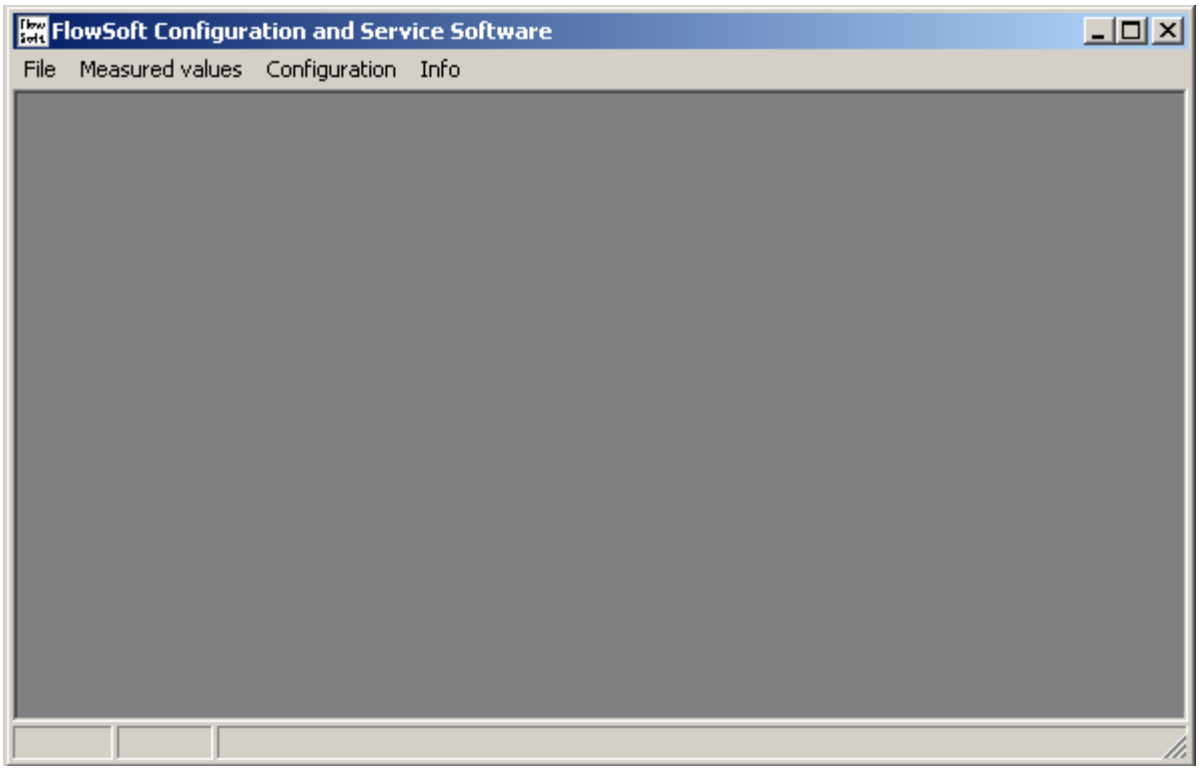
BA 011E/FS1-FM/10.07
Valid starting from Software V 2.3.3

FlowSoft®

Configuration and Service Software for ultrasonic flow meter Flowmax®

Operating manual



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Messtechnik & Industrieberatung

General Information

Warning!

Please read entire operating instructions before first use of FlowSoft software. It will introduce you step-by-step to the program. At the same time you will get to know all features offered by FlowSoft.

Please always observe the following cautions!

Pay attention to information with these pictograms contained in these operating instructions:


Note!


Attention!

Warning!

Validity of the operating instructions

These operating instructions are valid starting from FlowSoft software version V 2.3.3.

Copying rights

The software may be copied; it is not subject to any copy protection. However, we recommend ordering the entire software package directly from MIB. You will then not only receive the most current and executable version of the program, the operating instructions are also included in the package and MIB ensures support in case of potential questions.

Restrictions

The software was developed and programmed conscientiously and to the best MIB's of knowledge. However, MIB does not assume any warranty for potential direct or indirect damage that may be caused through the use of this software.

Technological progress

MIB reserves the right to modify technological data or information without special prior notice.

Table of contents

Page

2. How to operate FlowSoft

1. How to use FlowSoft

FlowSoft is a configuration program for the flow meters of the Flowmax family. FlowSoft offers the users the possibilities to

- Update the Flowmax operating program
- Configure the settings of the device
- Read the operating data and configurations of the device
- Visualize the operating data
- View the configuration data.

1.1 How to use these operating instructions

These operating instructions explain the steps to install and operate the FlowSoft software.

- Keyboard entries appear in angle brackets. E.g. <RETURN> adverts you to press the RETURN key.
- *Italics* indicate screenshots and menu options of the applications that are described.

1.2 System requirements


Attention!

The following minimum PC requirements are necessary for using the FlowSoft software:

- Pentium min. 90 MHz
- Microsoft Windows version 95 or higher
- 8 MB RAM
- 20 MB available disc space on hard disc
- 1 free USB port

1.3 Installation


Note!

To install software insert FlowSoft CD into CD-ROM drive of your PC. With the corresponding configuration of the PC, the installation will start automatically. If this is not the case, please start setup file in root directory of CD.

The setup program copies all FlowSoft-program files into folder *C:\Programme\FlowSoft_Flowmax*, updates the required Dynamic Link Libraries (DLL), and enters the required keys into the Windows-registry.

1.4 Uninstall


Note!

To uninstall FlowSoft please proceed as follows:

1. Select symbol *Software* in control panel
2. Select entry *FlowSoft_Flowmax* in list of installed programs
3. Use button *Add/Remove* .

2. How to operate FlowSoft

2.1 Start


Attention!

In order to be able to configure a Flowmax flow meter or to read its settings, the following has to be ensured:

1. Connection of the USB to RS485-Converters to a free USB port at the PC.
2. Connect Flowmax to the converter.
3. Power unit of RS485 converter has to be plugged into 230V plug.


Attention!

Close all programs with active access to the interface used by FlowSoft before starting FlowSoft.

When starting FlowSoft, the project frame with the menu bar will open. In addition, the start of communication with the connected Flowmax will be signaled through a white window during the start phase.

In the start phase the program will search for a connected Flowmax in line with the setting selected according to section 2.2. Should the follow error message appear according to fig.1,

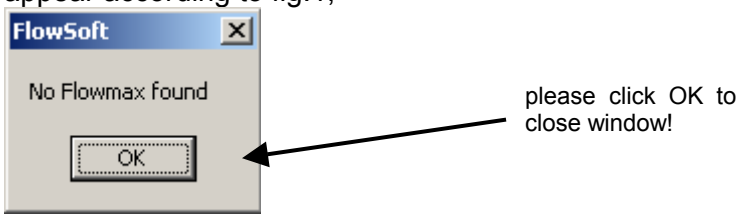


Fig. 1: The message *No Flowmax found*

the settings in the menu *configuration→interface* have to be checked. You may choose from 20 serial interfaces. Connection to Flowmax via *USB to RS485-Converter*.

2.2 Interface configuration

Master (Flowview, PC) and Flowmax communicate via a RS485 serial interface. To configure the interface parameters select menu item *Configuration→Define interface*.

After clicking *Define interface* the window *interface configuration* will open

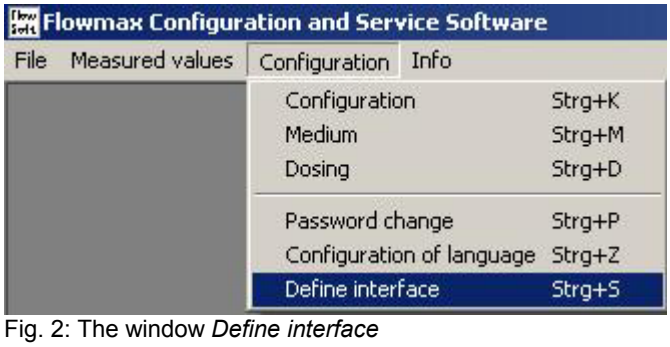


Fig. 2: The window *Define interface*

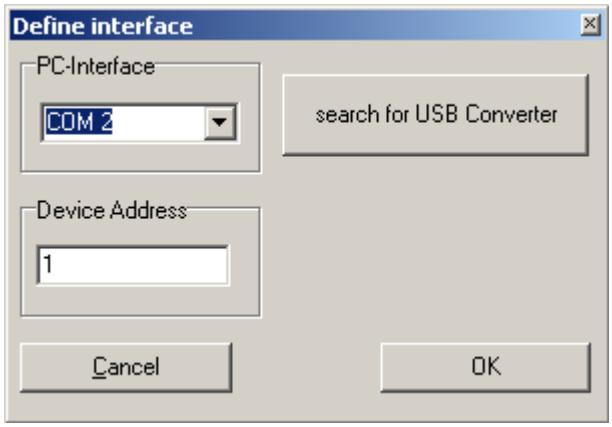


Fig. 3: The window *Define interface*

Additionally, the logical interface number of a connected USB to RS485 Converter may be read from the Windows Registry and taken over.

Note!

To do so, first the USB port defined as logical Com-Port has to be selected in the control panel of the PC that is used. Clicking the button search for USB Converter starts an automatic search in the Windows Registry. If there is a relevant entry, the necessary configuration will be adapted automatically.

Note:
In case of multiple installations of the corresponding interface driver without previous uninstall the Windows Registry may contain inadmissible entries. In this case the logical Com-Port has to be entered manually.

Note!

Additionally, the address configured in the device has to be entered in the field *Device Address*. On delivery, Flowmax receives by default address 1.

2.3 Update of Flowmax operating software

Before starting an update user must log in by entering a valid password. (See section 2.4).
FlowSoft can be used to update the software of the Flowmax devices. Please select *File→Flowmax update* in the menu bar.

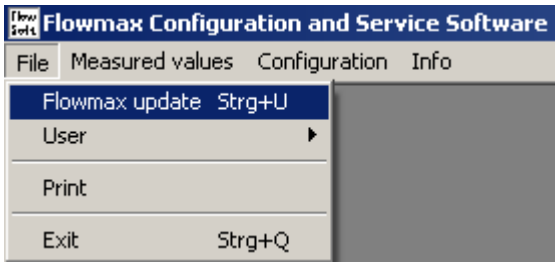


Fig. 4: The pull-down menu *File*

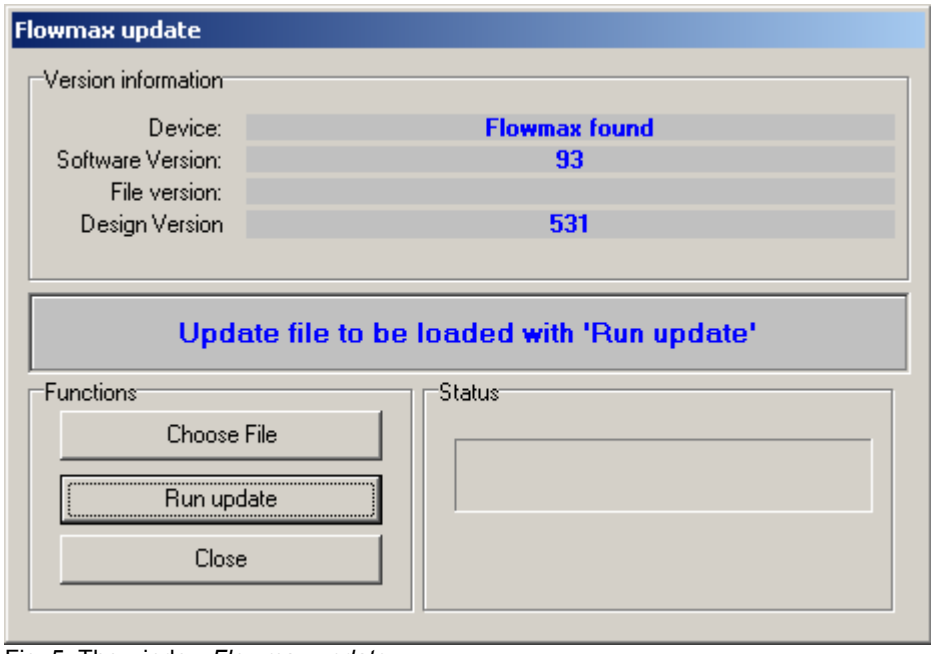


Fig. 5: The window *Flowmax update*

The window that opens shows the version number of the Flowmax software currently installed. After clicking the button Choose File hoose the program file to be loaded.

The window *Open* appears:

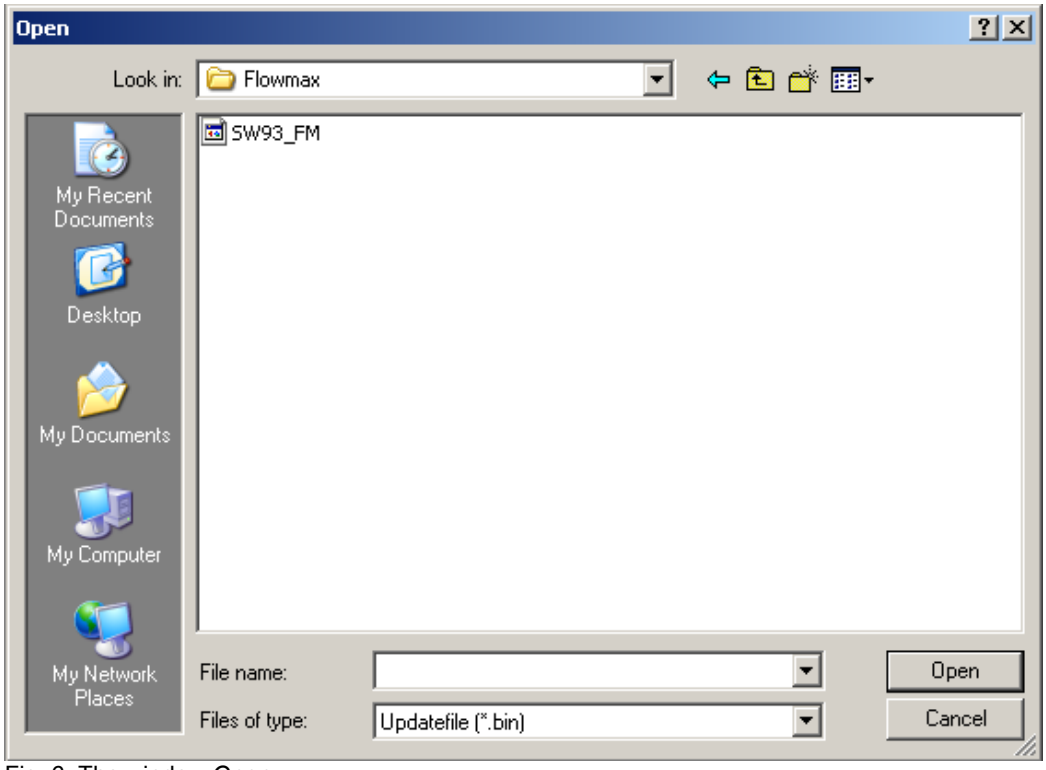


Fig. 6: The window *Open*

This dialogue is to set and to select the directory, which contains the program file to be loaded. You will obtain all necessary files for updating from MIB.

After selecting the program file through mouse click on Open the program returns to the window *Flowmax Update*.

After clicking the button Run update the update will be executed and the loading progress will be shown in the *Status* field.

When the update is completed the following message will be shown: Update successfully finished

2.4 User log in / log out

Note

User log in with password is required for running program updates as well as for changing various parameters.

Principally, two levels have to be distinguished:

- Configurations can be changed without user log in
- Program updates and changes of critical parameters as well as password changes require the entry of the customer's password

Attention!

After new installation of FlowSoft the password is pre-set to **141414** and can be changed after log in is completed. The password has to consist of 6 characters (see section 2.10).

You reach **Log in** via the menu *File* as follows:

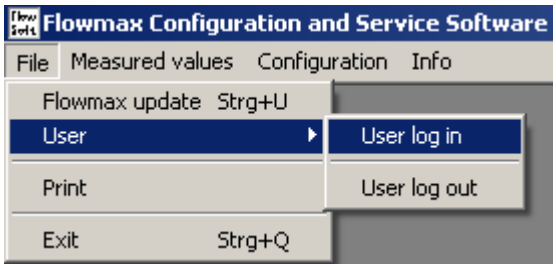


Fig. 7: *User log in* in the pull down menu *File*

Presently you will be asked to enter your password.

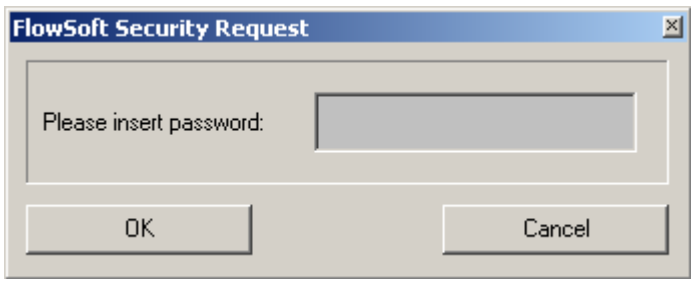


Fig. 8: The window *FlowSoft Security Request* for entering the password

Please enter password into edit field. Confirm completion of entry with mouse click on OK.

After correct entry of the password, the positive message will appear that the above areas are now active. If a negative message appears, you may try again.

Note!

If you should forget a password that was changed as compared to the password originally supplied, we recommend a new installation of the software. After the new installation the password will be *141414* again.

Attention!

For **log out** and for restoring the password protection please use function *User log out*.

2.5 How to print out device settings and measured values

For documentation of all settings including configuration and current measured values FlowSoft offers the possibility to print out these values in a transparent and well structured version to a printer connected to a PC.

To start printing, click with the mouse on the option *Print* in the pull-down menu *File*.

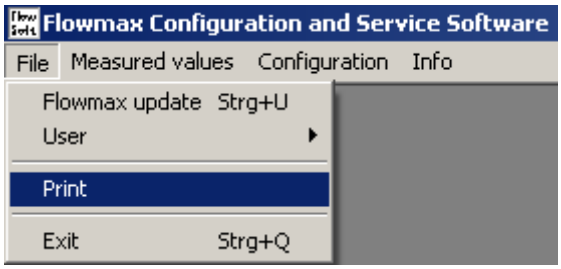


Fig. 9: Starting print-out

After clicking the button, the following window will open:

Fig. 10: Message Print starts

After confirming by clicking the button OK the current data retrieved from Flowmax are processed and formatted and send to printer for print-out. This may take several seconds.

2.6 Current measured values

2.6.1 View measured values

You reach the window *Display measured value figures* via the pull-down menu *measured values.*

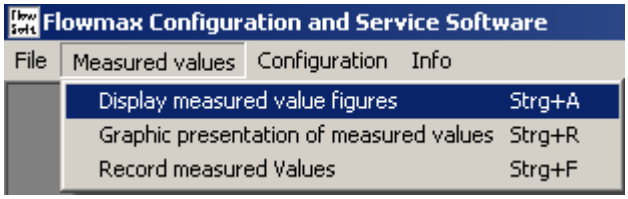


Fig. 11: Opening the window *Display measured value figures*

Mouse click on *Display measured value figures* opens the following window:

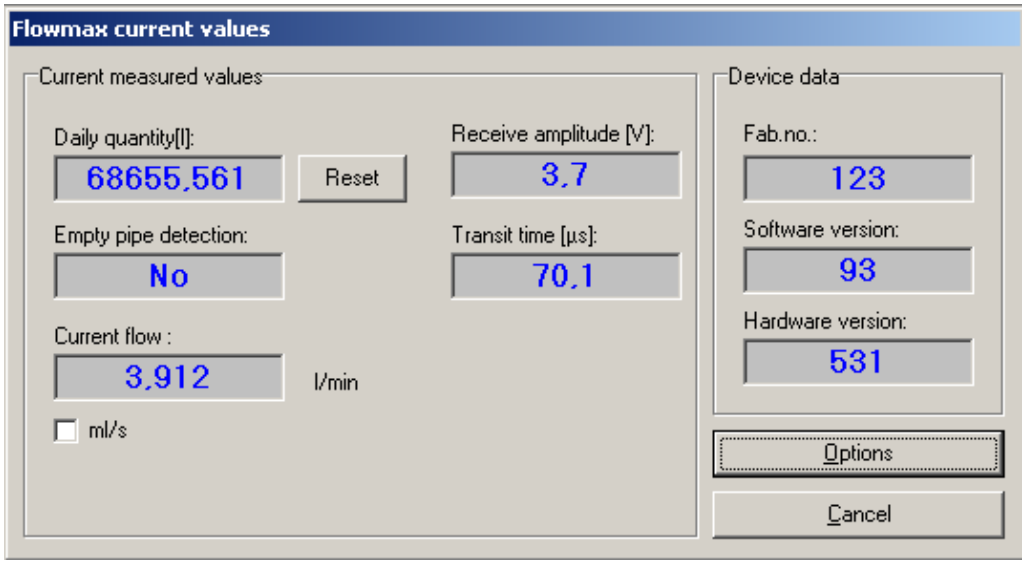


Fig. 12: The window *Flowmax current values*

This window shows the permanently updated measured values of daily quantity, current flow, receive amplitude and transit time as well as empty pipe detection. The flow is shown in liters/minute [l/min] and can, if necessary, be switched to milliliters/second [ml/s].

Note!

Apart from the current measured value the information of empty pipe detection is also displayed.

In addition, device information, fabrication number, software and hardware version are made available.

The daily quantity value can be reset to zero by clicking the button Reset.

Attention!

2.6.2 Graphic presentation of measured values

Attention!

This part of the program is only an assisting tool for process analysis during commissioning or when troubleshooting problems that might affect recording of the measured values. Quality assurance documentation and similarly important tasks can thus be realized with explicitly developed and released programs.

You reach the window *Graphic presentation of measured values* via the pull-down menu measured values.

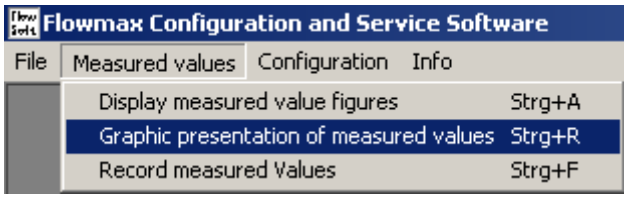


Fig. 13: Opening the window *Graphic presentation of measured values*

Clicking on *Display measured values* opens the following window

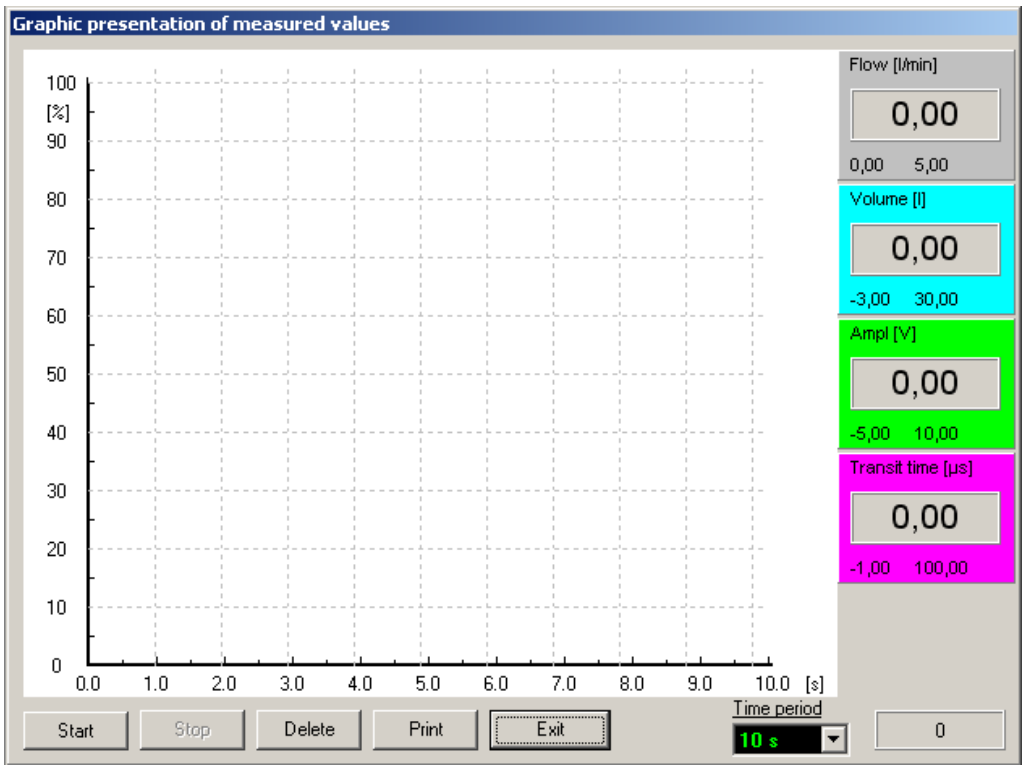


Fig. 14: The window *Display measured values*

In this window the values flow [l/min], volume [l], receive amplitude [V] and transit time [µs] can be presented in online diagram format.

The field *Time period* can be used to set the duration of the recording in different steps from 10s to 48h.

After clicking the button Start the above measured values are cyclically retrieved from Flowmax and shown over the associated time value in the color specific for the value. The Y-scale ranges from 0-100% for a clear simultaneous presentation of up to 4 measured values. 100% always correspond to the maximum value for each value given in a window on the right in the color in which it is presented. The X-axis shows the time that has lapsed since the recording. The scaling depends on the pre-selected timeline.

By clicking the button Stop a running recording can be stopped. After clicking the button Delete the previously recorded data are discarded, so that a new recording can be started.

There is also the possibility to print out a diagram that was recorded with this function. Simply click the button Print with the mouse.

2.6.3 Recording of measured values

You reach the window *record measured values* via the pull-down menu *Measured values.*

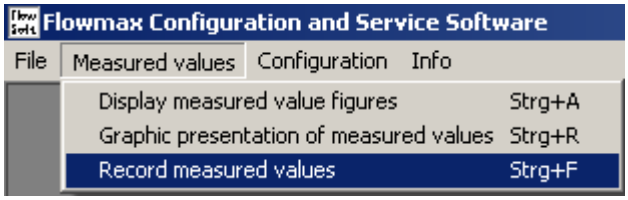


Fig. 15: Opening the window *Record measured values*

The function connected to this window allows to record the measured values flow [l/min], volume [l], input amplitude [V] and transit time [µs] with date and time in CSV-file format.

In addition information about date+time is saved, which when further process in Microsoft Excel allows to prepare diagrams from the recorded data that exceed the daily 24 hour grid.

Note!

In addition, basic device data are recorded such as settings, device number, hardware and software version.

In the upper half of the window *Record measured values* the above measured values as well as a counter for the number of data points already saved are shown in a frame. In the lower half there are 2 input fields.

The interval for saving the data can be set to seconds in the input field *Time interval*. In the input field *Filename* the desired name for the recording can be entered. The field comes with the pre-set name *file1*.

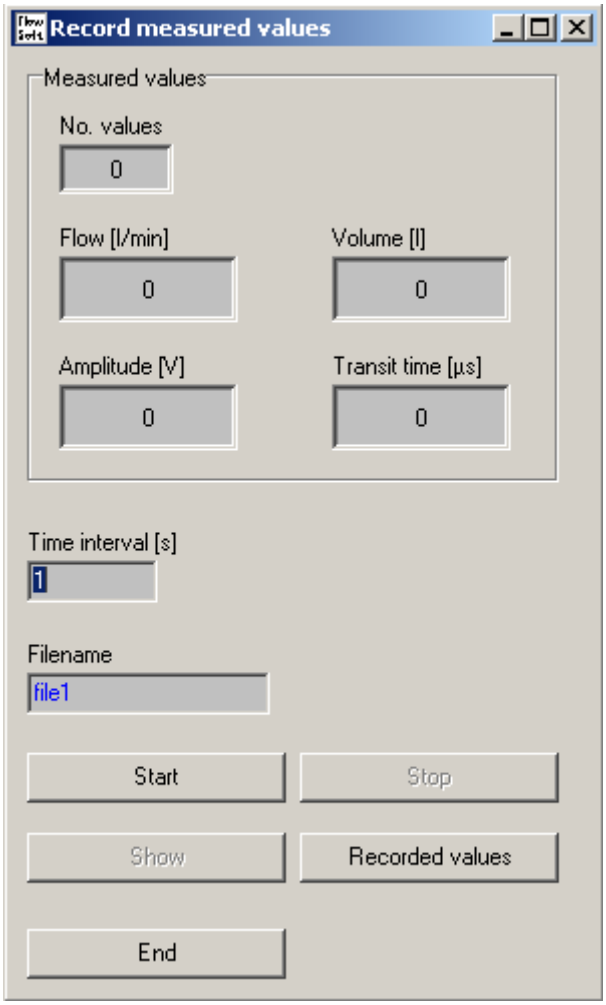


Fig. 16: The window *Record measured values*

Note!

The definite name used for a recording will receive a suffix consisting of date and time of start of recording, so that even if the same name is selected, individual recordings can be made or started at different times without overwriting the old data.

Example:
1. Recording started on 19 July 2007 at 12:07:42 under the name H2O2_in_Cab1 leads to file H2O2_in_Cab1_1_19-07-2007_12-07-42.csv

2. Recording started on 19 July 2007 at 12:31:50 under the name H2O2_in_Cab1 leads to file H2O2_in_Cab1_1_19-07-2007_12-31-50.csv

Functions of the buttons

In addition, the buttons Start, Stop, Show, Recorded values and End are located in the lower part of the window *Record measured values*

Recording is started by clicking the button Start. While recording is running, only the buttons Stop and Recorded values can be selected, all the other buttons are blocked during this phase.

Clicking the button Stop stops running of a recording and the file that was generated is closed. Now, all buttons apart from Stop are available.

Clicking the button Show starts Microsoft Excel and opens the CSV-file that was just created through recording. The precondition is, of course, that Microsoft Excel is installed on the relevant PC.


Note!

The dialog window *Open file* allows opening any of the CSV-files in the pre-set working directory.

The button End closes the window.

Attention!
Neither the working directory nor any of the higher-level directories must contain blanks in their names.


Attention!

Please see Excel operating instructions for preparation of diagrams with Microsoft Excel. Microsoft Excel is not contained in the scope of delivery of FlowSoft.


Attention!

2.7 Configuration of Flowmax

FlowSoft offers the possibility of a transparent presentation of all current configurations of a Flowmax volume flow meter as well as of their settings. So this tool can be used for application-specific adjustments.

Note!

In standard cases, such adjustments are not necessary because the standard default settings of the devices are such that they only have to be changed in exceptional cases.

Warning!

Warning!
Changes of the values shown here may result in malfunctioning of the device. We therefore recommend to gain knowledge about the influence of a parameter before changing it, and to document the current settings by noting them down or printing them out (see section 2.5).

2.7.1 Presentation of current device configuration

After selecting the function *Configuration* in the pull-down menu *Configuration* the relevant window will open.

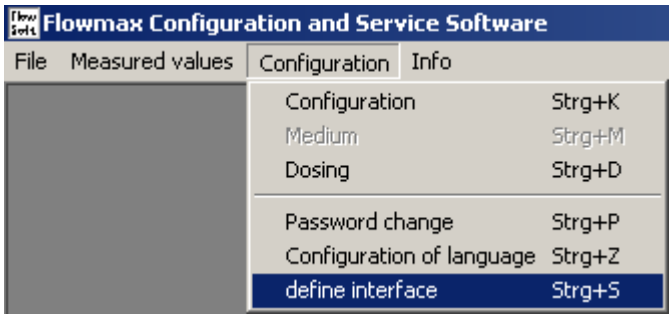


Fig. 17: Starting the window *Configuration*

After opening the window *Configuration* the PC reads out the configuration values from the connected device and presents them in table format in the column titled *ACTUAL* (see Fig.18).

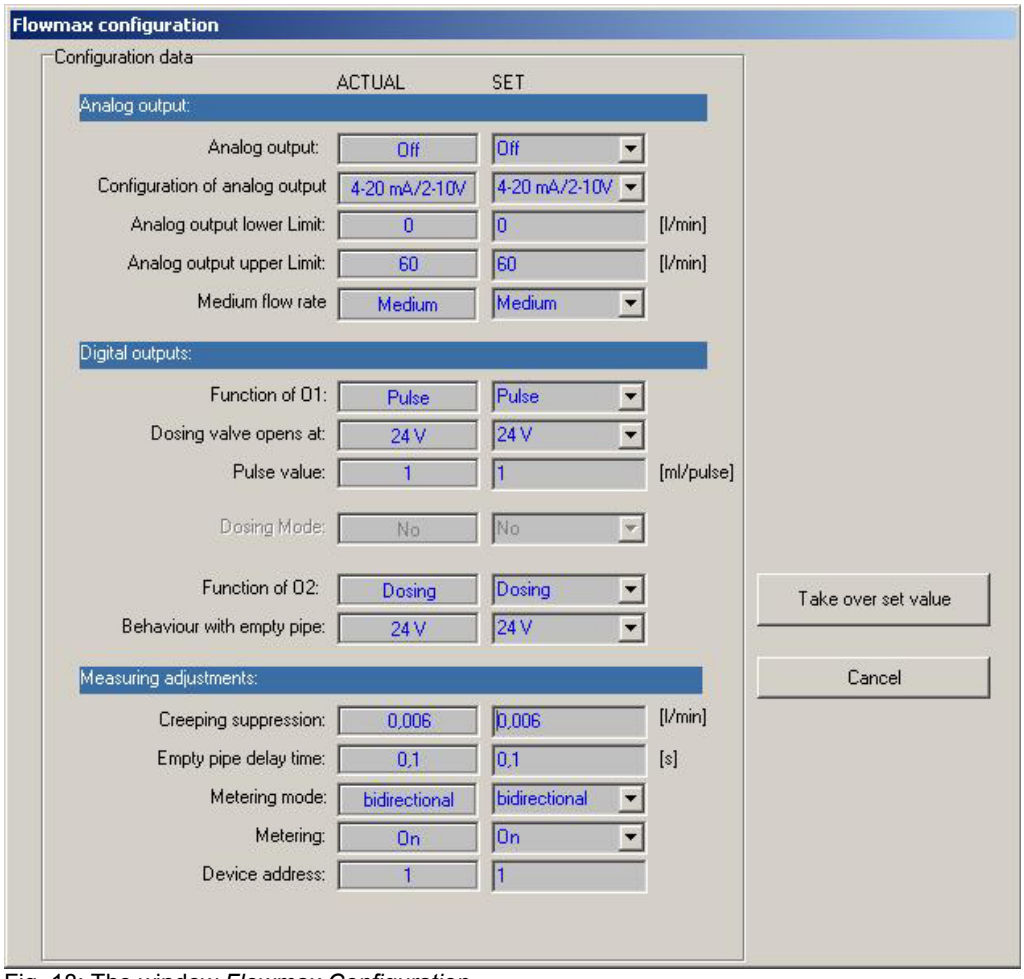


Fig. 18: The window *Flowmax Configuration*

2.7.2 Changing configuration settings

Attention!
It is principally possible to change any of the parameters of this window. However, we would like to expressly advise you again, that it is indispensable to get sufficiently acquainted with the individual parameters and their significance before interfering with the configuration of the device.


Attention!

Warning!
If you would like to change the parameters to adapt them to plant-specific requirements, it is indispensable to enter the new setting either numerically into the column *SET* or select it in one of the button-down fields. When changing a numerical value use the numerical format of column *ACTUAL*.


Warning!

If a change of Flowmax in the column *SET* is to be executed in the Flowmax use mouse to click on button Take over set value. The PC will now transmit the new configuration data to the Flowmax, which will save the changed configuration in its memory.

2.7.3 Significance of the configuration parameters

***Analog output*:** The Flowmax has an analog output that depending on the type can transmit the current flow as electrical current or voltage.

***Configuration of the analog output*:** It can be decided, if the analog output is to transmit current in the range from 0 to 20mA or from 4 to 20mA or a voltage from 0 to 10V or from 2 to 10V for the respective pre-set flow range.

***Lower limit analog output*:** Please enter the flow rate, at whose occurrence the current respectively the voltage is to be created according to the lower limit of the pre-set range.

***Upper limit analog output*:** Please enter the flow rate, at whose occurrence the current respectively the voltage is to be created according to the upper limit of the pre-set range.

Median flow rate: The Flowmax has a median filter for the measured raw flow value. The function smoothens the output value at the analog interface, which outputs the measured flow value as a directly proportional current or voltage signal.
Apart from smoothening the median filter excludes such measured values from determining the average that are clearly erratic. This is where you decide whether to use to filter or not. 10 raw values are used for the computation.
Smoothening can be pre-selected in 3 steps, but can also be switched off totally.

Function of O1: This is to determine, whether output O1 is used to output pulses or an empty pipe message or whether it will be used to control a dosing valve.

Dosing valve open at: This determines, whether a valve connected via a relay will be wired to 0 V or to 24 V for opening.

Pulse value: The *pulse value* represents the volume, after which the Flowmax, when it has passed, will generate a complete pulse phase at output O1.

***Dosing mode*:** Here you can choose, if dosing is to be started via a push button that will wire the dosing input to 24 V when actuated or via PC command. In addition, the dosing function can be fully deactivated.

Function of O2: This is to determine, if the output O2 will serve to output empty messages or to control a dosing valve.

Behavior with empty pipe: same as *dosing valve open at,* but referring to empty message.

Creeping supression: The creeping suppression serves the purpose of excluding flows from the measurement that can evolve through convection even with a closed valve in a narrow frame around zero.

Empty pipe delay time*:* The *empty pipe delay time* is the time interval during which metering in the measured section continues after detection of a gas bubble, before the empty pipe detection responds. This prevents small gas bubbles from being recognized as empty pipe and thus interrupting metering.

Metering mode: Here you can define the behavior of the internal counter (daily quantity counter or operation quantity counter). **This selection does not affect the pulse output.**

- unidirectional => Counter changes only with positive flow direction
- bidirectional => Counter changes in both flow directions

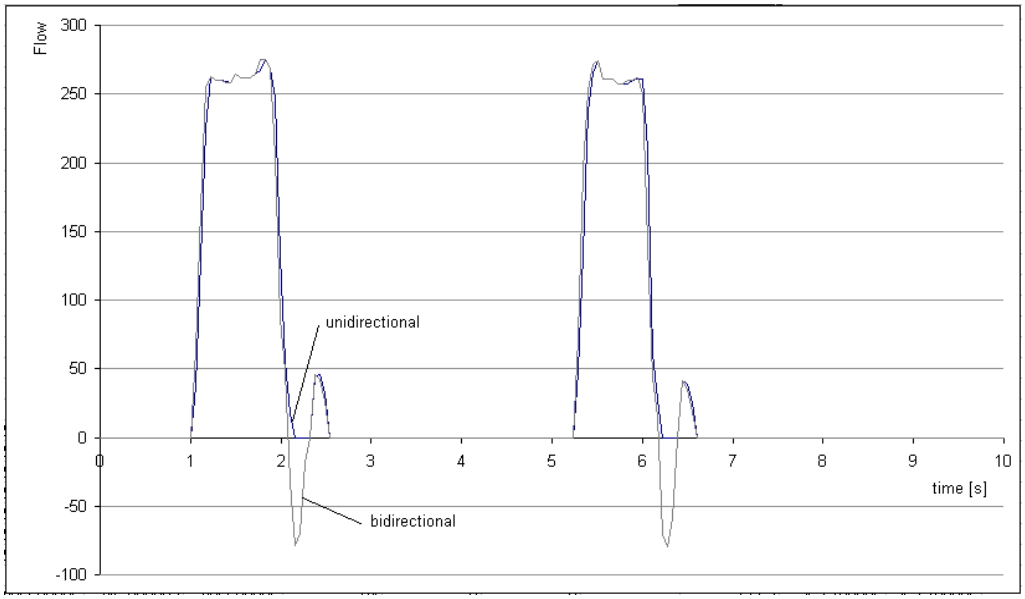


Fig. 19: Flow with unidirectional or bidirectional metering

The standard setting is bidirectional, because in this mode dynamic and uniform flows can be metered with high accuracy. Choose this setting, if high accuracy is necessary in plants with oscillations in the control system due to e.g. closing of valves (see Fig. 19). In this case, setting to unidirectional metering would mean that the negative parts of the oscillation would not be metered and thus cause metering errors.

Setting to unidirectional is advisable, if e.g. forward and backward flows have to be determined independent from each other. In this case, install one Flowmax in direction of the flow and one Flowmax in counterdirection of the flow in the same pipe.

Metering: This is to switch off metering of the flow volumes. Deactivating the counter may e.g. be useful when cleaning the pipe. The cleaning media flowing through the metering device during this time are in general not to be recorded.

Device address**:** It is possible to connect several Flowmax devices parallel to one RS485 bus. The master system can address each individual metering device selectively via a previously allocated address. The necessary configuration settings are made here. The range of admissible values is from 1 to 254.


Attention!

Attention!
If you change the device address here and transmit it, the bus address in the interface configuration will also be changed correspondingly. This has to be taken into account when later connecting another Flowmax.

Phase filter: The Flowmax has a filter for smoothing the phase values. In standard cases the filter will remain ON, since the Flowmax has excellent dynamics also with activated filter.
The filter should only be switched off when metering extremely dynamic flows. During ordinary metering operations switching OFF the filter may have a negative impact on the accuracy.


Note!

Note!
This parameter only appears after user log in with admissible password.

2.8 Adaptation of Flowmax to medium and the environment

The window *Medium* offers the user the possibility of adapting the metering device in a very differentiated way to medium-specific properties. At the factory, the measuring devices are calibrated with water. When metering media that have similar properties to water as to viscosity and sound these adaptations are therefore usually not necessary. If metering errors are detected in the application that are outside of the specifications of the device, these can be corrected with a matrix function. Non-linear variances can be compensated with the help of a maximum of 8 basic values over the entire metering range. The user determines the number of basic values. The measured values are presented online in order to facilitate the comparison. In addition, several basic adjustments can be carried out automatically. Furthermore, complete data sets can be stored, in order to be able to transmit them to another metering device.

Warning!

Warning!
Changes of the values shown here may result in malfunctioning of the device. It is therefore recommended to gain precise knowledge about the influence of a parameter before changing it, to write down the current settings or to document them by printing them out.

2.8.1 Presentation of the current medium values

Selecting the function *Medium* in the pull-down menu *Configuration* opens the relevant window.

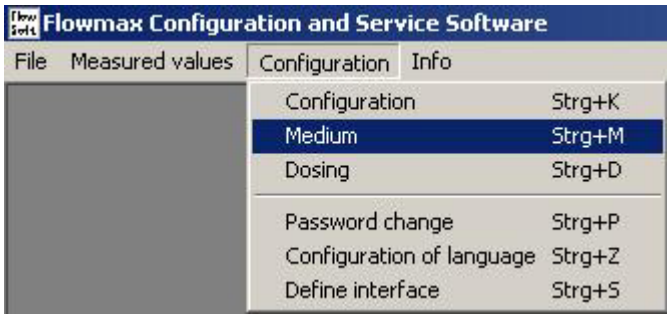


Fig. 20: Starting the window *Medium*

When opening the window *Medium* the medium values set in the connected device are read out and shown.

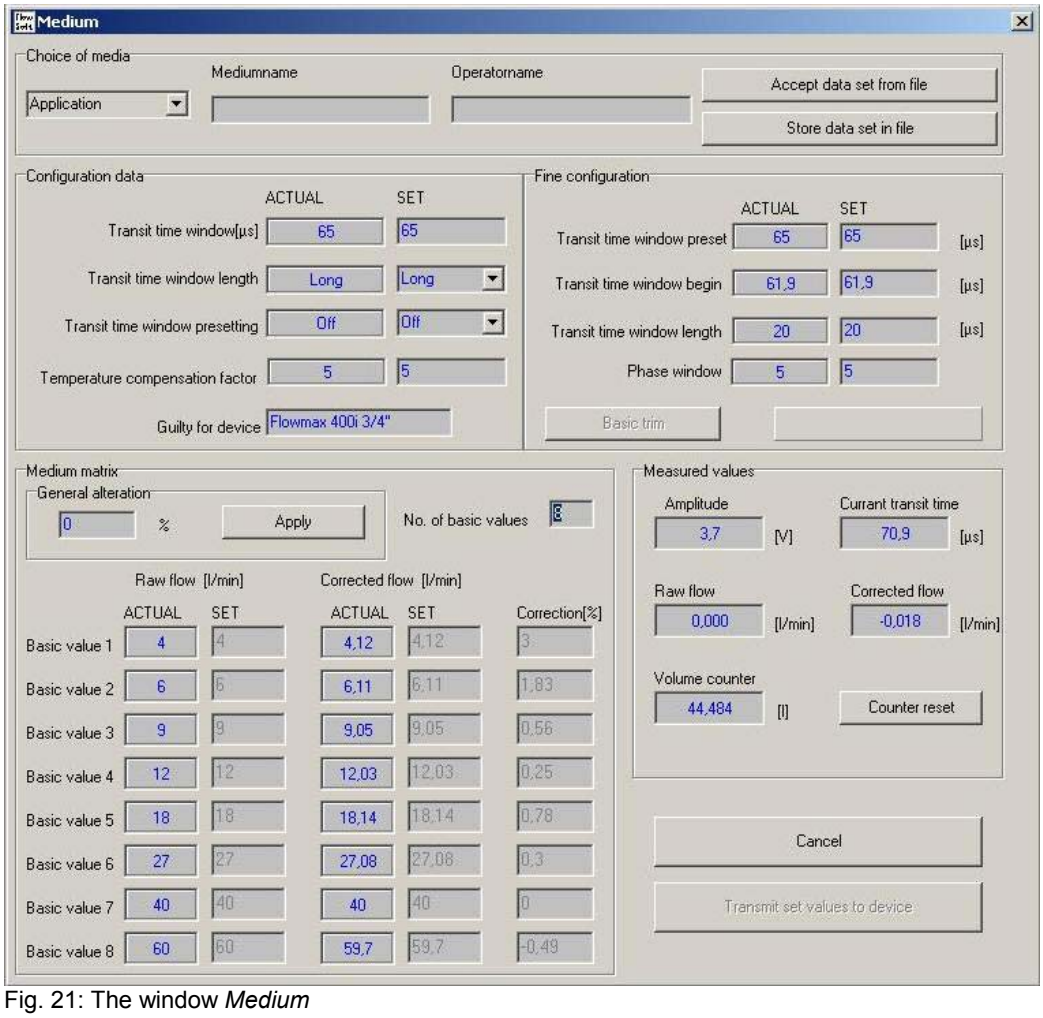


Fig. 21: The window *Medium*

2.8.2 The field measured values

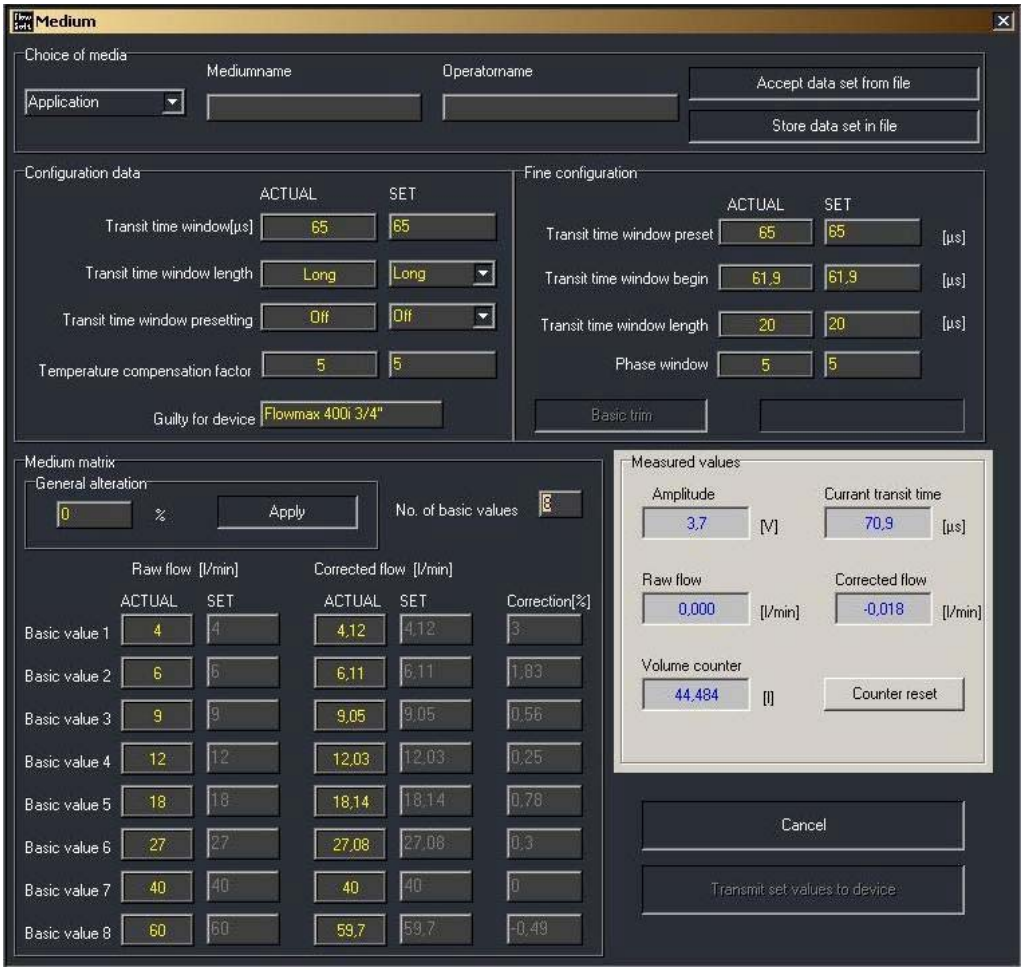


Fig. 22: The field *Measured values*

The values presented here are measured values that facilitate determining the parameters to be inserted into the matrix. The values are continuously read from the connected metering device and they are online data. The indispensable prerequisite for reliable values in this context is the correct previous settings in the window transit time as well as the execution of a basic trim (see section 2.8.3).

Attention!

Amplitude: The measured value presented here is the receive amplitude. If the amplitude value is lower than 2.5 V or higher than 4.5 V a basic trim has to be carried out. If the value = 0, metering is not possible because the gas portion in the medium is too high.

Current transit time: This is a presentation of the transit time determined by the device for the medium it contains. The prerequisite for a usable measurement are the correct settings in the transit time window (see also fields configuration data and fine configuration, see sections 2.8.5.3 and 2.8.5.4). The transit time depends on the medium and the temperature.

Raw flow: The *raw flow* is the flow determined directly from the phase values of the reception electronics. Median filtering as well as leak flow monitoring (both section 2.7.3) do not influence the presented measured value.

Corrected flow: The *corrected flow* is the result of the computation of the values in the matrix as well as the filtration via creeping suppression and median filter. The measured value thus generated can be used for determining the correction factors for the matrix, if a master flow meter is used for reference metering.

Volume counter: The *volume counter* shows the current counter reading of the Flowmax in liters with a resolution of 1 milliliter. For user-friendly calculation of a measured volume without the need for calculating the difference between two counter readings, it can be reset to 0 (zero) before a metering process, by clicking on the button 

2.8.3 Basic trim

The basic trim is a commissioning function to automatically optimize the measured signal enhancement, the phase window, and the zero point of the device.

Attention!

The basic trim must always be carried out during commissioning of the flow meter. To be able to do so the metering device has to be bubble-free filled with the medium to be measured. The basic trim may repeated, when essential operating parameters have changed. This is e.g. the case after change of medium.

To execute the function, it is indispensable that the following preconditions are met:

- The measuring pipe has to be filled with the SET medium
- The SET medium has to be gas-free and bubble-free
- The temperature has to correspond to the one during the process
- There has to be a minimum pressure of 0.3 bar rel.
- Meter and medium hat to be absolutely undisturbed. We recommend to close a valve in flow direction behind the Flowmax.
- The transit time window has to be set for the medium.
  Please compare the approximate congruence of the transit time parameters currently programmed in the Flowmax with the information given by the manufacturer of the fluid.

After clicking the button 

there will be an automatic basic trim to the medium contained in the measuring pipe.

During the basic trim the following message for signaling the active function is shown in the status panel underneath the field *Phase window*:

Fig. 23: The status message *Basic trim is active* in the field *Fine configuration*

When the basic trim is successfully finished the feedback message appears.

Fig. 24: The message B*asic Trim successfully finished*

Note!

When this message appears the device is ready for executing a general alteration or a matrix adjustment.

If basic trim could not be finished successfully, the following message will be shown

Fig. 25: The message B*asic trim finished with Error*

We recommend in this case to first check, if the conditions listed on page 23 are complied with and then repeat the basic trim.

If the field *Measured values* shows received amplitude of less than 2.0 V, filling and bubble-freeness of measuring pipe must be checked.

2.8.4 Changing medium-specific settings

Attention!
It is basically possible to modify any of the parameters of this window apart from the pure measured values. However, we would like to expressly advise you again, that it is indispensable to get sufficiently acquainted with the individual parameters and their significance before interfering with the settings for the medium.

Attention!

If a change of parameters is desirable for adaptation to a medium, as a general rule the column *SET* has to be newly set either as numerical entry or in one of the button-down fields. When changing a numerical value use the numerical format of column *ACTUAL*.

Note!

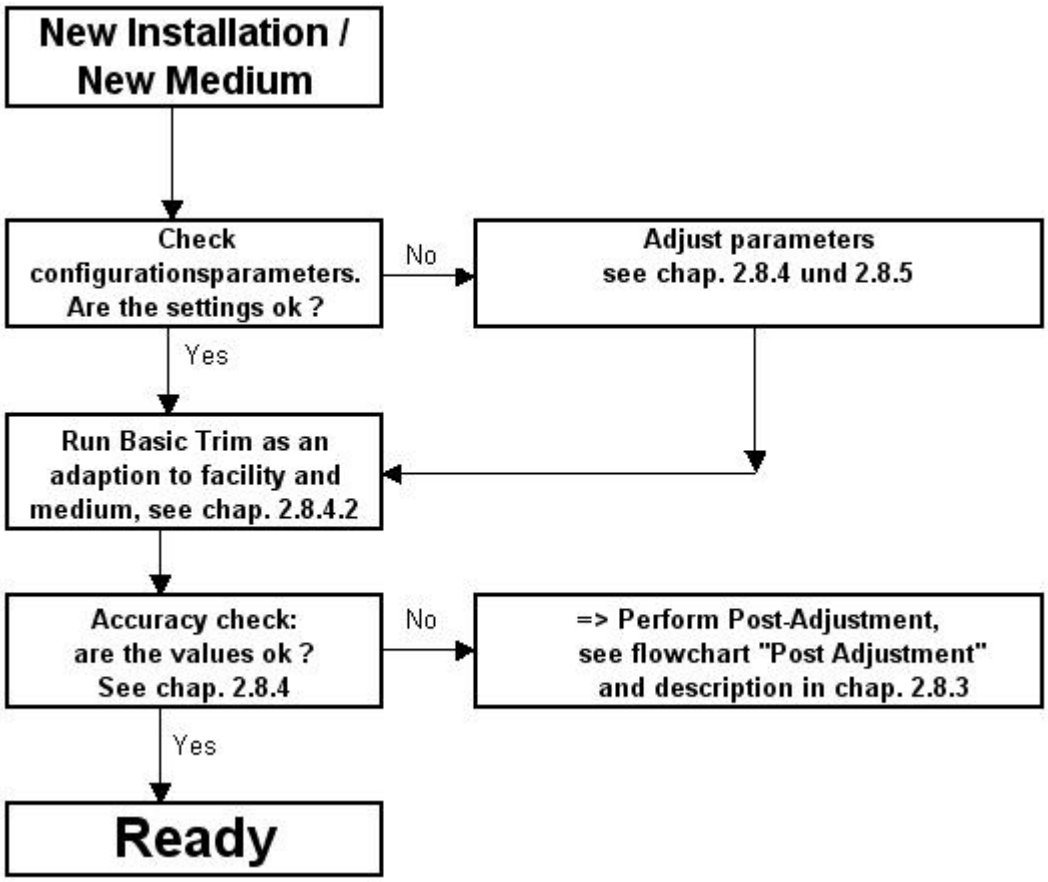


Fig. 26: Flow chart *New installation / New medium*

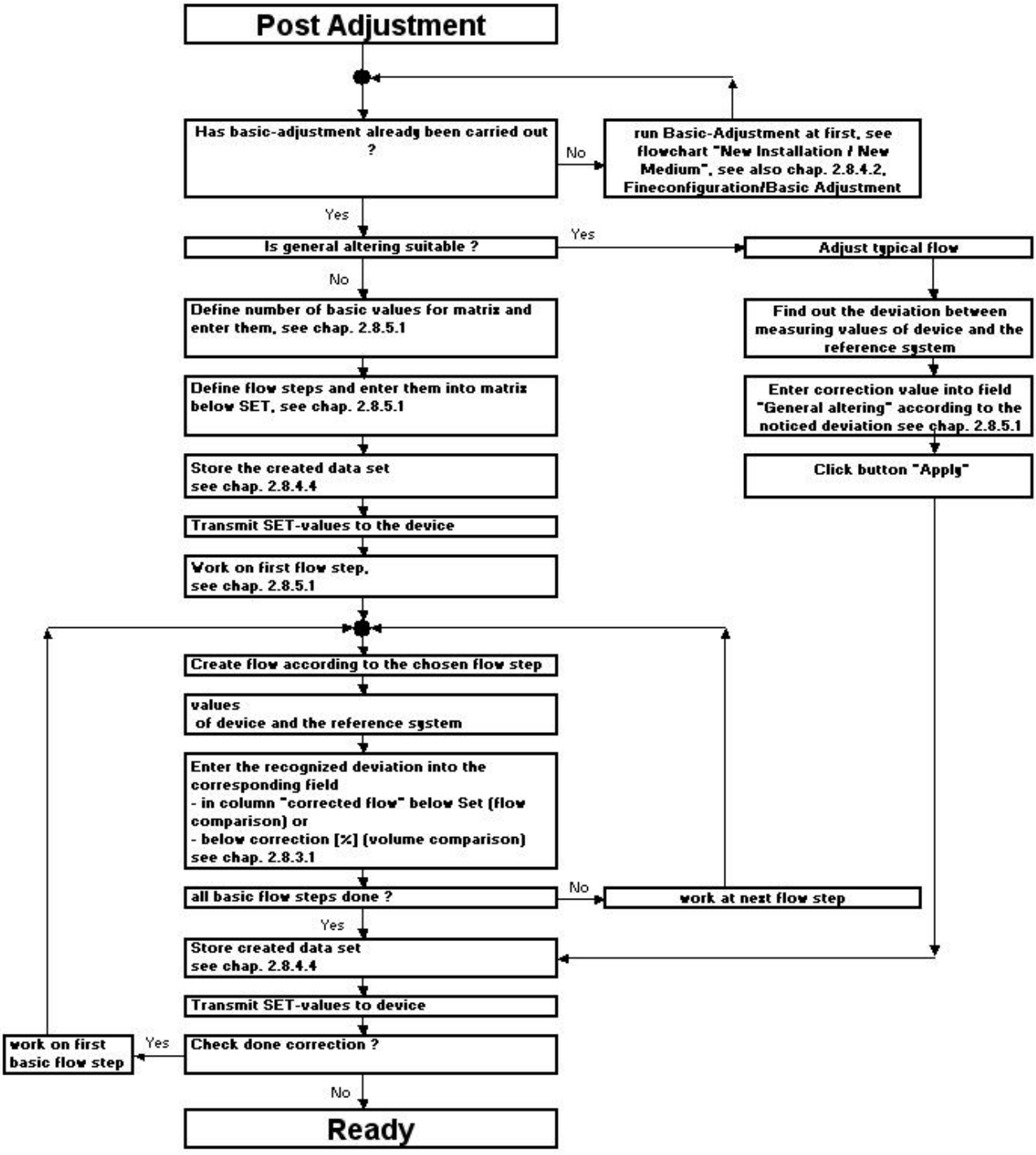


Fig. 27: Flowchart *Post adjustment*

To change the settings for the medium values of Flowmax please proceed as follows:

If a change in the column *SET* is to be executed in the Flowmax, click the button 

. The PC will now transmit the new configuration data to the Flowmax, which will save the changed configuration in its memory.

Note!
In order for the *FlowSoft* to release the function *Take over SET values*, first the data set visible in the window has to be saved by entering a medium name and an operator name and clicking the button Store data set in file.

Attention!
As a general rule: to determine all measured values with Flowmax the device must be filled bubble-free with the SET medium.

2.8.5 Determining medium-specific corrective data

2.8.5.1 Correction via general alteration

The fastest way to obtain a metering result is to adapt to the medium to be metered via *general alteration*.

During *general alteration* all corrective values for all 8 matrix basic values will be changed by the same factor defined by the user.

Attention!
This method is recommended for applications with flow rates that vary little. This method uses a one point correction, therefore, a minimum of one verification with several typical flow steps must be carried out for applications with varying flow rates.

A comparison with a balance may help to check the application conditions in consideration of the density of the medium. The volume determined by Flowmax and the mass determined by the balance have to be compared for a clearly defined filling process. Insert the calculated difference for the same flow considering the density after confirmation in several repetitions into the matrix.

$V[l] = m[kg] / \rho[kg/l]$, $V_{Flowmax} - V_{balance}$ = difference

The flow rate that is set has to be constant and the value should be as close as possible to the typical value for the application.

The corrective value thus determined has to be entered into the input field general alteration. After clicking the button Apply, the conversion of the corrective values for all basic values is calculated automatically based on the value of the general alteration. Now the modified data set will be stored (media management) and transmitted to the device. In the subsequent test run the modifications that were made can be verified with the same approach.

2.8.5.2 Correction via individual matrix changes

Note!

In order to achieve highest possible accuracy in the entire metering range of the Flowmax we recommend to use all 8 support points over the flow range in question. It is also possible to reduce the number of support points, in order to minimize the adaptation efforts.

By default the 8 basic values are distributed over the metering range. We recommend to orient the adaptation toward this distribution.

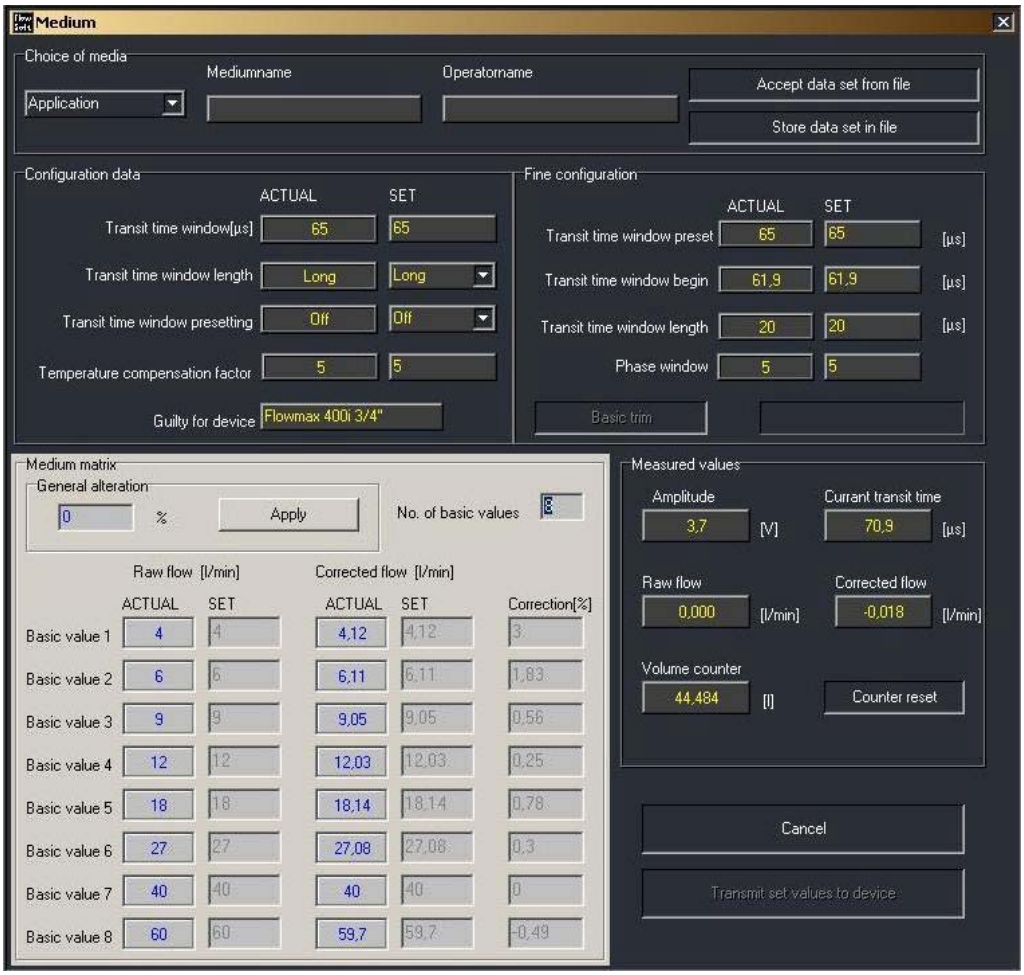


Fig. 28: Example of a matrix with specific corrective data

A comparison with a balance may help to check the application conditions in consideration of the density of the medium. The volume determined by Flowmax and the mass detected with the balance have to be compared for a clearly defined filling process. Insert the calculated difference for the same flow considering the density after confirmation in several repetitions into the matrix.

$V[l] = m[kg] / \rho[kg/l]$, $V_{Flowmax} - V_{balance}$ = difference

The flows for the individual steps should be constant and their value should be as close as possible to the basic value that is verified. If the relevant flow cannot be set accurately, the basic value in the matrix has to be adjusted to the actual value.

Now the modified data set will be stored (Choice of medium) and transmitted to the device.

The corrective values thus determined have to be entered into the input fields of the matrix screen and the modified data set will be stored (Choice of medium) and transferred to the device. In the subsequent test run, the modifications that were made can be verified with the same approach.

The medium matrix is designed for positive flows. Therefore, negative values may only be used for percentage correction.

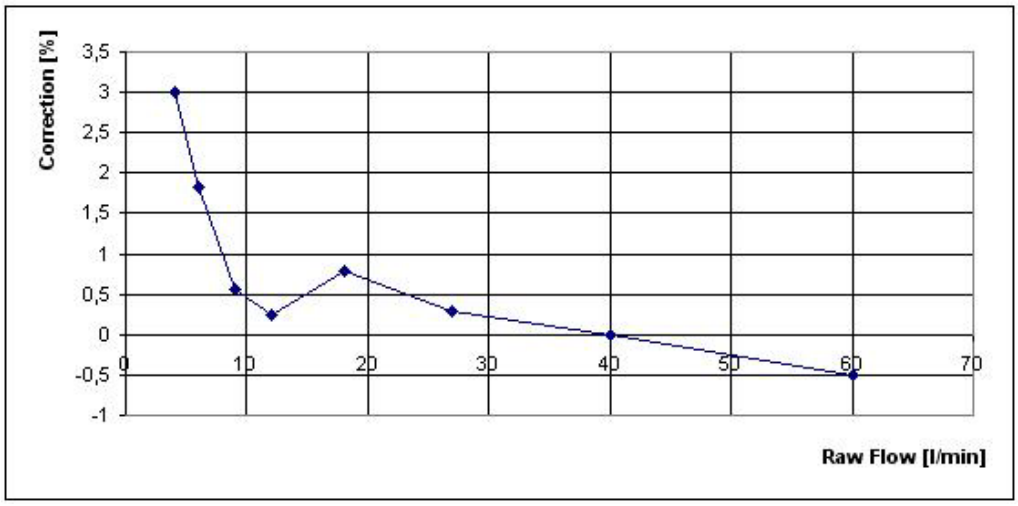


Fig. 29: Correction[%] via raw flow according to matrix in Fig.28

2.8.6 Fields and parameters of the medium window

2.8.6.1 The field medium matrix

This field contains the actual matrix for adaptation of the device to the medium and plant-specific conditions.

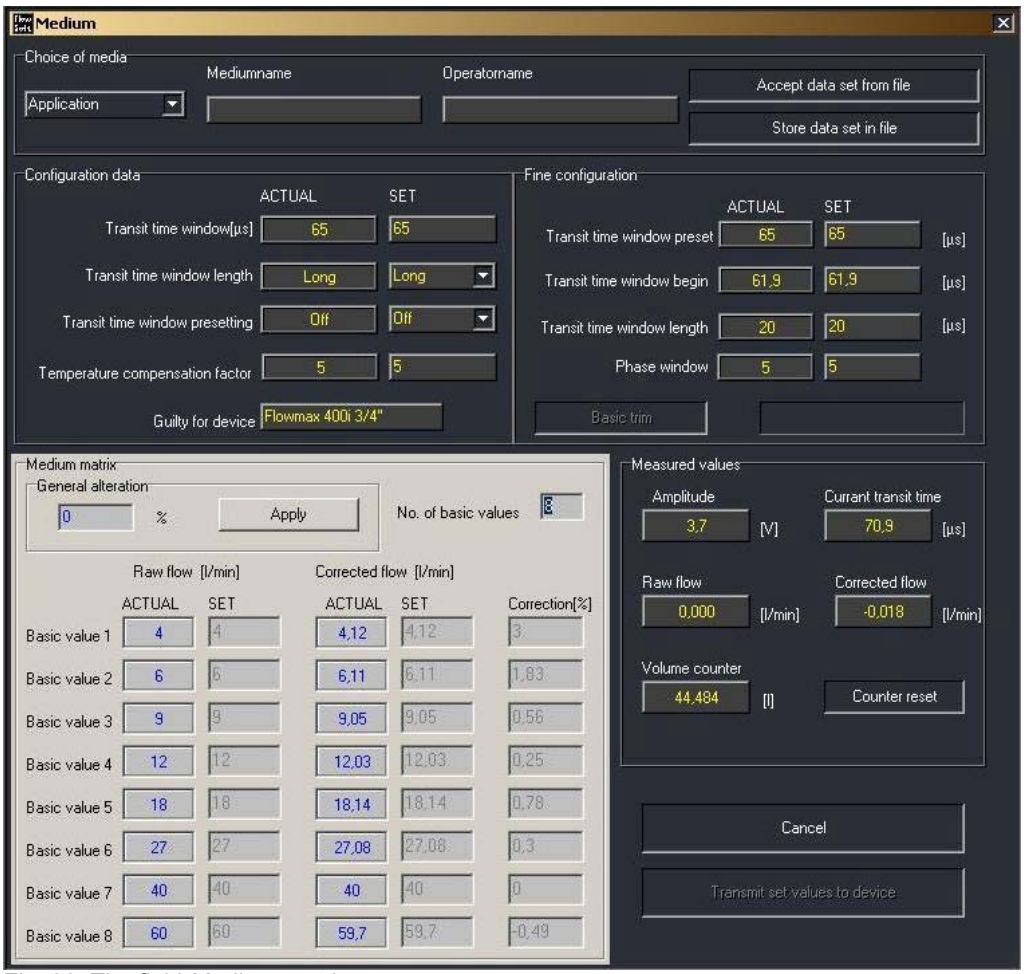


Fig. 30: The field *Medium matrix*

Basically, the matrix consist of a table with the columns *Raw flow* and *Corrected flow* and 8 lines.

The *raw flow* is the flow directly calculated by Flowmax. Median filtering and creeping suppression (both section 2.7.3) do not have an influence on the presented measured value.

The *corrected flow* is the measured value resulting from the correction in the medium matrix (see example in Fig. 29) as well the creeping suppression, and serves the purpose of outputting current/voltage respectively generating a pulse and for serving as the internal volume counter. In addition, the *corrected flow* is smoothened in a median filter and evaluated by the creeping suppression.

The eight lines in the first column of the table contain the standard default basic values (flow steps), that serve as the basis for making corrections. The result for the respective basic value is comprised in the column *corrected flow*. Since the values of both columns can change, auxiliary columns exists for both titled *SET*, with whom the values in the column ACTUAL can be changed. This means *ACTUAL* and *SET* refer to the current settings in the device.

Warning!
Please pay attention that any values in the columns, apart from the column *correction %* have to ascend with the number of the basic value. Otherwise there may be device errors. **The software does not carry out a plausibility check here!**

Warning!

The column *correction in %* is for the relative changes of the *SET* value *of the corrected flow* as compared to the *SET* value of the *raw flow.* The values of the columns titled *SET* are transmitted to the metering device after clicking the button 

. After subsequently reading back the settings from the device these are presented in the column titled ACTUAL. The results may be used for documentation purposes when stored and/or printed out as a screenshots.

By entering a value between 2 and 8 the user decides the number of flow steps to carry out a correction. If the metering device is e.g. used in a reproducible very narrow flow range very few steps will be sufficient.

If the range of flow velocities is big, it is advisable to use the maximum number of 8 steps. The more basic values/flow steps are used, the more fine-tuned is the adaptation of the metering device to the medium and the plant properties.

After entry of a valid value in the input field *number of basic values*, the table is automatically re-created in the desired size. Lines that are not needed are hidden.

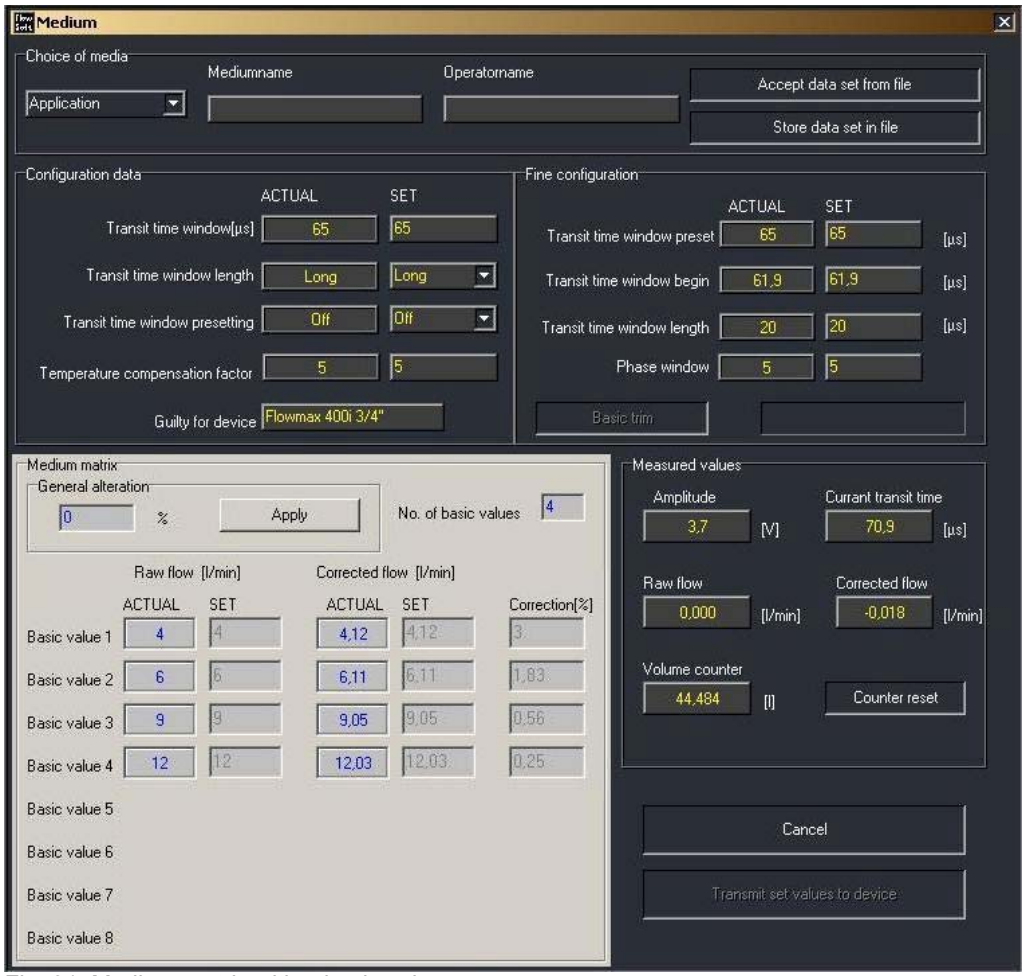


Fig. 31: Medium matrix with 4 basic values

A minimum of 2 basic values have to be entered in order to ensure a reasonable correction.

2.8.6.2 The field general alteration

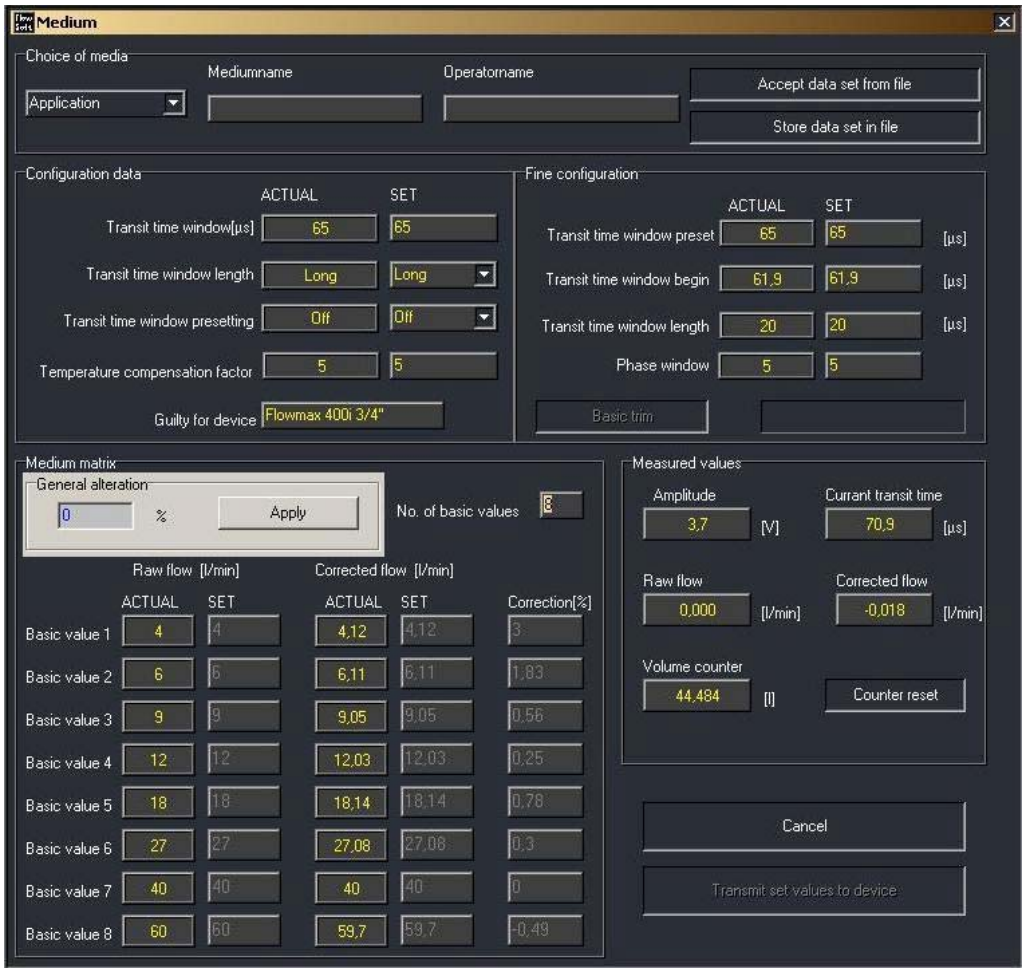
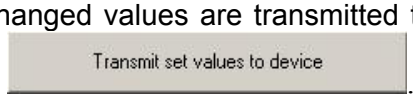


Fig. 32: The field *general alteration*

If all the output values of the pre-selected basic values in the field *medium matrix* are to be changed by the same corrective factor, this can be done centrally via *general alteration*. After entering a value into the edit field and then clicking the button 

all values in the columns *Correction* and *Corrected Flow* (SET) are calculated correspondingly. The message appears

Fig. 33: The message *general alteration done*

The changed values are transmitted to the metering device after clicking the button 

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2.8.6.3 The field configuration data

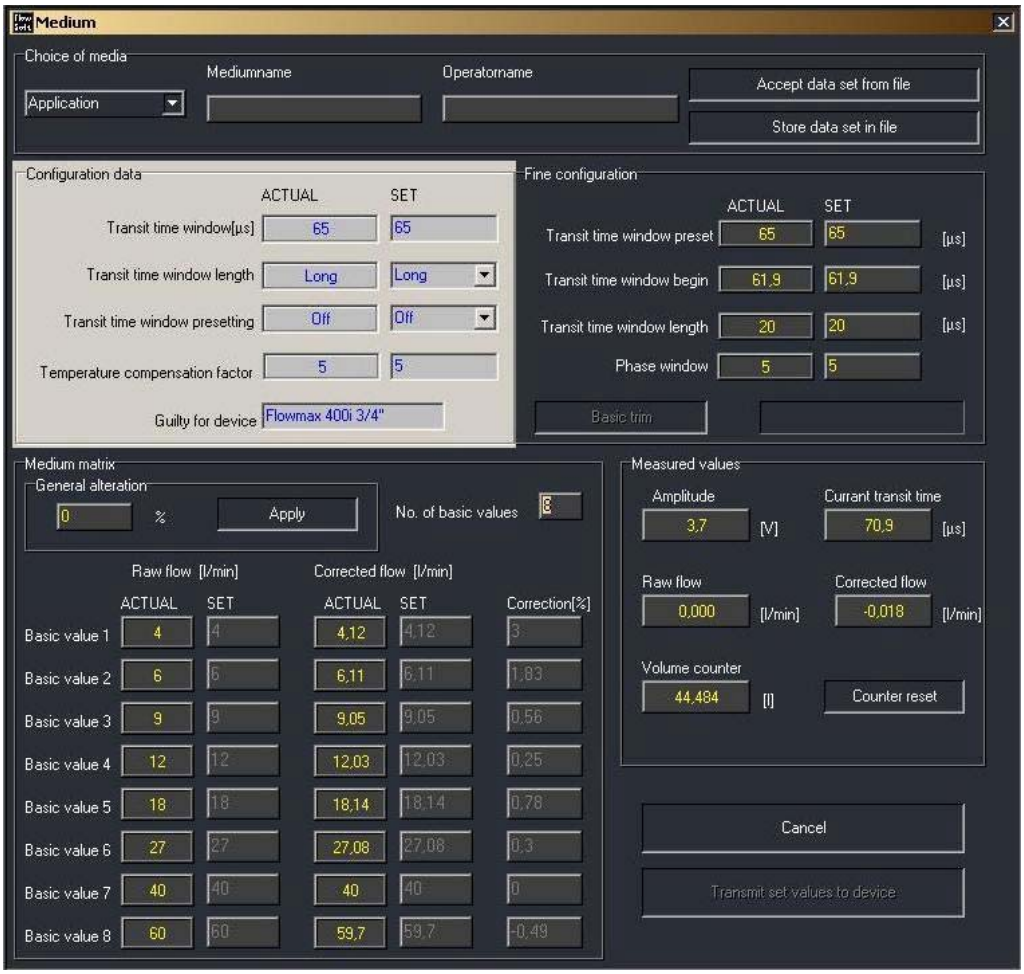

Fig. 34: The field *Configuration data*

This field offers a user-friendly way to enter the settings concerning the sonic properties of the medium to be measured, which is the precondition for any further medium adaptations.

Transit time window: The transit time is the time that lapses between the time of the transmittal of a measuring signal from the sensor at one end of the measuring channel to the reception of the signal by the sensor at the other end of the measuring channel. The transit time depends on the medium.

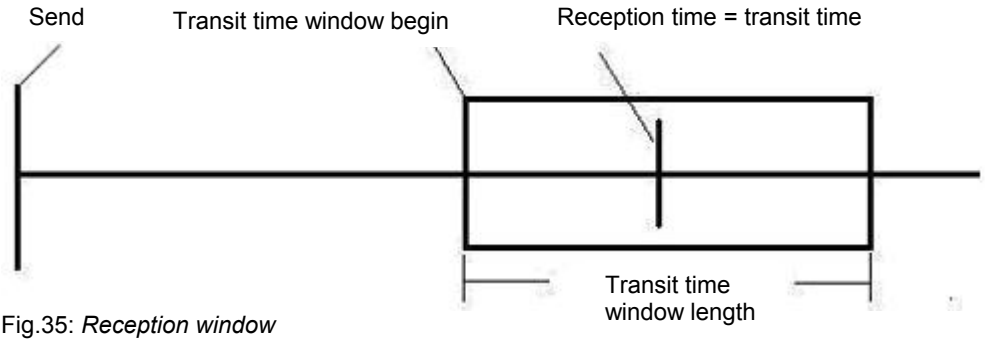

Fig.35: *Reception window*

Transit time window length: A 3-fold grid can be used for setting the length of the time interval, in which the metering device is to expect the signal for *transit time metering*. If the data of the medium to be metered are known from tables, it is advisable to select the setting *short* here. In case of imprecise information, the window should initially be set to *long* and should be switched to *short* after more precise determination of the transit time, i.e. as soon as the transit time is in the middle of the pre-set window based on the measured result. When using the setting *short*, the measurements of the transit time and of the phase are clearly separated from each other.

Transit time window presetting: This is to decide whether to use a preset transit time (ON) based on experience or to calculate with the transit time resulting from the transit time measurement (OFF).

Valid for device: Shows the type of connected metering device from which the settings are read when opening the window, such as Flowmax ¾“.

2.8.6.4 The field fine configuration

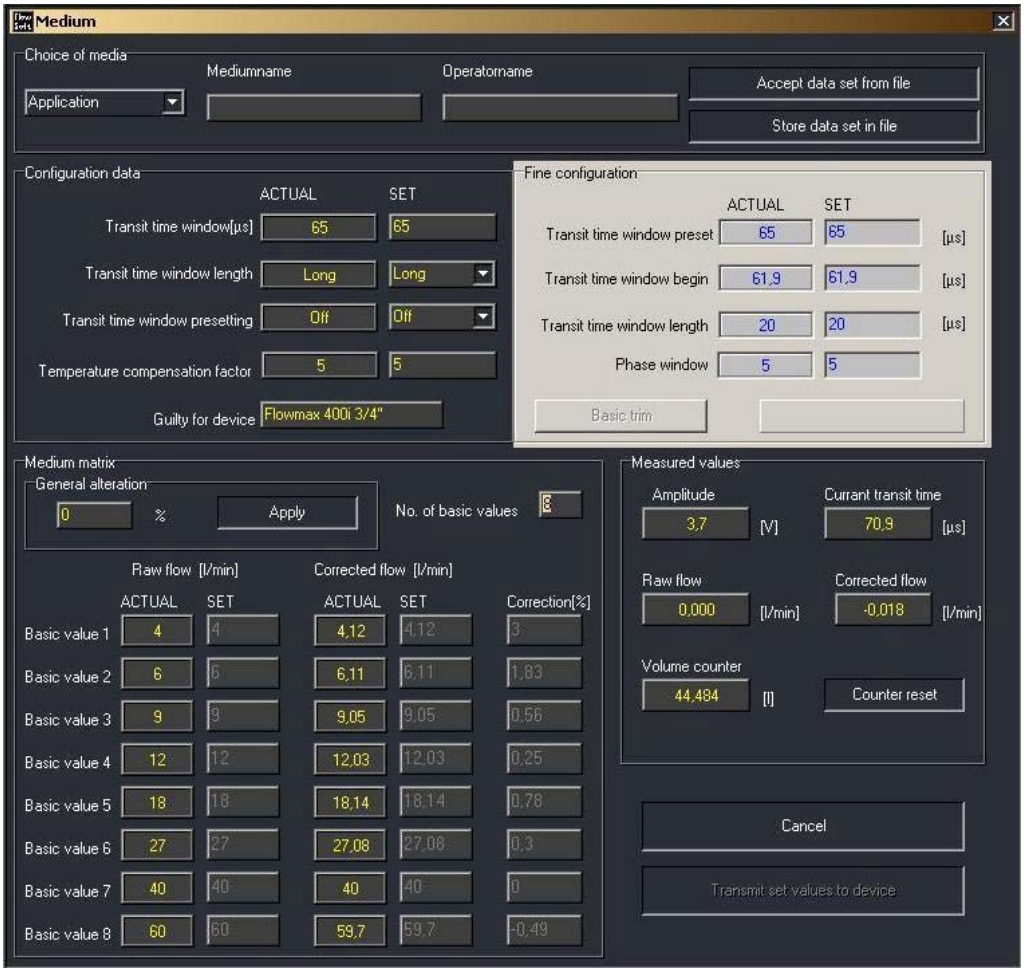

Fig. 36: The field *Fine configuration*

The fine configuration can be used for Flowmax settings made by personnel with in-depth detail knowledge of the sonic properties of a medium. It allows even finer configuration of the transit time and phase windows as well as of the temperature compensation factor.

Basic trim: see section 2.8.3

Transit time window preset: The preset transit time is a parameter that is included in the flow calculation, if the transit time compensation is switched off (see section 2.8.6.3, transit time presetting ON/OFF). The preset transit time should correspond to the transit time of the medium at process temperature.

Transit time window begin**:** The begin of the transit time window is the time calculated in µs starting from the time of the transmittal of the transit time signals, when electronics has to be switched to triggering to the reception signal (see section 2.8.6.3).

***Transit time window length*:** The length of the transit time window is the period, starting from the begin of the transit time window, in which the Flowmax electronics is to trigger the transit time signal. Since the transit time may fluctuate depending on the temperature, the selected transit time window should not be too small. Values around 20µs have proved to be reasonable.

Phase window: The phase window is the period after transmittal of the measuring signal in which a usable reception can be expected. The period until start of the phase window depends on medium and temperature.

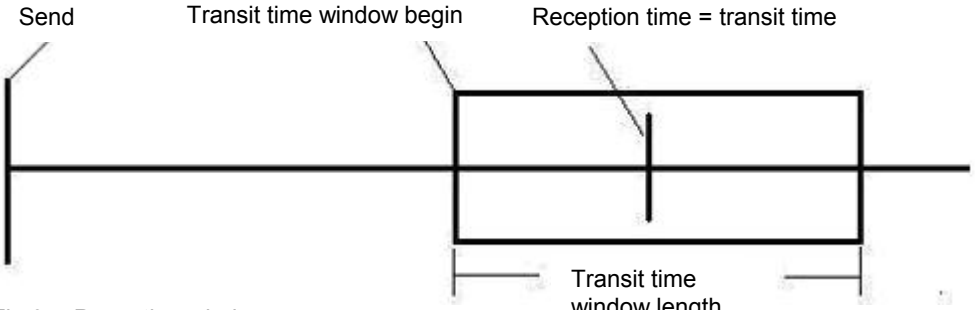

Fig.37: *Reception window*

2.8.6.5 The field choice of medium

FlowSoft offers the possibility of storing the data set determined for a specific diameter for a specific medium and a specific Flowmax on the hard disc of the computer that is used under a name that can be chosen freely.

A data set created in this way may later be loaded from the hard disc and transmitted to a Flowmax with the same nominal diameter for setting it for the same medium.


Attention!

In order to recognize the author of the data set later on it is necessary to also enter the operator name.

The media data sets are managed in the window *Medium* in the field *Choice of medium*.

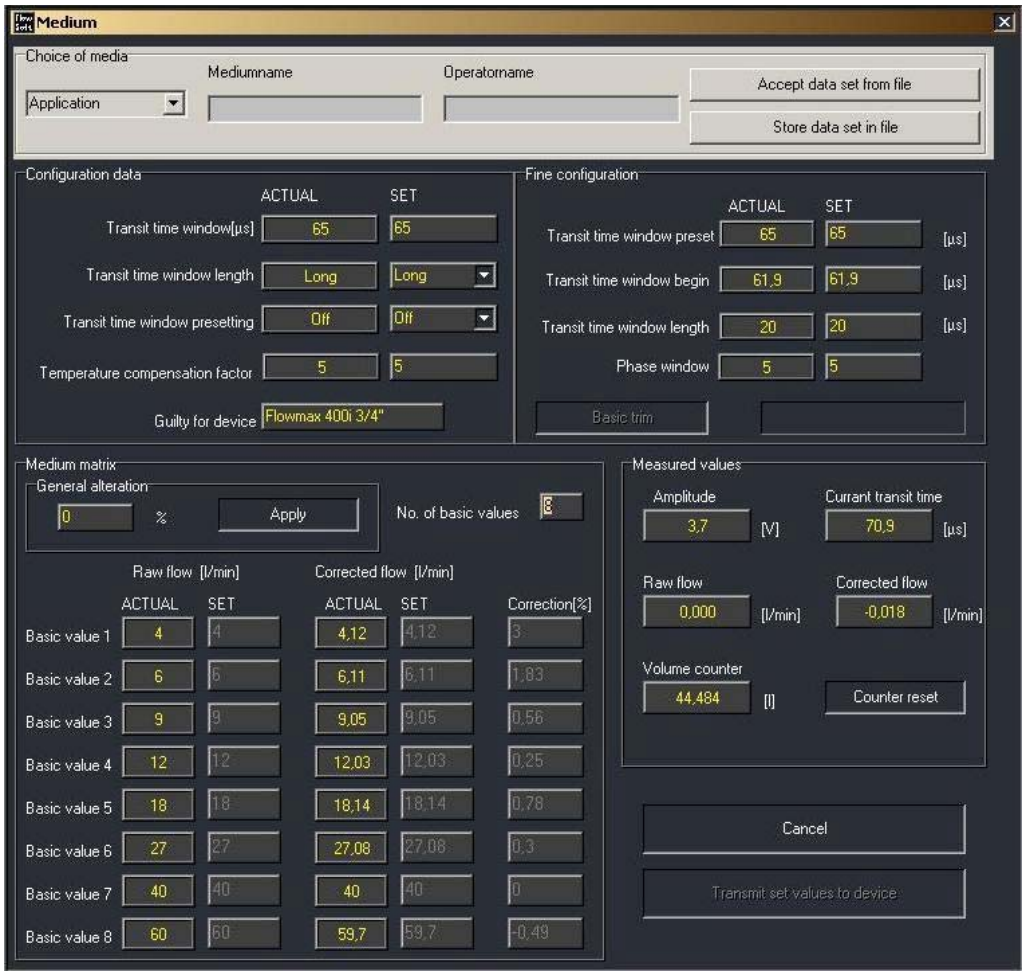

Fig. 38: The field *Choice of medium*

Storing data sets: for storing a data set first enter name of medium into the input field, a designation for the data set, and in the field *operatorname* a designation for the user. If you then click the button Store data set in file the data set is stored on the hard disc of the PC.

Accept data set from file: If you want to re-load a data set that was previously stored, first click the application in the field *Choice of medium* and make your selection of the existing data sets.

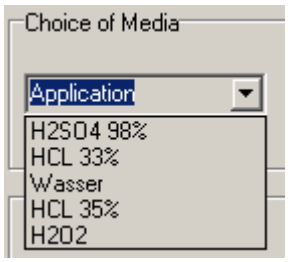

Fig. 39: Select data set from list under *application*

Now the complete data set will be transmitted to the auxiliary columns titled SET.
If the data set that was loaded is to be transmitted to the connected Flowmax, press button 

.

Data sets that are stored are contained in the file Medium.cfg and can e.g. be send via e-mail. This is useful in order to create a data base of media parameters, but also in order to transfer data sets from an existing data base to an application.

2.9 Dosing with Flowmax


Note!

Flowmax offers the possibility of an independent dosing function for which no separate control unit is necessary. See also operating instructions Flowmax, section dosing function. The dosing function only requires the one-time setting of the dosing quantity with the help of the PC software documented here.

Apart from configuring the dosing quantity a test of the dosing function as well as an optimization of the dosing accuracy can be run taking account of plant-specific influences.

Selecting the function *Dosing* in the pull-down menu *Configuration* opens the related window:

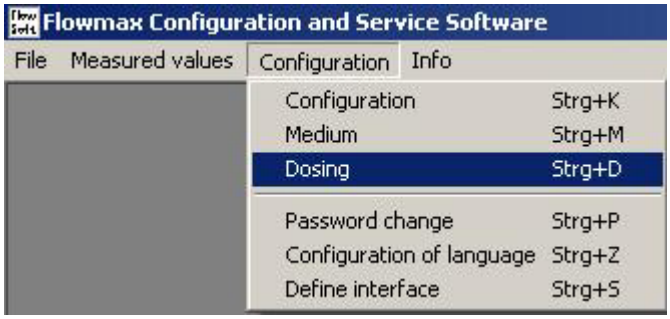

Fig. 40: Starting the window *Flowmax dosing operation*

After opening the window *Flowmax Dosing operation* the PC will read out the values configured in the connected device and will present them in table format in the column titled *ACTUAL* .

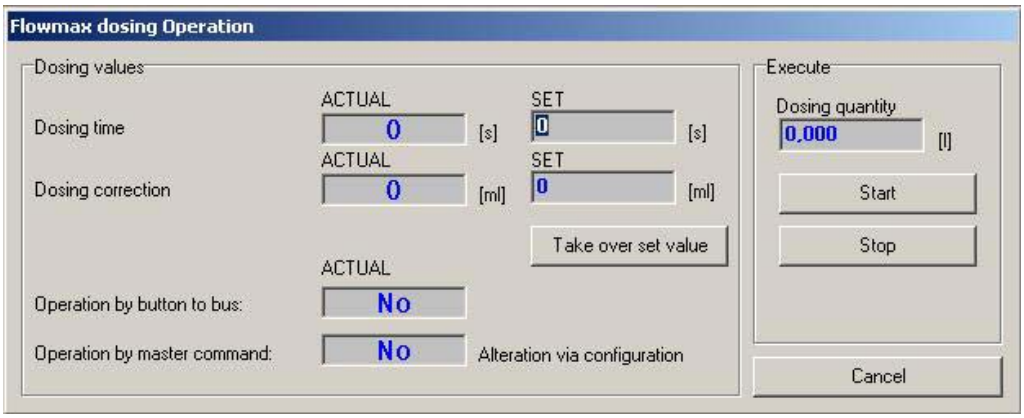

Fig. 41: The window *Flowmax Dosing operation*

2.9.1 Setting the dosing parameters

Basically, for the dosing parameters presented in the left frame applies that the current values in the connected Flowmax are shown in the column *ACTUAL*. If a value is to be altered the new target value has to be entered into the column *SET*. After clicking the button Take over set value the new value is transmitted to the Flowmax, where it is permanently stored.

Dosing may be started via a master command (PC) or via the dosing input.

The configuration of the switching output for the valve control has to be set according to section 2.7.2 *Changing configuration settings*. This is where also the configuration of the switching output for the valve control is explained.

2.9.2 Dosing quantity and dosing test

The dosing quantity is set in the input field in the right frame of the window *Flowmax Dosing operation*. After clicking the button Start the value entered there is transmitted to the Flowmax, where it is permanently stored.

There is also the possibility to run a test of the dosing function. Similar to the transmission of the dosing value it is triggered by clicking the button Start. By clicking the button Stop a running dosing process may be interrupted at any given time.

2.9.3 Significance of the dosing parameters

Dosing time: The dosing time is the period of time, for which the output O1 is maximally activated after start of dosing. This function helps to prevent that large quantities of liquid are dosed uncontrolled e.g. in case of operating troubles.

Dosing correction: The dosing correction serves the purpose of compensating for empirically identified variances between ACTUAL and SET volumes. For example a later running empty when the valve has long been closed can distort the dosing accuracy. This is possible by setting the value dosing correction.

Dosing quantity: The dosing quantity is the fluid volume, after whose passing through the Flowmax the output O1 switches to passive again at the end of a dosing process. After transmittal, the value for the dosing quantity from the PC is stored in the Flowmax and serves as the basis for any further dosing processes, if it is not changed by the PC.

2.10 Changing the password

As mentioned in section 2.4 user log in/log out, the standard default password after installation

Note!

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can be changed by the user. The password is changed in the window *Password change*.

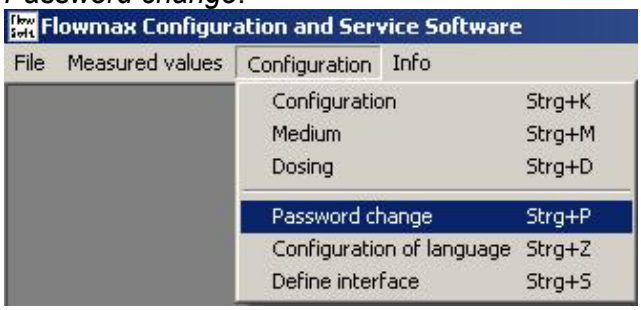

Fig. 42: Starting the window *Change password*

After selecting *Change password* in the pull-down menu *Configuration,* the relevant window will open.

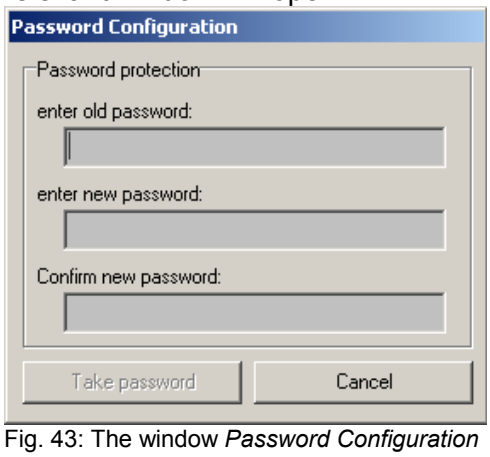

Fig. 43: The window *Password Configuration*

Take the following steps to change the password:

1. First write the password that is still valid into the field*: enter old password.*
2. Then write the desired password that is to be valid in the future into the field*: enter new password*.
3. Then *Confirm new password:* the new password again.
4. If the three entries above are correct please click the button Take password to conclude. The new password will be saved and is valid immediately.

The following message appears:

Fig. 44: The message after valid password change

Entering new passwords can be cancelled any time by clicking the button Cancel and maintaining the old password.

2.11 Select language

FlowSoft offers the possibility to choose between the languages German and English.
After selecting the function S*elect language* in the pull-down menu *Configuration* the related window will open.

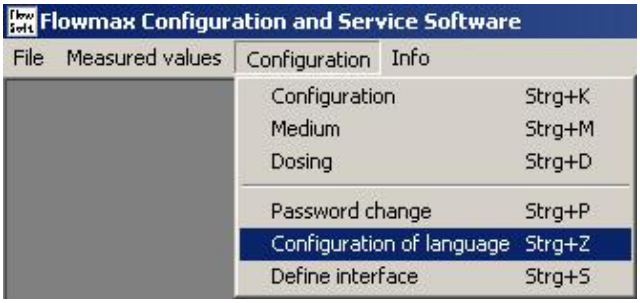

Fig. 45: Starting the window *FlowSoft language configuration*

Attention!

The selection is made by choosing the desired language in the button-down menu and then confirming it by clicking the button Take over. The selected language will be active **after** the next start of the software.

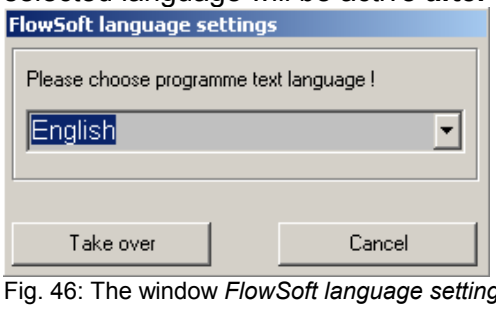

Fig. 46: The window *FlowSoft language settings*

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