

# *Preliminary version*



## **User Manual**

Version: V0.1.0  
Date: 10.01.2020

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### 1.1 VERSION OVERVIEW

*Table 1 Version overview*

Version	Release date	Changes
V0.1.0	10-01-2020	Basic version

## 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 ALGcontrol.



*Figure 2 Caution, risk of electric shock*



*Figure 3 Hot surface*



*Figure 4 Beware of moving parts*

**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 ALGcontrol 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

The ALGcontrol is an on-line sensor for the detection of algae in water according to 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

 ALGcontrol Software Manual

### 3. INTRODUCTION ALGCONTROL

#### 3.1 INTRODUCTION

Due to the fact that algae of the same division contain a similar quantity and quality of photosynthetic pigments, their fluorescence excitation spectrum (with a fixed emission wavelength at 680nm) is significant. Thus, it is possible to differentiate divisions of algae by their fluorescence excitation spectrum. In addition, other fluorescing matter (for example, yellow substances) is detected to enhance the accuracy.

For algae differentiation the ALGcontrol uses 7 LEDs for fluorescence excitation. The LEDs emit light at 7 selected wavelengths (370nm, 450nm, 525nm, 570nm, 590nm, 610nm and 710 nm).

#### 3.2 DETERMINATION OF DIFFERENT ALGAE

The division of *chlorophyceae* (green algae) shows a broad maximum of fluorescence at the 450nm LED, which is caused by chlorophyll-a and -b. The *cyanophyceae* (blue-green algae) have their maximum at 610nm due to the photosynthetic antenna pigment *phycocyanin*. *Cyanophyceae* also contain chlorophyll-a if there is low intensity at 470nm. This is due to the masking effect of the *phycocyanin*. Furthermore, the high peak at the 525nm region for the *bacillariophyceae* originates from *xanthophyll fucoxanthin* and for the *dinophyceae* from *peridin*. The maxima at 470nm are caused by chlorophyll-a and -c. In our last analysed group, *cryptophyceae*, a significant maximum can be found at 570nm, which originates from *phycoerythrin*.

It is obvious from the figure 1 that it is not possible to distinguish *bacillariophyceae* and *dinophyceae* by their “fluorescent fingerprints”. But it can be clearly seen that it is possible to distinguish four groups of algae: *chlorophyceae*, *cyanophyceae*, *dinophyceae/bacillariophyceae* and *cryptophyceae*.

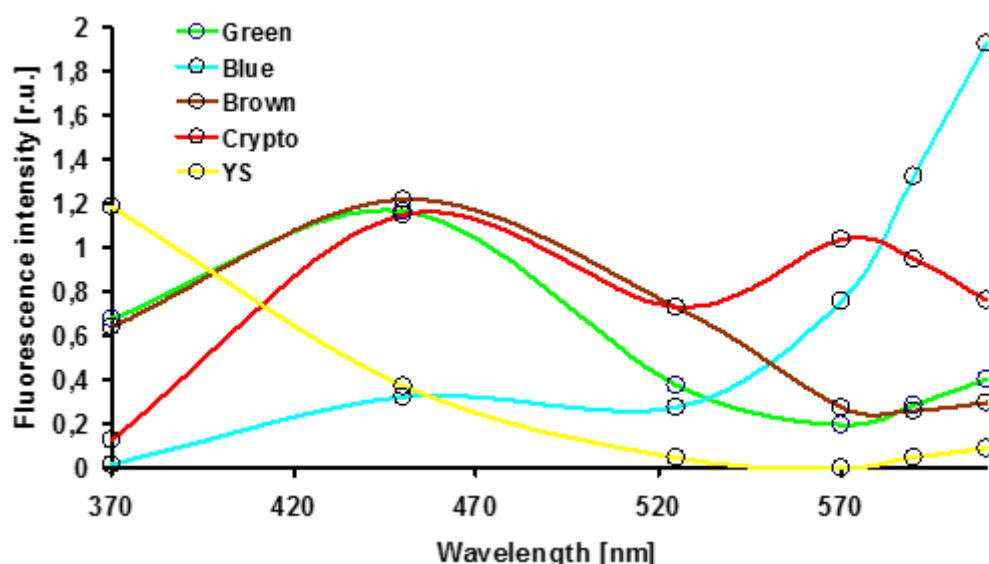


Figure 5 Norm spectra of spectral algal groups and YS (Fingerprint) (Beutler, 2003)

The table below shows the four different groups of algae and the different type of algae, which belong to each group, that were used as standard for the calibration of the ALGcontrol.

Table 2 Types of algae used for calibration

Group of algae	Algae used for calibration	Colour indication
<i>Chlorophyceae</i>	<i>Chlorella vulgaris</i>	Green
<i>Cyanophyceae</i>	<i>Microcystis aeruginosa</i>	Blue
<i>Dinophyceae/ bacillariophyceae</i>	<i>Cyclotella meneghiniana</i> (diatom)	Brown
<i>Cryptophyceae</i>	<i>Cryptomonas spec</i>	Red

Additionally, it should be mentioned that sometimes the *phycocyanin* content per cell in *cyanophyceae* varies. Nevertheless, the average fingerprint can be used to differentiate this division.

## 4. TECHNICAL DETAILS

### 4.1 CONDITIONS

The ALGcontrol is specially designed for use on a table or on a trestle.

Place the ALGcontrol in a properly ventilated area

Make sure the ALGcontrol setup is at least 20 cm from a wall

The area temperature should be between 15– 35°C / 59 – 86°F.

The humidity conditions in the area should be between 20 and 80 %

Keep the ALGcontrol out of direct solar irradiation

Protect the ALGcontrol from rain

### 4.2 MATERIAL AND WEIGHT

Cabinet: Coated steel

Protection classification: IP 54 (IP 65 optional)

Weight : 25kg

### 4.3 FLOOR SPACE ALGCONTROL

Depth: 321 mm (347 mm incl. hinges & door handle)

Width: 450 mm ( 482 mm incl. connectors)

Height: 460 mm (470 mm incl. rubber feet)

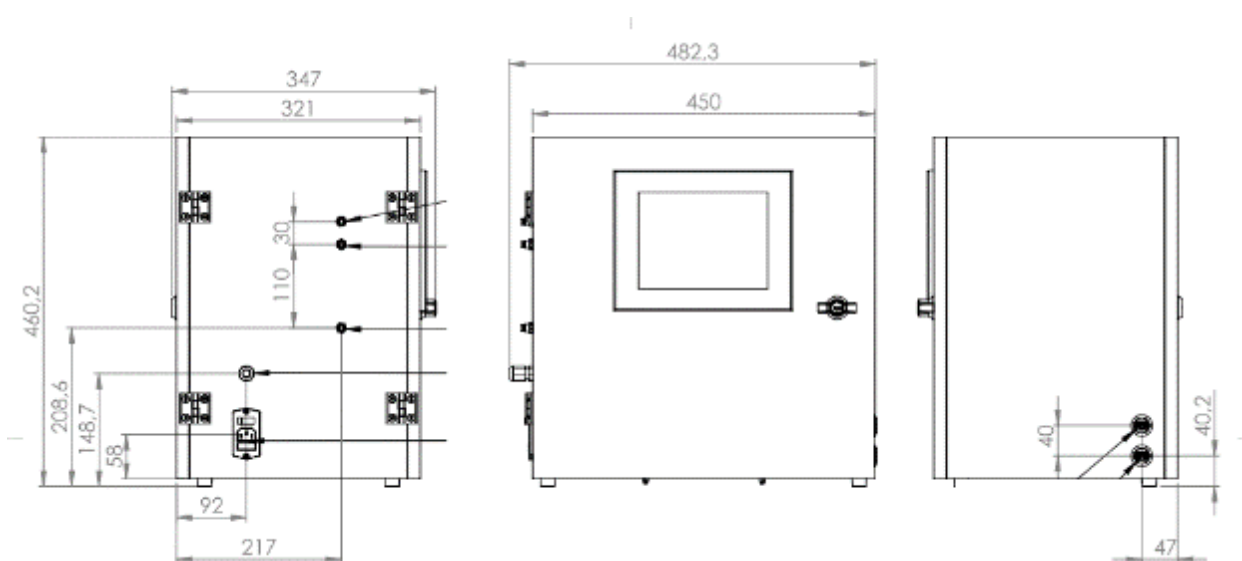


Figure 6 Dimensions ALGcontrol

#### **4.4 SAMPLE DETAIL**

##### **Sample inlet**

- Sample connection: 4 mm ID
- Tube size: 2,5 mm ID x 4,0 mm OD
- Sample pressure: max 0.05 bar
- Sample flow: 3l/h
- Sample temperature: 10- 35°C / 50 – 95°F

##### **Sample outlet**

- Sample connection: 4 mm ID
- Tube size: 2,5 mm ID x 4,0 mm OD

##### **Sample waste**

- Sample connection: 4 mm ID
- Tube size: 2,5 mm ID x 4,0 mm OD

##### **Second inlet/ Extra rinsing**

- Sample connection: 4 mm OD
- Tube size: 2,5 mm ID x 4,0 mm OD
- Sample pressure: max 0.05 bar
- Sample flow: 3l/h
- Sample temperature: 10- 35°C / 50 – 95°F

#### **4.5 ELECTRICAL CONDITIONS**

Operation voltage: 230V - 50Hz or 110V – 60Hz

Typical power consumption: <200W

It is recommended to protect the electrical supply with an earth leakage circuit breaker

#### **4.6 ENVIRONMENTAL CONDITIONS**

Place the ALGcontrol in a properly ventilated area

Temperature between 15– 30°C / 59 – 86°F, (at higher temperatures, an optional Cooling-unit is recommended)

No direct solar irradiation

Protect from rain

Humidity conditions between 20 and 80 %

#### **4.7 SPECIFICATIONS OPTIONS**

Modem slot for UMTS, ISDN or analog (modem optional)

Second sample inlet / extra rinsing

#### **4.8 GENERAL COMPUTER SPECIFICATIONS**

Integrated PC with Windows operating system

Graphical user interface with touchscreen

Touchscreen power DC12V/5A

Full network capability via direct LAN

2 x USB 2.0 type A

2 x LAN 10/100/1000MB/s; RJ-45

1 x DB-9 RS-232/422/485 COM1; default RS-232

1 x DB-9 RS-232; COM2

Protocols: Modbus, others on request

1x 4 - 20mA output

English operating system:

#### **4.9 SYSTEM SPECIFICATIONS**

Processor: Onboard Intel® Cedarview dual core D2550 (1.86GHz, 1MB L2 cache, 10W) mobile Processor

Chipset: Intel® NM10 Chipset

Ram: Onboard 2GB DDR3 1066MHz Memory

Graphics: Intel CedarView Integrated Graphics Engine with GMA3650

IP65: YES

Power: DC12V/5A Power Adapter

#### **4.10 SCREEN**

Integrated PC with Windows

Graphical user interface with touchscreen

LCD Size: 8,4 inch

Display type: XGA LCD

Resolution: 800 x 600

Display color: 262K

Viewing Angle: 65/65/65/45

Brightness: 300cd / C m2

Contrast: 500:1

Touchscreen: Five-wire resistive touch screen

## 4.11 CONNECTIONS TOUCH PANEL



Figure 7 Connections touch panel

- 1 On/Off button
- 2 Com port
- 3 USB ports (4)
  - 1. Used for software log (Sticklock, Not available for external use)
  - 2. USB to RS-485 converter (Not available for external use)
  - 3. USB cable to USB socket outside (Free port for external use)
  - 4. Free USB port (for external use)
- 4 Network connection (2)
- 5 Com port
- 6 Power input DC12V/5A

## 4.12 COMMUNICATION SPECIFICATIONS

Full network capability via direct LAN  
 2 x USB 2.0 type A  
 2 x LAN 10/100/1000MB/s; RJ-45  
 2x digital input  
 2x relays output  
 Protocols: Modbus TCP and Modbus serial, others on request  
 1 x 4 - 20mA output  
 English operating system



## 4.13 THE SYSTEM

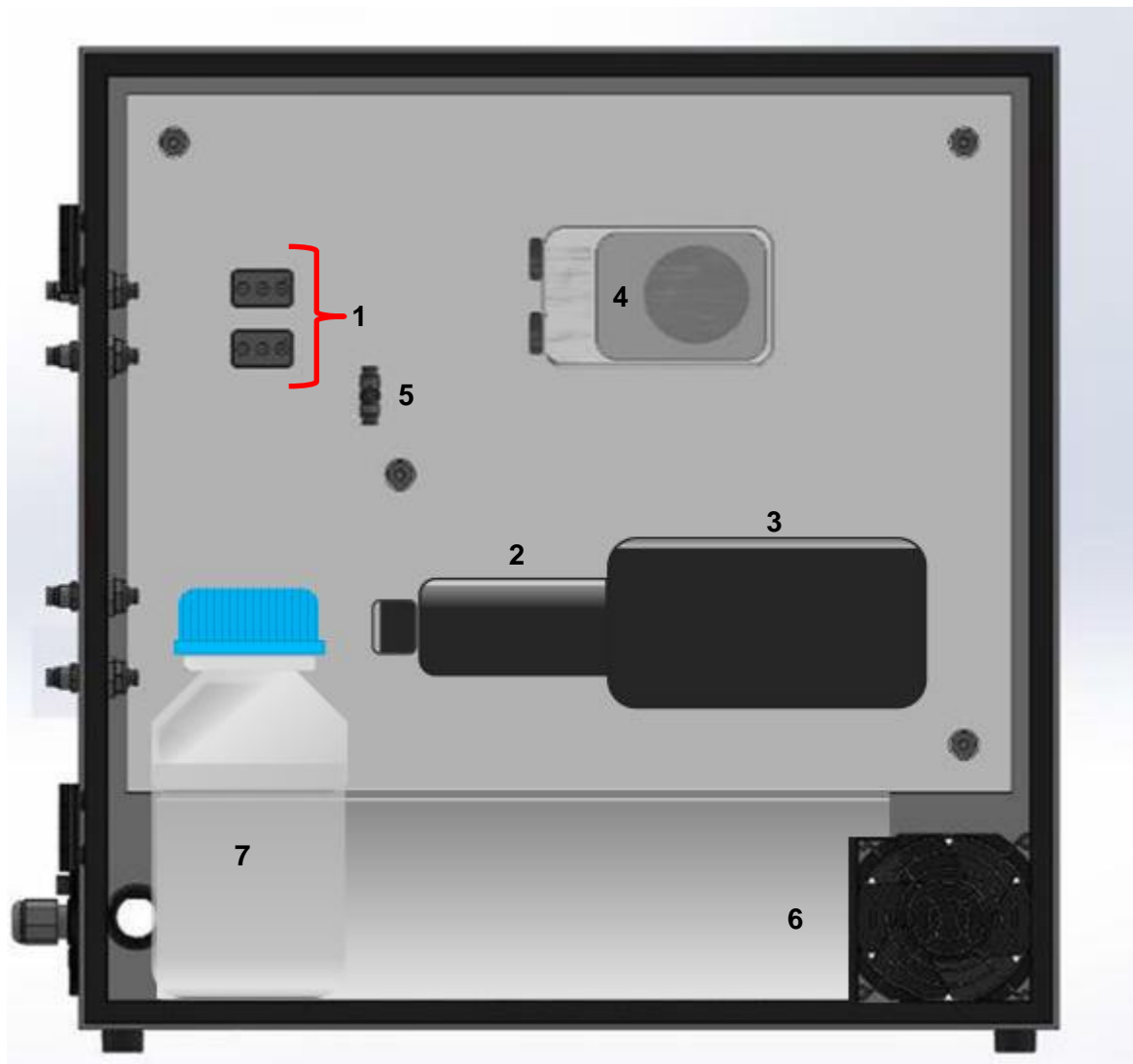


Figure 8 Overview inside ALGcontrol (frontside)

- 1 Valves
- 2 Sensor unit
- 3 Measuring chamber
- 4 Peristaltic pump
- 5 Bubble sensor
- 6 Ventilator (Optional)
- 7 Cleaning solution

## 4.14 Measuring Principle

The sensor unit of the ALGcontrol is responsible for the measurement of fluorescence as explained in the previous chapter.

The 7 LEDs in the ALGcontrol are switched on at high frequency, one after the other. Depending on the amount and type algae, an amount of light is absorbed, continued by an emission of fluorescence. The emitted fluorescence goes through the emission filter of 680 nm and it is measured by the photomultiplier. The measured amount of fluorescence is calculated into µg/liter chlorophyll and can be displayed in a graph or a table.

In Figure 9 the measuring principle is illustrated in detail.

In Figure 10 the different process steps and flow directions are shown.

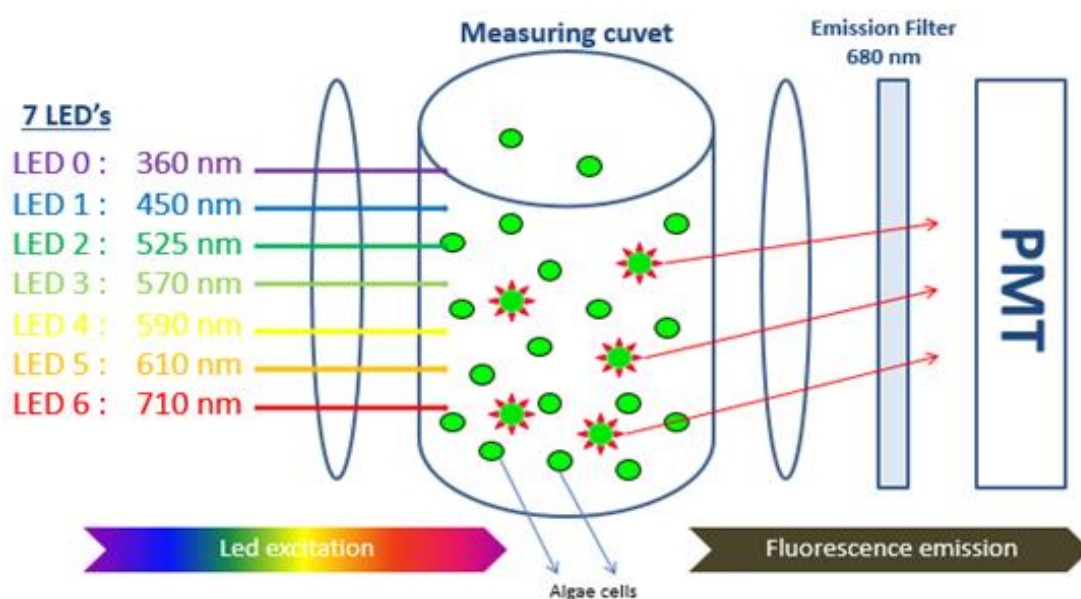


Figure 9 Detailed illustration of the ALGcontrol sensor

The main components are:

1. The sensor unit and the electric parts of the sensor such as PCB, LED's and PMT.
2. The cover which is placed to avoid any disturbances caused by light or pollution that could end up in the measurement cell.
3. The measurement cell, where the samples are measured.

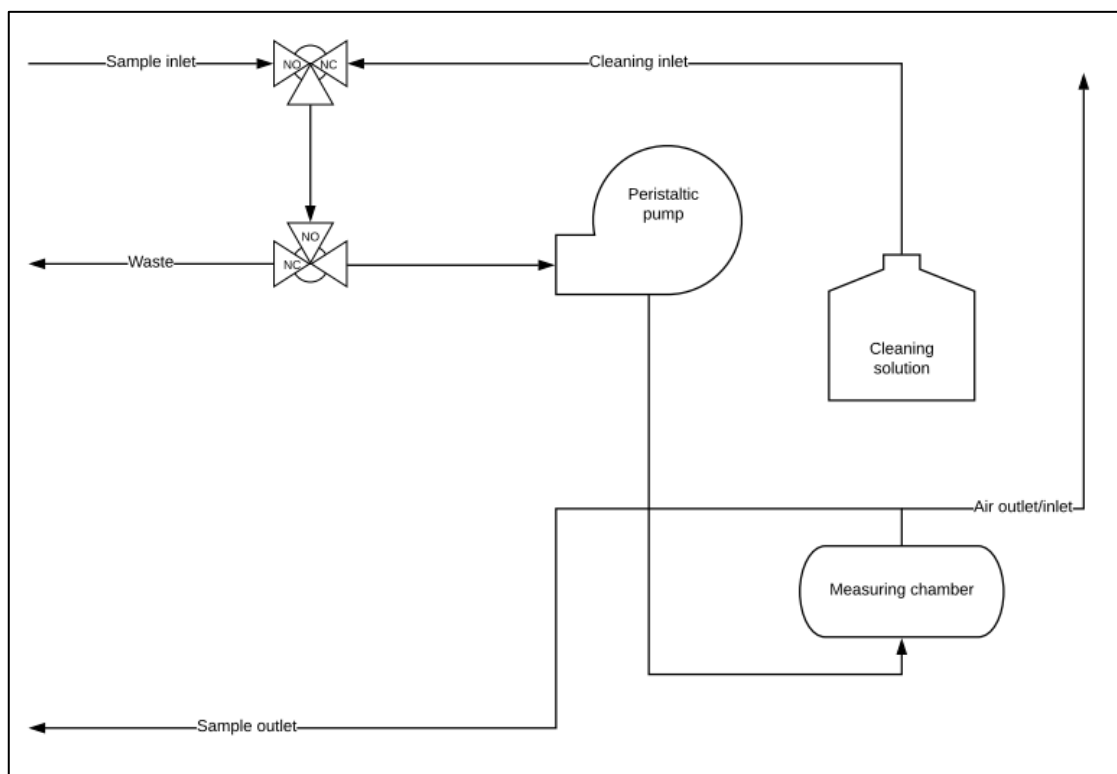


Figure 10 Flowchart ALGcontrol

## 4.15 BUBBLE SENSOR

The bubble sensor monitors bubbles flowing from the sample pump into the reaction chamber. Bubbles might cause disturbances or deviating results. Also a process alarm will be activated in case the water flow of the sample supply is interrupted.

## 4.16 PUMP UNIT

The ALGcontrol is equipped with a peristaltic pump which has only one moving part, the rotor.

## 4.17 VALVES

There are two valves installed for controlling the flow direction during the various process steps

#### 4.18 Cleaning Solution

Periodic cleaning with a cleaning solution is used to prevent biofouling in the measuring cell. The interval of this cleaning can be adjusted based on the potential of biofouling in the sample water.

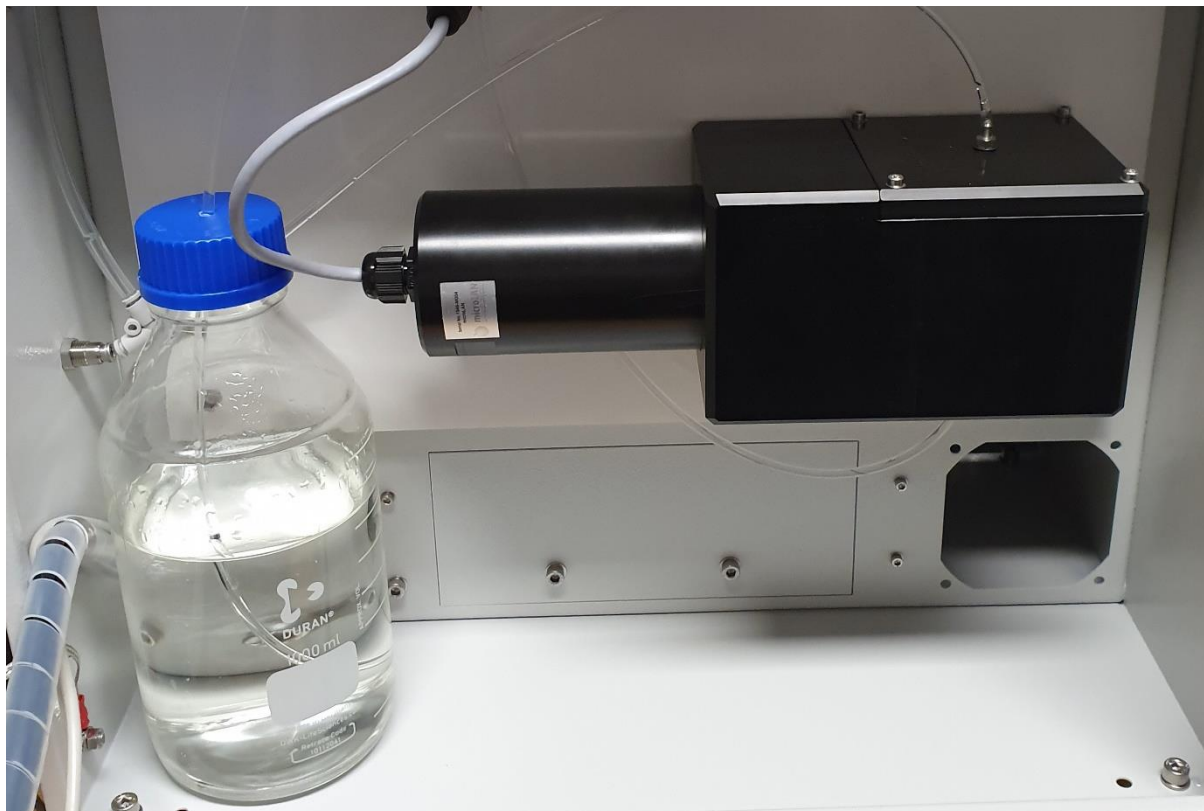


Figure 11 Cleaning Solution

1. Cleaning solution concentrate: Contains sodium hypochlorite solution (<0.05% Cl active).

## 5. ALGCONTROL INSTALLATION

Installation of the ALGcontrol system is performed by microLAN engineers or qualified engineers of the local distributor.

The procedures in this section should only be carried out by authorized engineers.

### 5.1 CONNECTIONS ON THE ALGCONTROL



Figure 12 Connections on the ALGcontrol

- |                               |  |
|-------------------------------|--|
| 1 Inlet sample                | 7 Fuse box   |
| 2 Outlet waste                | 8 USB type-A input                                 |
| 3 Outlet sample               | 9 Ethernet RJ-45 input                             |
| 4 Optional /Extra rinsing     | 10 Cable gland for wiring 4-20 mA and alarm relays |
| 5 On/Off Button               |  |
| 6 Power connection main power |  |

## 5.2 CONNECTION OF THE WATER SAMPLE INLET, OUTLET & WASTE

The waste can be separately connected to a container <sup>\*</sup>.

- Make sure the tubing is pushed completely into the connectors!



*Figure 13 installing tubing*

- <sup>\*</sup> Any disposal practice must be in compliance with all local and national laws and regulations. Customers are advised to check their local legislation governing the disposal of waste materials. If this preparation becomes a waste, the final user must define and assign the appropriate European Waste Catalogue code. Use only authorized contractors

## 5.3 CONNECTING ALARMS AND ANALOG OUTPUT

Alarm and analogue output are located on the printed circuit board (PCB) in the backside compartment of the ALGcontrol.

The ALGcontrol have two alarm outputs:

- Instrument Alarm: Connect wiring (DC) to **82 (+)** and **83 (-)**
- Measurement Alarm: Connect wiring (DC) to **84 (+)** and **85 (-)**

The ALGcontrol has one analogue output (4-20 mA) for connecting to an external controller or system:

- Connect the wiring to 76 (-) and 77 (+)

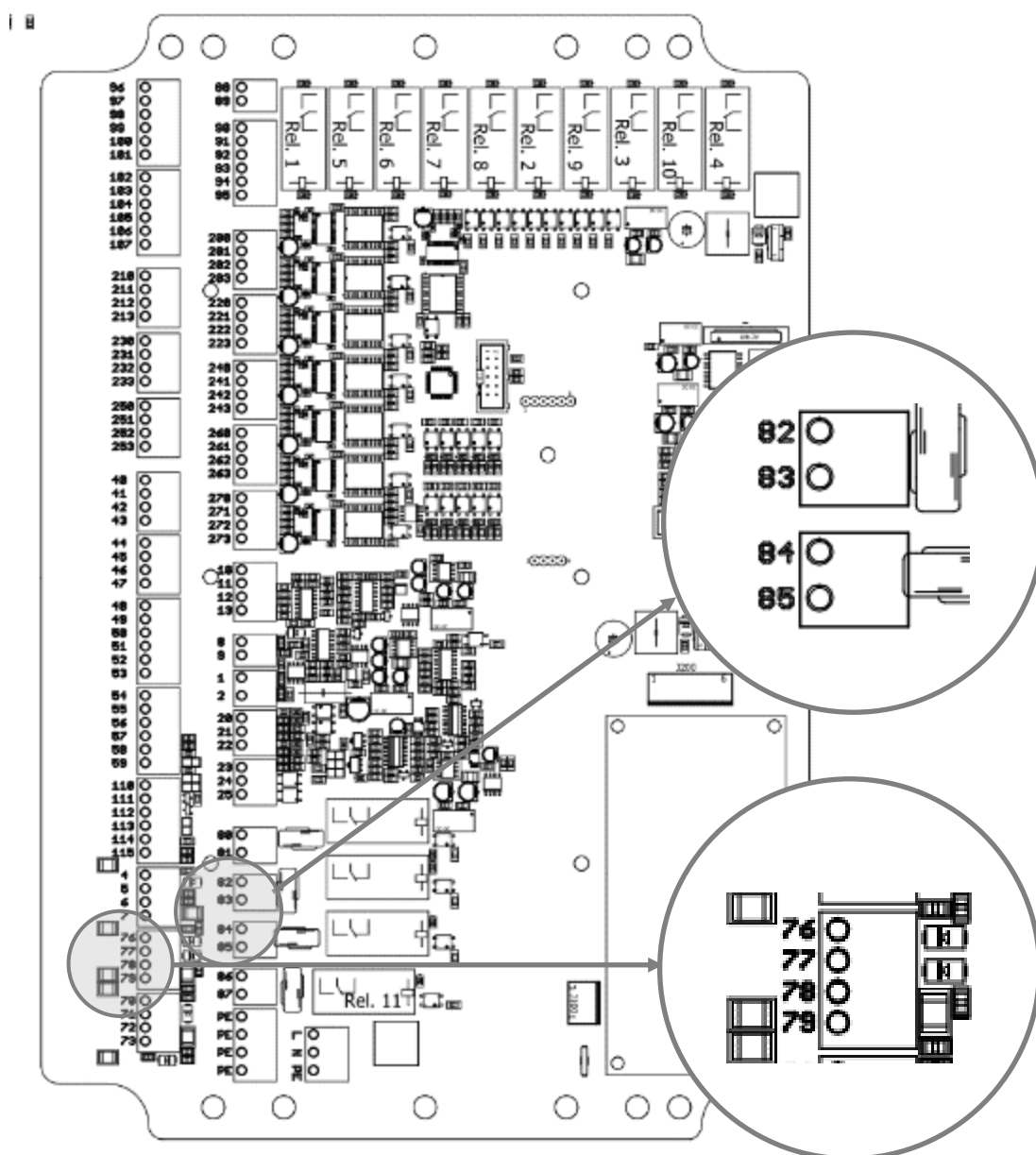


Figure 14 Printed circuit board of the ALGcontrol



## 5.4 POWER SUPPLY

The power supply cable should be connected on the main power connection ( 5)

Operation voltage: 230V - 50Hz or 110V – 60Hz

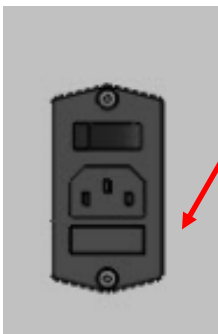
Typical power consumption: <700W

It is recommended to protect the electrical supply with an earth leakage circuit breaker

## 5.5 CHANGING/REPLACING FUSES

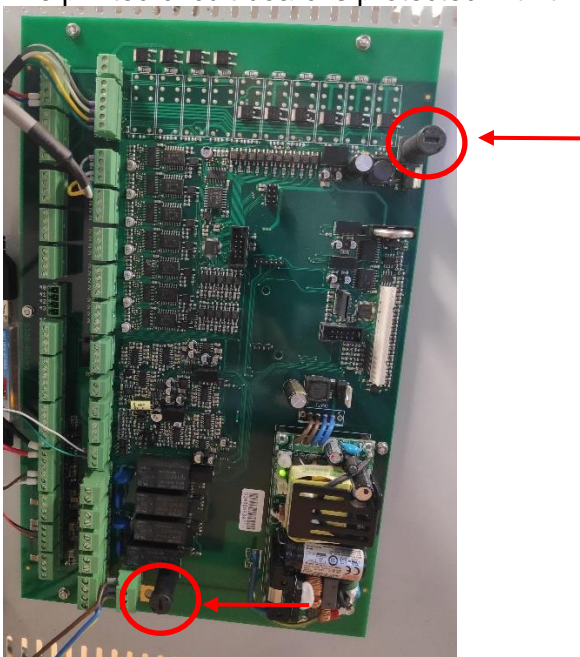
For protection of the electrical system three fuses (part nr. 06ALG001A269) are installed in the ALGcontrol.

1. The main power fuse (Nr 7 left side ALGcontrol)



2. PCB fuses

The printed circuit board is protected with two fuses





## 6. INTRODUCTION TO THE ALGCONTROL SOFTWARE

For a complete explanation of the software, see: ALGcontrol Software Manual

### 6.1 Operating terminal

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.

### 6.2 Software

The software is build up in menu's and sub-sections.

For daily use of the software there is no LOG IN required\*.

\*Some parts in the software are only available after Logged in as "Administrator"  
(Login via menu SERVICE)

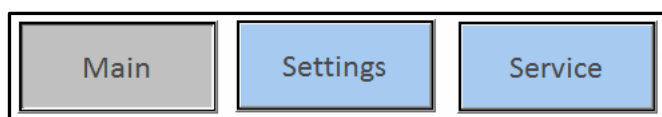


Figure 15 Menu's ALGcontrol software

### 6.3 STATUS

In the status section, the main procedures can be operated. Details of the measurement and possible alarms are displayed. Figure 16 shows the different options that are available in the status screen together with the information of the current or last measurement.

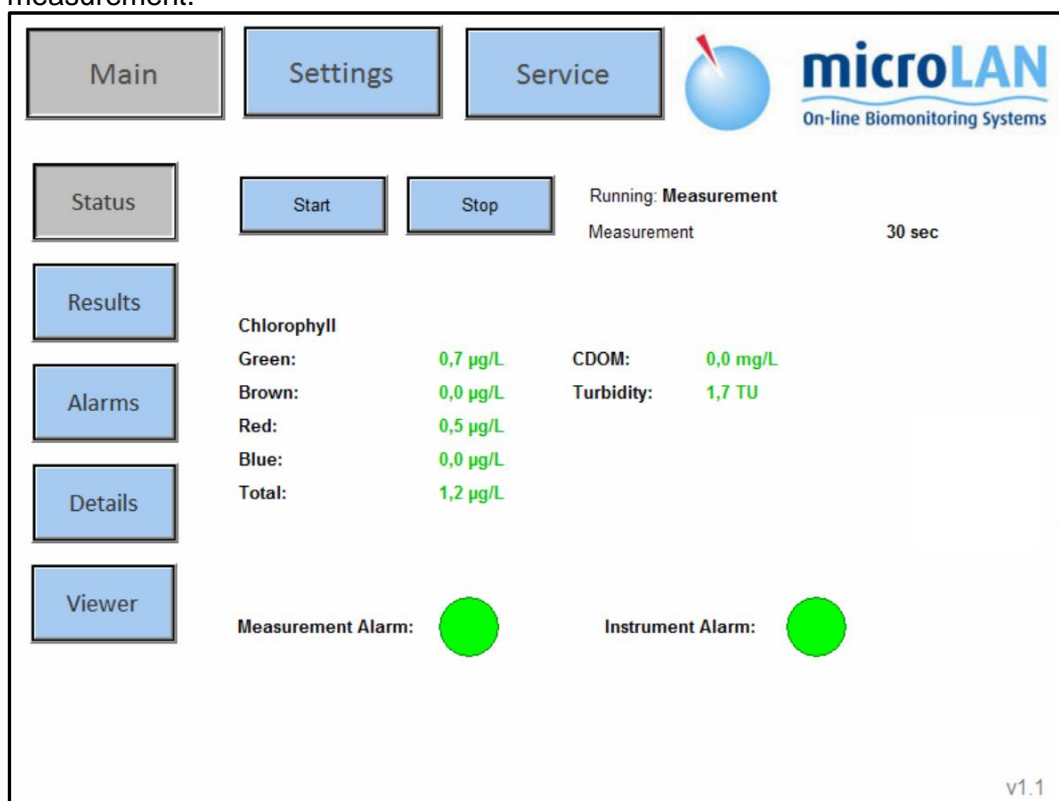
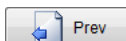


Figure 16 Status screen

## 6.4 RESULTS

On the results screen measurement results are showed.

Previous results can be seen with



Measurement					
Description	Measurement...	Measurement_...	Measurement_...	Measurement...	Measurement... Units
Date	10/01/2020	10/01/2020	10/01/2020	10/01/2020	10/01/2020
Time	08:31:31	08:11:31	07:51:30	07:30:31	07:07:30
Chlorophyll Green	0,6	0,3	0,0	0,0	0,0 µg/L
Chlorophyll Brown	0,0	0,0	1,6	0,0	0,0 µg/L
Ghlorophyll Red	0,2	0,1	0,0	0,2	0,1 µg/L
Ghlorophyll Blue	0,0	0,0	0,4	0,0	0,1 µg/L
Ghlorophyll Total	0,8	0,4	2,0	0,2	0,2 µg/L
CDOM	0,0	0,0	0,0	0,0	0,0 mg/L
Turbidity	1,2	1,5	1,4	1,1	1,2 TU
Remark	Test	Test	Test	Test	Test

Figure 17 Results screen

## 6.5 ALARMS

In this screen possible alarms are displayed.

Alarm settings can be changed via menu "Settings".

Main
Settings
Service

Status

Results

Alarms

Details

Viewer

Start

Stop

Running: Measurement  
M4
73 sec

CDOM: ●  
Turbidity: ●  
Green: ●  
Brown: ●  
Red: ●  
Blue: ●  
Total: ●  
  
Modbus Communication: ●  
Water Detection: ●  
Sensor Data: ●

microLAN  
On-line Biomonitoring Systems

Figure 18 Alarm screen

## 6.6 DETAILS

Process details such as sensor temperature, pump speed and direction, status of valves etc. are displayed in Details section.

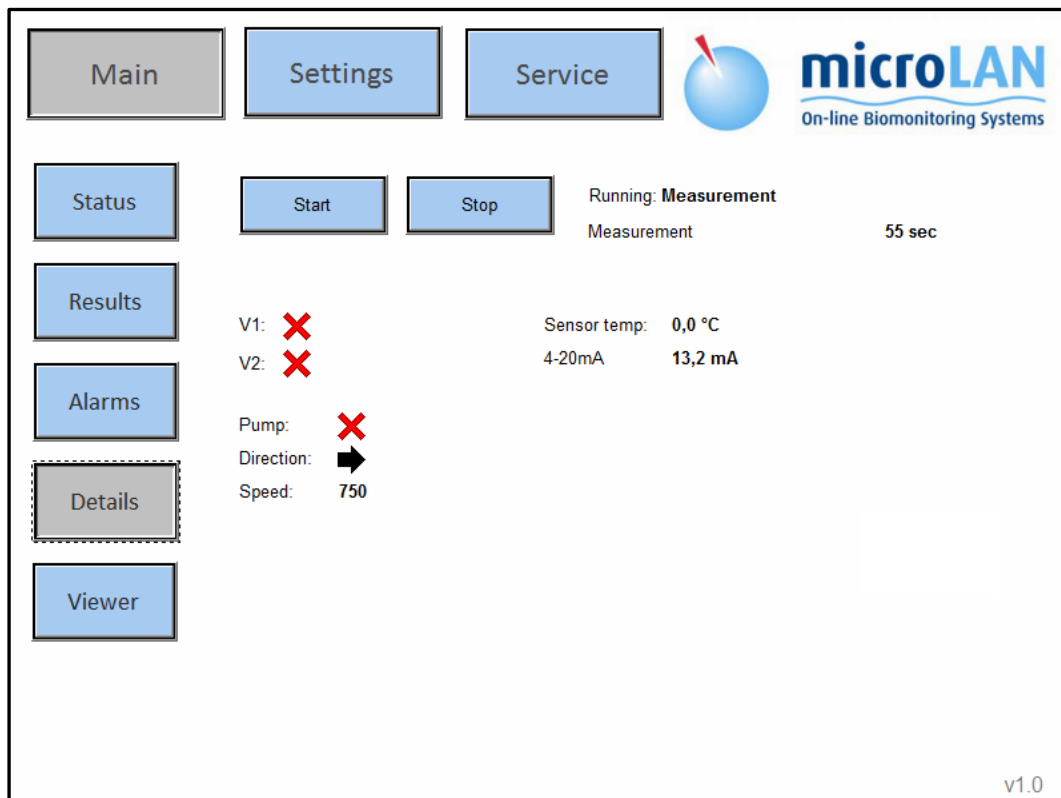


Figure 19 Details screen

## 6.7 VIEWER

On the Viewer screen charts of measurement can be created selected  
For more details see chapter 6.12

## 6.8 SETTINGS

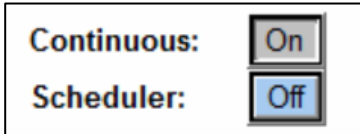
In the SETTINGS menu process parameters and settings can be changed.

### 6.8.1 Cycle

In the sub section “Cycle”, different parameters, such as measurement interval, mA-output and delays can be changed\*.

\*Process parameters for cleaning and measurement can only be seen and changed when logged in as Manager (via menu SERVICE)

Figure 20 Cycle screen

With the buttons  a choice can be made between continuous or scheduled (interval) measuring.

## 6.8.2 Scheduler

Sub section “SCHEDULER” can be used to set an interval measuring is stead of continuous measurement (Minimum interval 1 hour).

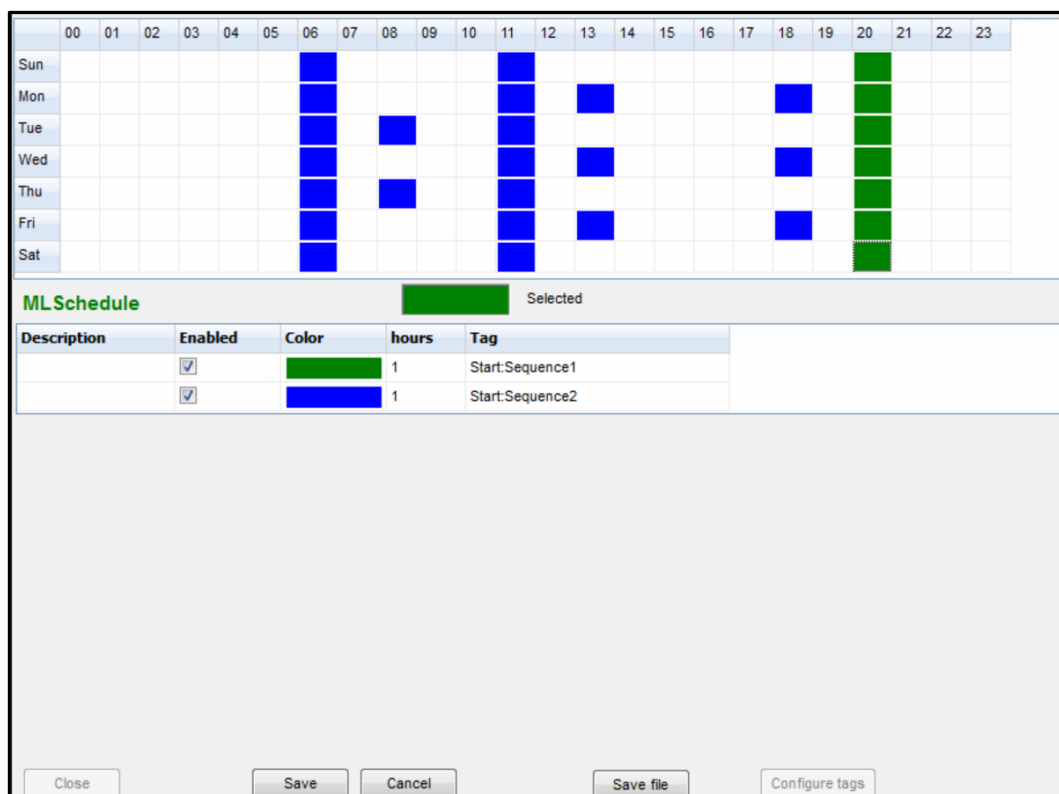


Figure 21 Schedule for interval measuring

- Sequence1 GREEN, is used for cleaning
- Sequence2 BLUE, is used for Measuring

## 6.8.3 Alarms

In the sub section “Alarms”, High and High-High alarms can be assigned to different parameters.

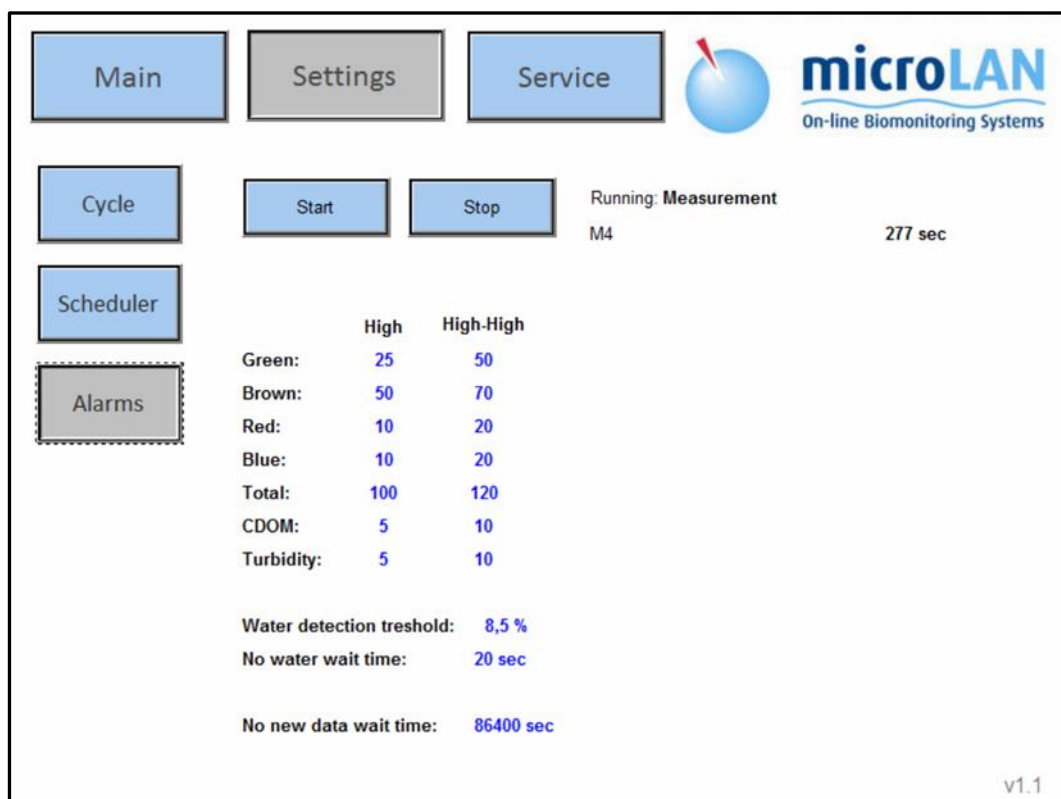


Figure 22 Alarms

## 6.8.4 CHANGE A VALUE IN A SUBMENU:

- Double click on an item to change.

Now a pop-up window appears

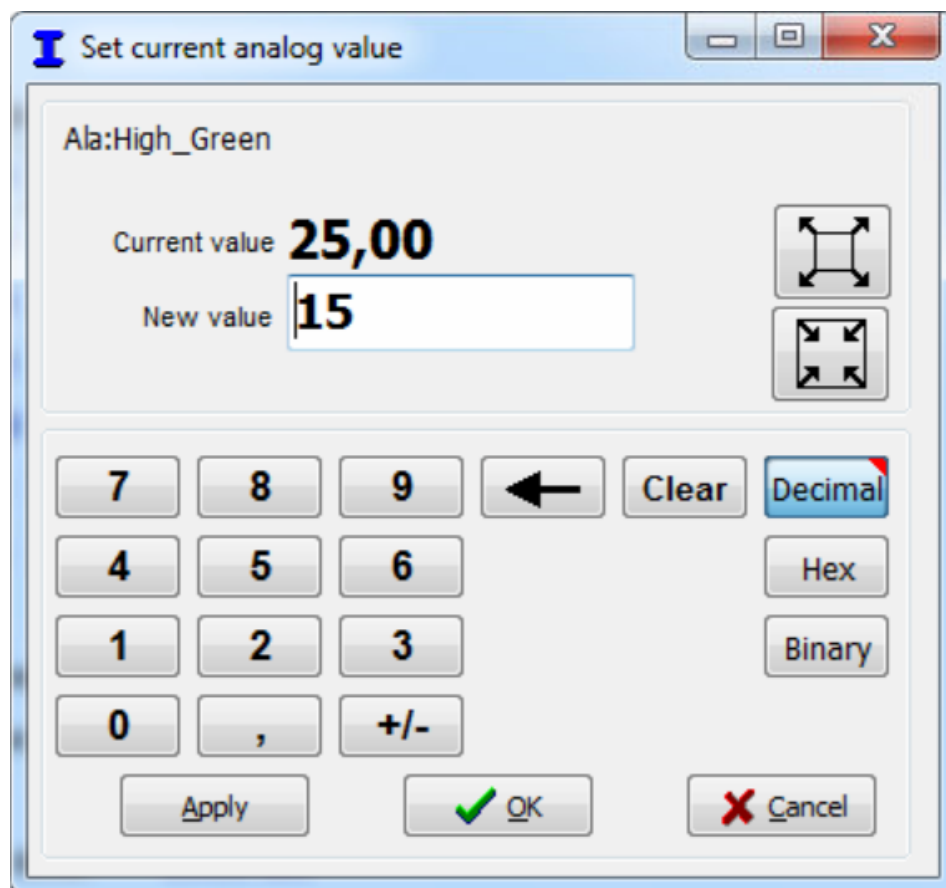


Figure 23 Change value

- Change the value and press **OK** (It is recommended to use Decimal)

## 6.9 START A MEASUREMENT

- To start a new measurement click  on the Main screen

Now a pop-up window appears

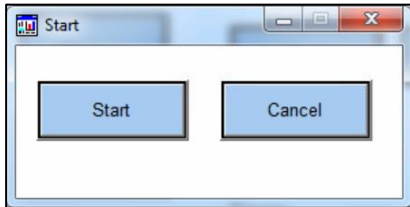


Figure 24 Measurement start menu

- When **Start** is pressed the ALGcontrol immediately will start measuring the next sample
- 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 chlorophyll/ algae concentrations are measured in the last measurement are displayed under



## 6.10 STOP A MEASUREMENT

- To Stop a measurement press 

Now a pop-up window appears

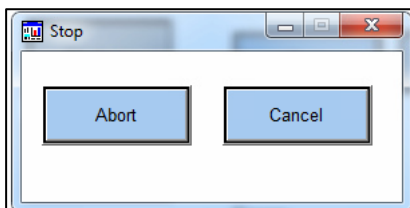


Figure 25 measurement stop menu

- Abort**, the ALGcontrol will immediately stop with the current measurement, no data or results are saved;
- Cancel**, no measurement will be stopped nor aborted. The ALGcontrol will finish the current measurement and will go further with a next measurement.



## 6.11 SERVICE

In the service menu individual program steps can be activated manually. This can be necessary after service or refilling reagent etc.

(For more detailed information about service: view the ALGcontrol Software manual)

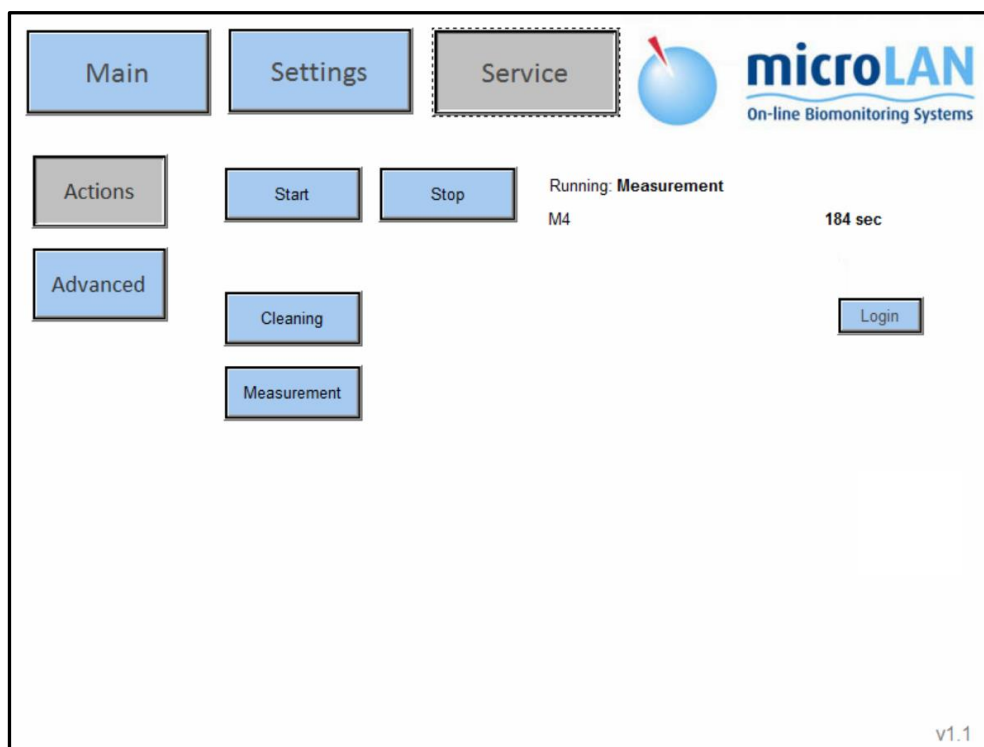


Figure 26 Service menu

## 6.12 VIEWER RESULTS

The results of the last measurements can be displayed in a graph

Go to the MAIN menu and click on

Viewer

Now a graph appears

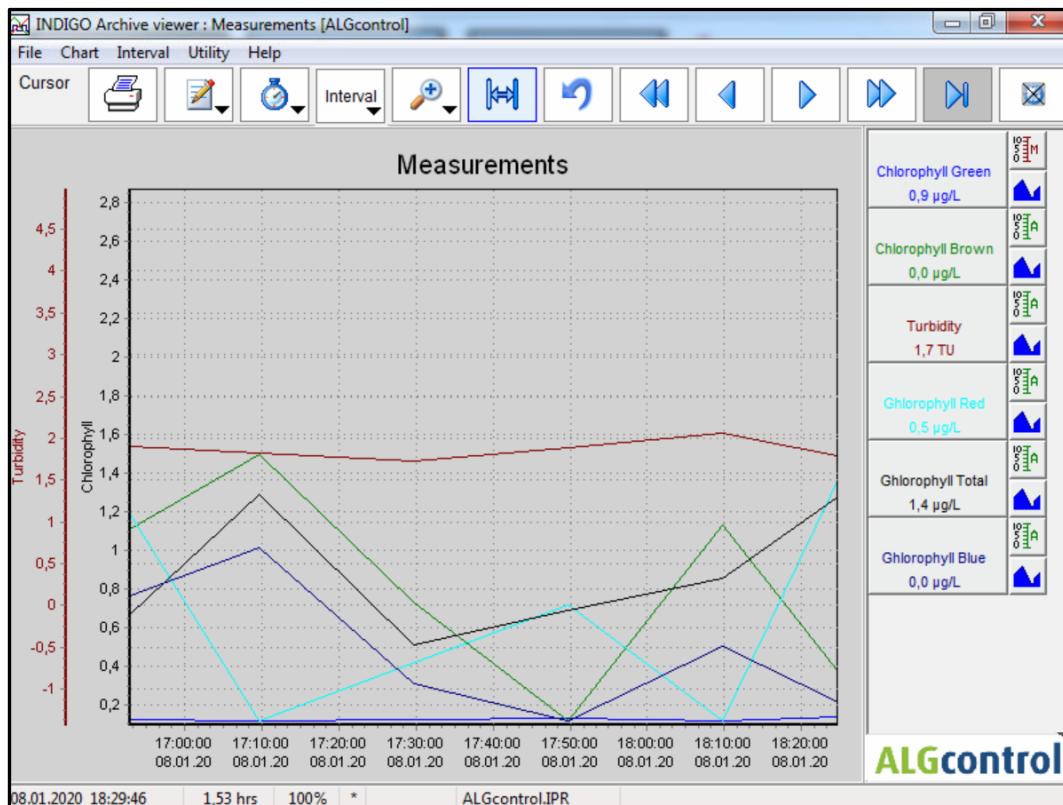


Figure 27 Graph data ALGcontrol

- Move the cursor along the graph 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



Hide the Graph to the status bar below on the screen with  
(to see it again point at status bar )



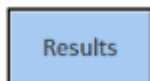
- Close the graph by clicking on



## 6.13 DATA EXPORT

Stored data can be exported to a USB-stick.

- Go to the main display and press



Measurement						
Description	Measurement...	Measurement_...	Measurement_...	Measurement...	Measurement...	Units
Date	09/01/2020	09/01/2020	09/01/2020	09/01/2020	09/01/2020	
Time	13:06:06	12:47:05	12:27:05	12:07:05	11:47:05	
Chlorophyll Green	0,0	0,0	0,0	0,1	0,0	µg/L
Chlorophyll Brown	2,2	0,8	1,0	0,0	0,7	µg/L
Ghlorophyll Red	0,0	0,0	0,0	0,2	0,0	µg/L
Ghlorophyll Blue	0,8	0,2	0,2	0,0	0,2	µg/L
Ghlorophyll Total	2,9	0,9	1,2	0,3	0,9	µg/L
CDOM	0,0	0,0	0,0	0,0	0,0	mg/L
Turbidity	-2,6	-2,0	-1,4	-1,1	-0,6	TU
Remark	Test	Test	Test	Test	Test	

Figure 28 Results screen

- Press



Now a pop-up screen will be displayed.

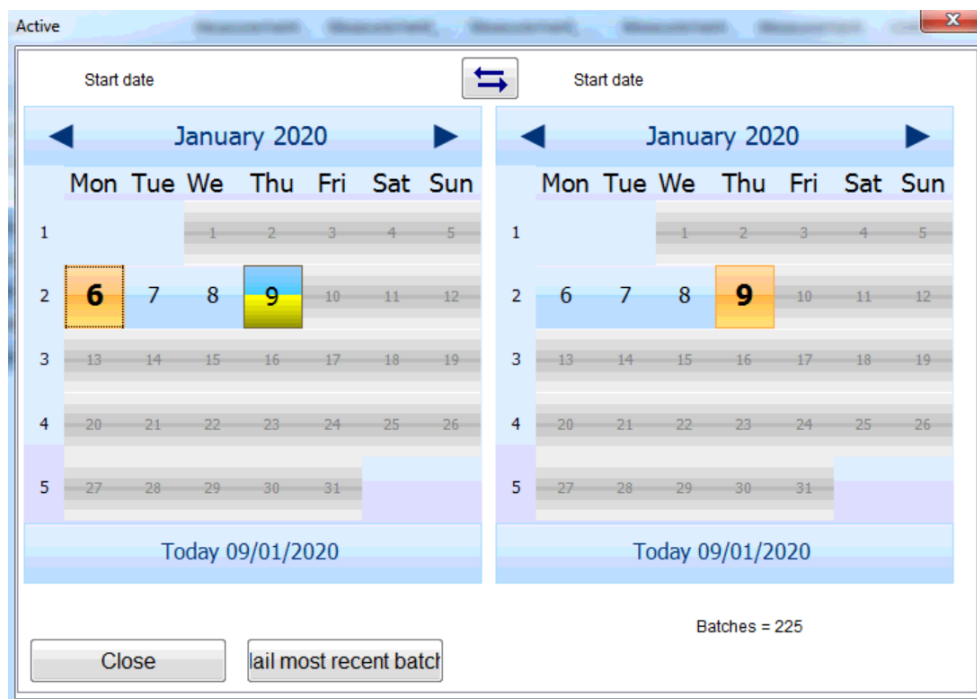


Figure 29 Calendar screen for data export

- Choose the Start date (left) and End date (right)
- Press the button **“Mail most recent Batch”**

The data will be stored on:

**Windows > documents > I:\microLAN\IndProj\ALGcontrol v1.1\Export**

- Copy the data to an USB-stick (CSV-file can be imported in Excel)

## 7. MAINTENANCE SCHEDULE

This chapter describes the maintenance schedule.

Always use the original ALGcontrol spare parts which are only provided by microLAN and microLAN distributors.

### 7.1 DAILY MAINTENANCE

Daily maintenance can be done on any time the instrument is visited. This is not really necessary for the instrument but can be seen as extra attention to the instrument.

See Appendix A: CHECKLIST

#### 7.1.1 VISUAL CHECK

- Open the front of the ALGcontrol.
- Check visually if tubes are connected properly and if there are no leakages on the instrument.



#### 7.1.2 SUPPLY AND WASTE CONTAINERS

- Make sure the sample supply is clean and working properly
- If applicable, check the volume of the waste container and empty if necessary.
- It is recommended to replace the supply tubing on a regular basis (3 to 6 months).

#### 7.1.3 DATA CHECK

- Check the data and possible alarms on the display of the ALGcontrol

## **7.2 MONTHLY MAINTENANCE**

### **7.2.1 CLEANING MEASURING CHAMBER**

#### **Opening measuring chamber**

- Remove the cover of the measuring chamber. (unscrew bolts with an Allen key)

#### **Cleaning measuring chamber**

- Check for possible biofilm or pollution inside the measuring chamber.
- Clean the measurement cell, and the sensor window with some cleaning solution and dry with a soft paper cloth

#### **Closing reaction chamber**

- Close measuring chamber and turn on the bolts with an Allen key
- Make sure that the cover and its gasket are placed properly to prevent any leakage.

## 7.3 QUARTERLY MAINTENANCE

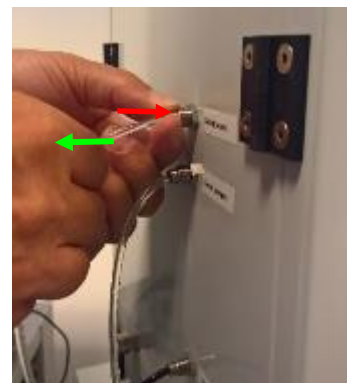
(required interval depends on type of sample water)

### 7.3.1 REPLACE TUBING

(to prevent pollution or scaling on the tubing it is recommended to replace the tubing every 3 to 6 months)

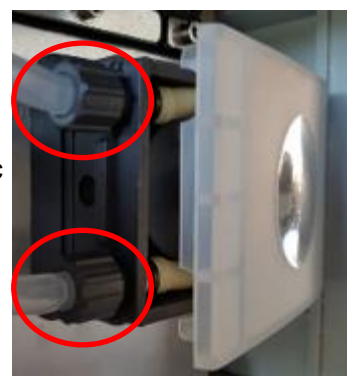
To remove the tubing from the sample inlet, Second inlet, waste outlet and sample outlet

- First press the metal one touch fitting, then pull the tubing out of it.
- To place a new tubing, just insert the tubing in the one touch fitting.



### 7.3.2 PERISTALTIC PUMP TUBE CHANGING

- Switch off the device.
- Remove the external tubes connected to the peristaltic unscrewing fixations



- Remove pump cover and pump rotating cover (**part number 04ALG001A518**)



- Remove the peristaltic pump tube subset part.
- Re install a new one and do all actions in reverse order. Re connect the external tubes
- Switch on the device again.



- Check the liquid aspiration.

#### **7.4 PREVENTIVE MAINTENANCE (YEARLY)**

Preventive maintenance can be performed by your distributor.

During preventive maintenance the instrument is fully calibrated and tested.

If necessary software updates will be performed.

To prevent deviations it is also advised to re-calibrate the sensors every year.

For more information about this preventive maintenance contact your local distributor.



## 8. CLEANING SOLUTION

*Table 3 Cleaning Solution*

	Reagents
	Cleaning solution 1000 ml

MSDS are available on request by microLAN and microLAN distributors

## 9. Consumables and Spare parts

*Table 4 Consumables and spare parts*

<b>Starter package ALGcontrol: 01ALG001A597 (consists all items below)</b>		
<b>1x</b>	<b>06BACT001A270</b>	<b>Toolbox</b>
<b>1x2M</b>	<b>04BACT001A247</b>	<b>Sample inlet tubing (black)</b>
<b>2x2M</b>	<b>04BACT001A251</b>	<b>Sample out / waste tubing (transparent)</b>
<b>1x</b>	<b>06BACT001A313</b>	<b>Duran bottle cap GL45 Modified</b>
<b>1x</b>	<b>06ALG001A625</b>	<b>Bottle 1L</b>
<b>1x</b>	<b>04ALG001A516</b>	<b>Peristaltic pump tubing kit ALGcontrol</b>
<b>1x</b>	<b>06BACT001A269</b>	<b>Cartridge 5x20mm, T 2A (2 pack)</b>
<b>1x</b>	<b>06BACT001A304</b>	<b>Optical mouse</b>
<b>1x</b>	<b>06BACT001A271</b>	<b>Door key (double-bit key 5mm)</b>
<b>2x</b>	<b>06BACT001A168</b>	<b>Front door key (part of 001A168)</b>
<b>1x</b>	<b>06BACT001A640</b>	<b>Hexagon key 2,5mm (to open reactor)</b>

## 10. SOFTWARE


*Table 5 Software*

	Software
	Software license (sticklock)
	Software sticklock USB
	USB-Nano-RS485 converter

## 11. REFERENCES

Beutler, M., Hansen, U. P., & Wiltshire, K. H. (2003). *Spectral fluorescence of chlorophyll and phycobilins as an in-situ tool of phytoplankton analysis-models, algorithms and instruments* (Doctoral dissertation, Christian-Albrechts-Universität Kiel).

## APPENDIX A: CHECKLIST

<b>Checklist</b>		 <b>microLAN</b> On-line Biomonitoring Systems
ALGcontrol	Maintenance Schedule Checklist	

Rev.: 0.1/ CK  
Date: 01-2020

Year /		Monthly/Quarterly		Yearly	
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Item:						
		By:				
		Date:				
	0.1	Check general condition ALGcontrol	yes / no			
	0.2	Visual check on leakage	yes / no			
	0.3	Check sample supply and waste storage	yes / no			
	1.1	Visual check volumes solutions	yes / no			
	1.3	Clean measurement cell and glass lens	yes / no			
	1.4	Check pumps and valves	yes / no			
	2.1	Clean tubing	yes /no			
	3.1	Replace tubing	yes / no			
	3.2	Replace pump tubing	yes / no			

<b>Other service:</b>
<b>Notes:</b>