



Automatic Filling kits – User guide



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Contents

1	Introduction	2
2	Installation guidelines and wiring connections.....	2
3	About the Electrovalves	5
3.1	Solenoid valve.....	6
3.2	Servomotor ball valve	6
4	About the JDH Flowmeter Liter counter	6
4.1	Alarm Reset	7
4.2	JDH FlowVisor Port	7
4.3	Sensor	8
4.4	Relays.....	8
5	How to configure for Automatic filling	9
5.1	Single capacity	9
5.2	4-capacities application	10
6	Online Support and Shop catalog	10
6.1	Sensors catalog	11
6.2	JDH FlowVisor	11
6.3	Serial port converters	11

1 Introduction

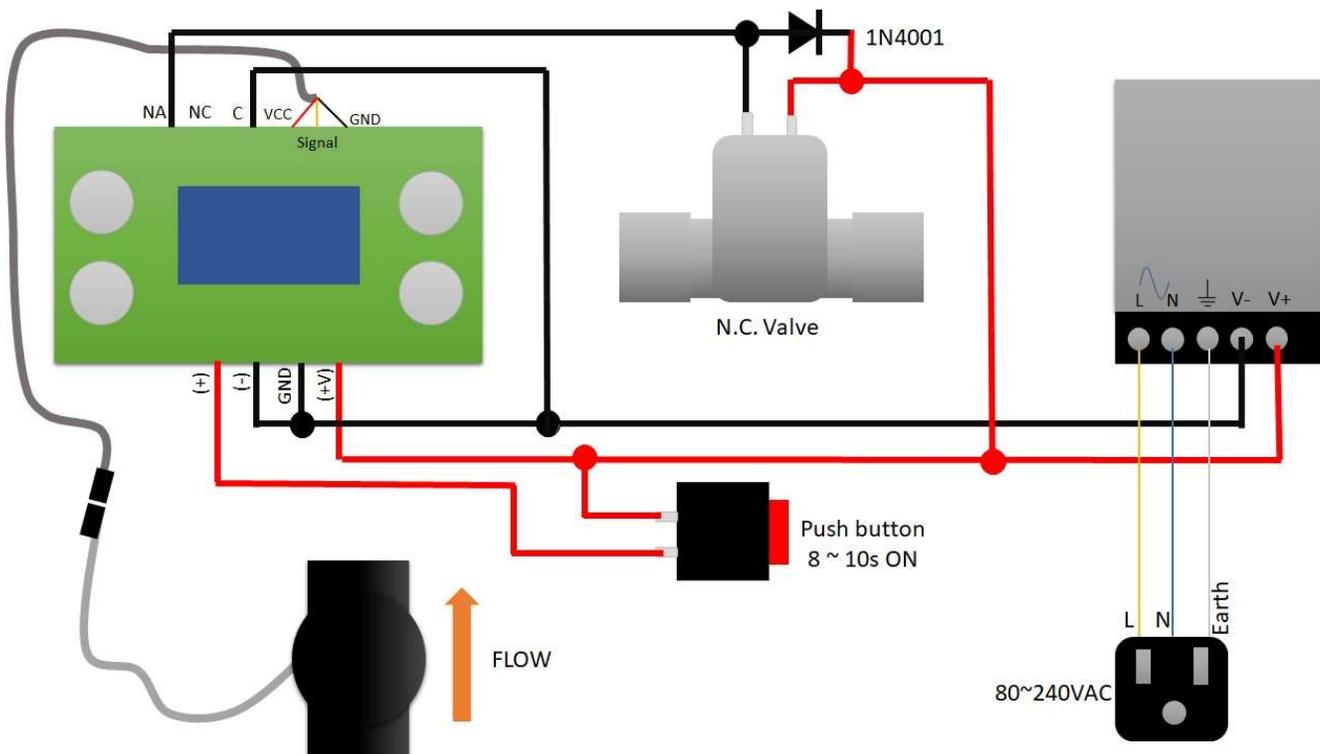
This User Guide is designed as a basic guidance on the installation and usage of our Automatic Filling Kits. We recommend users to get the advice of an expert technician to carry out the installation and the periodic maintenance that is needed. Although the Flowmeters and the components that form part of the kit are essentially not complicated pieces of hardware, we discourage non-technician users to do the installation or configurations. Please note that the following Guide is meant to be read by an Electronic or Electric Technician or some experienced individual with background knowledge and familiarity with electronic appliances, wiring, alarms, relays, etc.

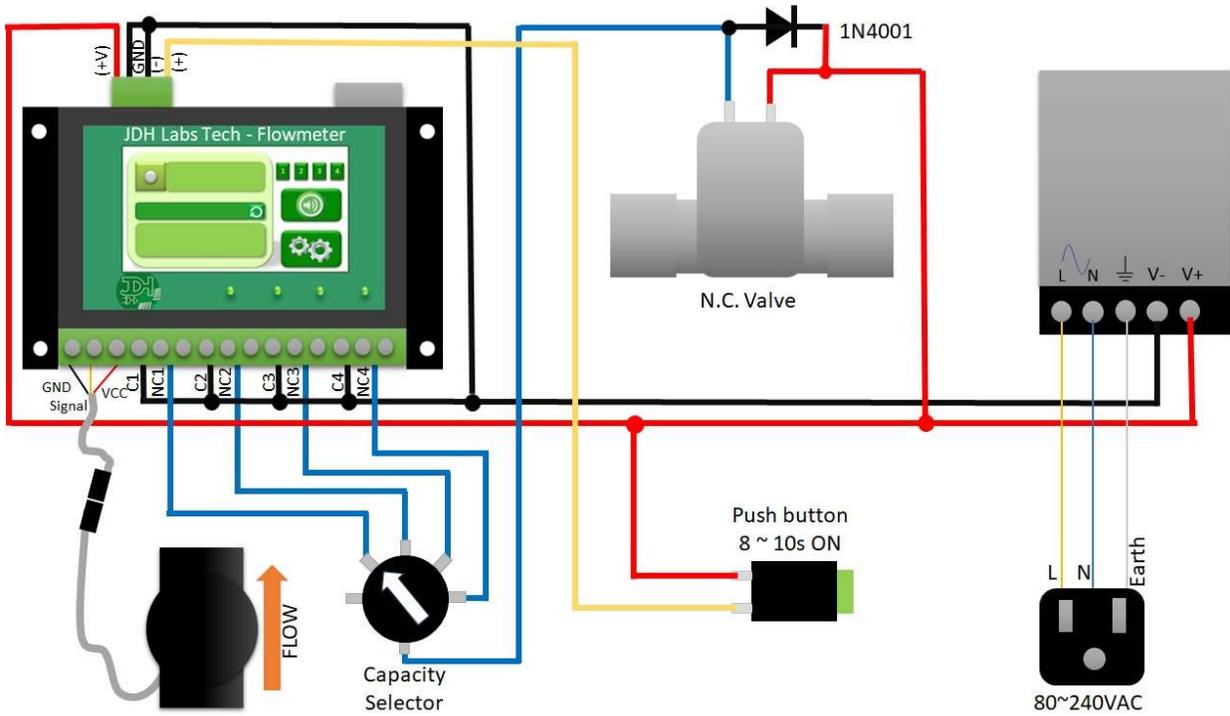
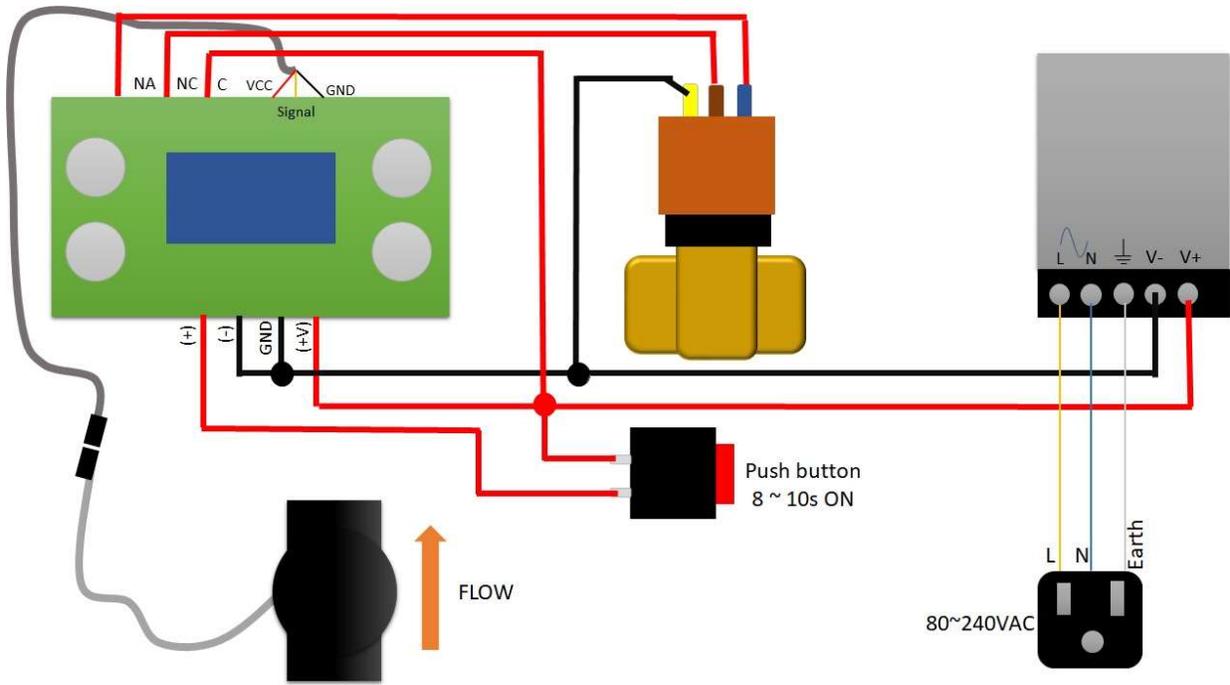
The Automatic Filling kits are meant to be used as one of the most popular applications for our JDH Labs Tech Flowmeters. This guide will focus on explaining the details of the system as a whole, and then exploring the main features of the components that come with the kits.

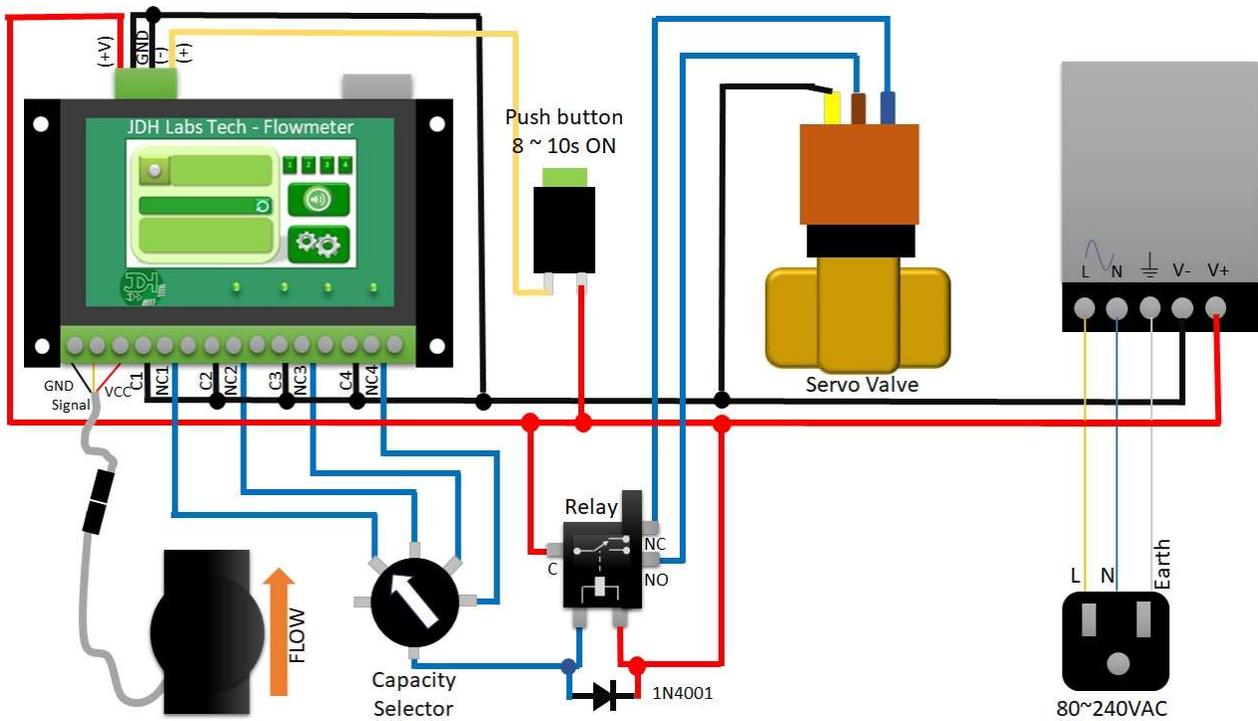
We have two kinds of kits, the basic one based on the economic 1-alarm Flowmeter and the four-capacity kit, which is based on the 4-alarms Flowmeter. This Guide will describe the common elements of the two, and then explore the details of the 4 capacity-kit.

2 Installation guidelines and wiring connections

Please refer to the following diagrams for your installation, depending on the version of kit you just purchased.







From the above schematic diagrams, please notice that the variations are basically the flowmeter version (either 1 alarm or 4 alarm) and the kind of electrovalve used. Just follow the schematic that fits the system that you received.

NOTE 1: Avoid machines, electrical equipment and high-powered motors that may radiate EMI near your cables! Run your wires away from this kind of equipment to make sure that your system will work reliably on all conditions. If you are installing in an industrial environment, use some sort of shielded cables to safely wire preventing Electromagnetic Interference



NOTE 2: One of the typical issues with our economical one-alarm flowmeter is that its screw terminals are tiny, so your wiring must be carefully checked, cable by cable to ensure that the terminals make good contact with the wire conductors. Peel your cables properly and make sure that all connections are tightened well. CHECK THEM TWICE BEFORE YOU CONTINUE!

Please notice that the 1N4001 diode is required only to act as a flyback diode, to absorb the Counter-Electromotive Force (CEMF) generated by the switching of the relay or solenoid. It can be replaced by any diode rated for the voltage and current matching this part number or above. Do not forget to install it, it is mandatory to avoid spooky damages or bad readings caused by the conducted EMI noise of the switching.

The push-button is wired to the Alarm Reset input. It can be omitted and be replaced by another system that generates a voltage signal, for example, a PLC in case that you have an automated system based on it. For further convenience, the Alarm Reset input is an optically isolated input (5V to 24V), so it does not need to share the same ground as the Power supply used in this system.

The Alarm-Reset input is designed to acknowledge the resetting of the Alarms only if the signal stays high for 8 seconds. If you find inconvenient this “Long Push”, you may optionally use a Normally Closed button instead, so you would Reset the alarm with a minimal duration push. Although we discourage this practice, as it is susceptible of false-starts or accidental resets specially in noisy environments.

The Capacity Selector is just a 1 Pole 5 Position (1P5T) switch, which is used to commute the alarms to control the electrovalve. In this case, each position is a setting in capacity. You can optionally connect the fifth position to GND to force the valve to open regardless of the current alarm status. You may optionally leave it open or connect to +12V in case you would like to have a STOP flow position.

About the hydraulics, the most important consideration about the turbine sensors installation, is that they are designed to be installed in a vertical section of pipe, in such a way that the liquid flows from bottom to top, covering the whole traversal area of the sensor as it flows. For better results, flow should not contain air or gas bubbles or solid particles that may interfere with the turbine spinning.

The important thing is that during installation the pipe is full at all times, with the liquid completely covering the cross-sectional area of the sensor. For this reason, it is preferred that the sensor be installed in a vertical section of pipe. Otherwise, there is a risk that the turbine will rotate even with any trickle of water running, giving incorrect measurements.

3 About the Electrovalves

We have prepared kits with Normally Closed solenoid valves and Servomotor ball valves. We do not recommend the Normally Open solenoid valve for this application, although we can supply upon request. Servomotor ball valves are used for our larger systems (DN15 steel, DN20 steel, DN32, DN40, DN40 steel, DN50 and DN50 steel). We can supply servomotor ball valves for the other systems upon request.

3.1 Solenoid valve

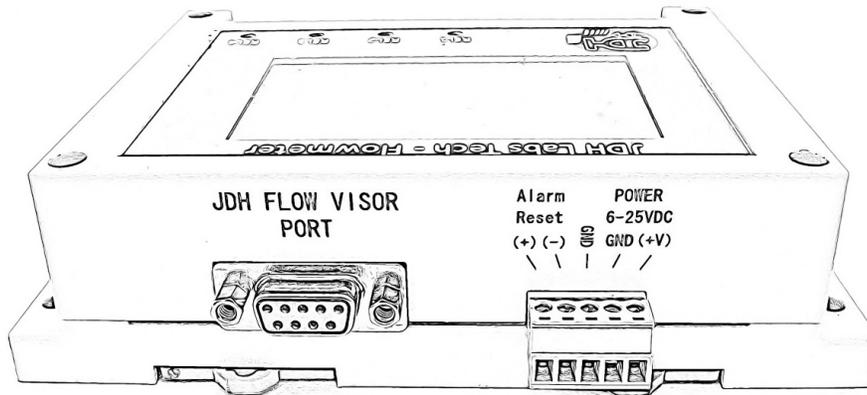
The suggested wiring diagrams show the configuration in such a way that the valve will be energized when the Alarm is OFF. This will enable the liquid to flow until the Alarm is triggered, this is, when the configured alarm setting counts down to zero. Then, the valve must switch to stop the flow!

3.2 Servomotor ball valve

The servomotor ball valve is activated on two terminals, one is to control opening and the other is for closing. In some cases, the brown and blue terminals' actions are swapped (brown is to open and blue is to close / or vice versa!) so please check the functionality on your valve and make sure that the wiring follows the same logic as intended: To enable the liquid to flow until the Alarm is triggered, this is, when the configured alarm setting counts down to zero. Then, the valve must switch to stop the flow!

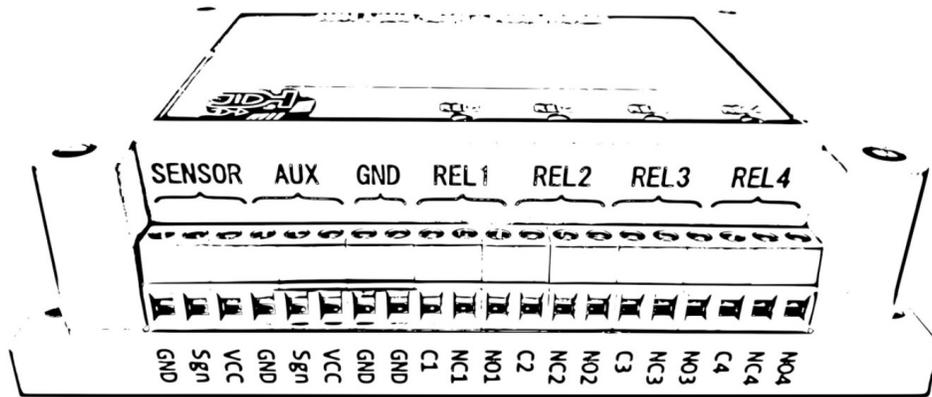
4 About the JDH Flowmeter Liter counter

The flow meter has the following connections on the top connector...



- ✓ JDH FLOW VISOR PORT This is a standard DB9 connector to interface with an external PC running JDH FlowVisor software
- ✓ Alarm Reset (+) Positive input for Reset signal +5VDC to +24VDC (See section 4.1 for details)
- ✓ Alarm Reset (-) Reference input of the Alarm Reset signal (0V)
- ✓ GND System Reference Ground
- ✓ POWER Power Supply input +5VDC to +25VDC
- ✓ POWER GND Power Supply input ground reference

The bottom connector has the following connections



- ✓ SENSOR GND 0V Supply connection output for flow sensor (conect to BLACK cable)
- ✓ SENSOR Sgn Pulsed Signal connection input for flow sensor (conect to YELLOW cable)
- ✓ SENSOR VCC Supply connection input for flow sensor (conect to RED cable)
- ✓ AUX GND Not implemented – do not connect
- ✓ AUX Sgn Not implemented – do not connect
- ✓ AUX VCC Not implemented – do not connect
- ✓ GND Spare GND connection output
- ✓ GND Spare GND connection output
- ✓ RELx Cx Relay Common pin
- ✓ RELx NCx Relay Normally Closed pin
- ✓ RELx NOx Relay Normally Open pin

4.1 Alarm Reset

The Alarm Reset input is designed to Reset all the Countdown Alarms to the configured setting at any given time. It is activated by an isolated voltage (independent from system ground) from 5VDC to 24VDC held for at least 8 to 10 seconds, afterwards the Alarms will get reset. Pay attention to the polarity of the signal, the positive voltage must be connected to the (+) pin and the negative reference to the (-) pin.

4.2 JDH FlowVisor Port

The JDH Flow Meter is compatible with the JDH FlowVisor software. The software can be installed in Windows or Linux systems. It is designed to help users visualize graphically the flow, the counts and the alarms in a customizable dashboard. It is a multilanguage, multiplatform software with a friendly user interface, designed to run even on a pocket PC or embedded computer running Linux, like Raspberry Pi

You can find more details about it in our shop www.jdhlabstech.com

4.3 Sensor

The flow meter is compatible with any pulsed signal sensor. You only need to configure the $\mu\text{Liter}/\text{pulse}$ accordingly. In our shop, we offer a wide range of options of sensors, from 6mm hose port small sensor to threaded pipes, from 1/2" inch (DN15), to 3" inches (DN80) pipes. We mostly support sensors for water and liquids with similar density. Copper-made, Aluminum-made and recently introducing steel-made sensors.



Please visit our shop for more details www.jdhlabstech.com

4.4 Relays

The alarm is associated with 4 SPDT relays. The relay outputs offer the three connections of each relay, which allows users to develop any sort of applications. You must know that the Relays are energized by default when there the alarm is off (continuity from C to NO). When alarmed, the relays will turn off (continuity from C to NC). The general specifications of the relays are as follows...

- Maximum load
 - Resistive: 0.40 A at 125 VAC, 2 A at 30 VDC
 - Inductive (power factor = 0.4) (L / R = 7 ms): 0.20 A at 125 VAC, 1 A at 30 VDC
- Maximum load current: 3A
- Maximum operating voltage: 250 VAC, 220VDC
- Maximum switching capacity:
 - Resistive: 50VA, 60W
 - Inductive (power factor = 0.4) (L / R = 7 ms): 25VA, 30W

5 How to configure for Automatic filling

Initially, you need to configure sensor's $\mu\text{L}/\text{pulse}$ according to this table.

"Set Sensor" $\mu\text{L}/\text{pulse}$	
uFlow 6mm	122
6mm	170
DN15	2222
DN15cu	1515
DN20	2778
DN20cu	2525
DN25	3472
DN25s	2104
DN25cu	2264
DN32	37037
DN40	33333
DN40s	37037
DN50	83333
DN80	333333

This value can be calibrated empirically according to your tests, for example if you allow flow to fill a 10-liter bucket and the meter only counts 9 liters, you must increase it by 10%

5.1 Single capacity

For the economical counter, the setting is like follows:

1. Go to the MENU, select SET ALARM..., select by Volume
2. Set the value to the desired amount of liters/gallons. Use the (-) key to modify the digit you want to set, and use the (+) key to increase the digit.
3. After the number is set to the desired value, press the OK key and confirm again after prompted to successfully finish the configuration.

Once this alarm is configured, let the liquid flow first and verify that the total count increases in the main screen. Please NOTE that the Total count is NOT the Alarm countdown that you just configured in the steps above.

When the alarm countdown reaches zero, the alarm will be triggered and you may hear the alarm beeping (and the Relay will switch to close the valve). The only way to disable the beeping while alarming, is through the software JDH FlowVisor. Please refer to it if you wish to keep the alarm

silent while the flow is stopped.

5.2 4-capacities application

For the 4-Alarm flowmeter, the setting is like follows:

1. Go to the Alarm Menu (Bell icon)
2. Set the desired values for the 4 alarms using the numeric keypad and press ENTER when done
3. Make sure to click on the third button to show the vertical cylinder that represents that the alarm is set by Volume
4. Make sure that the Relay button is pressed (dark green) to ensure that the relay is enabled
5. If you wish to keep the beeping on while alarmed (when the flow is stopped), make sure that the Speaker button is pressed. If you prefer to disable beeping, keep it unpressed.



6 Online Support and Shop catalog

If you have further questions, you might like to see our videos to find a visual explanation of our products. Watch our videos in our YouTube channel!

→ <https://www.youtube.com/@jdhlabstechvideos3030>



6.1 Sensors catalog

Our catalog of sensors is growing constantly. Feel free to look for a sensor that better fits your application in the following link

<https://jdhlabstech.com/jdshop/en/sensors-and-transducers/flow-sensors-control/>

6.2 JDH FlowVisor

JDH FlowVisor software is a program that can run in a PC, laptop or even in a single board computer like Raspberry Pi. It allows you to create your own visualization dashboard for your specific industrial application. You can see more details in the following link

<https://jdhlabstech.com/jdshop/en/sensors-and-transducers/flow-sensors-control/jdh-flow-visor-software-multi-platform-solution-for-flow-monitoring-windows-linux-mac.html>

6.3 Serial port converters

If you don't have a serial port in your laptop or PC, you may need a Serial to USB cable or perhaps a Serial to WiFi or a Serial to Ethernet converter so you can access your Flow Meter data from any remote location. Please find more information at our shop: www.jdhlabstech.com

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