# **MPG through binary inputs**

#### Main window:

<u> </u>	SYS PLC	SUPPORT	CEG							•
Q	SYS PLC CFG ?=.		2							<b>V</b>
	CNC Settings		MPG/Encoder t	hrough hige	ry inputs					
	Axes/Motors		Input1	Input2	Slot		Axis	Dimension	Encod	
	Network Motion								Resolut	
	Hardware PLC	#0 [	Input 8 🔻	Input 9 🔻	MPG wheel	*	Pendant		400	
	Software PLC	#1 [	🖺 Input 10 🔻	Input 11 🔻	MPG wheel	¥.	General Purpose 🔻		400	
	G-codes settings	#2 [	Input 8 🔻	Input 9 🔻	MPG wheel	•	Pendant -	•	65536	×
	DXF import settings		✓ Input 10 ▼	_			General Purpose			
	Macro List Macro Wizard		MPG/Encoder	1			General Pulpose		400	<b>X</b>
5	Probing Wizard						2.2	1201.00	Encod	ler
C.	Preferences		Inp	ut#	Slot		Axis	Dimension	Resolut	
	Screen Work Offsets	#4 [	ET 10 En	ncoder#0 🔻	MPG wheel	*	X *		100	
20	Parking Coordinates	#5 [	ET 10 En	coder#0 🔻	MPG wheel	-	X -		100	<u>A</u>
	Inputs/Outputs/Sensors	#6 [	ET 10 En	coder#0 👻	MPG wheel	-	x -		100	
	Alarms									
	Limits	#7 [	ET 10 En	ncoder#0 🔻	MPG wheel	Ψ	X		100	
all	MPG through binary inputs	3								
•	Jog through ADC inputs									
	I/O Expand cards mapping									
	ADC Mapping Connections									
	Technology									
	Camera									
	5 axes RTCP Panel/Pendant									
	<ul> <li>Panel/Pendant</li> <li>Hardware</li> </ul>									
	Advanced									
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Daria	functions									
Basic	functions:									
Ô	SYS PLC CFG	SUPPORT	CFG	Select	t No S	elec	t Set	axis		et step Set resolution
NO.			1 2	of inp		PG ty				encoder for MPG
		elect No								
1	CNC Settings		MPG/Encoder t	hrough bina	ry inputs		./		/	
	AXES/IVIOLOIS		Input1	Input2	Slot		Axis	Dimension	Berch	
	Network Motion	#0 [							Resoluti	Save
	Hardware PLC			Input 9 🔻	MPG wheel		Pendant 💌		400	
*	Software PLC	#1		Input 11 🔻	MPG wheel	Υ.	General Purpose 🔻		400	🖻 / settings
	G-codes settings	#2 [	🗸 Input 8 🔻	Input 9 💌	MPG wheel	•	Pendant 🔻		65536	
	Macro List	vation #3 🛛	Input 10 🔻	Input 11 🔻	MPG wheel	-	General Purpose 🔻		400	
	Macro Wizard		MPG/Encoder		er inputs				_	
Tom	P Trobing made		Inp	ut#	Slot		Axis	Dimension	Encode	
5	Preferences     Screen		100 A					1	Resoluti	
50	Work Offsets	#4 [		coder#0 🔻	MPG wheel		× •		100	
	Parking Coordinates	#5 [		coder#0 🔻	MPG wheel	Ψ.	х -		100	
	<ul> <li>Inputs/Outputs/Sensors</li> <li>Alarms</li> </ul>	#6 [	ET 10 En	coder#0 👻	MPG wheel	-	х –		100	
	Limits	#7 [	ET 10 En	coder#0 🔻	MPG wheel	*	X +		100	★
	Triggers/Timers									
ull fin.	MPG through binary inputs	3	/		1		1	1		
	Jog through ADC inputs I/O Expand cards mapping							/		
	ADC Mapping									
	Connections			_					1	
	D Technology Camera	Select number of			Select		Set axis		et sta	ep
					JUUUUL		901 9112			

**MPG type** 

**Set axis** 

for MPG

in «mm»

of MPG

**Select number of** 

encoder for ET10

Camera 5 axes RTCP Panel/Pendant Hardware Advanced

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## Mpg/Encoder throught 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 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 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

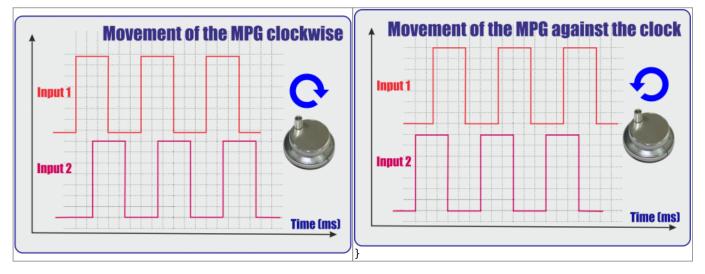
input1:

	Input	1	Input2	Input2 Slot		Axis		Dimension	Encod Resolut		
#0 🔽	Input 8	•	Input 9	•	MPG wheel	•	Pendant	•		400	*
#1 🔲	Input 0 Input 1	-	Input 11	¥	MPG wheel	Ŧ	General Purpose	¥		400	A
#2 🕅	Input 2 Input 3	-	Input 9	-	MPG wheel	7	Pendant	7		65536	×
#3 🕅	Input 4 Input 5		Input 11	*	MPG wheel	w.	General Purpose	-		400	×
M	Input 6 Input 7		ET10 enco	ode	r inputs						
	Input 8 Input 9	-	ut#		Slot		Axis		Dimension	Encod Resolut	
#4 🕅	ET	10 Er	ncoder #0	*	MPG wheel	Ŧ	X	*		100	A V

### input2:

M	PG/Encod		hrough b		<b>ry inputs</b> Slot		Axis		Dimension	Enco	
in the second										Resolution	
#0 🔽	Input 8	•	Input 9		MPG wheel	•	Pendant	•		400	*
#1 🕅	Input 10	*	Input 0 Input 1	Â	MPG wheel	*	General Purpose	*		400	* *
#2 🕅	Input 8	*	Input 2 Input 3		MPG wheel	*	Pendant	٣		65536	5 1
#3 🕅	Input 10		Input 4 Input 5		MPG wheel	*	General Purpose	-		400	×
٨	1PG/Enco	Inp	Input /	Ŧ	<i>r inputs</i> Slot		Axis		Dimension	Enco	-
#4 🕅	ET	10 Er	icoder#0	Ŧ	MPG wheel	-	X	*		100	A. V

• Timing diagram for the MPG signals:



• It is also necessary to select the MPG function:

	MP	G/Encod	ler t	hrough b	inar	y inputs							
		Input1		Input2		Slot		Axis		Dimension	Encoo Resolu		
#0		Input 8	•	Input 9	•	MPG wheel	•	Pendant	•		400	*	
#1		Input 10	*	[Input 11	7	MPG wheel THC/Z axis offset		General Purpose	*		400	(A) (V)	
#2		Input 8	-	Input 9	*	Spindle Sync MPG wheel	-	Pendant	*		65536		
#3		Input 10	•	Input 11	*	MPG wheel	-	General Purpose	-		400		
Functions		Discrij	pti	ons									
MPG wheel		Direct	con	trol of t	ne	MPG							
THC/Z axis off	fset	Contro	llin	g the tra	icki	ng (torch heig	ht c	ontrol) while	cut	ting with	the h	elp of a	n 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

	Input1	Input2	Slot		Axis	Dimension	Encoder Resolution
#0 🔽	Input 8 🔻	Input 9 🔻	MPG wheel		Pendant	-	400 🚔
#1 🕅	Input 10 💌	[Input 11 💌	MPG wheel	<b>T</b>	X Y		400
#2 🕅	Input 8 🔻	Input 9 🔻	MPG wheel	-	Z A		65536 🗳
#3 🕅	Input 10 💌	Input 11 🔻	MPG wheel		B C		400
M	IPG/Encoder	ET10 encode	r inputs		U V		
	Inp	ut#	Slot		W Pendant	Dimension	Encoder Resolution

 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 8	Input 9 🔻	MPG wheel	▼ Pendant ▼	0.1	400 🚖
#1 🕅	Toput 10		MDG wheel	* General Durnoce *	11	400

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

MPG/Encoder t	hrough binar	y inputs					
Input1	Input2	Slot		Axis		Dimension	Encoder Resolution
#0 📝 [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 🗹	Encoder#0 💌	MPG wheel	x •	1									
#5	Encoder#4 💌	MPG wheel	x •										
#6	Encoder#0 🔻	MPG wheel	x •										
#7	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):

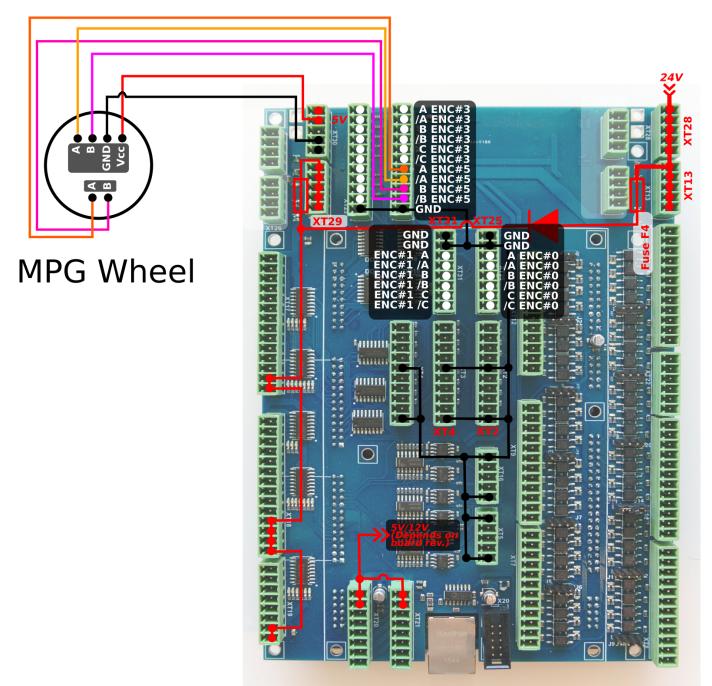
Functions	Discriptions
MPG wheel	Direct control of MPG
THC/Z axis offset	Controlling the tracking (THC) while cutting with the help of an MPG
Spindle Sync	Spindle control, via the analog output to control the spindle speed.

- 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.

SYS PLC Log	Config I	Info Support C	amera Config				
CNC Settings	MF	G/Encoder through b	inary inputs				
Axes/Motors		· ·				Encoder	
<ul> <li>Inputs/Outputs/Sensors</li> </ul>		Input1 Input2	Slot	Axis	Dimension	Resolution	
Alarms X-Alarms	#0	16 🗘 17 📫	MPG wheel 👻	General Purpose 🔻		400 🜲	
Limits							
Triggers/Timers	#1 🔲 '	18 🜩 19 📫	MPG wheel 👻	General Purpose 🔻		400 🜲	
MPG through binary inputs	#2	16 🗘 17 🗳	MPG wheel	Pendant 💌		65536 🛓	
Jog through ADC inputs							
I/O Expand cards mapping	#3	18 🌲 19 🚅	MPG wheel 🔻	General Purpose 🔻		400 🜲	
ADC Mapping	MPG o	n Fast Encoder inputs	(ET7/ET10/ET15)				
Connections		Input#	Slot	Axis	Dimension		
Network Motion	#4 🟹		MPG wheel	x -	soft		
	#4 💌						
G-codes settings	#5	Encoder#4	MPG wheel	X 👻			
DXF import settings	#6	Encoder#0	MPG wheel	x			
Macro List							
Macro Wizard	#7 🔲	Encoder#0	MPG wheel 👻	x -			
Probing Wizard							
Preferences							
<ul> <li>Screen</li> <li>Work Offsets</li> </ul>							
Parking Coordinates							
Technology							
Camera							
5 axes RTCP							
Panel/Pendant							
▶ Hardware							
Advanced							

• 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 in 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:

Info Support Config X							
CNC Settings	Source Pa	rameter De	stination Para	meter K KO			<u> </u>
<ul> <li>Inputs/Outputs/Sensors</li> <li>Alarms</li> </ul>	Input Pin 💌	0	Item 👻	cnc-gvariable-7011	0.5	×	
X-Alarms Limits	Encoder 💌	105	Item 💌	jog-overspeed	1	×	
Triggers/Timers	Output Port 👻	24	Input Port 👻	24	1	×	
MPG through binary inputs Jog through ADC inputs	<b>&gt;</b> +						
I/O Expand cards mapping ADC Mapping							
Connections Network							
Motion							
▶ PLC							
G-codes settings							
DXF import settings							
Macro List							
Macro Wizard							
Probing Wizard							
Preferences							
▶ Screen							
Work Offsets							
Parking Coordinates <ul> <li>Technology</li> </ul>							
Camera							
5 axes RTCP							
Panel/Pendant							
▼ Hardware							
Common Hardware Settings							
Encoders							
Analogue Closed Loop							
Pulse-Dir Closed Loop							
ET2/ET4							¥

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.

From: http://docs.pv-automation.com/ - myCNC Online Documentation

Permanent link: http://docs.pv-automation.com/mycnc/mpg\_through\_binary\_inputs



