

MPG through binary inputs

Main window:

The screenshot shows the 'CNC Settings' window with the 'MPG through binary inputs' option selected in the left sidebar. The main area displays two tables for configuring MPG inputs.

MPG/Encoder through binary inputs

	Input1	Input2	Slot	Axis	Dimension	Encoder Resolution
#0	Input 8	Input 9	MPG wheel	Pendant		400
#1	Input 10	Input 11	MPG wheel	General Purpose		400
#2	Input 8	Input 9	MPG wheel	Pendant		65536
#3	Input 10	Input 11	MPG wheel	General Purpose		400

MPG/Encoder ET10 encoder inputs

	Input#	Slot	Axis	Dimension	Encoder Resolution
#4	ET10 Encoder #0	MPG wheel	X		100
#5	ET10 Encoder #0	MPG wheel	X		100
#6	ET10 Encoder #0	MPG wheel	X		100
#7	ET10 Encoder #0	MPG wheel	X		100

Basic functions:

The screenshot shows the same CNC Settings window with yellow callout boxes highlighting the basic functions for configuring MPG inputs:

- Select № of input 1**: Points to the 'Input1' column in the first table.
- Activation MPG**: Points to the checkboxes in the first table.
- Select № of input 2**: Points to the 'Input2' column in the first table.
- Select MPG type**: Points to the 'Slot' column in the first table.
- Set axis for MPG**: Points to the 'Axis' column in the first table.
- Set step in «mm» of MPG**: Points to the 'Dimension' column in the first table.
- Set resolution encoder for MPG**: Points to the 'Encoder Resolution' column in the first table.
- Save settings**: Points to the floppy disk icon in the top right.
- Select number of encoder for ET10**: Points to the 'Input#' column in the second table.
- Select MPG type**: Points to the 'Slot' column in the second table.
- Set axis for MPG**: Points to the 'Axis' column in the second table.
- Set step in «mm» of MPG**: Points to the 'Dimension' column in the second table.

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Mpg/Encoder through binary inputs

- To activate the MPG, it is necessary to check the box next to the MPG number:

MPG/Encoder through binary inputs

	Input1	Input2	Slot	Axis	Dimension	Encoder Resolution	
#0	<input checked="" type="checkbox"/>	Input 8	Input 9	MPG wheel	Pendant		400
#1	<input type="checkbox"/>	Input 10	Input 11	MPG wheel	General Purpose		400
#2	<input type="checkbox"/>	Input 8	Input 9	MPG wheel	Pendant		65536
#3	<input type="checkbox"/>	Input 10	Input 11	MPG wheel	General Purpose		400

- MPG - designed for manual control of the CNC without resorting to controlling the system from the operator panel. With the help of the control panel, the operator of the CNC machine can change the position of the axes, change the feedrate, adjust the spindle operation, set “0” and perform other operations while in close proximity to the workpiece.
- MPG examples are shown below:



- After activation, you can select the operating input numbers for the MPG on the controller - input1 and input2

input1:

MPG/Encoder through binary inputs

	Input1	Input2	Slot	Axis	Dimension	Encoder Resolution	
#0	<input checked="" type="checkbox"/>	Input 8	Input 9	MPG wheel	Pendant		400
#1	<input type="checkbox"/>	Input 0	Input 11	MPG wheel	General Purpose		400
#2	<input type="checkbox"/>	Input 1	Input 9	MPG wheel	Pendant		65536
#3	<input type="checkbox"/>	Input 2	Input 11	MPG wheel	General Purpose		400
#4	<input type="checkbox"/>	Input 3					
#5	<input type="checkbox"/>	Input 4					
#6	<input type="checkbox"/>	Input 5					
#7	<input type="checkbox"/>	Input 6					
#8	<input type="checkbox"/>	Input 7					
#9	<input type="checkbox"/>	Input 8					
#10	<input type="checkbox"/>	Input 9					

ET10 encoder inputs

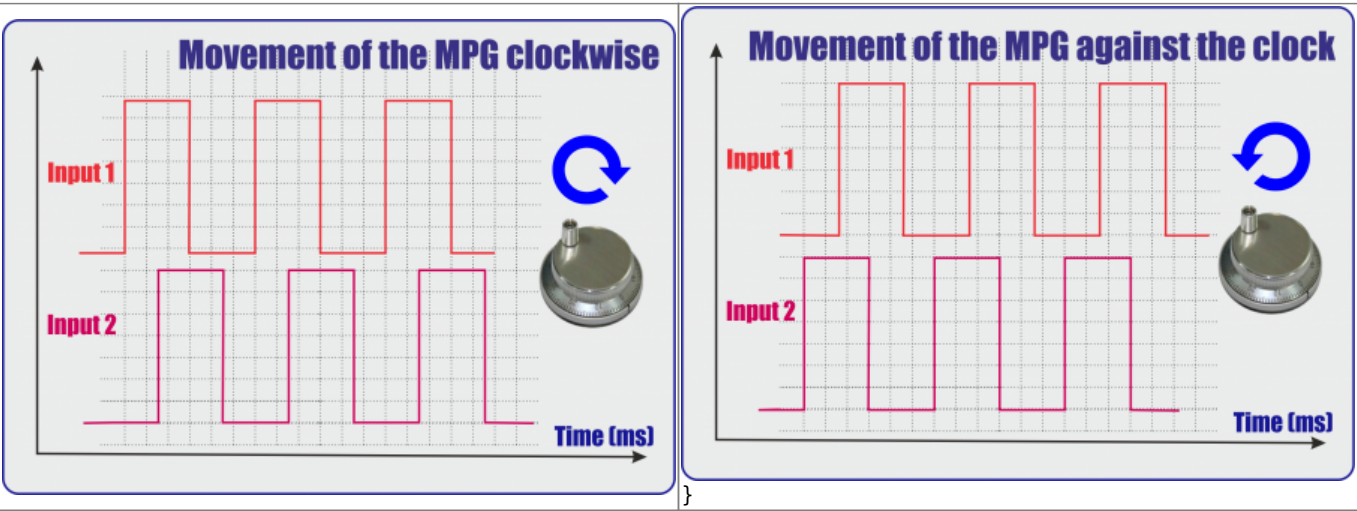
	Input#	Slot	Axis	Dimension	Encoder Resolution
#4	ET10 Encoder #0	MPG wheel	X		100

input2:

MPG/Encoder through binary inputs

	Input1	Input2	Slot	Axis	Dimension	Encoder Resolution
#0	<input checked="" type="checkbox"/> Input 8	Input 9	MPG wheel	Pendant		400
#1	<input type="checkbox"/> Input 10	Input 0	MPG wheel	General Purpose		400
#2	<input type="checkbox"/> Input 8	Input 1	MPG wheel	Pendant		65536
#3	<input type="checkbox"/> Input 10	Input 2	MPG wheel	General Purpose		400
		Input 3				
		Input 4				
		Input 5				
		Input 6				
		Input 7				
		Input 8				
		Input 9				
#4	<input type="checkbox"/> ET 10 Encoder #0		MPG wheel	X		100

- Timing diagram for the MPG signals:



- It is also necessary to select the MPG function:

MPG/Encoder through binary inputs

	Input1	Input2	Slot	Axis	Dimension	Encoder Resolution
#0	<input checked="" type="checkbox"/> Input 8	Input 9	MPG wheel	Pendant		400
#1	<input type="checkbox"/> Input 10	Input 11	MPG wheel	General Purpose		400
#2	<input type="checkbox"/> Input 8	Input 9	THC/Z axis offset	Pendant		65536
#3	<input type="checkbox"/> Input 10	Input 11	Spindle Sync	General Purpose		400

Functions	Discriptions
MPG wheel	Direct control of the MPG
THC/Z axis offset	Controlling the tracking (torch height control) while cutting with the help of an MPG
Spindle Sync	Spindle control, via the analog output to control the spindle speed.

- If necessary, select the coordinate axis, which will be controlled by the MPG

MPG/Encoder through binary inputs

	Input1	Input2	Slot	Axis	Dimension	Encoder Resolution
#0	<input checked="" type="checkbox"/> Input 8	Input 9	MPG wheel	Pendant		400
#1	<input type="checkbox"/> Input 10	Input 11	MPG wheel	X		400
#2	<input type="checkbox"/> Input 8	Input 9	MPG wheel	Y		65536
#3	<input type="checkbox"/> Input 10	Input 11	MPG wheel	Z		400

MPG/Encoder ET10 encoder inputs

Input#	Slot	Axis	Dimension	Encoder Resolution
		A		
		B		
		C		
		U		
		V		
		W		
		Pendant		

- Next we select the length of displacements with the help of an MPG. Number of movements in mm per pulse MPG. If using a software pendant approach while having selected a particular axis (for example, by using the hotkeys to switch the step size while only using the MPG wheel to control the X axis), you can enter soft into the Dimension field so that the length of displacements uses the software pendant value:

	Input1	Input2	Slot	Axis	Dimension	Encoder Resolution
#0	<input checked="" type="checkbox"/> Input 8	Input 9	MPG wheel	Pendant	0.1	400
#1	<input type="checkbox"/> Input 10	Input 11	MPG wheel	General Purpose		400

- We set the resolving power of the MPG - the number of pulses per one revolution of the MPG

MPG/Encoder through binary inputs

	Input1	Input2	Slot	Axis	Dimension	Encoder Resolution
#0	<input checked="" type="checkbox"/> Input 8	Input 9	MPG wheel	Pendant	0.1	401

NOTE: The ET7 controller has two encoder slot reserved for the ET7 keyboard panel. These are permanently assigned to inputs #16, 17, 18, and 19, and cannot be changed despite editing the Config window (the preset cannot be overridden). If encoder input slots are to be used on the ET7 board, the latter two slots (2 and 3) should be used. This preset is not present on the ET6/ET10/ET15 boards where encoder slots 0-3 can all be used.

ET10 MPG connection through encoder inputs

If you use the [ET10 controller](#), you can utilize the dedicated encoder inputs instead of connecting the MPG wheel to the binary inputs of this controller. In this way, it is not necessary to specify two binary inputs but rather one specific encoder input.

MPG on Fast Encoder inputs (ET7/ET10/ET15)				
	Input#	Slot	Axis	Dimension
#4 <input checked="" type="checkbox"/>	Encoder#0	MPG wheel	X	1
#5 <input type="checkbox"/>	Encoder#4	MPG wheel	X	
#6 <input type="checkbox"/>	Encoder#0	MPG wheel	X	
#7 <input type="checkbox"/>	Encoder#0	MPG wheel	X	

- To activate the MPG or Encoder, it is necessary to check the box next to required MPG/encoder number
- After activation, you can select the encoder number on the controller for to specify which encoder will be operated
- It is also necessary to select the MPG function (MPG wheel/THC/Spindle Sync):

Functions	Discriptions
MPG wheel	Direct control of MPG
THC/Z axis offset	Controlling the tracking (THC) while cutting with the help of an MPG
Spindle Sync	Spindle control, via the analog output to control the spindle speed.

- If necessary, select the coordinate axis which will be controlled by MPG. This will allow to move the machine along that axis when the MPG wheel is turned.
- Next we select the length of displacements with the help of MPG. This specifies the length of each movement per one click of the MPG wheel (turning by one mark). *Note that this number is IGNORED when using the Pendant option - the software value will be chosen instead:*
 - If using a software pendant approach while having selected a particular axis (for example, by using the hotkeys to switch the step size while only using the MPG wheel to control the X axis), you can enter soft into the Dimension field so that the length of displacements uses the software pendant value.

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MPG/Encoder through binary inputs

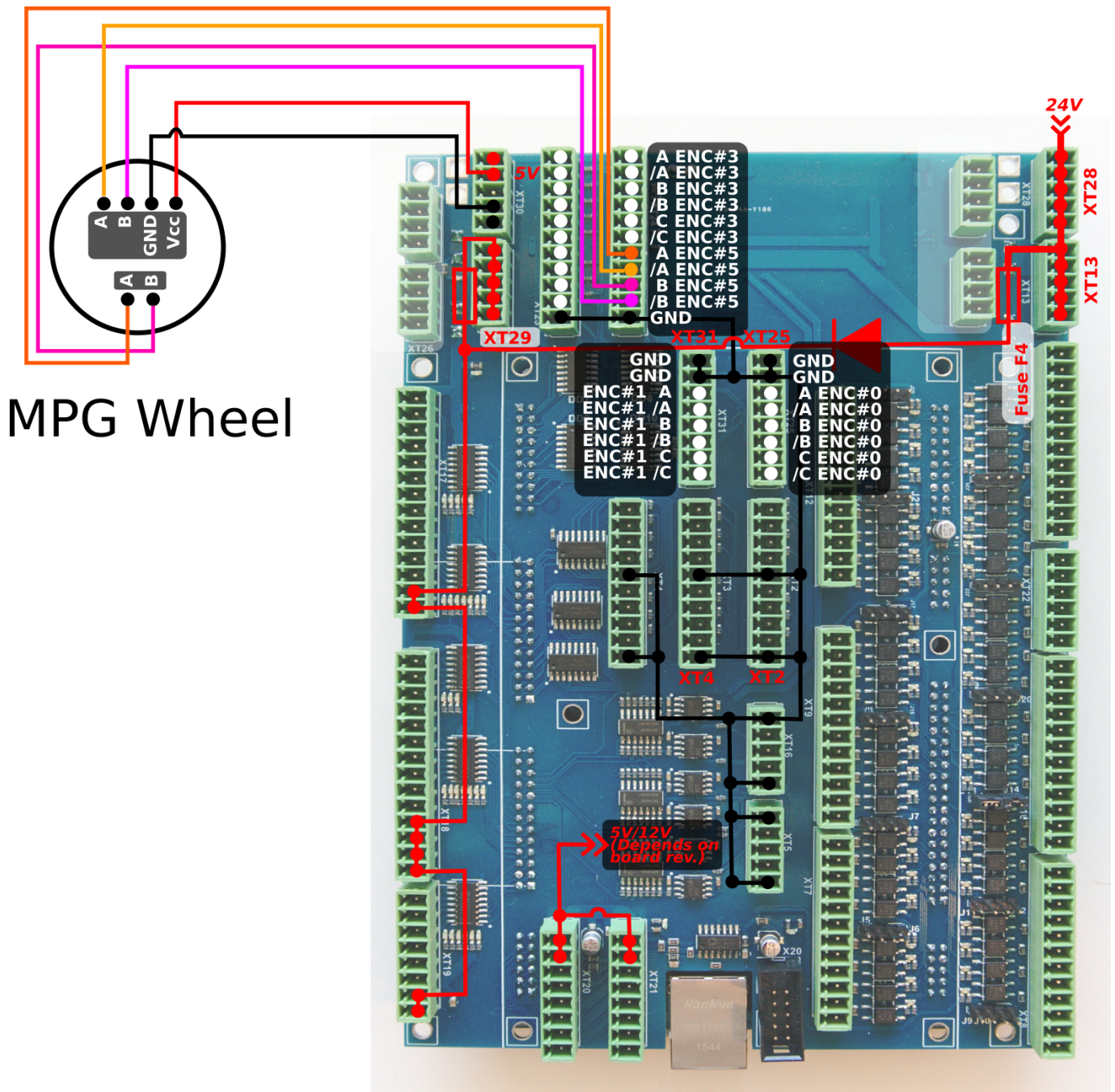
	Input1	Input2	Slot	Axis	Dimension	Encoder Resolution
#0 <input type="checkbox"/>	16	17	MPG wheel	General Purpose		400
#1 <input type="checkbox"/>	18	19	MPG wheel	General Purpose		400
#2 <input type="checkbox"/>	16	17	MPG wheel	Pendant		65536
#3 <input type="checkbox"/>	18	19	MPG wheel	General Purpose		400

MPG on Fast Encoder inputs (ET7/ET10/ET15)

	Input#	Slot	Axis	Dimension
#4 <input checked="" type="checkbox"/>	Encoder#3	MPG wheel	X	soft
#5 <input type="checkbox"/>	Encoder#4	MPG wheel	X	
#6 <input type="checkbox"/>	Encoder#0	MPG wheel	X	
#7 <input type="checkbox"/>	Encoder#0	MPG wheel	X	

- The encoder resolution is hard-coded to be 65536 (as of November 2019).

The diagram below shows an example of an MPG wheel connection to the ET10 controller (in this example, the MPG wheel is connected to the encoder input #5):

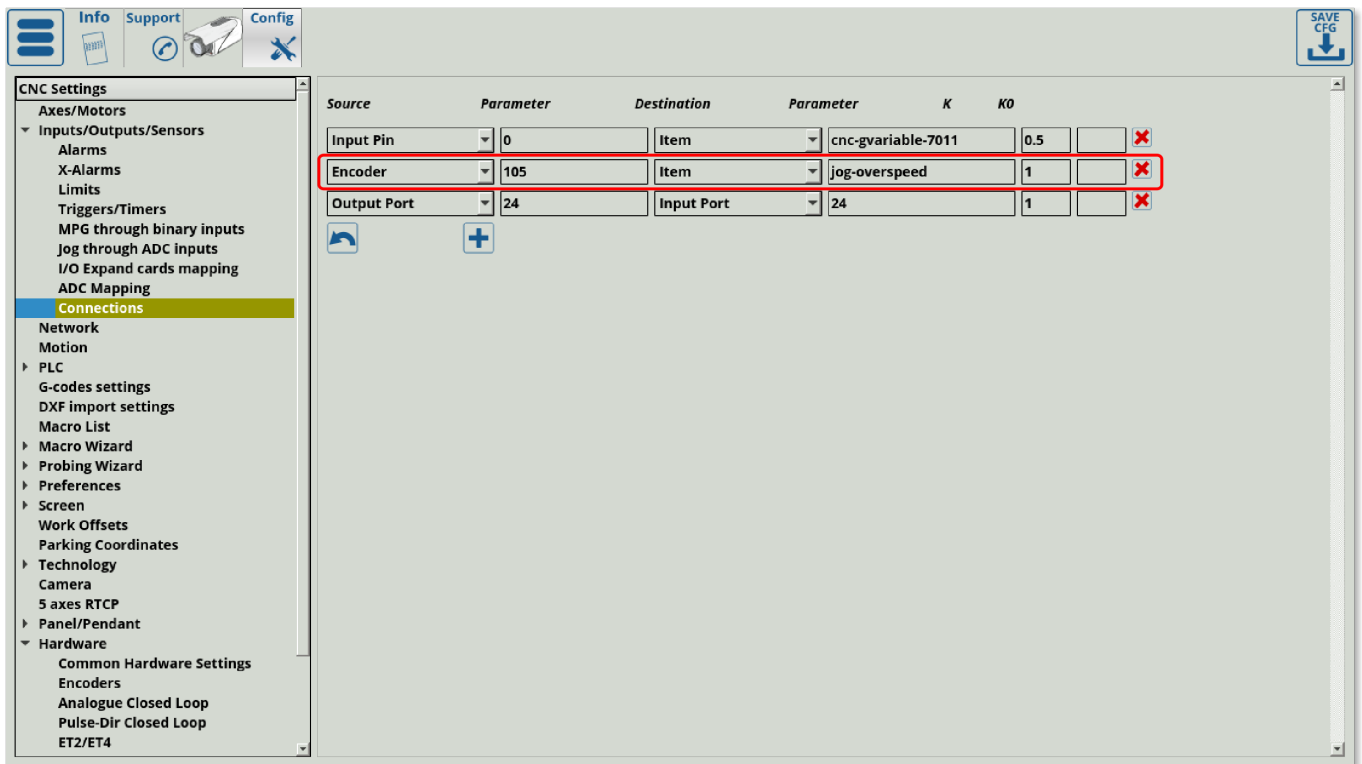


As already mentioned, axis jog control can be set up directly from the *MPG through binary inputs* settings window. In order to set up this encoder to change some values within the software (such as jog overspeed, motion overspeed, etc), the user can go into Settings > Config > Inputs/Outputs/Sensors > Connections, and add a new connection or edit an existing one.

- In the **Source** field, select Encoder.
- For the **parameter**, type in some parameter 100-112 for fast encoders (0-16 is reserved for slow encoders). In order to check which particular encoder is used, the user can go into Settings > Config > Hardware > Encoders and note which encoder value changes as the MPG wheel is being turned. For example, for fast encoder #5, parameter 105 will be chosen.
- For **destination**, select Item.

- For **destination parameter**, input the parameter you require (for example, jog-overspeed)
- Set K to 1, leave K0 blank.

The settings window should then look similar to this:



This will allow the operator to use the MPG wheel connected to the encoder inputs to change a number of myCNC parameters of the fly by simply turning the MPG wheel handle.

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Permanent link:
http://cnc42.com/mycnc/mpg_through_binary_inputs

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