Pinball PLC docs

PLC outputs and inputs are labeled in the code, which is mostly commented so I won't describe much of it here.

In general, the PLC controls the immediate-react components, and the pi directs the PLC with game logic(I.E., the PLC fires pop bumpers when the ball hits them, but the pi tells the PLC when to load a new ball and/or reset the pop bumpers).

Hardware

NOTE:
There are 2 types of relays in the machine. The small relays handle a small amount of 48 volt current - enough for the flippers because they draw less current when held on, but not for the other solenoids. The larger DC contactor relays handle 48 volts to other solenoids. The solenoids are running on a mix of 24 and 48. The 2 front pop bumpers, the drop target reset, and both flippers are on 48v, all others are on 24v. All switches are running 24v, except for the drop target opto-switches which run on 12 volts (These have a dedicated 12v sourcing input section on the PLC).

There is also 5v running to the incandescent lights, and 24v to the white light strip.
A 5v addressable light strip as well as some single addressable LED's meant to be controlled by the pi was purchased but not installed or integrated.

Wire Colors:

In general, blue means +dc and white w blue stripes means -dc. Red after the power supplies generally means +48, but we ran out of time when converting so some blue wires are also +48. Red before the power supplies means 120 AC. There is only one wire of this type, it runs to the switch on the bottom of the machine, which breaks power between the breaker and the 24 and 48 volt power supplies.

Most wires to the playfield are labeled, although plc -> relay wires are currently not.

Filter board & power switch

There is a power filter board for 12 and 48 volts mounted to the rear wall of the cabinet. All 48 and 12 volt current used by the machine passes through here(it has it's own wall plug for 12 volts). It has replaceable fuses and an enable pin, which is ran to the same switch that breaks

the wall power. This means that the switch breaks all power except for the 5 volt line, which comes from a separate power supply.