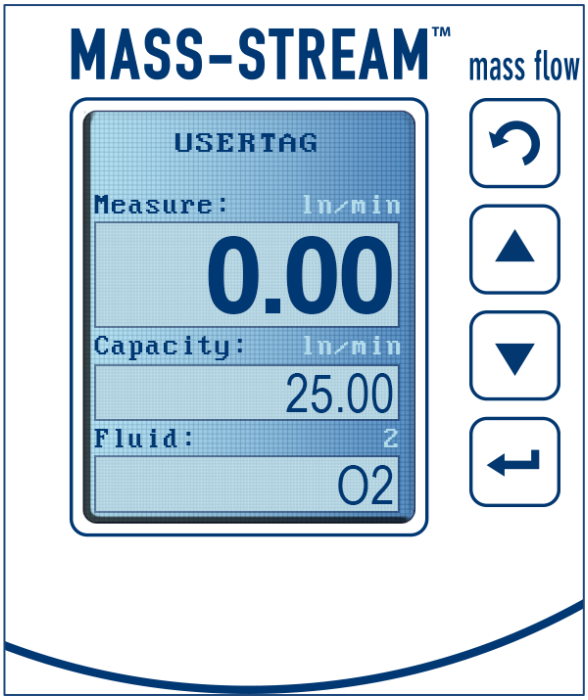
MASS-STREAM™
Instruction Manual

Multi-Functional Display of the Digital D-6300 Mass Flow Meters / Controllers

Doc. no.: 9.17.105A Datum: 04-10-2016



ATTENTION

Before operating the multi-functional display it is strongly recommended that this appendix and the instruction manual should be read carefully. Not following the guidelines could result in personal injury and/or damage to the equipment!

SCOPE OF THIS INSTRUCTION MANUAL

This appendix to the instruction manual covers the operation of the multi-functional display. The instruments with display will be delivered with a standardized configuration. For the quickest way to get the instruments operational in your system please refer to the Instruction Manual *MASS-STREAM™ D-6300 Digital Mass Flow Meters / Controllers*.

ATTENTION!

Prior to any activity or operation it is strongly recommended that full attention is given to all relevant Bronkhorst® information in the *Instruction Manual MASS-STREAM™ D-6300 Digital Mass Flow Meters / Controllers* for the installation, start-up and operation as well as to this appendix for operating the multi-functional display!

The information in this appendix has been reviewed and is believed to be wholly reliable. No responsibility, however, is assumed for inaccuracies. The material in this appendix is for information purposes only and it is subject to change without notice.

Table of Contents

1 Overview of Display Functionalities in Normal Mode

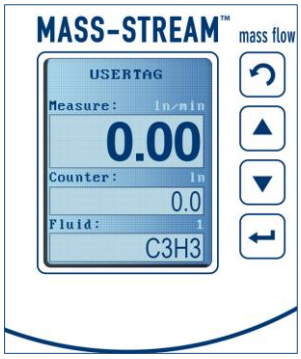
Display functionalities					Operation
Readout	- Actual				via display only
	- Percentage				via display only
	- Fluid selection	- Fluid	- Gas 1		also via FlowDDE
			- Gas 2		also via FlowDDE
			...		also via FlowDDE
			- Gas 8		also via FlowDDE
Controller	- Speed	- User defined number			also via FlowDDE
	- Slope	- User defined number			also via FlowDDE
	- Mode	- Analog input			also via FlowDDE
		- Bus/RS232			also via FlowDDE
		- RS232			also via FlowDDE
		- FB ana slave			also via FlowDDE
		- Analog slave			also via FlowDDE
		- FB slave			also via FlowDDE
		- Valve open			also via FlowDDE
		- Valve close			also via FlowDDE
		- Control idle			also via FlowDDE
		- Setpoint 100%			also via FlowDDE
		- Setpoint 0%			also via FlowDDE
	- PID Controller	- PID-Kp	- User defined number		also via FlowDDE
		- PID-Ti	- User defined number		also via FlowDDE
		- PID-Td	- User defined number		also via FlowDDE
		- Response	- Open from zero	- User defined number	also via FlowDDE
			- Normal step	- User defined number	also via FlowDDE
			- Stable situation	- User defined number	also via FlowDDE
Counter	- Mode	- Off			also via FlowDDE
		- Up to limit			also via FlowDDE
		- Up			also via FlowDDE
	- Reset	- Automatic			also via FlowDDE
		- Manual			also via FlowDDE
	- Unit	- (See table in manual)			also via FlowDDE
	- Limit	- User defined number			also via FlowDDE
	- Setpoint step	- No			also via FlowDDE
		- Yes			also via FlowDDE
	- Setpoint	- User defined number			also via FlowDDE

Display functionalities					Operation
Alarm	- Mode	- Min/Max			also via FlowDDE
		- Off			also via FlowDDE
		- Power-up			also via FlowDDE
		- Response			also via FlowDDE
	- Reset	- Automatic			also via FlowDDE
		- Manual			also via FlowDDE
	- Min Alarm	- User defined number			also via FlowDDE
	- Max Alarm	- User defined number			also via FlowDDE
	- Delay	- User defined number			also via FlowDDE
	- Setpoint step	- No			also via FlowDDE
		- Yes			also via FlowDDE
	- Setpoint	- User defined number			also via FlowDDE
Setup	- Info	- Usertag	- User defined data		also via FlowDDE
		- Serial			read only
		- Model			read only
		- Firmware instrument			read only
	- Customize	- Info top	- Usertag		via display only
			- Serial		via display only
		- Info middle	- Capacity		via display only
			- Counter		via display only
			- Valve		via display only
			- Setpoint		via display only
		- Setpoint	- Step		via display only
			- Cursor		via display only
	- Display	- Brightness	- User defined number		via display only
		- Screensaver	- On		via display only
			- Off		via display only
		- Delay	- User defined number		via display only
	- Bus	- Bus	- Bus type if applicable		read only
		- Node address	- User defined number		also via FlowDDE
Advanced	Sensor	dyn filer	- User defined number		also via FlowDDE
(if activated)		stat filter	- User defined number		also via FlowDDE
	Autozero	cancel			via display only
		start auto zero			via display only
	Restore	cancel			via display only
		Start restore			via display only

2 Operation

The modern, multi-colored TFT-display has a very user-friendly design and it is easy to read. The digital communication via RS232 or fieldbus interface remains fully accessible. The mass flow meters and controllers with the integrated multi-functional display (in succession called display) are fully compliant with IP-65 protection.

2.1 Operator buttons on the instrument



→ ***Back***
→ ***Up***
→ ***Down***
→ ***Enter***

There are data fields with fixed pre-settings and some for individual texts. The selection and the data entry are carried out with ***Up*** and ***Down***.

By repeating ***Up*** or ***Down*** letters and/or numbers are selected and set with ***Enter***. Pressing ***Up*** will show letters in alphabetical order, first small letters - then capitals, and the numbers 0-9 come last. Pressing ***Down*** will show the numbers first, being then followed by capitals and small letters in reversed order. Blanks are generated with ***Enter***.

The device has an adjustable screen saver which will be de-activated by pressing ***Enter*** once.

2.2 Standard display

After powering-up and initiating, the instrument display automatically shows the 3 data fields. The most recent set-up is initially seen in case that the instrument has already been in operation. In case of a power shut-down the display will be set according to the factory settings.

The upper data field always displays the reading, either in [unit] or in [%] (please refer to page 9: Operation Examples ‘Readout’).

The middle and lower data field can be individually adjusted by pre-settings. The following displayed possibilities for mass flow meters and mass flow controllers are available:

2.2.1 Display of mass flow meters

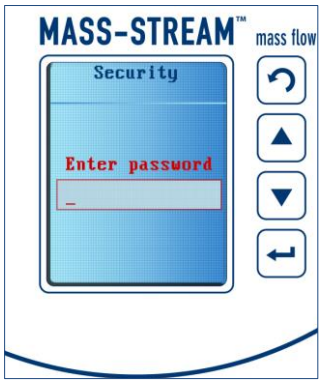
Upper display:	Measure	(= actual flow)	in	[unit] or [%]
	4 digits	acc. to flow rate *0.000 ; 00.00 ; 000.0* or *0000*		
Middle display:	Capacity	(= flow rate)	in	[unit]
or	Counter	(= totalizer)	in	[unit]
		7 digits (max. 9999999)		
Lower display:	Fluid	(= calibrated gas)	in	[no. of calibration curve]
or	Counter	(= totalizer)	in	[unit]
or	Alarm			
or	Capacity	(= flow rate)	in	[unit]

2.2.2 Display of mass flow controllers

Upper display:	Measure	(= actual flow)	in	[unit] or [%]
	4 digits	acc. to flow rate *0.000 ; 00.00 ; 000.0 or 0000*		
Middle display:	Counter	(= totalizer)	in	[unit]
		7 digits (max. 9999999)		
or	Valve		in	[%]
or	Setpoint		in	[unit]
or	Capacity	(= flow rate)	in	[unit]
Lower display:	Fluid	(= calibrated gas)	in	[no. of calibration curve]
or	Setpoint		in	[unit]
or	Valve		in	[%]
or	Counter	(= totalizer)	in	[unit]
or	Alarm			
or	Capacity	(= flow rate)	in	[unit]

For each mass flow meter and controller the individual screen settings of the lower display can be successively selected with ***Back***.

2.3 Password protection

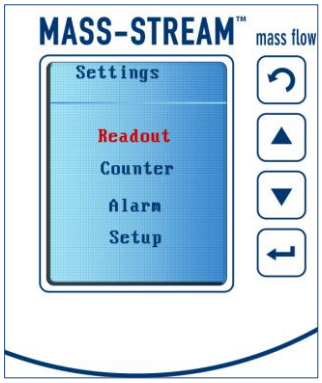


A password upon delivery protects the device from unauthorized operation and data entry via the local operator buttons. The factory settings for the password are „abc“ plus 5 blanks. ***Enter*** activates the screen and the password is entered with ***Up***, ***Down***, and ***Enter***.

A description of additional display functionalities in a special mode, including how to store an individual password, can be found on page 22.

2.4 Individual settings

Individual settings and the monitoring of additional information is possible via the serial interface as well as via the local operator buttons on the instrument, like resetting the counter, defining a bus address or entering device-specific data. The latest data entry is always valid, regardless whether it has been performed via interface or operator button.



The main menu is opened with ***Enter*** and the requested data field can be selected with ***Up*** or ***Down***. Another ***Enter*** confirms and opens the selection.

A little white triangle on the display's bottom right indicates more data fields in the selected menu.

Pressing ***Back*** several times leads to the main menu first and then to the display screen in operation.

Within each menu the settings can be performed and changed in the same manner. The actual opened data field is marked with text or cursor in red colour. Each menu has a variety of fixed pre-settings or a data field for individual text entries.

The procedure how to change the display settings individually is illustrated with the help some examples on the following pages.

The overview on pages 3 and 4 comprises all menu settings as well as the referring parameters and/or settings. The overview indicates which parameters can be adapted on the instrument only and which can be also adapted via communication with the accompanying software ‚FlowDDE'. This Bronkhorst® software is a set part of the documentation that accompanies every delivery of digital MASS-STREAM™ D-6300 mass flow meters and controllers.

2.5 Setpoint adjustment

On mass flow controllers the setpoint can be adjusted via the operator buttons, given the instrument had been delivered with „digital pre-settings".

In case the mass flow controller had been ordered with „analog pre-settings", the pre-settings can be changed via the display. There are examples on the following pages.

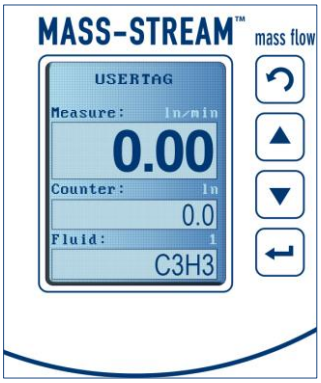
Furthermore the control characteristics of valve can be modified by changing the PID-settings via the display.

ATTENTION!

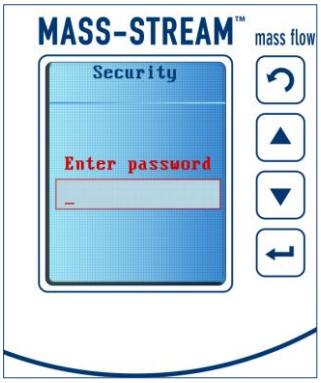
In the event of power loss or when unplugging the main connector the instrument will be reset into factory settings (=delivery condition).

3 Operation Examples

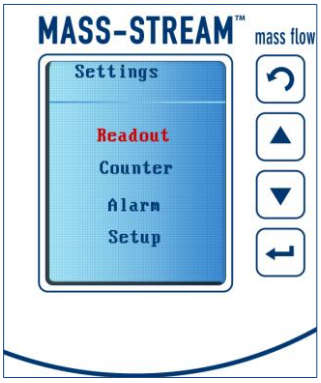
3.1 Operation example: Adjustment of readout display [unit] ⇔ [%]



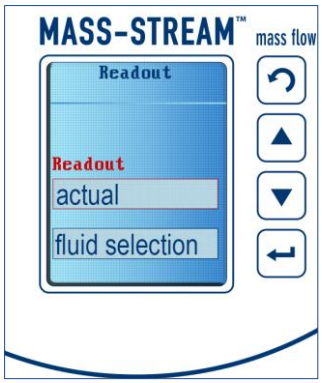
→ ***Enter***



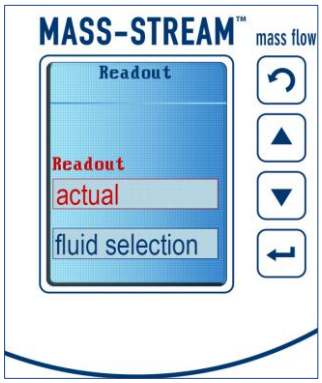
→ ***Up*** / ***Down*** **and** ***Enter***



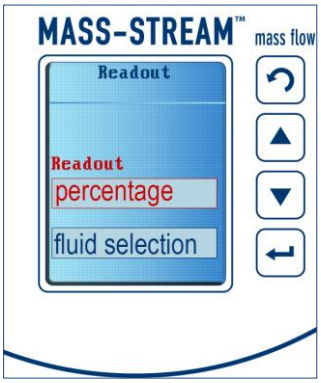
→ ***Enter***



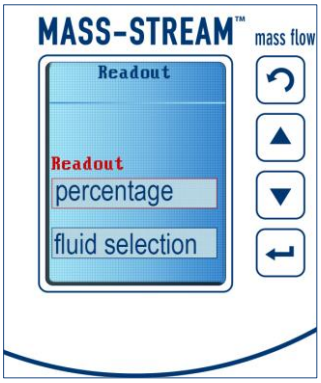
→ ***Enter***



→ ***Up / Down***



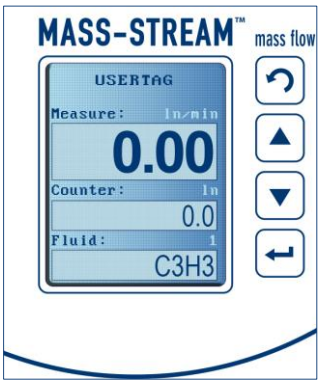
→ ***Enter***



→ ***Back***

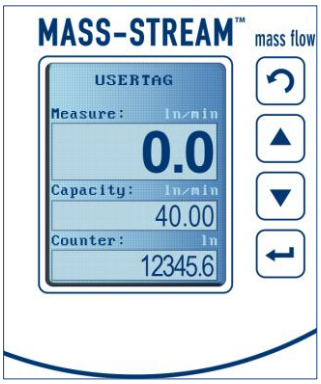
(in main menu)

3.2 Operation example: Counter – Reset

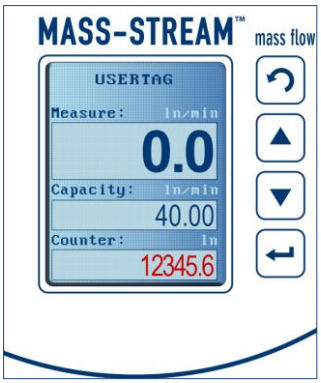


→ ***Back***

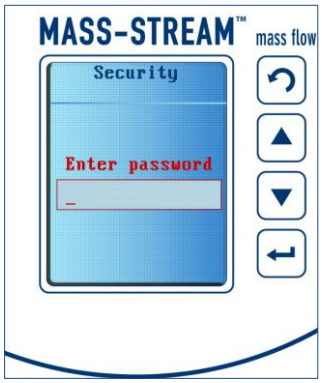
(until counter is displayed)



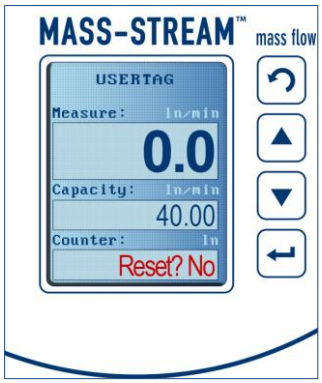
→ ***Down***



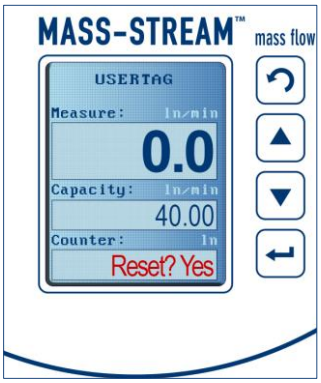
→ ***Enter***



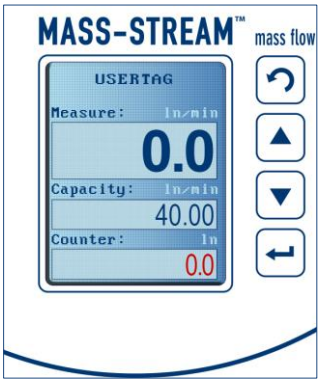
→ ***Up*** / ***Down*** **and** ***Enter***



→ ***Up / Down***



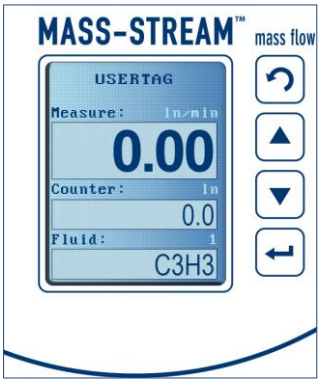
→ ***Enter***



→ ***2 x Back***

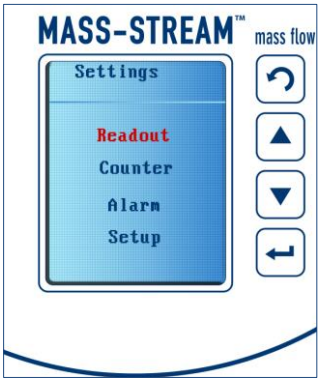
(in main menu)

3.3 Operation example: Selection of an additional flow curve (if applicable)



→ ***Enter***

→ ***Up*** / ***Down*** and ***Enter***



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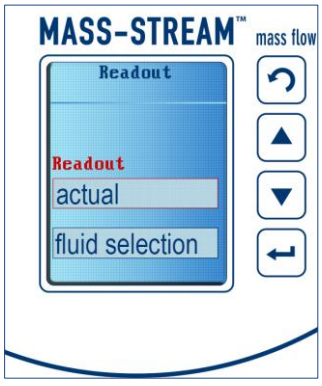
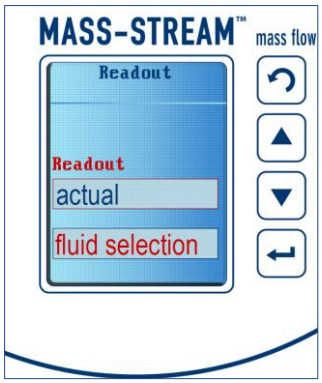
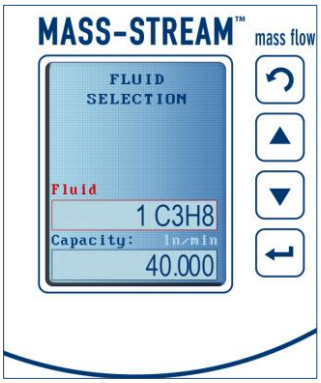


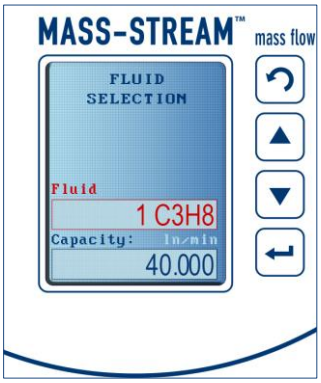
→ ***Down***



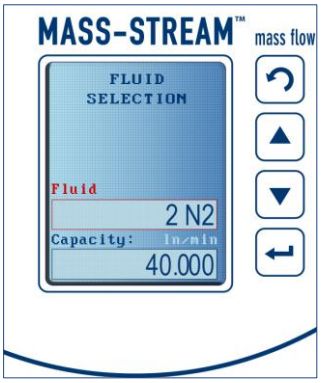
→ ***Enter***



→ ***Enter***



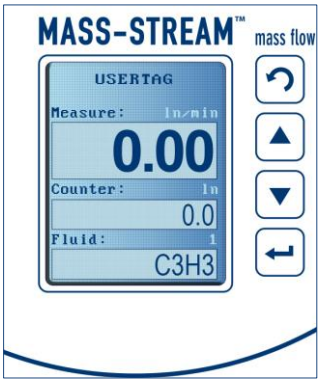
→ ***Up / Down***



→ ***3 x Back***

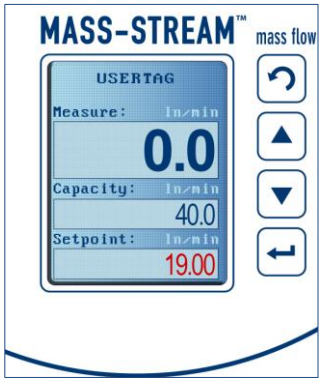
(in main menu)

3.4 Operation example: Setpoint change of controllers (requires digital pre-settings)

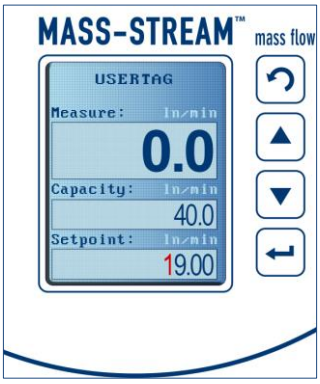


→ ***Back***

→ ***Up / Down***

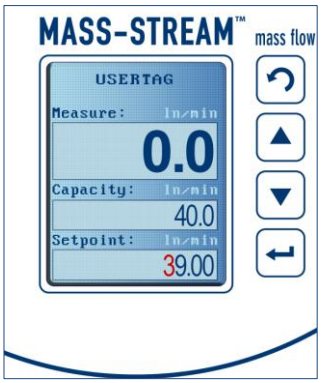


→ ***Enter***

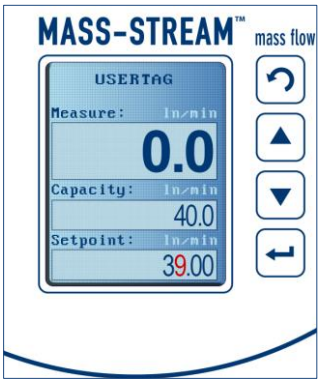


→ ***Up / Down***

enter required value

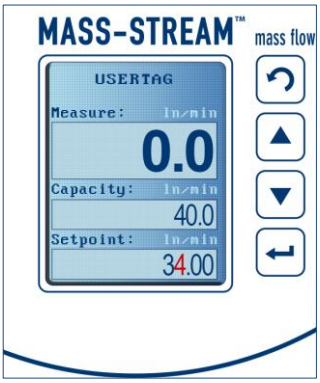


→ ***Enter***



→ ***Up / Down***

enter required value



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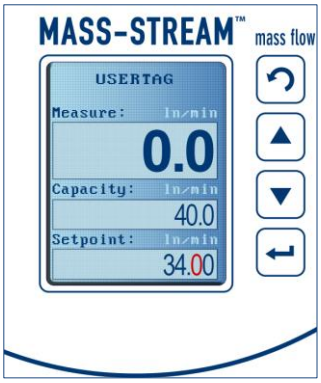
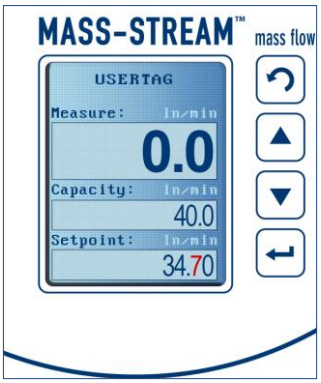


→ ***Up / Down***

Enter required value



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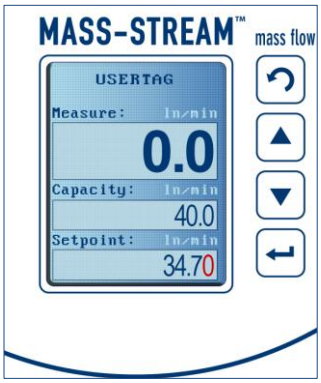
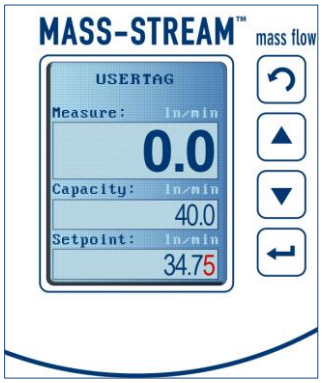
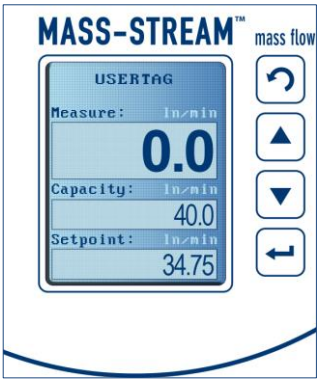


→ ***Up / Down***

enter required value

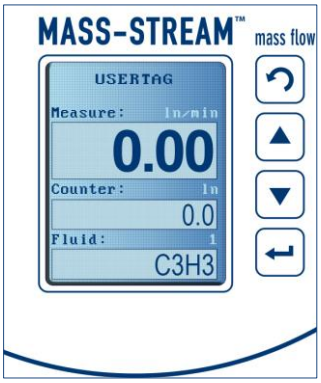


→ ***Enter***



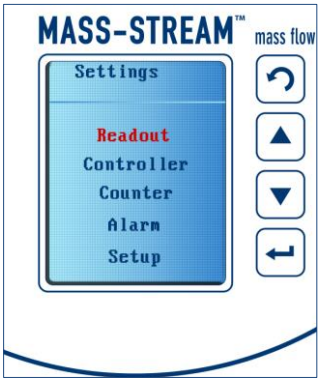
→ ***Zurück***

3.5 Operation example: Pre-settings change of controllers [digital] ⇔ [analog]

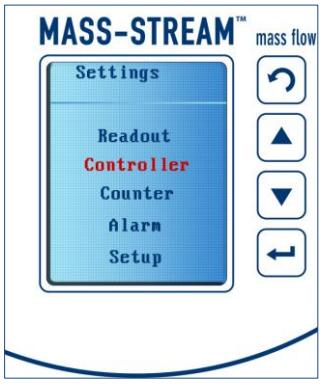


→ ***Enter***

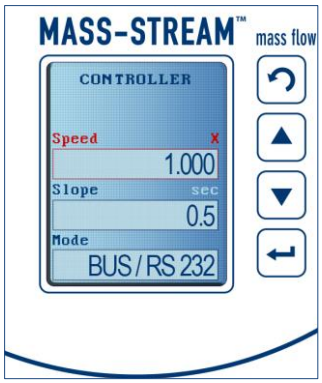
→ ***Up*** / ***Down*** **and** ***Enter***



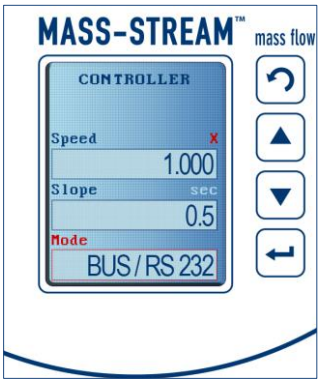
→ ***Down***



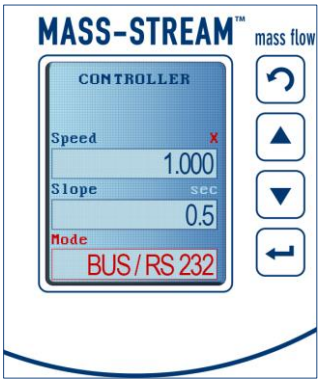
→ ***Enter***



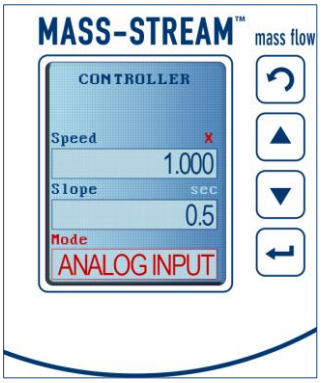
→ ***2 x Down***



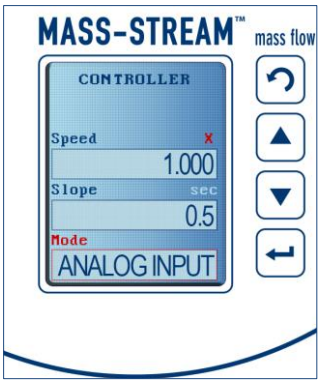
→ ***Enter***



→ ***Up / Down***



→ ***Enter***



→ ***2 x Back***

(in main menu)

The PID-settings for the control characteristics can be adjusted in the same menu „Controller“.

4 Overview of Display Functionalities in Special Mode

To activate the special mode press ***Up*** and ***Down*** simultaneously for a minimum of 4 seconds			
Display functionalities			**Operation**
Enter Password	-		only via display
	Edit setpoint	- password	only via display
		- disable	only via display
		- enable	only via display
	Reset counter	- password	only via display
		- disable	only via display
		- enable	only via display
	Reset alarm	- password	only via display
		- disable	only via display
		- enable	only via display
	Settings menu	- password	only via display
		- disable	only via display
		- enable	only via display
	Advanced	- password	only via display
		- disable	only via display
		- enable	only via display
	New password	- confirm	only via display