SwemaFlow 4001

Operating instructions

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SwemaFlow 4001

1. Introduction

Thank you for choosing a quality instrument from Swema. SwemaFlow 4001 measures airflow directly in l/s, m3/h or cfm (when set to US units). The instrument is turned on and off with the red button next to the display. When the instrument is turned on the display shows first the firmware version then the voltage of the battery. After a few seconds the instrument is ready for measurement. The instrument is automatically turned off after ten minutes.

The measuring equipment includes:
- Flow capture instrument
- Flow hood 650x650mm
- Carrying case
- Charger
- USB-cable

Accessories:
Flow hood 250 x 1200 mm, h = 800 mm (Part.nr 764.420)

2. Technical data

Measuring range:
Air Flow: 3... 1500 l/s, 11... 5400 m3/h, 7... 3100 cfm
Temperature: 0... 50°C, 32... 122°F
Barometer: 600... 1200 hPa, 18... 35 inHg

Measurement uncertainty:
Air Flow: 3,5% read value, min 0,5 l/s
Temperature: ±0,6°C below 50 l/s
                    ±0,4°C above 50 l/s
Barometer: ±3,5 hPa

At 95% coverage probability in non condensing, non moist air, <80 % RH, non aggressive gases

Measuring method:
Mass flow, net of hot wires

Weight:
3,7 kg (including capture hood 650x650mm)

3. Function

SwemaFlow 4001 calculates the average value of the airflow during 2 seconds. The average flow is presented on the display with an update two times per second. SwemaFlow 4001 compensate automatically for the air density by measuring air temperature and barometric pressure.

On/Off (RED button)

Turn on the instrument by pressing the RED button. When turning on the display will go trough a sequence of showing the firmware version, the battery status and showing the barometric pressure, it will after that go into measuring mode. Turn off the instrument by pressing the RED button.

The display light is turned on by pressing down the blue button when turning the instrument on. The light is shut off by turning off the instrument.

Unit (BLUE button)

By pressing the BLUE button the display toggles between l/s, m3/h, air temperature (°C) and barometric pressure (hPa). When set to US units it toggles between cfm, air temperature (°F) and barometric pressure (inHg).

Mode (GREY button)

Toggle between Standard mode, Flow Factor mode and stored values (notE) with Grey button.
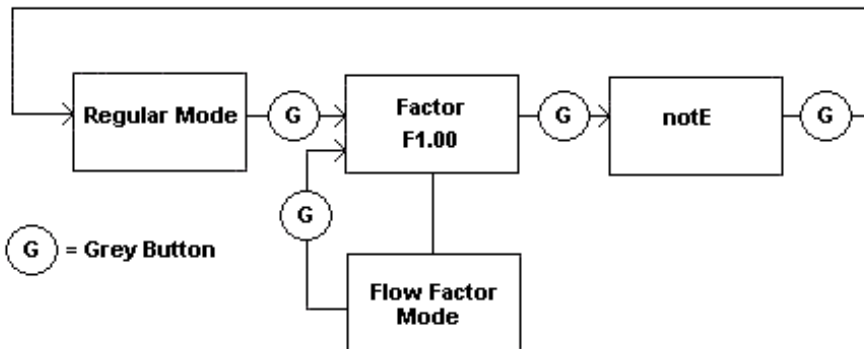
Standard Measurement

Place the hood with the sealing list making a proper seal around the valve. Read the air flow value from the display.

SwemaFlow 4001

HOLD function (RED button on handle)
If the button on the handle (small red button) is pressed down shortly the display will freeze the measured value. This will be shown with the text "Hold" is shown in the upper left corner of the display. Realese it by pressing down the button shortly again. Press the BLUE button to toggle between the freezed values (freezed air flow, temperature and barometric pressure).

Save measurement (RED button on handle holded down)
If a measurement is freezed it can be stored by holding down the button on the handle (small red button) for 2 sec. The display will show which note number the measurment is saved as and then return to measuring mode.

FF Measurement (Flow Factor)
In Flow Factor mode the flow is multiplied with a flow factor (flow factor 1.00 will not alter the flow). A flow factor can be used to compensate for example a leakage. Warning: Changing to anything else than 1.00 will alter the reading from calibration certificate.
If in Standard measuring mode and the GREY button is pressed the display will show F1.00 (or the value of flow factor that the instrument is set to).

**Make a FF Measurement (RED button on handle)**
To measure with the flow factor displayed (example F1.10 will multiply measured flow with 1.10 and display the result) press button on the handle (small red button), the text "Factor" on the display is shown to indicate that you are in FF-mode. To change FF-value hold down the button on the handle (small red button) for minimum 2 sec when F1.00 is shown. The first digit will start flashing, change value by pressing GREY or BLUE button. When correct value is choosen confirm by press shortly the button on the handle and the second digit will start flashing, repeat the same procedure with the second and third digit. After the third digit is confirmed the instrument will go to FF mode. Measurement can be stored in the same way as in regular measuring mode.
To return to regular measuring mode press GREY button 3 times (first press will show FX.XX, second will show notE and the third will take you to Standard measurement mode).

Note book (notE)

If GREY button is pressed two times when in standard measuring mode notE will be displayed. To enter the note book press the button on the handle (small red button). "Note" and the number of the last saved note will be shown on the display. With GREY and BLUE button it's possible to scroll through the saved notes. To return to notE press RED button.

To see saved measurement in a note press button on the handle (small red button). With GREY and BLUE button it's possible to scroll through the saved measurements in the note (air flow, temperature and barometric pressure). To return to notes press the RED button.

To erase the note book memory hold down the button on the handle (small red button) for 2sec, "E ALL" (Erase All?) will be shown in the display. To return to notes press the RED button, to erase all notes hold down the measuring button (small red button on handle). After all notes are erased "notE" will be shown in the display, press GREY button to go to regular measuring mode.
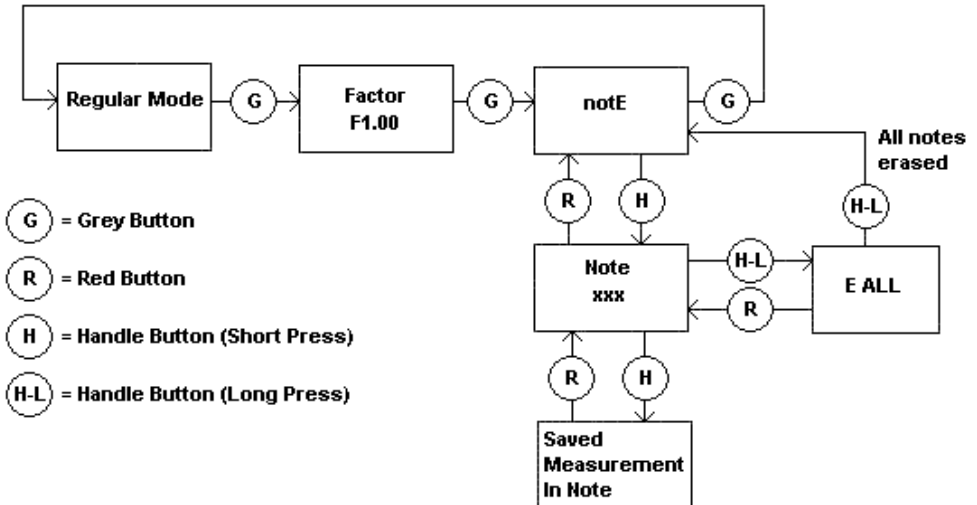
4. Charging

SwemaFlow 4001 has built-in rechargeable Li-ion-batteries. Battery charge time is approxematley 4h (80% after approx. 2h). The charger can be connected to the instrument longer without damaging the battery. The green led will have a fixed light during charging, when fully charged the green led will be turned off. You can use the instrument while charging. Caution! Use only the original charger other charger can damage the batteries.

Battery check

When turning on the instrument the display shows the voltage of the battery. A fully charged instrument shows approximately 4.1 V (it will drop to 3.8-3.9V quite fast). When the supply voltage is lower than 3.2 V a battery symbol will be visible on the display. When the supply voltage is lower than 2.9 V the instrument will be automatically shut off.

5. Driver installation

To be able to use SwemaFlow 4000 with a PC or to change settings a driver for the probe needs to be installed. The drivers are automatically installed after installation of the of the fre software "SwemaTerminal 3".

1. Download "SwemaTerminal 3" (is a zip-file) from www.swema. com.

2. Unzip the file and run the setup file. When the setup is done connect the USB cable to the PC and turn the instrument on. The PC will now install the necessary drivers automatically.

In case the driver installation dosen`t succeed you can also do it manually. Open the device manager, right click on "unknown device" and then "update driver". The drivers can be found at "C:/Program Files/ Swema" (make sure that the box "include sub folders" is checked).

6. SwemaTerminal 3
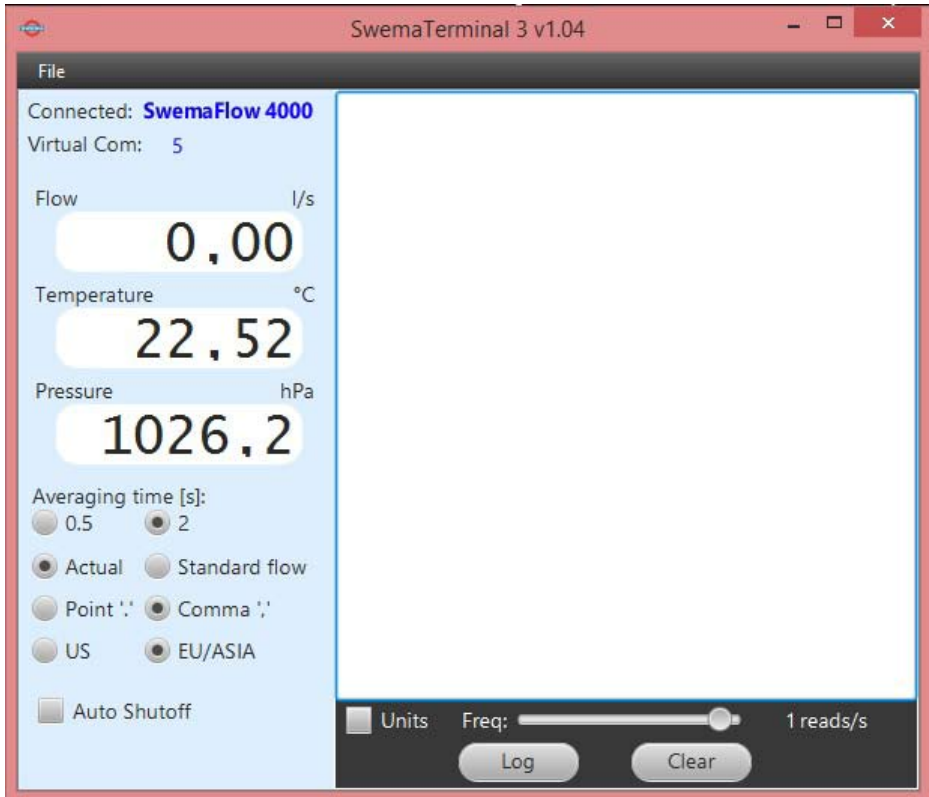
With SwemaTerminal 3 it's possible change settings, print stored measurements, update firmware, print calibration protocol, do on-line logging and store the logged data on your PC. Information of what kind of instrument and at which COM-port it's connected can be found on the top left side.

"Flow", "Temperature" & "Pressure":
SwemaTerminal 3 shows the air flow, temperature and barometric pressure that SwemaFlow 4001 is currently measuring.

"Averaging time":
Averaging time is used to decide how fast the displayed values will be updated. A higher "Averaging time" will use more internal samp-les for the averaging and by that give a more stable value.

"Actual" or "Standard flow":
If set to "Actual" the flow shows as it is at present temperature and barometric pressure. If set to "Standard" the flow is presented as it is at standard conditions (1013hPa & 20°C).

"Point" or "Comma":
Set point or comma as decimal separator for the the prinout of stored values and for logged measurment to PC.

"US" or "EU/ASIA":
Set unit system to US (ft3/min, °F, inHg) or EU/ASIA (l/s, °C, hPa).

"**Auto Shutoff":**
Set in minutes after how long time the instrument will be turned off if not used. If set to 0 min the auto shutoff is disabled.

Log:
Press the "Log" button to start an online logging of measured values (will be saved as a txt-file). If the box to the left of "Unit" is checked the logged values will be shown/stored with chosen unit (m/s, fpm etc.) With "Freq:" it's possible to set how often a new value should be stored.
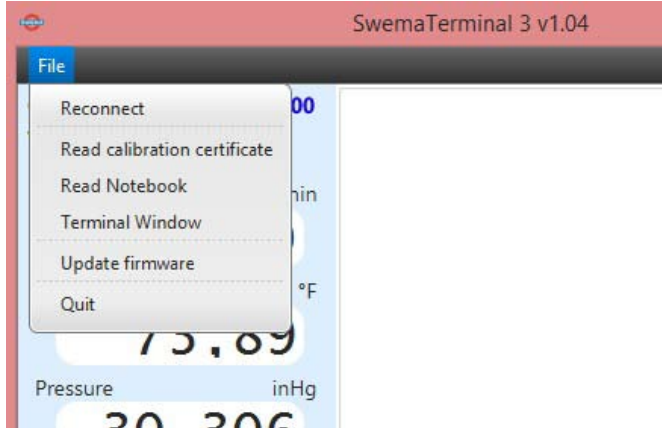
"Read calibration certificate" and "Read Notebook":
By clicking on "File" a dropdown menu is opened. It's here possible to show SwemaFlow 4001:s calibration certificate and print the stored measurements to the PC.

7. Terminal Window

Under the "File" dropdown menu it's possible to open a Terminal window through SwemaTerminal 3 to access some extra features such as adjustment and calibration and erasing to notebook. After "Terminal Window" is clicked a new window is opened. Press "Enter" on the keyboard and the main terminal menu for SwemaFlow 4000 will be opened. To change a setting or enter a sub menu such as the "Calibration and Flow Adjustment Menu" use the PC keyboard and press on the corresponding letter.

SwemaFlow 4000 main terminal menu:

SwemaFlow 4001   Firmware: 1.08   Hardware: 1.1

[T] Averaging Time: 2 seconds
[D] Density compensation: Actual Flow
[S] Auto Shutoff: Disabled
[P] Print Calibration Certificate
[N] Print Notebook
[E] Erase Notebook
[O] Decimal delimiter: Comma
[C] Calibration and Flow Adjustment Menu
[U] Unit System: EU/ASIA
[ ] Space - Print measurement Values

8. Calibration & Adjustment

To calibrate and adjust SwemaFlow 4000 press "C" on the keyboard when in the main terminal menu. In the Calibration and Adjustment menu it's possible to adjust the flow in low, middle and high range. It is also possible to make an offset for temperature and barometric pressure. After adjustment the calibration is made to create a valid calibration protocol. If an adjustment or offset is made the calibration certificate is not valid in the corresponding range. Question mark, "?", will appear on several rows to show that calibratioon has to be made again. When exiting this menu by pressing "Esc" the changes will automatically be stored.

NOTE: It's possible to restore Swema:s original adjustment and calibration data by pressing [=] "Restore Factory Adjustment, Calibration and Settings".

9. Firmware update

On www.swema.com the newest firmware version will be possible to download. To update the firmware first download the new firmware to your PC. Start SwemaTerminal 3 with the SwemaFlow 4000 connected to a USB port with the USB cable. In SwemaTerminal 3 click on "File" and then "Update firmware". A new window is opened, follow the instructions in that window.
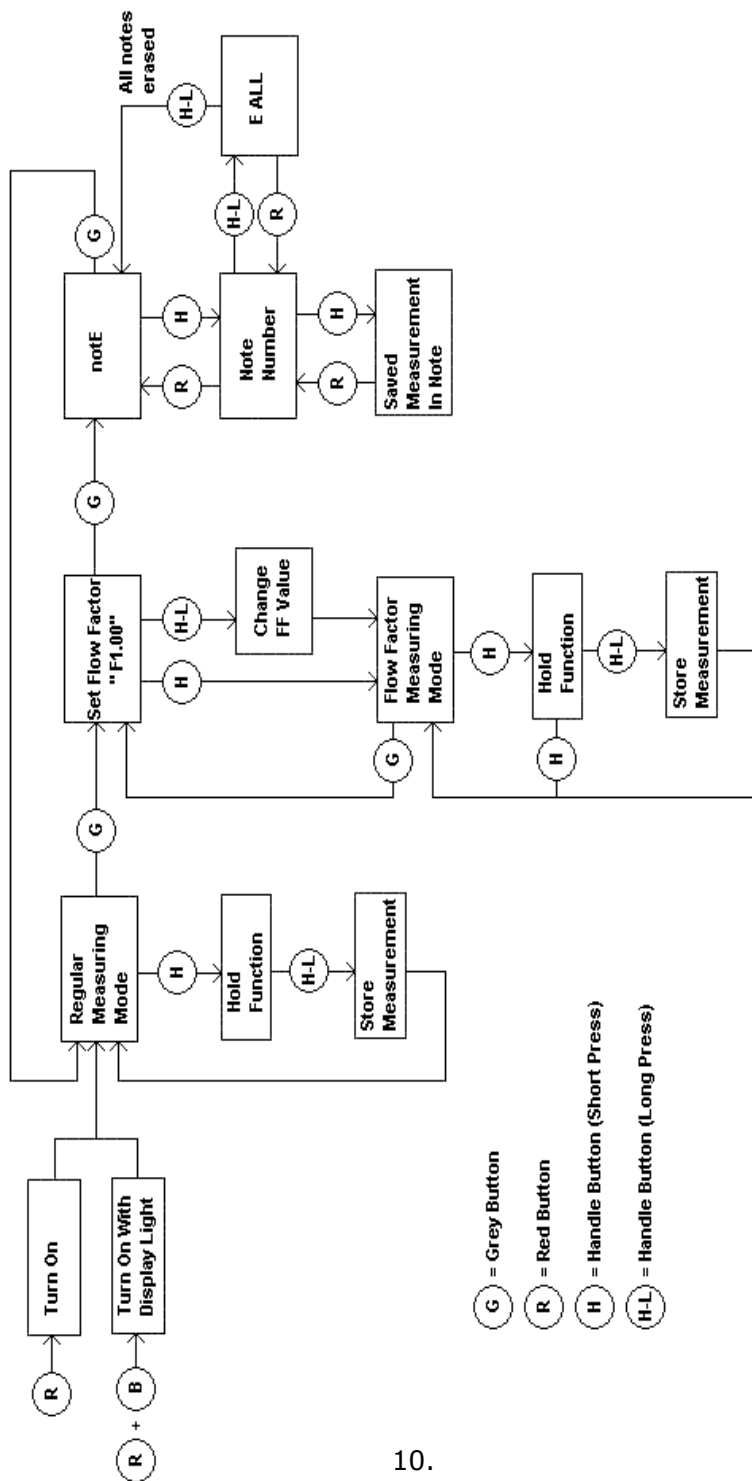
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