

Wiring and Connecting

If it has to be wired up or plugged in, look here.

- [Regenerative Resistors](#)
- [Parallel Port Connection](#)
- [Solenoid or Pump Wiring](#)
- [Wiring Prox Switch Input](#)
- [Wiring Switches and Inputs on Apollo](#)

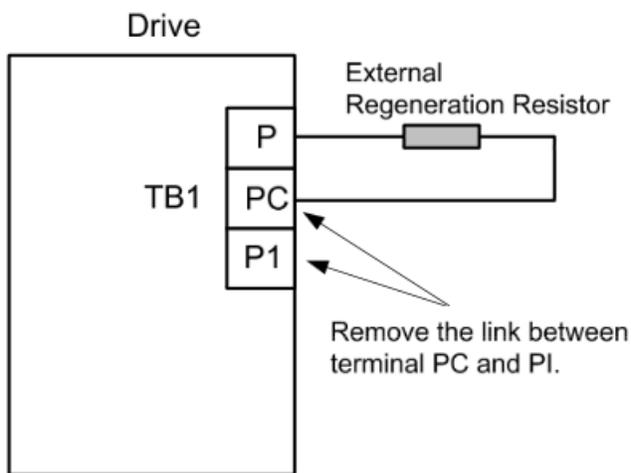
Regenerative Resistors

▲ When installing Regeneration Resistors care must be taken as the resistor absorbs the regeneration power, and it is possible to generate high temperatures above 100°C.

▲ Provide adequate cooling and use appropriate high temperature wires and ensure there is adequate space between regeneration resistor and other materials. Install as far away from other components as possible to avoid electrical noise and heat damage.

For Teco:

- Most users will use the internal resistor; leave the jumper between PC-P1
- Persistent AL02 errors may require the addition of an external resistor to the servo drive
- For an external resistor, remove PC-P1 jumper and wire between P-PC
 - Set Cn012 to the wattage of the external resistor (i.e. - Set Cn012 to 500 for a 500W resistor)



For Yaskawa:

- If the drive has an internal resistor, there will be a jumper between B2-B3 terminals
- Some servopack models do not have an internal resistor so an external regenerative resistor is required
- For an external resistor, remove B2-B3 if present and wire between B1-B2
 - Set Pn600 with the Regenerative Resistor Capacity
 - A.320 alarm is because the resistor wattage has not been programmed or not set correctly
 - See pg. 3-38 thru 3-40 for further details (not sure what page that is referring to. Found it starting 3-41 in our online manual).
- SETTING PN600:

Be sure to set the regenerative resistor capacity (Pn600) to a value that is in accordance with the allowable capacity of the actual external regenerative resistor being used.

Note:

1. If Pn600 is not set to the optimum value, alarm A.320 will occur.

2. When set to the factory setting (Pn600 = 0), the SERVOPACK's built-in resistor or Yaskawa's regenerative resistor unit has been used.

The setting will vary with the cooling method of external regenerative resistor:

- For natural convection cooling: Set the value to a maximum 20% of the actually installed regenerative resistor capacity (W).
- For forced convection cooling: Set the value to a maximum 50% of the actually installed regenerative resistor capacity (W).

Example: Set 20 W (100 W × 20%) for the 100-W external regenerative resistor with natural convection cooling method:

Pn600 = 2 (unit: 10 W)

See attached PDF for more information.

Keywords:

regen resistor, Teco, Yaskawa, A.320, AL02

Keywords: 10978

Parallel Port Connection

To properly attach the dual-parallel port, align the red stripe on the ribbon cable to the white triangle on the back end of the board.

See attached document for photos.

Keywords: 11256

Solenoid or Pump Wiring

- 1 If you have a RapidPath control, the following concepts apply, but connecting will be a little different. See the installation manual for your kit to see additional detail.

Outputs on the breakout board can be used for a variety of control functions. Often they are used for controlling solenoids, coolant pumps, lights, etc, such as water jets often use an output solenoid for the abrasive and mills have an oiler pump.

Common voltages are 24Vdc, 110Vac, 220Vac (single phase). These output controlled devices should be wired through a relay. See the attached PDFs for example wiring (the 120VAC example works for 220V as well). Where 0V is labeled, this would be GND.

MachMotion default for mist on Mach4 systems is output Y0 (P11 Output0) and coolant / flood is output Y1 (P11 Output 1). For Mach3 it is Output 3 and Output 4. Wiring to those outputs is not mandatory as the software configurations can be changed.

NOTE - If the output control device needs 3-phase power, then a contactor needs to be used along with the relay. See the attached photo for example wiring (if wiring for single phase, then the contactor is not needed, use the 120VAC example instead). Contact us with your specific application and associated parts for assistance if needed.

Keywords: Flood, Mister, Valve

Wiring Prox Switch Input

PNP 3-wire example:

(see attachment for photo)

Brown to C0+

Blue to C0-

Black to the input (such as X1, X2, or X3...)

[https://www.automationdirect.com/adc/Shopping/Catalog/Sensors_-z-Encoders/Inductive_Proximity_Sensors/12mm_Round_Industrial_Automation/Standard_Sensing_\(12mm\)/PBM-AP-1H](https://www.automationdirect.com/adc/Shopping/Catalog/Sensors_-z-Encoders/Inductive_Proximity_Sensors/12mm_Round_Industrial_Automation/Standard_Sensing_(12mm)/PBM-AP-1H)

PNP 4-wire example:

(see attachments for photo)

Brown to C0+

Blue to C0-

White to the input (such as X1, X2, or X3...) (this is normally closed which is preferred method. Black can be used for normally open).

[https://www.automationdirect.com/adc/Shopping/Catalog/Sensors_-z-Encoders/Inductive_Proximity_Sensors/18mm_Round_Harsh_Duty/Food_-a-Beverage_IP69K_\(18mm\)/PFK1-BP-3H](https://www.automationdirect.com/adc/Shopping/Catalog/Sensors_-z-Encoders/Inductive_Proximity_Sensors/18mm_Round_Harsh_Duty/Food_-a-Beverage_IP69K_(18mm)/PFK1-BP-3H)

⚠ If the switches are not functioning or not reading in remove the proxy switch and place a jumper wire between C0+ and the input (such as X1, X2 or X3..). If the LED on the Apollo board lights up than it is an issue with the proxy switch.

keywords: proxy, proximity, proxy switch, proximity switch, proxi, proximity switch

Wiring Switches and Inputs on Apollo

Inputs

There are 16 inputs on the Apollo III (15 available for your use as X0 is reserved for the drive fault signal). These can be used for limit/home switches, tool changer signals, alarm conditions, or most anything else.

Note: To learn how to set up limit switches, go to [Setting up Limits and Homing](#).

As shown below, the inputs are located on the main green terminal block (note: your Apollo board should have black colored terminals for the outputs, not green as shown on the right side of this board).

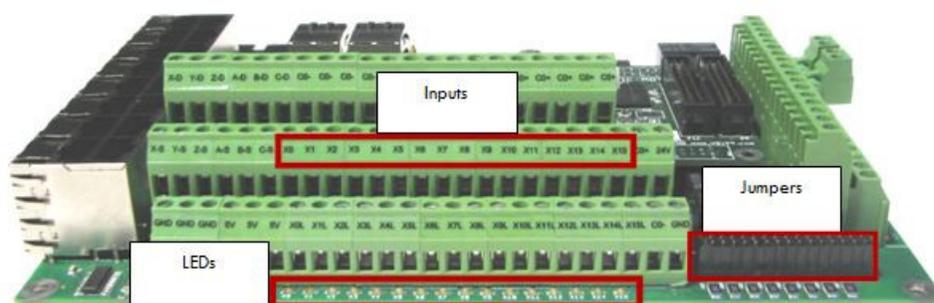


Figure 27 Inputs

Each input has an LED that shows the current state of the input. Both the LED and input are labeled with the input name. The inputs run from X0, up to X15. If the LED is on, then the input is activated. Different configurations can be selected for each input by using the jumpers near the bottom right of Apollo III. Each jumper corresponds to an input. For example, the jumper labeled X10 corresponds to the input terminal labeled X10 and the LED X10.

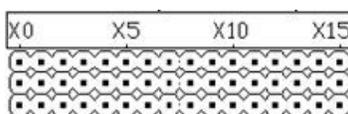


Figure 28 Input Jumpers

There are 3 jumper positions. Position 1 is the jumper in the lower position across the bottom 2 pins. Position 2 is the jumper in the upper position across the top 2 pins. Position 3 is the jumper removed (can be placed on just the top or bottom pin with the other side of jumper not connected to any pin so that you can easily use it again if needed).



Figure 29 Jumper Positions

WARNING

Input X0 is configured as drive fault by default.



DO NOT connect anything to X0. It could damage your drives or Apollo III motion controller.

Wiring Inputs

There are helpful videos on our youtube channel:

<https://www.youtube.com/watch?v=wVQ1OE3PQDE>

<https://www.youtube.com/watch?v=wgD4nAkKHLQ>

Standard 24V Inputs

For a standard 24V input, place the jumper on the bottom two pins. Next, connect C0+ to 24V and C0- to GND on the input terminals (should already be jumper in place from factory for this). In the example below, all the inputs are set up as standard 24V inputs.

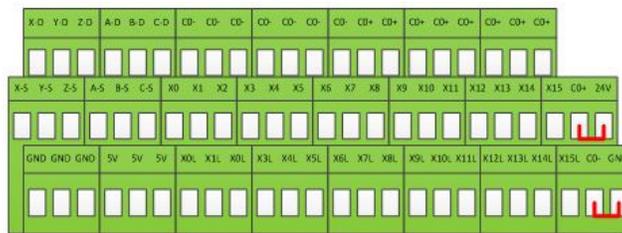


Figure 30 24V Configuration

Then connect the input to the input terminal on the middle row (X1, X2, etc.). See the diagram below.



Figure 31 Standard 24V Input

To activate the input, 24V must be supplied to the input. A floating signal or a ground will not turn on the input. The LED corresponding to the input will turn on brightly when the input is activated.

If the switches are not functioning or not reading in remove the switch and place a jumper wire between **▲ C0+** and the input (such as X1, X2 or X3..). If the LED on the Apollo board turns on than it is an issue with the proxy switch.

Sinking Inputs (NPN)

For most NPN proxies place the jumper on the top two pins. Then connect the signal into the corresponding input. See the example below.

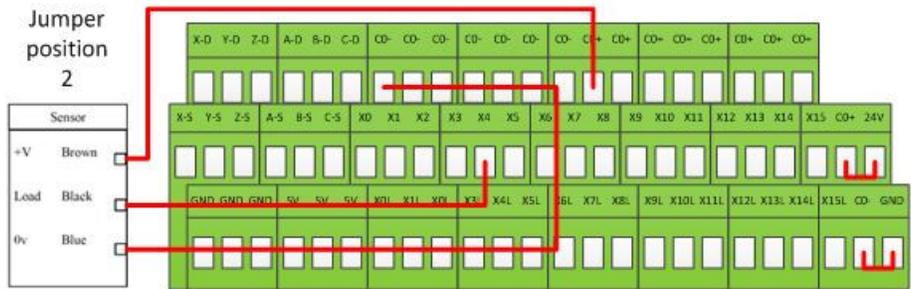


Figure 32 Standard NPN Proxy

If the proxy has an internal pull-up resistor, depending on its size, it could require the jumper to be completely removed. Use a 3.9k ohm resistor and connect it between XSL and C0+.

Below is an example of a 24V NPN proxy with an internal pull-up resistor. The jumper on the Apollo III must be completely removed for this to work.

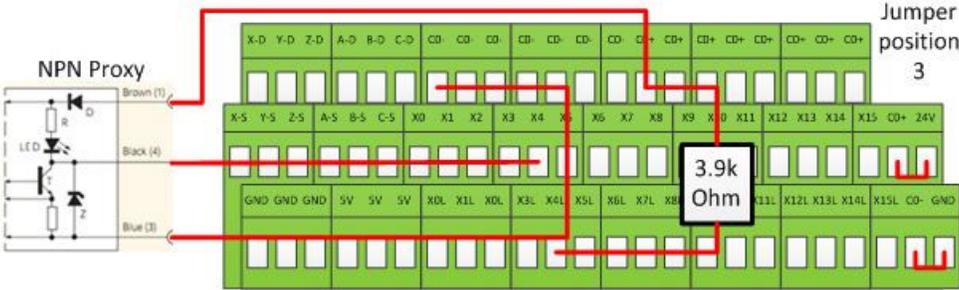


Figure 33 NPN Proxy with Internal Pullup

Sourcing Inputs (PNP)

For PNP proxies place the jumper on the bottom two pins. Then connect the signal into the corresponding input.

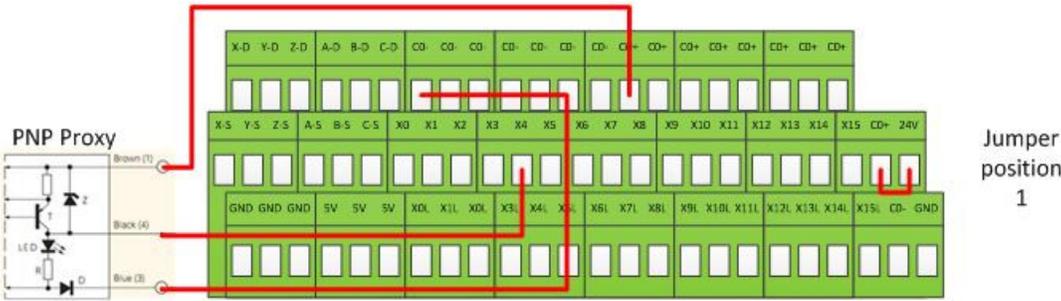


Figure 34 24V Proxy Example

If the switches are not functioning or not reading in remove the proxy switch and place a jumper wire between C0+ and the input (such as X1, X2 or X3..). If the LED on the Apollo board turns on than it is an issue with the proxy switch.

See more information about proxy switches at the following link:

Wiring Prox Switch Input

Keywords: Limit switches, switches, home switch, jumpers, proxy, prox