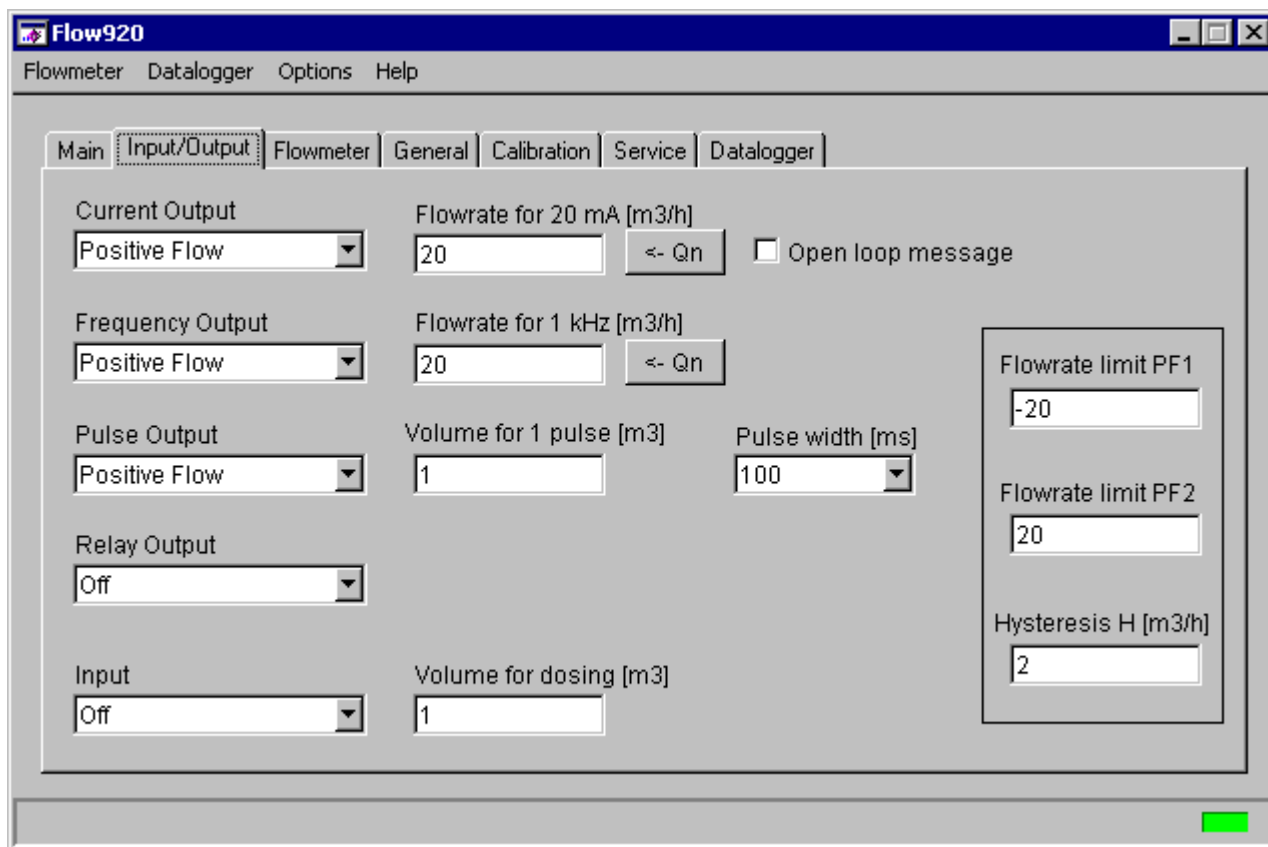


FLOW920

M920 remote control

User's manual



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1. Basic information

1.1. Introduction

Flow920 software is a programme for remotely controlling the flowmeter M920 and is for flowmeter configuration and calibration. A minimum of Windows 98/ME/NT/2000/XP/Vista is required.

Flow920 displays (and prints), timing charts of flowrates with selectable time interval.

1.2. System requirements

There are minimum hardware and software requirements that must be satisfied to ensure that the software functions properly. You must have:

- Personal computer Pentium 166 MHz or better, monitor SVGA, RAM 128 MB.
- Operating system MS Windows 98/ME/NT/2000/XP/Vista.
- Program Flow920
- RS232 cable or RS485 cable

2. Program Flow920

Flow920 is software for remotely controlling flowmeters M920.

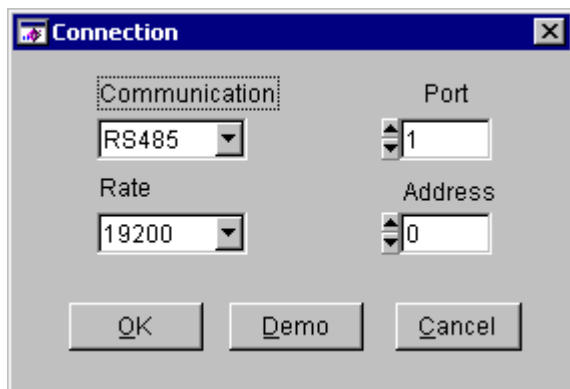
2.1. Installation information

2.1.1. Installation

Put CD into the computer, wait for autorun and select “Software installation” and “Flow920” or start direct „install\freeware\M920 “.

2.1.2. Demo version

Demo version allows you to check software functions without the real flowmeter. Flowmeter is simulated by program.



Demo version is activated from the main menu (“Flowmeter -> Connect – Demo”).

2.1.3. Uninstall Flow920

To remove the Flow920 software from your system, you should run “uninstall” from Program group (“Start -> Programs -> Flow920 -> Uninstall Flow920” from the Windows Start menu).

2.2. Starting with Flow920

Following commencement, the basic screen for program “Flow920” is displayed. The screen consists of two main parts:

1. **Main menu** – is located at the top of the screen. Items from the menu are used for communication parameter settings, data-logger reading and date format setting etc. The help and registration form is located here too.
2. **Working area** – active program windows are displayed here.

The required function can be activated by clicking (left mouse button) on the appropriate item of menu. The program uses commonly used features for navigation in Windows.

There is an Information line located at bottom of the screen. The program automatically displays the state of the program (text) and the state of communication, (colour indicator: grey – closed communication, green – opened communication, red - communication in process).

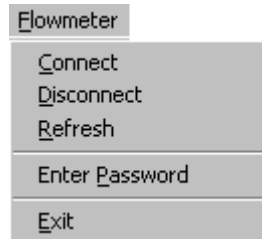
Flowmeter M920 offers following access levels:

- view mode (without password protection – lowest level)
- basic level (basic password required)
- calibration level (calibration password required)
- service level (service password required)

Note: Password is required for changing any parameter. Most changes can be done with the “basic” password. Flow920 displays message “access denied” in case that higher password level is required. With the “service” password all changes can be done.

2.3. Main menu

Flowmeter This item is intended for basic communication with the flowmeter.



Connect starts communication with the flowmeter. You will be asked for type of communication (RS232 or RS485) and for communication port (COM1 ... COM8). RS485 communication requires selecting Baud rate (4800 ... 19200) and the flowmeter's address (000 ... 255). Pressing „Demo“ button starts demo version.

Disconnect terminates communication with the flowmeter. Using Connect you can start communication with another flowmeter.

Refresh renews information displayed on actual window.

Enter Password appropriate password permits access to calibration and service functions. Program maintains three access levels:

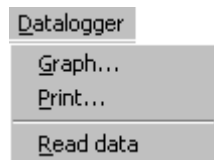
Basic – user can operate the major part of program functionality. (basic password required)

Calibration – user can perform flowmeter calibrations. (calibration password required)

Service – user can perform calibrations, change service settings. (service password required)

Exit closes Flow920 programme.

Datalogger Datalogger item is for setting parameters of timing charts, for printing and reading flowrates from the datalogger. Item is not available for M910E.



Graph... timing charts (graphs) and parameter settings.

Print... printer selecting and printing timing charts of the flowrate.

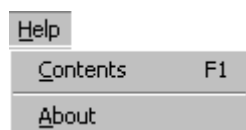
Read data datalogger reading. Datalogger is cleared after a successful reading.

Options Intended for setting up program options. Item is not available for M910E.



Date format... Date format configuration. Individualise day, month and year order and their separators.

Help Help item is for displaying built-in help.



Contents F1 It displays content of Help.

About It displays information about program.

2.4. Program Windows

The program's main window consists of 7 sub windows. You can select these sub windows by clicking the left mouse button on the appropriate name.

2.4.1. Main Window

Main window displays basic flowmeters information. This menu corresponds with the flowmeter "Main" menu. See M920 users manual.

Flowrate [m3/h]	Min. Flowrate [m3/h]	Max. Flowrate [m3/h]	Clear
48.0834	48.0469 12:54 26.06.2009	48.3547 08:34 30.06.2009	Clear
Total Volume [m3]	Positive Volume [m3]	Negative Volume [m3]	Clear
197.017741	197.017741	0.0	Clear
Actual dose volume [m3]	Aux. Volume [m3]		Clear
0.0	Clear	Start	197.01347 Clear
Timed volume [m3]	Date begin	Date end	Clear
36.603909	17:58 29.06.2009	08:34 30.06.2009	Clear

All textboxes situated here are read-only and cannot be edited.

Clear button in the first line zeroes Min. and Max. flowrates.

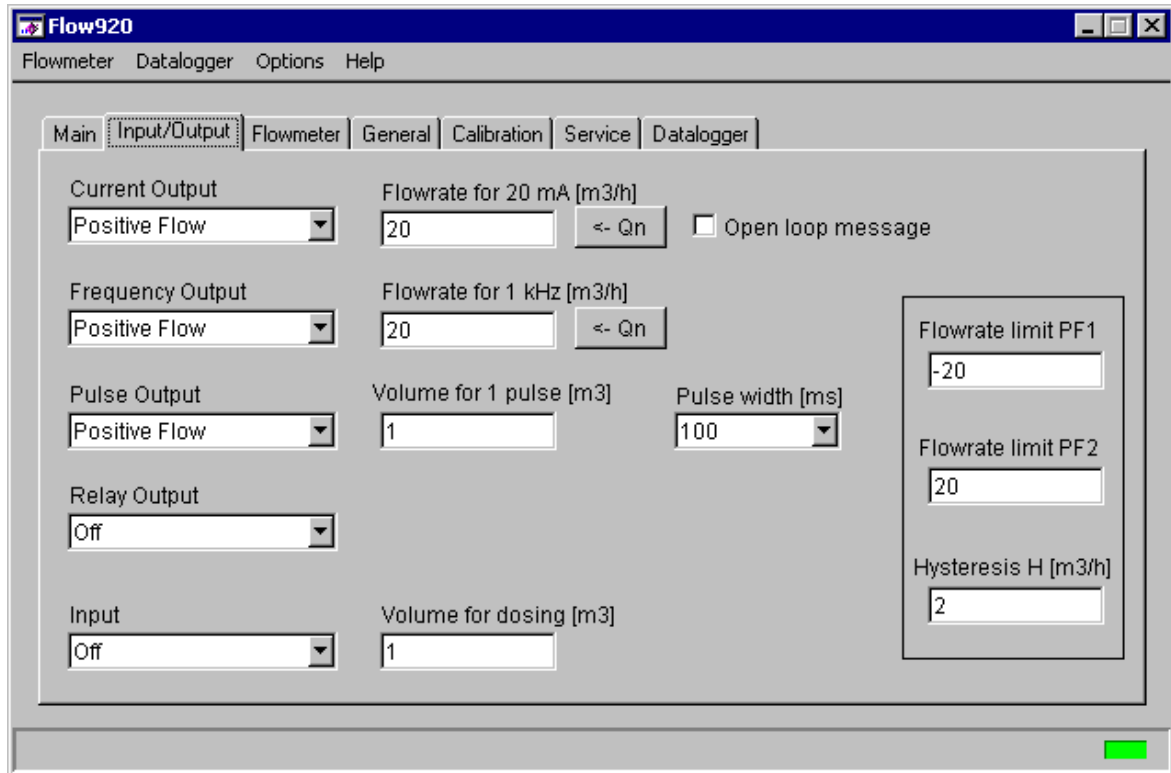
Clear button in the second line zeroes Total Volume. In this case a Service password is required.

Clear button in the third line zeroes Auxiliary Volume.

Clear button in the fourth line zeroes Timed Volume (M920 only).

2.4.2. Input/Output Window

An Input/Output window displays the flowmeters input and outputs configuration and permits changes to be made to this configuration. This menu corresponds with the flowmeter “Input/Output” menu. For detail information see M920 users manual.



Current Output – current loop output mode setting.

Flowrate for 20 mA – represents a flowrate for a current of 20 mA. It can be set to nominal flowrate (Qn) by pushing “<-Qn” button.

Open loop message – disables and enables error message “Current output”. This message informs that current loop is not closed.

Frequency Output – frequency output mode setting.

Flowrate for 1 kHz – represents a flowrate for a frequency of 1000 Hz. It can be set to nominal flowrate (Qn) by pushing “<-Qn” button.

Pulse Output – pulse output mode setting.

Volume for 1 pulse – represents volume for 1 impulse.

Pulse width – pulse width of “Impulse Output” in milliseconds. Any value between 10 and 2500 with resolution 10 can be set (M910) or 2.5 to 500 (M920).

Relays Output – relays output mode setting. Item is not available for M910E.

Input – digital input mode setting. Item is not available for M910E.

Volume for dosing – represents volume for dosing. Item is not available for M910E.

Flowrate limit PF1 – represents low flowrate limit for some functions of digital outputs.

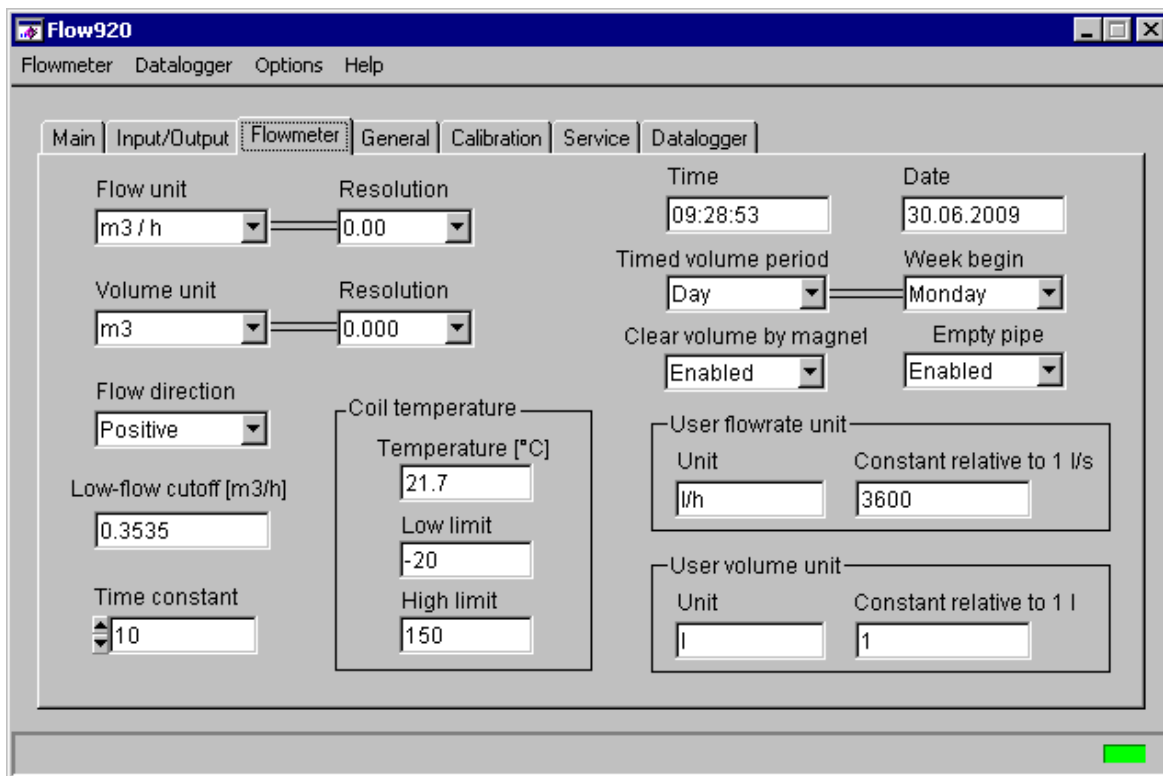
Flowrate limit PF2 – represents high flowrate limit for some functions of digital outputs.

Hysteresis H – represents hysteresis of limit values for some functions of digital outputs.

The program window “Main” can be controlled with a mouse or via a keyboard.

2.4.3. Flowmeter Window

The flowmeter window displays the flowmeter configuration and permits changes. This menu corresponds with the flowmeters “Flowmeter” menu. For detail information see M920 users manual.



Flow unit – flowrate units selection.

Resolution – flowrate resolution.

Volume unit – volume units selection.

Resolution – volume resolution.

Flow direction – It is possible to switch between “Positive” and “Negative” flow direction (changes the sign in flowrate value).

Low-flow cut-off – flowrate limit for suppressing low flowrates. Flowrates below this limit will be represented as zero.

Time constant – time for moving average calculation of the flowrate.

Coil temperature – current coil temperature and limits for temperature alarm (M920 only).

Time – time of internal Real time clock. Item is not available for M910E.

Date – date of internal Real time clock. Item is not available for M910E.

Timed volume period – counting period for auxiliary timed volume (M920 only).

Week begin – day for starting new timed volume counting period (M920 only).

Clear volume by magnet – enables / disables possibility to clear auxiliary volumes and min/max flowrates using magnetic pointer (M920 only).

Empty pipe – enables / disables error message “Empty pipe” (M920 only).

User flowrate unit – defines custom flowrate unit.

Unit – flowrate unit name (1-5 characters).

Constant relative to 1 l/s – conversion constant between “user flowrate unit” and “1/s”.

User volume unit – defines custom volume unit.

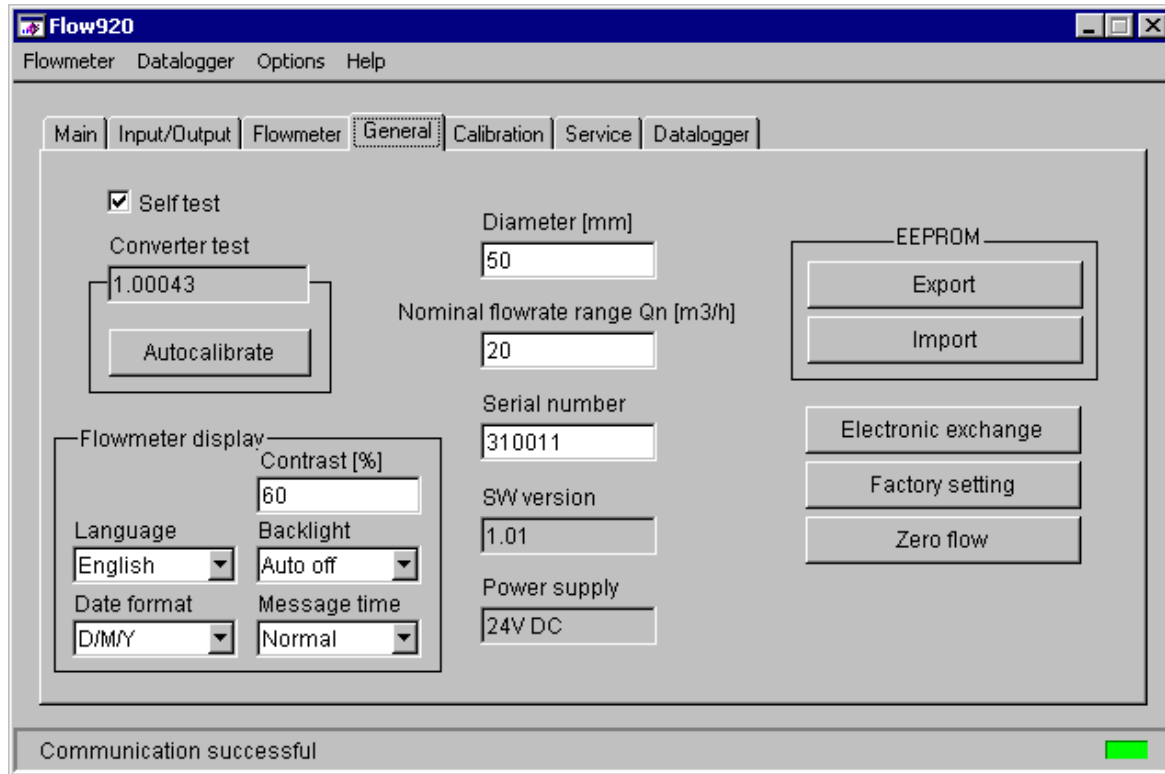
Unit – volume unit name (1-5 characters).

Constant relative to 1 l – conversion constant between “user volume unit” and “Ltr”.

The program window “Main” can be controlled with a mouse or via a keyboard.

2.4.4. General Window

The General window displays general information about the flowmeter. This menu corresponds with the flowmeters “General” menu.



Self test – enables you to switch an internal self-test (flowrate simulator) “On” or “Off”. Item is not available for M910E.

Converter test – displays the result of an internal converter test. A number in range (0.98, 1.02) is displayed, if the signal converter is OK. A number is displayed only if the Self test is switched “On”. After switching on, you have to wait for converter stabilization (up to 20 seconds). Item is not available for M910E.

Autocalibrate – available only for service department. Autocalibration is recommended after exchanging the electronic unit. Item is not available for M910E.

Diameter – nominal diameter of the flowmeter in mm. You can change the diameter after entering the service password.

Flowmeter display – parameters of M920 display (M920 only)

Language – language selection

Date format – date format selection

Contrast – display contrast

Backlight – backlight mode selection

Message time – time interval for error messages

Nominal flowrate range Qn – nominal flowrate of the flowmeter in selected unit. You can change Qn after entering the service password.

Serial number – serial number of flowmeter.

SW version – internal SW version.

Power supply – current information about power supply voltage and frequency.

Note: Next items are available after entering the service password only.

EEPROM

Save – saves the content of internal eeprom connected flowmeter to the disk.

Load – overwrites internal eeprom of connected flowmeter with data stored in computer. This operation overwrites also calibration data.

Electronic exchange – overwrites internal eeprom of new electronic unit with values (all settings and calibration constants) with values from old electronic unit.

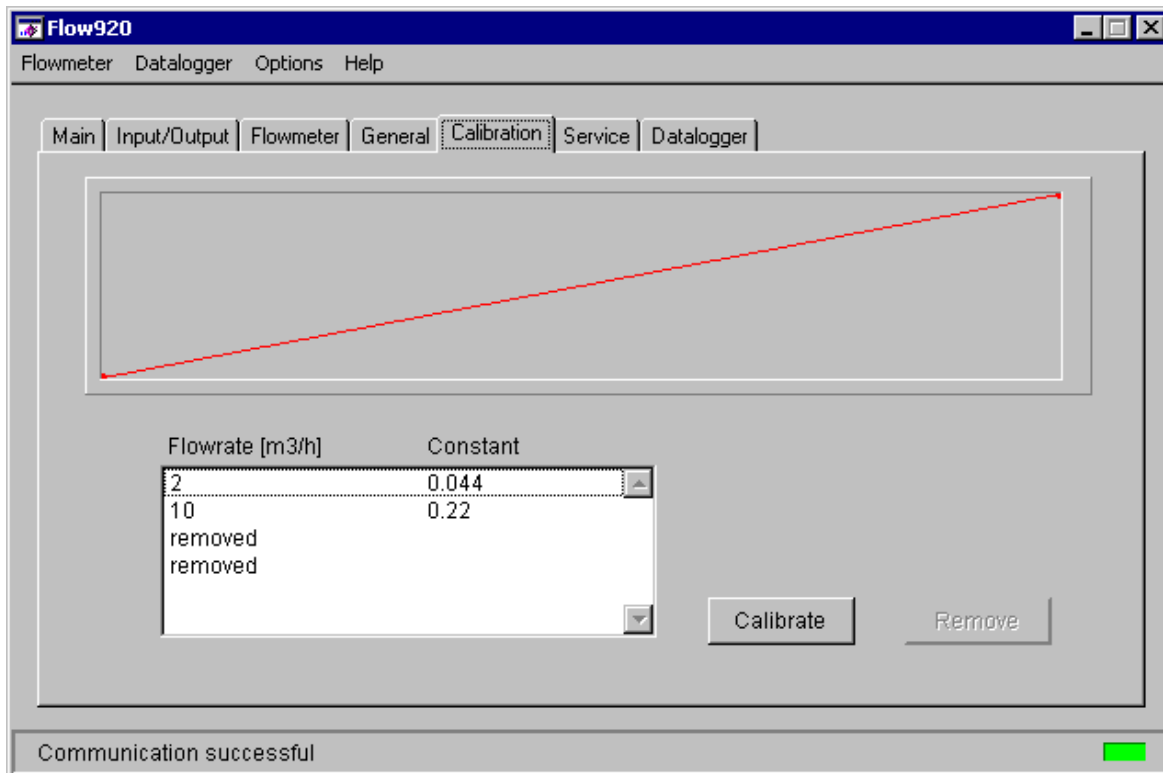
Factory setting – overwrites internal eeprom with default values (except of calibration data).

Zero Flow – recalibrates flowmeters zero point. Before starting recalibration measuring tube must be completely filled and flowrate must be '0'.

2.4.5. Calibration Window

The Calibration Window is for the flowmeter's calibration. This menu corresponds with flowmeters "Calibration" menu. Access to the Calibration menu is refused without the correct password. Enter valid Calibration password (main menu, item Flowmeter).

Setting any new value in calibration window changes calibration data! Calibration should be performed in an appropriate equipped laboratory.



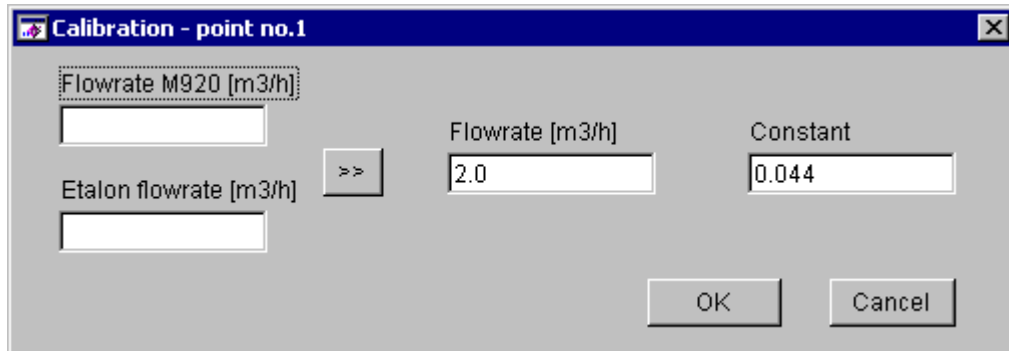
The calibration curve is displayed in the upper part of window. It is a line for 2 calibration points or polyline for more calibration points.

Note: The flowmeter can be calibrated at 2, 3 or 4 points. Each calibration point contains 2 values. A nominal value of the calibration point is selected by the user in the range between $\pm Q_{MAX}$. It is expressed in flowrate units. To this nominal value is attached a calibration constant. Calibration constants do not have a unit. In the calibration process this calibration constant can be changed to reach similarity between the standard flowmeter and the calibrated flowmeter. The higher the calibration constant, the lower the displayed value.

Calibration constants must be different. In the case of two equal calibration constants, the measured values could be wrong.

In the lower part of the window the flowmeter's calibration points and calibration buttons are displayed.

Calibrate – for flowmeter calibration. After selecting the second calibration point and pressing the “Calibrate” button, the following window is displayed:



This window allows you to change old calibration values (nominal value of flowrate and constant) and press “OK” button. This calibration is recommended for slight correction of calibration values. For example if you want to increase the displayed flowrate value, at a point 180 m³/h by 0.1%, you should decrease the constant by 0.1%.

The second way how to calibrate the flowmeter is as follows: Compare the real flowmeter with a the standard flowmeter. You will find that your flowmeter (measured) displays 179.6 m³/h and the standard flowmeter displays 180.1 m³/h. You enter these numbers into the appropriate fields (“M910 flowrate” and “Standard flowrate”) and press “>>” button. The values will be recalculated to the new calibration constants. After pressing the “OK” button, new calibration constants will be written in the flowmeter’s memory. This second method is recommended for the first flowmeter calibration.

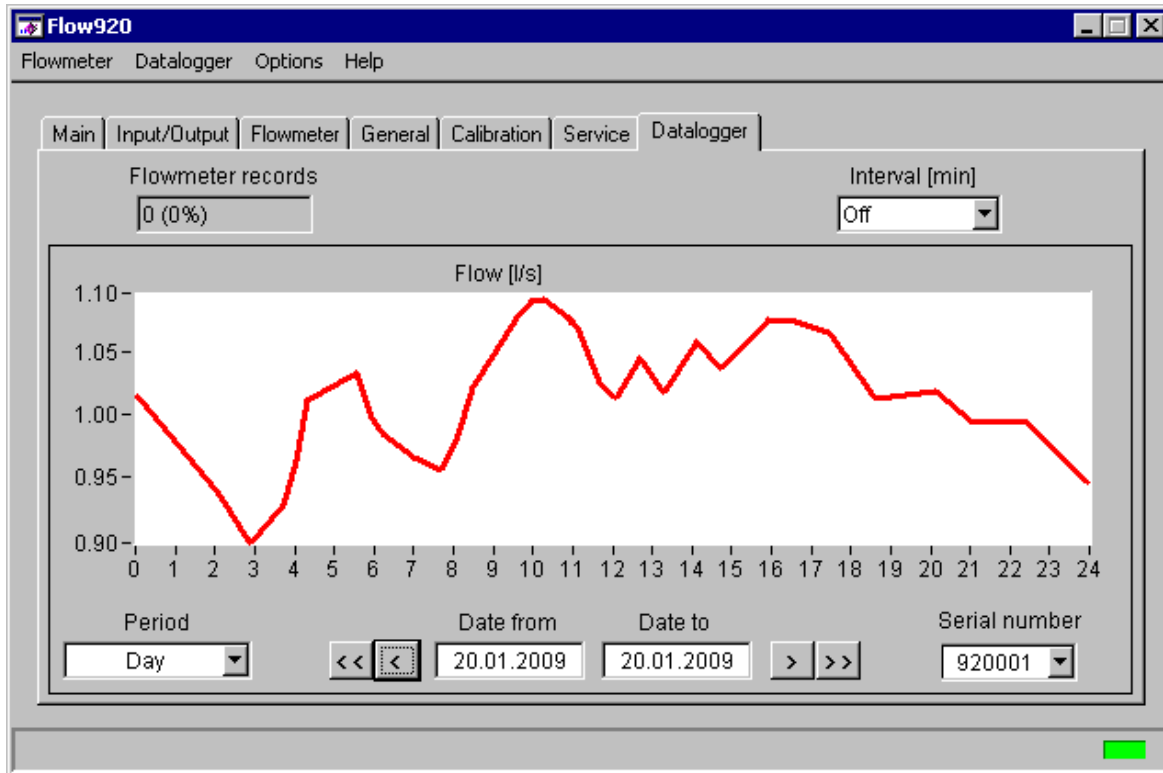
Remove – for calibration points removing. You can remove calibration point only if number of calibration points exceeds two.

2.4.6. Service Window

A Service Window is available only for the service department and is not described in this manual.

2.4.7. Datalogger Window

The Datalogger window displays datalogger information and flowrate chart. Window is not available for M910E.



Flowmeter records – number of samples actually stored in the flowmeter and percentage of memory used. The datalogger capacity is more than 10000 samples (typically 15000 samples). Records are cleared after reading the datalogger (menu Datalogger, item Read data).

Interval – enables you to set sample interval in minutes for internal datalogger. Any value from the row OFF, 5, 10, 15, 30, 45, 60, 120, 180 and 240 can be select.

Flow - flowrates in the selected period.

Period – time interval for the chart. Any value from the row Day, Week, Month and Free (user defined period) can be selected.

Date from / Date to – displays the first and the last date displayed on the chart.

Serial number – displays the serial number of the flowmeter, which is displayed on the chart. You can have several flowmeters and select amongst the appropriate charts using their serial number.

Following navigation buttons work when “Day”, ”Week” or “Month” period is selected:

<< **button** – program searches for the first records (the oldest) available in data files.

< **button** – program displays previous data period.

> **button** – program displays next data period.

>> **button** – program searches for the last records (the newest) available in data files.