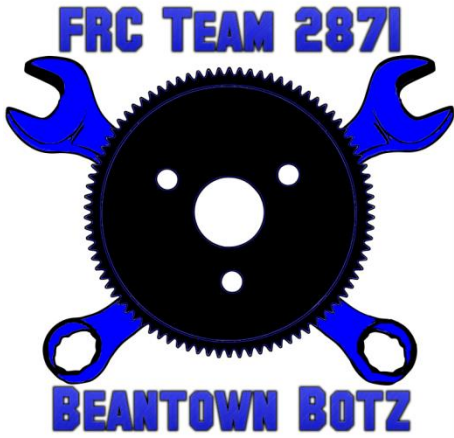


Programming Pneumatics

By Lead Programmer: Christopher Villar

Compressor Setup

Let's cover the mechanical and electrical first. The pneumatic system has a high pressure side and a low pressure side. The high pressure side tops out at 120psi. It connects to the low pressure side through a regulator, which limits the pressure on the low side to 60psi. The high pressure side is limited to 120psi by two things. First is a mechanical pressure relief that will start dumping air at around 125 psi. Second is a pressure switch. This is a normally closed switch that opens when the pressure reaches 120 psi. This switch is what lets your software know when you need to run the compressor more to get back up to 120 psi. It needs to be connected to the signal and ground pins of a digital input on your sidecar.

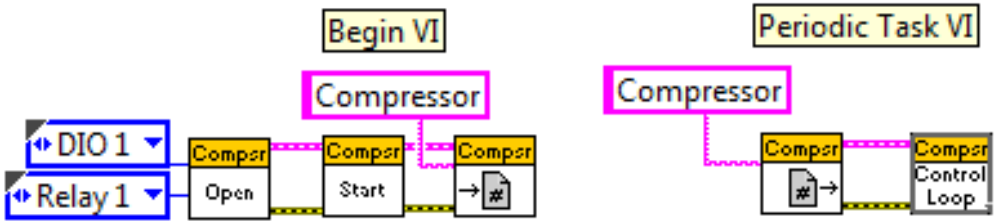
Compressor Setup II

Programming is pretty easier. The relevant VIs are in WPI Robotics Library ->Actuators-> Compressor.

In your Begin VI, you want to "Open" a compressor reference, then connect the created reference to the Start VI. Then the program will automatically monitor the pressure switch, and turn the compressor off and on with the Spike relay. Make sure you Do a Refnum Set to save the reference for later use.

In your Periodic Tasks VI, you need to drop the "WPI CompressorControlLoop" VI and pass it the save reference.

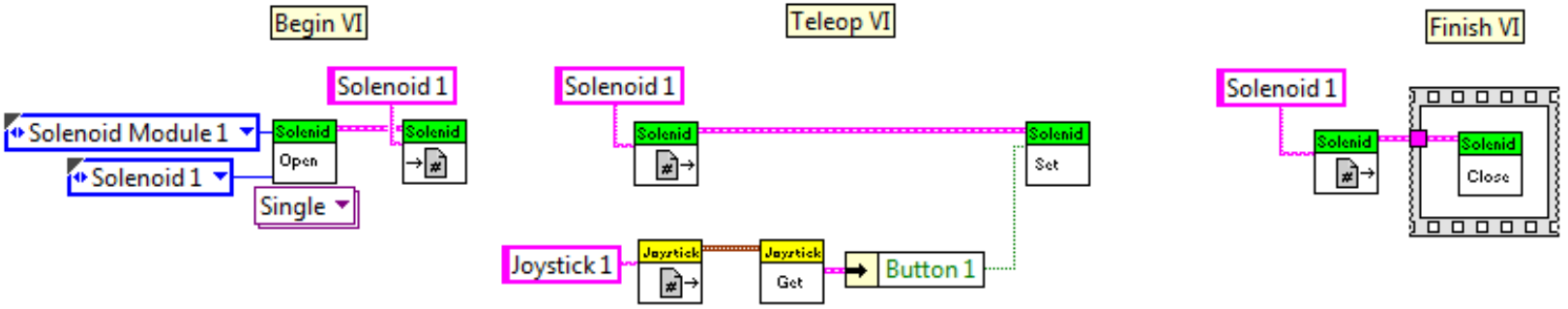
We are going to assume that the Spike that runs the compressor is controlled through Digital Sidecar Relay 1, and the pressure switch is connected to the Digital Sidecar GPIO 1. These can be changed physically but you have to make sure to make these same changes in the code.



Solenoid Connected to The cRIO Solenoid Bumper

This eliminates the need for a Spike and connects the solenoid directly to the cRIO's Solenoid Bumper using the #1 pins. In these examples the trigger on joystick 1 controls the solenoid. The Bumper also has status lights for each set of output pins that indicate when it is activated. You must hold down the button(In this case it's the trigger) to activate solenoids.

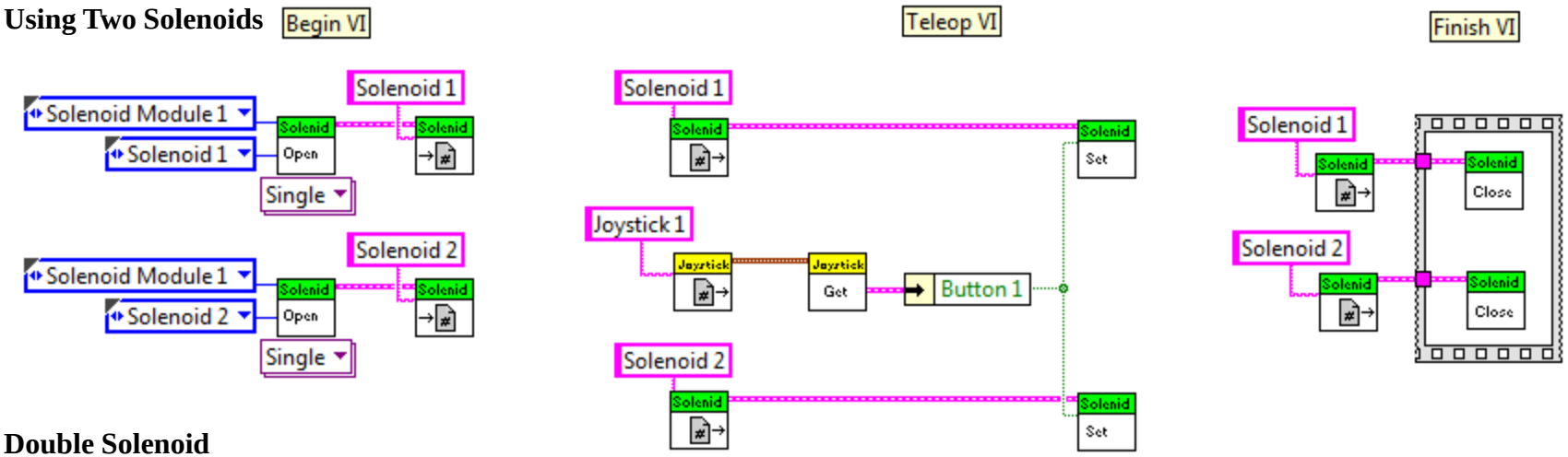
Remember you must also "Open" and "Close" your joystick as well.



Solenoid Connected to The cRIO Solenoid Bumper II

Let's say you have to pistons you want to use on your robot, you can't control both with one Solenoid. You can take two approaches either using two Solenoids or using a double Solenoid.

Using Two Solenoids



Double Solenoid

To accomplish this create a constant on the "Solenoid Set" you will get a "Off" Enum Constant. Now just connect the "Off" Enum Constant to the true of the Select Block. Create a constant on the false of the Select block. Change both constant to Forward and Reverse and delete the wire that goes from the "Solenoid Set" to forward. Now just wire the end of the triangle to "Solenoid Set"