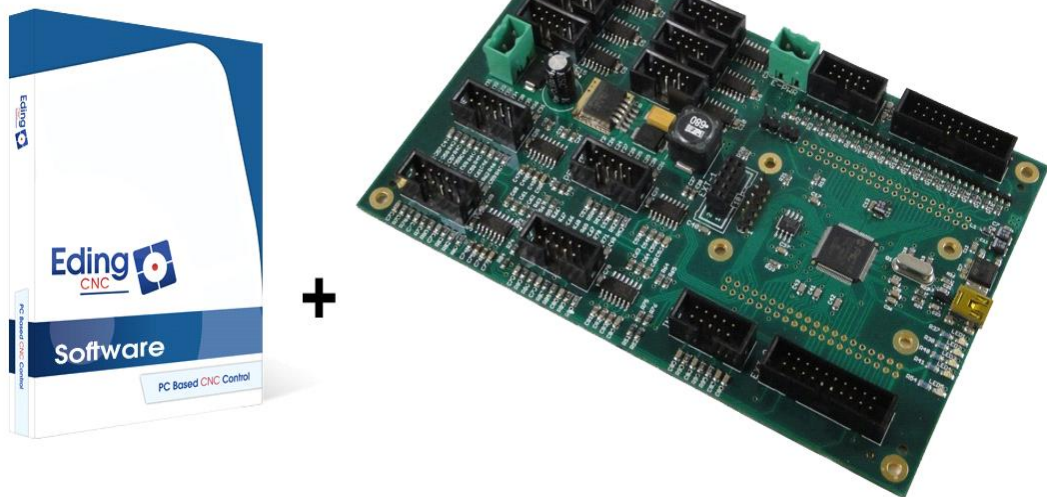
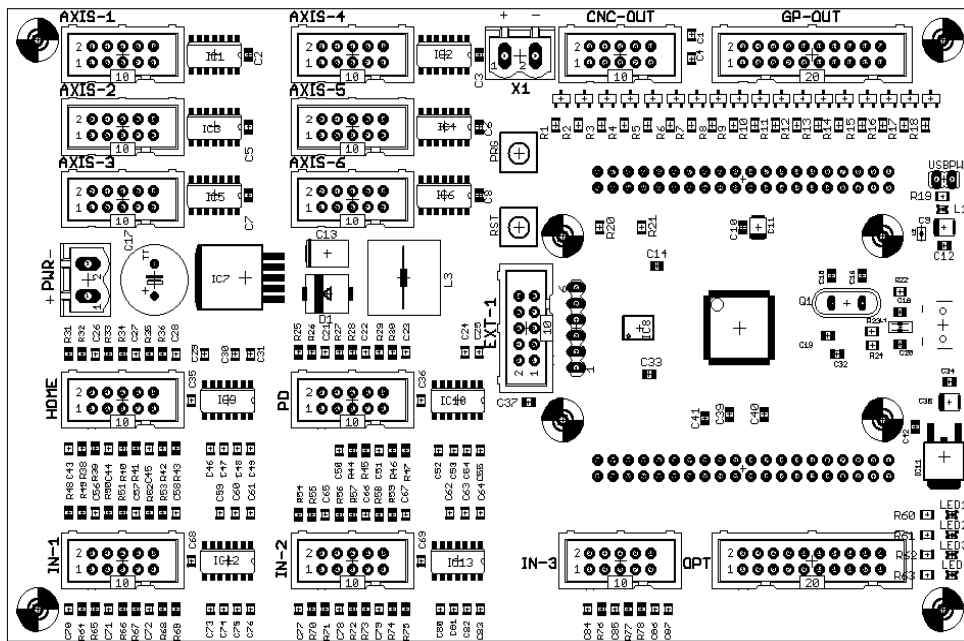


CPU5B

- 125 KHz step frequency.
- Full 6 axes interpolation.
- Euro card size 100x160mm.
- 5 status LED's.
- 6 Standard CNC outputs (Tool, Tool direction, TOOL PWM, Flood coolant, Mist coolant, Charge PUMP for external watchdog)
- 9 Standard CNC inputs (6 Home inputs, Probe, Spindle sensor, 2 x E-Stop, External ERROR, Run, Pause, Hand wheel).
- 9 general purpose digital outputs (tool-changer).
- 2 Extra PWM outputs for motor speed or temperature control.
- 6 Extra digital Inputs (tool changer).
- 3 Extra analogue Inputs 3. The extra IO is controlled by M54, M55, M66.
- Interface to PC is USB2.0.
- Optional 100 Mbit Ethernet.
- On board Power supply, input +9 – 24 Volt.
- Field upgradable firmware.
- **USBCNC Software included.**
- Windows XP, Windows 7.
- Runs on single core Atom PC.

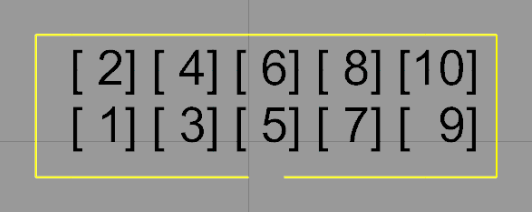
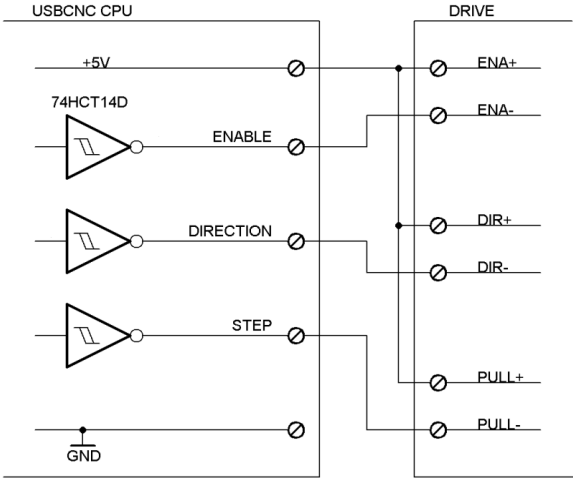


The CPU is delivered with software.

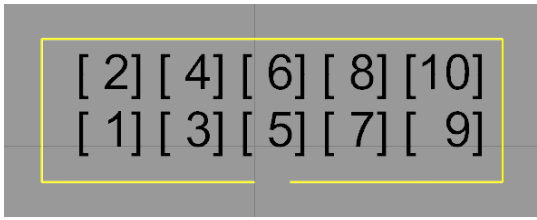


Features

- Shortest possible CNC production time, especially 3D work, depending on the product, USBCNC can be up to 2 times faster . This is thanks to the advanced Look Ahead Feed Algorithm that works for all motion segments, lines and circles by looking at their curvature and reduce speed only when absolutely necessary.
- Simple one screen operation, UI designed for and by professional CNC operators.
- Array mode execution for multiple production.
- Optimized tooltip feed calculations for 4th axis milling, no tool breakage due to wrong tool-tip feed.
- Feed Override control while running 0-300%.
- Easy start half way in g-code file, using search method
- Slave axes, for systems with dual motors (tandem) on X, Y or Z axis.
- Special homing sequence for tandems, sets tandem straight.
- Tangential knife, you need to program only X.Y coordinates and the tangential knife follows, also in circles and lifts automatically up when needed.
- Backlash compensation.
- Spindle proportional ramp-up time.
- Collision detection when g-code job is loaded prevents machine damage.
- Running time estimation when job is loaded.
- Thread cutting (Lathe).
- OpenGL graphics allows real-time PAN/ZOOM/ROTATE
- G-code is EMC compatible, RS274NGC, can be used with all CAM software's so far.
- G-code extensions with IF..THEN, WHILE..ENDWHILE, SUB ENDSUB, GOSUB.
- Super long file mode allows endless files, tested with 100.000.000 lines g-code.
- User interaction from G-Code with DlgMsg command and a lot more.
- Automatic tool change can be programmed entirely in G-code.
- Pause, Jog away, resume run in middle of g-code run.
- Hand wheel jog with position and velocity mode.
- Build in 2D CAM for drilling, engraving, profiling and pocketing, reads DXF and HPGL.
- SDK for building customized UI's.

<p>Connector PWR</p> <p>The CPU needs external power 24V/0.5A This is the power connector for the CPU. + : +24V - : GND</p> <p>The CPU has protection for reversal polarity.</p>	<p>Connector E-PWR</p> <p>This E-PWR power connector is routed to the home and CNC-OUT and GP-OUT connector. It is just for convenience to have power on the home connectors for home sensors. It has further no function on the board.</p>
<p>Connector AXIS-1 – AXIS-6</p>  <p>1: AMP-ENABLE 2: GND 3: DIRECTION 4: GND 5: STEP 6: GND 7: GND 8: GND 9: +5V 10: GND</p> <p>74HCT14 outputs 17 mA per output source or sink.</p>	<p>Example Connection</p> <p>Preferred connection for Leadshine and compatibles:</p> 

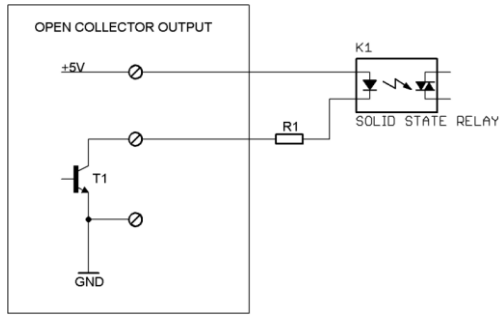
Connector CNC-OUT



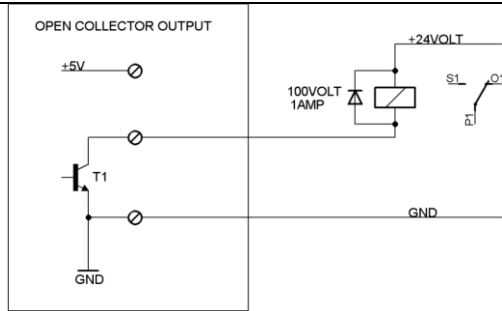
- 1: PWM1
- 2: OUT-1
- 3: TOOL
- 4: TOOL-DIRECTION
- 5: MIST COOLANT
- 6: FLOOD COOLANT
- 7: +V-EXT (From E-PWR)
- 8: CHARGE PUMP
- 9: +5V
- 10: GND

Open collector transistor outputs
 100 mA max current.
 PWM frequency 5 KHz
 Charge-pump frequency 10 Hz (LED4)

Example Connection



Example



Example

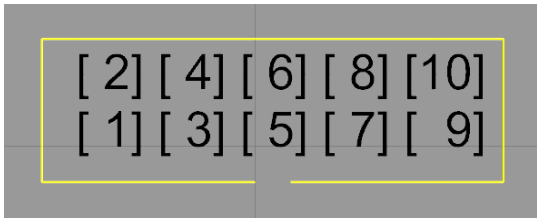
Connector OUT (AUX OUTPUTS)

[2] [4] [6] [8] [10] [12] [14] [16] [18] [20]
[1] [3] [5] [7] [9] [11] [13] [15] [17] [19]

- 1: GND
 - 2: GND
 - 3: GND
 - 4: GND
 - 5: OUT-8
 - 6: OUT-9
 - 7: OUT-6
 - 8: OUT-7
 - 9: PWM-2
 - 10: PWM-3
 - 11: OUT-5
 - 12: PWM-1 (pin 1 of CNC-OUT)
 - 13: OUT-3
 - 14: OUT-4
 - 15: OUT-1
 - 16: OUT-2
 - 17: +V-EXT (From E-PWR)
 - 18: +V-EXT (From E-PWR)
 - 19: +5V
 - 20: +5V
- Open collector transistor outputs
100 mA max current.
PWM frequency 5 KHz

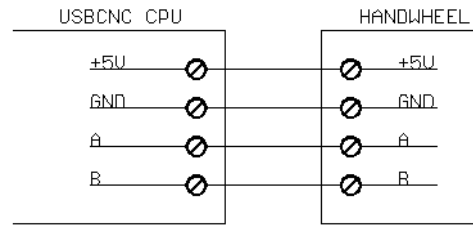
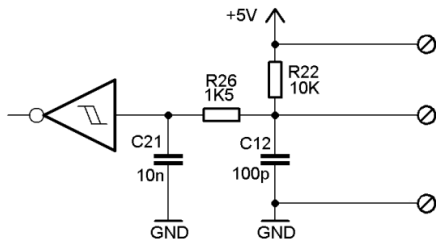
Example, same as CNC-OUT

Connector PENDANT

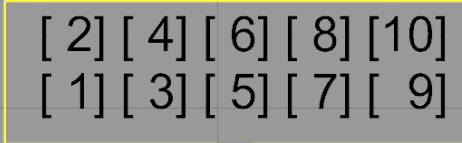


- 1: -
- 2: PAUSE
- 3: HANDWHEEL-A
- 4: RUN
- 5: HANDWHEEL-B
- 6: ESTOP
- 7: +5V
- 8: GND
- 9: +5V
- 10: GND

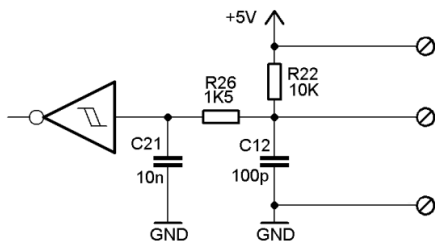
74HCT14 inputs.
 Pull-up to +5V with 10K
 Filtered with R/C filter



Connector Home

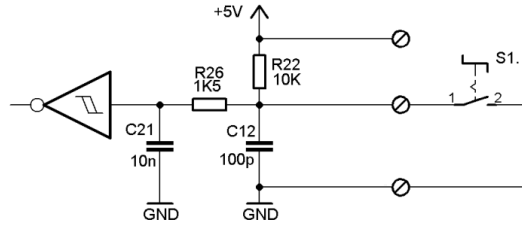


- 1: HOME-1
- 2: HOME-4
- 3: HOME-2
- 4: HOME-5
- 5: HOME-3
- 6: HOME-6
- 7: +V-EXT (From E-PWR)
- 8: GND
- 9: +5V
- 10:GND

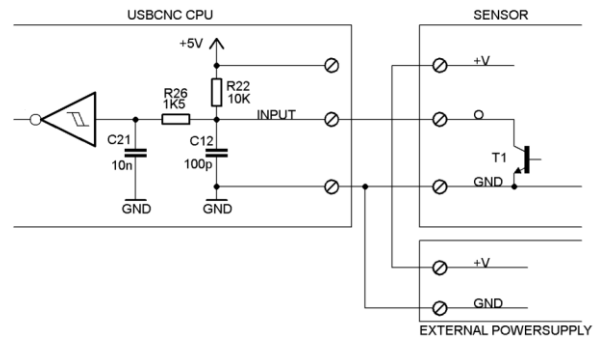


Example:

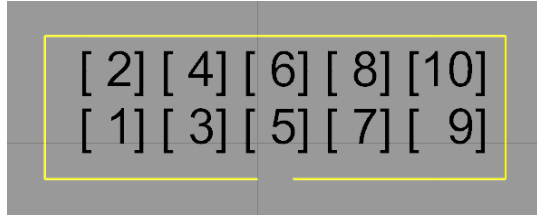
Connect a switch



Connect an inductive NP sensor (never use a PNP sensor, it will blow up the input if the sensor voltage is higher than +5V)



Connector IN-1

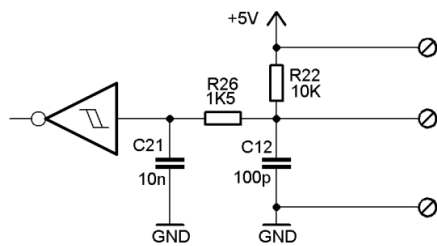


- 1: PROBE
- 2: SPINDLE PULSE (LATHE)
- 3: ESTOP
- 4: EXTERN ERROR
- 5: AUX-IN-6
- 6: AUX-IN-5
- 7: +5V
- 8: GND
- 9: +5V
- 10: GND

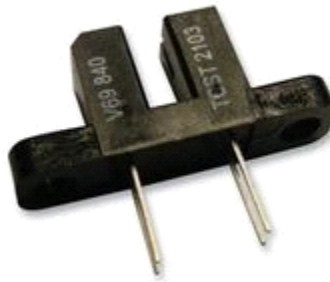
74HCT14 inputs.

Pull-up to +5V with 10K

Filtered with R/C filter



Example Spindle Pulse sensor



Vishay TCST2103

LED Side (+ and E):

Connect + of Led with 82 Ohm to +5V [7] or [9].

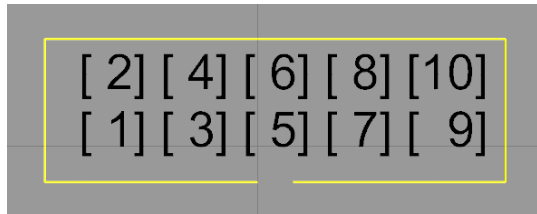
Connect E to GND [8] or [10]

Output transistor side (D and +):

Connect D (Emitter) to GND [8] or [10]

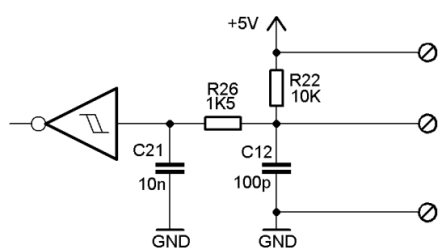
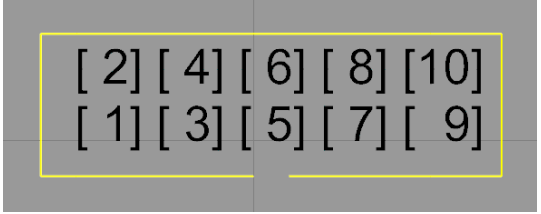
Connect + (Collector) to CPU input spindle pulse [2]

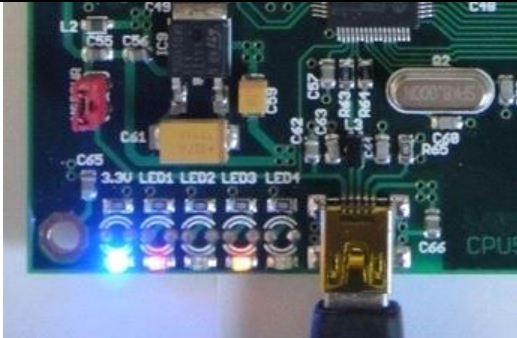
Connector IN-2



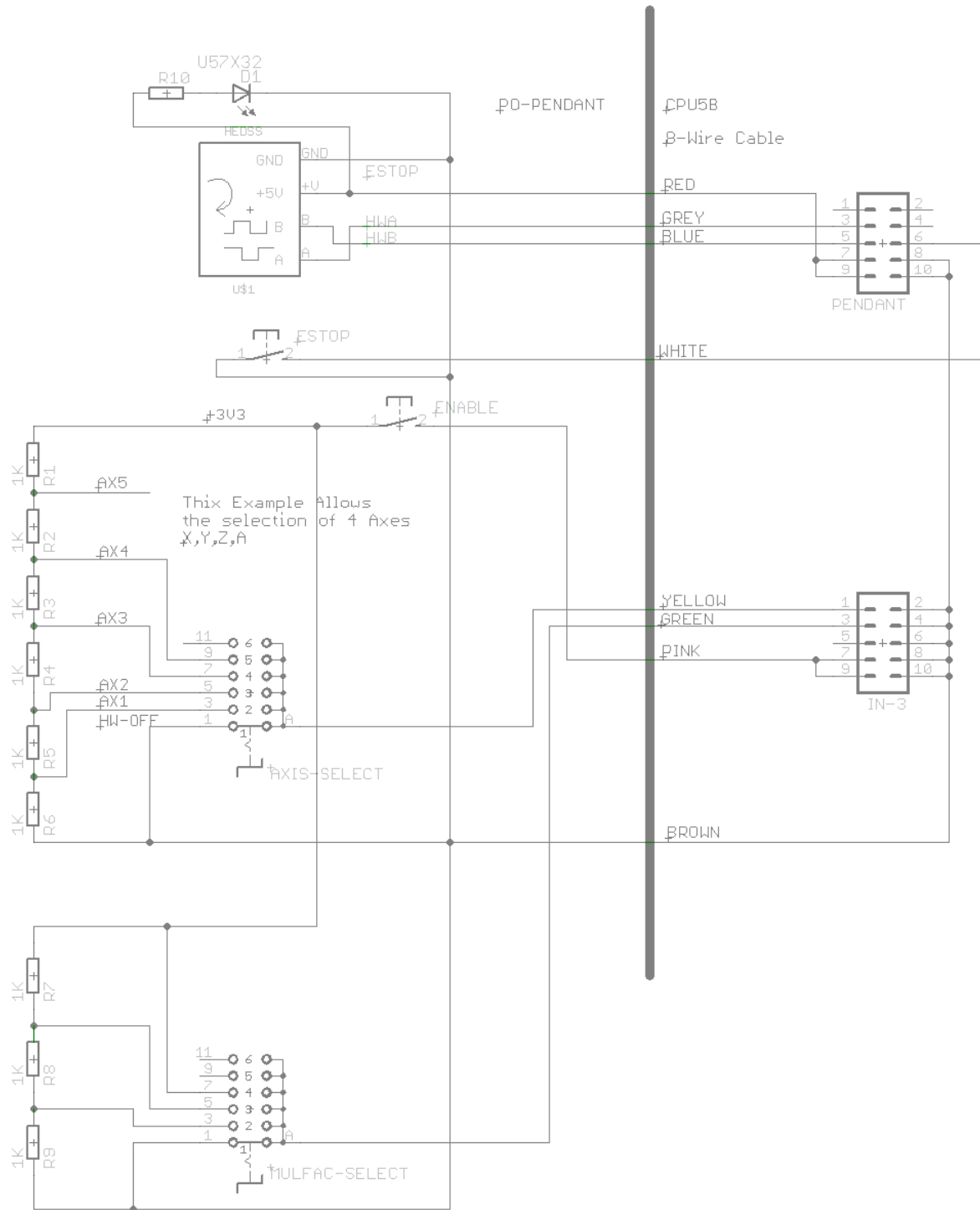
- 1: AUX-IN-4
- 2: AUX-IN-1
- 3: AUX-IN-2
- 4: AUX-IN-3
- 5: HW2A
- 6: HW2B
- 7: +5V
- 8: GND
- 9: +5V
- 10: GND

Examples, the same as with the HOME connector

<p>74HCT14 inputs. Pull-up to +5V with 10K Filtered with R/C filter, same as IN-1 Connector.</p> 	
<p>Connector IN-3</p> 	<p>Analogue Input</p>
<p>1: Analog In 3 2: GND 3: Analog In 2 4: GND 5: Analog In 1 6: GND 7: +3.3Volt 8: GND 9: +3.3Volt 10: GND</p>	<p>Connect a potentiometer of 4K7 (value not critical) between GND and +3.3V. Connect the wiper of the potentiometer to the analogue input.</p> <p>The analog inputs can be used to control the feedOverride, SpeedOverride and selection of axis and multiplication factor for a Pendant. (Form Software Version 4.01). A full schematic of a Pendant is on the last page of this document.</p>
<p>Opt Connector</p>	<p>For connection with the RLY8 IO card</p>

LEDS					
 <p>LED's from left to right</p>	BOOTLOADER MODE		CNC MODE		
	Blue			+5 Volt and CPU 3.3Volt present.	
Red			Error during programming.	Watchdog reset signal, 10 Hz pulse.	
Yellow			Alternating flash indicate boot loader active and communication with USB working.	Flashing: CNC Ethernet communication	FLASH=>ETHERNET ACTIVE
Green				Flashing: CNC USB communication	FLASH =>USB ACTIVE
Orange			Capture status, if on boot loader remains active. See also CPU5 configuration tool.	10 pulses at startup to show CNC firmware starting. On if E-Stop activated. Off if no E-Stop activated.	

Example of Connecting a pendant with axis selection and multiplication rotation selection button via analog inputs. This is supported from software version V4.01



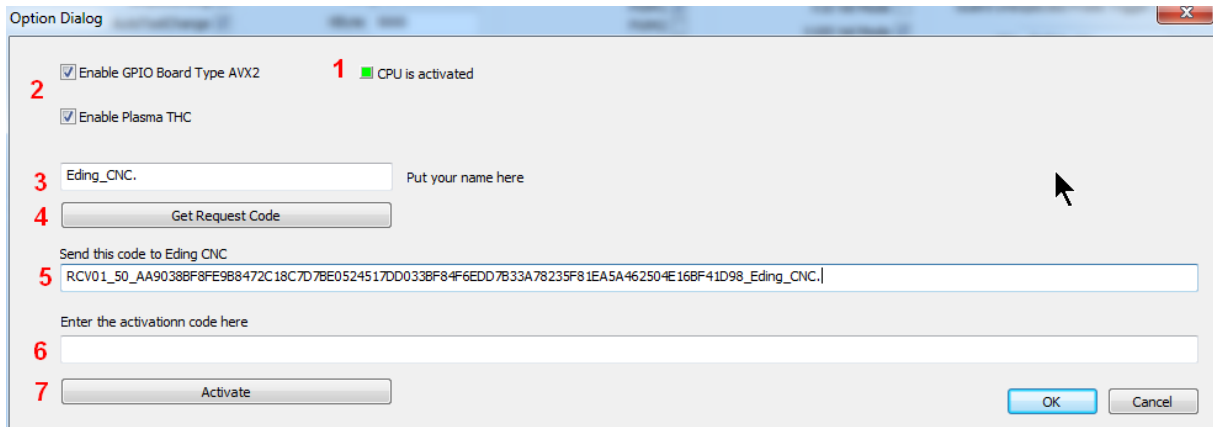
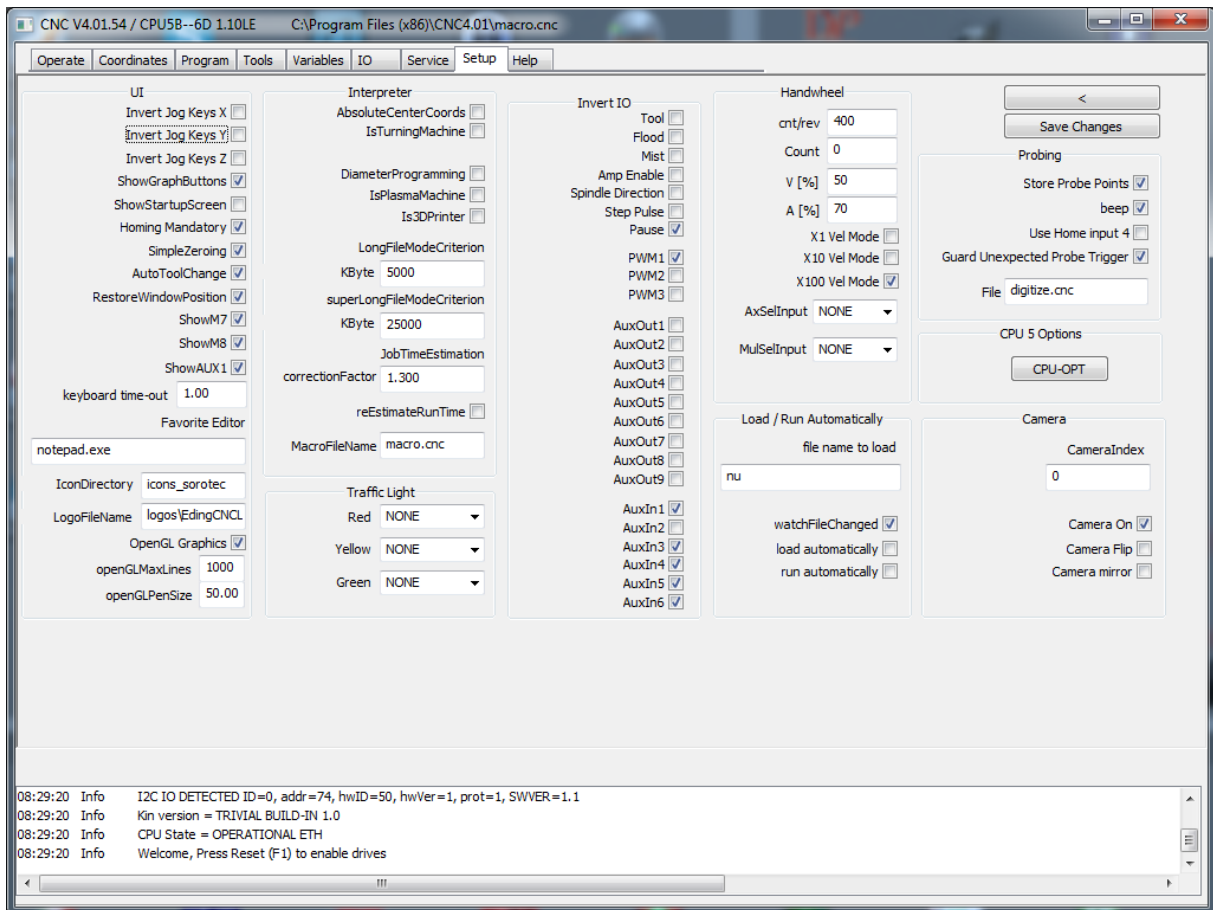
For more explanation, see Chapter "Hand wheel Setup" in the Manual.

CPUOPT:

This is special for CPU5 series.

This button allows to enable extra options like THC or extra IO board.

It also allows to enable the CPU if it is not already enabled when you get it.

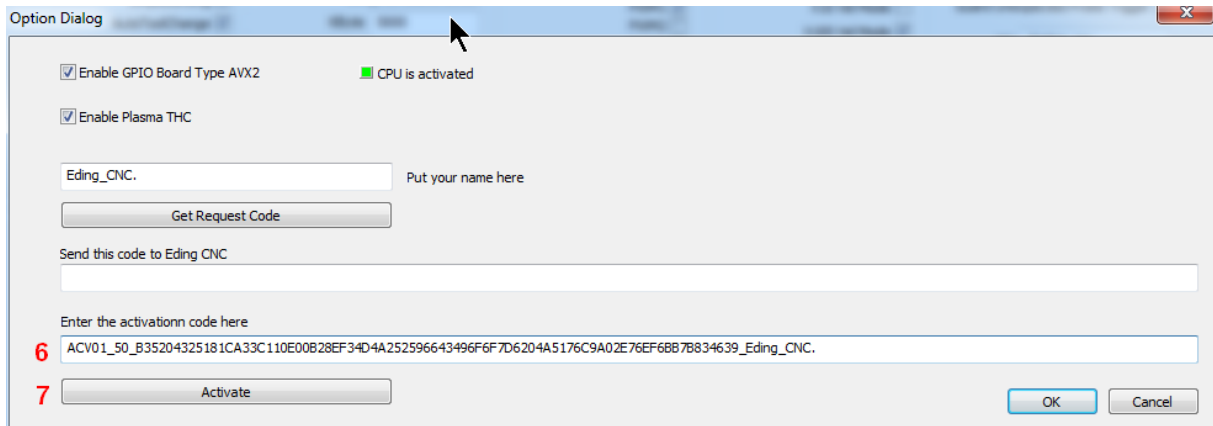


- 1 you see if the CPU is activated or not, this check is only set by the software and cannot be changed.
- 2 you check the option that you wish to obtain, if you need only to enable the CPU, select nothing.
- 3 Put Your name here.
- 4 Press the button "GetRequestCode".

5 Copy and paste the code into an email and send it to your Eding CNC supplier.
To do this double click the code, press ctrl-c, in your e-mail press control-v.

Your supplier will send you a activation code.

6 Copy and paste this into the activation code area. **7** then press activate.
Do what the dialog tells you, press ok twice, press save changes. and restart.
Now your new option is active.



This is all your CPU or Extra Option is activated.