

## Rotary encoder connection and setup

There are 2 types of rotary encoders widely used in Pendants and operator panels -

- Simple rotary encoder based on 2 switches. This type of encoders usually generate 10-40 pulses per revolution (PPR) and used as fancy style “endless multi-turn potentiometer”.

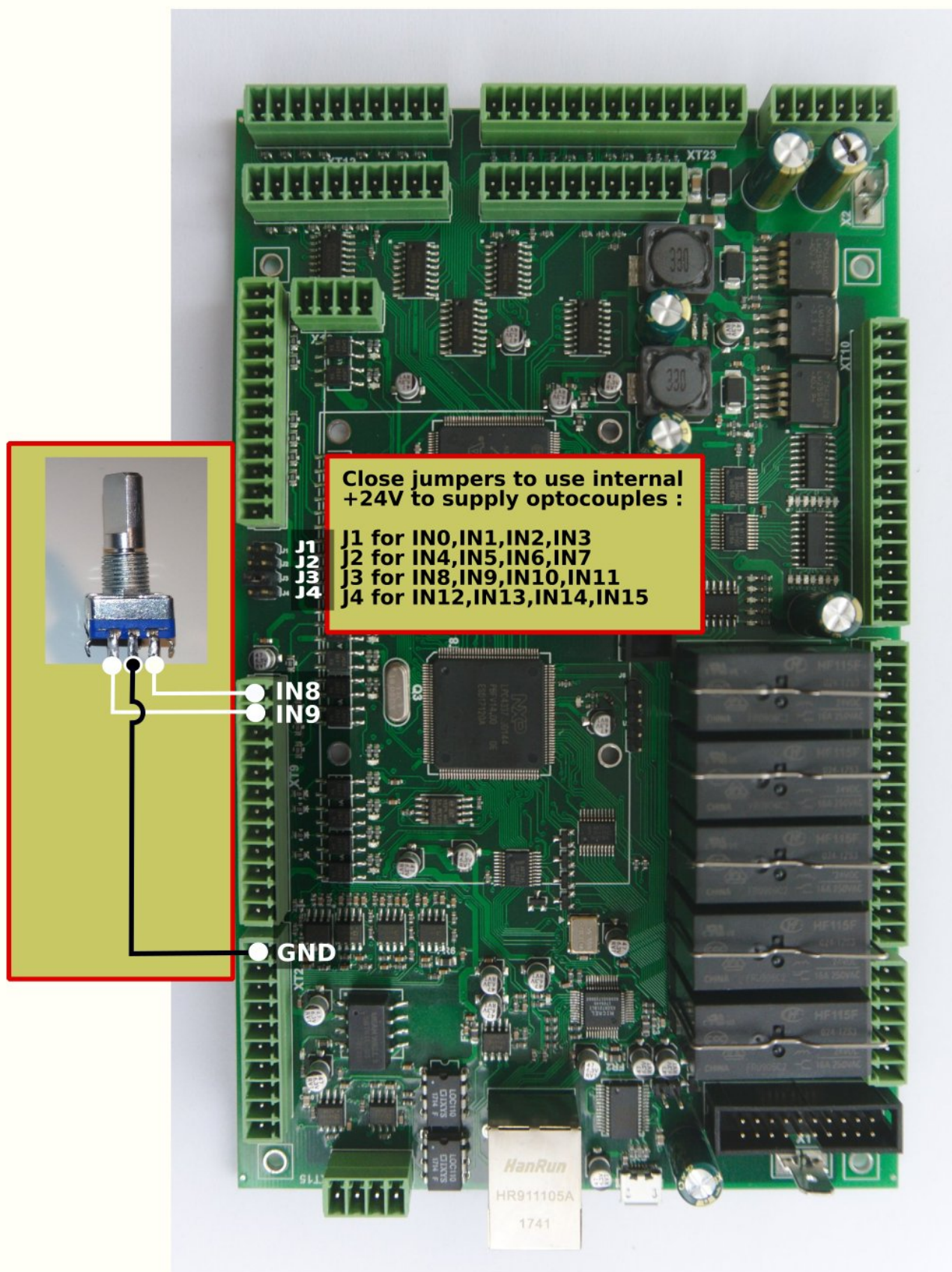


- Industrial style MPG with 100ppr and line driver 5V output 

Both types can be connected to myCNC controller and used in operator control panel.

### EN11 rotary encoder connection

Encoders can be connected to galvanic isolated binary inputs. 2 Inputs are used to connect each encoder.



Encoder should be setup in **Cfg→Inputs/Sensors→MPG through binary inputs** configuration dialog.

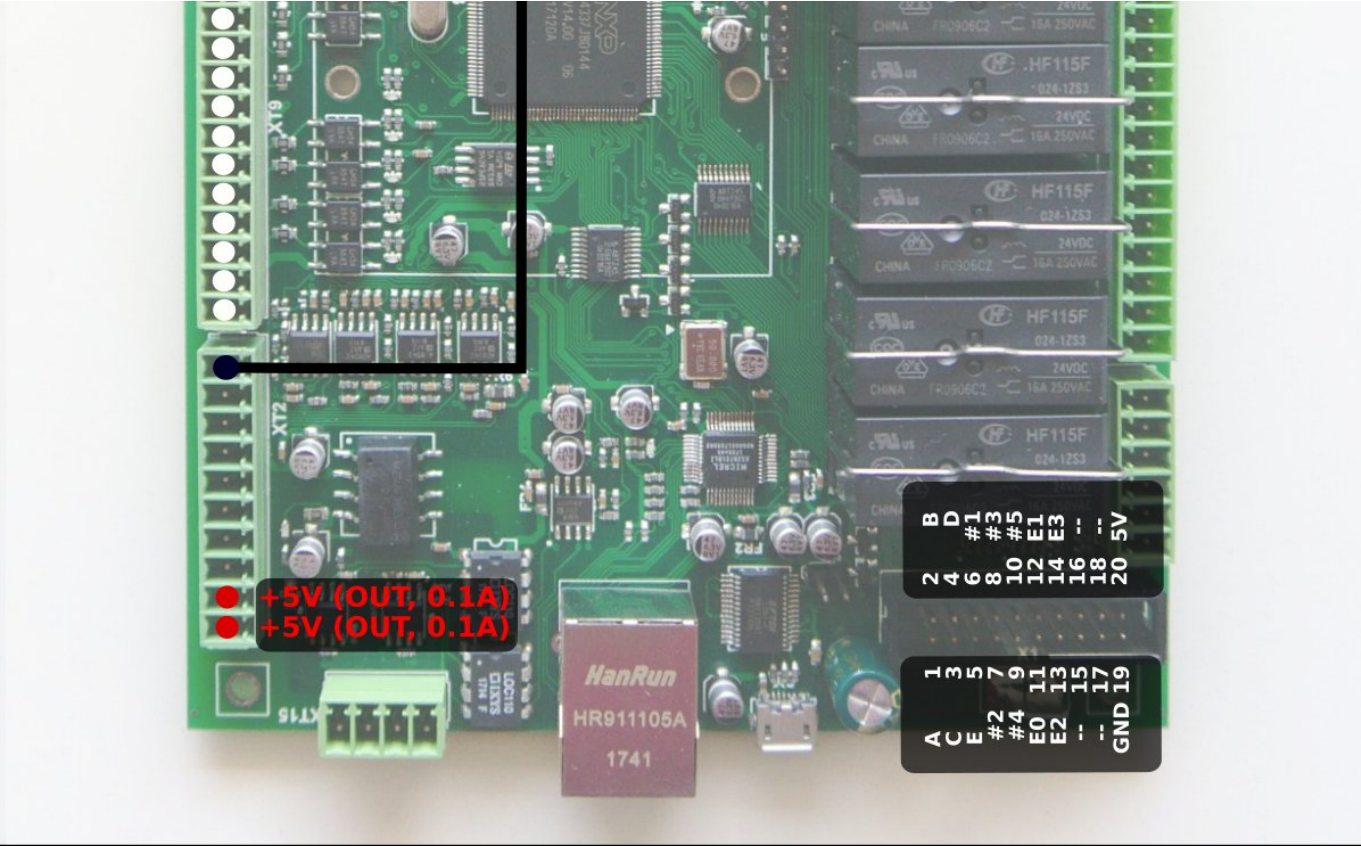
myCNC controllers support up to 4 software encoders defined through binary inputs.

ET7 controller slow encoders setup

However myCNC-ET7 control board has 2 encoders (Encoder #0, #1) defined permanently. These encoders are supposed to be installed on ET7-Key keyboard panel and connected to the 20-pin X4 connector on ET7 control board. It's possible to use external encoders without ET7-key panel board and connect it directly to X4 pins 11,12,13,14 and 19. See the table below.

ET7 connector X4 pinout table

X4 connector to External 25-keys keyboard		
Pin#	Name	Comments
11	E#0	Binary input #16, En#0 A
12	E#1	Binary input #17, En#0 B
13	E#2	Binary input #18, En#1 A
14	E#3	Binary input #19, En#1 B
19	GND	

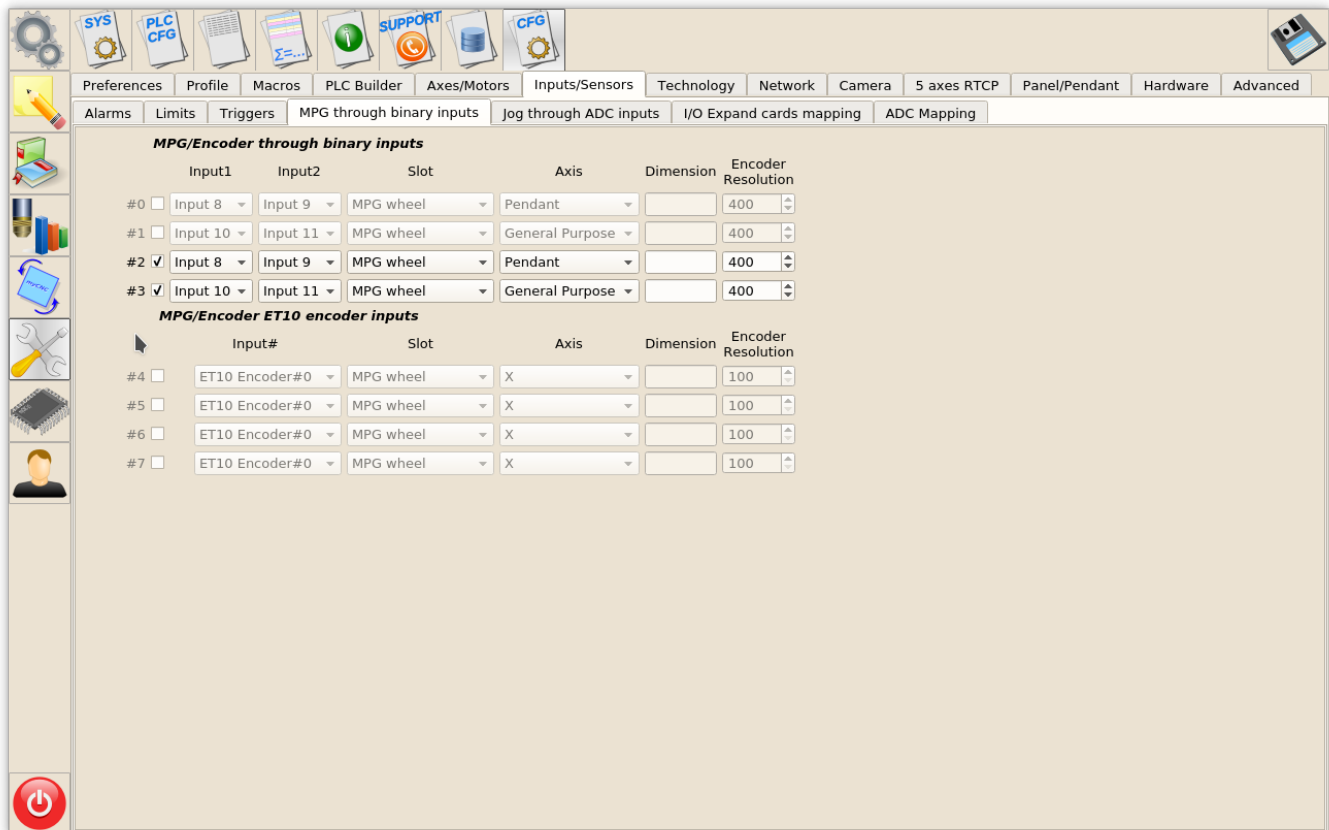


These pins are actually Binary inputs #16, #17, #18, #19 which are permanently configured as Encoder#0 and Encoder#1 in myCNC-ET7 controller firmware. This is the reason Slow Encoders #0, #1 configuration for ET7 controller in myCNC software is ignored and can be skipped. However, Encoder #2, Encoder#3 can be attached to any or binary inputs and configured accordingly.

For all other control boards ET6, ET10, ET15 all slow encoders configuration #0 - #3 is active and can be used by users.

Rotary encoders setup example is shown on a picture below





There are 2 encoders attached on Inputs #8,9,10,11 and set up in the dialog.

- Encoder #2 is attached to inputs #8 and #9 and used as a Pendant MPG/Wheel.
- Encoder #3 is attached to inputs #10 and #11 and used as a general purpose encoder.

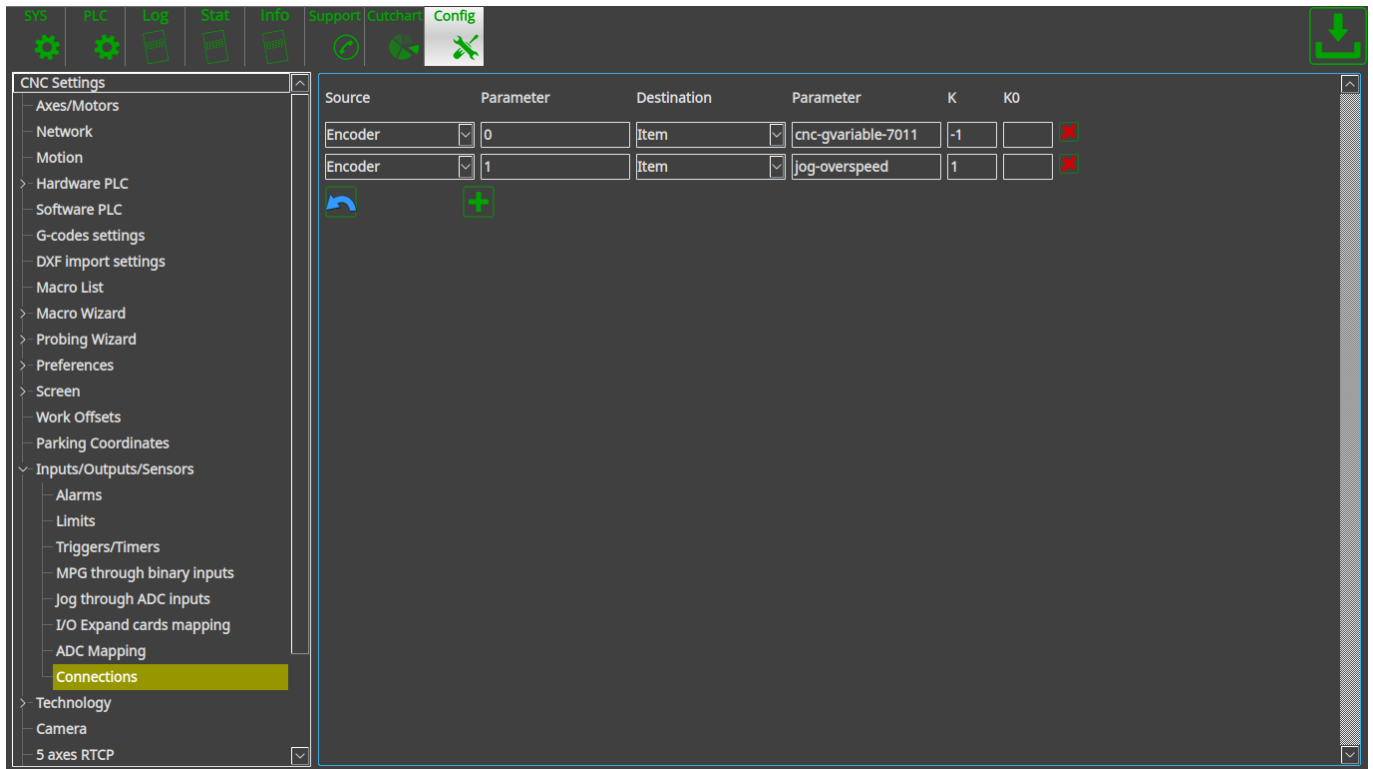
For ET7 controller Encoders #0, #1 connected to X4 connector pins 11-14 (or through ET7-KEY keyboard) are configured despite on disabled settings.

## Encoder connection setup through configuration dialog.

A general purpose encoder can be connected to one of the system variables for convenient control.

There is configuration dialog to set up connection between slow encoder values and CNC parameters.

- Source - a source of connection - can be Encoder, ADC, input/output pin, PWM, a global variable or other parameters
- Source/Parameter - address of the source. It can be Encoder number, input pin number, global variable address etc
- Destination - destination connection
- Destination/Parameter - destination address
- K - destination ratio. For example, Spindle speed will be increased 100RPM every encoder clicks if "K=100".



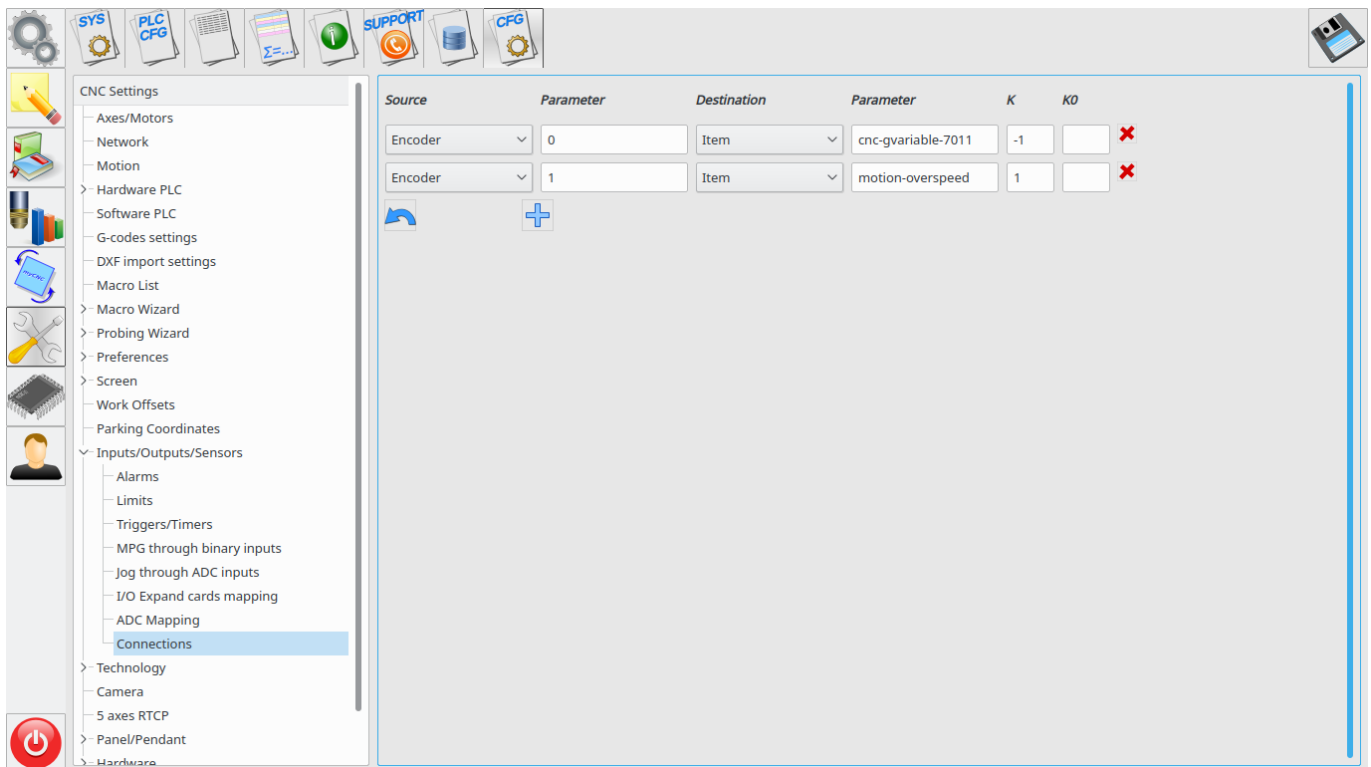
On-panel rotary encoders mostly used to control on-the-fly

- Overspeed [%]
- THC Arc reference voltage [V] (actually cutting height)
- Spindle speed

A rotary encoder should be connected to XML configuration Item “motion-overspeed” to control Overspeed [%]

Global variable register 7011 is used to change on-the-fly Cutting height (THC Arc reference voltage)

To change Spindle speed XML Item “spindle-default-speed” can be used.



Name	Destination type	Parameter
Overspeed [%]	Item	motion-overspeed
THC Arc voltage reference	Item	cnc-gvariable-7011
Spindle Speed	Item	spindle-default-speed

## Obsolete method to establish connection through "cnc-variables.xml" configuration file.

(this method was used before the dialog described above was issued)

The connection assignment can be written directly in cnc-variables.xml configuration file . For example

```
<value name="cnc-connection-item-002"
source="encoder:3"
dest="item:motion-overspeed" >0</value>
```

- **source="encoder:3"** - encoder #3 defined as a source
- **dest="item:motion-overspeed"** - **motion-overspeed** defined as destination

Encoder #3 connected to **motion-overspeed** variable. Overspeed (%) value will be changed by rotating the encoder.


```
<value name="cnc-connection-item-003"
source="encoder:2"
dest="item:cnc-gvariable-7012">0</value>
```

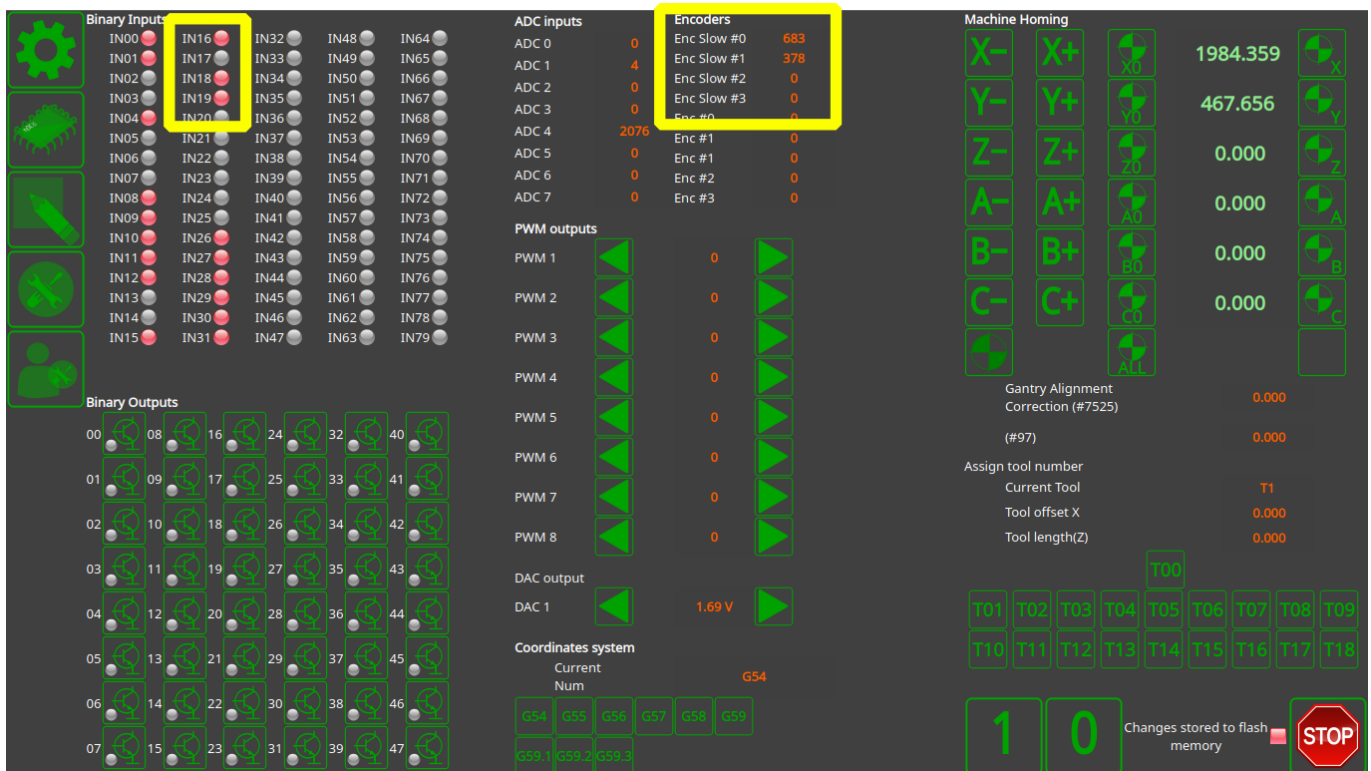
- **source="encoder:2"** - encoder #2 defined as a source

- **dest="item:cnc-gvariable-7012"** - Global variable for THC Arc Voltage Adjustment value is a destination for the connection

Encoder #2 connected to THC Arc voltage adjustment. Adjustment Arc value will be changed "+1" or "-1" every encoder click.

## Encoder connection troubleshooting

1. Goto Diagnose widget and check binary input pins the encoder attached to are blinking while you turn the encoder. There are input pins #18, #19 on a picture 
2. Check "Slow Encoder" value are changed while you turn the encoder.
3. Check Destination item value is changed while you turn the encoder.





## Video

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

Permanent link:  
[http://docs.pv-automation.com/mycnc/rotary\\_encoder\\_connection\\_and\\_setup?rev=1536371980](http://docs.pv-automation.com/mycnc/rotary_encoder_connection_and_setup?rev=1536371980)

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