

## APPLICATION NOTE

### Using Multiple Mass Flow Controllers to Control Gas Mixture Concentration

Process gases are essential for chemical reactions to take place. Different process gas concentrations will yield different results & hence this is common to see researchers to vary ratio of individual gases at different timings as part of their R&D to obtain the desired results.

#### Setup

For this reaction, heating to 600 deg C and total of 4 different process gases (N<sub>2</sub>, Ar, CO<sub>2</sub>, H<sub>2</sub>) are required. 4 mass flow controllers are setup in a platform and connected respectively to each individual gas supply. They are subsequently connected to quartz tube within a tube furnace where heating occurs.

#### Software

Using our self developed software **GasFlow2.0**, end user is able to use the below capabilities.

- View status of the MFCs
- Control each individual gas composition in % or sccm
- Specify run time duration (i.e 5 minutes) for each gas mixture.
- Create recipes for few gas mixtures to run in sequence.
- View realtime gas flowrates in display windows.
- Datalog results for gas flow rates in past 48 hours
- Perform ad hoc flushing the system with inert gases (Ar, N<sub>2</sub>)

Our setup has allowed the customers to run several experiments in sequence without any customer intervention and also remotely. If there is a need to change to a different gas type, the setup can well be configured within minutes to serve a complete range of R&D experiments.

