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Welcome to Flow Vision™ SC

Flow Vision™ SC is a graphic based software package that allows you to operate any Alicat flow or pressure instrument via a graphical user interface.

Flow Vision™ SC lets you: access information from your Alicat instruments; make changes in commands to those instruments; monitor performance; log data; chart data; and communicate directly with the unit via a terminal window.

If you have used earlier versions of Alicat Scientific's Flow Vision™ software, we are sure you will find many new and improved functions in this latest version: Flow Vision™ SC.

Note: Identifiers and scripts from earlier versions of Flow Vision™ are not recognized by Flow Vision™ SC.



System Requirements

- Microsoft® Windows® XP® or Microsoft® VISTA®
- Microsoft® .NET Framework Version 3.0
(A copy of Microsoft® .NET Framework can be downloaded at:
<http://www.microsoft.com/downloads/details.aspx?Familyd=262D25E3-F589=4842-8157-034D1E7CF3A3&displaylang=en>)
- 18 MB hard disk space
- Available COM port that supports 19200 baud communications*

* Note: Some laptops are not equipped with serial ports. A virtual serial port can be created using a USB to Serial adapter.

Section 1 - Getting Started

In this section you will learn about:

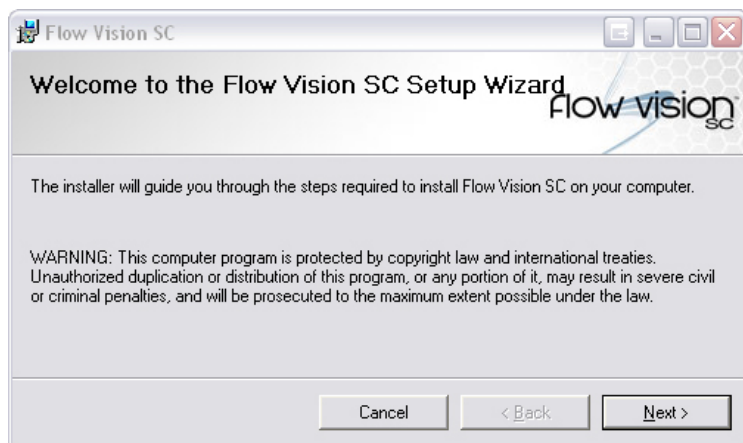
- How to install Flow Vision™ SC to your computer
- How to start using Flow Vision™ SC

Installing the Software

In order to begin using the Flow Vision™ SC software, you will need to install the software onto the computer to which you plan to connect your Alicat flow or pressure instrument.

To install the software, place your original Flow Vision™ SC CD into the CD or DVD drive on your computer or laptop. If your computer does not have a CD or DVD drive installed, please contact the vendor from whom you purchased the computer, the manufacturer of the computer or your company's computer technician.

Once you have placed the CD into the computer's drive, you should hear some noise from the computer's drive. In a moment, you will see the installation screen on your monitor:



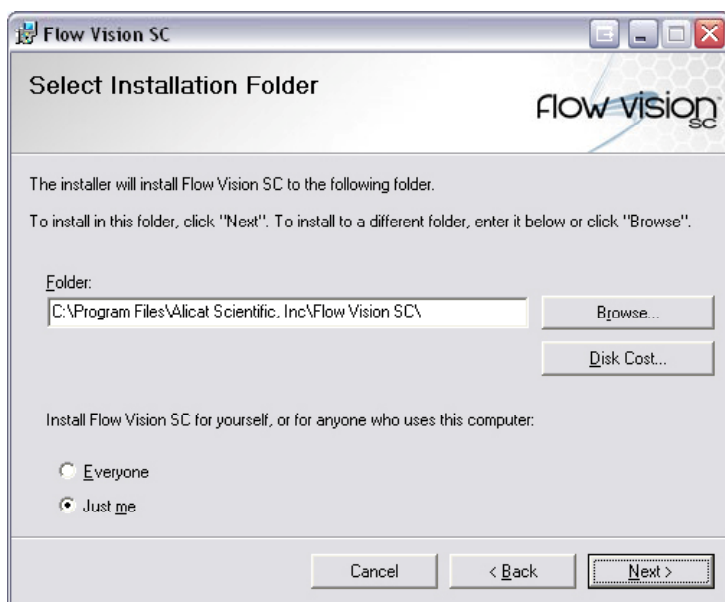
To continue, choose the button marked "Next >".

Upon clicking "Next" the End User License Agreement will be shown.

Please read the Agreement carefully and if you agree to the terms listed, use the mouse pointer to place a check mark in the box next to the sentence indicating that you agree to the End User License Agreement. After you have done that you can click the "Next" button to continue with the software installation. If you do not agree to the terms listed, cancel the installation, remove the CD from your computer and contact your software vendor to arrange returning the software for a refund.

You can abort the installation at any time by choosing the button marked "Cancel" or revert to the previous step by choosing the button marked "Back".

The next screen will ask into which directory you would like to install the Flow Vision™ SC software.



By default, the program will create a program folder and subfolder in the “Program Files” folder in your main drive directory. This location is suitable for most users. If you would like to install Flow Vision™ SC into a different location, you can manually enter the location’s address in the space provided or you can choose the button marked “Browse” and select the appropriate directory.

If you are using a computer at your company and are unsure of the appropriate location for installation, please request assistance from your company’s IT department.

You can review the amount of space required on your computer to install Flow Vision™ SC by choosing the button marked “Disk Cost”.

A window will appear showing available drives in the computer, the size of each drive, how much space is available on each drive, the space required for Flow Vision™ SC, and the amount of space that will be available after Flow Vision™ SC is installed.

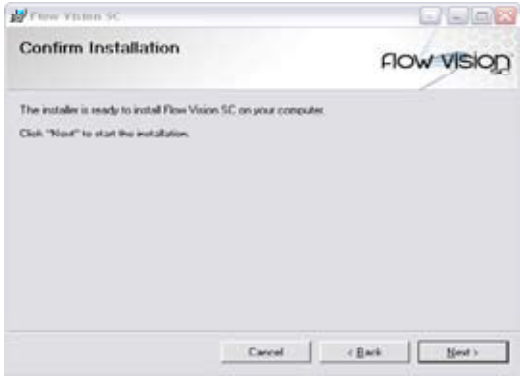
This allows you to select the most appropriate location for Flow Vision™ SC to be installed based on drive space constraints.

To exit this screen and continue with the installation process, select the button marked “OK”.

You will also be asked if you would like to install Flow Vision™ SC for yourself only or for anyone who uses the computer. Flow Vision™ SC’s operation will not be affected in any way by this selection. Once you have made your selections, click the button marked “Next”.

The following screen will inform you that Flow Vision™ SC is ready to be installed. You can take this opportunity to go back and make changes or to cancel the installation.

If you are satisfied with your choices, you can continue with the installation by choosing the button marked “Next”.



You ***will not*** see an installation screen with a progress bar visually indicating the progress of the installation of Flow Vision™ SC onto your computer.

Do not turn off or restart the computer during the installation process. Turning off or restarting the computer during this process will cause Flow Vision™ SC to not install properly and possibly cause damage to your computer.

When the installation process is complete, a screen will appear indicating that Flow Vision™ SC has been successfully installed on your computer. To exit this screen and the Flow Vision™ SC installation process, select the button marked “Close”.



Once you have selected “Close”, the installation screen will disappear from your screen.

You can now remove the Flow Vision™ SC CD from your computer. You will no longer need the Flow Vision™ SC CD to run the software.

Be sure to keep the Flow Vision™ SC CD and the case with the Registration Key Label in a safe place in the event you need to reinstall the software.

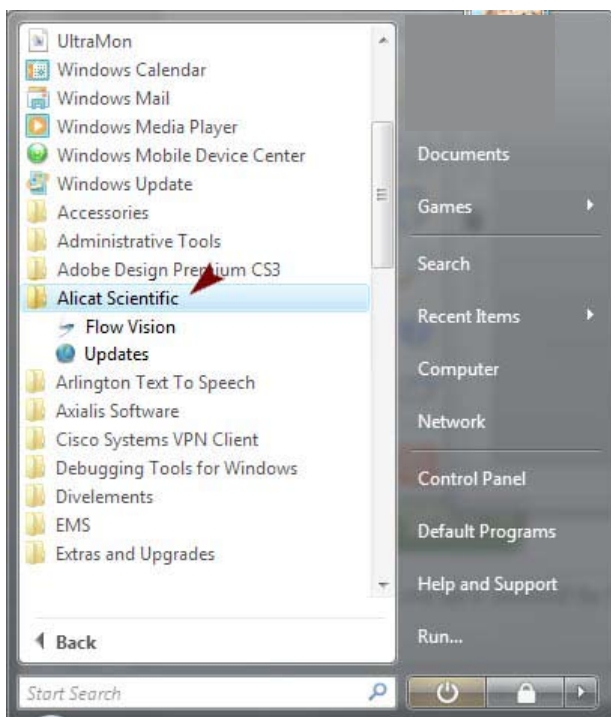
Launching Flow Vision™ SC

With Flow Vision™ SC installed to your computer, you can now begin using the Flow Vision™ SC program.

In order to begin you must first start the program.

To start the program you will need to select the Flow Vision™ SC program shortcut from the Start Menu.

>>Start Menu>Alicat Scientific>Flow Vision



Once you have selected the Flow Vision™ SC shortcut from the Start Menu, the program will begin.

After registration, the application will gather information about your system. Specifically, Flow Vision™ SC probes your computer for available COM ports. This process only occurs on the first launch of Flow Vision™ SC. All subsequent launches will load more quickly.

Section 2 - Setting up Flow Vision™ SC

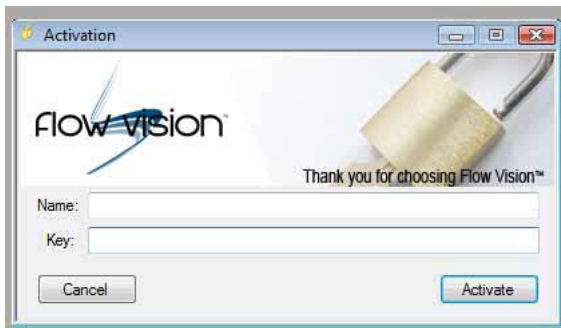
In this section you will learn about:

- Registering Flow Vision™ SC
- Flow Vision™ SC Menu and Menu functions
- Flow Vision™ SC screen layout

Registering Flow Vision™ SC

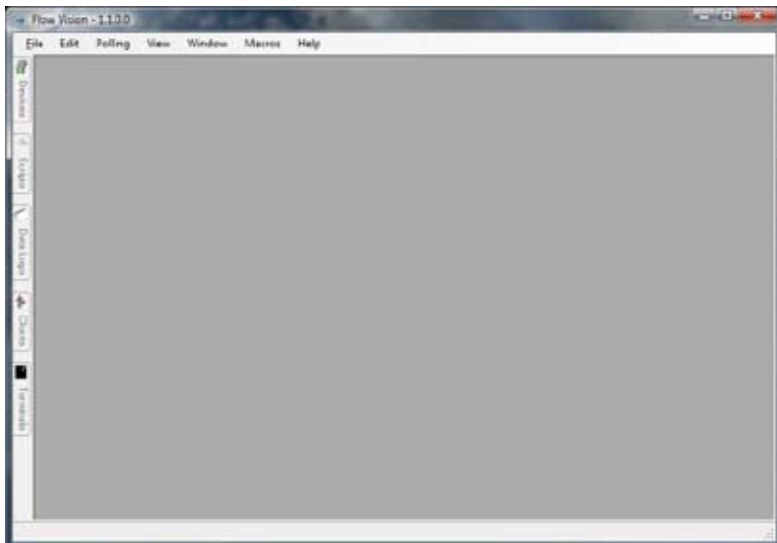
Before Flow Vision™ SC will launch, it needs to be registered. A registration key label is affixed to the CD case in which the FlowVision™ SC CD is stored.

Please enter the name and registration key from the registration key label in the appropriate fields. After successful registration, the application will launch.



Flow Vision™ SC Menu and Menu functions

When you start Flow Vision™ SC for the first time you will see this screen:



Along the top of the screen you will find the menu functions: File; Edit; Polling; View; Window; Macros and Help.

To access a menu, place your mouse cursor over the desired menu and click the left mouse button.

To select a function from the menu point the mouse arrow to the desired function and once it is highlighted, click the left mouse key.

Explanations of each menu and its sub-functions follow.

File Menu

The file menu allows you to exit the program.

Edit Menu

The edit menu allows you to access the “Properties” section of Flow Vision™ SC. In this section, you can make changes as to how Flow Vision™ SC functions.



The polling rate is the time interval for the software to take data from the instrument, measured in milliseconds.

Increasing the polling rate (lengthening the time interval) will reduce the frequency at which data is taken from the instrument by the software.

Conversely, *decreasing* the polling rate (shortening the time interval) will increase the frequency at which data is taken from the instrument by the software.

The “View trace/debug information” option will allow you to view in-depth information about the application.

The options on the “Appearance” tab allow you to modify the way Flow Vision™ SC looks, including background color and image.

The “Updates” tab is used to modify the Flow Vision™ SC updating settings. You can disable automatic updates on this tab.

Polling Menu

Polling is the term used to describe communicating with the instrument. The Polling Menu will allow you to initialize or terminate polling via the software.

To initialize polling select “Start Polling” > “All” and to terminate polling select “Stop Polling” > “All”.

View Menu

The View Menu allows you to choose how the main screen will appear when you start the program. Flow Vision™ SC is a modular program and each function of the software is represented by a module. The View Menu lets you select which modules will be available when the program starts. Modules are explained in detail later in this manual.

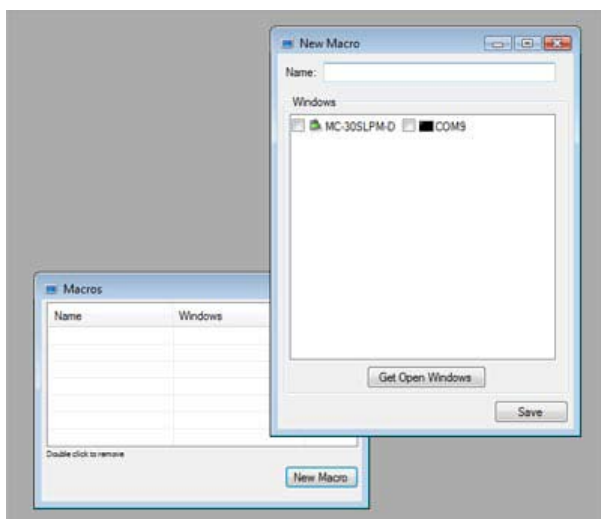
The View Menu also allows you to save variations of screen layouts in the event multiple users have different preferences or you have different requirements at different times. You can save and load modules as you require via the View Menu.

Window Menu

The Window Menu allows you to arrange open windows in a specific way. The formats are Cascade, Tile Horizontally, Tile Vertically and Icon.

Macro Menu

The Macro Menu allows you to store groups of windows that are launched together. Saved window macros are launched through the Macro Menu item.



Help Menu

The Help Menu contains documentation that will answer questions about the software and how it is used. You can access Flow Vision™ SC version information by selecting the “About” tab.

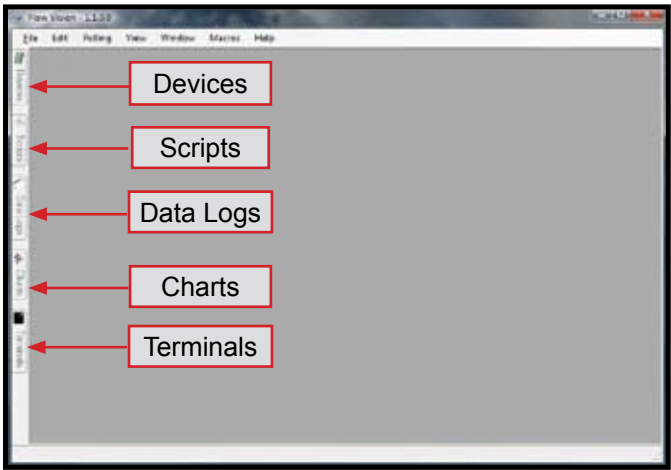
The “Register” tab will allow you to enter a CD Key if your CD Key has been compromised or if you receive a new CD Key from the software vendor.

Flow Vision™ SC Screen Layout

Flow Vision™ SC allows you several options in screen configuration. Flow Vision™ SC is a modular program. Some people will use more functionality than others. As such, components of Flow Vision™ SC have been housed in separate modules. Modules and their functions will be discussed later in this manual.

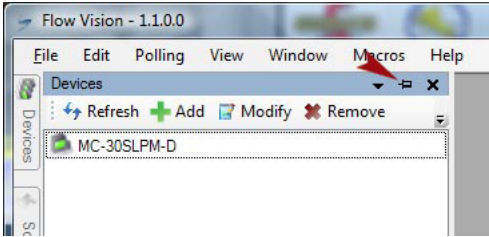
Tabs

When Flow Vision™ SC is started for the first time, you will see a column of tabs along the left side of the Flow Vision™ SC window.



Placing your mouse cursor over an individual tab will open the tab into the main screen. Removing your cursor from the tab window for a few seconds will cause the tab to disappear from the main screen.

If you would like the tab to stay open permanently, simply press the auto-hide (push-pin shaped) button located on the upper right corner of the tab screen.



If the pin is facing to the left the tab window will disappear when not in use. If the pin is facing downward the tab window will stay open until the auto-hide button is pressed again.

The auto-hide is useful when performing multiple functions. Non-critical functions can be hidden while the critical functions are pinned to the screen.

Flow Vision™ SC allows you to choose which modules are visible and which are not.

By using the using the View>Modules menu, you can select which module tabs are made available. By default, all module functions are shown as tabs.

Use your mouse button to uncheck the modules you do not want shown.

If you decide you want to use a module that is not visible, simply return to the View>Modules menu and use your mouse button to check the module you would like to have visible.

Based on the size of the Flow Vision™ SC window, you may not see all of the available options in a particular module tab.

If the window is too small to list all of the options, you will see a downward facing arrow to the right of the visible options. Clicking this arrow will display the remaining options. If the window is wide enough, you will see all of the available options and the downward arrow will not be visible.

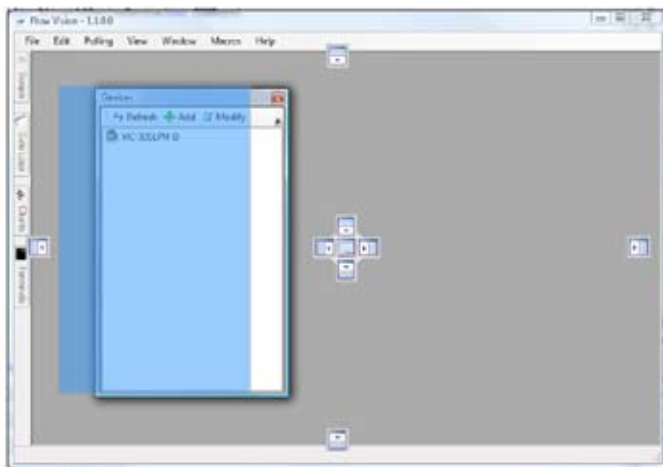
Moving and Docking Modules in the Flow Vision™ Window

Another innovative feature of Flow Vision™ SC is the ability to move and dock modules to different locations on the screen.

To move a tab menu you will first need to turn off the auto-hide function by using your mouse to press the auto-hide button. (See 'Tabs' section, page 13, for instructions).

Drag the open window towards the part of the screen in which you like it to stay. The following diagram will appear on the screen:

Drag the window to one of the anchor points and the window will reattach itself to the screen.



You can also re-activate the auto-hide feature and a tab will be created on the side of screen on which the window is attached.

You may repeat this procedure for any number of tabs. By using the center anchors you can arrange tabs side-by-side or bottom-to-top, in order to maximize open tab arrangement on the screen.

Individual screen layouts can be saved via the View>Layout menu.

Section 3 - Communicating with a Device

In this section you will learn about:

- Connecting and registering an Alicat Scientific device
- Opening the Device Module
- Polling a device
- Locking the front display
- Changing the measured gas
- Changing averaging
- Taring the unit
- Set-point control (controllers only)
- Valve tuning (controllers only)
- Getting information about the instrument
- Removing devices
- Setting software alarms
- Creating custom modifiers

Connecting To An Instrument And Receiving Data

In order to start using Flow Vision™ SC with an instrument, you will need to add the instrument to Flow Vision™ SC's device module.

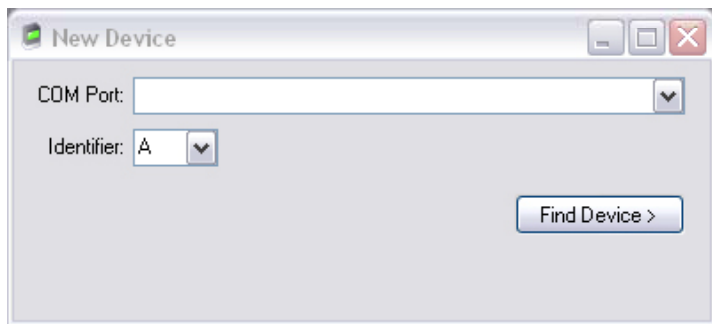
There are two ways to add devices to Flow Vision™ SC. The "Add" option allows you to add a single device on a known COM port. If you have multiple devices or you are not sure which port your device is connected to the "Search" option is a better choice.

Adding a device on a known COM Port

If you have not connected your instrument to your computer you will need to do this before taking the next step. You can connect an Alicat instrument to a computer using Alicat accessory cable MD8DB9 or by following the directions in the Alicat instrument manual about how to make a cable.

With your device connected to your computer and powered up, open the "Devices" tab and select "Add".

A window will appear entitled "New Device".



Use the arrow to the right of the blank space entitled “COM Port:” to select the com port to which your device is attached. By default your unit will come with the unit identifier A. (For information on unit identifiers please consult the product manual that accompanied your Alicat instrument).

If your unit identifier is not A, select the appropriate identifier.

Once the proper selections have been made, select “Find Device >” and Flow Vision™ SC will look for the attached instrument. The process may take a few moments. A successfully added device will be visible in the Devices tab.

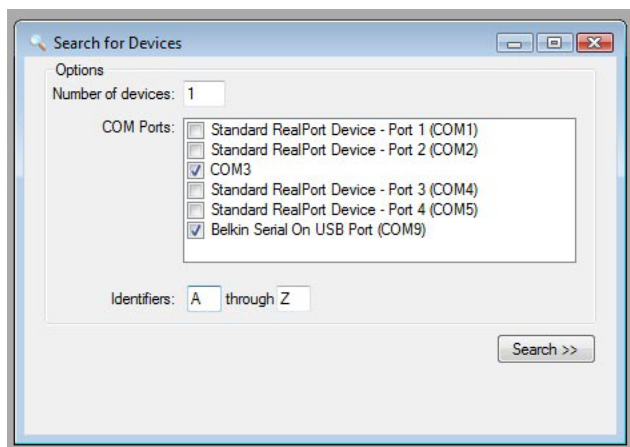
Searching for Devices

To search for devices connected to your computer choose the “Search” option from the “Devices” menu.

Note: If you do not see the “Search” option in the “Devices” menu click the down arrow for more options.



After selecting the option, the “Search for Devices” window will open.



Select the number of devices connected to your system. After Flow Vision™ SC finds this number of devices it will stop searching.

The “COM ports” box lists the available ports on your system. Ports that Flow Vision™ SC determines may have devices connected are checked.

Check any other ports you would like to search.

Finally, choose the range of identifiers you would like to check for. Click the “Search >>” button.

Flow Vision™ SC will locate and load devices matching the selected parameters. Once you have successfully added a device, it will be visible in the Devices tab.

Opening the Device Window

After you have successfully connected to your instrument, from the Device tab double click on the device you would like to monitor. After a few moments a window will appear showing a virtual image of your device with a functional display.

With the device window open, you will see a row of tabs across the top of the window underneath the window header.



The tabs are: Display; General; Control; Info.

Each of these tabs allows you to make functional changes to the instrument.

Display Tab

The display tab is the default starting tab when opening the device window. In this tab you will see a virtual representation of an instrument.

The image is generic and may not look exactly like the unit connected, this is normal.



You will immediately notice the display screen. This screen is a representation of the display functions on the instrument. You can access display functions by rolling your mouse over and pressing any of the buttons on the virtual screen.

Using the buttons on the Flow Vision™ SC virtual display will not make the same change to the display on the instrument itself.

You will notice that the menu screen available on the instrument display is not available on the Flow Vision™ SC virtual display, this is normal.

General Tab

The General tab is where you will make changes affecting the unit's operation. In this tab you will find the gas select menu, flow tare, display lock and averaging functions.



Gas Select™ — To change the measured gas type, simply click the down arrow to the right of the gas name to display the gas list.

Scroll down the list until you see the gas you will be flowing and click on that gas. The selected gas should be displayed in the white box. If it is not, repeat the steps.

If you do not see the gas you will be flowing on the list, please contact the factory before proceeding to verify if your unit is compatible with the gas.

Do Not Flow Gases That Are Not On The Gas List Without Factory Approval. Doing So Will Void Your Warranty And May Cause Permanent Damage To Your Flow Instrument.

Averaging changes the sensitivity of the unit's display to reduce "jitter". *Averaging does not change Flow Vision™ SC's data.*

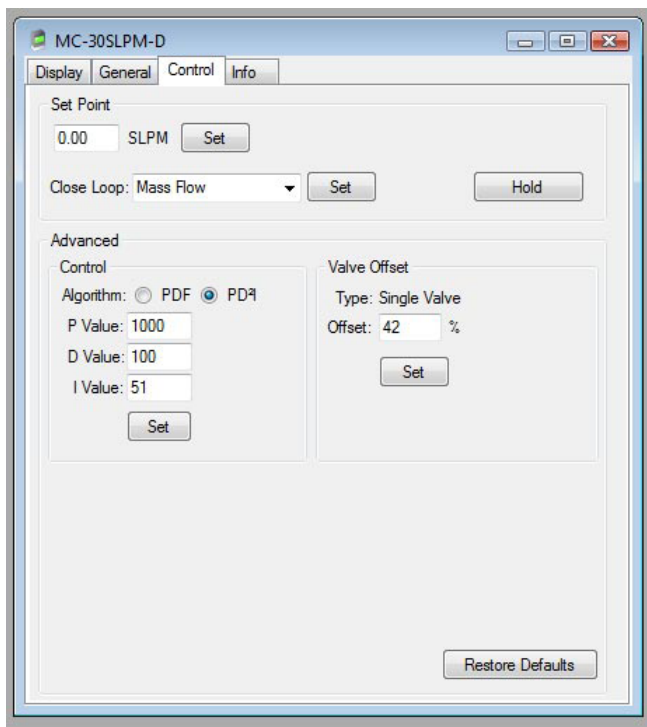
When the averaging is set to a low figure, the unit's display will show flow rate changes to the last significant digit as it is happening. The result is a rapidly changing integer to the right of the decimal. Some users find this to be a nuisance when trying to record data.

By increasing the averaging, the display will stabilize and not show the minute changes in flow. *Increasing averaging will not affect the performance or accuracy of the unit in any way.* Averaging is simply a setting that helps reduce the "jitter" of the display.

Tare — The tare function is used to set the zero on the instrument. *Tare only when there is **no** gas flow going to the unit.* The tare function is discussed in detail in the instruction manual that accompanied your instrument.

Control Tab (Controllers only)

The control tab allows you to change set-point and perform valve tuning on your controllers.



To change the set-point simply enter the desired set-point in the text box.

Once the set-point number is in the box, click the mouse on the “Set” button to send the set-point to the instrument. The unit should now be flowing the process gas at the desired set-point.

Control Loop — You can change the **control loop** if your process requires. By clicking the down arrow in the box to the right of “Close Loop”, you can select to close loop on mass flow, volumetric flow or pressure.

With MC/MCP/MCR series mass flow controllers, you can select to close loop on mass flow, volumetric flow or pressure, while pressure controllers will allow you to close loop on pressure and liquid controllers will allow close loop on volumetric flow.

Once the desired control loop has been selected, click on the “Set” button to send the command to the flow instrument.

Valve Tuning — If you require specialized valve tuning, you may do this via the “Control” section in the “Advanced” section.

Adjustment of PD&I values will change how the valve responds, valve stability and valve speed.

It is strongly recommended that adjustments to PD&I settings not be made unless you have some experience with proportional valve tuning.

Adjusting The PD&I Settings Without Prior Training May Result In Permanent Damage To Your Control Valve.

Valve offset or preload is a setting to compensate for the mechanical pressure effects that gas pressure may exert on the control valve. Gas pressure in the system exerts a mechanical force on the control valve that, depending upon the gas pressure, may slow its response when opening.

By increasing valve offset, a signal is sent to the valve that will increase its force when opening.

Adjusting valve offset may help your Alicat controller respond more quickly when moving away from a zero set-point.

Valve offset is a value between 0 and 100, 0 being little to no offset and 100 being maximum offset.

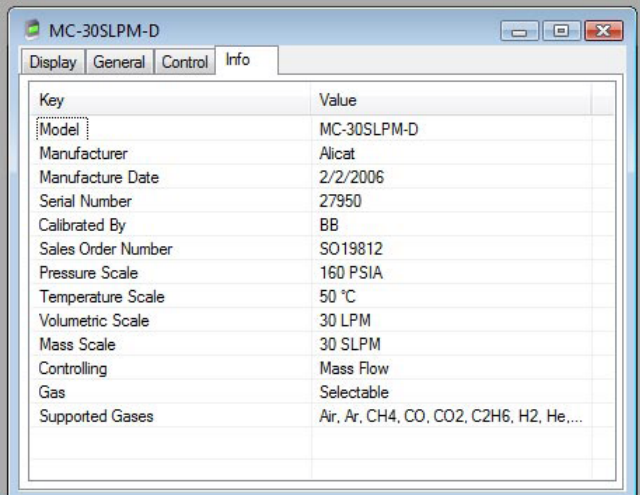
If your controller uses an Alicat medium sized valve, the offset effect is reversed. 0 being maximum offset and 100 being little to no offset.

Valve offset has no effect at a zero set-point.

Info Tab

The info tab provides specific information about the unit.

This information is helpful when requesting telephone support or authorization for recalibration or repair.



The screenshot shows a software window titled "MC-30SLPM-D" with four tabs: "Display", "General", "Control", and "Info". The "Info" tab is selected, displaying a table of unit information.

Key	Value
Model	MC-30SLPM-D
Manufacturer	Alicat
Manufacture Date	2/2/2006
Serial Number	27950
Calibrated By	BB
Sales Order Number	SO19812
Pressure Scale	160 PSIA
Temperature Scale	50 °C
Volumetric Scale	30 LPM
Mass Scale	30 SLPM
Controlling	Mass Flow
Gas	Selectable
Supported Gases	Air, Ar, CH4, CO, CO2, C2H6, H2, He,...

Polling a Device

To poll a device choose the “Polling > Start Polling > All” option from the main menu. Alternately, you can press Ctrl + P on your keyboard. The device will begin polling at the rate selected in the “Properties” window. All process that display/use device data (device windows, data logs, charts, etc.) will start updating. To stop polling, choose the “Polling > Stop Polling > All” option from the main menu or press Ctrl + Alt + P on your keyboard.

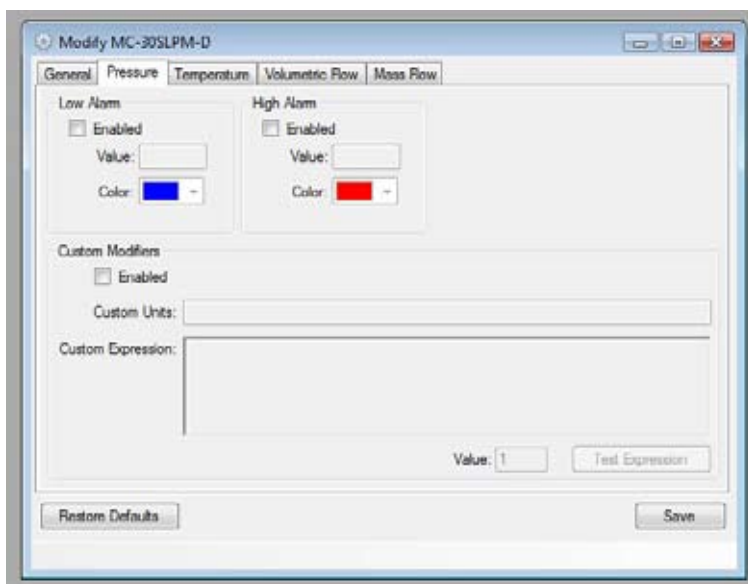
Removing a Device

To remove a device, select the desired device in the “Devices” tab by clicking it once. After selecting the device click the “Remove” option in the menu. After selecting “Yes” at the prompt the instrument will be removed from Flow Vision™ SC.

Removing A Device That Is Used In a Data Log/Chart Will Cause That Data Log/Chart To Stop Working.

Setting Software Alarms

The “Modify” button will activate a window from which you may review information about the device, set software alarms and/or modify any of the measured parameters.



To create a software alarm, use your mouse to check the “Enabled” box on the “Low Alarm” and/or “High Alarm” checkbox. Once enabled you will be able to enter a number in the “Value:” box. This value should reflect the point at which you would like the alarm to initiate. You will see that there is a tab for each measured parameter in the “Modify” window. An alarm can be set for any available measured parameter by entering those values into the properly corresponding section.

When an alarm is activated you will hear a tone from your computer (speakers are required for tone warning) and the virtual display will change from the normal green to the color you have selected for the alarm type.

If you have an alarm set please be sure to keep the virtual display window open.

PLEASE NOTE: The alarm function in Flow Vision™ SC is done via the software only and does not activate any kind of alarm on the device itself. If an alarm is triggered the device will continue to operate.

A technician must make changes to the device either directly or through the Flow Vision™ SC software. Also, in order for the alarm to function, Flow Vision™ SC must be running and the monitored device must be communicating with Flow Vision™ SC.

Creating Custom Modifiers

Custom modifiers can be used to change the value and heading for any measured parameter.

For example, temperature is measured in degrees Celsius by the device and in turn is displayed as such. Using Flow Vision™ SC, you can change the value and heading of the measured parameter using the Custom Modifier field.

We want to change the temperature display from degrees C to degrees F.

To do this, check the “Enabled” box under “Custom Modifier” in the tab corresponding to the measured parameter you want to modify.

Next, in the space next to “Custom Units:” type the heading that you would want to use, for this example it would “°F”.

In the space next to “Custom Expression” you will enter the formula used to convert the measured parameter into your desired measurement.

In this case we will use the formula $(^{\circ}\text{C} * 9/5) + 32$ as the conversion. The word “value” is used to define the measured parameter. So, the formula for converting °C to °F will look like this: “(value * 9/5) + 32” without the quotes.

Once you have entered the conversion expression and the units you can test the functionality of the expression before applying it.

To do that, enter a number in the box to the right of “Value” and then click the “Text Expression” button. If your formula is correct the window that appears will show the correct integer based on your formula.

In this case we use 2 as the test value and receive a test expression of 35.6. This means our formula is working.

Section 4 – Optional Modules

Flow Vision™ SC, as mentioned earlier, is built around the concept of modules. As such, you can now add or remove modules based on your intended level of use.

For the casual user only the most essential modules can be made available and the others made invisible — reducing screen clutter and possible confusion.

For the advanced user, all modules can be made visible and available on the screen.

In this section, we will go over each of the modules and their functionality.

Data Logs

Data logs can be created if you are required to keep records of measured data for the device for any period of time. Data logs are useful because they can be viewed outside of Flow Vision™ SC or incorporated into a database to create an accurate history of data given by the device.

To create a data log, you will first need to access the “Data Logs” module. If you cannot see the Data Logs module please refer to section 2 (page 11).

Once you have accessed the Data Logs module click on “Add”. A window will appear with options for configuring your data log.

New Log

File Options | Data | File Splitting | Start/Stop

Log Name: Test1

File Type: Access 2007 Database (.accdB)

File

Path: C:\Documents and Settings\Flow Vision Data\ Browse

File Name: Test1

Data Delimiter: , ☐ Name in series

End of Line:
☐ Carriage Return (\r)
☐ New Line (\n)
☒ Windows® Standard (\r\n)
☐ Other

Database

Host: localhost Port: 3306

Username:
Password:
Database:
Table: Test

Save

First, name the data log. This is done by entering a name into the text box to the right of “Log Name:”.

Next, using the drop down arrow next to the “File Type:” indicator, select the type of log file you would like.

After you have selected the log name and the type of log file, you will need to tell Flow Vision™ SC where you would like to save the file and under what name.

Next, define the unit (data source) and the parameters you want to log. To do this, click the “Data” tab on the top of the New Log window.

Device	Parameters
<input type="checkbox"/> MC-20SLPM-D	Pressure, Temperature, Volumetric Flow, Mass Flow, Set Point, ...

Remove

New Data Source

Device: MC-20SLPM-D

Parameter:

<input checked="" type="checkbox"/> Pressure	<input checked="" type="checkbox"/> Mass Flow	<input type="checkbox"/> Gas
<input checked="" type="checkbox"/> Temperature	<input checked="" type="checkbox"/> Set Point	<input checked="" type="checkbox"/> Date
<input checked="" type="checkbox"/> Volumetric Flow	<input type="checkbox"/> Totalizer	<input checked="" type="checkbox"/> Time

Add Source

Save

Define a data source by clicking the arrow on the right side of “Device:” in the “New Data Source” section on the bottom portion of the window. Choose the device from which you will be logging data.

In the “Parameter” section, place check marks next to the parameters you wish to log.

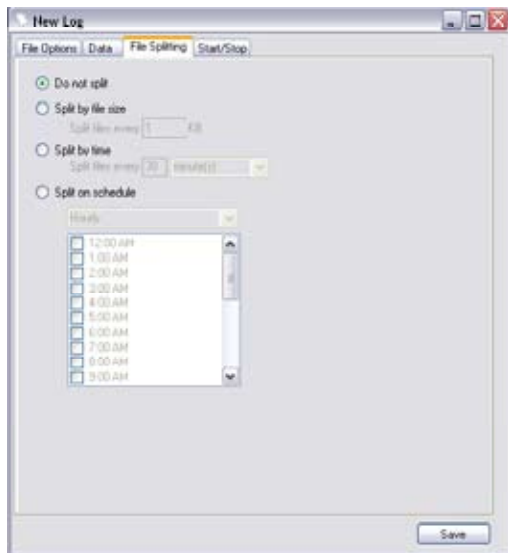
Note: Not all parameters are applicable to all Alicat devices.

Finally, click the “Add Source” button and the device, along with the selected parameters, will appear on the top portion of the window.

Splitting Data Files

If you are logging to a .txt file or a .csv file, you can have Flow Vision™ SC split the file into smaller pieces so that the data is more manageable.

Data can be split by file size, by time or by a predefined schedule selected by the user.



Please note: When database file extensions are selected, the File Splitting menu will be inaccessible. Database files are handled by external programs that are not affected by file size and have interfaces that allow users to manipulate data through the database program itself.

Starting and Stopping Data Logs

Flow Vision™ SC also allows you to configure how data logs are started and stopped.

To access this functionality, select the “Start/Stop” tab at the top of the New Log window.

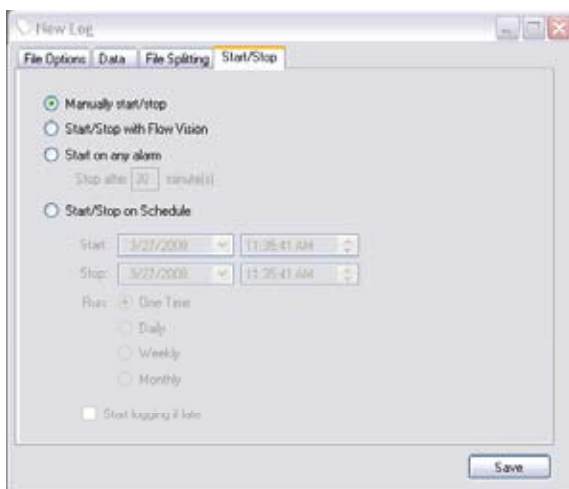
Logs can be set to start: manually; when Flow Vision™ SC starts; after an alarm is triggered; or by a user defined schedule.

Click the round button next to how you would like the logging to start and/or stop and fill in any necessary blanks.

Once you have completed all of the sections for a new log, click the “Save” button in the bottom right hand corner to save the log file.

When the log file has been successfully saved, the New Log window will automatically close.

By accessing the Data Logs module again, you will see your saved test in the window.

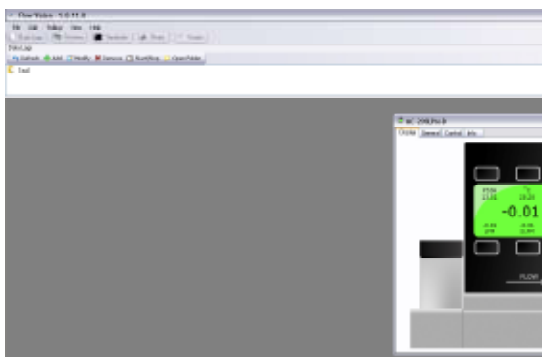


If you chose to start or stop the data log manually, you can do so by selecting the log you want to run from the window and clicking the Start/Stop button in the Data Logs module window.

Once you have completed the data log, you can recover the file using the Open Folder button in the Data Logs module window.

By accessing the Data Logs module again, you will see your saved test in the window.

If you chose to start or stop the data log manually, you can do so by selecting the log you want to run from the window and clicking the Start/Stop button in the Data Logs module window.



Once you have completed the data log, you can recover the file using the Open Folder button in the Data Logs module window.

Charts

Flow Vision™ SC allows you to create charts to display data.

Creating Charts

To create a chart, access the Charts module. If you do not see the Charts module refer to section 2 (page 11) for instruction on how to make the Charts module visible.

Once you have accessed the Charts module, click on the “Add” button to bring up the “New Chart” window.

Device	Parameter	Type
<input type="checkbox"/> MC-20SLPM-D	Mass Flow	Line
<input type="checkbox"/> MC-20SLPM-D	Temperature	Line
<input type="checkbox"/> MC-20SLPM-D	Pressure	Line

In the New Chart window, begin by naming the chart. To do this, type a name for the chart in the space provided to the right of “Chart Title”.

Now select the type of chart you would like. This is done by using the down arrow to the right of “Chart Type”.

The available chart choices are: Spline; Line; or Column.

Next, you will need to add a device or series to the chart.

To do this, select the device to chart by using the down arrow to the right of the “Device” field.

The arrow will display a list of available devices from which to select one.

Finally, select the parameter you would like to chart.

Clicking the down arrow to the right of the “Parameter” field will display a list of available parameters from which to select.

Once you have selected a parameter, assign it a color using the “Color” field below the parameter field.

Again, click the down arrow to the right of the “Color” field to display a list of available colors from which to select.

With the color selected, press the “Add Series” button to add the parameter to the “Series” section of the New Chart window.

Each series represents a charted line. You can repeat the “New Series” step for as many parameters you would like to chart from as any units you have connected.

You will notice that the color of the text defining the charted parameter in the series field will correspond to the color of its line on the chart.

A series can be removed by placing a check mark in the box next to the series name in the Series field and pressing the “Remove Selected” button.

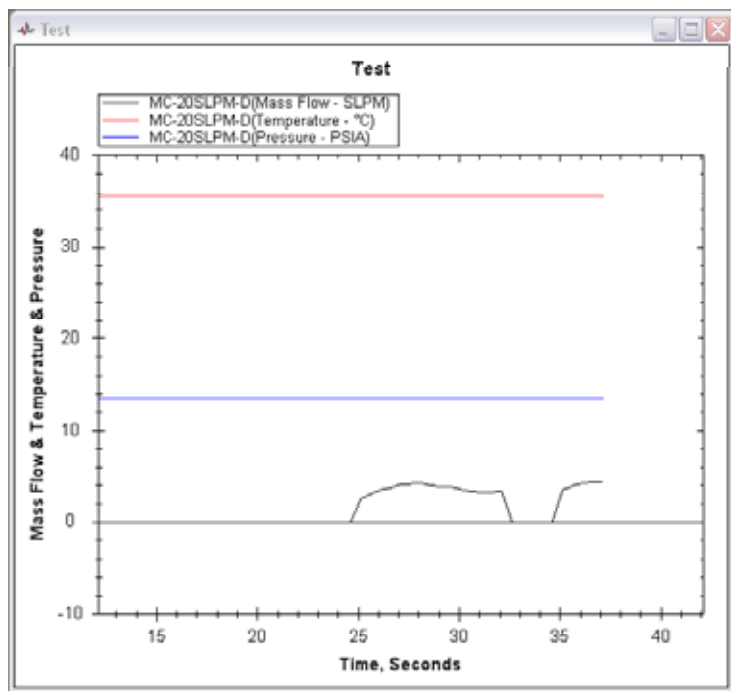
Once satisfied with your selections, press the “Add Chart” button to add the chart to the list of available charts in the Chart module.

After you have added the chart, the New Chart window will disappear from your screen.

Charting

To begin charting, access the Chart module to see your chart in the list of available charts.

Double click on your chart and it will bring up a window charting your selected series.



Charting is done based on units of time in seconds. The Y axis will scale according to the parameter with the largest integer measurement. In this case, it is temperature.

Please note: You cannot save/export a chart setting. Once the chart is removed from the Chart module, it will need to be redone if you would like to chart the same series.

The Chart module will allow you to modify an existing chart using the “Modify” button or to delete an existing chart by using the “Remove” button.

You can also “Refresh” the list if a previously added chart does not appear on the list.

Scripts

Scripts allow users to create automated command sets based on time. You can program Flow Vision™ SC to send specific commands to your connected flow instruments at specified time intervals.

To create a script, you will first need to access the Script module tab. If you do not see the Script module refer to section 2 (page 11) for instruction on how to make the Script module visible.

Once you have accessed the Script module, click “Add” to bring up the New Script window.

At the top of the window, in the box to the right of “Script Name”, name the script you are building. You can name the script anything you would like.

To the left of the device for which you would like to add a command, press the “+” symbol to display a list of available commands.

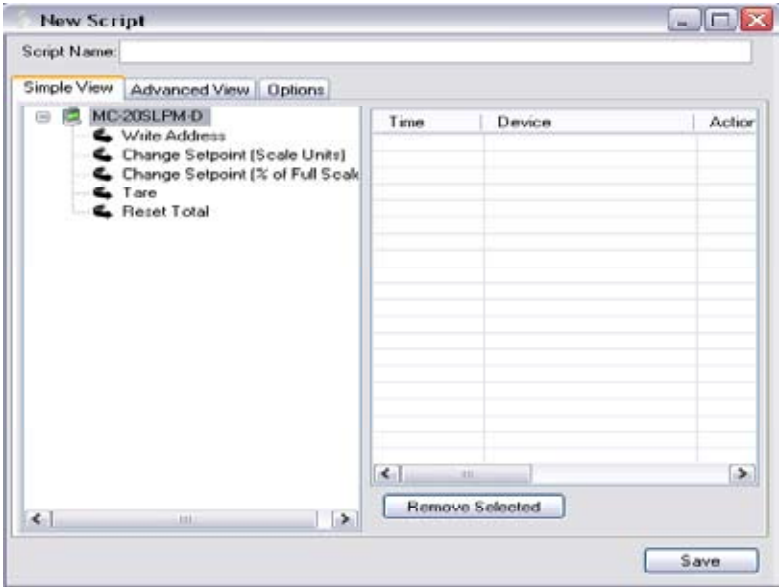
Add a command by either double-clicking on the desired command or clicking and dragging the command into the box on the right half of the screen.

After you have double-clicked or dragged a command, an Input window will appear in which you will fill in the blanks with your desired values.

Note: The common value among all the script functions is Execution Time. The Execution Time is the time (in seconds) at which the address change should take place from the start of the script.

Once you have populated the Parameter Values, simply click the “Add Command” button to add the command to the script.

If you require the script to run in a loop, you can select the number of loops to run and the time between each loop in the Options tab.



Descriptions of Simple Script Commands

Write Address

The Write Address command allows you to write a value to a register address of the instrument. You are required to enter Execution Time, Address Code and Address Value. The Address Code is the actual address to be changed, while the Address Value is the value for the register.

Please note: Written register values are not easily undone. You must rewrite the original value to the register if you want to undo your changes.

Please use this function only if you are sure you need to do so and only after recording the original register value. If you are unfamiliar with register values and their corresponding functions, please contact Alicat or your local distributor for information.

Change Set-point (Scale Units)

The Change Set-point (Scale Units) command lets you change the set-point of the instrument as a function of the unit's scale. Selecting this command will cause an Input window to appear that requires input of Execution Time (in seconds) and Scale Units.

Please note: The Change Set-point (Scale Units) function is only available with controllers.

Change Set-point (% of Full Scale)

The Change Set-point (% of Full Scale) command allows you to change the set-point of the instrument as a function of percentage (0 - 100%). Selecting this command will cause an Input window to appear that requires input of Execution Time (in seconds) and % of Full Scale. It is not necessary to use the "%" symbol when populating the Parameter Value.

Please note: The Change Set-point (% of Full Scale) function is only available with controllers.

Tare

The tare function is used to set the zero on the instrument. Tare only when there is **no** gas flow going to the unit. The tare function is discussed in detail in the instruction manual that accompanied your instrument. Choosing the tare function will cause an Input window to appear that requires input of Execution Time (in seconds).

Reset Total

The Reset Total function is used to reset the instrument's flow totalizer. Choosing the Reset Total function will cause an Input window to appear that will require input of Execution Time.

Please note: The Reset Total function is available only for instruments ordered with the optional totalizer.

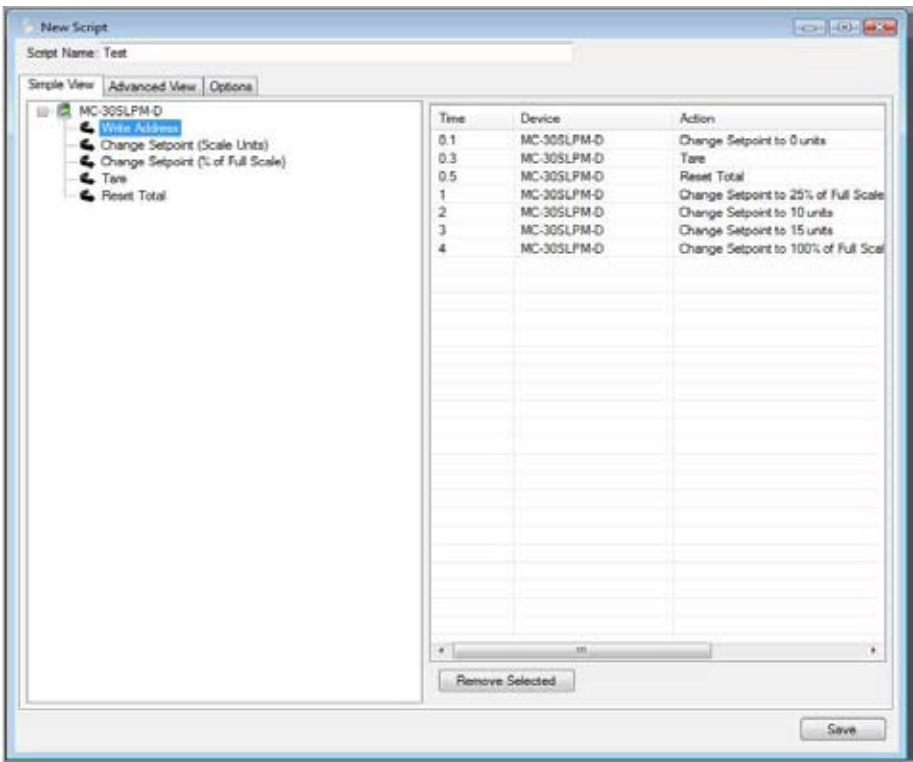
Sample Script

Below is a sample script that will cause a flow controller to:

- 1. Change the set-point to 0 at .1 seconds from start (*controllers only*)
- 2. Tare at .3 seconds from start
- 3. Reset the flow totalizer at .5 seconds from start (*devices with totalizer only*)
- 4. Change the set-point to 25% at 1 seconds from start (*controllers only*)
- 5. Change the set-point to 10SLPM at 2 seconds from start (*controllers only*)
- 6. Change the set-point to 15SLPM at 3 seconds from start (*controllers only*)
- 7. Change the set-point to 100% at 4 seconds from start (*controllers only*)

Once you have completed a script, you can review your selections. If you decide you don't want particular steps, they can be removed by selecting the specific step(s) and then clicking the "Remove Selected" button.

Finally, click the "Save" button to save the script into the Script module tab.

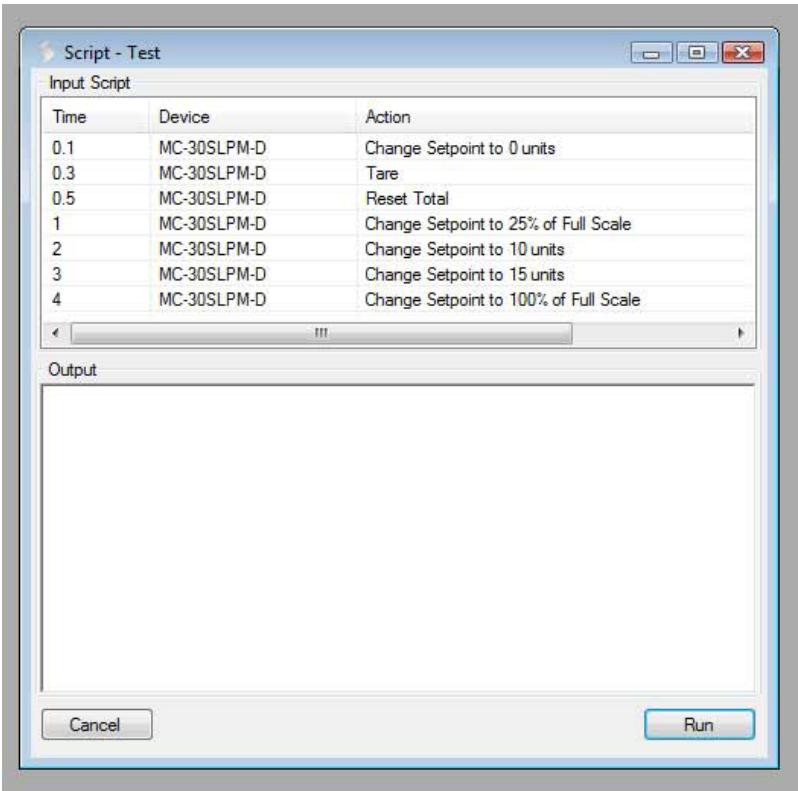


Running the Script

To run the script, access the Script module tab and double-click the script you would like to run.

In this example, it is the script that was just saved.

Once you have double-clicked on the script, a window will appear that will allow you to run the script and monitor the results of each command.



Click the “Run” button to run the script. In the Output box on the bottom half of the screen, you will see a verification of each function as it takes place.

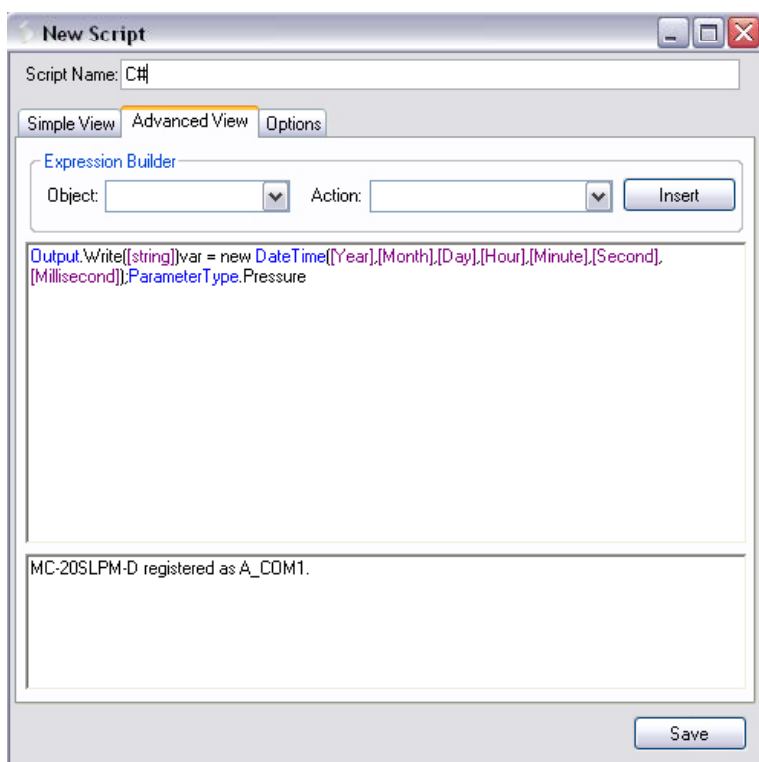
At the end of the script, the instrument will remain as it was after the last command in the script.

Advanced View Tab – Building Advanced Scripts

Flow Vision™ SC includes a complex script building system that is based on the C Sharp (C#) programming language.

While the majority of users will find that the Simple View will offer all of the flexibility they require, users who are familiar with C# can use the Advanced View tab to create complex scripts with nearly limitless functionality.

If you intend to use the Advanced Tab, you must be familiar with C# programming language. Please do not attempt to use this feature without C# experience and knowledge.



Terminals

The Terminals module allows communication with the device through an ASCII terminal without leaving the Flow Vision™ SC program.

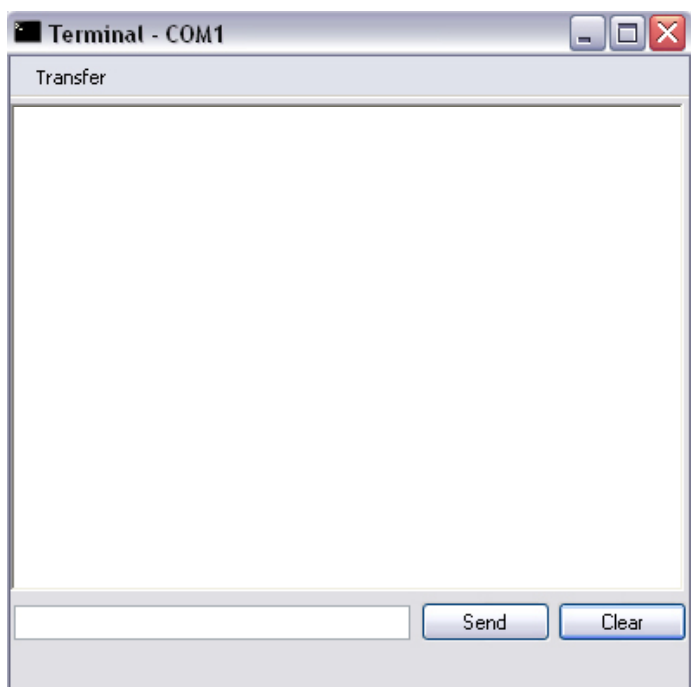
To begin a terminal session, you will need to open the Terminal module tab. If you do not see the Terminal module tab refer to section 2 (page 11) for instruction on how to make the Terminal module visible.

Upon accessing the Terminal module tab, you will see the communication port to which your unit is attached.

Before beginning a terminal session, make sure that Flow Vision™ SC is not polling the connected instrument(s). If the program is polling, you will see polled data on the terminal window.

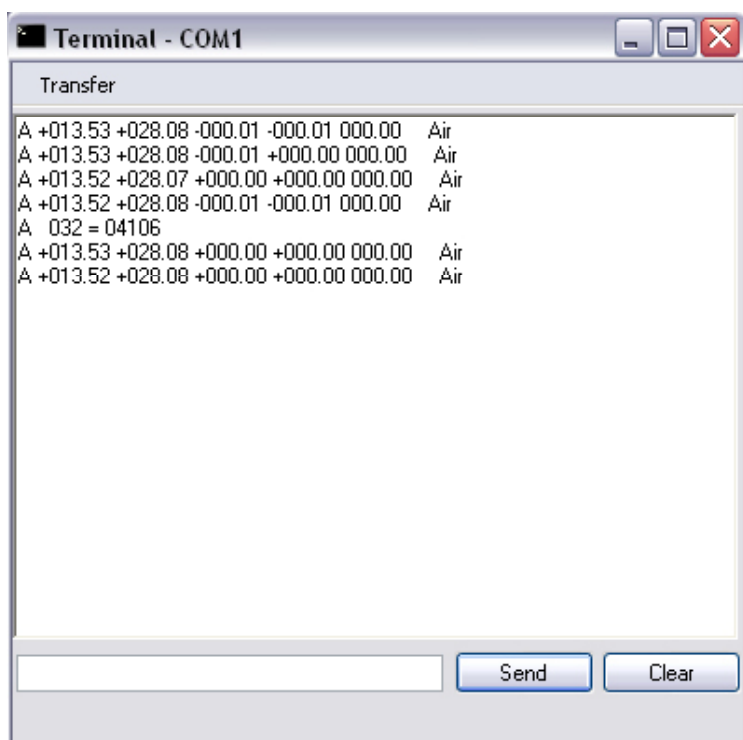
Begin the terminal session by double clicking on the communication port to which the instrument you would like to poll is connected.

A window will appear that will allow you to communicate with the instrument as you would via a terminal window.



Please refer to the instruction manual that accompanied your instrument for instructions on communicating with a unit via a terminal window.

You will not have to worry about connection settings as this is done through Flow Vision™ SC if the device has been identified by Flow Vision™ SC as a connected and available device.



Uninstalling Flow Vision™ SC

To uninstall Flow Vision™ SC use the Add and Remove Programs function from your Windows® control panel. Flow Vision™ SC can be selected from the program group and uninstalled. If you are unfamiliar with the Add and Remove Programs function of your Windows® software please consult your system administrator or refer to your Windows® operating manual.

Troubleshooting and FAQs

If you have Flow Vision™ SC installed and running, the **Help Menu** (page 12) may provide the answer you are looking for.

My Alicat device will not connect to Flow Vision™ SC.

1. Check all connections between Alicat device and computer.
2. Make sure Alicat unit is powered.
3. Make sure Alicat unit communication is set to 19,200 baud.
4. Verify that the communication cable is built correctly and installed properly.
5. Verify that a connection can be made with the computer using Windows® HyperTerminal® and following the instructions in the manual that accompanied your flow device.

Flow Vision™ SC will not start when I put the CD into my CD/DVD drive.

Your computer may not be able to run the autorun script. Try to run the Flow Vision™ SC setup.exe program from the drive directory using Windows® Explorer®

Flow Vision™ SC will not install properly.

1. Verify that your computer meets the minimum requirements to run Flow Vision™ SC.
2. If your computer meets the requirements and the problem persists please contact Alicat directly for support.

The process information displayed on my Alicat device and on the Flow Vision™ SC screen don't always match.

In the configure menu the polling rate will dictate how often the Flow Vision™ SC screen is updated.

Flow Vision™ SC and the display on my Alicat device don't always match at zero flow.

The Alicat flow device comes with programming to help stabilize the display at zero flow. The Flow Vision™ SC display will not have this stabilization feature and will show minute fluctuations at zero, while the device's display will be a solid zero. This slight difference in reading is normal.

I can't find my captured flow data.

Click on the Script. Choose open folder.

Contact Information

For more information regarding this or any Alicat product, please contact:

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2045 N. Forbes Blvd. Bldg. 103
Tucson, Arizona 85745
USA

Ph: 520-290-6060

888-290-6060

Fax: 520-290-0109

email: info@alicatscientific.com

Web site: www.alicatscientific.com

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Alicat Scientific

Innovative Flow and Pressure Solutions

- ♦ *Ranges from 0.5SCCM to 1500SLPM*
- ♦ *Digital and Analog Communication*
- ♦ *Speed: 10 ms Response*
- ♦ *LCD with Push Button Interface*
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- ♦ *Field Adjustable PID Loop Tuning*
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- ♦ *Mass Flow Controllers that also control
absolute pressure or volume flow*

Alicat Digital Flow and Pressure Products:

Mass and Volumetric Gas Meters

Ranges: 0-0.5SCCM to 0-1500SLPM
Response Time: $\leq 10\text{ms}$
Accuracy: $\pm(0.8\%$ of reading + 0.02% of Full Scale)

Mass and Volumetric Gas Controllers

Ranges: 0-0.5SCCM to 0-1500SLPM
Response Time: $\leq 100\text{ms}$
Accuracy: $\pm(0.8\%$ of reading + 0.02% of Full Scale)

Precision Water Meters and Controllers

Precision Pressure Gauges

Precision Digital Pressure Controllers

Dual Valve Pressure Controllers

See our full product line and
complete technical specifications at:
www.alicatscientific.com

Gas Viscosity, Density and Compressibility:

#	Gas	Absolute Viscosity* 25°C	Density ** 25°C	Compressibility 25°C
0	Air	Air 184.918	1.1840	0.9997
1	Argon	Ar 225.593	1.6339	0.9994
2	Methane	CH4 111.852	0.6569	0.9982
3	Carbon Monoxide	CO 176.473	1.1453	0.9997
4	Carbon Dioxide	CO2 149.332	1.8080	0.9949
5	Ethane	C2H6 93.540	1.2385	0.9924
6	Hydrogen	H2 89.153	0.08235	1.0006
7	Helium	He 198.457	0.16353	1.0005
8	Nitrogen	N2 178.120	1.1453	0.9998
9	Nitrous Oxide	N2O 148.456	1.8088	0.9946
10	Neon	Ne 311.149	0.8246	1.0005
11	Oxygen	O2 204.591	1.3088	0.9994
12	Propane	C3H8 81.458	1.8316	0.9841
13	normal-Butane	n-C4H10 74.052	2.4494	0.9699
14	Acetylene	C2H2 104.448	1.0720	0.9928
15	Ethylene	C2H4 103.177	1.1533	0.9943
16	iso-Butane	i-C4H10 74.988	2.4403	0.9728
17	Krypton	Kr 251.342	3.4274	0.9994
18	Xenon	Xe 229.785	5.3954	0.9947
19	Sulfur Hexafluoride	SF6 153.532	6.0380	0.9887

#	Gas	Absolute Viscosity* 25°C	Density ** 25°C	Compressibility 25°C
20	75%Ar / 25% CO2	C-25 205.615	1.6766	0.9987
21	90% Ar / 10% CO2	C-10 217.529	1.6509	0.9991
22	92% Ar / 8% CO2	C-8 219.134	1.6475	0.9992
23	98% Ar / 2% CO2	C-2 223.973	1.6373	0.9993
24	75% CO2 / 25% Ar	C-75 167.451	1.7634	0.9966
25	75% Ar / 25% He	A-75 230.998	1.2660	0.9997
26	75% He / 25% Ar	A-25 234.306	0.5306	1.0002
27	90% He / 7.5% Ar / 2.5% CO2 Helistar® A1025	A1025 214.840	0.3146	1.0003
28	90% Ar / 8% CO2 / 2% O2 Star29	218.817	1.6410	0.9992
29	95% Ar / 5% CH4 P-5	223.483	1.5850	0.9993

*In micropoise (1 Poise = gram / (cm) (sec)) **Grams/Liter
Reference: NIST REFPROP 7 Database

Flow Conversions:

SCFM	1.00 = 28.3160	SLPM	SLPM	100.00 = 3.5316	SCFM
SCFH	1.00 = 0.4719	SLPM	SLPM	100.00 = 211.9093	SCFH
SCIM	100.00 = 1.6390	SLPM	SLPM	1.00 = 61.0128	SCIM
SCIH	1000.00 = 0.2732	SLPM	SLPM	1.00 = 3660.7688	SCIH



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