MyCNC closed loop configuration

Servo ON handling

There are few ways to Enable/Disable Servo PID loops in myCNC software

1. On-Screen button. To enable/disable Servo PID control button should have actions:

```
action="servo-pid-on"  (enable pid)
action="servo-pid-off"  (disable pid)
```

For example

Buttons for Servo-ON and Servo-OFF

```
<gitem where="toolbar-servo" image="motor/motor-start" action="servo-pid-on"
height="80" event="pressed-delay-1000" type="button"/>
<gitem where="toolbar-servo" image="motor/motor-stop" action="servo-pid-off"
height="80" type="button"/>
```

Popup widget container for Servo Pid On/Off buttons

```
<quick-popup-layout>
<current>popup-servo</current>
<layout stretch="0" name="popup-servo" wa="80;160;right"
orientation="vertical" skin="skin/metal-01">
    <widget stretch="1" spacing="0" name="toolbar-servo"
orientation="vertical">myitems</widget>
</layout>
</quick-popup-layout>
```

Button to show containner with 2 buttons for servo-on/servo-off buttons and led to show current servo pid state

```
<gitem where="magic" position="960;0" width="80" height="80"
image="motor/servo-driver"
action="mypopup-toggle:popup-servo" xattr="56;4;20;20;led;green;round"
address="outputs" number="47" type="xbutton" />
```

2. Using Global Variables API. Global variables 60000 and 60001 are mapped to turning On and Off Servo PID control.

- Write “1” to register number **60000** will turn ON Motor closed-loop control PIDs
- Write “1” to register number **60001** will turn OFF Motor closed-loop control PIDs

3. Automatic Servo ON/OFF. There are 2 handler procedures in Software PLC can be used to automatic PID ON/OFF.

- **_HANDLER_INIT** - procedure executed once judt after CNC control software loaded, connection

with myCNC controller established and a complete configuration is sent to the controller.
- **_HANDLER_EXIT** - procedure executed while myCNC control software shut down process.

To handle automatic Servo ON/OFF writing to registers 60000, 60001 should be added to handler procedures. Example are below

__HANDLER_INIT.PLC

```
main()
 {
  gvarset(60000,1);  //turn Servo PIDs On
  exit(99);
 };
```

__HANDLER_EXIT.PLC

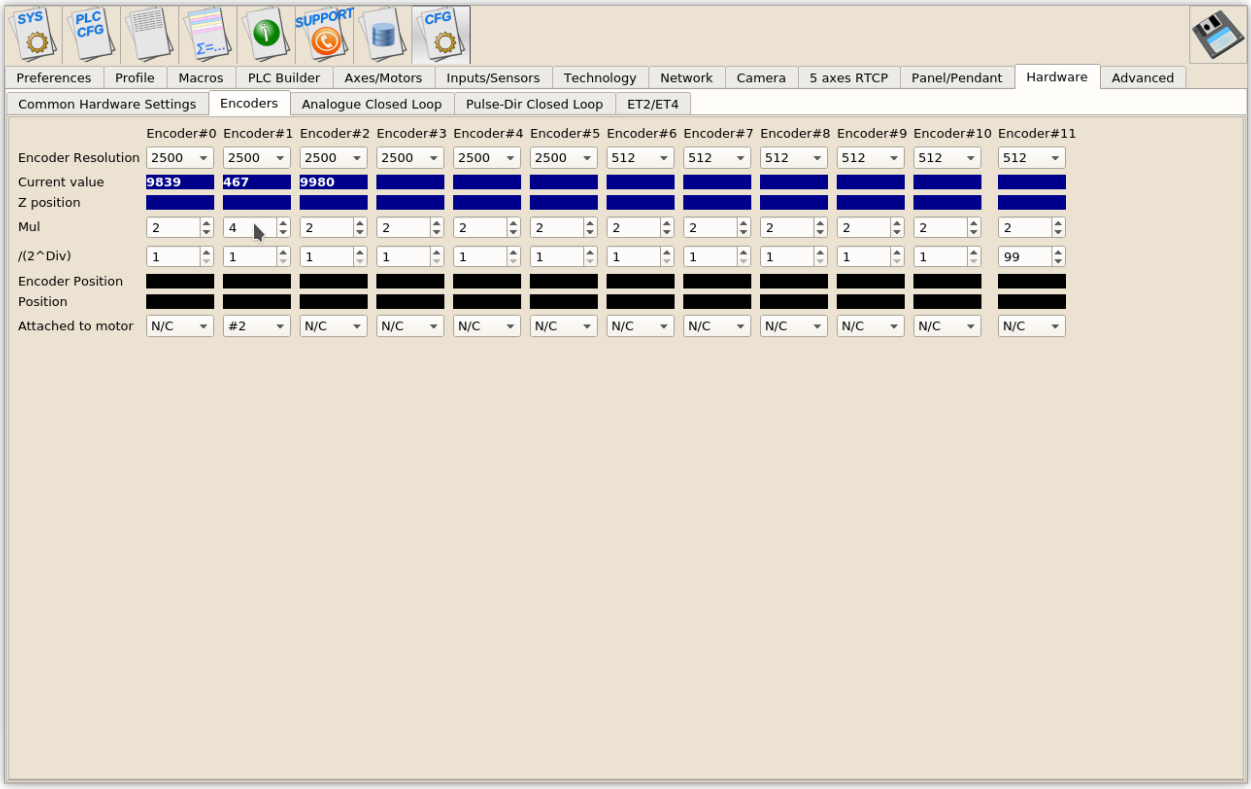
```
main()
 {
  gvarset(60001,1);  //turn Servo PIDs Off
  exit(99);
 };
```

Analogue -10V..+10V/Incremental encoder closed-loop setup

Pulse-Dir/Incremental Encoder closed-loop setup

Let's use Motor output #2 (configured as axis X) and Encoder #1 to build closed-loop PID control.

1. Goto **Encoders** settings tab. If rotary encoder is used as a feedback - setup **Encoder resolution** for Encoder #1. For linear encoder set resolution **2500**.



2. Set **Mul** and **/(2^Div)** ratios to get result Encoder resolution equal to **Pulses-per-Unit** resolution. For example

```
Servo driver with 2500 pulses per revolution,
Electronic gears "1" and ball screw 5mm are used.
Linear encoder with 1um resolution used as a feedback.
Pulses per unit are (2500*4)/5=2000 pulses per mm
Original Linear encoder resolution (1um) is 1000 pulses per mm, need to
set
multiplier to "4" and divider to "1" to get result ratio
4/(2^1)=4/2=2 and result Encoder resolution -
1000* 4/(2^1)=2000
```

3. Set **Attached to motor** to “#2”
4. Goto **Pulse-Dir Closed Loop** ang setup PID parameters for PID attached to Motor#2. The most importalt parameters are
    1. PID proportional ratio Kp
    2. PID integral ratio Ki
    3. PID integral limit. Integral value will be limited by given value.
    4. Encoder channel used as PID feedback