



Laser & Electronics

ProtoMat S63 and S103

Align S63 and S103

English, Version: 1.1

LPKF Laser & Electronics AG

Osteriede 7
D-30827 Garbsen

Phone: ++ 49 - 51 31 - 70 95 – 1333

Fax: ++ 49 - 51 31 - 70 95 – 90

E-Mail: support.rp@lpkf.com

Internet: www.lpkf.com

Copyright (C) 2008 LPKF AG

Die Verteilung oder Kopie dieser Anleitung oder Teile dieser Anleitung bzw. die Nutzung des Inhalts bedingen der schriftlichen Zustimmung der LPKF AG. LPKF nimmt sich das Recht, Änderungen oder Modifikationen am System durchzuführen.

Deutsches Original.

Documentinformation

Department	For Use	Author			
Support	distributor	Wietgrefe			

Dokumentenhistorie

Version	Date	Author	Note
1.0	09.09.2015	Wietgrefe	
1.1	05.11.15	Wietgrefe	Software version has been changed

1.1 Needed Tool's

pcs	Tool
1	Torx T25 screwdriver
1	1.0 x 5.5 mm flat screwdriver

1.2 Needed Material

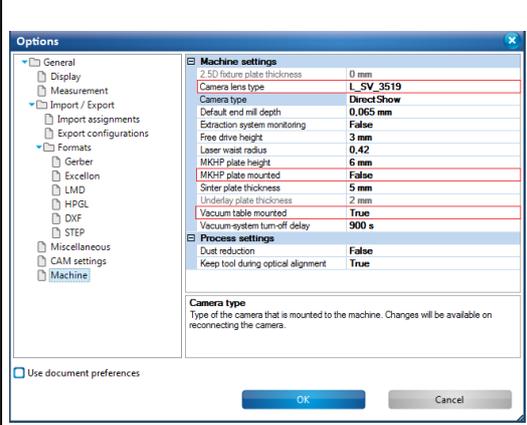
Ordercode	Description	pcs
10052846	base material FR4, 229 mm x 305 mm (9"x12"), 18/18µm, copper plated,1,5 mm thickness	1

2 Short Description

1) Here you'll be informed how to align the ProtoMat S63 and S103

3 Step's to do

Check Software and Firmware	1)
	<ol style="list-style-type: none"> 1. Update the software to CircuitPro Version 2.30.156 (Deinstall the old version incl. configuration file before and install the new version with default settings) 2. Update the firmware to 1.0.800

Check machine settings	2)
	<p>Make sure that the settings are correspond with the connected machine</p>

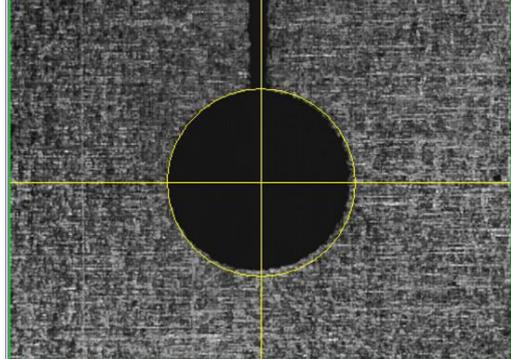


Determining the camera head offset	3)
	<ol style="list-style-type: none"> 1. Load a 1,5mm SpiralDrill 2. Click on “Machining” 3. Click on “Determine camera head offset”

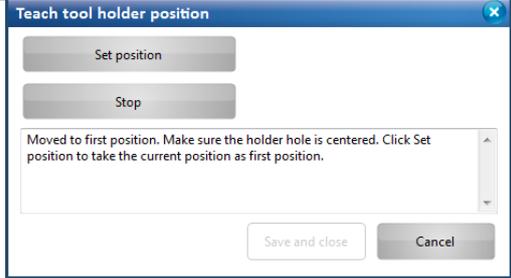
Determine the X/Y Offset	4)
<p>The screenshot shows a dialog box with a question mark icon. The title is 'Determine camera-to-milling-head offset'. The text inside says: 'Please select whether you want to determine the X/Y-offset between camera position and milling head position or whether you want to determine the position offset between z-focus level and the position where the tool tip touches the material surface. The Z-offset is used for 2.5D applications only.' There are three buttons at the bottom: 'Determine X/Y-Offset', 'Determine Z-Focus-Offset', and 'Cancel'.</p>	<ol style="list-style-type: none"> 1. Put the base material onto the table (FR4, 18µm copper) 2. Click on “Determine X/Y Offset”

Determine the X/Y Offset	5)
<p>The screenshot shows a software interface with a dialog box titled 'Determine camera-to-milling-head offset'. The dialog box contains instructions: 'To measure the camera-to-head offset, a reference hole has to be drilled. Click on the machine area to modify the position for the reference hole within the shown rectangle on the material.' Below the instructions, there is a 'Results' section showing 'Old offset: 0.000 mm / 40.000 mm'. There are 'OK', 'Start', and 'Cancel' buttons at the bottom of the dialog box. The background shows a machine interface with a red rectangle on a material surface.</p>	<p>Follow the instructions in the dialog window</p> <p>A hole will be drilled at the selected position. The camera moves to this drill hole and measure the position (see “Camera” window)</p> <p>Confirm all messages in the following dialog windows and save the results to machine (this takes some minutes)</p>

Teach tool holder position	6)
	<ol style="list-style-type: none"> 1. Click on "Machining" 2. Click on "Teach tool-holder positions"

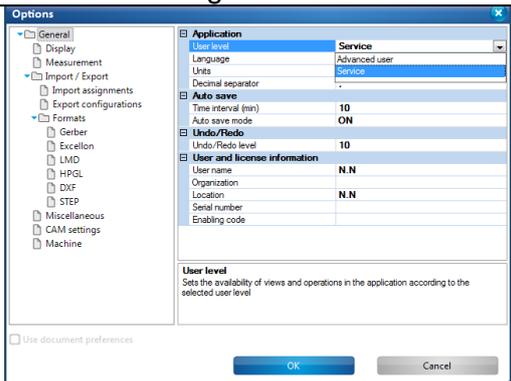
Teach tool holder position	7)
	<p>The milling head moves to the position of the first tool holder. The camera focuses automatically and displays the following image in the "Camera" window.</p> <p>Move the cross-hair to the center of the tool-holder position (black circle) using the X and Y buttons in the "Processing" window</p>

Teach tool holder position	8)
	<p>Confirm the first position by clicking on "Set position".</p> <p>The milling head moves to the position of the last tool holder</p>

Teach tool holder position	9)
	<p>Move the cross-hair to the center of the tool-holder position (black circle) using the X and Y buttons in the "Processing" window.</p> <p>Confirm the position by clicking on "Set position".</p> <p>The camera moves to all tool-holder positions one after the other</p>

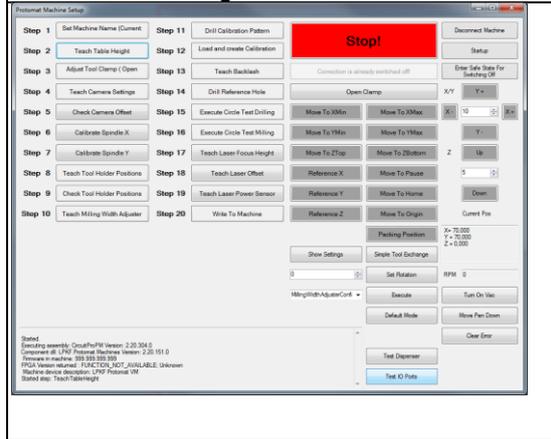
Teach tool holder position	10)
	<ol style="list-style-type: none"> 1. Click on “Save and close” 2. Click on “Yes” in order to store the results to the machine's memory

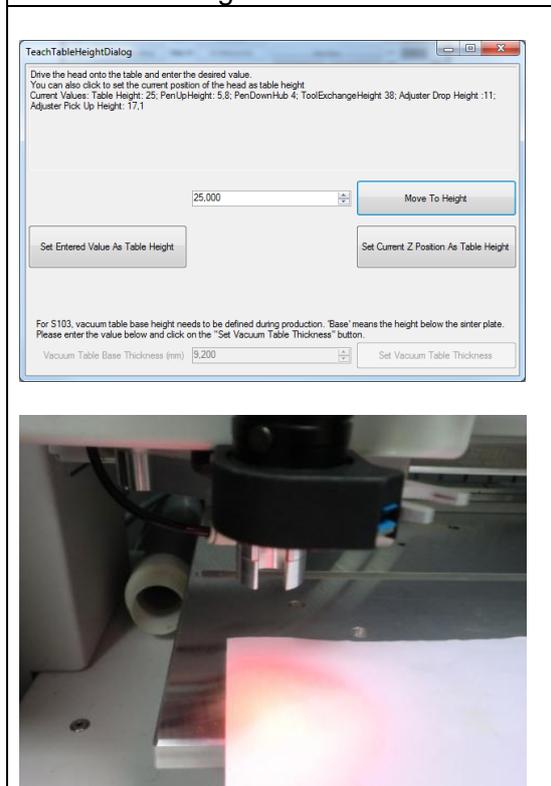
Teach table height	11)
	<p>For teaching the table height, execute the function “Set teach table height” in the service menu. For that purpose, you have to activate the service mode of CircuitPro first</p>

Teach table height	12)
	<ol style="list-style-type: none"> 1. Click on “Extras” 2. Click on “Options” 3. Click on “Service” in the drop-down list 4. Enter the password “cpro” 5. Confirm by clicking on “OK” until the dialog close

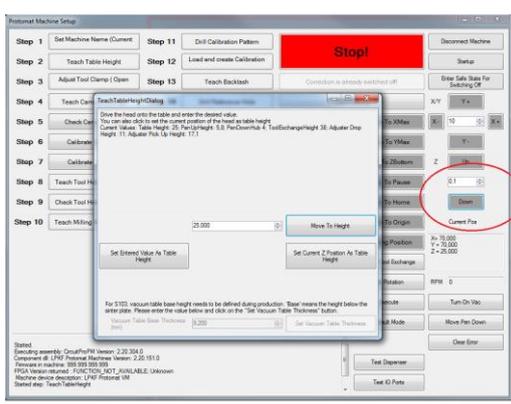
Teach table height	13)
	<ol style="list-style-type: none"> 1. Remove the sinter plate 2. Remove the vacuum table by using a Torx T25 screwdriver and a 1.0 x 5.5 mm flat screwdriver 3. Dismount the grey tube from the vacuum table

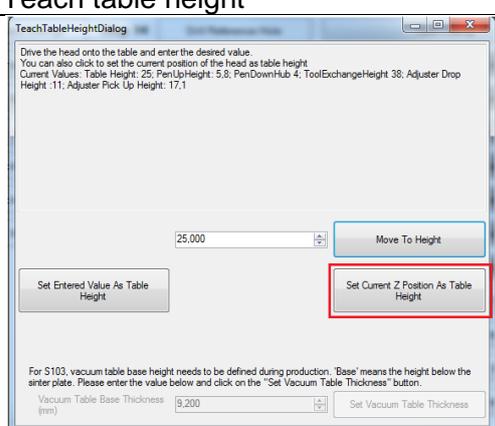
Teach table height	14)
	<ol style="list-style-type: none"> 1. Click on “Machining” 2. Click on “Service” 3. Click on “Set Up Machine Dialog”

Teach table height	15)
	<ol style="list-style-type: none"> 1. Click on “Teach Table Height” (Step 2)

Teach table height	16)
	<ol style="list-style-type: none"> 1. Place a sheet of paper on the object plate (metal plate)

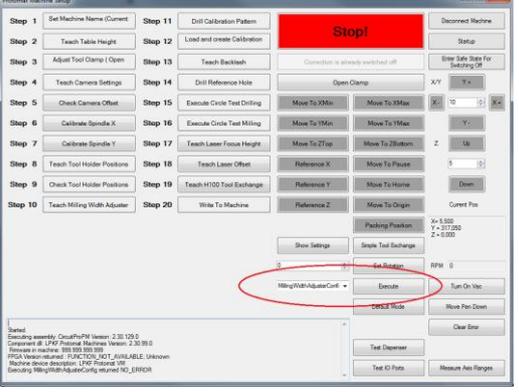
<p>Teach table height</p>	<p>17)</p> <p>1. Click on “Move to Height”</p> <p>The milling head moves to the table height that was previously saved in the machine.</p>
---------------------------	--

<p>Teach table height</p> 	<p>18)</p> <p>Move the milling head downward in 0,1mm increments until the depth limiter touch the sheet of paper (the paper must not be moveable)</p>
--	--

<p>Teach table height</p> 	<p>19)</p> <p>1. Click on “Set Current Z Position As Table Height”</p> <p>The dialog is closed and the milling head is moved to the pause position.</p>
---	---

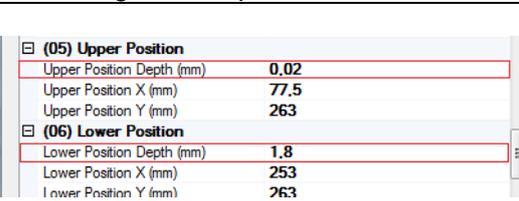
Teach table height	20)
	<ol style="list-style-type: none"> 1. Click on “Write to machine” (Step 20) to store this value to machine`s memory

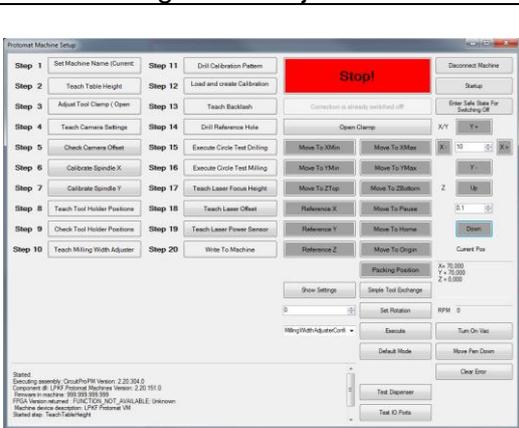
Teach table height	21)
	<ol style="list-style-type: none"> 1. Mount the vacuum table by using a Torx T25 screwdriver and a 1.0 x 5.5 mm flat screwdriver. 2. Mount the grey tubes to the vacuum table. 3. Mount the sinter plate

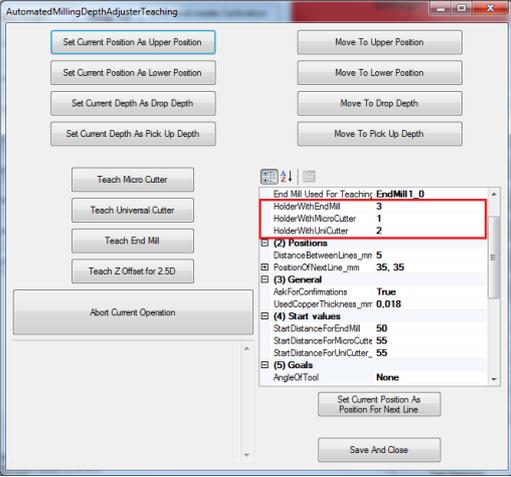
Teaching the ramp	22)
	<ol style="list-style-type: none"> 1. Select the function “MillingWidthAdjusterConfig” in the drop-down list 2. Click on “Execute”

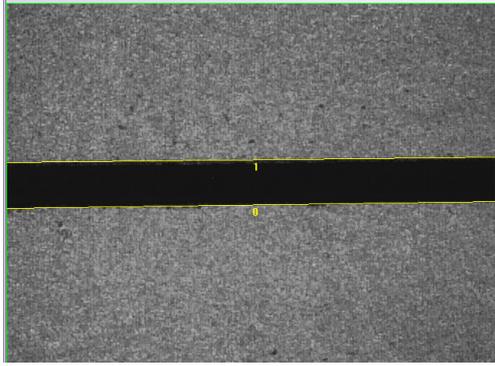
Teaching the ramp	23)
	<p>Use the caliper to measure the height of the ramp at the left end</p>

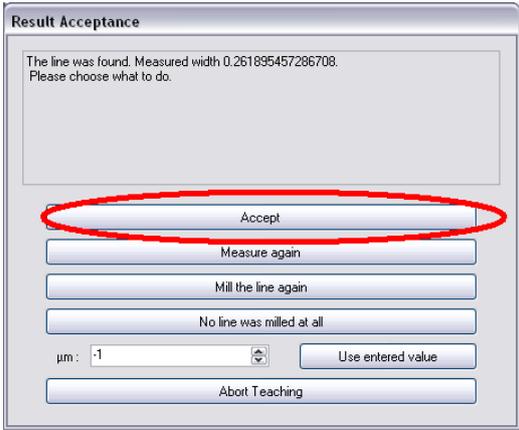
Teaching the ramp	24)
	<p>Use the caliper to measure the height of the ramp at the right end</p>

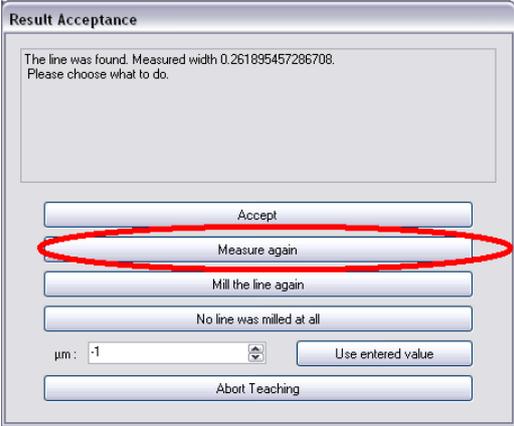
Teaching the ramp	25)																
 <table border="1" data-bbox="432 1167 951 1368"> <tr> <td colspan="2">(05) Upper Position</td> </tr> <tr> <td>Upper Position Depth (mm)</td> <td>0.02</td> </tr> <tr> <td>Upper Position X (mm)</td> <td>77,5</td> </tr> <tr> <td>Upper Position Y (mm)</td> <td>263</td> </tr> <tr> <td colspan="2">(06) Lower Position</td> </tr> <tr> <td>Lower Position Depth (mm)</td> <td>1,8</td> </tr> <tr> <td>Lower Position X (mm)</td> <td>253</td> </tr> <tr> <td>Lower Position Y (mm)</td> <td>263</td> </tr> </table>	(05) Upper Position		Upper Position Depth (mm)	0.02	Upper Position X (mm)	77,5	Upper Position Y (mm)	263	(06) Lower Position		Lower Position Depth (mm)	1,8	Lower Position X (mm)	253	Lower Position Y (mm)	263	<ol style="list-style-type: none"> 1. Enter the measured values in the fields “Upper Position Depth” and “Lower Position Depth” 2. Click on “OK” to close this dialog
(05) Upper Position																	
Upper Position Depth (mm)	0.02																
Upper Position X (mm)	77,5																
Upper Position Y (mm)	263																
(06) Lower Position																	
Lower Position Depth (mm)	1,8																
Lower Position X (mm)	253																
Lower Position Y (mm)	263																

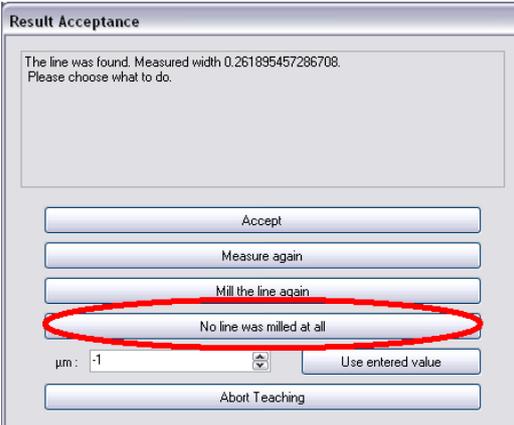
Teach Milling Width Adjuster	26)
	<ol style="list-style-type: none"> 1. Click on “Teach Milling Width Adjuster” (Step 10)

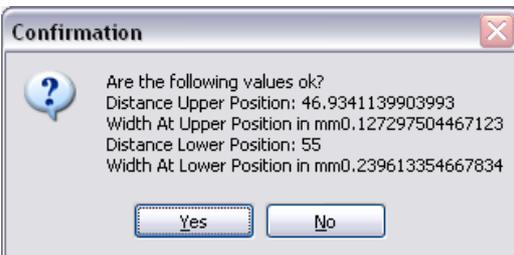
<p>Teach Milling Width Adjuster</p> 	<p>27)</p> <p>Place the three required tools (marked area in the figure) in the tool magazine as follows:</p> <p>Position 1: Micro Cutter Position 2: Universal Cutter Position 3: EndMill 1mm</p>
--	--

<p>Teach Milling Width Adjuster</p> 	<p>28)</p> <p>1. Click on “Teach Micro Cutter”</p> <p>The micro cutter is picked up automatically and set according to the ramp. A line 10 mm in length is milled and measured with the camera.</p>
---	---

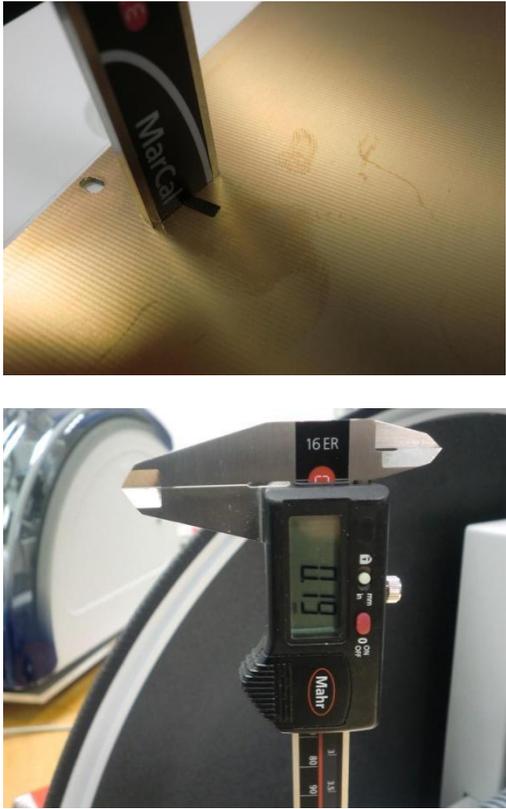
<p>Teach Milling Width Adjuster</p> 	<p>29)</p> <p>SCENARIO 1</p> <p>Check that the milling channel has been correctly detected. The yellow lines in the camera image must run along the edges of the milling channel.</p> <p>If the measuring result is correct, click on “Accept” for confirmation</p>
--	--

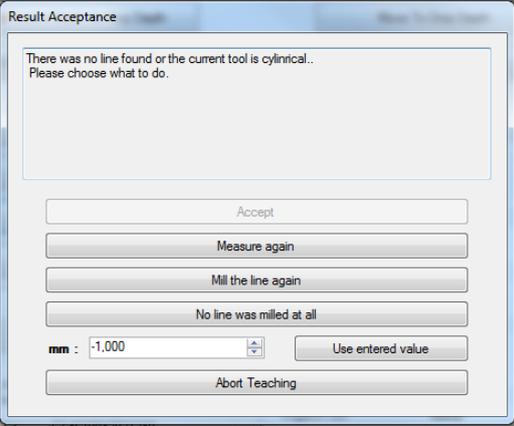
Teach Milling Width Adjuster	30)
	<p>SCENARIO 2</p> <p>If the milling path was not successfully detected adjust the camera light and click on “Measure again”</p>

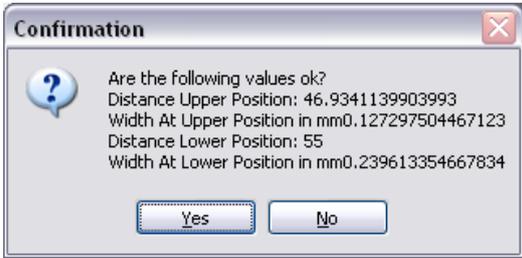
Teach Milling Width Adjuster	31)
	<p>SCENARIO 3</p> <p>If no line was milled click on “No line was milled at all”</p>

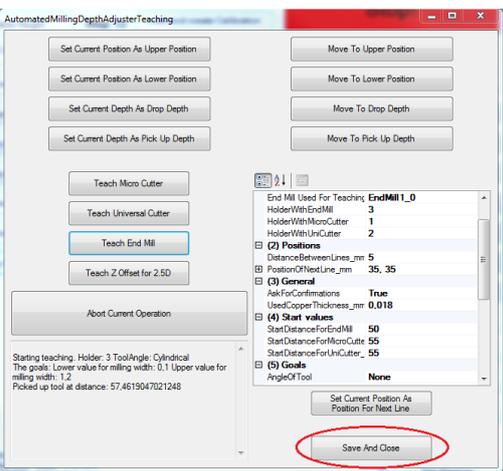
Teach Milling Width Adjuster	32)
	<p>Lines with different widths are milled until there are sufficient values to calculate the actual ramp inclination. Once this occurs, the confirmation window is displayed and confirm the result by clicking on “Yes”</p>

Teach Milling Width Adjuster	33)
	Repeat the steps 27-31 to teach the Universal Cutter

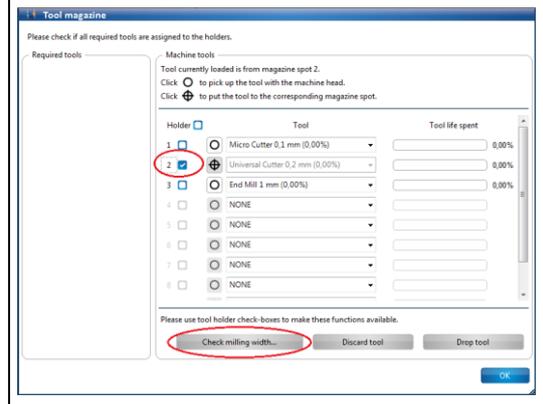
Teach Milling Width Adjuster	34)
	<ol style="list-style-type: none">1. Click on "Teach End Mill"2. Measure the depth of the milled slot by using a caliper

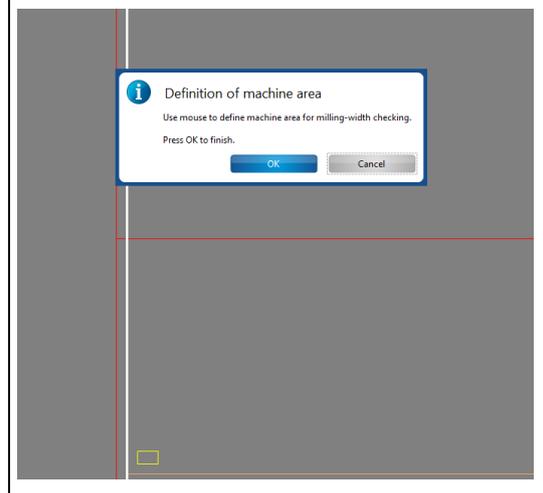
<p>Teach Milling Width Adjuster</p> 	<p>35)</p> <p>Enter the measured value in the field “mm:” and click on “Use entered value”</p> <p>Two additional slots are milled</p>
--	---

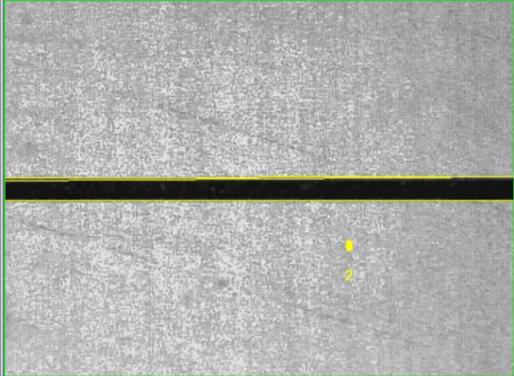
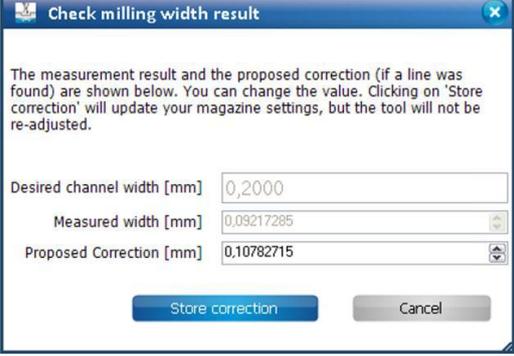
<p>Teach Milling Width Adjuster</p> 	<p>36)</p> <p>Confirm the results by clicking on “Yes”</p>
---	--

<p>Teach Milling Width Adjuster</p> 	<p>37)</p> <p>Click on “Save and close” to save the results</p>
--	---

Write to machine	38)
 <p>Step 20 Write To Machine</p>	<p>Click on "Write to machine" (Step 20) to store all values to machine's memory</p>

Check Milling Width via Tool magazine dialog	39)
 <p>The screenshot shows the 'Tool magazine' dialog box. It lists tools in a table with columns for Holder, Tool, and Tool life spent. The second tool, 'Universal Cutter 0.2 mm (0.00%)', has its holder checkbox checked. Below the table, the 'Check milling width...' button is circled in red.</p>	<p>A tool has to be in the clamp to enable checking the milling width.</p> <ol style="list-style-type: none"> 1. Pick up the Universal Cutter with the clamp 2. Activate the check box of the currently mounted tool in the clamp 3. Click on "Check milling width"

Check Milling Width via Tool magazine dialog	40)
 <p>The screenshot shows a dialog box titled 'Definition of machine area'. It contains the text: 'Use mouse to define machine area for milling-width checking. Press OK to finish.' There are 'OK' and 'Cancel' buttons at the bottom.</p>	<ol style="list-style-type: none"> 1. Click on "OK" to confirm the position where a line can be milled

<p>Check Milling Width via Tool magazine dialog</p>	<p>41)</p>
	<p>After the line has been milled the camera moves to the corresponding position</p>
<p>Check Milling Width via Tool magazine dialog</p>	<p>42)</p>
	<p>The dialog with the measurement results is displayed</p> <p>If there is a difference between the desired milling width and the measured width the software automatically proposes a correction value</p> <p>Click on “Store correction” to confirm the correction</p>
<p>Check Milling Width via Tool magazine dialog</p>	<p>43)</p>
	<p>Repeat the steps 38 – 41 until the milling width result is in the range 190µm – 210µm.</p> <p>Please click on “Cancel” if the milling width result is in the range</p>
<p>Check Milling Width via Tool magazine dialog</p>	<p>44)</p>
	<p>Repeat the steps 38 – 41 to teach the Micro Cutter until the milling width result is in the range 90µm – 110µm.</p> <p>Please click on “Cancel” if the milling width result is in the range</p>

LPKF Laser & Electronics AG

Osteriede 7

D-30827 Garbsen

Tel: +49 (5131) 7095-1333

Fax: + 49 (5131) 7095-90

e-mail: support.rp@lpkf.com