microAeth® AE51 Flow Calibration Kit

Operating Manual

AETHLABS

Introduction & Parts Identification

The AE51 Auto Flow Calibration software communicates with both the microAeth® AE51 and the external flowmeter included with the AethLabs Flow Calibration Kit.

In order to communicate with microAeth AE51, specific USB drivers are required. If you have already installed the microAethCOM software for configuring and communicating with the AE51, then these USB drivers are already installed on your computer. If this is the first time using the microAeth AE51 with your computer then first install the microAethCOM software.

Carefully unpack the flowmeter assembly and accessories:

Quantity	Description
1	Auto Flow Calibration Flowmeter Assembly
1	AC Wall Power Adapter
1	2-part Flowmeter Computer Cable, serial mini-DIN to 9-pin RS-232 with RS-232 to USB adapter
1	Flow Calibration Kit Documentation & Software CD
1	TSI Flowmeter Operation and Service Manual
1	TSI RS-232 Serial Command Set Manual

Flow Calibration Kit Setup

1. Connect the barrel jack end of the AC wall power adapter to the flowmeter. Plug in the AC wall power adapter to an electrical outlet.

2. Connect the mini-DIN end of the 2-part flowmeter computer cable to the flowmeter. Connect the USB end of this cable to the computer with the software installed.

3. Screw the 10-32 threaded elbow fitting connected to the outlet port of the flowmeter to the inlet port of the microAeth AE51 (10-32 threaded elbow fitting connected to 1/8” tube WITHOUT the In-line 60mm round ULPA Filter). On the rear panel, opposite of the flowmeter LCD screen, there is an arrow denoting the direction of air flow through the flowmeter. **Be careful to ensure that the elbow fitting o-ring face seal seats properly against the AE51.**

4. Connect the USB cable to the microAeth AE51 and your computer using the USB cable that was provided with the AE51.

Install/Exchange Filter Strip

1. **Always make sure that a filter strip is installed in the microAeth AE51 when it is operating.**

2. **When exchanging a filter strip in the microAeth AE51, make sure that it is turned off.**

3. The sample deposit side of the filter strip is the white side. When the filter strip is installed in sample chamber, the white side of the filter strip should be facing the same direction as indicated by the white arrow on the faceplate of the AE51.

Top of microAeth AE51

Bottom of microAeth AE51

White sample deposit side of filter strip faces the top.

Metal side of filter strip faces the bottom.

4. Hold the AE51 in once hand, with the release button on the lower side.

5. Loosen the rubber cover on the front of the AE51 by pulling the tab away from the instrument. This will expose the filter strip slot.

6. If there is a filter strip already installed, depress the release button with your left thumb and pull the filter strip out of the sampling head.

7. Install a new filter strip by pressing and holding the release button and then inserting the new filter strip into the sample chamber opening.

8. Make sure to push the new filter strip all the way into the slot and that the locating pinhole on the filter strip is not visible.

9. Release the button.

10. Replace the rubber cover. A tight fit is essential to prevent the entry of contamination and stray light into the sample chamber.

PC Software Installation

1. Do not connect the microAeth AE51 to the computer until the software installation is complete.

2. Make sure that you have the necessary user privileges on your computer to install software.

3. **Make sure that you have already installed the the microAethCOM software on your computer.** If the microAethCOM software is not installed, please follow the microAethCOM installation procedures outlined in the microAeth AE51 Quick Start Guide or microAeth AE51 Operating Manual.

4. Locate and copy the AE51 Auto Flow Calibration.exe to your computer.

Auto Flow Calibration

1. **Always make sure that a filter strip is installed in the microAeth AE51 when it is operating.**

2. **When exchanging a filter strip in the microAeth AE51, make sure that it is turned off.**

3. **Install a clean, unused filter strip into the microAeth AE51.** A pre-used filter with heavy loading may create an offset in the flow calibration table of the AE51.

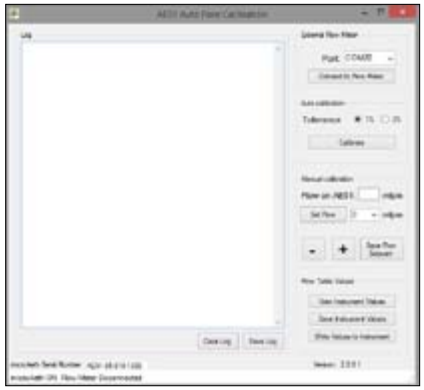
4. Make sure that the flow calibration kit is connected to the AE51.

5. Connect the flowmeter and microAeth AE51 to the computer with the software installed.

6. Turn on the flowmeter and let it stabilize for at least 10 minutes before use.

7. Turn on the microAeth AE51.

8. Open the AE51 Auto Flow Calibration software.



9. Select the appropriate COM port from the dropdown menu in the External Flowmeter section of the software. There may be multiple COM port options depending on the computer and the peripherals connected to it.

10. Click the Connect to Flowmeter button. If the port is already in use, a window will pop up to request that a different port is selected. If the status bar at the bottom of the software, does not show 'microAeth ON, Flow Meter Connected' status, check your connections and ensure that communication with the microAeth AE51 and flowmeter has been initiated as previously described.

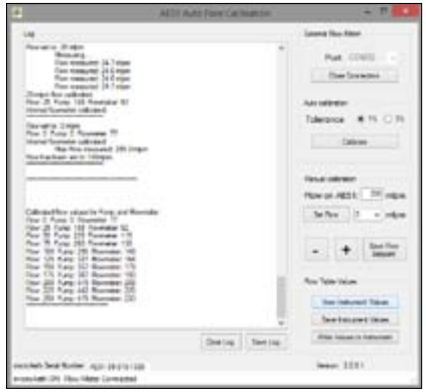
11. Select the flow tolerance setting in the Auto Calibration section.

    The sofware will attempt to calibrate the internal flow system of the microAeth AE51 with 1% of the external flowmeter measurement. Some instruments, especially older units that have not had pump upgrade service by AethLabs, may need to use the 3% tolerance setting. Some instruments may have internal pumps that cannot reach the higher flow setpoints. Instruments not sold by AethLabs may require pump servicing by AethLabs in order to achieve flow rates of 200 mlpm or higher. Contact AethLabs for additional information.

12. Click the Calibrate button.

    The system will automatically cycle through all the setpoints of the flow calibration table of the microAeth AE51 (from 250 ml/min down to 0 ml/min). The software will first check the maximum achievable flow rate of the instrument to determine what setpoints can be calibrated. If the internal pump cannot achieve the specified flow rate, the setpoint will not be calibrated. Contact AethLabs for a pump upgrade, replacement, or service.

13. Click the View Instrument Values button. This will display all the values of the flow calibration table.



14. **Please check the values to make sure that as the flow setpoint increases from 0 to 250 ml/min, the pump drive and internal flowmeter values also increase.** If this is not the case, please try again to calibrate the microAeth AE51 using the auto and manual flow calibrations. If this issue persists, please contact AethLabs for further assistance.

Manual Flow Calibration

1. **Always make sure that a filter strip is installed in the microAeth AE51 when it is operating.**

2. **When exchanging a filter strip in the microAeth AE51, make sure that it is turned off.**

3. **Install a clean, unused filter strip into the microAeth AE51.** A pre-used filter with heavy loading may create an offset in the flow calibration table of the AE51.

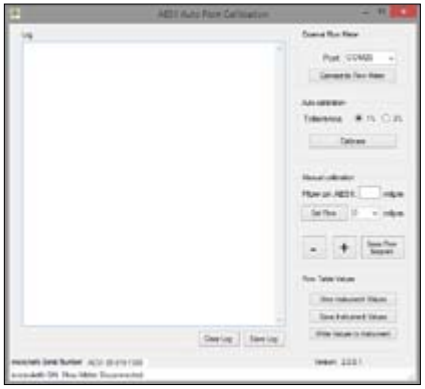
4. Make sure that the flow calibration kit is connected to the AE51.

5. Connect the flowmeter and microAeth AE51 to the computer with the software installed.

6. Turn on the flowmeter and let it stabilize for at least 10 minutes before use.

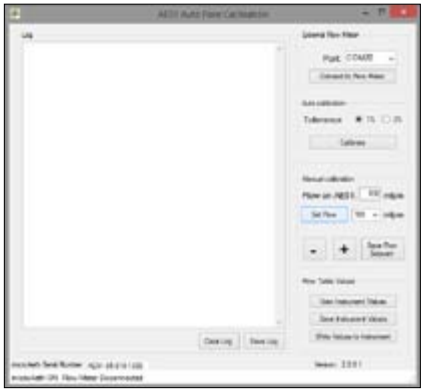
7. Turn on the microAeth AE51.

8. Open the AE51 Auto Flow Calibration software. Wait until the microAeth AE51 establishes communication with AE51 Auto Flow Calibration software. The status bar in the bottom left corner of the software will show the connection status of the AE51 and AE51 Auto Flow Calibration software. If the status bar does not show microAeth ON status, check your connections and ensure that communication with the AE51 has been initiated as previously described and disconnect the USB cable from the computer and reinsert it.

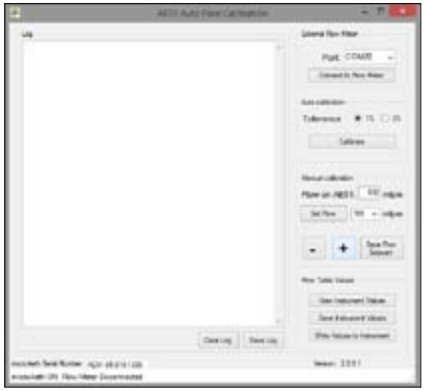


9. Select the flow setpoint to calibrate from the dropdown menu in the Manual calibration section of the software. Then click the Set Flow button.

10. The flow rate of the microAeth AE51 will change and the text box to the right of Flow on AE51: should be populated with the desired flow setpoint.



11. Use the + and - buttons to adjust the pump speed of the microAeth AE51 until the flow rate on the external flowmeter closely matches the selected flow setpoint in the software.

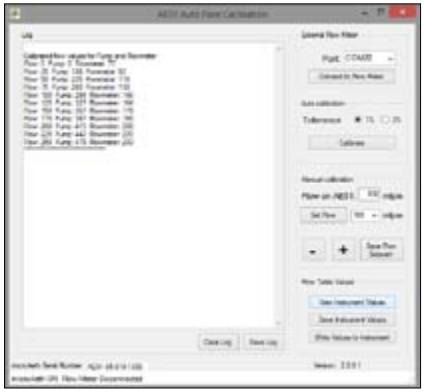


12. Then click the Save Flow Setpoint button to save the setpoint calibration in the AE51 flow calibration table stored in the instrument.

13. Repeat steps 9-12 for all flow setpoints in the dropdown menu in the Manual calibration section of the software.

    If the internal pump of the microAeth AE51 cannot reach the highest flow rate setpoint, contact AethLabs for further assistance.

14. Click the View Instrument Values button. This will display all the values of the flow calibration table.



15. **Please check the values to make sure that as the flow setpoint increases from 0 to 250 ml/min, the pump drive and internal flowmeter values also increase.** If this is not the case, please try again to calibrate the AE51 using the auto and manual flow calibrations. If this issue persists, please contact AethLabs for further assistance.

Flow Table Values

View Instrument Values
The View Instrument Values button requests the contents of the flow calibration table stored in the AE51.

The flow calibration table shows the pump drive values and internal flowmeter values for the specified flow setpoints.

VERY IMPORTANT: As the flow setpoint increases from 0 to 250 ml/min, the pump drive and internal flowmeter values should increase. If this is not the case, please try again to calibrate the AE51. If this issue persists, please contact AethLabs for further assistance.

Save Instrument Values
The Save Instrument Values button will prompt the user to select a location to save the flow calibration table file.

The flow calibration table values will be read from the AE51 and saved to a selected location where it can be kept for archival purposes and comparison, or can be retrieved and uploaded to the AE51 at a later time.

Write Values to Instrument
The Write Values to Instrument button will prompt the user to select a previously saved flow calibration table file for upload to the AE51.