Batching Feature
for AFLOWT MF-PRO

1. Introduction

Batching feature is designed for dispensing a certain amount of measured liquid. It is most commonly used for the preparation of working solution from concentrate and water. In order to obtain a needed amount of a solution, you have to set batched quantity of measured liquid/s (concentrate or water).

A dose value is entered into a flowmeter via serial interface in the WORK mode.

It is possible to activate the start of batching in two different ways:

- with an external signal that is sent to control input, for example, when the external button is pressed;
- with a ModBus command sent via serial interface.

After a pre-set dose is filled, a signal is sent through the flowmeter to the discrete (universal) output. This signal either turns off a pump or closes a valve.

To configure and manage the batching feature, connect your computer via serial interface, start the Universal Viewer program (Fig. 1) and open the Aflowt MF-Pro screen (Fig. 2).

Fig.1. Universal Viewer Window.

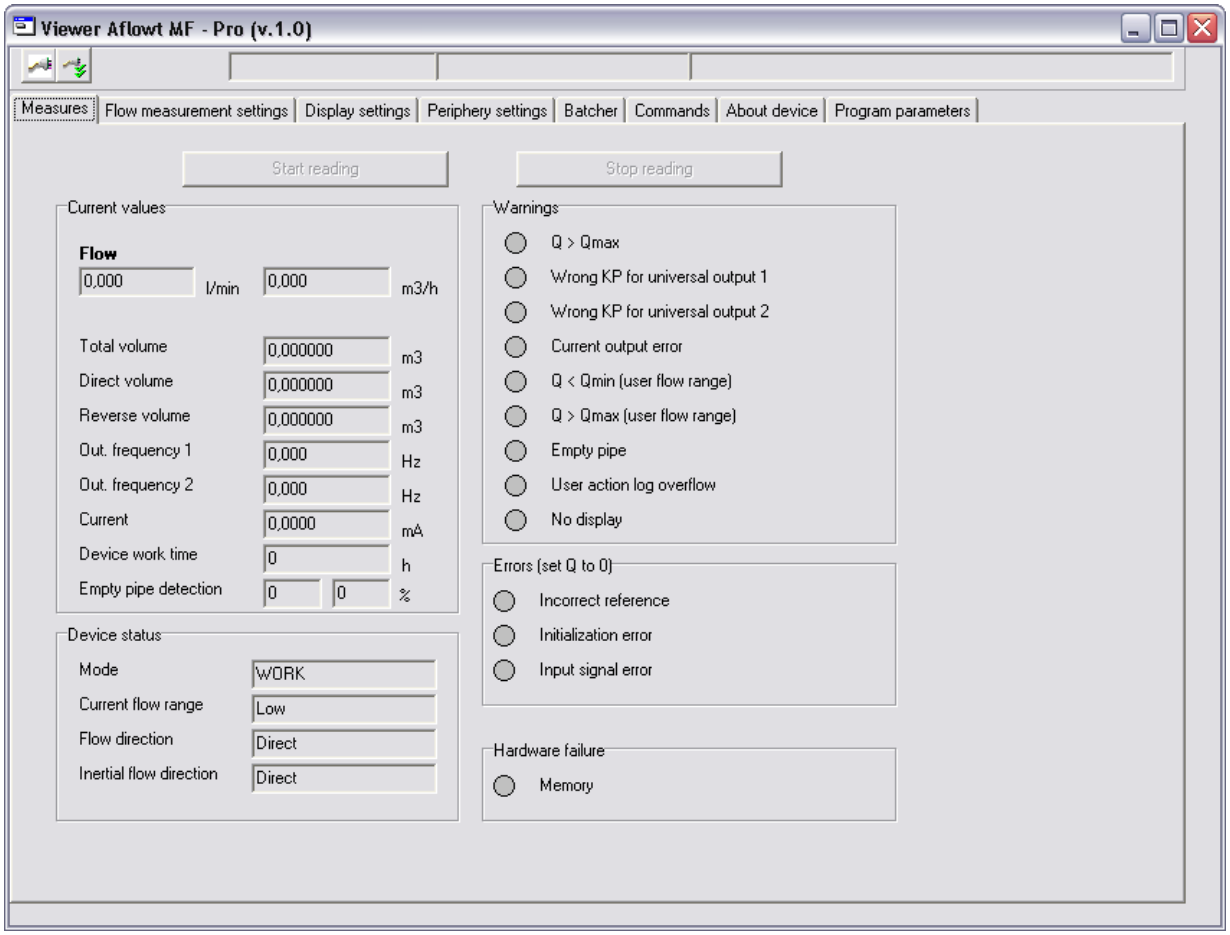

Fig.2. Aflowt MF-Pro Screen.

2. Setup of the Discrete (Universal) Output of the Batcher

To control the batching process, you have to configure one of the discrete (universal) outputs of the flowmeter.

To do this, one of the discrete (universal) outputs on the **Periphery Settings \ Universal Output N tab** (Fig.3), where N – number of the output, has to be set to output dosing signal mode in one of two options:

- Pulse mode
- Logic mode

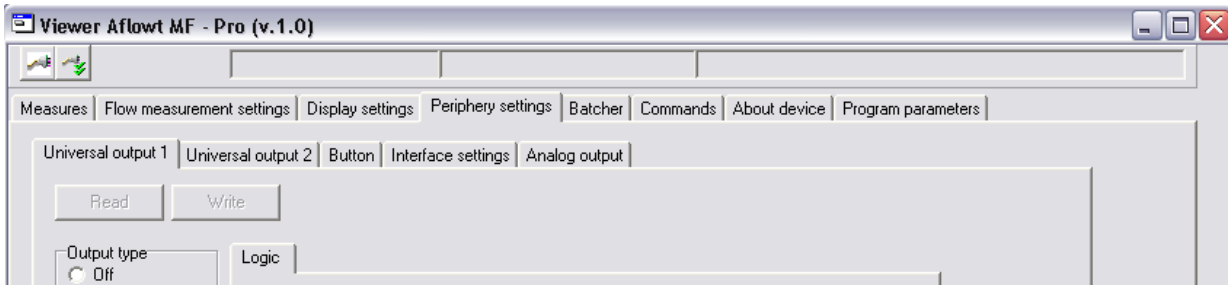

Fig.3. General View of the Periphery Settings tab.

2.1. Pulse Output Mode of the Batcher

In pulse mode, when the batching is over, a single pulse of preset duration will be sent.

To set the batcher in the pulse mode, do the following:

- in *Output type* field, set the mode to **Pulse**,
- in the *Pulse* tab, select **Batching stop signal mode** (Fig.4).

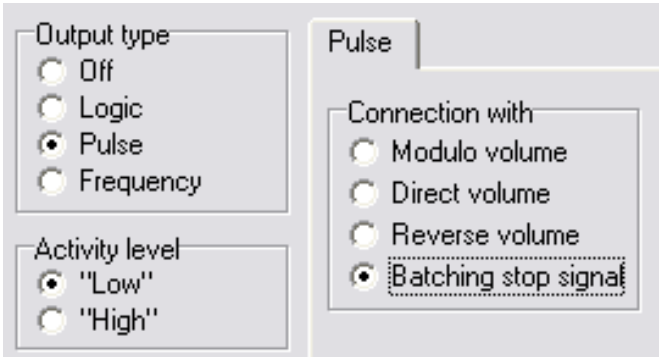

Fig.4. Connection of the pulse output with the batcher operation mode.

2.2. Logic Output Mode of the Batcher

In the logic operation mode, after batching starts, a given active level is set at the output (see below: *Activity level)*, and after a pre-set dose is filled, a passive level is set.

To set the batcher in the logic mode, do the following:

- in the *Output type* field select **Logic** operation mode,
- **in** the *Logic* tab select **Batcher signal** (Fig.5).

In the *Activity level* field set a signal level corresponding to the active mode of the batcher:

- **Low –** the signal level at the discrete (universal) output at the time of dosing will be equal to logic zero (<0,4V).
- **High –** the signal level at the discrete (universal) output at the time of dosing will be equal to logic unit (>2,4V).

The logic mode can be used to relay logic control of a valve or a pump.

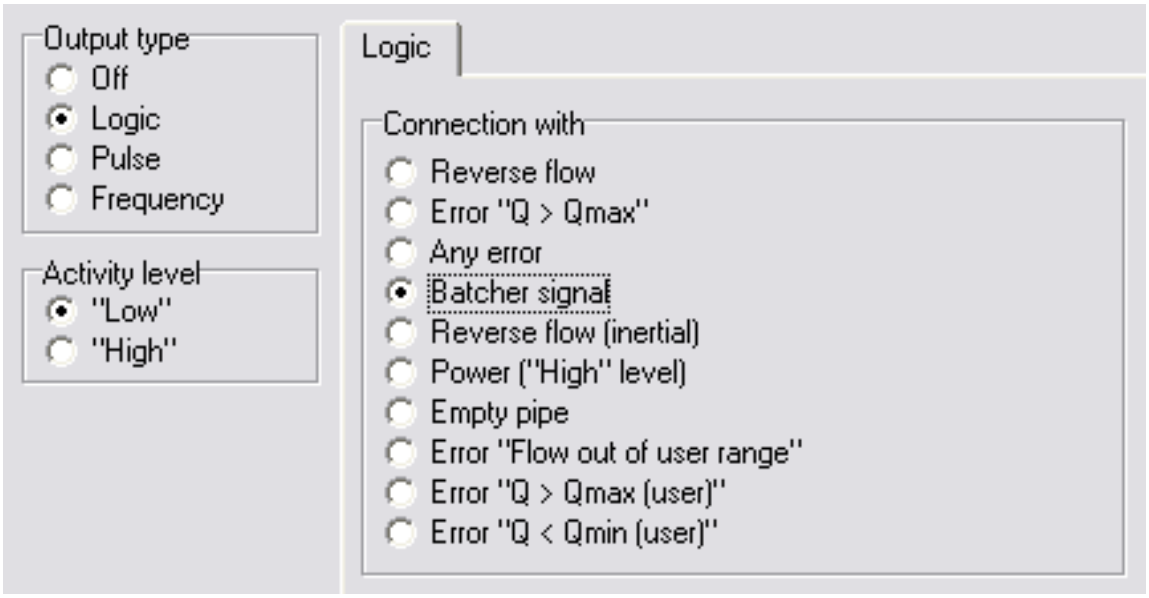

Fig.5. Connection of the logic output with the batcher operation mode.

3. Setup of the Batch Control Signal

In order to activate the batch control via an external signal or the button, link the button with the batcher.

To change the settings, go to the **Periphery Settings** \ **Button** (Fig. 3) tab and select **Start-Stop batching** (Fig. 6)**.**

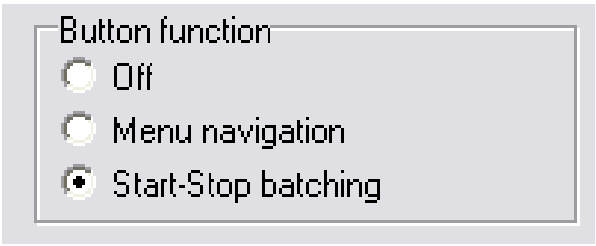

Fig. 6. Setup of the batching button.

You do not have to set this mode when you start batching from a computer or via a controller using Mod-Bus protocol.

Note: To save changes in the flowmeter settings, press **Write** button with an arrow  .

The diagram of the button connection or an external signal to the flowmeter terminals **Control input (XT4)** is shown in the Figure B.3. in Appendix B in the Operation Manual for MF-Pro.

4. Setup and Control of the Batching Mode from a PC

You can setup and manage the batcher from the **Batcher** tab (Fig. 7)**.**

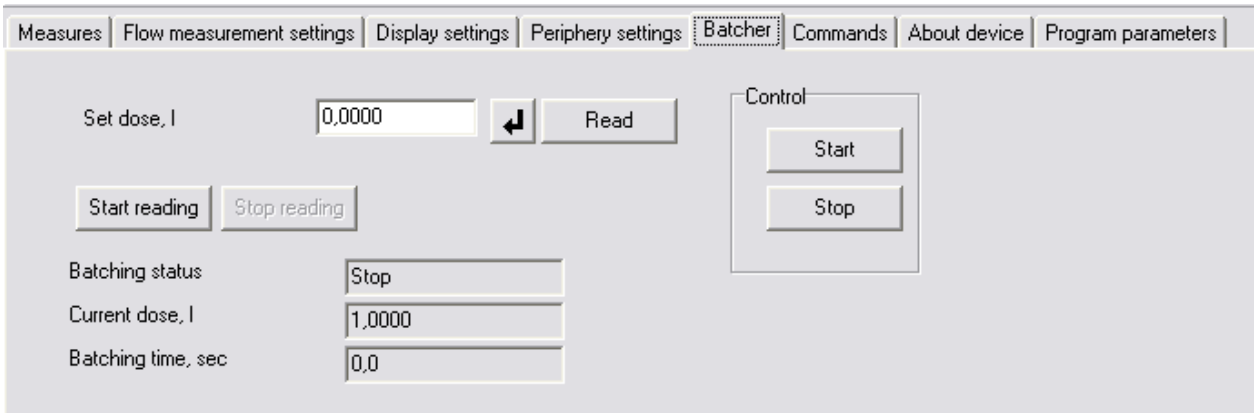

Fig. 7. Batcher setup tab.

Batching can be set in two ways:

- batching a dose
- start-stop batching

4.1. Batching a Dose

To batch a dose, you should enter the dose value (other than zero) in the **Set dose** field in the **Batcher** tab (Fig.7). The value is saved when you press ↵. To read the current value, press **<Read>**.

Batching starts when:

- the first signal comes from the control unit (for example, when the external button is pressed)

or

- when **<Start>** button in the **Batcher** tab is pressed.

Batching stops automatically when the pre-set dose is filled.

You can force stop batching in two ways:

- by repeating an input signal (for example, pressing the external button)

or

- by pressing **<Stop>** button in the **Batcher** tab.

4.2. «Start-Stop» Mode

In the **start-stop** mode, batching starts and ends with a signal and cannot be stopped automatically.

To set the flowmeter for work in the **start-stop** mode, the dose value in the **Set dose** field **in the Batcher** tab must be set to zero**. (Fig.7).** To save the value, press ↵.

To read the current value press **<Read>**.

In the **start-stop** mode, batching starts when the first signal comes to the control input (for example, when the external button is pressed) or **<Start>** command comes via the serial interface in the **Batcher** tab. Batching stops when the second signal comes to the control input or when **<Stop>** command comes via the serial interface, **Batcher** tab.

Note: The response to pressing the **<Start>** and **<Stop>** buttons in the **Batcher** tab can occur with some delay (in comparison to pressing the external button) because the program needs time to process the command and send it from a computer to a flowmeter. The length of this delay can be determined empirically for each particular hardware configuration and communication channels.

5. Information about the Current Batching Status

The current batching status is displayed in the **Batcher** tab in the following fields:

- **Batching Status**
- **Current Dose**
- **Batching Time**

To see the information about the current status press **<Start Reading>.** Periodic reading of the information about batching will be shown on the screen.

The **<Stop Reading>** button will stop displaying of the batching information and status.

6. Modbus Registers of the Batcher

It is possible to manage batching through a controller via Modbus protocol.

Logic MB address	Parameter	Type	Access levels	Limits	Notes
400026	Batcher control	unsigned char	WORK, SERVICE, VERIFICATION	0 – 2	0 – OFF 1 – start 2 – stop
400057	Button mode	unsigned char	WORK, SERVICE, VERIFICATION	0 – 2	0 – turned off 1 – navigation menu 2 – batcher
432785	Dose	float	SERVICE, VERIFICATION		„liters“
300012	Batching	unsigned char			0 – stoped 1 – started
332779	Filled dose	float			
332781	Batching time, 100 ms	unsigned long			

6.1. The Format of Register Logic Address:

- First digit – type of register memory: 4 – holding register; 3 – input register
- Other digits – serial decimal number of the register, starting from 1.

Consequently, register 400026 is a holding register with hexadecimal address 19.

Dose is defined by the dimension of "liters".