

## Macros

The macros function in **WinPC-NC** offers you a powerful tool for individual adaptations to an extremely wide range of different mechanics and applications. User-definable macros enable the working sequence to be influenced and configured in many respects.

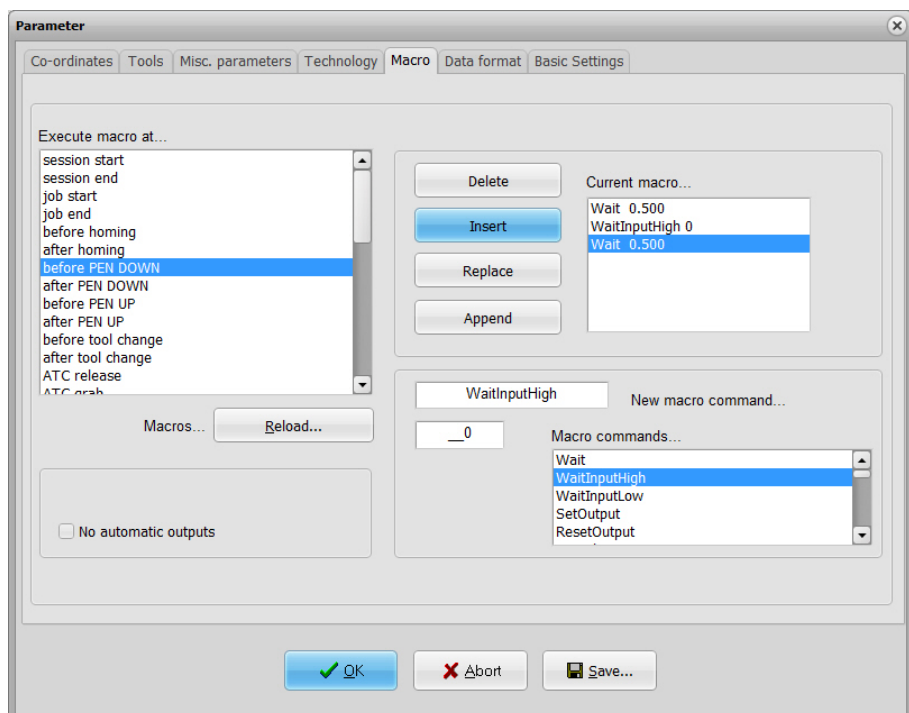
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**In order for macros to be used in WinPC-NC, they must be enabled as a special function.**

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### *Flexibility with macros*

**WinPC-NC** always stores defined macros in the WINPCNC.MAC file when the parameters are saved. They are always valid and apply to all projects. By clicking the Reload button, it is possible to load the most recently saved macros from the file again.



Macro definition

**The dialog box for defining macros is divided into several parts:**

<b>left-hand list box</b>	Possible points in the program when macros can be run
<b>Top-right list box</b>	Current macro, a new macro is assembled in this list box using macro commands
<b>Bottom right List box</b>	All possible macro commands which can be list box used to assemble macros
<b>Editing boxes</b>	Here, the selected macro commands are combined with the necessary parameter values, e.g. times in wait commands or distances in movement commands
<b>Editing buttons</b>	These allow the current macro command to be deleted, replaced or a new command can be inserted and append

Executing of macros must be assigned to certain program points and situations. You can assign a macro to be activated before a reference move or after a tool change or even when a special tool is selected.

In addition there are macros which can be activated by specific commands in a G-Code or HPGL file. As an example the programmable macro1 can be called up by M90. Further information are provided in later chapters concerning G-Code and HPGL files.

### *Creating macros*

**Macros are defined in a procedure made up of several steps:**

- Select a program condition by double-clicking in the left-hand list box. This is the program condition for which the macro is to be defined. The top right list box then either displays an existing macro or No macro defined.
- Edit the required macro by double-clicking the lines you want to change to transfer them to the editing box. There, you can define different values for the commands. The new command is adopted when you click Replace or Insert.

- In order to create new or partial macros, you have to select the required command from the list box at the bottom right and then can be transferred into the current macro using Replace or Insert.
- To delete macro command, simply move the bar to the corresponding command in the current macro and click the Delete button.

#### *Macro commands*

Most of the macro commands are self-explanatory and herefore we want to treat solely some special ones.

<b>Wait time</b>	Performs a wait time in ms
<b>Wait InputHigh no</b>	Waits for HIGH level of input no
<b>Set OutputHigh no</b>	Sets output no HIGH
<b>Speed spd</b>	Speed setting for future moves in mm/secs.
<b>MoveX xxx</b>	Moves a relative distance
<b>MoveAbs xxx</b>	Moves to absolute position xxx, i.e. in machine coordinates
<b>Spindle ON/OFF</b>	Switches the additional signal Spindle
<b>Cooling ON/OFF</b>	Other outputs are functioning analogously
<b>Wait Spindle Stop</b>	Waits until input 'Spindle Stop' is activated and the milling spindle has definitely been stopped (subject to installation and wiring)
<b>WaitStart</b>	Waits for a start signal on input I255 Start
<b>OffsetX</b>	not available in WinPC-NC USB
<b>Block Z zero point</b>	not available in WinPC-NC USB
<b>Spindle Speed</b>	sets up a new spindle speed

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**Defining inputs and outputs always requires the indication of the corresponding numbers. Do not indicate the pin number of the LPT port. Typical numbers to be used are I100 to I107 or Q100 to Q115. In advance it is necessary to assign to these inputs and outputs a pin numbers and wires via signal wizard.**

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*Example 1*  
*Release tool***Example for releasing a tool in the changer magazine:**

<b>Speed 80,00</b>	Set the speed to 80 mm/s
<b>MoveZ 156,34</b>	Move down with the Z-axis
<b>Speed t 5,00</b>	Set speed slower
<b>Wait Spindle Stop</b>	Wait until spindle has stopped
<b>MoveY 10,00</b>	Move the tool into the chuck holder
<b>MoletteOpen</b>	Open the molette
<b>Wait 500</b>	Wait 500 ms for pneumatic system
<b>Speed 2,00</b>	Set very slow speed
<b>MoveZ -5,00</b>	Move 5 mm up from tool
<b>Speed 80,00</b>	Set speed back to fast
<b>MoveZ -151,34</b>	Move Z-axis all the way up
<b>MoveY -10,00</b>	Move Y-axis back to starting position

*Example 2*  
*Insertion when*  
*flame cutting***Example of a macro defining an insertion procedure when flame cutting. It is always performed before PenDown commands.**

<b>MoveZ 50,00</b>	Move down with the Z-axis
<b>Wait 10000</b>	Wait 10 seconds at pre-heating position 1
<b>MoveZ 20,00</b>	Move down again by 20 mm
<b>Wait 2000</b>	Wait 2 seconds and pre-heat
<b>SetOutputHigh 100</b>	switch on oxygen with output 100
<b>Wait 500</b>	Wait another 500 ms before movement

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**Please note that certain macro commands like offset or macros for certain additional functions, e. g. Block zero Z, are only usable by WinPC-NC Professional.**

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## Signals only via macros

*Outputs  
automatically or  
by macros*

Usually some output signals are automatically performed in **WinPC-NC**. For example, the output 'Job runs' is set when starting up and it is reset at the end or with break off. The same applies to the signals for drilling spindle, coolant pump, dispensing, etc.

Automatic operation mode must be deactivated in this parameter, if it is more convenient to manage signals by macros or if operation times are to be changed.

All signals can solely be used by macros.