Rotary encoder connection and setup

There are 2 types or 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".
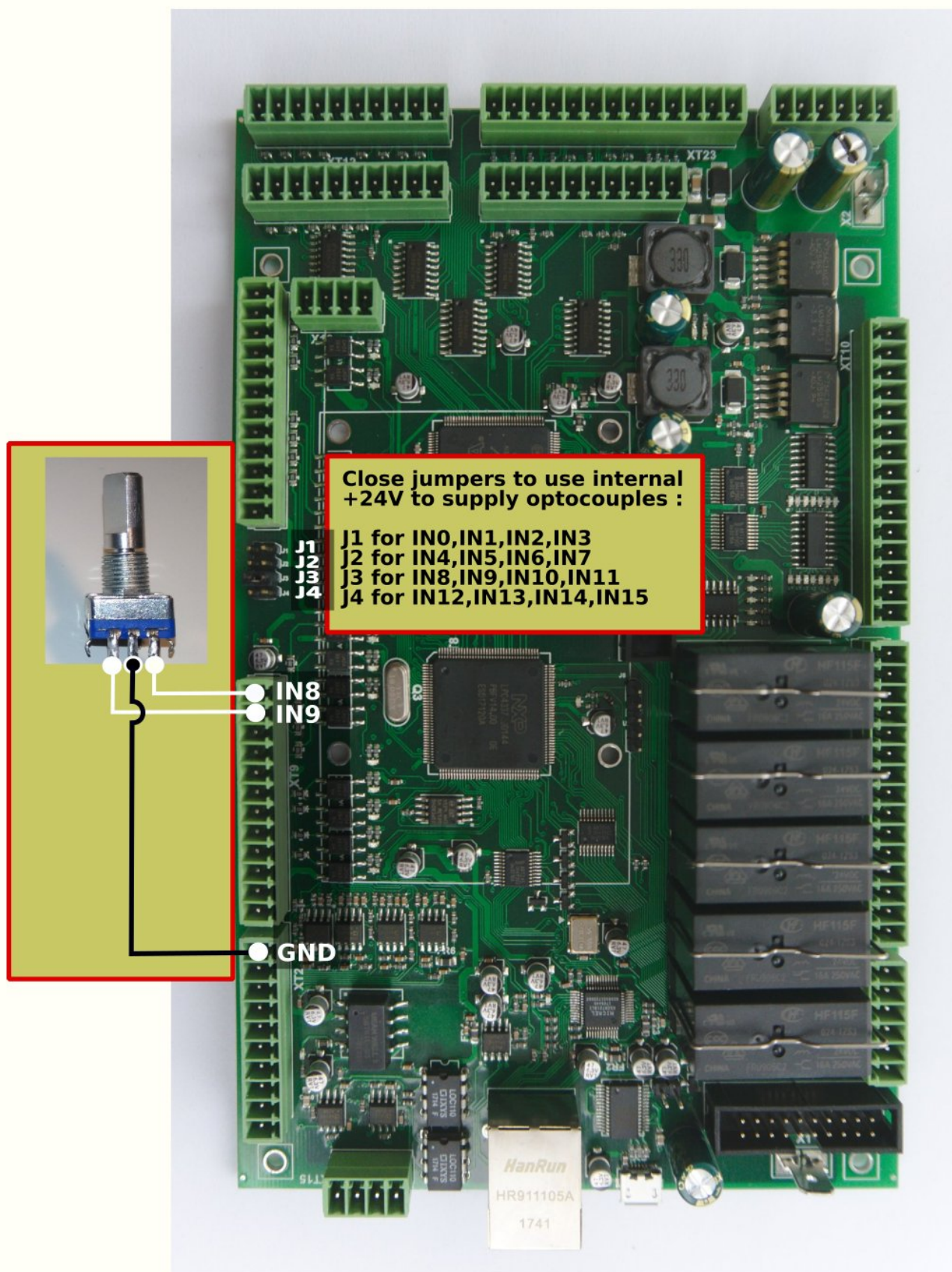
- Industrial style MPG with 100ppr and line driver 5V output

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	
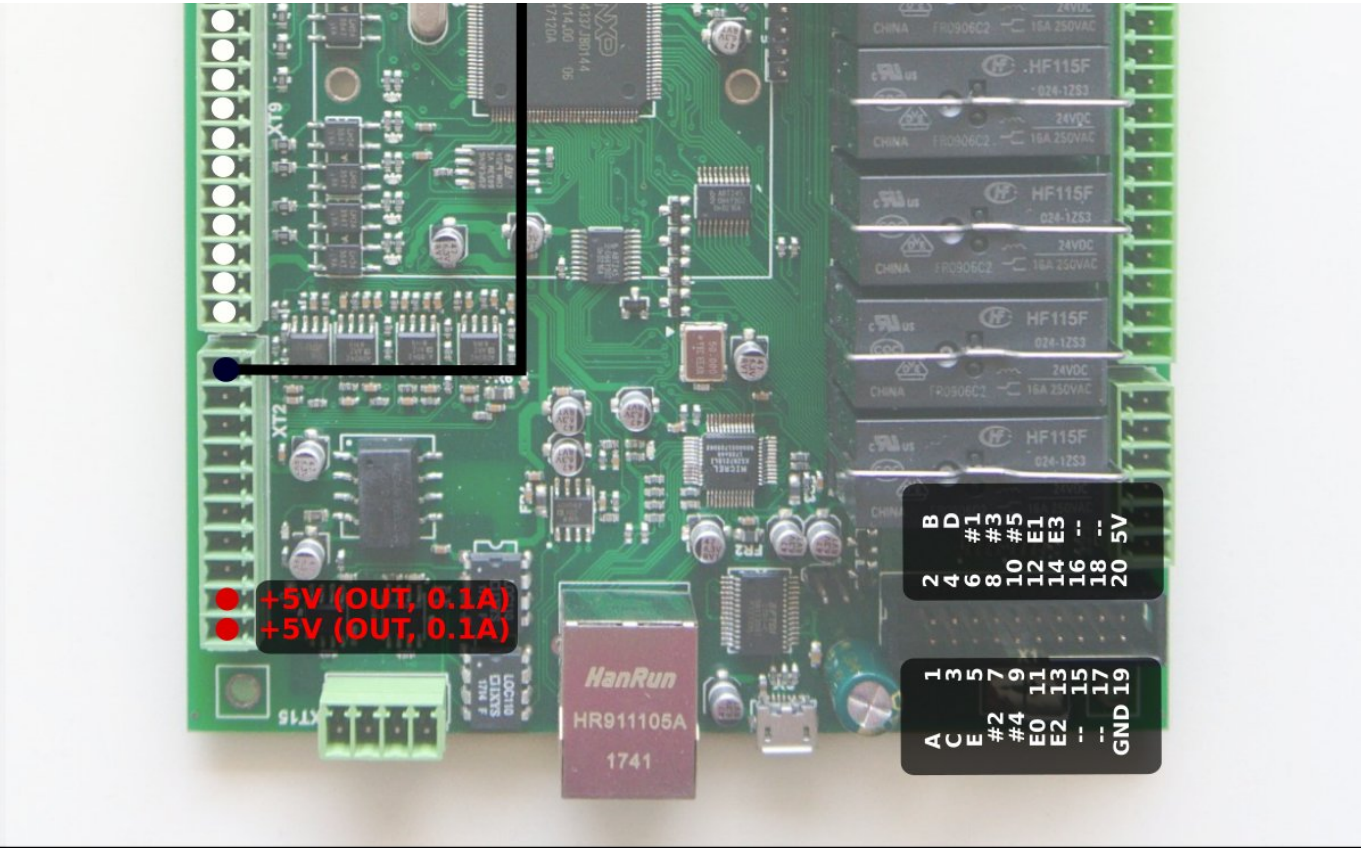
These pins are actually Binary inputs #16, #17, #18, #19 which are permanently configured as Encoder#0 and Encoder#1 in myCNC-ET7 controller firmware. This is the reason Slow Encoders #0, #1 configuration for ET7 controller in myCNC software is ignored and can be skipped. However, Encoder #2, Encoder#3 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
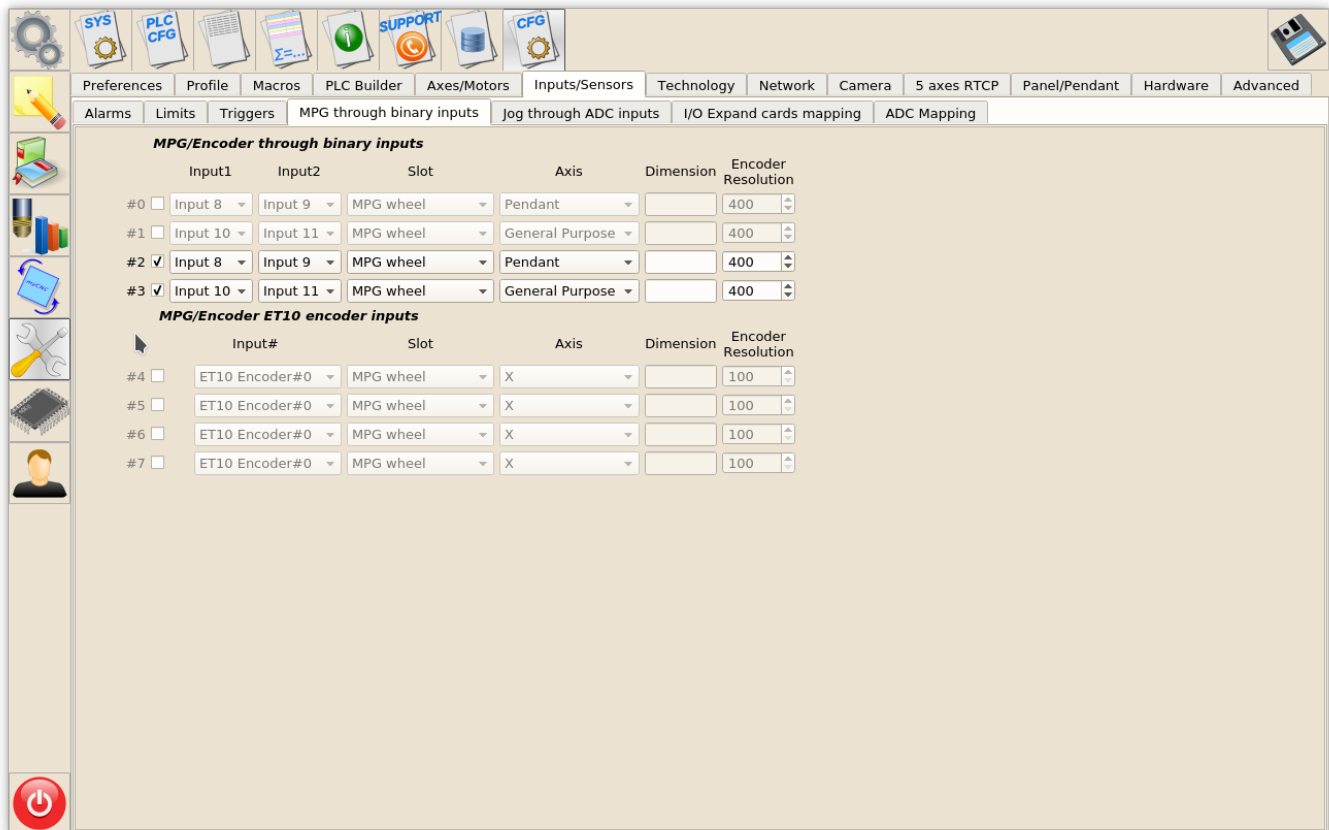
There are 2 encoders attached on Inputs #8,9,10,11 and set up in the dialog.

- 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 - source of connection - can be Encoder, ADC, input/output pin, PWM, global variable or other parameters
- Source/Parameter - address of 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 click if "K=100".
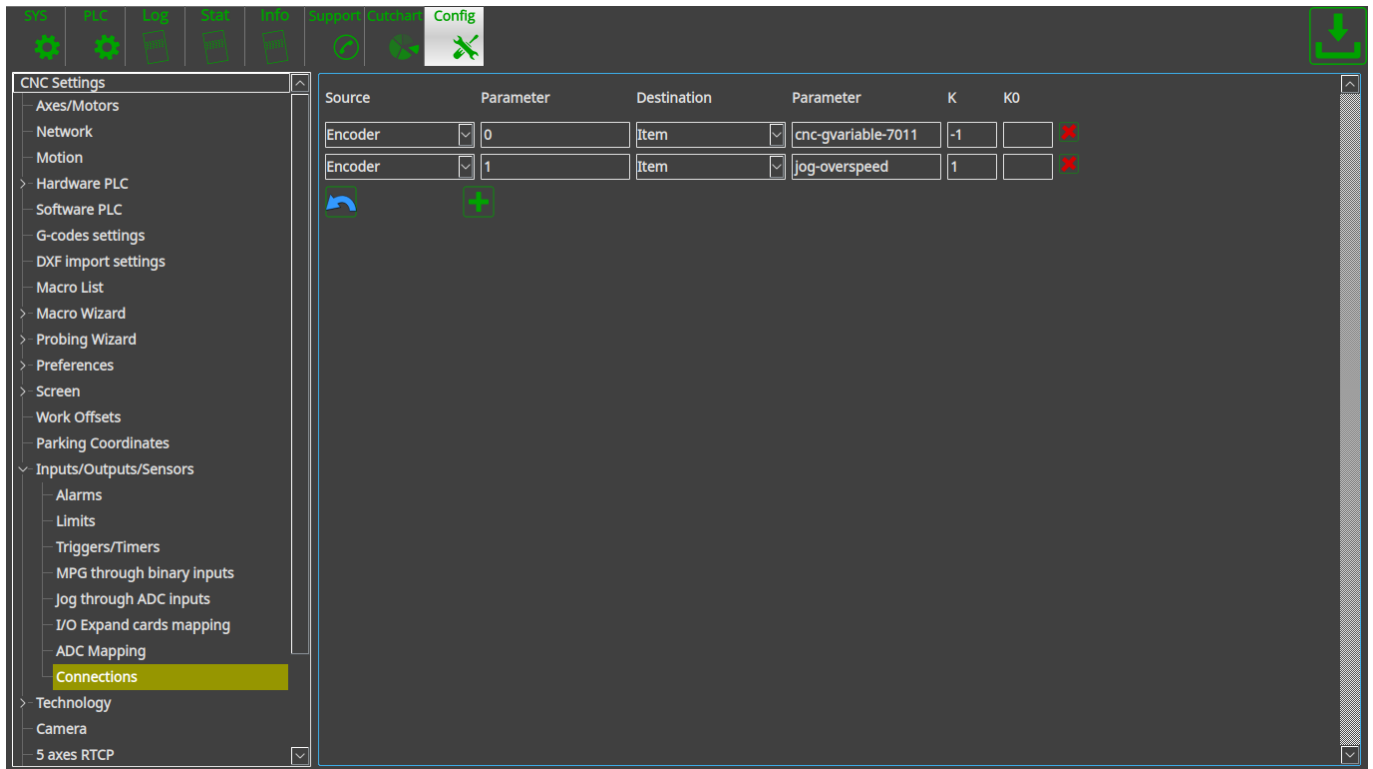
On-panel rotary encoders mostly used to control on-the-fly

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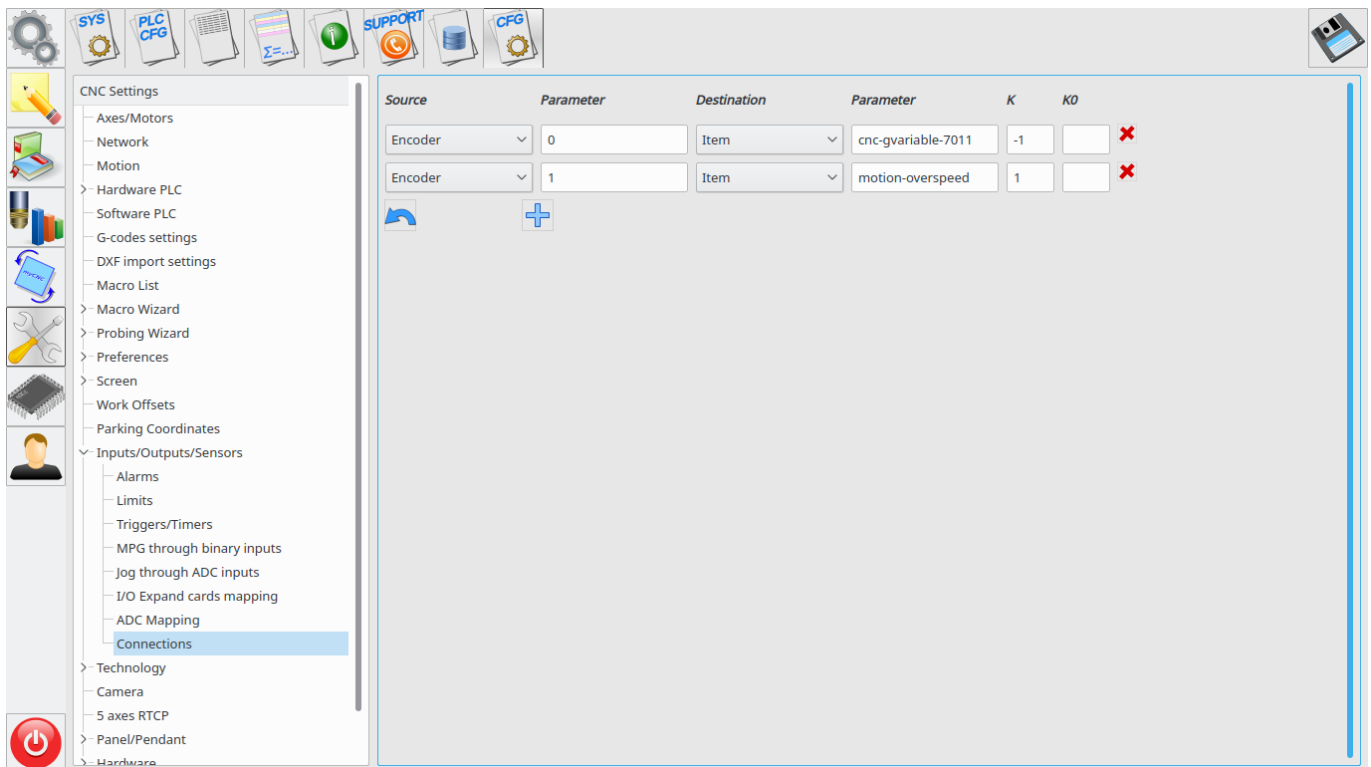
Name	Destination type	Parameter
Overspeed [%]	Item	motion-overspeed
THC Arc voltage reference	Item	cnc-gvariable-7011
Spindle Speed	Item	spindle-default-speed

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

```xml
<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.

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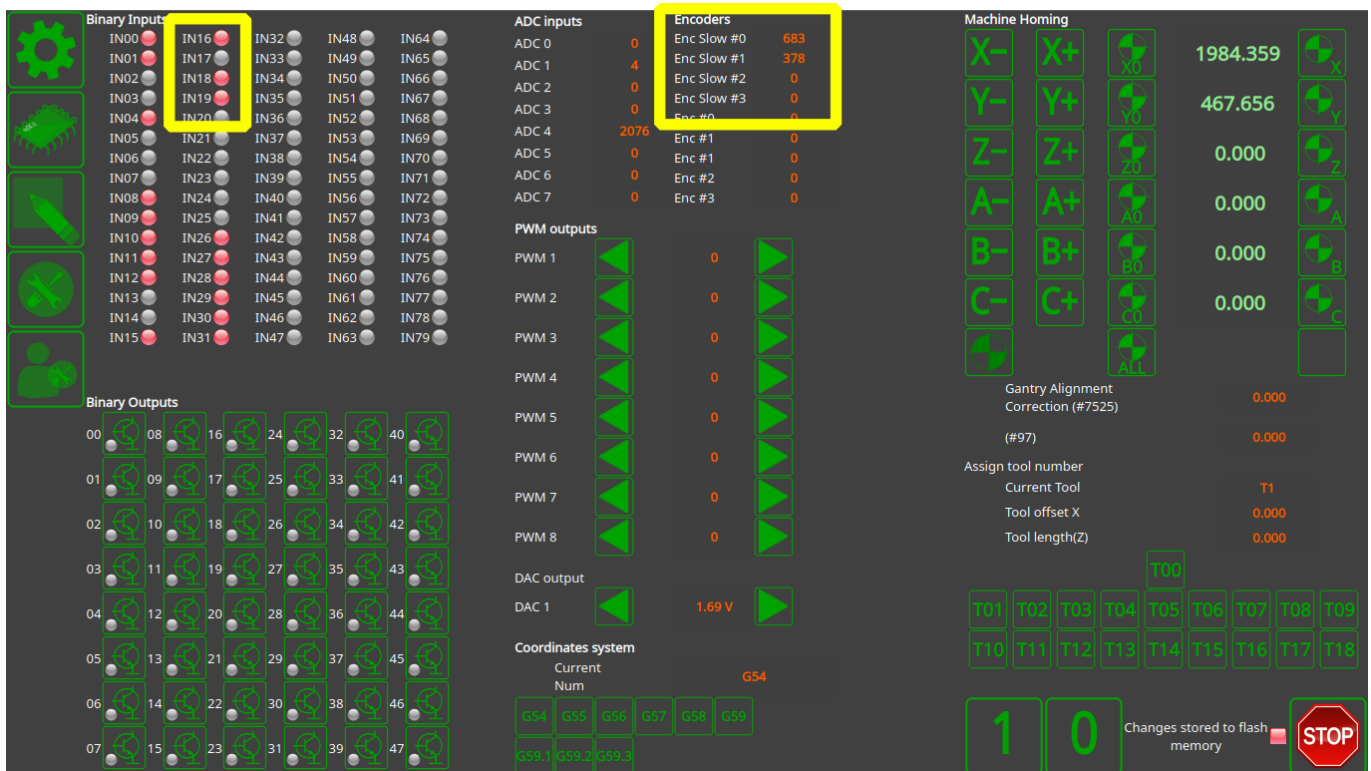
From:
http://docs.pv-automation.com/ - **myCNC Online Documentation**

Permanent link:
http://docs.pv-automation.com/mycnc/rotary_encoder_connection_and_setup?rev=1533951524

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