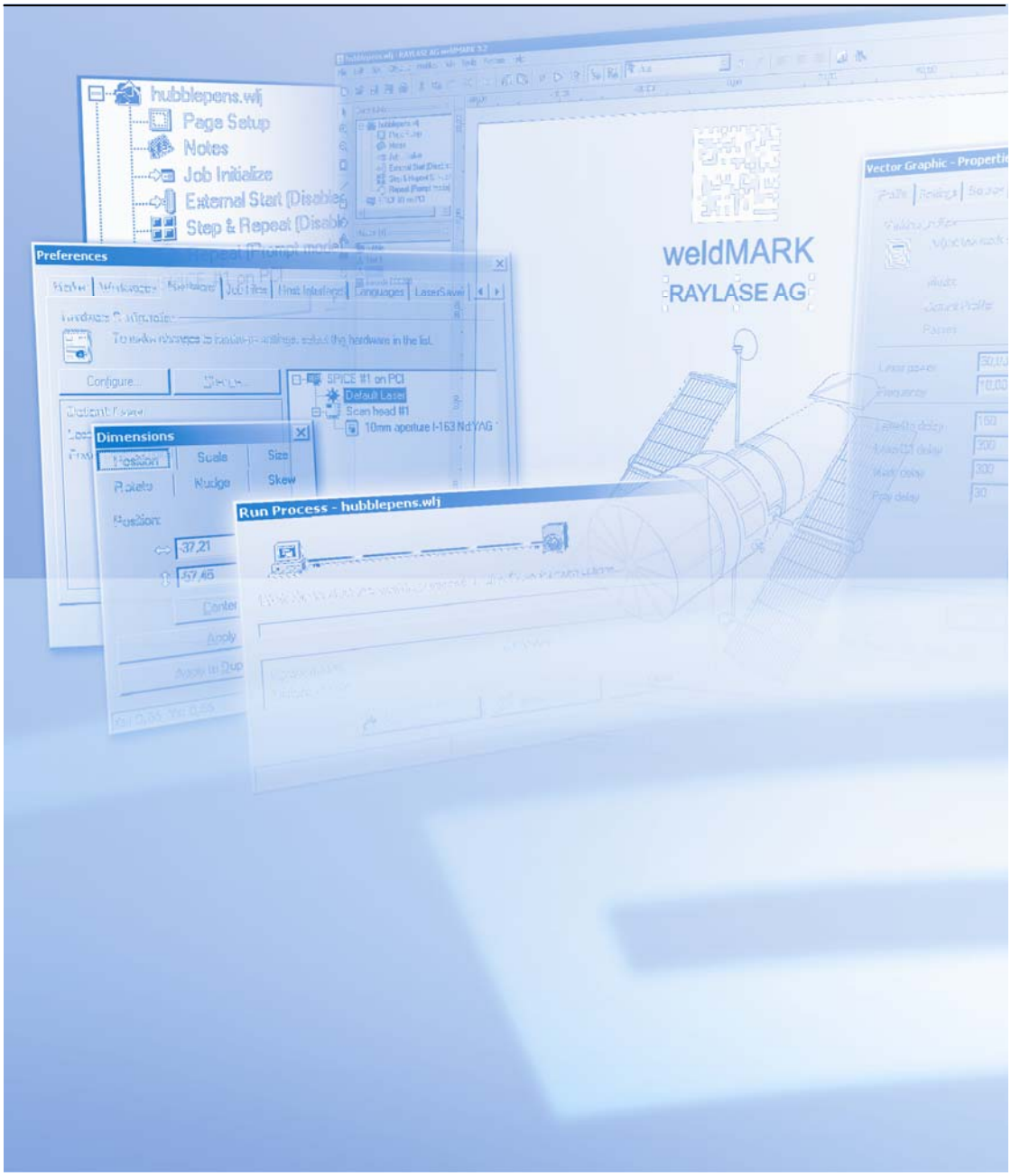
RAYLASE
focus on laser

Software Manual
weldMARK® 2.0



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CONTENTS

1 INTRODUCTION

weldMARK® is a powerful and flexible laser processing software suite. The software package sets new standards with its flexible, powerful and easy to learn user interface. It makes it easy for the user to create or import text, barcode or graphic elements and to use these to create a complete marking job. Objects and laser-specific parameters can be edited by just a few simple entries.

The weldMARK® software package supports the RAYLASE SP-ICE, RLC-USB and RLC-PCI control cards.

1.1 The weldMARK® software package

The weldMARK® software package is made up of the following modules:

- weldMARK® graphical user interface
- COMServer (ActiveX) interface
- TCP/IP Test Client
- weldMARK® COM Tester

The sections below provide a brief description of these modules.

1.1.1 Function overview

The following weldMARK® functions are particularly important:

- Opening up to ten jobs simultaneously, easy selection of opened jobs with a click of the mouse
- Support for various laser types, precise control of laser parameters
- Creation of linear, rectangular, polygonal, drill and bezier objects
- Output of drill objects as single points or grid points
- Scaling, moving and rotation of objects on screen
- Use of objects as templates in the background for easy positioning of marking objects
- Import of extensive types of vector and bitmap files
- Support for all TrueType™ fonts installed on the computer (filled or as contour)
- Serialization functions for text and barcode objects
- Easy creation of automation scripts
- Programming of alarms, warnings, user entries for job numbers and batch numbers
- Control of rotary tables, XY tables or one-dimensional movements using the integrated 4-axis motor control
- Detection of object movements with an optional encoder
- Password protection to restrict users to performing pre-prepared jobs.
- weldMARK® includes all the elements and tools required for integration into an automated process environment. Most procedures can be operated efficiently from within the program itself.
- Support of standard scan heads and various 3-axis subsystems (AXIALSCAN, AXIALSCAN motorized, FOCUSSHIFTER)

1.1.2 COM automation server API

weldMARK® provides a COM automation server interface. This enables external programs to use the library functions in weldMARK®. For more detailed information, refer to the ComServer manual, which is available from RAYLASE.

1.1.3 TCP/IP test client

The TCP/IP test client allows the weldMARK® software's server interface to be tested using a remote computer. Any errors detected can be corrected over the network using the TCP/IP test client.

The Appendix includes instructions for starting and using the TCP/IP test client.

1.1.4 weldMARK® COM example program

The weldMARK® software is supplied complete with a COM example program with source text. Use this simple COM automation server program as a template for programming your own application programs.

1.2 Laser safety

The user is responsible for safe operation and for safeguarding the surrounding area against hazards that can be caused by laser radiation. OEM customers must ensure compliance with all local and national regulations.

WARNING:

Turn on the PC before turning on the laser system. This prevents the laser from behaving in an uncontrolled manner when the PC is turned on.

Check your application carefully before using the laser system. Defective software can block the entire system and lead to uncontrolled operation of the laser or deflection unit.

1.3 Manufacturer

RAYLASE AG
Argelsrieder Feld 2+4
D-82234 Wessling
Germany
Tel.: +49 (0) 81 53 - 88 98 - 0
Fax: +49 (0) 81 53 - 88 98 - 10
http://www.raylase.de
E-mail: info@raylase.de

1.4 Customer service

RAYLASE Customer Service can assist you with any queries or problems with weldMARK® or this manual. Before contacting Customer Service, note the following information, which will enable RAYLASE Customer Service to assist you as effectively as possible:

- Consult this manual to determine whether you have performed the failed action correctly.
- Attempt to reproduce the problem and note the exact settings and operator actions that lead to the problem.
- Check and record whether the problem can be prevented by changing the operator actions or settings.
- If possible, create screenshots of all error and event messages.
- If the problem is with the hardware, refer to the associated manual for details of how to resolve or isolate the error.

If you need further assistance, you can contact RAYLASE Customer Service from Monday to Friday between 08:00 and 16:00.

Germany (Wessling)
+49 (0) 81 53 - 88 98 - 0

... Simply contact Customer Service

2 WELDMARK® REQUIREMENTS AND INSTALLATION

This chapter provides you with an overview of the system requirements and the necessary steps to be taken to install weldMARK®.

2.1 Hardware requirements

The following minimum hardware configuration is required:

- Intel Pentium or compatible computer with operating system Windows 2000 (service pack 1), Windows XP Professional or Windows Vista.
- CD-ROM drive for installing the software.
- 1024 MB RAM or more is recommended.
- 100 MB free space on the local drive.

2.2 Installing the dongle

The weldMARK® software only runs with the dongle supplied. The dongle should be plugged into a free USB port on the computer. Every computer on which weldMARK® is installed requires a separate dongle.

2.3 Software installation

The procedure for installing weldMARK® is as follows:

o Start your computer and log in as an administrator.
o Insert the weldMARK® installation CD in the CD-ROM drive. The installation routine starts automatically.
o Click on the *Software installation* button and then on *Installation weldMARK.*
o Follow the instructions on the screen.

3 INTRODUCTION TO THE WELDMARK® SOFTWARE PACKAGE

3.1 Starting and exiting weldMARK®

Starting weldMARK®

Select *Start >All Programs >RAYLASE >weldMARK*. The program starts with the set access level (⇨ on page 24, Changing the access level).

When you start weldMARK®, a new job is created automatically. You can disable this and specify that weldMARK® should start with a particular existing job (⇨ on page 150, Settings for the job file).

Exiting weldMARK®

o Select *File >Exit from the menu.*

3.2 Basic concepts

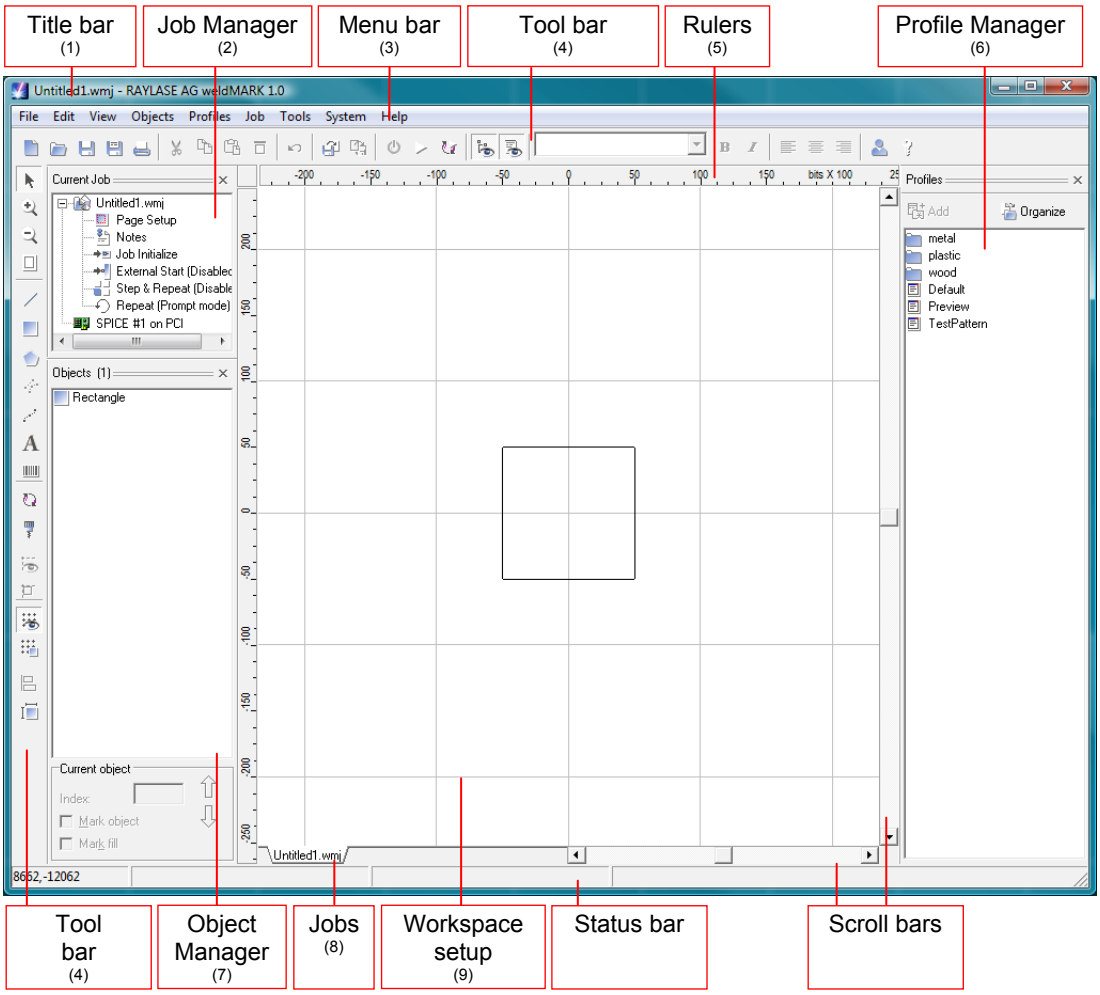
Marking objects	Marking objects represent the graphical elements and texts to be marked by the laser. The following object types are available in weldMARK®: ▪Graphic objects, i.e. imported vector or bitmap graphics ▪Line ▪Rectangle ▪Polygon ▪Text ▪Bezier ▪Barcode ▪Drill ⇨ on page 25, Working with objects
Template	A template is an object that is not marked. It can be used to align objects. ⇨ on page 93, Templates
Automation objects	Automation objects allow communication with the user and control of external components. ⇨ on page 94, Using automation objects
Profile	Every marking object is assigned a profile, which specifies the parameters for the laser marking. ⇨ on page 108, Using profiles
Job	A job is a collection of objects and settings. The settings determine the actions of the deflection unit, the laser and the additional equipment. ⇨ on page 119, Job settings, Run job

3.3 Access levels

weldMARK® has three access levels that allow different types of access to the software's functions. The program starts with the preset access level (⇨ on page 24, Changing the access level). Password protection can be applied to changing the access level (⇨ on page 156, System security settings).

Access levels	Description
All editing functions	All software functions can be used with no restrictions. ⇨ below, "All editing functions" access level
Operator interface only	Only saved jobs can be opened and executed. The jobs cannot be modified. ⇨ on page 22, "Operator interface only" access level
Touchscreen interface	Only saved jobs can be opened and executed. The jobs cannot be modified. The design of this access level is optimized for touch screens. Mouse control is also possible. ⇨ on page 23, "Touchscreen interface" access level

3.3.1 "All editing functions" access level

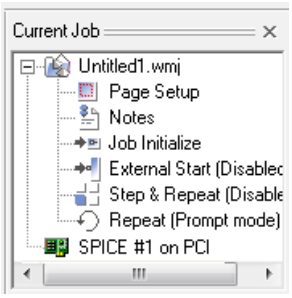


(1) Title bar

The title bar shows the name of the current job, the company name and the name of the program.

(2) Job Manager

The Job Manager shows the name of the current job with the elements of the job settings below. The installed control cards are also listed.



To view or edit a job setting, double click on the corresponding element. Right clicking on the element displays a pop-up menu containing element-specific options.

(⇨ on page 119, Editing the job settings)

(3) Menu bar

The menu bar contains the following menus (some menu commands are only available after setting the corresponding function or setting up the corresponding hardware drivers):

File menu		
New	Opens a new job with a blank workspace.	Up to ten jobs can be opened simultaneously.
Open Job...	Allows you to open a saved job.	
Close Job	Closes the current job.	
Close All Jobs	Closes all open jobs.	
Import...	Allows you to select and import objects in different file formats.	
Export...	Allows you to export the currently selected weldMark® objects in various file formats.	
Import and Export Profiles...	Opens the Import/Export Wizard for profiles. Profiles can be exported from or imported to the Profile Manager.	
Save Job	Saves the current job. The first time you save a new job, the *Save Job as* window will be opened. You must specify a file name and a storage location.	
Save Job As...	Allows you to save a new job or to save an open job under a new name.	
Save Job to Embedded Controller	Jobs can be saved to a stand alone control card and executed from here without the need for a PC (⇨ on page 131, Enabling "Save to stand alone control card" mode).	
Print Setup...	Allows you to enter settings for the printer you want to use.	
Print	Allows you to enter print settings, change printer settings and start printing of the current job.	
Exit	Exits the weldMARK® program.	

Menu Edit	
Undo	Reverses the last action performed. You can undo the last ten actions.
Cut	Removes all selected objects from the job and sends them to the clipboard.
Copy	Copies all selected objects to the clipboard.
Paste	Pastes objects copied or cut in weldMARK® into the current job.
Paste Special	Allows objects on the clipboard to be pasted into the current job as image or text objects. This command enables you to paste objects from other applications.
Delete	Deletes all selected objects.
Select All	Selects all objects contained in the current job.
Snap To Guidelines	If this function is enabled, objects are aligned with the guidelines when you move them.
Snap To Grid	If this function is enabled, objects are aligned with the grid lines when you move them.

View menu	
Host Monitor	This command shows or hides the host interface monitor. The host monitor allows you to observe the communication between a host and weldMARK® (⇨ on page 151, Editing the host interface settings).
Job Manager	This command shows and hides the Job Manager.
Object Manager	This command shows and hides the Object Manager.
Profile Manager	This command shows and hides the Profile Manager.
Motor Manager	Only available if a motor control card is installed. Opens the window for operating the optional stepper motor control card.
Guidelines	Shows or hides guidelines.
Grid	Shows or hides grid lines.
Rulers	Shows or hides rulers.
Millimeters	Selects the unit for the ruler display and for the input dialog boxes.
Inches	
Bits	

Objects menu		
Add	The following submenus are available:	
	Automation...	Opens a window for selecting an automation object.
	Barcode...	Inserts the selected object in the center of the work-space.
	Drill...	
	Line	
	Polygon	
	Rectangle	
	Text	
	Bezier	
Convert To Template	Converts the selected object into a template. The template is automatically added to the Job Manager.	
Lock Object *Unlock Object*	Locks or releases the selected object for editing.	
Lock All/ *Unlock All*	Locks or releases all objects in the job for editing.	
Defaults...	Allows you to make default settings for the various object types.	
Dimensions...	Allows you to change the size, shape and position of the selected objects.	
Properties...	Allows you to edit various parameters of the selected objects.	

Profiles menu	
Add to Profiles...	The parameters of the selected object can be combined under a profile name and added to the Profile Manager under that name.
Organize Profiles...	Allows you to specify the folder structure for the profiles.

Job menu	
Preview	Creates a frame representing the rectangular boundaries of the selected objects using the visible pointer and opens the "Preview" window. This window allows you to adjust the boundaries of the objects to the target object. (To activate the visible pointer ⇨ on page 166, Configuring a laser driver).
QuickMark	Allows you to start execution of either the selected objects or all objects included in the job. Automation objects are skipped.
Run...	Allows you to start execution of the current job including all marking and automation objects.
Run from Hardware…	To ensure that they are executed without interruption, jobs are first sent to the control card and then started. This function is particularly useful when using a slow PC. (⇨ on page 129, Run from Hardware)
Convert Template to Object	Converts the selected template into a marking object.
Settings...	Allows you to make job-specific settings.

Tools menu	
Configure Tools	Allows you to add external programs to the Tools menu.
Align...	Allows you to align selected objects with one another based on particular settings.
Grid/Guidelines...	Allows you to set parameters for the grid and for guidelines.
Configure I/O Cards...	Starts the Configuration Wizard for the I/O card.
I/O Card&Diagnostics...	Allows you to check the ports of the standard I/O board.
Laser Diagnostics tool	Allows you to set parameters for the laser radiation and to test the position and effect of the laser beam.

System menu		
Preferences...	You can make various settings for working with weldMARK®.	
Properties...	Displays the properties of the operating system and the hardware relevant for weldMARK®.	
Globals...	Allows you to enter general settings for the laser power, the marking speed and the marking offset. weldMARK® can thus be adjusted for changed external parameters, e.g. a diminishing laser power.	
Run from Host...	Sets weldMARK® to host mode, enabling it to accept commands from external host programs.	
Security	*Access level*	Allows you to change the access level. Any changes take effect immediately.
	Change Password	You can set up password protection for changing the access level, change the password or cancel password protection.
	Startup Options	Sets the access level used when you start the program.
Backup...	Opens the *Browse for Folder* window. In the structure tree in this window, you can select a storage location for the backup file containing the weldMARK® system settings.	
Restore...	Opens the *Restore Application Settings* window. In this window, you can select a backup file. Opening the file restores the saved system settings for weldMARK®.	

Help menu	
Content & Index	Allows you to use weldMARK online help.
Online Updates...	Displays information about the current program version. Clicking on *Check for Updates* calls up the RAYLASE homepage, provided you are connected to the Internet.
About...	Displays the currently installed weldMARK® version number. The *Info* button can be used to obtain additional copyright information.

(4) Tool bars

The toolbars provide fast access to frequently used functions.

The **toolbar below the menu bar** contains the following standard commands:

	Install New File...		Nd:YAG only Reduce laser power to minimum
	Open Job		QuickMark
	Save Job		Starting execution
	Save as		Show/Hide Job Manager
	Print job		Show/Hide Profile Manager
	Cut selection		Text attribute bold
	Copy selection		Text attribute italics
	Paste selection (special)		Align text left
	Delete selection		Center text
	Undo		Align text right
	Import job		Change Access Level
	Export Graphic		Change Password

The **toolbar on the left-hand edge of the screen** contains functions for adding, selecting and manipulating objects:

Select objects	
Zoom in	
Zoom out	
Full view	
Insert line object	
Insert rectangle object	
Insert polygon object	
Insert Bezier object	
Insert text object	
Insert barcode object	
Insert automation object	
Insert drill object	

Show/Hide guide-lines	Only available if guidelines have been entered.
Snap To Guide-lines	
Show/Hide grid	
Snap To Grid	
Set dimensions	

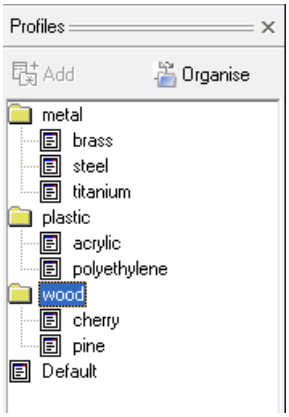
(5) Rulers

The rulers can be displayed with the following units: "Millimeters", "Inches" or "Bits". The rulers are scaled automatically based on the correction file for the deflection unit lens.

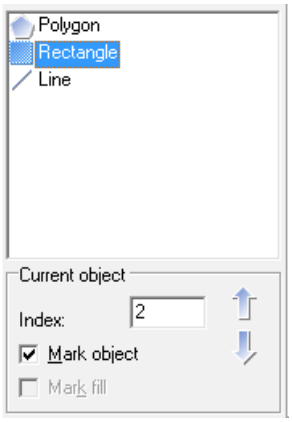
(6) Profile Manager

The Profile Manager displays a hierarchical overview of the profile folders and profiles created by the user. Profiles can be applied to selected objects or to all objects in a job. To do this, right click on the corresponding profile and select the required option in the pop-up menu. Double clicking on the profile allows you to modify its parameters.

(⇨ on page 108, Using profiles)



(7) Object Manager



The Object Manager lists all marking and automation objects in the job. The objects appear in the order in which they were created and will subsequently be executed. You can change the order of the objects using the blue arrow buttons in the Object Manager screen.

The number of objects in a job is specified in the Object Manager title bar. You can select an object by clicking on it in the Object Manager or by entering the corresponding index number in the *Index* input box.

The *Mark object* check box for certain objects allows you to specify that you want the object contour to be marked. For an object that does not have any contour (e.g. a bitmap object), this option specifies whether the object is to be marked.

For objects to which you can apply an object fill, the *Mark fill* option can be used to specify that the object fill is to be marked.

(⇨ on page 25, Working with objects)

(8) The “Jobs” tabs

The tabs at the bottom of the screen provide an overview of the currently open jobs and allow you to select these jobs directly.

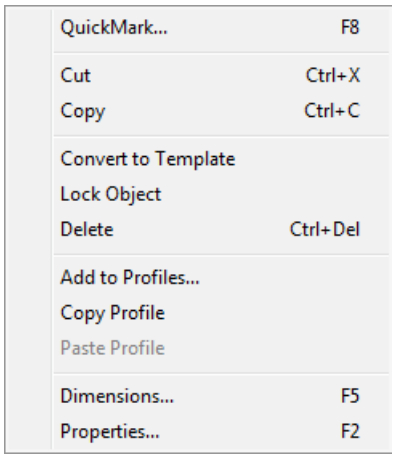
(9) Workspace

The size of the workspace can be set individually or automatically adjusted to the size of the operating field of the deflection unit (⇨ on page 120, Job settings - "Page Setup"). The maximum size of the workspace is determined by the size of the deflection unit's operating field. Objects that are (partly) located outside the workspace are not marked.

Pop-up menu

The pop-up menu provides fast access to frequently used functions for editing objects.

o Right click on an object to open the pop-up menu.

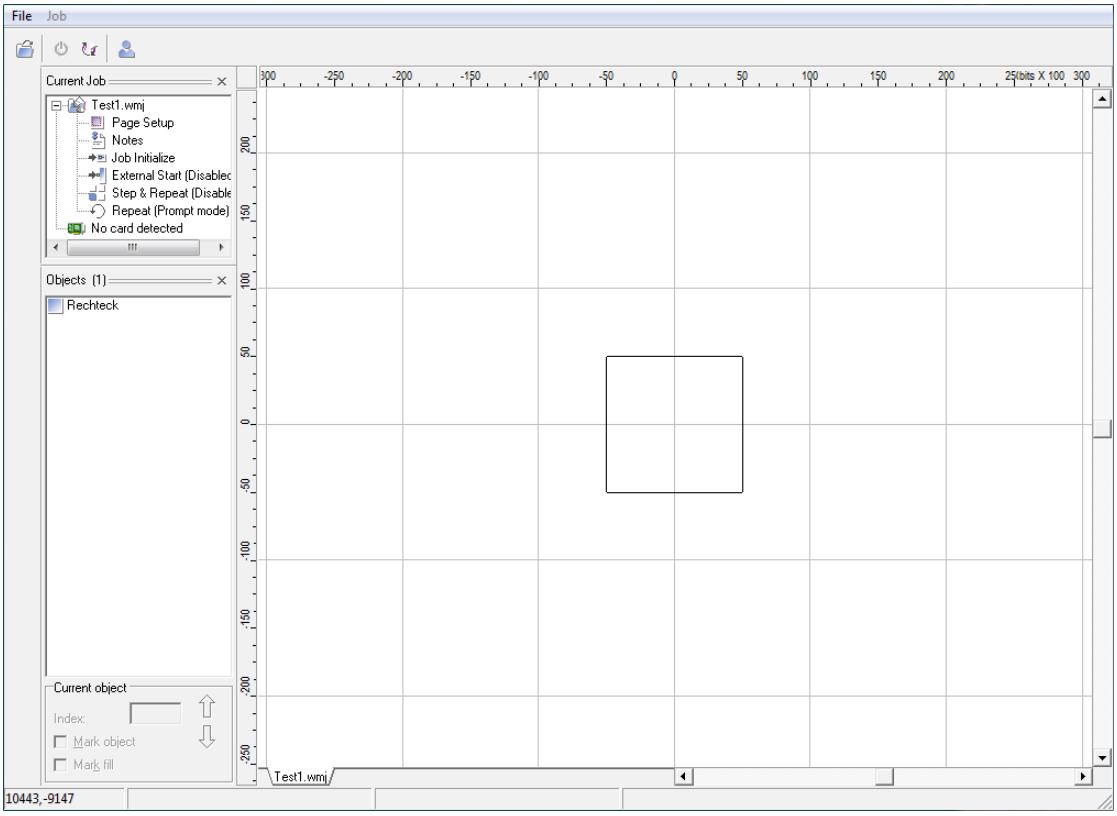


The following functions are available:

QuickMark...	Allows you to start execution of either the selected objects or all objects included in the job. Automation objects are skipped.
PreviewMark...	Creates a frame representing the rectangular boundaries of the selected objects using the visible pointer and opens the "Preview Mark" window. This window allows you to adjust the boundaries of the objects to the target object. (To activate the visible pointer ⇨ on page 166, Configuring a laser driver).
Cut	Removes all selected objects from the job and sends them to the clipboard.
Copy	Copies all selected objects to the clipboard.
Convert To Template	Converts the selected object into a template. The template is automatically added to the Job Manager.
Lock Object *Unlock Object*	Locks or releases the selected object for editing.
Delete	Deletes all selected objects.
Add to Profiles...	The parameters of the selected object can be combined under a profile name and added to the Profile Manager under that name.
Copy Profile	Copies the profile for the selected object to the clipboard.
Paste Profile	Applies the profile saved to the clipboard to the selected object.
Dimensions...	Allows you to change the size, shape and position of the selected objects.
Properties	Allows you to edit various parameters of the selected objects.

3.3.2 "Operator interface only" access level

This access level only allows the user to open and execute prepared jobs. The jobs to be executed must be located in the preset folder (⇨ on page 150, Settings for the job file).

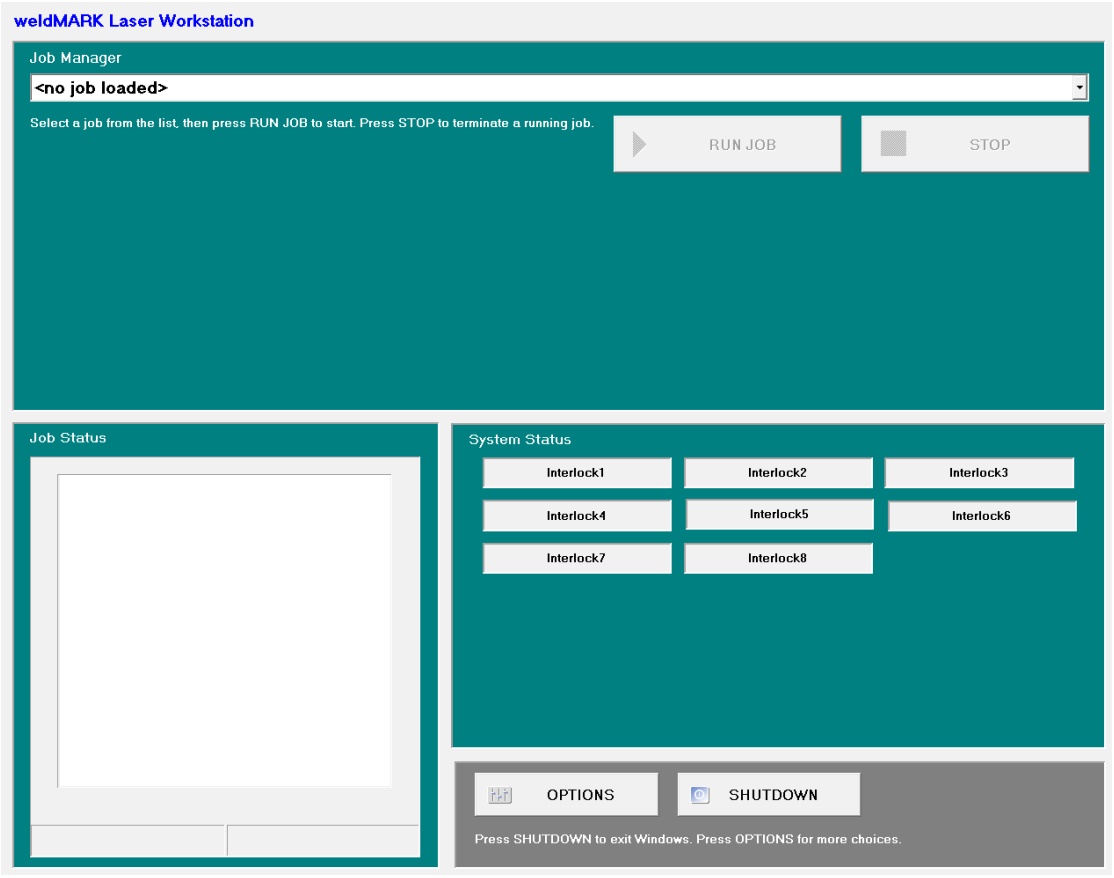


The following functions are available:

File >Open Job...		Allows you to open a saved job.
File >Exit		Exits the weldMARK® program.
Job >Run...		Allows you to start execution of the current job including all marking and automation objects.
		Changing access level If password protection is activated, you need to enter the password to change access level.

3.3.3 "Touchscreen interface" access level

This access level only allows the user to open and execute prepared jobs. The jobs to be executed must be located in the preset folder (⇨ on page 150, Settings for the job file).
The design of the user interface is optimized for touch screens. Mouse control is also possible.



The following functions are available:

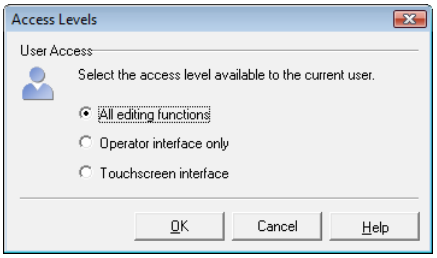
Job Manager	Allows you to open a saved job. Only one job at a time can be opened.
Run Job	Executes the open job.
Stop	Stops execution of the job.
Job Status	The graphic shows the workspace and the marking objects positioned on it.
System Status	The fields show the status of interlocks 1 to 8. Depending on the setting, a particular status can be a prerequisite for marking individual or all objects. The names of the interlock fields can be changed.
Options	Allows you to adjust the job for changed external conditions (⇨ on page 155, Global) or to change the access level (⇨ on page 24, Changing the access level).
Shutdown	Exits the weldMARK® program and shuts down Windows.

3.3.4 Changing the access level

Access level

From the "All editing functions" or "Operator interface only" access level

- Select the *System >Security >User Access* option or click on the *Change Access icon.*
  If password protection is activated, you will be prompted to enter the password.
  The adjacent window is opened.
- Select the required access level.



From "Touchscreen interface" access level

- Touch the *OPTIONS button.*
  The adjacent window is opened.
- Touch the *FULL ACCESS* button.
  If password protection is activated, you will be prompted to enter the password.

4 WORKING WITH OBJECTS

This chapter provides an overview of the objects available in weldMARK® and describes how to use them.

4.1 Basic principles

4.1.1 Selecting and deselecting objects

Objects must be selected in order for you to be able to edit them or display their properties. You can select multiple objects at the same time. Selected objects are identified by squares (resizing handles) around them and by emphasis in the Object Manager.

Selecting objects with the selection tool

- Select the *Selection tool* icon in the toolbar.
- Click on the desired object with the arrow cursor.
- To select multiple objects, either hold down the mouse button and draw a rectangle with the arrow cursor around all objects you want to select or hold down the Shift key and click on the objects you want to select in turn.

Selection tool

Arrow cursor

Selecting objects using the Object Manager

- Click on the desired object in the Object Manager.
- To select multiple objects, click on the first object in the Object Manager. Hold down the Ctrl key and then click on all of the other objects you want to select.

Selecting all objects

- Select the *Edit >Select All* option from the menu.

Deselecting objects

- Select the *Selection tool* icon in the toolbar.
- With the arrow cursor, click on a point outside the object or object group,
  or
  click on a free space in the Object Manager.

Selection tool

4.1.2 Moving objects

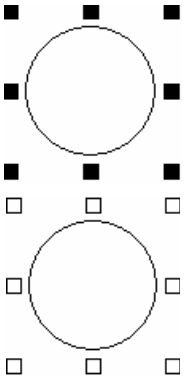
- o Select the desired objects.
- o Click on the objects and, with the mouse button held down, drag them to the desired position
  or
  use the *Nudge* tool (⇨ on page 87, Nudging objects).

4.1.3 Locking and unlocking objects

Locked objects cannot be edited or deleted. This prevents the object or its properties from being inadvertently modified.

>Lock Object

- o Click on the object to be locked.
- o Select the *Objects >Lock Object* option from the menu.
  The resizing handles for locked objects appear as unshaded squares.
- o You can use the *Objects >Unlock Object* command to release the object for editing.
  The resizing handles for unlocked objects appear as shaded squares.



4.1.4 Object types

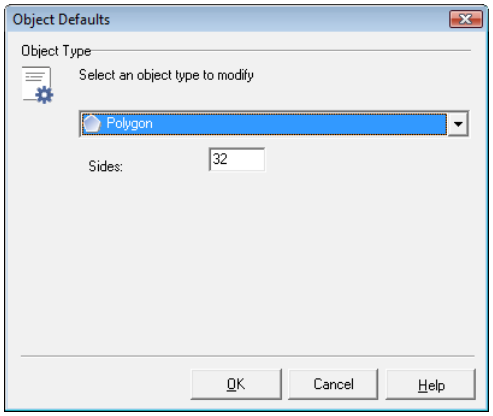
The following object types are available in weldMARK®:

Marking objects	*Graphic objects*	
	Line	The adjacent marking object types can be selected.
	Rectangle	
	Polygon	
	Polyline	
	Bezier	
	Text	
	Barcode	
	Drill	
Automation objects	*Automa-tion...*	Automation objects allow communication with the user and control of external components.

4.1.5 Object defaults

Object defaults are set for some objects. For example, when creating new polygons the number of corners is preset. You can change these object defaults:

o Select the *Objects >Defaults...* option from the menu.
The adjacent window is opened.



The table below lists all object types for which object defaults exist.

Polygon	⇨ on page 47, Defaults for Polygon Objects
Text...	⇨ on page 53, Defaults for Text Objects
1D Barcode	⇨ on page 61, Defaults for barcode objects
2D Barcode	
Bitmap Graphic	⇨ on page 38, Defaults for bitmap objects
Wait for External Signal	⇨ on page 95, Defaults for "Wait for External Signal"
Set I/O Port	⇨ on page 97, Defaults for "Set I/O Port"
Show Messagebox	⇨ on page 100, Defaults for "Show Messagebox"

4.1.6 Object properties

You can change the properties of objects as follows:

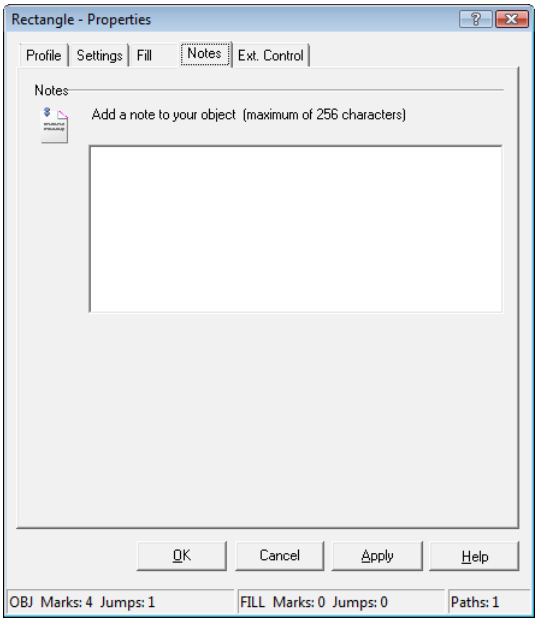
o Right click on an object.
o Select the *Properties...* option from the menu.
o Make the required changes. Refer to the following sections to see which properties are possible for which objects.

The following properties can be set for all object types:

Notes

Notes can be added to objects as follows:

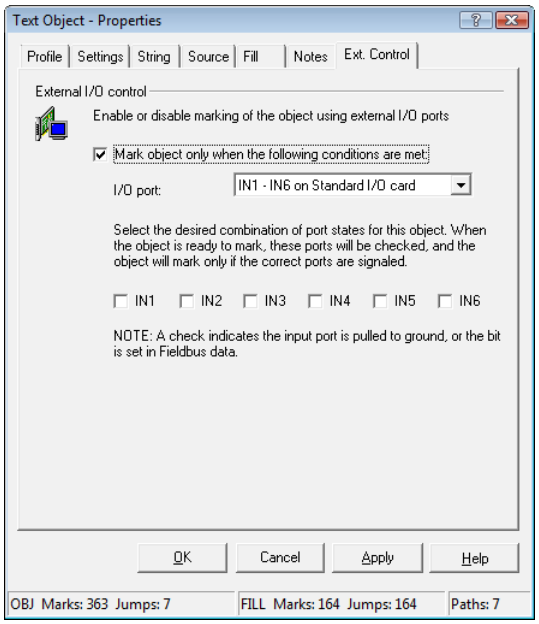
- Right click on the object to which you want to add a note.
- Select the *Properties...* option from the menu.
- *Notes* tab.
  The adjacent window is opened.
- Enter the desired text.
- Confirm your entry with the *OK* button.



External Control

During execution of the job, each individual marking object can be marked or skipped depending on external signals. The settings for this can be called up as follows:

- Right click on the object to which you want to add external marking control.
- Select the *Properties...* option from the menu.
- Select the *Ext. Control* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



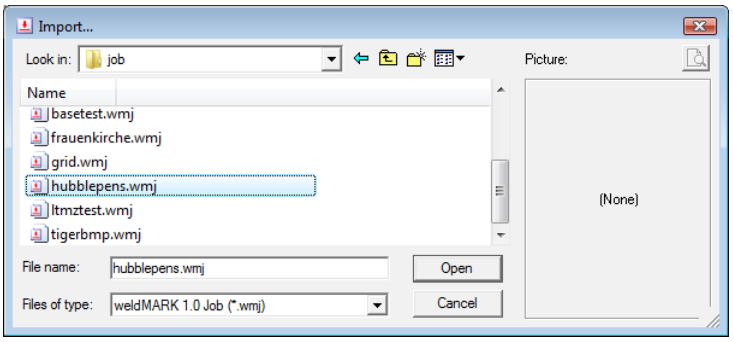
External control activated	If this function is enabled, the I/O ports are checked before marking the selected object. If they match the setting in IN1-IN6 the object is marked, otherwise it is skipped.
I/O Port	Select the input ports to be checked.
IN1–IN6	Specification for port status (high / low). If the specification is met, the object is marked. If the specification is not met, the object is skipped.

(⇨ on page 173, Standard I/O card / Interlock card)

4.2 Importing a job

A job is a collection of objects and settings. The settings determine the actions of the deflection unit, the laser and the additional equipment. If a job is imported into another job, the objects and settings it contains will be added to the currently open job.

o Select the *File >Import...* option from the menu.
The adjacent window is opened.
Refer to the table below for explanations.



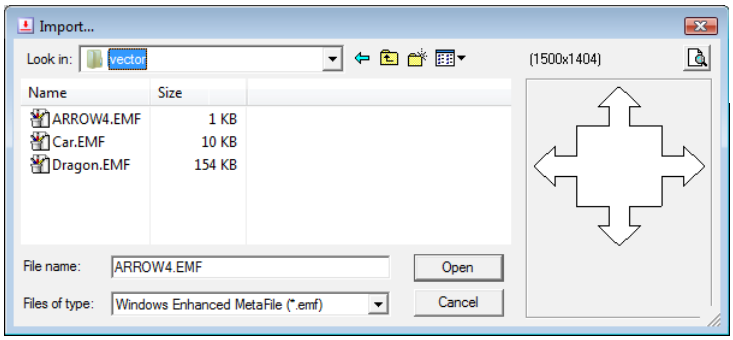
Look in	Allows you to choose the folder in which the job to be imported is saved.	
File name	This text box displays the name of the currently selected file.	
File type	The file type for a job file must be selected. Only files of the selected type will be displayed. The following file formats can be imported:	
	weldMARK Job (.wmj)*	A weldMARK® job file format.
	TruviewJob (.job)*	A file format developed by GSI Group Inc. based on the Truview® software package.
	winLase Job (.wlj)*	A WinLase job file format.
	remaining	⇨ on page 31, Importing vector graphic files. ⇨ on page 37, Importing bitmap files.

4.3 Importing and editing vector graphic objects

4.3.1 Importing vector graphic files

Mathematically, vector graphics are defined as a sequence of points connected by lines. They can be scaled as required with no loss of quality. They are ideally suited for use with laser processing systems as the deflection unit is a vector output device.

o Select the *File >Import...* option from the menu. The adjacent window is opened.




Import...

The table below contains explanations of the vector graphic formats that can be imported.

File type	*CAD Drawings*	File formats and export formats of different CAD programs (*.dgw; *.dxf; *.plt; *.hgl; *.hg; *.hpg; *.plo; *.hp; *.hp1; *. hp2; *.hpgl ; *. hpgl2; *.gl2; *.pm; *.spl; *.rtl; *.cgm; *.svg)
	weldMARK Object	weldMARK® format for objects (*.wlo).
	HPGL Plotter File	The industry standard (*.plt); this format is primarily used for output to a pen plotter. Note that the resolution of the plotter file to be imported must match the resolution set in weldMARK so that the output size will be displayed correctly in weldMARK. The resolution in weldMARK depends on the F-Theta lens used. It is referred to as the calibration factor and can be seen under *System >Preferences* on the *Hardware* tab.
	Windows Enhanced Meta File	A format developed by Microsoft (*.emf). It can be used to store both vector graphic information and bitmaps embedded in the file. When vector graphic objects are copied to the clipboard, EMF format is used.
	Windows Meta File	A format developed by Microsoft (*.wmf), the precursor to the EMF format.
	AutoCAD	An export format (*.dxf), normally from AutoCAD®.
	Encapsulated PostScript	A format that is normally used as an output format for printing (*.eps).
	remaining	⇨ on page 30, Importing a job. ⇨ on page 37, Importing bitmap files.

4.3.2 Properties of a vector graphic object

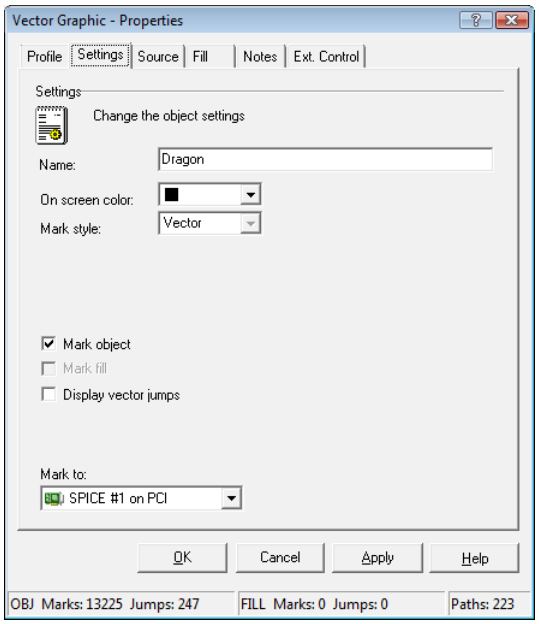
Vector graphics are assigned properties that determine how they are displayed on the screen and the behavior during laser processing. These properties are divided up as follows:

Profile	The object is assigned a marking profile. The parameters of this profile can be changed.	⇨ on page 108, Using profiles
Settings	Various settings can be made for the object.	⇨ on page 33, Settings for a vector graphic object
Source	Allows you to view the path to the source file.	⇨ on page 34, Source file for a vector graphic object
Fill	Fill parameters can be entered for the object.	⇨ on page 69, Object fill
Notes	A note can be assigned to the object.	⇨ on page 28, Notes
Ext. Control	A marking condition can be applied to the object. If the external control is activated, external signals determine whether the object is marked or skipped.	⇨ on page 29, External Control

Settings for a vector graphic object

Every vector graphic object is assigned specific settings that can be called up and, if necessary, modified as follows:

- o Right click on a vector graphic object.
- o Select the *Properties...* option from the menu.
- o Select the *Settings* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
On screen color	The color selection list can be used to select one of the preset colors to display the object on screen.
Mark object	If this function is enabled, the object contour is marked. The function is enabled by default.
Mark fill	If this function is enabled, the object fill is marked. The function can only be enabled if a fill has been set. This function is disabled by default.
Display vector jumps	If this function is enabled, the vector jumps between the individual part of the object are displayed on screen. The function is disabled by default.
Mark to	If more than one control card is installed, this drop-down menu can be used to set the control card to be used for marking the object.

Source file for a vector graphic object

Vector graphic objects are created in external programs and imported into weldMARK®. The path to the source file can be viewed as follows:

- Right click on a vector graphic object.
- Select the *Properties...* option from the menu.
- Select the *Source* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.

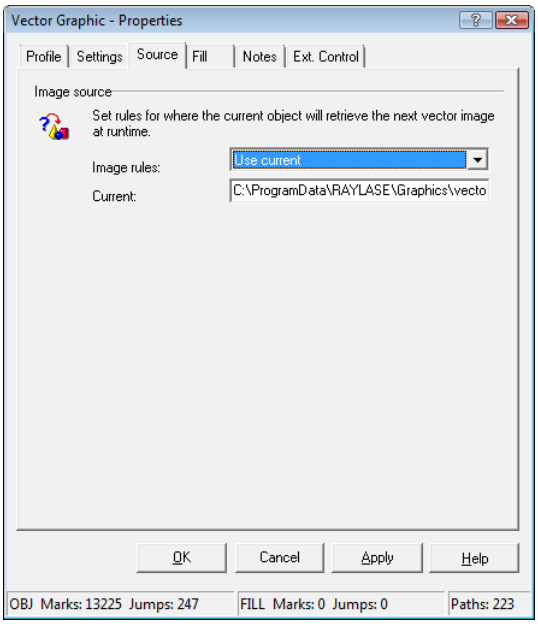


Image rules	No rules can be configured for graphic objects.
Current	This field specifies the path to the source file.

CAD settings of a vector graphic object

For vector graphic objects of the type CAD an additional tab „CAD“ is available. This tab is called as follows:

- o Right click on a vector graphic object.
- o Select the *Properties...* option from the menu.
- o Select the *CAD* tab.
- o The adjacent window is opened.
  Refer to the table below for explanations.

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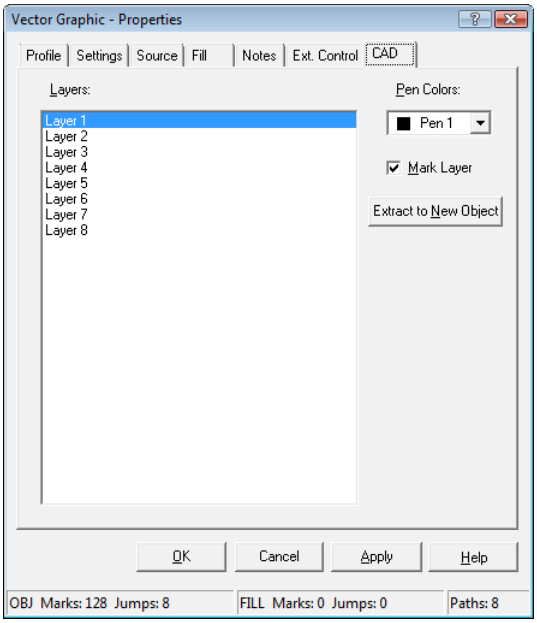
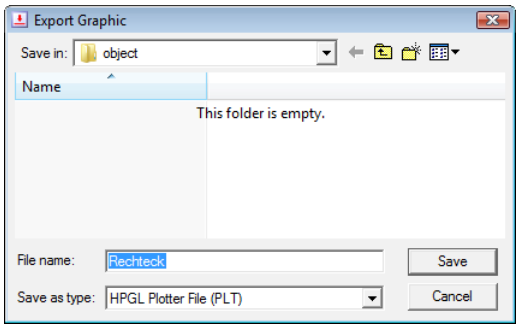


Layers	All layers of the vector graphic object are listed.
Pen Colors	A specific pen can be defined for every layer. Eight predefined pens are available (Pen 1 to Pen 8). Via the profile settings its possible to set marking parameters for each pen seperately (⇨ on page 108, Marking object profile).
Mark Layer	Via this field marking can be activated or deactivated for each layer seperately.
Extract to New Object	With clicking this button, the selected layer is removed from the vector graphic object and added as a new object to the object manager.

4.3.3 Exporting vector graphics

Vector graphic objects can be exported for use in other programs.

- o Right click on the vector graphic you want to export.
- o Select the *File >Export...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.



Save in	Folder in which you want to save the graphic.	
File name	The object name is suggested as the file name. However, you can overwrite this with the name of your choice.	
Save as type	The graphic can be saved in the following formats:	
	PLT	HPGL Plotter File
	WLO	weldMARK® object format

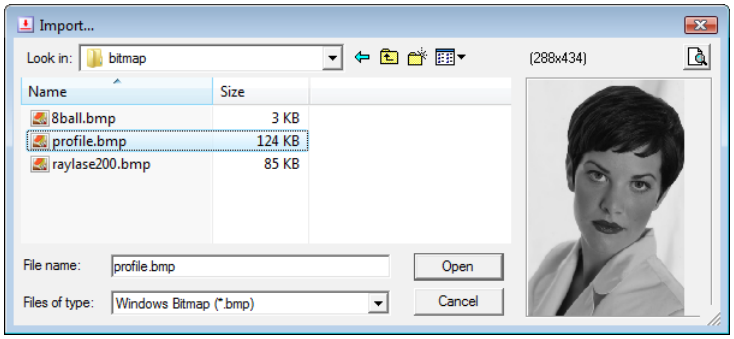
4.4 Importing and editing bitmap objects

4.4.1 Importing bitmap files

A bitmap is a rectangular grouping of pixels. For laser marking, the bitmap must be rasterized. As the deflection unit is a vector output device, this raster has to be simulated. To do this, the laser beam moves repeatedly over the image and marks a series of pixels each time. This process can take a long time. It normally takes longer to mark a bitmap representation of an object than a vector representation. However, some images only allow bitmap marking, e. g. photographs.

weldMARK® supports the import of bitmap files with monochrome, gray or colored content. Once imported, all images are automatically converted into gray scale images.

o Select the *File >Import...* option from the menu.
The adjacent window is opened.



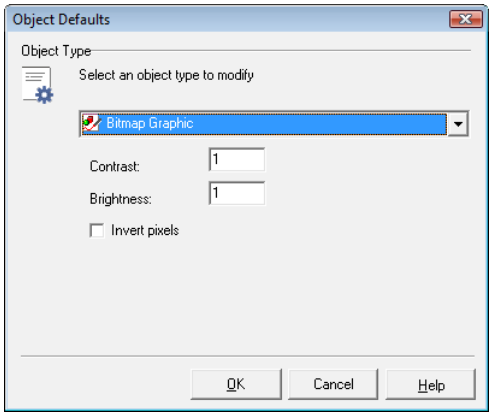
The table below contains explanations of the bitmap formats that can be imported.

Files of type	*Windows Bitmap (BMP)*	A Windows bitmap format.
	JPEG Bitmap (JPG)	Compressed bitmap format.
	CompuServe Bitmap (GIF)	
	PaintBrush (PCX)	*A PaintBrush* bitmap format.
	remaining	⇨ on page 31, Importing vector graphic files. ⇨ on page 30, Importing a job.

4.4.2 Defaults for bitmap objects

This section describes how you can call up and modify the defaults for bitmap objects. The defaults affect all new bitmap objects.

o Select the *Objects >Defaults...* option from the menu.
The adjacent window is opened.
Refer to the table below for explanations.



Contrast	The relationship between dark and light pixels in the image can be changed.
Brightness	The brightness of all pixels in the bitmap image can be changed.
Invert pixels	Enabling this function creates a negative of the original bitmap.

4.4.3 Properties of a bitmap object

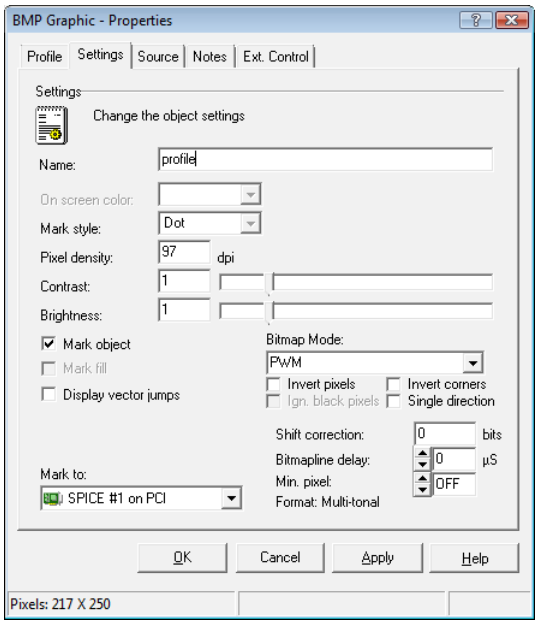
Bitmap objects are assigned properties that determine how they are displayed on the screen and the behavior during laser processing. These properties are divided up as follows:

Profile	The object is assigned a marking profile. The parameters of this profile can be changed.	⇨ on page 108, Using profiles
Settings	Various settings can be made for the object.	⇨ on page 39, Settings for a Bitmap Object
Source	Allows you to view the path to the source file.	⇨ on page 41, Source file for a bitmap object
Notes	A note can be assigned to the object.	⇨ on page 28, Notes
Ext. Control	A marking condition can be applied to the object. If the external control is activated, external signals determine whether the object is marked or skipped.	⇨ on page 29, External Control

Settings for a Bitmap Object

Every bitmap object is assigned specific settings that can be called up and, if necessary, modified as follows:

- o Right click on a bitmap object.
- o Select the *Properties...* option from the menu.
- o Select the *Settings* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.	
Pixel density	The pixel density can be changed.	
Contrast	The difference between lightest and darkest pixels can be modified.	
Brightness	The brightness of the marking result can be changed. If the value is increased, the laser rests on each pixel for longer; the marking result will be brighter or darker depending on the material.	
Mark object	Enabling this function means that the object will be marked. The function is enabled by default.	
Display vector jumps	If this function is enabled, the vector jumps between the individual part of the object are displayed on screen. The function is disabled by default.	
Bitmap mode	Depending on the kind of the bitmap object and the set laser type, the following modes can be selected (on page 40, Selectable bitmap modes).	
	PWM	If this function is selected, the laser power is controlled via pulse width modulation.
	Analog	If this function is selected, the laser power is controlled via an analog signal (0V to10V).
	Digital	If this function is selected, the laser power is controlled via a digital signal (8bit digital output).
	Timed	If this function is selected, the stored energy in the cavity of the laser will be used.
	Error Diffusion	If this function is selected, the bitmap object is converted into a monochrome bitmap using the default error diffusion algorithm. Black pixels are positioned in a way that the picture seems to consist of shades of grey.

Invert pixels	Creates a negative of the original bitmap object.
Single direction	Bitmap objects are marked a line at a time, with marking being performed in an alternating direction. If this function is enabled, marking is only performed in one direction, which can improve the marking quality (deactivates the hysteresis of the scanner mirror).
Ign. black pixels	During marking, the laser beam ignore pixels that have a 100% black value and are not therefore to be marked. This reduces the processing time.
Invert corners	If bitmap objects have been rotated, each corner can contain pixels that are not in the original. The color of these superfluous pixels can be set to black (no marking) or white.
Shift correction	Mechanical inertia and laser specific delay may cause hysteresis errors in the bidirectional operation, especially when marking with high speed. Via the parameter *Shift Correction* this hysteresis can be compensated.  not corrected  compensated  correction value too high
Bitmapline delay	Via this parameter an idle time is defined. The next line is marked not until the set time is elapsed.
Min. pixel.	Via this parameter a minimum grey value is defined. Only pixels of a bitmap object of the same or higher value are marked. If more than three pixels are to be ignored, automatically a jump command is performed to the next pixel to be marked. This may increase the marking speed. The value for *Min. pixel.* ranges from OFF to 1000. If the value is set to OFF, 0 or 1, no pixels are skipped.
Format:	The recognized file format of the bitmap object is displayed.
Mark to	If more than one control card is installed, this drop-down menu can be used to set the control card to be used for marking the object.

Selectable bitmap modes

Type of laser	Setting for laser power	Bitmap mode				
		PWM (Point&Shoot)	Analog	Digital	Timed „FPS“-Mode	Error Diffusion
CO_2	PWM	●				● [3]
YAG	Analog [1]	●	●		●	● [3]
	Digital [2]	●		●	●	● [3]
IPG	Digital [2]	●		●		● [3]
SPI	Analog [1]	●	● [4]	● [5]		● [3]
SLOW	–	●				
PCD	–	●				

● = selectable, 1 = DAC, 2 = Port B, 3 = not possible for combination with monochrome bitmaps
4 = Basic Interface, 5 = Extended Interface

Source file for a bitmap object

Bitmap objects are created in external programs and imported into weldMARK®. The path to the source file can be displayed as follows:

- Right click on a bitmap object.
- Select the *Properties...* option from the menu.
- *Source* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.

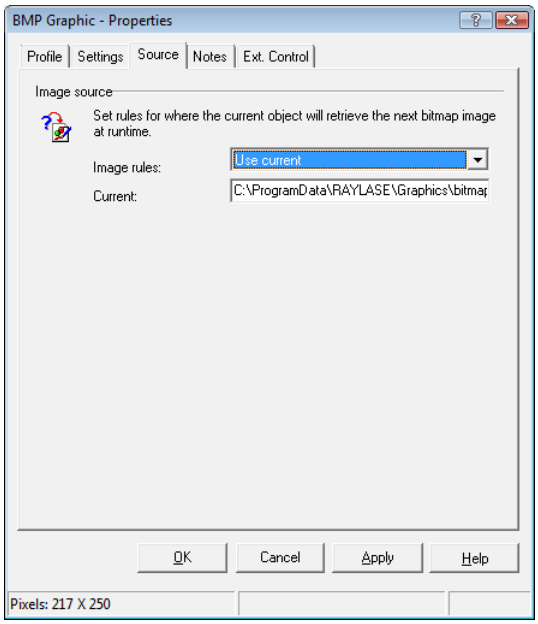
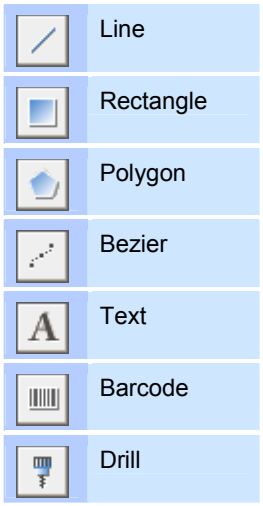


Image rules	No rules can be configured for graphic objects.
Current	This field specifies the path to the source file.

4.5 Adding and editing marking objects

Marking objects are all objects that can be marked with a laser. weldMARK® allows you to select the following marking object types:



The sections below describe how marking objects are added to a job and how these objects can subsequently be modified.

4.5.1 Line objects

A line is a one-dimensional object. It causes the laser to mark a straight line.

Adding a Line Object

o Select the *Objects >Add >Line* option from the menu.
A new line is inserted in the center of the workspace.


New line

Properties of a Line Object

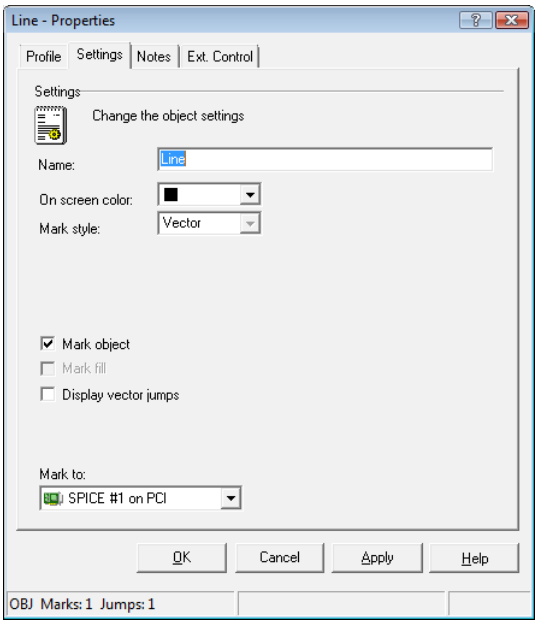
Line objects are assigned properties that determine how they are displayed on the screen and the behavior during laser processing. These properties are divided up as follows:

Profile	The object is assigned a marking profile. The parameters of this profile can be changed.	⇨ on page 108, Using profiles
Settings	Various settings can be made for the object.	⇨ on page 44, Settings for a Line ObjectSettings for a Line Object
Notes	A note can be assigned to the object.	⇨ on page 28, Notes
Ext. Control	A marking condition can be applied to the object. If the external control is activated, external signals determine whether the object is marked or skipped.	⇨ on page 29, External Control

Settings for a Line Object

Every line object is assigned specific settings that can be called up and, if necessary, modified as follows:

- o Right click on a line object.
- o Select the *Properties...* option from the menu.
- o Select the *Settings* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
On screen color	The color selection list can be used to select one of the preset colors to display the object on screen.
Mark object	Enabling this function means that the object will be marked. The function is enabled by default.
Display vector jumps	If this function is enabled, the vector jumps between the individual part of the object are displayed on screen. The function is disabled by default.
Mark to	If more than one control card is installed, this drop-down menu can be used to set the control card to be used for marking the object.

4.5.2 Rectangle objects

A rectangle is a marking object with four corners.

Adding a Rectangle Object

o Select the *Objects >Add >Rectangle* option from the menu.
A new rectangle object is inserted in the center of the workspace.


New rectangle

Properties of a Rectangle Object

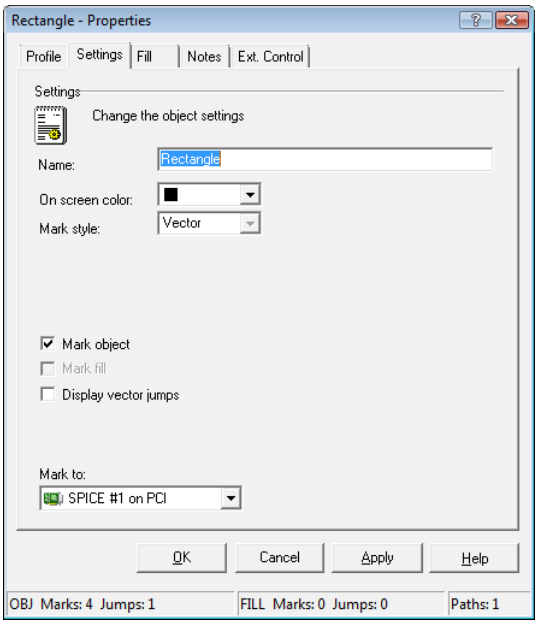
Rectangle objects are assigned properties that determine how they are displayed on the screen and the behavior during laser processing. These properties are divided up as follows:

Profile	The object is assigned a marking profile. The parameters of this profile can be changed.	⇨ on page 108, Using profiles
Settings	Various settings can be made for the object.	⇨ on page 46, Settings for a Rectangle Object
Fill	A fill can be applied to the object.	⇨ on page 69, Object fill
Notes	A note can be assigned to the object.	⇨ on page 28, Notes
Ext. Control	A marking condition can be applied to the object. If the external control is activated, external signals determine whether the object is marked or skipped.	⇨ on page 29, External Control

Settings for a Rectangle Object

Every rectangle object is assigned specific settings that can be called up and, if necessary, modified as follows:

- o Right click on a rectangle object.
- o Select the *Properties...* option from the menu.
- o Select the *Settings* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
On screen color	The color selection list can be used to select one of the preset colors to display the object on screen.
Mark object	If this function is enabled, the object contour is marked. The function is enabled by default.
Mark fill	If this function is enabled, the object fill is marked. The function can only be selected if a fill has been set. This function is disabled by default.
Display vector jumps	If this function is enabled, the vector jumps between the individual part of the object are displayed on screen. The function is disabled by default.
Mark to	If more than one control card is installed, this drop-down menu can be used to set the control card to be used for marking the object.

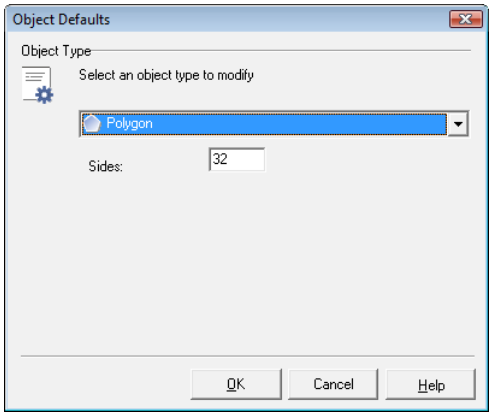
4.5.3 Polygon objects

A polygon object is an object that can be marked and has a definable number of sides of equal length. The distance from a corner to the center of the object is always the same.

Defaults for Polygon Objects

This section describes how you can call up and modify the defaults for polygon objects. The defaults affect all new polygon objects.

- Select the *Objects >Defaults...* option from the menu.
- Select the object type *Polygon*.
  The adjacent window is opened.
  Refer to the table below for explanations.



Sides	All new polygons are created with the number of corners entered.

Adding a Polygon Object

- Select the *Objects >Add >Polygon* option from the menu.
  A new polygon is inserted in the center of the workspace.


New polygon

Properties of a Polygon Object

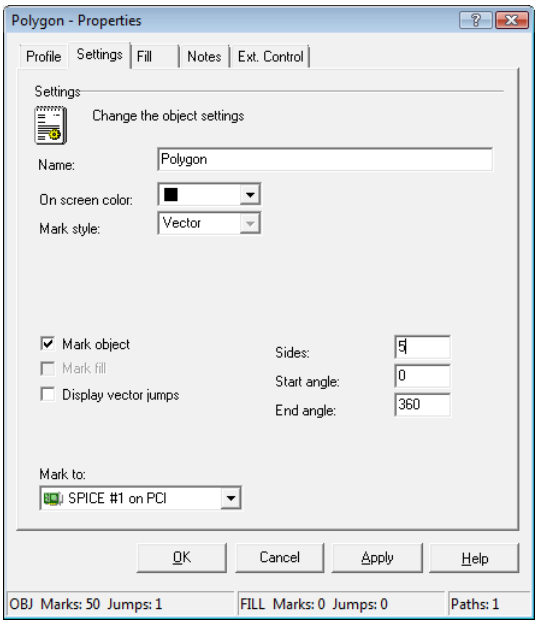
Polygon objects are assigned properties that determine how they are displayed on the screen and the behavior during laser processing. These properties are divided up as follows:

Profile	The object is assigned a marking profile. The parameters of this profile can be changed.	⇨ on page 108, Using profiles
Settings	Various settings can be made for the object.	⇨ on page 48, Settings for a polygon object
Fill	A fill can be applied to the object.	⇨ on page 69, Object fill
Notes	A note can be assigned to the object.	⇨ on page 28, Notes
Ext. Control	A marking condition can be applied to the object. If the external control is activated, external signals determine whether the object is marked or skipped.	⇨ on page 29, External Control

Settings for a polygon object

Every polygon object is assigned specific settings that can be called up and, if necessary, modified as follows:

- o Right click on a polygon object.
- o Select the *Properties...* option from the menu.
- o Select the *Settings* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
On screen color	The color selection list can be used to select one of the preset colors to display the object on screen.
Mark object	If this function is enabled, the object contour is marked. The function is enabled by default.
Mark fill	If this function is enabled, the object fill is marked. The function can only be selected if a fill has been set. This function is disabled by default.
Display vector jumps	If this function is enabled, the vector jumps between the individual part of the object are displayed on screen. The function is disabled by default.
Sides	Specifies the number of sides for the polygon.
Start angle	Specifies the angle position at which the first line segment begins. An angle of "0" corresponds to the 12:00 position on a clock.
End angle	Specifies the angle position at which the first line segment ends.
Mark to	If more than one control card is installed, this drop-down menu can be used to set the control card to be used for marking the object.

4.5.4 Bezier objects

Bezier objects are markable. This object kind consists of free-style spline curves. The object shape is defined by points and it can be changed by moving these points.

Adding a bézier object

o Select menu item *Objects >Add >Bezier*.
A new bezier object is added to the center of the screen.


Bezier

Properties of a bezier object

Bezier objects are assigned properties that determine how they are displayed on the screen and the behavior during laser processing. These properties are divided up as follows:

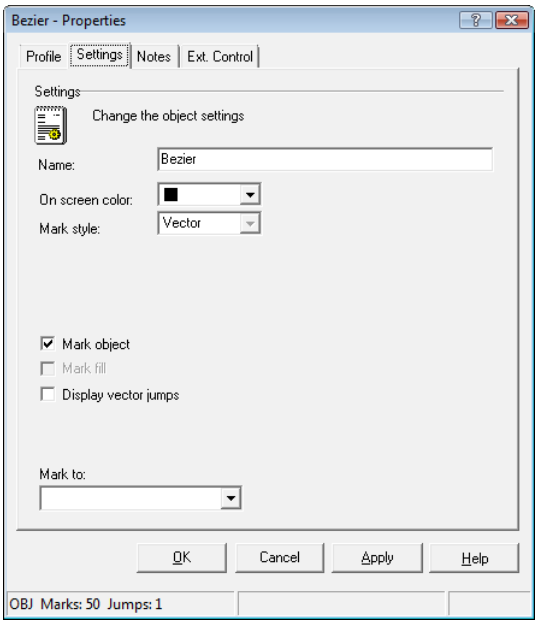
Profile	The object is assigned a marking profile. The parameters of this profile can be changed.	⇨ on page 108, Using profiles
Settings	Various settings can be made for the object.	⇨ on page 50, Settings of a bézier object.
Fill	A fill can be applied to bezier objects with a closed contour.	⇨ on page 69, Object fill
Notes	A note can be assigned to the object.	⇨ on page 28, Notes
Ext. Control	A marking condition can be applied to the object. If the external control is activated, external signals determine whether the object is marked or skipped.	⇨ on page 29, External Control

Settings of a bézier object

Every bezier object is assigned specific settings that can be called up and, if necessary, modified as follows:

- o Right click on a bezier object.
- o Select the *Properties...* option from the menu.
- o Select the *Settings* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.

Cxxx



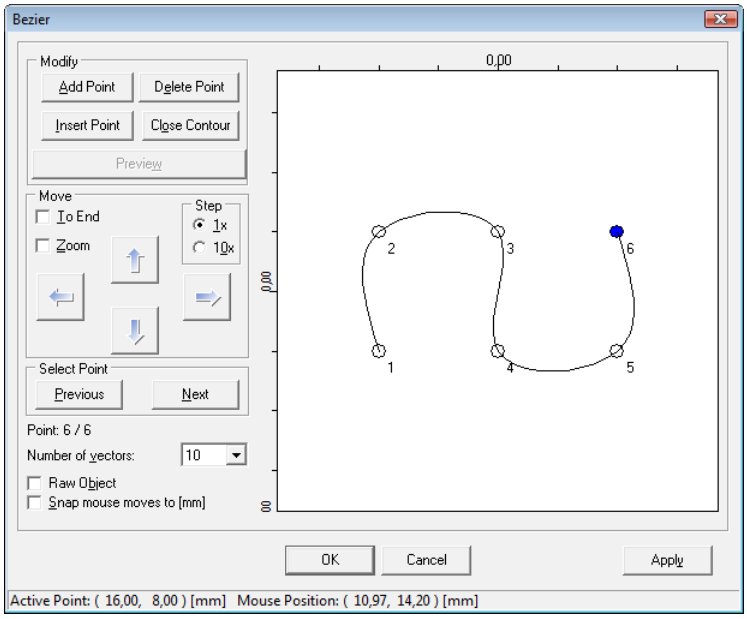
Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
On screen color	The color selection list can be used to select one of the preset colors to display the object on screen.
Mark object	If this function is enabled, the contour lines (shape) of the characters will be marked. The function is enabled by default.
Mark fill	If this function is enabled, the character fill is marked. The function can only be enabled for TrueType fonts and if a fill has been set for the object. This function is disabled by default.
Display vector jumps	If this function is enabled, the entire sequence of movements is displayed on the screen, including the times in which the laser is deactivated while moving to the next vector to be marked (vector jumps). The function is disabled by default.
Mark to	If more than one control card is installed, this drop-down menu can be used to set the control card to be used for marking the object.

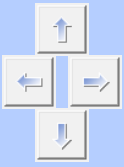
Modifying the shape of a bezier object

A bezier object is inserted with a standard shape. The shape can be modified as desired as described in the following:

- Left click on a bezier object.
- Press key *F6*.
  The adjacent window is opened.
  Refer to the table below for explanations.

Cxxx



Add Point		A new point is inserted behind the current point (no. 6 in the picture above).
Insert Point		A new point is inserted behind the selected point.
Delete Point		The selected point is deleted.
Close Contour		As described for the function *Add Point*, a new point is inserted behind the last point. Using this function, the new point is inserted exactly on the same position as point no.1. In this way a closed contour is created. Areas with closed contours can be filled, if necessary. If one of these both points, the first or the last one, are moved afterwards, the contour may not be closed anymore.
		The selected point can be moved via the arrow keys in the desired direction.
	To End	If this function is activated, the selected point is moved together with all subsequent points via the arrow keys.
	Zoom	If this function is activated, the bezier object can be zoomed up and down on the screen via the arrow keys.
	1x	Via this options fields the step width of the arrow key movement can be defined. *1x* = 0.1 mm, *10x* = 1 mm.
	10x	

Previous	To select the next or previous point in the bezier object.
Next	
Number of vectors	Via these pop-aup menü the number of vector lines, which connect two neighboured points, can be defined. If „1“ is selected, the points are connected via one line only.
Raw Object	It’s possible to modify or move Bezier objects in the weldMARK window (via dimension tools). After a modification in the weldMARK window it is possible that the Bezier object is positioned outside Bezier window borders. In this case activate function *Raw Object* to display the original bezier object at its point of origin.
Snap mouse moves to [mm]	If this function is activated, the point is snapped to a grid (1mm), when moving it via mouse.

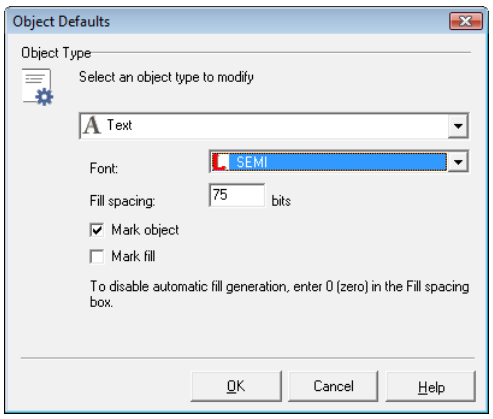
4.5.5 Text objects

Text objects can be created using either TrueType™ fonts or laser-optimized fonts. For TrueType™ fonts, the characters are defined by their contour. The contour can be given a fill. For laser-optimized fonts, the characters are made up of lines or points. The laser-optimized fonts "Stroke" and "SEMI Dot Matrix" are included in the weldMARK® installation.

Defaults for Text Objects

This section describes how you can call up and modify the defaults for text objects. The defaults affect all new text objects.

- Select the *Objects >Defaults...* option from the menu.
- Select the object type *Text*.
  The adjacent window is opened.
  Refer to the table below for explanations.

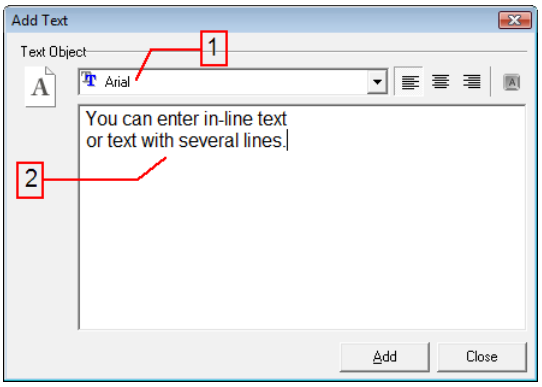


Font	The character set for all new text objects can be selected.
Fill spacing	The distance between the individual fill lines can be set for all new text objects. Entering "0" means that the characters will not be filled.
Mark object	If this function is enabled, the contour lines for the characters will be marked. The function is enabled by default.
Mark fill	If this function is enabled, the character fill is marked. The function can only be enabled if a fill spacing of > 0 has been set. This function is disabled by default.


New text

Adding a Text Object

o Select the *Objects >Add >Text* option from the menu.
The adjacent window is opened.
Refer to the table below for explanations.



(1)	Character set to be used for the new text object.
(2)	Content of the new text object (string).
	Text alignment buttons for multi-line texts (left aligned, centered, right aligned).
	The Windows character map is called up to make it easier to enter special characters. (⇨ on page 60, Unicode character map)
Add	The new object is inserted in the center of the workspace.

Properties of a text object

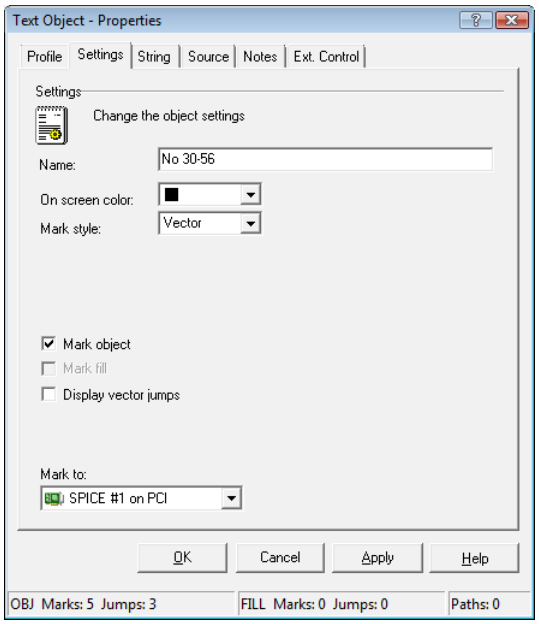
Text objects are assigned properties that determine how they are displayed on the screen and the behavior during laser processing. These properties are divided up as follows:

Profile	The object is assigned a marking profile. The parameters of this profile can be changed.	⇨ on page 108, Using profiles
Settings	Various settings can be made for the object.	⇨ on page 55, Settings for a text object.
String	Content and formatting of the text object.	⇨ on page 57, String for a text object
Source	The content of text objects can be changed dynamically based on various rules.	⇨ on page 57, String rules
Fill	A fill can be applied to the object.	⇨ on page 69, Object fill
Notes	A note can be assigned to the object.	⇨ on page 28, Notes
Ext. Control	A marking condition can be applied to the object. If the external control is activated, external signals determine whether the object is marked or skipped.	⇨ on page 29, External Control

Settings for a text object

Every text object is assigned specific settings that can be called up and, if necessary, modified as follows:

- o Right click on a text object.
- o Select the *Properties...* option from the menu.
- o Select the *Settings* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.

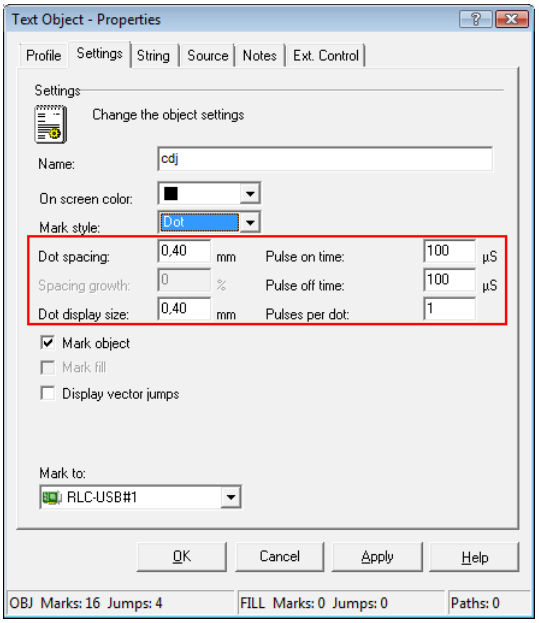


Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
On screen color	The color selection list can be used to select one of the preset colors to display the object on screen.
Mark style	The text object is marked in either a vector-based or dot matrix style. Additional settings are available for the "dot matrix" marking style. (⇨ on page 56, Additional settings for dot matrix fonts).
Mark object	If this function is enabled, the contour lines (shape) of the characters will be marked. The function is enabled by default.
Mark fill	If this function is enabled, the character fill is marked. The function can only be enabled for TrueType fonts and if a fill has been set for the object. This function is disabled by default.
Display vector jumps	If this function is enabled, the entire sequence of movements is displayed on the screen, including the times in which the laser is deactivated while moving to the next vector to be marked (vector jumps). The function is disabled by default.
Mark to	If more than one control card is installed, this drop-down menu can be used to set the control card to be used for marking the object.

Additional settings for dot matrix fonts

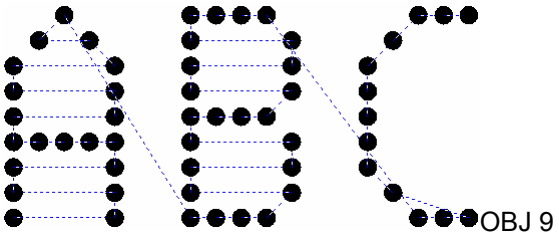
Dot matrix fonts are special character sets in which the characters are made up of individual dots. The character set SEMI Dot Matrix is included in the weldMARK® installation. Special settings are available for this kind of character set:

- Right click on a text object.
- Select the *Properties...* option from the menu.
- Select the *Settings* tab.
- Select the marking style *Dot*.
  The adjacent window is opened.
  Refer to the table below for explanations.



Dot spacing	Distance between the marking points in the X and Y axis.	
Dot display size	Dot size on the screen. This parameter has no influence on the actual marking.	
Pulse on time	Laser activation time per pulse.	Depending on the material, the combination of these settings determines the size of the marking points.
Pulse off time	Laser deactivation time between the individual pulses (with > 1 pulses).	
Pulses per dot	Number of pulses emitted per marking point.	

Example:



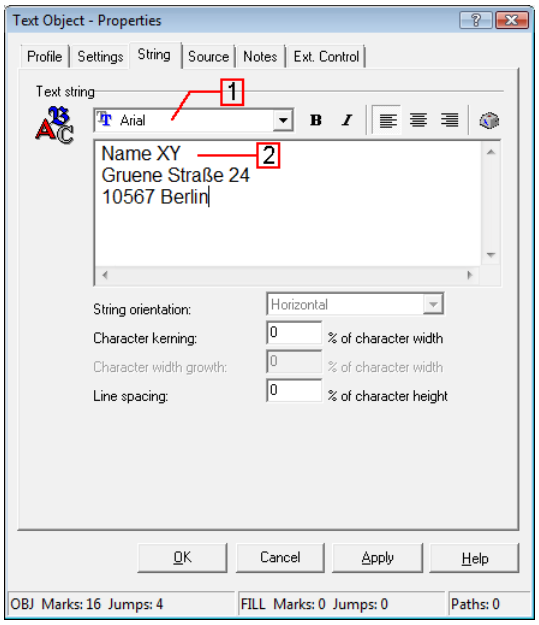
Screen display for a dot matrix font with vector jumps shown.

String for a text object

The content of a text object consists of a string. In turn, this string can consist of any combination of letters and numbers. weldMARK® differentiates between one-line and multi-line strings (with paragraph breaks) and provides different functions in each case.

Content and display options for multi-line text objects

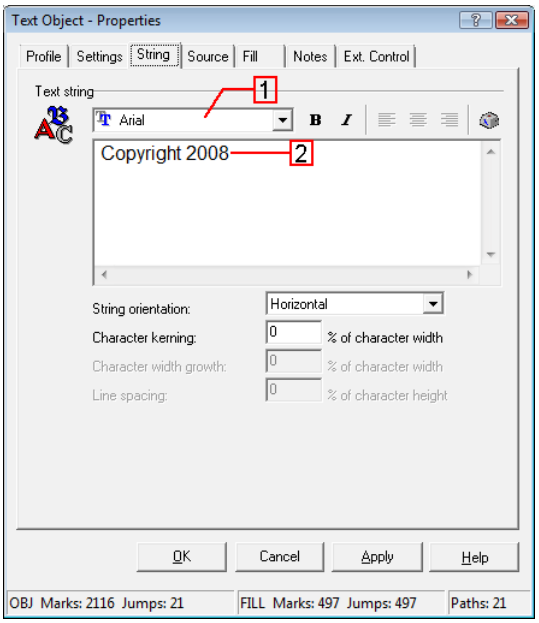
- Right click on a multi-line text object.
- Select the *Properties...* option from the menu.
- Select the *String* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



[1]	Font for text object.
[2]	Content of the text object (string).
	The font styles "Bold" and/or "Italic" can be applied to text objects with True Type Fonts.
	Text alignment buttons for multi-line texts (left aligned, centered, right aligned).
	The Windows character map is called up to make it easier to enter special characters. (⇨ on page 60, Unicode character map)
Character kerning	The spacing between the individual characters can be changed. Positive values increase the spacing, negative values reduce it. A value of "0" uses the kerning defined in the character set.
Character width growth	The width of the individual characters can be changed. Positive values increase the character width, negative values reduce it. Entering "0" means that the character width defined in the character set is used.
Line spacing	The spacing between the lines can be changed. Positive values increase the spacing, negative values reduce it. Entering "0" means that the line spacing defined in the character set is used.

Content and display options for single line text objects

- o Right click on a single line text object.
- o Select the *Properties...* option from the menu.
- o Select the *String* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.

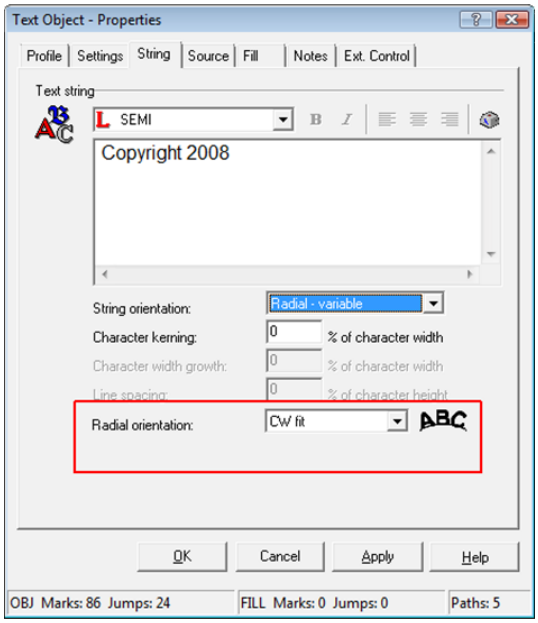


[1]	Font for text object.
[2]	Content of the text object (string).
B I	You can apply the styles "Bold" and/or "Italic" to the text object.
	The Windows character map is called up to make it easier to enter special characters. (⇨ on page 60, Unicode character map)
String orientation	You can choose between *Horizontal*, *Vertical*, *Radial - variable* and *Radial – fixed*. If a 4-axis motor control card is installed, the additional option *circumferential* is also available.
Character kerning	The spacing between the individual characters can be changed. Positive values increase the spacing, negative values reduce it. A value of "0" uses the kerning defined in the character set.
Character width growth	The width of the individual characters can be changed. Positive values increase the character width, negative values reduce it. A value of "0" uses the character width defined in the character set.

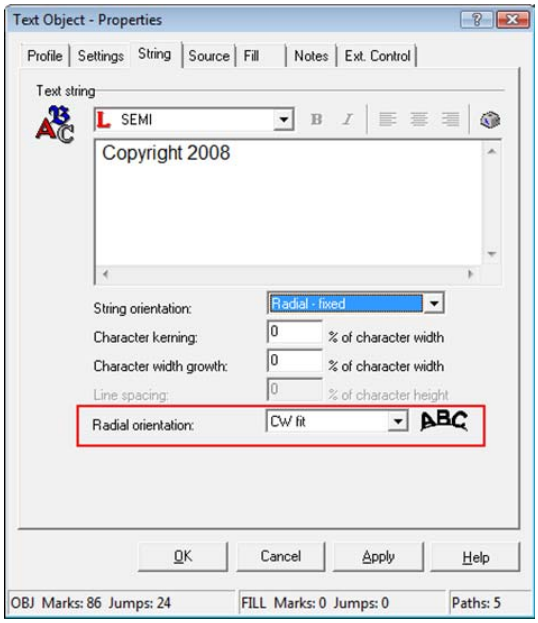
Horizontal | Vertical | Radial - variable Clockwise (CW fit) | Radial - variable Anticlockwise (CCW fit) | Circumferential

⇨ on page 59, Additional setting options for radial text
⇨ on page 59, Additional setting options for circumferential text

Additional setting options for radial text



Radial - variable



Radial - fixed

Radial orientation	The text can run clockwise *(CW fit)* or anticlockwise (*CCW fit*).
Character width growth	The width of the individual characters can be changed. Positive values increase the character width, negative values reduce it. Entering "0" means that the character width defined in the character set is used.

Additional setting options using keyboard commands

The following settings can be made exclusively using keyboard commands when the *Properties* and *Dimensions* windows are closed:

Radius	Make sure that the required text object is selected. Hold down the *ALT* key and use the *Up* and *Down* arrow keys to enlarge or reduce the object radius.
Rotation	Make sure that the required text object is selected. Hold down the *ALT* key and use the *Right* and *Left* arrow keys to rotate the object.

Additional setting options for circumferential text

The *Circumferential* option is only available if the optional 4-axis motor control card is installed. The following additional settings are available:

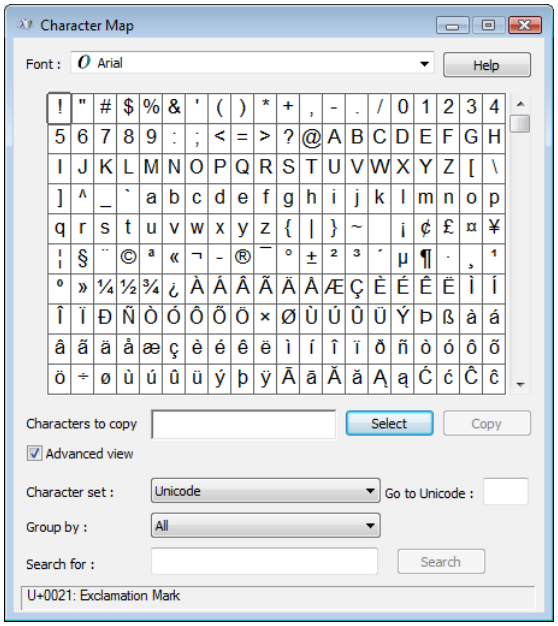
Part radius	Radius of the area to be marked.
Index step speed	Step speed of the motor.
Index step delay	Delay between the movement of the motor and marking of a character. This allows the motor to come to rest before the marking is performed.
Reset indexer to:	Enable this function to return the motor to a defined start position before processing an object.

Unicode character map

The Windows Unicode character map enables you to insert any characters in a font, particularly special characters, into the string of characters in a text object.

Character Map

- Right click on a text object.
- Select the *Properties...* option from the menu.
- Select the *String* tab.
- Click on the *Character Map* icon.
  The adjacent window is opened.
  Refer to the table below for explanations.



Font	This selection box can be used to select a font.
Select	Clicking on this button adds the selected character to the list of *Characters to copy*.
Characters to copy	This field lists the selected characters.
Group by	This selection box can be used to display a subgroup of characters from the selected font.
Copy	Clicking on this button copies the characters in the *Characters to copy* list to the clipboard.

4.5.6 Barcode objects

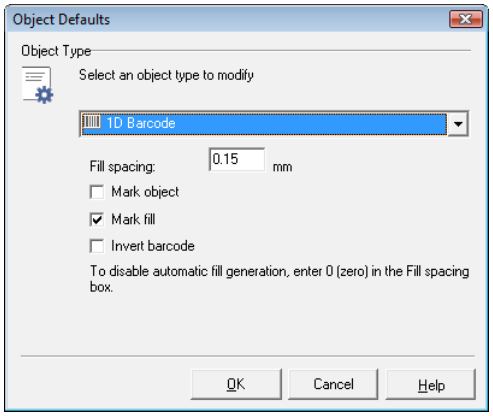
Barcode objects represent numerical and/or alphanumeric characters as a machine readable graphic. The following barcode objects are supported by weldMARK®:

Code 39, Extended Code 39, HIBC	UPC A, UPC E
CodaBar	EAN 8, EAN 13, BookLan
Code 93	DataMatrix (ECC200)
Code 128, EAN/UCC 128	Denso QR code
Interleaved 2 of 5 (ITF)	PDF 417
POSTNET (Zip+4, Zip+6)	

Defaults for barcode objects

This section describes how you can call up and modify the defaults for barcode objects. The defaults affect all new barcode objects.

- Select the *Objects >Defaults...* option from the menu.
- Select the object type *1D Barcode* or *2D Barcode.*
  The adjacent window is opened.
  Refer to the table below for explanations.

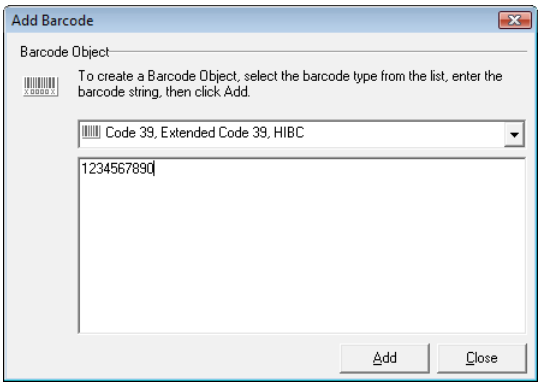


Fill spacing	When marking a barcode object, each bar or cell in a barcode is created with single lines. Via the value for *Fill spacing* the distance of these fill lines can be set. A value of "0" means that the bars will not be filled.
Mark object	If this function is enabled, the contour lines for the bars or cells will be marked. This function is disabled by default.
Mark fill	If this function is enabled, the bar or cell fill is marked. This function is enabled by default.
Invert barcode	Enabling this function creates a negative of the original barcode. This function is disabled by default.

New barcode

Adding a barcode object

- Select the *Objects >Add >Barcode* option from the menu.
  The adjacent window is opened.
- Select the required barcode type.
- Enter the necessary data for the barcode.
- Click on the *Add* button.
  A new barcode object is inserted in the center of the workspace.



Properties of a barcode object

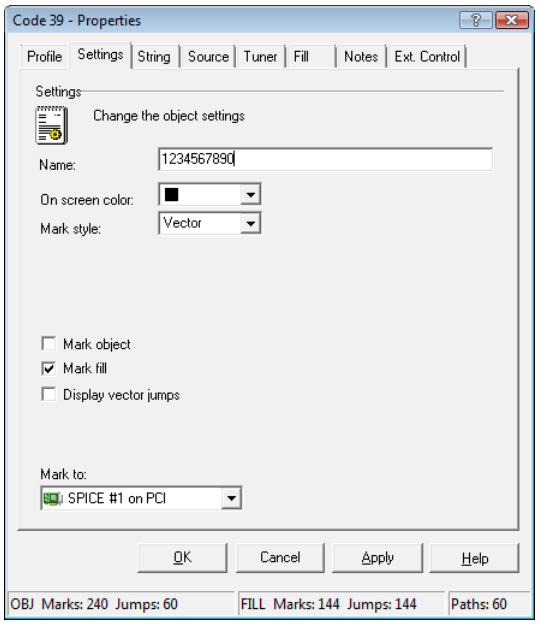
Barcode objects are assigned properties that determine how they are displayed on the screen and the behavior during laser processing. These properties are divided up as follows:

Profile	The object is assigned a marking profile. The parameters of this profile can be changed.	⇨ on page 108, Using profiles
Settings	Various settings can be made for the object.	⇨ on page 63, Settings for a barcode object
String	Content of the barcode object.	⇨ on page 65, String for a barcode object
Source	The content of barcode objects can be changed dynamically based on various rules.	⇨ on page 71, String rules
Tuner	The barcode can be adapted for individual requirements.	⇨ on page 66, Tuner values for barcode objects
Fill	A fill can be applied to the object.	⇨ on page 69, Object fill
Notes	A note can be assigned to the object.	⇨ on page 28, Notes
Ext. Control	A marking condition can be applied to the object. If the external control is activated, external signals determine whether the object is marked or skipped.	⇨ on page 29, External Control

Settings for a barcode object

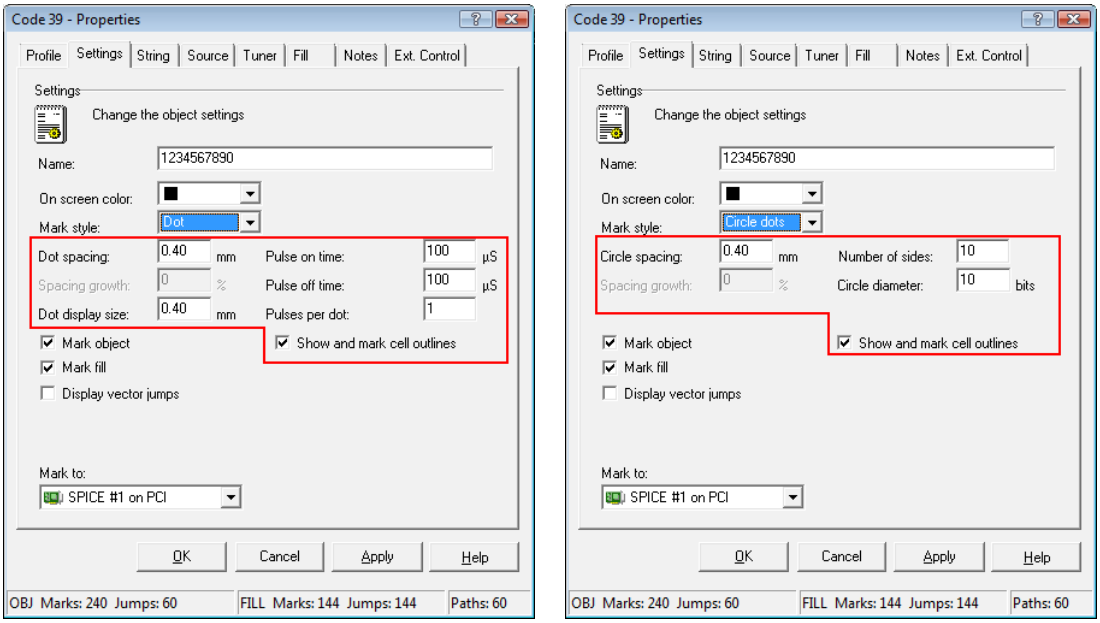
Every barcode object is assigned specific settings that can be called up and, if necessary, modified as follows:

- o Right click on a barcode object.
- o Select the *Properties...* option.
- o Select the *Settings* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



Settings

Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
On screen color	The color selection list can be used to select one of the preset colors to display the object on screen.
Mark style	Barcode objects can be marked using vectors, dots or circle dots. ⇨ on page 64, Settings for "dot" mode ⇨ on page 64, Settings for "Circle dots" mode
Mark object	If this function is enabled, the contour lines for bars or cells will be marked. This function is disabled by default.
Mark fill	If this function is enabled, the bar or cell fill is marked. This function is enabled by default.
Display vector jumps	If this function is enabled, the entire sequence of movements is displayed on the screen, including the times in which the laser is deactivated while moving to the next vector to be marked (vector jumps). The function is disabled by default.
Mark to	If more than one control card is installed, this drop-down menu can be used to set the control card to be used for marking the object.



Settings for "dot" mode

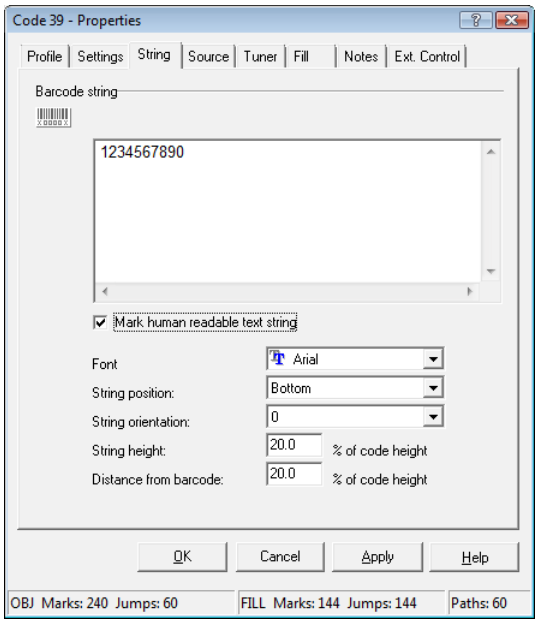
Dot spacing	Distance between the marking points in the X and Y axis.	
Dot display size	Dot size on the screen. This parameter has no influence on the actual marking.	
Pulse on time	Laser activation time per pulse.	Depending on the material, the combination of these settings determines the size of the marking points.
Pulse off time	Laser deactivation time between the individual pulses (with > 1 pulses).	
Pulses per dot	Number of pulses emitted per marking point.	
Show and mark cell outlines	If this function is enabled, the outlines of the bars will be displayed and marked.	

Settings for "Circle dots" mode

Circle spacing	The distance between two adjacent marking circles.
Number of sides	Each circle is made up of a number of lines. The more lines, the more rounded the circle appears. The number of sides determines how many lines make up each circle dot.
Circle diameter	The diameter of a marking circle.
Show and mark cell outlines	If this function is enabled, the outlines of the bars will be displayed and marked.

String for a barcode object

- o Right click on a barcode object.
- o Select the *Properties...* option.
- o Select the *String* tab.
- o The adjacent window is opened.
  Refer to the table below for explanations.

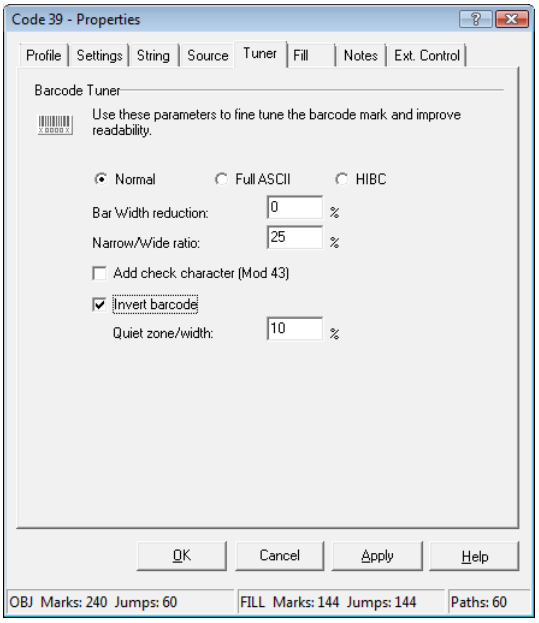


Barcode string	Content of the barcode object.	
Mark human readable text string	If this function is enabled, in addition to the barcode the associated string is marked in plain text.	
	Font	Font for the string.
	String position	The string can be positioned below, above to the left or to the right of the barcode.
	String orientation	The alphanumeric string can be rotated in 90° increments.
	String height	The height of the characters relative to the height of the barcode can be set.
	Distance from barcode	The distance between the string and the barcode can be set relative to the height of the barcode.

Tuner values for barcode objects

The tuner values allow you to adapt a barcode object to individual requirements. Some barcode types require special options and tuner settings. The tuner values in the following example represent the values for barcode type “Code 39”. Please refer to the respective barcode explanations for non-listed tuner values.

- Right click on a barcode object.
- Select the *Properties...* option from the menu.
- Select the *Tuner* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



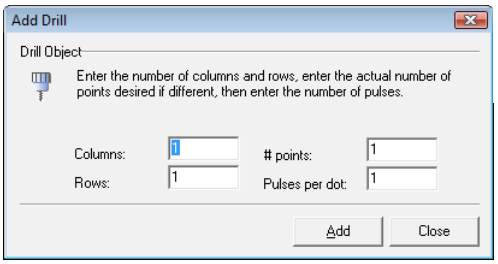
Bar width reduction	The bar width can be adjusted between -99% and 99%. A positive value reduces the bar width and a negative value increases it.	
Narrow/Wide ratio	Ratio of dark and light areas in the barcode (the value must be an integer between 20 and 30).	
Add check character	Enabling this function adds a check character to the barcode.	
Invert barcode	Enabling this function creates a negative of the original barcode.	
	Quiet zone/width	The width of the quiet zone can be set relative to the barcode width.

4.5.7 Drill objects

When executing drill objects, the laser is moved to the specified co-ordinates and activated for a set time. Drill objects consist of individual dots arranged in rows and columns. Drill objects are used for perforating or drilling through a workpiece, for example.

Adding a drill object

o Select the *Objects >Add > Drill...* option from the menu.
The adjacent window is opened.
Refer to the table below for explanations.



New drill object

Columns	Number of (dot) rows and columns that the drill object will consist of.
Rows	
# points	Number of dots that the drill object consists of. Note that a value of "1" creates a single dot. For precision setting, a number of points that is less than the product of the rows and columns can be set.
Pulses per dot	Number of pulses emitted per marking point.

Properties of a drill object

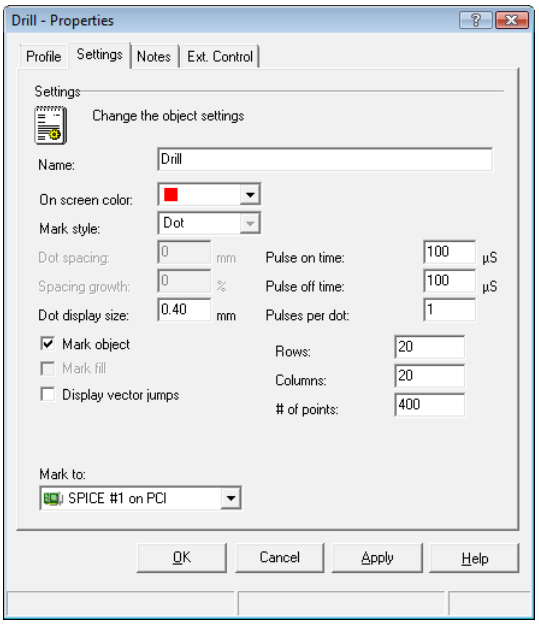
Drill objects are assigned properties that determine how they are displayed on the screen and the behavior during laser processing. These properties are divided up as follows:

Profile	The object is assigned a marking profile. The parameters of this profile can be changed.	⇨ on page 108, Using profiles
Settings	Various settings can be made for the object.	⇨ on page 68, Settings for a drill object
Notes	A note can be assigned to the object.	⇨ on page 28, Notes
Ext. Control	A marking condition can be applied to the object. If the external control is activated, external signals determine whether the object is marked or skipped.	⇨ on page 29, External Control

Settings for a drill object

Every drill object is assigned specific settings that can be called up and, if necessary, modified as follows:

- o Right click on a drill object.
- o Select the *Properties...* option from the menu.
- o Select the *Settings* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.	
On screen color	The color selection list can be used to select one of the preset colors to display the object on screen.	
Dot display size	Dot size on the screen. This parameter has no influence on the actual marking.	
Pulse on time	Laser activation time per pulse.	Depending on the material, the combination of these settings determines the size of the marking points.
Pulse off time	Laser deactivation time between the individual pulses (with > 1 pulses).	
Pulses per dot	Number of pulses emitted per marking point.	
Mark object	Enabling this function means that the object will be marked. The function is enabled by default.	
Display vector jumps	If this function is enabled, the entire sequence of movements is displayed on the screen, including the times in which the laser is deactivated while moving to the next vector to be marked (vector jumps). The function is disabled by default.	
Rows	Number of rows of dots in the drill object.	
Columns	Number of columns of dots in the drill object.	
# of points	Number of dots that the drill object consists of. The number of dots can be less than the product of *Rows* and *Columns*.	
Mark to	If more than one control card is installed, this drop-down menu can be used to set the control card to be used for marking the object.	

4.6 Object fill

weldMARK® enables areas of an object to be given a fill. Only completely enclosed areas of polygon objects (characters of text objects, polygon or rectangle objects, enclosed Bezier objects, barcode objects or imported vector graphics) can be filled. The exceptions are bitmap objects, laser optimized fonts, dot matrix fonts and drill objects.

Overlapping objects can not be given a fill.

The fill is created by densely packed lines that can be identified as hatching with a larger spacing.

Empty object

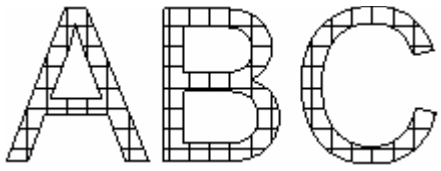
Filled object

The optimum spacing between the individual lines in a fill depends on the wavelength of the laser, the spot size, the material and other factors. The set line spacing is saved along with the object and remains unchanged even if the size of the object is changed.
The examples below show different fill spacings:

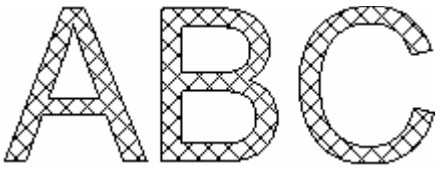
Fill spacing = 150 bits

Fill spacing = 30 bits

In addition to parallel lines, a crosshatch fill with different angles is available:

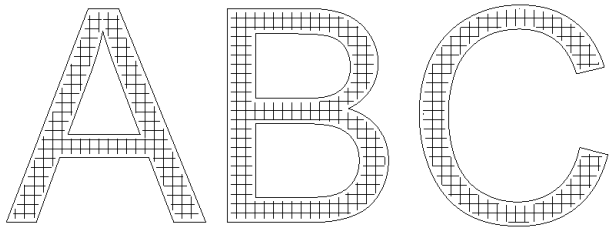


Crosshatch with 0 and 90 degrees



Crosshatch with –45 and +45 degrees

Via the „Offset“ option a distance between the object filling and the object outline can be defined:

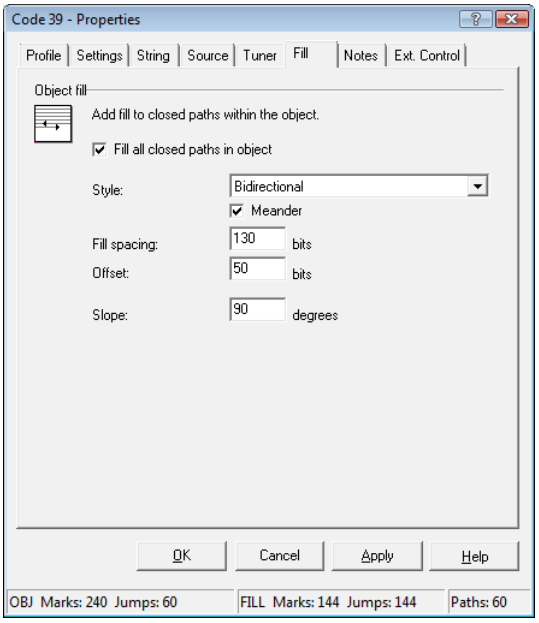


Object filling with a distance to the object outline

Setting the object fill

The fill for a selected object is activated and set as follows:

- o Right click on the object to be filled.
- o Select the *Properties...* option.
- o *Fill* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.

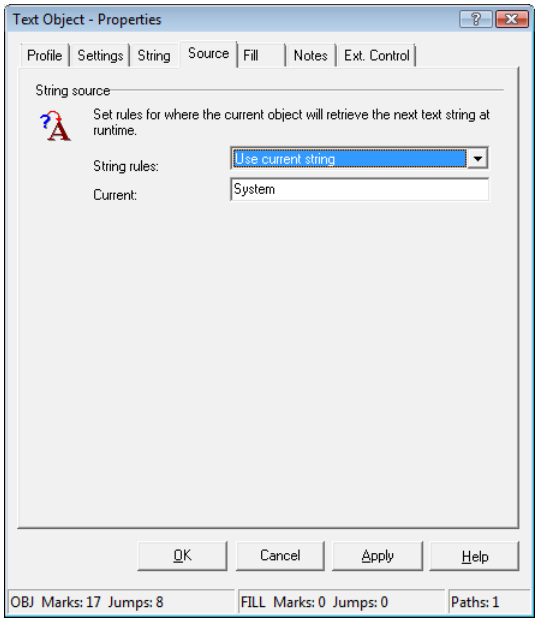


Fill all closed paths in object	If this function is enabled, all closed paths in the selected object are filled.	
	Style	 Parallel lines
		 Crosshatch
		 Parallel lines, bidirectional
		Crosshatch+Bidirectional
	Meander	Only for barcode objects with bidirectional hatches (not for 2D barcodes): The filling of the objects are marked in one go, i.e. without switching off of the laser between end and start point of the single lines.
	Fill spacing	Spacing of the fill lines.
	Offset	This option enables an improvement of the marking quality of a filled object. The laser beam creates rounded start and end dots with the diameter of the laser spot on each fill line. This causes an waved appearance of the object outline. The outline is straightened by an additional marking of the outline itself. Because the outline overlaps the start and end points of the filling lines, these areas are marked twice. This can be prevented by an offset, i.e. a distance between the outline and the filling lines.
	Slope 1	Hatching angle for parallel lines.
	Slope 2	Hatching angle for crosshatch.

4.7 String rules

The strings on which text and barcode objects are based can be changed dynamically during execution of the job. The content of the string is adjusted at regular intervals according to the selected string rule.
The string rule for a text or barcode object can be called up and, if necessary, modified as follows:

- Right click on a text or barcode object.
- Select the *Properties...* option from the menu.
- Select the *Source* tab.
  The adjacent window is opened. The table below contains an overview of the available string rules.



Use current string		The content of the *String* tab acts as the source for the string. This is the default setting.
Use TextMerge		The source of the string is a linked text file. ⇨ on page 72, "Use TextMerge" string rule (one line objects) ⇨ on page 73, "Use TextMerge" string rule (multi-line objects)
For one line text and barcode objects only	*Use AutoDate*	Depending on the setting, the string will either consist of the current date, the current time or the current shift code. ⇨ on page 74, "Use AutoDate" string rule
	Supply string at start	The string must be entered by the user before starting each job. This entry is then valid until the end of the job. ⇨ on page 76, "Supply string at start" string rule
	Supply string every mark	The string must be entered by the user each time the object is marked. ⇨ on page 76, "Supply string every mark" string rule
	Serialize w/current start value	The content of the string is changed in specified increments. The content of the *String* tab is used as the start value. ⇨ on page 77, "Serialize w/current start value" string rule
	Serialize w/supplied start value	The content of the string is changed in specified increments. The user is prompted to enter a start value. ⇨ on page 78, "Serialize w/supplied start value" string rule
	Get string from memory buffer	The content of one of the ten weldMARK® buffers is used as the source for the string. ⇨ on page 79, "Get string from memory buffer" string rule
	Custom string	The content of the string is determined by a formatting code. ⇨ on page 80, "Custom string" string rule

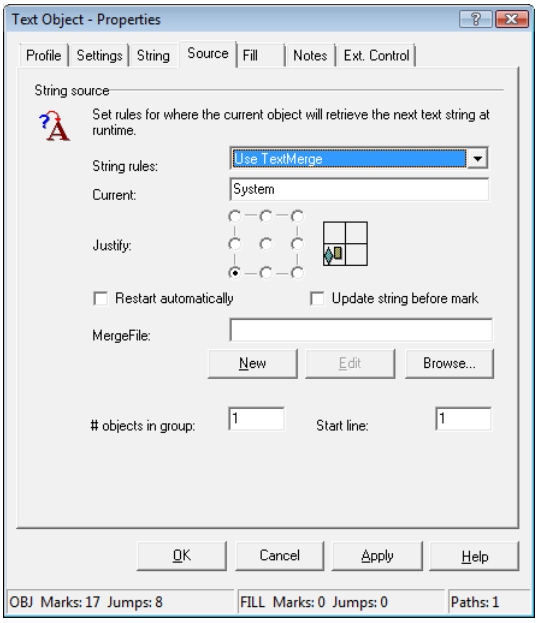
The range of options available is reduced for multi-line text objects.

4.7.1 "Use TextMerge" string rule (one line objects)

This rule enables the strings for one line text or barcode objects to be loaded from a merge file. A simple text file with the extension ".txt" is used as the merge file. Each string in the merge file must be completed with a line break (Enter key). This also applies to the last line in the merge file.

The parameters of the TextMerge function can be set as follows for one line objects:

- Right click on a one line text or barcode object.
- Select the *Properties...* option from the menu.
- Select the *Source* tab.
- Select the *Use TextMerge* string rule.
  The adjacent window is opened.
  Refer to the table below for explanations.



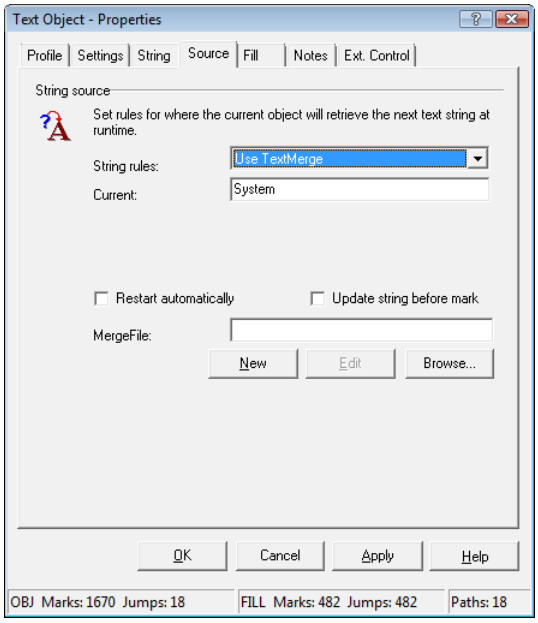
Justify	With strings of different lengths, this function aligns the strings with the selected point in the original string (left, right, centered / top, center, bottom).
Restart automatically	If this function is enabled, the merge file will be re-processed as soon as its end has been reached.
Update string	If this function is enabled, the merge file will be read again before executing.
MergeFile	The specified text file is completely loaded when starting the job. For each marking operation, the string for the text or barcode object is overwritten with the next line from the merge file. If the job is ended, weldMARK® sets a bookmark in this text file to indicate the last item processed.
New	The merge file can be created, searched, loaded and edited in weldMARK®.
Edit	
Browse...	
# objects in group	Number of text or barcode objects in current job that read their string from the same merge file. The value entered corresponds to the increment for reading the lines: For each marking operation, lines in the merge file are skipped corresponding to the number of objects in the group.
Start line	Number of the first line to be read from the merge file.

4.7.2 "Use TextMerge" string rule (multi-line objects)

This rule enables the strings for multi-line text or barcode objects to be loaded from a merge file. A simple text file with the extension ".txt" is used as the merge file. Each string in the merge file must be completed with a line break (Enter key). This also applies to the last line in the merge file.

The parameters of the TextMerge function can be set as follows for multi-line objects:

- Right click on a multi-line text or barcode object.
- Select the *Properties...* option from the menu.
- Select the *Source* tab.
- Select the *Use TextMerge* string rule.
  The adjacent window is opened.
  Refer to the table below for explanations.

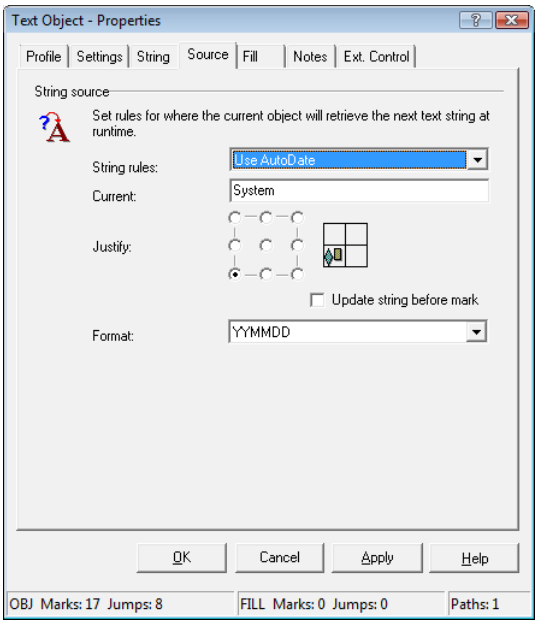


MergeFile	The specified text file is completely loaded when starting the job. For each marking operation, the string for the text or barcode object is overwritten with the next lines from the MergeFile. If the job is ended, weldMARK® sets a bookmark in this text file to indicate the last item processed.
Restart automatically	If this function is enabled, the merge file will be re-processed as soon as its end of file has been reached.
Update string	If this function is enabled, the merge file will be read again before executing.
New	The merge file can be created, searched, loaded and edited in weldMARK®.
Edit	
Browse...	

4.7.3 "Use AutoDate" string rule

This rule enables text or barcode objects to be marked with the current date, the current time or the current shift code. This information is derived from the Windows system clock and is updated for each marking operation.

- Right click on a one line text or barcode object.
- Select the *Properties...* option from the menu.
- Select the *Source* tab.
- Select the *Use AutoDate* string rule.
  The adjacent window is opened.
  Refer to the table below for explanations.

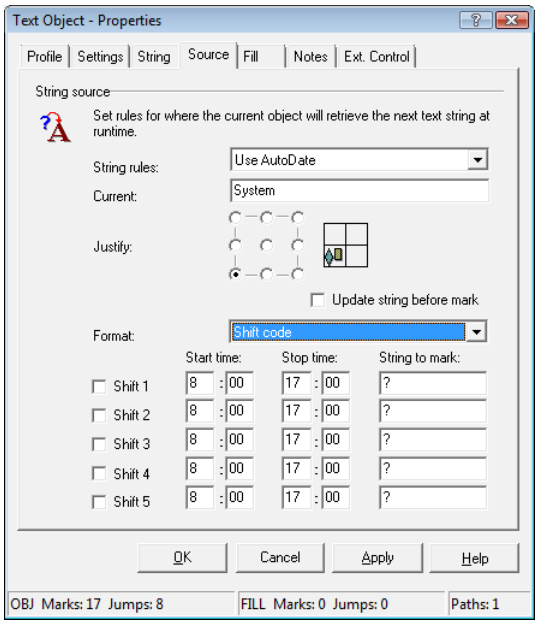


Justify	With strings of different lengths, the strings are aligned with the selected point in the original string (left, right, centered).	
Format	Format selection for the AutoDate string. The available AutoDate formats are as follows (example date 15th January 2006):	
	Format	Output
	YYMMDD	060115
	MM/DD/YY	01/15/06
	DD/MM/YY	15/01/06
	Month DD, YYYY	January 15, 2006
	DD Month, YYYY	15 January, 2006
	YWW	602 (WW: Week number)
	YMD	61E (single digit alphanumeric values for year, month and day. Sequence: 1,2,3...9,0,A,B,C...)
	DDD	015 (three digit value for day of the year)
	DDDY	0156 (three digit value for day of the year and single digit value for the year)
	YY	06
	Shift code	See next section.
	DDMY	1516
	HH:MM:SS	11:55:00

4.7.4 "Shift code" string format

This format is part of the *Use AutoDate* string rule (⇨ on page 74, "Use AutoDate" string rule). If this format is selected, the current shift code is applied to the object as a string for each marking operation. The information is derived from the Windows system clock.

- o Right click on a one line text or barcode object.
- o Select the *Properties...* option from the menu.
- o Select the *Source* tab.
- o Select the *Use AutoDate* string rule.
- o Select the *Shift code* format.
  The adjacent window is opened.
  Refer to the table below for explanations.

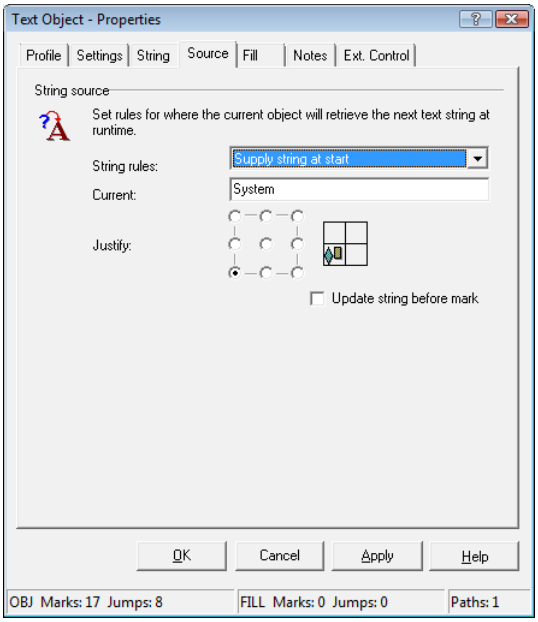


Shift 1 … Shift 5	These check boxes can be used to activate up to five shifts.	
	Start time	These fields are used to define the start and end times for each shift. If the shifts overlap, the first permissible shift is used. The remaining shifts are ignored. If there are periods of time that are not assigned to an active shift, a "?" is output. If a shift includes the time 0:00 (change of date), it must be split into two sections with the same shift code.
	Stop time	
	String to mark	These fields can be used to enter the shift codes to be marked with the laser.

4.7.5 "Supply string at start" string rule

If this rule is selected, each time a job is started the user is prompted to enter a string for the text or barcode object. This string is then used until completion of that job.

- o Right click on a one line text or barcode object.
- o Select the *Properties...* option from the menu.
- o Select the *Source* tab.
- o Select the *Supply string at start* string rule.
  The adjacent window is opened.
  Refer to the table below for explanations.

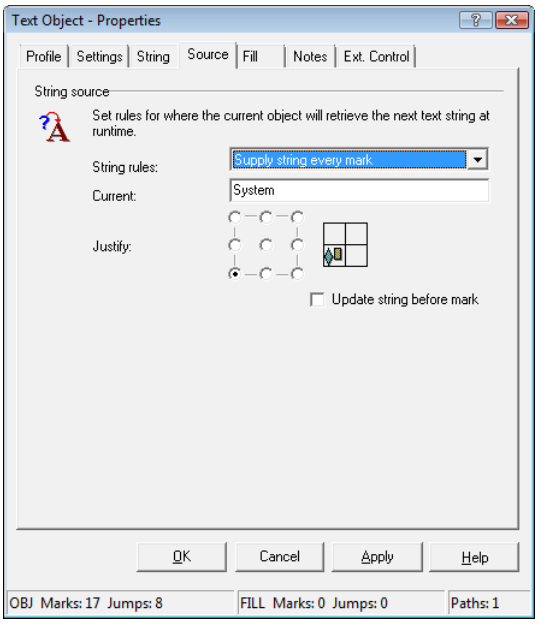


Justify	With strings of different lengths, the strings are aligned with the selected point in the original string (left, right, centered).

4.7.6 "Supply string every mark" string rule

If this rule is selected, before marking the object the user is prompted to enter a string for the text or barcode object. The string entered is only used for one marking operation.

- o Right click on a one line text or barcode object.
- o Select the *Properties...* option from the menu.
- o Select the *Source* tab.
- o Select the *Supply string every mark* string rule.
  The adjacent window is opened.
  Refer to the table below for explanations.

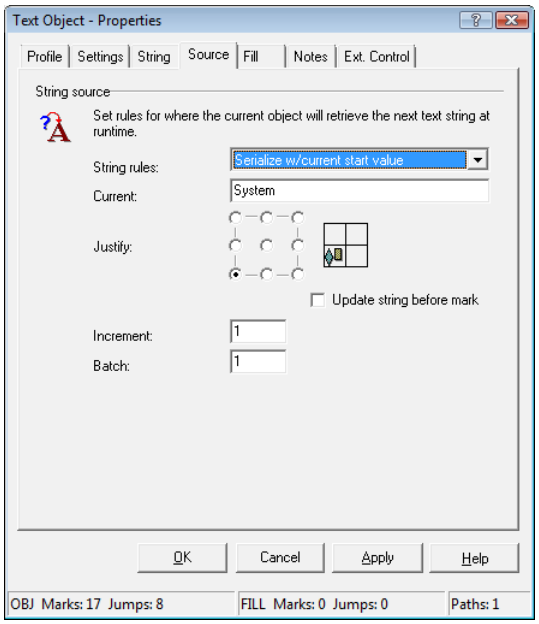


Justify	With strings of different lengths, the strings are aligned with the selected point in the original string (left, right, centered).

4.7.7 "Serialize w/current start value" string rule

If this rule is selected, the value of a text or barcode object is automatically increased or reduced by a particular value.
When starting the job, the string used to save the job is used as the start value.

- Right click on a one line text or barcode object.
- Select the *Properties...* option from the menu.
- Select the *Source* tab.
- Select the *Serialize w/current start value* string rule.
  The adjacent window is opened.
  Refer to the table below for explanations.

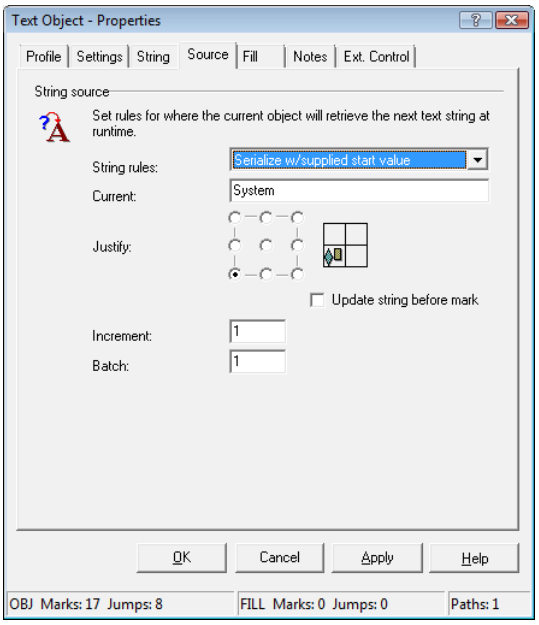


Justify	With strings of different lengths, the strings are aligned with the selected point in the original string (left, right, centered).
Increment	Sets the increment by which the string will be changed. A positive value increases the value of the string, a negative value reduces it. Both letters and numbers can be incremented, e.g. 0001A is increased to 0001B. Note that an arrangement of letters is only permissible for ANSI text. It is possible that Unicode text consisting of letters will not be incremented correctly. Leading zeroes are retained.
Batch	Batch size for serialization. The string is only incremented when the number of markings specified under *Batch* has been performed.

4.7.8 "Serialize w/supplied start value" string rule

If this rule is selected, the value of a text or barcode object is automatically increased or reduced by a particular value.
When starting the job the user is prompted to enter a string as the start value.

- Right click on a one line text or barcode object.
- Select the *Properties...* option from the menu.
- Select the *Source* tab.
- Select the *Serialize w/supplied start value* string rule.
  The adjacent window is opened.
  Refer to the table below for explanations.

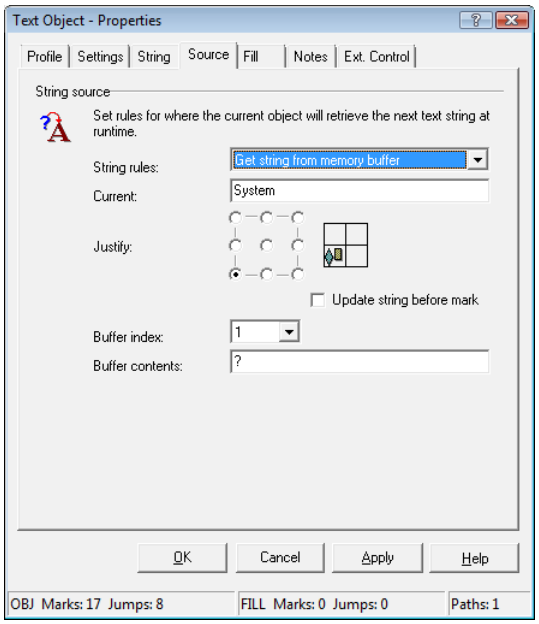


Justify	With strings of different lengths, the strings are aligned with the selected point in the original string (left, right, centered).
Increment	Sets the increment by which the string will be changed. A positive value increases the value of the string, a negative value reduces it. Both letters and numbers can be incremented, e.g. 0001A is increased to 0001B. Note that an arrangement of letters is only permissible for ANSI text. It is possible that Unicode text consisting of letters will not be incremented correctly. Leading zeroes are retained.
Batch	Batch size for serialization. The string is only incremented when the number of markings specified under *Batch* has been performed.

4.7.9 "Get string from memory buffer" string rule

This rule enables the strings for text and barcode objects to be read from one of the ten weldMARK® buffers immediately prior to the marking operation. The content of the buffer can constantly be changed using an external host program (⇨ on page 181, Remote interface).

- o Right click on a one line text or barcode object.
- o Select the *Properties...* option from the menu.
- o Select the *Source* tab.
- o Select the *Get string from memory buffer* string rule.
  The adjacent window is opened.
  Refer to the table below for explanations.

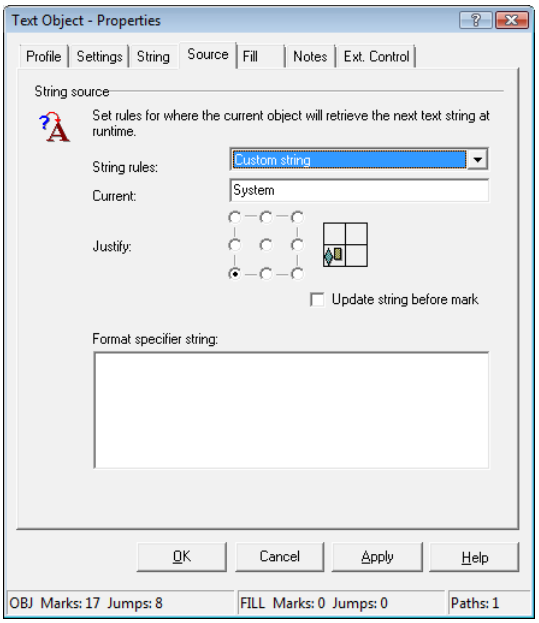


Justify	With strings of different lengths, the strings are aligned with the selected point in the original string (left, right, centered).
Buffer index	Number of the weldMARK® memory buffer to be used to obtain the data.
Buffer contents	Current content of the weldMARK® buffer selected under *Buffer index*. When the application is started, the buffers are set to a value of "?".

4.7.10 "Custom string" string rule

This rule enables the string for the text or barcode object to be created using a custom string.

- o Right click on a one line text or barcode object.
- o Select the *Properties...* option from the menu.
- o Select the *Source* tab.
- o Select the *Custom string* string rule.
  The adjacent window is opened.
  Refer to the table below for explanations.



Justify	With strings of different lengths, the strings are aligned with the selected point in the original string (left, right, centered).
Format specifier string	Enter the custom string to be used to create a string for the object (see table below).

Code	Code example	Text created for string
%A		Abbreviated day of the week (Mon, Tue, Wed, Thu, Fri, Sat, Sun)
%B		Abbreviated month (Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec)
%C		Date and time (MM/DD/YY HH:MM)
%D		Day of the month (01 - 31)
%H		Hour (00 - 23)
%h		Hour (00 - 12)
%J		Day of the year (001 - 366)
%K		Month code (1 - 9, O, N, D)
%L		Last digit of year (0 - 9)
%M		Month (01 - 12)
%N		Minutes (00 - 59)
%O		Ascending numerical value. Starts with a value of "1" at the beginning of the process.
%o		Same as code *%O*. After restart, the last used numerical value will be used as start value.
%P		AM or PM
%Q#	*%Q1*	The string is copied from the weldMARK® buffer (# 1-10).
%R		Week (01-53). Week "01" is the week that includes 1st January.

Code	Code example	Text created for string
%r		Week (01-53). Week "01" is the week that includes the first Thursday of the new year.
%S,d,s,i,b	*%S,9,1,1,1*	S = Consecutive number d = End number s = Start number i = Increment b = batch **Note:** Only integer values are supported. The parameters "i" and "b" must be positive.
%s		Same as code *%S*. After restart, the last used numerical value will be used as start value.
%T		Time (HH:MM)
%V''	*%V'RAYLASE'*	Any text can be entered here. The text must be placed between quotation marks ("RAYLASE" in the code example).
%W		Day of the week (coding: 1 = "Sunday" ... 7 = "Saturday")
%w		Day of the week (coding: 1 = "Monday" ... 7 = "Sunday")
%X#	*%X5*	A particular number of spaces can be inserted (5 spaces in the code example).
%Y		Year (00 - 99)

5 TOOLS FOR EDITING MARKING OBJECTS

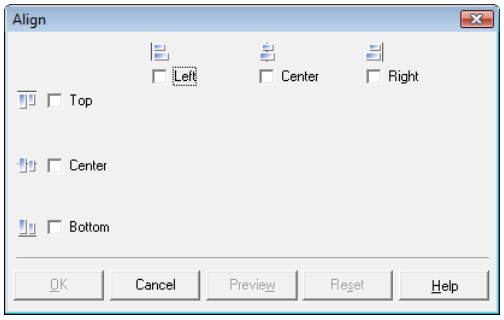
weldMARK® provides the following tools for editing marking objects:

Align...	Objects can be aligned relative to one another.	⇨ below, Aligning objects
Dimensions...	Objects can be positioned, scaled, rotated or skewed.	⇨ below, The "Dimensions..." toolbox
Grid/Guidelines	The grid and the guidelines are used to make it easier to align objects on the screen. Their properties can be set.	⇨ on page 89, Setting the gridlines ⇨ on page 90, Editing the guidelines
Zoom tools	The display size of the workspace on the screen can be enlarged or reduced.	⇨ on page 92, Using the zoom tools

5.1 Aligning objects

The *Align...* tool enables objects to be aligned relative to one another. Objects are always aligned with the last selected object.

- o Select the objects you want to align.
- o Select the *Tools >Align...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.



Top, Center, Bottom *Left, Center, Right*	These check boxes allow you to specify the required vertical and horizontal alignment of the objects with one another.
Preview *Reset*	Clicking on this button displays the expected result of the alignment. The alignment can then either be reversed by clicking on *Reset* or confirmed by clicking on *OK*.

5.2 The "Dimensions..." toolbox

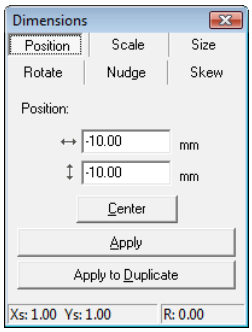
The "Dimensions" toolbox contains the following tools for editing marking objects:

Position	⇨ on page 83, Positioning objects
Scale	⇨ on page 83, Scaling and mirroring objects
Size	⇨ on page 84, Changing the object size
Rotate	⇨ on page 86, Rotating objects
Move to Folder...	⇨ on page 87, Nudging objects
Skew	⇨ on page 87, Skewing objects

5.2.1 Positioning objects

The *Position* tool enables you to display and change an object's current position.

- o Select a marking object.
- o Select the *Objects >Dimensions...* option from the menu.
- o Select the *Position* tool.
  The adjacent window is opened.
  Refer to the table below for explanations.

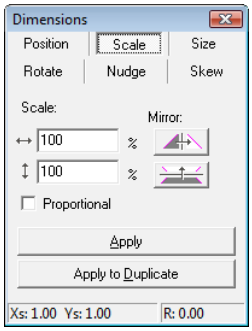


Position	The current position of the selected object is shown in the two input boxes. The specified position can be overwritten with your required target position. The data relates to the lower left corner of the object.
Center	Clicking on this button positions the selected object in the center of the work-space.
Apply	Clicking on this button applies the settings made to the selected object.
Apply to Duplicate	Clicking on this button copies the selected object and applies the changed settings to the copy.

5.2.2 Scaling and mirroring objects

The *Scale* tool enables you to scale objects by a specified factor and, if required, to mirror them.

- o Select a marking object.
- o Select the *Objects >Dimensions...* option from the menu.
- o Select the *Scale* tool.
  The adjacent window is opened.
  Refer to the table below for explanations.



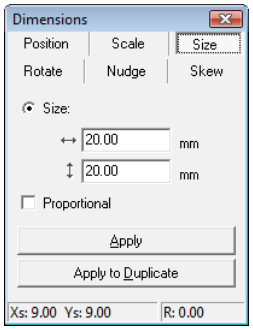
Scale	The required scaling factor is specified in this input box.
Proportional	If this function is enabled, the object is scaled by the same factor horizontally and vertically.
Mirror	Clicking on this button mirrors the selected object horizontally or vertically.
Apply	Clicking on this button applies the settings made to the selected object.
Apply to Duplicate	Clicking on this button copies the selected object and applies the changed settings to the copy.

A separate tool is available for fixed radial text objects (⇨ on page 85, Changing the object size (radial text - fixed)).

5.2.3 Changing the object size

The *Size* tool enables you to change the width and height of objects by entering the required values.

- o Select a marking object.
- o Select the *Objects >Dimensions...* option from the menu.
- o Select the *Size* tool.
  The adjacent window is opened.
  Refer to the table below for explanations.

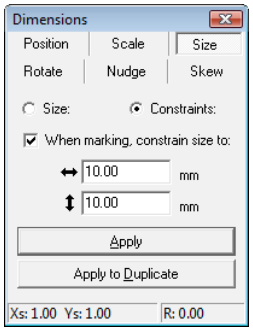


Size	These input boxes display the current width and height of the selected object. The values can be changed as required. The change in size is performed from the center of the selected object or object group.
Proportional	If this function is enabled, the width and height of the object are changed by the same factor horizontally and vertically. Making an entry in one field automatically changes the value in the other field.
Apply	Clicking on this button applies the settings made to the selected object.
Apply to Duplicate	Clicking on this button copies the selected object and applies the changed settings to the copy.

Size option for standard and radial text objects

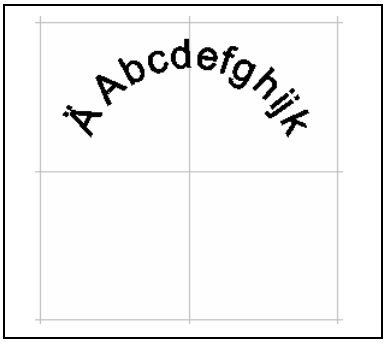
For standard text objects and for text objects with the *Radial* display option, in addition to the option of changing the size (⇨ above, Changing the object size) the special *Constraints* function is available. This function enables an output size differing from the size shown on screen to be applied to these objects for the marking process.

- o Select a text or radial text object.
- o Select the *Objects >Dimensions...* option from the menu.
- o Select the *Size* tool.
- o Select the *Constraints* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.

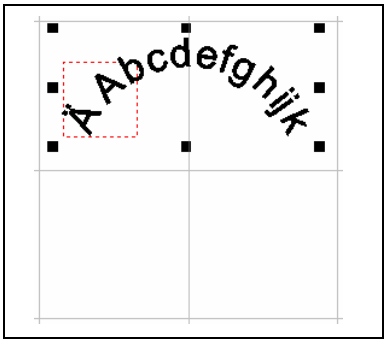


When marking, constrain size to	Enabling this function allows you to specify the output size of the radial text object.
↔ ↕	The required output size for the radial text objects can be entered in these fields.
Apply	Clicking on this button applies the settings made to the selected object.
Apply to Duplicate	Clicking on this button copies the selected object and applies the changed settings to the copy.

Example:



Radial text variable



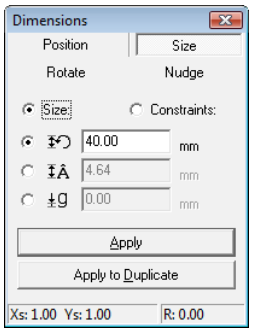
Option: *Constraints*

The red rectangle indicates the output size.

Changing the object size (radial text - fixed)

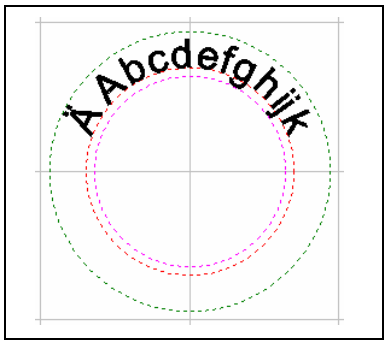
Special options are available for changing the size of *Radial - fixed* type objects. These objects can also be assigned an output size differing from the size shown on screen for the marking process.

- o Select a fixed radial text object.
- o Select the *Objects >Dimensions...* option from the menu.
- o Select the *Size* tool.
  The adjacent window is opened.



Size		The diameter for the base line of the text can be specified here.
		The font size can be specified by entering the x-height and ascender.
		The font size can be specified by entering the descender.
Constraints		Enabling this function allows a different diameter to be selected for the marking process.
Apply		Clicking on this button applies the settings made to the selected object.
Apply to Duplicate		Clicking on this button copies the selected object and applies the changed settings to the copy.

Example:

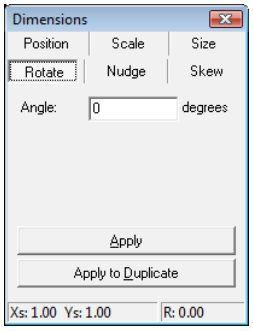


Radial text - fixed

5.2.4 Rotating objects

The *Rotate* tool enables objects to be rotated by a specified angle.

- o Select a marking object.
- o Select the *Objects >Dimensions...* option from the menu.
- o Select the *Rotate* tool.
  The adjacent window is opened.
  Refer to the table below for explanations.

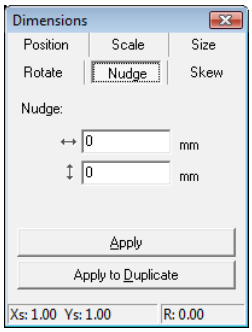


Angle	This field can be used to enter an angle for rotating the object. Positive values = Clockwise rotation Negative values = Anticlockwise rotation
Apply	Clicking on this button applies the settings made to the selected object.
Apply to Duplicate	Clicking on this button copies the selected object and applies the changed settings to the copy.

5.2.5 Nudging objects

The *Nudge* tool enables objects to be moved by a specified amount.

- o Select a marking object.
- o Select the *Objects >Dimensions...* option from the menu.
- o Select the *Nudge* tool.
  The adjacent window is opened.
  Refer to the table below for explanations.

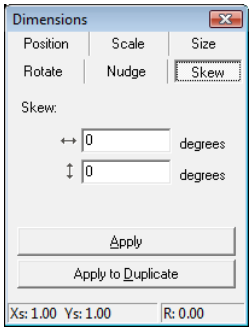


Nudge	These input boxes can be used to specify values for the required movement of the object in a horizontal and vertical direction.
Apply	Clicking on this button applies the settings made to the selected object.
Apply to Duplicate	Clicking on this button copies the selected object and applies the changed settings to the copy.

5.2.6 Skewing objects

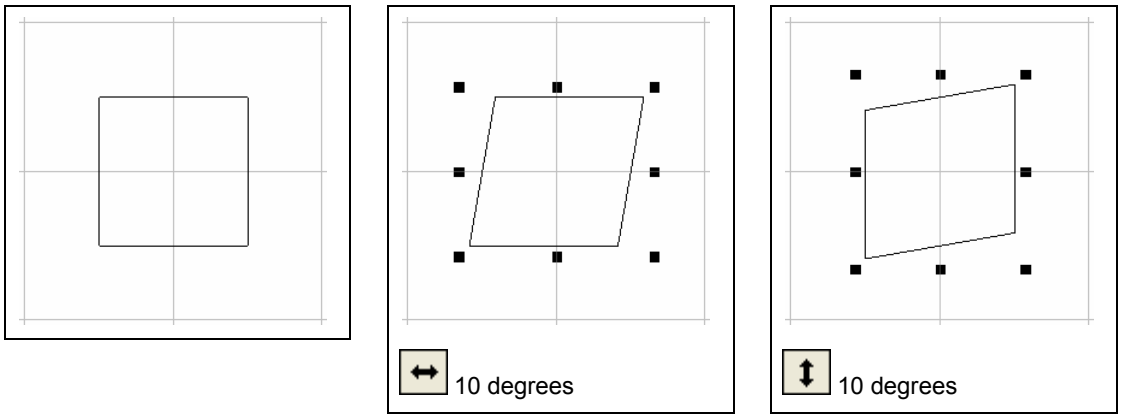
The *Skew* tool enables objects to be skewed by a specified angle.

- o Select a marking object.
- o Select the *Objects >Dimensions...* option from the menu.
- o Select the *Skew* tool.
  The adjacent window is opened.
  Refer to the table below for explanations.



Skew	These input boxes can be used to specify values for skewing the object. Refer to the example below for details.
Apply	Clicking on this button applies the settings made to the selected object.
Apply to Duplicate	Clicking on this button copies the selected object and applies the changed settings to the copy.

Example:



This tool is not available for fixed radial text objects.

5.3 Grid/Guidelines

The guidelines and the grid make it easier to align objects on the screen. Their properties can be set.

5.3.1 Grid lines

The grid is made up of equally spaced horizontal and vertical lines and makes it easier to draw and arrange objects.

Showing and hiding the grid lines

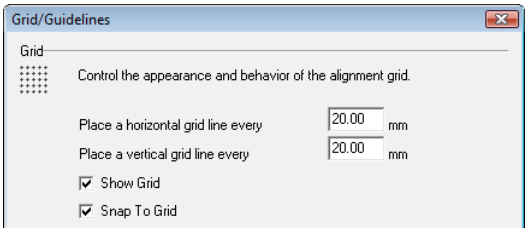
o Select the *View >Grid* option from the menu.
Grid lines are displayed or hidden.


Grid

Setting the gridlines

The grid settings determine the way in which the grid is displayed on screen and the behavior of an object if it is placed close to one of the grid lines.

o Select the *Tools >Grid/Guidelines...* option from the menu.
The adjacent window is opened. The figure shows only the section that is relevant for the grid lines.
Refer to the table below for explanations.



Place a horizontal grid line every	These input boxes can be used to specify the horizontal and vertical spacing between the individual grid lines.
Place a vertical grid line every	
Show Grid	Enabling this function shows the grid lines.
Snap To Grid	If this function is enabled, objects are aligned with the grid lines when you move them.

5.3.2 Guidelines

The guidelines are made up of horizontal and vertical lines with the spacing of your choice. Any combinations of guidelines can be saved and reloaded at a later date.

Showing and hiding the guidelines

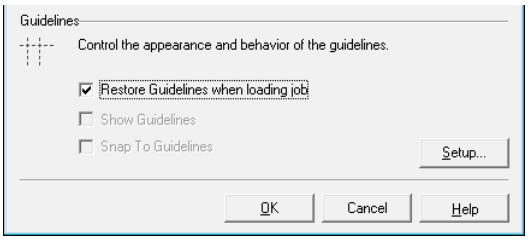
o Select the *View >Guidelines* option from the menu.
The guidelines are displayed or hidden. This function is only available if guidelines are set (⇨ on page 90, Editing the guidelines).


Guidelines

Editing the guidelines

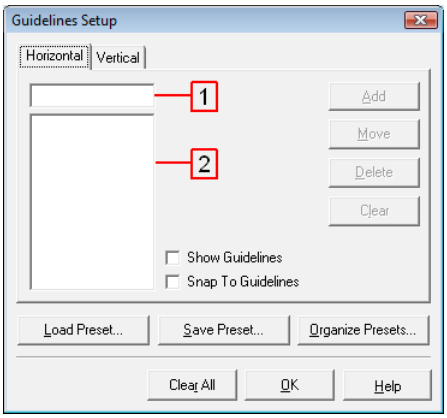
Guidelines can be added, moved and deleted. An unlimited number of guidelines can be inserted in the workspace.

o Select the *Tools >Grid/Guidelines...* option from the menu.
The adjacent window is opened. The figure shows only the section that is relevant for the guidelines.
Refer to the table below for explanations.



Restore Guidelines when loading job	Enabling this function saves the guidelines created as part of the job.

o Click on the *Setup* button.
The adjacent window is opened.
Refer to the table below for explanations.

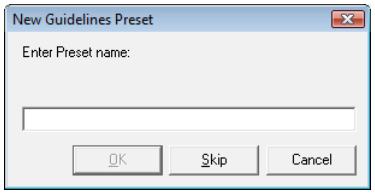


Horizontal, *Vertical*	One tab is available for the horizontal guidelines and one for the vertical guidelines.
(1)	Input box to specify the position of the guideline to be created.
Add	Clicking on this button adds the new guideline at the position entered.
(2)	List of all guidelines created.
Move	Clicking on this button moves the guideline selected in the list box *(2)* to the position specified in the input box *(1)*.
Delete	Clicking on this button deletes the guideline selected in the list box *(2)*.
Clear	Clicking on this button deletes all horizontal or vertical guidelines. The horizontal and vertical guidelines are not deleted together.
Show Guidelines	Enabling this function shows the guidelines.
Snap To Guidelines	If this function is enabled, objects are aligned with the guidelines when you move them.
Load Preset...	Allows saved preset guidelines to be loaded to the active job. (⇨ on page 91, Loading preset guidelines).
Save Preset...	All guidelines in a job can be saved as a preset and will then be available for use in other jobs (⇨ on page 91, Saving preset guidelines).
Organize Presets...	Allows saved preset guidelines to be renamed or deleted (⇨ on page 91, Organizing preset guidelines).
Clear All	Deletes all guidelines in the job.

Saving preset guidelines

All guidelines in a job are referred to as preset guidelines. If you want preset guidelines to be available for other jobs, they can be saved as described below. If you only want the guidelines to be saved with the current job, you can use the *Restore Guidelines when loading job* function (⇨ on page 90, Editing the guidelines).

- Select the *Tools >Grid/Guidelines...* option from the menu.
- Click on the *Setup* button.
- Click on the *Save Preset...* button.
  The adjacent window is opened.

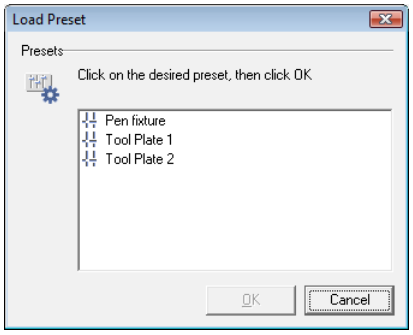


OK	Once you have entered a name for the preset guidelines, you can save them.
Skip	This button allows the preset guidelines to be saved without a name. This overwrites the internal preset guidelines.

Loading preset guidelines

Saved preset guidelines can be loaded to the active job as described below. This overwrites any existing guidelines.

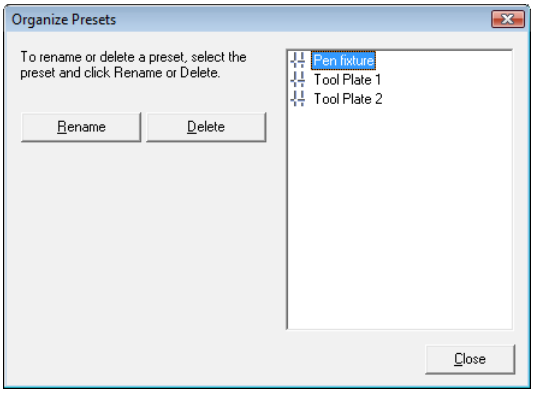
- Select the *Tools >Grid/Guidelines...* option from the menu.
- Click on the *Setup* button.
- Click on the *Load Preset...* button. The adjacent window is opened.
- Select the preset guidelines you want to use and click on *OK*.



Organizing preset guidelines

Saved preset guidelines can be renamed or deleted as follows:

- Select the *Tools >Grid/Guidelines...* option from the menu.
- Click on the *Setup* button.
- Click on the *Organize Presets...* button.
  The adjacent window is opened.



5.4 Using the zoom tools

Three tools are available for changing the size at which the workspace is displayed.


Zoom in

Zoom in

- Click on the *Zoom in* icon.
- Hold down the right mouse button and draw a rectangle around the area you want to zoom in on.


Zoom out

Zoom out

- Click on the *Zoom out* icon.
  The workspace display is reduced in size.
- To reduce the display size further, click on the *Zoom out* button again.


Full View

Full View

- Click on the *Full View* icon.
  The entire workspace is displayed as large as possible.

6 TEMPLATES

A template is an object that cannot be modified and is not actually marked. It is created from a marking object. In order to edit a template, it must be converted back into a marking object first. Only one template can be created in each job.

Examples of using a template would include aligning objects or placing additional information that is not to be marked in the workspace.

Creating templates

- o Add the object you want to use as a template to your job.
- o Edit the object as required.
- o Select the object.
- o Select the *Objects >Convert to Template* option from the menu.
  The object converted into a template appears in the Job Manager (*Current Job* window) as a *Template* and disappears from the Object Manager.

Convert to Template

Converting a template into a marking object

- o In the *Current Job* window, right click on *Template* and select *Convert to Object*.

7 USING AUTOMATION OBJECTS

Automation objects allow communication with external applications and control devices. They are used to automate processing and the internal weldMARK® processes. weldMARK® provides the following automation objects:

Wait for External Signal	This object checks whether a signal is present at a selected I/O port. The marking process is not continued until the signal is present.	⇨ on page 95, "Wait for External Signal" automation object
Set I/O Port	This object sets one or more I/O ports to "Low" or "High".	⇨ on page 97, "Set I/O Port" automation object
Insert Time Delay	This object inserts a time delay between two objects. The marking process is only continued when the specified time span has elapsed.	⇨ on page 99, "Insert Time Delay" automation object
Show Messagebox	This object displays a message window on the screen during the marking process. The process is stopped until the user closes the message box.	⇨ on page 100, "Show Messagebox" automation object
XY Table	This object controls an optional XY Table that is connected.	⇨ on page 102, "XY Table" automation object
Rotary Indexer	This object controls an optional rotary indexer that is connected.	⇨ on page 104, "Rotary Indexer" automation object
Custom Axis	This object controls an optional custom axis that is connected.	⇨ on page 106, "Custom Axis" automation object

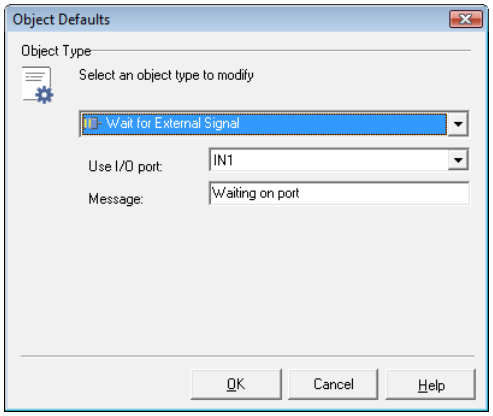
7.1 "Wait for External Signal" automation object

This object checks whether a signal is present at a selected I/O port. The marking process is not continued until the signal is present.

Defaults for "Wait for External Signal"

This section describes how the defaults for "Wait for External Signal" type automation objects can be called up and changed. The defaults apply to all new automation objects of this type.

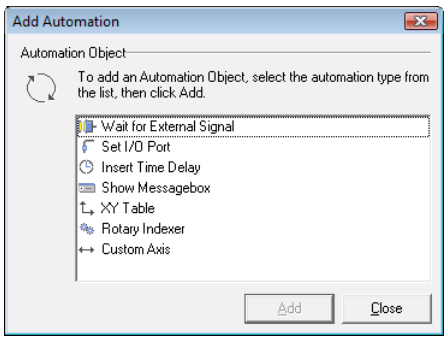
- Select the *Objects >Defaults...* option from the menu.
- Select the object type *Wait for External Signal*.
  The adjacent window is opened.
  Refer to the table below for explanations.



Use I/ port	Preset I/O port to be monitored.
Message	A text can be entered for a message to be displayed during the waiting time.

Adding a "Wait for External Signal" object

- Select the *Objects >Add >Automation...* option from the menu.
  The adjacent window is opened.
- Select the *Wait for External Signal* automation object type.
- *Add* button.
  The automation object is added to the Object Manager.



Properties

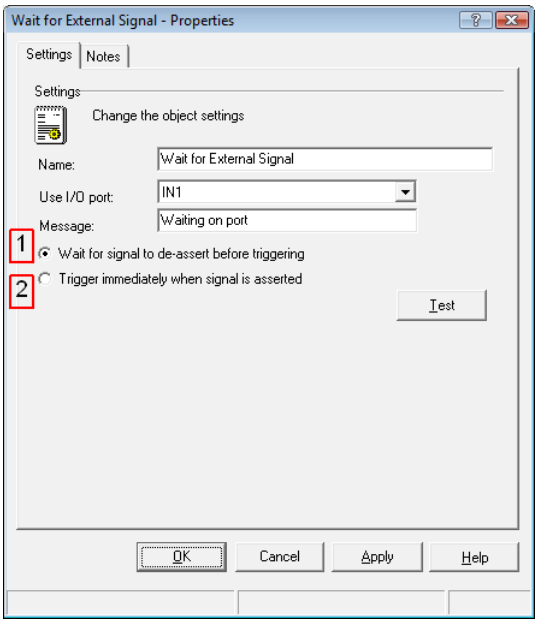
The automation object is assigned properties, which are classified as follows:

Settings	Various settings can be made for the object.	⇨ on page 96, Settings
Notes	A note can be assigned to the object.	⇨ on page 28, Notes

Wait for External Signal

Settings

- In the Object Manager, right click on a *Wait for External Signal* type automation object.
- Select the *Properties...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.



Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
I/O Port	You can select the input port to be checked.
Message	A text can be entered for a message to be displayed during the waiting time. The text entered in *Defaults...* is used if you do not enter anything here.
(1)	The marking process is not started until the start signal is de-assented.
(2)	The marking process is started as soon as the start signal is assented.
Test	Clicking on this button reads the I/O port and displays the result.

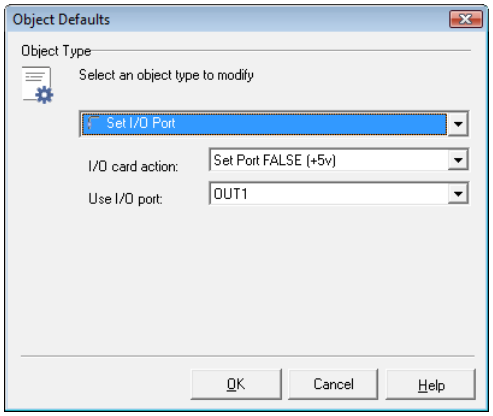
7.2 "Set I/O Port" automation object

This object sets the status of one or more I/O ports to "Low" or "High".

Defaults for "Set I/O Port"

This section describes how the defaults for "Set I/O Port" type automation objects can be called up and changed. The defaults apply to all new automation objects of this type.

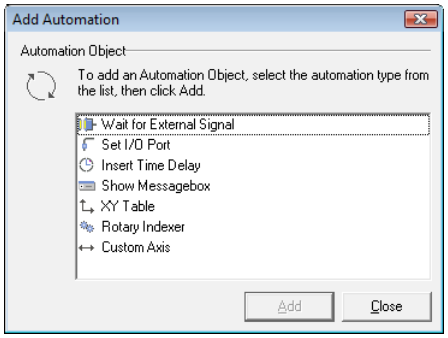
- Select the *Objects >Defaults...* option from the menu.
- Select the object type *Set I/O Port*.
  The adjacent window is opened.
  Refer to the table below for explanations.



I/O card action	The required behavior of the port can be selected.
Use I/ port	You can select the input port to be set.

Adding a "Set I/O Port" object

- Select the *Objects >Add >Automation...* option from the menu.
  The adjacent window is opened.
- Select the automation object type *Set I/O Port*.
- *Add* button.
  The automation object is added to the Object Manager.



Properties

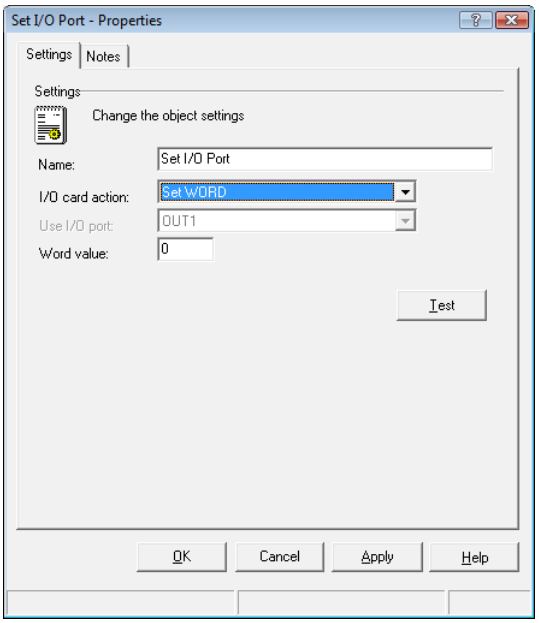
The automation object is assigned properties, which are classified as follows:

Settings	Various settings can be made for the object.	⇨ on page 98, Settings
Notes	A note can be assigned to the object.	⇨ on page 28, Notes

Set I/O Port

Settings

- In the Object Manager, right click on a *Set I/O Port* type automation object.
- Select the *Properties...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.



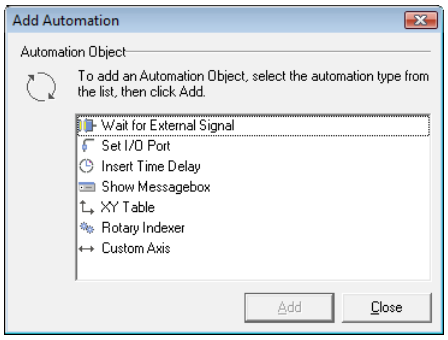
Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.	
I/O card action	The following actions can be selected:	
	Set Port TRUE	The selected port is set to TRUE.
	Set Port FALSE	The selected port is set to FALSE.
	Pulse Port	The selected port is alternately set to FALSE - TRUE - FALSE. The time span for the TRUE status can be adjusted. Note that the value for the time span is only an approximate value.
	SET WORD	The word consists of 6 bits, corresponding to the six output ports OUT1 to OUT6. Each bit sets one output port.
Use I/O port	The output port to be set (⇨ on page 108, Marking object profile).	
Word value	This input box is only active if the *Set WORD* action has been selected. A value between 0 and 63 (decimal) can be set.	
Test	Clicking on this button sets the I/O port in line with the settings made for testing purposes. The set port and the current status are displayed.	

7.3 "Insert Time Delay" automation object

This object inserts a time delay between two objects. The marking process is only continued when the specified time span has elapsed.

Adding an "Insert Time Delay" object

- Select the *Objects >Add >Automation...* option from the menu.
  The adjacent window is opened.
- Select the automation object type *Insert Time Delay*.
- *Add* button.
  The automation object is added to the Object Manager.



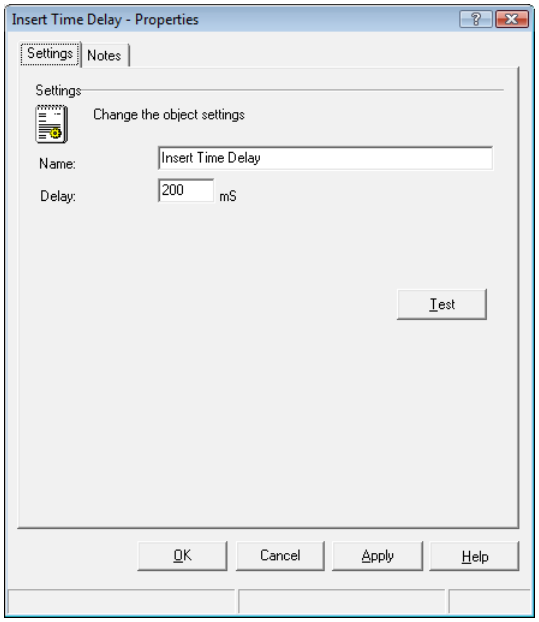
Properties

The automation object is assigned properties, which are classified as follows:

Settings	Various settings can be made for the object.	⇨ below, Settings
Notes	A note can be assigned to the object.	⇨ on page 28, Notes

Settings

- In the Object Manager, right click on an *Insert Time Delay* type automation object.
- Select the *Properties...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.



Insert Time Delay

Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
Delay	Time delay in milliseconds.
Test	Clicking on this button displays a window specifying the current time delay setting.

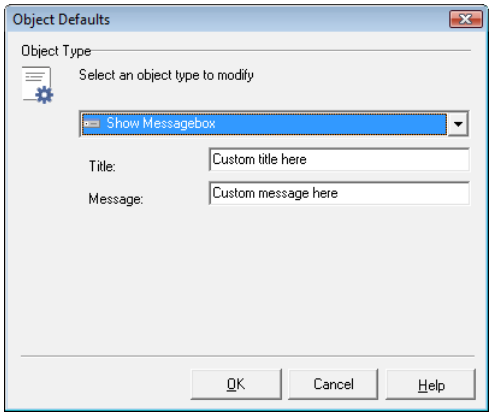
7.4 "Show Messagebox" automation object

This object displays a message window on the screen during the marking process. The process is stopped until the user closes the message box.

Defaults for "Show Messagebox"

This section describes how the defaults for "Show Messagebox" type automation objects can be called up and changed. The defaults apply to all new automation objects of this type.

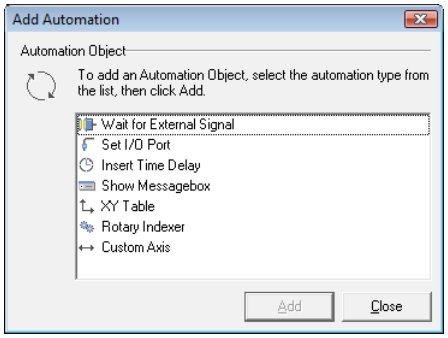
- Select the *Objects >Defaults...* option from the menu.
- Select the object type *Show Messagebox*.
  The adjacent window is opened.
  Refer to the table below for explanations.



Title	The text that will appear in the title bar of the message window.
Message	The text that will appear as the message.

Adding a "Show Messagebox" object

- Select the *Objects >Add >Automation...* option from the menu.
  The adjacent window is opened.
- Select the automation object type *Show Messagebox*.
- *Add* button.
  The automation object is added to the Object Manager.



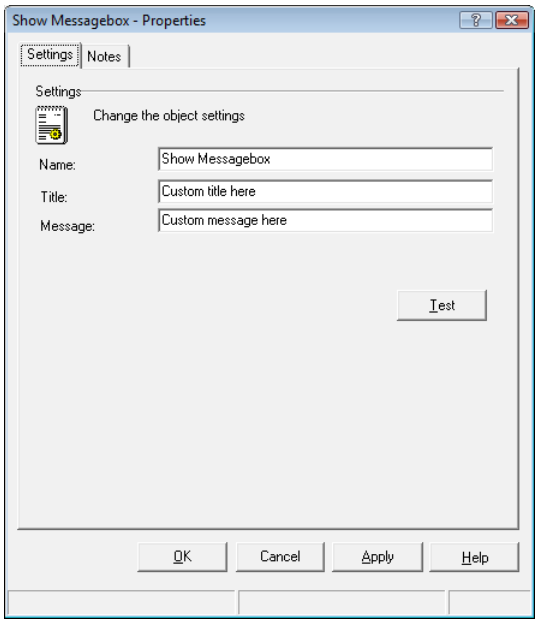
Properties

The automation object is assigned properties, which are classified as follows:

Settings	Various settings can be made for the object.	⇨ on page 101, Settings
Notes	A note can be assigned to the object.	⇨ on page 28, Notes

Settings

- o In the Object Manager, right click on a *Show Messagebox* type automation object.
- o Select the *Properties...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.



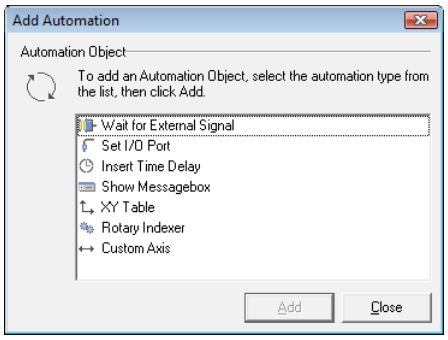
Show Messagebox

Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.
Title	The text for the message box title bar can be adjusted.
Message	The text that will be displayed in the message box can be entered in this field.
Test	Clicking on this button displays the message box for testing purposes.

7.5 "XY Table" automation object

This object controls an optional XY Table that is connected. A motor controller card is necessary to control the table (⇨ on page 175, Operating stepper motors).

Adding an "XY Table" automation object



o Select the *Objects >Add >Automation...* option from the menu.
The adjacent window is opened.
Select the *XY Table* automation object.
o Click on the *Add* button.
The automation object is added to the Object Manager.

Properties

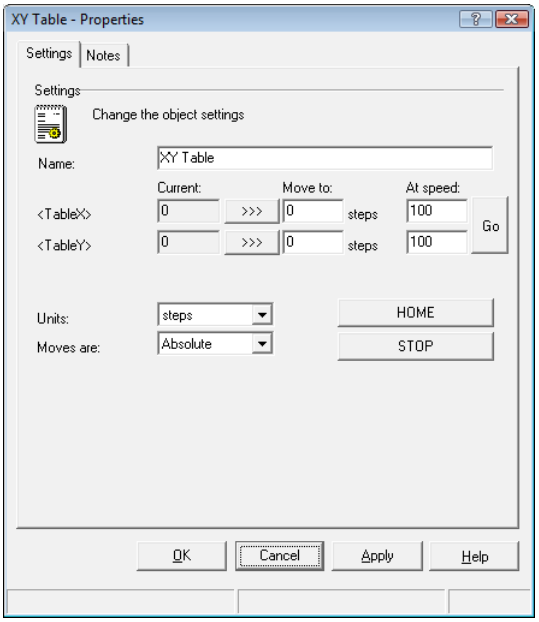
The automation object is assigned properties, which are classified as follows:

Settings	Various settings can be made for the object.	⇨ below, Settings
Notes	A note can be assigned to the object.	⇨ on page 28, Notes

Settings

XY Table

o In the Object Manager, right click on an *XY Table* type automation object.
o Select the *Settings* option from the menu.
The adjacent window is opened.
Refer to the table below for explanations.

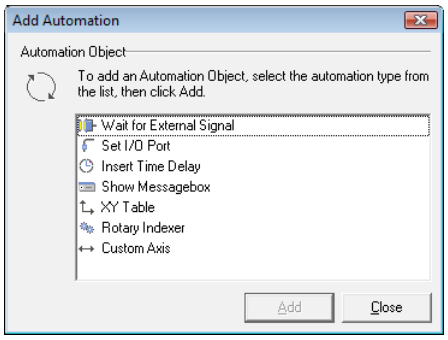


Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.	
Current	These fields show the current position of the motor axes.	
Move to	These fields can be used to enter an absolute target position, i.e. the position to which you want the table to move. These fields are only available if the *Absolute* setting has been selected in the *Moves are* list box.	
Move	These fields can be used to enter a relative target position, i.e. the distance you want the table to move. These fields are only available if the *Relative* setting has been selected in the *Moves are* list box.	
At speed	These fields can be used to enter the speed [steps per second] at which you want the table to move.	
Units	*mm*	The distances can be entered in millimeters, inches or motor steps.
	Inches	
	Steps	
Moves are	The mode for specifying the moves must be selected:	
	Absolute	The table moves to the position specified under *Move to*.
	Relative	The table moves by the values specified under *Move*.
Go	Clicking on this button performs the specified table movement.	
HOME	Clicking on this button moves the table to its home position.	
STOP	Stops the movement of the XY table.	

7.6 "Rotary Indexer" automation object

This object controls an optional rotary indexer that is connected. A motor controller card is necessary for this (⇨ on page 175, Operating stepper motors).

Adding a "Rotary Indexer" automation object



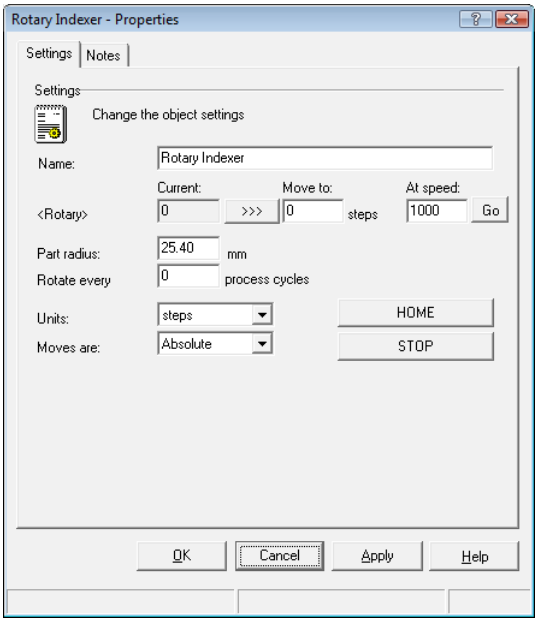
- Select the *Objects >Add >Automation...* option from the menu.
  The adjacent window is opened.
- Select the automation object type *Rotary Indexer*.
- *Add* button.
  The automation object is added to the Object Manager.

Properties

The automation object is assigned properties, which are classified as follows:

Settings	Various settings can be made for the object.	⇨ below, Settings
Notes	A note can be assigned to the object.	⇨ on page 28, Notes

Settings



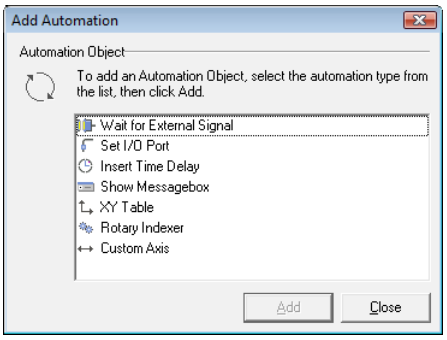
- Right click on the object you want to change in the Object Manager.
- Select the *Properties...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.

Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.	
Current	This field shows the current position of the rotary indexer.	
Move to	In this field, you can enter an absolute target position, i.e. the position you want the rotary indexer to rotate to. This field is only available if the *Absolute* setting has been selected in the *Moves are* list box.	
Move	In this field, you can enter a relative target position, i.e. the distance you want the axis to rotate by. This field is only available if the *Relative* setting has been selected in the *Moves are* list box.	
At speed	This field can be used to enter the speed [steps per second] at which you want the axis to rotate.	
Part radius	This field is used to enter the radius of the rotating component. The radius is required to calculate the target position or distance, if this is entered in inches or millimeters.	
Rotate every … process cycles	This field is used to enter the number of process cycles to be performed before the axis is rotated.	
Units	*mm*	The distances can be entered in millimeters, inches, degrees or motor steps.
	Inches	
	Degrees	
	Steps	
Moves are	The mode for specifying the moves must be selected:	
	Absolute	The axis is rotated to the position specified under *Move to*.
	Relative	The axis is rotated by the value specified under *Move*.
Go	Clicking on this button performs the specified rotary movement.	
HOME	Clicking on this button rotates the rotary indexer to its home position.	
STOP	Stops the movement of the rotary indexer.	

7.7 "Custom Axis" automation object

This object controls an optional custom axis that is connected. The custom axis can be configured for either linear or rotating applications. A motor controller card is necessary for this (⇨ on page 175, Operating stepper motors).

Adding a "Custom Axis (Z axis)" object



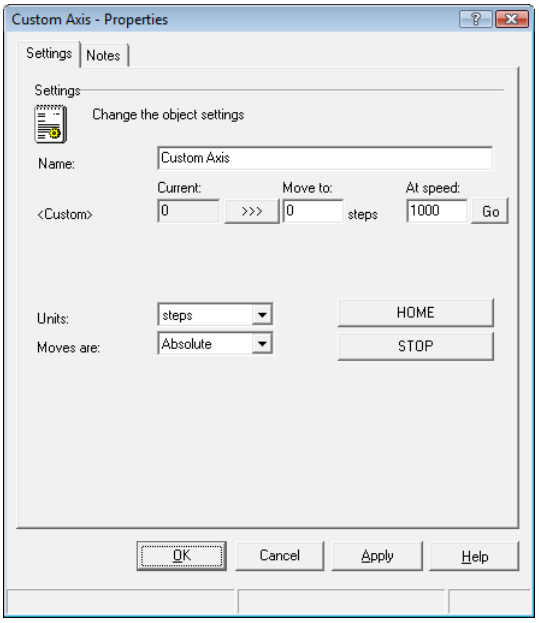
- Select the *Objects >Add >Automation...* option from the menu.
  The adjacent window is opened.
- Select the automation object type *Custom Axis*.
- Click on the *Add* button.
  The automation object is added to the Object Manager.

Properties

The automation object is assigned properties, which are classified as follows:

Settings	Various settings can be made for the object.	⇨ below, Settings
Notes	A note can be assigned to the object.	⇨ on page 28, Notes

Settings



- Right click on the object you want to change in the Object Manager.
- Select the *Properties...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.

Name	The object name entered in this text box is used to list the object in the Object Manager. The name also appears in all information and dialog boxes relating to that object.	
Current	This field shows the current position of the custom axis.	
Move to	In this field, you can enter an absolute target position, i.e. the position you want the custom axis to move to. This field is only available if the *Absolute* setting has been selected in the *Moves are* list box.	
Move	In this field, you can enter a relative target position, i.e. the distance you want the custom axis to move by. This field is only available if the *Relative* setting has been selected in the *Moves are* list box.	
At speed	These fields can be used to enter the speed [steps per second] at which you want the custom axis to move.	
Units	*mm*	The distances can be entered in millimeters, inches or motor steps.
	Inches	
	Steps	
Moves are	The mode for specifying the moves must be selected:	
	Absolute	The axis is moved to the position specified under *Move to*.
	Relative	The axis is moved by the value specified under *Move*.
Go	Clicking on this button performs the specified movement of the custom axis.	
HOME	Clicking on this button rotates the custom axis to its home position.	
STOP	Stops the movement of the custom axis.	

8 USING PROFILES

This chapter provides you with an overview of how to manage the profiles in weldMARK®.

A profile is assigned to each marking object, which specifies the parameters for the laser marking. When you create a new object, the default profile is applied automatically. This profile can be adapted to your individual requirements; however, changes only affect the objects that are created subsequently.

If different laser settings are required (e.g. for marking different materials), any number of profiles can be created with different parameters. This is done using the Profile Manager.

The Profile Manager lists all available profiles. The profiles can be organized and applied to marking objects. In addition, the parameters from a selected profile can be applied to the default profile.

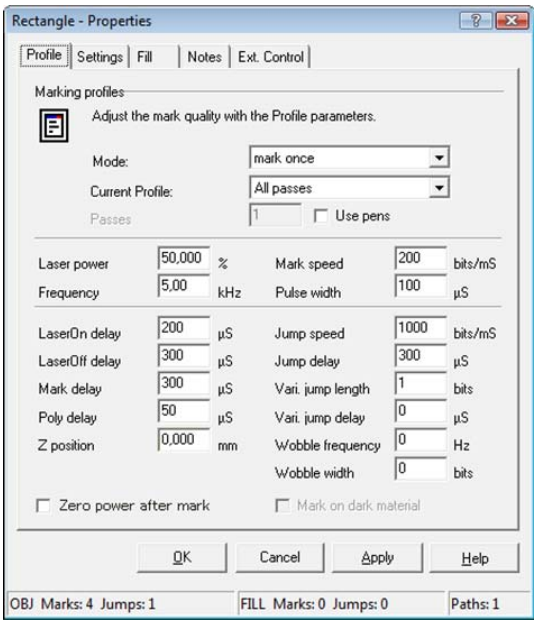
A profile can also be transferred from one marking object to another.

The profiles included in the Profile Manager are available throughout the system, i.e. they are program-specific, not job-specific.

8.1 Marking object profile

The profile applied to the marking object determines the settings for laser processing, such as the power, frequency etc. These parameters are summarized on the *Profile* tab and can be changed as follows:

- Right click on the marking object whose profile you want to change and then select *Properties...*.
- Select the *Profile* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



Mode	*Mark once*	The object is marked once.
	Mark multiple times	The object is marked the number of times entered in the *Passes* field.
	2 pass Cut & Clean	The object is marked two, three or four times, and different laser parameters can be set for each pass. The settings can be called up using the passes that are available for selection in the *Current Profile* list box.
	3 pass Cut & Clean	
	4 pass Cut & Clean	
Current Profile	If variable passes are selected in the *Mode* list box, this field can be used to call up the parameters for each individual pass.	
Passes	The *Passes* field is only available if *Mark multiple times* mode has been selected. In this field, you can enter the required number of passes for the marking object. The object is marked this number of times during execution of the job even if it is only listed once in the object list.	
Use pens	This field is only available if an imported object with layers is selected. In this case marking parameters can be defined for each pen after activating this function. The elements are displayed with the defined pen color. Elements on layers which are not selected for marking (tab *CAD*) are not shown.	
Laser power %	This field can be used to specify the laser power. The laser power can be entered in percent (%) or watts depending on the settings in the laser configuration file.	
Frequency	This field can be used to set the frequency of the laser modulation signal. In association with YAG lasers, this is also referred to as the Q-Switch frequency.	
Mark speed	This field can be used to specify the speed at which the laser beam moves over the object during processing.	
Pulse width	This field can be used to set the pulse width of the laser modulation signal. The maximum possible pulse width is determined by the frequency entered. This parameter is not available when using CO_2 lasers.	
LaserOn delay	The adjacent parameters are described in detail in the application manual and/or in the "Commands and Functions" manual.	
LaserOff delay		
Mark delay		
Poly delay		
Z position	Via z-position the focal plane of the scan head can be adapted to the object to be marked. This field only is displayed if a 3-axis subsystem with FOCUSSHIFTER is set as scan head. The value for the z-position can be positive or negative. It is limited to the maximum values of the used 3-axis subsystem.	

Jump speed	The adjacent parameters are described in detail in the application manual and/or in the "Commands and Functions" manual.
Jump delay	
Var. jump length	
Var. jump delay	
Wobble frequency	
Wobble width	
Zero power after mark	If this function is activated, the laser power is set to zero after marking via *Job>Run*.
Mark on dark material	Only for bitmap objekts If this function is activated, the bitmap object will be marked inverted. This allows you to mark a pseudo-positive image on dark materials. In the weldMARK window the bitmap object is not displayed inverted.

Hints for optimizing delay times

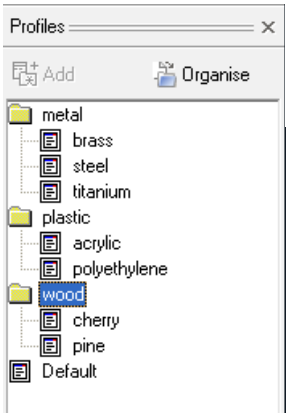
The delay times must be adapted for the application and the jump and marking speeds entered. Failure to optimize the delay times gives poor processing results and can increase the processing time. The length of the laser on and off delays have no influence on the processing time.

The procedure for setting the delay times is as follows:

- Optimize the laser on and off delay.
  We recommend setting a high value for the jump and mark delays.
- Optimize the delay times for controlling the galvanometer scanners, e. g. the jump, mark and poly delay.

8.2 Showing and hiding the Profile Manager

o Select the *View >Profile Manager* option from the menu.
The adjacent window is shown or hidden.



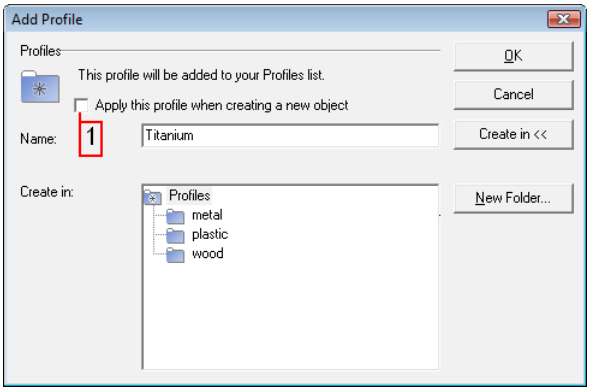
Showing the Profile Manager

8.3 Creating and managing profiles

In the Profile Manager, you can view, delete and modify existing object profiles and apply them to objects. You can also add new object profiles and organize all object profiles hierarchically.

8.3.1 Creating profiles

o Right click on the object whose profile you want to add to the Profile Manager.
o Select the *Add to Profiles...* option from the menu.
The adjacent window is opened.
Refer to the table below for explanations.

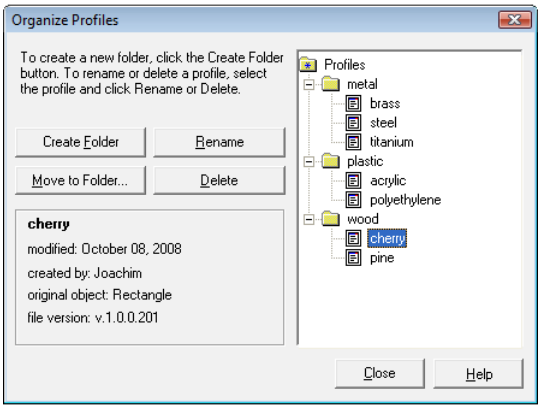


(1)	If this function is enabled, the profile parameters for the selected object are applied to the default profile in the Profile Manager. The default profile is automatically applied to all new marking objects.
Name	The name of the profile is entered in this field.
Create in <<	This window shows the Profile Manager folder structure. The new profile is saved in the selected folder. If no folder is selected, the profile is saved at the highest level in the Profile Manager structure.
OK	Clicking on this button saves the profile in the Profile Manager.

8.3.2 Organizing profiles

You can structure individual profiles in folders or rename, move and delete them.

- Select the *Profiles >Organize Profiles...* option from the menu,
  or
  Click on *Organize* in the Profile Manager.
  The adjacent window is opened.
  Refer to the table below for explanations.
- Click on *Close* to add the changed structure to the Profile Manager.



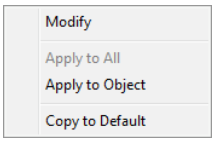
Create Folder	Clicking on this button prompts the user to enter a folder name; a new profile folder is then created with the name entered.
Rename	Clicking on this button allows you to rename a selected folder or a profile.
Move to Folder...	Clicking on this button allows a selected profile to be moved to a different folder.
Delete	Clicking on this button deletes either a selected folder and the profiles it contains or a selected individual folder.

8.4 Applying profiles

The profiles saved in the Profile Manager can be applied to selected marking objects. The profile of one marking object can also be applied to other marking objects.

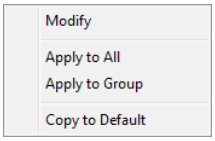
8.4.1 Applying a profile from the Profile Manager to an object

- Select the object to which you want to apply a profile.
- In the Profile Manager, right click on the profile you want to apply.
- Select the *Apply to Object* option from the menu.



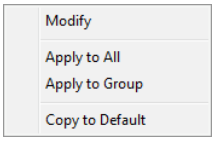
8.4.2 Applying a profile from the Profile Manager to multiple objects

- Select the objects to which you want to apply a profile.
- In the Profile Manager, right click on the profile you want to apply.
- Select the *Apply to Group* option from the menu.



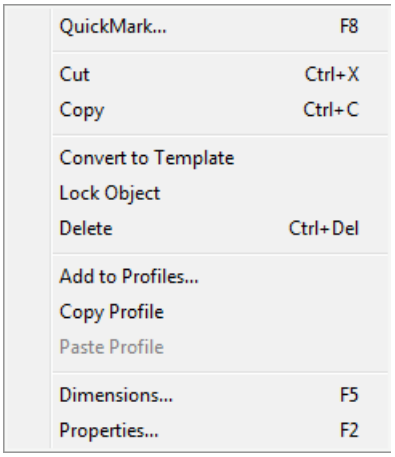
8.4.3 Applying a profile from the Profile Manager to all objects

- In the Profile Manager, right click on the profile you want to apply.
- Select the *Apply to All* option from the menu.



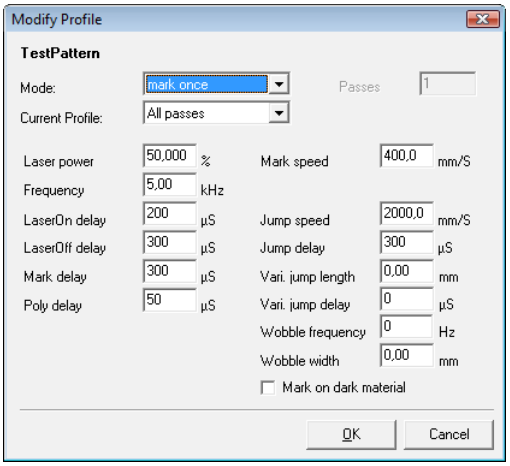
8.4.4 Copying a profile from object to object

- o Right click on the object whose profile you want to copy.
- o Select the *Copy Profile* option from the menu.
- o Select the objects to which you want to copy the object.
- o Right click on the selected objects.
- o Select the *Paste Profile* option from the menu.



8.5 Modifying a saved profile

- o In the Profile Manager, right click on the profile for which you want to modify the parameters.
- o Select the *Modify* option from the menu. The adjacent window is opened. Explanations can be found in the section below:
  ⇨ on page 108, Marking object profile.



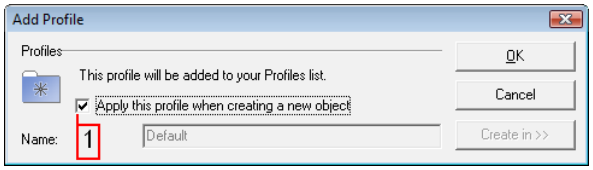
8.6 The default profile

The default profile is listed under the name *Default* in the Profile Manager. It cannot be deleted or moved to another folder. When you create a new marking object, the default profile is applied automatically. Markings performed to calibrate the marking field are performed using the settings in the test pattern profile.

The default profile can be adapted to your individual requirements; however, changes only affect the objects that are created subsequently.

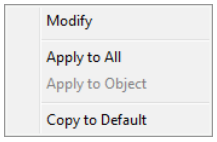
8.6.1 Assigning the default profile the parameters for a marking object

- Right click on the marking object whose profile parameters you want to applying to the default profile.
- Select the *Add to Profile Manager* option from the menu.
  The adjacent window is opened.
- Enable the check box *(1)*.
- Confirm the operation with *OK*.



8.6.2 Applying the parameters of a different profile to the default profile

- In the Profile Manager, right click on the profile whose parameters you want to apply to the default profile.
- Select the *Copy to Default* option from the menu.



8.6.3 Modifying the default profile

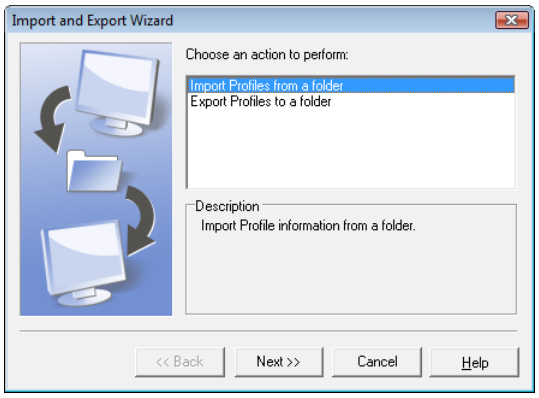
The default profile can be modified in the same way as any other profile (⇨ on page 113, Modifying a saved profile).

8.7 Importing and exporting profiles

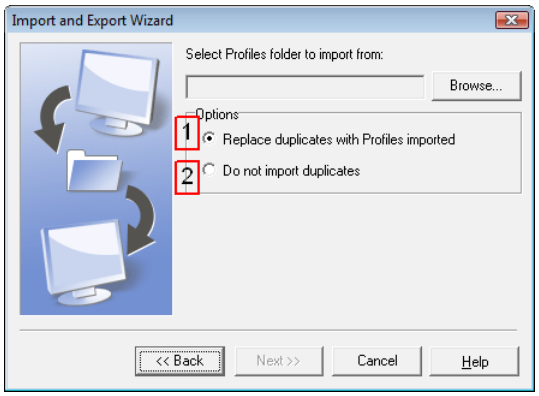
8.7.1 Importing profiles

Only profile folders can be imported, not individual profiles. The profile folder to be imported must be located in a folder with the name "Profiles".

- Select the *File > Import and Export Profiles...* option from the menu.
  The adjacent window is opened.
- Select *Import Profiles from a folder* and click on *Next.*
  The following window is opened.



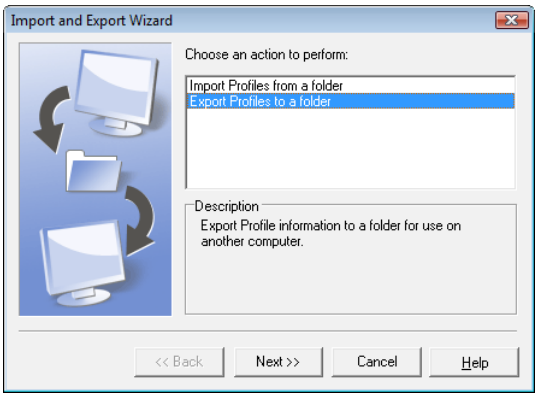
- Click on *Browse...* and then select the folder named "Profiles", which contains the profiles to be imported.
- Select option *(1)* if you want to replace profiles with the same name or *(2)* if you do not want to do so.
- Click on *Next* to perform the import.



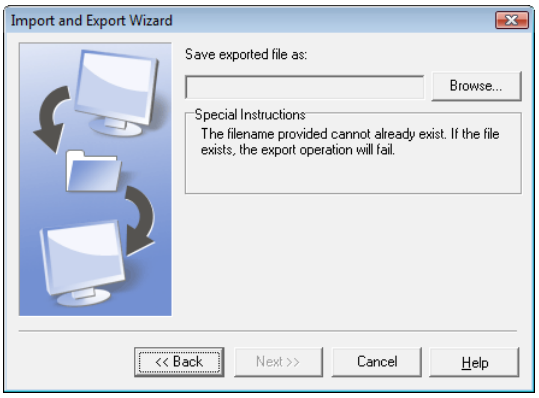
8.7.2 Exporting profiles

Only profile folders can be exported, not individual profiles. The profile folder to be exported is saved in a folder with the name "Profiles" (weldMARK® creates this folder if there is no folder with this name at the specified location).

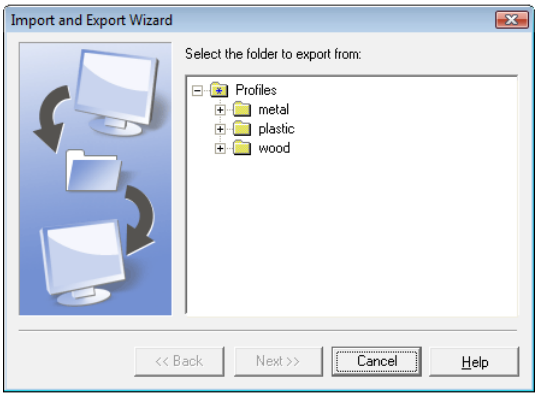
- Select the *File > Import and Export Profiles...* option from the menu.
  The adjacent window is opened.
- Select *Export profiles to a folder* and click on *Next.*
  The following window is opened.



- Click on the *Browse* button.
- Select the location in which you want to save the "Profiles" folder
  or
  Select the location of an existing "Profiles" folder in which you want to save the profile folder to be exported.
- Click on the *Next* button.
  The following window is opened.



- Select the profile folder to be exported.
- Click on *Next* to perform the export.



9 EXECUTING MARKING OBJECTS (QUICKMARK)

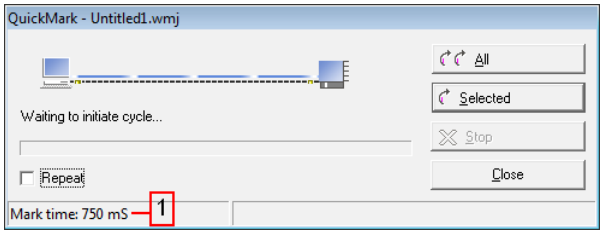
This chapter provides an overview of the QuickMark function. The function enables you to execute the marking process with no automation objects or additional functions (e.g. serialization). It is also possible to mark only particular marking objects from a job.

Before using the QuickMark function, you should familiarize yourself with the job settings (⇨ on page 119, Job settings).

Warning:
The laser beam can cause severe injury to the eyes and the skin. Make sure that there are no reflective objects in the beam path before starting the QuickMark function and turning on the laser. Note that even apparently matt objects can reflect the wavelength of laser beams.

All personnel in the room must wear appropriate laser protection goggles, or the marking area must be completely covered. Follow the local safety regulations, which can be obtained from the person responsible for laser safety.

- Select the objects you want to mark. It you want to process all objects, you do not need to select an object.
- Select the *Job >QuickMark...* option from the menu.
  The adjacent window is opened. Refer to the table below for explanations.



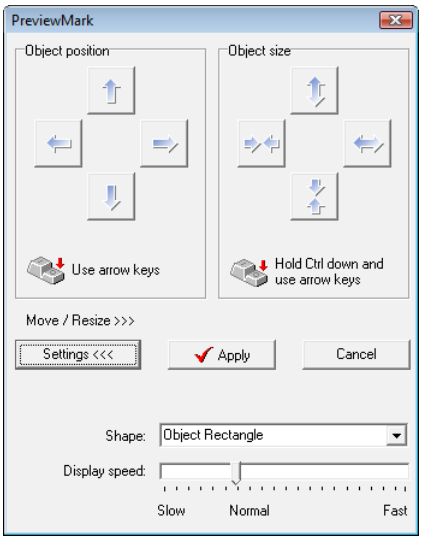
Repeat	Enabling this function means that once the marking process has been started it will be repeated until you stop it with the *Stop* button.
All	Executes all marking objects in the current job.
Selected	Executes only the selected marking objects.
Stop	Clicking on this button stops the marking process immediately. Alternatively, you can do this by pressing the *ESC* key.
(1)	When laser marking is complete, the elapsed marking time is displayed in the status bar.

PreviewMark

The PreviewMark can be used if the laser system is fitted with a visible pointer and you have selected a laser driver file that supports a visible pointer in the system preferences. Note that the visible pointer needs to be calibrated in order for it to correctly represent the position of the marking laser (⇨ on page 170, Calibrating the visible pointer).

The Preview Mark shows the shape of a marking object or a group of marking object using the visible pointer. This shape can be used to position and scale the marking objects exactly. The marking laser remains off.

- o Select the marking objects whose marking position and size you want to set.
- o Select the *Job >PreviewMark...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.



Object position	These buttons can be used to change the marking position of the selected objects.
Object size	These buttons can be used to change the size of the selected objects.
Settings	Clicking on this button enables you to show or hide the slider for adjusting the speed of the visible pointer.
Shape	The object is shown as a rectangle, the shape of which symbolizes the object dimensions.
Display speed	This slider can be used to adjust the speed of the visible pointer. The higher the speed, the more static the representation of the shape.
Apply	Clicking on this button applies the settings made.

10 JOB SETTINGS, RUN JOB

This chapter provides an overview of the sequence of a job, which settings you can make and how you run a job.

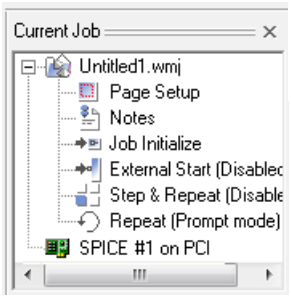
When executing a job, all objects contained in the job are executed, including the automation objects and all additional functions for the objects, e.g. serialization.

10.1 The Job Manager

The Job Manager gives you an overview of the job settings. The settings can only be changed at the *All editing functions* access level. In *Operator interface only* mode, the Job Manager is read only, while it does not appear at all in *Touchscreen interface* mode.

Showing and Hiding the Job Manager

o Select the *View >Job Manager* option from the menu.
The adjacent window is shown or hidden.



Job Manager

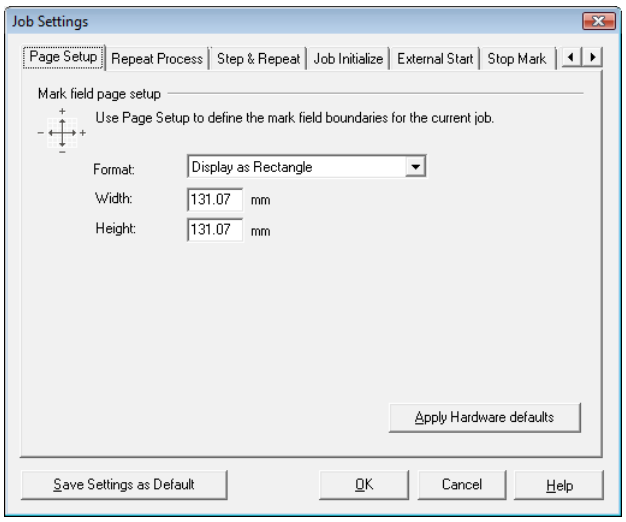
10.2 Editing the job settings

The job settings enable you to adapt the execution of a job to specific requirements. The job settings are saved as part of the job itself. The job settings are divided up as follows:

Page Setup	Allows you to set the format and size of the workspace.	⇨ on page 120, Job settings - "Page Setup"
Repeat Process	Execution of the job can be repeated several times or continuously.	⇨ on page 121, Job Settings „Repeat Process“
Step & Repeat	The matrix function allows an object to be marked several times. The duplication is based on adjustable row and column arrangements.	⇨ on page 122, Job settings - "Step & Repeat"
Job Initialize	When running the job, external components can be automatically prepared for the marking process.	⇨ on page 123, Job Settings „Job Initialize“
External Start	The start of job execution can be controlled by external signals.	⇨ on page 124, Job settings - “External Start”
Notes	A note can be added to the job.	⇨ on page 125, Job settings - "Notes"
Interlocks	Execution of the job can be interrupted by external interlock loops.	⇨ on page 126, Job settings - "Interlocks"

10.2.1 Job settings - "Page Setup"

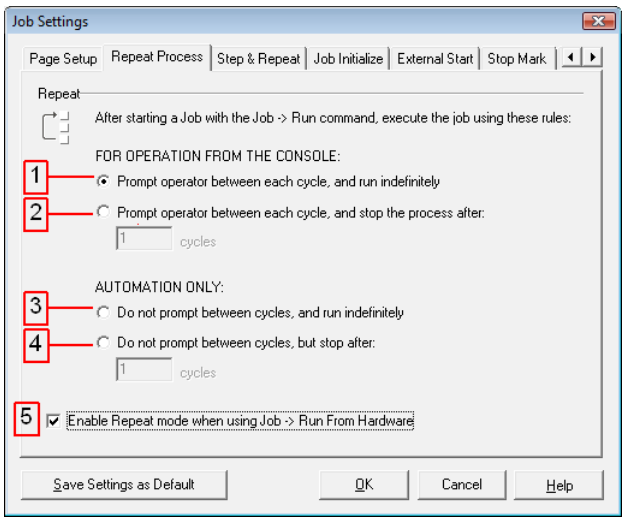
o Select the *Job >Settings...* option.
or
Double click on the *Page Setup* option in the Job Manager.
The adjacent window is opened.
Refer to the table below for explanations.



Format	You can select a rectangular or circular workspace.
Width	The size of the workspace can be adjusted. The maximum size of the workspace is determined by the size of the deflection unit's operating field.
Height	
Apply Hardware defaults	Clicking on this button sets the workspace to its maximum possible size (size of deflection unit's operating field).
Save Settings as Default	Clicking on this button allows you to save the current settings as the defaults for the *PageSetup*.

10.2.2 Job Settings „Repeat Process“

o Select the *Job >Settings...* option.
o Select the *Repeat Process* tab.
The adjacent window is opened.
Refer to the table below for explanations.

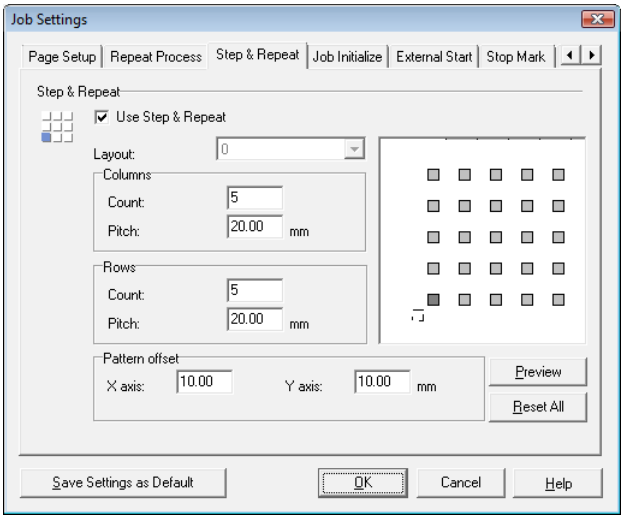


FOR OPERATION FROM THE CONSOLE	If you select a manual repeat function, each new execution of the job must be started manually.	
	(1)	The job is executed as many times as you wish.
	(2)	The frequency of execution is limited by the specified number of *Cycles*.
AUTOMATION ONLY	It you select an automatic repeat function, execution of the job is automatically restarted after completion of a cycle.	
	(3)	Execution of the job is automatically repeated continuously.
	(4)	Execution of the job is automatically repeated for the specified number of *Cycles*.
(5)	Only selectable if a SP-ICE Control Card is used If this function is enabled, the settings are also used in *Run from Hardware* mode. This option is only available if *Run from Hardware* mode is enabled (⇨ on page 129, Run from Hardware).	
Save Settings as Default	Clicking on this button uses the current settings as the defaults for *Repeat Process*.	

10.2.3 Job settings - "Step & Repeat"

The *Step & Repeat* function allows objects to be marked several times. The duplication is based on adjustable row and column arrangements.

- o Select the *Job >Preferences* option from the menu.
- o Select the *Step & Repeat* tab. The adjacent window is opened. Refer to the table below for explanations.

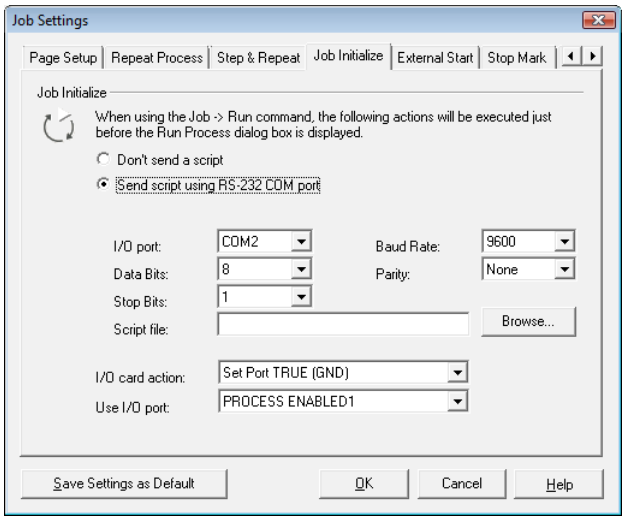


Use Step & Repeat	If this function is enabled, the following parameters can be set:		
	Layout		If a standard I/O card is installed, up to four matrix layouts can be created. Each layout can have a different matrix arrangement. The layout can be selected using the ports on the standard I/O card.
	Columns	*Count*	The matrix is made up of columns and rows. You can specify the number of rows and columns and the distance between them (pitch).
		Pitch	
	Rows	*Count*	
		Pitch	
	Pattern offset	*X axis*	The position of the matrix on the marker can be adjusted using these offset values.
		Y axis	
	Preview		Clicking on this button updates the preview window.
	Reset All		Clicking on this button restores all settings to the defaults.
	Save Settings as Default		Clicking on this button uses the current settings as the defaults for *Step & Repeat*.

10.2.4 Job Settings „Job Initialize“

When the job is started, the RS232 port can be used to output a string to initialize external components. In addition, you can specify a port to be used to report execution of the job to external components. As initialization is job specific, the components can be initialized in a different way for each job that is loaded.

- Select the *Job >Settings...* option.
- Select the *Job Initialize* tab.
  The adjacent window is opened. Refer to the table below for explanations.

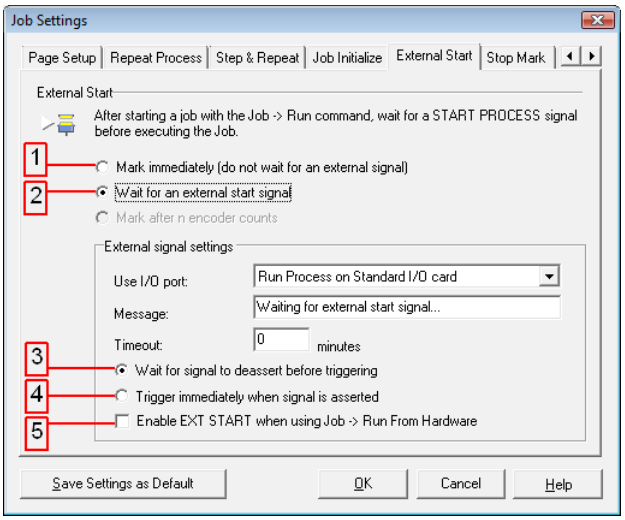


Don't send a script	No script is sent to initialize external components.	
Send script using RS-232 COM port	A script is sent to initialize external components using an RS232 port.	
	I/O Port	Select an RS232 port for sending the script.
	Data Bits	These parameters are used to adapt the RS232 port to the parameters of the script recipient.
	Stop Bits	
	Baud Rate	
	Parity	
	Script file	Select the script file to be sent using the RS232 port.
	Browse...	
I/O card action	A port can be selected. The port must be assigned an action that is to be executed when the job is started.	
Use I/O port		
Save Settings as Default	Clicking on this button uses the current settings as the defaults for *Initialization*.	

10.2.5 Job settings - “External Start”

The *External Start* function allows execution of the job to be controlled by an external signal. This tab is only available if the standard I/O card is installed and/or SP-ICE/RLC series control cards are installed.

Select the *Job >Settings* option from the menu.
Select the *External Start* tab.
The adjacent window is opened. Refer to the table below for explanations.

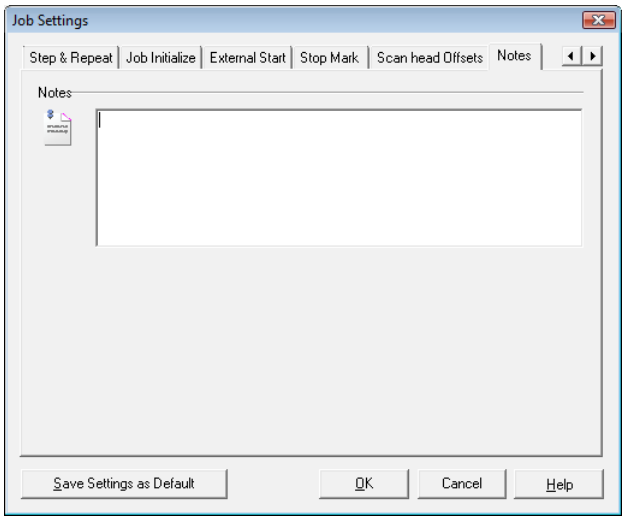


(1)	If this check box is selected, the *External Start* function is deactivated.	
(2)	If this check box is selected, the *External Start* function is activated and the following setting options are available:	
	Use I/O port	This selection box can be used to choose the port for the start signal. The selection options vary depending on the cards installed.
	Message	A text can be entered for a message that appears during the waiting time.
	Timeout	A time limit can be placed on the waiting time for the external start signal. When this time has elapsed, an error message will be output. If a value of "0" is entered, the waiting time is unlimited.
	(3)	The job is not started until the start signal is de-asserted.
	(4)	The job is started as soon as the start signal is asserted.
	(5)	If this function is enabled, the selected parameters are also used in *Run from Hardware* mode. This option is only available if *Run from Hardware* mode is enabled (⇨ on page 129, Run from Hardware).
	Save Settings as Default	Clicking on this button uses the current settings as the defaults for *External Start*.

10.2.6 Job settings - "Notes"

A note can be added to the job. weldMARK® can be set up in such a way that the job note is automatically displayed when loading a job and has to be acknowledged by the user (⇨ on page 150, Settings for the job file).

- Select the *Job >Settings* option from the menu.
- Select the *Notes* tab.
  The adjacent window is opened. Refer to the table below for explanations.

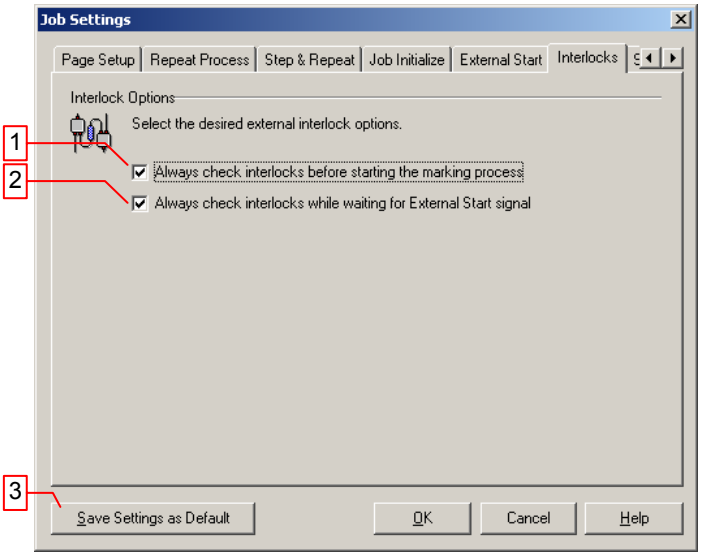


Save Settings as Default	Clicking on this button uses the text entered as the default for *Notes*.

10.2.7 Job settings - "Interlocks"

Use the settings on the *Interlocks* tab to set when and how weldMARK® will report interlock events. The *Interlocks* tab is only available if an interlock card is installed.

o Select the *Job >Settings* option and then select the *Interlocks* tab.
The adjacent window is opened.
Refer to the table below for explanations.



(1)	If this check box is enabled, the interlock status is checked before starting each job. If there is an interlock event, the job is not started and an error message is output.
(2)	If this check box is enabled, the interlock status is checked while the system is waiting for the external start signal and, if necessary, an error message is output. If the check box is not enabled, an interlock event does not result in an error message but the start signal is ignored and the READY signal on the standard I/O card changes to BUSY.
(3)	Clicking on this button uses the current settings as the defaults for *Interlocks*.

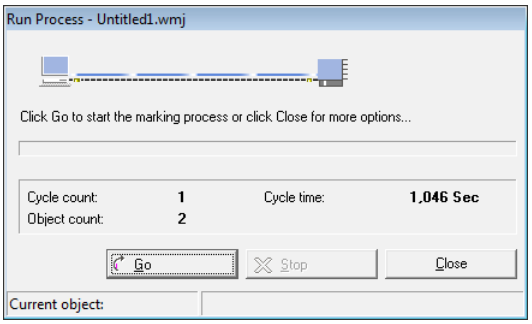
10.3 Executing a job

In order to be able to execute a job, the Object Manager must contain at least one object that can be marked. The procedure for starting a job differs depending on the access level and is described below.

Warning:
The laser beam can cause severe injury to the eyes and the skin. Make sure that there are no reflective objects in the beam path before starting a job and turning on the laser. Note that even apparently matt objects can reflect the wavelength of laser beams. All personnel in the room must wear appropriate laser protection goggles, or the marking area must be completely covered. Follow the local safety regulations, which can be obtained from the person responsible for laser safety.

Starting a job at "All editing functions" access level

- o If necessary, open the required job.
- o Select the *Job >Run* option from the menu.
  The adjacent window is opened.
- o Click on the *Go* button.
  The job is executed.

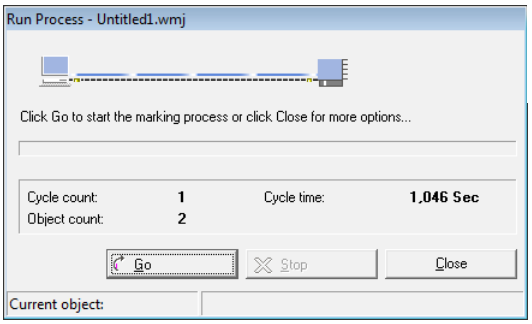


Stopping the job

Click on the *Stop* button or press the *ESC* key.

Starting a job at "Operator interface only" access level

- o If necessary, open the required job.
- o Select the *Job >Run* option from the menu.
  The adjacent window is opened.
- o Click on the *Go* button.
  The job is executed.



Run Process

Stopping the job

- o Click on the *Stop* button or press the *ESC* key.

Starting a job at "Touch screen interface" access level

- o If necessary, open the required job.
- o Touch the *Run* button.
  The job is executed.

Stopping the job

- o Touch the *Stop* button or press the *ESC* key.

10.3.1 Displays during a job

While the job is being executed, the following values are displayed in the status bar:

Cycle count	How often the entire Object Manager has been executed so far.
Object count	Number of objects processed so far.
Cycle time	Time required to execute the current job (current cycle).
Current object	The object that is currently being processed.

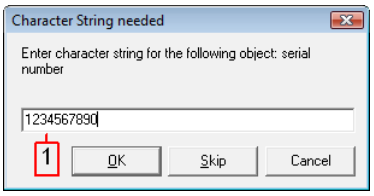
10.3.2 Events during a job

Depending on the objects included in the job and their properties, the program may prompt the user for input during execution.

Entering a string

If an object has been created for which a string is to be entered by the user, the adjacent window is opened.

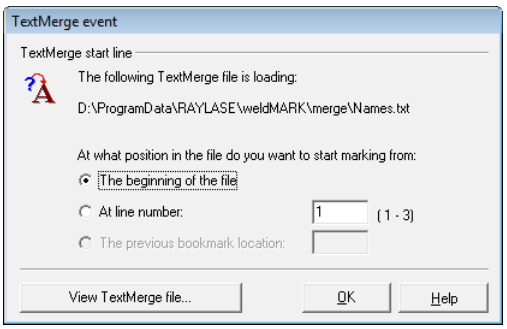
Refer to the table below for explanations.



(1)	Input box for the string to be used for marking the object. Execution of the job is continued as soon as the entry is confirmed by clicking on the *OK* button.
OK	
Skip	Clicking on this button skips the input prompt. The object is marked using the last string used.

Parameters for TextMerge

If an object has been created that uses a TextMerge function, the adjacent window is opened. Refer to the table below for explanations.



The beginning of the file	The first string for the object is taken from the first line of the merge file.
At line number	The first string for the object is taken from the specified line of the merge file. The available line numbers are specified in brackets.
The previous bookmark location	The first string is taken from the line in the merge file that is bookmarked. This option is not available until at least one line has been read from the merge file. The bookmark is inserted each time a line from the merge file is read and specifies the next line to be read. This allows serialization to continue seamlessly after restarting the job.

10.3.3 Run from Hardware

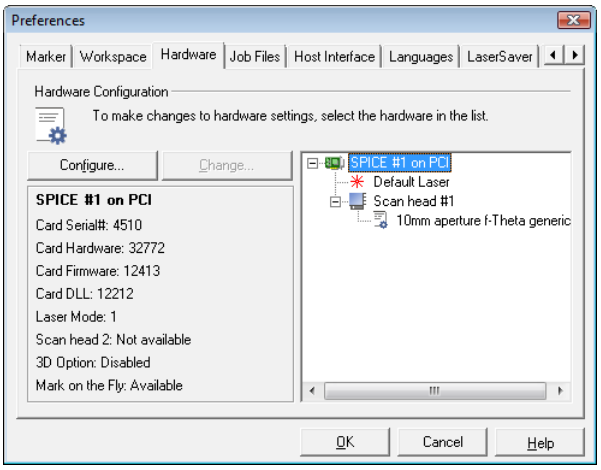
weldMARK® allows all marking objects in a job to be loaded to the control card memory. This enables the job to be executed very quickly as possible delays caused by the operating system are avoided. However, no automation objects can be executed.

To allow direct operation, the following conditions must be met:

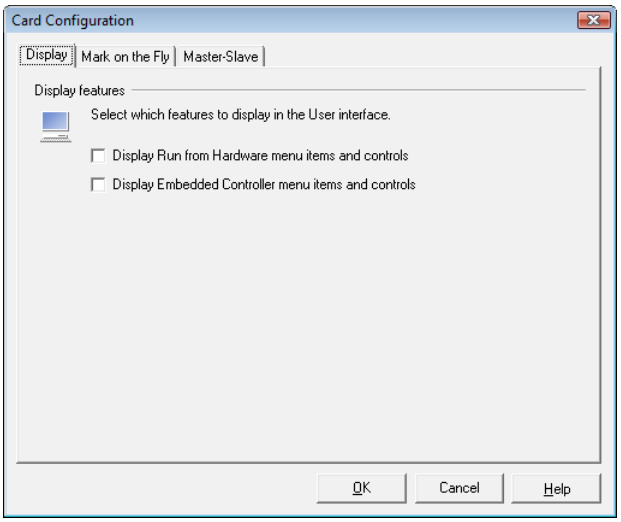
- A SP-ICE control card must be used.
- The *Run from Hardware* mode must be activated.
- The job may not contain more objects than can be stored in the available memory on the control card.

Activating "Run from Hardware" mode

o *System >Preferences* option from the menu.
o Select the *Hardware* tab.
The adjacent window is opened.
o Select the control card for which you want to activate the mode.
o Click on the *Configure* button.
The following window is opened.



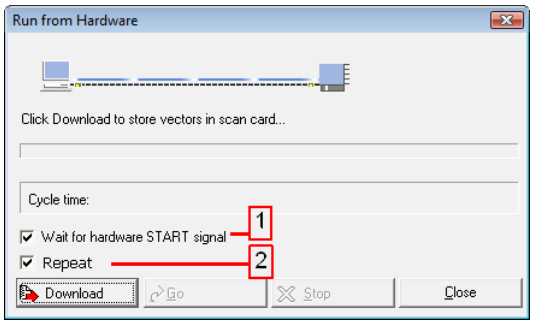
o Select the *Display* tab.
o Enable the *Display Run from Hardware menu items and controls* check box.



Running a Job from Hardware

Warning:
The laser beam can cause severe injury to the eyes and the skin. Make sure that there are no reflective objects in the beam path before starting a job and turning on the laser. Note that even apparently matt objects can reflect the wavelength of laser beams. All personnel in the room must wear appropriate laser protection goggles, or the marking area must be completely covered. Follow the local safety regulations, which can be obtained from the person responsible for laser safety.

o Select the *Job >Run from Hardware* option from the menu.
The adjacent window is opened.
Refer to the table below for explanations.



Download	Clicking on this button sends the marking objects to the control card.	
	Go	This button only becomes active when all marking objects have been saved on the control card. Clicking on the button starts execution of the job.
	(1)	If this function is enabled, the job is not executed until the hardware signal is present.
	(2)	If this function is enabled, the job is executed repeatedly (⇨ on page 121, Job Settings „Repeat Process“”).
	Stop	Clicking on this button or pressing the *ESC* key stops execution immediately.

10.3.4 Stand Alone Operation

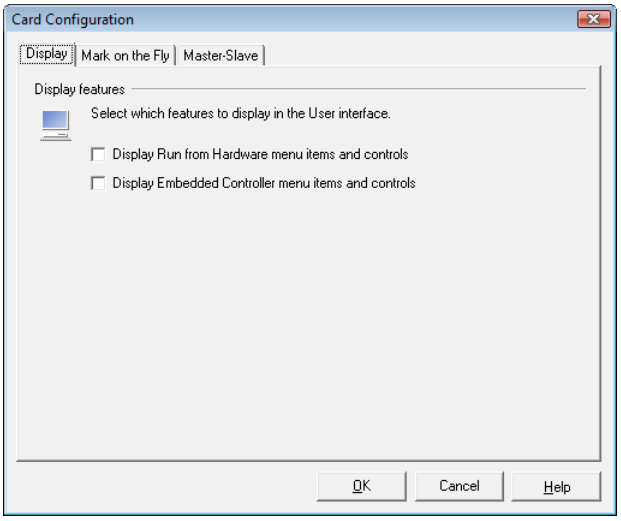
weldMARK® allows all objects in a job to be loaded to the memory on a stand alone control card. The job can then be executed from the control card itself without a connection to weldMARK®. This function is only available with SP-ICE control cards.

In order to be able to save a job on a stand alone control card, the following conditions must be met:

- The corresponding hardware must be available.
- The function must be enabled.
- The job may not contain more objects than can be stored in the available memory on the control card.

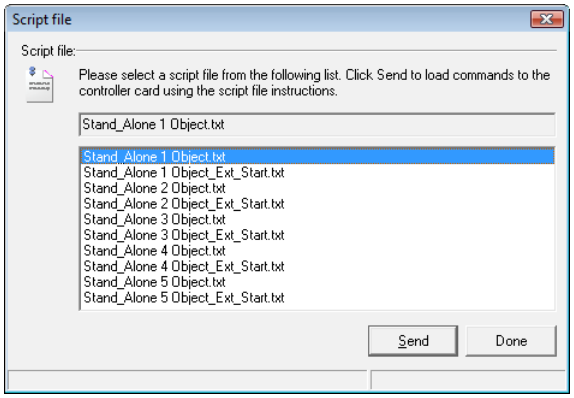
Enabling "Save to stand alone control card" mode

o Select the *System >Preferences* option from the menu.
o Select the *Hardware* tab.
o Select the control card for which you want to activate the mode.
o Click on the *Configure* button. The adjacent window is opened.
o Select the *Display* tab.
o Enable the *Display Embedded Controller menu items and controls* check box.



Saving a job to a stand alone control card

o Select the *File >Save Job to Embedded Controller* option from the menu. The adjacent window is opened.
o Select a script file from the list.
o Click on the *Send* button to start saving.



10.4 The "Mark on the Fly" option

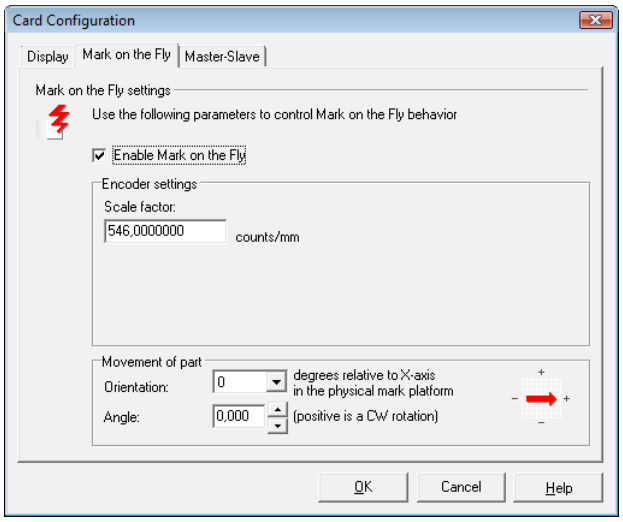
The *Mark on the Fly* option allows moving workspaces to be marked. This requires an SP-ICE control card with an MOTF add-on card. The add-on card is connected to an encoder that detects the current speed of the marker; the vectors for a job are then adjusted according to the speed.

In order to be able to use the *Mark on the Fly* option, the following conditions must be met:

- The corresponding hardware (SP-ICE control card with MOTF add-on card) and a suitable encoder signal must be available.
- The function must be enabled.

Activating the "Mark on the Fly" option

o Select the *System >Preferences* option from the menu.
o Select the *Hardware* tab.
o Select the card for which you want to activate the mode.
o Click on the *Configure* button.
o Select the *Mark on the Fly* tab.
The adjacent window is opened.
Refer to the table below for explanations.



Enable Mark on the Fly	If this function is enabled, the following settings are available:		
	Scale factor	This field can be used to enter the number of pulses emitted by the encoder for each millimeter of movement of the marker (this is the same for each other set measuring unit).	
	Orientation	Rough setting for the direction of movement of the marker. "0" corresponds to a horizontal movement from left to right. The orientation entered under *System >Preferences...* on the *Marker* tab is not taken into account. Rotation is clockwise.	If the marker is moving at a 20° angle relative to the X-axis, enter "0" in the *Orientation* field and "20" in the *Angle* field.
	Angle	Precise setting for the direction of movement of the marker. You can enter an angle between -45° and +45°. Rotation is clockwise, relative to the X-axis configured under *System >Preferences...* on the *Marker* tab.	

10.5 Master/slave mode

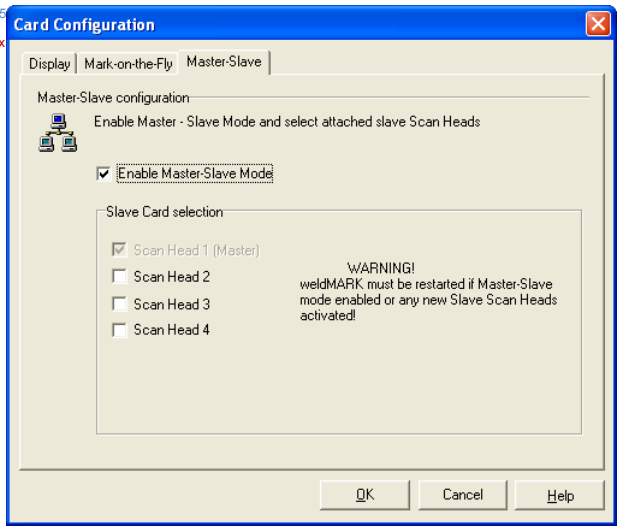
In a PC one SP-ICE control card can be defined as master card and up to three cards as slave cards.

In master/slave operation weldMARK® sends the job file to the master SP-ICE control card. This master card controls the connected scan head and the laser – like in normal operation with a SP-ICE control card. Additionally, the master card controls the slave SP-ICE control cards. Thus the content of a job file can send to up to four SP-ICE control cards (one master and three slave cards) which allows to control up to four scan heads.

Information in detail can be found in the hardware manual of the SP-ICE control card.

Activating option „Master-Slave“

- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
- Select the card for which you want to activate the mode.
- Click on the *Configure* button.
- Select the *Master-Slave* tab. The adjacent window is opened. Refer to the table below for explanations.

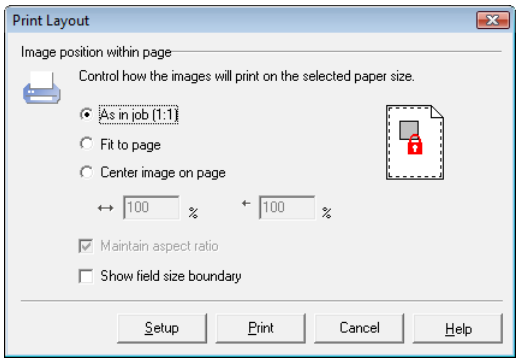


Scan Head 1 (Master)	Via this check box SP-ICE control card „1“ can be defined as master.
Scan Head 2	Via these check boxes each other built-in SP-ICE control card can be activated for slave operation.
Scan Head 3	
Scan Head 4	

10.6 Printing a job

The content of the workspace can be printed as described below:

- Select the *File >Print Setup...* option and make the required settings (printer, paper size, orientation).
- Select the *File > Print* option from the menu. The adjacent window is opened. Refer to the table below for explanations.



As in job (1:1)	The objects are printed at actual size.	
Fit to page	The printout is scaled to use the full size of the page.	
Center image on page	The printout is scaled as specified and centered on the page.	
	Width	The width and height of the printout can be changed as a percentage of the actual size.
	Height	
	Maintain aspect ratio	If this function is enabled, the aspect ratio of the printout remains unchanged even if the print size is changed (no distortion).
Show field size boundary	If this function is enabled, the boundaries of the workspace are printed as a frame.	
The *Setup* or *Print buttons*	Clicking on these buttons calls up the printer settings.	

11 SYSTEM TOOLS

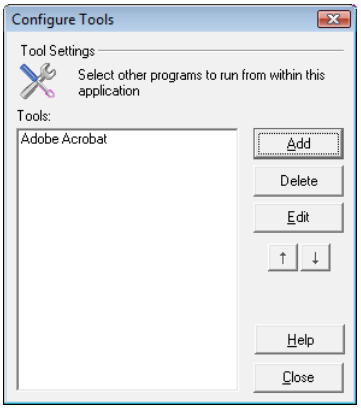
weldMARK® provides the following system tools:

Configure Tools	The tool menu can be extended with options for calling up external programs.	⇨ below, Configure Tools
Configure I/O Cards...	This tool allows you to configure newly installed I/O cards.	⇨ on page 137, Configure I/O Cards
Laser Diagnostics Tool	This tool allows you to check the positioning and power of the marking laser.	⇨ on page 138, Laser Diagnostics tool
I/O Card diagnostics		⇨ on page 139, "I/O Card Diagnostics" tool

11.1 Configure Tools

The weldMARK® *Tools* menu can be extended with additional tools (external programs). These programs can then be launched from within weldMARK®.

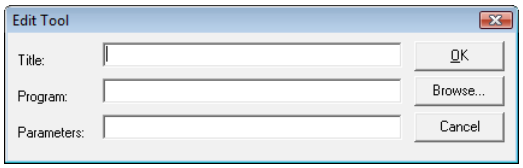
o Select the *Tools >Configure Tools...* option from the menu.
The adjacent window is opened.
Refer to the table below for explanations.



Tools	This section of the window lists all programs added.
Add	Clicking on this button allows new tools to be added to the *Tools* list (⇨ on page 136, Adding / editing tools).
Delete	Clicking on this button removes the selected tool from the list.
Edit	Clicking on this button allows you to edit the settings for the tool selected in the Tools list (⇨ on page 136, Adding / editing tools).
	These buttons can be used to change the position of a program in the list (and also in the Tools menu).

Adding / editing tools

o Select the *Tools >Configure Tools...* option from the menu.
o Click on the *Add* button.
The adjacent window is opened.
Refer to the table below for explanations.



Title	The name of the selected program file is automatically entered in this field when the *Browse* button has been used to select a program. This name can be changed as required. The entry in the *Title* field is used in the *Tools* menu.
Program	The location of the selected program file is automatically entered in this field when the *Browse* button has been used to select a program. The path to the selected program can also be entered manually.
Parameters	This field can be used to enter parameters for calling up the program. Refer to the manual for the relevant program for details of which parameters are available.

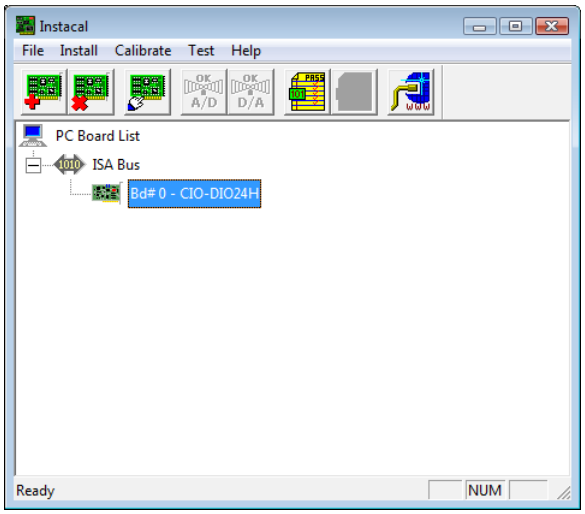
11.2 Configure I/O Cards

If a new standard I/O card and/or interlock I/O card (type CIO-DIO24H card) has been installed in the computer, it must be configured using the *Configure I/O Cards...* tool.

Configuration must be performed again if a PCI card is removed, added or moved within the computer.

Warning:
This tool is only necessary when using I/O cards with a PCI slot. Do NOT use this tool for ISA I/O cards, otherwise the communication with the ISA card may be lost.

- Select the *Tools >Configure I/O Cards...* option from the menu.
  A warning message relating to ISA I/O cards appears.
- Read and acknowledge the warning message.
  The *Instacal* program is opened in the adjacent window.
  All installed I/O cards are displayed in the list. The cards are now set up for use with weldMARK®.
- Exit *Instacal* by selecting *File >Exit*.

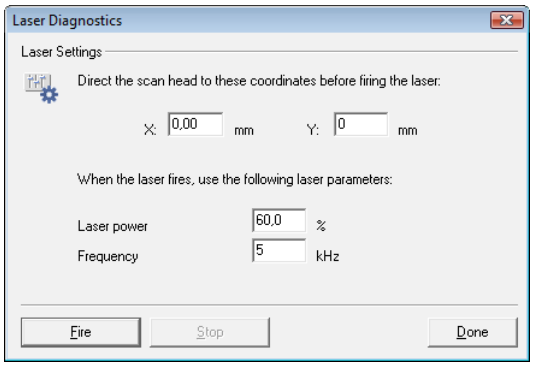


11.3 Laser Diagnostics tool

The Laser Diagnostics tool can be used to diagnose and, if necessary, adjust the impact point and power of the marking laser you are using.

Warning:
The laser beam can cause severe injury to the eyes and the skin. Make sure that there are no reflective objects in the beam path before starting a job and turning on the laser. Note that even apparently matt objects can reflect the wavelength of laser beams. All personnel in the room must wear appropriate laser protection goggles, or the marking area must be completely covered. Follow the local safety regulations, which can be obtained from the person responsible for laser safety.

o Select the *Tools >Laser Diagnostics...* option from the menu.
The adjacent window is opened.
Refer to the table below for explanations.



X:	The values in these input boxes determine the position to which the laser beam is directed after clicking on the *Fire* button.
Y:	
Laser power	This input box determines the laser power.
Frequency	This input box determines the frequency of the laser modulation signal.
Pulse width	This input box determines the pulse width of the laser modulation signal.
Fire	Clicking on this button turns on the laser immediately.
Stop	Clicking on this button turns off the laser immediately.
Done	Clicking on this button closes the Laser Diagnostics tool.

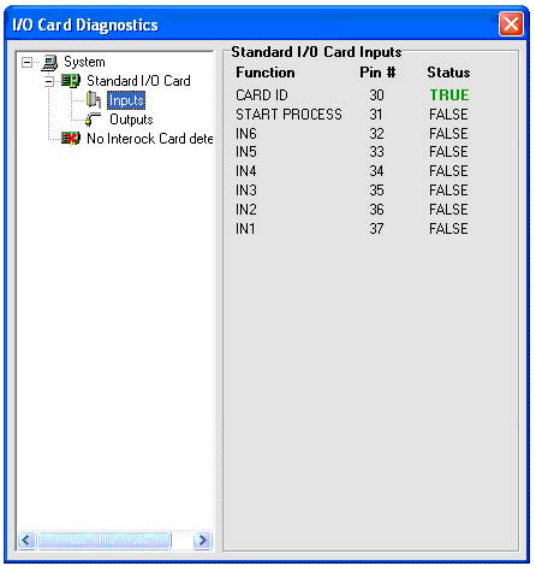
11.4 "I/O Card Diagnostics" tool

This tool allows the ports for the standard I/O card and the interlock I/O card (type: CIO-DIO24H card) to be tested. The tool is only available if one of these cards is installed.

Reading inputs from the standard I/O card

The following function is only available if a standard I/O card is installed:

- Select the *Tools >I/O Card Diagnostics...* option from the menu.
  A warning message appears.
- Read and acknowledge the warning message.
- Under *Standard I/O Card* select the *Inputs* option.
  The adjacent window is opened.
  Refer to the table below for explanations.

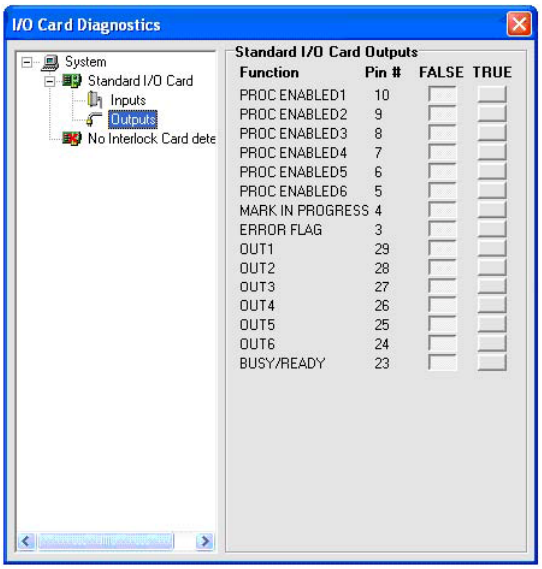


Function	This column lists the names used for the input ports in weldMARK®.
Pin #	This column lists the PIN numbers on the 37-pin connector on the I/O card.
Status	This column specifies the current status of the input ports. If the status is *TRUE*, the corresponding port is connected to GND.

Testing outputs on the standard I/O card

The following function is only available if a standard I/O card is installed:

- Select the *Tools >I/O Card Diagnostics...* option from the menu.
  A warning message appears.
- Read and acknowledge the warning message.
- Under *Standard I/O Card* select the *Outputs* option.
  The adjacent window is opened.

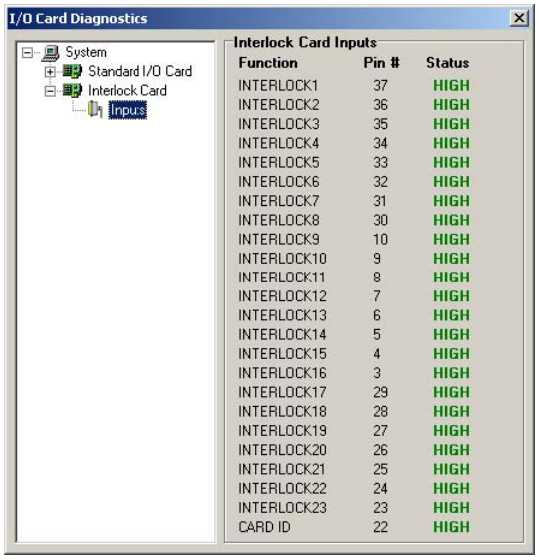


Function	This column lists the names used for the output ports in weldMARK®.
Pin #	This column lists the PIN numbers on the 37-pin connector on the I/O card.
FALSE	Clicking on these buttons allows you to switch the corresponding output to the status *FALSE* or *TRUE* for testing purposes. If the status is *TRUE*, the corresponding input is connected to GND.
TRUE	

Reading inputs from the interlock I/O card

The following function is only available if an interlock I/O card is installed:

- Select the *Tools >I/O Card Diagnostics...* option from the menu.
  A warning message is displayed.
- Read and acknowledge the warning message.
- Under *Interlock Card* , select the *Inputs* option.
  The adjacent window is opened.



Function	This column lists the names used for the input ports in weldMARK®.
Pin #	This column lists the PIN numbers on the 37-pin connector on the I/O card.
Status	This column specifies the current status of the ports. Each interlock port can have the status *HIGH* or *LOW*. If the status is *LOW*, the corresponding input is connected to GND.

12 SYSTEM SETTINGS

This chapter provides an overview of the configuration of the weldMARK® environment:

Preferences	The settings for the weldMARK® user interface can be changed throughout the system.	⇨ below, Preferences
Properties...	The current system properties for Windows and all of the configured hardware can be changed.	⇨ on page 154, System properties displays
Globals...	The laser power, the marking speed and the position of the marking objects can be changed throughout the system.	⇨ on page 155, Global
Security	Access to weldMARK® can be controlled using access rights and passwords.	⇨ on page 156, System security settings
Backup.../ Restore...	All system settings used by weldMARK® can be saved in a backup file and loaded from a backup file.	⇨ on page 157, Backing up system settings

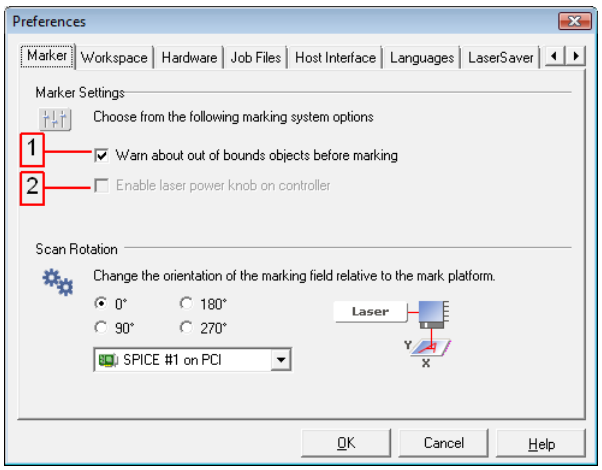
12.1 Preferences

The weldMARK® system preferences are divided into groups and split across several tabs:

Marker	⇨ on page 143, Settings for marking field	
Workspace	⇨ on page 143, Workspace settings	
Hardware	weldMARK® can be adapted for various deflection units, control cards and laser systems.	⇨ on page 144, Hardware Configuration (without control card) ⇨ on page 146, Hardware configuration (with control card)
Job Files	Job files can be automatically saved and loaded. In addition, you can also specify a folder in which jobs are saved to be loaded when using the *Operator interface only* and *Touchscreen interface* access levels.	⇨ on page 150, Settings for the job file
Host Interface	weldMARK® can communicate with external programs using different protocols and parameters.	⇨ on page 151, Editing the host interface settings
Languages	The weldMARK® user interface can be set to one of the supported languages.	⇨ on page 151, Language settings
LaserSaver	After a certain time has elapsed, the laser can be automatically blocked and/or the laser power reduced.	⇨ on page 152, Setting the LaserSaver
Beam Home	The scanner mirrors in the deflection unit can automatically be moved to a particular position at the end of a processing sequence.	⇨ on page 153, Setting up the beam home position
Motor control	The parameters for an installed motor control card can be adjusted.	⇨ on page 175, Operating stepper motors

12.1.1 Settings for marking field

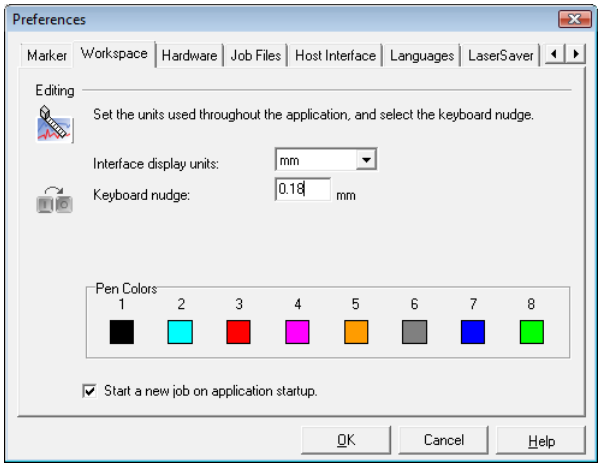
o Select the *System >Preferences* option from the menu.
o Select the *Marker* tab.
The adjacent window is opened.
Refer to the table below for explanations.



(1)	If this function is enabled, a warning is displayed on the screen if one of the objects is located outside the marking field.
(2)	If this function is enabled, the laser power settings specified in the object profiles are ignored. The laser power can then be adjusted externally. This function can only be enabled if it has been released when installing the laser driver (⇨ on page 166, Configuring a laser driver).
Scan Rotation	Note the orientation of the marking field, which is represented in the figure next to the check boxes.

12.1.2 Workspace settings

o Select the *System >Preferences* option from the menu.
o Select the *Workspace* tab.
The adjacent window is opened.
Refer to the table below for explanations.

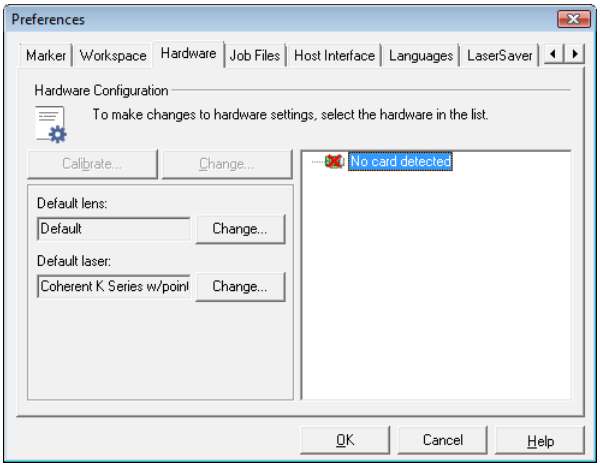


Interface display units	Selection box for the unit for the ruler display and for the input dialogs.
Keyboard nudge	This field determines how far an object is moved when it is nudged using the arrow keys (arrow + CTRL key).
Start a new job on application startup	If this function is enabled, a new job is automatically opened when weldMARK® is started.

12.1.3 Hardware Configuration (without control card)

If weldMARK® does not find a control card when it is started for the first time, the defaults for the correction file and for the laser driver are automatically activated. If you want to create jobs without connecting hardware, however, it is necessary to adjust the correction file for the deflection unit and the laser that you will use later. This means that weldMARK® will set the correct workspace size and release all options for the selected laser.

- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.

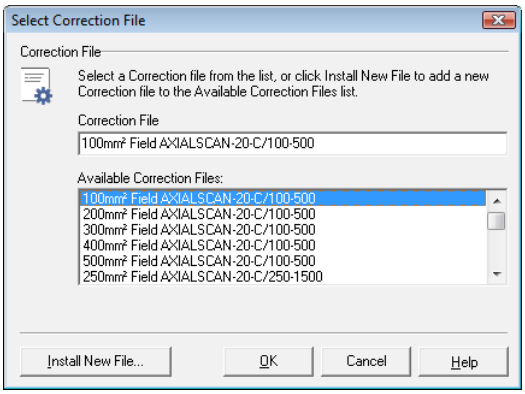


Default lens, *Change...*	⇨ below, Select default correction file
Default laser, *Change...*	⇨ on page 145, Select default laser driver

Select default correction file

This section describes how to select a correction file if no control card is installed.

- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
- Click on the *Change...* button to the right of the *Default lens* list box.
  A warning message appears.
- Read and acknowledge the warning message.
  The adjacent window is opened.
  Refer to the table below for explanations.

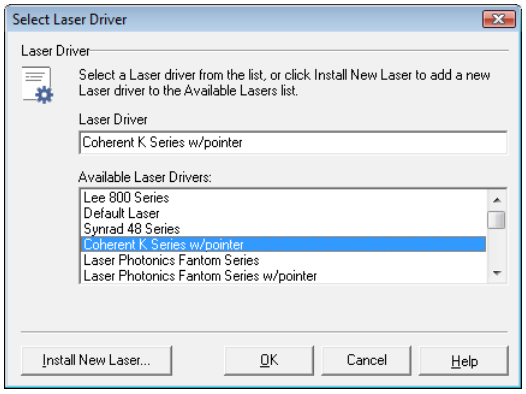


Correction File	This text box displays the currently selected correction file.
Available Correction Files	This list box displays all available correction files.
Install New File...	Clicking on this button starts the wizard for installing a correction file that is not included in the list.

Select default laser driver

This section describes how to select a laser driver if no control card is connected.

- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
- Click on the *Change...* button to the right of the *Default laser* list box.
  A warning message appears.
- Read and acknowledge the warning message.
  The adjacent window is opened.
  Refer to the table below for explanations.

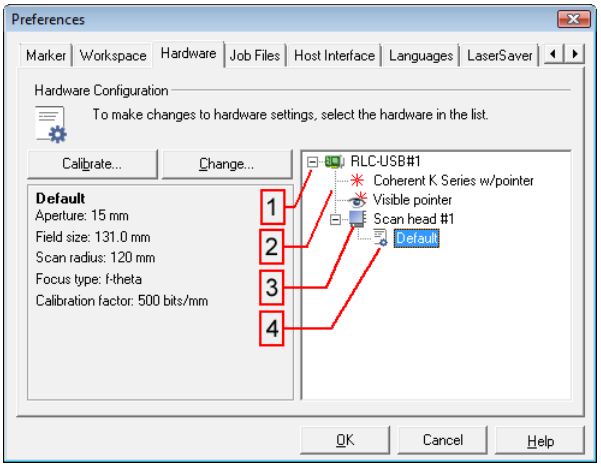


Laser Driver	This text box displays the currently selected laser driver file.
Available Laser Drivers	This list box displays all available laser drivers.
Install New Laser...	Clicking on this button starts the wizard for installing a laser driver file that is not included in the list.

12.1.4 Hardware configuration (with control card)

If a control card is installed, the currently set laser driver file and the correction file for the deflection unit can be viewed and, if necessary, changed as follows:

- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
  The adjacent window is opened.
- Select the driver you want to change from the list.
  Refer to the table below for explanations.

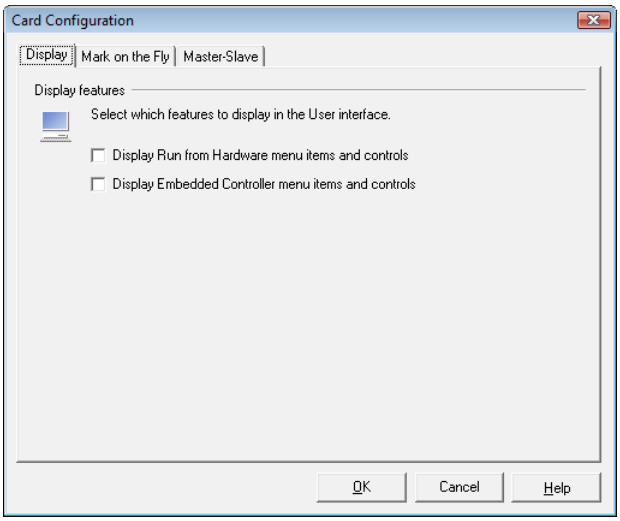


(1)	Control Card	*Configure...*	⇨ on page 147, Configure control card
(2)	Laser Driver	*Configure...*	⇨ on page 166, Configuring a laser driver
		Change...	⇨ on page 150, Select laser driver
(3)	Scan Head	*Configure…*	Selectable only with a connected Dongle and after selecting a suitable scan head. ⇨ on page 148, Configure 3-axis subsystem
		Change	⇨ on page 147, Select/change type of Scan Head
(4)	Correction File	*Calibrate...*	⇨ on page 158, Calibrating the marking field
		Change...	⇨ on page 144, Select default correction file

Configure control card

Only valid for SP-ICE control cards

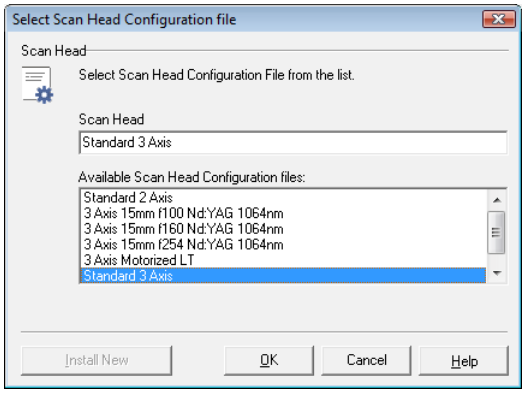
- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
- Click on the required control card in the hardware list.
- Click on the button *Configure*.
- Select the *Display* tab.
  The adjacent window is opened. Refer to the table below for explanations.



Display Run from Hardware menu items and controls	If this function is enabled, marking objects can be completely saved on the control card first and then executed directly from the card.
Display Embedded Controller menu items and controls	If this function is enabled, marking objects can be completely saved on a control card first and then executed directly from the card without a PC connection.
Mark on the Fly	⇨ on page 132, The "Mark on the Fly" option
Master-Slave	⇨ on page 133, Master/slave mode

Select/change type of Scan Head

- Select *System >Preferences* option from the menu.
- Select *Hardware* tab.
- In the hardware list select the desired scan head.
- Click on button *Change…*.
- Read and confirm the following warning message. The adjacent window is opened. Refer to the table below for explanations.

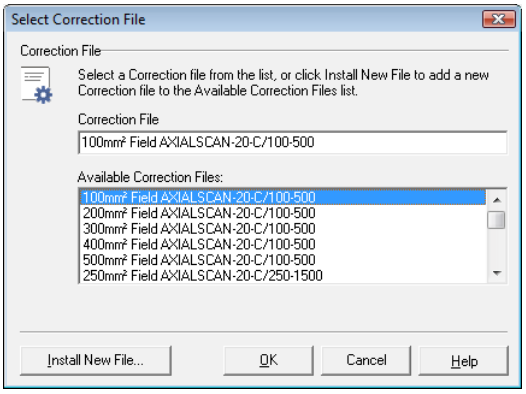


Scan Head	Shows the actually selected scan head.
Available Scan Head Configuration files	Selection list of all scan heads for which configuration files are installed.
OK	To confirm the selection and to return to the hardware configuration ⇨ on page 146, Hardware configuration (with control card)

Select correction file

This section describes how to select a correction file if a control card is connected.

- o Select the *System >Preferences* option from the menu.
- o Select the *Hardware* tab.
- o In the hardware list, click on the correction file displayed under the deflection unit you are using.
- o Click on the *Change* button.
- o Read and acknowledge the confirmation prompt that appears.
  The adjacent window is opened.
  Refer to the table below for explanations.

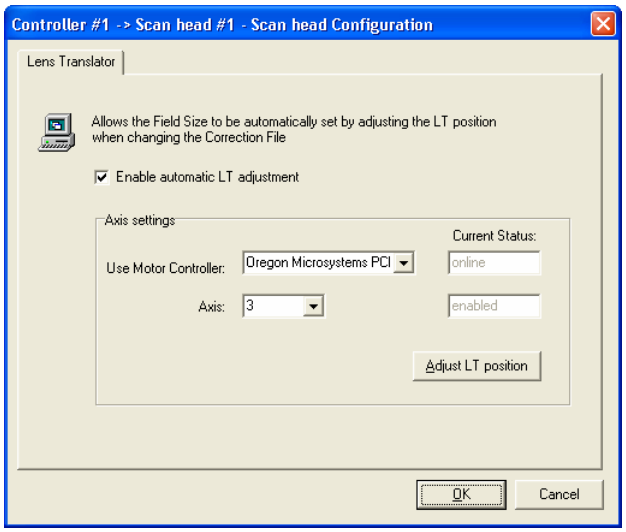


Correction File	This text box displays the currently selected correction file.
Available Correction Files	This list box displays all available correction files.
Install New File...	Clicking on this button starts the wizard for installing a correction file that is not included in the list.

Configure 3-axis subsystem

Only valid for 3-axis subsystems with motorised linear translator

- o Select *System >Preferences* option from the menu.
- o Select *Hardware* tab.
- o In the hardware list select the desired scan head.
- o Click on button *Configure*.
  The adjacent window is opened.
  Refer to the table below for explanations.



Enable automatic LT Adjustment	Enables the control of the linear translator.
Use Motor Controller	Allows selecting the motor controller.
Axis	Allows the mapping of the motor axis. For the linear translator axis 3 is selected as default.
Adjust LT position	⇨ on page 149, Positioning of linear translator.

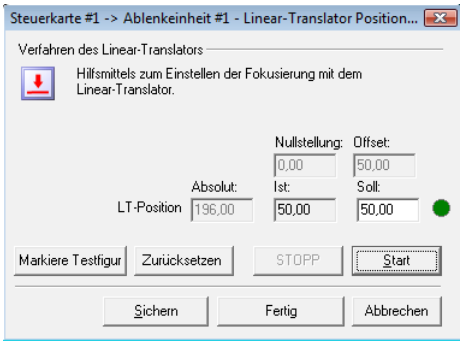
Positioning of linear translator

Only valid for scan heads with motorised linear translator

The 3-axis subsystem has to be focused to the working plane. In case the working plane field size has been changed, the 3-axis subsystem has to be focused again by moving the linear translator to the new working position.
Via weldMARK a test pattern can be issued to the scan head. The marking result allows a judgement and optimization of the focusing.

Warning:
The laser beam can cause severe injury to the eyes and the skin. Make sure that there are no reflective objects in the beam path before marking the test pattern and therefore turning on the laser. Note that even apparently matt objects can reflect the wavelength of laser beams. All personnel in the room must wear appropriate laser protection goggles, or the marking area must be completely covered. Follow the local safety regulations, which can be obtained from the person responsible for laser safety.

- Select *System >Preferences* option from the menu.
- Select *Hardware* tab.
- In the hardware list select the desired scan head.
- Click on button *Configure*
- Click on button *Adjust LT position*.
  The adjacent window is opened.
  Refer to the table below for explanations.

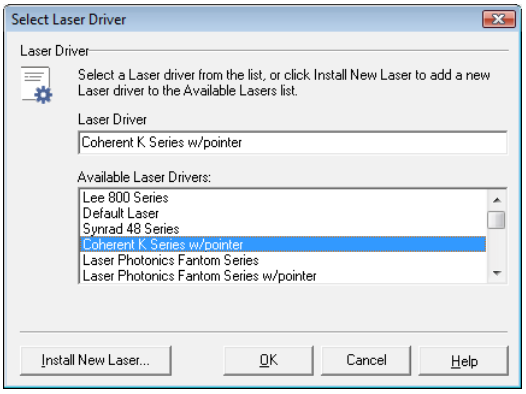


Preset	Displays the linear translator's home postion.
Offset	Displays the stored working position of the linear translator. The value is relative to the home position.
Physical	Displays the absolute position of the linear translator.
Current	Displays the actual position of the linear translator relative to the zero position.
Move To	To enter a nominal value for the position of the linear translator.
Mark Test Pattern	To issue a test pattern for judgement of the focusing quality.
Preset to Saved	The value of *Move To* is reset to the last saved value for position of the linear translator.
STOP	To stop the movement of the linear translator.
Move	To move the linear translator to the position defined in field *Move To*.
Save	To store the actual position of the linear translator.
Save and Exit	To store the actual position of the linear translator and exit the adjustment window.

Select laser driver

This section describes how to select a laser driver if a control card is connected.

- o Select the *System >Preferences* option from the menu.
- o Select the *Hardware* tab.
- o In the hardware list, click on the laser driver file you want to change.
- o Click on the *Change* button.
- o Read and acknowledge the confirmation prompt that appears.
  The adjacent window is opened.
  Refer to the table below for explanations.

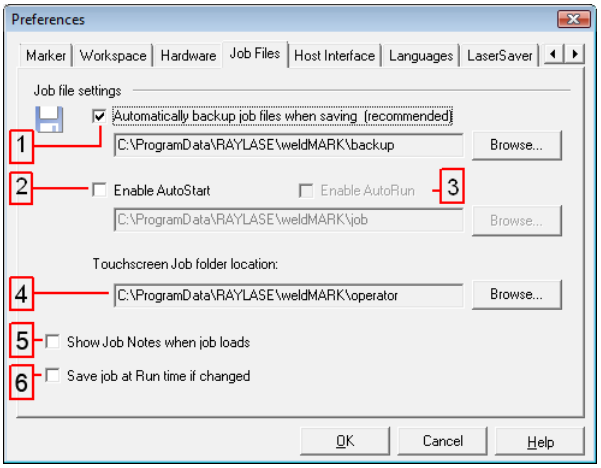


Laser Driver	This text box displays the currently selected laser driver file.
Available Laser Drivers	This list box displays all available laser driver files.
Install New Laser...	Clicking on this button starts the wizard for installing a laser driver file that is not included in the list.

12.1.5 Settings for the job file

The settings for job files are shown in the window below.

- o Select the *System >Preferences* option from the menu.
- o Select the*Job Files* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.

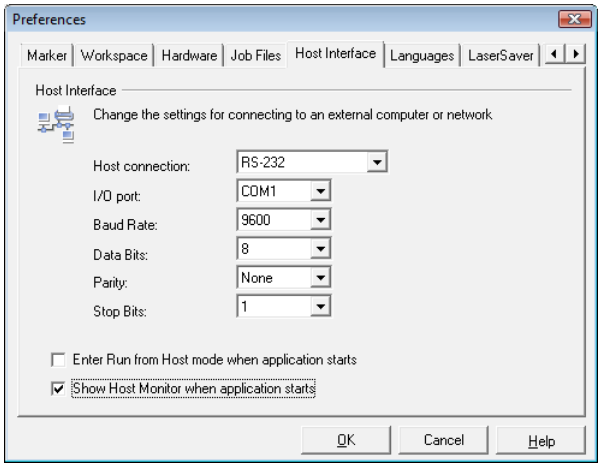


(1)	If this function is enabled, a backup file (with the extension .bak) is automatically created when saving a job file. The function is enabled by default. The backup file is saved in the specified folder. Clicking on the *Browse...* button allows you to select a different folder.
(2)	If this function is enabled, the job file specified in the text box will be opened automatically each time you start weldMARK®. Clicking on the *Browse* button allows you to select a different job file.
(3)	If this function is enabled, the designated job file will be executed each time you start weldMARK®.
(4)	This field specifies the location for jobs that can be loaded when working in the access levels *Operator interface only* and *Touchscreen interface*.
(5)	If this function is enabled, any job notes will be displayed automatically when a job is loaded (⇨ on page 125, Job settings - "Notes").
(6)	If this function is enabled, the job will be saved during running, if it is changed during processing (serialization).

12.1.6 Editing the host interface settings

The host interface provides an interface that external programs can use to communicate with weldMARK®.

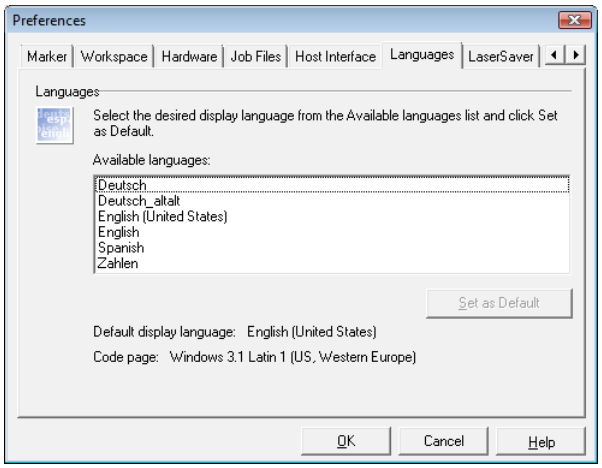
- o Select the *System >Preferences* option from the menu.
- o Select the *Host Interface* tab.
  The adjacent window is opened.
  For further information on the settings, refer to the RAYLASE Remote Interface Manual, which you will receive separately.



12.1.7 Language settings

weldMARK® supports various languages for the user interface. After installation, English (United States) is set as the default language.

- o Select the *System >Preferences* option from the menu.
- o Select the *Languages* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.



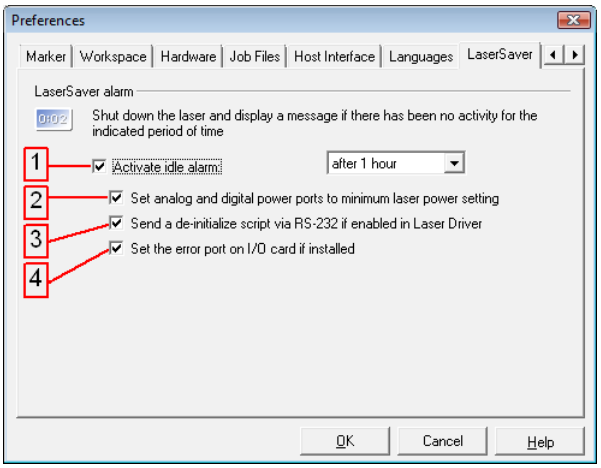
Available languages	This list box shows all available languages. When you change the language, you must first click on the *Set as Default* button and then restart weldMARK®. The user interface will then be available in the selected language.
Set as Default	Clicking on this button sets the language selected from the list box as the default language.

12.1.8 Setting the LaserSaver

After a certain time has elapsed, the laser can be automatically blocked and/or the laser power reduced. An optional error message can also be set.

Note: The LaserSaver is primarily intended for Nd:YAG lasers.

- Select the *System >Preferences* option from the menu.
- Select the *LaserSaver* tab.
  The adjacent window is opened.
  Refer to the table below for explanations.

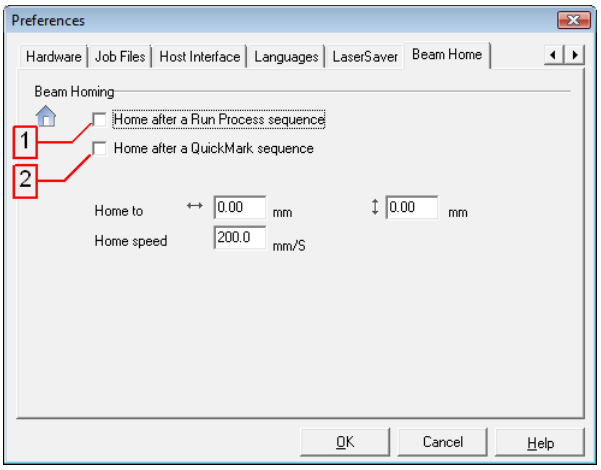


(1)	If this function is enabled, the time controlled LaserSaver is activated; options *(2)* to *(4)* are then available.	
	(2)	If this function is enabled, when the time entered has elapsed the interface that controls the laser power is adjusted to its minimum settings.
	(3)	If this function is enabled, when the time entered has elapsed a corresponding script is sent to the laser via the RS233 port. Further information on this function is available from the manufacturer.
	(4)	If this function is enabled, when the time entered has elapsed the error port on the standard I/O card is set.

12.1.9 Setting up the beam home position

The scanner mirrors in the deflection unit can automatically be moved to a particular position at the end of a processing sequence. If this function is disabled, the mirrors remain at the end position of the last object to be marked.

- Select the *System >Preferences* option from the menu.
- Select the *Beam Home* tab.
  The adjacent window is opened. Refer to the table below for explanations.



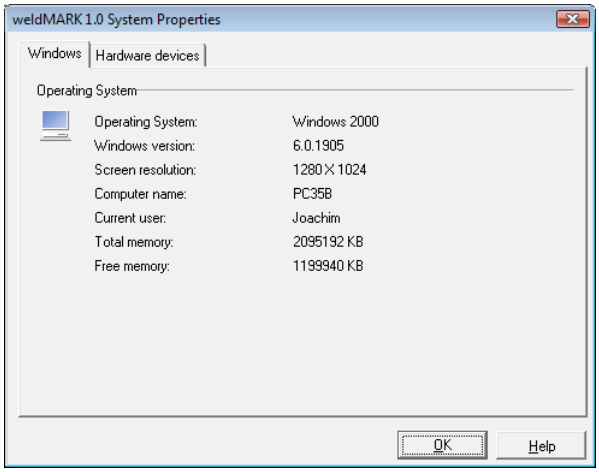
(1)	If this function is enabled, the beam moves to the home position entered at the end of a job initiated using the *Job >Run* command in the menu.	
(2)	If this function is enabled, the beam moves to the home position entered at the end of a job initiated using the *Job > QuickMark* command in the menu.	
Home to	These input boxes are used to define the home position.	The unit used can be changed (⇨ on page 143, Workspace settings).
Home speed	This input box is used to specify the speed with which the beam moves to the home position.	

12.2 System properties displays

You can view the software and hardware properties for weldMARK®:

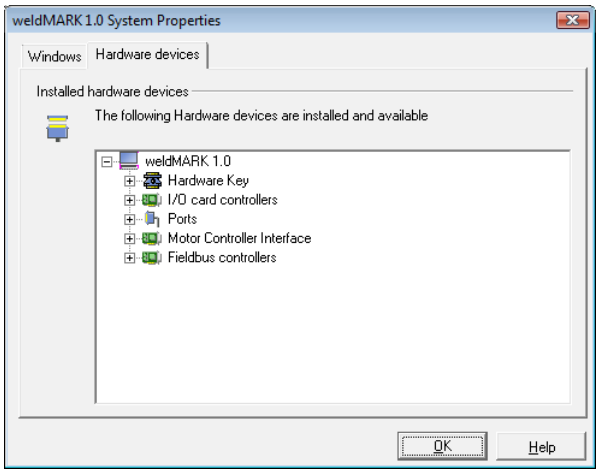
Software properties

- Select the *System >Properties...* option from the menu.
- Select the *Windows* tab.
  The adjacent window is opened.



Hardware properties

- Select the *System >Properties...* option from the menu.
- Select the *Hardware devices* tab.
  The adjacent window is opened.
  You can view the properties for the hardware by opening the associated tree view.

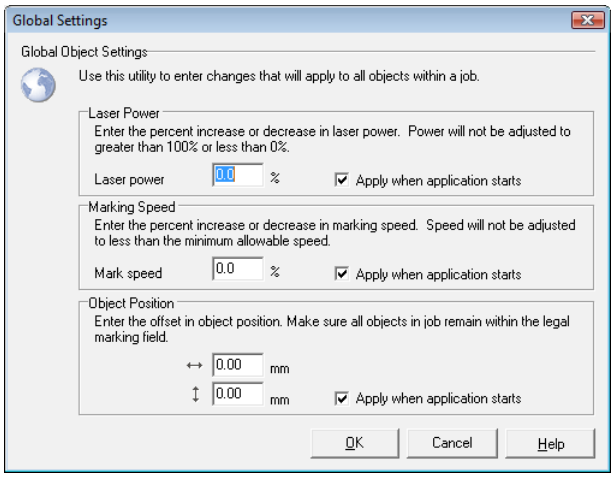


12.3 Global Settings

The "Globals..." allow weldMARK® to be adapted to changed external conditions. For example, this can be necessary because of a slowly declining laser power or a slight change in the position of the objects to be marked. The windows in which these adaptations can be made differ at the various access levels.

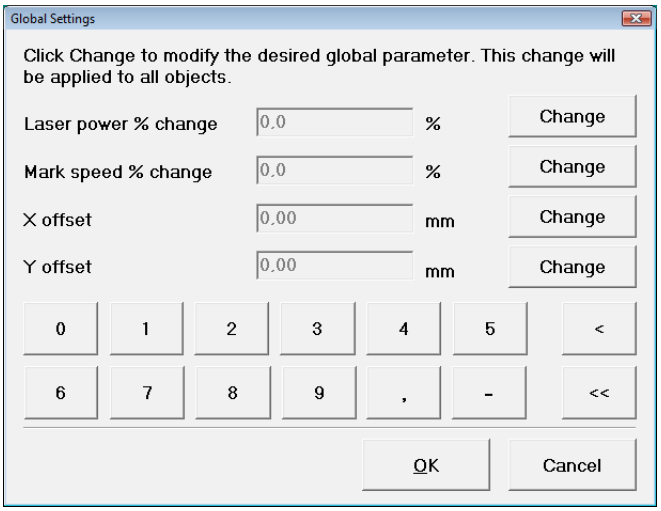
Globals at the "All editing functions" access level

- Select the *System >Globals...* option from the menu.
  The adjacent window is opened.
  Refer to the table below for explanations.



Globals at the "Touchscreen interface" access level

- Touch the *OPTIONS* button.
- Touch the *ADJUST* button.
  The adjacent window is opened.
  Refer to the table below for explanations.



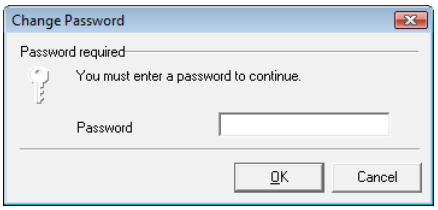
Laser power % change	Adapting the laser power or the marking speed affects all marking objects included in the job.
Mark speed % change	
X offset	All objects included in the job are marked offset by the X and Y values entered here.
Y offset	
Apply when application starts	Only available at "All editing functions" access level: If this function is enabled, the settings will be saved along with weldMARK®. They then apply throughout the system.

12.4 System security settings

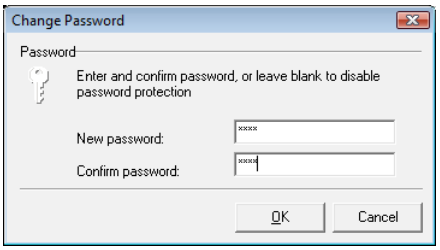
12.4.1 Password protection

weldMARK® provides three access levels, which allow full or limited access to the program's functions (⇨ on page 11, Access levels). Changing access level can be protected by a password.

o Select the *System >Security >Change Password* option from the menu.
If a password has already been entered, you will be prompted to enter it.



The adjacent window is opened.
Refer to the table below for explanations.



New password	Enter the password of your choice in the input boxes. The password can consist of any string of characters. If you want to disable password protection, do not enter a password.
Confirm password	

12.4.2 Job files for restricted access levels

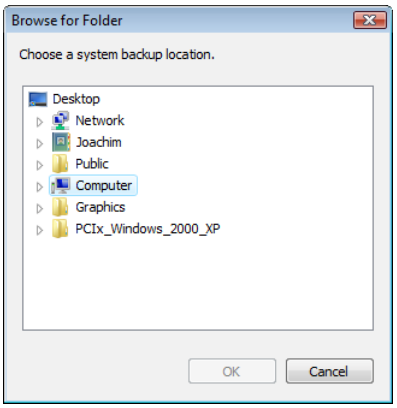
At the *Operator interface only* and *Touchscreen interface* access levels, you can only load jobs that are located in the preset folder. The preset folder when installing weldMARK® can be changed (⇨ on page 150, Settings for the job file). All jobs you want to be accessible at the restricted access levels must be stored in this folder.

12.5 Backing up system settings

The entries in the operating system registry can be saved in a backup file. This backs up the entries or allows them to be transferred to a different weldMARK® system.

12.5.1 Backing up system settings

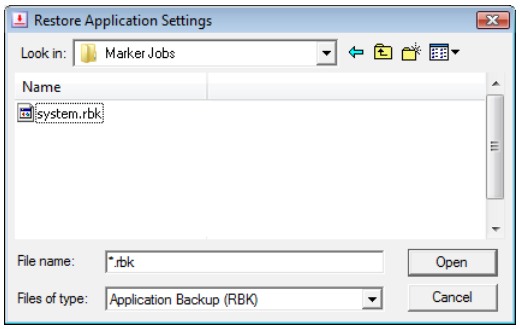
- Select the *System >Backup...* option from the menu.
- Select the folder in which you want to save the backup file.
  The system settings will be saved in the file "system.rbk".



12.5.2 Restoring system settings

Note that the following procedure overwrites all existing system settings in the weldMARK® system!

- Select the *System >Restore...* option from the menu.
- Browse to the file to be loaded - *system.rbk*.
- Select the file and click on *Open*.
  The system settings saved in the backup file are loaded.



13 CALIBRATING THE MARKING FIELD

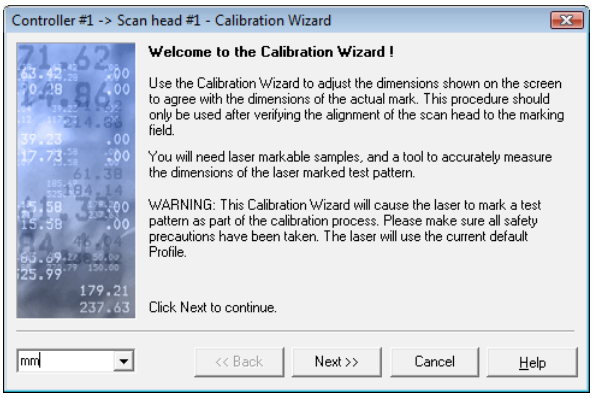
Because of the construction of the X/Y deflection units and the optical properties of F-Theta lenses, a distorted marking field is output. Therefore, a specific correction file is provided for each deflection unit, which allows the software to compensate for this distortion. Further information on field distortion can be found in the application manual available from RAYLASE.

13.1 Correction of mechanical tolerances

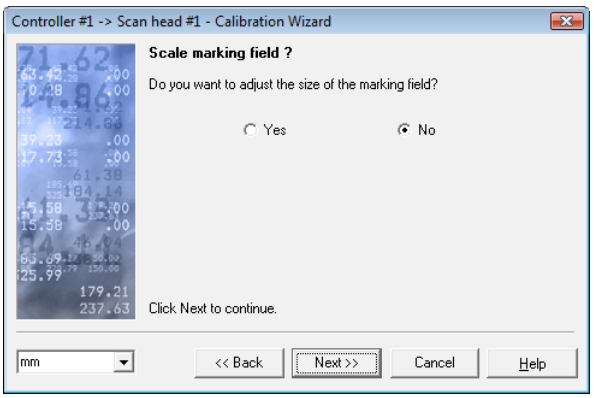
The type-specific field distortion of a deflection unit is compensated for automatically once the corresponding weldMARK® correction file has been assigned. However, because of mechanical tolerances every deflection unit can also produce its own individual field distortion. The procedures below allow you to compensate for this distortion as well.

13.1.1 Calibrating the size of the marking field

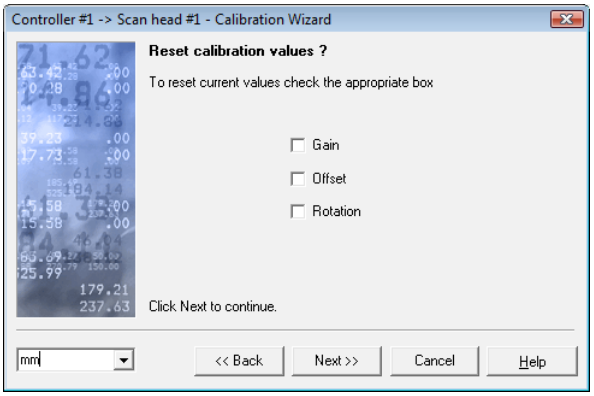
- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
- From the directory tree, select the lens under the deflection unit you want to calibrate.
- Click on the *Calibrate…* button.
- Read and acknowledge the confirmation prompt that appears. The adjacent window is opened.
- Click on the *Next* button. The following window is opened.



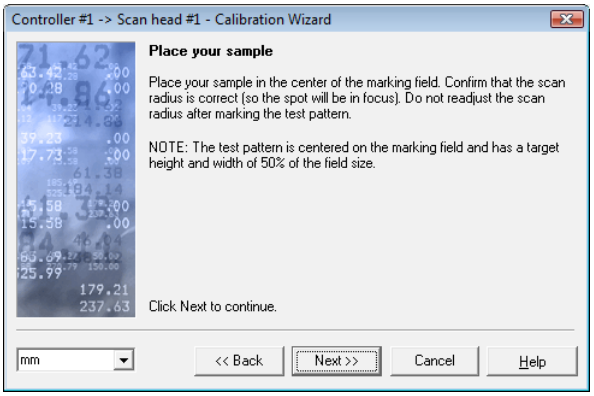
- Select *Yes* and click on *Next*. The following window is opened.



- Select the calibration value that you want to reset and click on *Next*.
  The following window is opened.



- Place a sufficiently large sample in the center of the marking field and click on *Next*.

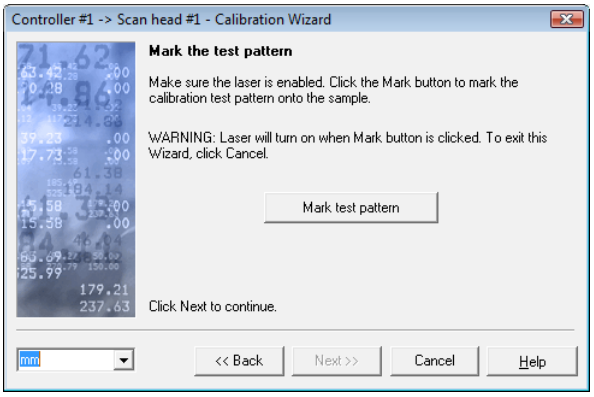


Warning:
The next action activates the marking laser.

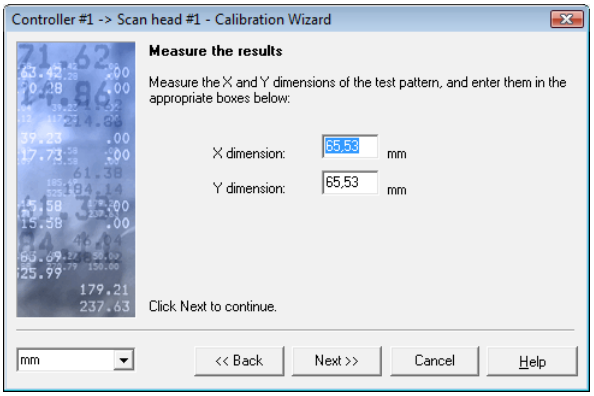
The laser beam can cause severe injury to the eyes and the skin. Make sure that there are no reflective objects in the beam path before starting a job and turning on the laser. Note that even apparently matt objects can reflect the wavelength of laser beams.

All personnel in the room must wear appropriate laser protection goggles, or the marking area must be completely covered. Follow the local safety regulations, which can be obtained from the person responsible for laser safety.

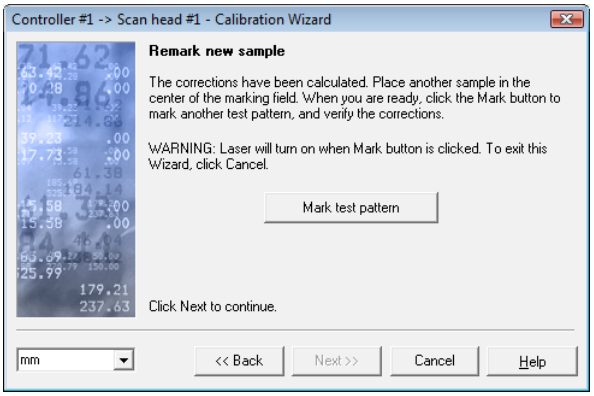
- Click on the *Mark test pattern* button.
  The pattern is marked using the test pattern settings.
- Click on the *Next* button.
  The following window is opened.



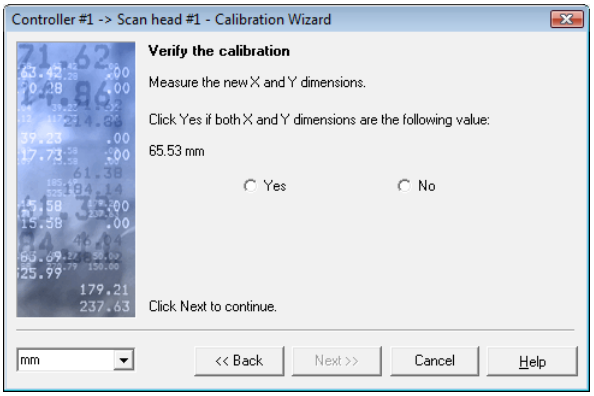
- Measure the marked test pattern and enter the measured width (X dimension) and height (Y dimension) in the corresponding input boxes.
  Click on the *Next* button.
  If differing values have been entered, the following window is opened. Otherwise, the offset setting screen is opened (⇨ on page 161, Calibrating the offset).



- Place another sufficiently large sample in the center of the marking field.
- Click on the *Mark test pattern* button.
  The pattern is marked using the test pattern settings.
- Click on the *Next* button.
  The following window is opened.



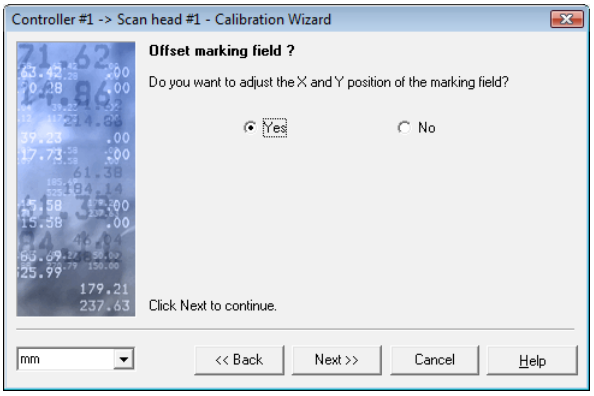
- Measure the marked test pattern.
- Compare the measured values with the target values specified in the adjacent window.
- Depending on the result, click on *Yes* or *No* in the adjacent window.
- Click on the *Next* button.
  Depending on your previous selection, either calibration is repeated or the process continues with the next window.



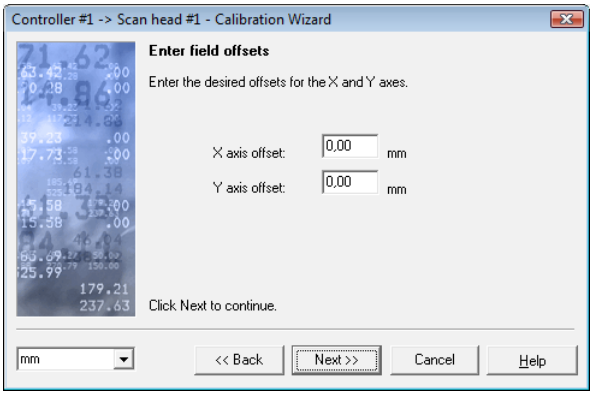
13.1.2 Calibrating the offset

Offset calibration is part of the Calibration Wizard and is offered automatically after size calibration.

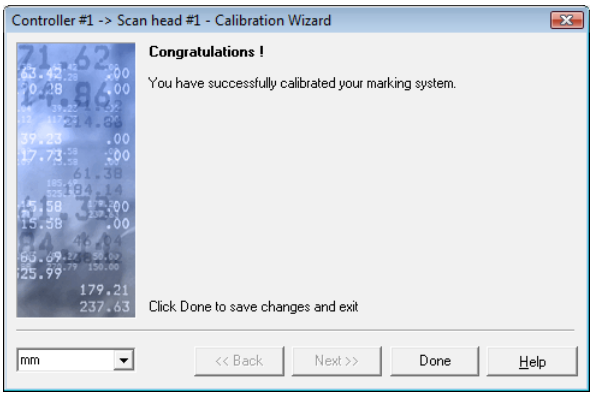
- o If you want to perform offset calibration, select *Yes* in the adjacent window.
- o Click on the *Next* button.
  The following window is opened.



- o Enter the values by which you want the marking field to be moved horizontally (*X axis offset*) and vertically (*Y axis offset*).
- o Click on the *Next* button.
  The following window is opened.



- o Exit the Calibration Wizard by clicking on *Done*.
  Your entries will be saved.

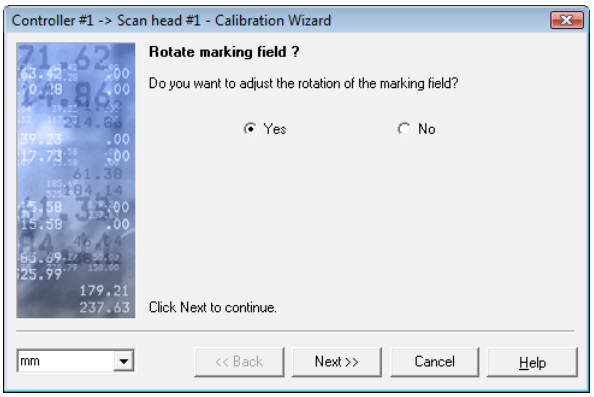


13.1.3 Calibrating the rotation

Rotation calibration is part of the Calibration Wizard and is offered automatically after an offset calibration.

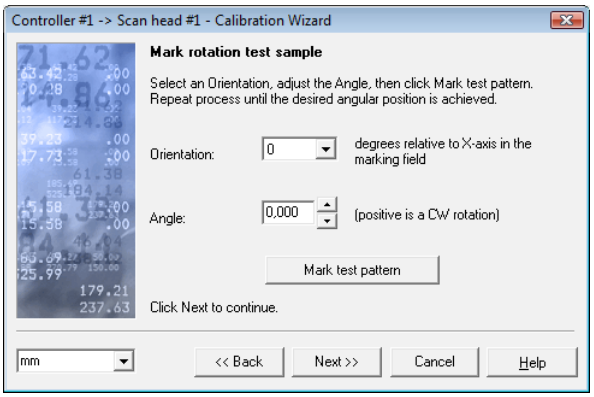
- If you want to perform a rotation calibration, select *Yes* in the adjacent window.
- Click on button *Next*.
  The following window is opened.

C337



- Select a orientation (0°, 90°, 180°, and 270°) for the rough rotation direction.
- Insert a value in field *Angle* to define the exact rotation angle.
- Click on button *Next* to finish the wizard.

C337



13.2 Grid correction

13.2.1 Using grid correction

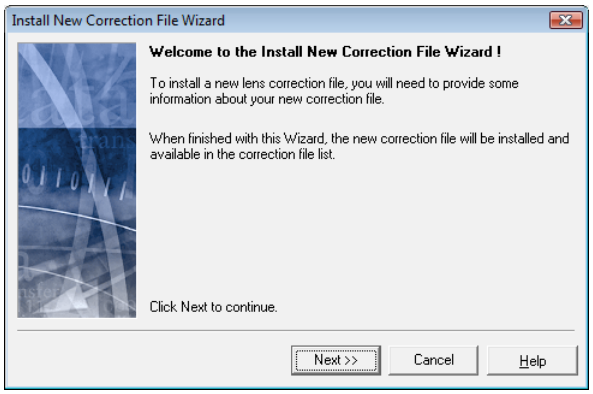
The correction files supplied with weldMARK® contain all the information required to compensate for the field distortion caused by laser deflection units. As this process assumes ideal lenses and mirror systems, the following points are not taken into account:

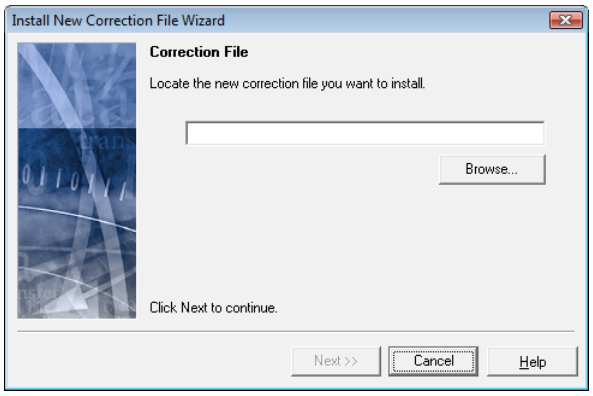
- All lens systems differ slightly due to production tolerances and thus cause individual distortion.
- The galvanometer scanners are not perfectly linear due to production tolerances.

These differences are normally so slight that they can be ignored for most applications. However, there are applications in which these tolerances will also need to be compensated for. A grid correction program can be used to do this. Based on an existing correction file, the program creates a new correction file with its own name, specially tailored for the current lens combination. The new correction file can be added to the list of correction files in weldMARK®. The procedure for this is described in the next section.

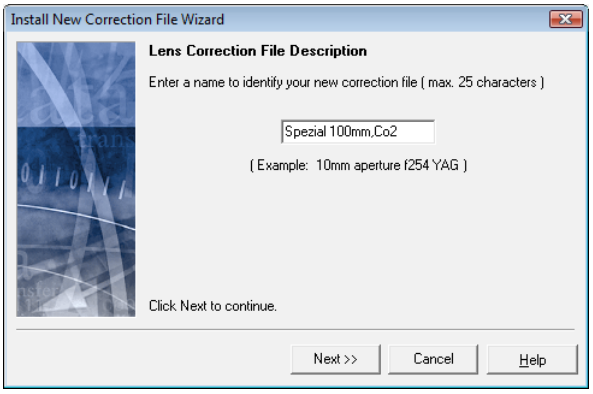
13.2.2 Adding a correction file

- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
- In the directory tree, click on the correction file for the deflection unit you want to optimize.
- Click on the *Change* button.
- Read and acknowledge the confirmation prompt that appears.
- Click on the *Install New File* button. The adjacent window is opened.
- Click on the *Next* button. The following window is opened.
- Click on *Browse...* and select the correction file you want to add to the list.
- Click on the *Next* button. The following window is opened.

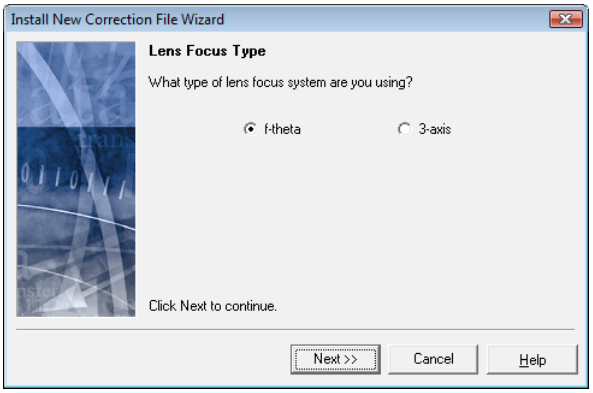




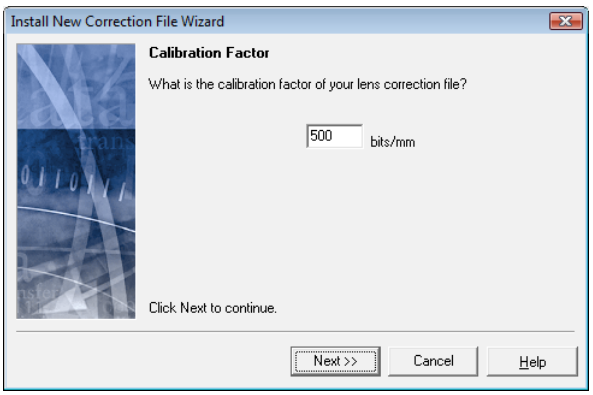
- Enter a name for the new correction file (max. 25 characters).
- Click on the *Next* button.
  The following window is opened.



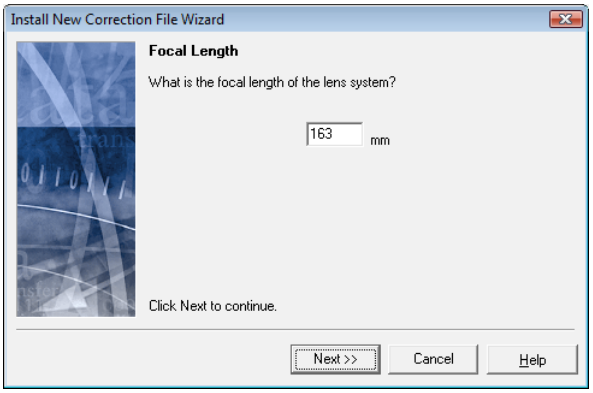
- Specify the type of focusing system used.
- Click on *Next*.
  The following window is opened.



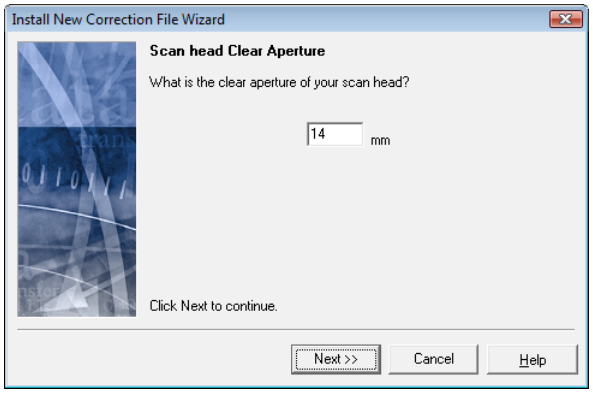
- Enter the calibration factor in bits/mm. This value can be obtained from the manufacturer of the deflection unit.
- Click on *Next*.
  The following window is opened.



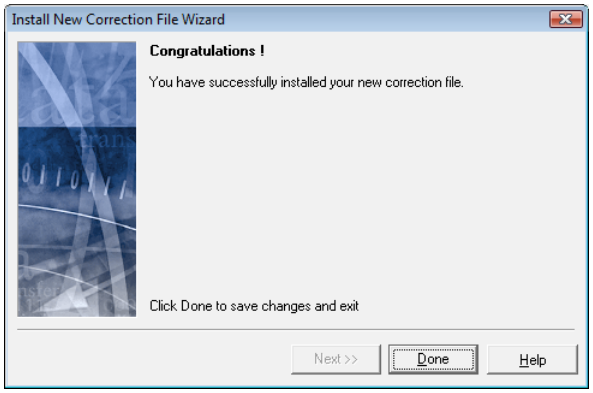
- Enter the focal distance of the lens used.
- Click on *Next*.
  The following window is opened.



- Enter the input aperture of the deflection unit.
  This value can be obtained from the manufacturer of the deflection unit.
- Click on *Next*.
  The following window is opened.



- Exit the wizard by clicking on *Done*.
  The new correction file is added to the list.



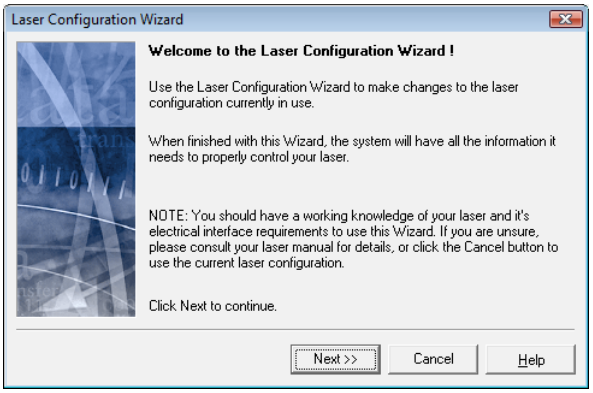
14 CONNECTING THE LASER

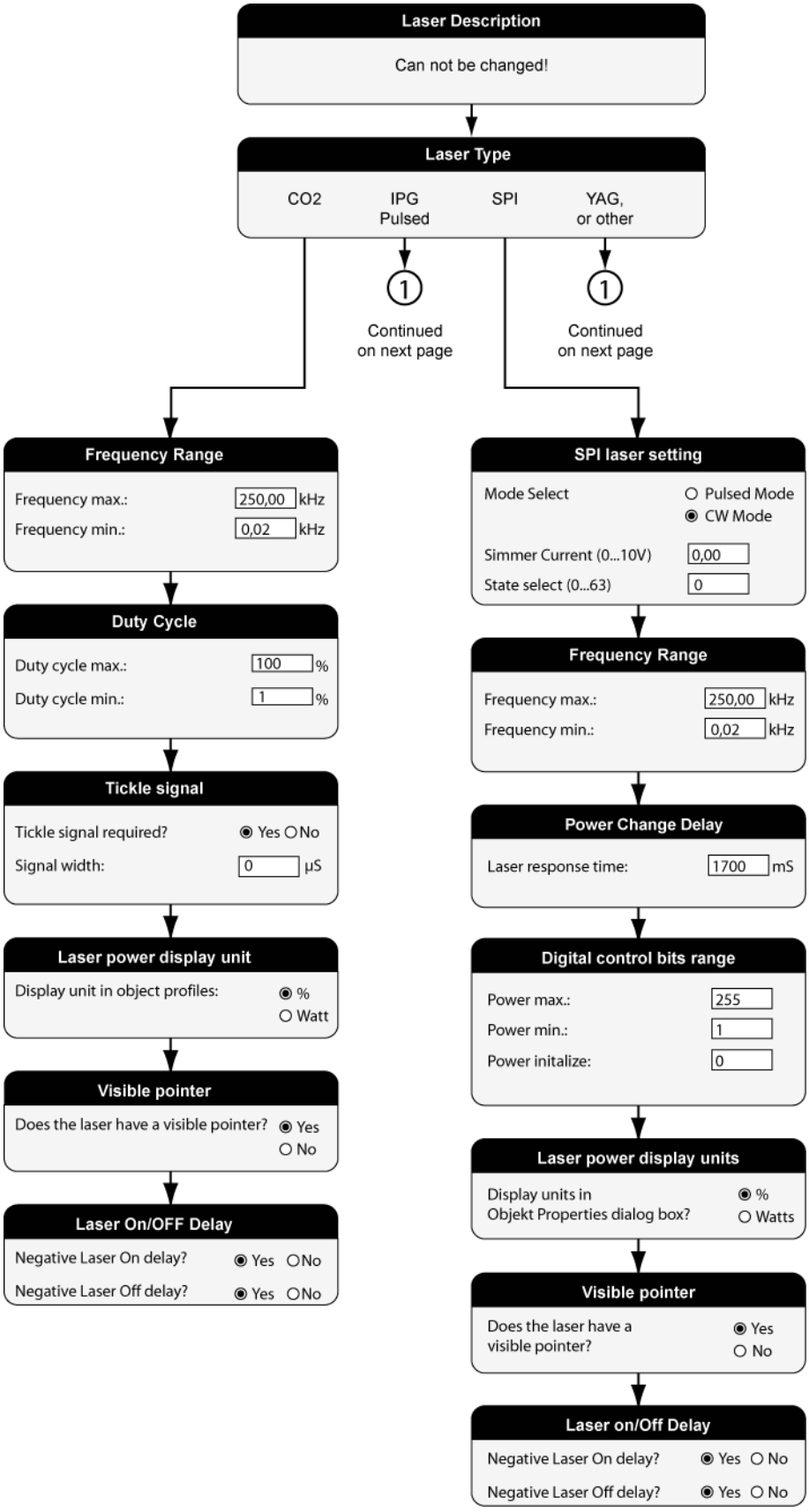
weldMARK® supports SP-ICE, RLC-USB and RLC-PCI control cards. For details of how to connect a laser to the relevant control card, refer to the corresponding control card manual.

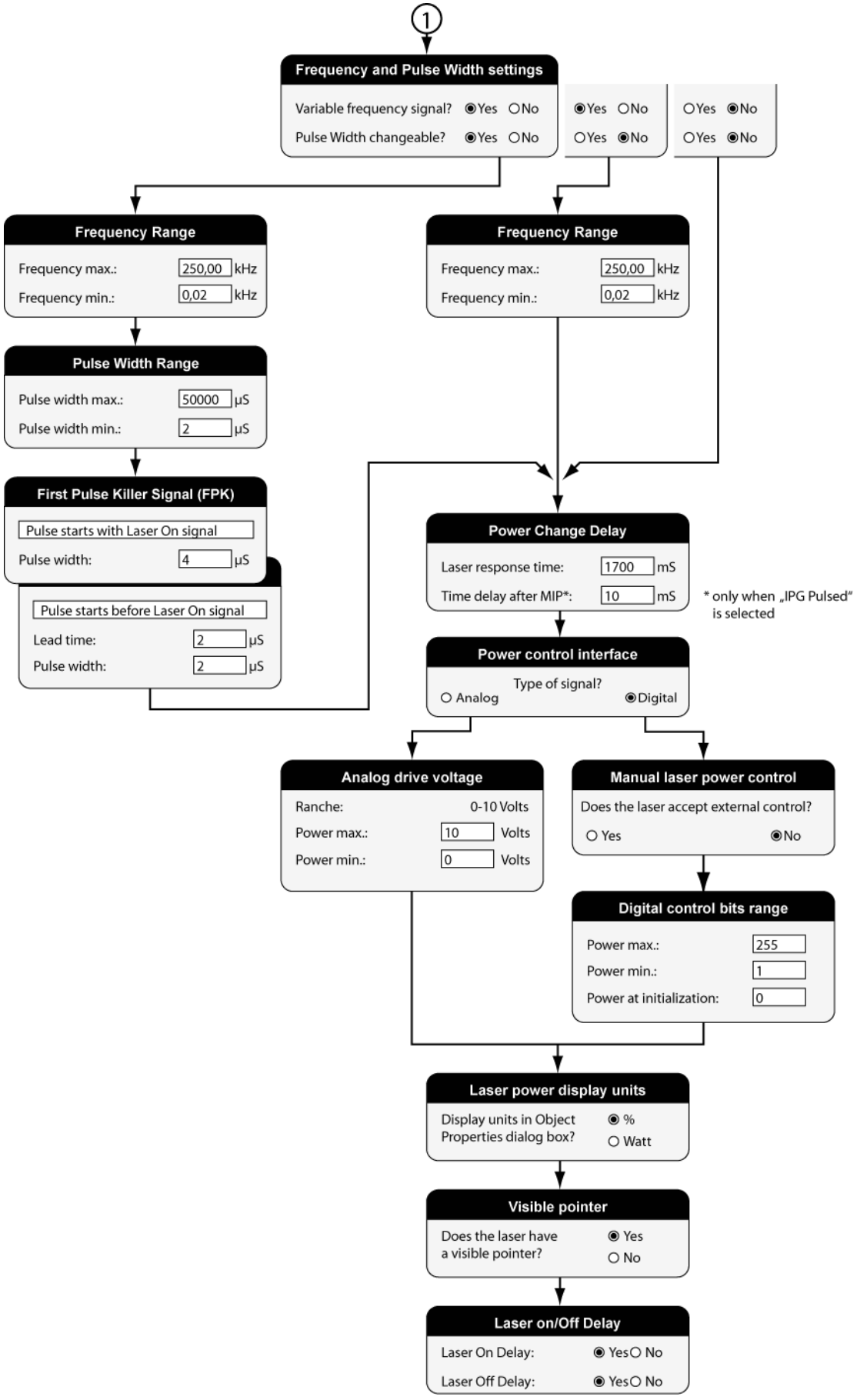
14.1 Configuring a laser driver

weldMARK® is supplied with drivers for various laser systems. If any changes to the settings in these drivers are necessary, the procedure is as follows:

- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
- In the directory tree, click on the laser driver file you want to configure.
- Click on the *Configure…* button.
- Read and acknowledge the confirmation prompt that appears. The adjacent window is opened.
- Click on the *Next* button. See the flow diagram on the following pages for settings.




Laser Description
Can not be changed!
Laser Type
CO2
IPG Pulsed
SPI
YAG, or other
1
Continued on next page
1
Continued on next page
Frequency Range
Frequency max.: 250,00 kHz
Frequency min.: 0,02 kHz
Duty Cycle
Duty cycle max.: 100 %
Duty cycle min.: 1 %
Tickle signal
Tickle signal required? Yes No
Signal width: 0 µS
Laser power display unit
Display unit in object profiles: % Watt
Visible pointer
Does the laser have a visible pointer? Yes No
Laser On/OFF Delay
Negative Laser On delay? Yes No
Negative Laser Off delay? Yes No
SPI laser setting
Mode Select Pulsed Mode CW Mode
Simmer Current (0...10V) 0,00
State select (0...63) 0
Frequency Range
Frequency max.: 250,00 kHz
Frequency min.: 0,02 kHz
Power Change Delay
Laser response time: 1700 mS
Digital control bits range
Power max.: 255
Power min.: 1
Power initalize: 0
Laser power display units
Display units in Objekt Properties dialog box? % Watts
Visible pointer
Does the laser have a visible pointer? Yes No
Laser on/Off Delay
Negative Laser On delay? Yes No
Negative Laser Off delay? Yes No

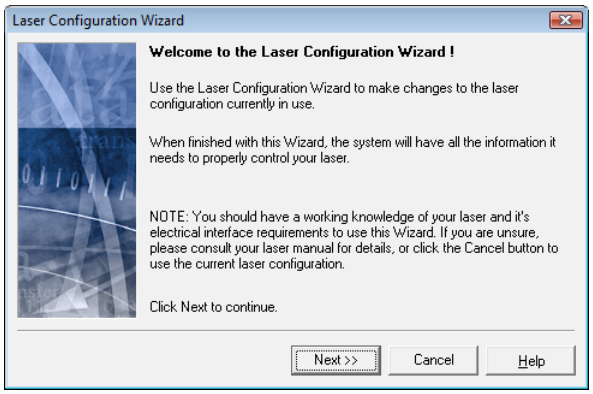

1
Frequency and Pulse Width settings
Variable frequency signal? Yes No
Pulse Width changeable? Yes No
Yes No
Yes No
Yes No
Yes No
Frequency Range
Frequency max.: 250,00 kHz
Frequency min.: 0,02 kHz
Pulse Width Range
Pulse width max.: 50000 µS
Pulse width min.: 2 µS
First Pulse Killer Signal (FPK)
Pulse starts with Laser On signal
Pulse width: 4 µS
Pulse starts before Laser On signal
Lead time: 2 µS
Pulse width: 2 µS
Frequency Range
Frequency max.: 250,00 kHz
Frequency min.: 0,02 kHz
Power Change Delay
Laser response time: 1700 mS
Time delay after MIP*: 10 mS
* only when „IPG Pulsed" is selected
Power control interface
Type of signal?
Analog Digital
Analog drive voltage
Ranche: 0-10 Volts
Power max.: 10 Volts
Power min.: 0 Volts
Manual laser power control
Does the laser accept external control?
Yes No
Digital control bits range
Power max.: 255
Power min.: 1
Power at initialization: 0
Laser power display units
Display units in Object Properties dialog box? % Watt
Visible pointer
Does the laser have a visible pointer? Yes No
Laser on/Off Delay
Laser On Delay: Yes No
Laser Off Delay: Yes No

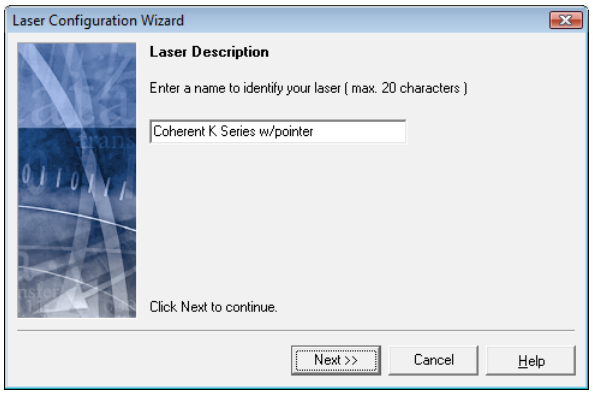
14.2 Adding a new laser driver

A laser driver is a file that contains the operating parameters for the laser. This file enables weldMARK® to control the laser correctly and to display the accurate laser parameters.

weldMARK® is supplied with various drivers for standard lasers. If the laser type you want to use is not included in the list of available laser driver files, you can add a new driver file:

- Select the *System >Preferences* option from the menu.
- Select the *Hardware* tab.
- In the directory tree, click on the laser driver you want to configure.
- Click on the *Change* button.
- Read and acknowledge the confirmation prompt that appears.
- Click on the *Install New Laser...* button.
  The adjacent window is opened.
- Click on the *Next* button.
  The following window is opened.
- Enter a name for the laser driver file in the input box.
  This name will appear in the list of available laser drivers.
- Click on the *Next* button.
- Continue with the procedure as described in the next section: ⇨ on page 166, Configuring a laser driver.

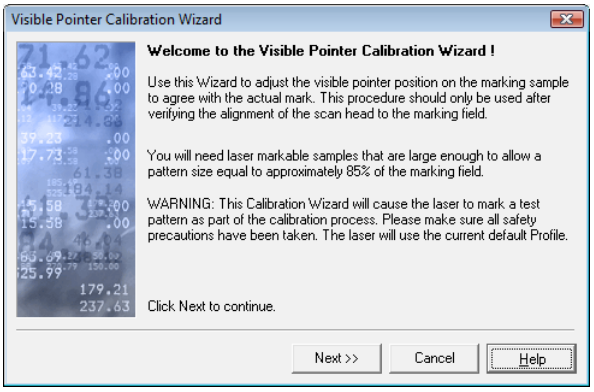




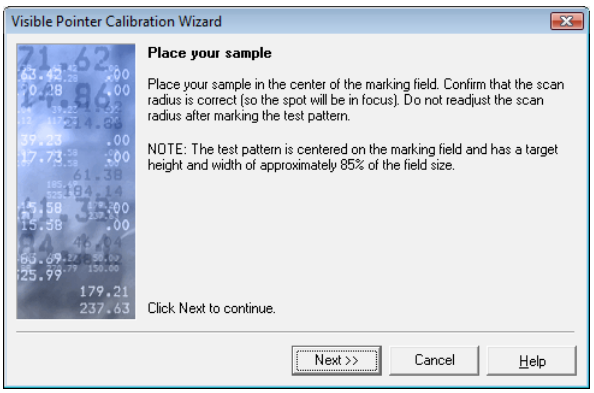
14.3 Calibrating the visible pointer

As a result of wavelength differences between the visible pointer and the marking laser, the position of the visible pointer in the marking field does not always correspond exactly to that of the marking laser. It is therefore necessary to calibrate the visible pointer. This chapter describes how to do this.

- o If necessary, activate the visible pointer in the laser driver (⇨ on page 166, Configuring a laser driver).
- o Select the *System >Preferences* option from the menu.
- o Select the *Hardware* tab.
- o Click on the visible pointer in the directory tree.
- o Click on the *Calibrate* button.
  The adjacent window is opened.
- o Click on the *Next* button.



- o Place a sufficiently large sample in the center of the marking field and click on Next.
  The following window is opened.

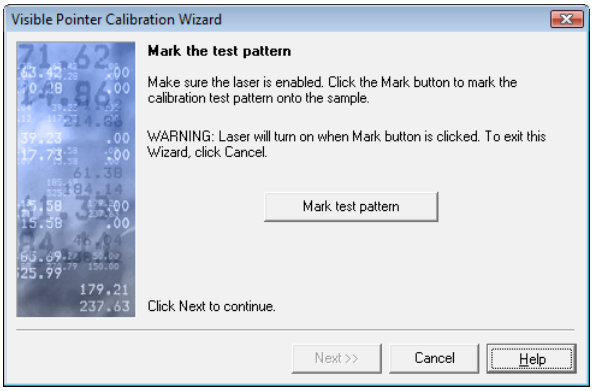


Warning:
The next action activates the marking laser.

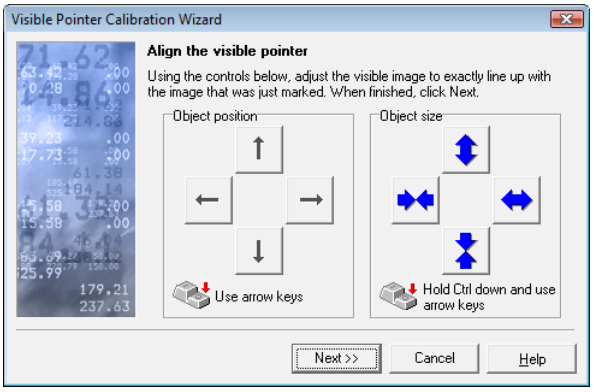
The laser beam can cause severe injury to the eyes and the skin. Make sure that there are no reflective objects in the beam path before starting a job and turning on the laser. Note that even apparently matt objects can reflect the wavelength of laser beams.

All personnel in the room must wear appropriate laser protection goggles, or the marking area must be completely covered. Follow the local safety regulations, which can be obtained from the person responsible for laser safety.

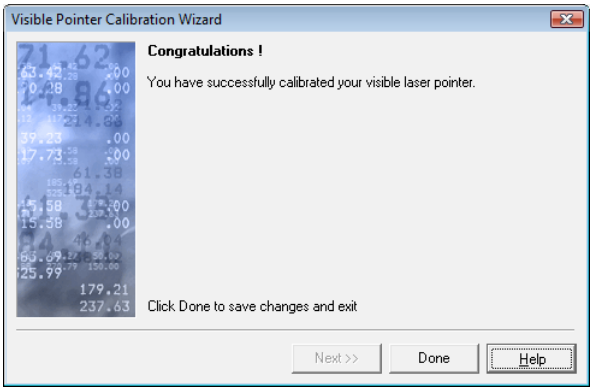
- Click on the *Mark test pattern* button.
  The pattern is marked using the parameters set in the test pattern profile.
- Click on the *Next* button.
  The following window is opened.



- Use the arrow keys to adjust the position and size of the test pattern shown by the visible pointer.
- Click on the *Next* button.
  The following window is opened.



- Click on *Done* to exit the wizard.



15 CONNECTING DEFLECTION UNITS

weldMARK® uses the XY2-100 protocol to operate deflection units using RAYLASE control cards. Deflection units made by other manufacturers can also be used, provided they support this protocol. Detailed information on connecting the deflection units to the control cards can be found in the manual for the relevant card.

15.1 Connecting multiple control cards

weldMARK® can operate with multiple control cards in a computer. Each card can be used to operate one laser and one deflection unit. This is only possible with control cards that have multi-card capability. With the SP-ICE control card, up to four cards can be installed in a computer.

Installation of control cards is described in the manuals supplied with them. When weldMARK® is started after installing control cards, the program detects the new cards installed and shows them in the Job Manager.

15.2 Connecting multiple deflection units to a control card

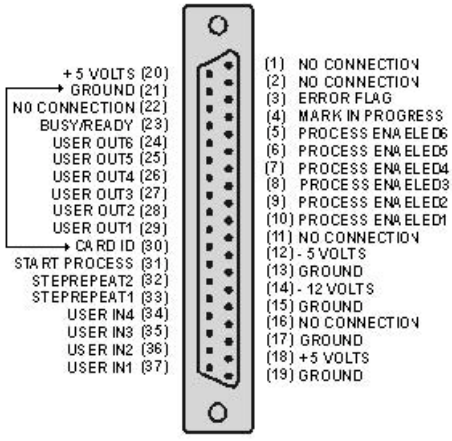
If the SP-ICE control card is used, multiple deflection units and a laser can be connected to a single SP-ICE card. Output of the vectors to the individual deflection units is synchronized. For details, refer to the manual for the SP-ICE card.

16 CONNECTING TO EXTERNAL DEVICES

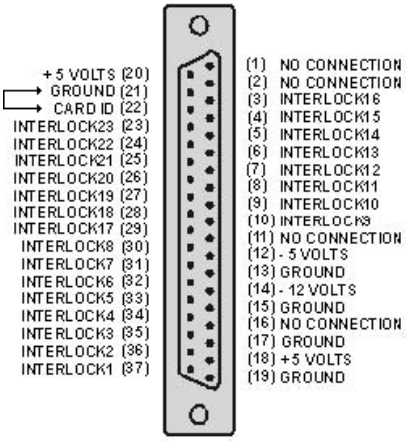
weldMARK® supports various I/O interfaces for communicating with external devices. In addition, weldMARK® can be operated with up to four stepper motor controls.

16.1 Standard I/O card / Interlock card

weldMARK® uses the same card type as the standard I/O card and as the interlock card. The mode is set by a bridge from GND to the corresponding pin (CARD ID). Depending on the mode, this results in one of the following pin assignments:



Standard I/O card



Interlock card

Signal		Explanation
UserI1-4	I	Trigger (>50mS LOW)
STEPREPEAT1-2	I	
START PROCESS	I	
PROCESS ENABLED1-6	O	LOW active
MARK IN PROGRESS	O	LOW during marking
ERROR FLAG	O	LOW on error
USEROUT1-6	O	Programmable
BUSY/READY	O	Programmable

Signal		Explanation
INTERLOCK1-23	I	Trigger (>50mS LOW)

I = Input, O = Output

All inputs and outputs are TTL connected and have a pull-up resistance of 2.2kΩ. The ports must be electrically isolated from the connected hardware. Electrical interference pulses must be prevented as far as possible. If relays are used, they must be fitted with diodes. The connecting cables must be shielded and kept as short as possible, and the shield must be connected to the computer housing.

I/O card

The optional standard I/O card allows job sequences to be controlled by external signals using automation objects. In addition, weldMARK® can use automation objects to output control signals to operate external components.

Interlock card

The optional interlock card enables weldMARK® to respond to interlock signals from external components. Each of the interlock inputs (INTERLOCK1 to INTERLOCK23) can be configured as HIGH or LOW when active. This configuration is carried out in the file "\Program Files\raylase\weldmark\bin\intmsg.txt", as shown below.

```
Interlock Messages
[ASSERTION]
AssertLevel0=0
AssertLevel1=0
AssertLevel2=0
AssertLevel3=0
AssertLevel4=0
AssertLevel5=0
AssertLevel6=0
AssertLevel7=0
AssertLevel8=0
AssertLevel9=0
AssertLevel10=0
AssertLevel11=0
AssertLevel12=0
AssertLevel13=0
AssertLevel14=0
AssertLevel15=0
AssertLevel16=0
AssertLevel17=0
AssertLevel18=0
AssertLevel19=0
AssertLevel20=0
AssertLevel21=0
AssertLevel22=0
AssertLevel22=0
[MESSAGE]
Msg0=Interlock 1 error !
Msg1=Interlock 2 error !
Msg2=Interlock 3 error !
Msg3=Interlock 4 error !
Msg4=Interlock 5 error !
Msg5=Interlock 6 error !
Msg6=Interlock 7 error !
Msg7=Interlock 8 error !
Msg8=Interlock 9 error !
Msg9=Interlock 10 error !
Msg10=Interlock 11 error !
Msg11=Interlock 12 error !
Msg12=Interlock 13 error !
Msg13=Interlock 14 error !
Msg14=Interlock 15 error !
Msg15=Interlock 16 error !
Msg16=Interlock 17 error !
Msg17=Interlock 18 error !
Msg18=Interlock 19 error !
Msg19=Interlock 20 error !
Msg20=Interlock 21 error !
Msg21=Interlock 22 error !
Msg22=Interlock 23 error !
```

In the lines *AssertLEVEL0* to *AssertLEVEL22*, the active status of each interlock input can be set to "0" or "1".

Each interlock input is assigned a name using the lines *Msg0-Msg22*. This name is displayed by weldMARK® if there is a corresponding interlock event.

In some situations, it may be necessary to use different interlock names and AssertLevels for different laser types. weldMARK® supports this function by linking the interlock configuration file with the laser driver file. Please contact RAYLASE for further details.

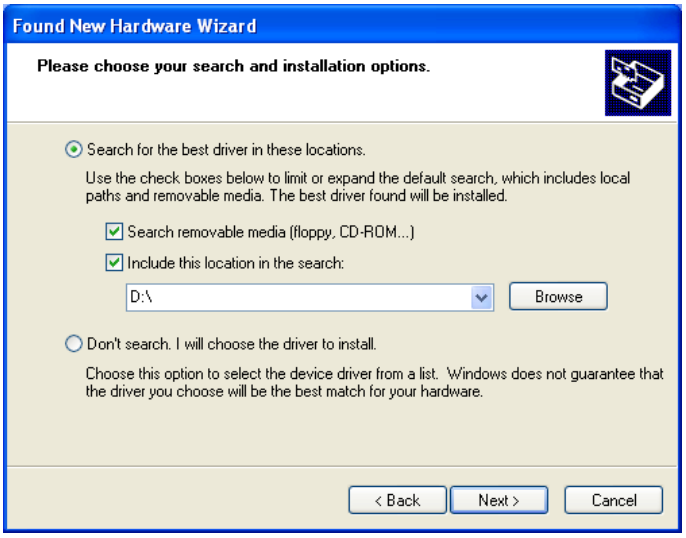
16.2 Operating stepper motors

weldMARK® can be operated with up to four stepper motor controls. For example, this allows an XY table, a Z axis and a rotary axis to be controlled.

16.2.1 Installing the Plug&Play drivers in Windows 2000, Windows XP

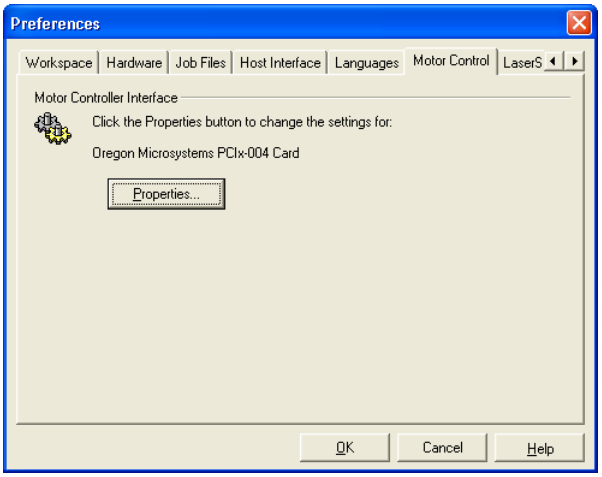
The card for operating stepper motors must be installed in your computer.

- Start the computer. Windows detects the new hardware and starts the wizard for installing the driver files.
- Click on the *Browse* button.
- Select the directory …\Program Files\raylase\ weldmark\oms.
- Click on the *Next* button. Windows installs the OMS driver.



16.2.2 Configuring the motor control settings

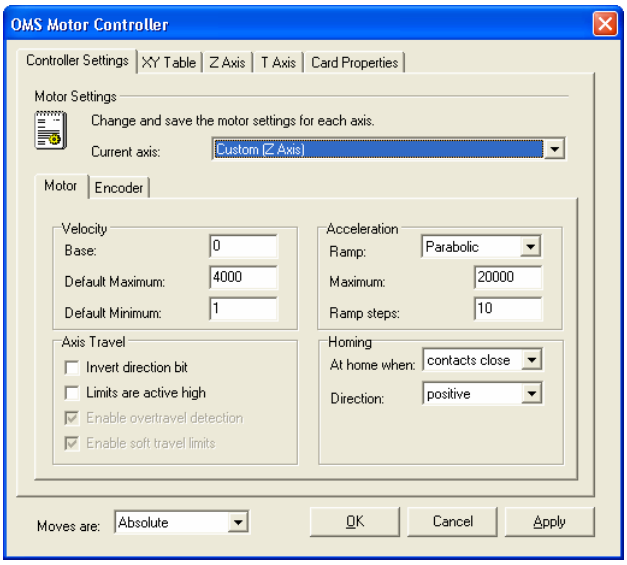
- Select the *System >Preferences* option from the menu.
- Select the *Motor Control* tab. The adjacent window is opened.
- Edit the settings as described in the next section.



Editing the motor settings

The settings for the stepper motor control determine the default speed, the default acceleration and the functions for moving the individual axes and moving to the home position.

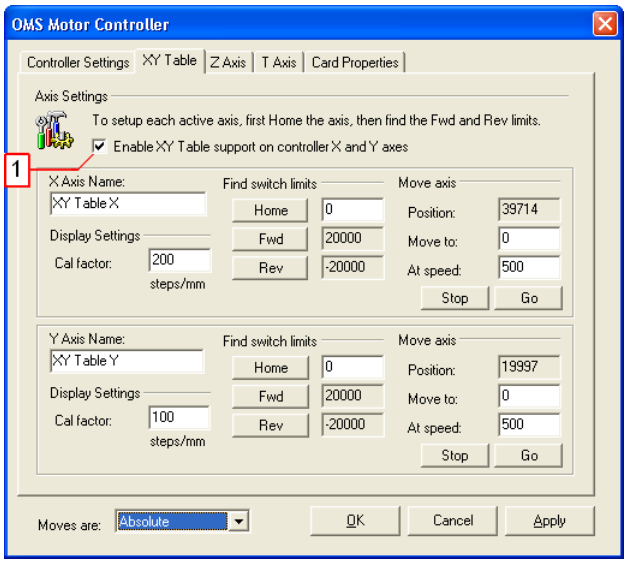
- Select the *System >Preferences* option from the menu.
- Select the *Motor Control* tab.
- Click on the *Properties* button.
- Select the *Controller Settings* tab.
  The adjacent window is opened.
  The displayed values are default settings used with motorized linear translator.
  Refer to the table below for explanations.



Current axis	This list box can be used to select the required axis.	
Velocity	*Base*	These input boxes can be used to determine the basic, maximum and minimum speed of the stepper motor.
	Default Maximum	
	Default Minimum	
Acceleration	*Ramp*	These input boxes can be used to determine the acceleration characteristics, the maximum acceleration and the number of acceleration steps.
	Maximum	
	Ramp steps	
Axis Travel	*Invert direction bit*	If this function is enabled, the direction of movement is inverted.
	Limits are active high	If this function is enabled, the status of the limit switch is set to active LOW to active HIGH.
	Enable overtravel detection	If this function is enabled, the limit switches are monitored during movement.
	Enable soft travel limits	If both the *Enable overtravel detection* function and this function are enabled, the control card stops the axis when a limit switch is detected.
Homing	*At home when*	Status of the limit switch when the home position is reached.
	Direction	Direction of travel of the movement unit when searching for the home position.
Moves are	*Absolute*	For destinations, the co-ordinates to which you want the movement unit to move are specified.
	Relative	For destinations, the distances by which you want the movement unit to move are specified.

Editing the settings for the XY table

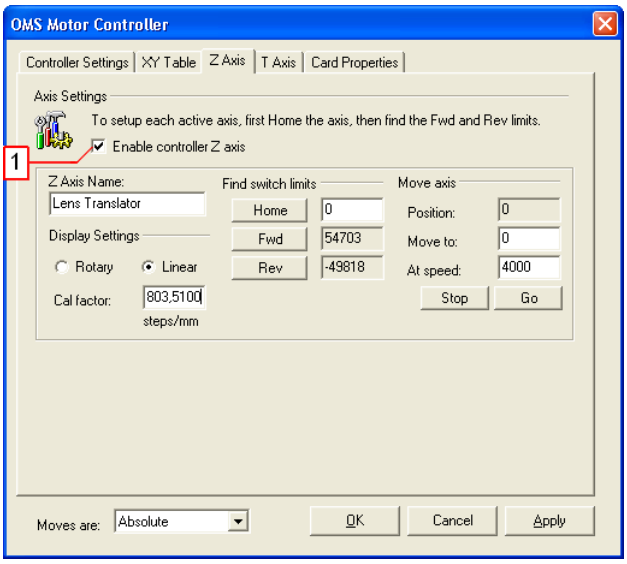
- Select the *System >Preferences* option from the menu.
- Select the *Motor Control* tab.
- Click on the *Properties* button.
- Select the *XY Table* tab.
- Make the required changes. The adjacent window is opened. Refer to the table below for explanations.



(1)		This check box can be used to activate the movement unit. The corresponding functions in the program interface are then available.
	Axis Name	These text boxes can be used to specify the name for the movement unit X and Y-axes. The names are then used in the corresponding dialogs in the program interface.
	Cal factor	Calibration factor for the axes in steps per millimeter.
	Home	Clicking on this button returns the movement unit to its home position. The home position is defined in the field to the right of the *Home* button.
	Fwd	Clicking on these buttons determines the limit switch position. As soon as the movement unit arrives at the limit switch, the position is saved and displayed. This information allows the user to be notified of the physical boundaries in the program sequence.
	Rev	
	Timeout	A time can be entered in this field. If a limit switch is not found before this time has elapsed, the movement unit stops as a precaution.
	Go	Clicking on this button allows the movement unit to be moved with the following parameters for testing purposes:
		Move to: This field can be used to specify the position to which the XY table moves when you click on the *GO* button.
		At speed: This field can be used to specify the speed at which the XY table moves when you click on the *GO* button.
	Stop	Clicking on this button stops movement of the motor immediately.
Moves are	*Absolute*	For destinations, the co-ordinates to which you want the movement unit to move are specified.
	Relative	For destinations, the distances by which you want the movement unit to move are specified.

Editing the settings for the Z-axis (laser lift or Lens Translator)

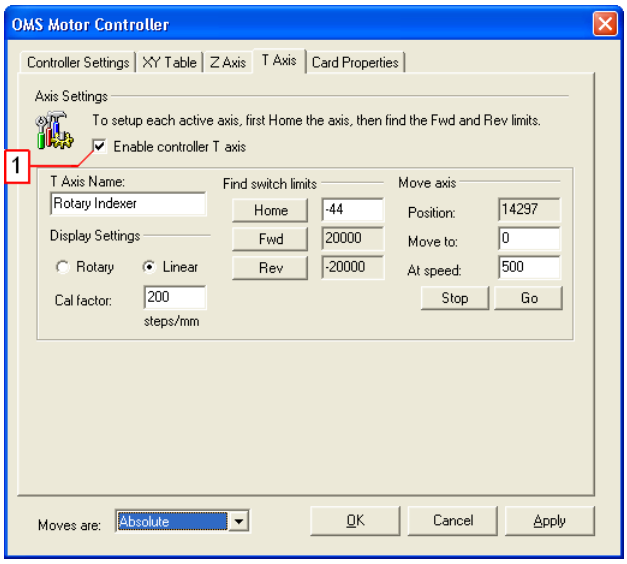
- Select the *System >Preferences* option from the menu.
- Select the *Motor Control* tab.
- Click on the *Properties* button.
- Select the *Custom Axis* tab.
- The adjacent window is opened. The displayed values are default settings for motorized linear translator.
  Refer to the table below for explanations.



(1)			This check box can be used to activate the movement unit. The corresponding functions in the program interface are then available.
	Z Axis Name		This text box can be used to specify the name of the motion unit Z-axis. The name is then used in the corresponding dialogs in the program interface.
	Display Settings	*Rotary*	These check boxes specify whether you want to operate a rotary or linear axis.
		Linear	
	Cal factor		Calibration factor for the axis in steps per millimeter.
	Home		Clicking on this button returns the movement unit to its home position. The home position is defined in the field to the right of the *Home* button.
	Fwd		Clicking on these buttons determines the limit switch position. As soon as the movement unit arrives at the limit switch, the position is saved and displayed. This information allows the user to be notified of the physical boundaries in the program sequence.
	Rev		
	Timeout		A time can be entered in this field. If a limit switch is not found before this time has elapsed, the movement unit stops as a precaution.
	Go		Clicking on this button allows the movement unit to be moved with the following parameters for testing purposes:
		Move to	This field can be used to specify the position to which the Z table moves when you click on the *GO* button.
		At speed	This field can be used to specify the speed at which the Z table moves when you click on the *GO* button.
	Stop		Clicking on this button stops movement of the motor immediately.
Moves are	*Absolute*		For destinations, the co-ordinates to which you want the movement unit to move are specified.
	Relative		For destinations, the distances by which you want the movement unit to move are specified.

Editing the settings for the rotary axis (indexer)

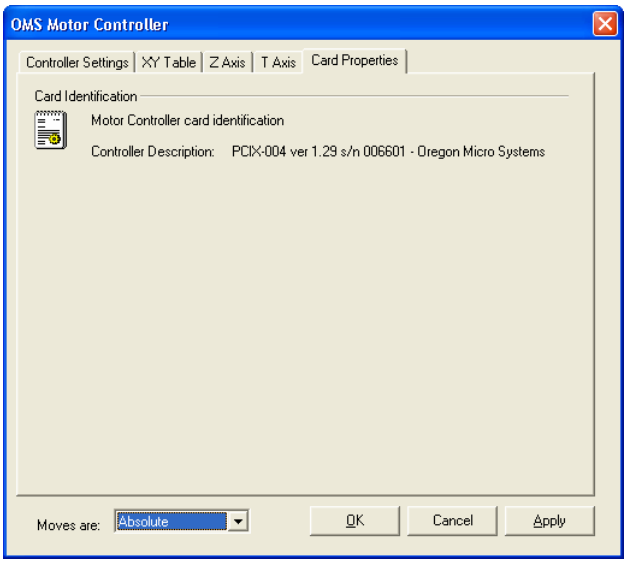
- o Select the *System >Preferences* option from the menu.
- o Select the *Motor Control* tab.
- o Click on the *Properties* button.
- o Select the *Rotary* tab.
- o The adjacent window is opened. Refer to the table below for explanations.



(1)	This check box can be used to activate the movement unit. The corresponding functions in the program interface are then available.		
	T Axis Name	This text box can be used to specify the name of the motion unit rotary axis. The name is then used in the corresponding dialogs in the program interface.	
	Display Settings	*Cal factor*	Calibration factor for the axis in steps per millimeter.
	Home	Clicking on this button returns the movement unit to its home position. The home position is defined in the field to the right of the *Home* button.	
	Fwd	Clicking on these buttons determines the limit switch position. As soon as the movement unit arrives at the limit switch, the position is saved and displayed. This information allows the user to be notified of the physical boundaries in the program sequence.	
	Rev		
	Timeout	A time can be entered in this field. If a limit switch is not found before this time has elapsed, the movement unit stops as a precaution.	
	Go	Clicking on this button allows the movement unit to be moved with the following parameters for testing purposes:	
		Move to	In this field, you can specify the position to which the motion unit moves when you click on the *GO* button.
		At speed	In this field, you can specify the speed at which the motion unit moves when you click on the *GO* button.
	Stop	Clicking on this button stops movement of the motor immediately.	
Moves are	*Absolute*	For destinations, the co-ordinates to which you want the movement unit to move are specified.	
	Relative	For destinations, the distances by which you want the movement unit to move are specified.	

Stepper motor control properties

- Select the *System >Preferences* option from the menu.
- Select the *Motor Control* tab.
- Click on the *Properties* button.
- Select the *Card Properties* tab. The adjacent window is opened. This window shows the stepper motor control properties.



16.3 Remote interface

The remote interface enables weldMARK® to be controlled using a remote program. The external program can run jobs, dynamically change the content of marking objects and execute jobs. After executing each command, weldMARK® sends a response to the remote program.

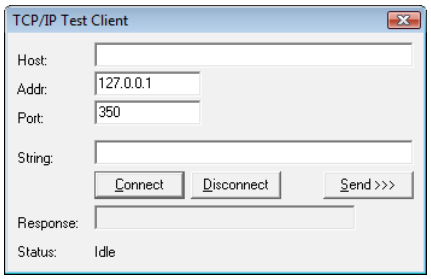
While weldMARK® is being controlled by the remote program, the normal weldMARK® user interface is blocked to prevent the user from intervening in processes that are in progress.

Detailed information about the remote interface can be found in the weldMARK® Remote Interface manual.

17 APPENDIX: TCP/IP TEST CLIENT

The TCP/IP test client is a tool for testing the remote interface functionality. For further information about the remote interface refer to the corresponding manual. This is available separately from RAYLASE.

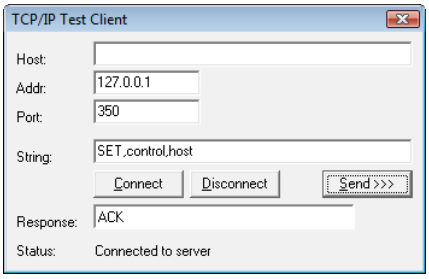
Starting the TCP/IP test client



- Start the program tcptestclient.exe, located in the directory …\Program Files\raylase \weldmark\bin.
- If the TCP/IP test client is running on the same computer as weldMARK®, enter the IP address "127.0.0.1".
  If the TCP/IP test client is running on a different (remote) computer, you must enter the IP address of the computer on which weldMARK® is running in the *Addr.* field.
- In the *Port* field, enter the value "350":
- Make sure that weldMARK® is running on the local computer or on the remote computer.
- Click on the *Connect* button.
  The TCP/IP test client connects to the weldMARK® instance and is ready to exchange data with weldMARK®.

Example:

Note: For this example, weldMARK® must be configured in such a way that the program will accept commands from the TCP/IP port. Detailed information can be found in the remote interface manual.



- Enter the following command lines (with variations on meaning), and send each line with the button *Send >>>*.

- SET,control,host
- OPEN,file,c:\Ts00t.wmj
- RUN
- MODIFY,filed,01,123456
- OFFLINE
- SET,control,local

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