run. In order to do this you have to select the type of reference run or a certain distance. Afterwards, a reference or a test run can be executed.

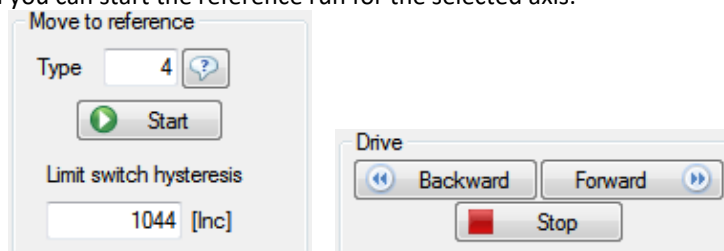
Text box **Type** - select type of reference run (as index).

If you do not know the type, you can click the “?” button. A dialog box appears with descriptions of all reference run types.

Text box **Limit switch hysteresis** - display limit switch hysteresis.

This data is specific for each control unit. If the function is not available for the selected control unit, the corresponding control is faded out.

With the **Start** button you can start the reference run for the selected axis.



A click on the **Show axis state** button displays the **Axis state** dialog box. The according axis is selected.

With the **Forward** button you can start the test run for the selected axis into positive direction.

With the **Backward** button you can start the test run for the selected axis into negative direction.

With the **Stop** button you can immediately interrupt each positioning process (reference run, test run).

With the **Close** button you can close the dialog box at any time.

To check the test run you can use the controls indicating the current limit switch state (**Limit switches** tab), and also the other check values.

Text box **Distance** - select distance for test run.

The measuring unit is the same as for the position output for the assigned axis.

Text box **Current position** - display current axis position.

The measuring unit is the same as for the position output for the assigned axis.

Text box **Positioning error** - display current positioning deviation for the selected axis.

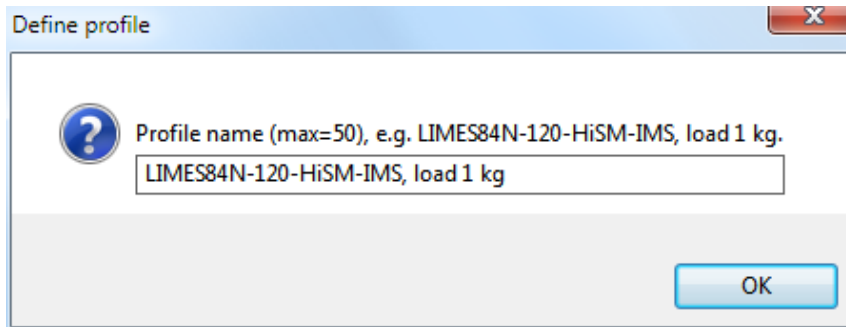
The positioning deviation is the difference between the actual position and the desired position.

Label **Time for readjustment**

- display time necessary for readjustment.

This data is specific for each control unit. If the function is not available with the selected control unit, the corresponding control is grayed or faded out. The adjustment will be displayed only for the hardware adjustment of the control unit.

Because of the complexity of the axis parameters you have the possibility to store these settings as a profile under a certain name, which may consist of up to 50 characters (**Create new profile** button). A dialog box appears, enter the profile name. With the **OK** button you can save the parameters into the customer database as a new profile; the dialog box will be closed.



! We recommend putting as much data in coded form as possible in the profile name in order to facilitate later use. Example: “LIMES84N-120-HiSM-IMS, load 1 kg” could designate a linear measuring stage LIMES84N with stepper motor and linear measuring system with 0.05 µm resolution, installed as y axis and with 1 kg load, e.g.

Notes:

- If a profile has to be updated, you have to select the appropriate profile name which must appear in the **Select profile** combo box. The parameters will be changed in the controls. Then they are sent to the control unit. One can store the parameters assumed by the control unit as the updated configuration into the customer database (**Update profile** button).
- If a profile has to be deleted, you have to select the appropriate profile name in the **Select profile** combo box (**Clear profile** button). Only the profiles from the customer database can be deleted.
- Nevertheless, a profile with empty name can be displayed in the combo box, and it can be invoked or deleted.

All selected parameters as well as all axis identifiers are saved in a separate configuration file (OWI) for each control unit.

3.12 Continuous-path control

This dialog box enables to define continuous-path control and to execute it for the selected control unit (the active window). Only for PS 90, PS 30, PS 35.

Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).

The control is axis-based and applies to the selected control unit.

Index	--1	--2	--3	--4	ax5	ax6	--7	--8	--9	Time	Function	Error	Release	Velocity	Accel.	^
0	0	0	0	0	-0,536	2,000	0	0	0	500	0	0	48	3,906	93,132	
1	0	0	0	0	-1,464	1,464	0	0	0	500	0	0	48	2,860	93,132	
2	0	0	0	0	-2,000	0,536	0	0	0	500	0	0	48	1,046	93,132	
3	0	0	0	0	-2,000	-0,536	0	0	0	500	0	0	48	1,046	93,132	

The data for continuous-path control are stored in the memory of the control unit, in a table. This data can be loaded into a table control element in the application. In the first row of the table (heading line) you find the axis identifiers for all defined axes. For a not defined axis the axis number stands here (e.g., “– 2”). In the first column of the table you find the coordinate set numbers (as index), from 0 to 1999 or 3999.

PS 90

The table exists of 4000 rows. Every row exists of 15 elements:

1,2,3,4,5,6,7,8,9 – distance with sign for the corresponding axis (32 bit);

Time - time interval in ms (1.024 x N, N=20-65535);

Function - function code (16 bits – bit pattern);

Error - error byte (9 bits – bit pattern),

bit 0 - axis 1,

bit 1 - axis 2,

bit 2 - axis 3,

bit 3 - axis 4,

bit 4 - axis 5,

bit 5 - axis 6,

bit 6 - axis 7,

bit 7 - axis 8,

bit 8 - axis 9;

Release - release byte (9 bits – bit pattern),

bit 0 - axis 1,

bit 1 - axis 2,

bit 2 - axis 3,

bit 3 - axis 4,

bit 4 - axis 5,

bit 5 - axis 6,

bit 6 - axis 7,

bit 7 - axis 8,

bit 8 - axis 9;

Velocity - after the table check calculated speed (internal values);

Accel. - after the table check calculated acceleration (internal values).

PS 30, PS 35

The table exists of 2000 rows. Every row exists of 14 elements:

1,2,3,4,5,6,7,8 – distance with sign for the corresponding axis (-32760...+32760 increments);

Time - time interval in ms (1.024 x N, N=20-1638);

Function - function code (16 bits – bit pattern);

Error - error byte (8 bits – bit pattern),

bit 0 - axis 1,

bit 1 - axis 2,

bit 2 - axis 3;

Release - release byte (8 bits – bit pattern),

bit 0 - axis 1,

bit 1 - axis 2,

bit 2 - axis 3;

Velocity - after the table check calculated speed (internal values);

Accel. - after the table check calculated acceleration (internal values).

Function code

With a function code the velocity mode for continuous-path control can be defined and the current state of three digital outputs can be changed.

Bits 0-14 – control of digital outputs:

bits 0...3 – output number 1 (0 – deactivated);

bit 4 - output state (0,1 – low,high);

bits 5...8 – output number 2 (0 – deactivated);

bit 9 - output state (0,1 – low,high);

bits 10...13 – output number 3 (0 – deactivated);

bit 14 - output state (0,1 – low,high).

Bit 15 – velocity mode for continuous-path control:

0 – moving with constant velocity;

1 – moving with constant acceleration.

Several functions for editing and navigating in the table are available. There are two operating modes: Read mode and Input mode. In the Read mode you can edit the whole table, in the Input mode only the selected table cell.

The numbers in the table cells are presented in Windows format. By default, OWISoft (like Excel) uses the system separators that are defined in the regional settings in Control Panel (decimal and thousands separators). The thousands separator is deactivated in the following table columns: Time, Function, Error and Release.

Input mode.

In order to activate this mode, please select a cell; confirm the selection by double clicking or by pressing the F2 key. You can also enter the value directly. The colour of the cell changes to white and its contents are marked. Now you can handle the cell like a text field. If you click on the Enter key, you will leave the Input mode and accept the changes. If you click on the Escape key, you will leave the Input mode and discard the changes. The colour of the cell changes and its contents are displayed as formatted. Their format is the same as the one of the position outputs for the assigned axis. If no axes have been assigned, the output is unformatted. Using the Tab key you can rapidly handle several cells in the Input mode. Having activated the Input mode you enter the new value, e.g. pressing the Tab key, you add the new value and activate the Input mode for the next cell at the same time. You can also use the navigation keys.

Read mode.

If the Input mode is not activated, the table is in Read mode. You can navigate in the table and edit the selected (marked) cells. You can select the desired position (cell) with the mouse. You can, of course, use the keyboard as well.

Shortcuts:

- Arrow keys - move one cell up, down, left, or right in a table.
- Shift+Arrow keys - extend the selection by one cell.
- Home key - move to the beginning of a row.
- Shift+Home - extend the selection to the beginning of the row.
- Ctrl+Home - move to the beginning of a table.
- End key - move to the last cell in the row.
- Shift+End - extend the selection to the last cell of the row.
- Ctrl+End - move to the last cell in a table.
- Page Down key - move one screen down in a table.
- Shift+Page Down - extend the selection down one screen.
- Page Up key - move one screen up in a table.
- Shift+Page Up - extend the selection up one screen.
- Tab key - move one cell to the right in a table.
- Shift+Tab - move one cell to the left in a table.

You can also select (mark) more than one cell using the keyboard or the mouse. The left upper table cell of the selection is interpreted as reference cell. In the selected cells the sign can be changed (reversed) with keyboard (Minus key). To edit the marked table selection, the pop-up menu is defined. Pop-up menus are menus specific for context that can be displayed when the user clicks the right mouse button over a control.

Table, functions of the pop-up menu

- Cut (Ctrl+X)** - cut contents of selected cells (reset contents).
- Copy (Ctrl+C)** - copy contents of selected cells to the clipboard.
- Paste (Ctrl+V)** - paste content from clipboard into selected cells.

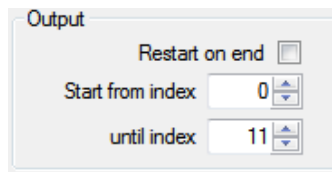
The selected cell contents are substituted with the contents of the reference cell. Besides, the lower cells, which correspond to the before marked table area, are overwritten. The data are accepted in Windows format (system separators).

- Paste (ANSI)** - paste content from clipboard into selected cell.

The selected cell contents are substituted with the contents of the reference cell. Besides, the lower cells, which correspond to the before marked table area, are overwritten. The data are accepted in ANSI format (decimal separator=decimal point).

- Clear (Del)** - delete selected cells (reset contents).
- Select All (Ctrl+A)** - select the entire table.

An Excel worksheet can be copied similarly. Please start the Excel application and load the desired worksheet. Mark the desired range of cells and copy them to the clipboard. Afterwards, activate the application window (**OWISoft, Continuous-path control** dialog box). Then select the desired table cell and insert the contents of the clipboard (Paste pop-up menu).



Text box with spin button **...from index** - select table rows for function (start row).
The table is executed beginning from this row.
Text box with spin button **until index** - select table rows for function (end row).
The table is processed up to the defined end row.

Check box **Restart on end** - activate continuous execution of the table for continuous-path control (important only for the execution of the continuous-path control).

If the option is active, the table for continuous-path control is executed as a loop. If the last position is reached, the execution of the table continues with the first row etc. If the continuous-path control is started, it is accomplished by the control unit (hardware). The actual position in the table cannot be determined.

A continuous-path control is finished:

1. if defined rows of the table are processed.
2. if a row with release byte cleared (=0) is processed.
3. if all rows of the table are processed.



Check box **Option1** - select option 1 for function.

Check box **Option2** - select option 2 for function.

Options=0 – no options selected,

Options=1 – option 1 selected,

Options=2 – option 2 selected.

Button **Load values** - load table (options 0,1).

Options=0: read selected rows (control unit), update table (dialog box).

Options=1: load selected rows from FLASH memory (control unit PS 90).

Button **Save values** - save table (options 0,1).

Options=0: save selected rows (control unit).

Options=1: save selected rows in FLASH memory (control unit PS 90).

Button **Import** - import data.

The selected rows are filled from text file (OWV).

Button **Export** - export data.

The selected rows are saved into text file (OWV). The table values can be backed up with it. After a control unit restarting these values are lost (table is reset).

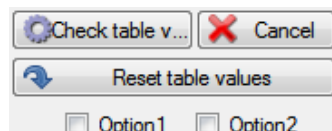
Button **Change font** - change font.

The default font for table control is specified.

Button **Print** - print table (options 0,1).

Options=0: fit print range to page width.

Options=1: print table in original size.



With the **Check table values** button the selected rows are checked, read in the control unit and are inserted to the table in the dialog. A plausibility check of the table for continuous-path control can be carried out with this function. The limit values for speed and acceleration are calculated and entered in the rows of the table. The axis parameters for speed and acceleration are checked and the error byte is set accordingly.

With the **Reset table values** button the selected rows are deleted, read in the control unit and inserted to the table in the dialog box. Besides, the values are set in the suitable rows to zero.

With the **Cancel** button you can terminate each running process.

With the **Circular interpolation calculate and enter** button the selected rows are calculated for circular interpolation, read in the control unit and inserted to the table in the dialog box. Click on the button to open a dialog box, in which you can create a configuration of the circular interpolation.

Combo box **Axis X**

- select axis X for circular interpolation.

Combo box **Axis Y**

- select axis Y for circular interpolation.

Text box with spin button **Circumradius** - define circumradius for circular interpolation.

The measuring unit is the same as for the position output for the assigned axis.

Text box with spin button **Time for segment** - define time interval for segment in ms.

Text box with spin button **Start angle** - define start angle in degrees.

Text box with spin button **Angle range** - define angle range in degrees.

Text box with spin button **Secant number** - define secant number for circular interpolation.

Text box with spin button **Function** - define function code (16 bits – bit pattern).

For more information see a description of the table for continuous-path control.

Text box with spin button **Factor Z** - define optional: scaling factor Z (numerator).

Text box with spin button **Factor N** - define optional: scaling factor N (denominator).

Clicking the **OK** button you can save the configuration for circular interpolation and close the dialog box. With the **Cancel** button you can close the dialog box any time. The configuration is not saved.



With the **Start continuous-path control** button you can start a continuous-path control for the selected rows.

With the **Stop continuous-path control** button a running continuous-path control can be stopped. The moving axes behave like at the end of the table.

With the **Close** button you can close the dialog box any time.

3.13 Trigger control

In this dialog box you can define trigger control and enable it for the selected control unit (the active window). Only for PS 90.

Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 1.1, Software features).

Index	Action ID	Input	State	Param1	Param2	
0	1=Start axis in velocity mode		1	1	5	0
1	2=Stop axis in velocity mode		1	0	5	0
2	1=Start axis in velocity mode		1	1	6	0
3	2=Stop axis in velocity mode		1	0	6	0

The data for trigger control (Trigger & Event) are stored in the memory of the control unit, in 2 tables. This data can be loaded into a table control element in the application. In the first column of the table you find the configuration set numbers (as index), from 0 to 63.

The table exists of 64 rows. Every row exists of 5 elements:

Trigger

Action ID (1-9),

1=Start axis in velocity mode,

2=Stop axis in velocity mode,

3=Start axis,

4=Start multiple axes in velocity mode,

5=Start multiple axes,

6=Stop axis,

7=Stop multiple axes,

8=Switch axis on,

9=Switch axis off;

digital input (1-16);

input state,

0 - low active,

1 - high active;

Parameter 1: axis number (1-9) or bit pattern;

Parameter 2 (optional).

Event

Event ID (1-6),

1=Velocity greater than a given value,

2=Velocity smaller than a given value,

3=Position greater than a given value,

4=Position smaller than a given value,

5=Axis runs,

6=Axis stands still;

digital outputs (16 bits – bit pattern);

output state (16 bits – bit pattern),

0 - low active,

1 - high active;

Parameter 1: axis number (1-9) or bit pattern;

Parameter 2 (optional).

Several functions for editing and navigating in the table are available. There are two operating modes: Read mode and Input mode. In the Read mode you can edit the whole table, in the Input mode only the selected table cell.

The numbers in the table cells are presented in Windows format. By default, OWISoft (like Excel) uses the system separators that are defined in the regional settings in Control Panel (decimal and thousands separators). The thousands separator is deactivated in the following table columns: input/output, state. The Param1, Param2 columns are for user input (unformatted).

Input mode.

In order to activate this mode, please select a cell; confirm the selection by double clicking or by pressing the F2 key. You can also enter the value directly. The colour of the cell changes to white and its contents are marked. Now you can handle the cell like a text field. If you click on the Enter key, you will leave the Input

mode and accept the changes. If you click on the Escape key, you will leave the Input mode and discard the changes. The colour of the cell changes and its contents are displayed as formatted. Their format is the same as the one of the position outputs for the assigned axis. If no axes have been assigned, the output is unformatted. Using the Tab key you can rapidly handle several cells in the Input mode. Having activated the Input mode you enter the new value, e.g. pressing the Tab key, you add the new value and activate the Input mode for the next cell at the same time. You can also use the navigation keys.

Read mode.

If the Input mode is not activated, the table is in Read mode. You can navigate in the table and edit the selected (marked) cells. You can select the desired position (cell) with the mouse. You can, of course, use the keyboard as well.

Shortcuts:

Arrow keys - move one cell up, down, left, or right in a table.

Shift+Arrow keys - extend the selection by one cell.

Home key - move to the beginning of a row.

Shift+Home - extend the selection to the beginning of the row.

Ctrl+Home - move to the beginning of a table.

End key - move to the last cell in the row.

Shift+End - extend the selection to the last cell of the row.

Ctrl+End - move to the last cell in a table.

Page Down key - move one screen down in a table.

Shift+Page Down - extend the selection down one screen.

Page Up key - move one screen up in a table.

Shift+Page Up - extend the selection up one screen.

Tab key - move one cell to the right in a table.

Shift+Tab - move one cell to the left in a table.

You can also select (mark) more than one cell using the keyboard or the mouse. The left upper table cell of the selection is interpreted as reference cell. In the selected cells the sign can be changed (reversed) with keyboard (Minus key). To edit the marked table selection, the pop-up menu is defined. Pop-up menus are menus specific for context that can be displayed when the user clicks the right mouse button over a control.

Table, functions of the pop-up menu

Cut (Ctrl+X) - cut contents of selected cells (reset contents).

Copy (Ctrl+C) - copy contents of selected cells to the clipboard.

Paste (Ctrl+V) - paste content from clipboard into selected cells.

The selected cell contents are substituted with the contents of the reference cell. Besides, the lower cells, which correspond to the before marked table area, are overwritten. The data are accepted in Windows format (system separators).

Paste (ANSI) - paste content from clipboard into selected cell.

The selected cell contents are substituted with the contents of the reference cell. Besides, the lower cells, which correspond to the before marked table area, are overwritten. The data are accepted in ANSI format (decimal separator=decimal point).

Clear (Del) - delete selected cells (reset contents).

Select All (Ctrl+A) - select the entire table.

An Excel worksheet can be copied similarly. Please start the Excel application and load the desired worksheet. Mark the desired range of cells and copy them to the clipboard. Afterwards, activate the application window (**OWISoft, Trigger control** dialog box). Then select the desired table cell and insert the contents of the clipboard (Paste pop-up menu).

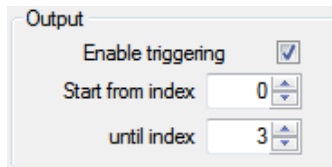
Text box with spin button **...from index** - select table rows for function (start row).

The table is executed beginning from this row.

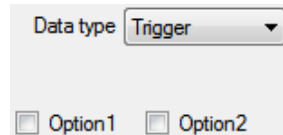
Text box with spin button **until index** - select table rows for function (end row).

The table is processed up to the defined end row.

Check box **Enable triggering** - enable or disable trigger control.



Combo box **Data type** - select table (Trigger or Event) for function.
 Check box **Option1** - select option 1 for function.
 Check box **Option2** - select option 2 for function.
 Options=0 – no options selected,
 Options=1 – option 1 selected,
 Options=2 – option 2 selected.



Button **Load values** - load table (options 0,1).
 Options=0: read selected rows (control unit PS 90), update table (dialog box).
 Options=1: load table from FRAM memory (control unit PS 90).
 Button **Save values** - save table (options 0,1).
 Options=0: save selected rows (control unit PS 90).
 Options=1: save table in FRAM memory (control unit PS 90).



Button **Import** - import data.
 The selected rows are filled from text file (CSV,TXT).
 Button **Export** - export data.
 The selected rows are saved into text file (CSV,TXT). The table values can be backed up with it. After a control unit restarting these values are lost (table is reset).
 Button **Change font** - change font.
 The default font for table control is specified.
 Button **Print** - print table (options 0,1).
 Options=0: fit print range to page width.
 Options=1: print table in original size.



With the **Reset table values** button the selected rows are deleted, read in the control unit and are inserted to the table in the dialog. Besides, the values are set in the suitable rows to zero.
 With the **Cancel** button you can terminate each running process.
 With the **Close** button you can close the dialog box any time.

3.14 Options

3.14.1 General

In this dialog box the program options are changed.

Text box **OWIS database** - select OWIS® database for the application.
 Combo box **ODBC driver** - select ODBC driver for database.

OWIS database:	<input type="text" value="C:\Program Files\OWISoft\Application\database\owis_1903.mdb"/>
ODBC driver:	<input type="text" value="Microsoft Access Driver (*.mdb)"/>
<input type="checkbox"/> ODBC DSN:	<input type="text"/>
Customer database:	<input type="text" value="C:\Program Files\OWISoft\Application\database\owis_custom.mdb"/>
ODBC driver:	<input type="text" value="Microsoft Access Driver (*.mdb)"/>
<input type="checkbox"/> ODBC DSN:	<input type="text"/>

Check box **ODBC DSN** - activate DSN option.
 Combo box **ODBC DSN** - select ODBC configuration (DSN).

Text box **Customer database** - select customer database for the application.
 Combo box **ODBC driver** - select ODBC driver for database.
 Check box **ODBC DSN** - activate DSN option.
 Combo box **ODBC DSN** - select ODBC configuration (DSN).

Text box **Plug-ins directory** - select directory for program extensions.
 Text box **Audio file** - select wave file for the application.

This file is played in the **Beep** function from the program script. If no wave file is selected, then a system sound (WindowsLogon) is played.

With the **OK** button (Enter key) you will accept the changes and close the dialog box. With the **Cancel** button (Escape key) you will discard the changes and close the dialog box.

3.14.2 Customize

In this dialog box the Quick Access Toolbar and the keyboard shortcuts are customized. For further information see chapter 2.1.8.

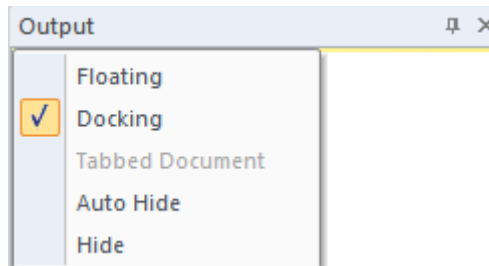
3.14.3 Support

In this dialog box the program and support information, version number and copyright are displayed. Contact OWIS®, find online resources and obtain additional information regarding our products and services.

4 Docking windows

4.1 Chain

Beside the ribbon and status bar, the docking windows are important elements in the OWISoft user interface (Chain, Program, Properties, Watch, File view, Output). Each individual docking window in the user interface can be hidden or displayed in the Ribbon (View tab). Several docking windows can be moved, placed on top of each other and be represented as tabs.



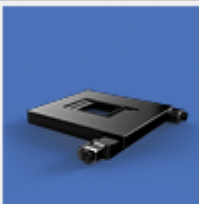


You can release a docking window by double-clicking in its title bar. To move a docking window, click the left-hand mouse button in the title bar and move the mouse while holding down the mouse button. If you move the mouse close to the edge of the main window, a new position for the docking window will be displayed. Release the mouse button to position the docking window.

Using the **Chain** docking window (work area), you can define and execute simple movements (coordinate table).

It enables you to define any sequence of target coordinates for driving any axis you desire. Additionally, you can read out positions captured by means of joystick (so-called “teach-in”) by clicking to store them as table values. You have the possibility to determine the chain positions for the positioning and to execute them automatically. The software halts at every position for the defined time or waits until function is done. If a table cell is not selected (check box not checked), this cell is ignored when executing the coordinate table.

The control is axis-based and applies to all connected control units.

Nr.	Fn_entry	Tm_exit	Fn_exit	 ax1	 ax2	 ax3
1	---	200	F1	<input checked="" type="checkbox"/>	0,000	<input checked="" type="checkbox"/>
2	---	200	---	<input checked="" type="checkbox"/>	10,000	<input checked="" type="checkbox"/>
3	---	200	---	<input checked="" type="checkbox"/>	20,000	<input checked="" type="checkbox"/>

The chain is defined in a table control element. In the first row of the table (heading line) you find the axis identifiers and the associated graphics (positioning unit type) for all defined axes. These headings are updated every time you change the axis definition. If the axis is not defined, the corresponding column is hidden. In the first column of the table you find the coordinate set numbers from 1 to 4000 (changeable).

The table exists of 4000 rows. Every row exists of 53 elements:

Fn_entry – execute function (before axis movement) in the row;

Tm_exit - break time (after axis movement) in the row (decimal value in ms);

Fn_exit - execute function (after axis movement) in the row;

ax1-ax50 – target position or distance with sign for the corresponding axis.

Function in position (Fn_entry, Fn_exit)

If this option is activated, a function is executed in the row. The chain execution will be continued if the function executing was completed. The function is assigned to a function key (combo box). The functions can be customized in the **Property Grid** (see chapter 4.4.5, configuration of function keys). If no function is assigned to the selected function key, the chain positions are reached without break.

There are three function types: Macro, Application and Script file.

1. Execute the defined commands from the program script are line-by-line (up to 10 lines). The function executing was completed if the last line was executed.
2. Start the predefined application. The function executing was completed if the application was closed.
3. Execute the predefined script file. The function executing was completed if the script file was closed.

Several functions for editing and navigating in the table are available. There are two operating modes: Read mode and Input mode. In the Read mode you can edit the whole table, in the Input mode only the selected table cell. You can search and replace the number in the table (Ribbon, Home tab). For more information, see chapter 2.1.2.

The numbers in the table cells are presented in Windows format. By default, OWISoft (like Excel) uses the system separators that are defined in the regional settings in Control Panel (decimal and thousands separators). The thousands separator is deactivated in the following table column: Tm_exit.

Input mode

In order to activate this mode, please select a cell; confirm the selection by double clicking or by pressing the F2 key. You can also enter the value directly. The colour of the cell changes to white and its contents are marked. Now you can handle the cell like a text field. If you click on the Enter key, you will leave the Input mode and accept the changes. If you click on the Escape key, you will leave the Input mode and discard the changes. The colour of the cell changes and its contents are displayed as formatted. Their format is the same as the one of the position outputs for the assigned axis. Using the Tab key you can rapidly handle several cells in the Input mode. Having activated the Input mode you enter the new value, e.g. pressing the Tab key, you add the new value and activate the Input mode for the next cell at the same time. You can also use the navigation keys.

Read mode

If the Input mode is not activated, the table is in Read mode. You can navigate in the table and edit the selected (marked) cells. You can select the desired position (cell) with the mouse. You can, of course, use the keyboard as well.

Shortcuts:

Arrow keys - move one cell up, down, left, or right in a table.

Shift+Arrow keys - extend the selection by one cell.

Home key - move to the beginning of a row.

Shift+Home - extend the selection to the beginning of the row.

Ctrl+Home - move to the beginning of a table.

End key - move to the last cell in the row.

Shift+End - extend the selection to the last cell of the row.

Ctrl+End - move to the last cell in a table.

Page Down key - move one screen down in a table.

Shift+Page Down - extend the selection down one screen.

Page Up key - move one screen up in a table.

Shift+Page Up - extend the selection up one screen.

Tab key - move one cell to the right in a table.

Shift+Tab - move one cell to the left in a table.

You can also select (mark) more than one cell using the keyboard or the mouse. The left upper table cell of the selection is interpreted as reference cell. In the selected cells the sign can be changed (reversed) with keyboard (Minus key). In the selected cells the check box can be changed (checked or not checked) with keyboard (Space key). To edit the marked table selection, the pop-up menu is defined. Pop-up menus are menus specific for context that can be displayed when the user clicks the right mouse button over a control.

Table, functions of the pop-up menu

Cut (Ctrl+X) - cut contents of selected cells (reset contents).

Copy (Ctrl+C)

- copy contents of selected cells to the clipboard.

Paste (Ctrl+V)

- paste content from clipboard into selected cells.

The selected cell contents are substituted with the contents of the reference cell. Besides, the lower cells, which correspond to the before marked table area, are overwritten. The data are accepted in Windows format (system separators).

Paste (ANSI)

- paste content from clipboard into selected cell.

The selected cell contents are substituted with the contents of the reference cell. Besides, the lower cells, which correspond to the before marked table area, are overwritten. The data are accepted in ANSI format (decimal separator=decimal point).

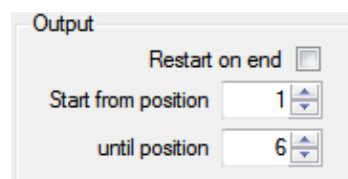
Clear (Del)

- delete selected cells (reset contents).

Select All (Ctrl+A)

- select the entire table.

An Excel worksheet can be copied similarly. Please start the Excel application and load the desired worksheet. Mark the desired range of cells and copy them to the clipboard. Afterwards, activate the application window (OWISoft, **Chain** work area). Then select the desired table cell and insert the contents of the clipboard (Paste pop-up menu).



Text box with spin button **...from position** - select table rows for function (start row).

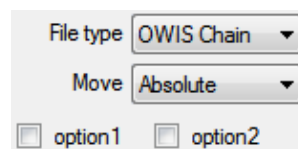
The table is executed beginning from this row.

Text box with spin button **until position** - select table rows for function (end row).

The table is processed up to the defined end row.

Check box **Restart on end** - activate repeated chain execution.

If the option is active, the chain is executed as a loop. If the last position is reached, the execution of the chain continues with the first row etc.



Combo box **File type** - select file type (Chain or CSV format) for function.

Combo box **Move** - select target mode.

The table values are interpreted as distance for the corresponding axes (Relative). The table values are interpreted as target position for the corresponding axes (Absolute).

Check box **Option1** - select option 1 for function.

Check box **Option2** - select option 2 for function.

Options=0 – no options selected,

Options=1 – option 1 selected,

Options=2 – option 2 selected.



Button **Insert line** - insert a new row above selected row.

The row number is changed. The contents of lower table rows are shifted downward.

Button **Delete line** - delete selected row.

The row number is changed. The contents of lower table rows are shifted upward.

Button **Import** - load table values (options 0,1,2).

Options=0: load chain configuration (OWC) or data in CSV format (CSV,TXT).

Options=1: replace selection.

Options=2: import data in standard numeric format (decimal separator=decimal point).

Button **Export** - save table values (options 0,1,2).
Options=0: save chain configuration (OWC) or data in CSV format (CSV,TXT).
Options=1: save selection.
Options=2: export data in standard numeric format (decimal separator=decimal point).

Button **Read position values** - read position values (options 0,1).
Options=0: read position values, change values in selected row (all axes).
Options=1: read position values, change values in selected row (joystick axes).

Button **Print** - print table (options 0,1).
Options=0: fit print range to page width.
Options=1: print table in original size.



Button **Wizard** - fill table values (options 0,1,2).
Options=0: fill selected positions, whole way=stage range.
Options=1: fill selected positions, set whole way.
Options=2: start configuration wizard (see chapter 4.2).

Click on the **Start chain** button in order to execute the chain for the defined axes. If a table cell is not selected (checkbox not checked), this cell is ignored when executing the coordinate table. With automatic execution, the chain positions can be reached once or several times (repeated chain executing is activated), namely downwards. In the current row the program waits for the desired time (Tm_exit) or until function is done (Fn_entry, Fn_exit). The axes on one control unit (PS 90) will be started synchronously.

Please note that the dual position-control loop of an axis remains active in the positioning mode 2,3,7,9 (see **Axis parameters** dialog box, Dual position-control loop), if the position is reached (phase 3 active, magenta colour). In this state only a further positioning with a dual position-control loop is possible. With the **Stop chain** button the phase 3 can be finished.

Click on the **Break chain** button in order to interrupt the execution of the chain. The positioning will not be stopped and the current target positions will be reached. The button label changes to **Continue chain**. Next click on the button continues the chain execution (starting from that position where it was interrupted).

Click on the **Stop chain** button in order to stop the one-time or repeated chain execution, or to break the execution of a script file. The axes are stopped. The **Start chain** button will be activated and the other buttons deactivated. Clicking the **Stop All** menu (Home tab in the Ribbon) also stops the one-time or repeated chain execution. For more information, see chapter 2.1.2.

4.2 Wizard

The Wizard can fill the coordinate table (**Chain** work area) or create a program script in the code editor (**Program** work area) automatically. The data are generated following a certain scheme (e.g. Meander etc.).

4.2.1 Meander

Within the **Meander** tab, you may implement a meander-like movement with any 2 or 3 axes of the connected control units. The software halts at every position for the defined time or waits until function is done. The control is axis-based and applies to all connected control units. The meander positions are defined as target position for the corresponding axes (absolute positioning).

Meander travel means that all coordinates of a two-dimensional pattern or of a three-dimensional grid are reached once. Two meander versions are available: "standard" and "unidirectional". Short description of the two versions as follows:

Standard:

- The X axis moves one step and stops then. This will be repeated until the X sequence is completed, i.e. until the desired number of steps is reached.
- The Y axis moves one step ahead.
- The X axis performs the X sequence backwards.

- The Y axis moves one step ahead.
- The X axis performs the X sequence ahead.
- etc.
- When the Y axis finished the last step, and the X axis completed its last backward or forward sequence, the Z axis moves the first step forwards.
- The next sequence of the X axis starts.
- The Y axis moves one step backwards.
- etc.

Unidirectional:

- The X axis moves one step and stops then. This will be repeated until the X sequence is completed, i.e. until the desired number of steps is reached.
- The Y axis moves one step ahead.
- At the same time, the X axis is going to the origin coordinate. If the B value (backlash compensation distance) has been set to a different value than zero, the motion target will be the (-B) coordinate, instead. Afterwards, the axis turns back and returns to the origin coordinate out of negative direction.
- The X axis performs the X sequence forwards.
- The Y axis moves one step ahead.
- etc.
- When the Y axis has executed the last step, and the X axis completed its last forward sequence, the Z axis moves the first step forwards.
- At the same time, the X axis is going to the origin, or to the (-B) coordinate and finally to the origin. At the same time, the Y axis starts its motion to the origin.
- The X axis performs the X sequence forwards.
- The Y axis moves one step ahead.
- etc.

Meander axes (assignment + step number)

Axis X:	<input type="text" value="ax1"/>	Step number X:	<input type="text" value="10"/>
Axis Y:	<input type="text" value="ax2"/>	Step number Y:	<input type="text" value="4"/>
Axis Z:	<input type="text" value="----"/>	Step number Z:	<input type="text" value="0"/>

- Combo box **Axis X** - select axis X.
- Combo box **Axis Y** - select axis Y.
- Combo box **Axis Z** - select axis Z.

The combo box contains the axes (axis identifiers) defined for the connected control units. In order to use the meander axis, please select an axis. For a deactivated axis please select the line "----".

! It is not possible to define identical axes as different meander axes. For example, the axis with the identifier "ax1" is defined as X axis. If you try to select this axis ("ax1") as Y axis, there is a new assignment and the old one is deleted (the line "----" displayed in combo box for the X axis).

- Text box with spin button **Step number X** - select number of steps for meander axis.
- Text box with spin button **Step number Y** - select number of steps for meander axis.
- Text box with spin button **Step number Z** - select number of steps for meander axis.

Axis configuration

- Text box with spin button **Range X** - select step length for meander axis.
- Text box with spin button **Range Y** - select step length for meander axis.
- Text box with spin button **Range Z** - select step length for meander axis.

The measuring unit is the same as for the position output of the assigned axis. The new step length is calculated from the defined range (stage travel) and the defined step number. The sign defines the positioning direction.

Range X:	<input type="text" value="50,000"/>	[mm]
Range Y:	<input type="text" value="4,000"/>	[mm]
Range Z:	<input type="text" value="0"/>	
Offset X:	<input type="text" value="0"/>	

Text box with spin button **Offset X** - define offset position for axis X.

Only positive values are expected. Their measuring unit is identical to the unit of the X axis. For the offset position we recommend a value, which is at least order of magnitude (factor 10) higher than the maximum backlash. Example: backlash of $\pm 0.5 \mu\text{m}$, e.g. means $\text{Offset} \geq 10 \mu\text{m}$.

! Note: Backlash compensation and unidirectional travel are only possible with the X axis.

Additional options

<input checked="" type="checkbox"/>	Begin with start position	
<input type="checkbox"/>	Move back to start position	
<input checked="" type="checkbox"/>	Function in position (Fn_entry, Tm_exit, Fn_exit)	
<input type="text" value="--"/>	<input type="text" value="200"/> [ms]	<input type="text" value="F1"/>

Check box **Begin with start...** - define start position as the first meander position.

For unidirectional meander the backlash compensation of the axis X will be carried out (offset > 0).

Check box **Move back to start...** - define start position as the last meander position.

Check box **Function...** - enable function in position (or break time).

Combo box **Fn_entry** - select function (before axis movement) in the row.

Text box with spin button **Tm_exit** - define break time for meander positions.

Combo box **Fn_exit** - select function (after axis movement) in the row.

The software halts at every position for the defined time or waits until function is done.

Function in position (Fn_entry, Fn_exit)

If this option is activated, a function is executed in the row. The chain execution or program execution will be continued if the function executing was completed. The function is assigned to a function key (combo box). The functions can be customized in the **Property Grid** (see chapter 4.4.5, configuration of function keys). If no function is assigned to the selected function key, the meander positions are reached without break.

There are three function types: Macro, Application and Script file.

1. Execute the defined commands from the program script are line-by-line (up to 10 lines). The function executing was completed if the last line was executed.
2. Start the predefined application. The function executing was completed if the application was closed.
3. Execute the predefined script file. The function executing was completed if the script file was closed.

With the **OK** button (Enter key) you will accept the meander configuration and close the dialog box. With the **Cancel** button (Escape key) you will discard the meander configuration and close the dialog box.

4.2.2 DXF file

Within the **DXF file** tab, you can convert data from dxf file to coordinates of a two-dimensional pattern or of a three-dimensional grid. 2 or 3 axes of the connected control units are selected for this movement. The software halts at every position for the defined time or waits until function is done. The control is axis-based and applies to all connected control units. The DXF positions are defined as target position for the corresponding axes (absolute positioning).

The defined movement means that all coordinates of a two-dimensional pattern or of a three-dimensional grid are reached once.

DXF (Drawing Interchange Format) is a CAD data file format developed by Autodesk for enabling data interoperability between AutoCAD and other programs. ASCII versions of DXF can be read with any text editor.

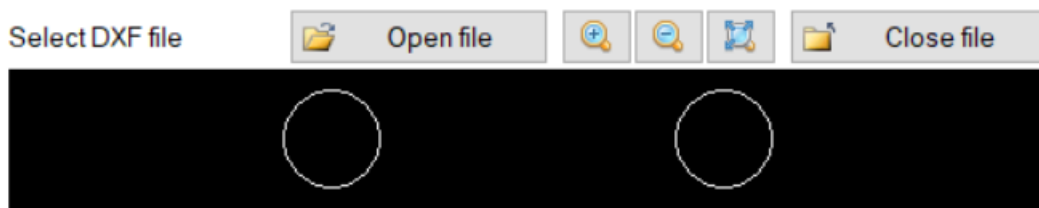
A DXF file is organized into several sections; each section is composed of records, which in turn are composed of a group code and associated data values. A DXF file is a text only file which consists of the following 7 sections: HEADER, TABLES, BLOCKS, CLASSES, OBJECTS, ENTITIES, EOF.

The BLOCKS section of the DXF file contains all the block definitions. Each block definition contains the entities that make up that block as it is used in the drawing. The format of the entities in this section is identical to those in the ENTITIES section. It is also possible to use INSERT entities (ENTITIES section) if a block name is provided for an entity.

The ENTITIES section of the DXF file contains all graphic elements (drawing entities), including any block references. The more common of these are Point, Line, Polyline, Rectangle, Polygon, Circle and Arc. Graphic elements are represented by various objects in a DXF file. A point is assigned to POINT object, a line is assigned to LINE object, a filled quadrangle is assigned to SOLID object, circles and arcs are assigned to CIRCLE and ARC objects. Polylines and polygons (closed polylines) are assigned to POLYLINE object. The polyline is closed if the last point of the line is connected to the first by a line segment.

All these graphical objects are present in dxf format since its implementation. They are available in modern CAD programs by conversion into dxf version "R12". The DXF format is further expanded and supplemented. New geometric elements were added. One of the most common is the LWPOLYLINE object, which replaces the complicated memory structure of the POLYLINE object, especially in the newer versions of the DXF format (e. g. DXF version 2004). Ellipses and splines are assigned to newer ELLIPSE and SPLINE objects.

Select DXF file



Here a dxf file can be opened and displayed in the preview window. The file can be closed anytime. The preview can be zoomed in or out, and reset. The DXF positions of the graphic elements (POINT, LINE, SOLID, POLYLINE, LWPOLYLINE) are determined directly. For circles, arcs and ellipses the DXF positions are calculated. It is important to specify a secant number (n). These graphic elements are interpreted as closed polylines (number=n+1). The polyline is closed if the last point of the line is connected to the first by a line segment. SPLINE objects are not supported. They can be saved to the DXF version "R12". Splines are converted into POLYLINE objects. The DXF positions of the graphic elements inserted with the INSERT command are added with the coordinates (X,Y) of the insertion point (without scaling and rotation).

DXF axes (assignment, secant number for CIRCLE/ELLIPSE/ARC)

Axis X:	<input type="text" value="ax1"/>	Secant number C:	<input type="text" value="12"/>
Axis Y:	<input type="text" value="ax2"/>	Secant number E:	<input type="text" value="0"/>
Axis Z:	<input type="text" value="----"/>	Secant number A:	<input type="text" value="0"/>

Combo box **Axis X** - select axis X.

Combo box **Axis Y** - select axis Y.

Combo box **Axis Z** - select axis Z.

The combo box contains the axes (axis identifiers) defined for the connected control units. In order to use the meander axis, please select an axis. For a deactivated axis please select the line "----".

! It is not possible to define identical axes as different meander axes. For example, the axis with the identifier "ax1" is defined as X axis. If you try to select this axis ("ax1") as Y axis, there is a new assignment and the old one is deleted (the line "----" displayed in combo box for the X axis).

Text box with spin button **Secant number C** - select secant number for graphic elements (CIRCLE).

Text box with spin button **Secant number E** - select secant number for graphic elements (ELLIPSE).

Text box with spin button **Secant number A** - select secant number for graphic elements (ARC).

Additional options

Check box **Activate linear...** - activate or deactivate linear interpolation (axes X,Y).
The axis goes to a new target position or a distance either in the trapezoidal or S-curve profile with linear interpolation, if the option is activated. If this option is activated with several axes of the same control unit, such axes go synchronically with linear interpolation. The setting is valid for all work areas.

Check box **Debug mode** - activate or deactivate debug mode.
In the debug mode, the DXF positions will be not accepted. A dialog box with short information about graphic elements will be displayed.

Activate linear interpolation (X,Y) Debug mode

Function in position (Fn_entry, Tm_exit, Fn_exit)

----- ▾ 200 [ms] F1 ▾

Check box **Function...** - enable function in position (or break time).
Combo box **Fn_entry** - select function (before axis movement) in the row.
Text box with spin button **Tm_exit** - define break time for DXF positions.
Combo box **Fn_exit** - select function (after axis movement) in the row.

The software halts at every position for the defined time or waits until function is done.

Function in position (Fn_entry, Fn_exit)

If this option is activated, a function is executed in the row. The chain execution or program execution will be continued if the function executing was completed. The function is assigned to a function key (combo box). The functions can be customized in the **Property Grid** (see chapter 4.4.5, configuration of function keys). If no function is assigned to the selected function key, the meander positions are reached without break.

There are three function types: Macro, Application and Script file.

1. Execute the defined commands from the program script are line-by-line (up to 10 lines). The function executing was completed if the last line was executed.
2. Start the predefined application. The function executing was completed if the application was closed.
3. Execute the predefined script file. The function executing was completed if the script file was closed.

With the **OK** button (Enter key) you will accept the DXF positions (opened dxf file) and close the dialog box (debug mode is inactive). With the **Cancel** button (Escape key) you will discard the DXF positions and close the dialog box.

4.3 Program

4.3.1 Front-end

The **Program** docking window (work area) enables you to define complex movements, to store them as a program script into a script file and execute them later. Thus, loops and even computations are possible to a certain extent. With the program script you can extend possibilities of the application and automate certain sequences. A small universal (applicable for all control unit types) script language is used. The script is created, changed and tested in a code editor. The script language consists of 49 commands. Short command descriptions can be found as follows.

The control is axis-based and applies to all connected control units.

```
1 CmdValueToVar ax2 var5='?astat
2 VarStrCmp var5 'RRI' +1 -1
3 GoVel ax2=1,500
4 AxisStateToVar ax2 var3=1
5 PosToVar var2=ax2
6 VarCmp var2 20 +1 -2
7 Stop ax2
8 AxisStateToVar ax2 var3=1
9 Rem axis in position 20 ***
10
```

The Code Editor was developed for the comfortable, simple and clearly laid out coding of programs. Such features as syntax highlighting, line numeration, search and replace, undo/redo capabilities, and code completion in Command mode (auto-complete function) make your work with the Editor extremely comfortable.

Some syntax elements of script files are coloured differently to distinguish them. For example, keywords (script commands, e.g. GoVel, PosToVar etc.) are one colour, but global variables (var1,var2...) or axis names (ax1, ax2...) are another colour. Other syntax elements are also colourized, such as string literals and comments. You can search and replace text in single files (Ribbon, Home tab). For more information, see chapter 2.1.2.

The numbers in the script are presented in Windows format. By default, OWISoft (like Excel) uses the system separators that are defined in the regional settings in Control Panel (decimal and thousands separators).

Function in position (ExecWait command)

If this option is activated (e.g. ExecWait F2), a function is executed in the line of the script file. The program execution will be continued if the function executing was completed. The function is assigned to a function key. The functions can be customized in the **Property Grid** (see chapter 4.4.5, configuration of function keys). If no function is assigned to the selected function key, the program execution is continued.

There are three function types: Macro, Application and Script file.

1. Execute the defined commands from the program script are line-by-line (up to 10 lines). The function executing was completed if the last line was executed.
2. Start the predefined application. The function executing was completed if the application was closed.
3. Execute the predefined script file. The function executing was completed if the script file was closed.

Several functions for editing and navigating in the Code Editor are available. There are two operating modes: Input mode and Command mode. In the Input mode you can enter and edit the text. In the Command mode you can enter commands, variables, axis names with pressing of keys.

Command mode

To start the Command mode (list1), place your text cursor somewhere inside the text, and press CTRL+SPACE. To start the Command mode (list2), place your text cursor somewhere inside the text, and press CTRL+1. To start the Command mode (list3), place your text cursor somewhere inside the text, and press CTRL+2. All commands of the script language are listed in the command list (list1 - sorted alphabetically). All defined axes (list2) and global variables (list3) are listed in other lists (sorted alphabetically). Click in the appropriate line to transfer the command into the editor and replace the marking. If you click on the Enter key (Tab or Space keys), you will leave the Input mode and accept the changes. If you click on the Escape key, you will leave the Input mode and discard the changes. You can use the navigation keys in the list element. With the arrow keys (left, right) and the character input the auto-complete function is used.

Input mode

If the Command mode is not activated, the Code Editor is in Input mode. You can enter all commands with the appropriate parameters through keyboard. You can place only one command within a line. That command has to be in the first position. The command line may consist of several elements (words). They are separated by blanks or tabulators, except the "MessageBox..." commands. They expect a message string as a first parameter, which has to be enclosed in inverted commas ('...' or "..."). The message string is interpreted as an element and can consist of several words. The empty lines or the commented lines are ignored when the program is executed.

! Commands not having valid parameters are not executed. Using the "Loop" and "WaitForAxisStop" commands, it is possible, e.g. to cancel single program blocks. Without valid parameters the loop command is ignored. The program block located in such a loop is "commented out" in the program virtually.

You can navigate in the Code Editor and edit the selected text. You can select the desired position with the mouse. You can, of course, use the keyboard as well.

Shortcuts:

Arrow keys - move the cursor one character up, down, left, or right.

Shift+Arrow keys - select text.

Ctrl+Arrow keys - move the cursor one word up, down, left, or right.

Home key - move the cursor to the beginning of the current line.

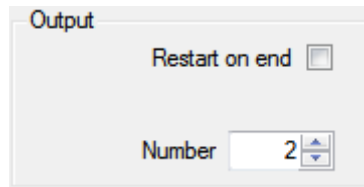
Shift+Home - extend the selection to the beginning of the current line.

Ctrl+Home - move the cursor to the beginning of the text.
 End key - move the cursor to the end of the current line.
 Shift+End - extend the selection to the end of the current line.
 Ctrl+End - move the cursor to the end of the text.
 Page Down key - move the cursor one screen down.
 Page Up key - move the cursor one screen up.

To edit the marked text in the Code Editor, the pop-up menu is defined. Pop-up menus are menus specific for context that can be displayed when the user clicks the right mouse button over a control.

Code Editor, functions of the pop-up menu

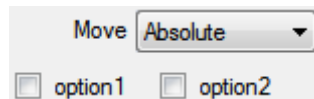
- Undo (Ctrl+Z)** - undo the previous action.
 - Redo (Ctrl+Y)** - redo the previous action.
 - Cut (Ctrl+X)** - cut the selected content to the clipboard.
 - Copy (Ctrl+C)** - copy the selected content to the clipboard.
 - Paste (Ctrl+V)** - paste the contents of the clipboard.
- The selected contents are substituted with the contents of the clipboard.
- Clear (Del)** - delete selected contents.
 - Select All (Ctrl+A)** - select all content.



Text box with spin button **Number** - select position number (wizard, options 0,1).

Check box **Restart on end** - activate continuous program execution.

If the option is active, the program script is executed as a loop. If the last line is reached, the execution of the program continues with the first line etc.



Combo box **Move** - select target mode (wizard, options 0,1).

The position values are interpreted as distance for the corresponding axes (Relative). The position values are interpreted as target position for the corresponding axes (Absolute).

Check box **Option1** - select option 1 for function.

Check box **Option2** - select option 2 for function.

Options=0 – no options selected,

Options=1 – option 1 selected,

Options=2 – option 2 selected.



Button **Insert line** - insert a new line above selected line.

The lines below are shifted downward.

Button **Delete line** - delete selected line.

The lower lines are shifted upward.

Button **Import** - load program script (options 0,1,2).

Options=0: load program script from text file (OWP,TXT).

Options=1: replace selection.

Options=2: import data in standard numeric format (decimal separator=decimal point).

Button **Export** - save program script (options 0,1,2).

Options=0: save program script into text file (OWP,TXT).

Options=1: save selection.

Options=2: export data in standard numeric format (decimal separator=decimal point).

Button **Read position values** - read position values (options 0,1).
 Options=0: read position values, insert values in selected line (all axes).
 Options=1: read position values, insert values in selected line (joystick axes).
 The positions are converted to the **SetTarget** command, for example, "SetTarget X=0 Y=0 Z=0". For the axes with a dual position-control loop the position of the way measuring system of an axis is read out.
 Button **Print** - print program script (options 0,1,2).
 Options=0: print program script.
 Options=1: print selection.
 Options=2: create list of commands with a short description (output window=1, chapter 4.7).



Button **Wizard** - create program script (options 0,1,2).
 Options=0: calculate positions and setup travel sequence, whole way=stage range.
 Options=1: calculate positions and setup travel sequence, set whole way.
 Options=2: start configuration wizard (see chapter 4.2).

Button **Start program** - start program (options 0,1,2).
 Options=0: execute program script.
 Options=1: check command syntax and parameters (debug mode).
 Options=2: fast program execution (without delay).

If the program script has been created, you can test or execute it. The script file must be saved at first before the execution of the script file is started. The existing file is overwritten. The file loaded last is used for saving (file path).

Please note that the dual position-control loop of an axis remains active in the positioning mode 2,3,7,9 (see **Axis parameters** dialog box, Dual position-control loop), if the position is reached (phase 3 active, magenta colour). In this state only a further positioning with a dual position-control loop is possible. To use another positioning type (e.g., reference run), you can break the dual position-control loop with the Stop command from the script or with the **Stop program** button.

With the **Break program** button you halt the program execution. The positioning will not be stopped and the current target positions will be reached. The button label is changed to **Continue program**. Next click on the button continues the program execution (from that position where it was interrupted).

Click on the **Stop program** button in order to stop the one-time or repeated program execution, or to break the execution of a script file. The axes are stopped. The **Start program** button will be activated and the other buttons deactivated. Clicking the **Stop All** menu (Home tab in the Ribbon) also stops the one-time or repeated program execution. For more information, see chapter 2.1.2.

Check syntax

Only the program script will be checked, no positioning will be started and no axis parameters will be changed. When automatically processing, the program lines are checked top down. The current line is marked. If an error is found, the execution will be interrupted. Afterwards, the error position is marked and a dialog box is opened, which displays the line and the position of the error. Click on the **OK** button in order to continue the check. At the end an error log is displayed, which contains all the errors found.

! We recommend checking the new program first before you use it. Only the syntax and the defined parameters (primarily the axis identifiers) are tested. The software cannot check the logical structure of the program.

For more information see command descriptions.

4.3.2 Command definition

MoveAbs

Description

Absolute positioning. Please first define the target position, if necessary (see SetTarget). The target mode is set to absolute. The axes on one control unit (PS 90) will be started synchronously.

Parameters

Axis identifiers are expected as parameters (ax1-ax50), separated from each other by blanks or tabulators. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed.

Syntax

MoveAbs <identifier 1> <identifier 2> ...

MoveRel

Description

Relative positioning. Please first define the distance, if necessary (see SetTarget). The target mode is set to relative. The axes on one control unit (PS 90) will be started synchronously.

Parameters

Axis identifiers are expected as parameters (ax1-ax50), separated from each other by blanks or tabulators. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed.

Syntax

MoveRel <identifier 1> <identifier 2> ...

SetTarget

Description

Define target position or distance. The target mode is set to absolute. After that an axis can be started (see MoveAbs, MoveRel).

Parameters

Axis identifiers and position value are expected as parameters, separated by an equal sign. Instead of a position value you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

SetTarget <axis 1>=<var1>...

or

SetTarget <axis 1>=<constant 1>...

SetPosition

Description

Set actual position of the axis counter.

Parameters

Axis identifiers and position value are expected as parameters, separated by an equal sign. Instead of a position value you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

SetPosition <axis 1>=<var1>...

or

SetPosition <axis 1>=<constant 1>...

Stop

Description

Stop the selected axis.

Parameters

Axis identifiers are expected as parameters (ax1-ax50), separated from each other by blanks or tabulators. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed.

Syntax

Stop <identifier 1> <identifier 2> ...

SetVel

Description

Set axis positioning velocity.

Parameters

Axis identifier and velocity value are expected as parameters, separated by an equal sign. Instead of a speed value you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

SetVel <axis 1>=<var1>...

or

SetVel <axis 1>=<constant 1>...

SetAccel

Description

Set axis acceleration.

Parameters

Axis identifier and acceleration value are expected as parameters, separated by an equal sign. Instead of an acceleration value you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

SetAccel <axis 1>=<var1>...

or

SetAccel <axis 1>=<constant 1>...

JoystickOn

Description

Switches joystick mode on.

Parameters

No parameters.

Syntax

JoystickOn

JoystickOff

Description

Switches joystick mode off.

Parameters

No parameters.

Syntax

JoystickOff

MessageBox

Description

Displays a dialog box and interrupts program, until the user closes the window, for example, by mouse click.

Parameters

As first parameter, the message string is set. It has to be placed in inverted commas ('...' or "..."). Optionally, the variable names can be set (var1-var100), separated by blanks or tabulators from each other. For the corresponding variable the text and numeric value are displayed in the dialog box (list element). Incorrect identifiers are ignored. If no valid parameters are set, an empty dialog box is displayed.

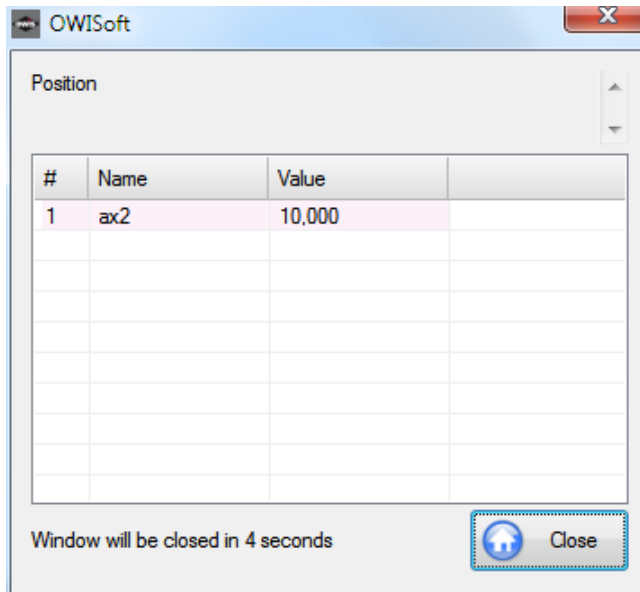
Syntax

MessageBox <"message"> <var1> <var2>...

MessageBoxDelay

Description

The functionality is similar to that of the **MessageBox** command. Displays a dialog box and interrupts a program for the time set as additional parameter in seconds, or until the user closes the window by mouse click.



Parameters

As first parameter you set the interruption time in seconds, afterwards the message string, which must be included in inverted commas. Optionally, the variable names can be set (var1-var100), separated by blanks or tabulators from each other. For the corresponding variable the text and numeric value are displayed in the dialog box (list element). Incorrect identifiers are ignored. If no valid parameters are set, an empty dialog box is displayed. If the time value is null, this command is interpreted just like the **MessageBox** command.

Syntax

MessageBoxDelay <delay> <"message"> <var1> <var2>...

- ! **Note:** The dialog box can be closed anytime, for example, by mouse click, even if the defined interruption time is not elapsed yet.

Delay

Description

Defines delay.

Parameters

As parameter you need a number which defines the delay in milliseconds. Instead of a number you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

Delay <var1>

or

Delay <delay>

Beep

Description

Plays wave file. For more information see chapter 3.14.1.

Parameters

No parameters.

Syntax

Beep

Loop ... EndLoop

Description

Generates repeated sequences by using a loop (repetition number). The **Loop** command necessarily needs the completion by means of **EndLoop**. Herewith, the "loop" program block is completed.

Parameters

A number of the loops (repetition number) is expected as parameter. The program block included in the loop is executed accordingly then, one loop after the other. Instead of a number you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the loop is ignored. The program block located in such a loop is commented out in the program virtually.

Syntax

Loop <repetition number>

Beep

EndLoop

or

Loop <var1>

Beep

EndLoop

WaitForAxisStop ... EndWait

Description

Generates repeated sequences by using a loop (condition). This is a conditioned loop, which is executed until the condition is fulfilled. The condition is that the positioning of the selected axes is completed (axes are in position). The **WaitForAxisStop** command necessarily needs the completion by means of **EndWait**. Herewith, the program block "wait" is completed.

Parameters

Axis identifiers are expected as parameters (ax1-ax50), separated from each other by blanks or tabulators. Incorrect identifiers are ignored. If no valid parameters are set, the loop is ignored. The program block located in such a loop is commented out in the program virtually.

Syntax

WaitForAxisStop <identifier 1> <identifier 2> ...

Beep

EndWait

AxisStateToVar

Description

Read actual axis state and saves to defined variable.

Parameters

Axis identifier, variable (var1-var100) and mode (0-3) are expected as parameters, separated by a space or equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed. Possible variants:

mode=0 – read axis state and save as numeric value,

mode=1 – read move state and save as numeric value,

mode=2 – read axis state in velocity mode and save as numeric value,

mode=3 – read error state and save as numeric value.

Syntax

AxisStateToVar <axis 1> <var1>=<index>

Goto

Description

Navigates to a specified line of the script file absolute (new line number) or relative (+offset or –offset).

Parameters

As parameter you need a number which defines a new line number or an offset to the current line. There is no action, if no valid parameters are set.

Syntax

Goto <line number>

or

Goto <+offset>

or

Goto <-offset>

VarStrCmp

Description

Compares values and navigates to a specified line of the script file absolute (new line number) or relative (+offset or -offset).

Compares two variables or a variable and a text constant (text). If strings are equal, goes to line1, otherwise goes to line2. If the line2 is not defined, goes to next line.

Parameters

As first parameter you need a variable name (see chapter 4.4.4, configuration of variables). As second parameter you need a variable name or a text constant. As third parameter you need a number which defines a new line number or an offset to the current line. As fourth parameter you need a number (optionally) which defines a new line number or an offset to the current line. There is no action, if no valid parameters are set.

Syntax

VarStrCmp <var1> <var2> <line1> <line2>

or

VarStrCmp <var1> <var2> <offset1> <offset2>

VarCmp

Description

Compares values and navigates to a specified line of the script file absolute (new line number) or relative (+offset or -offset).

Compares two variables or a variable and a constant (numeric value). If values are equal ($v1=v2$), goes to line1. If values are not equal ($v1<v2$), goes to line2, otherwise goes to line3. If the line2 or line3 is not defined, goes to next line.

Parameters

As first parameter you need a variable name (see chapter 4.4.4, configuration of variables). As second parameter you need a variable name or a constant. As third parameter you need a number which defines a new line number or an offset to the current line. As fourth parameter you need a number (optionally) which defines a new line number or an offset to the current line. As fifth parameter you need a number (optionally) which defines a new line number or an offset to the current line. There is no action, if no valid parameters are set.

Syntax

VarCmp <var1> <var2> <line1> <line2> <line3>

or

VarCmp <var1> <var2> <offset1> <offset2> <offset3>

Add

Description

Addition of a constant or of a variable to a variable (numeric value).

Parameters

Two variable names (see chapter 4.4.4, configuration of variables), or a variable name and a constant are needed. There is no action, if no valid parameters are set.

Syntax

Add <var1> <var2>

In this case: <var1> = <var1> + <var2>

or

Add <var1> <constant>

In this case: <var1> = <var1> + <constant>

Sub

Description

Subtraction of a constant or of a variable from a variable (numeric value).

Parameters

Two variable names (see chapter 4.4.4, configuration of variables), or a variable name and a constant are needed. There is no action, if no valid parameters are set.

Syntax

Sub <var1> <var2>

In this case: <var1> = <var1> - <var2>

or
Sub <var1> <constant>
In this case: <var1> = <var1> - <constant>

Mul

Description

Multiplication of a variable with a constant or a variable (numeric value).

Parameters

Two variable names (see chapter 4.4.4, configuration of variables), or a variable name and a constant are needed. There is no action, if no valid parameters are set.

Syntax

Mul <var1> <var2>

*In this case: <var1> = <var1> * <var2>*

or

Mul <var1> <constant>

*In this case: <var1> = <var1> * <constant>*

Div

Description

Division a variable by a constant or a variable (numeric value).

Parameters

Two variable names (see chapter 4.4.4, configuration of variables), or a variable name and a constant are needed. There is no action, if no valid parameters are set.

Syntax

Div <var1> <var2>

In this case: <var1> = <var1> / <var2>

or

Div <var1> <constant>

In this case: <var1> = <var1> / <constant>

Let

Description

Assignment of a constant or a variable to a variable (numeric value).

Parameters

Two variable names (see chapter 4.4.4, configuration of variables), or a variable name and a constant are needed. There is no action, if no valid parameters are set.

Syntax

Let <var1> <var2>

In this case: <var1> = <var2>

or

Let <var1> <constant>

In this case: <var1> = <constant>

Rem

Description

Comments out a program script line.

Parameters

No parameters are needed. Enter a comment character at the start of the comment script line ("Rem" or "//"). This line is excluded from the program execution.

Syntax

Rem <out-commented script line>

or

// <out-commented script line>

ExecWait

Description

Executes function in the line of the script file or starts external application. The running script is interrupted until the function executing is complete or the user terminates the application.

Parameters

The name of a function key (F1-F50) or a valid file path is expected as parameter. The functions can be customized in the **Property Grid** (see chapter 4.4.5, configuration of function keys). There are three function types: Macro, Application and Script file. With the second type (also through file path) the file is executed (an application) or opened with the suitable program. An application can be started with parameters (command-line, ShellExec or cmd.exe). You can define software installed under Windows by its name (without path information), for example, "excel". There is no action, if no valid parameters are set.

Syntax

```
ExecWait F2  
or  
ExecWait <program name or path> + [parameters]  
ExecWait notepad "D:\test.txt"  
ExecWait "D:\ mytool.exe" 5 50000 0  
ExecWait E:\chart.vi
```

WaitForInput

Description

Checks a digital input until a predefined state appears or the timeout is expired.

Parameters

As first parameter you set an axis identifier. The control unit which digital input is checked is exactly defined by an axis identifier. An input number (1-16) and a state value (0 – low, 1 – high) are expected as second parameter, separated by an equal sign. As third parameter you can set a timeout value in ms. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed. If the timeout value is smaller than 1 or empty, a digital input is checked only once. If the string "max" is given for the timeout, a digital input is checked without time restriction (endless loop). Click on the **Stop program** button in order to terminate the check loop and the program script execution. Clicking the **Stop All** menu (Home tab in the Ribbon) also stops the check loop and the program execution. A short description of inputs and outputs can be found in chapter 3.6.

Syntax

```
WaitForInput <identifier> <input>=<state> <timeout>
```

SetPTrigger

Description

Set a digital output to high, reset it after a predefined delay to low.

Parameters

As first parameter you set an axis identifier. The control unit which digital output is set is exactly defined by an axis identifier. An output number (1-16) is expected as second parameter. As third parameter you can set a delay value in ms. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed. If the delay value is smaller than 1 or empty, a digital output is not reset. A short description of inputs and outputs can be found in chapter 3.6.

Syntax

```
SetPTrigger <identifier> <output> <delay>
```

SetNTrigger

Description

Set a digital output to low, reset it after a predefined delay to high.

Parameters

As first parameter you set an axis identifier. The control unit which digital output is set is exactly defined by an axis identifier. An output number (1-16) is expected as second parameter. As third parameter you can set a delay value in ms. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed. If the delay value is smaller than 1 or empty, a digital output is not reset. A short description of inputs and outputs can be found in chapter 3.6.

Syntax

```
SetNTrigger <identifier> <output> <delay>
```

PosToVar

Description

Read actual position of the axis counter and saves to defined variable.

Parameters

Variables (var1-var100) and axis identifiers are expected as parameters, separated by an equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

PosToVar <var1>=<axis 1>...

GoVel

Description

Set target velocity of an axis for velocity mode, after that starts velocity mode. The axes on one control unit (PS 90) will be started synchronously.

Parameters

Axis identifier and velocity value are expected as parameters, separated by an equal sign. Instead of a speed value you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

GoVel <axis 1>=<var1>...

or

GoVel <axis 1>=<constant 1>...

SetMem

Description

Set value of a memory marker (1 byte) of the control unit. Memory index for PS 90 – 0...511. Memory index for PS 30 and PS 35 – 0...255.

Parameters

As first parameter you set an axis identifier. The control unit which memory marker is set is exactly defined by an axis identifier. A memory index and a value of the memory marker (0-255) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

SetMem <identifier> <memory index>=<var1>

or

SetMem <identifier> <memory index>=<constant>

SetMem16

Description

Set value of a memory marker (2 bytes = 16 bits) of the control unit. Memory index for PS 90 – 0...511. Memory index for PS 30 and PS 35 – 0...255.

Parameters

As first parameter you set an axis identifier. The control unit which memory marker is set is exactly defined by an axis identifier. A memory index and a value of the memory marker (-32768...32767) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

SetMem16 <identifier> <memory index>=<var1>

or

SetMem16 <identifier> <memory index>=<constant>

SetMem32

Description

Set value of a memory marker (4 bytes = 32 bits) of the control unit. Memory index for PS 90 – 0...511. Memory index for PS 30 and PS 35 – 0...255.

Parameters

As first parameter you set an axis identifier. The control unit which memory marker is set is exactly defined by an axis identifier. A memory index and a value of the memory marker (-2147483648...2147483647) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

SetMem32 <identifier> <memory index>=<var1>

or

SetMem32 <identifier> <memory index>=<constant>

WaitForMem

Description

Checks value of a memory marker (1 byte) until a predefined state (value) appears or the timeout is expired. Memory index for PS 90 – 0...511. Memory index for PS 30 and PS 35 – 0...255.

Parameters

As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A memory index and a value of the memory marker (0-255) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name (var1-var100), so that its value will be taken. As third parameter you can set a timeout value in ms. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If the timeout value is smaller than 1 or empty, a digital input is checked only once. If the string "max" is given for the timeout, a digital input is checked without time restriction (endless loop). Click on the **Stop program** button in order to terminate the check loop and the program script execution. Clicking the **Stop All** menu (Home tab in the Ribbon) also stops the check loop and the program execution. If no valid parameters are set, the command is not executed.

Syntax

WaitForMem <identifier> <memory index>=<var1> <timeout>

or

WaitForMem <identifier> <memory index>=<constant> <timeout>

WaitForMem16

Description

Checks value of a memory marker (2 bytes = 16 bits) until a predefined state (value) appears or the timeout is expired. Memory index for PS 90 – 0...511. Memory index for PS 30 and PS 35 – 0...255.

Parameters

As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A memory index and a value of the memory marker (-32768...32767) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name (var1-var100), so that its value will be taken. As third parameter you can set a timeout value in ms. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If the timeout value is smaller than 1 or empty, a digital input is checked only once. If the string "max" is given for the timeout, a digital input is checked without time restriction (endless loop). Click on the **Stop program** button in order to terminate the check loop and the program script execution. Clicking the **Stop All** menu (Home tab in the Ribbon) also stops the check loop and the program execution. If no valid parameters are set, the command is not executed.

Syntax

WaitForMem16 <identifier> <memory index>=<var1> <timeout>

or

WaitForMem16 <identifier> <memory index>=<constant> <timeout>

WaitForMem32

Description

Checks value of a memory marker (4 bytes = 32 bits) until a predefined state (value) appears or the timeout is expired. Memory index for PS 90 – 0...511. Memory index for PS 30 and PS 35 – 0...255.

Parameters

As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A memory index and a value of the memory marker (-2147483648...2147483647) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name (var1-var100), so that its value will be taken. As third parameter you can set a timeout value in ms. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If the timeout value is smaller than 1 or empty, a digital input is checked only once. If the string "max" is given for the timeout, a digital input is checked without time restriction (endless loop). Click on the **Stop program** button in order to terminate the check loop and the program script execution. Clicking the **Stop All** menu (Home tab in the Ribbon) also stops the check loop and the program execution. If no valid parameters are set, the command is not executed.

Syntax

WaitForMem32 <identifier> <memory index>=<var1> <timeout>

or

WaitForMem32 <identifier> <memory index>=<constant> <timeout>

MemToVar

Description

Read value of a memory marker (1 byte) and saves to defined variable. Memory index for PS 90 – 0...511. Memory index for PS 30 and PS 35 – 0...255.

Parameters

As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A variable (var1-var100) and a memory index are expected as second parameter, separated by an equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

MemToVar <identifier> <var1>=<memory index>

Mem16ToVar

Description

Read value of a memory marker (2 bytes = 16 bits) and saves to defined variable. Memory index for PS 90 – 0...511. Memory index for PS 30 and PS 35 – 0...255.

Parameters

As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A variable (var1-var100) and a memory index are expected as second parameter, separated by an equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

Mem16ToVar <identifier> <var1>=<memory index>

Mem32ToVar

Description

Read value of a memory marker (4 bytes = 32 bits) and saves to defined variable. Memory index for PS 90 – 0...511. Memory index for PS 30 and PS 35 – 0...255.

Parameters

As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A variable (var1-var100) and a memory index are expected as second parameter, separated by an equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

Mem32ToVar <identifier> <var1>=<memory index>

MoveAxis

Description

Define target position or distance (optionally). The target mode remains unchanged. After that an axis is started (see MoveAbs, MoveRel). The axes on one control unit (PS 90) will be started synchronously.

Parameters

Axis identifiers and position value are expected as parameters, separated by an equal sign. Instead of a position value you can use a variable by indicating its name (var1-var100), so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). Without position value the target position is not redefined. If no valid parameters are set, the command is not executed.

Syntax

MoveAxis <axis 1>=<var1>...

or

MoveAxis <axis 1>=<constant 1>...

or

MoveAxis <axis 1>...

AninToVar

Description

Read value of an analog input and saves to defined variable.

Parameters

As first parameter you set an axis identifier. The control unit which analog input is read is exactly defined by an axis identifier. A variable (var1-var100) and an input number (1-8) are expected as second parameter, separated by an equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed. A short description of inputs and outputs can be found in chapter 3.6.

Syntax

AninToVar <axis 1> <var1>=<input>

VarToList

Description

Creates a formatted output line from the values of variables and writes into the output window.

Parameters

As first parameter you set an index (0-2), which determines the output window (0 – chain, 1 – program, 2 – direct commands). As second parameter you set a number (0-4), which determines the output format. Possible formats (separator + decimal separator):

0 – Semicolon + Point,

1 – Space + Point,

2 – Comma + Point,

3 – Semicolon + Comma,

4 – Space + Comma.

Variable names (var1-var100) are expected as next parameters, separated from each other by blanks or tabulators. For the corresponding variable the text or numeric value are displayed in the line. The numeric data are accepted in ANSI format (decimal separator=decimal point or comma). If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

VarToList <index> <format> <var1> <var2>...

FileValueToVar

Description

Read value from the text file (CSV format) and saves to defined variable.

Parameters

A variable (var1-var100) is expected as first parameter. The name of a function key is expected as second parameter. Thus the file path is defined for data export (Application function of the function key). As third parameter you set a number (0-6), which determines the output format. Possible formats (separator + decimal separator):

- 0 – Semicolon + Point,
- 1 – Tab + Point,
- 2 – Space + Point,
- 3 – Comma + Point,
- 4 – Semicolon + system separator,
- 5 – Tab + system separator,
- 6 – Space + system separator.

The line number in the file is expected as fourth parameter. This line in the file corresponds to a dataset; single data fields (columns) are separated by separator. The column (field) number in the file is expected as fifth parameter. The numeric data are accepted in ANSI format (decimal separator=decimal point) or in Windows format (system separator) and saved to variable. The data are also saved to variable as text. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

FileValueToVar <var1> F2 <format> <row> <column>

ExecCmd

Description

Sends a direct command to the control unit. Shows interface communication in the output window (2 – direct commands). The commands from the command reference of the control unit are used.

Parameters

As first parameter you set an axis identifier. The control unit is exactly defined by an axis identifier. A command for the control unit is expected as second parameter. As third parameter you can define a delay value for the communication, in ms. If the delay value is empty, the standard delay is used for the communication. If the identifier is not correct, this parameter is ignored. If no valid parameters are set, the script command is not executed.

Syntax

ExecCmd <axis 1> <command> <delay>

CmdValueToVar

Description

Sends a direct command to the control unit and saves answer to defined variable. The commands from the command reference of the control unit are used.

Parameters

As first parameter you set an axis identifier. The control unit is exactly defined by an axis identifier. A variable (var1-var100) and a command for the control unit are expected as second parameter, separated by an equal sign. As third parameter you can define a delay value for the communication, in ms. If the delay value is empty, the standard delay is used for the communication. The numeric data (answer) are accepted and saved to variable. The data (answer) are also saved to variable as text. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Syntax

CmdValueToVar <axis 1> <var1>=<command> <delay>

AnyValueToVar

Description

Read defined value and saves to defined variable.

Parameters

Variables (var1-var100) and mode (0-3) are expected as parameters, separated by an equal sign. If the variable was not found, this parameter is ignored (see chapter 4.4.4, configuration of variables). If no valid parameters are set, the command is not executed.

Possible variants (date and time requests, representation in Windows format):

mode=0 – read date and save as text (e.g. DD/MM/YYYY),

mode=1 – read time and save as text (e.g. HH:mm:ss),

mode=2 – read date and time and save as text (e.g. DD/MM/YYYY HH:mm:ss),

mode=3 – read time exactly and save as text (e.g. HH:mm:ss.xxx).

For the variants (0-3) the number of milliseconds elapsed since the system was restarted is saved to variable as numeric value.

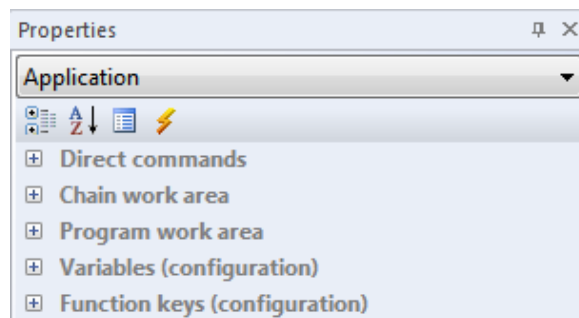
Syntax

AnyValueToVar <var1>=<index>...

4.4 Properties window

Use this window to view and change the properties in coordinate table (**Chain** work area) and code editor (**Program** work area). You can also use the Properties window to edit and view properties of variables and function keys. You can find **Properties** window on the Ribbon (View tab).

The Properties window displays different types of editing fields, depending on the needs of a particular property. These edit fields include edit boxes, drop-down lists, and links to custom editor dialog boxes. Properties shown in gray are read-only.



Commands of the toolbar

Categorized (1)

Lists all properties and property values for the selected object, by category. You can collapse a category to reduce the number of visible properties. When you expand or collapse a category, you see a plus (+) or minus (-) to the left of the category name. Categories are listed alphabetically.

Alphabetical (2)

Alphabetically sorts all properties. To edit an undimmed property, click in the cell to its right and enter changes.

Function key (3)

Saves the configuration for the selected function key.

Direct commands (4)

Sends the defined string to the selected control unit and reads out the answer. Shows interface communication in the output window (2 – direct commands).

4.4.1 Direct commands

The **Direct commands** category enables the input of direct commands, in accordance with the respective control unit manual to test purposes. It is possible to communicate directly with a control unit. The commands used for the corresponding control unit are described in the control unit's command reference.

PS90	
Send command	?ASTAT
Timeout value	50

Combo box **Send command** - enter or select command for the control unit. The direct inputs are made in the text box. The code completion (auto-complete function) makes this input extremely comfortable. All commands from the command reference of the control unit are displayed in the list box of this control (sorted alphabetically). Click in the appropriate line to select the command. If you click on the Enter key, you will accept the changes. If you click on the Escape key, you will discard the changes. Please note that a read command begins with a question mark.

The **Timeout value** text box with spin button displays the timeout value (delay in milliseconds) for the communication. Click the **Direct commands** command in the toolbar to send the defined string to the selected control unit.

4.4.2 Chain work area

Use this category to view and change the properties in coordinate table (**Chain work area**).

Chain work area	
Table	
Rows number	100
Font	Segoe UI(9)

The **Rows number** text box with spin button specifies the number of table rows. Values from 1 to 4000 are possible. The number of columns is constant. The **Font** text box specifies the default font for the table control.

4.4.3 Program work area

Use this category to view and change the properties in code editor (**Program work area**).

Program work area	
Text editor	
Font	Courier New(10)

The **Font** text box specifies the default font for the editor window.

4.4.4 Variables (configuration)

Use this category to view and edit properties of variables. The number of variables is 100 (global definition, var1-var100).

Variables (configuration)	
Variable	var1
Numeric	True
Value	5
Digits	0
Text	

Combo box **Variable** - select variable. The configuration is specially defined for each variable. Any modification takes effect immediately.

Combo box **Numeric** - select output value. For the corresponding variable the text (FALSE) or numeric value (TRUE) are used for output.

Text box with spin button **Value** - specify numeric value. Text box with spin button **Digits** - select number of decimal places.

These values define output data format for the variable, which is used for each value output. Text box **Text** - specify text value.

4.4.5 Function keys (configuration)

Use this category to view and edit properties of function keys. The number of function keys is 50 (global definition, F1-F50).

Function keys (configuration)	
Function key	F1
Function	Macro
Show in the Ribbon	True
Text	MessageBox
+ Macro (text)	
+ Application (file path)	
+ Script file (file path)	

Combo box **Function key** - select function key.

The configuration is specially defined for each function key.

Combo box **Function** - select function of the function key.

There are three function types: Macro, Application and Script file.

1. Execute the defined commands from the program script are line-by-line (up to 10 lines). The function executing was completed if the last line was executed.
2. Start the predefined application. The function executing was completed if the application was closed.
3. Execute the predefined script file. The function executing was completed if the script file was closed.

Combo box **Show in the Ribbon** - show function key in the Ribbon.

If this option is activated (TRUE), the command is add to the Ribbon (Extras tab). You can assign a keyboard shortcut to the command (see chapter 2.1.8).

Text box **Text** - specify function key label in the Ribbon.

Macro (text)

Combo box **Line1-10** - enter or select macro.

If this option is activated, the text box is interpreted as a command line (up to 10 lines). Here you can enter the commands from the program script (one command per line). The lines are executed successively. The direct inputs are made in the text box. The code completion (auto-complete function) makes this input extremely comfortable. All commands of the script language are displayed in the list box of this control (sorted alphabetically). The exceptions are: Loop, EndLoop, WaitForAxisStop, EndWait, GoTo, VarCmp, VarStrCmp. Click in the appropriate line to select the command. If you click on the Enter key, you will accept the changes. If you click on the Escape key, you will discard the changes. Short command descriptions can be found in chapter 4.3.2.

Application (file path)

Text box **Application** - enter or select application.

If this option is activated, the content of the text box is interpreted as a file path. By clicking the function key, this file (an application) is executed or opened with the suitable software. You can define the software installed under Windows by their name (without path designation), for example, "excel". You may select the path in a dialog box, when using the button on the right from the text box. An application can be started with parameters (see ExecWait command from the program script). Short command description can be found in chapter 4.3.2.

Script file (file path)

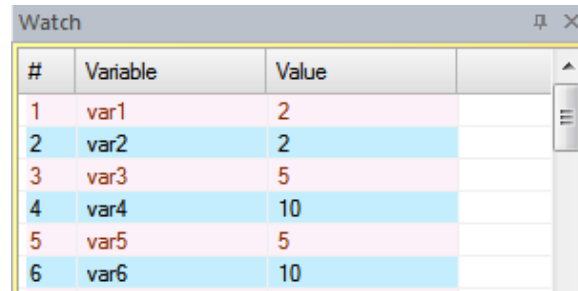
Text box **Script file** - enter or select script file.

If this option is activated, the content of the text box is interpreted as a file path. By clicking the function key, this text file (OWP,TXT) is executed. You may select the path in a dialog box, when using the button on the right from the text box.

With the **Function key** command on the toolbar you can save the configuration for the selected function key.

4.5 Watch window

Use this window to watch several variables. You can find **Watch** window on the Ribbon (View tab).

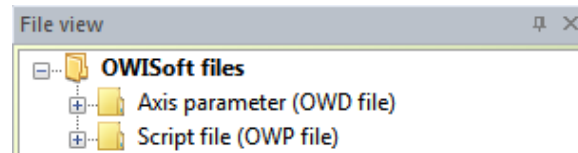


#	Variable	Value
1	var1	2
2	var2	2
3	var3	5
4	var4	10
5	var5	5
6	var6	10

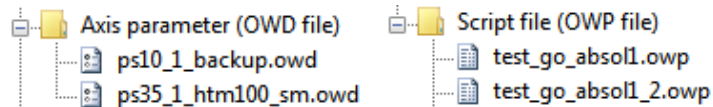
For each variable the text or numeric value are used for output. Any change is visible immediately.

4.6 File view

Use this window to view and edit the list of script files (OWP,TXT) and text files with axis parameters (OWD,TXT). You can find **File view** window on the Ribbon (**View** tab).



You can load the axis parameters from a text file and save them. The defined script file is executed.

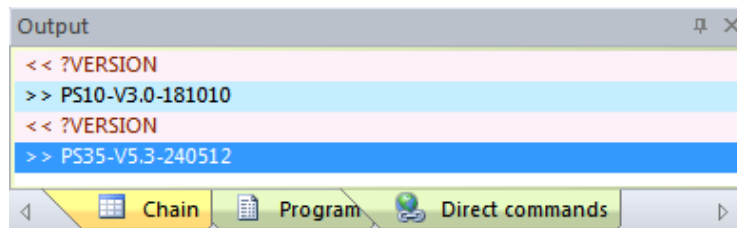


Functions of the pop-up menu

- New item** - add a new item.
You can select and save the file path in a dialog box. The file name is entered in the list.
- Remove** - delete selected item.
- Load parameters** - load axis parameters from selected text file.
You can confirm the selected axes (manual selection).
- Execute script** - execute defined script file.
- Properties** - display properties for selected element.
The file properties of Windows Explorer are displayed.

4.7 Output windows

Use this window to show the formatted output and the interface communication. You can find **Output** window on the Ribbon (**View** tab). There are three output windows (0 – chain, 1 – program, 2 – direct commands).



Show communication

Clicking the **Show communication** menu (**Control** tab in the Ribbon) shows the interface communication for the selected control unit (the active window) in the output window (2 – direct commands). Output: “<< Command + >> Answer”.

OWISoft offers the possibility to log the interface communication from the software to the control unit (the commands sent from the software and the answers received by the control unit). Two versions are possible, a long and a short protocol (text file, e.g. ps10trace.txt). The short version contains a head with name of the control unit and the starting time, as well as a list of the commands sent and the answers received. The long version also contains the corresponding transmitting and receiving times, and the device status signals are displayed additionally. The long version increases the communication time slightly.

List of commands (**Program** work area)

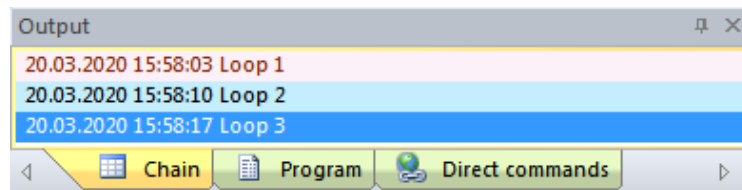
With the **Print** button (option 2) you can create the list of commands with a short description in the output window (1 - program). Output: "Command + << Parameters".

Direct commands (**Properties** window)

In the **Direct commands** category you can send direct commands to the control unit. The commands from the command reference of the control unit are used. The interface communication is shown in the output window (2 – direct commands). Output: "<< Command + >> Answer".

Direct commands (program script, **ExecCmd** command)

With **ExecCmd** command you can send a direct command to the control unit. The commands from the command reference of the control unit are used. The interface communication is shown in the output window (2 – direct commands). Output: "<< Command + >> Answer".



Formatted output (program script, **VarToList** command)

With **VarToList** command you can create a formatted output line from the values of variables and write into the output window (0,1,2). For more information, see chapter 4.3.2.

Functions of the pop-up menu

- | | |
|----------------------------|-----------------------------------|
| Copy list (Ctrl+L) | - copy the list to the clipboard. |
| Clear list (Del) | - delete the list. |
| Print list (Ctrl+P) | - print the list. |
| Save list as | - save the list into text file. |

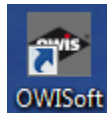
A double click on the selected line copies contents to the clipboard. The list contains up to 1024 lines. If the maximum number is exceeded, the program will delete the oldest entries.

5 How to use OWISoft

5.1 Starting the application

After installation you can start the software and put the positioning units into operation. You have three possibilities to start the program in Windows:

- Click the **OWISoft** icon on the desktop.





- Alternatively, click the **OWISoft** menu item in the Start menu (Programs\OWISoft).
- Or double click on the configuration file (OWI) for the control unit. You can find them in the data directory (..\OWISoft\Application\data).

5.2 Connect control unit

For every working session the desired control unit will be connected with the software. Besides, the following conditions must be fulfilled:

- The control unit is switched on and connected to the PC or to the Ethernet.
- The positioning units are connected with the control unit.
- The desired interface is already present in the system (USB or RS232 interface, configured Ethernet interface). A free connector ("port" or "address") is available.
- Before to connect the application with USB or RS232 interface, please check the selected values. The parameters for Baudrate, Parity, Databits and Stopbits are predefined (115200 or 9600, no parity, 8 databits, 1 stopbit). The software handshake character is CR. One can configure the Ethernet interface (LAN port or Modbus/TCP) with the following tools: "Anybus IPconfig" (..\OWISoft\Application\system) and "PS90 IPconfig" (..\OWISoft\OWISoftools). "Anybus IPconfig" configures the TCP/IP network settings of an Anybus module (Modbus/TCP). This utility can scan the Ethernet network for connected Anybus products (a control unit with Anybus module). Please note: the settings are lost after a reboot of the control unit. "PS90 IPconfig" configures the TCP/IP network settings of the LAN port or an Anybus module (Modbus/TCP). This utility needs a USB connection for the configuration. Please note: the settings are saved and available after a reboot of the control unit.
- The hardware is built in. The driver is installed. A power supply cable is connected (24V supply for control unit PS 30).

You have two different possibilities to connect a control unit with the application:

1. as a new control unit – **New** menu (**File** tab in the Ribbon) or icon  in the Quick Access Toolbar, or
2. as an existing control unit – load the configuration file for a control unit – **Open** menu (**File** tab in the Ribbon) or icon  in the Quick Access Toolbar (configurable).

Click the **New** menu (**File** tab in the Ribbon or Quick Access Toolbar) to start the setup wizard. The hardware configuration is created by using the integrated hardware configuration wizard automatically in only 3 steps.

Clicking the **Open** menu (**File** tab in the Ribbon or Quick Access Toolbar) opens an existing configuration file, loads settings and connects to the control unit in the background. If you want to check or to change the interface configuration for an existing control unit, select the control unit (the active window). Click the **Control** tab (Ribbon), and then click **Setup** menu in the Interface panel to display the **Interface Setup** dialog box. Here an interface configuration will be defined (serial, USB or Ethernet interface/Com-Server). For the control unit PS 90 one can select an Ethernet interface (LAN port or Modbus/TCP).

For further information see chapter 3.2.

5.3 Configure axes

After connection of the various control units, you have to define the active axes. For each connected control unit a document window (control unit view) will be created in the main frame (area with OWIS® catalogue picture). The position and the size of this window can be changed (see chapter 1.2). After having defined the active axes, this view displays the axis identifiers and the actual positions.

Only one of these document windows can be active at a certain time and also in the foreground. This is being indicated by the highlighted title bar. The control unit is selected (marked) now. You may continue defining the axes and the axis parameters for this control unit. The axes can be configured automatically or manually.

5.3.1 New configuration

Click the **New** menu (**File** tab in the Ribbon or Quick Access Toolbar) to start the setup wizard. The hardware configuration is created by using the integrated hardware configuration wizard automatically in only 3 steps.

For further information see chapter 3.1.

5.3.2 Existing configuration

Clicking the **Wizard mode** menu (Ribbon, **Control** tab) you can open the **Axis configuration** dialog box. In this dialog box an axis configuration is possible for the selected control unit (the active window). Every axis can be prepared for the work (configured) automatically.

For further information see chapter 3.8.

5.3.3 Set stage parameters and output format (optional)

Clicking the **Define positioning unit** menu (Ribbon, **Control** tab) you can open the **Define positioning unit** dialog box.

This dialog box enables you to define the positioning unit for the selected control unit. Additionally, you can define an output format for position and speed values, which will be used for each value output. The parameters will be separately defined for each control unit axis. After the selection the parameters are indicated for the suitable axis (controls are updated).

For further information see chapter 3.9.

5.3.4 Justify power supply (optional)

Clicking the **Justify power supply** menu (Ribbon, **Control** tab) you can open the **Justify power supply** dialog box.

This dialog box displays the parameters and the status of the power supply. The parameters which are grayed out are fix ones coming from the OWIS® database; they cannot be changed and are for information only. Control-relevant parameters can be changed to your special requirements. The power supply is specially defined for each control unit axis. After the selection the configuration is indicated for the suitable axis (controls are updated).

For further information see chapter 3.10.

5.3.5 Set and test axis parameters and limit switch configuration (optional)

Clicking the **Axis parameters** menu (Ribbon, **Control** tab) you can open the **Axis parameters** dialog box.

In this dialog box the specific axis parameters are displayed for the selected control unit (the active window), such as limit switch configurations, positioning speeds and acceleration values, as well as PID feedback control loop parameters or special parameters of the control unit. They will be read out from the control unit. Here you can change and save these parameters in the control unit. The parameters will be separately defined for each control unit axis. After the selection the parameters are indicated for the suitable axis (controls are updated).

For further information see chapter 3.11.

5.4 Working with the software

After having connected the control units, defined the necessary axes and set the desired parameters, the preparatory phase is concluded. To create your first configuration may take a certain time. But once saved, this configuration can be restored, changed, etc. Now you can dedicate yourself to your daily tasks. You can use two work areas and commands of the ribbon.

5.4.1 Ribbon

Customize user interface, show help (tab bar)

Clicking the **Sprache / Language** menu you can switch between the interface languages German and English.

Clicking the **Style** menu you can choose one of the visual style themes.

Clicking the **Clone** menu you can open another OWISoft window.

Clicking the **OWISoft help** menu you can show the directory of available help subjects (index of topics).

Define program database

Clicking the **Options** menu (**File** tab) you can open the **Options** dialog box. In this dialog box (**General** tab) you can define the OWIS® database (file "owis_XXXX.mdb") and to the customer database (file "owis_custom.mdb") for the application.

Hardware diagnostics (**Control** tab)

Click the **Info** menu to display a short summary of the information regarding the selected control unit.

Clicking the **Axis state** menu you can open the **Axis state** dialog box. In this dialog box the state information for an axis and its power amplifier are displayed for the selected control unit.

Clicking the **Hardware reset** menu you can reset a selected control unit to its initial state.

Click the **Logging (short protocol)** menu to activate the logging (short version) of the interface communication for the selected control unit.

Click the **Logging (long protocol)** menu to activate the logging (long version) of the interface communication for the selected control unit.

Click the **Disable logging** menu to deactivate the logging of the interface communication for the selected control unit.

Click the **Show communication** menu to show interface communication for the selected control unit in the output window (2 – direct commands).

Start, stop axes (**Home** tab)

Clicking the **Stop All** menu you can stop the movement of all axes, break chain execution, program execution and execution of a script file.

Clicking the **Stop selection** menu you can stop the movement of the axes (selection), the calibration and the travel measurement. The axes belong to the selected control unit.

Clicking the **Stop axis** menu you can stop the movement of an axis, the calibration and the travel measurement. Here you can start relative or absolute positioning to the defined positions. The axes can be driven to home positions (absolute positioning). You can start the calibration or the measurement of the stage travel. All these operations are valid for the selected axes only. You can confirm the axis selection automatically or manually.

Joystick mode (**Control** tab)

Click the **Joystick on** menu to switch the joystick mode for the selected control unit on.

Click the **Joystick off** menu to switch the joystick mode for the selected control unit off.

Clicking the **Setup** menu you can open the **Joystick control** dialog box. Using this dialog box you can change the joystick configuration for the selected control unit.

For further information see chapter 2.1.

5.4.2 Chain

Using the **Chain** docking window (work area), you can define and execute simple movements (coordinate table). It enables to define and drive any coordinate sequences for all axes. Additionally, you can read positions using the joystick (so-called "teach-in") and save them as table values. You have the possibility to determine the chain positions for the positioning and to execute them automatically. The software halts at every position

for the defined time or waits until function is done. If a table cell is not selected (check box not checked), this cell is ignored when executing the coordinate table.

Several functions for editing and navigating in the table are available. You can search and replace the number in the table. You can also select (mark) more than one cell using the keyboard or the mouse. To edit the marked table selection, the pop-up menu is defined. It can be used for data import from an Excel file.

The export and import functions are also available. You can save or load chain configuration (OWC) or data in CSV format (CSV,TXT).

For further information please see chapter 4.1.

5.4.3 Program

The **Program** docking window (work area) enables you to define complex movements, to store them as a program script into a script file and execute them later. Thus, loops and even computations are possible to a certain extent. With the program script you can extend possibilities of the application and automate certain sequences. A small universal (applicable for all control unit types) script language is used. The script is created, changed and tested in a code editor. The script language consists of 49 commands. Short command descriptions are to be found in chapter 4.3.2.

If the program script has been generated, you can test (syntax check) or execute it.

The export and import functions are also available. You can save or load program script (OWP,TXT).

For further information please see chapter 4.3.


5.4.4 Communication with the control unit (Properties window)


The **Direct commands** category enables the input of direct commands, in accordance with the respective control unit manual to test purposes. It is possible to communicate directly with a control unit. The commands used for the corresponding control unit are described in the control unit's command reference. Please note that a read command begins with a question mark.

Click the **Direct commands** command in the toolbar to send the defined string to the selected control unit. The interface communication is shown in the output window (2 – direct commands).

For further information see chapter 4.4.1.


5.5 Save a control unit configuration

Click the **Save** menu (**File** tab in the Ribbon) or icon  in the Quick Access Toolbar to save the settings of the active control unit.

Click the **Save as** menu (**File** tab in the Ribbon) or icon  in the Quick Access Toolbar to save the settings of the active control unit with a new name.

If the control unit view is closed, the connection will be closed, control unit axes stopped, and the interface closed. If desired, the parameters and the values of the interface configuration can be stored into the configuration file.

5.6 Close the application window

Clicking the **Exit** menu (**File** tab in the Ribbon) or the icon  in the title bar you can quit the program. You will be prompted to save the configuration files.

Appendix

PS 90 error handling

1. Initialization error.

1.1 Function PS90_Connect.

The returned value is the error code.

- 0 – no error
- 1 – function error (invalid parameters)

COM interface

- 3 – invalid serial port (port is not found)
- 4 – access denied (port is busy)
- 5 – no response from control unit (check cable, connection or reset control unit)

NET interface

- 8 – no connection to Modbus/TCP
- 9 – no connection to TCP/IP socket

1.2 Function PS90_SimpleConnect.

The returned value is the error code.

- 0 – no error
- 1 – function error (invalid parameters)

COM interface

- 5 – no response from control unit (check cable, connection or reset control unit)
- 7 – control unit with the specified serial number is not found

NET interface

- 9 – no connection to TCP/IP socket

2. Function error (all other functions).

With the write functions (PS90_Set...) the error code is defined as return value.

With the read functions (PS90_Get...) the error code is stored as a variable. You can read the variable value with the function PS90_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

- 0 – no error
- 1 – function error (invalid parameters)
- 2 – communication error (communication control unit <--> PC)
- 3 – syntax error (control unit)
- 4 – axis in wrong state (control unit)

Function PS90_GetOWISidData (read OWISid data)

- 9 – error, OWISid is not found
- 10 – error, OWISid parameter is empty (not defined)

PS 30 error handling

1. Initialization error.

1.1 Function PS30_Connect.

The returned value is the error code.

- 0 – no error
- 1 – function error (invalid parameters)

COM interface

- 3 – invalid serial port (port is not found)
- 4 – access denied (port is busy)
- 5 – no response from control unit (check cable, connection or reset control unit)

NET interface

- 9 – no connection to TCP/IP socket

1.2 Function PS30_SimpleConnect.

The returned value is the error code.

- 0 – no error
- 1 – function error (invalid parameters)

COM interface

- 5 – no response from control unit (check cable, connection or reset control unit)
- 7 – control unit with the specified serial number is not found

NET interface

- 9 – no connection to TCP/IP socket

2. Function error (all other functions).

With the write functions (PS30_Set...) the error code is defined as return value.

With the read functions (PS30_Get...) the error code is stored as a variable. You can read the variable value with the function PS30_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

- 0 – no error
- 1 – function error (invalid parameters)
- 2 – communication error (communication control unit <--> PC)
- 3 – syntax error (control unit)
- 4 – axis in wrong state (control unit)

Function PS30_GetOWISidData (read OWISid data)

- 9 – error, OWISid is not found
- 10 – error, OWISid parameter is empty (not defined)

PS 35 error handling

1. Initialization error.

1.1 Function PS35_Connect.

The returned value is the error code.

- 0 – no error
- 1 – function error (invalid parameters)

COM interface

- 3 – invalid serial port (port is not found)
- 4 – access denied (port is busy)
- 5 – no response from control unit (check cable, connection or reset control unit)

NET interface

- 9 – no connection to TCP/IP socket

1.2 Function PS35_SimpleConnect.

The returned value is the error code.

- 0 – no error
- 1 – function error (invalid parameters)

COM interface

- 5 – no response from control unit (check cable, connection or reset control unit)
- 7 – control unit with the specified serial number is not found

NET interface

- 9 – no connection to TCP/IP socket

2. Function error (all other functions).

With the write functions (PS35_Set...) the error code is defined as return value.

With the read functions (PS35_Get...) the error code is stored as a variable. You can read the variable value with the function PS35_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

- 0 – no error
- 1 – function error (invalid parameters)
- 2 – communication error (communication control unit <--> PC)
- 3 – syntax error (control unit)
- 4 – axis in wrong state (control unit)

Function PS35_GetOWISidData (read OWISid data)

- 9 – error, OWISid is not found
- 10 – error, OWISid parameter is empty (not defined)

PS 10 error handling

1. Initialization error.

1.1 Function PS10_Connect.

The returned value is the error code.

- 0 – no error
- 1 – function error (invalid parameters)

COM interface

- 3 – invalid serial port (port is not found)
- 4 – access denied (port is busy)
- 5 – no response from control unit (check cable, connection or reset control unit)

NET interface

- 9 – no connection to TCP/IP socket

1.2 Function PS10_SimpleConnect.

The returned value is the error code.

- 0 – no error
- 1 – function error (invalid parameters)

COM interface

- 5 – no response from control unit (check cable, connection or reset control unit)
- 7 – control unit with the specified serial number is not found

NET interface

- 9 – no connection to TCP/IP socket

2. Function error (all other functions).

With the write functions (PS10_Set...) the error code is defined as return value.

With the read functions (PS10_Get...) the error code is stored as a variable. You can read the variable value with the function PS10_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

- 0 – no error
- 1 – function error (invalid parameters)
- 2 – communication error (communication control unit <--> PC)
- 3 – syntax error (control unit)
- 4 – axis in wrong state (control unit)

Function PS10_GetOWISidData (read OWISid data)

- 9 – error, OWISid is not found
- 10 – error, OWISid parameter is empty (not defined)

Figures

Figure 1. Starting the application

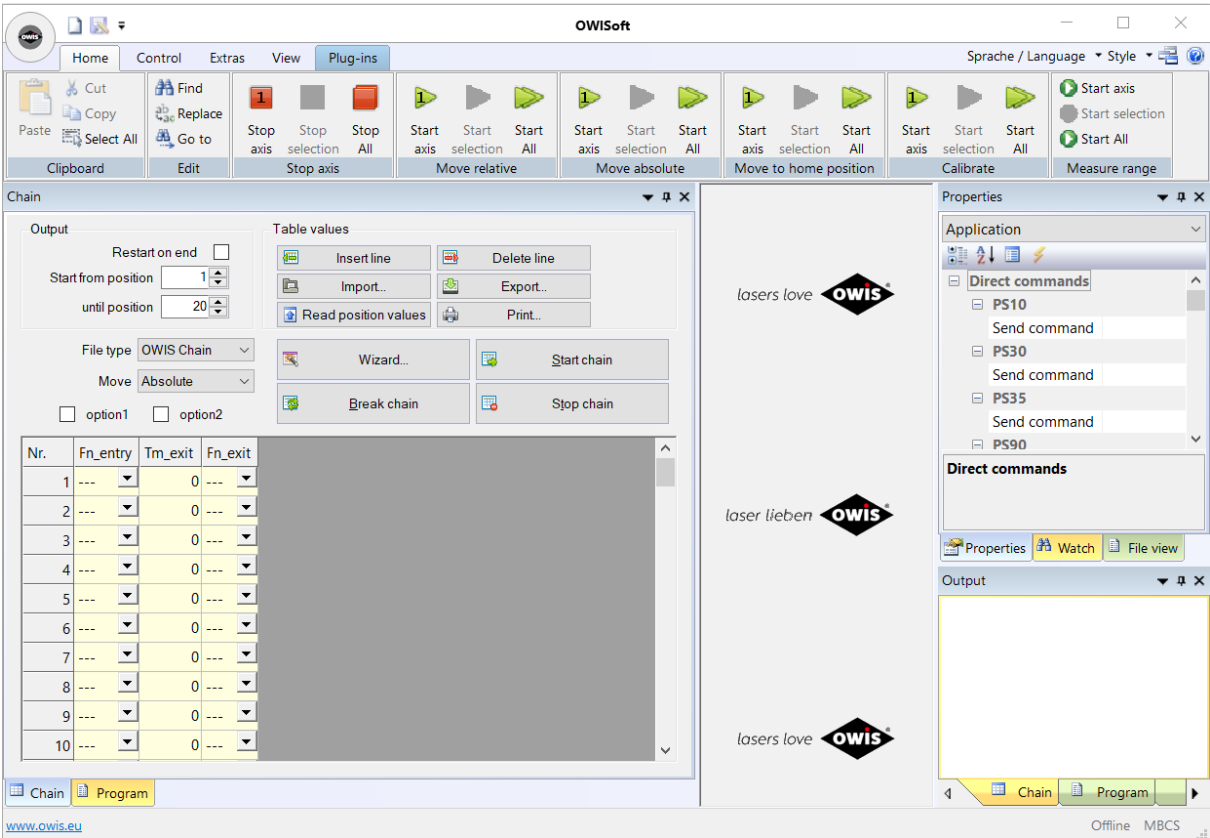


Figure 2. Chain work area

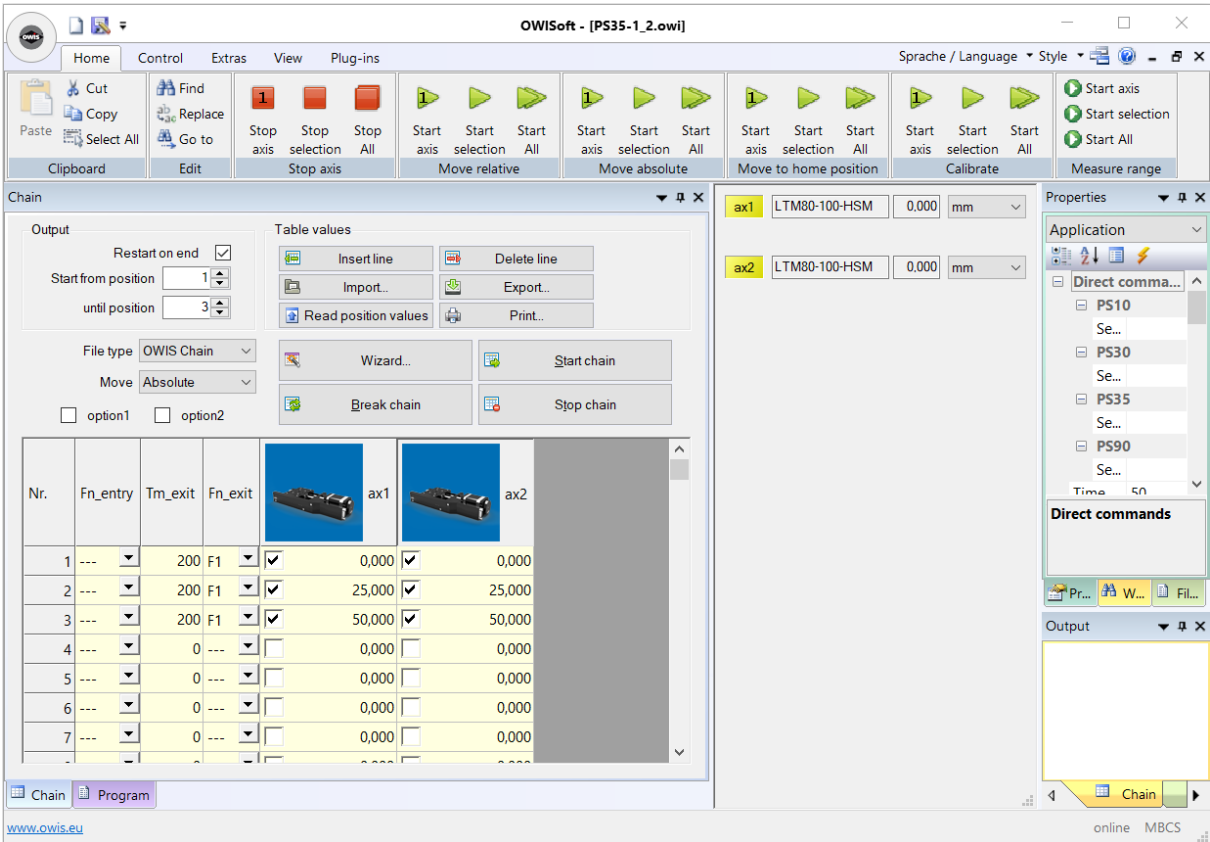


Figure 3. Program work area

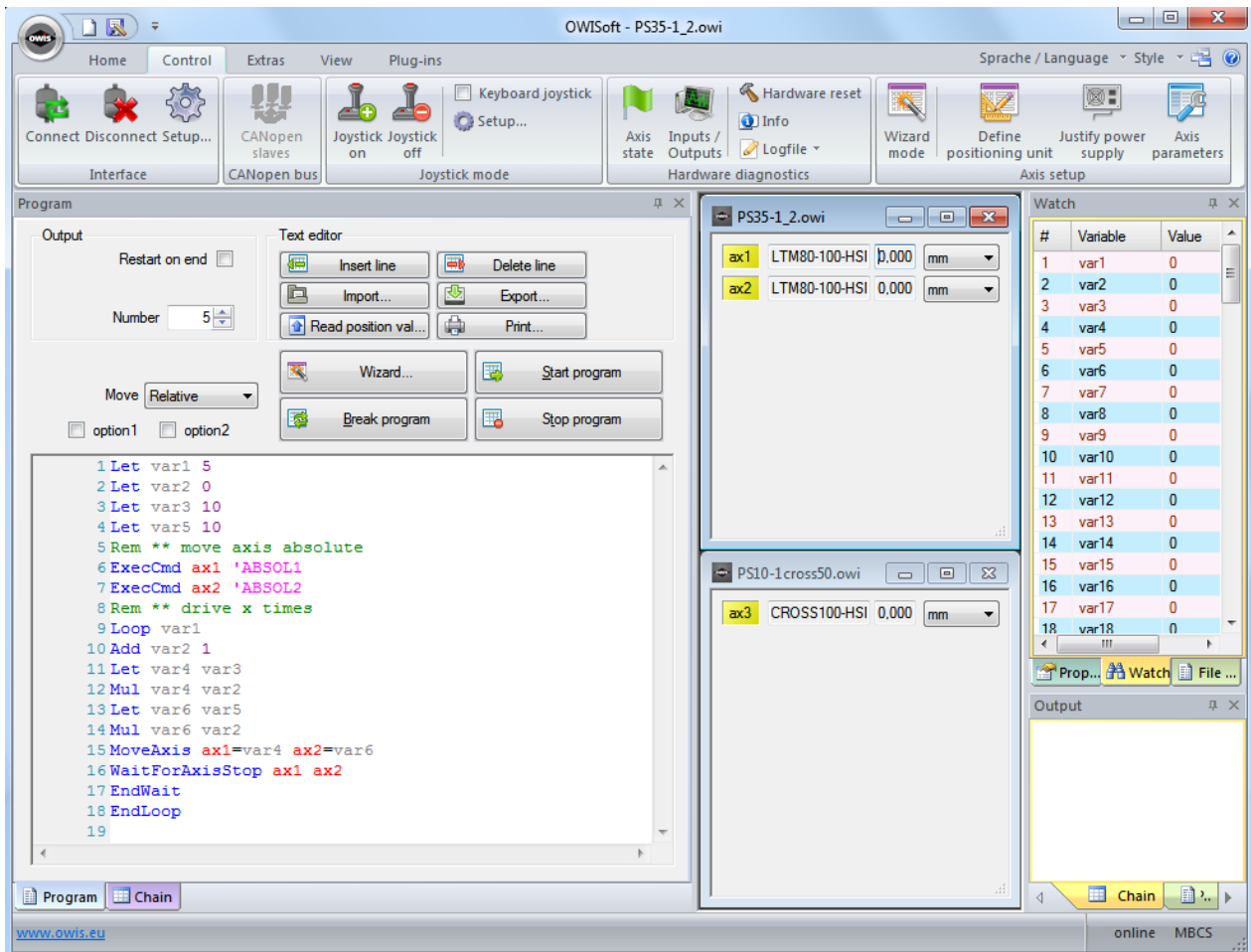


Figure 4. Program work area (program script is executed)

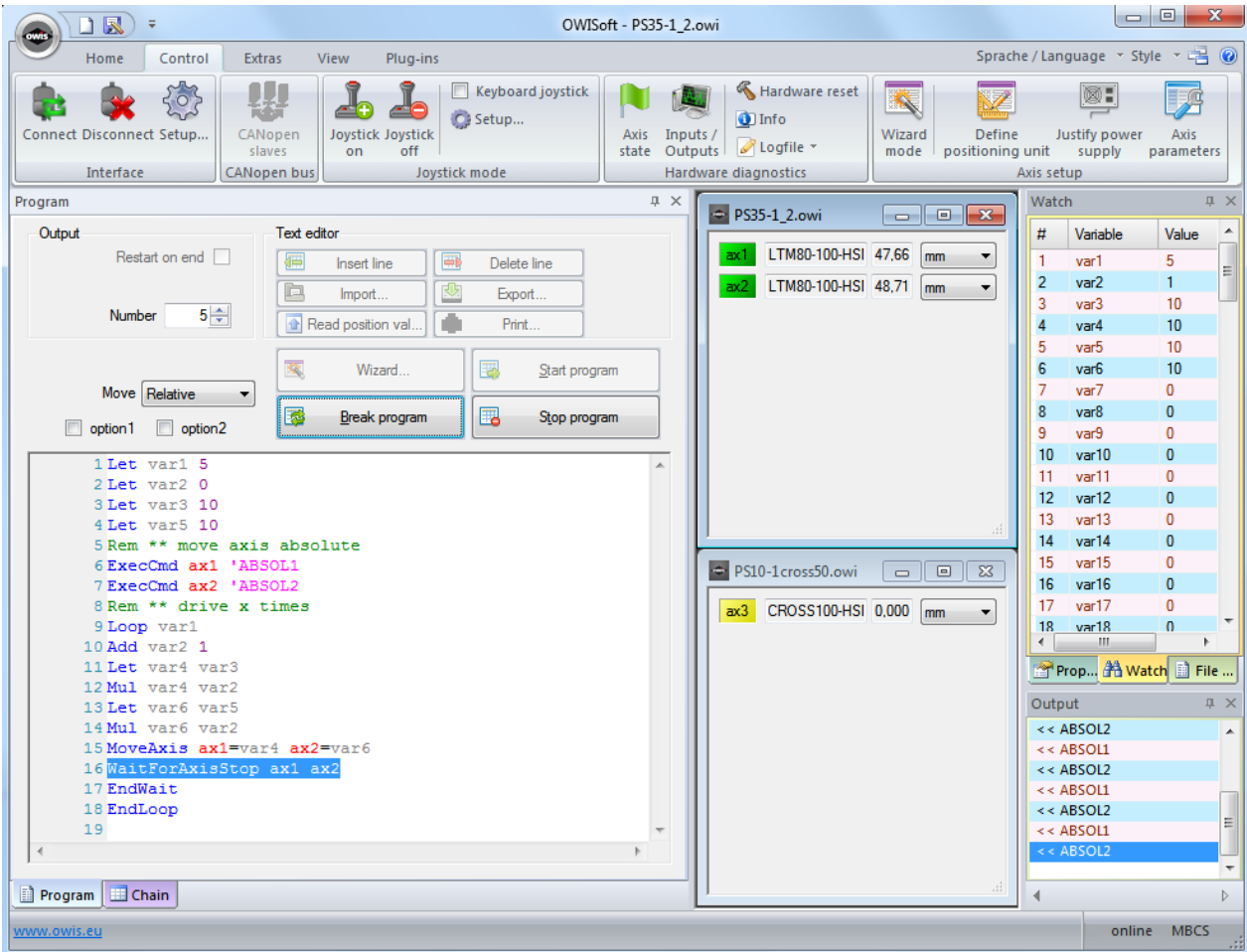


Figure 5. Direct commands (properties window)

