

Signal wizard

Using input and output signals

One of the most essential functions of **WinPC-NC** is the management of input and output signals.

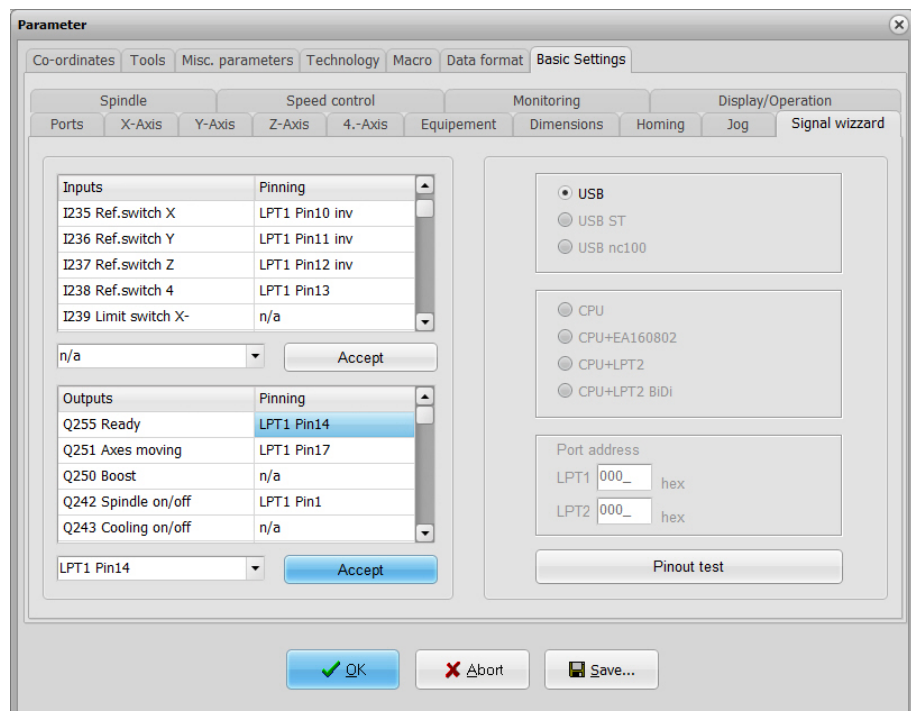
Input and output signals

By means of inputs many useful functions have been implemented, e.g....

- Monitoring of the axes by limit switches
- Moving reference and thereby calibration of the axes
- Synchronization with various signals, e.g. Start
- Monitoring of the protection hood and safety fences

By means of output signals **WinPC-NC** is able to control various additional appliances or reconcile the process with other components. Examples for outputs are...

- Switching spindle and cooling
- Locking the protection hood during a job
- Switching the dispensing pump



Signal wizard

Integration of the signals

WinPC-NC is able to manage a lot of different signals, certainly all inputs and outputs are not required for each task. In this way it is quite simple to assign the required signals to the available pins of the LPT ports at **ncUSB** using the signal wizzard.

Each LPT port disposes of 5 input lines at the pins 10, 11, 12, 13 and 15 and 4 additional output lines at the pins 1, 14, 16 and 17.

You can connect the required signals at any possible pin. The assignment is subsequently effected by the signal wizzard which is activated by parameter-machine-signals.

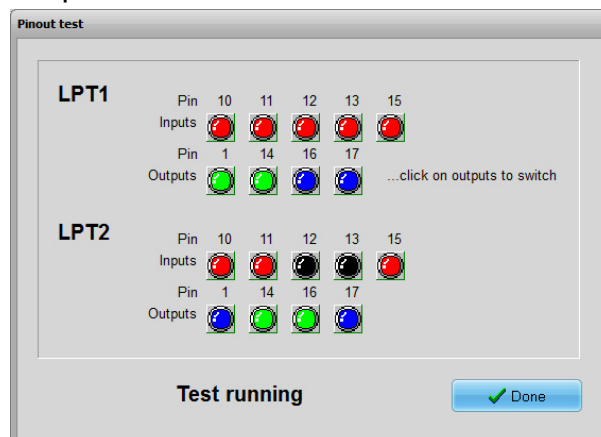
Attention: Please take greatest care when assigning and testing the inputs and outputs. Be always aware of uncontrolled actions of the output signals.

Assignment of inputs

Assignment of inputs

Please execute the following steps for assigning the input lines:

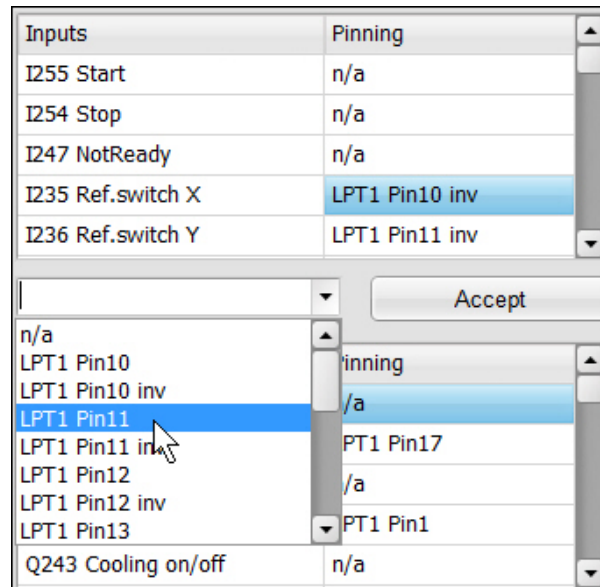
1. Connect the required switch or sensor to the available pin
2. First click to Pinout test and observe the LEDs in the next window which are symbolizing the status of the individual input lines



Testing of signals

3. Note or notice the pin number and the switching logic after manual pressing the individual switches. A normally open (NO) contact is characterized when the LED light changes from black to red during pressing. However, a normally closed (NC) contact is characterized when the LED light changes from red to black.
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4. Click to the function Done and change again into the window of the signal wizard. Select now the corresponding input signal in the lefthand window (e.g. I235 reference switch X) and open the drop-down menu below in order to assign the pin number (e.g. LPT1 Pin11).



5. With normally open contacts (color change from black to red) always select the normal pin number. With normally closed contacts (color change from red to black) select the inverted pin number, e.g. LPT1 PIN11 Inv

6. After clicking the button Accept the selected pin number is displayed in the assignment table.

7. Proceed in the same way with all other required input signals.

8. Save the parameter settings and if necessary, check once more all assignments with the function SPECIAL FUNCTION-SIGNAL TEST. Herewith a pressed switch must always produce a red LED light, i.e. a HIGH level.

With inputs WinPC-NC reacts only to a HIGH level. Please take care that the switching logic with the possibility for inverting is assigned in the way that an activated switch generates a HIGH level.

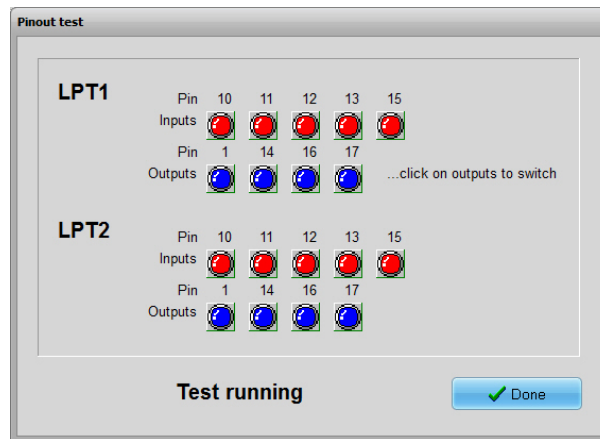
Assignment of output lines

Assignment of outputs

The assignment of outputs is similar to the assignment of inputs.

Please carry out the following steps :

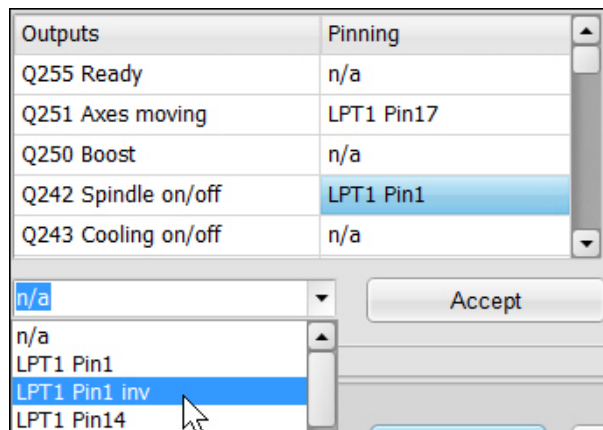
1. Connect the required cables to the available pins and use for control purposes a LED light or a lamp.
2. Click to Pinout test and observe the LEDs in the next window which are symbolizing the status of the individual output lines.



3. Click by mouse on to the possible outputs and observe the level of the cables. A blue LED light signalizes a LOW level or an output switched off. A green LED light signalizes a HIGH level or an output switched on. Please note or notice the corresponding pins as well as the switching logic.

4. Click to the button Done and change again into the window of the signal wizard. Select now the corresponding output signal in the right-hand window (e.g. Q242 Spindle on/off) and open the dropdown menu below in order to assign the pin number (e.g. LPT1 PIN1).
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5. After clicking the button Accept the selected pin number is displayed in the assignment table.



Assignment of the pin number for output lines

6. Proceed in the same way with all other required input signal and finally save the settings.

Input signals available

Possible inputs **WinPC-NC is able to manage following input signals:**

Input signal	Assigned action
I255 Start	Starts loaded job
I254 Stopp	Stops immediately each running action with HIGH level, subsequently another reference move has to be carried out
I247 Not ready	Monitors whether the machine is ready and the drives. With HIGH level each running action is immediately stopped. Here the emergency-stop signal is monitored
I235-238 Reference switch	Reference switch of all 4 axes
I239-242 Limit switch-	Limit switch positioned at the negative end of the axis
I243-246 Limit switch+	Limit switch positioned at the positive end of the axis
I234 ZinpositionUp	Synchronizes a semi-automatic drilling job and with HIGH level it can move to the next position at this input
I233 ZinpositionDown	Synchronizes a semi-automatic drilling job. The signals Zinposition top and Zinposition down must be activated by turns.
I229-232 Limit switch summary	Limit switch inputs, if only one switch is appropriate for both ends of the axes, e.g. a flexible switch moving on two cams. Using these inputs, WinPC-NC is not able to recognize the move direction and obviate continuation of the move.
I228 Spindle speed reached	Signal of the milling spindle, when the desired rotation speed has been reached and the job can be continued.
I222 Protection hood	Safety function for protection hoods, light screens and access controls

*Possible inputs***WinPC-NC is able to manage following input signals:**

Input signal	Assigned action
I221 Length sensor/ Surface probe	Input for surface sensors or tool length sensor
I180 JobSingle	Starts a loaded job in step by step mode and stops after each movement
I179 JobStart	Starts a loaded job from the main menu, previous check concerning a change of the job data by the function automatic reload
I178 JobStop	Stops running job
I177 JobResume	Continues interrupted job
I160-169 free I100-109 free	Signals freely to dispose, with macro programming

All additional input signals which are indicated in the table are reserved to special functions or only available in **WinPC-NC Professional**.

Output signals available

*Possible Outputs***WinPC-NC is able to manage the following output signals :**

Output signal	Assigned actions
Q255 Ready	Indicates whether the controlling software is ready with HIGH level. In the case of error the output turns to LOW.
Q251 Axes moving	Indicates moving (HIGH) or stopping (LOW) axes. This signal can be used for reducing current at the rating class limits.
Q242 Spindle	Spindle Switches on/off the drilling-/milling spindle.
Q243 Cooling	Switches on/off the coolant pump or the spray cooling

Q244 Dispensing/Laser	Switches on/off the dispensing signal or a connected Laser
Q245 Purging with compressed air	Indicates with HIGH level an upwards moving and thus a withdrawing Z-axis
Q246 Job works	Job working in HIGH level and thus indicates automatic operation.
Q247 JobEnd	Signals briefly the end of done job
Q248 Collet chuck/molette	Controls an automatic chuck in conjunction with tool changer
Q249 Spindle left-hand/righthand	Switches the rotation direction of the milling spindle, e.g by M-functions M3 and M4 in G code programs
Q219 Toggle/Chargepump	Toogle output continuously switching with 12kHz, can be considered as ready signal for machine control
Q218 Spindle speed /PWM	PWM-signal (pulse width modulation) for speed step display
Q100-115 output M70-87	Additional outputs, programmable with M-functions in G code programs.
Q220-230 free	Signals freely to dispose, with macro programming

All additional output signals which are indicated in the table are reserved to special functions or only available in **WinPC-NC Professional**.
