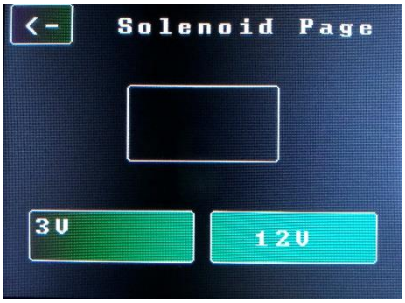
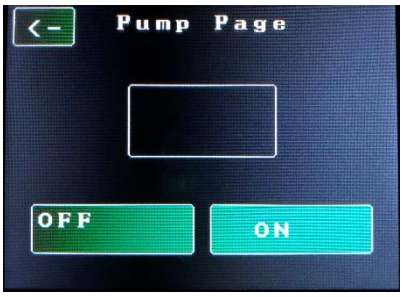
GRADIENT MIXER INSTRUCTION SET

Homepage

- There are two ways to control the gradient mixer, an automatic way and a manual way.
- The Automatic way is the “START” green button.
- The Manual Way controls two components, the solenoid valve and the pump. Both buttons redirects you to a new page where you can control each state.

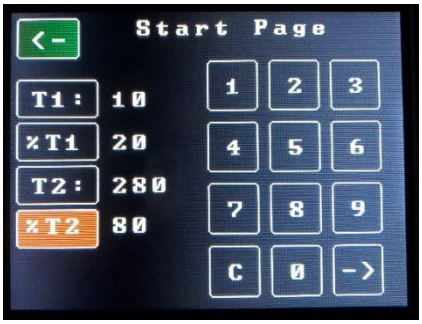
Manual Way





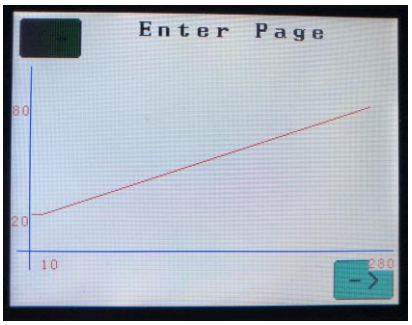
- To manually control the state of the valve, enter the solenoid valve page. Two buttons and one rectangle will appear, the “3V” button sets the solenoid valve in the off state and the “12V” button sets it to the on state. The rectangle in the middle will be yellow or black, if it is in yellow it indicated that the valve is on the on state, and if it is black then it is on the off state.
- The pump can be turn on and off manually on the pump page. The square in in the middle works the same as in the solenoid page. Black means off and yellow means on.

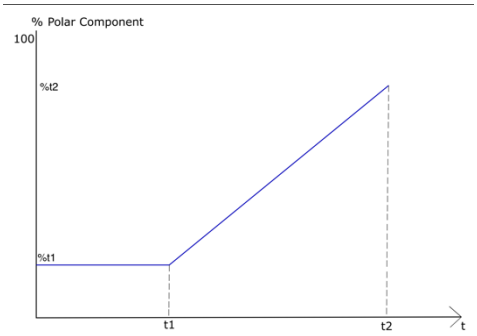
Automatic Way



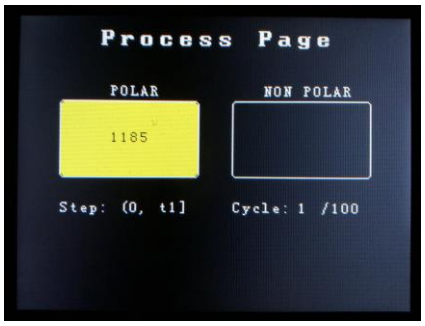
- The automatic way creates a linear gradient depending on the four inserted values.
- The gradient mixer will maintain the initial percentage inserted in $\%T_1$ for T_1minutes.
- After T_1minutes, the percentage will start to linearly increase until it reaches the percentage inserted in $\%T_2$ and it will take T_2 minutes.
- The maximum time the gradient mixer can run is 6 hours. Therefore, 360 minutes is the max number for T_2.
- Other restrictions are:$1 < T1 \leq 10; \%T1 \geq 1; T1 < T2; \%T1 < \%T2 \leq 100$, #This restrictions can be change on the arduino code.

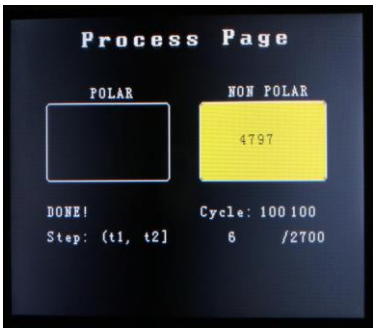
- When enter is pressed, the gradient mixer will show a preview of the graph that it's going to follow.

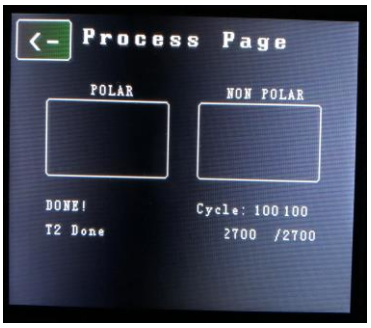




- Make sure that when the solenoid valve is on the on state (12V), the chemical flowing is the Polar one (or the chemical increasing).
- After confirming the preview graph, it will redirect you to the process page. In this page all the process starts automatically, it starts with the polar solvent flowing and then the non-polar. Once in the process page you cannot go back unless the progress has finished. The only way to stop the process is by using the emergency button and it will turn everything off. This page also updates you with all the progress of the mixer. It will indicate in which step of the process is in, either (0,t1] or (t1,t2]. It will also show how many cycles per step are needed, in which cycle it's on, it shows which chemical is flowing by filling its corresponding square in yellow and it shows by how many milliseconds it will flow.







- Each cycle last 6 seconds,. So, if its missing 1,000 cycles for it to finish. It will take $1{,}000 \times 6\ seconds \cdot \frac{1\ min}{60\ seconds} = \frac{1{,}000\ min}{10} = 100\ minutes.$

Emergency Stop Buttons

- The stop buttons only work when the gradient mixer is on the process page of the automatic part. If the gradient mixer is on another page, then all button press are ignored.
- Red button is to stop the automatic process at any moment. The process will stop from where it was, it will wirelessly turn the pump off and it will turn on the red LED indicating that the process is on hold.
- To renew the process from where it was, press and hold for 1 second two times the green button. This will wirelessly turn the pump on, turn off the LED, and it will container the gradient mixer from where it was stopped.