How to set up an automatic sequence with the Prospa and Spec Control software.

# Setup Prospa macro

Find the create\_auto\_seq.mac file and call the handshake procedure within your acquisition macro. The handshake procedure will write the sequence file and then wait 2 minutes for a response. Make sure the response is 1 and then begin the acquisition sequence in your macro.

The handshake procedure expects 4 parameters:

1: step\_types - This parameter expects a list of characters that are valid step types, e.g. step\_types = ["b", "h", "d"] # The types of steps you want in order (this does bubble, hold, depressurise)

Current valid step types are:

'd': 'Depressurise',

'n': 'Nitrogen',

'e': 'Evacuate',

'b': 'Bubble',

's': 'Sleep',

'h': 'Hold Bubble'

2: step\_times - This parameter expects a list of ints denoting the length of the step in milliseconds, e.g. step\_times = [10000, 8000, 3000]

3: motor\_positions - This parameter expects a list of positions for the motor to go to at each step in millimetres, e.g. motor\_positions = [0, 2000, 0]. The value is measured as the distance from the top position. Put a value of 0 for the motor to not move between steps. If all values are 0 then the motor is not required for operation, e.g. motor\_positions = [0, 0, 0]

4: save\_path - here is where you can specify where the measured pressure gauge values will be saved to. Please use double backslash in the string to avoid escape characters, e.g. save\_path = "C:\\ssbubble". This value is also the default value, so if you are missing data then check this path for a timestamped .csv file.

# Connect arduino and motor in Spec Control

Plug in the required devices to the USB ports in the computer. Open the Spec Control software. Specify the COM port for the required devices (can be found in device manager) and click connect. Check the console window for any errors.

# Starting the sequence

When your macro is ready to run, open the Spec Control software and ensure that:

1. The motor is connected and calibrated (if required for this sequence).
2. The arduino is ready to connect in automatic mode (you can connect in manual first to check the port is correct).
3. Connect the arduino in automatic mode and the program will begin looking for the sequence.txt file generated by Prospa. Ensure the info messages in the console window say that it is looking for the file
4. Run the Prospa macro and if the sequence file is decoded correctly, the automatic sequence will begin. Ensure that your Prospa macro aborts the sequence if the handshake macro returns 0