Hard- und Software
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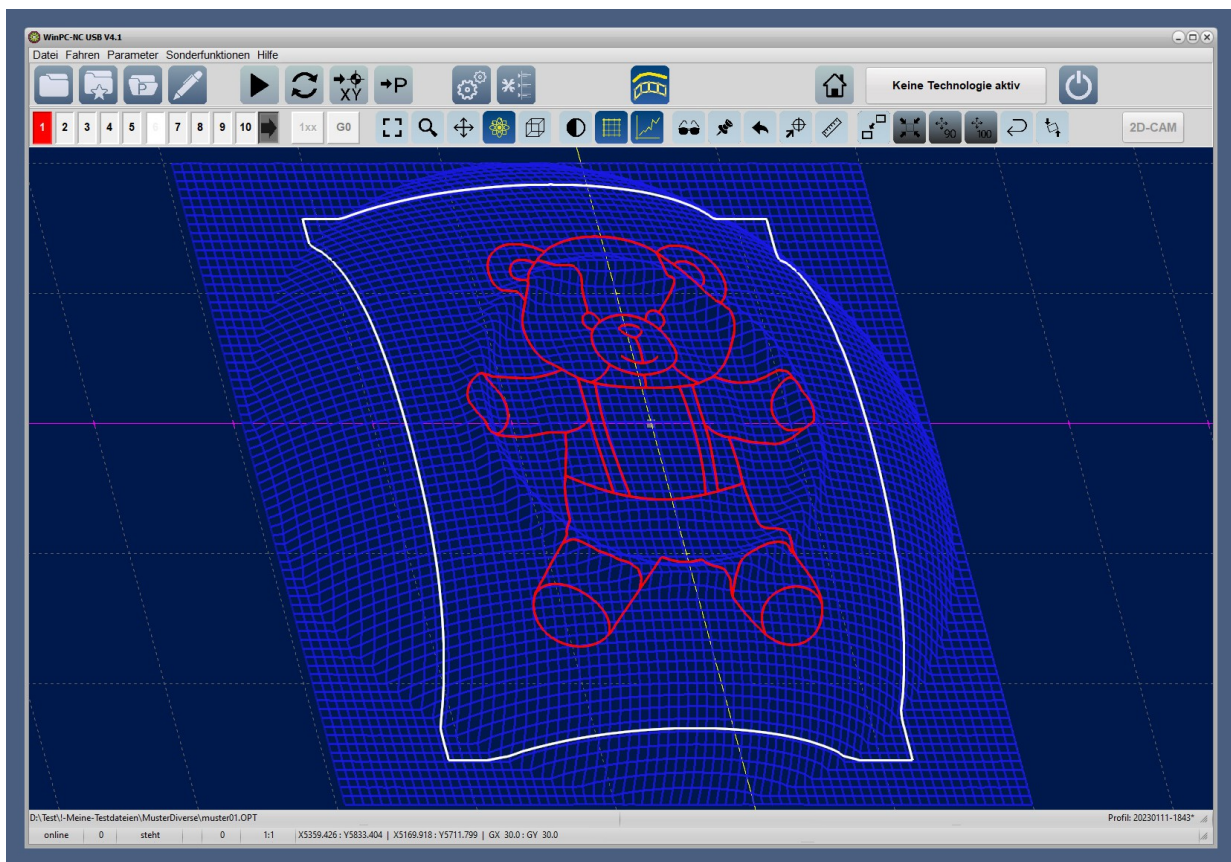
Technical Software Engineering

How does it work...
... with *WinPC-NC* ?

What is new in version 4.1

x	Light
x	USB
x	Professional

Table of contents

With the update to the new version 4.10 **WinPC-NC** offers some new features and enhancements, which are briefly presented here. The update is available for free download from our homepage for all users of version 4.x.

Further information and descriptions can be found in the **WinPC-NC** Quick Start Guides.

Further information and other relevant How to... documents...

Levelling and projection
https://www.lewetz.de/files/HowTo/HowTo_E_Levelling.pdf

Z probe and material thickness
https://www.lewetz.de/files/HowTo/HowTo_E_SurfaceProbeAndMaterialThickness.pdf

Critical and protected areas
https://www.lewetz.de/files/HowTo/HowTo_E_ProtectedAreas.pdf

User management and password protection
https://www.lewetz.de/files/HowTo/HowTo_E_UserManagement.pdf

Our new sensors **3D-Probe** and **Z-Probe** in the online shop
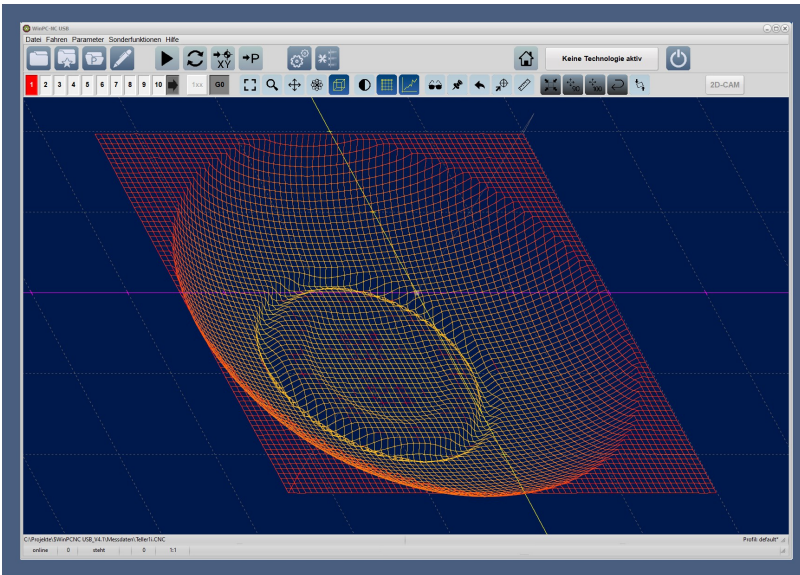https://lewetz.net/en/Equipment/3D-and-surface-probe/

# Levelling and projection

With a suitable 3D probe or tracing pin, non-planar surfaces of workpieces or even entire machine tables can be scanned and stored as a measurement table. Subsequent machining with engraving or milling can then take the measured values into account and project the data onto them.

The scanning is done with the special function *Digitize* and either a rectangle or a circle can be selected and a measuring grid can be determined. The scanning process then takes place step by step completely automatically.
The sampled data can also be saved as a new CNC file and used to duplicate or copy the original part. The measurement data can be copied, mirrored and inverted and thus adapted exactly to the later requirements.
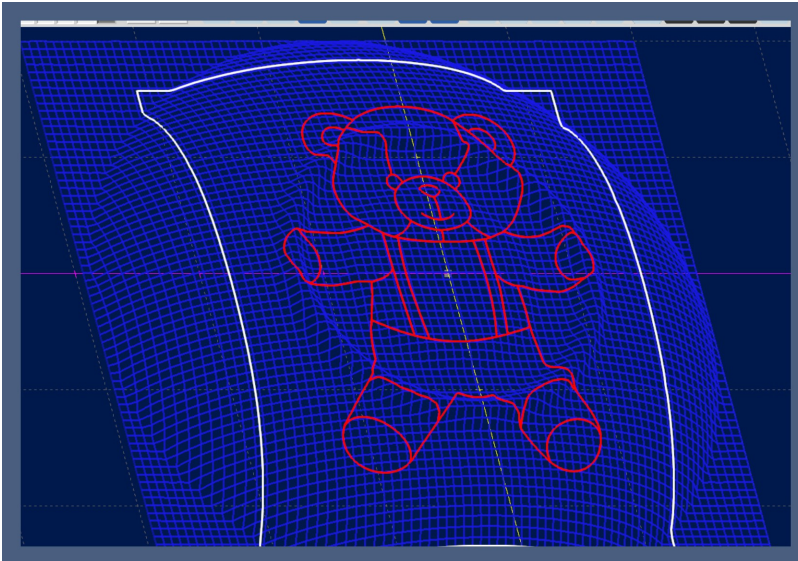
The projection of the NC data takes place automatically afterwards and a started job takes into account the different Z-heights for all movements. With this function, it is also possible to measure a machine table that is not completely flat and to compensate for the differences in all subsequent jobs.
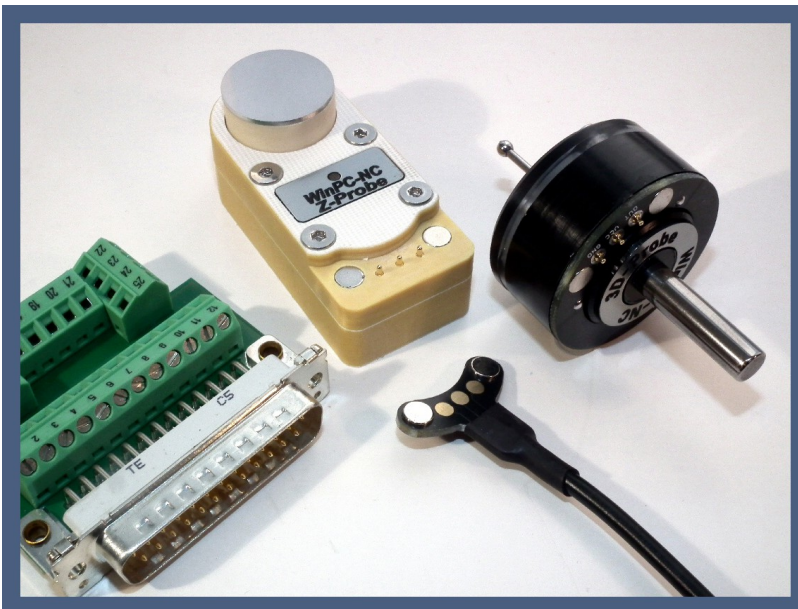
Our new sensors *3D-Probe* and *Z-Probe* in a set with magnetic clip cable and terminal socket.

Definition of critical or protected areas

	Light
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X	Professional

In *WinPC-NC Professional*, up to three critical areas or areas to be protected can be defined. These are monitored directly in the axis controller, i.e. at a lower real-time level, and if they are overrun, the machine stops immediately and a message is displayed.

This function can be used to protect certain areas from collisions with fixtures, tool magazines or special additional devices that are mounted in the working area of the machine.
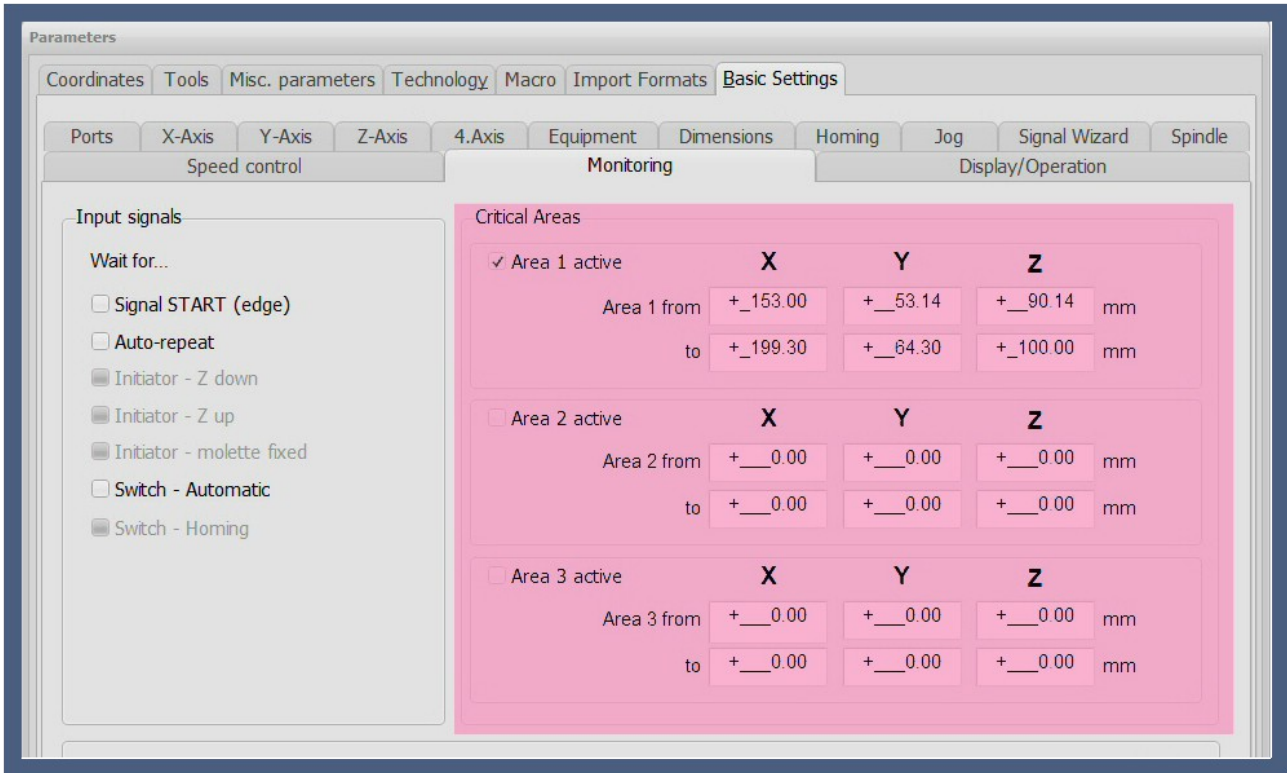
In the event of an injury and unintentional entry into critical areas, the monitoring function can easily be switched off/on with the new button in the button bar and manually moved out of the area again. The red button indicates inactive monitoring.

After a reference run or at the start of a job, the monitoring of the critical areas is automatically activated and thus this cannot be forgotten by mistake. The red button then automatically changes to blue and thus indicates active monitoring.

Ethernet connection of the CNCCON axis controller instead of serial and USB so far

	Light
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X	Professional

With ***WinPC-NC Professional*** and our ***CNCCON-S*** axis controller, an Ethernet connection is now also possible instead of the previously required serial COM connection or a USB connection with adapter. The axis controller must alternatively be equipped with the network interface and this can be specified optionally when ordering.

The axis controller is connected with a standard CAT cable and can be connected either directly to the control computer or via one or more switches in a network. This makes it easy to operate even in remote locations.

The connection and communication are completely reliable and the comfortable operation with ***WinPC-NC Professional*** does not change.

Easy moving of of NC data within machine working area

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X	Professional

Until now, the exact adjustment of the data could only be achieved by changing the workpiece zero point. This was already possible comfortably or automatically by manual approach or probing, but with the new shift function in version 4.1 this is now even possible directly in the graphic display.

Important for this is the button for the total view, which is used to switch between graphics and work area. The entire defined machine table is then visible and you can immediately see where the graphic is currently located and where the part is being machined.
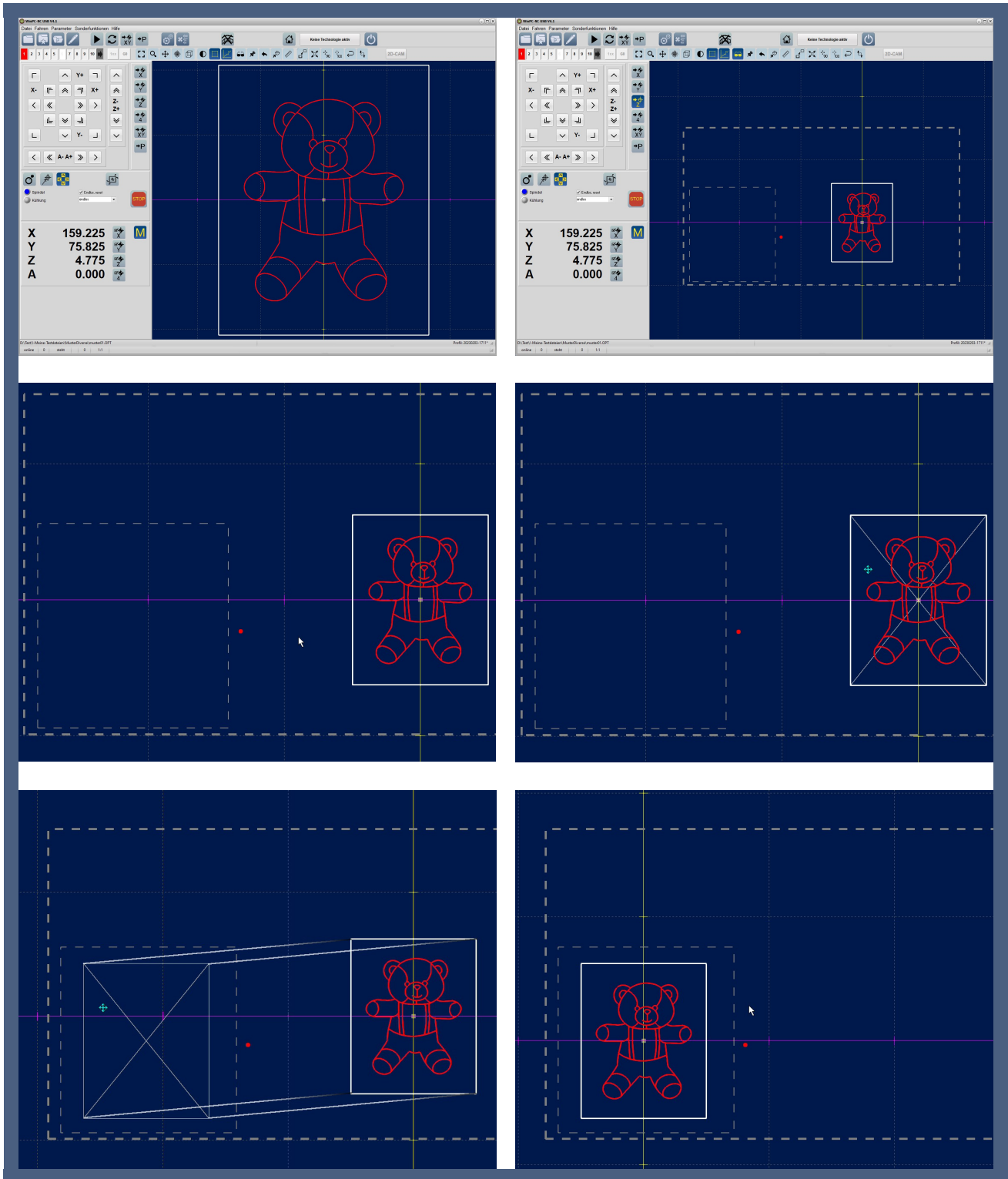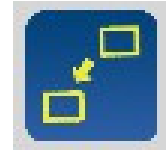
To move, the new move button must be pressed and a thick white frame
appears around the graphic and the cursor changes its shape. With mouse
click and drag you move the frame to the desired new position and with the
release of the mouse button appears the graphic appears there immediately.

The new function also makes it easy to move the graphic to a previously scanned and
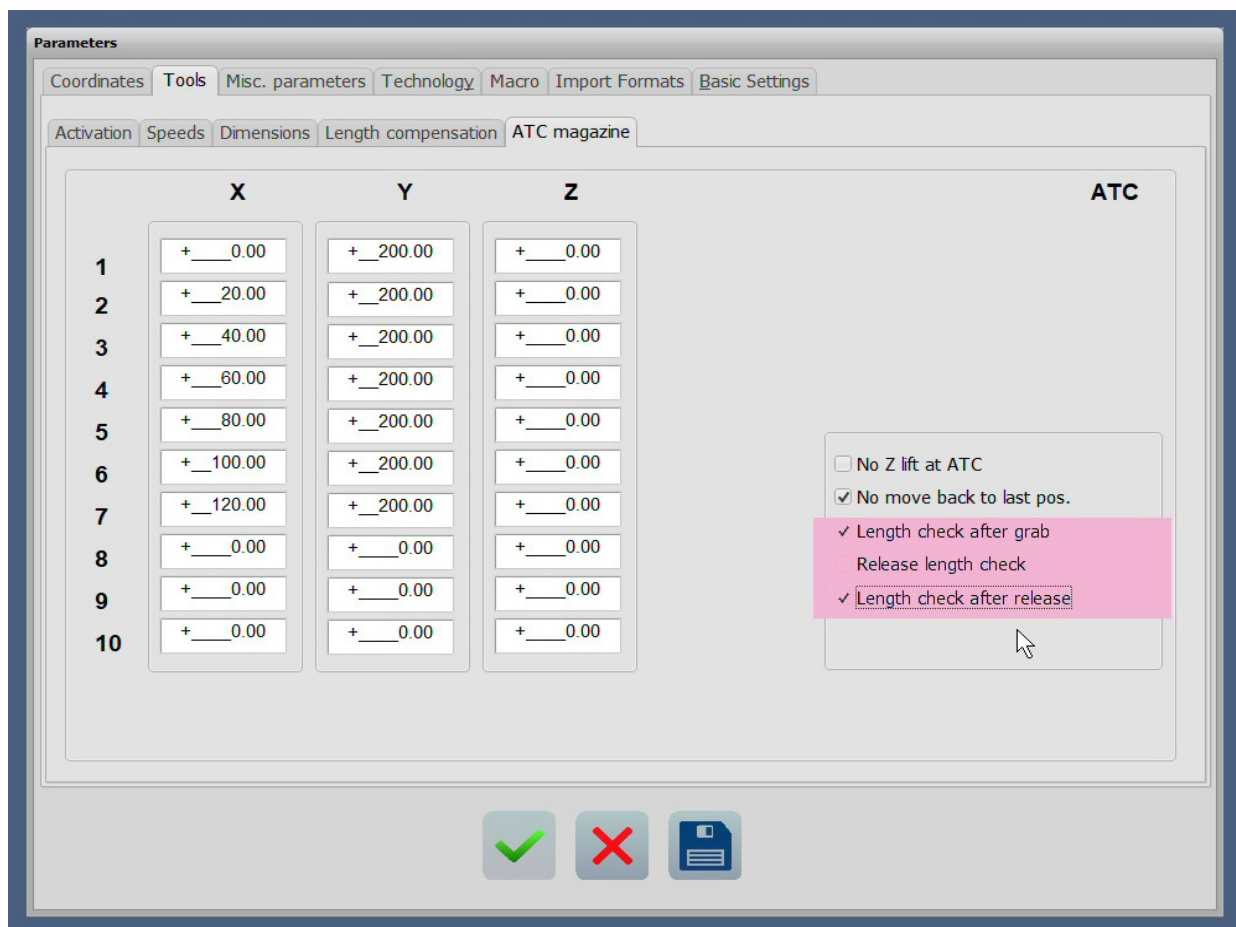digitized measuring area or to the clamped workpiece.
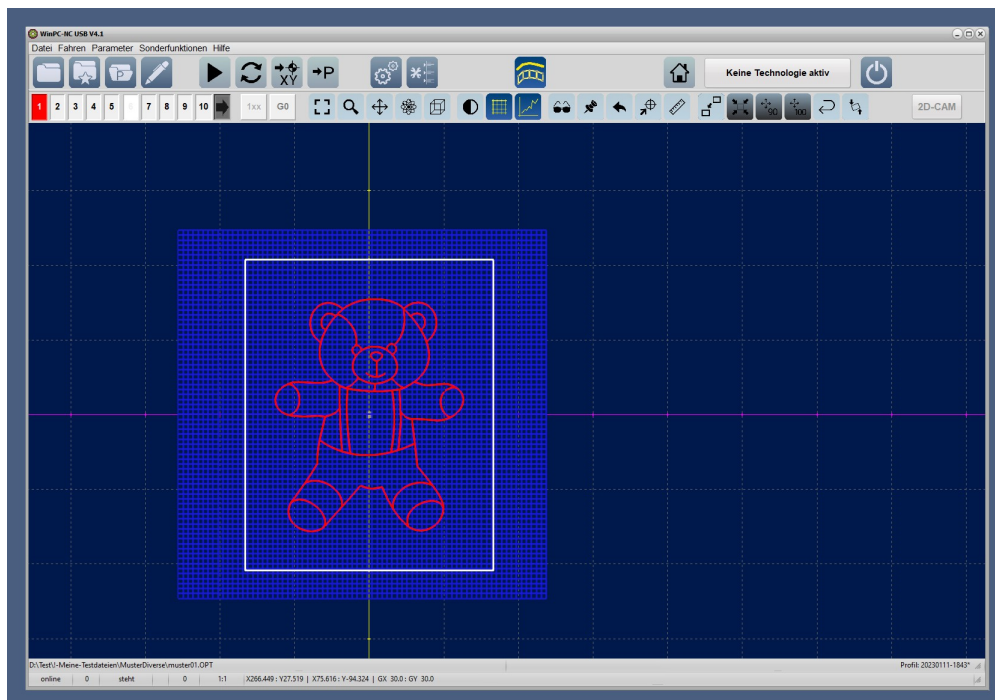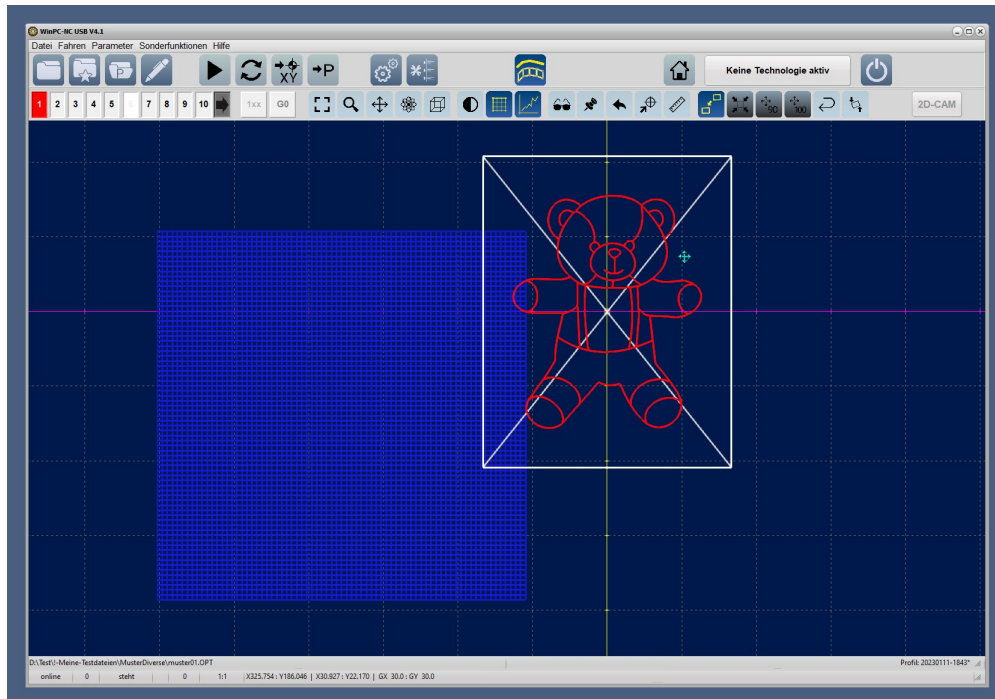
Test measurements for tools - Tool breakage control

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When the tool changer is active and the length measuring function or -compensation, three new checkboxes are available in the parameter dialog of the changer, which can be activated individually or in combination.


All three test functions move the tool or the collet specifically over the permanently mounted tool length sensor and measure the current length there or check for a non-existent tool in a previously known length. If a difference is detected, an error message is issued and the current action is aborted.

A test measurement can be made after the tool has been picked up from the magazine in order to check that it has been picked up and clamped correctly. Furthermore, the previous length can be measured after the tool has been deposited in the magazine, in order to detect whether the deposit has taken place correctly and the tool has actually been released from the collet. The third test measurement is made before depositing in the magazine and compares the previously measured and known length to detect tool breakage.

Output signals when axes are in certain position

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X	**Professional**
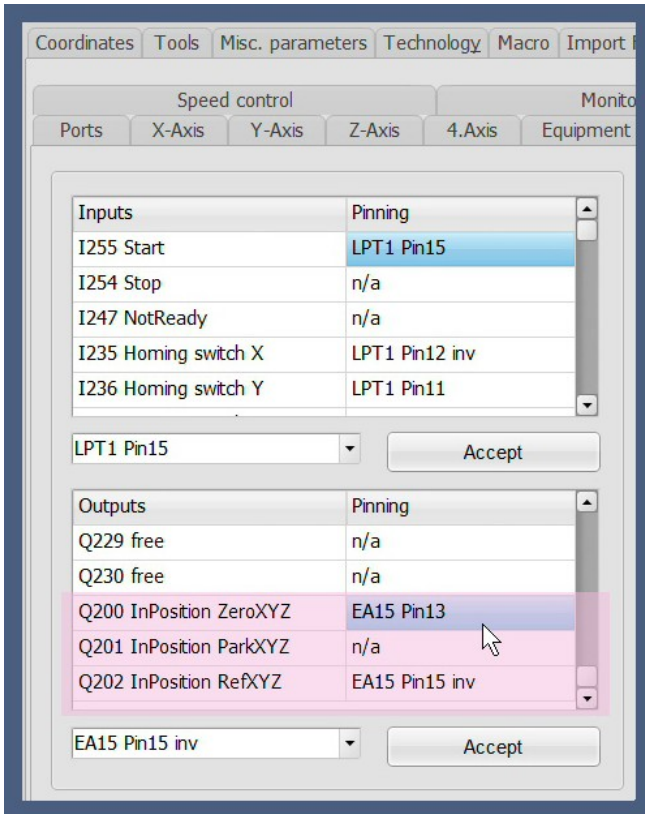
WinPC-NC Professional can generate output signals when the machine is or the three axes XYZ are in the reference position or park position or on the current zero point.

There are three new entries in the list of definable outputs, to which output lines are assigned as usual.

Furthermore, the position definitions for the zero point and the parking position from the *coordinate* settings and the reference positions from the *basic settings-reference* are used as comparison values.

With a cycle of 100ms, *WinPC-NC* constantly checks whether the current machine positions have reached these target positions within a tolerance of 50µm or have come to a standstill on them and outputs the assigned signals. In case of a movement away from the target position the output goes off as soon as the target window has been left.
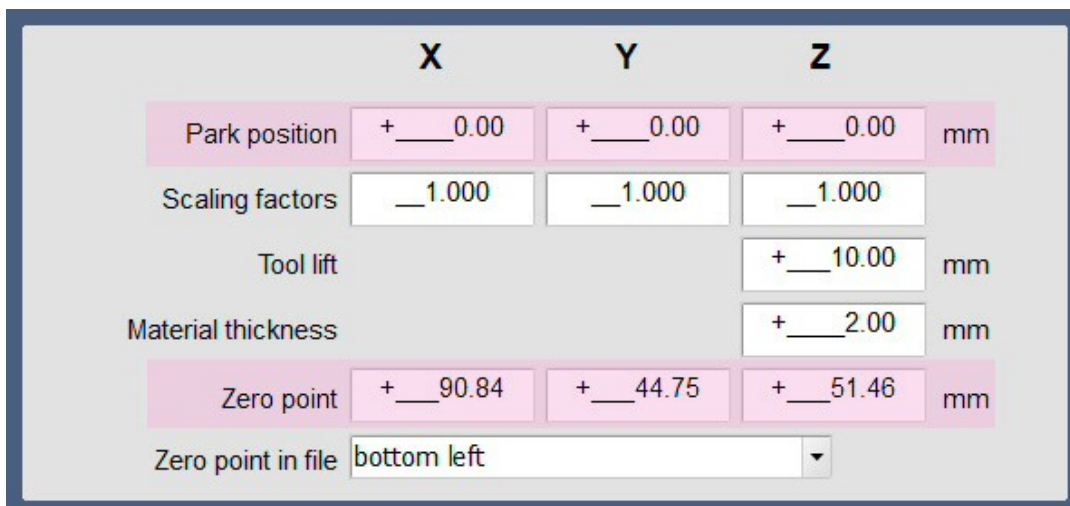
Fixed surface probe and definition of material thickness

As of version V4.10, you can determine the Z zero point on the machine table or the workpiece much more conveniently and no longer need a flying probe as before.

In the parameter dialog under *Basic settings - Sensor* you can define that the surface probe is fixed and also specify the exact position on the machine table.
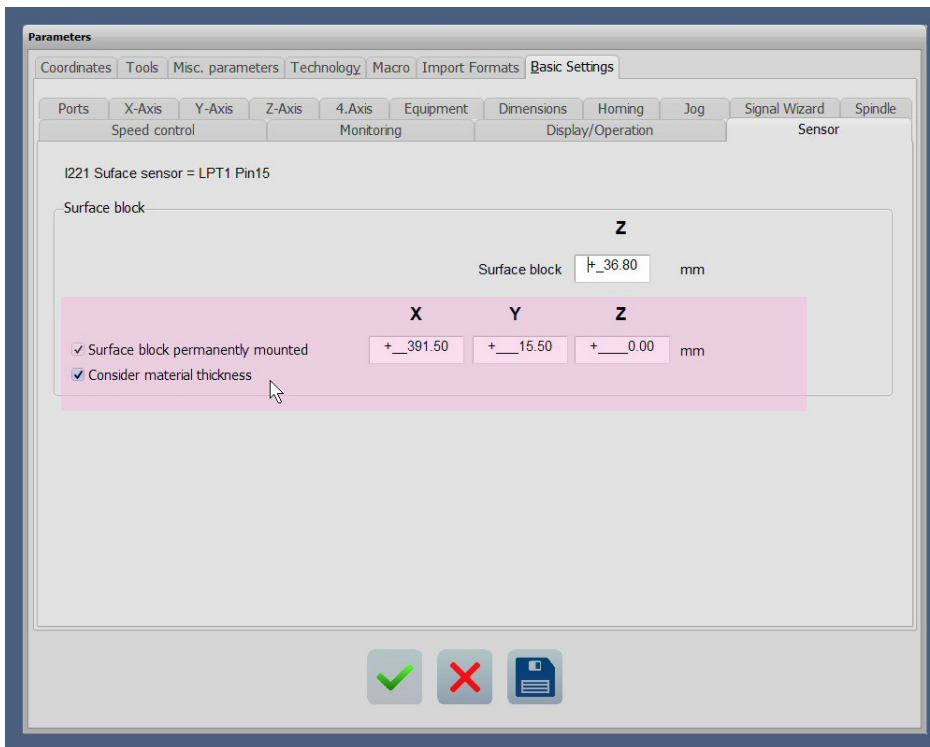
The surface block height set here should ideally define exactly the height that a Z zero point determined over it lies exactly on the base plate or sacrificial plate of the machine table. After that, the Z zero point can be determined very easily and quickly with tools of different lengths.

The checkbox for considering the material thickness and the material thickness itself are project parameters and are always saved with the current project. This means that different material thicknesses can be defined for each project.

The material thickness is defined under the *Coordinates-Auxiliary points* parameter and normally defines the thickness of the workpiece to be machined. If a height is defined here and the consideration with the checkbox *Consider material thickness* is activated, *WinPC-NC* subtracts this height when determining and measuring the Z zero point.
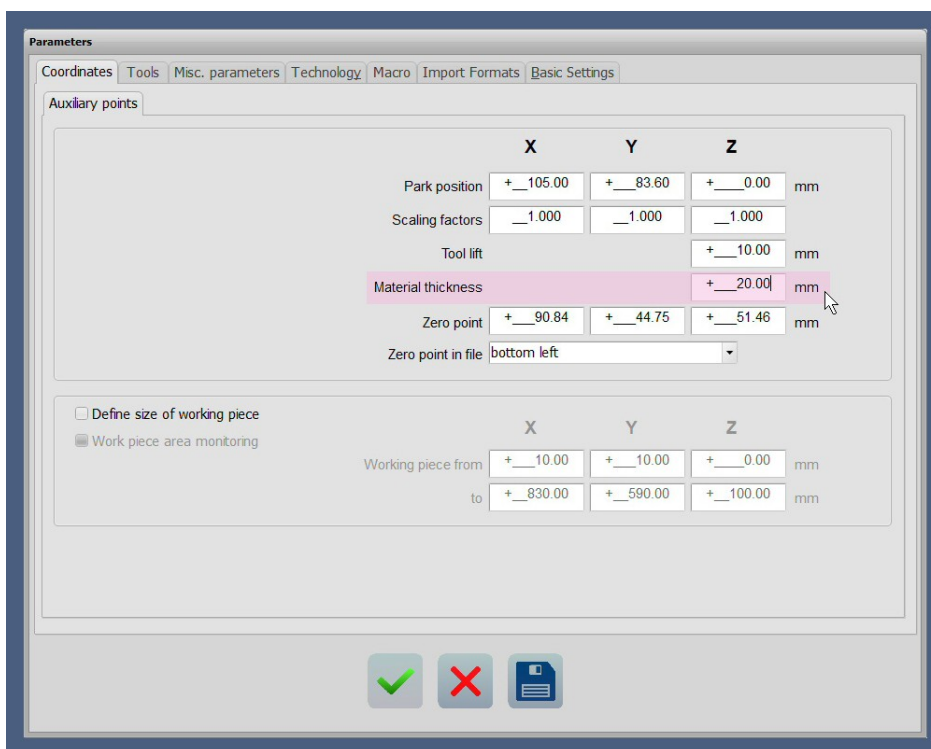
Until now, the Z zero point always had to be determined by scratching the surface or placing a flying probe as a surface probe. With the new function, after entering the material thickness and starting the *Probe Z-zero function*, the program moves to the fixed probe. ***WinPC-NC*** calculates the new Z zero point depending on the probed tool length and the material thickness and positions it automatically on the workpiece surface.

Manual traversing via the Z zero point probe on the workpiece and placing the probe on the workpiece is no longer necessary.

When using the new function with material thickness and permanently mounted probe as well as activated tool length measurement and compensation, it must be ensured that the previous steps are still carried out separately. First the inserted tool is measured via the tool change dialog and then the Z zero point must be set once before the job start.
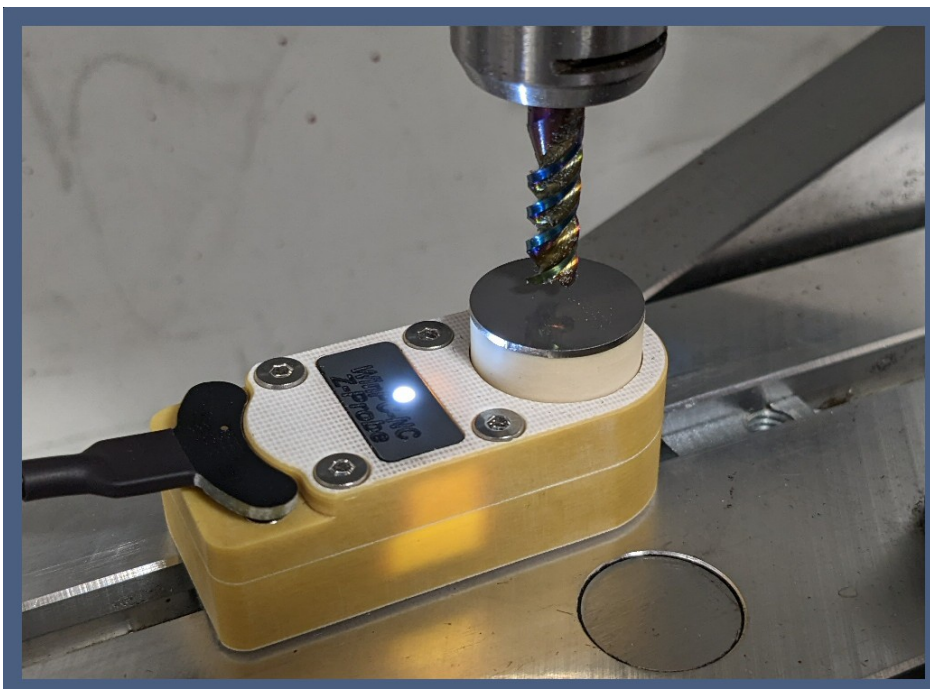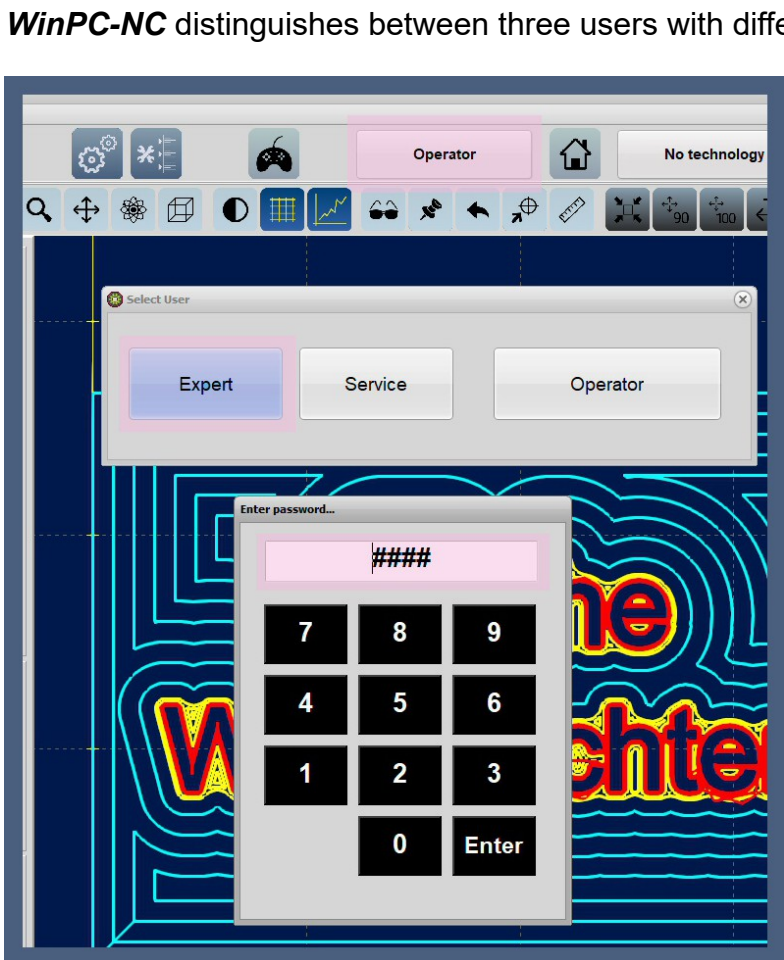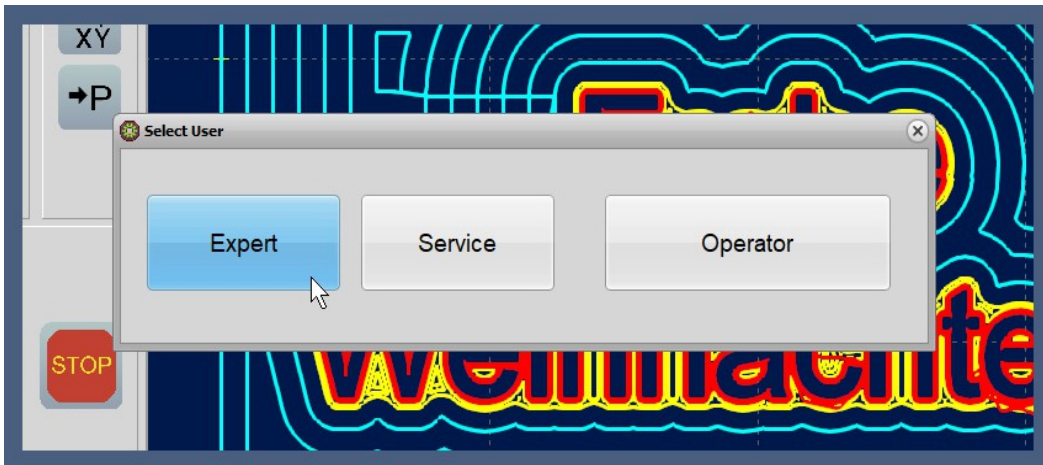
User management and password protection

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X	**USB**
X	**Professional**

From version 4.1 *WinPC-NC USB* and *WinPC-NC Professional* can manage password protected different user profiles with different permissions.

WinPC-NC distinguishes between three users with different rights. The *operator* can load and execute jobs and initialize the machine. The *expert* may set up new jobs or modify existing ones and make all job settings, and the *service employee* has access to all functions and settings of the machine and the system.

The login of the higher privileged users is done with a definable password.

Minor changes and enhancements

X	**Light**
X	**USB**
X	**Professional**

The following additional changes and enhancements have been realized in version 4.1...

- Function *rotary axis* now also works with Gcode and other 3D data

- Machine area monitoring also for all special movements and movements with edge finder or when using a touch plate

- Switchable monitoring and inhibition of a job start over a longitudinal probe or over a changer magazine

- If the reference run is rejected, the machine area monitoring cannot be active and this is indicated with a warning.

- with 2D data, changes to the plunge depths and the safety distance are immediately adopted in the graphics

- in manual moves, camera and laser pointer/pilot laser can be switched separately

- new macro commands for diagonal travel to absolute machine positions

- extensive revisions of the foreign languages

- switchable automatic parameter storage at the end of the program

- more safety functions and better fulfillment of machine safety guidelines

...and many other changes