Win-Commander

Version 4.0

Contents

Introduction

The comfortable user-program Win-Commander in combination with WINDOWS facilitates the application of the positioning-systems MCL and LSTEP. The necessary pre-adjustments (spindle-leads, positioning values, accelerations, feed rates, etc.) may be entered via menus in SI-units and then transferred to the respective control units. The complete command set for the positioning systems is available via mouseclick.

In addition, easy design, administration, and execution of complex movement procedures (chains, meanders) are made possible.

Equipment:

- Menu guided set up of all control parameters (axis acceleration, axis speed, spindle lead, idle state current etc).
- Complete command set for positioning systems MCL and LSTEP.
- Clearly arranged user-desktop with constant monitoring of the actual control situation.
- Automatic generation of meander data sets with adjustable step widths.
- Comfortable teach-in function: driving to selected positions via joystick. Acceptation of these position data into complex movement procedures.
- Saving of established movement procedures as data sets.
- On-line language switch over.

SYSTEM Requirements:

- Pentium
- 16 MB RAM
- Windows 95 / 98 / NT / 2000
- At least 4MB free space on H-disk
- Resolution at least 800x600
- RS232 interface

Full-Version:

In addition every positioning-system is delivered with a demo-version of Win-Commander. The demo-version contains all functions of the full-version except the storing and loading capabilities for meanders, chains and programs. The demo-version may easily be expanded to a full version.

1 Description of the User Desktop

This chapter describes the user desktop of Win-Commander and its elements. The layout of the user desktop, and how to input data are explained. Since Win-Commander is a Windows-based program, the user will soon be in a position to apply and understand the functions of Win-Commander.

1.1   Elements of the User Desktop

After Win-Commander has been started, the user desktop will be displayed as shown.
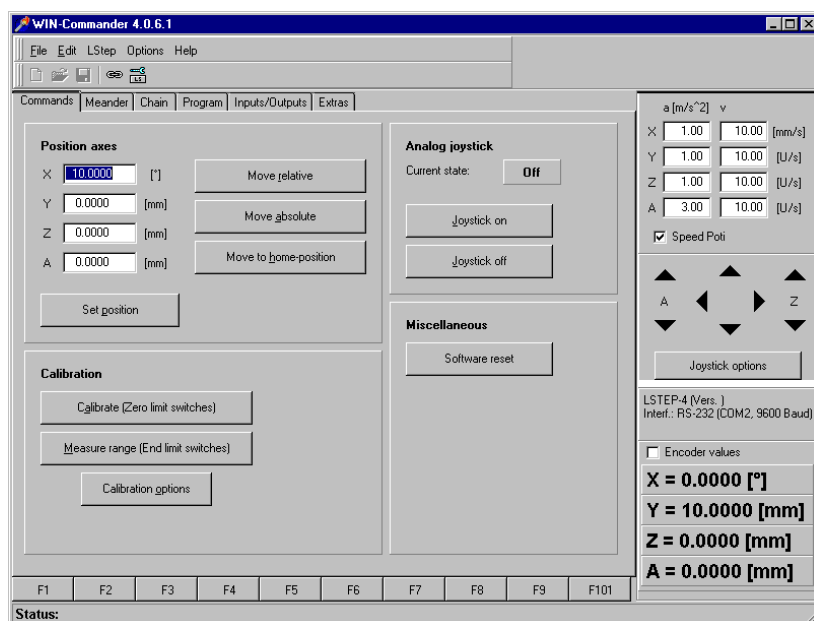
Fig.: The user desktop

1.1.1 The Title Bar

The title bar contains the program name and version-number and provides the window-specific functions to enlarge, reduce, shift, or close the program.

Fig.: The title bar

1.1.2 The Menu Bar

The menu bar provides terms like 'File', 'Edit', 'LStep', 'Options', and 'Help'. A 'mouseclick' on anyone of these terms will open a command menu.
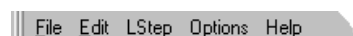
Fig.: The menu bar

1.1.2.1 Menu: File

The file operations „*New...*", „*Open...*", „*Save*" and „*Save as...*" are available under the tabs „*Chain*" and „*Program*". The „*Meander*" tab allows you to save meanders or to open existing meanders.
The menu item „*Exit*" ends the Win-Commander.

```
File  Edit  LStep  Opt.
 New...
 Open...      Strg+O
 Save         Strg+S
 Save as...

 Exit
```
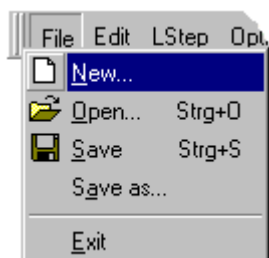
Fig.: The menu „File"

1.1.2.2 Menu: Edit

The „*Edit*" menu provides functions for cutting, copying, pasting and deleting values in input fields. The value in question must first be marked. These functions can also be peformed by pressing the key combinations which appear in the menu at the right of the entry. It is also possible to "undo" an operation.

```
File  Edit  LStep  Options  He.
  Undo      Strg+Z
  Cut       Strg+X
  Copy      Strg+C
  Paste     Strg+V
  Delete    Strg+Entf
```
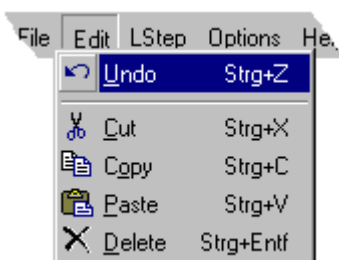
Fig.: The menu „Edit"

1.1.2.3 Menu: LStep

The „*LStep*" menu offers a number options for configuring Win-Commander. The individual menu items are described in Chapter 2.
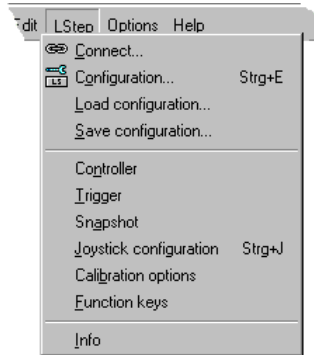
1.1.2.4 Menu: Options

A mouseclick on the menu item '*Language*' opens a selection of the languages supported by Win-Commander; either English, German, or French.
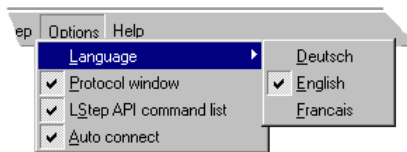
The menu item „*Protocol window*" opens a window in which the communication with the control unit is displayed online.
The menu item „*LStep API command list*" opens a window in which the processed API commands are displayed online.
Both windows have a button for deleting the contents and a button for saving the contents as a text file. This kind of file may be useful for localizing a problem if a fault occurs.
By activating the menu item „*Auto connect*", connection to the control unit takes place automatically, every time WinCommander is started.
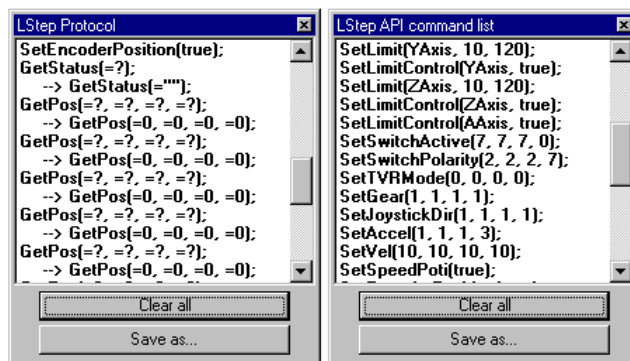
1.1.2.5 Enter Unlock Code

A demo-version of WinCommander is supplied with every control unit. If you purchase the full version, you will be given an unlock or authorization code. When you click on the menu item „Enter unlock code..." a window with three input fields opens. Enter the three-part unlock code here and confirm your entry by clicking the „OK"button.

Fig.: The menu „Help"
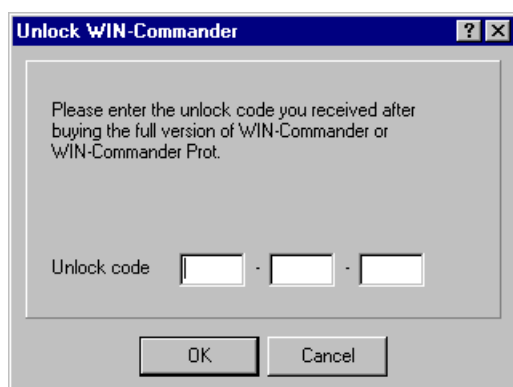
Fig.: The „Unlock Win-Commander" window

1.1.3 Tab Panels

The tab panels „Commands", „ Meander", „Chain", „Program", „Inputs/Outputs" and „Extras" contain all necessary commands and functions to safely move a coordinate table. These tab panels are designed in the format of index cards. Only one menu, or panel, is opened at a time for inputting or editing data. Only the tabs of the other three panels are displayed. A left mouseclick on any one of the tabs opens the respective tab panel. The tab panels are described in Chapter 3 through 8.
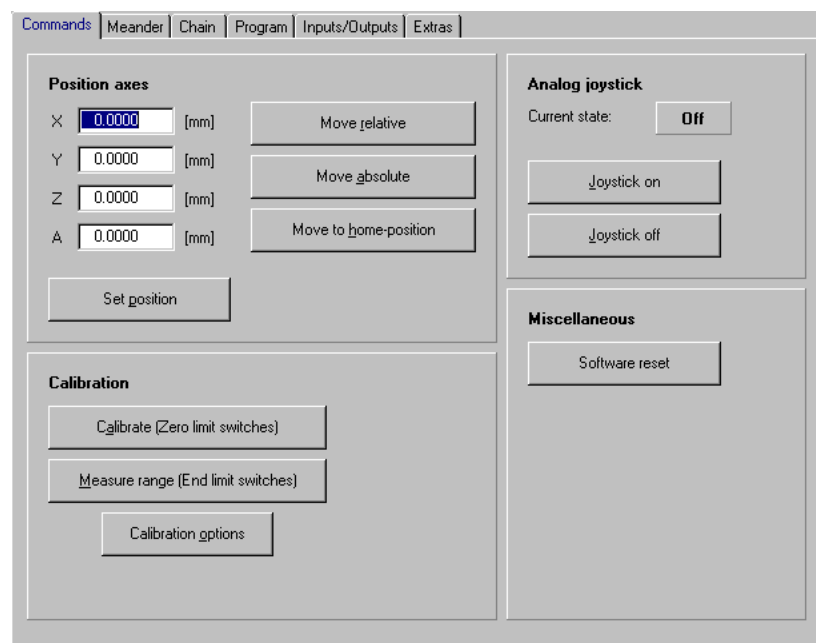
Fig.: The Tab Panels

1.1.4 Function keys

The keys F1-F10 can be found under the tab panels. The functions allocated to, and the names given to these keys can be customized.

Fig.: Function keys

1.1.4.1   Customizing The Function Keys

Select the „*Function keys*" item in the „*LStep*" menu. A window opens displaying a set of tab panels. Select the required function key by clicking on the appropriate tab. Activate the option field „*Set speed*", if the key is to be used to change the speed of the axes, or activate the option field „Set step length (Key joystick)", if the key is to be used to change the incrementation of the key joystick. Activate the option field „*Macro*", to input a series of commands into the text field, which are to be executed when the key is pressed.

To give the key its own name, activate the check box „*Name of function key*". You can then write the desired name for the key in the input field. So that your entries are taken over, you must exit the window by clicking the OK button.
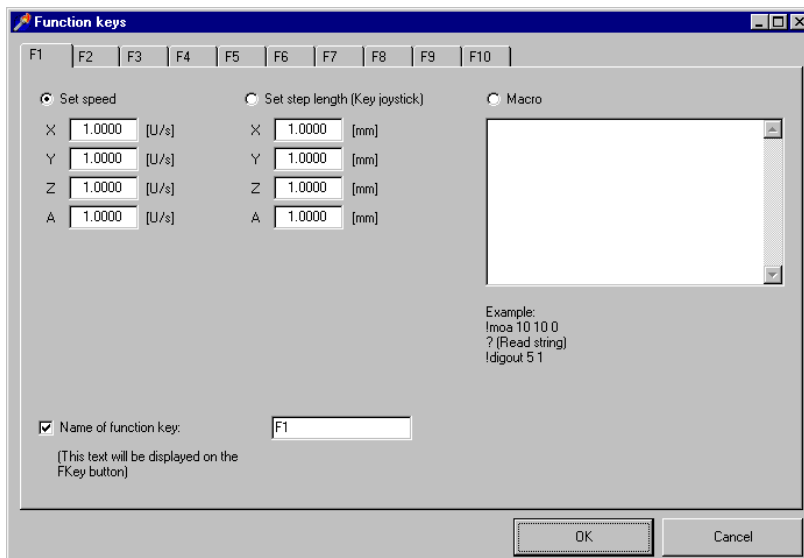
Fig.:Customizing The Function Keys

1.1.5 Display of Acceleration and Speed

At the top right, beside the tab panels there are two columns of input fields which display the current accelerations and speeds for all four axes. You can edit these values. The acceleration is specified in [m/s^2]. The unit of measure for the speed can be selected individually for each axis as either [mm/s] or (r/s) in the „*LSTEP configuration*" window with the „*Advanced options...*" button. The maximum values are laid down for the individual axes by inputting the maximum acceleration and the maximum speed in the tab panels of the window „*LSTEP configuration*" (see Chapter 2.2.9).

If the check box „*Speed Poti*" is activated, the speed of the motors can be regulated with the „Speed" potentiometer (for control units with a display and ECO-STEP only).
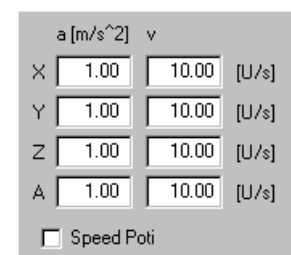
Fig.: The Speed Display

1.1.6 Joystick

The joystick control field appears under the speed display. The buttons marked with arrows allow you to move the axes by mouse-click.
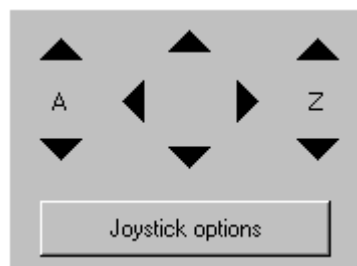
Fig.:Joystick Options

1.1.6.1   Joystick Configuration

The button „*Joystick options*" opens a window in which you can configure the key joystick and the analog joystick. You can also open this window with the item „*Joystick configuration*" in the „*LStep*" menu, or with the key combination Ctrl-J.

In order to move the axes with the on-screen buttons, or with the keys on the numeric pad at the keyboard, the incrementation (step length) for each axis can be set in the left section of the window. If the check box „*Same step length for all axes*" is activated, all axes are set to the value for the X-axis. The check box „*Change direction*" allows you to reverse the preceding sign for the movement. To control the axes from the numeric keypad at the keyboard, you must activate the check box „*Key joystick on NumPad*".

To activate an analog joystick, the check box „*Joystick is connected*" must be activated. If the check box „*Position count*" is activated, the position display is updated when the axes are moved with the joystick.

Below that, there is a matrix with check boxes which are used to make settings for the individual axes. In the column „*Change direction*", you can reverse the preceding sign for the respective axis. The column „*Lock axis*" enables you to lock individual axes, thus preventing accidental movement of that particular axis The column „*Red. current*" determines whether the motor current is to be reduced to idling current when the axis is not being moved.
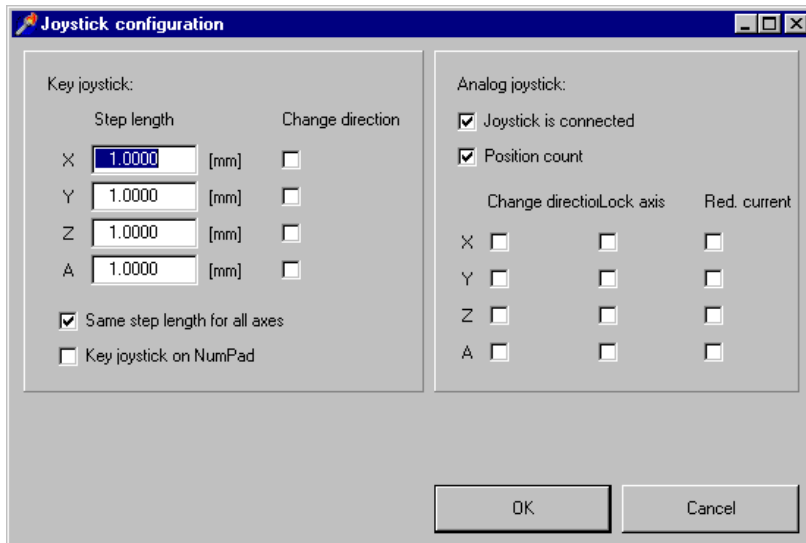
Fig.: Joystick configuration

1.1.7 Control Unit Version

The version and the interface port of the connected control unit is shwon below the joystick fields.

Fig.:Version

1.1.8 Coordinate Display

The coordinate display for the four axes is located behind the tab panels. These values are referred to the zero position (absolute) and always show the current position of the coordinate table. The unit of measure can be selected in the window „*LStep configuration*" in the combo field (i.e. drop down list box) „*Dimension*". The number of digits after the decimal point can be changed in the „*Options*" window by clicking the button „*Advanced options...*". If the check box „*Encoder values*" is activated, when measuring systems are connected, the encoder position is displayed. If this check box is not activated, the set position (rated position) is shown.
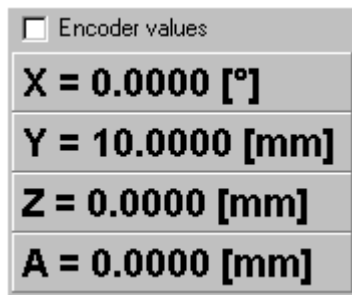
Fig.: The Coordinate Display

Note   *If a 3-axis control unit is connected, only the values of X-, Y- and Z-axes will be displayed.*

1.1.9 The Status Bar

A status bar is provided at the bottom of the user desktop screen. The status of the control unit is displayed here. As soon as the coordinate table has been positioned and Win-Commander is ready to accept and execute commands, "Status OK...' will be displayed.

Fig.: The Status Bar

1.2 Use of Mouse and Keyboard

The user desktop is designed in such a manner that all functions may be executed safely and quickly using the mouse. In some cases the keyboard is needed for input functions.

1.2.1 Buttons , Tab Panels and Menu Bar

All buttons, the six tab panels, and the menu bar can be activated with only one mouseclick.

1.2.2 Edit boxes

There are four different kinds of edit boxes available for Win-Commander which allow inputs to be made and parameters to be changed.

1.2.3 Input Field As A Combo Box (drop-down list box)

On the right hand side of these edit boxes a rectangular button is provided. If you click on this button with the mouse, a list will be opened which presents a selection of set-ups for Win-Commander which may be activated with another mouseclick. The menu will then be closed and the selection will be displayed in the edit box.
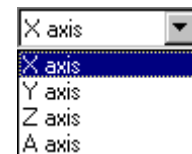
Figs.: The Combo box

1.2.4 Input Fields With „Up and Down" Buttons

These edit boxes are provided with an *'Arrow up'* and an *'Arrow down'* button at their right margins. These buttons are arranged one above the other. To increase or decrease the values in the input fields step by step, click on the *arrow up* or *arrow down* key accordingly. If you click and hold down the mouse button, the respective value will be reduced or increased continuously until you release the mouse button again. Alternatively, you can simply input the required values at the keyboard.
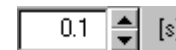
Fig.: The edit box

1.2.5 Option Buttons and Check Boxes

For simple O*N/OFF, YES/NO,* or *A* or *B* decisions Win-Commander is equipped with check boxes which are activated by mouseclick. A multiple selection is possible with the check boxes, but if settings exclude each other, the option buttons are used. Clicking on a check box reverses the current state (ON/OFF) of the check box. Clicking on a option button activates only the selected option. All the other option buttons of the same group will be inactive.
An active option button is marked with a dot and an active check box is marked with a check mark.

Fig.: The check box

Fig.: The option button

1.2.6 Edit Boxes for Numerical Values

Numerical values may be entered into these fields on the keyboard. The respective edit box must be activated by mouseclick. The background of the numerical value will then appear highlighted with a colored background. A new value may now be entered on the keyboard, the old value will be deleted. Alternatively, move the cursor until it is positioned immediately after the number or value which is to be replaced and click the mouse. Now press the '*Backspace*' key to delete the digit before the cursor and then enter the new digit.
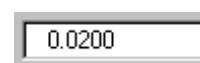
Fig.: The edit box for numerical values

Note

The complete user desktop can be controlled exclusively with the keyboard. This method however, is not advisable since this kind of usage is troublesome and difficult. Nevertheless, a short guide on how to use the keyboard only is given below.
Every command, menu, and edit box may be activated by pressing the 'Alt' key simultaneously with the underlined character (alpha- and numerical) of the respective command-, menu-, or edit box -name. Alternatively, any position within a menu may be selected by pressing the 'Tab' key. The selected function will be indicated by a dotted frame. Commands are executed by pressing the 'Space' bar.
Edit boxes are also marked by pressing the 'Space' bar. New values may be entered directly into the selected input fields.

2 Menu "LStep"

2.1 Connect

If you have activated the function „*Auto connect*" in the „*Options*"menu, connecting is done automatically when you call in the program. If the automatic connection feature has not been activated, the „*Connect*" window can be opened with the menu item „*Connect*" in the „LStep" menu, or with the 🔗 button. Here, you make the required settings for the connection. Click on the „*Connect*" button with the mouse to establish the connection.
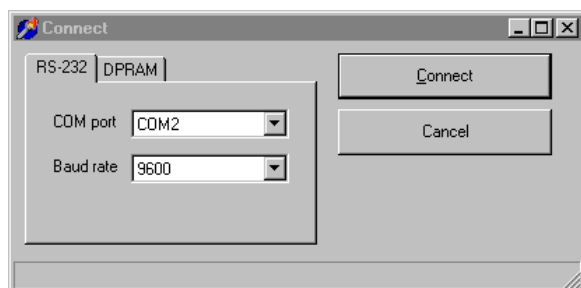
Fig.: The window „Connect"

2.1.1 RS232 Interfaces

The RS232 tab panel provides two combo boxes (drop down list boxes). The upper combo box is used for selection by mouseclick of one of the four RS232 interfaces of the PC to which the control unit is connected. The data transmission rate, or so-called Baud rate is set in the bottom of the two combo boxes. The standard Baud rate set here is 9600 Baud.

2.1.2 DPRAM

In the combo box of the tab panel „DPRAM" the I/O-Port address is adapted to the I/O-Port address of the control LSTEP PC.
The address must be received under DPRAM.The control LSTEP PC is a ISA-slot card, with a I/O-Port address that is set up via jumpers. It is important to ensure, that addresses of existing slot cards in the computer is not used.
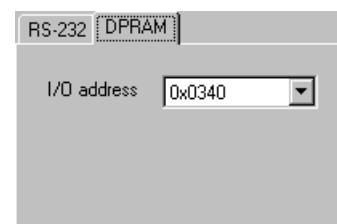
Fig.: The Tab panel „DPRAM"

2.2 Configuration

The „LSTEP configuration"window can be opened with the menu
item „*Configuration*" in the „LStep" menu, or by pressing the [icon]
button on the toolbar. General settings are made here for fine tuning
the drives and the coordinate table. The „*LSTEP configuration*"
window has a four tab panels. There is one panel each for
configuring the X-, Y-, Z- and A-axis. As the panels are all the same,
the parameters are explained below using the X-axis as an example.
There are two buttons in the top left corner of the tab panel, for
selecting the type of drive.

If driving is done by motor and spindle, the button „*Spindle*" must
be be activated. The tab panel then looks like this:
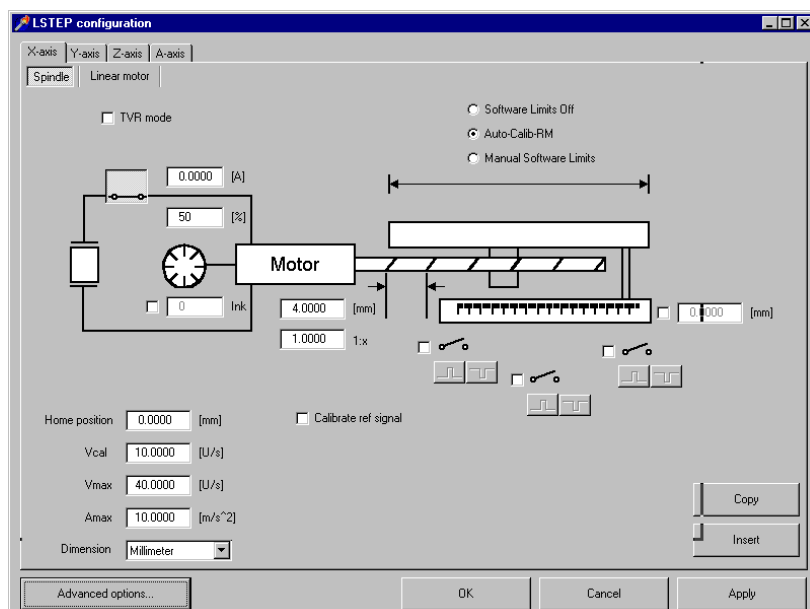
Fig.: The Tab Panel „Configuration Spindle"

If the drive has a linear motor, the button „Linear motor" must be activated. The tab panel then looks like this:
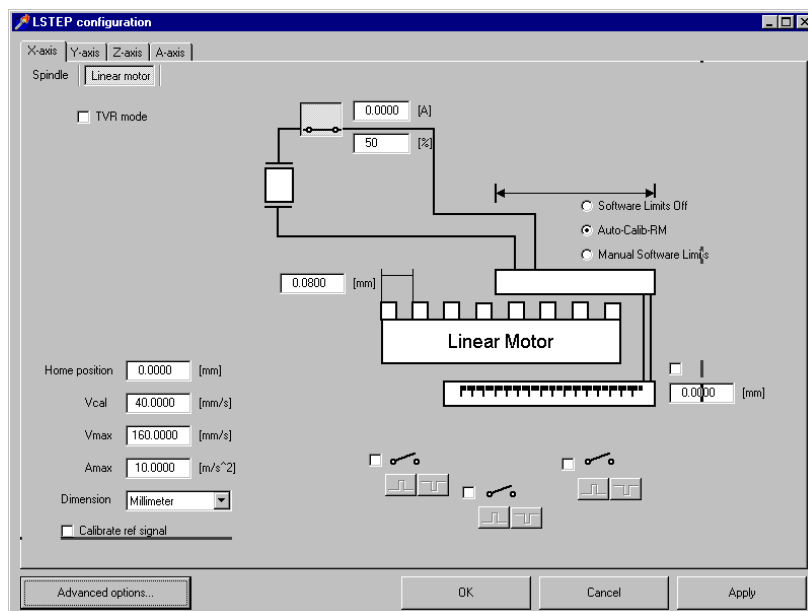
Fig.:The Tab Panel „Configuration Linear motor"

The two tab panels differ only slightly.
- For linear motor, there is no field for inputting the rotary encoder pitch and no field for inputting the gear factor.
- Instead of the input field for the spindle pitch, the linear motor has the input field „tooth pitch".

When the parameters have been input for all axes, click the "Apply" button to transmit the settings to the control unit. The „LSTEP configuration" window remains open and settings can be edited if necessary. The settings can also be transmitted to the control unit by clicking on the „OK" button. In this case however, the window is then closed.

2.2.1 Activate / Deactivate Axis

The button "Axis active/inactive" is integrated in the diagram of the drive. The axis is activated or deactived by clicking on this button with the mouse. If the button is depressed, the circuit is shown as closed in the diagram and the axis is active.

Fig.: The button „Axis activ/inactiv"

2.2.2 Motor Current

Text boxes to adjust the motor current: The unit of measure is ampere. Maximum 1.25 [A], 2.5[A], 3.75[A], 5[A], depending on the type of control unit used.

2.2.3 Current Reduction

The motor current may be reduced when the coordinate table is in idle state (table is stationary) to avoid unnecessary heating up of the motors. The value is input in the '*current reduction*' box as a percentage of the rated current. If a value of 50 is entered, the current is cut in half during the idle state.

Fig.: The text boxes „Motor current" and „Reduction"

Note

Due to the current reduction the available motor torque is also reduced. The position of the table may change slightly in this case.

2.2.4 Increments (Encoder)

To detect or to avoid a step offset, the axis may be equipped with an incremental rotary or linear encoder system. There is one input each for the rotary encoder and for the linear encoder. To set up the encoder system, the check box in front of the input field *„Increments (Encoder)"* or. *„Encoder period (Linear encoder))"* must be activated accordingly. The number of pitches or the encoder period are then input into the input field. Only one encoder system can be activated at any one time.

Fig.: The text box „Increments (Encoder)"

Fig.: The text box „Encoder period (Linear encoder)"

2.2.5 Pitch

To adapt the respective axis of the coordinate table to WinCommander, the spindle pitch in millimeters and the gear factor must be input into the input fields below the diagram of the motor.
If a linear motor is used, there is only one input field for inputting the tooth pitch of the motor.
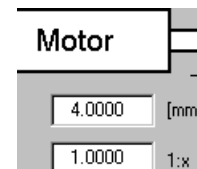
Fig.: The text boxes „Pitch" and "Gear factor"

2.2.6 Limit Switches

Limit switches can be activated or deactivated here. The polarities for the limit switches can also be set here.
In addition to the two limit switches, a reference switch can also be set up. The reference switch is not a definitely predefined switch, it is a switch which the operator can use at his own discretion. Below the diagram, there is a check box next to a switch symbol for setting each of the three switches and below that, there are two buttons. The check box is used to activate the respective limit switch. If the box is checked, the limit switch is active. The two buttons are used to define whether the limit switch is *„High- or Low-active"*.

Fig.: The controls for setting up the limit switches

2.2.7 Software Limits

The software limit switches allow you to limit the range of travel of the axis. To define software limits, activate the option field „*Manual Software Limits*". Two more input fields are then available for inputting the limit switch positions. The unit of measure depends on what has been set in the „*Dimension*" field The software limits defined here are not available if the option „*Auto-Calib-RM*" has been activated, or if these limit switches have been switched off with the option „Software Limits Off".
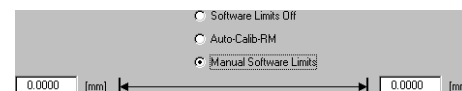
Fig.: The input fields for the software limits

2.2.8 Auto-Calib-RM

If the option „*Auto-Calib-RM*" is activated, the total stroke is measured and the limit switch position is taken over as the software limit.

2.2.9 Other Settings

Home Position
A standby or idling position can be input in the input field „*Home-position*". WinCommander moves the axis to this position every time the button "*Move to home position*" is clicked on "Commands" tab panel.

Calibration Speed
The speed at which the axis is travelled for calibration and stroke measurement purposes can be input in the input field „V_{cal}".

Maximum Speed
The maximum speed at which the axis can be travelled for positioning purposes is input in the field „V_{max}". A greater speed that the maximum speed specified here cannot be input into the relevant input field (see Chapter 1.1.5).

Fig..:The input fields for other settings

Maximum Acceleration
The maximum acceleration of the axis for positioning purposes is input in the field „A_{max}" eingegeben. A greater acceleration than the maximum acceleration specified here cannot be input into the relevant input field (see Chapter 1.1.5).

Dimension
The dimension, i.e. unit of measure, for the axis in question can be selected here. All settings must then be made in the unit of measure which has been activated here.. The position of the axis in question is also displayed in the activated unit of measure.

2.2.10   TVR Mode

With LSTEP control units, TVR mode enables an axis to be controlled manually, parallel to axis movements controlled by the control unit.
Also refer to the LSTEP operating manual.
For TVR-mode, three inputs are provided for each axis at the multi-function port (MFP).

Fig.:Settings for TVR mode

- **Forward-/Backward Input**
  Here, the User must set the signal for the direction of rotation of the motor.

- **Clock pulse input**
  The User must set the clock pulse for the moving operation (one pulse equals one micro step).

- **Start / Stop Input**
  The enabling signal for the clock pulse and the forward/backward input must be applied here.

Note

No acceleration ramps are calculated in TVR-mode. The operator must specify the ramps by means of the clock pulse signals to the motors.

If the check box „*TVR-mode*" is activated, more controls appear and the axis is deactivated. After you deactivate TVR mode, the axis in question must be reactivated manually.
You can choose from four modi which are listed in a combo box (drop down list box). Also refer to the LSTEPmanual.
A pulse is equal to a microstep. If you want to travel several microsteps per pulse, you can specify the number of microsteps by inputting a factor in the input field „*TVR factor*".

Fig.: Combo-box for mode selection

2.2.11   Taking Over Settings For Other Axes

If the settings are identical for several axes, you can copy the entries made for one axis by clicking the „*Copy*" button and paste, i.e. insert them into the tab panel for another axis by clicking the „*Insert*" button.
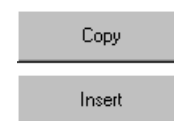
Fig.: Buttons for copying and inserting (pasting)

2.2.12 Advanced options

When you click the button „*Advanced options...*" in the Configuration window, the following window opens:
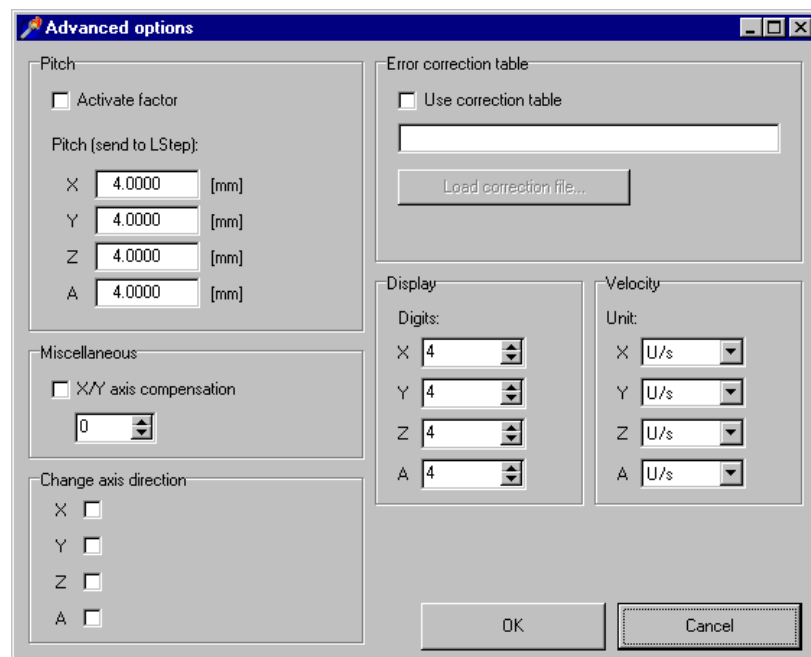
Fig.: The window "Advanced options"

2.2.13 Leadscrew (spindle) pitch

Because the controller of LSTEP control units does not calculate floating decimals, a correction factor must be activated for uneven leadscrew pitch values.

The actual leadscrew pitch is entered in the tab panel „LStep Configuration". If, for example, the actual pitch is 0.9798,. LSTEP can not process this kind of value without producing without receiving rounding errors. To avoid such errors, check the check box „Activate factor". A factor is then calculated program-internally. The position data is then multiplied by this factor. The leadscrew pitch which is input for the respective axis in "*Pitch (send to Lstep)*" is thus transmitted to the controller.

2.2.14 Miscellaneous

If a positioning table is used where the X- and Y-axis cannot be moved independently (e.g. H-drive by synchronous belt), the X/Y-axis compensation check box must be activated.

The mode for the axis in question must be input in the field below that (refer to the LSTEP operating manual).

2.2.15 Change Axis Direction

The direction of rotation of the individual axes can be reversed by activating the appropriate check box.

2.2.16 Correction Table

If correction values were determined and saved in an INI-file, this correction file can be loaded. When the check box „Use correction table" has been activated, the dialog box for loading the correction file can be opened by clicking on the button „Load correction file..." with the mouse.
The correction table must be input into an INI-file manually.

2.2.16.1 Layout Of The Correction Table

The file consists of the sections [Options] and [CorrTbl].
In the [Options] section, axis correction is activated with linear interpolation using the line „CorrectionXY=1". XCount and YCount specify the number of correction values. The parameter XDistance determines the distance between measuring points in a series (X-axis), YDistance is the distance between the series (Y-axis).
The [CorrTbl] section contains the correction values. A corrected position is allocated to each rated or set position (x/y pair of values), whereby the rated (set) positions must always be one of the positions laid down by the XCount, YCount, XDistance and YDistance grid.
The allocations (rated position=corrected position) can take place in any order in the correction table. The only thing of importance is that the rated positions must always be within this grid. The zero position of the correction table is (0 | 0).

Example:

```
[Options]
CorrectionXY=1
XCount=3
YCount=3
XDistance=1.0
YDistance=1.0

[CorrTbl]
0.0 0.0=0.0 0.0
1.0 0.0=1.0 0.0
2.0 0.0=2.0 0.0

0.0 1.0=0.0 1.0
1.0 1.0=0.9 1.1        ←———————  (rated (set) position x=1 y=1,
2.0 1.0=2.0 1.0                   corrected position x=0.9 y=1.1)

0.0 2.0=0.0 2.0
1.0 2.0=1.0 2.0
2.0 2.0=2.0 2.0
```

2.2.17 Display

The number of digits after the decimal point for displaying the position can be set in the „*Display*" box.

2.2.18 Velocity

In the „*Velocity*" box you can select either [mm/s] or [r/s] as the unit of measure for each axis.

2.3   Load Configuration / Save Configuration

The menu item „*Save configuration...*" allows you to save the settings made in the „*LStep configuration*" window in a file. When the menu item is activated, the dialog box „Save file as"opens. Here, you can determine where the file is to be saved (directory path) and allot a name to the file. The file is saved as an INI file.
The menu item „*Load configuration...*" opens the dialog box „*Open*". Here, you can select the required file and load it.

2.4   Controller Settings
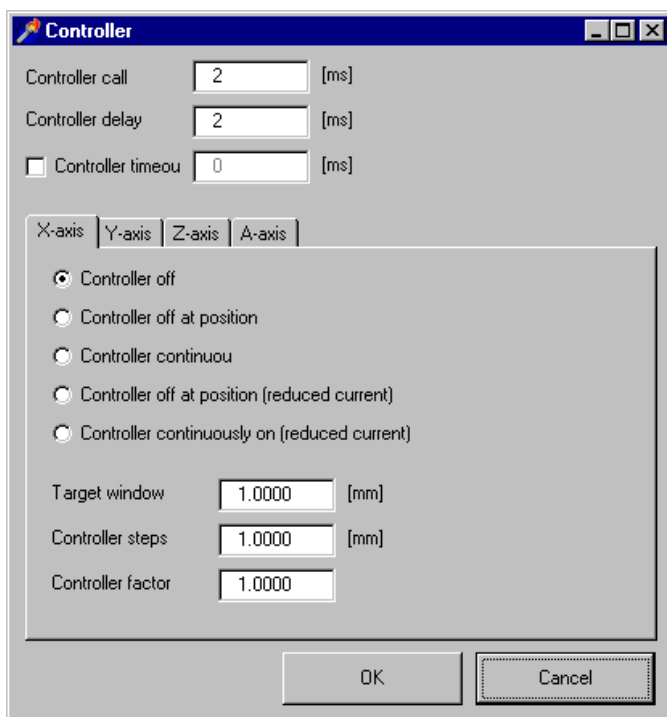
Fig.: The window "Controller"

The time between controller calls is defined in the input field „*Controller call*". Every time the controller is called, a check is made whether the axis is in the target window. To make sure that the axis is in the target window and that the system is not vibrating, a minimum length of time for which the axis must be in the target window is specified This minimum time is laid down in the input field „*Controller delay*". The input field „*Controller Timeout*" remains deactivated until the check box in front of it has been activated. If the system is vibrating and doesn't settle down in the target window within the period of time specified here, the controller is switched off and an error message is given.
The controller mode can be selected for the individual axes on the tab panels.

- **„Controller Off"**
  The position control feature is switched off.
- **„Controller Off at position"**
  When the position has been reached within the target window tolerances, the position control feature is switched off.
- **„Controller continuously on"**
  If, after reaching the position, the coordinate table leaves the target window due to mechanical influences, the controller re-adjusts to find the position again.
- **„Controller off at position (reduced current)"**
  When the position has been reached within the targetwindow tolerances, the position control feature is switched off and the motor current is reduced to idling current.
- **„Controller continuously on (reduced current)"**
  If, after reaching the position, the table leaves the target window due to mechanical influences, readjustment is done immediately at reduced current, to find the position again.

Below the controller mode option fields, there are three input fields for defining the target window and for inputting the parameters needed for calculation purposes. Please refer to the LSTEP operating manual for a full explanation of these parameters and the related formula..

2.5 Trigger

The special output (multi-functional port) of the LSTEP control unit is equipped with a trigger signal, that can be adapted to the existing condition.
See the LSTEP operating manual.
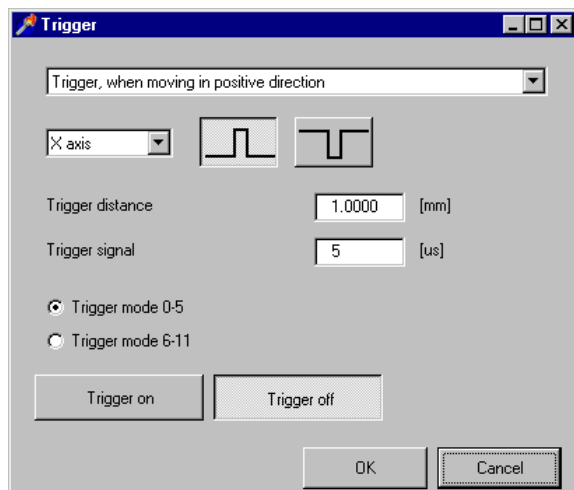
Fig.: The window "Trigger"

2.5.1 Set Direction Of Movement

The trigger mode set up is done by a combo box.

- *Trigger when moving in positive direction*
  The trigger signal is only applied to the trigger output if the coordinate table moves in positive direction.

- *Trigger when moving in positive and negative direction*
  The trigger signal is applied to the trigger output if the coordinate table moves in both positive and negative direction.

- *Trigger when moving in negative direction*
  The trigger signal is only applied to the trigger output if the coordinate table moves in negative direction.

2.5.2 Select trigger axis

The output of the trigger is only done for one axis. The trigger axis is set up by using another combo box.
The trigger signal is applied only in the direction of travel along the axis which is activated here. Depending on the trigger mode which was set, only in positive, only in negative, or in both positive and negative direction.

2.5.3 Polarity

There are two buttons for setting the polarity of the trigger signal, positive or negative.

If positive polarity was selected with the respective button, the basic voltage is 0 volt and the trigger pulse is 5 volts.

If negative polarity was selected with the respective button, the basic voltage is 5 volts and the trigger pulse is 0 volt.

Fig.: The button „Trigger positive"

Fig.: The button „Trigger negative"

2.5.4 „Trigger Distance"

The distance to be travelled by the table between two trigger pulses is input in this field.

2.5.5 „Trigger Signal Length"

Field for inputting the length of the trigger pulse.

2.5.6 Trigger Mode

The available modi are described in the LSTEP operating manual. They are divided into two groups. The option field for the required group must be activated here.

2.5.7 Trigger On / Off

The trigger signal can be activated by clicking the button „Trigger On". The trigger signal can be deactivated by clicking the button „Trigger Off".

2.6 Snapshot

The coordinates of a certain position can be saved whilst movement is in progess. This is controlled by an incoming signal. This position can then subsequently be approached. LSTEP control units can receive this signal via the *Snapshot input*.
Also refer to the LSTEP operating manual.
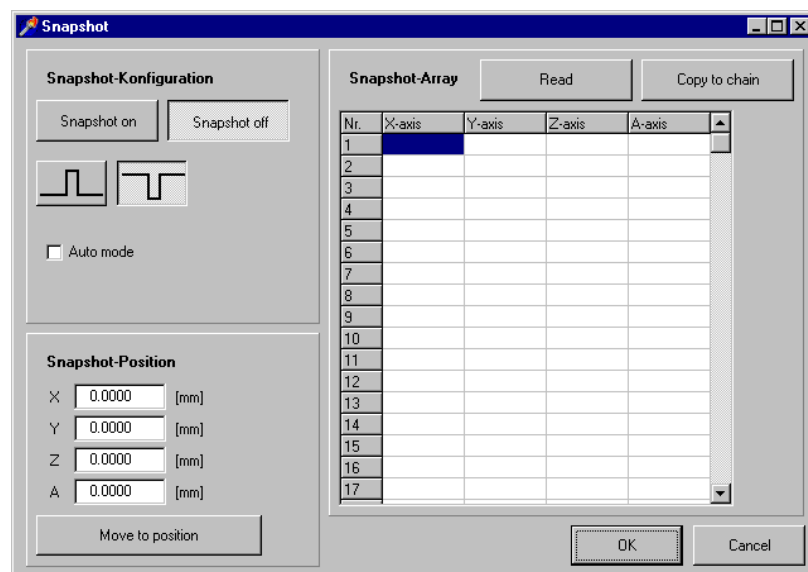
2.6.1 Snapshot On / Off

To activate the snapshot signal, click the „*Snapshot on*" button. To deactivate the snapshot signal, click the „*Snapshot off*" button.

2.6.2 Polarity

The polarity, positive or negative, of the snapshot signal is set with the two buttons which appear below the buttons „*Snapshot on*" and „*Snapshot off*".

2.6.3 Display-Position

The coordinates that were saved by the „Snapshot" are displayed in the display box for the X-, Y-, Z- and A-axis.

2.6.4 „Move to Position"

As the stepping motors of the coordinate table cannot be stopped without a delay, the saved snapshot position (from the last pulse) must be approached later. This is done manually, after a snapshot position has been saved, either by clicking on the button „*Move to position*", or with the „Auto mode" option.

2.6.5 „Auto Mode"

The „auto mode" function makes the coordinate table stop immediately after the snapshot and move to the snapshot position.

2.6.6 Snapshot Array

The LSTEP can save up to 200 positions in a snapshot array. To read the array, click on the „Read" button. Click on the „Copy to chain" button to copy the array into a chain.

3 Commands

3.1 Tab Panel: Commands

A number of functions may be executed quickly and easily by a simple mouseclick in the *'Commands'* menu. The functions are divided into four groups.
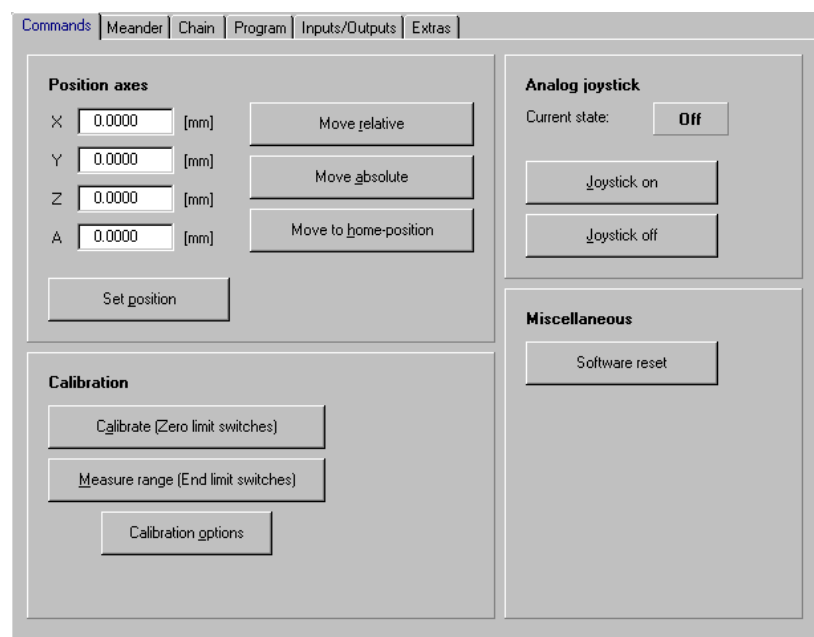
3.1.1 Position axes

In the „*Position axes*" box, the table can be moved to defined positions. If you click on the „*Move relativ*" button, the axes move the distances specified in the four input fields away from their present positions. The „*Move absolute*" buttons moves the axes to the positions defined in the four input fields. The button „*Move to home-position*" moves the axes to the home positions defined on the tab panel in the „*LStep configuration*" window.
If you click on the button „*Set position*", the values in the input fields for X, Y, Z and A are taken over for the position at which the coordinate table is presently located. That way, for example, a zero position can be defined at any point within the range of travel.

3.1.2 Calibrate

The table is moved to the zero limit switches. The coordinate values are set to zero (reset position). The position is stored as the zero position. This command has no effect on deactivated axes.
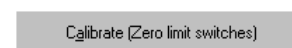
Fig.: The button „Calibrate"

3.1.3 Measure Range

The table moves away from the zero position, all the way to the limit switches. This command is required to define the maximum allowable range of movement, and should only be executed after calibration has been done.

Fig.: The button „Measure range"

3.1.4 Calibration Options

A window opens in which you can determine the order in which calibration and stroke measuring are to take place. To avoid a collision with attachments, it may be necessary to move the axes in a certain order. A check mark in the appropriate check box for the axis in question determines the order. First, all axes are calibrated which have a check mark in column „1" , then those with a check mark in column „2", are calibrated and so on…

Fig.: The button „Calibration options"

Fig.: The window „Calibration options"

3.1.5 Analog joystick

To switch the analog joystick on or off, simply click on the „*Joystick on*" or „*Joystick off*".button accordingly The field „*Current state*" indicates whether the analog joystick is on or off.

Note

If you switch to a different tab panel, the joystick is switched off.
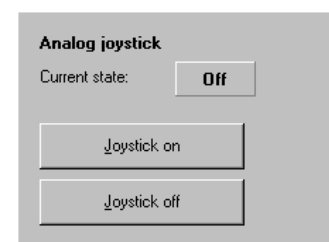
Fig.:The „Analog joystick" box

3.1.6 Software reset

If you click the button „Software reset", all settings are reset to their orignal values and the parameters of the tab panel „Register" are transmitted to the control unit.
The values that were determined with the commands „Calibrate" and „Measure range" are cancelled by the software reset, i.e. after the software reset, the commands „Calibrate" and „Measure range" have to be carried out again.
For details, refer to the operating manual for the control unit.
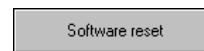
Software reset

Fig.: The button „Software reset"

4 Meander

4.1 Tab Panel: Meander

Win-Commander supports, in an effective manner, the design and output of meander data sets.
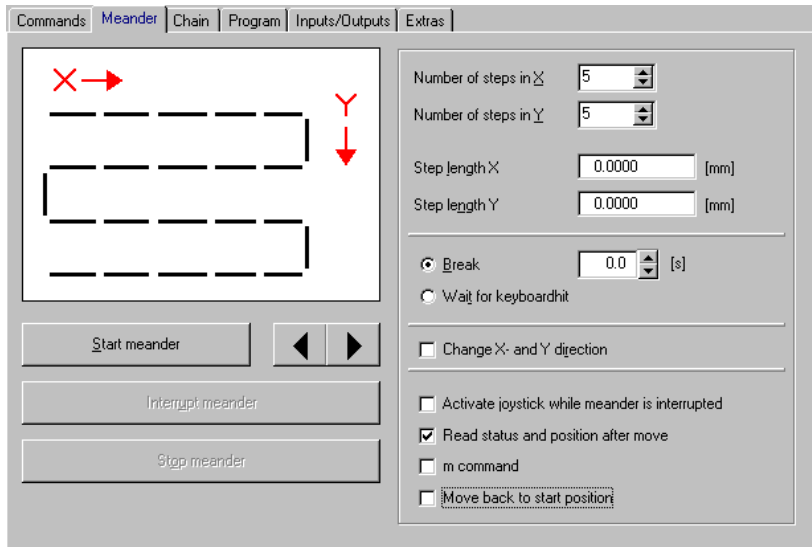
4.1.1 Defining The Meander

The input field „*Number of Steps in X*" is used to define how many steps are to be travelled in X-direction. The input field „*Number of steps in Y*" is used to define how many steps are to be travelled in Y. The number of Y-steps defines the number of times the direction is reversed in X-direction. The incrementation is specified in the input fields „*Step length X*" and „*Step length Y*".

4.1.2 Opening / Saving Meanders

Once a meander has been created it can be saved and can be called in again time and again. To save a meander, click on „*Save*" in the „*File*" menu, or click on the 🖫 icon on the toolbar. The dialog box „*Save*" then appears. Enter the directory path and the file name in this box. The file is saved with the file extension „*mdr*".
To reload a saved meander, click the menu item „*Öpen*" in the „*File*" menu, or click on the 📂. Icon in the toolbar. The dialog box „*Open*"then appears. After selecting the required file, click on the "*Open*" button to load it. If you make changes in the meander which you opened and you want to resave that meander, you can do this in two ways. You can use the menu item "*Save*", in which case the existing file of the same name will be overwritten, or, if you want to keep the existing file as well, you can use the "*Save as..*" menu item to save the edited meander under a different file name.
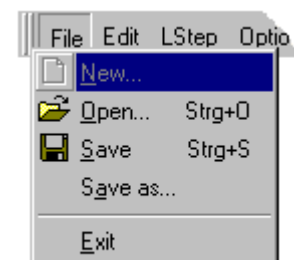
Fig.: The Menu Item „Open / Save" Meander

Note   To either '*Save or Load a meander*' the full-version of Win-Commander is required.

4.2 Start meander

When you click on the button 'Start meander' , Win-Commander starts to execute the meander data.
The tab panel 'Meander' provides additional parameters which allow you to enter information to "tell" Win-Commander how to execute the meander data.

Note   *Commands which move the coordinate table may be terminated immediately by pressing the ESC-key on the keyboard.*

4.2.1 Break

An interval (in seconds) can be setup if '*Break*' is selected. Win-Commander will stop at that position after every step for the length of time defined here.

Fig.: The option button „Break" and the selection box „Seconds"

4.2.2 Wait for Keyboardhit

If '*Wait for Keyboardhit*' is selected, Win-Commander will stop after every step until you click either '*Forward*' (arrow right) to proceed with the next step, or '*Backward*' (arrow left) to go back a step. Pressing the space bar causes Win-Commander to return to function '*Break*'

Fig.: The option button „Wait for keyboardhit"

4.2.3 Interrupt meander

While Win-Commander is processing a meander file, this function may be interrupted for any length of anytime by clicking on the button '*Interrupt meander*'. The vector in process, however, will be properly terminated. As long as the process is interrupted the button will display '*Continue meander*'. A mouseclick on this button causes Win-Commander to resume processing.

Fig.: The buttons „Forward / Backward"

Note   *As soon as a meander process is interrupted, the joystick becomes active and any position within the travel range may be approached. If the meander process is resumed, Win-Commander continues the meander at the exact same position where it was previously interrupted.Condition: The check box "Activate joystick while meander is interrupted" has been activated.*

4.2.4 Change X and Y direction

If the check box *Change X- and Y-direction"* is activated, the meander is turned 90°. The X-axis is the infeed axis.

4.2.5 Activate joystick while meander is interrupted

If the meander has been interrupted, the joystick is activated if this check box has been activated.

4.2.6 Read status and position after move

If this check box is activated, the status and the position are read after every move command.

4.2.7 m-command

Some applications require a movement at hight speed. Every position inquiry and program-internal calculation takes up valuable time and slows down processing of the meander. The check box *„m-command"* switches all unnecessary functions off and only fast, abbreviated commands are transmitted to the control unit. When *"m- command"* is active, the check boxes *„Activate joystick while meander is interrupted"* and *„Read status and position after move"* cannot be activated.

4.2.8 Move back to start position

If the check box „Move back to start position" is activated, the axes are returned to their starting positions after the meander has been completed.

Fig.: The check box „Change Y- and Y-direction"

Abb.: Sonstige Kontrollkästchen

5 Chain

5.1 Tab Panel: Chain

Win-Commander is able to store up to 999 positions and to approach one position after the other. There are three possibilities available to establish a chain data set.
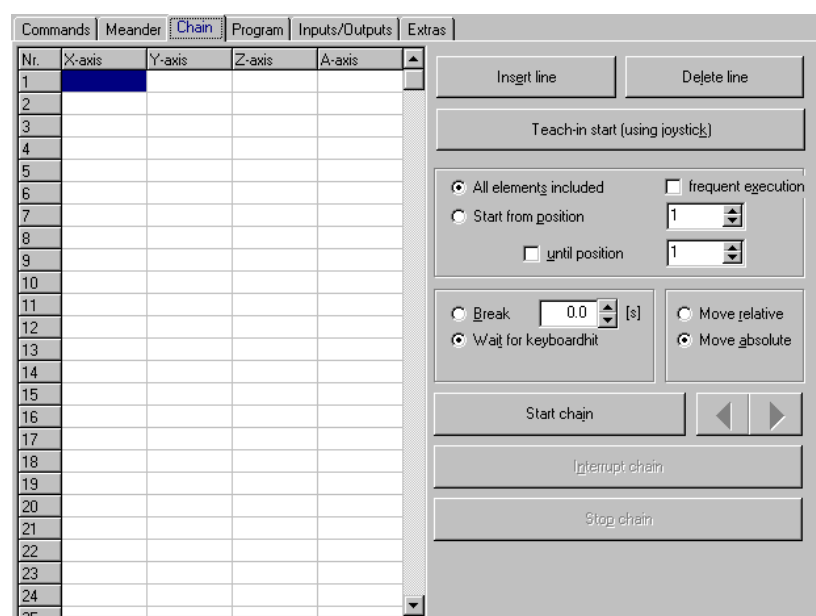
Fig.: The Tab Pane „Chain"

5.1.1 Write Coordinates In The Table

One way of establishing a chain data set is to write the values for the X, Y, Z and A yes directly into the cells of the table. Click on the cell with the mouse and the cursor appears in the selected cell. You can now input a value. Alternatively, you can press the „Tab"-key to move the cursor to the next cell. To define a position, you must enter a value in each and every cell. For those axes which are not to be moved, enter a „0"

5.1.2 Teach-In Start (using Joystick)

The second possibility is to establish a chain data set by defining a position with the joystick. The button 'Teach-in start' (using joystick) must be activated by mouseclick. The joystick is now active and any position may be moved to. For the duration of this process the button inscription is changed to 'Teach-in end' (using joystick). After a position has been defined with the joystick the values are transferred directly into the table by clicking on the button 'Teach-in end' (using joystick). This procedure may be repeated up to 999 times.

5.1.3   Create A Chain From Snapshots

You can also use the Snapshot function to create a chain and copy it into the "Chain" tab panel (see Chapter 2.6).

5.1.4   Insert / Delete Line

Click on the button „*Insert line*" to insert a line above the one in which the cursor is located. Click on the button „*Delete Line*" to delete the line in which the cursor is located.

5.1.5   Chain New / Open / Save

After the chain has been created, it can be saved and called in again at any later date. To save a chain, click the menu item „*Save*" in the „*File*" menu, or click on the 🖫 icon in the toolbar. The dialog box „*Save*"appears. Here, you can specify the directory path and the name of the file. The file is saved with the file extension „*wcc*".

To reload a saved chain, click the menu item „*Open*" in the „*File*" menu or click on the 📂 icon in the toolbar. The dialog box „*Open*" then appears.After you have selected the file you want, click on the button „*Open*" to load it. If you make changes in the chain which you opened and you want to resave that chain, you can do this in two ways. You can use the menu item "*Save*", in which case the existing file of the same name will be overwritten, or, if you want to keep the existing file as well, you can use the "*Save as..*" menu item to save the edited chain under a different file name.

If you click on the menu item „*New*" the contents of the table will be deleted and you can input a new chain.
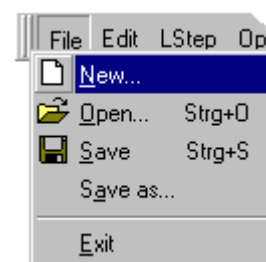
Fig.: The Menu Items „Chain New / Open / Save"

Note

To either save or load a chain, the full-version of Win-Commander is required.

5.2   Start Chain

When you click on the '*Start Chain*' button, Win-Commander starts to process (output) the chain data. The tab panel '*Chain*' contains a number of important parameters in which settings must be made, to "tell" Win-Commander how to process the chain data. These settings should be made before the chain is started.

5.2.1   All Elements Included

If the button '*All elements included*' is activated, the chain data will be processed from the first to the last position.
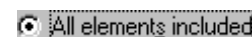
Fig.: The option button„All Elements Included"

5.2.2 Start from Position

If the button 'Start from Position' is activated the desired line number, from which processing of the chain is to commence, can be input in the edit box at the right side of the function field.
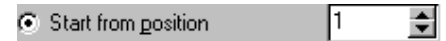
Fig.: The settings „Start from position"

5.2.3 Until position

If the checkbox 'until Position' is also checked, any line after the start line can be entered in the edit box as the last position which is to be processed. Win-Commander will process the chain data until that position is reached and then stop.
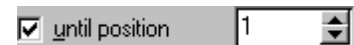
Fig.: The Settings „until position"

5.2.4 Frequent Execution

If the button 'frequent execution' is activated, the chain is processed as a loop. After the last position has been reached, processing continues with the first chain position again.
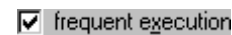
Fig.: The check box „frequent execution"

5.2.5 Break

If the 'Break' option is activated, a time can be input here (in seconds). Win-Commander will then stop at every position of the chain for this length of time, before automatically proceeding to the next position.

Fig.: The settings „Break"

5.2.6 Wait for keyboardhit

If 'Wait for keyboard hit' is selected Win-Commander will stop at a position until you click either the 'Forward' (arrow right) button to proceed to the next position, or the 'Backward' (arrow left) button to move back to the previous position.

Fig.: The option button„Wait for keyboardhit"

Fig.: The buttons „Forward / Backward"

5.2.7 Interrupt a Chain

Processing of a chain can be interrupted at any time by clicking the button 'Interrupt chain'. After clicking the button, the active vector will however finished. Whilst the process is interrupted, the inscription on the button changes to 'Continue chain'. Click on this button again to continue processing.

Note   *As soon as a chain process is interrupted, the joystick is activated and any position within the travel range may be approached. If the chain process is resumed, Win-Commander resumes the process at exactly the same position where it was previously interrupted.*

5.2.8 Move Relative

If '*Move relative*' is active, the position will be calculated in relation to the current position. Win-Commander advances the table the distance specified here.

5.2.9 Move Absolute

If '*Move absolute*' is active, the position will be calculated in relation to the zero position. Win-Commander will move the table to this position.

5.2.10 Move directly to a single position of the chain

To move directly to individual chain positions, the cell which contains the line number of the position in question must be activated by double-clicking on it. This can only be done if the chain has not already been started.
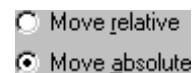
Fig.: The option buttons „Move absolute" and „Move relative"

6 Program

6.1 Tab Panel: Program

The Pro version of the 4-Axis Win-Commander includes a macro language which allows you to define complex cycles and save them as programs. The programs are interpreted in a module of Win-Commander and are transformed into the appropriate Lstep commands.
There is a text editor in the left section of the tab panel for editing the programs.
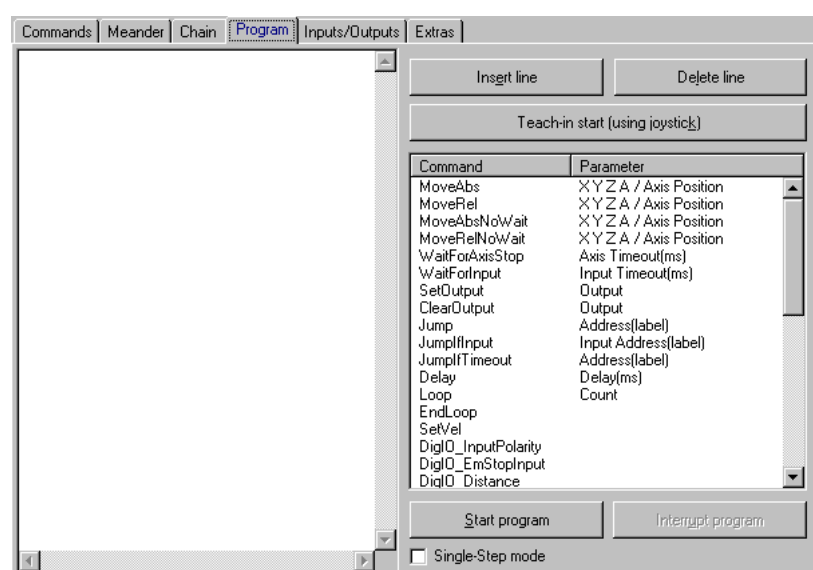
Fig.:The Tab Panel „Program"

6.1.1 Writing Programs
All commands and the parameters for these commands can be input on the keyboard. The tab panel does however offer more convenient features. The right section of the tab panel displays a table which contains all available commands. Simply click on the required command and it is inserted in a new line of the text editor. The cursor stops at the end of the line so that you can input the parameters needed for that command directly.

6.1.2 Insert / Delete Line
When the cursor is at the end of a line and you insert a command from the table by clicking on it with the mouse, the command is inserted into a new line and all subsequent lines move down one place. You can also use the button „Insert line" to insert a new line. The line is then inserted before the line in which the cursor is located.
A click on the button „Delete line" will delete the line in which the cursor is located.

6.1.3 Teach-In START (using joystick)

The button "*Teach-In START (using joystick)*" is used to determine axis position values with the joystick and to insert them as MoveAbs commands. Teach-In mode is activated by clicking on this button. The inscription on the button then changes to „*Teach-In STOP (using joystick)*". The analog or key joystick is switched on and the required position can be approached. When you click the button „*Teach-In STOP (using joystick)*", the axis position values are taken over into the program as the move command („MoveAbs").

6.1.4 Starting, Interrupting And Ending The Program

To start the program, click the „Start program" button. If there are any syntax errors, they will be displayed, otherwise the program will be started. To interrupt the program briefly, from time to time, click the „Interrupt program" button. To terminate the program prematurely, press the Esc key.

6.1.5 Program, New / Save / Open

After the program has been written, it can be saved and called in again at any later date. To save a program, click the menu item „*Save*" in the „*File*" menu, or click on the 🖫 icon in the toolbar. The dialog box „*Save*" appears. Here, you can specify the directory path and the name of the file. The file is saved with the file extension „*wcp*".

To reload a saved program, click the menu item „*Open*" in the „*File*" menu or click on the 🗁 icon in the toolbar. The dialog box „*Open*" then appears.After you have selected the file you want, click on the button „*Open*" to load it. If you make changes in the program which you opened and you want to resave that program, you can do this in two ways. You can use the menu item "*Save*", in which case the existing file of the same name will be overwritten, or, if you want to keep the existing file as well, you can use the "*Save as..*" menu item to save the edited program under a different file name.

If you click on the menu item „*New*" the contents of the text editor will be deleted and you can input a new program.
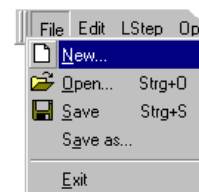
Fig.: The "File" Menu

Note

To either save or load a program, the full-version of Win-Commander-Pro is required.

6.2 Commands

6.2.1 Loops and Sub-Routines

The macro language also supports loops and sub-.routines (Procedures). The keywords „Loop" and „EndLoop" are used for programming loops, whereby nesting can be done to any level.
Procedures are called with the „Call" command. The keyword „Proc"denotes the beginning of a procedure, an "EndProc" must follow the commands of the procedure, at which point, the program jumps back to that part of the program which is to be executed next. Other procedures of the program may also be called within a procedure.

All available commands are described below.

MoveAbs	
Description:	Move to position (absolute)
Parameters:	X Y Z A or axis, positional value
Example:	MoveAbs 10.0 20.0 30.0 MoveAbs y 15.0

MoveRel	
Description:	Move to position (relative)
Parameters:	X Y Z A or axis, positional value
Example:	MoveRel 10.0 20.0 30.0 MoveRel y 15.0

MoveAbsNoWait	
Description:	Move to position (absolute, asynchronous)
Parameters:	X Y Z A or axis, positional value
Example:	MoveAbsNoWait 10 20 30 MoveAbsNoWait y 15

MoveRelNoWait

Description:	Move to position (relative, asynchronous)
Parameters:	X Y Z A or axis, positional value
Example:	MoveRelNoWait 10.0 20.0 30.0 MoveRelNoWait y 15.0

WaitForAxisStop

Description:	Wait until axis has reached its target position
Parameters:	Axis timeout(ms)
Example:	WaitForAxisStop z 1000

WaitForInput

Description:	Wait until the digital input is active
Parameters:	Input(0..15) Timeout(ms)
Example:	WaitForInput 2 1000

SetOutput

Description:	Set digital output
Parameters:	Output (0..15)
Example:	SetOutput 0

ClearOutput

Description:	Clear (cancel) digital output
Parameters:	Output(0..15)
Example:	ClearOutput 0

Jump

Description:	Jump
Parameters:	Where to jump to
Example:	Jump Adr1 ... Adr1: (Label indicating where to jump to, followed by a colon)

JumpIfInput

Description:	Jump when digital input is active
Parameters:	Input(0..15) Where to jump to
Example:	JumpIfInput 5 Adr1 ... Adr1:

JumpIfTimeout

Description:	Jump if timeout occurred during the last "wait" command
Parameters:	Where to jump to
Example:	JumpIfTimout Adr1 ... Adr1:

Delay

Description:	Delay
Parameters:	Delay(ms)
Example:	Delay 500

Loop

Description:	Loop
Parameters:	Number of times loop is to be repeated
Example:	Loop 10 ... EndLoop

EndLoop

Description:	End of the loop
Parameters:	-
Example:	Loop 10 ... EndLoop

SetVel

Description:	Set speed (velocity) (r/s)
Parameters:	Speed (the same for all axes) or X Y Z A or axis, speed
Example:	SetVel 10.0 SetVel 10.0 10.0 5.0 SetVel y 10.0

DigIO_InputPolarity

Description:	Configure polarity of the digital inputs
Parameters:	Input(0..15) Polarity(0=High-Active, 1=Low-Active)
Example:	DigIO_InputPolarity 5 0 (Input 5 High-Active)

DigIO_EmStopInput

Description:	"Emergency Stop" pin assignment
Parameters:	Input(0..15)
Example:	DigIO_EmStopInput 7

DigIO_Distance

Description:	Activation of an output dependent on the distance before the target/after the starting position
Parameters:	Output(0..15) Function(0=after start. pos./1=before target pos.) distance, axis
Example:	DigFunc_Distance 3 0 5.0 x (Output 3 is to be activated 5 mm after the starting position of the X-.axis)

DigIO_Off

Description:	Inputs /outputs off
Parameters:	-
Example:	DigIO_Off

SetDistance

Description:	Set distance for MoveRelShort
Parameters:	X Y Z A
Example:	SetDistance 10.0 0.0 0.0 0.0

MoveRelShort

Description:	Move to position (short command, better performance than with meanders)
Parameters:	-
Example:	MoveRelShort

Var

Description:	Define variable
Parameters:	Designator, value
Example:	Var test1 10.0

Add

Description:	Add value to variable
Parameters:	Designator, value
Example:	Add test1 1.0

Sub

Description:	Subtract value from variable
Parameters:	Designator, value
Example:	Sub test1 1.0

Mul

Description:	Multiply variable by value
Parameters:	Designator, value
Example:	Mul test1 2.0

Rem

Description:	Remarks
Parameters:	Text
Example:	Rem A note

SetJoystickOn

Description:	Switch on analog joystick
Parameters:	-
Example:	SetJoystickOn

SetJoystickOff

Description:	Switch off analog joystick
Parameters:	-
Example:	SetJoystickOff

Break

Description:	Interrupt program
Parameters:	-
Example:	Break

Choice

Description:	Message box with yes/no choice, conditional jump (if „No" button is clicked)
Parameters:	"Message", where to jump to
Example:	Choice "Move to home position?" adr1 MoveAbs 10 10 0 adr1:

MessageBox

Description:	Message box with OK button
Parameters:	"Message"
Example:	MessageBox "Test"

Call

Description:	Call sub-routine (Procedure)
Parameters:	Name of the procedure
Example:	Call Proc1

Proc

Description:	Beginning of a sub-routine (procedure)
Parameters:	Name of the procedure

Example:	Proc Proc1
	     MoveRel x 10
	     Loop 5
	     MoveRel y 1
	     EndLoop
	EndProc

EndProc

Description:	End of the sub-routine (procedure)
Parameters:	-
Example:	EndProc

Halt

Description:	Stop program with error message
Parameters:	-
Example:	Halt

Exit

Description:	End the program
Parameters:	-
Example:	Exit

CallMoveBack

Description:	Save present position, call sub-routine, then return to the saved position
Parameters:	Name of the procedure
Example:	CallMoveBack Proc1

UpdateDisplay	
Description:	Refresh (update) the position and status display in WinCommander
Parameters:	-
Example:	UpdateDisplay

SetAccel	
Description:	Set acceleration (m/s^2)
Parameters:	Acceleration (the same for all axes) or X Y Z A or Axis acceleration
Example:	SetAccel 1.0 SetAccel 1.0 1.0 0.5 SetAccel y 1.0

SendString	
Description:	Send string to Lstep
Parameters:	String
Example:	SendString "!trig 1"

6.3 Examples Of Programs

Example 1:

MoveAbs 0.0 0.0 0.0	*(Move to absoute position, wait until positioning has been completed)*
MoveRel 1.0 2.0 3.0	*(Move relative)*
SetOutput 1	*(Set output 1)*
Delay 100	*(Delay in ms)*
WaitForInput 14	*(Wait until input 14 is active)*
ClearOutput 1	*(Clear, i.e. cancel output 1)*
JumpIfInput 15 Adr1	*(Jump to label Adr1 when input 15 is true)*
Loop 10	*(repeat 10x)*
MoveRelNoWait x 7.5	*(NoWait -> no waiting for feedback from the controller that positioning has been done)*
Delay 50	
SetOutput 3	
WaitForAxisStop x	*(Wait until the X-axis is in positon)*
ClearOutput 3	
EndLoop	
Jump Adr1	*(Unconditional jump, can sometimes be very helpful, to skip certain parts of the program)*
MoveAbs 0.0 0.0 0.0	*(would never be executed)*
Adr1:	
SetVel y 10.0	*(Y-axis 10 r/s)*
MoveAbsNoWait y 20.0	*(As above, but absolute)*
DigFunc_InputPolarity 5 0	*(Input 5 High-active)*
DigFunc_EmergencyStopInput 7	*(Input 7 is emergency stop)*
DigFunc_Distance 3 0 5.0 x	*(Output 3 will be activated 5 mm after the X-axis starting position)*
DigFunc_Off 3	*(Switch function for dig. Input/output 3 off again)*

Example 2:

```
MoveAbs 0 0 0
Loop 8
        MoveRel z 4
EndLoop
WaitForInput 1 2000
JumpIfTimeout Adr1
Loop 4
        MoveRel y 8
EndLoop
Adr1:
Loop 8
        MoveRel x 6
        MoveRel x -2
EndLoop
Delay 1000
Loop 4
        MoveRel z -4
        Loop 2                          (Loops may be nested)
        MoveRel y -2
        EndLoop
EndLoop
```

7 Inputs / Outputs

7.1 Tab Panel: Inputs/Outputs

The functions of this tab panel are used for test purposes. The inputs and outputs of the control unit can be tested, also the control register can be set and read out for testing purposes.
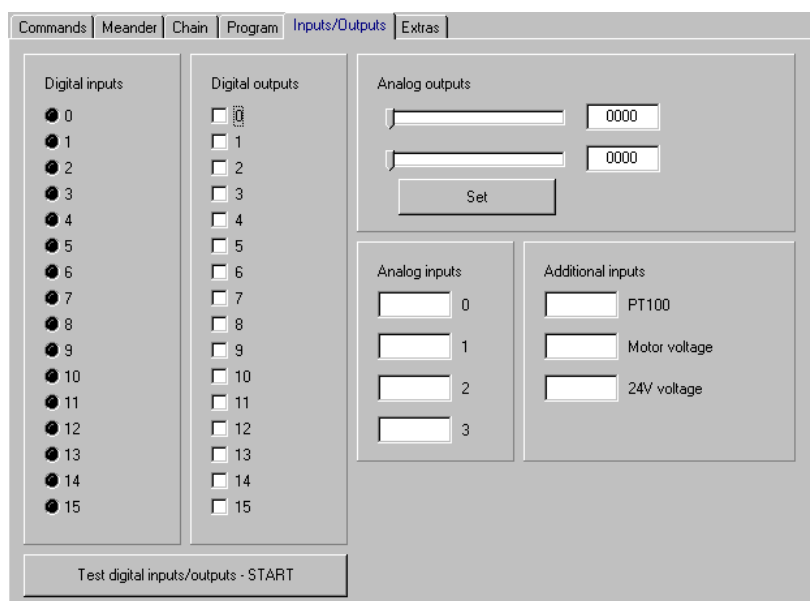

Fig.: The Tab Panel „Inputs / Outputs"

7.2 Digital and Analog In- and Outputs

7.2.1 Digital Inputs

If a voltage is applied at any of the digtal inputs (0-15), the corresponding LED of the input will switch to „red".

7.2.2 Digital Outputs

In order to apply a signal to a digital output (0-15) the corresponding check box has to be marked.

7.2.3 Test Digital Inputs/Outputs

The inputs and outputs are connected to each other with a test connector. Click on the button „*Test digital inputs/outputs - START*" to start the test. The outputs are then all set, one after the other. If the hardware is OK, the LED in question lights up.

7.2.4 Analog Outputs

A voltage can be applied to the analog outputs. A hexadecimal number that represents a certain voltage has to be entered in the edit box. Clicking the button „set" applies the voltage to the corresponding output.

7.2.5 Analog Inputs (LSTEP-PC only)

If voltage is being applied to an analog input, this is indicated in the output fields for the input in question. The voltage value is shown as a hexadecimal number.

7.2.6 Additional Inputs

If voltage is being applied to one of the additional inputs, this is indicated in the output fields for the input in question. The voltage value is shown as a hexadecimal number.

8 Extras

8.1 Tab Panel: Extras

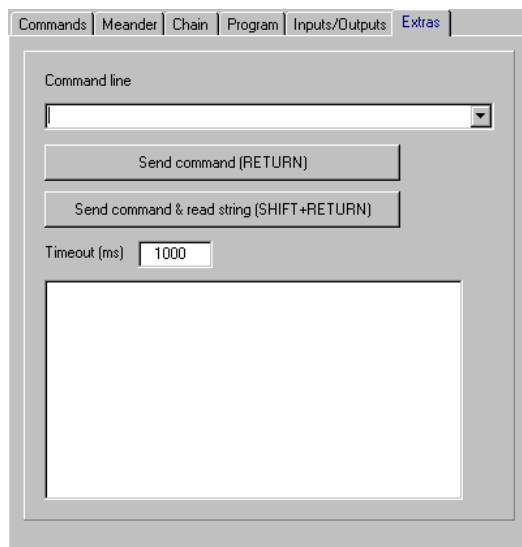This tab panel allows you to send individual commands to the control unit.

The command is input into the command line. The command line is a combo-box (drop down list box). Any commands which have already been input and executed appear in the list part of the combo-box, from where they can be selected again if needed. When you click on the button „*Send command (RETURN)*", the command is transmitted to the control unit and is executed. The button „*Send command & read string (SHIFT + RETURN)*" also transmits the command to the control unit. Here however, the position, setting, status etc. are fed back. The commands and the position inquiries are logged in the bottom section of the window. In the edit box „*Timeout (ms)*", you can define a time within which the command must have been executed. If the command has not been executed within this time because problems have occurred, the command is aborted.

9 Glossary

Baud	Defines the data transfer rate in bits per second
COM1	Is the description for a serial interface on a PC. A PC is equipped with two serial interfaces COM1 and COM2.
Limit switch	Switches the motors off of a coordinate table as soon as the end of a drive range is reached. (table stroke)
Joystick	Apparatus to manually control a coordinate table.
Chain	A saved number of coordination positions which Win-Commander drives to via command or automatically.
Lever	A gadget on a joystick used to control the speed and direction of a coordinate table.
Coordinate table	A horizontally and vertically moveable plane, horizontal precision working surface.
Meander	A series of positions, which numbers and distances are variable, and which are used by Win-Commander to drive to, according to a defined pattern, either automatically or according to the actual command step by step.
RS232	See COM1
Control (unit)	A unit connected between the PC and the coordinate table, which controls the motor currents and therefore controls the driving process.
Spindle lead	Defines the distance which is covered for one motor revolution.
Table stroke	The distance between the limit position of the X-and Y-axes a table may be moved to.