



Activated Research Company®

EFC Software Instruction Manual: PA-MAN-SM2

# Polyarc® FCS - Flow Control Software

## Installation Instructions

**System Requirements:** Microsoft® Windows XP, 7, 8 or 10 with the .Net Framework v4.0, or higher, installed.

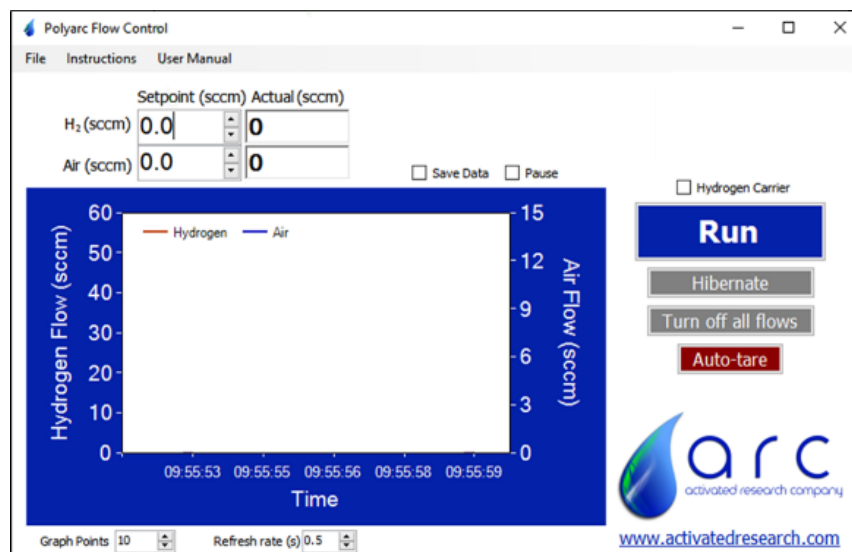
1. Before plugging-in ARC's USB communication cable – download, extract, and install the USB-RS485 drivers from the **FTDI Chip** website:

[http://www.ftdichip.com/Drivers/CDM/CDM21218\\_Setup.zip](http://www.ftdichip.com/Drivers/CDM/CDM21218_Setup.zip)

2. Download ARC's FCS file to your computer. The ZIP file contains this document and the Flow Control Software. Export both files and move them to the desired directory on your computer.

<https://www.activatedresearch.com/wp-content/uploads/2022/01/arc-efc-files.zip>

3. Ensure the electronic flow controller (EFC) is connected to the correct gases with the correct pressures – and are leak free.
4. Plug ARC's USB (RS-485) communication cable into your computer – and then firmly into the flow control box.
5. Turn the EFC ON by turning both power switches ON. Both lights should be illuminated.
6. Run the FCS by double-clicking on the PolyarcFC\_v#.exe file.
7. Select the COM port of the USB device – found on your computer under Device Manager/Ports. Use the Taskbar Search Box – type Device Manager – then click on the Device Manager “best match.”  
Select the USB device from the list.
8. The FCS will begin communicating.
9. Use the FCS fields and buttons to view | change | save flow rates.  
Values are saved in the flow controller's non-volatile memory – and will be used until they are changed.



# Polyarc® FCS - Flow Control Software

## Operating Instructions

### Notes:

1. Do not leave flow controllers ON for extended periods of time **with non-zero flow setpoints and without connected gases** – as the flow controller valves will try to maintain a fully open position and could overheat.
2. It is recommended that flow controllers are **tared** at least every six (6) months (see Auto-Tare Button below).
3. See the last page FCS UI image for field/button locations.

### Flow Rate Setpoints (1)

Set the H<sub>2</sub> and Air flow rates by entering values in the Setpoint fields and/or clicking on the appropriate button on the right-side of the UI.

### Actual Flow Rates (2)

Will display in the Actual fields AND in the Graph window – unless the Pause checkbox is checked.

### Save Data Checkbox (3)

Use the Save Data checkbox to specify a filename for data acquisition. Data will be saved in the CSV data format.

### Pause Checkbox (4)

Use the Pause checkbox to disable graphing and saving of Actual Flow Rates.

### Hydrogen Carrier Checkbox (5)

Controls **automated** flow rate adjustments:

#### Checked

- Enter a H<sub>2</sub> carrier flow rate setpoint
- Click on the Run button
- Flow Rate < 1.05 sccm H<sub>2</sub> flow rate adjusts to 40 sccm, Air to 5 sccm
- Flow Rate < 2.1 sccm H<sub>2</sub> flow rate adjusts to 40 sccm, Air to 7.5 sccm
- Flow Rate >= 2.1 sccm Contact ARC for best practices. Higher air flow rates can cause flame instabilities.

#### Unchecked

- Click on the Run button
- H<sub>2</sub> flow rate adjusts to 35 sccm, Air to 2.5 sccm

### Graph Points (6)

Sets the number of points shown on the Graph window.

### Refresh Rate(s) (7)

The Refresh Rate affects the amount of data shown on the Graph window – AND – the amount of data saved in the CSV file. Valid Data Refresh Rate values range from 0.5 sec to 3600 sec (one hour).

### Run Button (8)

Sets “standard” flow rates for H<sub>2</sub> and Air based on carrier gas selection.

### Hibernate Button (9)

Use to reduce gas usage while the Polyarc® reactor remains heated but is not being used.

Turns Air flow OFF – and reduces H<sub>2</sub> flow rate to 10 sccm.

During long periods of non-operation, we suggest setting the reactor temperature to a 150°C setpoint to prolong the life of the reactor.

### Turn Off All Flows Button (10)

Wait for the reactor to cool to below a 30°C setpoint before clicking the button.

Use when replacing the reactor – or for long-term storage at room temperature.

Turns Air flow OFF – pauses 10 seconds to purge the reactor of oxygen – then turns H<sub>2</sub> flow OFF.

### Auto-Tare Button (11)

Flow controllers require regular 6-month tare maintenance to correct for normal drift.

To determine if a tare is required – set one, or more, of the flow controller Setpoints to zero and verify the Actual value reports as zero.

If the Actual value is > 0.4 sccm – a tare should be performed.

### To perform a tare

- Let the reactor cool to <= 30°C to avoid oxidation of the reduction catalyst
- Click the Auto Tare Button  
This turns H<sub>2</sub> and Air flows OFF – then performs a tare to re-zero flow rate readings

