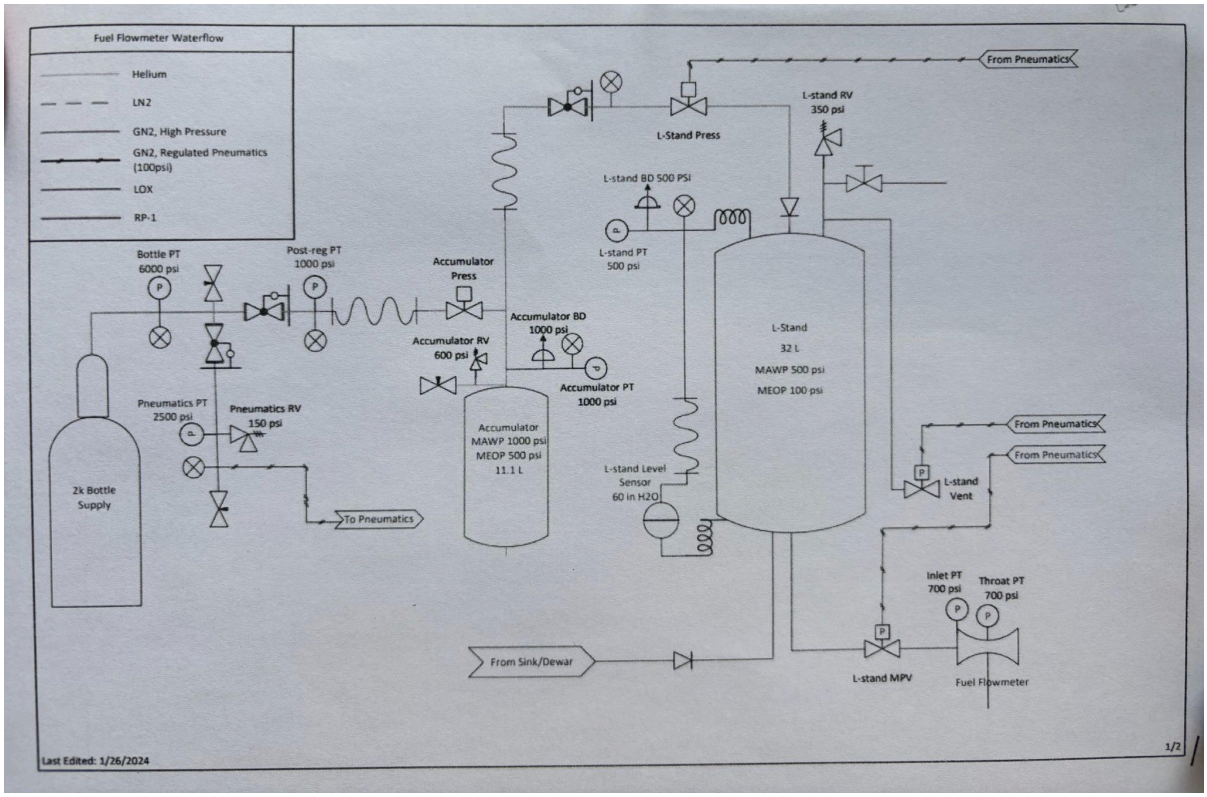
Creating the PID Diagram

To familiarize you with the process of creating a PID, this tutorial will walk you through producing the following PID on the Console. PIDs for each test will be different. When operating the console, adapt the following according to the given PID. This can still be used as a reference though.



1. Click on the Synnax icon to open Synnax. It should take you to the “Getting Started” page. [Insert screenshot of getting started page]
    a. By default the Console PC should be connected to the MASA cluster. As indicated by the “MASA” label under the cluster tab. [Insert screenshot here]
    b. If it is not. Click the “Connect a Cluster” button, and use the following connection parameters:

       Name: `MASA Remote`

       Host: `synnax.masa.engin.umich.edu`

       Port: `80`

Username: `synnax`

Password: `seldon`

Secure: `true`

c. Click done:) You should not be connected to the MASA cluster.

2. To make sure your PID and data is saved. Click the ranges icon (It looks like a little clock). Then click the plus button to add a new range. Define the range with the date and name of the test. For this specific PID, it would be “2/3 flowmeters”. The start date should be the start date and time of the test. For this PID it was “2024/02/03 10:00:00 AM”. The end date should be the anticipated end date and time of the test. Again, for this specific PID it was “2024/02/03 6:00:00 PM” Then click save
3. To create a PID Diagram click on the “Create a Visualization” button. Then, for the visualization type, choose PID. It should take you to a page that looks something like this. [insert PID start page]
4. From here, where you begin is really up to personal preference. I like to go from left to right for each component type, so I will begin by clicking on the tank icon in the symbols tab, and drag it to the dotted workspace. Since it is the leftmost element in the PID, let’s drag it to the left of the screen.
5. Let’s change the name to be more descriptive than “tank”. To do so, click on the tank on the workspace. In the Label tab, replace “Tank” with “2K Bottle Supply”. If you wish, you may adjust the sizes of the labels by clicking on another label size. Doing so will essentially increase or decrease the font size of the labels. Repeat this process for L-stand. The PID should now look something like this. [Insert screenshot with LStand and 2K bottle]
6. Next, let’s make a label for the bottle PT. Since the PT is just a sensor, we only need the value it’s reading, so we will just use the value icon. Again, replace “Value” with “Bottle PT” to make it more descriptive. For this PID, repeat this step for the Pneumatics PT, Post-reg PT, Accumulator PT, Throat PT, and Inlet PT. You PID should now look something like this. [insert screenshot of PIDs with PTs]

7. Now let's add a valve. We'll start with the accumulator press. Notice that there is a little square above the valve. This indicates that it is a solenoid valve. To make that in the PID, click on the "Solenoid Valve" from the symbols tab and drag it to the workspace. Again replace "Solenoid Valve" with "Accumulator Press" to make it more descriptive. Repeat this step for the L-Stand Press. Your PID should now look something like this. [insert screenshot of PIDs with solenoid valves]
8. To walk you through the process of adding a normal valve, let's add the L-stand MPV. Click and drag the icon labeled "Valve" from the symbols tab to the workspace. As per the solenoid valves and bottles, change the label from "Valve" to "L-stand MPV". Repeat this for the L-Stand vent. The PID should now look something like this. [insert screenshot of PIDs with normal valves]
9. Congratulations! You have just created your first PID :)

Some Helpful Tips

- If the icons do not seem to be appearing on your workspace, try clicking the "Fit view to screen icon," sometimes the symbols will be added to the edge of the workspace

Terminology and acronyms

- **PID** — Pin input and output diagram
- **De-energized —** Valve or vent is in its default state, icon is empty
- **Energized** — Valve or vent is not in its default state, icon is filled in
- **Cycling/actuating a valve or vent** — Energize the valve/vent for a few seconds, then de-energize it
- **DOA (digital output acknowledgement)** — typically used for valve channel inputs
- **DOC (digital output command)** — typically used for valve channel outputs
- **AI (Analog Input)** — typically used for Pressure Transducers (PTs), Thermocouples (TCs), and Load Cells

A Note About Vents and Valves

- Vents — normally open
- Valves — normally closed