# Setting up Index input for monitoring of spindle revolution speed using USB-MC motion controller
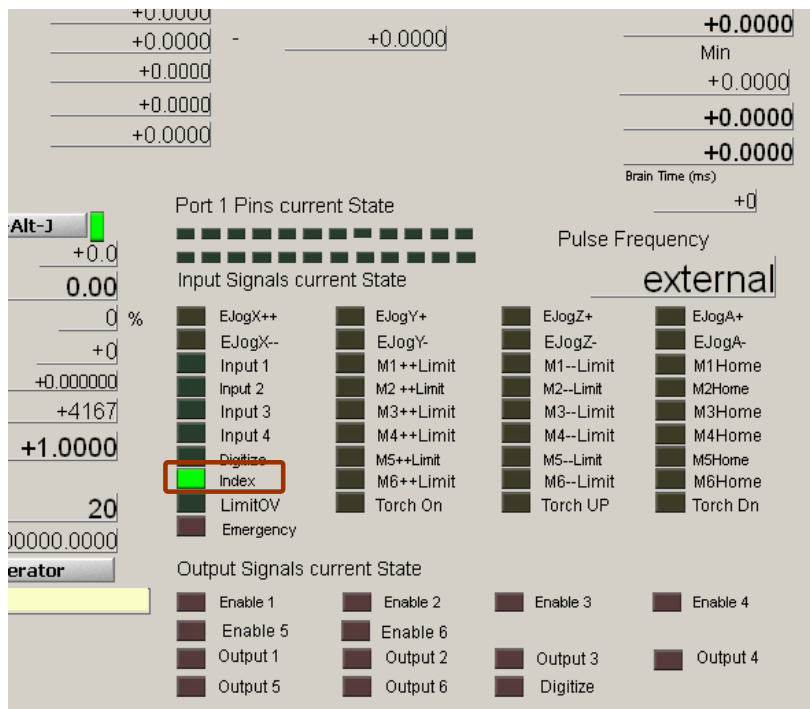
For spindle revolution speed monitoring, besides USB-MC motion controller, some revolution sensor is needed to provide at least one pulse per spindle revolution. Signal from this sensor must be connected to Index input.

To configure pin and port for Index input in Mach3 software, dialog Ports&Pins/Input Signals (figure 1) is used. With USB-MC motion controller, port number is always 1, and pin number is adjustable as desired in range 1-14 (depending on digital input line where Index signal is connected). In this example Index input is placed on pin 1.
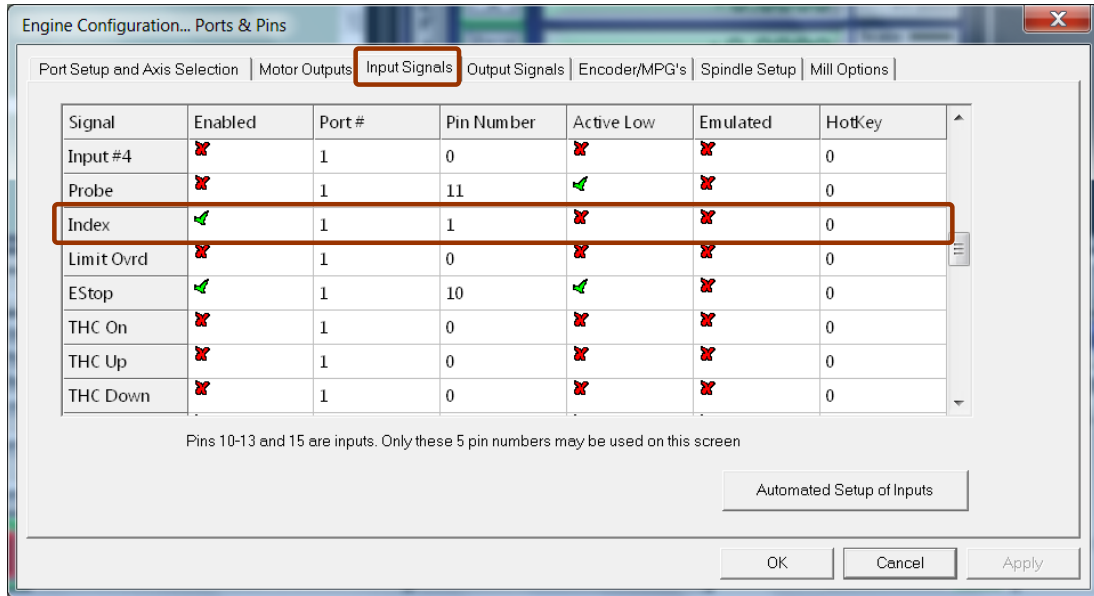
Figure 1 Index input, pin and port configuration

To test whether Index input is working it is possible to use Mach3 Diagnostics (Alt-7) screen (figure 2), or status window for USB-MC motion controller.

Figure 2 Status of input signals is shown in the bottom right corner of Diagnostics screen

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Status window of USB-MC controller displays real current state of digital inputs (high/low), while Mach3 Diagnostics screen shows whether signals are active/inactive in respect with their individual active low/high settings. If spindle is rotated and there is no change of state on Index input, something is not correct with software setup and/or wiring and the problem should be found and corrected.

USB-MC motion controller supports more than one pulse per spindle revolution, so the correct value should be entered in USB-MC configuration: menu PlugIn Control->USB-MC config.../ General Setup/Index pulses per revolution.

If everything is right, now on Mach3 main screen in Spindle Speed group, field RPM should show real spindle revolution speed in RPM (figure 3).

Figure 3 Monitoring spindle revolution speed

If needed, option Spindle Speed Averaging (figure 4) can be enabled. If this option is enabled, averaging of revolution speed is performed to obtain more stable display of numerical value.
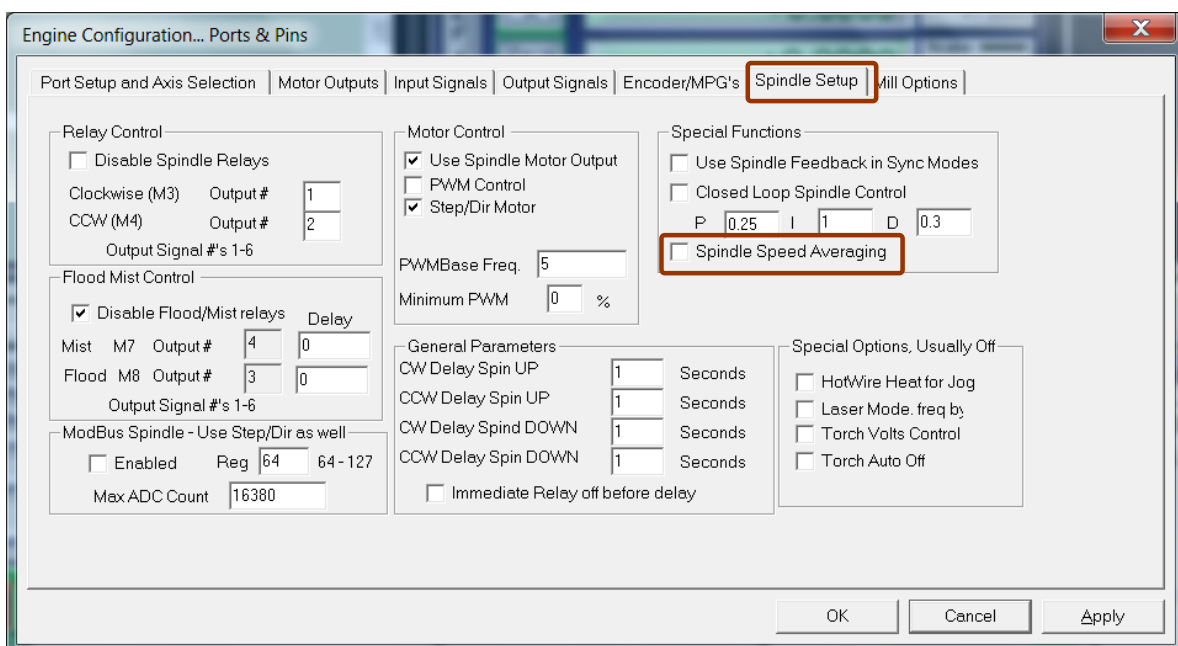
Figure 4 option for Spindle speed averaging

NOTE: If spindle is not driven directly by a motor but via transmission with some ratio other than 1:1 and if revolution sensor is located on the motor and not on spindle itself, then to enable correct spindle speed calculation, correct transmission ratio should be configured using Pulley setup dialog.

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Page 2 of 2

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