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# **Digisoft MC V1.00**

FOR DIGITAL MFC

**User's Manual**

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## 1. **DESCRIPTION**

This document describes the Digisoft MC 1.00 functionality.

Digisoft MC is a software intended to control one MFC at a time.

## 2. **COMPATIBILITY**

*This software is compatible with the following mass flow controllers:*

- AFC 310;
- AFC 410;
- AFC 510;
- LM 2100.

## 3. **REFERENCES**

Digital Mass Flow Controller MC-2000, MC-3000E Special Function Manual

Digital Mass Flow Controller MC-2000, MC-3000E, MC-4000 Command Char

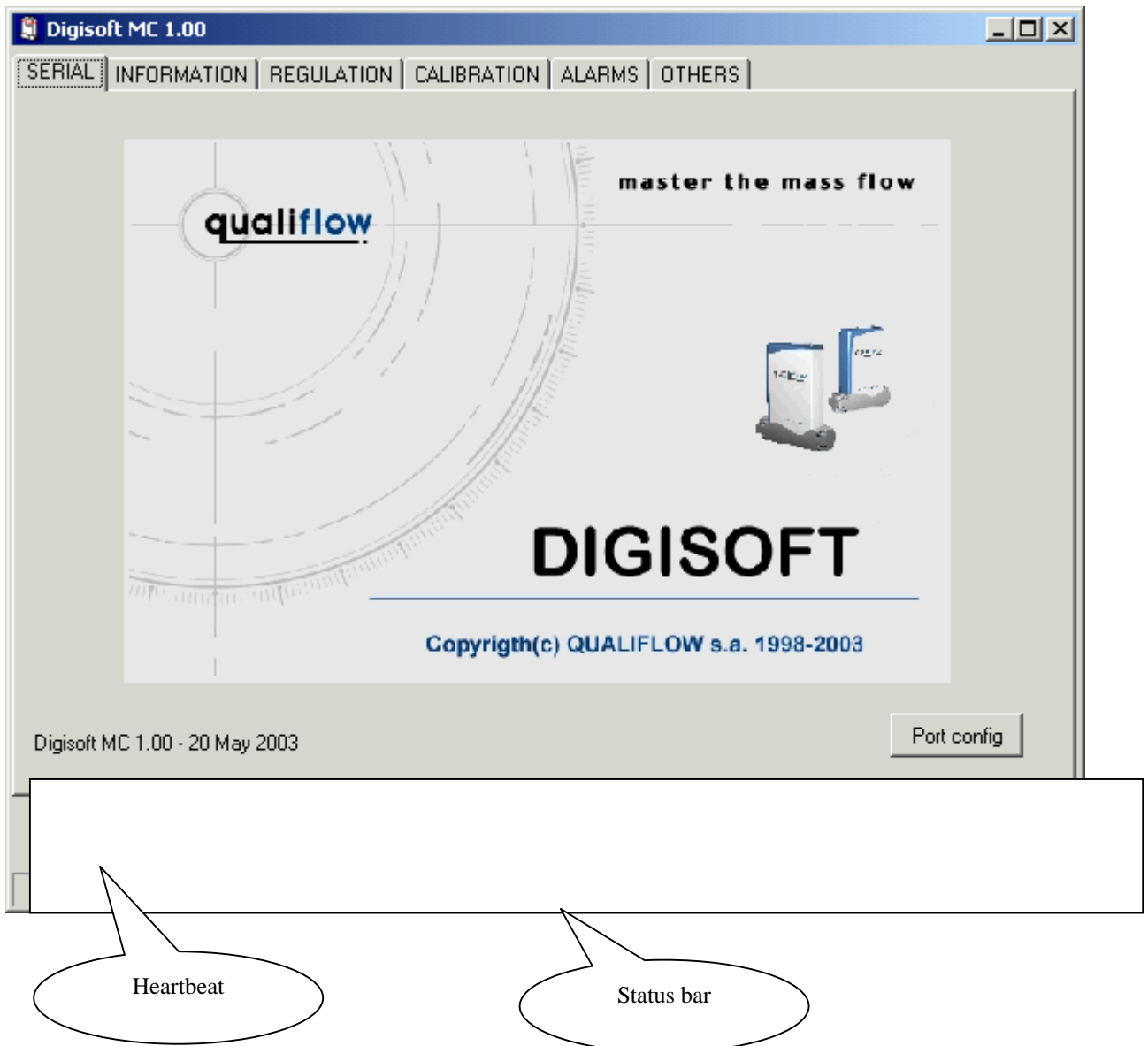
## 4. **INSTALLATION**

A setup program is available for installation.

## 5. **STARTUP**

At startup, Digisoft MC uses a broadcast message to read the identifier of the MFC wired on the serial line. In case of multiple MFC's wired on the serial line, RS-485 for instance, Digisoft MC will connect with the first MFC to answer. If only one MFC is connected, Digisoft MC connects with this MFC. It is recommended to have only one MFC on the line when using Digisoft MC.

**6. COMMON INFORMATION**



**6.1 MFC ID**

Displays the connected MFC identifier. All MFC's connected on a same network must have a different identifier.

**6.2 GROUP**

Displays the connected MFC group. Many MFC's of a same network can share the same group identifier.

Note that Digisoft MC does not implement any Group Control Message.

See 0 chapter 'Group control operation' for further group explanation.

**6.3 FULL SCALE**

Displays the MFC full scale.

### 6.4 UNIT

Displays the unit for the full scale. Usually “slm” or “sccm”.

### 6.5 PROCESS GAS

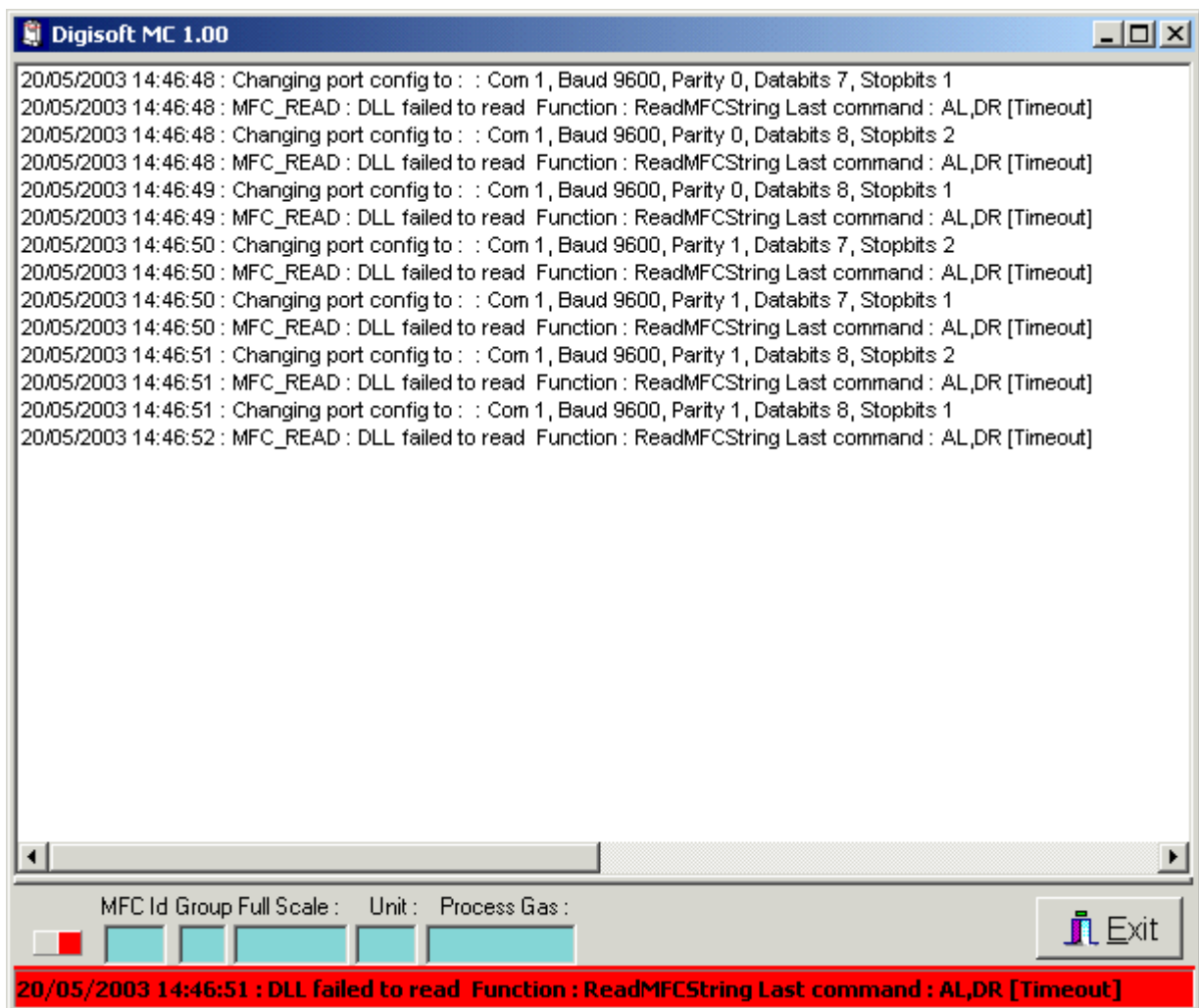
Gas symbol the MFC is calibrated for.

### 6.6 HEARTBEAT

The heartbeat is made of two squares. When communication is established with the MFC, they blink green alternatively. When communication is broken, the heartbeat blinks red.

### 6.7 STATUS BAR

Displays the last communication error. The error window can be expanded by double-clicking on status bar.



The last 500 errors are kept in a circular buffer. A contextual menu allows to clear or leave this window. A new double-click on status bar closes the window.

### 6.8 “EXIT” BUTTON

You can leave the application by pressing “Exit” button.

## 7. SERIAL

This page displays the default 'welcome' logo. To change the image, simply copy a "Qualiflow.JPG" or "Qualiflow.BMP" file in the same directory as "Digisoft\_MC.exe".

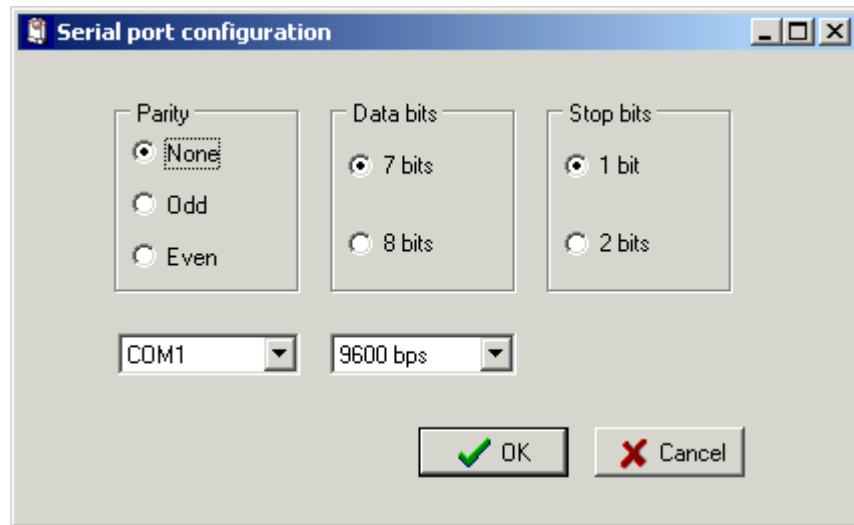
**Note that JPG file has a precedence on BMP.**

The new image would cover the actual default image area. Proportions are kept.



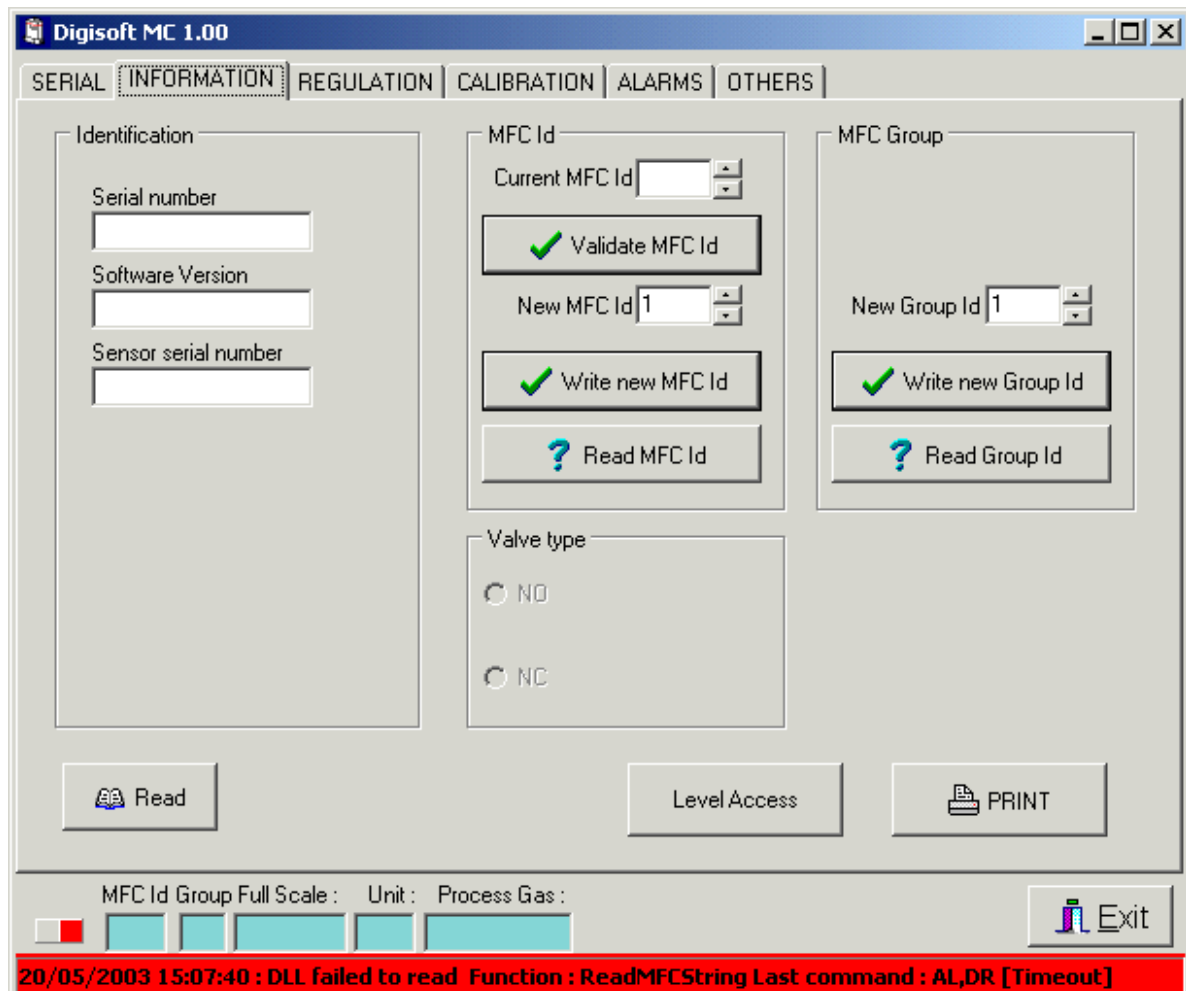
### 7.1 “PORT CONFIG” BUTTON

Pressing “Port config” button allows to configure the serial port.



PC port is immediately configured while the MFC needs to be powered off and on again.

## 8. INFORMATION



## **8.1 IDENTIFICATION GROUP**

### **8.1.1 Serial number**

Read only information.

Displays the actual “Serial number”

### **8.1.2 Software version**

Read only information.

Displays the actual “Software version”

### **8.1.3 Sensor serial number**

Read only information.

Displays the actual “Sensor serial number”

## **8.2 MFC ID GROUP**

### **8.2.1 Current MFC Id**

Range : [0 .. 99]

Select the identifier of the MFC you want to connect to.

### **8.2.2 “Validate MFC Id” button**

Connect to the MFC identified in chapter 8.2.1

### **8.2.3 New MFC Id**

Range : [0 .. 99]

Select the new identifier for the connected MFC.

### **8.2.4 “Write new MFC Id” button**

Change the identifier of the connected MFC.

### **8.2.5 “Read MFC Id” button**

For this function work, only one MFC must be connected on the serial line.

## **8.3 VALVE TYPE**

Read only information.

Range : “Normally Open”, “Normally Closed”.

## 8.4 MFC GROUP

### 8.4.1 New Group Id

Range : ['A'..'Z', 0 .. 99]

Select the new group identifier for the connected MFC.

### 8.4.2 Write new Group Id

Change the group identifier of the connected MFC.

See 0 chapter 'Group control operation' for further group explanation.

### 8.4.3 Read group Id

## 8.5 “READ” BUTTON

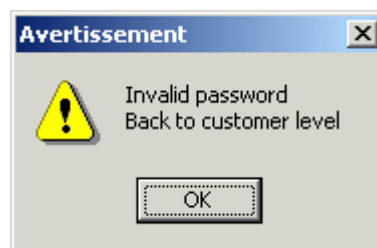
Read the group identifier of the connected MFC.

## 8.6 “LEVEL ACCESS” BUTTON

The password mechanism is not case sensitive.



Any other password leads to the following message :



### 8.7 “PRINT” BUTTON

Print the MFC configuration on default printer.

Note fake data is this documentation.

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**qualiflow**

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**DIGITAL FLOW CONTROLLER CONFIGURATION STATE**

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*Serial port*

<b>Baud rate :</b>	9600
<b>Parity :</b>	Odd
<b>Data bits :</b>	8
<b>Stop bits :</b>	2

*Identification*

<b>MFC Serial Number :</b>		<b>MFC address :</b>	
<b>Sensor Serial Number :</b>		<b>MFC group :</b>	
<b>Valve Type :</b>	NC		
<b>Microcontroller Soft Version :</b>			

*Control management*

<b>Setpoint :</b>	Digital
<b>Ramp rate :</b>	s
<b>2% control :</b>	QR2PercentControl

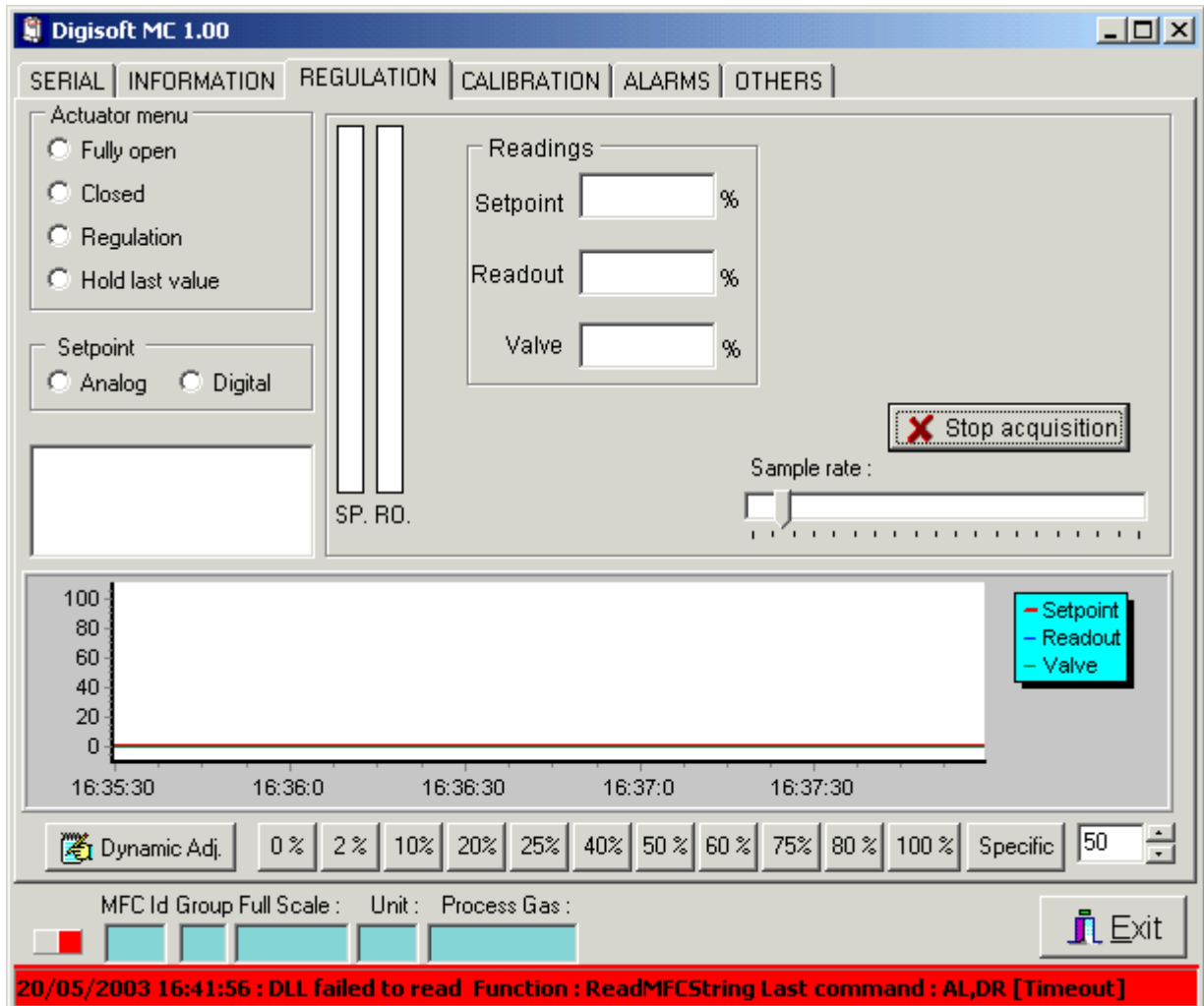
*Alarm management*

<b>Alarm timer :</b>	s	
<b>Alarm A :</b>	ON	% of FS
<b>Alarm B :</b>	ON	% of FS

*Integration management*

<b>Total flow :</b>	Off	FS
<b>Alarm 1 :</b>	Off	FS
<b>Alarm 2 :</b>	Off	FS

## 9. REGULATION



### 9.1 ACTUATOR MENU GROUP

#### 9.1.1 Fully open

Force the valve to open completely.

#### 9.1.2 Closed

Force the valve to close completely.

#### 9.1.3 Regulation

Allow the valve to operate in normal mode, that is regulation.

#### 9.1.4 Hold last value

Freeze the valve voltage to the current value.

**9.2 SETPOINT GROUP**

**9.2.1 Analog**

Accept analog setpoint.

**9.2.2 Digital**

Accept digital setpoint via serial communication line.

**9.3 READINGS GROUP**

**9.3.1 Setpoint**

Displays the setpoint in percent of full scale.

Also displayed in SP bar graph.

**9.3.2 Readout**

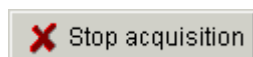
Displays the readout in percent of full scale.

Also displayed in RO bar graph.

**9.3.3 Valve**

Displays the valve voltage in percent of full scale.

**9.4 “STOP ACQUISITION” BUTTON**



Alternately stops or starts the data acquisition.

**9.5 “SAMPLE RATE” TRACK BAR**

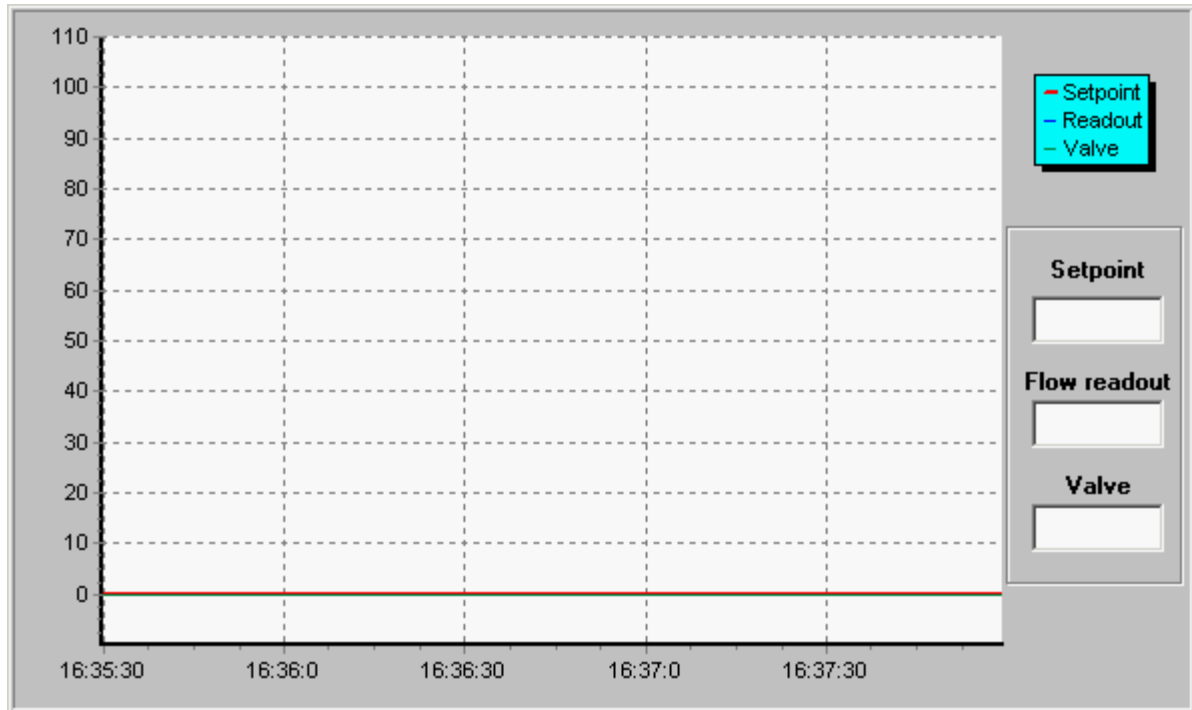
Range : [200..4000] ms

Slide the cursor to adjust the data acquisition rate.

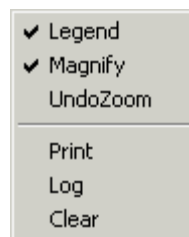
## 9.6 GRAPH AREA

Displays the real time curve for Setpoint, Readout and Valve voltage. Unit is percent of full scale.

A double click on graph area expands the window..



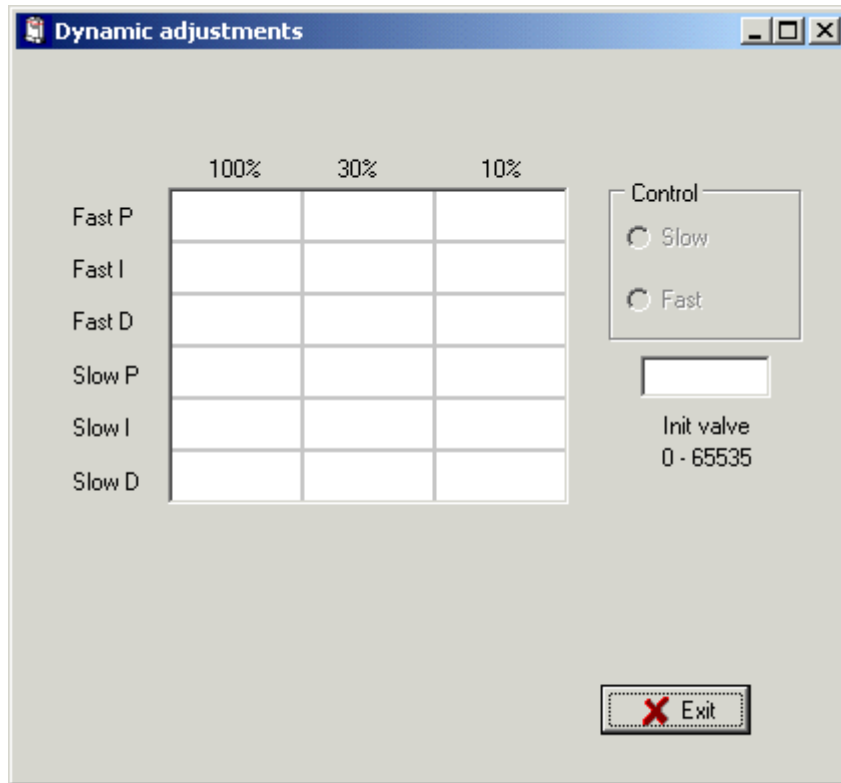
A contextual menu is also available



It is recommended to expand the window before printing.

### 9.7 “DYNAMIC ADJ.” BUTTON

Open the following window.

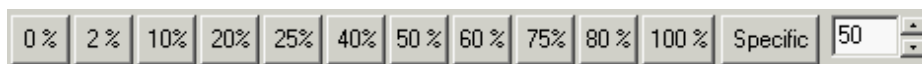


This window gives access to PID and control parameters.

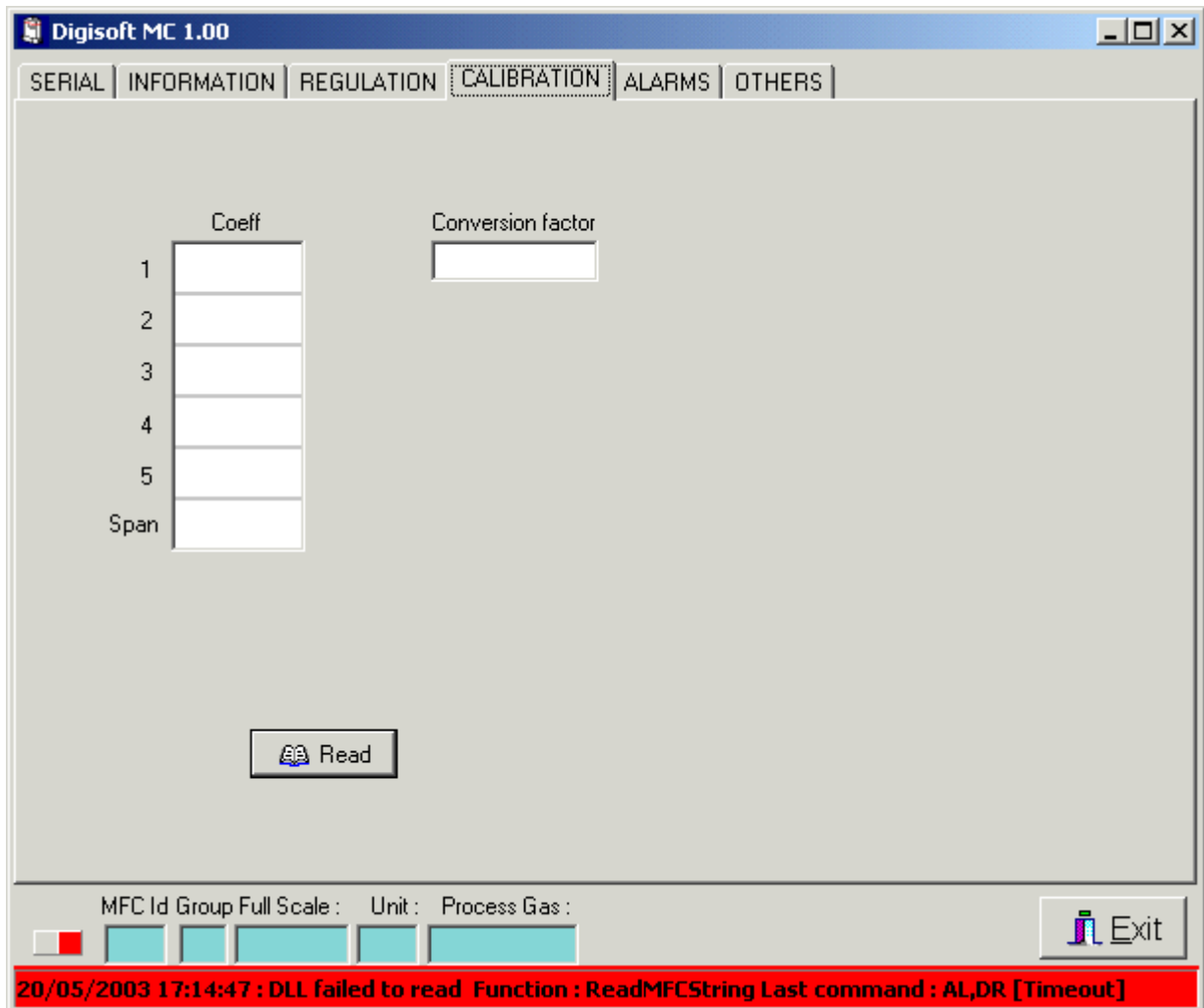
See appropriate MFC documentation for further explanation on these values.

### 9.8 SETPOINT SETTING BUTTONS

Give to setpoint setting.



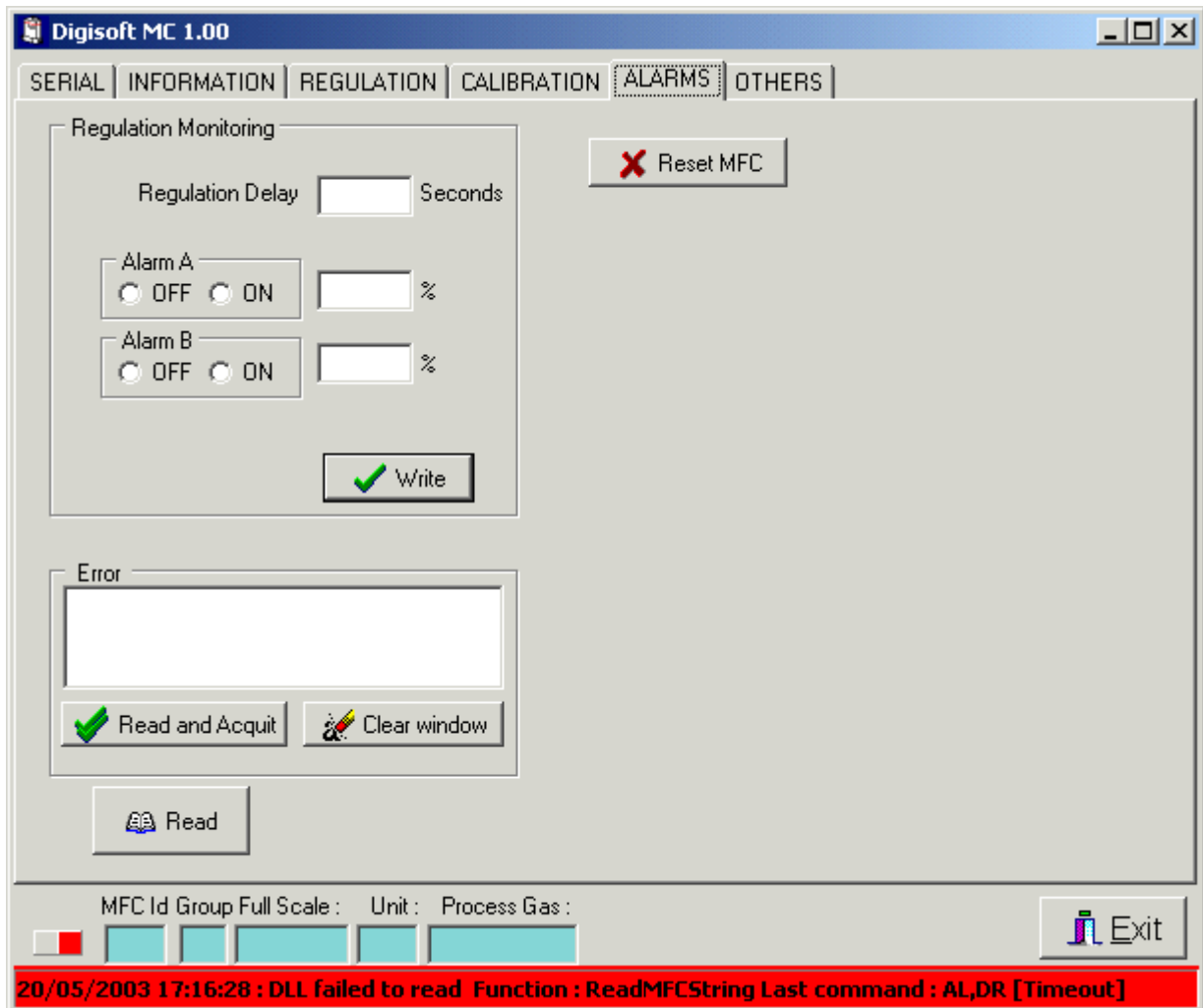
## 10. CALIBRATION



Give access to calibration parameters.

See appropriate MFC documentation for further explanation on these values.

## 11. ALARMS



### 11.1 REGULATION MONITORING AREA

#### 11.1.1 Regulation delay

Range : [0..99]

Delay before the regulation alarm is taken into account.

#### 11.1.2 Alarm A

Range : [0..99]

Band of acceptable mismatch between setpoint and actual flow.

**IF** the mismatch is greater than “Alarm A range”  
**AND** regulation delay is elapsed  
**THEN** Alarm A is triggered.

### 11.1.3 Alarm B

Range : [0..99]

Band of acceptable mismatch between setpoint and actual flow.

**IF** the mismatch is greater than “Alarm B range”  
**AND** regulation delay is elapsed  
**THEN** Alarm B is triggered.

### 11.1.4 “Write” button

Write new alarm values.

Note that radio buttons are immediately executed.

## 11.2 ERROR AREA

### 11.2.1 Display

Possible text is one “Code 1” plus one “Code 2” lines.

- 'Code 1 : Normal'
- 'Code 1 : Power supply voltage drop'
- 'Code 1 : Access error'
- 'Code 1 : EEPROM access error'
- 'Code 1 : Flow integration Alarm level 2'
- 'Code 1 : Setpoint <> readout'
- 'Code 1 : Unknown ##'
- 'Code 2 : Normal'
- 'Code 2 : Zero offset large'
- 'Code 2 : Sensor output'
- 'Code 2 : Sensor current'
- 'Code 2 : Sensor bridge voltage'
- 'Code 2 : Valve voltage'
- 'Code 2 : Flow integration Alarm level 1'
- 'Code 2 : Unknown ##'

### 11.2.2 “Read and acquit” button

Read and acknowledge the pending error. If the error is persistent, it will show up again.

### 11.2.3 “Clear window” button

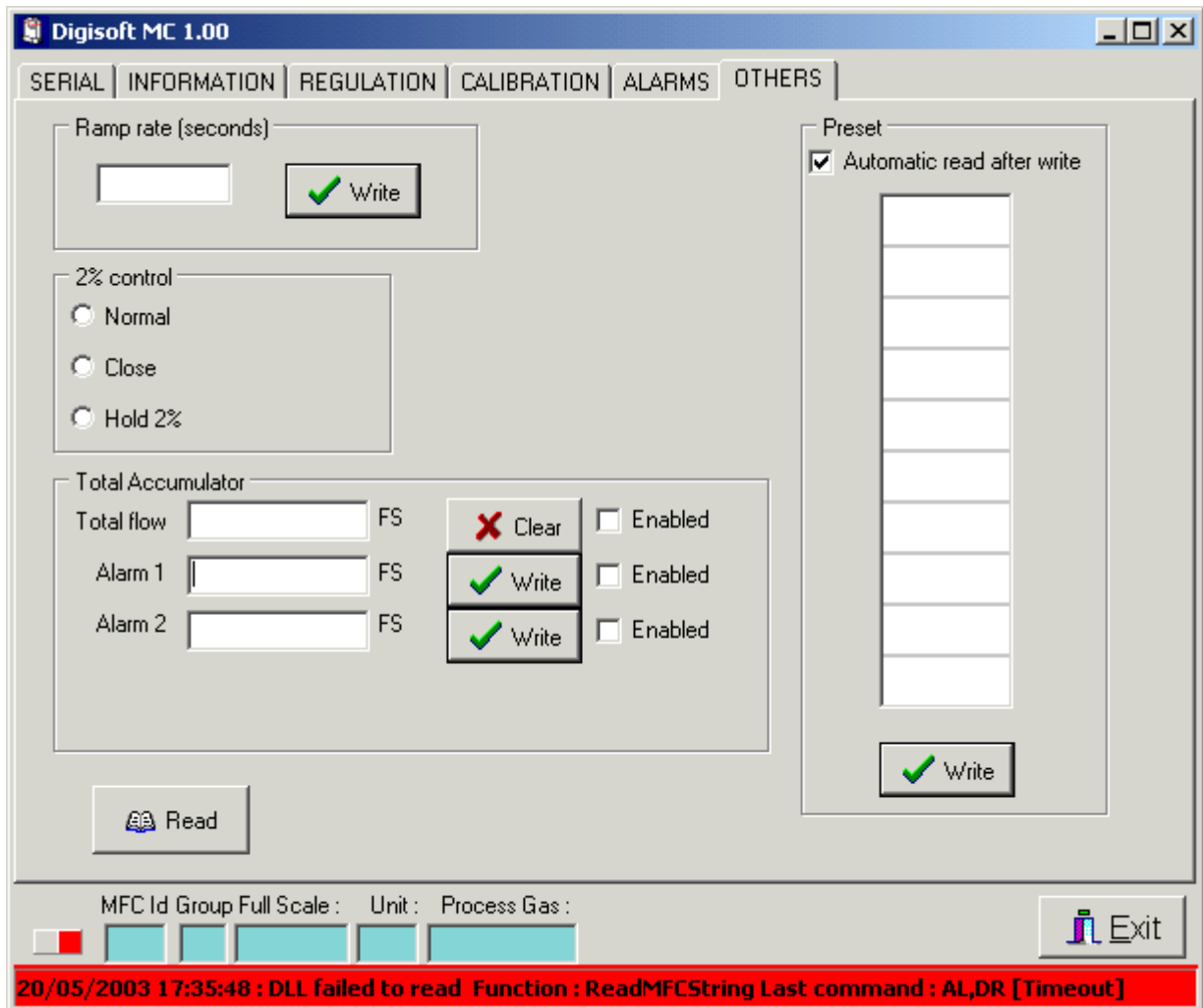
Clear the window.

## 11.3 “RESET MFC” BUTTON

Resets the MFC.

Note that resetting this way an MFC is not valid when changing the serial port configuration. See chapter 7.1 for further detail.

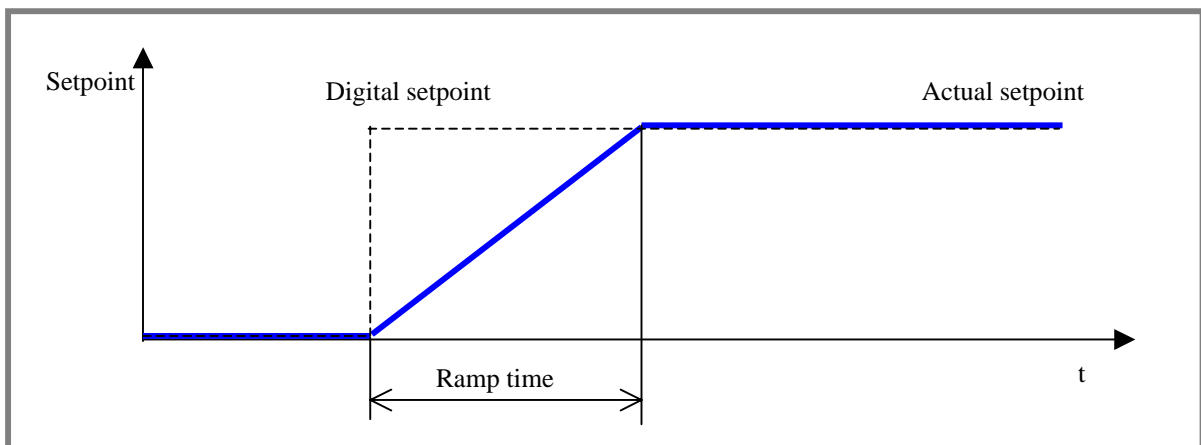
## 12. OTHERS



### 12.1 RAMP RATE

Range : [0..1310] seconds

Set the time for the actual setpoint reach the new indicated setpoint. The actual setpoint will crawl linearly from previous setpoint to next setpoint.



## **12.2 2% CONTROL AREA**

This area defined the behavior of the MFC for a setpoint lower than 2%.

### **12.2.1 Normal**

The MFC operates normally and tries to regulate for setpoints smaller than 2%

### **12.2.2 Close**

The MFC closes the valve for setpoints smaller than 2%

### **12.2.3 Hold 2%**

The MFC maintains the control at 2% for a setpoint smaller than 2%.

## **12.3 “TOTAL ACCUMULATOR” AREA**

### **12.3.1 Total flow**

Displays the total amount of gas flown through the MFC since this value was cleared.

See 0 chapter ‘Flow rate integration function’ for further explanation.

### **12.3.2 Alarm 1**

Set the first alarm level.

### **12.3.3 Alarm 2**

Set the second alarm level.

## **12.4 PRESET AREA**

Set the table of ten preset setpoints.

See 0 chapter ‘Presetting of flow value’ for further explanation.

oOo