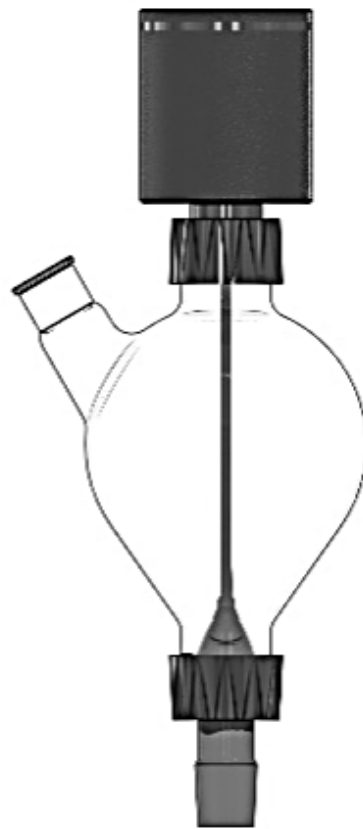


LAMBDA POWDER DISPENSER

Revision 4/2026

MANUAL



DOSER Touch.



TABLE OF CONTENTS

1.	Technical description.....	5
1.1	Technical parameters	5
1.2	Device description – dosing unit.....	6
1.3	Device description – control unit.....	6
2	Bottles	7
3	Dispensers.....	8
3.1	Dispensing ring standard 10 mm	9
3.2	Dispensing ring medium 6 mm.....	9
3.3	Dispensing ring reduced 2 mm	9
3.4	Dispensing ring long 10 mm	9
4	Power supply connection	10
4.1	Power supply for stand-alone Doser touch	10
4.2	Power supply for remote-controlled usage	10
5	Installation.....	11
5.1	Bottle assembly.....	11
5.2	Dose unit bottle connection	12
5.3	Dose unit bottle un-connection	13
5.4	Dose unit – status light color codes.....	14
6	Dosage control methods	15
6.1	Fixed value.....	15
6.2	Pre-defined program.....	16
6.2.1	Program overview.....	17
6.2.2	Chart view	17
6.3	Dose by time	18
6.4	Dose by amount.....	19
6.5	Set digital speed	20
6.6	Set flow rate	20
7	Function MAXIMUM	21
8	Remote mode.....	21
9	Main menu.....	22
9.1	Control method	22
9.2	Remote mode.....	23
9.3	Program library	23

9.4	Calibration.....	23
9.5	Settings	24
9.5.1	Common.....	24
9.5.2	Units.....	24
9.5.3	Display.....	24
9.5.4	Sound	25
9.5.5	Programs.....	25
9.5.6	Remote 2 I/O	25
9.5.6.1	RS-485 parameters	25
9.5.6.2	Input remote	26
9.5.6.3	Master control input	26
9.5.7	Substances enable	27
9.5.8	Device information.....	27
9.5.9	Restore default.....	27
10	Calibration.....	28
10.1	Performing calibration.....	29
11	Program library	31
11.1	Select program	32
11.2	Edit program.....	32
11.2.1	Edit name	33
11.2.2	Add new segment.....	33
11.2.3	Remove segment.....	34
11.2.4	Program options	34
11.2.4.1	Action on End.....	35
11.2.4.2	Repeat count.....	35
11.2.4.3	Units.....	36
11.2.4.4	Calibration.....	36
11.3	Start, pause/restart the dosing program	37
11.3.1	Program start.....	37
11.3.2	Program pause.....	37
11.3.2.1	Continue or restart of the dosing program after a pause	37
12	Substances name library.....	39
13	Alarms	40
13.1	Alarm codes.....	40
14	Software update.....	41
14.1	Connection	41

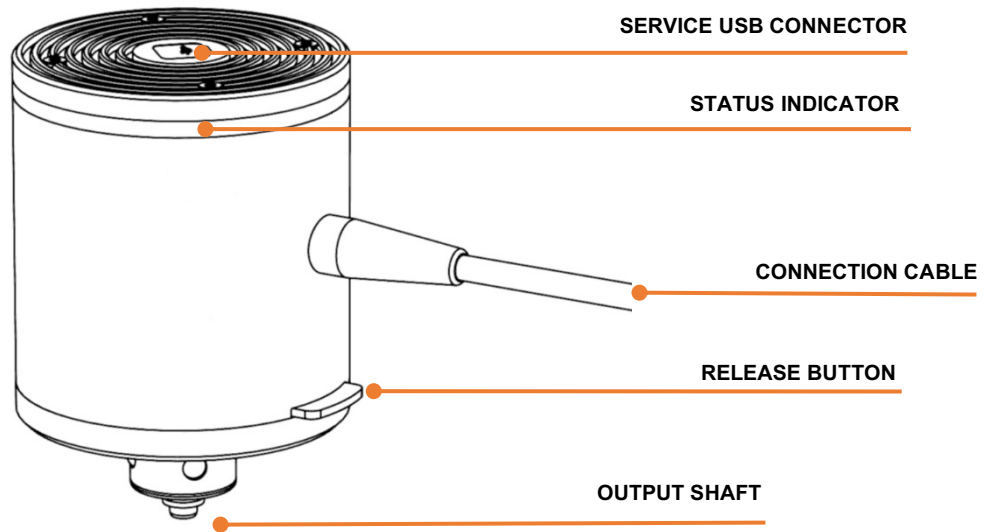
14.2	Software update file	41
14.3	PC Software application	42
14.4	Update procedure	43
15	USB communication.....	46
15.1	Syntax.....	46
15.2	Basic commands.....	46
15.3	Commands with objects	47
15.4	Response Object Description	48
16	CAN bus communication (REMOTE 1)	50
16.1	Description of communication	50
16.1.1	Extended data frame	50
16.1.2	EID bitwise significance	52
16.2	Message filtering.....	53
16.3	Commands (Pseudo-identifier).....	54
16.3.1	Read commands	56
16.3.2	Write commands.....	56
16.3.3	Data format	57
16.4	Heartbeat	58
16.5	Connector wiring	60
17	REMOTE 2 connector functionality	61
17.1	Connector wiring	61
17.2	RS Communication protocol	62
17.2.1	Format of data sent by the PC to the DEVICE and back	62
17.2.2	Commands not containing data.....	62
17.2.3	Checksum control.....	62
17.2.4	Format of the data transmission	62
17.2.5	Examples.....	63
17.3	RS Communication protocol for the on-board INTEGRATOR	63
17.3.1	Format of data sent by the PC to the Doser touch and back.....	63
17.3.2	Commands for the INTEGRATOR.....	64
17.3.3	Examples.....	64
18	List of accessories	65
19	Safety for installation, operation, cleaning, maintenance, and storage	66
20	Guarantee	66

1. TECHNICAL DESCRIPTION

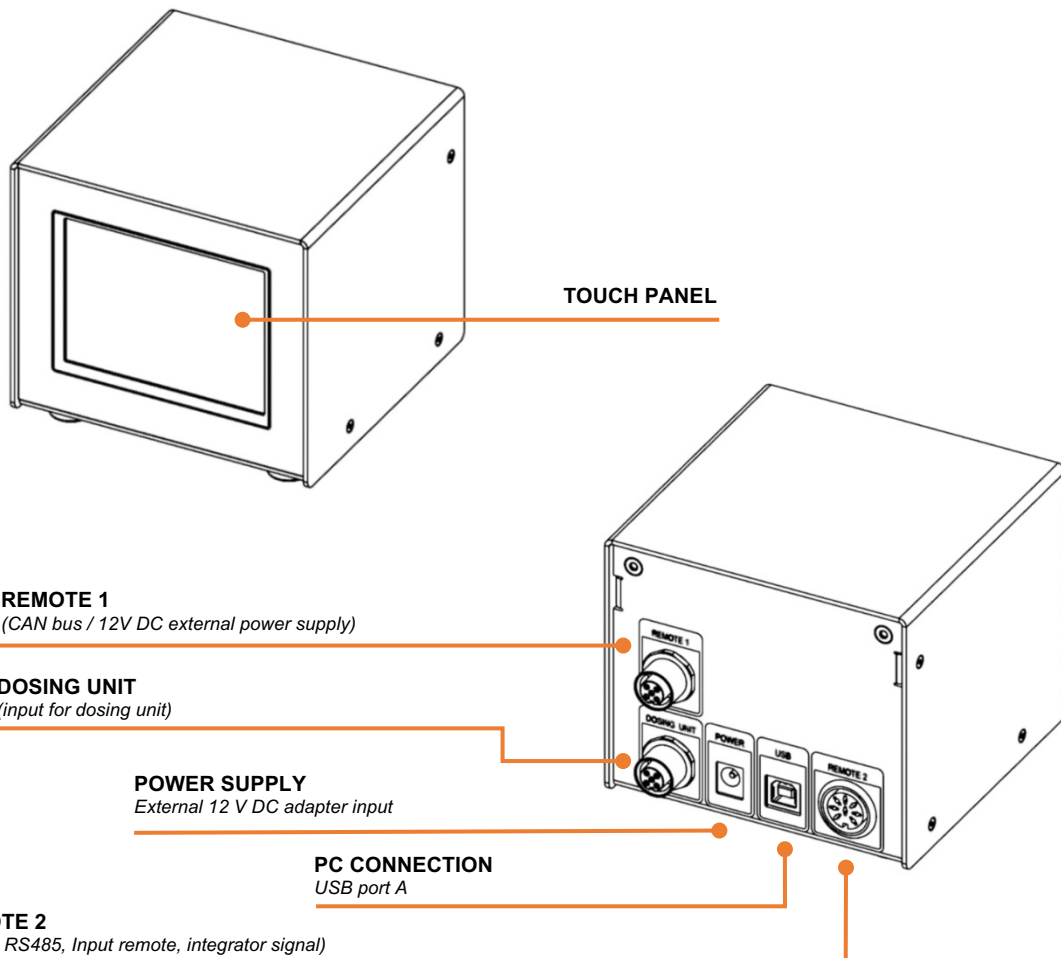
1.1 TECHNICAL PARAMETERS

DOSER Touch		
Type	Microprocessor-controlled programmable laboratory powder dispenser	
Accuracy	up to ± 0.2 degrees of shaft rotation	
Digital speed	0–9999 1 digital speed = 0.004 rpm	
Mechanical speed	up to 40 rpm	
Control methods	fixed speed, pre-defined program, dose by time, dose by amount, remote mode	
Flow rate	calibratable (built-in procedure) units: g/min, g/h	
Internal memory	built-in program library (10 programs with 100 items of speed) built-in substances name library (up to 32 items)	
User programs	up to 10 programs with 100 items step or ramp transitions between items repeat count (infinite or up to 99x) action on end (continue with last item, repeat, or stop) independent calibration constant independent flow rate units	
Containers	Approx. 0.2 L, 3 L, and 6 L glass vessels	
Interface	USB 2.0, CAN BUS, 0-10V signal, RS 485, Input remote (external contact)	
Display	3.5" TFT IPS Display with 320 x 240 pixels resolution Viewing angles: $\pm 70^\circ$	
Conformity	DIRECTIVE 2014/35/EU, DIRECTIVE 2014/30/EU	
Technical standards	EN 61010-1:2010/A1:2019/AC:2019-04, EN 61326-1:2013	
Weight	Dose unit < 800 g	Control unit < 450 g
Dimensions (W x H x D)	Dose unit diameter 80 x 125 mm (including flange)	Control unit 105 x 94.7 x 115.7 mm
Operating temperature	0 – 40 °C	
Operating humidity	0 – 90%, not condensing	
Power supply	Plug-in power adapter Input Voltage: 90–240 V AC 50/60 Hz, 12 V / 2.5 A Barrel jack 5.5/2.1	

1.2 DEVICE DESCRIPTION – DOSING UNIT

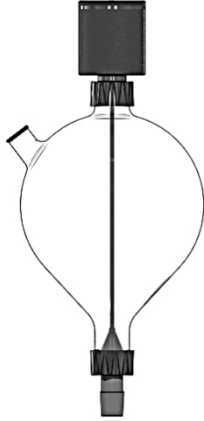


1.3 DEVICE DESCRIPTION – CONTROL UNIT



2 BOTTLES

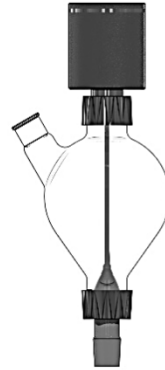
6 L



3 L



1 L

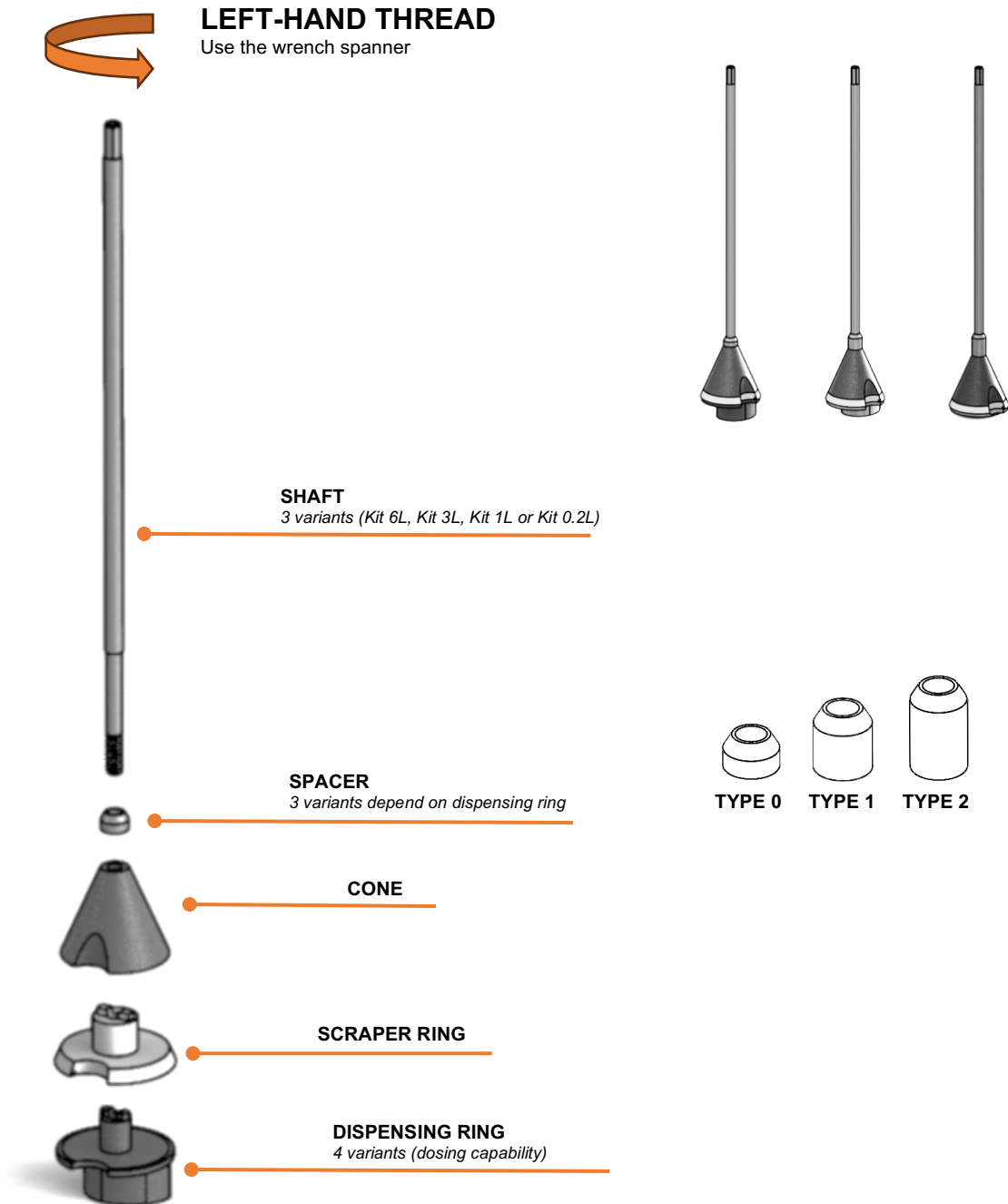


0.2 L



	Kit 6 L	Kit 3 L	Kit 1 L	Kit 0.2 L
Bottle with volume	6000 ml	3000 ml	1000 ml	200 ml
Dispenser compatibility	all dispenser (shaft 6l)	all dispenser (shaft 3l)	all dispenser (shaft 1l)	all dispenser (shaft 1l)
Included	Sealing silicone ring (2 pcs) Nut (2 pcs) Teflon disc (1 pcs)			

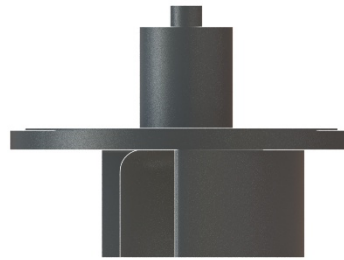
3 DISPENSERS



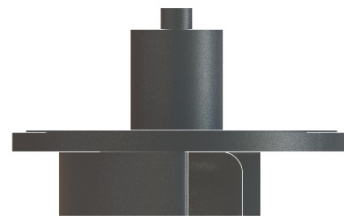
Dispensing ring variants

	Standard	Medium	Reduced	Long
Dispensing area height	10 mm	6 mm	2 mm	10 mm
Spacer needs	Type 0	Type 1	Type 2	Type 0

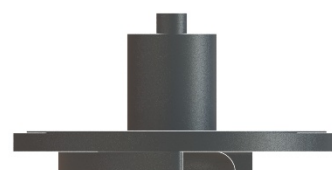
3.1 DISPENSING RING STANDARD 10 MM



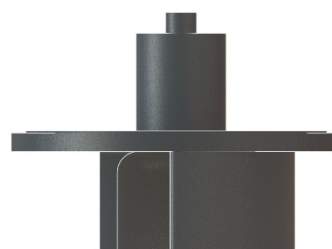
3.2 DISPENSING RING MEDIUM 6 MM



3.3 DISPENSING RING REDUCED BY 2 MM



3.4 DISPENSING RING LONG 10 MM



4 POWER SUPPLY CONNECTION

4.1 POWER SUPPLY FOR STAND-ALONE DOSER TOUCH

1. Plug the dosing unit cable into the DOSE UNIT connector of the control unit.
2. Plug the power supply connector into the corresponding socket (12 V DC) at the rear of the control unit.
3. Plug the power supply into the AC mains (90–240 V AC 50/60 Hz).
The display will illuminate, showing the last used settings. The dose unit will illuminate too.

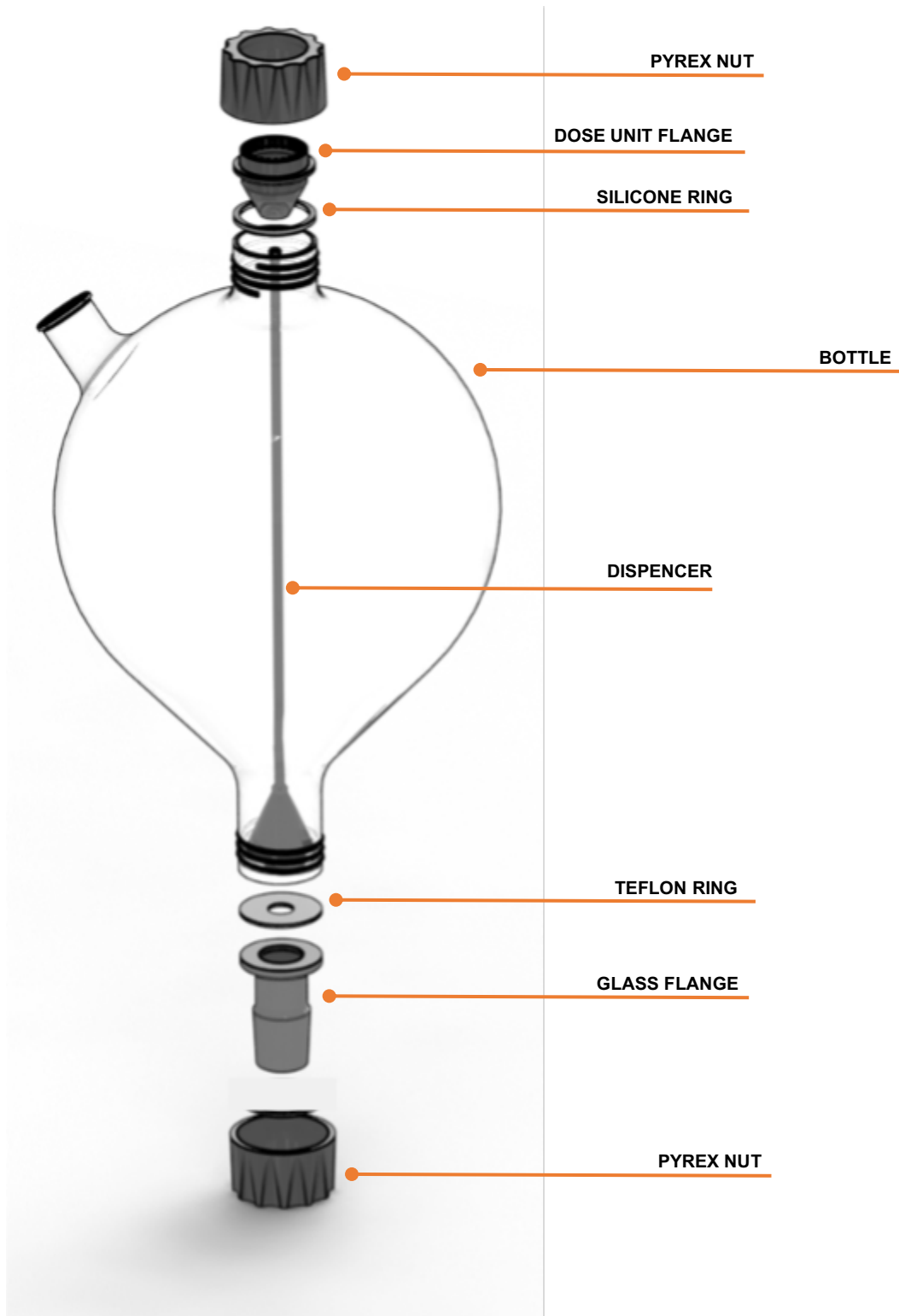
4.2 POWER SUPPLY FOR REMOTE-CONTROLLED USAGE

Do not use any power supply for the *LAMBDA powder dispenser* if the dispenser is connected to a bioreactor/fermenter LAMBDA MINIFOR or LAMBDA MINIFOR 2 BIO!

1. Plug the connector of the remote-control cable from the LAMBDA MINIFOR / LAMBDA MINIFOR 2 BIO into the corresponding socket (REMOTE 1) at the rear of the control unit.
2. The display will illuminate.

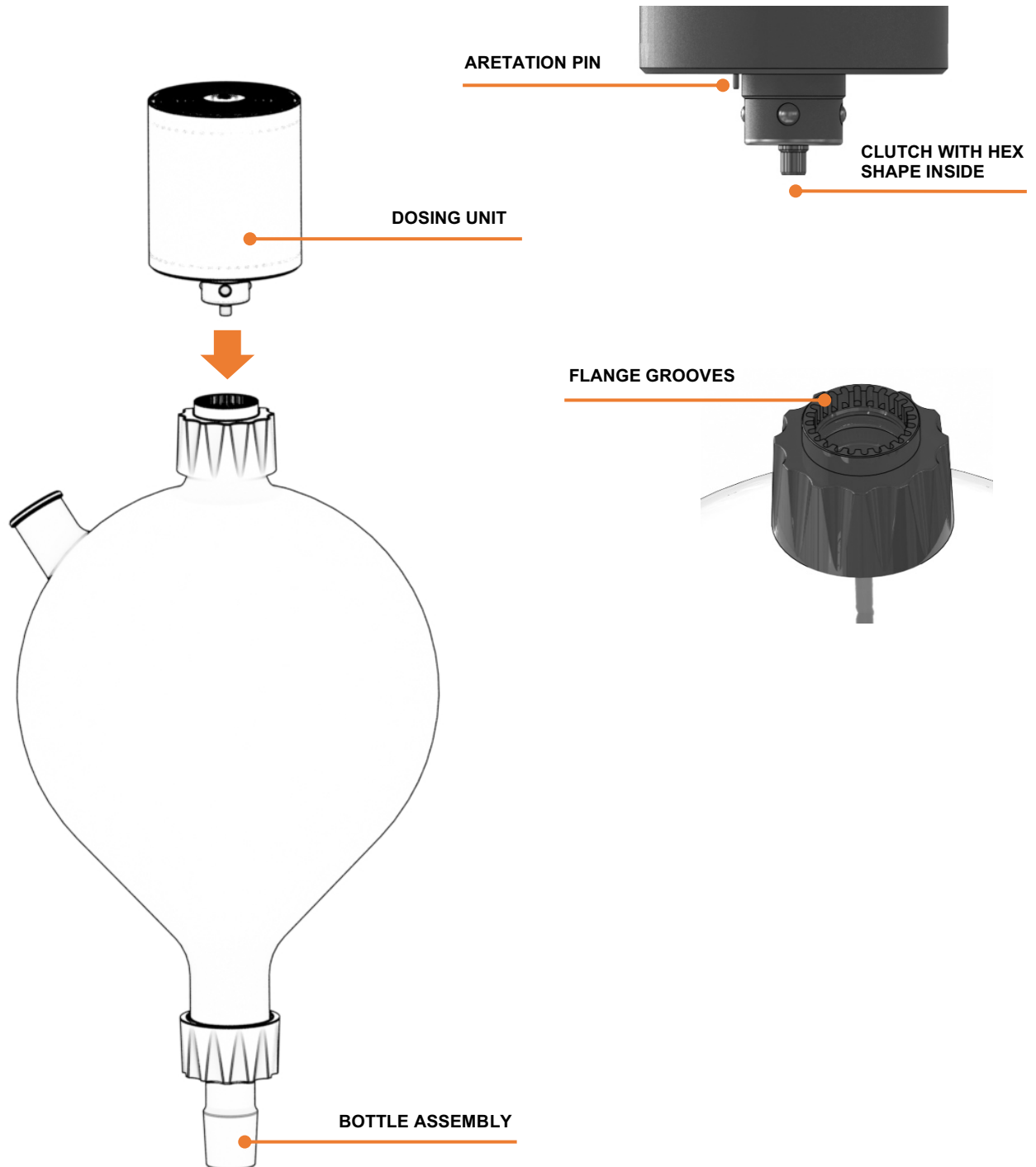
5 INSTALLATION

5.1 BOTTLE ASSEMBLY



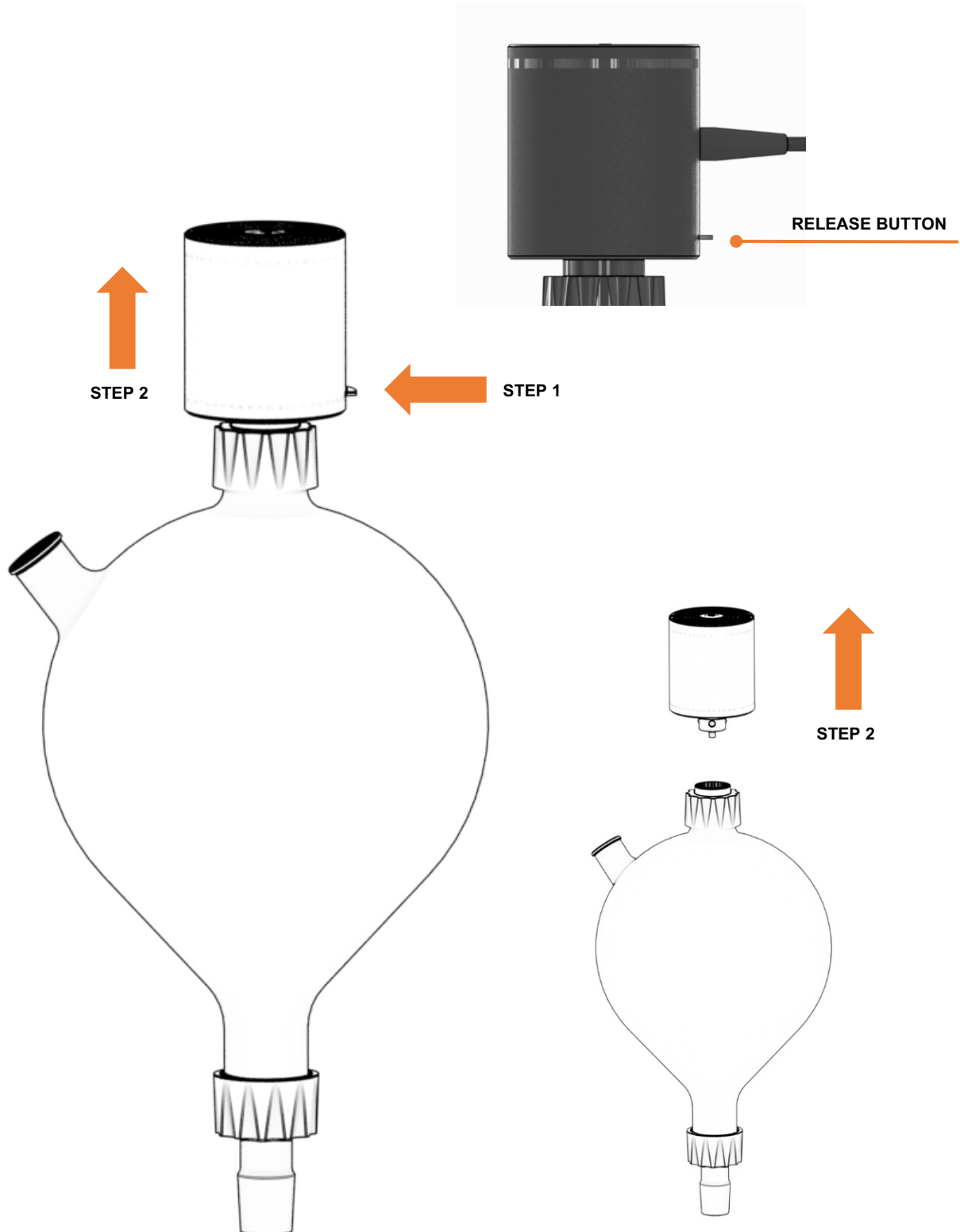
5.2 DOSE UNIT BOTTLE CONNECTION

Place the dosing unit onto the flange so that the locking pin engages with the groove in the flange, and then press down.

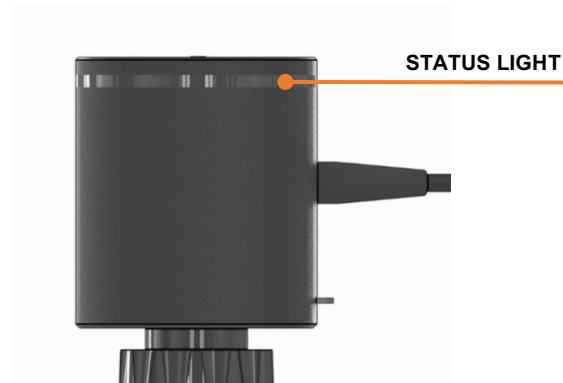


5.3 DOSE UNIT BOTTLE UN-CONNECTION

Press the release button, hold it down, and pull away from the bottle assembly.



5.4 DOSE UNIT – STATUS LIGHT COLOR CODES



Color codes

	A Medium Reduced Long
green – lit constantly	The unit is in RUN mode with zero speed
green - breathing	The unit is in RUN mode, dispensing
orange – lit constantly	The unit is in STOP mode
orange – blinking	The unit is in STOP mode disconnected, or improperly connected to the bottle
blue – blinking	Maximum mode active
purple – lit constantly	The unit is in REMOTE mode
red	The unit is in ALARM mode

6 DOSAGE CONTROL METHODS

6.1 FIXED VALUE

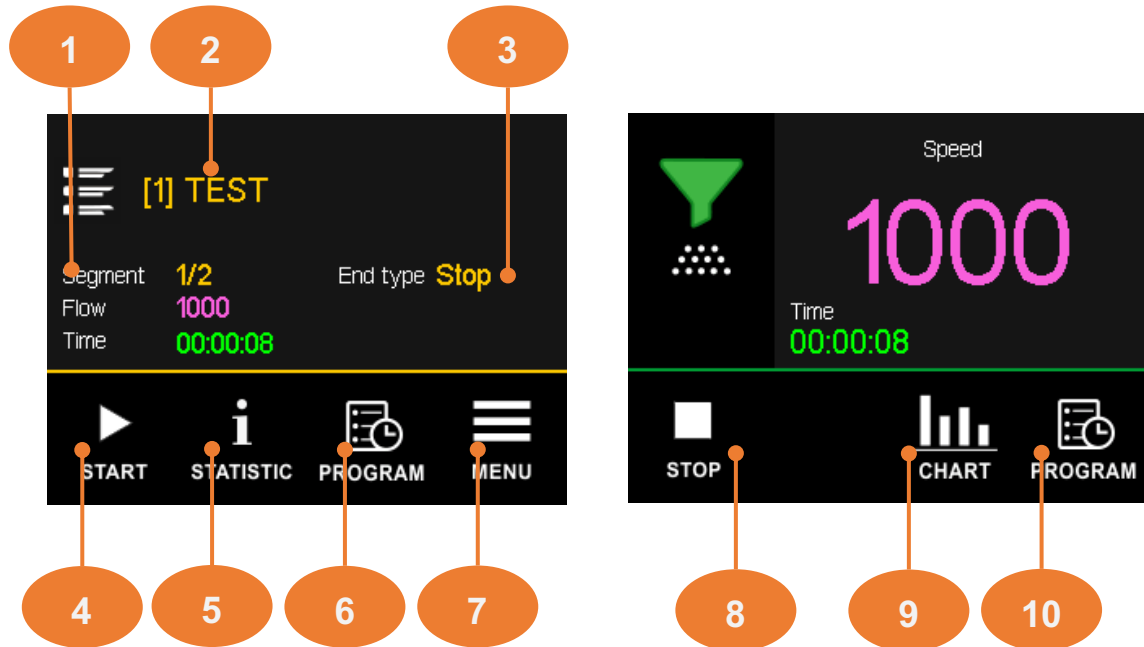
The fixed-value control method is used for linear dosing at a preset rate. The rate can be specified in digital units or amount units, depending on the settings. For amount units, a calibration procedure must be performed.



1. **Digital speed / Flow rate** - The flow rate is available only after the calibration constant has been set and the calibration procedure has been performed.
2. **Run time** - Total dosing time. You can choose whether to reset it automatically each time the system starts up or manually.
3. **Dispensed volume** - It is calculated automatically only if the calibration constant has been set and the calibration procedure has been performed.
4. **START** - tap to start dispensing.
5. **MAXIMUM** - tap and hold to dispense at maximum flow rate / digital speed.
6. **MENU** – tap to enter into main menu.
7. **STOP** - tap to stop dispensing.

6.2 PRE-DEFINED PROGRAM

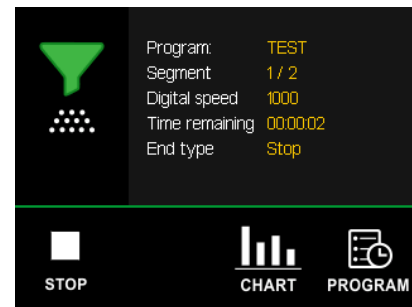
In this control mode, dosing is performed according to a predefined program. You can find more information about the programs in the chapter [“Program library”](#).



1. **Program parameters** - current segment (section) of the program / total count, digital speed or flow rate, and remaining segment time.
2. **Program name**
3. **Action on End** - the selected program termination type.
4. **START** - tap to start program dispensing.
5. **STATISTIC** - tap to view dosing statistics (time, amount).
6. **PROGRAM** – tap to enter into program library.
7. **MENU** - tap to enter the main menu.
8. **STOP** – tap to stop program dispensing.
9. **CHART** – tap to view program in chart view.
10. **PROGRAM** – tap to view program parameters.

6.2.1 PROGRAM OVERVIEW

During the program processing, it is possible to display the program's current parameters. The display can be called up by clicking the "**PROGRAM**" icon on the dosing screen in program mode.



6.2.2 CHART VIEW

It is possible to display the progress of program processing in a graph.

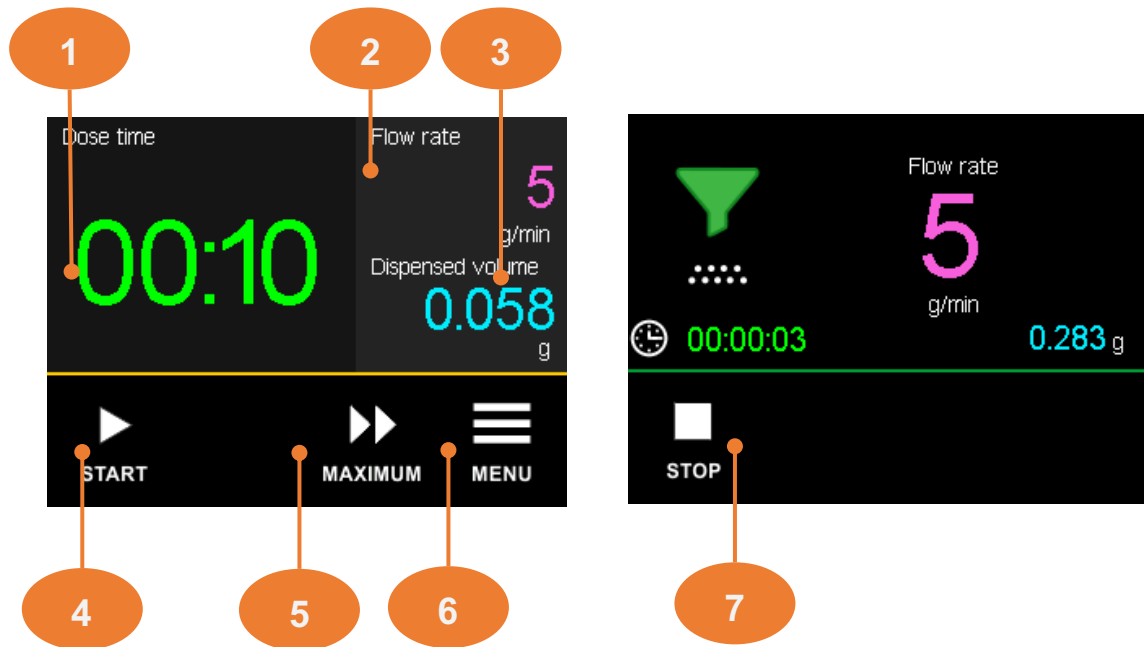
The program processing is represented by a gradually filling area of the graph. The different fill color symbolizes the dosing direction (**DIRECTION**).



By clicking the **+** or **-** icon, it is possible to change the timescale.

6.3 DOSE BY TIME

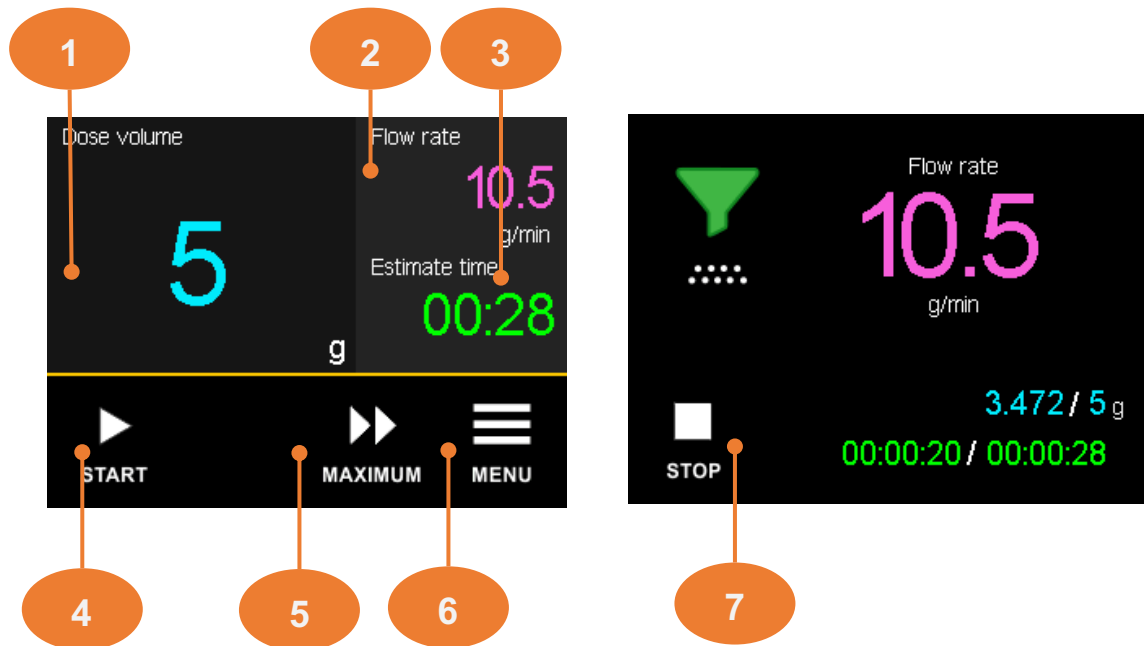
The Dose by Time method is used to dispense at a set rate for a specified duration. Once the time has elapsed, dispensing stops.



1. **Dosage time** - the duration of dispensing.
2. **Digital speed / Flow rate** - The flow rate is available only after the calibration constant has been set and the calibration procedure has been performed.
3. **Dispensed amount** - It is calculated automatically only if the calibration constant has been set and the calibration procedure has been performed.
4. **START** - tap to start dispensing.
5. **MAXIMUM** - tap and hold to dispense at maximum flow rate / digital speed.
6. **MENU** – tap to enter into main menu.
7. **STOP** - tap to stop dispensing.

6.4 DOSE BY AMOUNT

The Dose By Amount method is used to dispense at a set rate for a specified amount. Once the amount is dispensed, dispensing stops.



1. **Dosage amount** – amount to be dispensed.
2. **Digital speed / Flow rate** - The flow rate is available only after the calibration constant has been set and the calibration procedure has been performed.
3. **Estimate time** - Estimated time to dispense the set amount at the set rate.
4. **START** - tap to start dispensing.
5. **MAXIMUM** - tap and hold to dispense at maximum flow rate / digital speed.
6. **MENU** – tap to enter into main menu.
7. **STOP** - tap to stop dispensing.

6.5 SET DIGITAL SPEED

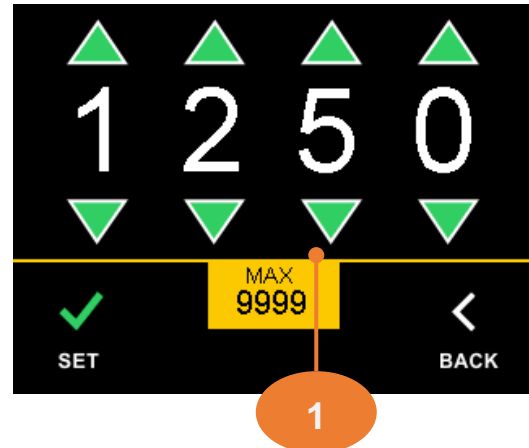


Available when digital speed units are selected.

To set the digital speed, click on the **digital speed parameter** on the **main screen**.

The individual flow rate digits will be displayed on the screen.

- Use the up or down arrows to set the desired value.
- Confirm the new value by clicking the **"SET"** button, or go back and ignore the change by clicking the **"BACK"** button.



1. **MAX** – maximal digital speed

6.6 SET FLOW RATE

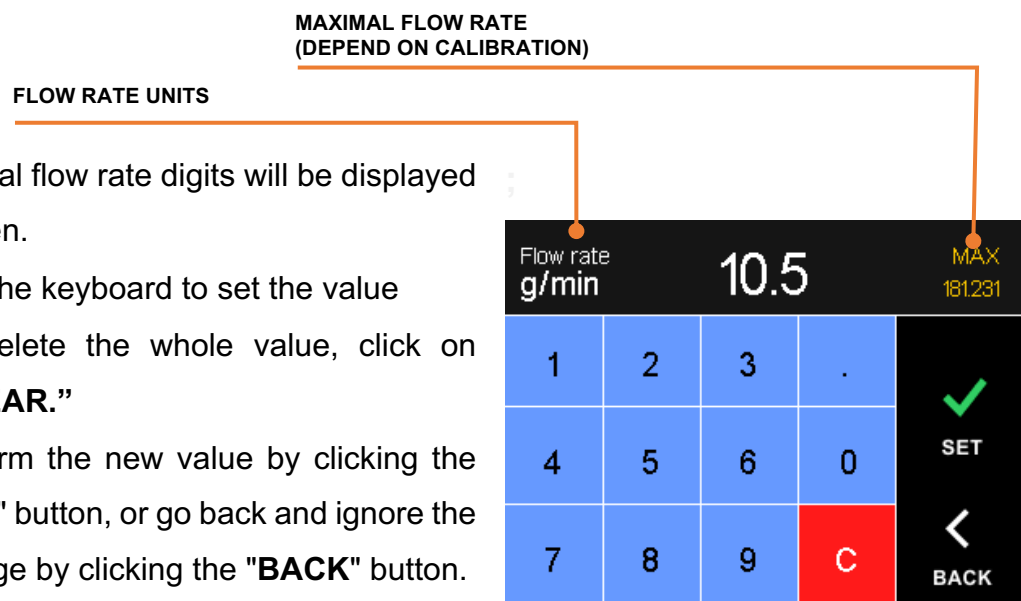


Available when amount units (ml/h, ml/min, or l/h) are selected.

The flow rate can be changed during dosing with DIRECT flow control. To set the flow rate, click on the **flow rate parameter** on the **main screen**.

The individual flow rate digits will be displayed on the screen.

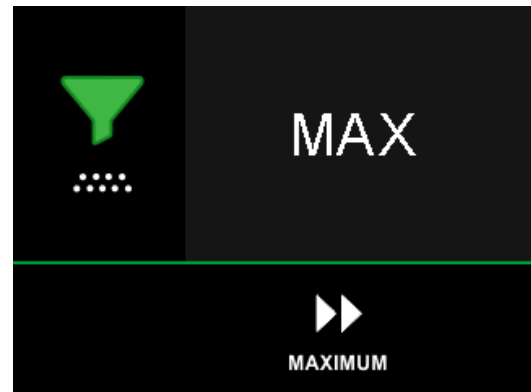
- Use the keyboard to set the value
- To delete the whole value, click on **"CLEAR."**
- Confirm the new value by clicking the **"SET"** button, or go back and ignore the change by clicking the **"BACK"** button.



7 FUNCTION MAXIMUM

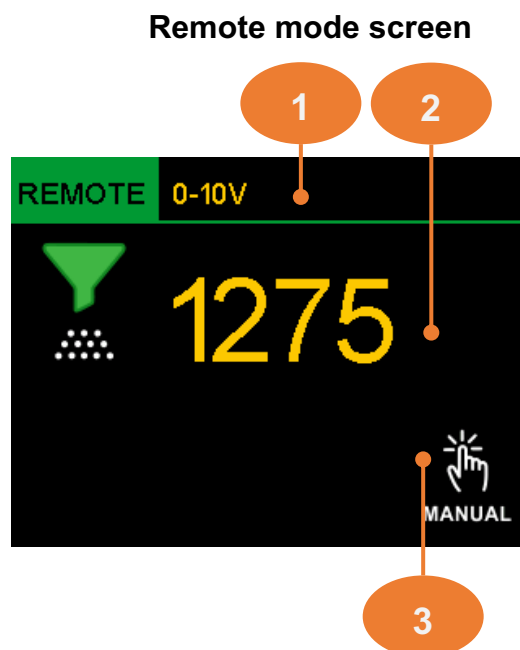
This function is used to start the dose unit at maximum speed, for example, to empty or purge.

To activate, tap and hold the "MAXIMUM" icon on the main screen. Release to stop dispensing.



8 REMOTE MODE

The device can be controlled remotely via a CAN bus or RS485 interface, or via a 0-10V analog signal. To do this, you must set the device to "REMOTE MODE" in the main menu. Outside of this mode, the control unit does not respond to commands or values. For more information on communication (remote control), see the following sections of this manual.



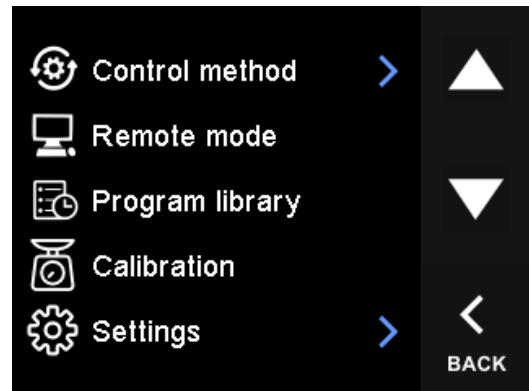
1. **Master control input** – Selected remote control mode. REMOTE 1 (CAN bus) has the highest priority; for 0-10V input and RS485, you must select the priority in the settings.
2. **Digital speed** - current digital speed.
3. **Manual** - tap to cancel remote mode.

9 MAIN MENU

The menu is **only available in the STOP state** when **dosing is not in progress**:

On the main screen in stop mode,

- › Press the icon "MENU".
- › For horizontal navigation between menu items, use the "UP" and "DOWN" icons on the right side of the screen.
- › Confirm the selection by clicking on the item



9.1 CONTROL METHOD

The Doser touch is equipped with these dosing control modes:

FIXED VALUE

The fixed value method is used to **dispense a fixed flow rate**.

PRE-DEFINED PROGRAM

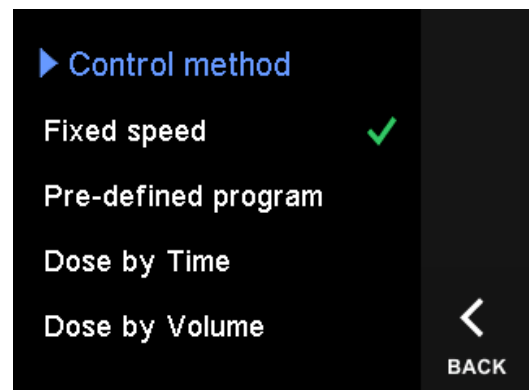
Program mode allows dosing control **at various rates and durations**.

DOSE BY TIME

Dosing for a **set duration** at a set **digital speed/flow rate**.

DOSE BY AMOUNT

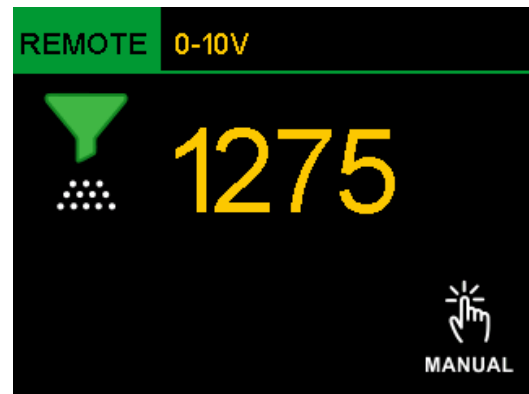
Dispensing the **set amount** at the **set digital speed/flow rate**.



9.2 REMOTE MODE

This item is used to activate REMOTE mode when the device is controlled by one of the selected communication interfaces.

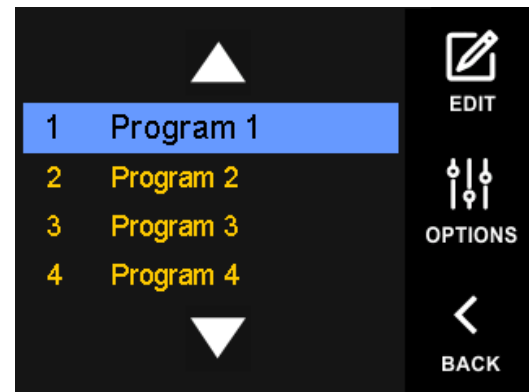
For external control of the device, it is always necessary to bring it into this mode.



9.3 PROGRAM LIBRARY

The built-in program library allows the creation of 10 programs, each of which can contain up to 100 records.

Use the “UP” and “DOWN” icons to navigate horizontally and change the program. The highlighted program is considered selected for use.



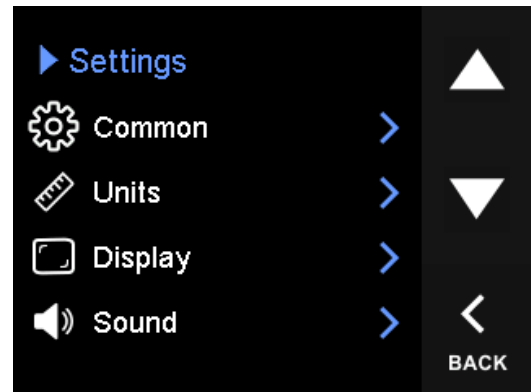
See chapter “[11 Program library](#)”.

9.4 CALIBRATION

Enter the calibration environment.
See chapter “[10 Calibration](#)”.

9.5 SETTINGS

Device settings file. For horizontal navigation between menu items, use the "UP" and "DOWN" icons on the right side of the screen.



9.5.1 COMMON

› **Auto zero when starting**

If the option is activated, the dosing statistics are automatically reset on restart (RUN).

9.5.2 UNITS

The dosing rate unit can be selected here.

The following are available: digital speed, g/min, g/hod.

In order to use the device in amount units (g/min, g/h), it is necessary to make and set a calibration constant.

9.5.3 DISPLAY

› **Backlight intensity**

Display backlight intensity setting/range from **1** to **5**

› **Touch sensitivity**

Adjust the sensitivity of the touch panel display/range from **1** to **5**

9.5.4 SOUND

› **Sound amount**

Central adjustment of the acoustic alarm amount /range from **0** to **4**
(Level 0 disable acoustic alarm amount)

› **Tap sound**

Switching the acoustic response on/off when processing a touch on the display

› **Alarm sound**

Switching on/off the permanent acoustic signaling when an alarm is announced. If enabled, the alarm condition is accompanied by an acoustic signal until cancelled.

9.5.5 PROGRAMS

› **Auto-reset when starting**

If the option is active, each new batch run in program mode automatically starts the program from the beginning.

If not active, the display shows the option “Continue or Restart”.

› **Program end alarm**

If the option is active, a “Program finished!” alarm will be issued to complete the program.

9.5.6 REMOTE 2 I/O

The item contains options for configuring REMOTE 2 connector functions and is only available on devices that are equipped with a REMOTE 2 connector.

9.5.6.1 RS-485 PARAMETERS

› **Address**

Communication address of the device, default **2**

› **Data/parity**

Setting the parity data size. Available modes:

8bit (parity none), 8bit (parity even), 8bit (parity odd)

› **Baud rate**

The available baud rates are:

2400 (default), 4800, 9600, 19200, 38400, 57600, 115200

› **Stop bits**

The modes available are: 0 bit, 1 bit, 2 bits

9.5.6.2 DIGITAL INPUT REMOTE

Setting the input remote signal function. This hardware signal is available on the REMOTE 2 connector (for wiring see chapter "[17 REMOTE 2 connector functionality](#)").

› **Disabled**

The function is disabled

› **Stop**

The signal stops dispensing

› **Start**

The signal will enable dispensing

› **Start/stop program**

The signal activates the program. If it is activated while the program is running, the program will be interrupted.

9.5.6.3 MASTER CONTROL INPUT

Option to set the main signal to control the dosing rate in REMOTE mode.

This setting only applies to the REMOTE 2 connector functionality.

› **0-10V input**

The dosing rate will be controlled by a 0-10V signal

› **RS-485 commands**

The device will be controlled by RS protocol commands.

(see chapter "[17.2 RS Communication protocol](#)")

9.5.7 SUBSTANCES ENABLE

Enable/disable the display of the substance name on the main.

Substance names enable information about the substance used in the bottle to be shown on the display. These names can then be selected manually by clicking on them on the main screen.

(For details about fluids name library, see chapter "[12 Substances name library](#)".)

9.5.8 DEVICE INFORMATION

View information about the device. Information is available:

Serial number, Software version, Hardware version, and Device type.

9.5.9 RESTORE DEFAULT

This option is used to reset the menu items to their default state.

10 CALIBRATION

A calibration is necessary to convert and directly set the flow rate. During calibration, the amount of substance the dose unit dispenses during a set time is measured. Use a laboratory scale to measure the amount of substance. The balance/scale must be adjusted according to the desired accuracy range. The calibration process uses an internal digital speed dosing rate and takes **one minute**.

Before calibration, first dispense a small amount of the substance to purge the system.

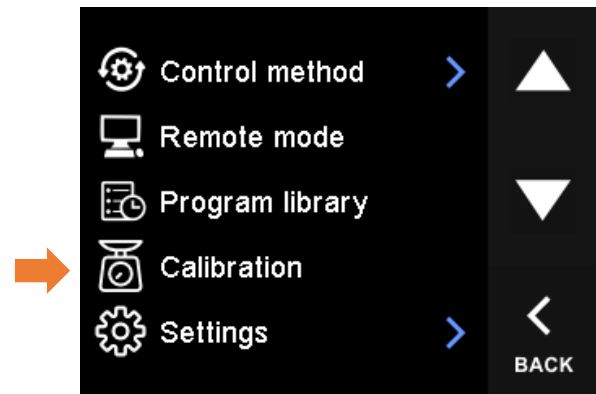
See chapter “9.5.2 Units” for setting amount units for flow rates.



Scale

10.1 PERFORMING CALIBRATION

Go to calibration by clicking the "CALIBRATION" item in the main menu.

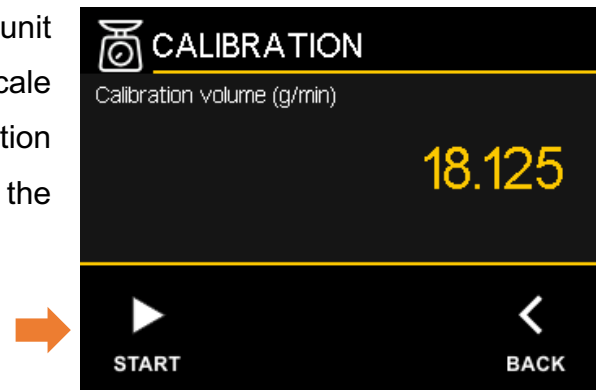


Prepare to measure the amount of substance dispensed (assemble the bottle with the dosing unit).

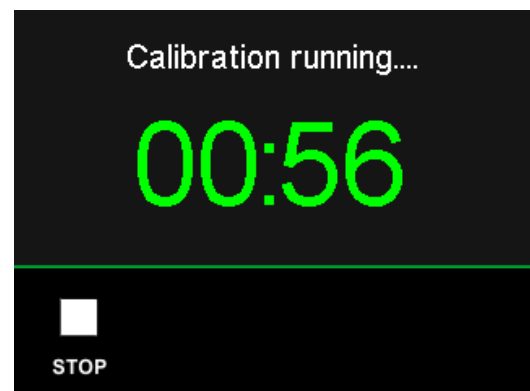
See the illustration above as an example of measurement with scale.

Steps:

1. Check the bottle with the dosing unit and the status of the laboratory scale (tare/zero). Start the calibration dispensing process by tapping the "START" icon.



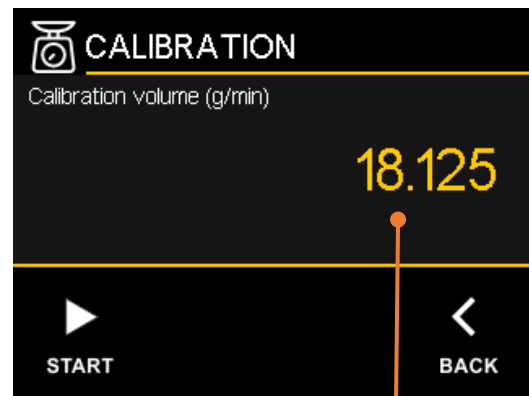
2. The calibration dispensing process takes **1 minute**. It then stops automatically. You can cancel the process by tapping the "STOP" icon.



3. Enter the **dispensed amount in grams:**

Tap the value and enter a new one.

Copy the value from the laboratory scale in grams.



1

11 PROGRAM LIBRARY

For use in program mode, it is necessary to activate the **control method** in the menu on **pre-defined program**.

Program structure:

<i>Name</i>	Name of program
<i>Segments</i>	Segment (defined by flow rate/speed, time length, type of transition, and dosing direction)
<i>Action on End</i>	Selection of the program ends by stopping (invoke alarm), continuing with the last speed/flow rate, or repeating from the start.
<i>Count</i>	Number of program repetitions
<i>Units</i>	Units for defining the flow rate
<i>Calibration</i>	Calibration constant for amount units



Completion of the program is indicated by the "Program finished!" alarm. Valid for action on end "stop" or "repeat" with defined repetition.

11.1 SELECT PROGRAM

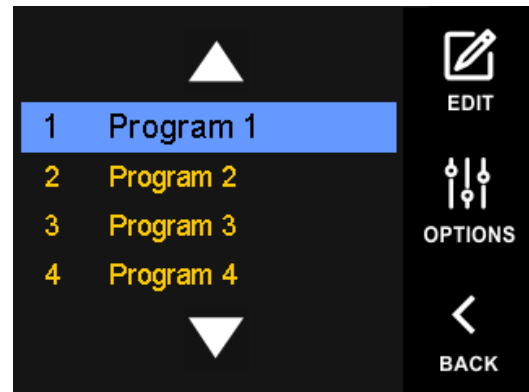
Changing or selecting the program is only possible when the Doser touch is stopped and idle.

Steps:

1. Go to the program library by clicking on the **Program** icon on the main screen or by clicking on **Program Library** in the menu.

On the **PROGRAMS** screen, the currently selected program is the highlighted row of the table.

1. Click the up and down arrow icons to **change the program**.
2. Click the "**BACK**" icon to **return to the main screen**.



Changing the program is done automatically by selection. The newly selected program is automatically applied by closing the program library by clicking on "**BACK**".

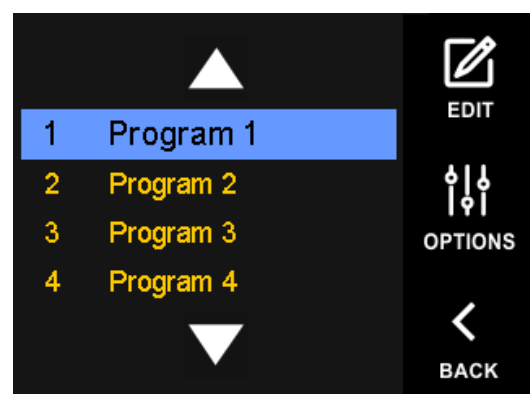
11.2 EDIT PROGRAM

Steps:

2. Go to the program library by clicking on the **Program** icon on the main screen or by clicking on **Program Library** in the menu.

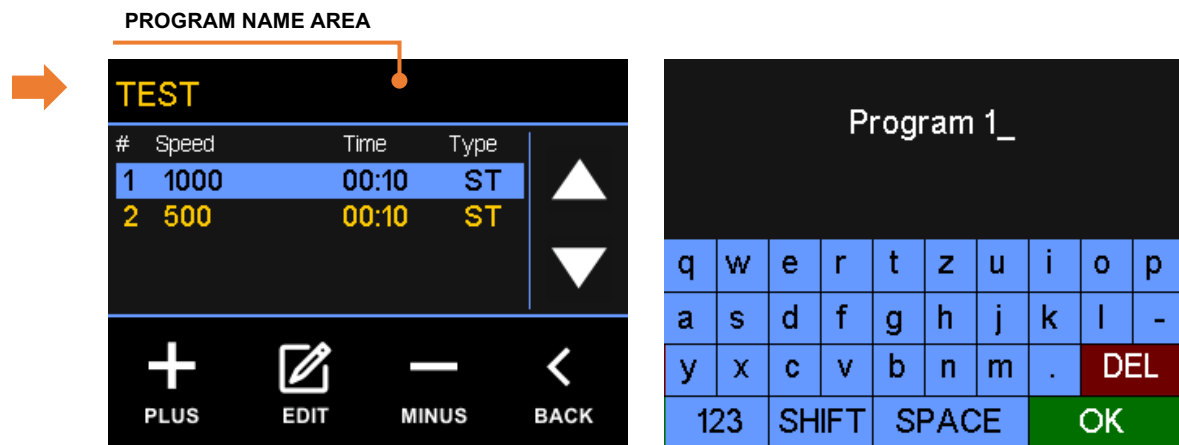
On the **Program library** screen, the currently selected program is the highlighted row of the table.

3. Click the up and down arrow icons to **select the requested program** to edit.
4. Click the "**EDIT**" icon to go to the program edit screen.



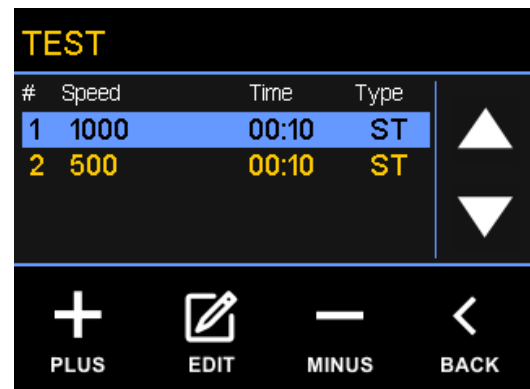
11.2.1 EDIT NAME

Click in the **program name area** to change it. The screen will show the current name with an alphanumeric keyboard. Confirm the change by clicking the "OK" button.



11.2.2 ADD NEW SEGMENT

1. Click on the "PLUS" icon to add a new program segment.



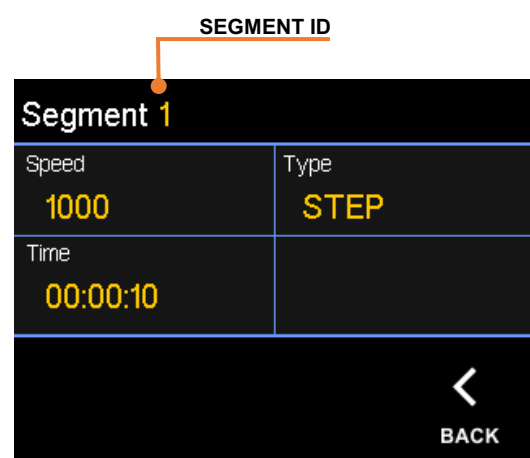
2. Enter the program segment parameters:
You can call up the settings of individual parameters by clicking on the parameter value.

DIGITAL SPEED/FLOW RATE:

requested speed/flow rate

TIME: requested time length of set digital speed/flow rate

TYPE: transition type (STEP or RAMP)

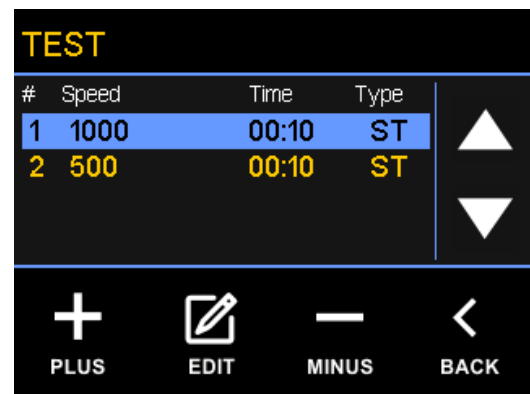


The speed/flow rate transition type has two setting options. **STEP** means that the value will be set immediately. **RAMP** means that the desired value is the target value and will be approximated for the set time length.

3. Click the **"BACK"** icon to return to the program edit screen.

11.2.3 REMOVE SEGMENT

1. Select the segment you want to remove (highlighted table row) by clicking the up and down arrow icons.
2. Click the **"MINUS"** icon to remove a currently highlighted program segment.



11.2.4 PROGRAM OPTIONS

Each program has its own specific global settings, such as action on end, repeat count, program units, and calibration constant.

The program includes setting options: [Action on End](#), [Repeat Count](#), and [Flow rate units](#).

Click on the **"OPTIONS"** icon to view the program settings.



11.2.4.1 ACTION ON END

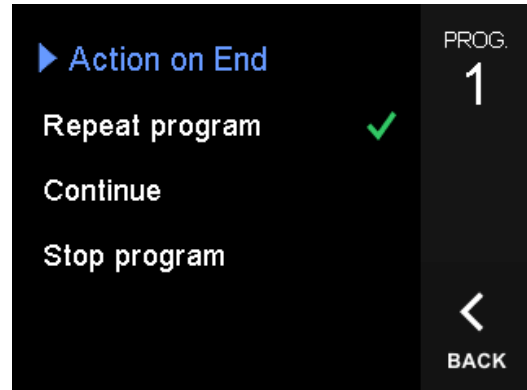
Choose what action shall take place to process all program segments:

REPEAT PROGRAM:

The program will be processed again from the first segment. The number of repetitions can be set.

CONTINUE:

After completion of the last segment of the program, dosing will continue with the last set speed/flow rate value.



STOP PROGRAM:

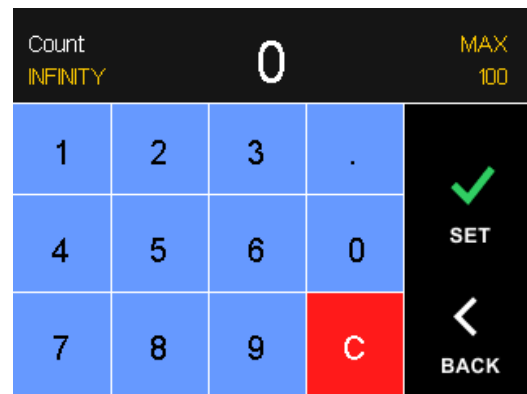
Dosing will be terminated when the last segment of the program is completed and invoke alarm “**Program finished!**”.

11.2.4.2 REPEAT COUNT

This parameter will only be used if the action on end is set to repeat.

Choose the number of program repetitions.

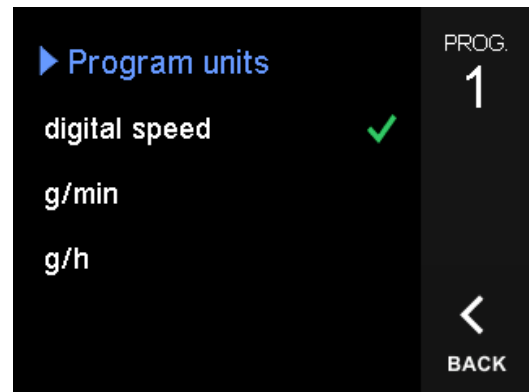
A value of 0 means infinite repetition!



11.2.4.3 UNITS

Setting the speed or flow rate units for the values listed in individual segments of the program.

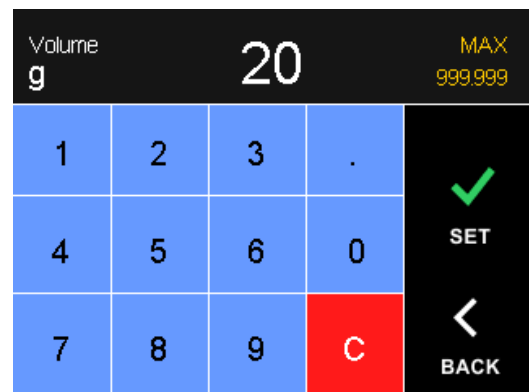
If amount units are selected, it is also necessary to set the calibration constant (chapter [11.2.4.4 Calibration](#)).



11.2.4.4 CALIBRATION

To use amount units, a conversion calibration constant must be set. The constant for the type of tubing used is obtained by calibration, see the chapter.

Enter the calibration constant, click **"SET"** to confirm the new value or **"BACK"** to return to the last saved value.



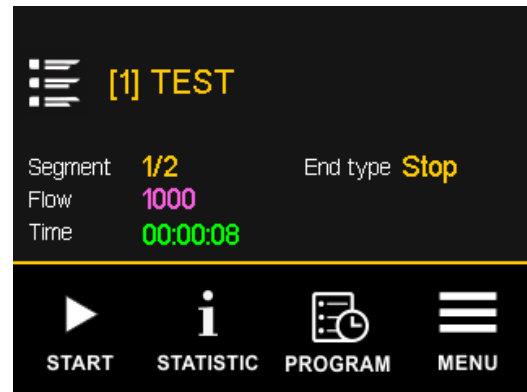
11.3 START, PAUSE/RESTART THE DOSING PROGRAM

To use programs, it is necessary to activate the **CONTROL METHOD** in the device menu to **PRE-DEFINED PROGRAM** mode.

11.3.1 PROGRAM START

To start the dosing by the dosing program, click on "START" on the Doser touch control unit display.

The dosing program is running.



11.3.2 PROGRAM PAUSE

To interrupt or pause the dosing program, click "STOP" on the Doser touch control unit display.

The dosing/dosing program is interrupted.

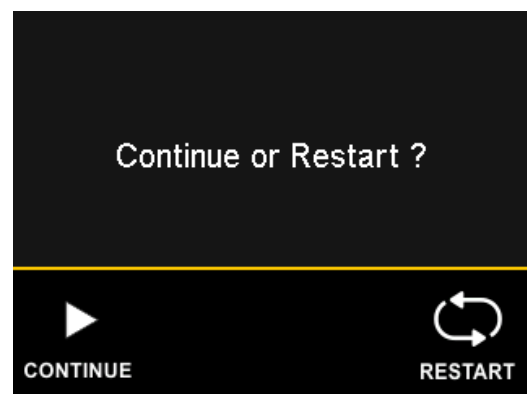
11.3.2.1 CONTINUE OR RESTART OF THE DOSING PROGRAM AFTER A PAUSE

To finish the pause, click on "START", on the unit display. The Doser touch control unit display shows "Continue or Restart?"

- Click "**CONTINUE**" to resume the program from where it stopped = continue the program.

OR

- Click "**RESTART**" to run the program from the beginning (First step 1 of the program, $t = 0$) = restart the program





The automatic restart of the program can be set in the main menu, settings item. See options in chapter “9.5.5 Programs”.

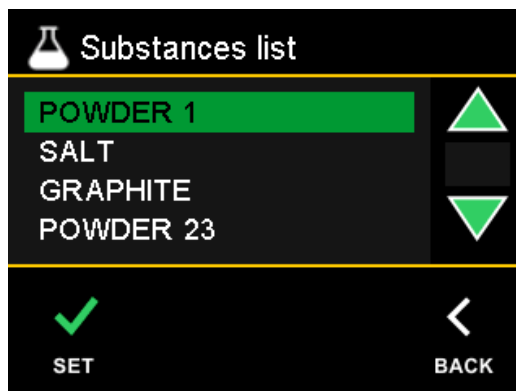
If the automatic restart is not active, the user is prompted for a decision with each new start of dosing.

12 SUBSTANCES NAME LIBRARY

The Doser touch has an integrated library of powder names that the user can display. It is used to quickly find out what preparation the Doser touch is dispensing.

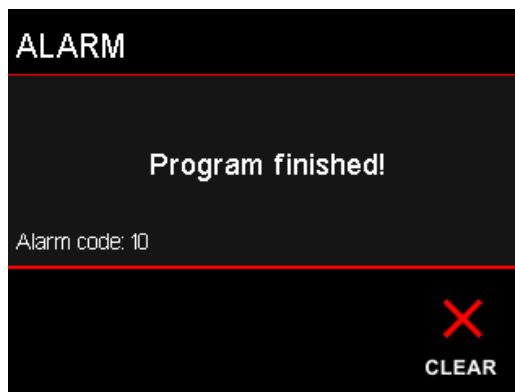
The library items can be edited from a PC via the *LAMBDA Device Manager* software application.

The number of items is limited to 32.



13 ALARMS

In the event that any error occurs or user intervention is required, the Doser touch will go into ALARM. Each alarm has its own separate identification code. The alarm can be accompanied by an audible alarm if it is active; the audible alarm is active for the entire time the alarm screen is displayed.



The acoustic alarm can be switched on/off in the menu (see chapter [“9.5.4 Sound”](#)).

13.1 ALARM CODES

Code	Name	Description
7	Dosing unit lost!	Communication with the dosing unit has been lost. Check the connection between the dosing unit and the control unit.
8	Time of dose over!	The preset dispensing time has expired.
9	Amount of dose reached!	The preset dispensing amount has been reached.
10	Program finished!	The current program has been completed, and all segments of the program have been processed.
11	The program has no data!	You are trying to run a program in which no segments are set. Go to the program settings and set the batching segments. See chapter “11.2 Edit program” .

14 SOFTWARE UPDATE

14.1 CONNECTION

a) Dose unit

Connect the dose unit to the PC via the service USB port. Carefully remove the cover on the top of the dose unit.

Disconnect the power cable—which is included with the dose unit—from the control unit or other power source.

Then connect the dose unit to the PC using a micro-USB cable. The dose unit will start up once the cable is connected to the PC.

b) Control unit

Connect the control unit to your PC using a USB cable. Then connect the 12V DC power supply adapter. The unit will start up.

14.2 SOFTWARE UPDATE FILE

You can download the update software using the "Check for updates" feature online, or contact your dealer or the manufacturer to obtain it.

The dose unit and control unit require separate software versions.

The dose unit software is labeled in this format: **dsrm-1-X.YY.zip**.

The control unit software is labeled in this format: **dsru-1-X.YY.zip**.

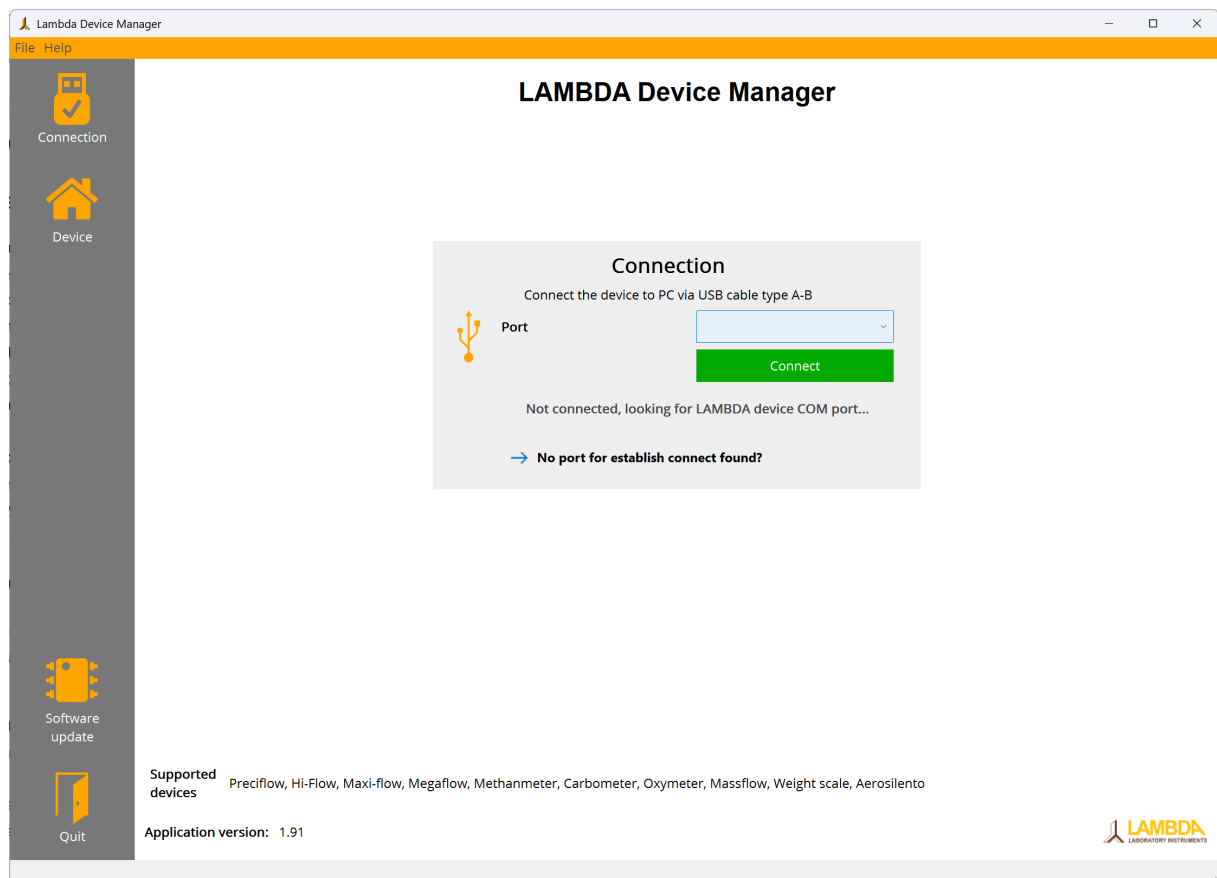
First, download the Doser touch software update file to your PC from the manufacturer's website or via the Lambda device manager. The file is compressed, tagged, and has a fixed format.

14.3 PC SOFTWARE APPLICATION

The LAMBDA Device Manager (Idm) software application is available for managing and updating devices from Lambda Instruments.

Steps:

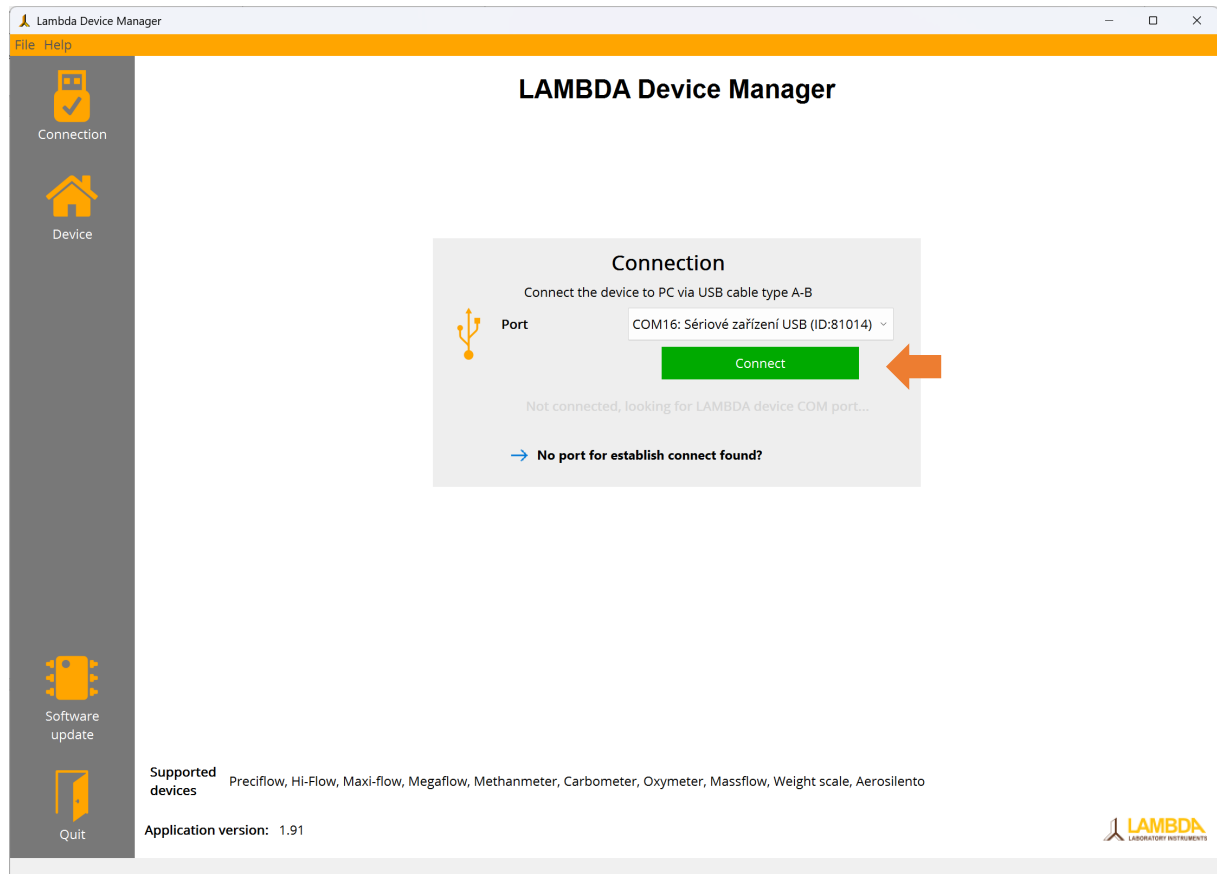
1. Download “**Idm-x.y-x64-setup.exe**” file (X, Y subsites version number)
2. Run the downloaded installation file.
3. Finish the installation of the application.



14.4 UPDATE PROCEDURE

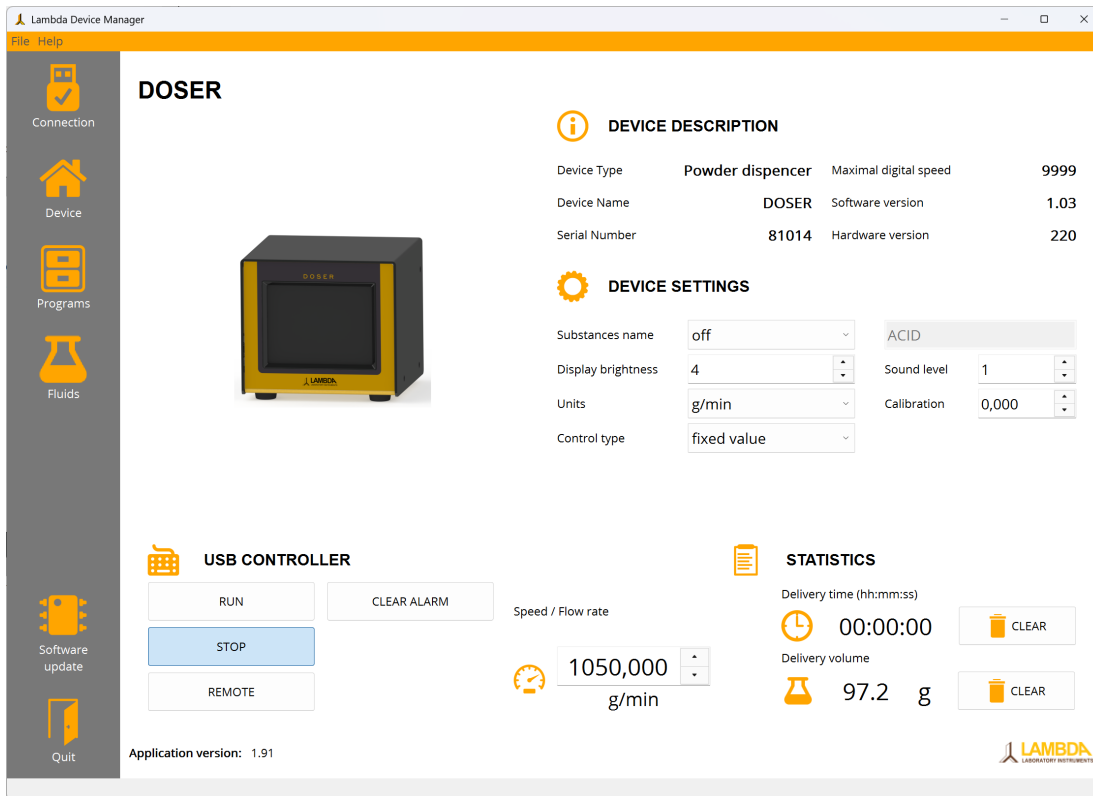
Follow these steps to update:

1. Connect the device (as described above)
2. Start the *Lambda Device Manager* application.
3. Wait and check that the computer has detected the device.

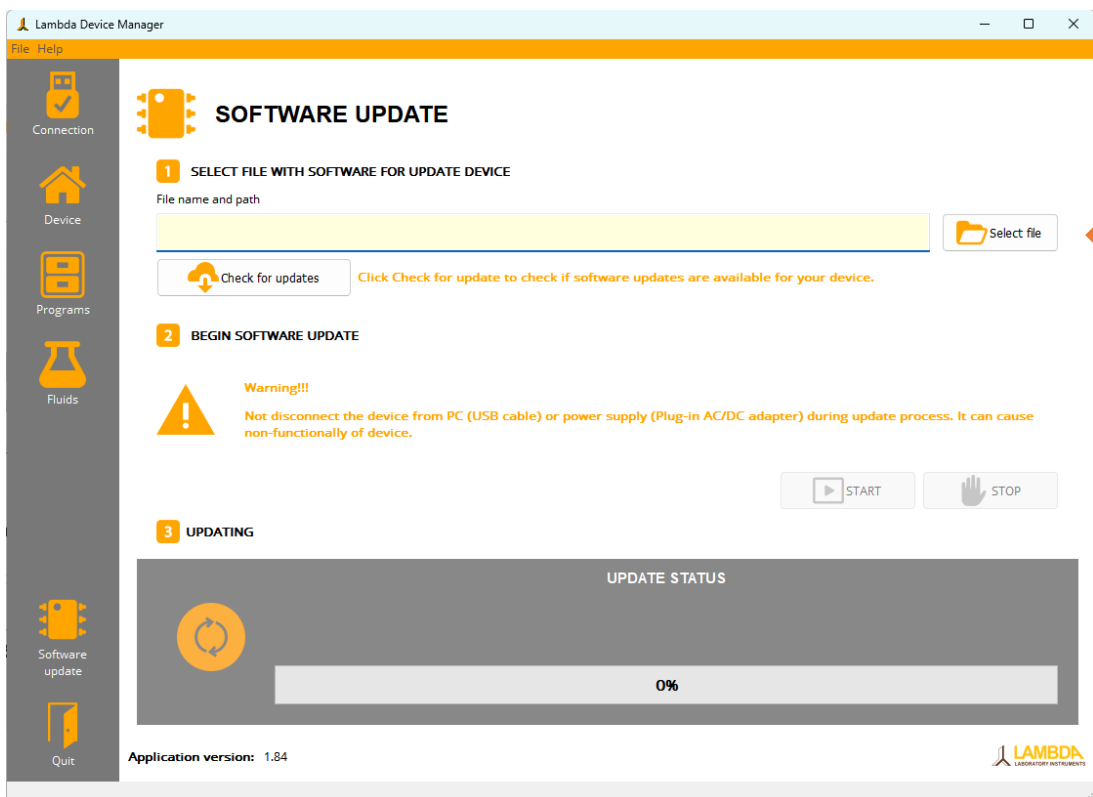


*Example: Detected **port** COM16, device with identification number 81014.*

4. Click on the "Connect" button.



5. Select the **“Software Update”** function on the bottom left side of the panel.



6. Click the “**Select file**” button and browse the path to the decompressed device software file (*.hex).
7. Click on the “**Start**” button to initiate the update process.



Do not disconnect the power or USB communication cable during the update process!!!

8. The progress of the process is displayed in the lower part of the window labelled “**UPDATE STATUS**”. Wait for the process to complete. When finished, a new text window will appear: “**Software update is successfully finished.**”
9. Click on the “**OK**” button.

15 USB COMMUNICATION

The Doser touch can be set and controlled using a USB interface via a virtual COM port. The communication is text-based and uses the JSON data transfer format. After connecting to a PC, a virtual COM port (COMx) is created automatically. Most operating systems will not require the installation of additional drivers, as the Doser touch is identified as a CDC-class device using the USB Descriptor.

Supported data types: number, string, object

15.1 SYNTAX

`{"Cmd":{"GetDeviceInfo":1}}` Each sending is initiated by send character LF (line feed)

Root object is "Cmd".

The internal JSON parser does not respect white spaces in strings. All JSON commands must be cleaned of white space.

Example send command GetDeviceInfo:

```
{"DeviceInfo":{"Name": "DOSER", "DeviceId":30, "SW":
"1.03","SerialNumber":3932390,"Type":"Powder dispenser",
"MaxSpeed":9999,"SW":1.03,"HW":"220"}}
```

Command returns parameters with values of string/number type (above).

15.2 BASIC COMMANDS

Example: `{"Cmd":{"GetDeviceInfo":1}}\n`

KEY	VALUE	RESPONSE	NOTES
ProcPeriod	Integer	<code>{"ACK":1}</code>	Set the period of sending asynchronously processed data (the value of the period is a multiple of 100 ms). Value 0 stop send process data.

KEY	VALUE	RESPONSE	NOTES
SetDefaults	1	{"ACK":1}	Reset configuration to factory defaults.
SetOpMode	0 or 1	{"ACK":1}	Set operating mode (RUN=1, STOP=0)
GetVer	1	Return object Version	
GetProcData	1	Return object ProcData	
GetDeviceInfo	1	Return object DeviceInfo	Information about the device
GetConfigData	1	Return object ConfigData	Device setup
ClearError	1	{"ACK":1}	Clear error

15.3 COMMANDS WITH OBJECTS

Example: {"Cmd":{"SetConfigData":{"Speed":100}}}

SUB-OBJECT	KEYS	RESPONSE	DESCRIPTION
SetConfigData	Flow		Flow rate (double) if non-rpm unit is set.
	Speed		Speed in rpm (integer)
	FluidName		String max. 32 characters
	Display		Set display brightness (value 0-5)
	Sound	{"ACK":1}	Set sound level (value 0-4)
	Fluids	{"ACK":2}	Enable/disable fluids name bar (0/1)
	Units		0=rpm, 1=ml/h, 2=ml/min, 3=l/h
	Calibration		Calibration constant (0-999.99)
	FluidName		Current fluid name text max. 32 characters

Receipt of the command is acknowledged by an ACK response with a value of 1. A parameter value that is not valid (e.g., out of range) is an ACK response value of 2.

15.4 RESPONSE OBJECT DESCRIPTION

Example:

```
{"ProcData":{"Flow":1000,"OpMode":0,"DelivTime":61128,"DelivVolume":0.6,"DelivVolumeProg":10.1,"FluidName":"Salt","FlowUnit":0}}
```

OBJECT	KEYS	VALUES	VALUE DESCRIPTION
Version	HW	String	Hardware version
	SW	Number	Software version (major.minor)
	SN	Number	Serial number
ProcData	Flow	Number	Flow rate if non-rpm unit is set
	Speed	Number	Speed
	DelivTime	Number	Delivery time in seconds
	DelivVolume	Number	Delivered volume in ml if calibration is set and units are non-rpm
	DelivVolumeProg	Number	Delivered volume in pre-defined program mode
	FluidName	String	Current substance name set
	FlowUnit	Int	0=RPM, 1=ml/h, 2=ml/min
DeviceInfo	Name	String	Device type (Doser touch)
	DeviceId	Number	ID of device
	SW	Number	Software version
	SerialNumber	Number	Device serial number
	Type	String	Device type (Doser touch, Peristaltic pump, ...)
	MaxSpeed	Number	Maximal rpm speed
	CalibrationSpeed	Number	Speed (rpm) used during calibration function
	HW	String	Hardware version
ConfigData	Fluids	Int	Enable/Disable the solution names bar on screen
	Display	Int	Display brightness (1-5)
	Sound	Int	Sound level (0-4)
	Units	Int	Current set units type (0=rpm, 1=ml/h, 2=ml/min, 3=l/hr)
	UnitsText	String	Current units text string (only read)

OBJECT	KEYS	VALUES	VALUE DESCRIPTION
	Calibration	Float	Current calibration constant float respects two decimal points – max. 999.999
	FluidName	String	Current fluid name text (max.32 characters)
	Motor	Int	0=smooth, 1=normal (only for PRECIFLOW <i>touch</i> , otherwise return --1)

16 CAN BUS COMMUNICATION (REMOTE 1)

The Doser touch implements the CAN Specification 2.0B (Controller Area Network) interface. This asynchronous serial data communication protocol provides reliable communication in an electrically noisy environment.

For internal purposes, the auxiliary bits in the extended identifier are used for the 1x master/n-slave communication model. See below for an explanation.

The Doser touch uses an extended data frame format with a 29-bit identifier. The nominal bit rate is fixed at 1 Mbit/s (cable length is limited to 20m).

16.1 DESCRIPTION OF COMMUNICATION

The CAN bus protocol uses asynchronous communication. Information is passed from the transmitters to receivers in data frames, composed of byte fields that define the contents of the data frame, as illustrated below.

Each frame begins with a Start of Frame (SOF) bit field and ends with an End of Frame (EOF) bit field. The SOF is followed by the Arbitration and Control fields, which specify the message's type, format, length, and priority. This information allows each node on the CAN bus to respond appropriately to the message. The Data field expresses the content of the message and has a variable length of 0 to 8 bytes. Error protection is provided by a Cyclic Redundancy Check (CRC) field and an acknowledgement (ACK) field.

CAN Bus Message Frame

SOF	ARBITRATION	CONTROL	DATA	CRC	ACK	EOF
-----	-------------	---------	------	-----	-----	-----

16.1.1 EXTENDED DATA FRAME

The extended data frame begins with an SOF bit followed by a 31-bit arbitration field, as shown below. The arbitration field for the extended data frame contains 29 identifier bits in two fields, separated by a Substitute Remote Request (SRR) bit and an IDE bit. The SRR bit determines whether the message is a remote frame. SRR is 1 for

extended data frames. The IDE bit indicates the data frame type. IDE is 1 for the extended data frame. The extended data frame Control field consists of seven bits. The first bit is the RTR. For the extended data frame, RTR is 0. The next two bits, RB1 and RB0, are reserved bits in the dominant state (logic level '0'). The last four bits in the control field are the DLC, which indicates the number of data bytes in the message. The control field is followed by the data field. This field contains the message data – the actual payload of the data frame. This field is of variable length, ranging from 0-8 bytes. The number of bytes is user-selectable. The data field is followed by the CRC field, which is a 15-bit CRC sequence with a delimiter bit. The Acknowledgement (ACK) field is sent as a recessive bit (logic level '1') and is overwritten as a dominant bit by any receiver that has correctly received the data. The message is acknowledged by the receiver regardless of the result of the acceptance filter comparison. The last field is the EOF field, which consists of seven recessive bits that indicate the end of the message.

Format of the Extended Data Frame (29-Bit identifier)

S O F	IDENTIFIER 11-bit	S R R	I D E	IDENTIFIER 18-bit	R T R	R1 1	R0 0	DLC 4 bits	DATA 8 bytes	CRC 16 bits	ACK 2 bits	EOF 7 bits	IFS 3 bits
-------------	--------------------------	-------------	-------------	--------------------------	-------------	---------	---------	---------------	-----------------	----------------	---------------	---------------	---------------

An extended identifier is used to identify the Doser touch on the network. 29 bits are used to distinguish master/slave messages (frames) and to transmit a serial number that uniquely identifies the Doser touch on the network (more in chapter 16.1.2).

After the Doser touch is connected to the CAN network, the Doser touch transmits the CAN_STATUS command (*chapter 16.3*) until the message is acknowledged by any receiver, regardless of the result of the acceptance filter comparison.

Once the CAN_STATUS message is acknowledged, the Doser touch automatically triggers the asynchronous transmission of the following commands outside CAN_STATUS:

- CAN_DEV_NAME
- CAN_FLOW
- CAN_FLUID_NAME

- CAN_PURPOSE
- CAN_ROTATION

It sends these commands periodically, approximately every 50 milliseconds.

(For more information about commands, see Chapter 16.3)

16.1.2 EID BITWISE SIGNIFICANCE

The extended data frame is composed as follows. Serial number 3932390_{10} is used for the following examples.

EID assembled for broadcasting (the Doser touch sends, master receives)

EID (29 bits)			
Slave identifier		None (no significance)	Doser touch serial Number
Bit 28 1	Bit 27 1	Bit 26	Bit 25 – Bit 0
0x1800 0000			0x3FF FFFF e.g. (0x183C00E6 [bitwise AND] 0x3FF FFFF -> 0x3C00E6 = 3932390_{10})
0x1800 000 (bitwise OR) 0x3C00E6			
↓			
0x183C00E6			

EID assembled for receiving (master transmits)

EID (29 bits)			
Slave identifier		None (no significance)	Doser touch serial Number
Bit 28 0	Bit 27 1	Bit 26	Bit 25 – Bit 0
0x0800 0000			$3932390_{10} = 0x3C00E6$
0x0800 0000 (bitwise OR) 0x3C00E6			
↓			
0x083C00E6			

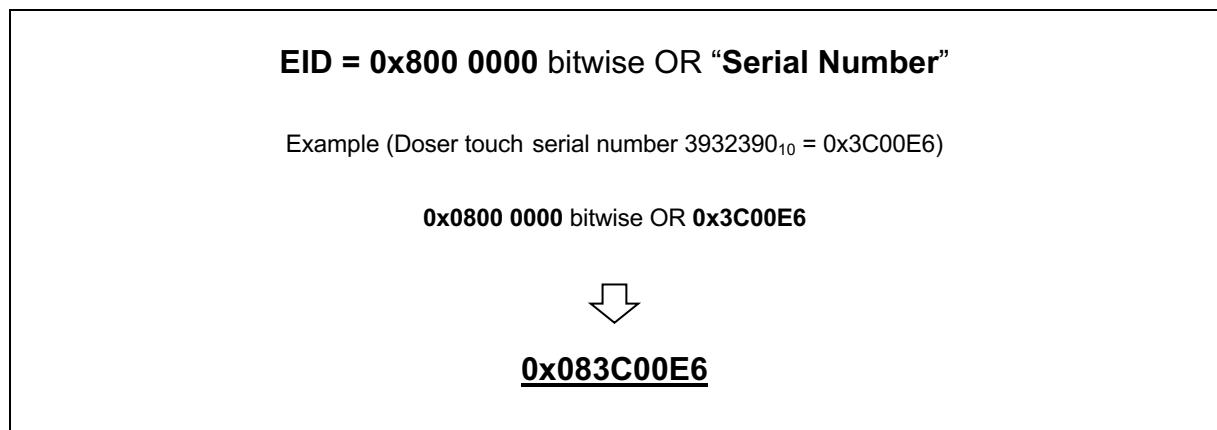
EID decomposed into SID and EID for arbitration fields (master sends)

EID (29 bits) – 0x083C00E6	
SID (11 bits)	EID (18 bits)
010 0000 1111	00 0000 0000 1110 0110
0x20F	0xE6
0x083C00E6 >> 18	0x083C00E6 bitwise AND 0x3FFFF
(shift the requested EID 18 bits to the right)	Perform bitwise AND with EID and 0x3FFFF

16.2 MESSAGE FILTERING

The peristaltic Doser touch continuously monitors messages on the CAN bus. As messages are received, the message identifier (EID) is compared to the filter/mask. If there is a match, the Doser touch processes the message (frame). The first byte of the CAN message/frame is reserved to identify the command to be executed by the peristaltic Doser touch or, when transmitting to a master device, to identify the data it is sending. The remaining bytes (up to 7) are reserved for the actual message data.

In order to accept the message, an EID (29-bits) must be created in the format described below.



If you use, for example, a 32-bit integer to compose the EID, you need to clean it up using bitwise AND 0x1FFFFFFF.

16.3 COMMANDS (PSEUDO-IDENTIFIER)

The commands (pseudo-identifiers) are used to identify the type of message that the peristaltic Doser touch is sending or that the Doser touch is to process. Commands sent to the Doser touch (EID bit 28 = 0 and 27 = 1) may or may not contain values. Some commands contain only the command code in the data portion of the message. A command that contains a value must be processed back to the correct state.

The EID must be constructed correctly to send a message to the Doser touch (see chapter 16.1.2).

Commands are identified by the code (value) of the first data byte of the CAN message (frame). The following bytes represent the data value of the parameter. The following data bytes (max. 7) represent the data value of the command.

EXAMPLE (READ)

CAN_STATUS message sent by Doser touch with serial number 3932390₁₀.

Message/Frame:

EID	DLC	DATA0 (command code)	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	CRC
0x183C00E6	0x7	0x80	0x03	0x00	0x00	0x04	0x1B	0x78	0x717A

Extracting the serial number from the EID identifier (hexadecimal):

0x183C00E6 bitwise AND 0x3FFFFFFF = 0x3C00E6 (**3932390**₁₀)

Command Type

DATA0 = 0x80 -> CAN_STATUS

Command Data

DATA1 = 0x03 -> Doser touch

DATA2 = 0x00 -> STOP operating mode

DATA3 = 0x00 -> No error

DATA4 = 0x04 -> Software version (**major.minor**) -> 0x04.xx (**4 decimal**)

DATA5 = 0x1B -> Software version (**major.minor**) -> x.0x1B (**27 decimal**)

DATA6 = 0x78 -> Hardware version 0x78 -> **120 decimal**)

EXAMPLE (WRITE)

CAN_FLOW command to set Doser touch speed to 1000 rpm with serial number 3932390₁₀.

EID	DLC	DATA0 (command code)	DATA1	DATA2	DATA3	DATA4
0x083C00E6	0x8	0x82	0x00	0x00	0x7A	0x44

For more information on how to represent each data type, see 16.3.3.

16.3.1 READ COMMANDS

The table lists the commands the Doser touch sends and describes the information they provide. Some commands are sent asynchronously, see section (16.1). Only the meaning of the data part of the CAN message (frame) is described in the table. The whole message is described above.

COMMAND NAME	CODE (1 st data byte)	DATA LENGTH (bytes)	DESCRIPTION (DATA1-DATA7)	
			Byte order	Byte (value) significance
CAN_STATUS	0x80	7	0	Command identifier
			1	Device type 0x03 = PRECIFLOW 0x05 = HIFLOW 0x06 = MAXIFLOW 0x07 = MEGAFLOW
			2	Operating mode 0x00 = STOP (LOCAL) 0x01 = RUN (LOCAL) 0x02 = ALARM (LOCAL) 0x03 = REMOTE
			3	Error code 0 = no error 0x01 = ERR_IMAX_OVER 0x02 = ERR_PWM_OVER 0x03 = ERR_IMAX_F_OVER 0x04 = ERR_IMF_LIM_OVER 0x05 = ERR_MOT_STALL 0x06 = ERR_LID_OPEN 0x10 = ERR_PROG_END
			4	Software version (major, e.g. 4 ₁₀)
			5	Software version (minor, e.g. 26 ₁₀)
			6	Hardware version (e.g. 120 ₁₀)
			e.g. 0x80 0x03 0x00 0x00 0x04 0x1B 0x78	
			CAN_FLOW	0x82
1-4	Double data type Current set flow in rpm units			
e.g. 1000 rpm 0x82 0x00 0x00 0x7A 0x43				
CAN_DEV_NAME	0x81	0 – 8 (max 4x 8 bytes)	0	Command identifier
			1-7	String data type Name of device (e.g. Megaflow)
			e.g. 0x81 0x50 0x72 0x65 0x63 0x69 0x66 0x6C 0x81 0x6f 0x77 0x00	

For information about the data format, see the chapter 16.3.3.

16.3.2 WRITE COMMANDS

The table contains commands that can be used to control the Doser touch or change parameter values. Only the commands, i.e., the data part of the CAN message, are

described in the table. Creating a complete CAN message/frame is necessary for writing, as described in chapter 16.1.1.

COMMAND NAME	CODE (1 st data byte)	DATA LENGTH (bytes)	DESCRIPTION	
CAN_FLOW	0x82	5	Byte order	Byte (value) significance
			0	Command identifier
			1-4	Double data type Current set flow in rpm units
			e.g. 1000 rpm 0x82 0x00 0x00 0x00 0x7A 0x44	
CAN_LOCATION	0x89	5	Byte order	Byte (value) significance
			0	Command identifier
			1-4	Integer data type 0x01 = calls up the location function (display flashes)
			e.g. 0x89 0x00 0x00 0x00 0x01	
CAN_MASTER	0x8C	1	Byte order	Byte (value) significance
			0	Command identifier
			e.g. 0x8C	
CAN_CLEAR_ERROR	0x8B	1	Byte order	Byte (value) significance
			0	Command identifier
			e.g. 0x8B	

For information about the data format, see the chapter 16.3.3.

16.3.3 DATA FORMAT

- Integer - 32-bit signed integer, in little-endian format with the Least Significant byte (LSB) at lower data byte (DATA1).

EXAMPLE, READ

EID	DLC	DATA0 (command code)	DATA1	DATA2	DATA3	DATA4
0x183C00E6	0x05	0x88	0x00	0x00	0x00	0x01

Result: 0x00000001 = 1₁₀

EXAMPLE, WRITE

EID	DLC	DATA0 (command code)	DATA1	DATA2	DATA3	DATA4
0x083C00E6	0x05	0x88	0xFF	0xFF	0xFF	0xFF

Change rotation (-1)

- Double (IEEE 754 floating point format, single-precision, 32bit) – values are represented in little-endian format with the Least Significant byte (LSB) at lower data byte (DATA1).

EXAMPLE, READ (CAN_FLOW)

EID	DLC	DATA0 (command code)	DATA1	DATA2	DATA3	DATA4
0x183C00E6	0x5	0x88	0x00	0x00	0x20	0x41

Result: 0x41200000 = 10₁₀ rpm

EXAMPLE, WRITE (CAN_FLOW)

EID	DLC	DATA0 (command code)	DATA1	DATA2	DATA3	DATA4
0x083C00E6	0x5	0x88	0x00	0x00	0x20	0x41

Result: 0x41200000 = 10₁₀ rpm

- Strings (ASCII characters)

Strings are represented as byte arrays (hexadecimal values of ASCII characters).

The maximum length of characters is limited to 32. The end of the string is identified by byte **0x00**. The user application must ensure the creation of a chain based on the processing of up to 4 messages.

EXAMPLE, READ (CAN_DEV_NAME) – 1st message

EID	DLC	DATA0 (command code)	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7
0x183C00E6	0x8	0x81	0x50	0x72	0x65	0x63	0x69	0x66	0x6C

Result: 0x50 = 'P', 0x72 = 'r', 0x65 = 'e', 0x63 = 'c'; 0x69 = 'i', 0x66 = 'f', 0x6C = 'l'

EXAMPLE, READ (CAN_DEV_NAME) – 2nd message

EID	DLC	DATA0 (command code)	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7
0x183C00E6	0x8	0x81	0x6f	0x77	0x00				

Result: 0x6f = 'o', 0x77 = 'w', 0x00 = end

Final string = **Preciflow**

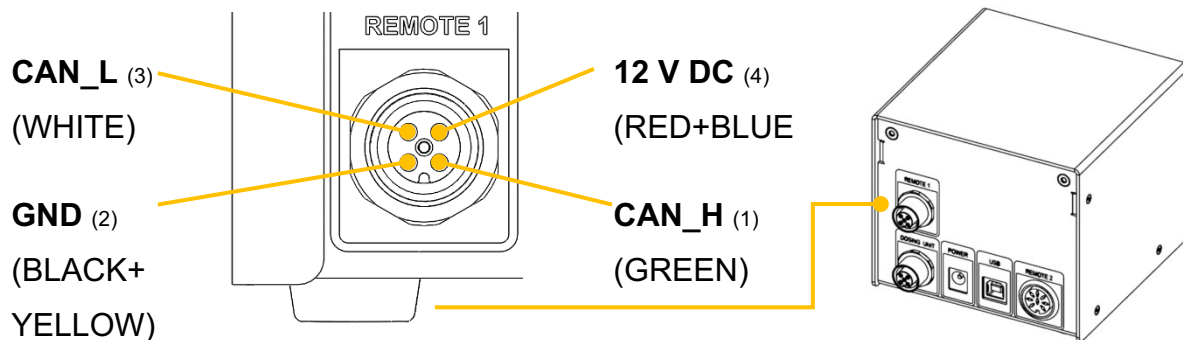
16.4 HEARTBEAT

Doser touch must accept the CAN_MASTER command to remain in REMOTE mode. If the peristaltic Doser touch loses the connection, i.e., stops receiving this command, the motor automatically stops, and the Doser touch switches from REMOTE mode to STOP mode (local control).

This method ensures that the Doser touch stops dosing the moment it loses contact with the element that controls it.

The limit for receiving the CAN_MASTER command is 15x the asynchronous transmission period (50 ms), i.e., approximately 750 milliseconds.

16.5 CONNECTOR WIRING



Marking	Color	Purpose
CAN_L	White	CAN-
CAN_H	Green	CAN+
GND	Black+Yellow	Ground (Device power supply)
12V DC	Red+Blue	Device power supply It is used to power the entire device instead of using an external power adapter. (If a power adapter is connected to the device, the voltage will also be present on this pin).



- The input voltage must not exceed 14V, the absolute maximum of 16V
- Take extra care not to reverse the polarity of 12V and GND

17 REMOTE 2 CONNECTOR FUNCTIONALITY

17.1 CONNECTOR WIRING

No.	Colour	Description
1	yellow	(+) input remote speed control 0-10V *)
2	grey	step signal from motor (0 and 5V)
3	green	earth, 0 V
4	brown	+ 12 V
5	white	(+) input remote ON/OFF; 0V = ON, 3–12 V = OFF
6	pink	earth, ground (GND)
7	red	RS 485 B (-)
8	blue	RS 485 A (+)

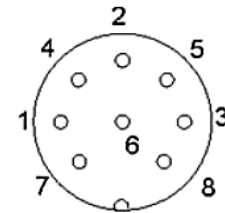


Figure 9-1 8-pole connector

*) (zero line connected to the contact no. 3)

17.2 RS COMMUNICATION PROTOCOL

17.2.1 FORMAT OF DATA SENT BY THE PC TO THE DEVICE AND BACK

Data sent by the PC: #ss mm a ddd qs c
 Data sent back by the device: <mm ss a ddd qs c
 where,

- #** is the first sign of a command sent by PC
- <** is the first sign of a message sent by Doser touch
- ss** is the address of the Doser touch
- mm** is the address of the PC
- r** for clockwise (cw) rotation (to the right)
- ddd** is the speed of rotation (3 ASCII numbers from 0 to 9; sent from the highest order digit to the lowest order digit)
- qs** is the control sum in HEX format (2 ASCII signs of the type 0...9ABCDEF)
- c** is the end sign cr (carriage return) The Doser touch will fulfill the task and block any manual command on the Doser touch front panel.

17.2.2 COMMANDS NOT CONTAINING DATA

ss mm **g** qs c activates the local command of the device
 # ss mm **s** qs c the device is stopped
 # ss mm **G** qs c to send device data to the PC

17.2.3 CHECKSUM CONTROL

The PC sends: #0201r123EEcr

The control sum (checksum) qs is made in the following way (only the last byte (2 ASCII characters of the type 0...9ABCDEF) is taken):

#	0	2	0	1	r	1	2	3	EE (last byte)	cr
23h	+30h	+32h	+30h	+31h	+72h	+31h	+32h	+33h	=1EEh	0Dh

17.2.4 FORMAT OF THE DATA TRANSMISSION

Speed: 2400 Bd (Baud)
 8 data bits, odd parity, 1 stop bit

These settings are for backward compatibility with previous generation devices.

17.2.5 EXAMPLES

Address of the PC: 01
Address of the device: 02

The PC sends: #0201r123EEcr
The device will rotate at a speed of 123

The PC sends: #0201s59cr
The device stops.

The PC sends: #0201g4Dcr
The device will go to the local command (device front panel is activated).

17.3 RS COMMUNICATION PROTOCOL FOR THE ON-BOARD INTEGRATOR

17.3.1 FORMAT OF DATA SENT BY THE PC TO THE DOSER TOUCH AND BACK

From the PC to the INTEGRATOR:
#ss mm z qs c

From the INTEGRATOR to the PC:
<mm ss = qs c confirmation of the reception of a command
<mm ss dddd qs c sending of the requested data

where,

#	is the first sign of a command sent by the MASTER (PC)
<	is the first sign of a message sent by the SLAVE (INTEGRATOR)
ss	is the address of the subordinate station (address of the instrument with integrated INTEGRATOR)
mm	is the address of the commanding station (PC)
z	is a command (see below): small letters indicate a command, capital letters request data transfer from the subordinate station
=	confirmation of reception
aa	new address of the subordinate station (ss) (two numbers and possibly other ASCII characters A B C D E F)
dddd	transferred data (values are two bytes in hexadecimal form. Single bytes are transformed into two ASCII characters 0,...,9,A,B,C,D,E,F)
qs	is the control sum (obtained by the addition modulo 256 of binary values of all preceding characters, including the leading sign) in HEX format (2 ASCII signs of the type 0...9ABCDEF)
c	is the end sign cr (carriage return)

17.3.2 COMMANDS FOR THE INTEGRATOR

n	reset (sets the INTEGRATOR to zero)
i	start the integration
e	stop of integration
I	sends the integrated value
N	sends the integrated value and sets the integrator to zero
L	sends the integrated value ccw rotation (to the left) (not for DOSER)
R	sends the integrated value of cw rotation (to the right)

17.3.3 EXAMPLES

Address of the PC: 01
 Address of the instrument with on-board INTEGRATOR: 02

The PC sends: **#0201I2Fcr**

The control sum (checksum), qs, is made in the following way (only the **last byte**. (2 ASCII characters of the type 0...9ABCDEF) is taken):

#	0	2	0	1	I	2F (last byte)	cr
23h	+30h	+32h	+30h	+31h	+49h	=12Fh	0Dh

The PC sends: **#0201i4Fcr**
 i.e., in hexadecimal form: 23h 30h 32h 30h 31h 69h 34h 46h 0Dh

This means: For a subordinate station (SLAVE) with address 02 from a commanding station (MASTER) with address 01

Start of integration

The control sum is 14Fh (last byte: **4F**); end of message cr (carriage return)

The INTEGRATOR answers: <0102=3Ccr

The PC sends: **#0201N34cr**
 The INTEGRATOR answers: <0102N03C225cr (integrated value is 03C2h)
 and resets to zero

The PC sends: **#0201e4Bcr**
 The integration will be stopped, and the command will be confirmed.
 The INTEGRATOR answers: <0102=3Ccr

18 LIST OF ACCESSORIES

Art. No. Accessories

- 4803 PUMP-FLOW INTEGRATOR (for LAMBDA pumps, DOSER, HIDOSER, and MASSFLOW)
- 4810 Pump remote control (analog and digital) cable, 8 poles (open ends)
- 4802 Pump ON/OFF remote control cable, 2 poles (open ends)
- 4823 Foot switch for ON/OFF control, 8 poles
- 4824 Cable for inverted analog ON/OFF control, 8 poles

Interface and Control software

- 4816 RS485 interface (for connection of the instruments to the serial port)
- 4817 RS232/485 converter
- 4818 Power supply for RS232/485 converter (5V/1W)
- 4819 RS-line connection cable (serial)
- 6600 PNet control software for peristaltic and syringe pumps, DOSER, HIDOSER or MASSFLOW
- 800202 Quadruple plug box (Power and RS-connection for up to 4 LAMBDA laboratory instruments)

Spare parts

- 4821 Plug-in power supply (12V/50W) for DOSER touch, HIFLOW, MAXIFLOW, VIT-FIT, MASSFLOW
- 5801 Glass adaptor with ground NS 29/32 fitting
- 5802 Screw cap SVL 42
- 5803 Teflon disc powders
- 5806 Rubber/Teflon sealing disc
- 5807 Centering part 5808-b Blind plug
- 5808-g Gassing plug
- A5815-c Control unit DOSER touch
- A5815-m Motor unit for DOSER touch
- 5810 Glass vessel with side arm (approx. 0.2 l)
- 5811 Glass vessel with side arm (approx. 1 l)
- 5811-L Glass vessel with side arm (approx. 3 l)
- 5810-s Silicone coated glass vessel with side arm (approx. 0.2 l)
- 5811-s Silicone coated glass vessel with side arm (approx. 1 l)

5811-L-s Silicone coated glass vessel with side arm (approx. 3 l)

5811-6L-s Silicone coated glass vessel with side arm (approx. 6.5 l)

A5842-kit Distributor kit (reduced dosing approx. factor 2, reduced dosing approx. factor 10, very fluid powders)

A5804 Modular distributor (standard) for 0.2 l / 1 l vessel

A5804-3L Modular distributor (standard) for a 3 l vessel

A5804-6L Modular distributor (standard) for 6.5 l vessel

19 SAFETY FOR INSTALLATION, OPERATION, CLEANING, MAINTENANCE, AND STORAGE

Installation

- Place the Doser Touch on a **stable, level surface** and ensure the **glass vessel is positioned securely** to prevent tipping or breakage.
- Keep the installation area **dry, clean, and free of vibration**.
- Connect only to a properly grounded power supply.

Operation

- Use the device **exclusively for powder dosing** with the supplied or compatible **glass vessel**.
- Inspect the glass vessel before each use; **do not use it if cracked or damaged**.
- Ensure the vessel is **properly seated** before starting a dosing cycle.
- Stop operation immediately if you notice **unusual noise, irregular movement, or error messages**.

Cleaning

- Switch off and unplug the device before cleaning.
- Wipe the housing and touchscreen with a **soft, slightly damp cloth**.
- Clean the **glass vessel** separately using mild detergent; avoid abrasive materials.

Maintenance

- Perform only the maintenance tasks described in the manual.
- Regularly check the **glass vessel and dosing components** for wear or damage.
- Use only original LAMBDA replacement parts.
- For service and repairs, contact support@lambda-instruments.com for instructions. Repairs and services can only be carried out by an authorized person who is aware of the hazard involved. LAMBDA assumes no liability for

any service or repair performed by the user, an unauthorized person, or third-party companies.

Storage

- Store the device and **glass vessel** in a **dry, dust-free environment**.
- Ensure all components are **clean and completely dry** before storage.
- Protect the glass vessel from impact or pressure.

20 GUARANTEE

LAMBDA provides a two-year guarantee on material and manufacturing defects if the instrument was used according to the operation manual.

Conditions of guarantee:

- The instrument must be returned with a complete description of the defect or problem. In order to send back the equipment for repair, you will need a returns authorization number from LAMBDA.
- The customer will send the instrument to our service office.
- Damage or loss of items during transport will not be compensated for by LAMBDA.
- Failure to fulfil these requirements will disqualify the customer from compensation.

Serial number: _____

Guarantee from: _____

The warranty becomes invalid in the event of improper installation, operation, cleaning, maintenance, or storage (for example, outside the intended environmental and/or electrical specifications), in case of damage caused by contamination or leaks due to torn or burst tubing, or unauthorized modification carried out by the user or a third party.