

FlowVision^{2.0}

ALICAT

USER MANUAL

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Welcome to FlowVision 2.0™!

FlowVision 2.0™ is a graphics-based software for operating any Alicat flow or pressure device via a graphical user interface (GUI). FlowVision 2.0™ is the latest version of Alicat Scientific's FlowVision™ software.

FlowVision 2.0™ can be used to:

- Access information from Alicat devices
- Make configuration changes to Alicat devices
- Monitor performance
- Log data
- Chart data
- Script/automate device operations
- Communicate directly with the device via a terminal tab



Note: Identifiers and scripts from earlier versions of FlowVision SC™ are not recognized by FlowVision 2.0™

System Requirements

- Microsoft Windows 7 SP1, Windows 8/8.1, Windows 10, Windows 11
- Microsoft .NET Core 3.1*
- An internet connection (if installing via web)
- Serial port**

*Microsoft .NET Core 3.1 can be downloaded at:
<https://dotnet.microsoft.com/download/dotnet/3.1/runtime>

**Some computers are not equipped with physical serial ports. A virtual serial port can be utilized with a USB to serial adapter.

Installation

Follow these instructions to install the FlowVision 2.0™ software onto the computer intended for use with the Alicat device.



Caution: *Do not turn off or restart the computer during the installation process, as this causes FlowVision 2.0™ to not install properly and may damage the computer.*

1. Open a browser and go to the FlowVision 2.0™ software page on the Alicat Scientific website, located here: alicat.com/flowvision.
2. Click **Download FlowVision 2.0™** to download the file. Open the file (Setup_FlowVision_2.0_Latest.exe) to begin the installation.
3. Choose which folder to install FlowVision 2.0™. By default, the program creates a program folder and subfolder in AppData. If you want to use another install directory, click **Browse** and navigate to the desired location. Click **Next** to proceed to the next step when ready.
4. Review the information on the screen. Once the information has been confirmed to be correct, click **Install** to begin the installation. If the information is not correct, click **Back** and review the previous steps.
5. When the installation process is complete, click **Close** to exit.

To start the FlowVision 2.0™ program, select the program shortcut from the Start Menu: **Alicat Scientific** → **FlowVision 2.0™**.

Layout

FlowVision 2.0™ is a modular program with access to layout customizations that best suit your needs. This section covers the FlowVision 2.0™ visual space and details how to customize the software windows and tabs.

Workspace and Tabs

The workspace is the main window of FlowVision 2.0™ (figure 1). The modules list on the left provides access to the software functions. When tabs are opened, they attach at the top of the workspace in the tabs group (figure 2).

- Click on a tab for it to expand and fill the workspace. Tabs are the access point for data, charts, information, and allow interaction with your device. Tabs are individually selected by clicking on the tab title.
- Close a tab by clicking the **close** button (X) in the right of the tab's title.
- Separate a tab by clicking and dragging the tab's title away from the tabs group it separates and floats on its own. A separated tab can leave the workspace window.



Figure 1. Workspace.

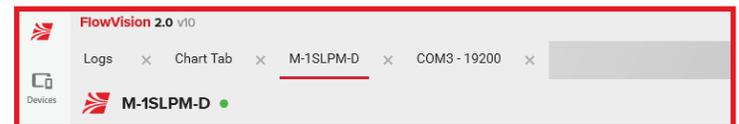


Figure 2. Tabs group.

Module Panel

See figure 3 and 4

When FlowVision 2.0™ starts, it displays a panel of modules on the left-hand side. These modules are the main components that allow for interaction with your Alicat devices.

Collapsing and Expanding Modules

Clicking on a module expands it with a list of the saved entries for that module. Within that this expanded space is also a search bar and a green plus icon that is used to add new entries. Clicking outside of the expanded module collapses it back into the **Module Panel**.

Adding and Deleting Entries

Click the **green plus sign** to the right of the search bar to add an entry to a module. Once a model is added it is added to the saved entries just below the search bar. Entries are sorted by the order they are added to the module.

- Click on a saved entry to open a tab for that entry
- Hover over the an entry and click the **gear** icon (⚙) to edit or remove an entry from a module.



Figure 3. Module panel.

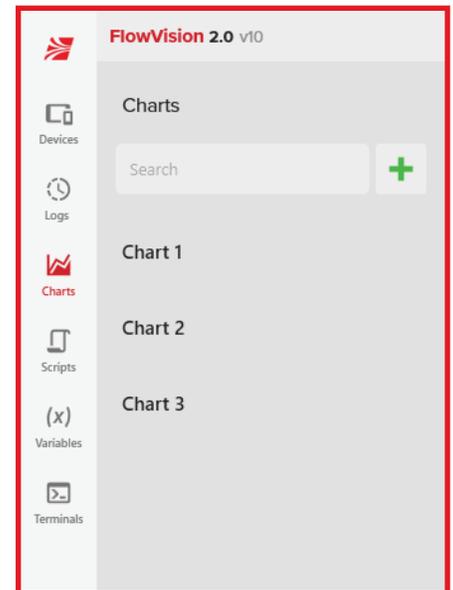


Figure 4. Expanded module.

Arranging and Docking Tabs

Tabs can be individually maximized, resized, docked various portions of the workspace, or re-attached to the tabs group.

- To separate a tab, click and drag the tab name away from the tabs group. The tab breaks off and creates a separate window from the rest of the workspace.
- Dock a separated tab to a side of the screen by dragging the tab. An overlay with available docking options appears in the middle of your screen. Drag the tab over an icon to dock the tab to that location. When the floating icon turns white and a portion of the screen turns red, release the mouse button to drop the tab into the dock.
- Re-attach an entry tab to the tabs group by clicking and dragging the tab over another tab and releasing the mouse button. Alternatively, drag the tab over the center icon before releasing the mouse button. When the screen is highlighted in red, release the tab to return it to the tabs group (figure 5).

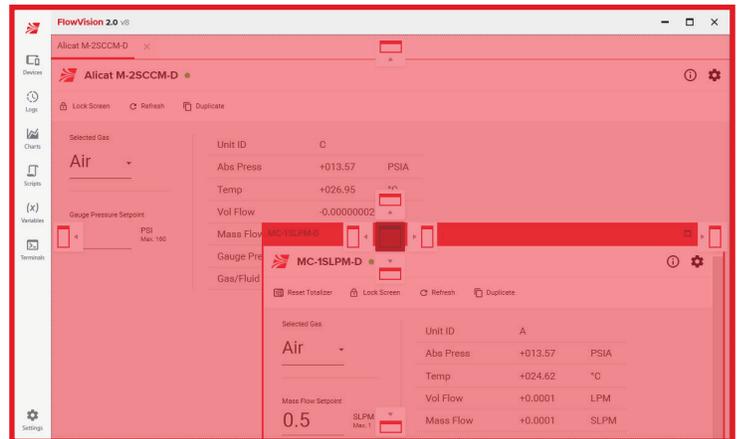


Figure 5. Re-attaching module to the tabs group.

Connecting to a device

To use FlowVision 2.0™ with a device, the device needs to be added to the **Devices** module saved items. There are two ways to connect to devices in FlowVision 2.0™.

Connecting Using a COM Port

See figures 6, 7, and 8

If adding a single device or multiple devices that are connected to the computer's COM ports, use this option.

1. Connect the device to the computer via a cable and then click the **green plus sign** in the **Devices** module. The **Add Device** window appears with two options, **Wired** or **Bluetooth**. Select **Wired**.
2. Specify the **Device ID**, **Baud Rate**, and **COM port** of the device.
 - Unless otherwise specified, Alicat devices have a default device ID of A and a baud rate of 19200 (CODA devices have a default unit ID of 1 as Modbus RTU is the default communication protocol).
 - If the computer has a built-in serial port, it is typically registered as **COM 1**. USB to serial adapters determine the next available COM port name and register it as such.
 - To find the exact COM port number you are connecting to, look at your computer's Device Manager under the Ports tab. If using a USB cable and the COM port number is still uncertain, try unplugging and plugging the USB cable in at the computer. The COM port disappears when unplugged and reappears when plugged in. If issues continue, use the COM port troubleshooter at alicat.com/support/software-drivers/ or contact Alicat for assistance.
 - If the name field is left blank, the name generator creates a name using the value of the device's ID, model, and serial number.
3. Clicking **Advanced** adds a timeout for how long in milliseconds to wait before the device is considered unreachable.
4. Click **Add**. If all the parameters are entered correctly, the device is saved as an entry under the **Devices** module. Click the **close** button (X) in the top right-hand corner to exit adding a device.

If the device is not detected by FlowVision 2.0™, a new window appears asking if you still want to add the device or cancel. If the device is properly connected to the computer but is still not showing up in the **Devices** module, try searching for the device by clicking the arrows next to **Device ID** and **Baud Rate**. This created new fields to search to create a range to search for the device through (Figure 8). You can also select multiple COM ports to search. When the search function discovers a device, FlowVision 2.0™ prompts you to select which device(s) to connect.

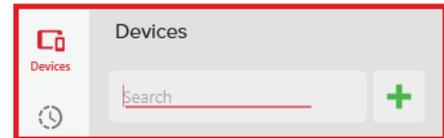


Figure 6. Green plus sign for adding a device.

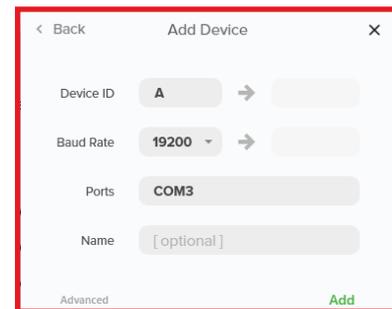


Figure 7. Connecting using a COM port.

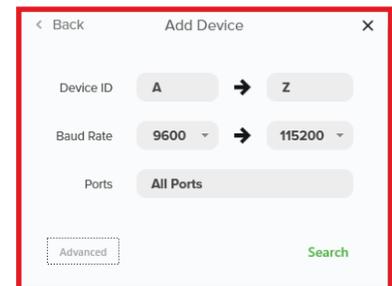


Figure 8. Searching for a device.

Connecting Using Bluetooth

See figure 9

If your Alicat device has Bluetooth capabilities, you can connect to FlowVision2.0™ wirelessly using the steps below.

! **Note:** *Alicat devices with Bluetooth include the FP-25 and the MB units with the Bluetooth configuration (-BT in the part number).*

1. With your device powered on and within the Bluetooth range, click the **green plus sign** to the right of the search bar in the **Devices** module. The **Add Device** window appears.
2. Select the **Bluetooth** option. The window automatically starts scanning for Alicat devices over Bluetooth. Once detected, the device appears with Alicat, its model, and its serial number.
3. Select the device and click the **Add** button.
4. Click the **Close** button (**X**) at the top-right corner to exit the add device window. Once the device has been added, it appears as an entry under the **Devices** module in its saved entries list.

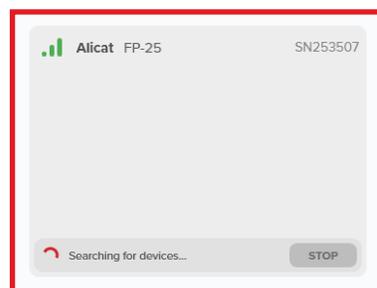


Figure 9. Connecting using Bluetooth.

Devices Tab

See Figure 10

Open the device tab by clicking a device's name in the **Devices** module saved items.

- The colored circle to the right of the device name is the status indicator.
- The indicator is green if the device is communicating properly.
- The indicator is red if the device is in error or not communicating.
- Below the device name is a row of buttons. This is referred to as the **device actions** panel.
- These are items like reset **totalizer**, **lock screen**, **refresh**, and more depending on the device.
- The left side has buttons and fields that you can use to control the device.
- Depending on the device, this can include items like setpoint, gas selection, batch, and more.
- The right side of the tab shows live measurements from the device (updated every 150ms by default).
- To obtain information on the device (Model, serial number, firmware version, and full scale range), click the information button in the top right hand of the tab (figure 11).

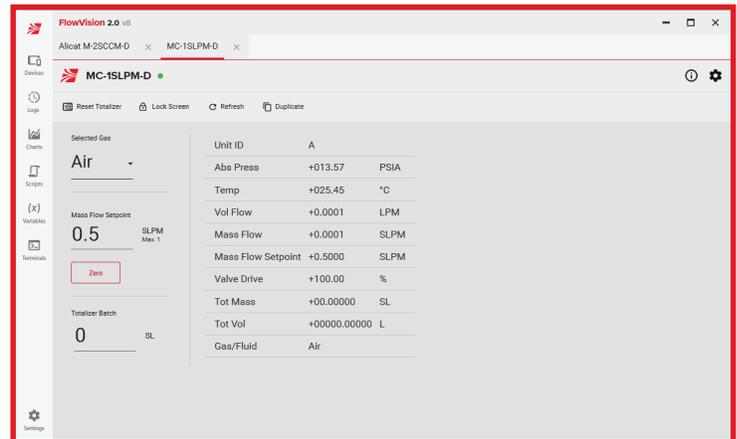


Figure 10. Device tab.

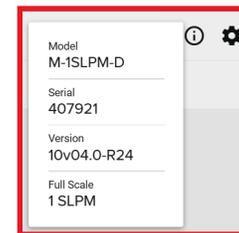


Figure 11. Device information.

Device Actions

Just beneath the device name are the device actions. These are quick functions that perform simple tasks on the device or in the tab. Not all actions are available on all devices.

Reset the Totalizer

Devices that have an enabled totalizer can track the total mass and volume that flows through the device. When this is the case, the **Reset Totalizer** button appears in the device actions panel.

- Reset the totalizer by clicking **Reset Totalizer**. The value resets immediately, without confirmation.
- This will also resets the amount that's been batched, starting a new batch if it has been completed ([page 10](#)).

Lock/Unlock the Screen

If your Alicat device is equipped with a screen, it can be locked and unlocked using FlowVision 2.0™. The **Lock Screen** option is located in the device actions panel near the **Reset Totalizer** and **Refresh** buttons.

- Lock/Unlock the screen by toggling **Lock Screen**. The icon has a check mark in the bottom right when the device's screen is locked.

Refresh Device

The **refresh** button manually polls the device and updates the live measurements.

Tare Function

The tare function sets the zero flow reading on a meter or gauge and is not present on controllers. Tare the meter by clicking the **Tare** button. Taring occurs immediately, with no confirmation. Controllers use the auto-tare function found in the device settings ([page 12](#)).



Note: The tare function is discussed in detail in the instruction manual for your device.



Warning: Tare flow only when there is no flow through the unit. Tare pressure only when the device is venting to atmosphere.

Duplicate

The **Duplicate** button creates a second tab for the device and adds it to the tabs group.

Changing Gas (Mass Flow Devices)

To change the gas that the device measures:

1. Select the device from the **Devices** module list to open its tab.
2. Click the drop-down menu under **Selected Gas** and scroll down to the gas that you are flowing.
3. Click the desired gas. The device is now set to measure that gas.

! **Note:** If you do not see the gas you are flowing on the list, please contact Alicat before proceeding to verify if your unit is compatible with the desired gas.

⚠ **Caution:** Do not flow gases that are not on the gas list. Doing so voids the device warranty and may cause permanent damage to your flow device. Contact Alicat with any questions about supported gases.

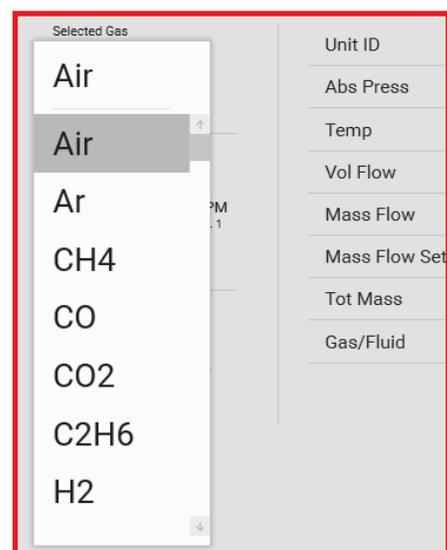


Figure 12. Selecting a different gas.

Setpoints (Controllers)

See figure 13

The setpoint field allows you to change the setpoint on a controller. The type of setpoint is displayed under the selected gas in the device tab.

- Change the setpoint by entering the desired value in the setpoint text box, then click **Apply**.
- Reset the setpoint to zero by clicking **Zero**.
- Change the setpoint type by going into the device's settings. Under the Controller tab, change the selected setpoint type.

! **Note:** If your device's setpoint source is set to analog, the setpoint entry is hidden. The Setpoint source is changed to Serial/Front-Panel through the device's settings under the **Controller** tab.

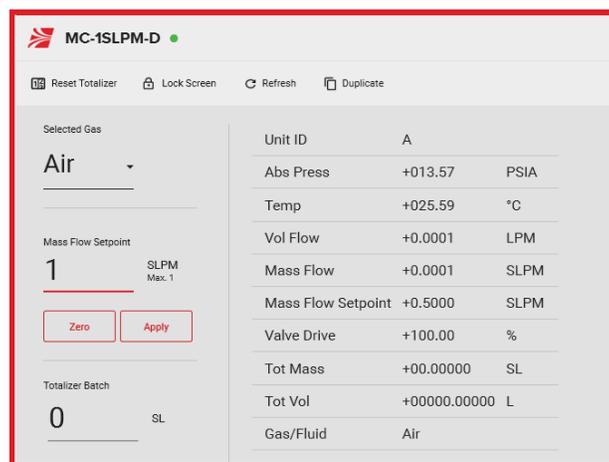


Figure 13. Device Tab. Note the setpoint on the left.

Totalizer Batch (Mass Flow and Liquid Controllers)

Controllers with an enabled totalizer have the option to dispense gas in batches of a desired volume. To do so, perform the following:

1. Reset the setpoint to zero.
2. Enter the desired amount in the Totalizer Batch field and click **Apply**.
3. Enter a valid setpoint and click **Apply**.

Once the desired amount of flow has passed through the device, the valve shuts, but the setpoint remains the same. The valve will remain shut until either the batch size is zero, or **Reset Totalizer** is clicked. Clicking **Reset Totalizer** with a defined setpoint starts a new batch.

The engineering units of the batch are determined by the **Total Mass Unit** box in the **Measurements** tab of the device settings.

! **Note:** If the totalizer is not enabled, please refer to your device's manual (alicat.com/manuals) on how to enable it.

Device Settings

Device settings control a number of different functions and features of your device. To access the device settings, click the **gear** icon (⚙️) next to the name of the device entry in the device modules saved entry list or the gear in the top right portion of the **device tab**. Below are explanations of each section within these settings.

Connection

See figure 14

The connection section controls how the device communicates with FlowVision 2.0™.

Connection Settings

Connection settings is used to modify things like the device name, COM port, baud rate, device ID, and the polling rate.

If COM port or baud rate are modified, connection to the device is lost until it's connected to the new COM port and the baud rate is updated on the device itself.

Changing the **Polling Rate** modifies how often the device information is updated. The default rate is 150ms.

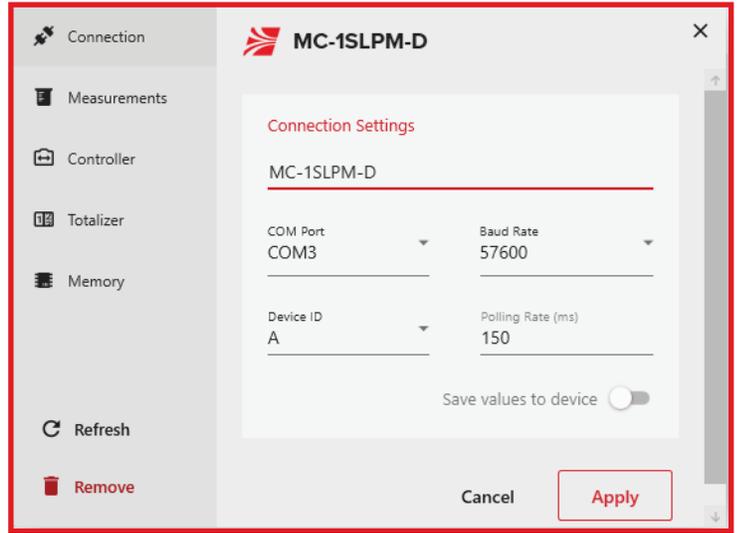


Figure 14. Connection settings.

Measurements

See figure 15

The **Measurement** section in the device settings window allows you to adjust units of measurement, averaging, and STP/NTP settings for an Alicat device.

Units of Measure

You can adjust the desired units for each type of measurement displayed by an Alicat device. By default, only related units of measurement are displayed in each dropdown menu.

- Change the unit of measurement by selecting a new unit from the dropdown menu underneath each measurement type, and clicking **Apply**. The device updates to display the new unit of measurement.

Averaging

Averaging the flow over a longer time is useful in smoothing fluctuating readings. Values correspond to the time constant (in milliseconds) of the averaged values. Higher numbers generate a greater smoothing effect. The maximum averaging time is 255 ms.

- Adjust the averaging by setting the number in one of the **Flow Avg** text boxes to your desired time in milliseconds (ms), and click **Apply**.

STP/NTP

If the device measures mass flow, you can adjust the STP (Standard Temperature and Pressure) or NTP (Normal Temperature and Pressure) values of a device to reflect a controlled environment.

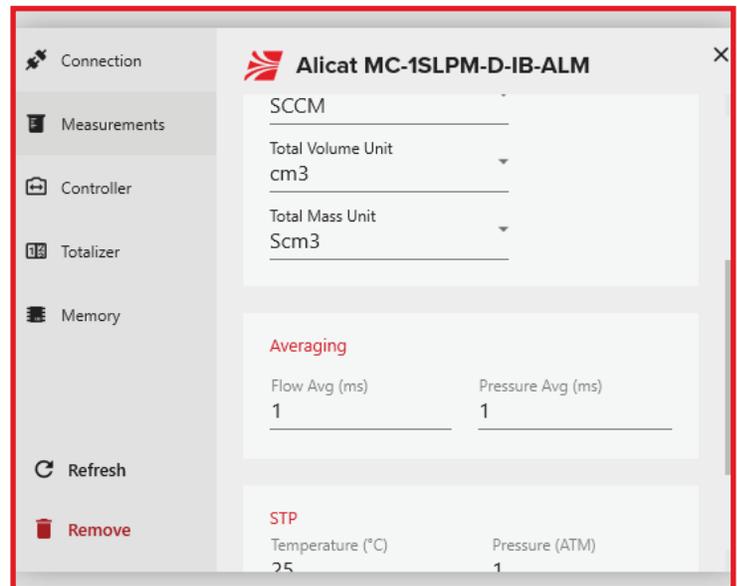


Figure 15. Measurement settings.

When the unit of measurement for mass flow is set to a standardized unit, such as SLPM, the STP settings display. However, when the unit of measurement is set to a normalized unit such as NLPM, the NTP settings display.

- Adjust the STP or NTP by setting the number in the **Temperature** textbox to your desired value in °C, and set the number in the **Pressure** text box to your desired value in ATM. Then click **Apply**.

Fluid Density (CODA Devices)

See figure 16

CODA devices use density to calculate a volumetric flow rate. A standardized density can be set if desired.

- Select **Fluid Type**, **Fluid**, and **Temp** to set the new standardized density.
- Click **Apply**. This density displays in the device tab and is used for the volumetric flow rate calculation.

Controller

See Figure 17

The **Controller** section adjusts the setpoint source, auto-tare function, and valve tuning of an Alicat controller. This section is not present on meters and gauges.

Control

The control portion of the **Controller** section manages the setpoint of the controller. The **Setpoint Source** manages if the setpoint is controlled by an analogue input or through serial communication and the front panel display (if a display is present).

- Adjust the source by using the dropdown menu under **Setpoint Source** to make a selection, then click **Apply**.
- Adjust the setpoint type by clicking the **Setpoint Type** dropdown menu and selecting a type of setpoint (mass flow, volumetric, pressure etc), then click **Apply**.

Valve Offset

Gas pressure in the system exerts a mechanical force on the control valve that, depending upon the gas pressure, may slow the valve's response when opening from a zero setpoint. To compensate for this, adjusting the valve offset (or "preload") may speed up integration time.

- Adjust valve offset by setting the value of the number under the **Valve Offset** label, then click **Apply**. Valve offset is a percentage value between 0 and 100, with 0 being little to no offset and 100 being the maximum offset.

PID

If you require specialized valve tuning, adjusting the PID values of a device is necessary. Adjustment of PID values changes valve stability and speed.



Caution: It is strongly recommended that adjustments to PID settings not be made unless you have experience with proportional valve tuning. Improper tuning may damage the device or valve.

- Adjust PID tuning by clicking the dropdown menu under **PID Type** and selecting either **PD**, **PDF** or **PDDI**. Set the new values for each parameter in the fields below, then click **Apply**.

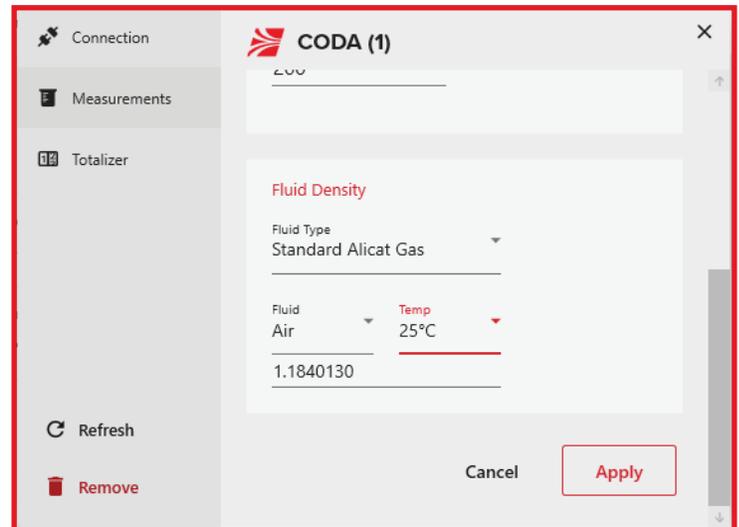


Figure 16. Fluid density settings.

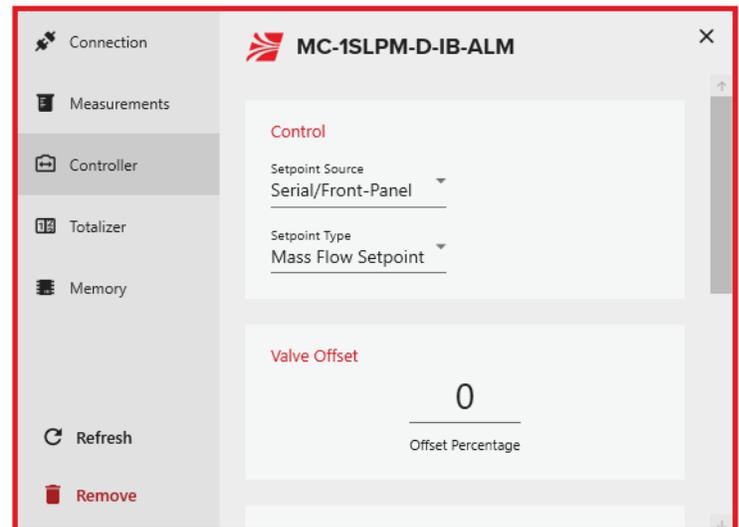


Figure 17. Controller settings.

Auto Tare

Enabling auto tare sets the device to tare after a zero setpoint is established for a given amount of time. The delay field below the toggle indicates how long the device waits before taring. This wait is measured in seconds.

Totalizer (Mass Flow or Liquid Devices)

Devices with a totalizer enabled have an extra setting. The totalizer section controls what measurement the totalizer counts, mass flow or volumetric. On liquid devices, this will only be volumetric.

Memory Settings

See Figure 18

The **Memory** section controls whether the setpoint and gas type values are saved to the device's EEPROM (electronically-erasable programmable read-only memory).

1. Under the **EEPROM** section, click the button to the right of each setting to toggle it on or off. When the button is active (red), the setting saves to EEPROM and is remembered as the device powers on. When the button is inactive (gray), the setting is not saved and resets to the default value as the device turns on.
2. Click **Apply** to confirm the new settings or **Cancel** to revert to the original settings.

Removing a Device

Removing a device is found in the bottom left hand corner on the device settings window. Clicking **Remove** prompts a confirmation window to appear. Clicking **Yes** removes the device and clicking **No** closes the confirmation window and returns the screen to the device settings options.

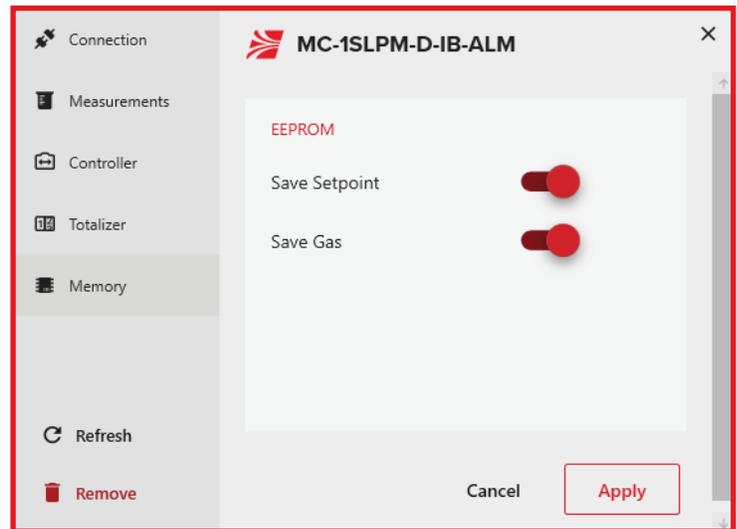


Figure 18. Memory settings.

Logs Tab

You can use data logs to keep records of measured data over time. Data logs are viewed outside of FlowVision 2.0™ or are incorporated into an external database.

Creating a Data Log

See figure 19 and 20

1. To create a data log, click the **green plus sign** to the right of the search bar in the **Logs** module. Define a name for the new log and click **Add**.
2. The **Edit Log** window appears allowing to configure the new log. The log name entered in step 1 is automatically filled in, but can be changed at this stage.
3. Below the name is the **Logging Rate**. Enter how often you want the device to record its current state to the log using days, hours, minutes, and seconds.
4. Below these fields is the **Log Type** option in a dropdown menu. Select either a **CSV File** or a **Database** to write the log data to.

When selecting CSV File, specify a file path under **File** that your computer has permission to write to. Click the **red folder** icon to the right of the **File** text box to browse for a location to save on your computer. When the log is active, FlowVision 2.0™ continuously writes to this file. Depending on the rate and amount of data being logged, there is a potential for the log to exhaust the space on your hard drive. Splitting the CSV file into smaller pieces may make the data more manageable. To do so, toggle the button from **No Split** to **Split Every**. Then set how often the log splits.

If you select **Database**, specify the type of database from the dropdown menu (only Microsoft SQL Server, MySQL Server, and PostgreSQL are currently supported). Then, provide a connection string with sign-in credentials and the name of the table in the database. Note that since these logs are handled by external programs, the splitting functionality is disabled for database types.

Once the log is created, it needs to be manually started. Click on the log name inside of the **Logs** module saved items list. This opens a tab with all of the saved logs inside of it. Press the **play** button next to a log's name to start it. When running, the log's box turns green and the **play** button becomes a **pause** button. Press the **pause** button to stop the log (figure 20).

! **Note:** A log continues to run at the specified interval until stopped manually or until the program exits. Closing the tab does not stop the log.

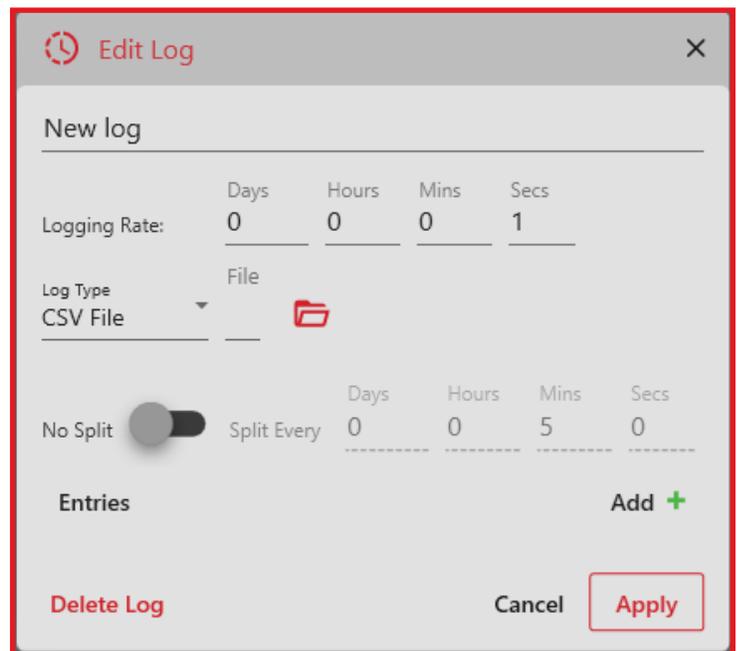


Figure 19. Edit log window.

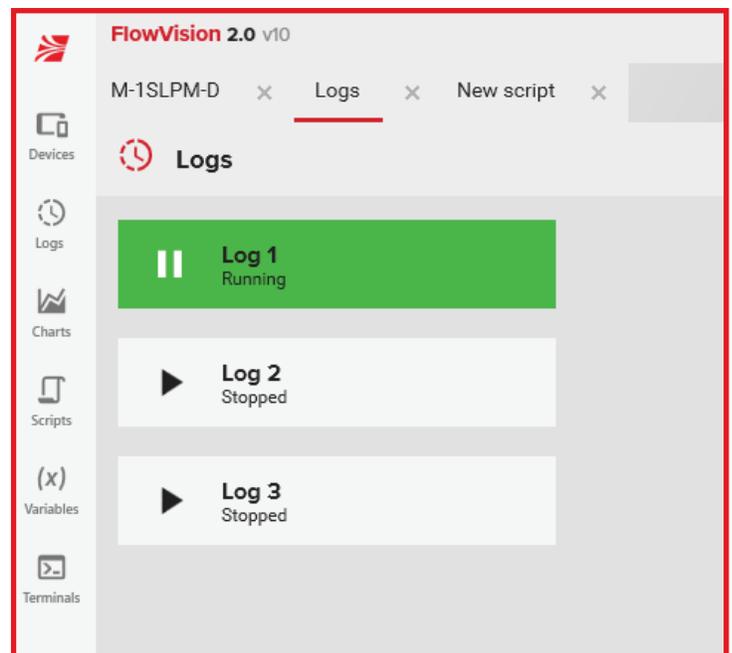


Figure 20. Running a log in the logs tab.

Editing Log Entries

See figure 21 and 22

The **Entries** panel is beneath the options in the **Edit Log** section. Adding items here determines the data being logged. The CSV file creates columns for each entry item along with the timestamp when data was recorded. There are many options for different possible entries that can be recorded. These instructions use a **Device Measurement** value as an example of adding a log entry. If further assistance is needed, please contact Alicat ([page 26](#)).

1. To add a new entry to the log, click **Add** on the right side of the **Entries** section. The edit log entry window opens.
2. Enter a **Name** for the entry. The name can only contain letters, numbers, and underscores.
3. Under the **Device Measurement** drop-down, select a device measurement, constant, variable, or expression to be recorded by the logger. This drop-down dictates the other options for the entry, and the other entries change based on this selection. For this example, select **Device Measurement**.
4. Select a **Device** from the dropdown menu to log data from. Once a valid device has been selected, the **Value** dropdown menu populates with data types that can be collected from the device.
5. Click the **Value** dropdown menu to select a value to be recorded.
6. In the **Unit** dropdown menu, select the unit of measurement to be used. The default unit of measurement for the given measurement **Value** is automatically selected. Click **Apply** when finished. The entry is added to the **Entries** list.
7. Repeat steps 1 through 6 for each data point you want to be recorded in the log.
8. When finished adding entries, click **Apply** on the **Edit Log** window to save the log.

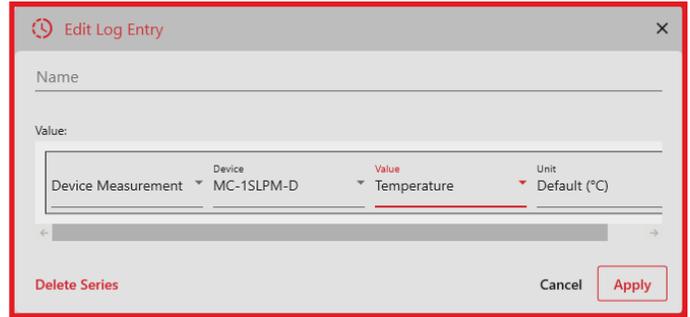


Figure 21. Edit log entry window.

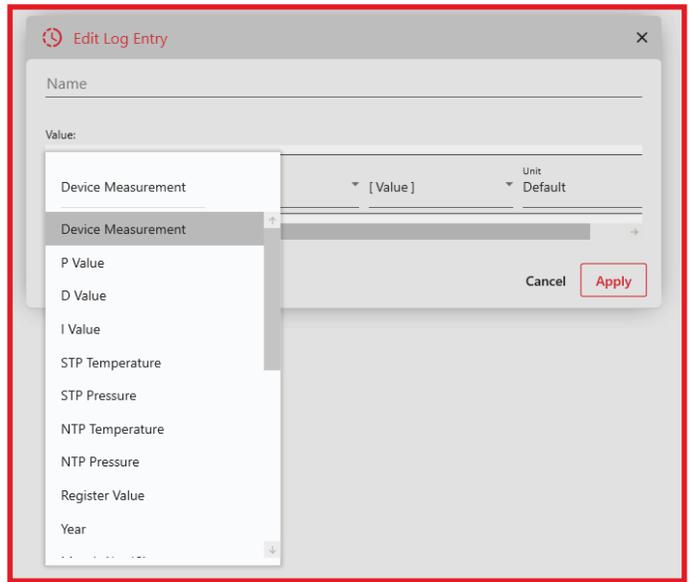


Figure 22. Selecting an entry to log.

Charts Tab

Charts are line graphs that are continuously updated with live data. A chart can log multiple measurements and also provide reference points to compare data.

Creating a Chart

See figure 23

FlowVision 2.0™ allows you to create charts to display data. Like logs, charts can cover several different options. The following instructions are for adding a chart for a device measurement. The process for other options is similar, but if further assistance is needed, please contact Alicat ([page 26](#)).

1. To the right of the search bar, click the **green plus sign**.
2. Define a name for the new chart and click **Add**. The **Edit Chart** window appears ([figure 23](#)) allowing you to add data series for the chart. The name you entered in the previous step is automatically filled in, but can still be changed if desired.
3. Click **Add** to the right of **Series** to add a data series to the chart. This opens a new **Edit Chart Series** window to set up the data series.
4. Clicking **Import From Data Frame** polls the device's serial data frame and creates a series for each item that is found there. (See the *Serial Communications Primer at alicat.com/manuals* for more information on data frames).
5. Enter a **Name** for the series if desired. To automatically generate a name for the series, leave the name field blank. If no name is provided, FlowVision 2.0™ assigns a name with the device and entry value type. Occasionally, if the value type is too complex to generate a name automatically, an error window asks you to manually enter a name.
6. Click the colored square to open a window and select a color for the data series. Clicking outside the window sets the **color** value with the chosen color's hex code prefixed by a pound sign/hashtag (#). It is also possible to type the hex code for the desired **color**.
7. Select **Device Measurement**. (This is the same system used in the **Logs** module and each option has different fields to choose from. Device measurement is covered in this example).

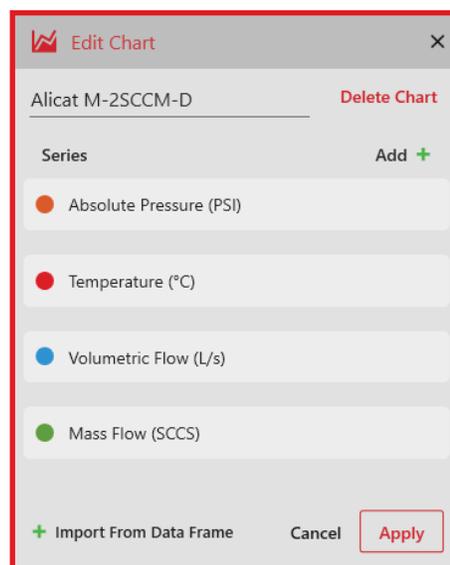


Figure 23. Editing a chart.

8. Click the **Device** menu to select an device to chart from. After a device is selected, the **Value** dropdown menu populates with data types that can be collected from the device.
9. Click the **Value** dropdown menu and select a value to chart.
10. Click the **Unit** dropdown menu to see the available units of measurement. Select the unit of measurement you want to be displayed in your chart, and click the **Apply** when finished. The series is added to the **Series** list back in the **Edit Chart** window.
11. Repeat steps 3-10 for each data series to be charted.
12. Click **Apply** in **Edit Chart** to complete the process. The chart opens in a new tab and starts displaying data.

Interacting With a Chart

Chart Functions

See Figures 24 and 25

The icons along the top left of the chart tab (just under the chart name) are the chart functions. These control features about how the chart is viewed, how it moves, and what data series is currently present on the chart.

Rate

By default, new data is charted every 50 milliseconds, but this can be sped up or slowed down by adjusting the value of the **Rate** field. The new rate takes effect when selecting the enter key or clicking outside the **Rate** field. Note that the chart continues to receive and display data until its tab is closed or until FlowVision 2.0™ exits.

Auto Track X

The chart tracks data while moving the X-axis forward and presents the latest data in the process. You can toggle this function by clicking the **Auto Track X** button (↔). Disabling this option prevents FlowVision 2.0™ from moving the **X-Axis** forward but doesn't prevent it from receiving or charting new data. Auto tracking is also automatically disabled while zooming in and out of the chart (it enables again once zooming is complete).

Auto Scale Y

The minimum and maximum values are visible at all times by default using the **Auto Scale Y** function. This prevents the chart data growing beyond the Y-axis. If data grows beyond the visible range, the chart will pull back the Y-axis to make it visible. To enable/disable, click the **Auto Scale Y** button (≡). Disabling allows you to freely zoom and move around the chart, but new data points may be displayed outside of the visible range.

Show Labels

Hovering over the chart displays the labels of the data series and their charted values at that given moment. This is enabled by default and can be toggled on/off by clicking the **Show Labels** button (🔍).



Figure 24. Charts tab.



Figure 25: Chart functions (left to right): Polling Rate, Auto Track X, Auto Scale Y, Show Labels, Show Legend, Drag to Pan, Show Range Selectors, Zoom on X-Axis, Zoom on Y-Axis.

Show Legend

To show or hide the chart legend from view, you can use the **Show Legend** toggle (ABC). Inside the legend are also boxes to enable and disable specific entries within the chart. Clicking the **red check mark** hides the entry, but data is still being charted even when the entry is not visible.

Drag to Pan

Drag to pan (👤) allows for clicking and dragging to move the chart view along the X-axis. To view previous data without this enabled, you must zoom out and then zoom back in on the desired data.

Show Range Selectors

It is possible to dictate a range of data to view by using the **Show Range Selectors** (|↔|) function. This adds two vertical lines to drag along the charted data. The data lines between these two lines becomes the selection. This function is disabled by default. Enabling **Show Range Selectors** disables **Auto Track X**, but it can be re-enabled without disabling **Show Range Selectors**.

Zoom Functions

See Figures 25 and 26

Most of the zoom functions are found on the top right of the chart tab.

Zoom In and Zoom Out

Use the **Zoom In** (🔍) and **Zoom Out** (🔍) buttons in the chart actions panel to perform their respective functions. You can also hover over the chart and scroll with the mouse wheel up to zoom in and down to zoom out.

Zoom on X-Axis and Zoom On Y-Axis

To enable/disable the zooming function on an axis, click either the **Zoom On X-Axis** (X) or **Zoom On Y-Axis** (Y) buttons (Y). When disabled, the chart will not zoom along the respective axis. These are found on the top left of the chart tab

Reset Zoom

To reset the zoom scale of the **Y-Axis** back to the current minimum/maximum values of data, click **Reset Zoom** (🔄) to the left of the **Zoom In** and **Zoom Out** buttons.

Zoom to Selection

The **Zoom To Selection** (📏) function is available when the **Show Range Selectors** function is enabled. **Zoom to Selection** fills the chart view with the selected range. **Auto Track X** should be disabled before performing this action or else the chart will continue to move with the new data.

Other Charts Module Functions

See figure 26

Located in the top right of the chart tab are further functions used to interact with the chart.

- Open the **Edit Chart** window by clicking the **gear** icon (⚙️). This window allows you to edit the data series for this chart.
- **Save image** is activated by clicking the camera icon (📷). It is recommended to disable **Auto Track X** temporarily so that the chart isn't moving while saving the image.
- Reset the scale of the **Y-Axis** to the current minimum and maximum values in the data series with the **Refresh** icon (🔄). This button does not clear any existing data points already added to the chart and only resets the view.
- Create a copy of the current chart in a new tab using the **duplicate** icon (📄). A second tab opens using the same chart. Interacting with one chart doesn't affect the other chart.

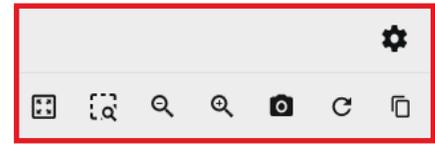


Figure 26. Zoom and other chart functions (left to right): Reset Zoom, Zoom to Selection, Zoom Out, Zoom In, Save image, Refresh, Duplicate.

Variables Tab

Expressions and variables are ways to create formulas, equations, and data variables inside FlowVision 2.0™ modules. These are options that can be selected in the measurement type option for logs, charts, or scripts to help FlowVision 2.0™ adapt to your desired data and processes.

Variables

See figure 27

There are three possible variable choices, **Conditional Variable**, **Numerical Variable**, or **Device Variable**. A conditional variable can hold a true or false value, a numerical variable can hold a number (integer or decimal), and a device variable holds a connected device.

These variables allow for the option to modify expressions, scripts, or other items quickly and as needed. When expressions use a custom variable, updating the variable also affects the expression. This cuts down on having to manually update multiple expressions or scripts that use the same variable. A device variable can be changed on the fly and all expressions and scripts update with the change.

To create a variable, perform the following:

1. Click the **green plus sign** to the right of the search bar in the **Variables** module.
2. Define a name for the new variable and then select either **Conditional Variable**, **Numerical Variable**, or **Device Variable** from the **Variable Type** dropdown menu. Click **Add**. The **Edit Variable** window opens and you can define a value for the device (figure 27).
3. Click **Apply** when you have selected or entered a value for the variable.

The new variable appears in the variables list with other expressions and variables. To edit or delete a variable, click on the **gear** icon. The **Edit Variable** window opens and allows for changes before clicking **Apply**. Clicking **Delete Variable** opens a prompt to confirm removing the variable from the saved items.

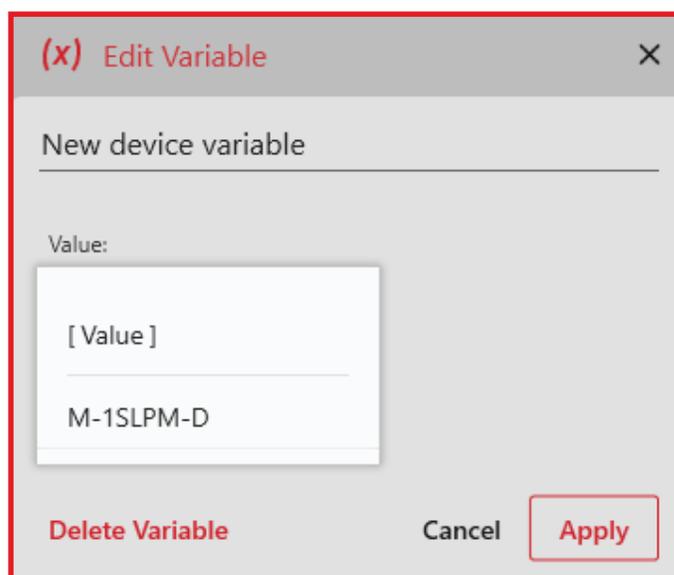


Figure 27. Edit variable window.

Expressions

All expressions can be considered variables, but not all variables are expressions. Expressions are more complex elements that you program to use an equation or react to certain conditions in the desired data point.

There are two possible expressions within FlowVision 2.0™, **Numeric** and **Conditional**. A **Numeric Expression** has multiple options such as binary math, unary math, time, and most things involving numeric values. Each of these options has further options to define and program the expression to provide the desired information.

The **Conditional Expression** provides the option for creating contingencies. These are contingencies such as or, and either-or. This allows for creating an expression that reacts to a specified condition when it is present in an application. It is very useful when creating a script to dictate how a device reacts when certain conditions are met.

Below is one example of the steps for creating an expression for converting Celsius to Fahrenheit (figure 28). There are a large number of possibilities with expressions, however, so if there are any questions, please contact Alicat support for assistance (page 26).

1. Click the **green plus sign** to the right of the search bar in **Variables**.
2. Define a name for the new variable, select the **Numeric Expression** option from the **Variable Type** dropdown menu, and click **Add**. The edit variable window opens to define a value for the expression.
3. Enter “DegreesInFahrenheit” for the name and from the first dropdown menu, set the type to **Binary Math**. This creates dropdown menus to select options for the operands. Think of each box as a set of parentheses in a math equation. Everything within the box performs before moving to the next part of the equation.
4. Select **Binary Math** again from the second dropdown menu. The first operand group is the measurement from an Alicat device in degrees Celsius multiplied by 1.8.

5. Select **Device Measurement** from the third drop-down menu. In the options to the right, select the **Device** to be used and the **Value** to read from. The value in this example is temperature.
6. Set the **Unit** to **Default (°C)** for Celsius. Then, select the operator to multiply ($x * y$) the first group by the next group. In the second group, set the first option as a **Constant** and give it a value of 1.8.
7. Set the second operator to add ($x + y$), and set the option to **Constant** with a value of 32. The expression now looks like this:
8. Click **Apply** below to save this expression and close the **Edit Variable** window. The new expression is displayed in the **Variables module list**.

After the expression is complete and found in the **Variable** list it can be selected in the logs, charts, or scripts like any other variable.

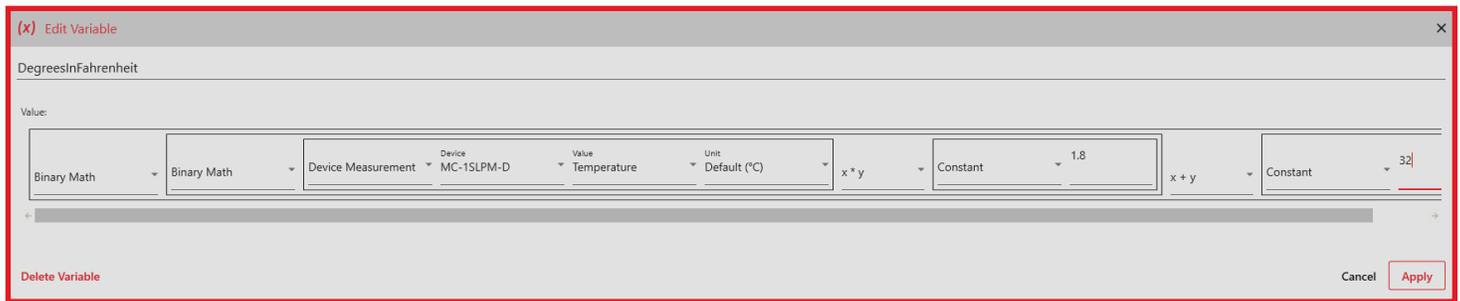


Figure 28. Expression variables.

Scripts Tab

Scripts are used to create automated command sets in FlowVision 2.0™. The **Scripts** module is a feature that sends and receives data from your connected flow devices. You can specify a script to run at specified time intervals or when a certain set of conditions have been met. This allows you to implement custom functions to suit your application's needs.

Creating a Script

Use the following steps to add a script to the module's saved items list.

1. Click the **green plus sign** to the right of the search bar in the **Scripts** module.
2. Define a name for the new script and click **Add**. The **Edit Script** window opens.
3. Set the parameters the script uses to run. A parameter can use time, conditions, variables, actions, and values to run highly detailed operations quickly. It is also possible to run a script within a script.
4. After the desired parameters are set, click the apply button in the bottom right-hand corner of the **Edit Script** window.

Edit Script Window

See figure 29

Delete

In the bottom left hand corner of the edit script window is the **Delete** button. Clicking **Delete** prompts a confirmation window. Clicking **Yes** deletes the script. Clicking **No** closes the confirmation prompt and returns to the edit script window.

Export

Next to the **Delete** button is the Export button. Clicking **Export** opens Windows file exploring and allows for the script to be saved as a JSON file.

Import

To import a script, click the **Import button**. Windows file explorer opens and a JSON file can be opened.

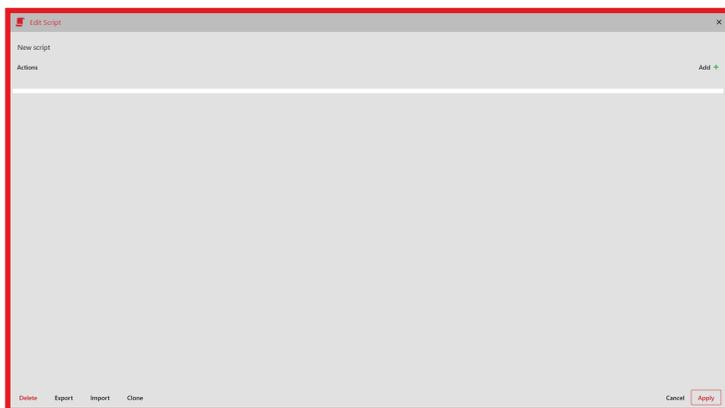


Figure 29. Edit Script Window

Clone

Clicking the **Clone** button creates a copy of the script. This immediately appears in the **Scripts** module's saved items list, the name is the same name as the cloned script with "copy" at the end.

Script Actions

- **Log Action:** Run a log, stop a log, or write a single line to a log.
- **Apply Setpoint:** Change the setpoint of a controller device.
- **Change Gas:** Change the gas type of an device.
- **Tare:** Set the zero on an device.



Warning: Tare flow only when there is no gas flow through the unit. Tare pressure only when the device is venting to atmosphere.

- **Reset Totalizer:** Reset the totalizer to zero, if the totalizer is configured.
- **Display Data Frame:** Display a single frame of data from an device.
- **Delay:** Wait a specified amount of time before performing the next action.
- **Conditional Actions:** Evaluate a condition and perform actions based on the evaluated result.
- **Display Numeric Value:** Display a number in the script output.
- **Display Condition:** Display a condition (true/false) in the script output.
- **Display Message:** Display an arbitrary message in the script output.
- **Loop:** Run this script in a loop several times or while a condition is met.
- **Run Script:** Run another script saved in FlowVision 2.0™.
- **Change Conditional Variable:** Change the value of a conditional variable (true/false).
- **Change Numeric Variable:** Change the value of a number variable.
- **Change Device Variable:** Change the value of a device variable.

Script Tab

See figure 30

The title of the script is displayed at the top left of the tab, and to the right of its title is the **Edit** button.

- To edit a script, click the **Edit** button. The **Edit Script** window opens allowing you to change the parameters of the script.

The center of the tab displays the output information from the script as it is received. Between the output information and the title bar is the script actions panel, which contains buttons with additional functionality:

- Begin a script by clicking **Run Script**.
- Stop a running script by clicking **Cancel**.
- Edit device polling rates while the script runs by clicking **Device Timing** (⌘).
- Clear all the output information currently displayed by that script by clicking **Clear** (⌫).
- Toggle between a serif and a sans-serif font used by the output field by clicking **Toggle Font Face** (⌘A).
- Increase the size of the font used by the output field by clicking **Increase Font Size** (A+).
- Decrease the size of the font used by the output field by clicking **Decrease Font Size** (A-).
- Create a new tab of the same script by clicking **Duplicate** (⌘D).

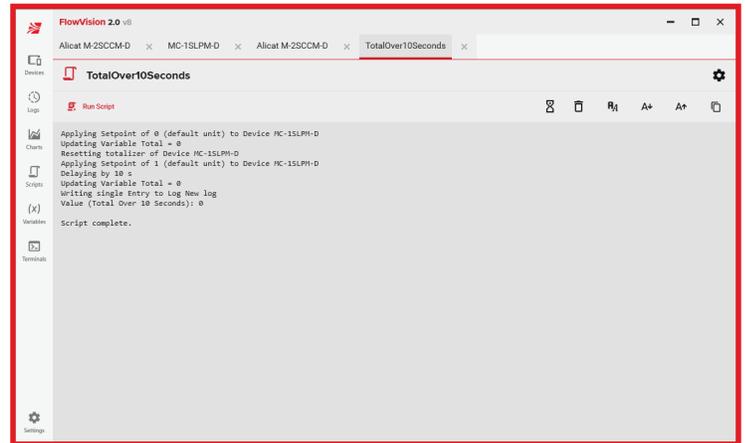


Figure 30. Running a script.

Sample Script

See figure 31

Below is a sample script for a device to totalize flow over a period of 10 seconds. As noted under **script actions**, there are many different ways to dictate what a script can do. This is just one example of what's possible with scripts:

1. **Apply a Setpoint** of 0 to the device.
2. **Change Numeric Variable** of the variable **Total** to 0.
3. **Reset Totalizer** of the device.
4. **Apply a Setpoint** of 1 to the device.
5. **Delay** for 10 seconds.
6. **Apply a Setpoint** of 0 to the device.
7. **Delay** for 1 second (So the system equalizes).
8. **Log Action** to log a single entry to a defined log.
9. **Display Numeric Value** using the **User Numeric Variable**.

If you need assistance with writing a script for your device, please contact Alicat support ([page 2](#))

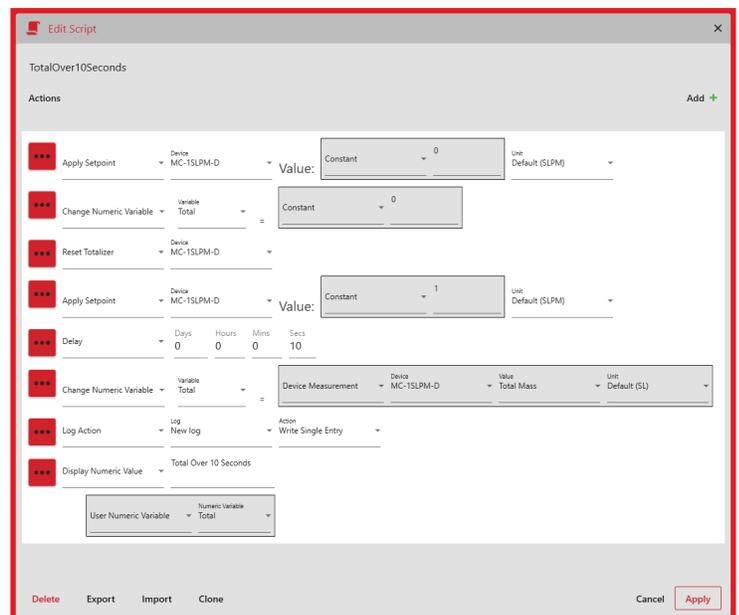


Figure 31. Sample script.

Terminals

See figure 32

The **Terminals** module communicates with an Alicat device through an ASCII terminal inside FlowVision 2.0™.

If you have any active devices available in the **Devices** module, a new terminal is automatically created for each COM port being used and is displayed under the **Terminals** module.

To begin a new terminal session, click the **green plus sign** to the right of the search bar in the **Terminals** module. In the new terminal window, enter the **COM port** and the **Baud Rate** that the device is connected to. Click **Connect** to confirm values and open the connection.

- If the connection is successful, the terminal tab opens in the workspace (figure 32).
- If the connection is unsuccessful, an error window displays asking you to verify that the settings were entered correctly. If successful, the terminal assigns a default name with its COM port and baud rate displayed under the **Terminals** module.

In the terminal tab, the output box occupies the majority of the space on a terminal tab and is where the device responds. The **Input** line, located at the bottom of the tab, is where device commands are entered.

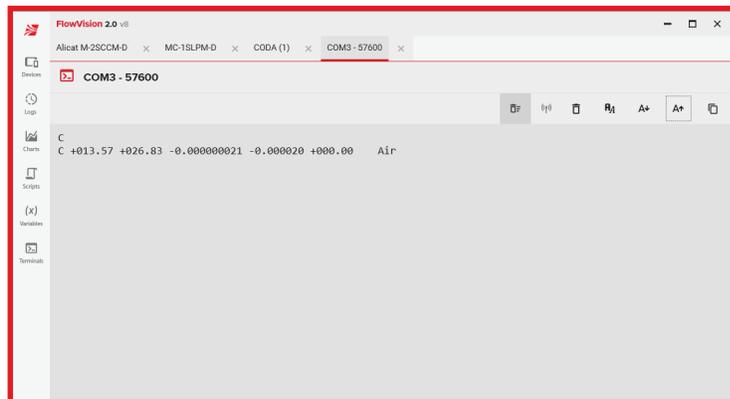


Figure 32. Terminals tab.

Terminal Actions

See figure 33

Terminals have a number of actions for increased functionality that include clearing the terminal, changing the font, and changing font size.

- Send a command to the device by clicking **Send** (the right-arrow in the bottom right) or pressing **enter** on the keyboard.
- Automatically clear the input box upon entering a new command by toggling the **Auto Clear Input** button (shown with a trash in motion icon, the farthest left icon, .
- Show the live communication on the serial interface by toggling the **Show Live Communication** button (shown with an antenna icon, .
- Erase everything within the input line or output box by clicking the **Clear Terminal** button (the trash icon on the top-right row, .



Figure 33. Terminal actions (left to right): Auto Clear Input, Show Live Communication, Clear Terminal, Toggle Font, Decrease Font Size, Increase Font Size, Duplicate.

- Toggle between a serif and a sans-serif font used by the output field by clicking **Toggle Font Face** (.
- Increase the size of the font used by the output field by clicking **Increase Font Size** (.
- Decrease the size of the font used by the output field by clicking **Decrease Font Size** (.
- Create a new tab of the same script by clicking **Duplicate** (.

Please refer to your device's instruction manual or the *Serial Communications Primer* for instructions on communicating with your device via a terminal tab.

FlowVision 2.0™ Settings

The settings module is found in the bottom left corner. In this module, there are several options to toggle between.

Enable an option by clicking the **gray button**. When clicked, the button toggles to the right and turns red to indicate it is enabled. A description of each option is located under each title.

All settings can be returned to the factory settings by running the **Master Reset**. After clicking **Run**, a prompt appears asking to confirm that you want to remove all data and configurations. Select **Yes** to perform the reset. **No** closes the window prompt and changes nothing.

Bootloader

See figure 34

The bootloader connects to a device through a COM port to update the firmware. Only one device can be updated at a time and communication with all other devices on the COM port stops during the upgrade process. A firmware file must be obtained from Alicat support prior to beginning the upgrade. Please contact Alicat directly to obtain the latest firmware version compatible with your device.



Caution: Attempting to update your device with an incompatible firmware may damage the device and stop it from functioning. Only use firmware files approved and provided by Alicat Scientific.

To run the bootloader on a device:

1. Define the COM port, baud rate, and the ID of the device to upgrade.
2. Click **Connect**. The bootloader stops polling all devices on the COM port and reads the selected device to be upgraded. The **Status** field indicates the current firmware of the device and any errors experienced when connecting.
3. Click **Browse** and select the firmware file provided by Alicat support.
4. When ready, click **Program Device**. The upgrade may take a few moments to complete.



Caution: Do not disconnect the device from the COM port or close the software while the bootloader is running. Doing so may corrupt the device and stop it from functioning.

5. When the bootloader confirms the upgrade has completed successfully, close the bootloader, restart FlowVision 2.0™, and power cycle the device.



Note: A device cannot be upgraded over Bluetooth. The device must be connected via a COM port.

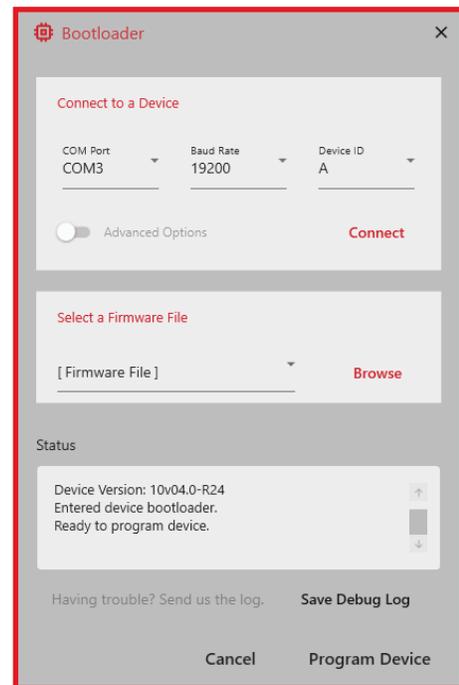


Figure 34. Bootloader window.

Updating FlowVision 2.0™

See figures 35, 36, and 37

New features and bug fixes are regularly released. FlowVision 2.0™ creates an alerts you whenever a new version has been published and can be updated directly through the software.

To read what changed in each new version, click **Changelog** at the top of the settings module. A new **Updates** tab opens that contains the newest features and bug-fixes that come with each new version. The tab also outlines the current version of FlowVision 2.0™ alongside the latest version in the top right-hand corner of the tab. If the current version is out of date, a green **Update** button is present. A blue **Update Available** button is also present in the title bar of FlowVision 2.0™ next to the **Minimize** button in the top right corner of the window.

To update FlowVision 2.0™, click either the green **Update** button in the **Updates** tab or the blue **Update Available** notification. A confirmation screen appears to confirm you wish to update. Click **Yes** to continue. The software then downloads and runs the new install file. The progress of the download is shown in the same location as the blue **Update Available** notification. FlowVision 2.0™ will close and then reopen when the update is complete.

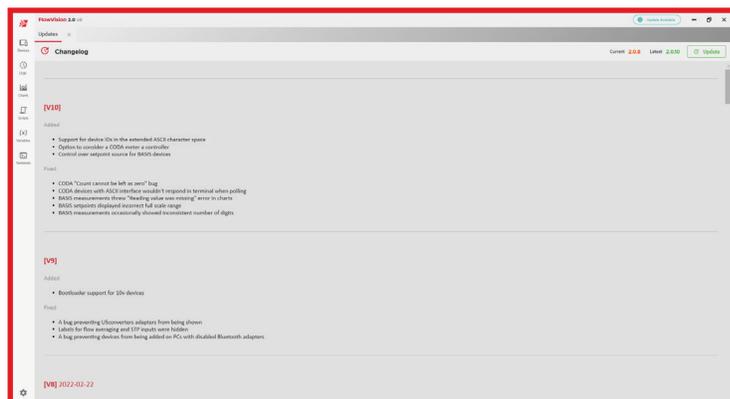


Figure 35. Updates tab.

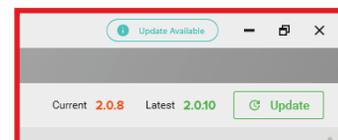


Figure 36. Current and latest version along with the update available notification and update button.

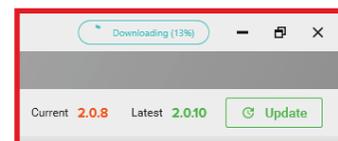


Figure 37. Downloading the latest update

Troubleshooting and FAQs

Uninstalling FlowVision 2.0™

To uninstall FlowVision 2.0™, use the **Add and Remove Programs** function from your Windows Control Panel or Apps section of the Windows Settings. FlowVision 2.0™ can be selected from the program group and uninstalled. If assistance is required, please consult your system administrator or refer to your Windows operating manual.

My Alicat device doesn't connect to FlowVision 2.0™.

1. Check all connections between the Alicat device and the computer.
2. Confirm the Alicat unit is powered.
3. Confirm FlowVision 2.0™ is on the most current version ([page 24](#)).
4. Verify that the communication cable is built and installed correctly. To find your Alicat's pinout, go to alicat.com/models/communications-cables/.
5. Verify that a connection can be made with the computer using Windows HyperTerminal and by following the instructions in the manual that accompanied your flow device.
6. If the issue persists, please contact Alicat support ([page 2](#)).

FlowVision 2.0™ doesn't install properly.

1. Verify that your computer meets the minimum requirements to run FlowVision 2.0™.
2. If your computer meets the requirements and the problem persists, contact Alicat directly for support ([page 2](#)).

I can't find my captured log data.

1. Click the **gear** icon to the right of the log in the modules panel.
2. In the **Edit Log** window that appears, click the red **open folder** icon to the right of the File text field. This opens the Windows file explorer with the location of the data.

For more information or support regarding FlowVision 2.0™ or any Alicat product, please contact Alicat ([see page 2](#)).

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