3 Parallel Droplet Generator and Mixer System

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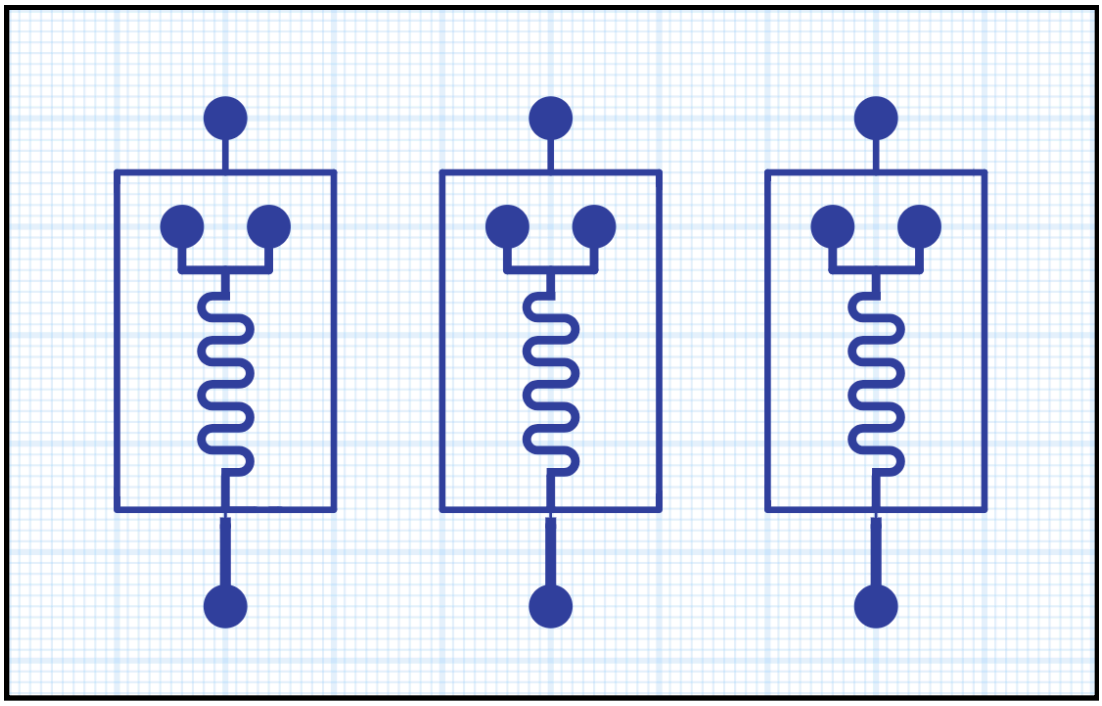
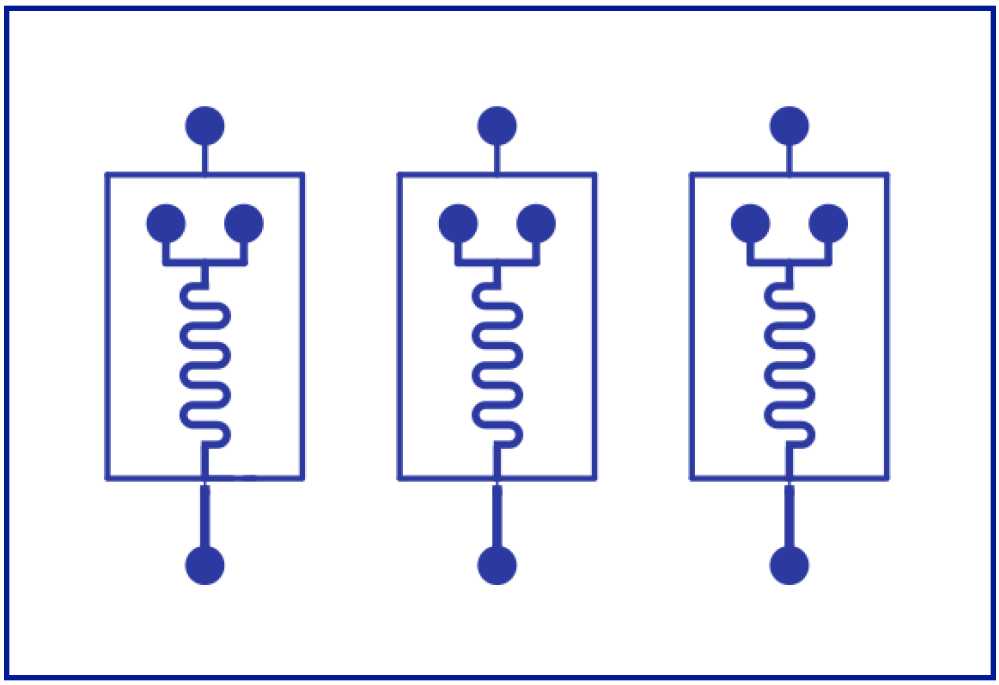
Overview



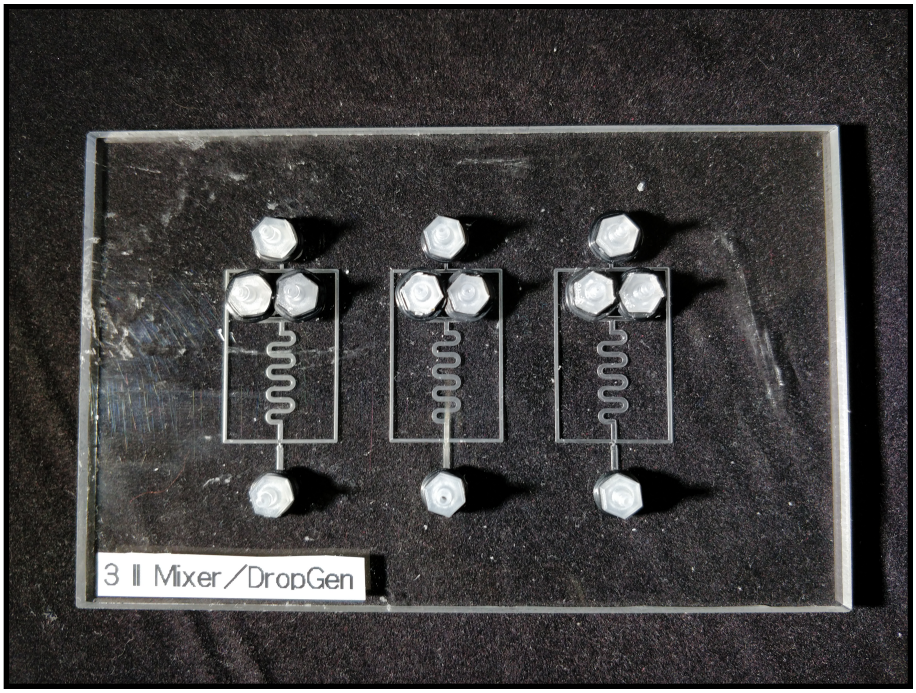
This chip is designed to be used with a TERRA Adapter. It consists of three identical parallel systems, each containing a mixer and a droplet generator. It can run one, two, or all three of these systems at any one time.

Chip Design



Flow Layer

Milling Instructions

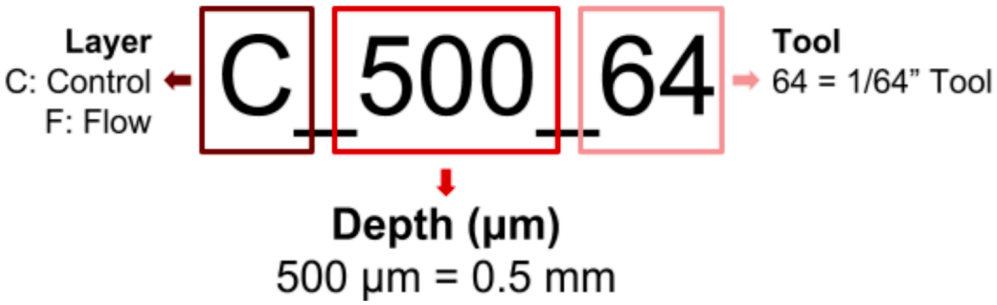


Flow Layer

Notes:

- This chip should be milled on thick polycarbonate (5.00mm < $Z_{Polycarbonate}$)
- This chip should be used with thin PDMS (0.24mm < Z_{PDMS} < 0.26mm)

All the required SVGs for milling this chip are provided in the ZIP file. The layer, depth, and tool required for each SVG are listed in the file name. Below is the key describing how to read an SVG file name.

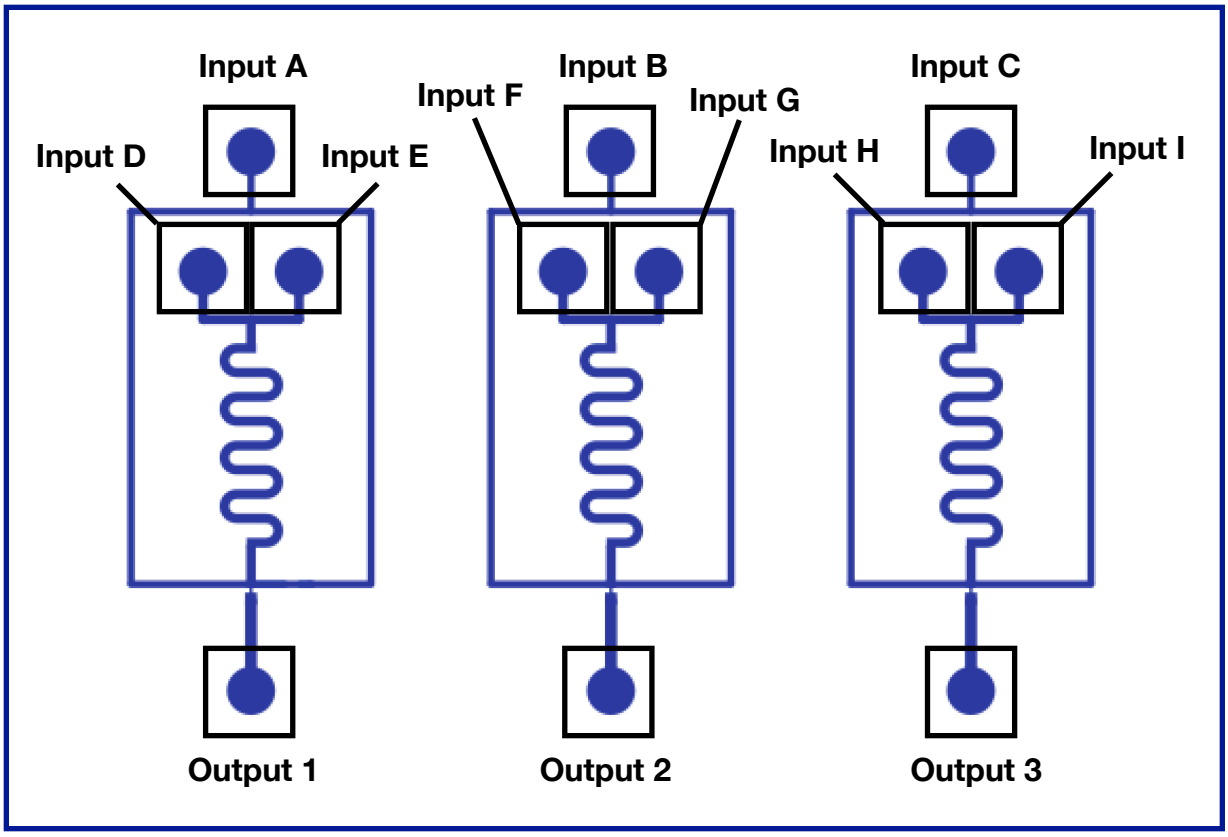


Mill the layers in the order they are listed with the correct depths and using the correct tool

Flow Layer	
Order	**Layer Name**
1	F_400_32
2	F_400_64
3	F_400_100
3	F_THRU_8
4	Border

Testing Protocol

Flow Layer Set Up



Inputs		
Name	**Liquid**	**Flow Rate**
A, B, C	Mineral Oil	4.0 mL/hour
D, E	Mixer 1 Inputs	2.0 mL/hour
F, G	Mixer 2 Inputs	2.0 mL/hour
H, I	Mixer 3 Inputs	2.0 mL/hour

Outputs	
Name	**Liquid**
1	Mixed Droplets from Mixer 1 in Mineral Oil
2	Mixed Droplets from Mixer 2 in Mineral Oil
3	Mixed Droplets from Mixer 3 in Mineral Oil

Testing the Chip: Set Up and Protocol

1. Attach all the syringes to their correct inputs and set each to the desired flow rate indicated in the above table
2. Attach the output tubing to the chip's output
3. Start flowing all inputs through the chip
4. Let stabilize
5. Attach the outputs to the inputs of the TERRA Adapter (see its documentation for more information)

Cleaning the Chip

1. Carefully disconnect tubing and dispose of all liquid waste
2. Disconnect all syringes
3. Clean the chip following the MARS protocols
4. Store the chip following the MARS protocols