We will be controlling two linear motion axes using LinuxCNC today.

Parts needed:
(1) Raspberry Pi 4B with Linuxcnc 2.8 installed
(2) AutomationDirect STP-DRV-6575 stepper drives
(2) SLA-90 linear actuators
(2) four wire cables
(1) 48V power supply (from your PLC kit)
(1) 25 pin breakout
(1) Mesa 7i92 card

Setup:
1. On the STP-DRV-6575's, set the motor switch to position 8 (2amps per phase, STP-MTR-17048 motor).
2. On the STP-DRV-6575's, set SW5,6,7 to on-on-off (2000 steps/rev), SW1,2,3,4=off-off-on-on
3. Wire one 4-wire cable to the motor connector: A+=BLACK, A-=GREEN,B+=WHITE, B-=RED
4. Wire the parallel port breakout to the stepper drives:

Parallel Port Pin	Signal	X Amplifier	Y Amplifier
14	X Step	+Step	
1	X Direction	+Dir	
15	Y Step		+Step
2	Y Direction		+Dir
18	ground	-Step	
19	ground	-Dir	
20	ground		-Step
21	ground		-Dir

5. Wire your 48v to the V- and V+ terminals on the motor connectors.
6. Plug the motor cables into the SLA90 actuators or stepper motors (these cables have the 4-pin male-male connectors).

7. Boot your Raspberry Pi 4B.
8. Click Applications -> CNC -> pncconf
9. In pncconf, use this information:
        a) Base Information: Machine Name: engr480, Axis config: XYZ, Machine units: mm
        b) uncheck "Require homing" and "Popup toolchange prompt"
        c) configuration: Mesa 7I92M card, with 7I76 daughter card (we don't really have the 7I76),
                        4 step generators, 0 encoders
           click "Accept component changes".
        d) In I/O Connector 2 tab, select X, Y, and Z stepgens for 0, 1, and 2.
        e) X and Y motor: calculate scale 200 motor steps/rev, 10 microstepping, 10mm/rev leadscrew pitch

10. After leaving pncconf, click Applications->CNC->Linuxcnc, and choose the engr480 configuration you just made.

11. Now that LinuxCNC is running, you can run your actuators. To do this, follow these steps:
        a) Click on the (X) and (I) icons to turn the controller on and remove E-stop.
        b) In MDI tab, type "G1 X10.0 Y10.0 F5000" to move each axis 10mm. If no motion is observed, figure out why
        before proceeding.

12. Load the blank CNC program engr480.ngc (File->Open), then edit (File->Edit), making the program:
        G1 X0.0 Y0.0 F5000.0
        G1 X20.0 Y30.0
        G1 X10.0 Y10.0
        G2 X0.0 Y0.0 R10.0
        M30

13. In LinuxCNC, load your program with File->Open, then press the ▶ button.