



Software Manual

Version: V0.1.15 (Draft Version)
Date: 26.02.2020

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1.1 VERSION OVERVIEW

Table 1 Version overview

Version	Release date	Changes
		Basic version
		Preliminary version
V0.1.1	07-07-2017	Draft version
V0.1.15		

2. GENERAL

2.1 SAFETY



Figure 1 Wash hands

Water supply can be contaminated with bacteria!
Always wash your hands before and after working with the BACTcontrol.



Figure 2 Caution, risk of electric shock



Figure 3 Hot surface

Always switch off the instrument during maintenance and cleaning.

2.2 COPYRIGHT

This manual and all containing information and figures are copyrighted. All rights (publishing, reproduction, printing, translating, storage) are reserved by microLAN b.v. Each reproduction or utilization outside the permitted limits of the copyright law are not allowed without previous written consent of microLAN b.v.

The reproduction of products names, registered trade names, designation of goods etc. in this manual does not imply that these names can be used by everyone, often these are registered trademarks, even if they are not marked as such.

2.3 WARRANTY

microLAN B.V. warrants each Model BACTcontrol and its optional equipment against defects in materials and workmanship under normal use and service for a period of one (1) year. Equipment installed by microLAN is warranted from the installation date; all other equipment is warranted from the ship date. If purchaser schedules or delays installation more than 90 days after delivery, then the warranty period starts on the 91st day from date of shipment. This warranty extends only to the original purchaser. microLAN will, at its option, repair or replace equipment that proves to be defective during the warranty period, provided the equipment is returned to microLAN at the expense of the purchaser. Parts, labour, and return shipment to the customer shall be at the expense of microLAN. Travel costs shall be at the cost of the purchaser.

Software and firmware designed by microLAN for use with an external PC will execute its programming instructions when properly installed on that PC. microLAN does not warrant that the operation of the PC, software, or firmware will be uninterrupted or error-free.

Consumables and parts are warranted for 30 days (parts only) and are not available for coverage under extended warranties or service contracts.

This warranty shall not apply to defects originating from:

- Improper maintenance or operation by purchaser.
- Purchaser-supplied accessories or consumables.
- Modification or misuse by purchaser.
- Operation outside of the environmental and electrical product specifications.
- Improper or inadequate site preparation.
- Purchaser-induced contamination or leaks.

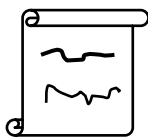
2.4 MANUAL INFORMATION

2.4.1 NOTES, CAUTIONS AND WARNINGS

This manual contains Notes, Cautions and Warnings, for situations that may:

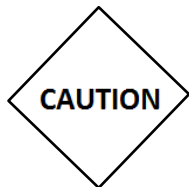
- Endanger operating personnel,
- Cause damage to equipment
- Need specific attention.

The following formats and symbols are used:



NOTE

Notes provide additional information, such as expanded explanations, hints or reminders.



CAUTION

Cautions alert you to conditions that may cause damage to the equipment or interfere with the normal processing and damage the product.



WARNING

Warnings point out procedures you must follow precisely to avoid personal injury or serious damage to the equipment.

2.5 ISO 15839

ISO 15839 describes the procedure and performance of on-line sensors/analyzing equipment for water. This standard is applicable to most sensors/analyzing equipment.

This International Standard :

- Defines an on-line sensor/analyzing equipment for water quality measurements;
- Defines terminology describing the performance characteristics of on-line sensors/analyzing equipment;
- Specifies the test procedures (for laboratory and field) to be used to evaluate the performance characteristics of on-line sensors/analyzing equipment.

2.6 RELATED DOCUMENTS

- BACTcontrol User Manual
- BACTcontrol Advanced user Manual
- BACTcontrol Quick user Manual
- Manual Optional Cooling-Unit

3. INTRODUCTION BACTCONTROL SOFTWARE

The software on the BACTcontrol is developed specifically to set and control the BACTcontrol. Generated data during operating is available in the software database

The software is preinstalled by microLAN.

The user can change standard settings for the BACTcontrol as described in this manual.

If an error or fault is given by the program, which relates to the software, please send an email to: service@microLAN.nl

BACTcontrol software

The required data for evaluation purposes or for obtaining a history, will be saved during a measurement run of the BACTcontrol. To view the data in tables or charts, the programme INDIGO Archive viewer can be used. This program is already standard installed on the BACTcontrol.

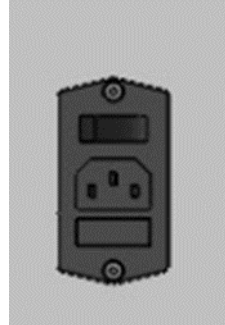
For data evaluation, the data can be exported very easily to on another computer. See also: Chapter 7.2.1

4. HARDWARE START-UP

Connect the BACTcontrol to a 230 VAC / 50 Hz power outlet (if 115V / 60 Hz is used check with your supplier whether the system is converted for this).

Switch on the main switch,.

The display of the BACTcontrol will light on. The software of the BACTcontrol starts automatically.



5. INTRODUCTION TO THE BACTCONTROL SOFTWARE

5.1 LOG IN

The operating terminal is a touchscreen that can be operated through finger contact or with a touchscreen pen. Do not touch the screen of the operating terminal with hard objects, this might damage the terminal.

5.2 Menu structure

The BACTcontrol software is built up in menu's which can be selected by buttons. There are three head menu's. Each head menu has several submenu's. Similarly extra buttons and additional information will be displayed.

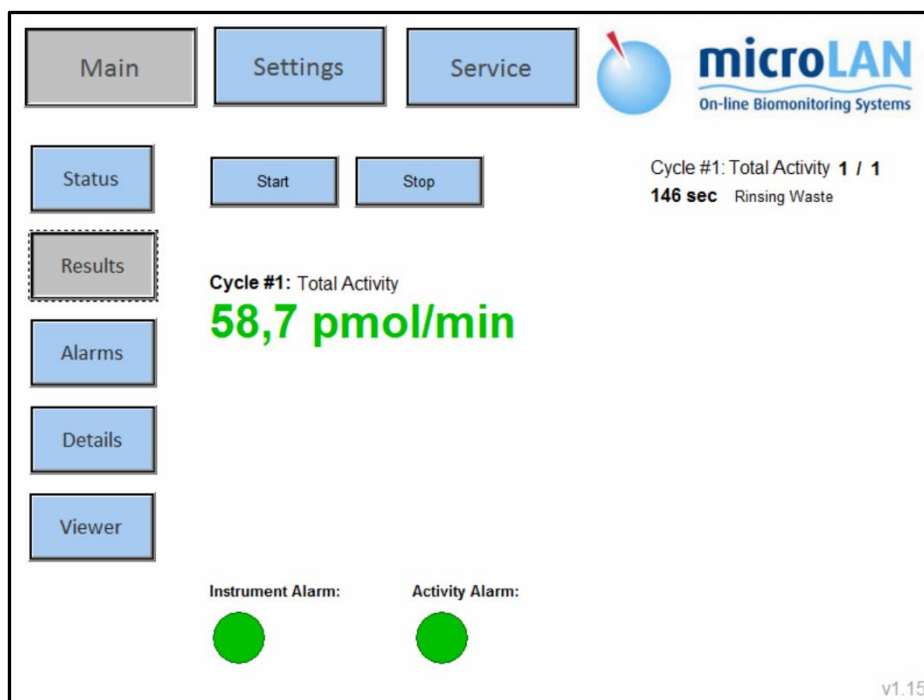
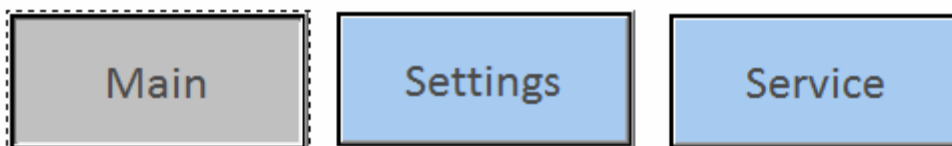


Figure 4: Main screen BACTcontrol software

5.3 HEAD MENU'S

There are three head menu's: MAIN, SETTINGS and SERVICE



6. MAIN MENU

In the main menu, measurement procedures can be operated and data is displayed.

The main menu is build up in five submenu's.

1. STATUS
2. RESULTS
3. ALARMS
4. DETAILS
5. VIEWER



6.1 STATUS

In the status section, the main procedures can be operated. Measurement results and possible alarms are displayed. Figure 5: Status menu shows the different options that are available in the status screen together with the information of the current or last measurement.

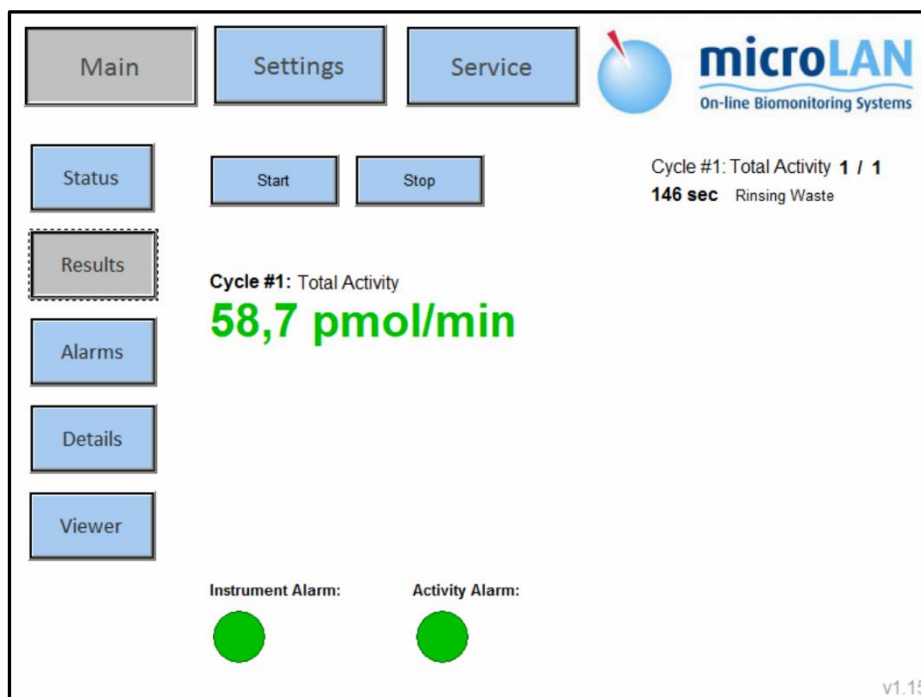


Figure 5: Status menu

6.2 RESULTS

Historic measurement Cycle or blank Cycle results are displayed.



(Choose measurement Cycle with)

Cycle#1	Measurement Cycle 1					
Description	Cycle#1_102	Cycle#1_101	Cycle#1_100	Cycle#1_99	Cycle#1_98	Units
Date	28/04/2017	27/04/2017	26/04/2017	26/04/2017	26/04/2017	
Time	04:50:36	13:09:01	21:30:51	14:55:12	11:47:17	
Type	Total Activity	Total Activity	Total Activity	Total Activity	Total Activity	
Remarks	TW, with stirrer	TW, with stirrer	TW, with stirrer	TW, with stirrer	TW, with stirrer	
Chamber Temperature	44.9	45.0	44.9	44.9	44.9	°C
Enclosure Temperature	25.9	26.5	28.1	28.3	26.5	°C
Filtrated Volume	100	100	100	100	100	mL
Max. Pressure	0.5	0.5	0.9	1.1	0.9	bar
Average Flow	10.9	10.9	10.9	10.6	10.9	mL/min
Filtration duration	9.2	9.2	9.2	9.4	9.2	min
Filtration start time	03:46:05	12:04:30	20:26:19	13:50:22	10:42:46	
Blank	7.85	4.25	5.35	8.67	6.44	pmol/min
Activity	145.52	81.74	78.11	98.66	101.20	pmol/min
Net Activity in pmol	137.66	77.49	72.75	89.99	94.76	pmol/min
Net Activity in Cells	137.66	77.49	72.75	89.99	94.76	cells/vol
Detection Limit	3.90	4.17	2.86	2.38	3.45	pmol/min
Fluorescence Increase	3505	2989	3145	3098	3220	rfu
Erroneous Measurement	OFF	OFF	OFF	OFF	OFF	

Close

Newest


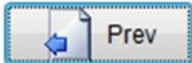
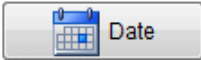
Next

Prev

Date

Export

Figure 6: Historic measurement results

- Press  or  to see current or historic results.
- For a specific period press 

A pop up will disappear (choose the wished period and press **OK**)

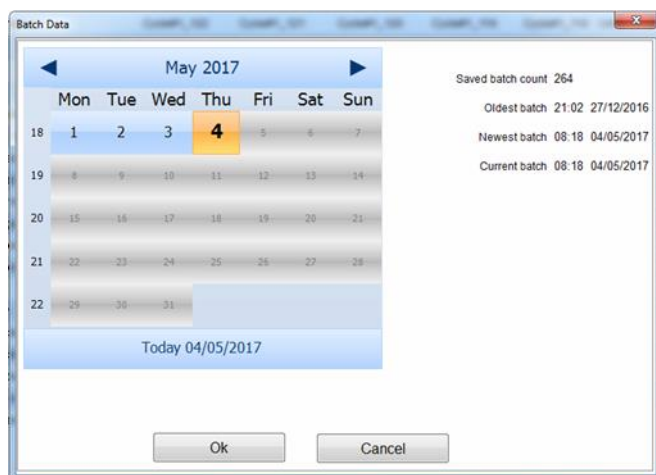



Figure 7: Date menu

- Stored data can be exported with  See chapter 7.2.1. for further information.

6.3 ALARMS

Possible instrument and process alarms are shown in the Alarm menu

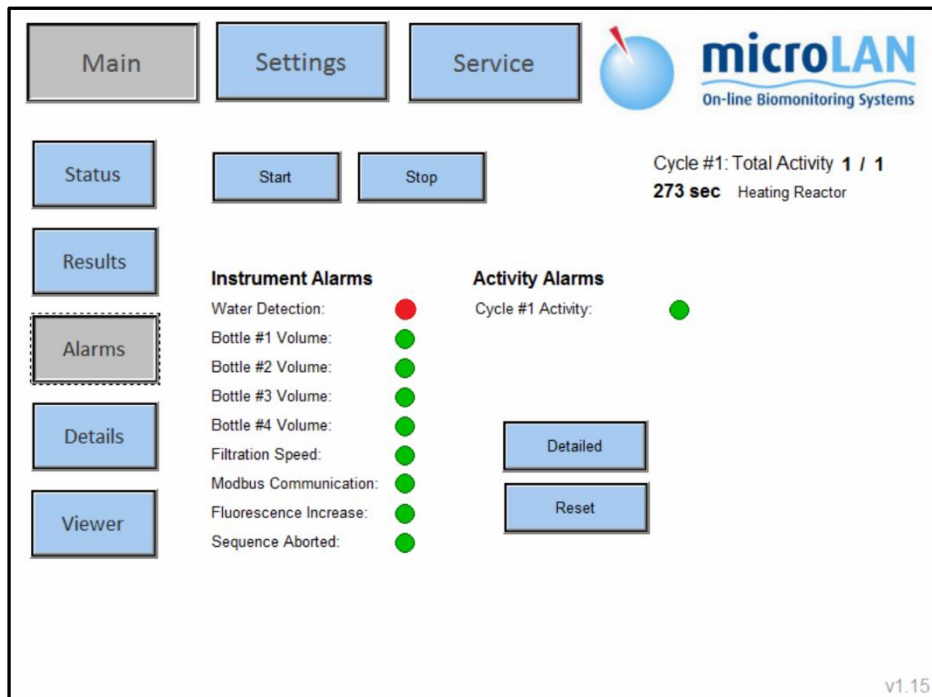
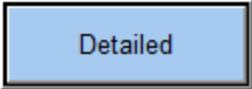



Figure 8: Alarms screen

- Press  for specific information about current and unacknowledged alarms.
- Press  to reset all Alarms. This will also reset the last measure result on the Status screen to 0,0!

6.4 DETAILS

Process details such as measurement step, temperature, volume of solutions, status of valves and pumps are displayed in Details section.

When, for instance, there is no water flow or a solution should be replaced, an instrument alarm will appear. For instructions regarding the replacement of solutions see user manual chapter 8.1.2 (Daily maintenance).

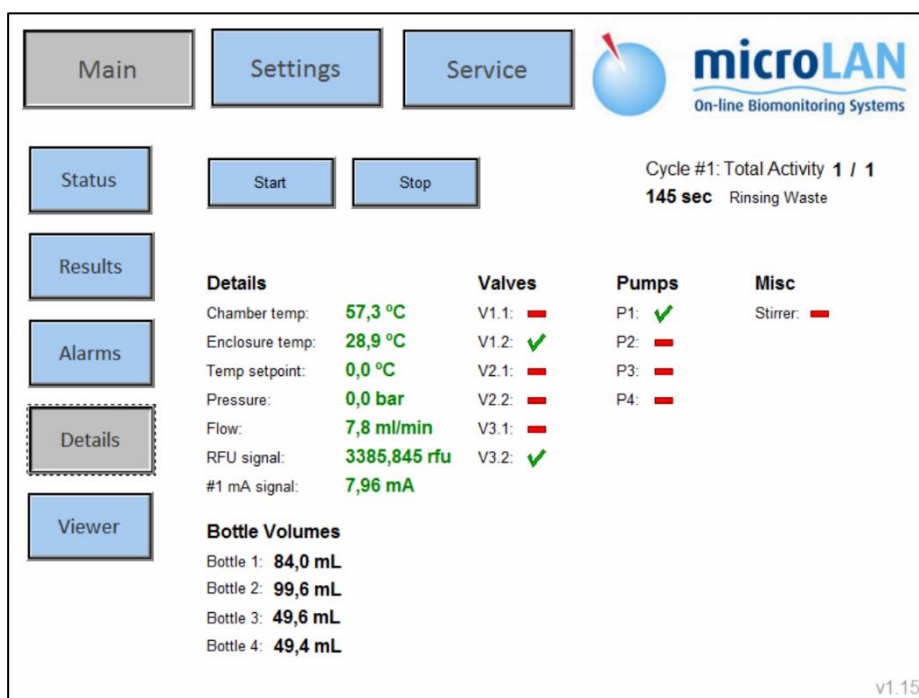


Figure 9 Details screen

6.5 VIEWER

A graph of the measurements results can be displayed in the Viewer menu.
(used program: **INDIGO Archive viewer**).

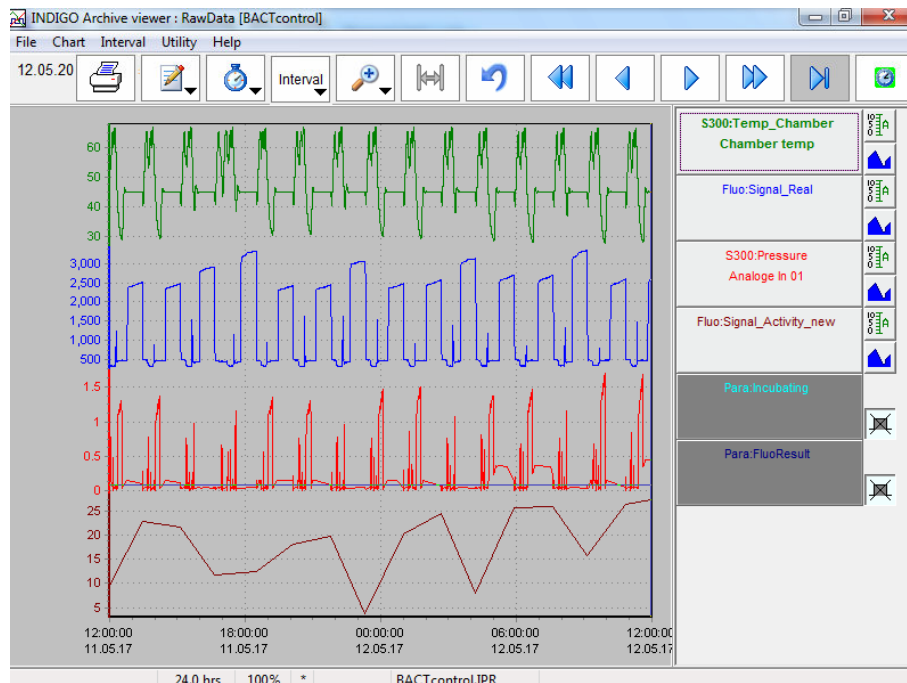


Figure 10 Graph data BACTcontrol

When there is no graph displayed after clicking on the Viewer button:

- Go to the status bar on the bottom of the screen (only visible when pointed on it)



- Press the graph button
- Now a graph appears.



- Move the cursor along the graph and click to see the results of a specific time on the right side of the window.

- A specific time frame vary from 1 hour to 1 month can be selected with



- Close the graph (and the program **INDIGO Archive viewer**) by clicking on



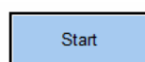
7. START AND STOP OF A MEASUREMENT

In the main menu also the start and stop buttons are displayed.



7.1 START A MEASUREMENT

- To start a new measurement click on



Now a pop-up window appears

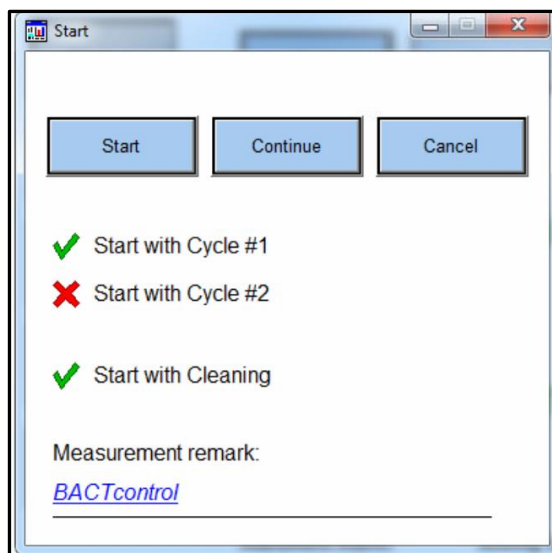


Figure 11 Measurement start menu

There are three options available:

- I. **Start** will start a new measurement
- II. When **Continue** is pressed the BACTcontrol starts the next cycle, proceedings regarding the preparation of the sample, such as heating, are skipped.
- III. Pressing **Cancel** will close the pop-up window.
(no further actions will take place)

The set points and current status of the measurements are displayed on the main window.

Further details of the last measurement, especially the activity that is

measured in the last measurement are displayed under

Results

7.2 STOP A MEASUREMENT

- To Stop a measurement press

Stop

Now a pop-up window appears

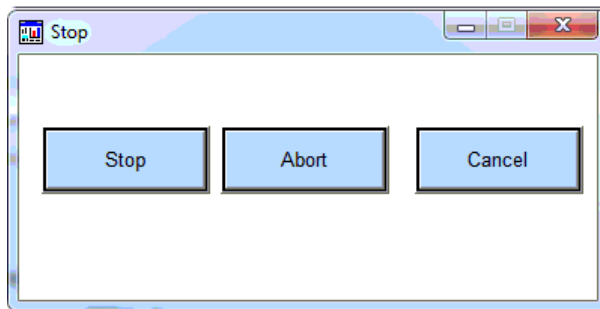


Figure 12 measurement stop menu

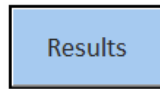
There are three options available:

- I. **Stop**, the BACTcontrol will finish the current measurement according to the normal procedures;
- II. **Abort**, the BACTcontrol will immediately stop with the current measurement, no data or results are saved;
- III. **Cancel**, no measurement will be stopped or aborted. The BACTcontrol will finish the current measurement and will go further with a next measurement.

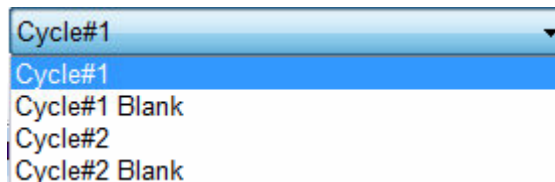
7.2.1 DATA EXPORT

Stored data can be exported to a USB-stick or an external computer.

- Go to the main display and press



- Choose the measurement cycle



- Press



Now a pop-up screen will be displayed.

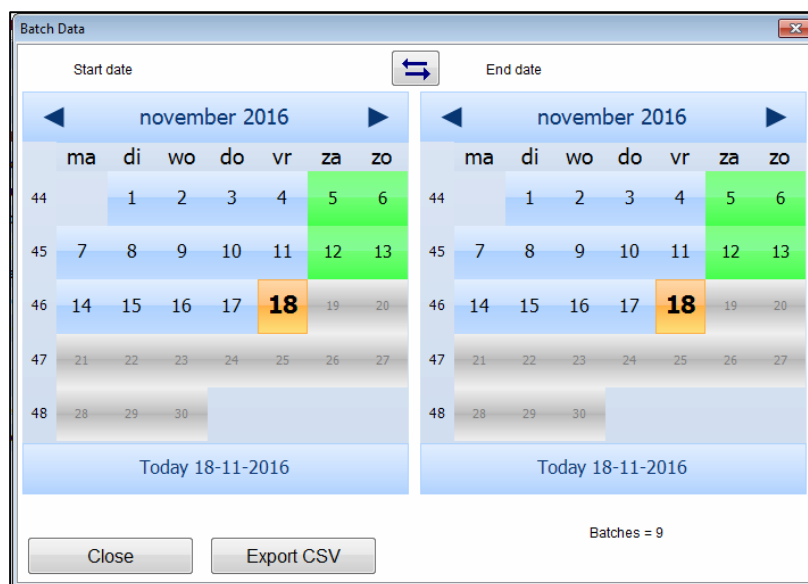
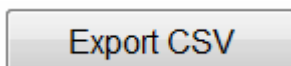


Figure 13 Calendar screen for data export

- Select a Start date (left) and End date (right)

- Press



The selected measurement data will be stored on:

Windows > documents > I:\microLAN\IndProj\BACTcontrol\Export.
(CSV-file can be imported in Excel)

- Copy the stored data to an USB-stick or external computer (For exporting to an external computer a Teamviewer connection should be set up).

8. SETTINGS

In the Settings menu process parameters and settings can be changed.



Make sure you change the correct parameter.

Changing the default settings may affect the measurement process or can damage some components of the BACTcontrol!

Settings can



only be changed when system is not “Busy” !

8.1 SEQUENCE

In the submenu Sequence, different parameters, such as temperature, stabilisation time, incubation time, Volumes, conversion factor and filtration volume can be changed. (When changing these settings, please contact microLAN for advice)

By clicking a blue selection button  the assigned pump can be chosen.



	<i>E.coli</i>	Coliform	Total Activity	Enterococci
Reaction temp.	44 °C	36 °C	45 °C	37 °C
Stabilisation time	20 min	20 min	20 min	20 min
Incubation time	20 min	15 min	20 min	20 min
Buffer volume	60 µL	60 µL		250 µL
Reagent volume	60 µL	120 µL	60 µL	250 µL
pmol CF	0,438	0,464	0,384	0,395
Filtration volume	100,0 mL	100,0 mL	100,0 mL	100,0 mL
Blank filtration volume	5,0 mL	5,0 mL	5,0 mL	5,0 mL
Buffer pump	P2 <input type="checkbox"/>	P2 <input type="checkbox"/>		P2 <input type="checkbox"/>
Reagent pump	P3 <input type="checkbox"/>	P3 <input type="checkbox"/>	P2 <input type="checkbox"/>	P4 <input type="checkbox"/>
Fluorescence threshold	200 rfu	100 rfu	400 rfu	100 rfu
Custom unit CF	0,158	0,130	0,000	0,000
Activity high alarm	5	5	250	5
Activity high-high alarm	10	10	500	10
Custom blank correction	0,0	0,0	0,0	0,0

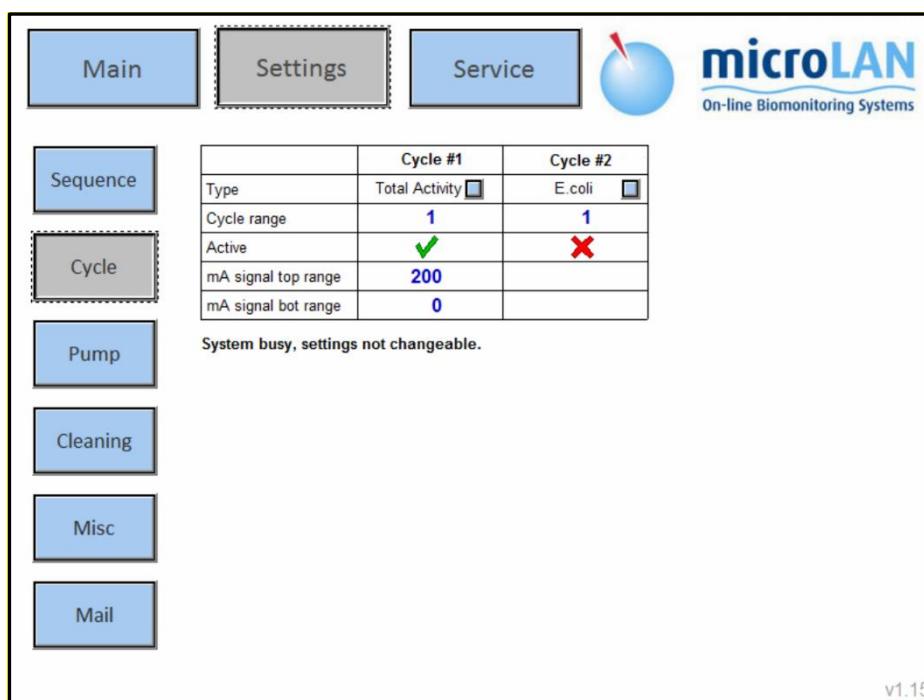
System busy, settings not changeable. v1.15





Figure 14 Sequence screen

8.2 CYCLE

In the submenu **Cycle** the settings for the different measurements can be changed.

- **TYPE:** By clicking a blue selection button  a measurement type can be assigned to a Cycle.
- **Blank Frequency:** Shows the number of measurements relative to a Blank measurement.
- **Active:** Selecting a check mark  will activate the Cycle
- **mA Signal Top Range:** Indicates the maximum value for analogue output (20 mA)
- **mA Signal Bot Range:** Indicates the minimum value for analogue output (4 mA)



	Cycle #1	Cycle #2
Type	Total Activity 	E.coli 
Cycle range	1	1
Active		
mA signal top range	200	
mA signal bot range	0	

System busy, settings not changeable.

Figure 15 Cycle screen

8.3 PUMP

In the **Pump** submenu the pump settings can be changed.



Always contact microLAN for required settings, incorrect settings may damage the filter or the reaction chamber!

- **Normal Pumping Speed:** This is the maximum speed for the pump. The pump speed is variable, depending on pressure.
- **Deaeration Pumping Speed:** This is the pump setting for deaerating the reactor.
- **Filtration Starting Speed:** Setting for the pump speed by a new filtration start.

- **Pressure Max:** This setting adjusts the pump speed. When pressure max is reached, the pump speed decreases (Settings: Decrease Size & Time).
- **Pressure Min:** This setting adjusts the pump speed. When pressure min is reached, the pump speed increases (Settings: Increase Size & Time).
- **Decrease Time:** Time setting for decrease pump speed.
- **Decrease Size:** Size for steps to decrease pump speed.
- **Increase Time:** Time setting for increase pump speed.
- **Increase Size:** Size for steps to increase pump speed.
- **Old pump firmware:** Only necessary for testing other versions Print board.
- **Filtration speed max:** This is the maximum speed for the pump during filtration.
- **Filtration speed low alarm:** When filtration speed is lower than this value a low- Alarm will occur
- **Filtration speed low-low alarm:** When filtration speed is lower than this value a low-low Alarm will occur and the measurement is abort.

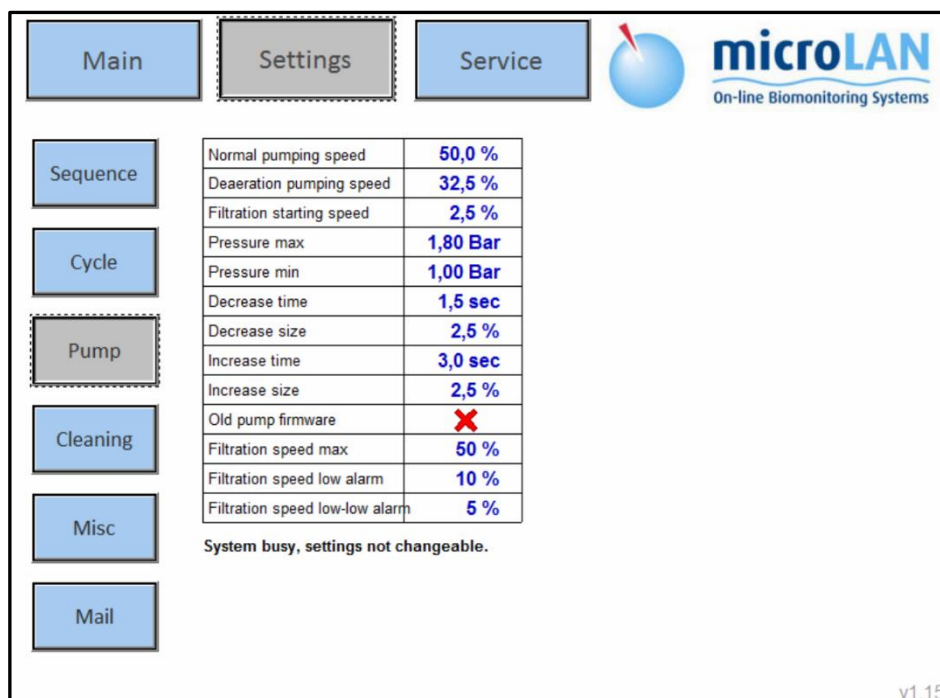

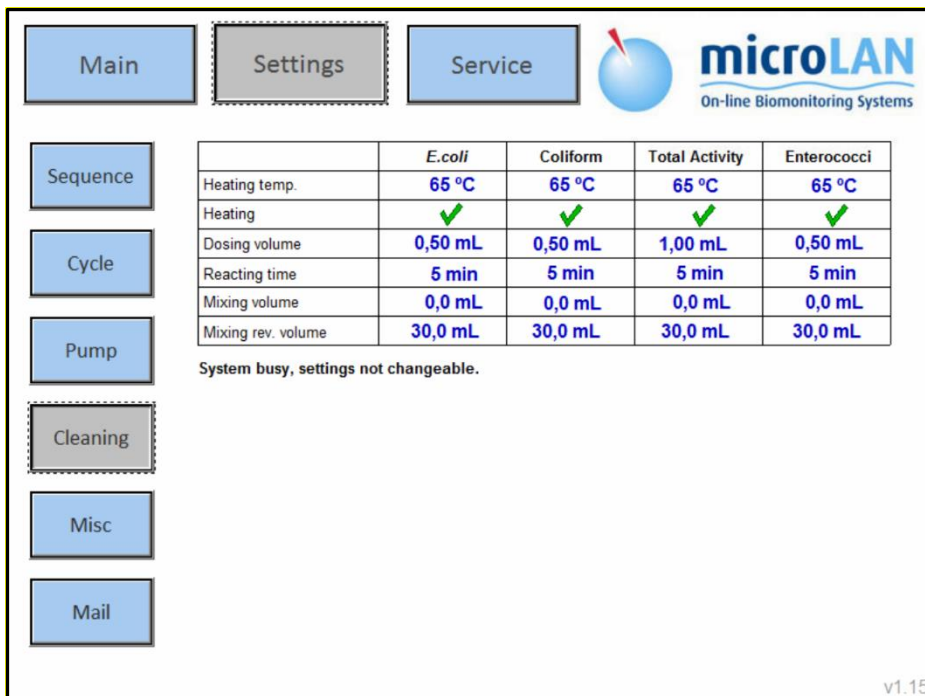






Figure 16 Pump screen

8.4 CLEANING

In the **Cleaning** submenu the individual settings for the cleaning procedure of each measurement type can be changed.

- **Heating temp:** Temperature setting for the heating step in the cleaning procedure
- **Heating:** Selecting a check mark  will activate the Heating step in the cleaning procedure
- **Dosing volume:** Setting for dosing volume cleaning solution
- **Reaction Time:** Setting for reaction time of cleaning solution
- **Mixing Volume:** This is the mixing volume for the forward cleaning step
- **Mixing Rev. Volume:** This is the mixing volume for the reversed cleaning step



	<i>E.coli</i>	Coliform	Total Activity	Enterococci
Heating temp.	65 °C	65 °C	65 °C	65 °C
Heating				
Dosing volume	0,50 mL	0,50 mL	1,00 mL	0,50 mL
Reacting time	5 min	5 min	5 min	5 min
Mixing volume	0,0 mL	0,0 mL	0,0 mL	0,0 mL
Mixing rev. volume	30,0 mL	30,0 mL	30,0 mL	30,0 mL







System busy, settings not changeable.

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Figure 17 Cleaning screen

8.5 MISC

In the **Miscellaneous** submenu the limits and delay settings can be changed

- **Inlet Tubing volume:** Setting to include the volume of the inlet hose in the measurement process
- **Show custom unit:** Selecting a check mark  will show a Custom calculated value instead of pmol/min.
- **Delay after Cycles:** Enter a value will stop the measurement process for a period of time after the entered cycles (time can be selected by Delay time)
- **Delay Time:** This is the amount of delay time before a new measurement cycle will start. Applicable only when the option; " Delay after Cycles" is activated
- **Detection limit minimum:** A detection limit above this value can be seen as unreliable. An Erroneous Measurement result will occur.
- **Detection limit threshold:** Internal calculation value (100 %)
- **10 ml chamber volumes:** Selecting a check mark  will activate settings for a 10 ml reaction chamber. Deselecting a check  mark will activate settings for a larger reactor.
- **Custom unit:** For setting a calculated Custom value and unit.
- **Bubble sensor sensivity:** This is the sensitivity of bubble check for incoming water and may occur an alarm. (value can be set lower when incoming water contains air bubbles).
- **2nd inlet:** When selecting a check mark here,  all pump steps, except the filtration step ,are done via 2nd inlet. (this will also add valve 3.3 in service menu
- **Enclosure Heating:** When selecting a check mark here  will turn on the cabinet heater (Optional)
- **Enclosure setpoint:** Setpoint for cabinet temperature.
- **Post filtration from 2nd inlet** When selecting a check mark here  This inlet will be used for rinsing the reactor with external fresh- or demi water to optimize a measurement.
- **Post filtration volume:** Setting volume to use for post filtration

Parameter	Value
Inlet tubing volume	10 mL
Show custom unit	✗
Delay after cycle(s)	✗
Delay time	18,0 Hour(s)
Detection limit minimum	5
Detection limit threshold	100 %
10 mL chamber	✓
Custom unit	n/a
Bubble detector sensitivity	6,0 %
2nd inlet	✗
Enclosure heating	✗
Enclosure setpoint	22,0 °C
Post filtration from 2nd inlet	✗
Post filtration volume	20 mL

System busy, settings not changeable.

v1.15

Figure 18 Misc screen

8.6 MAIL

Via Mail, alarms can be send to a maximum of 10 different mail-addresses.

Per mail address a selection of “**Activity**” and “**Instrument**” Alarm can be made.

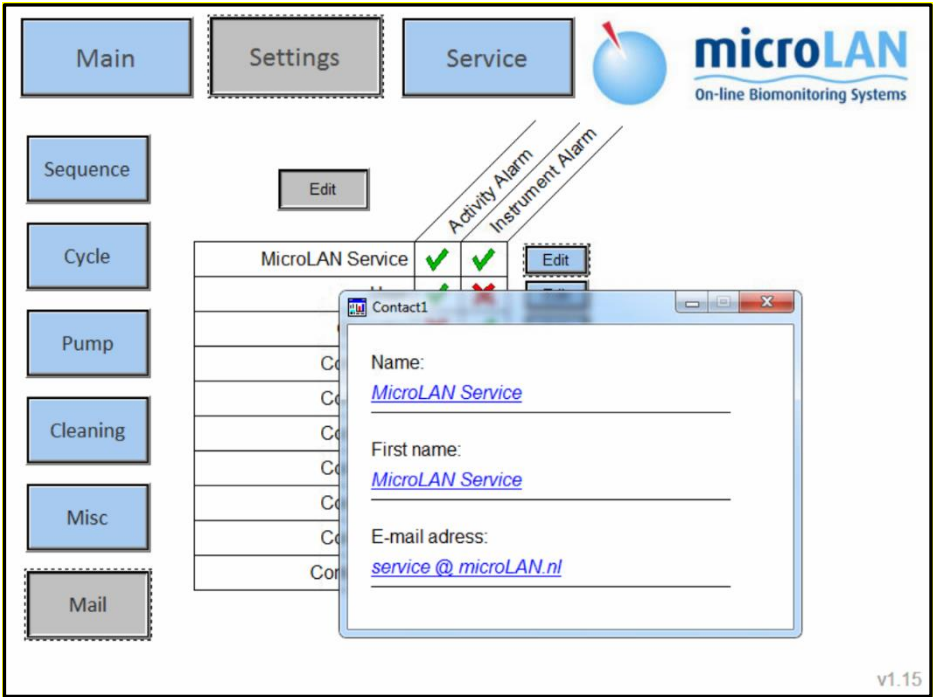
	Activity Alarm	Instrument Alarm
MicroLAN Service	✓	✓
User	✓	✗
Operator	✗	✓
Contact #4	✗	✗
Contact #5	✗	✗
Contact #6	✗	✗
Contact #7	✗	✗
Contact #8	✗	✗
Contact #9	✗	✗
Contact #10	✗	✗

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Whit

Edit

 Contact details can be added.



9. SERVICE

In the service menu manual operating actions and advanced pump and valve settings can be activated or changed.

Pump and valve numbers are mentioned in the figure below.

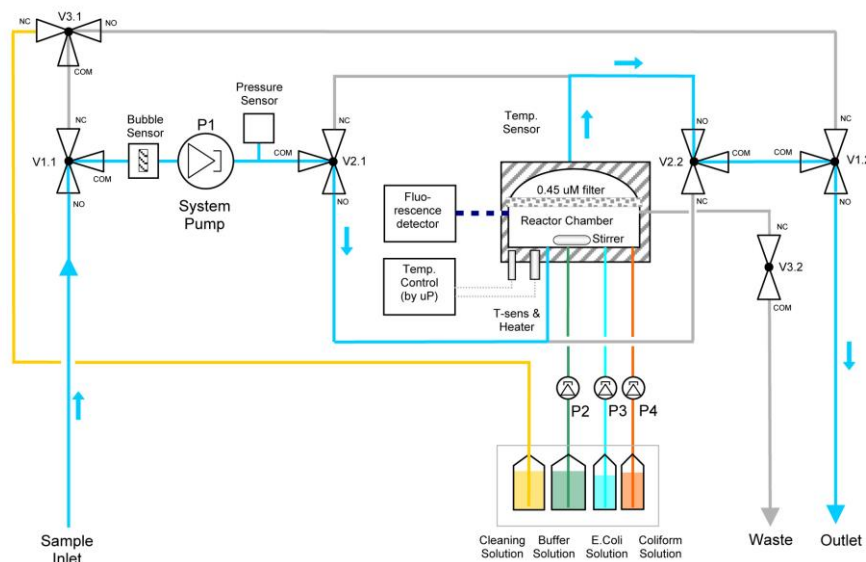


Figure 19: scheme of BACTcontrol system

9.1 ACTIONS

In the **Actions** menu operating actions for a first start-up of the system or flushing after maintenance can be activated. Also bottle volumes can be reset.

- **Fill Inlet System:** Selecting this button will fill the inlet probes of the system. (after replacing tubes or when air is accumulated in the inlet system)
- **Fill Cleaning Probe:** Selecting this button will refill the cleaning probe (can be selected after replacing the cleaning bottle)
- **Fill P2 Probe:** Selecting this button will refill the probe of the left reagents pump
- **Fill P3 Probe:** Selecting this button will refill the probe of the middle reagents pump
- **Fill P4 Probe:** Selecting this button will refill the probe of the right reagents pump
- **Cleaning:** Selecting this button will start a Cleaning (this will abort a running measurement!)

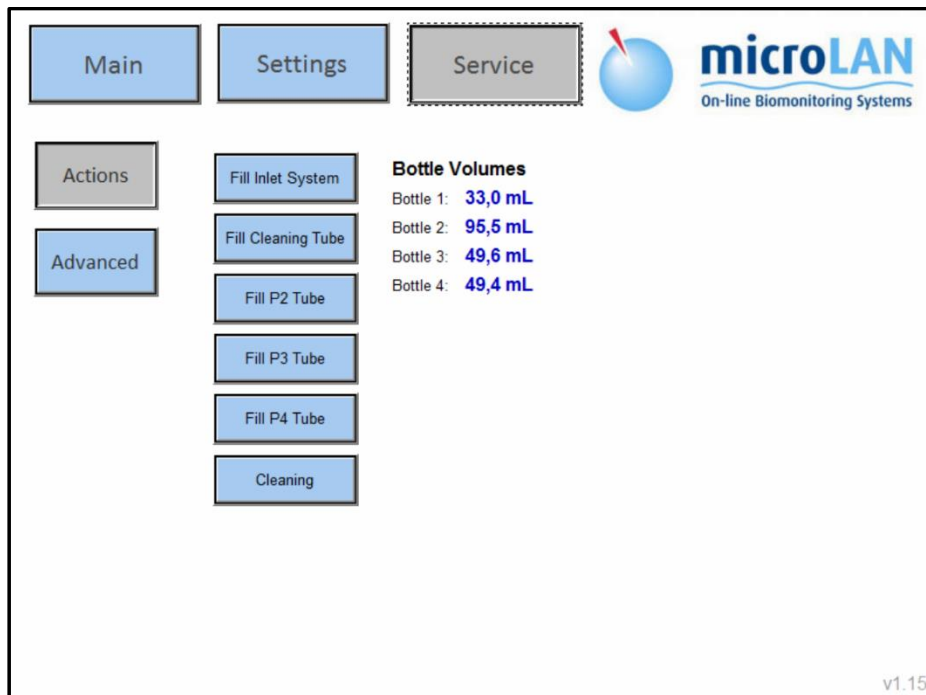


Figure 20 Service menu

9.2 ADVANCED

In the **Advanced** menu pumps, valves and other components can be started or operated manually

- **Main Pump Control P1:**
 1. Pressing **Start** will start the main pump manually at the set speed value (%) and steps. The pump will stop after the amount of steps is reached
 2. **Always on** will turn on the main pump continuous, the pump will not stop automatic!
- **Dosing pump Control P2:** Will start the left dosing pump manually at the set speed value (%) and steps.
- **Dosing pump Control P3:** Will start the middle dosing pump manually at the set speed value (%) and steps.
- **Dosing pump Control P4:** Will start the right dosing pump manually at the set speed value (%) and steps.
- **Valves control:** Pressing a button will open the selected valve manually (See scheme for valve numbers)
- **Stirrer:** Will activate the stirrer manually (Stirrer will turn off at the set reactor temperature)

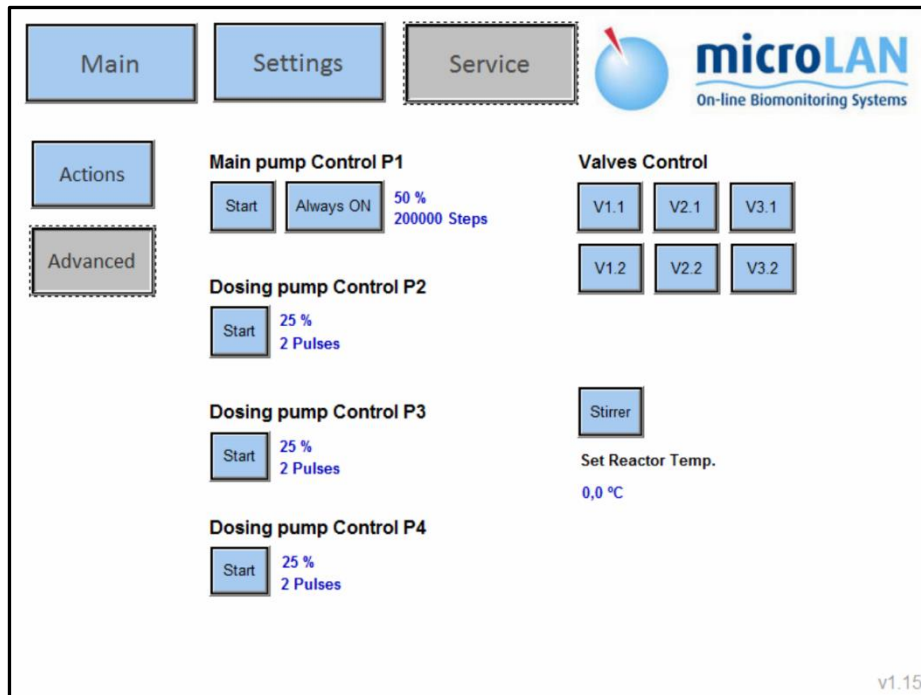


Figure 21: Advanced screen