

LinuxCNC Lathe

Generated by Doxygen 1.9.3



---

<b>1 Module Index</b>	<b>1</b>
1.1 Modules . . . . .	1
<b>2 Module Documentation</b>	<b>3</b>
2.1 Stepper_control . . . . .	3
2.1.1 PNCCConf . . . . .	3
2.1.2 cmorley . . . . .	3
2.1.3 StepperControlProposed . . . . .	4
<b>Index</b>	<b>5</b>



# Chapter 1

## Module Index

### 1.1 Modules

Here is a list of all modules:

Stepper\_control . . . . . 3



## Chapter 2

# Module Documentation

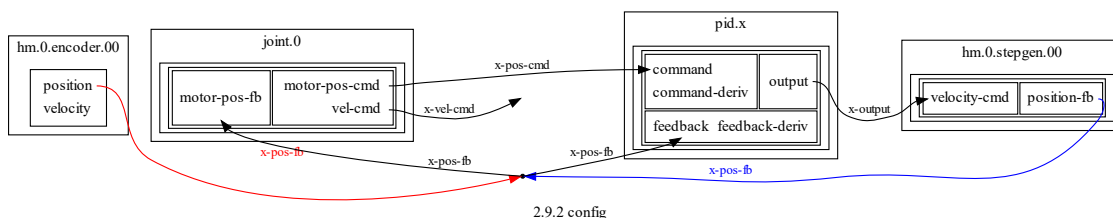
## 2.1 Stepper\_control

### 2.1.1 PNCCConf

Diagram showing default pnccconf configuration. Notice the default configuration requires an edit of the .hal file to select whether the x-pos-fb signal is from the encoder.position or stepgen.position-fb.

This choice will simultaneously change:

- pid control - stepgen position or encoder measurement for pid loop.
- Display of joint position - Motor command or encoder measured position.

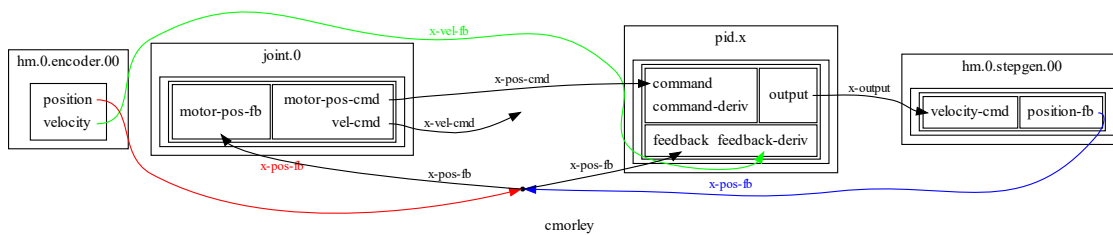


### 2.1.2 cmorley

cmorley 7 Jan 24 generated config. <https://forum.linuxcnc.org/39-pnccconf/51254-proposed-changes-f>

The only difference I see is the connection of x-vel-fb to pid.x.feedback-deriv. This should only be connected when encoder.position is also used as x-pos-fb.

```
# ---pid---
net x-pos-cmd      => pid.x.command
net x-pos-fb      => pid.x.feedback
net x-output      <= pid.x.output
net x-vel-fb      => pid.x.feedback-deriv
# Step Gen signals/setup
# ---closedloop stepper signals---
net x-pos-cmd     <= joint.0.motor-pos-cmd
net x-vel-cmd     <= joint.0.vel-cmd
net x-output      => hm2_7i96s.0.stepgen.00.velocity-cmd
net x-pos-fb      <= hm2_7i96s.0.stepgen.00.position-fb
net x-pos-fb      => joint.0.motor-pos-fb
# ---Encoder feedback signals/setup---
net x-pos-fb      <= hm2_7i96s.0.encoder.00.position
net x-vel-fb      <= hm2_7i96s.0.encoder.00.velocity
net x-pos-fb      => joint.0.motor-pos-fb
```



### 2.1.3 StepperControlProposed

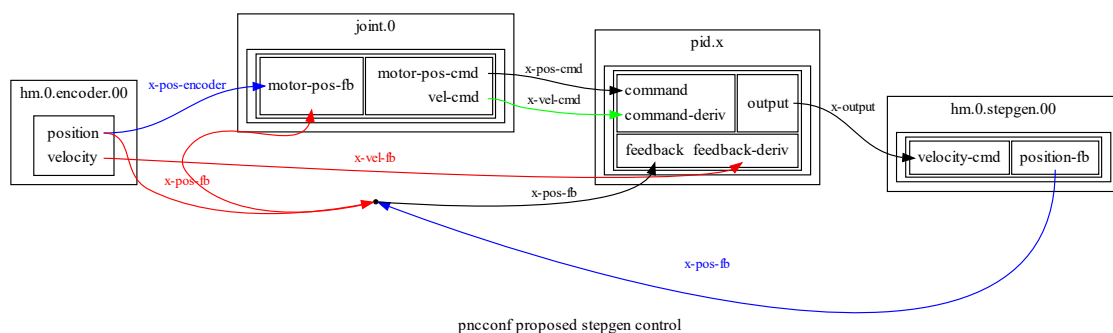
Proposed diagram showing x-pos-fb choices. (encoder in red, stepgen in blue, x-vel-cmd in green )

- Use the trajectory planner x-vel-cmd as an input to the pid FF1 calculation. This eliminates a velocity estimation within the pid.
- Always use the encoder position as the joint position feedback instead of the stepgen position. (requires new signal x-pos-encoder when stepgen position is used for pid feedback)
- When using the encoder position as pid feedback, also use encoder velocity as an input to the pid feedback derivative.

```

#
# *****
#  AXIS X JOINT 0
# *****
net x-pos-cmd      => pid.x.command
net x-pos-fb      => pid.x.feedback
net x-vel-fb      => pid.x.feedback-deriv
net x-output      <= pid.x.output
# ---closedloop stepper signals---
net x-pos-cmd     <= joint.0.motor-pos-cmd
net x-vel-cmd     <= joint.0.vel-cmd
net x-output      <= hm2_7i96.0.stepgen.00.velocity-cmd
#
# Enable/Disable BOTH the following TWO lines to use the encoder to close the control loop.
# Use both the encoder position and velocity.
#
net x-pos-fb      <= hm2_7i96.0.encoder.00.position => pid.x.feedback joint.0.motor-pos-fb
net x-vel-fb      <= hm2_7i96.0.encoder.00.velocity => pid.x.feedback-deriv
#
# Enable/Disable BOTH the following TWO line to use stepgen position to close the control loop.
# Add a new signal from encoder position so it can be used independent of pid fb signal. This allows
# encoder to be used as DRO without closing the control loop.
# Do not use the encoder x-vel-fb is you are using the stepgen position for x-pos-fb.
#
net x-pos-encoder <= hm2_7i96.0.encoder.00.position      => joint.0.motor-pos-fb
net x-pos-fb     <= hm2_7i96.0.stepgen.00.position-fb => pid.x.feedback

```





# Index

Stepper\_control, 3