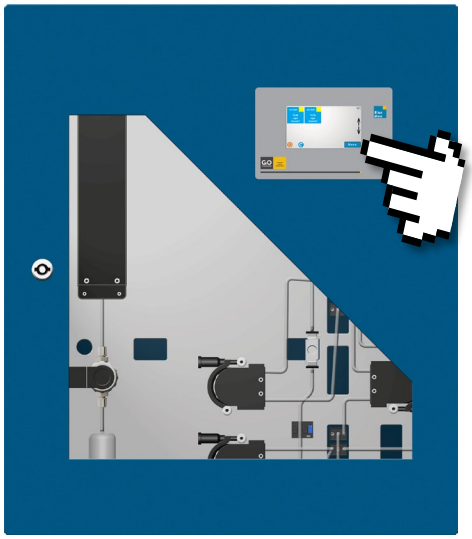
GO SYSTEMELEKTRONIK

WE MAKE LIQUIDS TRANSPARENT.

Manual BlueMon

Menu Operation



BlueMon

Version of this manual: 3.03 en

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Changes

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Liability exclusion

GO Systemelektronik GmbH takes no responsibility for correct system operation under all possible operating conditions. It is not possible to guarantee that the software will function completely without error under all possible circumstances. GO Systemelektronik GmbH therefore disclaims all liability for any direct or indirect damage resulting from system operation or the contents of this manual.

Product observance

Within the scope of our obligation for product observance GO Systemelektronik GmbH will endeavour to warn third parties about all identified dangers which could arise from the interaction between hardware and software and from the use of other components. Effective product observance is only possible with adequate information from the end user about the planned field of application and the hardware and software used. If the conditions of use change or if the hardware or software is changed, due to the complex relationships between hardware and software, it is no longer possible to describe all possible dangers and their effects on the total system, in particular on our system. This manual does not describe every possible property and combination of the system. For further information, please contact GO Systemelektronik GmbH.

Manufacturer's declaration

When installing the system it is necessary to ensure correct electrical connection, protection against moisture and foreign bodies and excessive condensation, and system heating which can arise from both correct and incorrect use. It is the responsibility of the installer to ensure that the correct installation conditions are provided.

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Creation date: 16.11.2021
Described firmware version: 4.03.07
Version of this manual: 3.03 en
Article number of this manual : DOC 488 XXXX-E-3.03-BDA-I
File name: DOC 488 XXXX-E-3.03-BDA-I BlueMon Menu.pdf

Table of Contents

1 Overview

This manual describes the menu operation at the touch display of a BlueMon Analyzer.

This manual describes **not the operation with the BlueMon PC Software**.
- Please refer to the enclosed *Manual BlueMon PC Software*.

This operating manual describes **not the commissioning and maintenance**.
- Please refer to the enclosed device specific *Manual BlueMon Commissioning and Maintenance*.

The BlueMon is a fully automatic wet-chemical multi-channel online analyzer. It detects trace concentrations in liquids.

It is operated via the touch display of the device or via the BlueMon PC Software.

The BlueMon can be connected to external sensors and actuators via CAN-bus and Modbus.

The BlueMon is equipped with all common interfaces.

Main features of the BlueMon:

- New developed photometer technology with high stability allows reliable measurements at low trace levels
- Many functions are included in the standard version, e.g. cyclical self-calibration and dilution processes; optimized analysis cycles with short runtime
- Interfaces: Ethernet, RS-232/RS-485, CAN-bus, current output
- Intelligent event-handling via SMS or E-mail
- Communication via TCP/IP over LAN, (optional W-LAN, UMTS)
- Extensive software products are offered for archiving (SQL data base), programming, visualization and online representation
- Applicable to a wide spectrum of wet-chemical methods (Ionometry, Colorimetry, Titrimetry)
- Connection option for a spectrometer
- Fully automatic operation with self-monitoring
- Compact user-friendly design with low maintenance effort
- Control and regulation of dosing pumps, dosing units and valves (analogue and digital); PLC functionality
- The BlueMon Analyser possesses all functions of the BlueBox-System from GO Systemelektronik, such as for example the connection of external sensors and the calculation of complex parameters
- Remote Control via cable, Intranet, Internet (roaming via the BlueGate data portal)

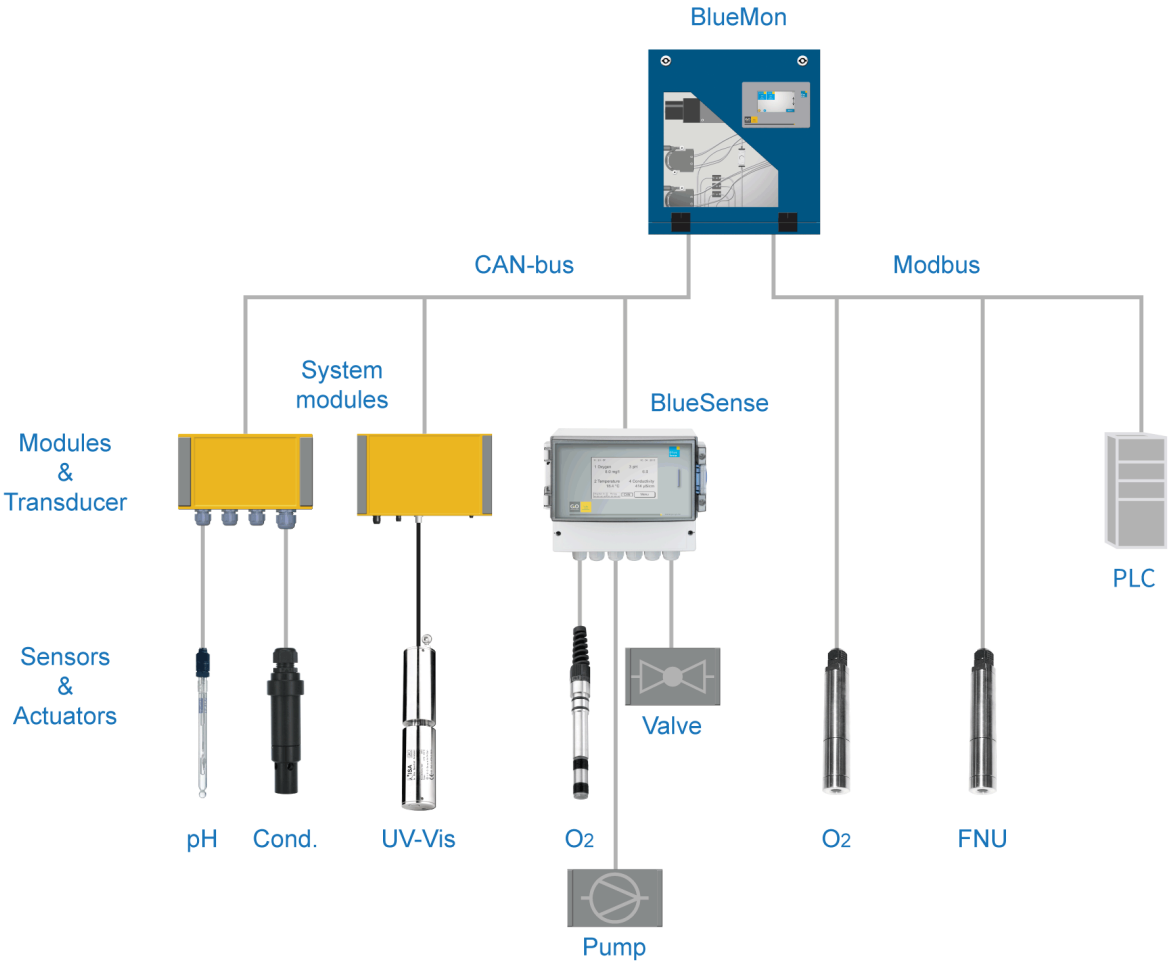
2 Hazard Notes

Danger: Improper handling of electrical devices endangers man and property.
The operation of the BlueMon should only be performed by informed and trained staff using appropriate tools. Incorrect installation could cause serious faults and errors that may damage the device.

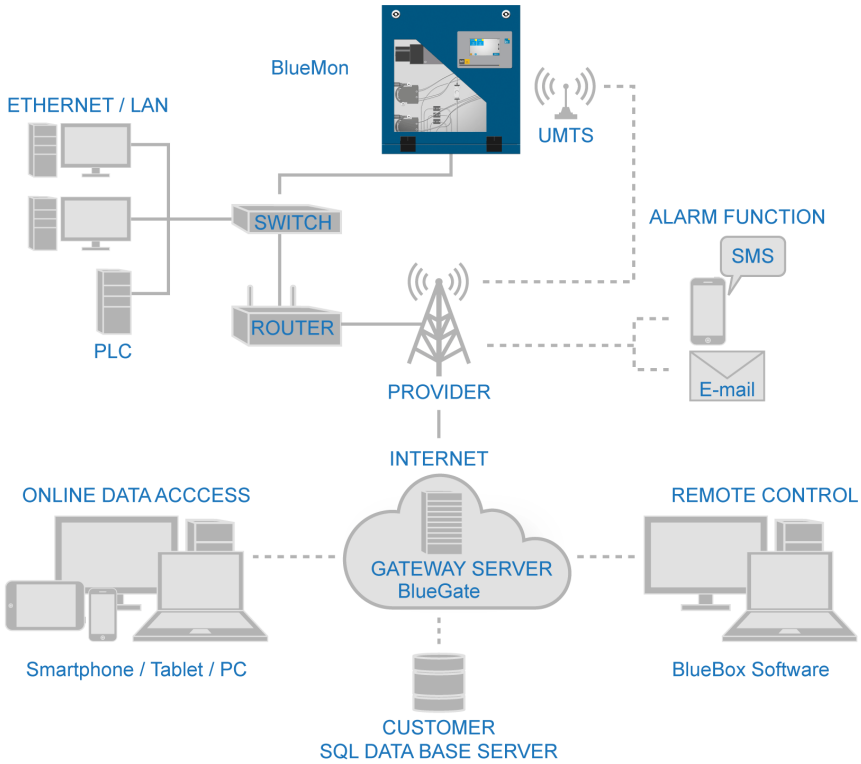
Danger: Improper handling of chemicals endangers humans and property.
The operation of the BlueMon should only be performed by informed and trained staff using appropriate tools. Read the allocated safety data sheets of the chemicals carefully and follow the appropriate instructions.

3 System Setup

System integration:



Network integration:



4 Connections, Interfaces and General Technical Data

Inputs – Connections of the mainboard
1x Photometer/Spectralphotometer
1x pH glass electrode
1x Temperature sensor PT1000 (0 – 80 °C)
1x ORP (Redox) electrode (optional pH)
1x Current input 0 – 20 mA | 4 – 20 mA
4x Digital In
1x Leakage sensor
2x Bubble detector (liquid detector) for sample reagent lack
Expandable with CAN-bus and Modbus
Input voltage 24 VDC

Inputs – Connections of the plug-on board
2x Digital In
1x Bubble detector (liquid detector) for sample reagent lack

Outputs– Connections of the mainboard	
1x Digestor control with heating and UV lamp, temperature and UV monitoring	
1x Stirrer control	
1x Motor control right/left	
3x Motor control (direction of rotation manually switchable)	
6x Relay 24 VDC/GND (called valve relays)	Free relays can be used as relay outputs.
4x Potential-free relays, max. switching voltage 48 V	
Expandable with CAN-bus and Modbus	

Outputs– Connections of the plug-on board	
1x Digestor control with heating and UV lamp, temperature and UV monitoring	
1x Motor control right/left	
3x Motor control (direction of rotation manually switchable)	
6x Relay 24 VDC/GND (called valve relays)	Free relays can be used as relay outputs.

Interfaces of the mainboard	
1x USB 2.0	
1x Ethernet (Modbus TCP)	
1x RS-232 or RS-485 (Modbus)	
1x CAN-bus (for connecting further modules, sensors and actuators)	
2x Current output[1]	0 – 20 mA | 4 – 20 mA

Interfaces of the plug-on board	
4x Current output[1]	0 – 20 mA | 4 – 20 mA

General		
Power supply		
Small housing	Panel plug	Input voltage 24 VDC Power consumption typical 50 W
Large housing	Power cable	Input voltage 85 – 264 VAC; 47 – 63 Hz | 120 – 370 VDC Power consumption typical 80 W
IP protection code		IP54 (optional IP65)[2]
Colour display		Touchpanel 480 x 272 Pixel
Dimensions (WxLxH) Small housing Large housing		 45 x 48.4 x 26 cm 60 x 70 x 31 cm
Weight Small housing Large housing		 approx. 20 kg approx. 45 kg
Housing material		Steel, powder coated
Housing colour		RAL 5010 (blue)
Sample pressure		0 bar (max 0.05 bar overpressure)
Sample flow rate		2 - 10 l/h, no suspended solids
Sample temperature		10 – 40 °C
Ambient temperature		15 – 35 °C
Computer		PC 104; 800 MHz; Access memory 256 MB
Storage memory		Industrial NANDrive™ 512 MB; optional 2 GB
Operating system		embedded Linux™

[1] Strictly speaking, a current output is not an interface, but an analogue actuator.

[2] Precondition for compliance with the IP protection code is the use of appropriate protective caps and plugs.

5 Functionality (Extract)

1. **Sequential execution of sequence programs in a process sequence.**
2. **Execution of analysis programs for up to 6 sample lines.**
3. **Control of relays and pumps by sequence program:**
    a. Switching the valve relays on/off
    b. Switching the potential-free relays on/off
    c. Switching the pumps on/off with setting of the desired speed
    For pump 1 and pump 5 the direction of rotation can also be specified.
4. **Each sequence program can contain the following commands:**
    a. Recording the current measurement values of the internal sensors
    b. Executing the formula entry in the formula field of the sample line
    c. Executing formula entries in the sequence program
    d. Wait
    e. Periodic calculation of measurement results
    f. Recording, saving and calling up spectra
    g. Perform self-test and intensity calibration of the spectrometer
    h. Perform spectrometer self-test with the aid of the comparison spectrum
    i. Carry out titration
    j. Heating
    k. Trigger controlled pumping process
    l. Control valves
5. **Program-controlled calibration, cleaning and cancellation**
6. **Time-controlled triggering of programs and functions**
7. **Triggering of device activities via signal inputs and Modbus**
8. **Sending of E-Mail and SMS**
    The triggering message condition can be determined almost arbitrarily.

5.1 Terminology

The **Process Sequence** consists of **Sequence Element**s.

Sequence Elements: **Sequence Programs**

Waiting Times (process waiting stops)

Sequence Programs: **6x Analysis Program** of the 6 sample lines

6x Calibration Program with the subset of the **DI-Water Calibration**

1x Cleaning Program

Sequence programs can also be started individually (i.e. not in the process sequence).

The BlueMon is in **measurement operation** as long as the process sequence or an individually started sequence program is running.

In addition, there is the only individually executable **Cancel Program** and the only individually executable **Sequence Stop Function**.

Measurement Values

- Measurement values[1] of the **sample lines**
- Measurement values of the **internal sensors**
- Measurement values of the **virtual (calculated) sensors**

5.2 Automatic Analysis Sequence

- **Without further specification:**
  The process sequence runs through cyclically, the cycle duration is then the duration of the process sequence, adjustable by waiting time(s) in the process sequence[2]. see *8.2.4.1 Process Sequence Menu (Sample Lines)*

- **Signal input (digital input):**
  A device activity can be triggered externally via a signal input. Device activities to be triggered: e.g. start/stop of the process sequence and starting a sequence program outside the process sequence.
  Up to 6 signal inputs can be defined. see *8.2.4.3 Digital Inputs*

- **Timer:**
  The timer can trigger device activities time controlled: e.g. start/stop of the process sequence and starting a sequence program outside the process sequence.
  Up to 20 service timers can be defined. see *8.2.4.4 Timer*

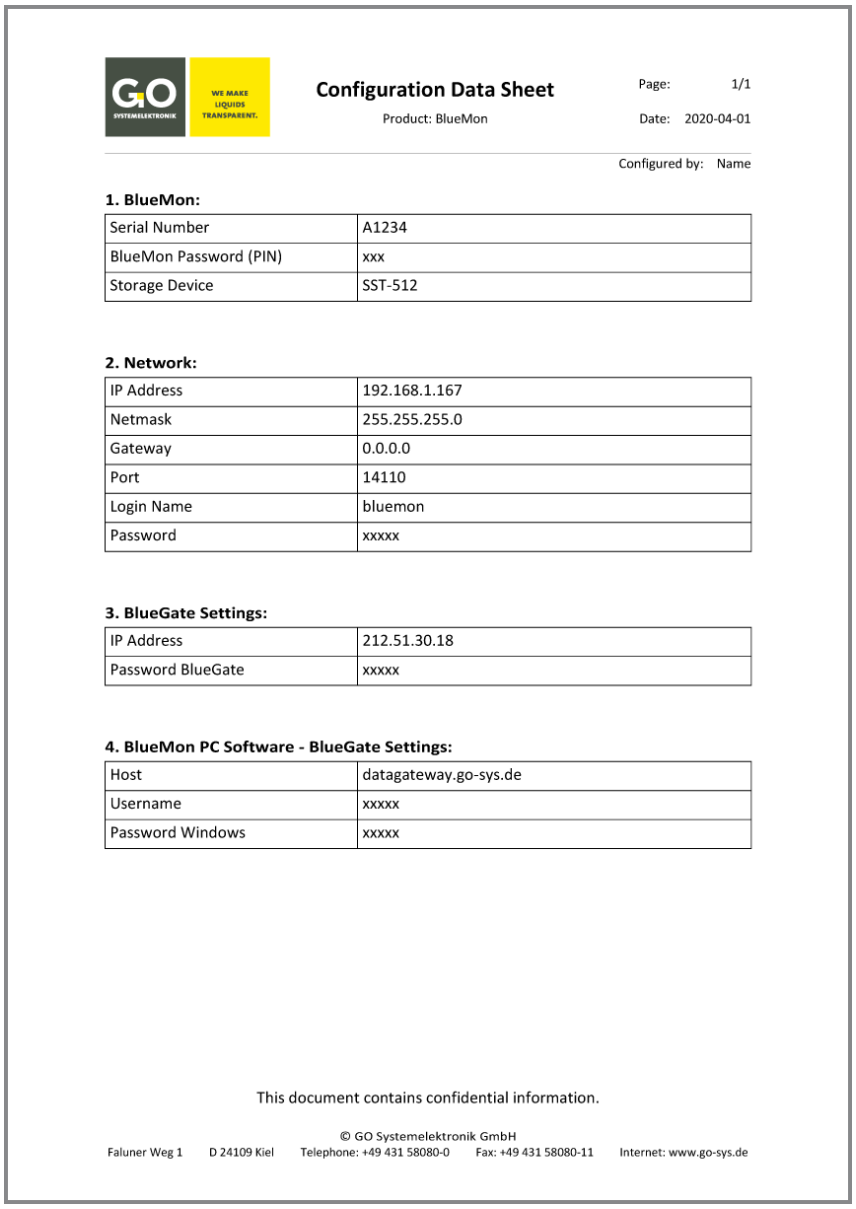
- **Service Timer (Counter):**
  The service timer can trigger alarms after a selected duration of a selected device activity, and then automatically stop the system. Up to 6 service timers can be defined. see *8.2.5.8 Counter (Service Timer)*

[1] Strictly speaking, the measurement values of the sample lines come from virtual (calculated) sensors.
[2] Waiting times can also be set in the sequence programs.

6 The Configuration Data Sheet

The configuration data sheet contains the passwords, network addresses etc. necessary for operating the BlueMon.

Example:



Configuration Data Sheet

Page: 1/1

Product: BlueMon

Date: 2020-04-01

Configured by: Name

1. BlueMon:

Serial Number	A1234
BlueMon Password (PIN)	xxx
Storage Device	SST-512

2. Network:

IP Address	192.168.1.167
Netmask	255.255.255.0
Gateway	0.0.0.0
Port	14110
Login Name	bluemon
Password	xxxxx

3. BlueGate Settings:

IP Address	212.51.30.18
Password BlueGate	xxxxx

4. BlueMon PC Software - BlueGate Settings:

Host	datagateway.go-sys.de
Username	xxxxx
Password Windows	xxxxx

This document contains confidential information.

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1. BlueMon:

Serial Number	A1234
BlueMon Password (PIN)	xxxxx
Storage Device	SST-512

Serial Number

Serial number of the BlueMon
With this serial number the BlueMon is identified by the BlueMon PC Software.
⇨ set at the factory, not changeable

BlueMon Password (PIN)

Password of the BlueMon
Is required to change the BlueMon system settings.
⇨ set at the factory, not changeable

Storage Device

Model and size of the internal BlueMon memory, here SST-512 (SST= SST NANDrive™; 512=512MB)
⇨ set at the factory, changeable by replacing

2. Network:

IP Address	192.168.1.167
Netmask	255.255.255.0
Gateway	0.0.0.0
Port	14110
Login Name	bluemon
Password	xxxxx

IP Address IP address of the BlueMon
At this address, the BlueMon is addressed on the network.
⇨ set at the factory, changeable

Netmask Netmask of the BlueMon
⇨ set at the factory, changeable

Gateway Standard gateway of the BlueMon
⇨ set at the factory, changeable

Port Default gateway of the BlueMon
⇨ set at the factory, not changeable

Login Name User name for a modem connection
⇨ set at the factory, not changeable

Password Network password of the BlueMon
Is needed to access the BlueMon via the BlueMon PC Software.
⇨ set at the factory, not changeable

3. BlueGate Settings:

IP Address	212.51.30.18[1]
Password BlueGate	xxxxx

IP Address IP address of an Internet Gateway
⇨ can be configured at the factory, changeable[2]

Password BlueGate Password of an Internet Gateway
⇨ can be configured at the factory, changeable

4. BlueMon PC Software – BlueGate Settings:

Host	datagateway.go-sys.de
Username	xxxxx
Password Windows	xxxxx

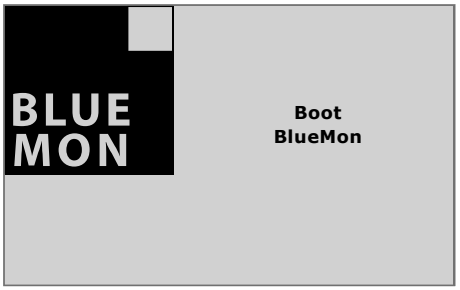
If the BlueMon is accessed via a gateway (e.g. with an UMTS connection), you have to enter these access data in the BlueMon PC Software.

[1] IP address of the GO webserver (default address)
[2] changeable only at the default address

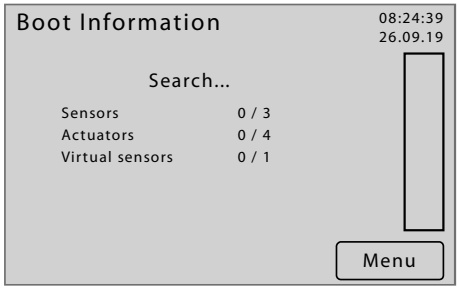
7 Switching On the BlueMon and Password Input

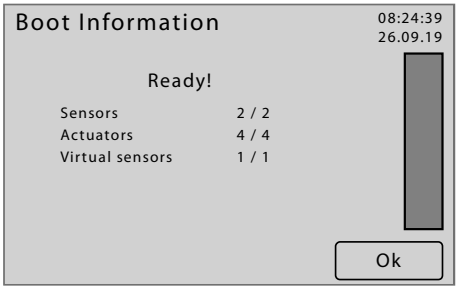
After the BlueMon has been started by switching on the power supply, shortly thereafter the following notes appear in succession on the display[1].

During this time the BlueMon checks the database and initiates the system.



Then the BlueMon initiates the connected sensors and actuators.





Pressing <Menu> switches directly to the Main menu (8.2), where you can make system settings while sensors and actuators are being initialized.[2]

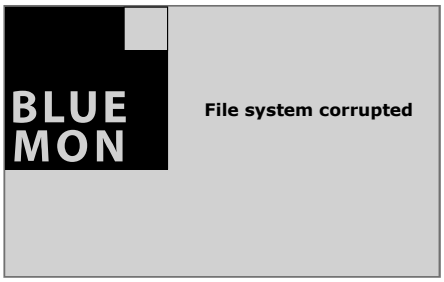
Once the initialization is complete, the display shows the number of connected sensors, actuators and virtual sensors[3]. After 20 seconds or after pressing <OK> the parameter display appears.

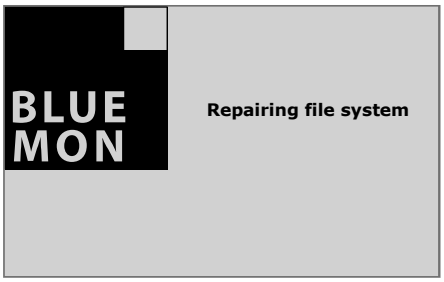
If warning or error messages are currently present, the menu of warning and error messages appears before the parameter display (here an example).

Pressing **<Error reset>** resets the displayed message and switches to the next message and after the last message to the parameter display.

After 6 seconds or after pressing ↓, the display switches to the next message and after the last message to the parameter display. The button ! appears in the parameter display.
Pressing this button switches back to the menu of warning and error messages. see *8.1.5 Menu of the Warning and Error Messages*

The device tries to repair a faulty file system automatically.
If this does not work, the service must be contacted so that it can reset the memory card.





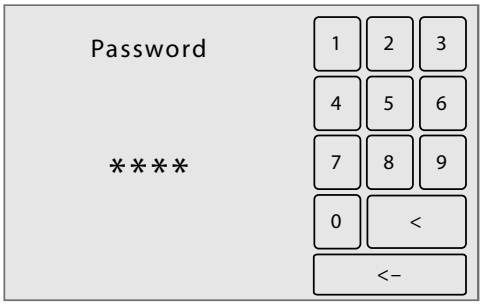
[1] At delivery the touch panel is calibrated and ready for use. After a longer storage it may be necessary to adjust for the touch panel (see *Appendix A – Adjustment of the Touch Display*).

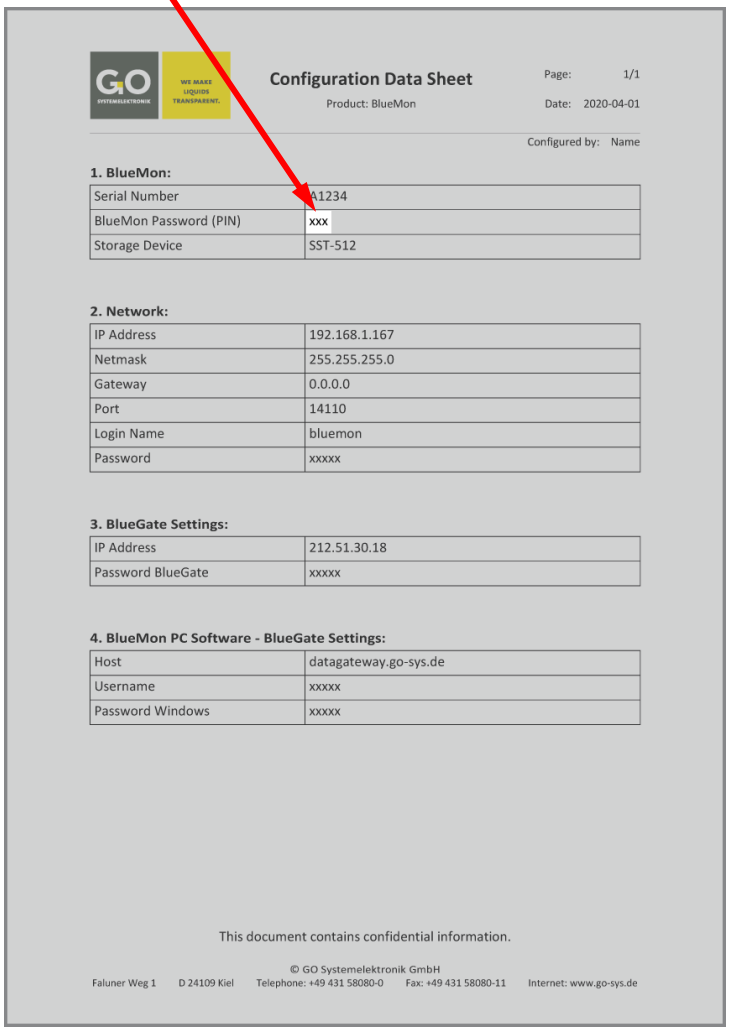
[2] The practical benefit increases with the size of the system. see *3 System Setup*

[3] see *Manual BlueMon PC Software*.

Password input

To access certain menus, a password consisting of 5 digits must be entered.
The password can be found in the configuration data sheet.





Configuration Data Sheet

Page: 1/1

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Date: 2020-04-01

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IP Address	212.51.30.18
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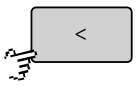
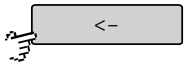


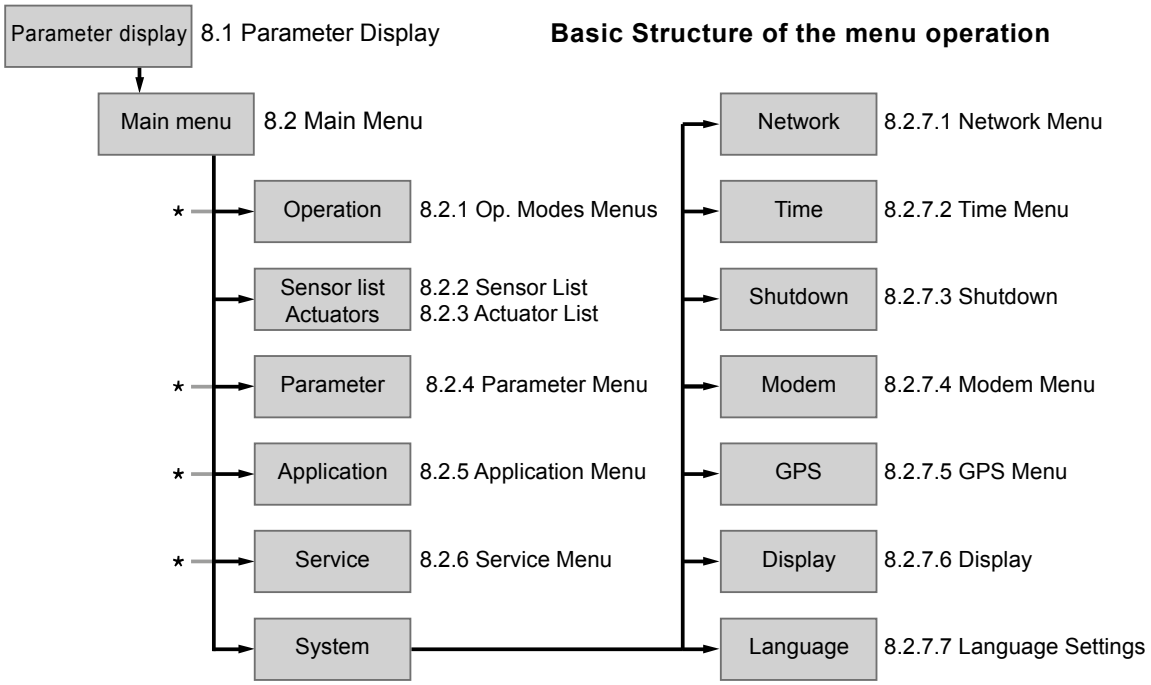
Deletes the last entered digit.



Verifies the password and switches to the System menu.
If the password is incorrect, you receive an error message.

8 The Menu Operation

The BlueMon has a colour display; older versions with a monochrome display are no longer available. The operation on the monochrome display is almost identical to the operation on the colour display and differs most in the measurement value display (see *8.1 Parameter Display* and following).



*complete structure see *Appendix B – Menu Structure Operation, Parameter, Application and Service*

8.1 The Parameter Display

Displayed are:

- the **internal sensors and actuators** *
- the **virtual (calculated) sensors**
- the connected external **CAN-bus sensors**
- the connected external **CAN-bus actuators** *

Selection types:

- Only in the sensor menus 8.2.2.1 and actuator menu 8.2.3.1 selected sensors and actuators are displayed.
- All sensors and actuators are displayed.
- All sensors are displayed.

The selection type is determined via the menu screen/display 8.2.7.6.

Displaying types:

- Display 8-way, 6-way und 1-way

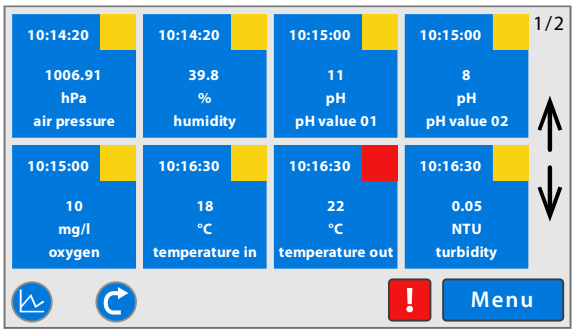
The displaying type is determined via the menu screen/display 8.2.7.6.

When there is no user activity in all other menus (except input menus) for 2 minutes, the display switches back to the parameter display.

* The state of an actuator can also be interpreted as a measured value.

8.1.1 Parameter Display 8-way (Tiles)

Selection via *8.2.7.6 Display*



Here, as an example, the parameter display with more than 8 displayed sensors/actuators.

The first 8 elements are displayed for 6 s, the order is alphabetical[1]. Thereafter the display cycles[2] to the display of the next elements.

The sensors/actuators are shown as tiles.

In the upper right corner you see the page number of the current display and the number of pages (in this case 1/2).

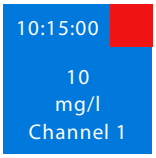
The sensors/actuators are displayed as tiles, and the following is shown in them:

Time of day of the measurement value | Numerical value of the measurement value
Unit of the measurement value | Sensor name

The sensor status (see *Appendix E – Sensor Status Messages)* is marked in colour.

yellow
Status: 0

orange
Status:
4, 50, 51, 57

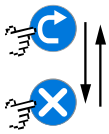


red
Status:
all others

Buttons

Switches to the display of the previous sensors/actuators.
Switches the cycling of the parameter display off.

Switches to the display of the next sensors/actuators.
Switches the cycling of the parameter display off.



Switches the cycling of the parameter display on or off and to the measurement overview, see *8.1.4 Measurement Overview*. The button is also a status indicator.

If warning or error messages are currently pending, this button appears and calls up the menu of warning and error messages. see *8.1.5 Menu of the Warning and Error Messages*

Switches to the Main menu.

Display of the device status icons

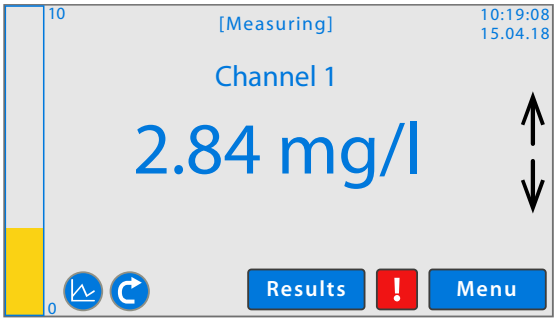
	**Measuring**	An analysis program is running or a waiting time (process waiting stop).[3]
	**Calibration**	A calibration program is running.[3]
	**Cleaning**	The cleaning program is running.[3]
	**Service**	The service menu of the BlueMon PC Software is open.
	**Standby**	The BlueMon is not in operation and is ready for use.
	**Error**	Operation terminated after error message

[1] The sequence is that of the ASCII numeric value, i.e.: Special characters ⇨ numbers ⇨ capital letters ⇨ lower case letters
[2] You can also stop cycling, see here "Buttons".
[3] **Definition**: In the device status Measuring, Calibration and Cleaning the BlueMon is in **Measuring Operation**.

8.1.2 Parameter Display 1-way

Selection via *8.2.7.6 Display*

The measurement value of a sensor is displayed for 6 s, thereafter the display switches in a cycling way [1] to the display of the next sensor. The order is alphabetical [2].



Display time/date, see below at Cycling on/off

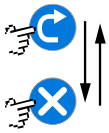
The yellow bar graph on the left side of the display shows the current measurement value. At the top center in square brackets the current device activity or device status is displayed, see *Appendix D – Display of the Device Activity and the Device Status*.

The sensor status (see Appendix E – Sensor Status Messages) is colour-coded via the display of the measurement value: blue = Status 0 | orange = Status 4, 50, 51, 57 | red = all others

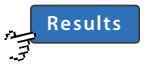
Buttons

Switches to the display of the previous sensors/actuators.
Switches the cycling of the parameter display off.

Switches to the display of the next sensors/actuators.
Switches the cycling of the parameter display off.



Switches the cycling of the parameter display on or off and to the measurement overview, see *8.1.4 Measurement Overview*. The button is also a status indicator.
Cycling on: In the upper right corner time and date are displayed.
Cycling off: In the upper right corner time and date of **the last measurement** are displayed.



Switches to the allocated measurement value, sensor or actuator menu.
see *8.2.2 Sensor List* and following

If warning or error messages are currently pending, this button appears and calls up the menu of warning and error messages. see *8.1.5 Menu of the Warning and Error Messages*

Switches to the Main menu.

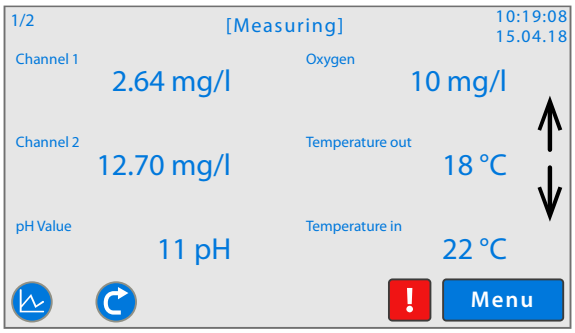
Display of the device status icons

	**Measuring**	An analysis program is running or a waiting time (process waiting stop).[3]
	**Calibration**	A calibration program is running.[3]
	**Cleaning**	The cleaning program is running.[3]
	**Service**	The service menu of the BlueMon PC Software is open.
	**Standby**	The BlueMon is not in operation and is ready for use.
	**Error**	Operation terminated after error message

[1] You can also stop cycling, see here "Buttons".
[2] The sequence is that of the ASCII numeric value, i.e.: Special characters ⇨ numbers ⇨ capital letters ⇨ lower case letters
[3] **Definition**: In the device status Measuring, Calibration and Cleaning the BlueMon is in **Measuring Operation**.

8.1.3 Parameter Display 6-way

Settings via *8.2.1.6 Display*



Here, as an example, the parameter display of more than 6 sensors.

The measurement values of the first 6 sensors are displayed for 6 s, the order is alphabetical[1].
Thereafter the display switches in a cycling way [2] to the display of the next sensors.

At the top left you see the page number of the current display and the number of pages (here 1/2), the time and date at the upper right.

At the top center in square brackets the current device activity or device status is displayed, see *Appendix D – Display of the Device Activity and the Device Status*.

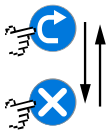
In the upper right corner time and date are displayed.

The sensor status (see Appendix E – Sensor Status Messages) is colour-coded via the display of the measurement value: blue = Status 0 | orange = Status 4, 50, 51, 57 | red = all others

Buttons

Switches to the display of the previous sensors/actuators.
Switches the cycling of the parameter display off.

Switches to the display of the next sensors/actuators.
Switches the cycling of the parameter display off.



Switches the cycling of the parameter display on or off and to the measurement overview, see *8.1.4 Measurement Overview*. The button is also a status indicator.

If warning or error messages are currently pending, this button appears and calls up the menu of warning and error messages. see *8.1.5 Menu of the Warning and Error Messages*

Switches to the Main menu.

Display of the device status icons

	**Measuring**	An analysis program is running or a waiting time (process waiting stop).[3]
	**Calibration**	A calibration program is running.[3]
	**Cleaning**	The cleaning program is running.[3]
	**Service**	The service menu of the BlueMon PC Software is open.
	**Standby**	The BlueMon is not in operation and is ready for use.
	**Error**	Operation terminated after error message

[1] The sequence is that of the ASCII numeric value, i.e.: Special characters ⇨ numbers ⇨ capital letters ⇨ lower case letters

[2] You can also stop cycling, see here "Buttons".

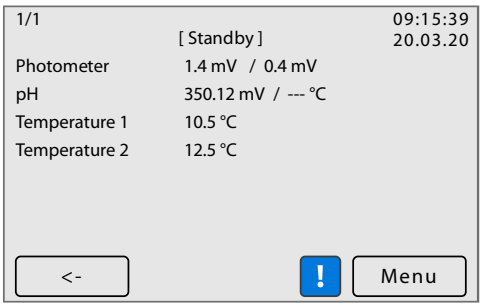
[3] **Definition**: In the device status Measuring, Calibration and Cleaning the BlueMon is in **Measuring Operation**.

8.1.4 Measurement Overview

Parameter display at cycling off

Here, the raw values of the internal sensors and the temperature(s) are displayed.

Example:



At the upper left corner you see the page number of the current display and the number of pages (here1/1.

At the top center in square brackets the current device activity is displayed, see *Appendix D – Display of the Device Activity*.

At the top right, the time and date are displayed.

<- Switches to the cycling Parameter display.

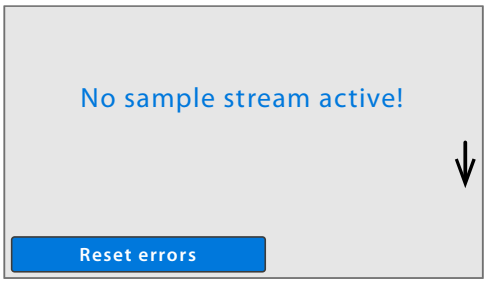
If warning or error messages are currently pending, this button appears and calls up the menu of warning and error messages. see below

Menu Switches to the main menu.

8.1.5 Menu of the Warning and Error Messages

Parameter display, only appears if warning or error messages are currently pending

Example:



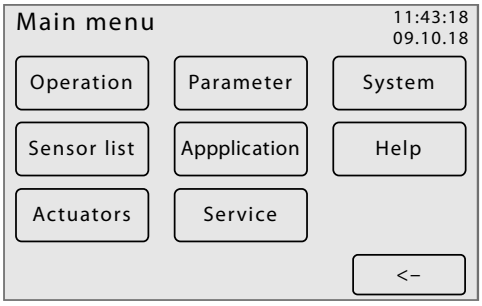
The list of warning and error messages can be found in *Appendix C - Warning and Error Messages*.

Reset errors Resets the displayed message and switches to the next message and after the last message to the parameter display.

After 6 seconds or after pressing ↓, the display switches to the next message and after the last message to the parameter display.

8.2 Main Menu

Menu — Parameter display 8.1



Operation — Switches to the menu of the operation modes 8.2.1.
There you can trigger device activities directly.
see also *Appendix B*, there *1 Menu Structure Operation*

Sensor list — Switches to the list of the measurement values of the Sample lines, the CAN-bus sensors and the Virtual (calculated) Sensors 8.2.2.

Actuators — Switches to the list of the connected CAN-bus actuators 8.2.3.

Parameter — Switches to the Parameter menu 8.2.4 via a password request.
see also *Appendix B*, there *2 Menu Structure Parameter*

Application — Switches to the Application menu 8.2.5 via a password request.
There you can view and change application specific settings.
see also *Appendix B*, there *3 Menu Structure Application*

Service — Switches to the Service menu 8.2.6 via a password request.
see also *Appendix B*, there *4 Menu Structure Service*

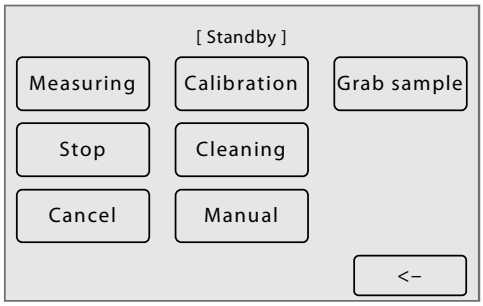
System — Switches to the Service menu 8.2.7 via a password request.

Help — Switches to the Help menu 8.2.8.

<- — Switches back to the Parameter display.

8.2.1 Operation Modes Menu

Operation Main menu 8.2



Via this menu the following device activities[1] are directly triggered:

- Measuring
- Stop
- Cancel[2]
- Calibration
- Cleaning[3]
- Grab sample

The current device activity is displayed in [ ], see Appendix D – Device Activity Display.

You can also switch the pumps, the valve relays and the potential-free relays manually.

Measuring In the device status "Standby" the process sequence is started, in any other device status only the warning and error messages are reset.

Stop Triggers the sequence stop function: Each running program is executed until the end, then the system enters the device status "Standby".

Cancel Executes the cancel program, duration about one minute. The cancel program terminates any running program and empties the BlueMon completely into the drain, then the system enters the device status "Standby".

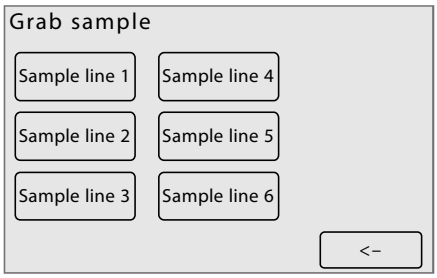
Calibration Switches to the calibration menu 8.2.1.1.

Cleaning Starts the cleaning program at the end of the currently running program. The cleaning program rinses the system with dilution water, if available, if not with sample water.[4]

Manual Switches to manual relay control via password request.
see *8.2.1.2 Manual Control of Pumps, Valve Relays and Potential-free Relays*

Grab sample Here you can start the analysis programs of the sample streams 1– 6 separately.

When an analysis program is started, a running process sequence is interrupted immediately; a running single sequence program is terminated immediately. After the end of the analysis program, the interrupted process sequence starts with the next sequence element.

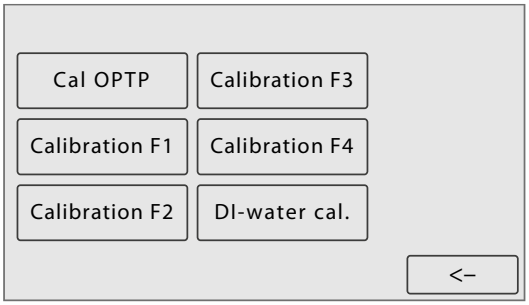


<– Switches back to the Main menu.

[1] **Definition**: When performing Measuring, Calibration, Cleaning and Grab sample, the BlueMon is in **Measurement operation**.
[2] means the performing of the cancel program
[3] means the performing of the cleaning program
[4] For cleaning when the BlueMon is taken out of operation, all suction tubing ends are placed in DI- water.

8.2.1.1 Calibration Menu

Calibration Operation modes menu 8.2.1



Example with a Phosphate-P-standard calibration and four unassigned calibration buttons

Cal OPTP Starts the calibration program,
here as an example a Phosphate-P-standard calibration.

Calibration F1 Buttons for further calibration programs

etc.

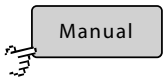
DI-water cal. Starts the DI-water calibration program.

<– Switches back to the Operation modes menu.

Note on starting a calibration program **during a running process sequence**
A running sequence program is executed to the end and then the process sequence is interrupted, then the calibration programme starts. After the end of the calibration program, the interrupted process sequence starts with the next ↻ sequence element.

Note on starting a calibration program **in the device status Standby**
The calibration program is executed to the end, **then the process sequence starts**.

8.2.1.2 Manual Control of Pumps, Valve Relays and Potential-free Relays



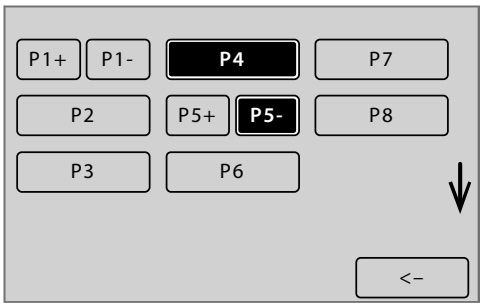
Operation modes menu 8.2.1 after password request

The BlueMon has 4 pump controls, 6 valve relays and 4 potential-free relays on the mainboard.
The plug-in board then has additionally 4 pump controls and 6 valve relays.
Pump relays and valve relays are connected to 24 VDC / GND.

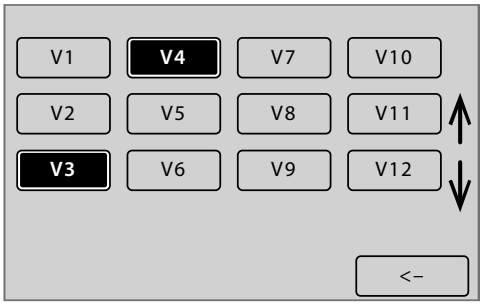
Via the following menus, the pumps and relays of the BlueMon can be controlled manually.

Note on a possible operating error: When the menu is called up, a running process sequence is immediately interrupted; a running single sequence program is immediately terminated. All pumps, valve relays and potential-free relays go into the idle state. As soon as you switch back to the operation mode menu, the interrupted process sequence starts with the next sequence element.

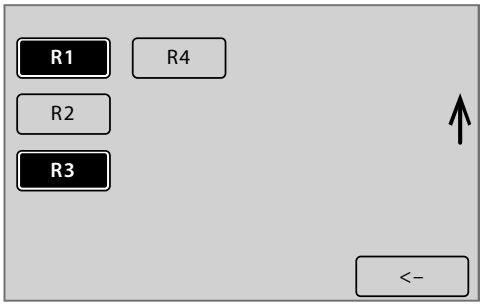
Manual pump control
Pressing the button <P1> etc. the pumps are turned on and off. They run at the preset speed. In pump 1 and 5, the rotation direction can be changed. In this example, pump 4 rotates to the right and pump P5 to the left.



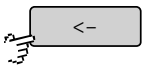
Manual valve control
By pressing the button <V1> etc. the valve relays are switched. In this example, the valve relays V3 and V4 are switched.



Manual control of the potential-free relays
By pressing the button <R1> etc. the potential-free relays are switched. In this example the relays R1 and R3 are switched.

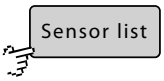


Scrolls the display.



Switches back to the operation modes menu.

8.2.2 Sensor List



Main menu 8.2

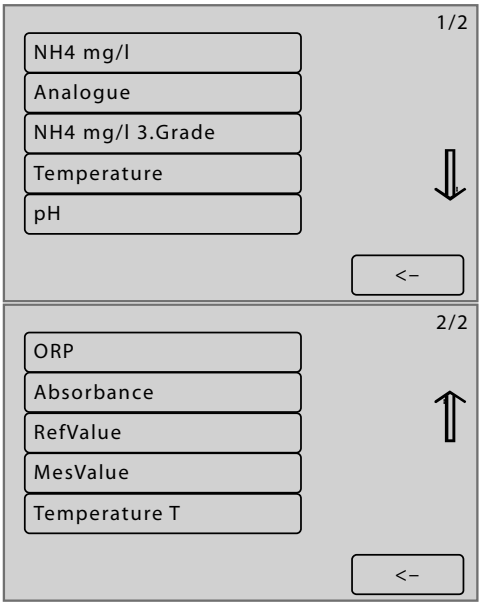
Via this menu you call up the menus of the measurement values of the sample lines, the CAN-bus sensors and the virtual (calculated) sensors.

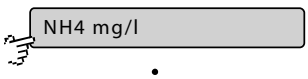
Here you can make settings for a measurement value, display measurement values over a period of time and view the current settings of the sample stream measurement value and the sensor measurement value.

> The menus of the CAN-bus sensors are not described here.
> For a complete documentation please contact GO Systemelektronik.

The menus of the internal sensors are described under 8.2.5.5 Sensor Inputs (Internal Sensors).

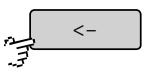
Example:





Switches to the menu of the measurement value 8.2.2.1.

Scrolls the display.



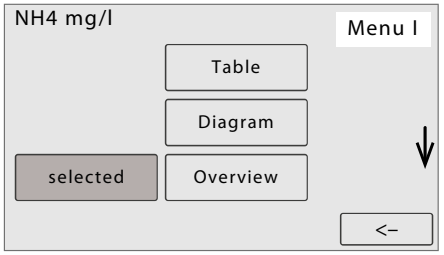
Switches back to the main menu.

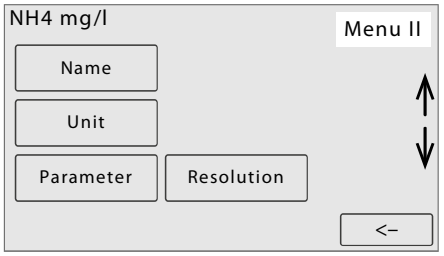
8.2.2.1 Menus of Measurement Values

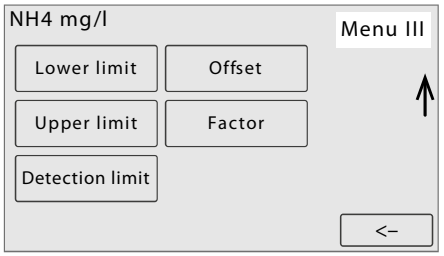
Example for measurement values of the sample lines

NH4 mg/l — Sensor list 8.2.2

Via these menus you can make settings for a measured value of a sample stream, display its measured values over a period of time and view the current settings of the sensor.







Menu I

selected / selected — Selects the sensor for the parameter display or not. see *8.2.7.6 Display*

Table — Switches to the table display of the measurement values. see 8.2.2.1.1

Diagram — Switches to the diagram display of the measurement values. see 8.2.2.1.2

Overview — Switches to the measurement value/ sensor information. see 8.2.2.1.3

Menu II

Name — Switches to the input of the sensor name.
max. 20 characters

Unit — Switches to the input of the unit of the measurement value.
More than 5 characters cannot be displayed on the BlueMon display.

Parameter — Switches to the input of the name of the measured parameter. max. 20 characters

Resolution — Switches to a selection menu for the number of decimal places displayed.

<- — Switches back to the sensor list.

Menu III

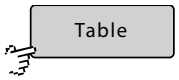
Lower limit / Upper limit — Switches to the input of the measurement range limits

Detection limit — Switches to the input of a detection limit.
If the measurement value is smaller than the detection limit, the detection limit is displayed and stored.

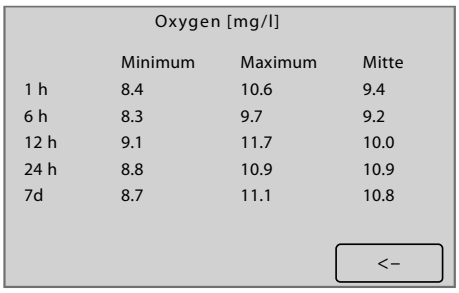
Offset — Switches to the input of an offset value.

Factor — Switches to the input of a gain factor.

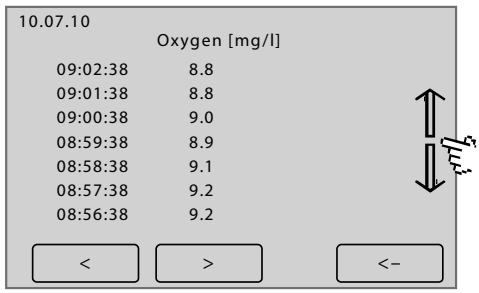
8.2.2.1.1 Table Display (Measurement Values)



Menus of the Measurement Values 8.2.2.1

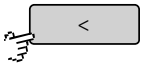


Statistics of the measurement values over the last 24 hours and the last 7 days.

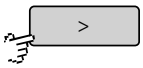


Scrolls the list.

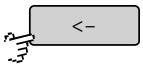
List of the measurement values of one day



Displays the measurement values of the previous day.

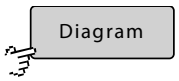


Displays the measurement values of the next day.

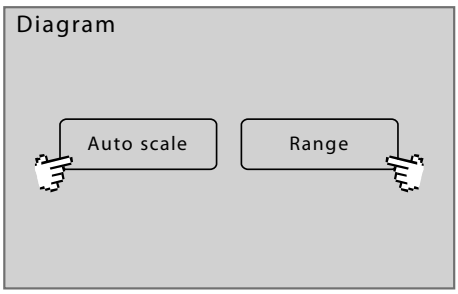


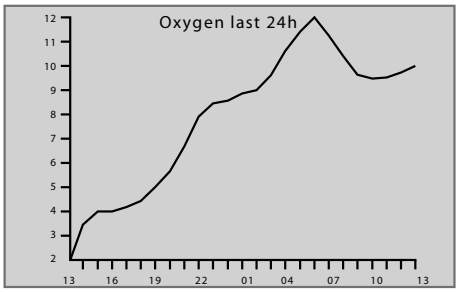
Switches to the Sensor menu.

8.2.2.1.2 Diagram Display (Sensor Values)



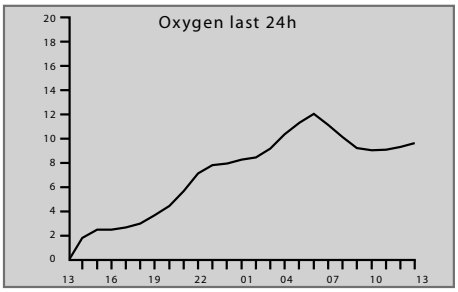
Menus of the Measurement Values 8.2.2.1





Measurement values over the last 21 – 24 hours (depends on the measurement range), scaled to min/max of all measurement values.

Pressing the display switches back to the sensor menu.

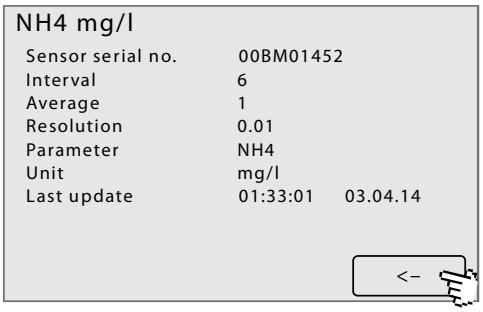


Measurement values over the past 21 – 24 hours (depends on the measurement range).

Pressing the display switches back to the sensor menu.

8.2.2.1.3 Measurement Value/Sensor Info

Overview — Sensor menu 8.2.2.1



Switches back to the sensor menu.

Sensor serial no. Sensor-ID: CAN-ID + serial number
8-digit designation of the Data Acquisition Module + consecutive number of the sensor (0-9)

Interval Measurement interval, only for virtual sensors

Average Measurement interval, only for virtual sensors

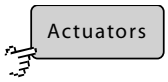
Resolution Measurement resolution

Parameter Name of the parameter

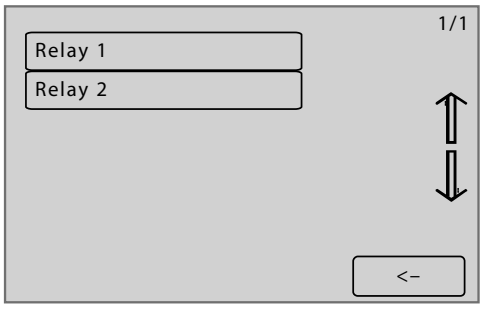
Unit Unit of the parameter

Last update Time and date of the last measurement

8.2.3 Actuator List



Main menu 8.2

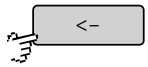


In this example there are two relays.
Via this menu you call up the menus of the connected CAN-bus actuators.
If necessary, you can change an actuator name with the BlueMon PC Software.

Switches to the menu of the first actuator.

Switches to the menu of the second actuator.

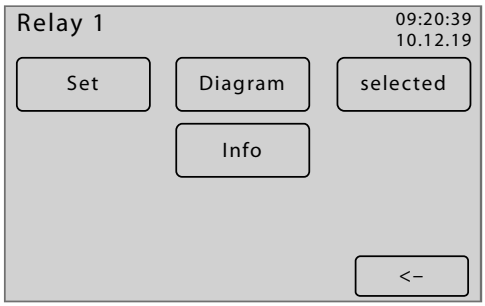
Scrolls the display.



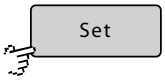
Switches back to the Main menu.

8.2.3.1 Actuator Menu Example Relay 1

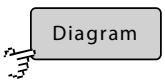
Actuator list 8.2.3



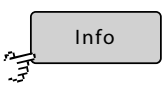
Via this menu you can switch an actuator on and off and display its behaviour over a period of time. The specific settings of the connected actuator can be found in the actuator description.



Switches to set the actuator state (ON or OFF for a relay).

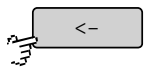


Switches to the diagram display of the actuator behaviour.



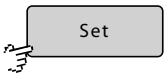
Switches to the info menu of the actuator.

Selects the sensor for the parameter display or not.
see also 8.2.7.6 Display

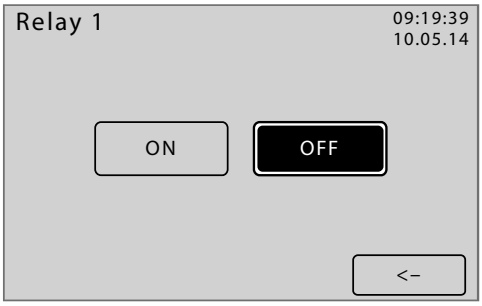


Switches back to the Actuator list.

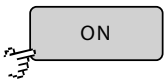
8.2.3.1.1 Set Actuator Menu Example Relay 1



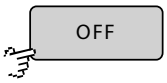
Actuator menu 8.2.3.1



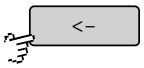
This menu allows you to determine the state of a connected actuator. In this example, you can switch a relay on and off. The specific settings of the connected actuator can be found in the actuator description.



Switches the relay on, the button is also a status indicator.

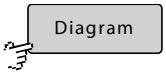


Switches the relay off, the button is also a status indicator.

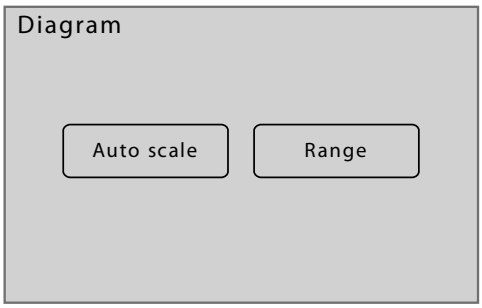


Switches back to the Actuator menu.

8.2.3.1.2 Diagram Display (Actuator)

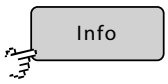


Actuator menu 8.2.3.1

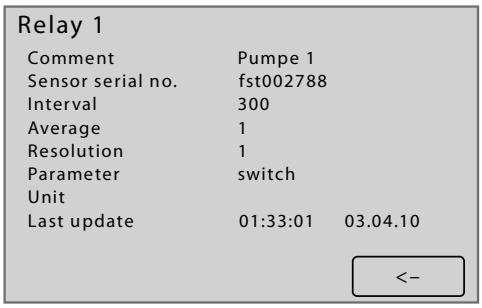


Displays the states of an actuator over the last 21 to 24 hours, similar *8.2.2.1.3 Diagram Display (Sensor Values)*.

8.2.3.1.3 Actuator Info



Actuator menu 8.2.3.1



Comment — General comment for the actuator

Sensor serial no. — Actuator-ID: CAN-ID + serial number
8-digit designation of the Data Acquisition Module + consecutive number of the actuator (0-9)

Interval — Control interval for the actuator function request

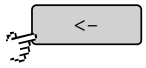
Average — 1 – Default value for actuators

Resolution — 1 – Default value for actuators

Parameter — switch – default value for relays

Unit — unallocated

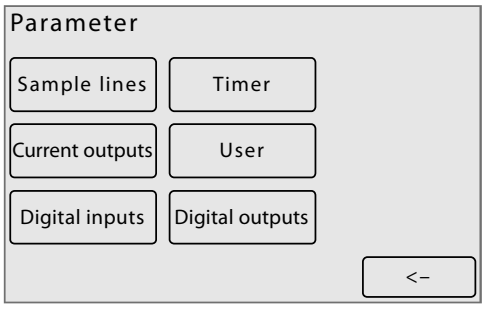
Last update — Time of the last function request; the function request takes place after each control interval.

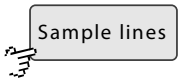


Switches back to the actuator menu.

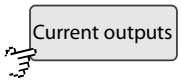
8.2.4 Parameter Menu

Main menu 8.2





Switches to the menus of the process sequence 8.2.4.1, there you can change the process sequence.

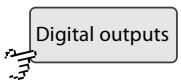


Switches to the menu for the settings of the two current outputs 8.2.4.2

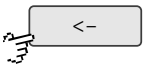
Switches to the menu for the configuration of the six digital inputs 8.2.4.3

Switches to the menus of the timer settings 8.2.4.4
Via this menu can trigger device activity time controlled.

Switches to the selection menu of the user defined variables 8.2.4.5



Switches to the menus of the digital outputs 8.2.4.6

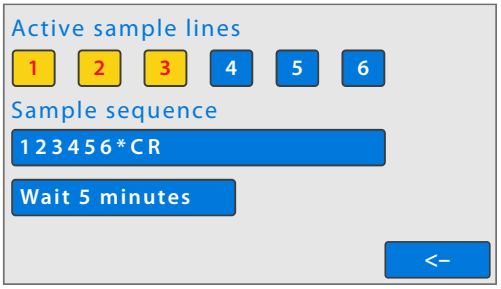


Switches back to the main menu.

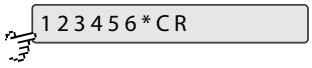
8.2.4.1 Process Sequence Menu (Sample Lines)

Parameter menu 8.2.4

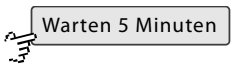
Via this menu, you can activate and deactivate the analysis programs of the 6 sample streams and define the duration of a process waiting stop. In addition, the current process sequence (sample line) is displayed. Deactivated analysis programs are skipped in the sequence.



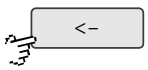
Activates and deactivates the analysis program of the respective sample stream.
- ⇨ yellow background = activated
- ⇨ blue background = deactivated



Switches to the input of the process sequence (sample sequence).
In the button, the current process sequence is displayed.



Switches to the input of the duration of a process waiting stop.
Only visible if a "**W**" is entered in the sample sequence.
See next page.

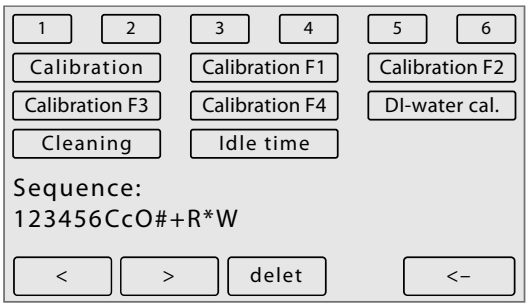


Switches back to the Parameter menu.

8.2.4.1.1 Input of the Process Sequence

123456*CR Process sequence menu 8.2.4.1

Here you can determine the process sequence (sample sequence).



With the process sequence you determine the order in which the sequence elements are executed.

- "**1**" to "**6**" stands for the analysis program of the respective sample line.
- The buttons <Calibration> to <Calibration F4> stand for the 5 possible calibration programs of the BlueMon. In practice, the buttons are marked with the name of an assigned calibration program, for instance Cal OPTP stands for a Phosphate-P-standard calibration.
  "**C**" stands for the calibration program behind the button <Calibration>. "**c**" and "**O**"(capital O) and "#" and "+" for calibration F1 to F4.
- "**R**" stands for the DI-water calibration program.
- "*****" (asterisk) stands for the cleaning program.
- "**W**" stands for a waiting time (duration of a process waiting stop).
  The duration is determined via the process sequence menu (see previous page).
  A set process waiting stop with duration 0 delays the process by approx. 2 seconds.

1 to 6 ⇨ Writes "**1**" to "**6**" into the process sequence.

Calibration to Calibration F4 ⇨ Writes "**C**" "**c**" "**O**" "**#**" "**+**" into the process sequence.

DI-water cal. ⇨ Writes "**R**" into the process sequence.

Cleaning ⇨ Writes "*****" into the process sequence.

Idle time ⇨ Writes "**W**" into the process sequence.

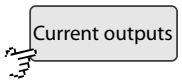
< Select left character.

> Select right character.

Debug Delete selected or left character.

<– Switches back to the process sequence menu.

8.2.4.2 Current Outputs 1 – 2

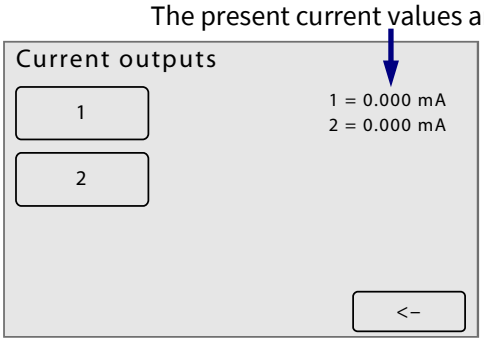


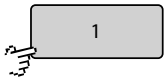
Parameter menu 8.2.4

Via this menu you can call up the settings of the current outputs of the BlueMon.

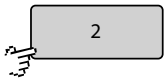
On the mainboard of the BlueMon there are two current outputs, on the plug-in board there are four additional current outputs.

The present current values are displayed.

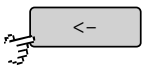




Switches to the setting menu of the first current output.

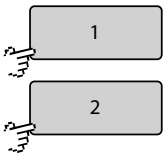


Switches to the setting menu of the second current output.



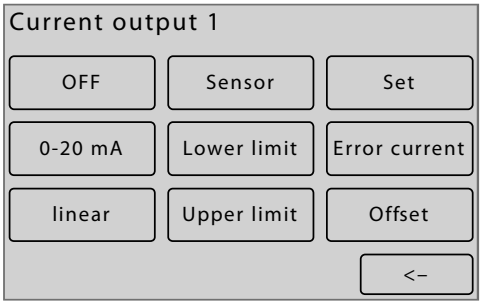
Switches back to the Parameter menu.

8.2.4.2.1 Current Output Menu



Current outputs 1 – 2 8.2.4.2

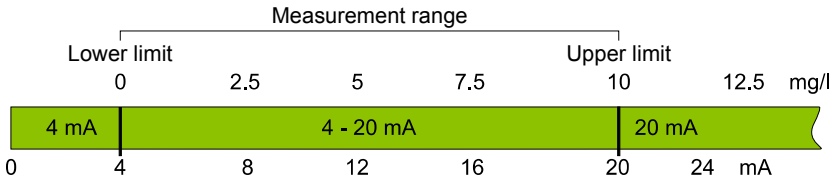
Here you parameterise the two current outputs of the BlueMon.

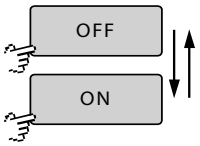


A measurement value from sample line or from a sensor controls the assigned current output. Thus, the signal is accurately represented by the current output, you must set a **measurement range**.

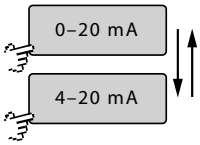
Via this menu you determine the measurement range with the input of a minimum value (Lower limit) and a maximum value (Upper limit).

Example 4 – 20 mA:

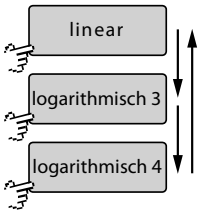




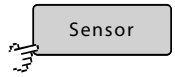
The current output is active (ON) or not (OFF).



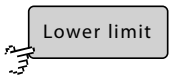
Current value range



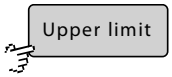
Determination of the output scale
logarithm 3 ⇨ logarithmically over 3 decades
logarithm 4 ⇨ logarithmically over 4 decades



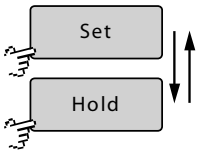
Switches to a selection menu for assigning a sensor.



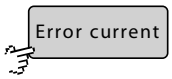
Input of the measurement value that corresponds to 0 or 4 mA.
Minimum value of the measurement range



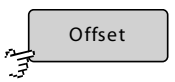
Input of the measurement value that corresponds to 20 mA.
Maximum value of the measurement range



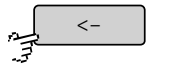
Definition of the error behaviour in the event of a device error.
Set ⇨ current value as determined in <Error mA>
Hold ⇨ last measurement value is held



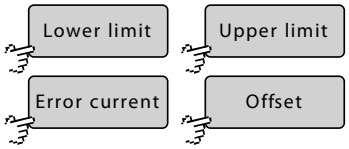
Input of the error value output in mA at <Set >

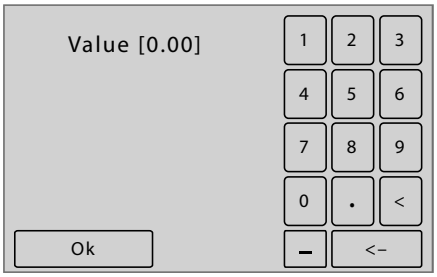


Input offset value in mA for adaption to a control room



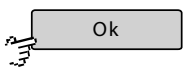
Switches back to the menu of the current outputs 1 to 2.



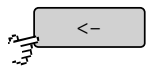


Value input, the current value is shown in square brackets.

Deletes the last entered character.



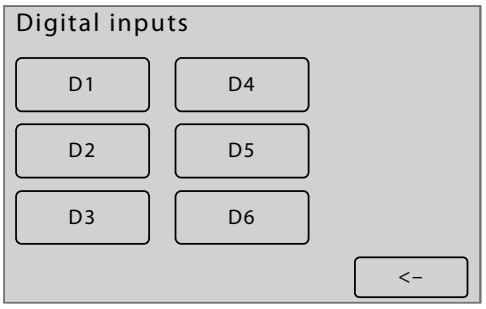
Saves the entry and switches back to the menu of the current outputs 1 to 2.



Switches back to the menu of the current outputs 1 to 2 without saving the entry.

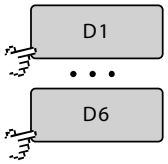
8.2.4.3 Digital Inputs

Parameter menu 8.2.4

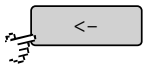


On the mainboard of the BlueMon there are four digital inputs, on the plug-in board there are two additional digital inputs.

These signal inputs react with a latency of 2 seconds to the change from 0 to 24 VDC or vice versa.



Switches to the settings of the corresponding digital input.

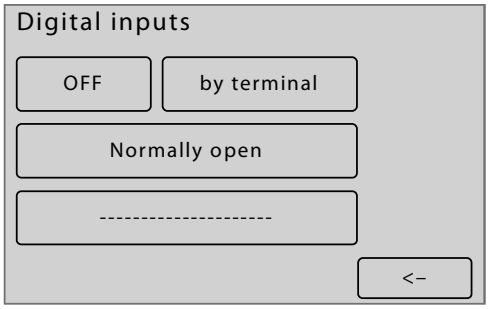


Switches back to the Parameter menu.

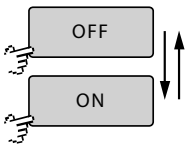
8.2.4.3.1 Digitals Input Settings

Digital Inputs 8.2.4.3

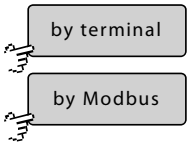
Here the reaction of the BlueMon to the digital inputs is determined. The signal inputs react to the change from 0 to 24 VDC or vice versa with a latency of 2 seconds.



A special case is the activation or deactivation of sample lines. The signal voltage must be kept on here as long as the desired action is to be carried out. If, for example, sample line 1 is not to be measured in the meantime, the action <Sample line 1 active> must be linked to a digital input. If the signal voltage is applied, sample line 1 is skipped in the process sequence (contact type: normally open).

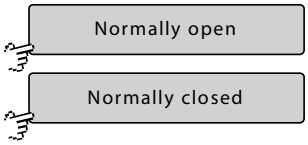


Switches the digital input on and off.



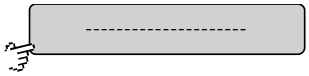
via terminal: Direct input via terminal contacts

via Modbus: Input is controlled by a PLC functionality via Modbus.

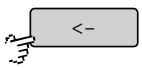


Normally open: Change from 0 to 24 VDC

Normally closed: Change from 24 to 0 VDC

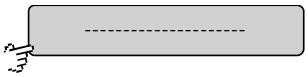


Opens the actions scroll list.
In the button the current action is displayed.



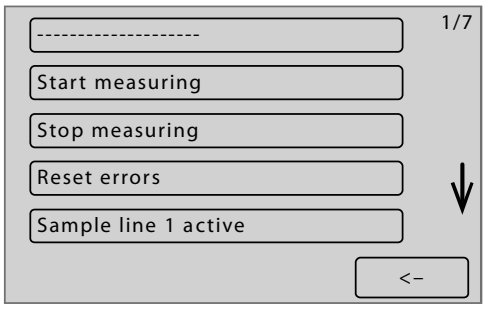
Switches back to the digital inputs menu.

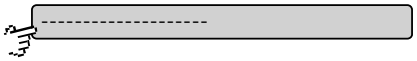
8.2.4.3.1.1 Digital Inputs Actions



Digitals input settings 8.2.4.3.1

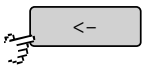
List menu of actions assigned to the signal input.





Opens the actions scroll list.
In the button the current action is displayed.

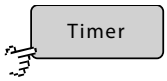
Scrolls the list.



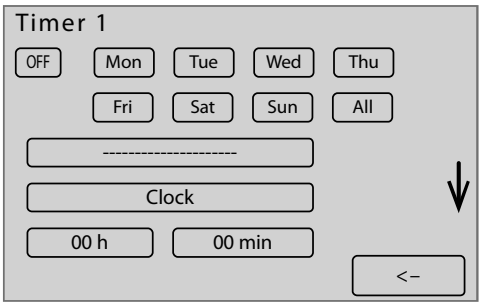
Switches back to the digitals input settings menu.

Actions:	
– – – – – – – – – – – –	no action
Start measuring	Starts the process sequence
Stop measuring	Starts the sequence stop function
Reset errors	Resets all error messages
Sample line 1 to **6 active**	Activates/Deactivates sample line 1 to 6 see *8.2.4.1 Process Sequence Menu*
Measure sequence	Runs process sequence once
Measure sample line 1 to **6**	Starts analysis program sample line 1 to 6
Run cleaning	Starts the cleaning program
Run calibration	Starts the calibration program
Measuring on/off	Process sequence toggle switch Start⇔Stop) Device status „Standby“ ⇨ Start of the process sequence Process sequence is running ⇨ Start sequence stop function
Run DI-water cal.	Starts DI-water calibration program
Run calibration F1 to **F4**	Starts a further calibration program
Sample error 1 to **6**	Triggers the error message "Sample 1 error" to "Sample 6 error" see *Appendix C – Warning- and Error Messages* there Message numbers 21 to 26

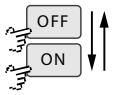
8.2.4.4 Timer



Parameter menu 8.2.4



Via this menu can trigger device activity time controlled.
Up to 6 service timers can be defined.

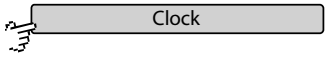


Switches the timer on and off.
The button is also a status indicator.

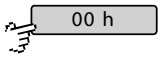
Selects particular weekdays or all weekdays.

etc.

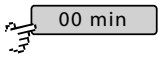
Opens the actions scroll list, see below.
In the button the current action is displayed.



Opens the scroll list of the time definitions. see next page

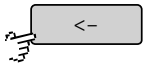


Opens the input menu for the start hour 8.2.4.4.1.



Opens the input menu for the start minute 8.2.4.4.1.

Scrolls to the next timer.



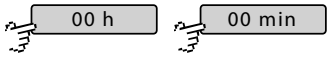
Switches back to the Parameter menu.

Actions:	
– – – – – – – – – – – –	no action
Start measuring	Starts the process sequence
Stop measuring	Starts the process sequence stop function
Run calibration	Starts the calibration program
Run cleaning	Starts the cleaning program
Measure sample line 1 to **6**	Starts the analysis program for sample line 1 to 6
Measure sequence	Runs the process sequence once
Run DI-water cal.	Starts the DI-water calibration program
Trigger autosampler	Triggering of an external autosampler (via RS-232 or RS-485)

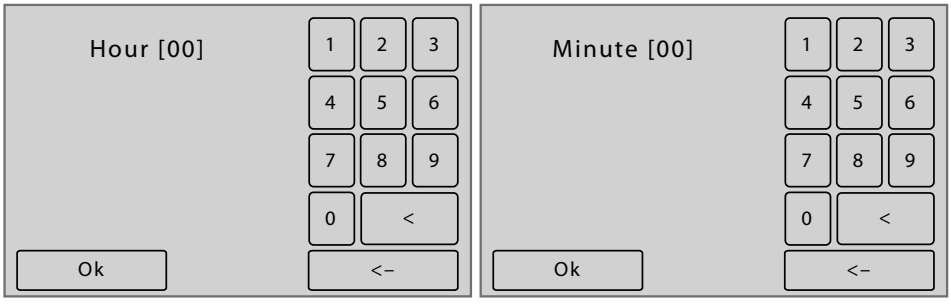
Reset sample error	Resets errors due to lack of liquid in sample lines see *Appendix C – Warning- and Error Messages* there Message numbers 21 to 26
Run calibration F1 to **F4**	Starts a further calibration program

Time definitions:	
Interval [measuring active]	Runtime of the system The selected action is triggered e.g. after every one hour of operation, if the BlueMon is in measurement operation*.
Interval	Interval duration The selected action is triggered e.g. from now on every hour, if the BlueMon is in measurement operation* or in device status "Standby".
Clock	Time and day of the week The selected action is triggered immediately at the set time on the selected weekdays, if the BlueMon is in measurement operation* or in the device status "Standby".
Clock [measuring active]	The selected action is only triggered if the BlueMon is in measurement operation*.

8.2.4.4.1 Timer Settings Start-hour/Start-minute



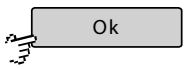
Timer 8.2.4.4



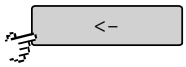
Input hour Input minute

The current value is displayed in [].

Deletes the last entered character.



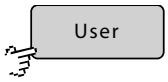
Saves the entry and switches back to the timer menu.



Switches back to the timer menu without saving the entry.

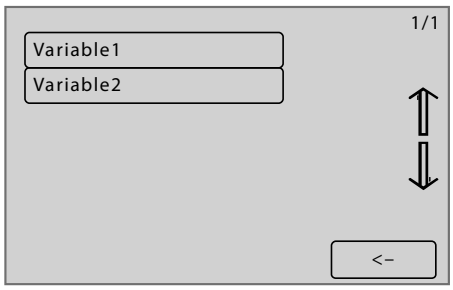
* see *Appendix D – Display of the Device Activity and the Device Status*

8.2.4.5 User Variables

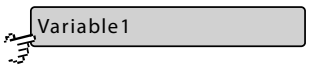


Parameter menu 8.2.4

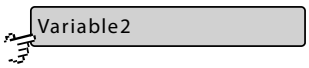
Selection menu of the user defined variables – Example with to user variables



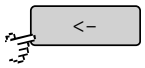
With the formula language AMS Formula, integrated in the BlueMon PC software, you can define user variables, which can be changed directly at the BlueMon. These user variables can be changed via the following menus.



Switches the menu of the first variable.

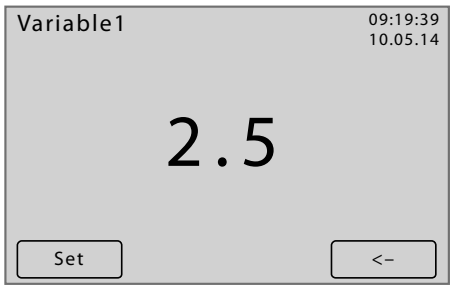


Switches the menu of the second variable.

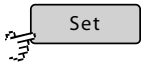


Switches back to the Parameter menu.

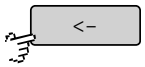
Menu of the first variable



The current value of the user variable is displayed.

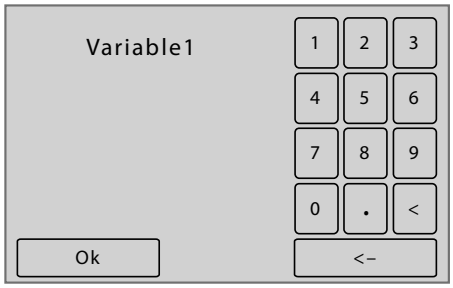


Switches to the input menu of the first variable.



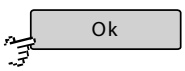
Switches back to the menu of the user variable.

Input menu of the user variable

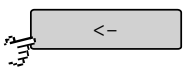


Here you can change the value of the user defined variable.

Deletes the last entered character.

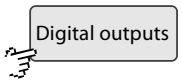


Saves the entry and switches back to the menu of the variable.



Switches back to the menu of the variable without saving the entry.

8.2.4.6 Digital Outputs (Relays)



Parameter menu 8.2.4

The BlueMon has 6 non-potential-free valve relays and 4 potential-free relays on the main board, the plug-in board then has 6 additional non-potential-free valve relays. All these relays can be switched as signal outputs 1 to 12, i.e. one relay switches as long as (± latency/reset time, see below) a certain switching condition is fulfilled.

Note on a possible operating error: If you use relays that have not previously been used in a sequence program, make sure that these relays are not already assigned to signal outputs.

Switching condition

1. Source System: the presence of certain warning and error messages (see *Appendix C - Warning and Error Messages.*)
2. Source Sensors: the exceeding and falling below of measured values

The buttons show the relay assigned to a signal output.

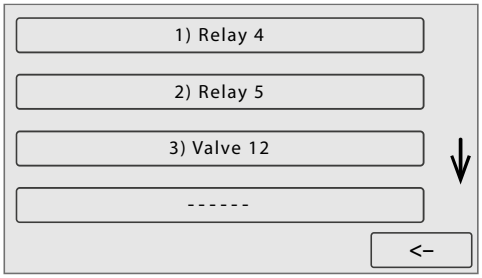
Assignment in this example:

Digital output 1) ⇨ Relay 4

Digital output 2) ⇨ Relay 5

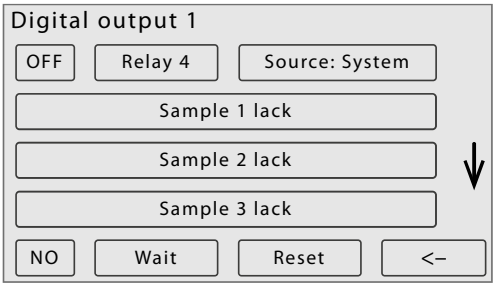
Digital output 3) ⇨ Valve relay 12

Digital output 4) ⇨ no Relay

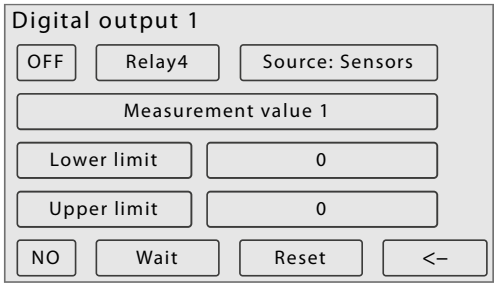


Switches to the settings of the respective digital output.

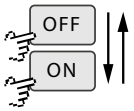
↓ Scrolls to the next signal outputs.



Settings <Source: System>
The signal output reacts to warning and error messages.

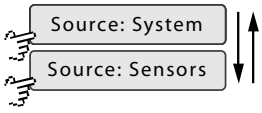


Settings <Source: Sensors>
The signal output reacts to exceeding or falling below of measured values.

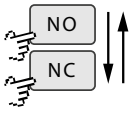


Switches the digital output active (ON) or inactive (OFF).
The button is also a status indicator.

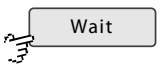
Assigns a valve or relay to the signal output.



Toggles between the *Source: Sensors* setting and the *Source: System* setting. The button is also a status indicator.

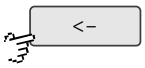


Switches the relay contact type to normally open (NO) or normally closed (NC).



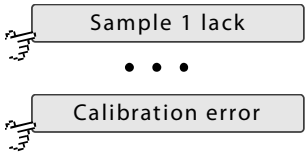
Opens the input menu for the latency (waiting time) in seconds.
The assigned relay only switches if the switching condition is longer than the latency.

Opens the input menu for the reset time in seconds.
The assigned relay only switches back when the reset time has elapsed after the end of the switching condition.



Switches back to the Parameter menu.

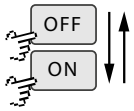
Settings <Source: System>



Buttons of the warning and error messages (see below)
Scrolls the buttons of the system events from <Sample 1 lack> to <Calibration error>.

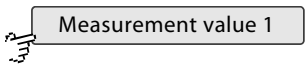
Buttons	**Meaning**	see *Appendix C – Warning and Error Messages*
*__Sample 1__ to __6 lack__	Lack of liquid in sample line 1 to 6; Warning message 21 to 26	
*__Calibrant lack__	Lack of liquid in the calibration liquid; Error message 27	
*__Dilution water lack__	Lack of liquid in the dilution liquid; Error message 28	
*__Reagent 1__ to __5__	Lack of liquid for reagent liquid 1 to 5; Error message 29 to 30	
Leakage	BlueMon has a leak; Error message 20	
UV lamp failed	UV lamp of the digestor is defect; Warning message 13	
Runtime counter 1 to **6**	Alarm or stop message triggered by the service timer 1 to 6; see *8.2.5.8 Counter (Service Timer)*	
System (error status)	Error message concerning the system	
Calibration error	Error message concerning the calibration	

Settings <Source: Sensors>

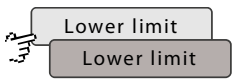


Switches the digital output active (ON) or inactive (OFF).
The button is also a status indicator.

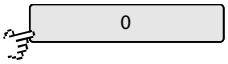
Assigns a relay to the digital output.



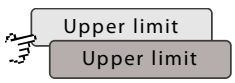
Switches to a selection between <Internal sensors> and <External sensors>.



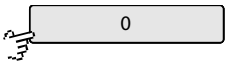
Switches the lower limit active or not.



Opens an input menu for the lower limit.



Switches the upper limit active or not.

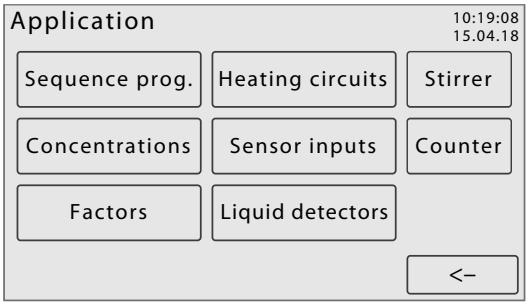


Opens an input menu for the upper limit.

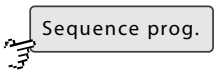
* For details see *8.2.5.6 Liquid Detectors (Bubble Detectors)*

8.2.5 Application Menu

Main menu 8.2



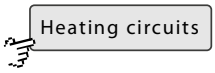
Via this menu you can view and change application-specific settings.



Switches to the program menu where the sequence programs (and the cancel program) can be changed. see 8.2.5.1

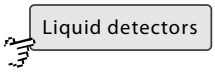
Switches to the menu of the calibration concentrations of the used calibration solutions. see 8.2.5.2

Switches to the menu of the calibration factors. see 8.2.5.3



Switches to the menus of the heating circuits. see 8.2.5.4

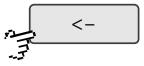
Switches to the menu of the internal sensors. see 8.2.5.5



Switches to the menu of the Liquid detectors (Bubble detectors). see 8.2.5.6

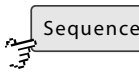
Switches to the menu of the stirrer. see 8.2.5.7

Switches to the menu of the Counter (Service timer). see 8.2.5.8

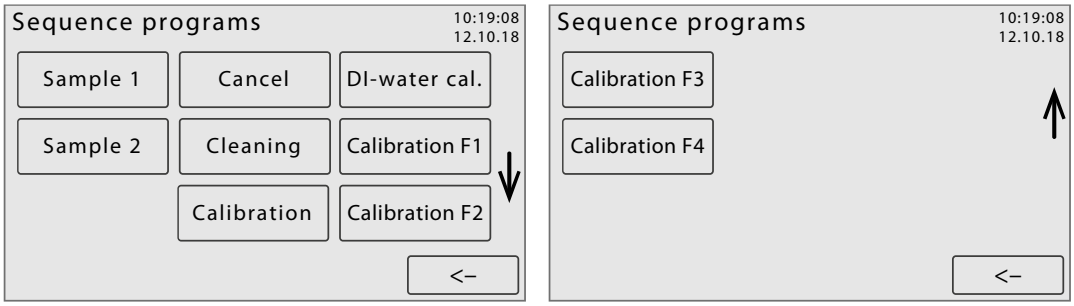


Switches back to the Main menu.

8.2.5.1 Sequence Programs



Application menu 8.2.5



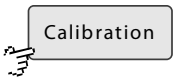
Via these menus you can change the sequence programs (and the cancel program) of the BlueMon. Scrollable if necessary.

etc.

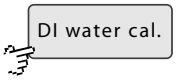
Analysis program, see *8.2.5.1.1 Analysis Program*
Switches to the menus of the analysis program of the respective sample line.
Standard: 2 sample lines Optional: up to 6 sample lines

Cancel program
The cancel program is executed if the process is interrupted by the user (see *8.2.1 Operation Modes Menu*) or if the process is automatically cancelled due to an error.
The operation is identical with *8.2.5.1.1 Analysis Program.*

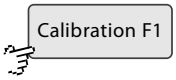
Cleaning program
The cleaning program is executed when the cleaning is started by the user (see *8.2.1 Operation Modes Menu*) r via the process sequence (see *8.2.4.1.1 Input of the Process Sequence*).
The operation is identical with *8.2.5.1.1 Analysis Program.*



Calibration program The labelling of the button is application-specific.
The calibration program is executed when the calibration is started by the user (see *8.2.1.1 Calibration Menu*) or via the process sequence (see *8.2.4.1.1 Input of the Process Sequence*).
The operation is identical with *8.2.5.1.1 Analysis Program*.



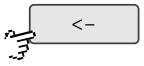
DI-water calibration program
The DI-Water calibration program is executed when the DI-Water calibration is started by the user (see *8.2.1.1 Calibration Menu*) or via the process sequence (see *8.2.4.1.1 Input of the Process Sequence*).
The operation is identical with *8.2.5.1.1 Analysis Program.*



etc.

Buttons for further calibration programs

Scrolls the display.



Switches back to the Application menu.

8.2.5.1.1 Analysis Program

Sample 1 Sequence Programs 8.2.5.1

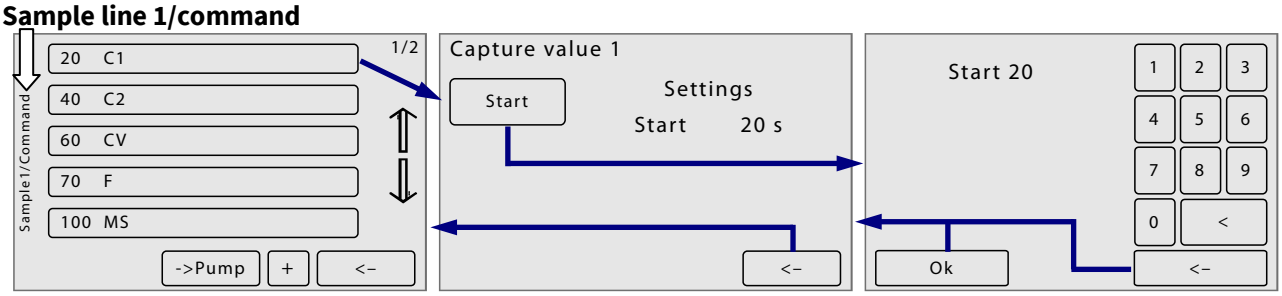
The following menus give you an overview of the program elements of an analysis program and allow you to change them:

- for the **commands** the start time, for exceptions see *8.2.5.1.1 Exceptions Commands*
  Display on the left side of the menu: **sample line X/command**
- for **pump control**, the start time, the runtime and the rotational speed*.
  Display on the left side of the menu: **sample line X/pump**
- for **valve relay control**, the start time and the switching duration
  Display on the left side of the menu: **sample line X/valve**
- for **relay control of the potential-free relays**, the start time and the switching duration
  Display on the left side of the menu: **sample line X/relay**

The selection is made via the buttons: Command | Pump | Valve | Relay

After calling up the menu, the following appears:

Sample line 1/command



Command list | Command menu | Command parameter: [1 - 65535]

20 C1 etc. Switches to command menu C1.
Display of the start time in seconds, here 20

\+ Creates a new command.

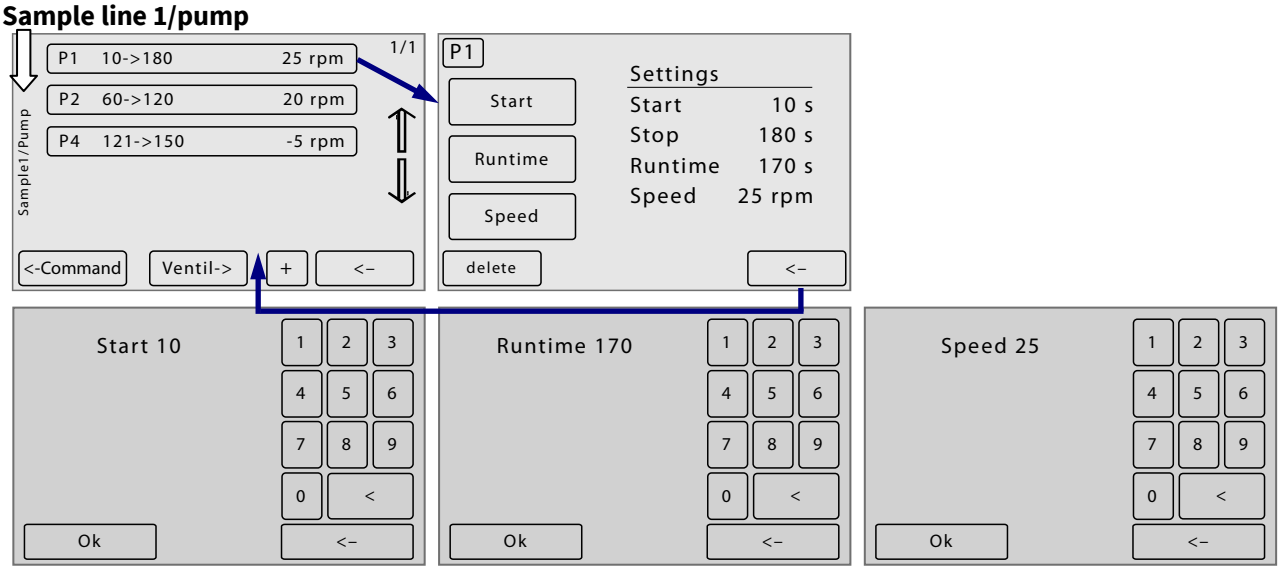
delete Cancels the command.

Commands:	
C*n*	save measurement value 1 to 6; n = 1 to 6
CV	calculate result
F	run formula
W*n*	wait; n = duration in s
CP*n*	calculate result periodically; n = duration in s
MS	capture sample spectrum
MR	capture reference spectrum
MC	capture test spectrum
SA#*n*	save absorbance spectrum; n = allocated spectrum number
SR#*n*	capture and save reference spectrum; n = allocated spectrum number
SS#*n*	capture and save sample spectrum; n = allocated spectrum number
SC#*n*	save absorbance spectrum at the BlueMon Compact Flash Card; n = allocated spectrum number

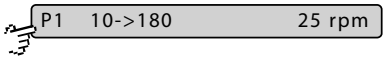
* B For pump 1 and 4, negative speed values are also possible, the pumps then rotate counterclockwise.

SD#*n*	save reference spectrum at the BlueMon Compact Flash Card; n = allocated spectrum number
SW#*n*	save sample spectrum at the BlueMon Compact Flash Card; n = allocated spectrum number
CS	perform self-test with test spectrum
AF	intensity calibration of the spectrometer
TT	perform titration

Sample line 1/pump



Start time⇦Value range: [1 – 65535]⇨Runtime Speed: [-50 to +50] or [0 – 50]

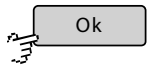


etc.

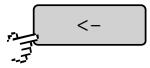
Switches to the corresponding pump menu, here pump 1.
Display start time -> stop time in seconds, here 10->180
Display pump speed in rpm, here 25

Switches to a selection menu in which the pump assignment can be changed.

Deletes the entry.



Saves the entry and switches back.



Switches back without saving the entry.

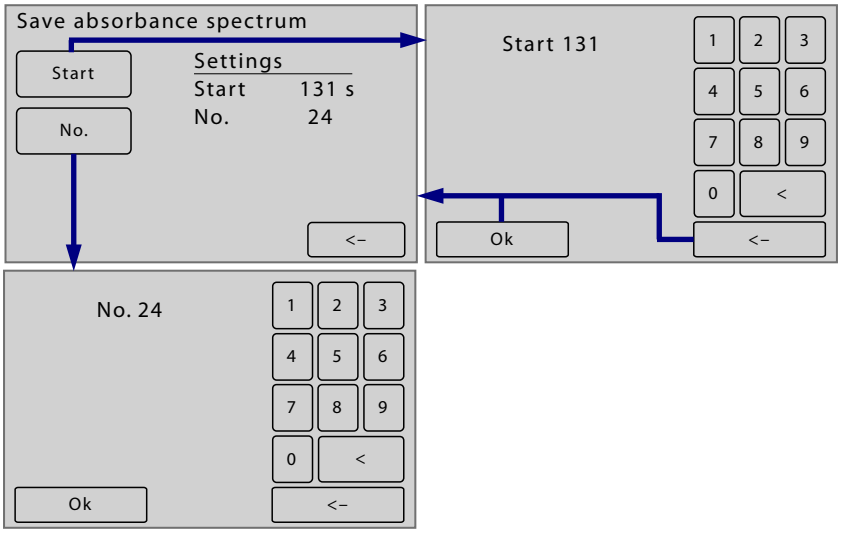
Sample line 1/valve and Sample line 1/relay

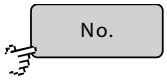
The menus for valve control and relay control are similar to those for pump control, but without adjustment of the pump speed.

8.2.5.1.1.1 Exceptions Commands

1. 1. Absorbance spectrum (SA) save

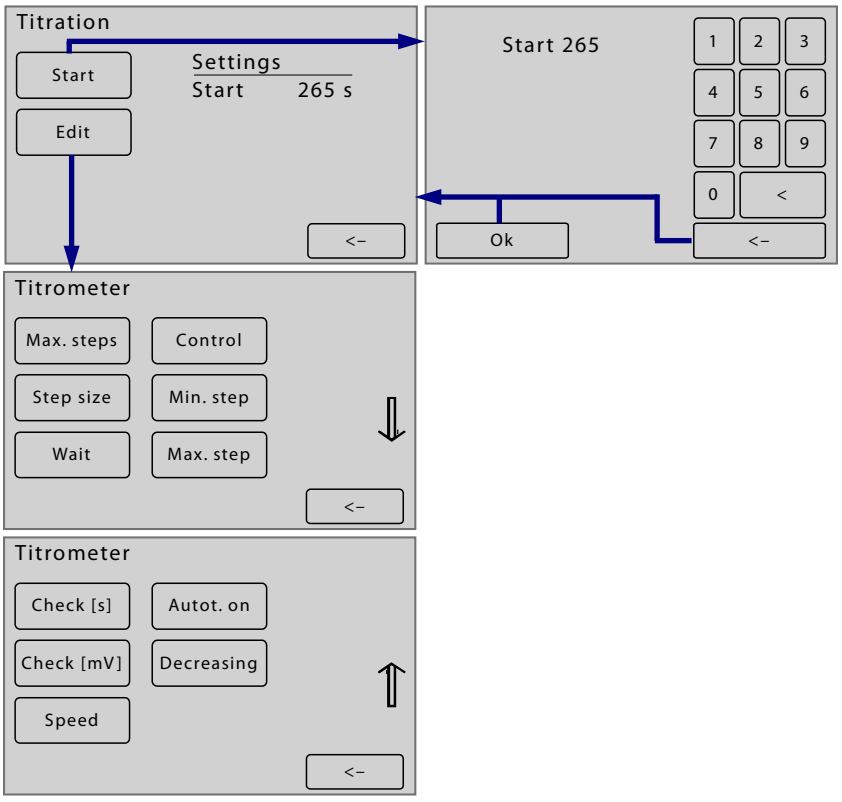
Reference spectrum (SR)/Sample spectrum (SW) record and save

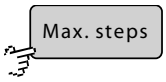




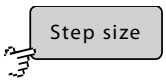
Switches to the display/input of a spectrum number.
The spectrum can then be called up by specifying the sample line and the spectrum number.

2. Perform titration (TT)

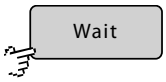




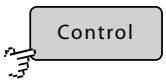
Switches to the display/input of the maximum number of titration steps of a titration.
After each titration step and after the waiting time period, the equivalence point is determined by the voltage of the measuring system. Was still no voltage jump detected after the maximum number of titration steps, the current cycle is aborted. Then the next sample line is analyzed. The number of titration steps combined with the step size and the concentration of the titrator determine maximum measurement range.



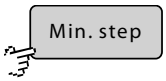
Switches to the display/input of the step size of a titration step as the number of rotations of the titration pump.
Step size values from 0.1 to 1.0 rotation are possible. The step size, in combination with the used dosing tube, sets how much titrator per titration step is metered.



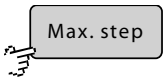
Switches to the display/input of the maximum waiting time in seconds between two titration steps.
A waiting period can compensate the inertia of the measuring system.
If the by <Check [s]> and <Check [mV]> established conditions are fulfilled before the end of the maximum waiting time, the next titration step is performed.



Switches to the display/input of the titration steps that are checked for consistency.
Before an equivalence point, the voltage differences per titration step increase steadily, thereafter they decrease steadily. For reliable detection of the equivalence point this consistency is checked.

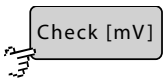


Switches to the display/input of a lower voltage limit in mV.
The titrometer can perform a maximum of three-step titrations. For each used titration step here a lower voltage limit is entered. Together with <Max. step> (see following paragraph) it defines a scope for each titration step. For a valid measurement applies: The highest voltage jump must be within that scope.

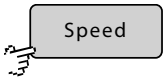


Switches to the display/input of an upper voltage limit in mV.
Upper voltage limit that, associated with the entry under <Min. step> (see previous paragraph), defines the scope for the particular titration step.

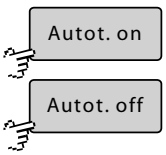
Switches to the display/input of the time in seconds to trigger a titration step after a voltage value underrunning.
If in this duration the voltage changing of the measuring chain underruns the in <Check [mV]> entered value, the next titration step is performed. This is done regardless of how much of the waiting time has passed up to this point. Hereby the duration of the titration can be shortened.



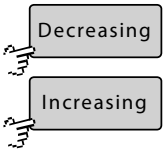
Switches to the display/input of a voltage value in mV.
see previous paragraph <Check [s]>



Switches to the display/input the number of rotations of the titration pump in rpm.
Titration pump is usually pump 1.
Input of negative values reverses the rotation direction of the pump.



Automatic detection of titration end on/off
Typically, a voltage jump is detected automatically. Because of the pump pulses this recognition may be incorrect at very low titration jumps, and then the automatic detection is turned off. The titration then proceeds up to the maximum number of steps, then the largest value change within the valid ranges is set as titration jump.

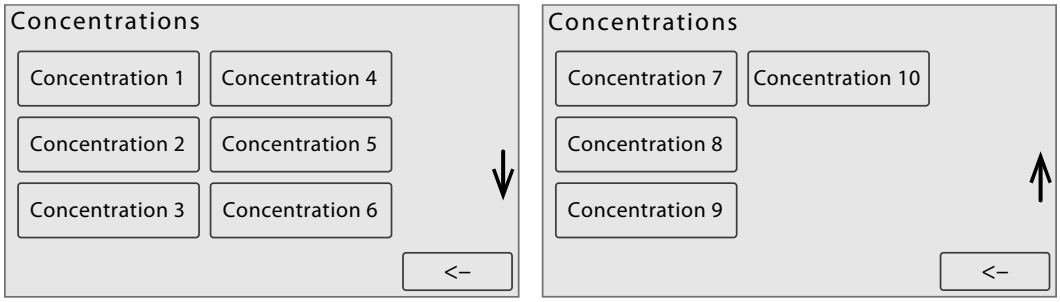


Titration with decreasing/increasing voltage
Decreasing: Falling voltage jumps are not detected.
Increasing: Rising voltage jumps are not detected.

8.2.5.2 Calibration Concentrations

Application menu 8.2.5

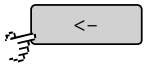
Input of the concentrations of the applied calibration solutions.
Up to 10 concentrations can be entered. The number of solutions depends on the measurement method.



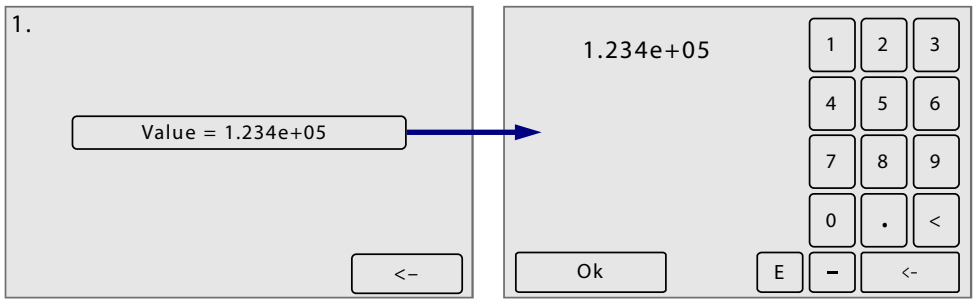
Switches to the input of the respective calibration concentration.

etc.

Scrolls the display if there are more than 6 calibration concentrations.



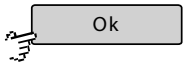
Switches back to the application menu.



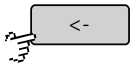
Input of a calibration concentration, the current value is displayed.

Input exponential notation

Deletes the last entered character.



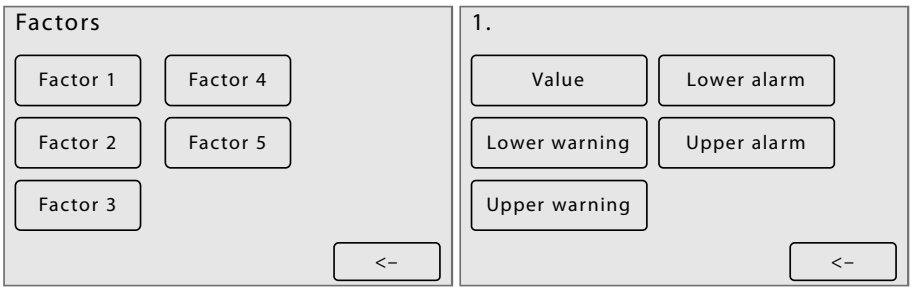
Saves the entry and switches back to the calibration concentrations menu.



Switches back to the calibration concentrations menu without saving the entry.

8.2.5.3 Calibration Factors

Factors — Application menu 8.2.5



Input/Display of the 5 calibration factors with min/max values, underrunning or exceeding of this min/max values triggers an alarm message or an error message.
see *Appendix C – Warning- and Error Messages* there Message no. 47 – 50

Factor 1 — Switches to the menu of the calibration factor.

etc.

<- — Switches back to the previous menu.

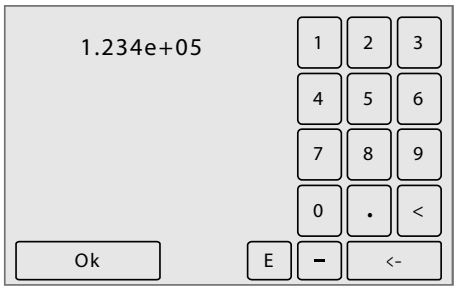
Value — Input/Display of the calibration factor

Lower warning / Upper warning — Input/Display of the warning limits for each of the 5 calibration factors.
If they are underrun or overrun:

- The calibration is repeated once.
- Underrun/Overrun continues: **Warning message**
- The BlueMon continues to run.

Lower alarm / Upper alarm — Input/Display of the error limits for each of the 5 calibration factors.
If they are underrun or overrun:

- The calibration is repeated once.
- Underrun/Overrun continues: **Operation stop** and **Error message**



The current value is displayed.

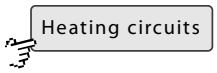
E — Input exponential notation

< — Deletes the last entered character.

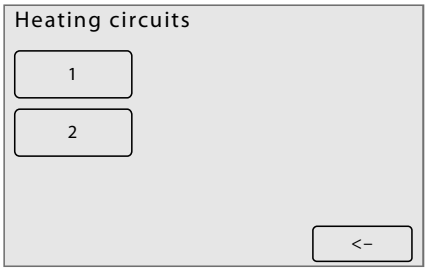
Ok — Saves the entry and switches back to the menu of the calibration factor.

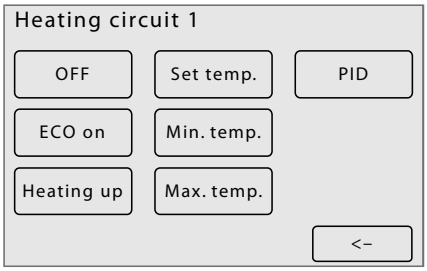
<- — Switches back to the previous menu.

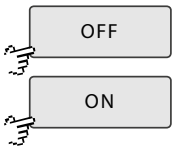
8.2.5.4 Heating Circuits



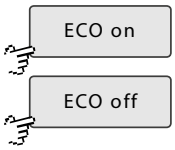
Application menu 8.2.5



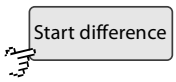




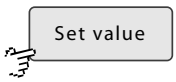
The heating is active or not.
The button is also a status indicator.



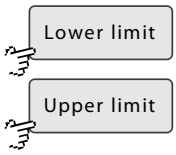
ECO on: The heating only heats while a sequence program is running.
ECO off: The heating remains at the set temperature.
The button is also a status indicator.



Only visible with <ECO on>. Switches to input/display of a temperature difference. Setpoint temperature - temperature difference = minimum temperature. The minimum temperature must be reached before the BlueMon, after a stop starts again.

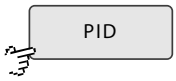


Switches to the input/display of the setpoint temperature.
Value range: [1 - 150]

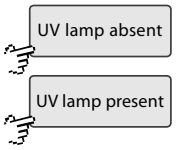


Switches to the input/display of the lower and upper limit value of the temperature.
Value range: Lower limit [1 - 150] Upper limit [1 - 160]

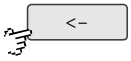
- **Safety shutdown:** If the temperature is lower than the lower limit set here and the temperature does not rise by 0.3 °C in 60 s, the heating is switched off for 180 s.
  ⇨ Warning message: Heating n Safety stop
- **Emergency shutdown**: If the temperature is higher than the lower limit set here and the heating power is greater than 99% for 10 minutes, then the heating is switched off and the cancel program is executed.
  ⇨ Error message: Heating n Emergency stop
- Safety stop and emergency stop can be deactivated with the BlueMon PC Software.



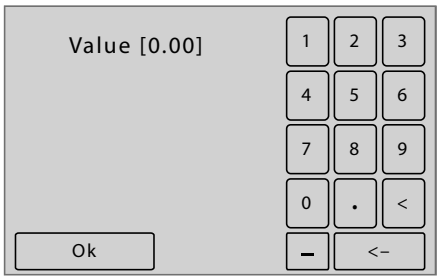
Switches to the PID controller menu. see next page



Functionless in the version of the BlueMon described here

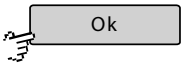


Switches back to the previous menu.

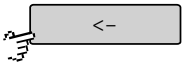


Value input and value display, the current value is indicated in brackets.

Deletes the last entered character.

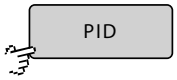


Saves the entry and switches back to the heatings menu.



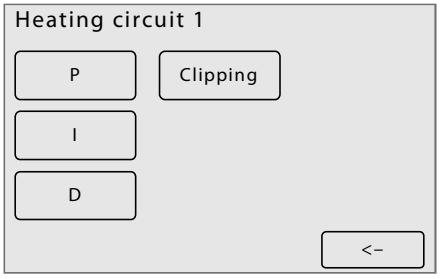
Switches back to the heatings menu without saving the entry.

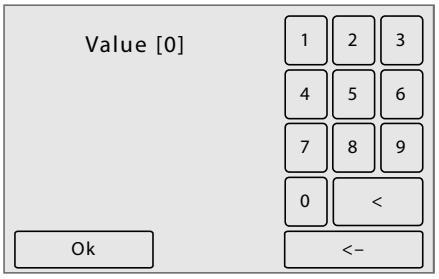
8.2.5.4.1 PID Controller (Heating)



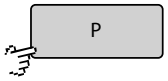
Heating circuits 8.2.5.4

The PID controller has a proportional, an integral and a differential component of the control action. The particular strength of the component at the control action is determined by the input values for **P**, **I** and **D**.

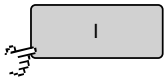




Value input and display, the current value is indicated in brackets.



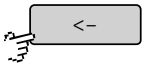
Switches to the input/display of the P-value.



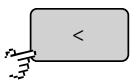
Switches to the input/display of the I-value.

Switches to the input/display of the D-value.

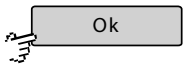
Switches to the input/display of the limit of the integral of the PID controller.



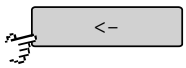
Switches back to the heating circuits menu.



Deletes the last entered character.



Saves the entry and switches back to the PID controller menu.



Switches back to the PID controller menu without saving the entry.

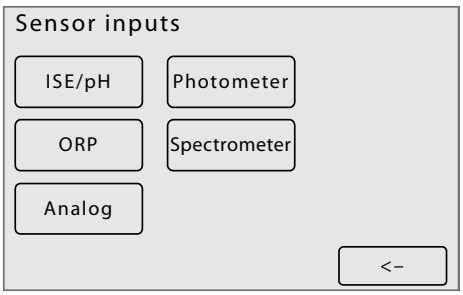
8.2.5.5 Sensor Inputs (Internal Sensors)

Sensor inputs — Application menu 8.2.5

Via this menu you can change and view the settings of the internal sensors of the BlueMon.
The equipment of the BlueMon with internal sensors is device-specific.

The calibration of the internal sensors is done via the service menu.
see *8.2.6 Service Menu* and following

Example:



ISE/pH — Switches to the menus of the ISE/pH sensors.

ORP — Switches to the menu of the ORP sensors.

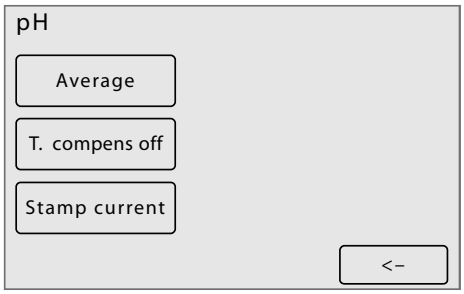
Analog — Switches to the menu of the sensor analog current input.

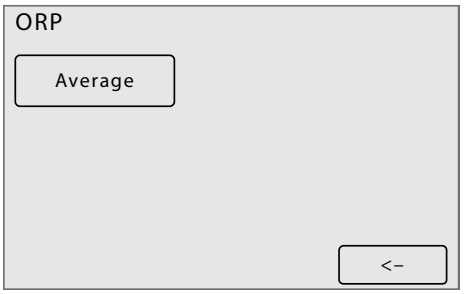
Photometer — Switches to the menu of the photometer.

Spectrometer — Switches to the menu of the spectrometer.

<- — Switches back to the Application menu.

ISE/pH





ORP

pH sensor **ORP sensor**

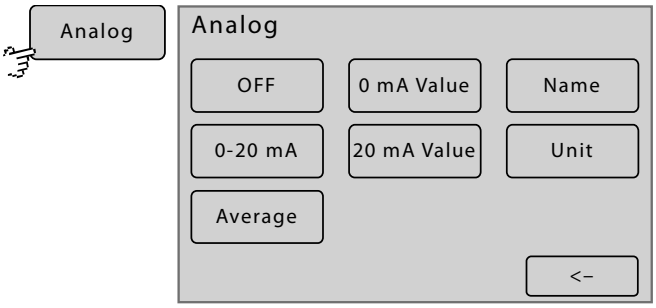
Average — Switches to the input/display of the averaging. Averaging determines the number of single measurements from which a running average value is calculated, this average is the recorded measurement value. Value range: [1 - 600]

T. compens. off / T. compens. on — Switches the temperature compensation of the pH sensor on and off. The button is also a status indicator.

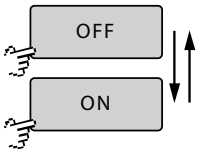
Stamp current — Switches to display and input the sensor stamp current* in µA.

<- — Switches back to the menu of the sensor inputs.

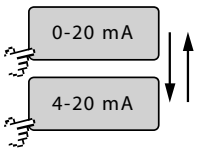
* This defines the current value of the sensor output, independent of voltage and resistance.



Parameterisation of a sensor at the analog current input

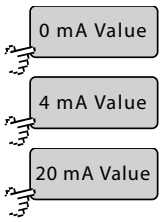


The current input is active or not.

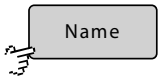


Selection of the current input range

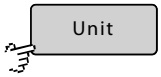
Display/Input of the number of single measurements, the running arithmetic average of these single measurements results the measurement value. Value range: [1 - 600]



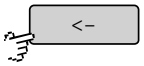
Assignment of a measurement value range to a current input range
Example: 0 mA ≙ 0 mg | 20 mA ≙ 100 mg



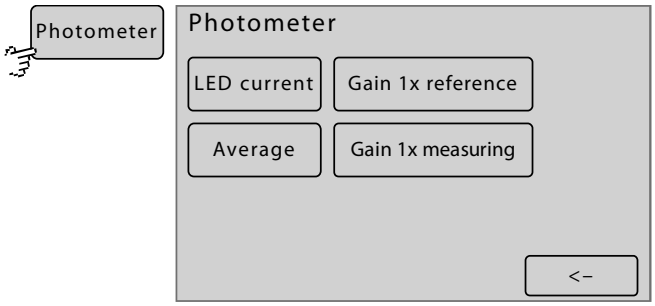
Sensor name



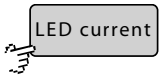
Unit of the measurement value



Switches back to the menu of the sensor inputs.



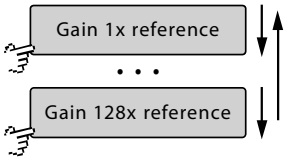
Photometer



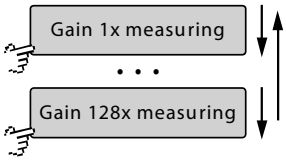
Display/Input of the LED current of the photometer, determines the brightness of the LED. Value range: [1 - 80 mA]

⚠	The permissible maximum current of the LED is 20 mA. In special cases please contact GO Systemelektronik.

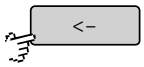
Number of single measurements, the running arithmetic average of these single measurements results the measurement value. Value range: [1 - 60]



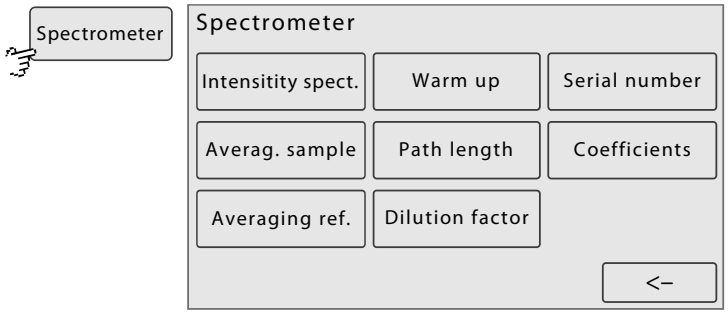
Increases the gain factor for the reference channel of the photometer step by step from 1 to 128, the button is also a status indicator.
Also called **Gain 2 TX**.



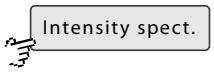
Increases the gain factor for the measuring channel of the photometer in steps from 1 to 128, the button is also a status display.
Also called **Gain 2 RX**.



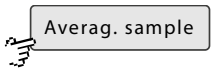
Switches back to the menu of the sensor inputs.



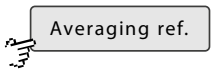
Spectrometer



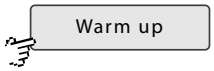
Display/Input number of light flashes per single measurement (intensity): results in a spectrum. Value range: [1 - 100]



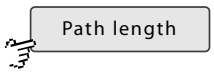
Display/Input number of single measurements per sample measurement: The final measurement result is the arithmetic average of the single measurements.
Value range : [1 - 10]



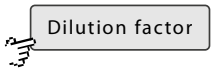
Display/Input number of single measurements per reference measurement: The final measurement result is the arithmetic mean of the single measurements.
Value range: [1 - 10]



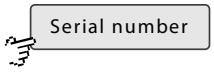
Display/Input number of light flashes to heat up the xenon lamp of the spectrometer
Value range : [1 - 100]



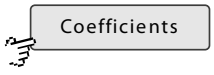
Display/Input input of the measurement path length of the spectrometer



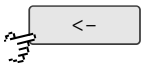
Display/Input input of the solution dilution



Display serial number of the spectrometer



Display/Input Zeiss coefficients of the spectrometer



Switches back to the menu of the sensor inputs.

8.2.5.6 Liquid Detectors (Bubble Detectors)

Liquid detectors Application menu 8.2.5

The BlueMon has four liquid detectors, two on the main board (liquid detector 1 and 2) and two on the optional plug-in board (liquid detector 3 and 4).

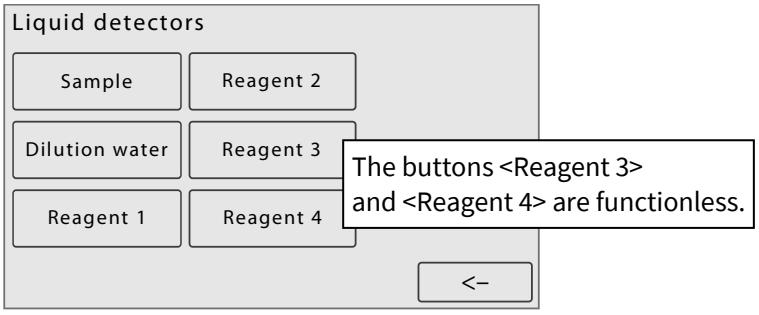
Liquid detector 1 is the bubble detector of the samples and the calibration liquids.
The BlueMon reacts to a lack of liquid during the runtime of an **analysis program** by aborting the program, warning message* 21 (*Sample 1 error*) to 26 (*Sample 6 error*) and selecting the next sequence element.
The BlueMon reacts to a lack of liquid during the runtime of a **calibration program** with a warning message* (*Calibrant error*).
Afterwards:

1. execution of the cancel program
2. at the first time execution of the cleaning program
3. calibration is repeated
4. if the error is not corrected:
   Error message* (*Calibration fault*)

Liquid detector 2 is the liquid detector of the dilution liquid.
The BlueMon reacts to a lack of dilution liquid by aborting the measurement, a warning message* (*Dilution water error*) and selection of the next sequence element.

Liquid detector 3 and 4 are freely assignable.
The BlueMon reacts to a lack of liquid by aborting the running program, executing the cancel program and error message* 29 or 30 (*Reagent 1 error 1* or *Reagent 2 error*).
Afterwards, the system goes into the device status "Standby"

A liquid detector is not active if an assigned pump (see next page) **is not in operation**.



Sample Switches to the menu of liquid detector 1 (sample and calibration liquids).

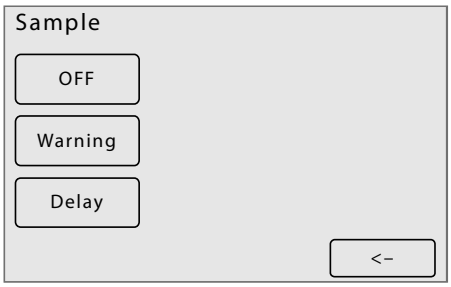
Dilution water Switches to the menu of liquid detector 2 (dilution liquid).

Reagent 1 Switches to the menu of liquid detector 3.

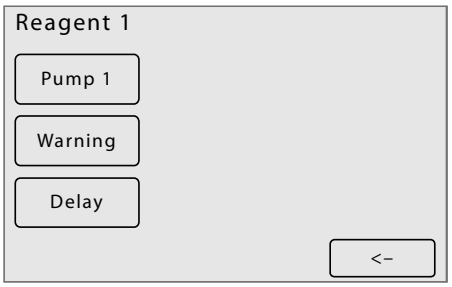
Reagent 2 Switches to the menu of liquid detector 4.

<– Switches back to the application menu.

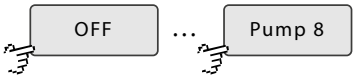
* see *Appendix C – Warning and Error Messages*



Example: Liquid detector of the sample in the "OFF" state



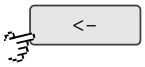
Example: Liquid detector of reagent 1 with allocated pump 1



Switches to the list menu of the allocated pumps. Allocated pumps are displayed.

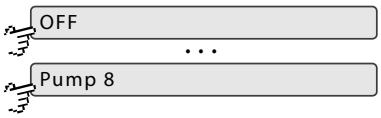
Switches to the entry of the warning time. see below

Switches to the input of the delay. see below



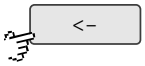
Switches back the previous menu.

List menu pump allocation

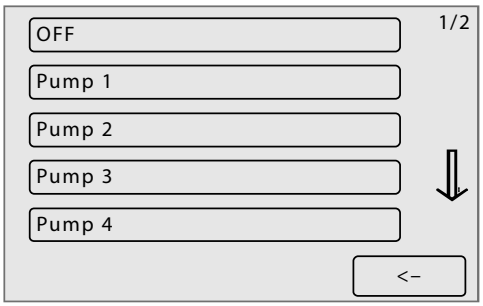


Allocation pump 1 to 8 or nothing (OFF)

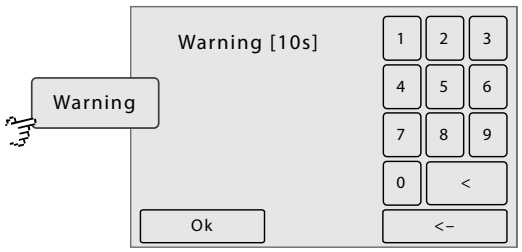
Scrolls the list.



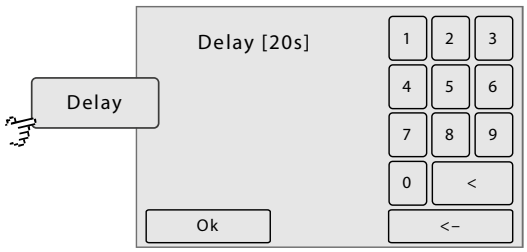
Switches back the previous menu.



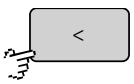
Entry warning latency time and minimum pumping time



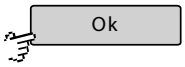
Warning latency time: Duration of liquid shortage in seconds before a reaction occurs.
Value range: [0 - 65535]



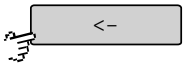
Minimum pump time: Pump time in seconds before the liquid detection starts.
Value range: [0 - 65535]



Deletes the last entered character.



Saves the entry and switches back to the previous menu.

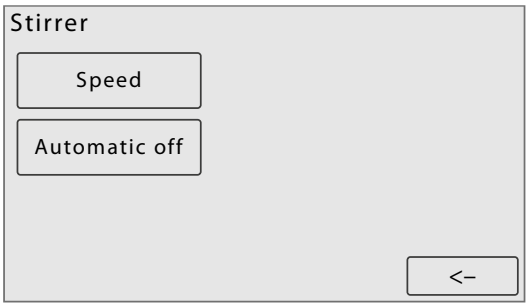


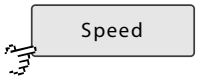
Switches back to the previous menu without saving the entry.

8.2.5.7 Stirrer

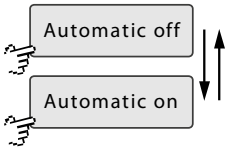
Application menu 8.2.5

Via this menu the magnetic stirrer from GO Systemelektronik (Article-No. 363 200) is controlled.



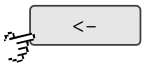


Switches to the input of the stirrer speed (max. 1000 rpm).

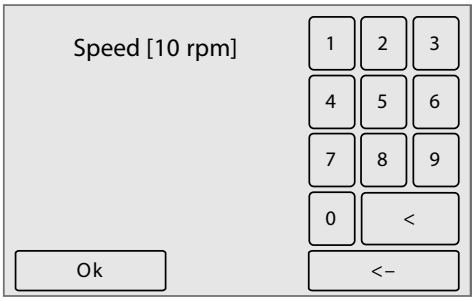


Switches the automatic on and off.
The button is also a status indicator.

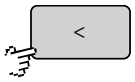
- <Automatic off> the stirrer runs always
- <Automatic on> the stirrer runs program-controlled



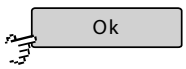
Switches back to the application menu.



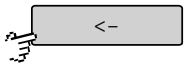
Input stirrer speed in rotations per minute (max. 1000)



Deletes the last entered character.

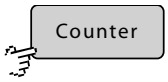


Saves the entry and switches back to the previous menu.

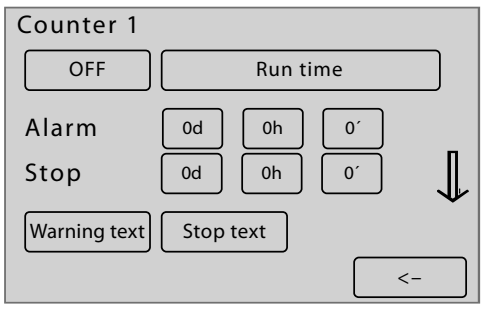


Switches back to the previous menu without saving the input.

8.2.5.8 Counter (Service Timer)



Application menu 8.2.5



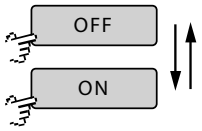
Via this menu, you can trigger the alarm and stop messages of the service timer time-controlled.

- Alarm messages are warning messages of the system.
- Stop messages are error messages of the system.

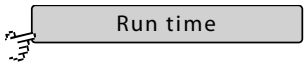
see *Appendix C - Warning and Error Messages*

The trigger condition of a message is either the duration of a device activity or the time elapsed since a calibration was performed.

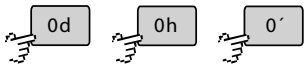
Up to 6 service timers can be defined.



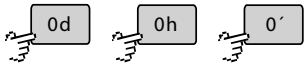
Switches the timer off and on.



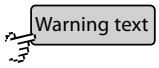
Opens the scroll list of the trigger conditions.

Alarm 

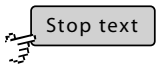
Duration until alarm message is triggered.
An alarm is ignored for entry 0 0 0.

Stop 

Duration until the system stops automatically.
A stop is ignored with entry 0 0 0 0.

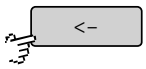


Switches to the input of the text of the alarm message.



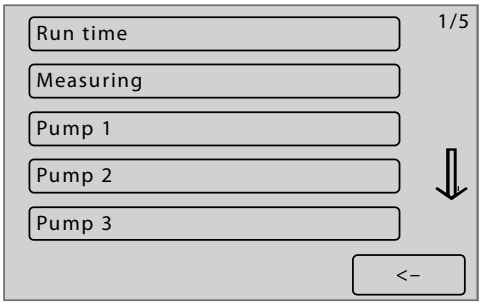
Switches to the input of the text of the stop message.

Switches to the next service timer.

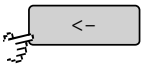


Switches back to the application menu.

Scroll list of the trigger conditions



Scrolls the list.

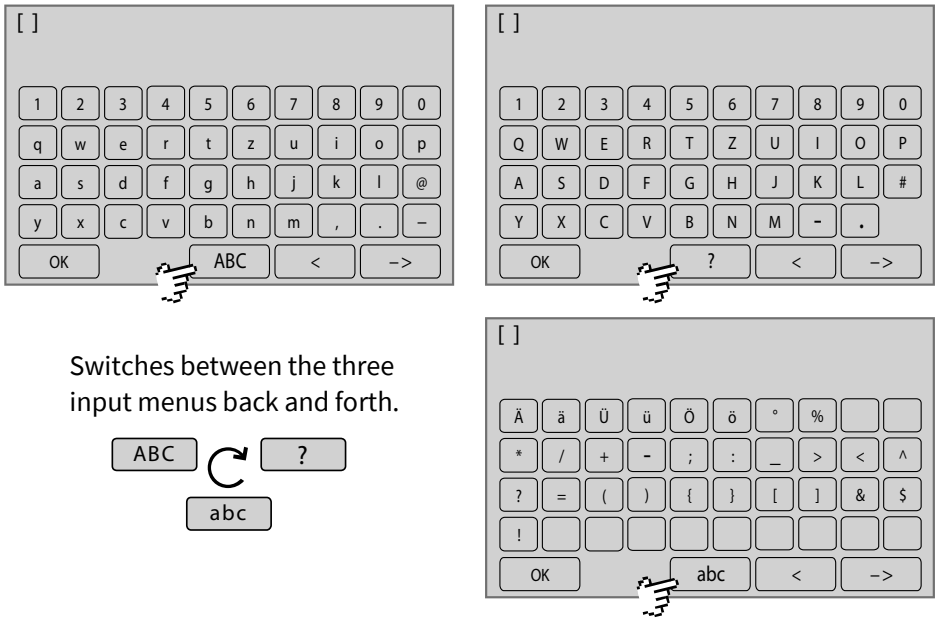


Switches back to the menu of the service timer.

Trigger condition:	
Run time	Power-on time (duration since power supply was switched on)
Measuring	Runtime of the process sequence
Pump 1 to **8**	Runtime pump 1 to 8
Valve 1 to **12**	Switch-on duration valve relay 1 to 12
Relay 1 to 4	Switch-on duration potential-free relay 1 to 4
pH calibration	Time elapsed since the last calibration of the internal pH sensor
ORP calibration	Time elapsed since the last calibration of the internal ORP sensor
Calibration analog sensor	Time elapsed since the last assignment of a measured value range of a sensor at the analog current input, see *8.2.5.5 Sensor Inputs (Internal Sensors)*

Input Warning text and Stop text , max. 27 characters

The current setting is displayed in [].



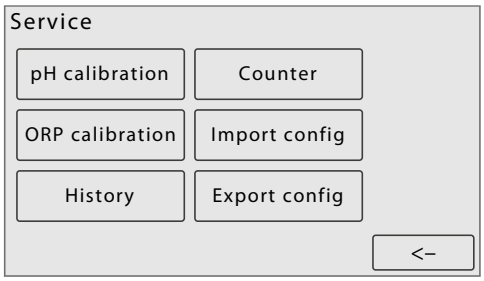
OK Saves the entry and switches back to the service timer menu.

< Deletes the last entered character.

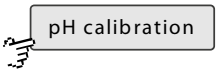
-> Switches back to the service timer menu without saving the entry.

8.2.6 Service Menu

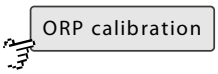
Main menu 8.2



Via this menu, you can manually[1] calibrate the sensors at the internal pH input and the internal Redox input.
You can also call up log data and reset the service timer.



Switches to the calibration menu pH sensor. see 8.2.6.1

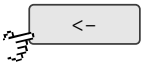


Switches to the calibration menu ORP sensor. see 8.2.6.2

Switches to the menu of the service history. see 8.2.6.3

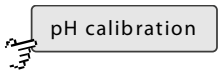
Switches to the service timer (counter) protocol. see 8.2.6.4

Import and export of configuration settings from/to USB, further details are available on request from GO Systemelektronik.

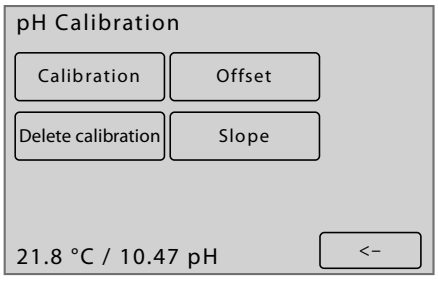


Switches back to the main menu.

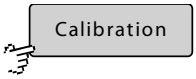
8.2.6.1 Calibration Menu pH Sensor



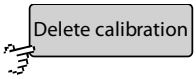
Service menu 8.2.6



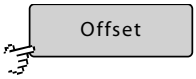
Below left, the current temperature and the current pH measurement value is displayed.



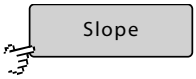
Switches to the calibration.



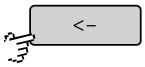
Switches to the menu “pH Sensor Calibration Reset to Default“[2].



Switches to the entry of an offset value, only visible at „default pH calibration“[2].



Switches to the entry of a slope value, only visible at „default pH calibration“[2].

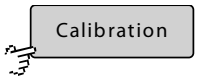


Switches back to the service menu.

[1] Manual calibration in contrast to automatic calibration using calibration programs
Normally, the internal pH/ORP sensors are calibrated automatically.

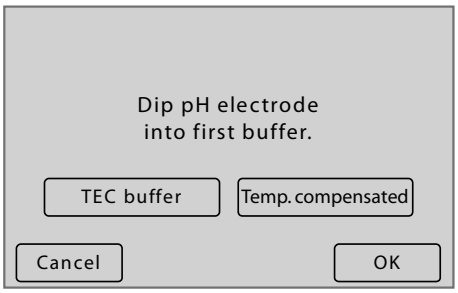
[2] see 8.2.6.1.2 *pH Sensor Calibration Reset to Default*

8.2.6.1.1 pH Sensor Calibration

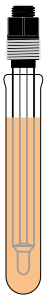


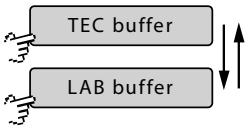
Calibration Menu pH Sensor 8.2.6.1

Before immersion, rinse the electrode in clean tap water.



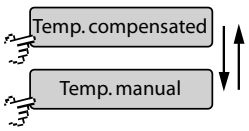
Almost the entire glass shaft of the sensor must be in the liquid.





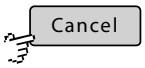
TEC buffer ⇨ Technical buffer solution *

LAB buffer ⇨ Laboratory buffer solution / Calibration according to NIST/DIN

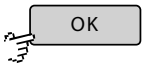


Temp. compensated ⇨ The temperature compensation is automatic, if a temperature sensor exists.

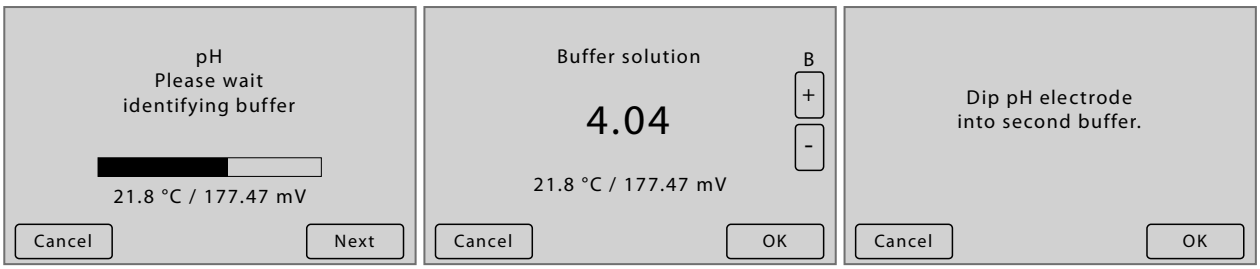
Temp. manual ⇨ The temperature compensation is carried out manually, i.e. the temperature is entered from a menu.



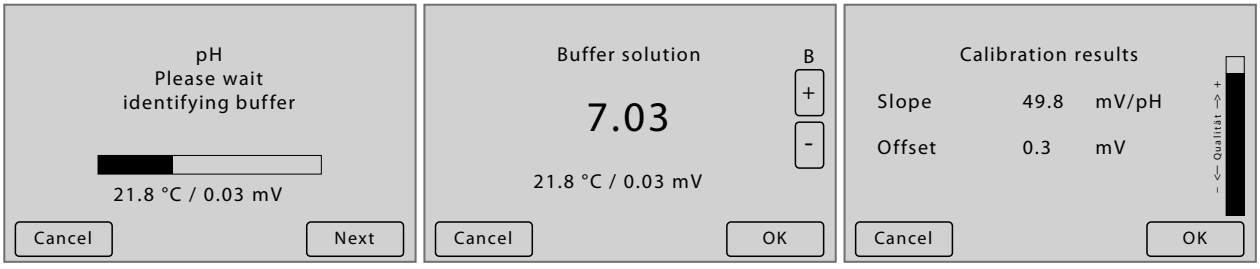
Aborts calibration, switches to Calibration menu pH sensor.



Saves the entry and switches to the next menu.



Before immersion, rinse the electrode in clean tap water.

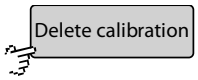


At the right border of the last menu there is a quality factor graphically displayed. Calculated from offset and slope.

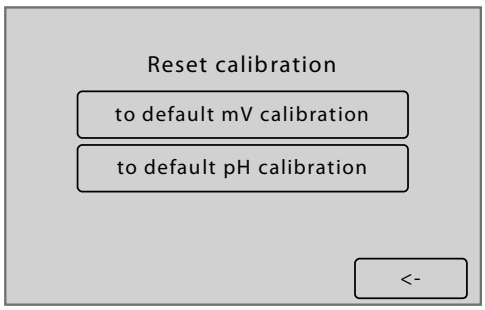
If during the calibration procedure the permissible range of values has been exceeded, this is displayed with *inf* or *-inf*. If undefined values were entered during the calibration procedure, this is displayed with *nan*.

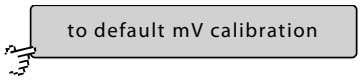
* Buffer solution for calibration of pH sensors from GO Systemelektronik

8.2.6.1.2 pH Sensor Calibration Reset to Default

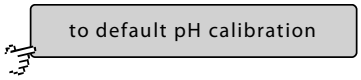


Calibration Menu pH Sensor 8.2.6.1

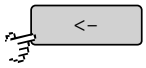




Default mV calibration, measurement value in mV
Offset = 0 | Slope) = 1
Switches back to the Calibration menu pH sensor.

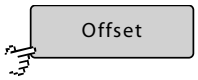


Default pH calibration, measurement value in pH
7 pH ≙ 0 mV | Slope = 59.16 mV/pH unit
Switches back to the Calibration menu pH sensor.

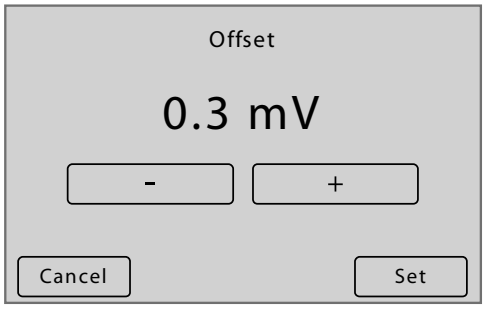


Switches back to the Calibration menu pH sensor.

8.2.6.1.3 pH Sensor Offset

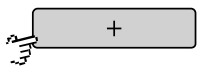


Calibration Menu pH Sensor 8.2.6.1

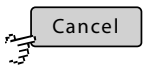


input offset value = measured mV at pH 7

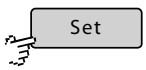
Input minus value, each 0.1 mV



Input plus value, each 0.1 mV

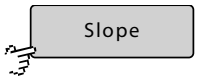


Switches back to the Calibration menu pH sensor without saving the entry.

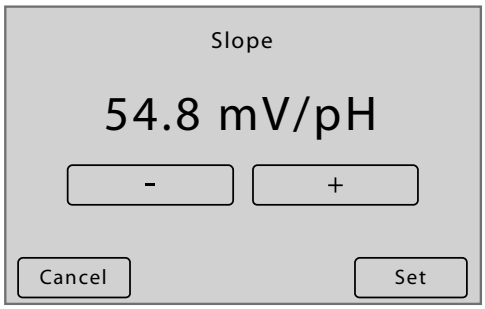


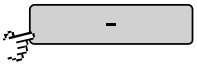
Saves the entry and switches back to the Calibration menu pH sensor

8.2.6.1.4 pH Sensor Slope

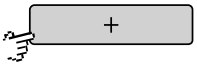


Calibration Menu pH Sensor 8.2.6.1

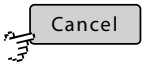




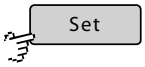
Input minus value, each 0.1 mV/pH



Input plus value, each 0.1 mV/pH



Switches back to the Calibration menu pH sensor without saving the entry.

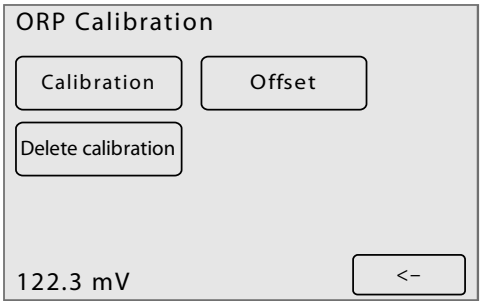


Saves the entry and switches back to the Calibration menu pH sensor

8.2.6.2 Calibration Menu ORP Sensor

Note: The ORP sensor is also called Redox sensor.

ORP calibration — Service menu 8.2.6



Below left, the current mV value is displayed.

Calibration — Switches to the calibration.

Delete calibration — Switches to the menu ORP sensor delete calibration 8.2.6.2.2.

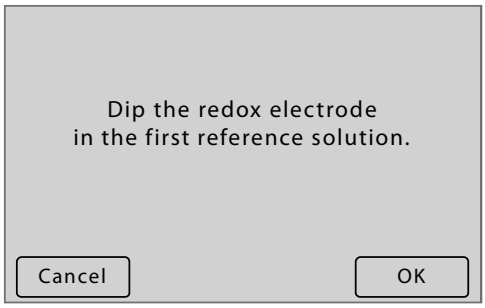
Offset — Switches to the input of an offset value.

<- — Switches back to the Service menu 8.2.6.

8.2.6.2.1 ORP Sensor Calibration

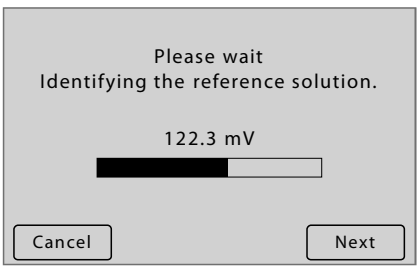
Note: The ORP electrode is also called Redox electrode.

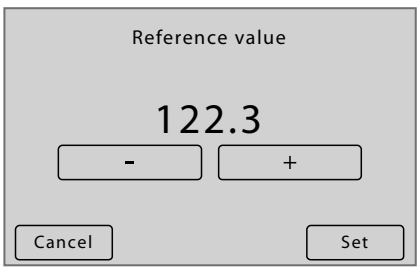
Calibration — Calibration menu ORP sensor 8.2.6.2

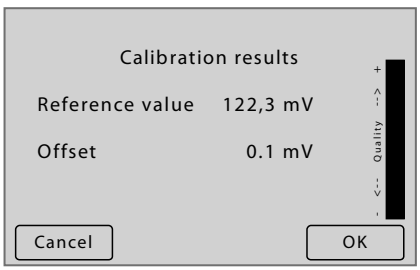


Cancel — Aborts calibration, switches to Calibration menu ORP sensor.

Set — Resumes the calibration.

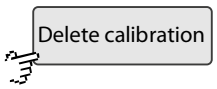




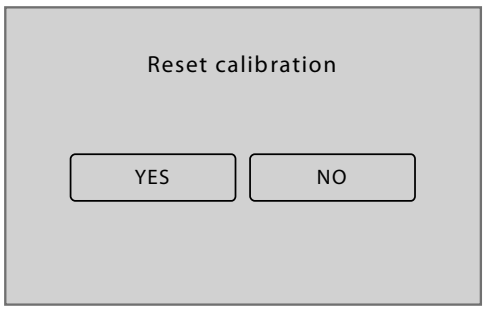


At the right border of the last menu there is a quality factor displayed. Calculated from offset and slope.

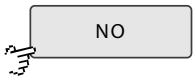
8.2.6.2.2 ORP Sensor Delete Calibration



Calibration menu ORP sensor 8.2.6.2

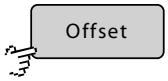


Offset = 0
Switches back to Calibration menu ORP sensor.

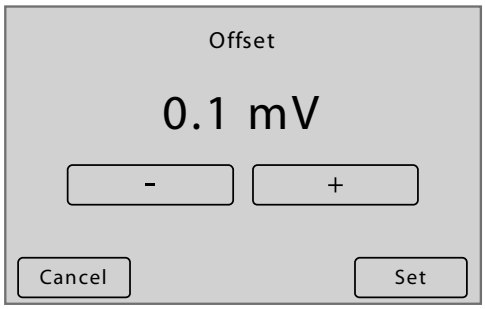


No reset, switches back to Calibration menu ORP sensor.

8.2.6.2.3 ORP Sensor Offset

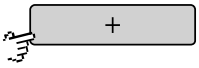


Calbration menu ORP sensor 8.2.6.2

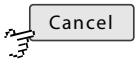


Input offset value

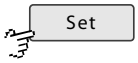
Input minus value, each 0.1 mV



Input plus value, each 0.1 mV



Switches back to Calibration menu ORP sensor without saving the entry.

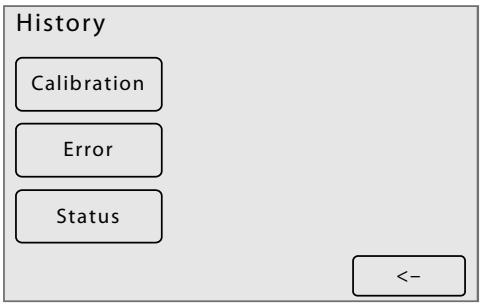


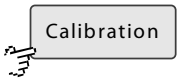
Saves the entry and switches back to Calibration menu ORP sensor.

8.2.6.3 Service History

Service menu 8.2.6

From this menu, the history of calibrations, warning- and error messages, and the device status display are called up.

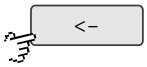




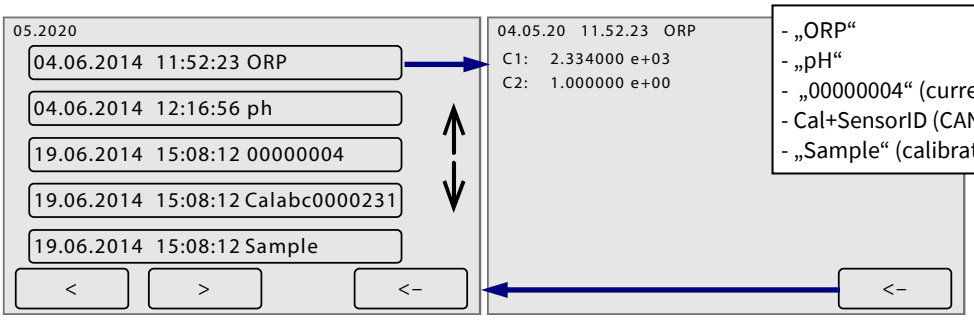
Switches to the display of the history of the calibrations.

Switches to the display of the history of the warning- and error messages.

Switches to the display of the device status history.



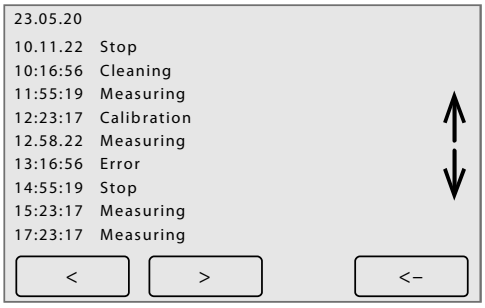
Switches back to the Service menu 8.2.6.



History of stored calibrations
Display: „Date“ „Time“ „Calibration“

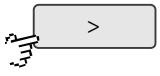
Calibration factors of a calibration

History of the warning and error messages
+ ⇨ Message triggered
- ⇨ Message resetted



Device status history

Switches the display one day back.



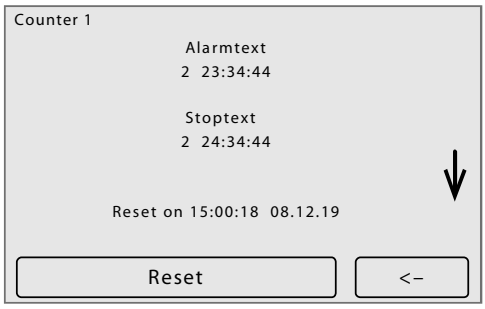
Switches the display one day forward.

Switches back to the previous menu.

Scrolls the display.

8.2.6.4 Service Timer (Counter) Protocol

Service menu 8.2.6

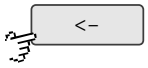


Protocol of the alarm and stop messages of the service timer
see *8.2.5.8 Counter (Service Timer)*

Displayed is the counter number, the alarm text, the remaining time until the alarm starts, the stop text, the remaining time until the next stop and the time of the last reset.

Scrolls to the next counter.

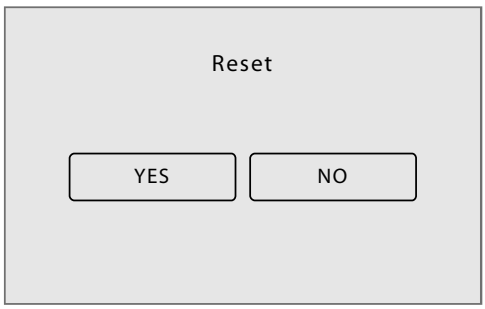
Resets the alarm and stop messages. see below

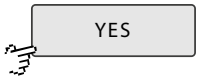


Switches back to the service menu 8.2.6.

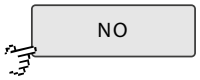
8.2.6.4.1 Service Timer Reset

Menu service timer (Counter) protocol 8.2.6.4





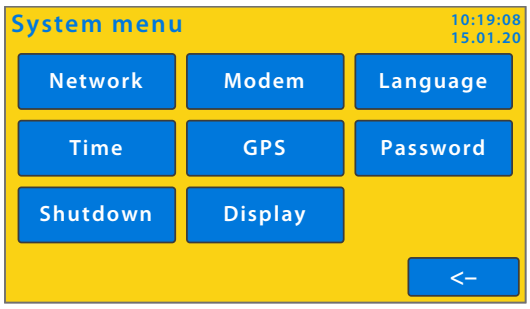
Resets the alarm and stop messages.



Does not reset the alarm and stop messages.

8.2.7 System menu

Main menu 8.2 after password request



The system menu and all subsequent menus have a yellow background on the colour display.

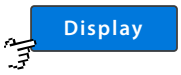
Switches to the Network menu, see *8.2.7.1 Network Menu*.

Switches to the Time menu, see *8.2.7.2 Time Menu*.

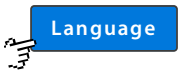
Shuts down the BlueMon, see *8.2.7.3 Shutdown*.

Switches to the Modem menu, see *8.2.7.4 Modem Menu/Modem Settings*.

Switches to the GPS menu, see *8.2.7.5 GPS Menu*.



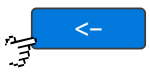
Switches to the Display menu, see *8.2.7.6 Display*.



Switches to the Language menu, see *8.2.7.7 Language Settings*.

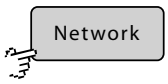
Switches to the menus of access modes with password assignment.

The **menus of the access modes with password assignment** are **not described** in this manual, for more information please contact GO Systemelektronik.



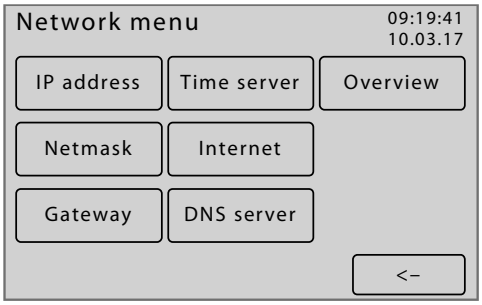
Switches back to the main menu.

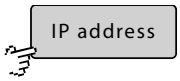
8.2.7.1 Network Menu



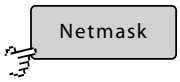
System menu 8.2.1

The network connection allows data exchange with the BlueMon and a remote control.
To ensure the accuracy of the timing, you can synchronize the time setting of the BlueMon with a timeserver.

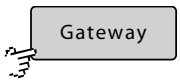




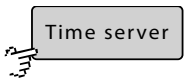
Switches to the input of the local IP address, see *8.2.7.1.1 IP-Address Input*.



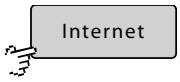
Switches to the input of the local Netmask, see *8.2.7.1.2 IP-Netmask Input*.



Switches to the input of the IP address of the device, which executes the connection to other networks, see *8.2.7.1.3 Gateway IP-Address Input (Default Gateway)*.

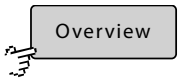


Switches to the input of the IP address of a timeserver, see *8.2.7.1.4 Timeserver Input*.

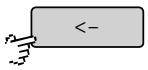


Switches to the settings of a direct Internet connection, see *8.2.7.1.5 Internet Settings*.

Switches to the input of two possible DNS server, see *8.2.7.1.6 DNS Server Input*.

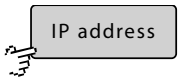


Switches to the Info menu, see *8.2.7.1.7 Info Network*.



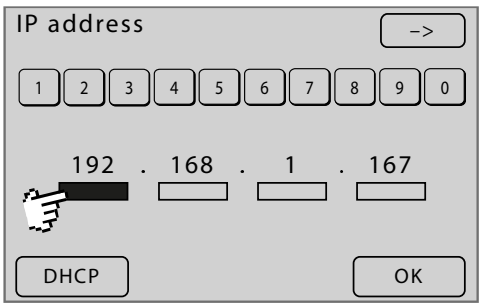
Switches back to the System menu.

8.2.7.1.1 IP-Address Input



Network menu 8.2.1.1

Here you can change the IP address, which identifies the BlueMon on your local network.
The IP address is configured at the factory (see *6 The Configuration Data Sheet*).
The current setting is displayed.



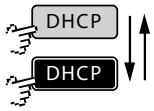
Enter the IP address using the numeric buttons in the marked block.

2. Network:

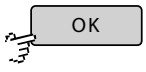
IP Address	192.168.1.167
Netmask	255.255.255.0
Gateway	0.0.0.0
Port	14110
Login Name	bluemon
Password	xxxxx

see *6 The Configuration Data Sheet*

Selects the next block of the IP address.
Even works with ☞ on a block.

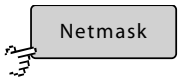


Sets the entry to 0.0.0.0.0, so the IP address is set via the DHCP protocol when the BlueMon is started up. Another ☞ restores the previous IP address.
The button is also a status indicator.



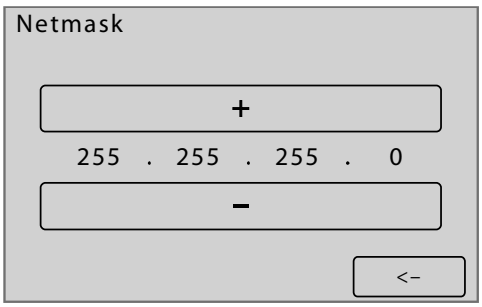
Saves the entry and switches back to the Network menu.

8.2.7.1.2 IP-Netmask Input



Network menu 8.2.1.1

Here you can change the netmask; the netmask defines the IP address range of the network.
The netmask is configured at the factory (see *6 The Configuration Data Sheet*).
The current setting is displayed.

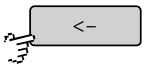


Input of the netmask with <+> <–> Buttons

2. Network:

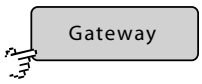
IP Address	192.168.1.167
Netmask	255.255.255.0
Gateway	0.0.0.0
Port	14110
Login Name	bluemon
Password	xxxxx

see *6 The Configuration Data Sheet*



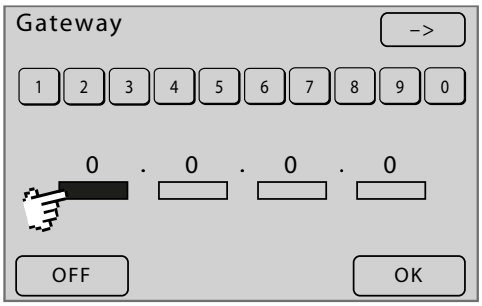
Saves the entry and switches back to the Network menu.

8.2.7.1.3 Gateway IP-Address Input (Default Gateway)



Network menu 8.2.1.1

If the BlueMon shall communicate via the LAN connection with other networks, enter the IP address of the device that executes the connection (another BlueMon, routers, servers, etc.).
The current setting is displayed.



Enter the IP address using the numeric buttons in the marked block.

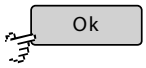
2. Network:

IP Address	192.168.1.167
Netmask	255.255.255.0
Gateway	0.0.0.0
Port	14110
Login Name	bluemon
Password	xxxxx

see *6 The Configuration Data Sheet*, Basic setting of the Gateway: 0.0.0.0

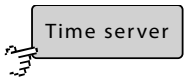
Selects the next block of the IP address.
Even works with ☞ on a block.

After confirmation, sets the setting to "0.0.0.0.0".



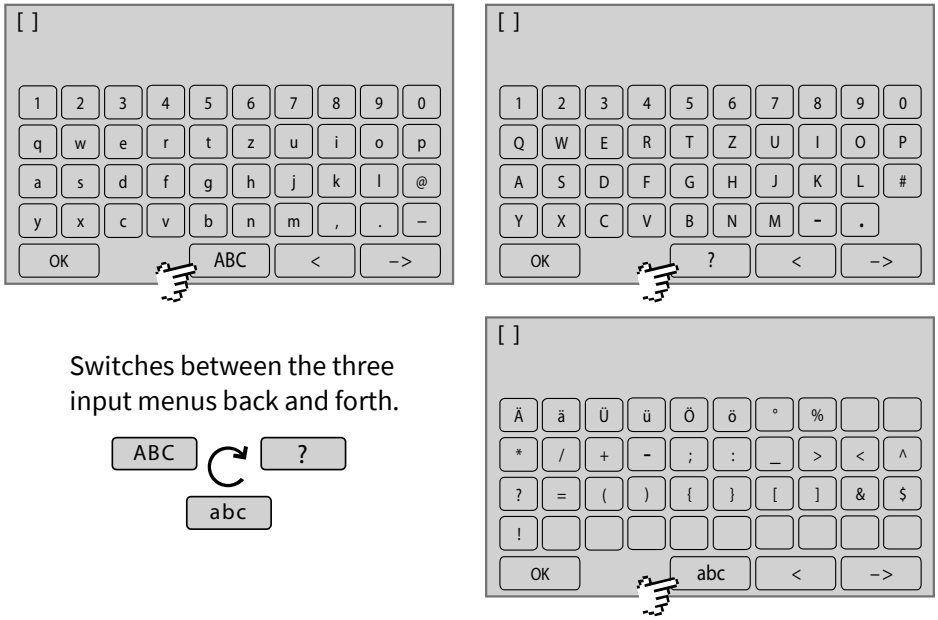
Saves the entry and switches back to the Network menu.

8.2.7.1.4 Time Server Input



Network menu 8.2.7.1

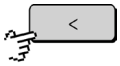
After entering a URL (web address) or an IP address of a time server, the BlueMon automatically synchronizes* its system time with the time server. The current URL or IP address is displayed in [ ].



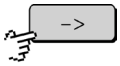
Switches between the three input menus back and forth.

GO Systemelektronik provides a time server under the URL "ntp.go-sys" (IP address 212.51.30.18) – the only requirement here is that the BlueMon has Internet access.

Saves the input and switches back to the Network menu.



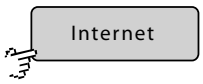
Deletes the last entered character.



Switches back to the Network menu without saving the input.

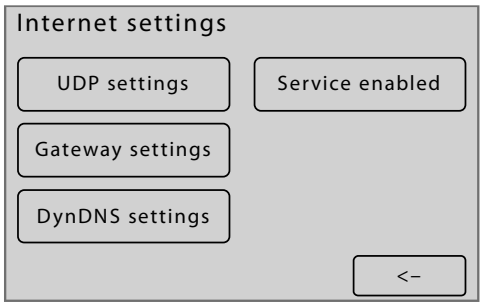
* Synchronization is performed using the NTP protocol.

8.2.7.1.5 Internet Settings

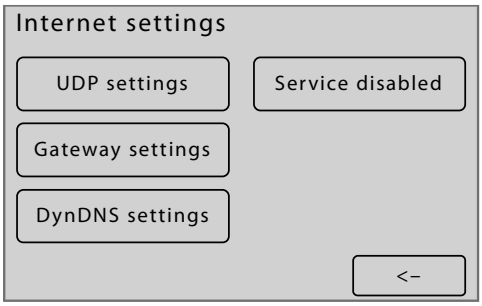


Network menu 8.2.7.1

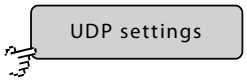
This menu is used for the settings of the data transmission and a gateway for the bi-directional connection behind a firewall.
Prerequisite is an internet connection via the network cable on the BlueMon or an internet connection via an internal or external [1] UMTS modem (see *8.2.7.4 Modem menu/Modem Settings*).



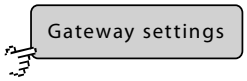
View Service enabled



View Service disabled

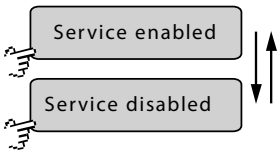


Switches to the menu of the UDP [2] settings.

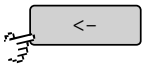


Switches to the menu of the Gateway settings of the Internet connection.

Switches to the menu of the DynDNS settings of the Internet connection. Only by a connection via GPRS/UMTS modem.



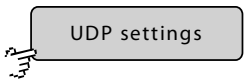
For service tasks GO Systemelektronik can access from the outside to the BlueMon.
Service enabled: access to the operating system functions of the BlueMon
Service disabled: no access to operating system functions of the BlueMon
Default: Service enabled
The button is also a status indicator.



Switches back to the Network menu.

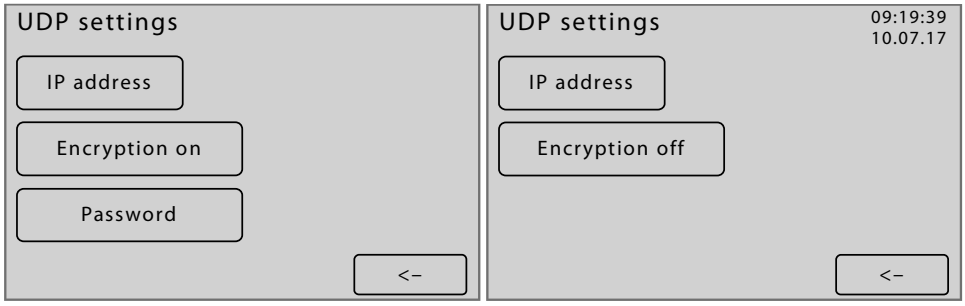
[1] External modems are not supported by GO Systemelektronik.
[2] UDP = User Datagram Protocol

8.2.7.1.5.1 UDP Settings

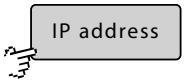


Menu internet settings 8.2.7.1.5

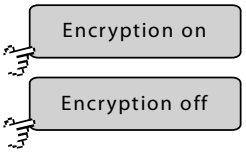
The UDP* settings are necessary for the transmission of measurement data to a PC (e.g. for the online data service BlueGate.



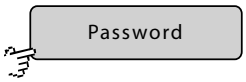
View Encryption on View Encryption off



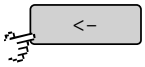
Switches to the input of the IP address of the destination computer.



Switches the AES encryption of the connection off and on.
Default = Encryption off
The button is also a status indicator.



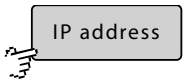
Switches to the setting of the encryption password.
Only visible at <Encryption on>.



Switches back to the menu Internet settings.

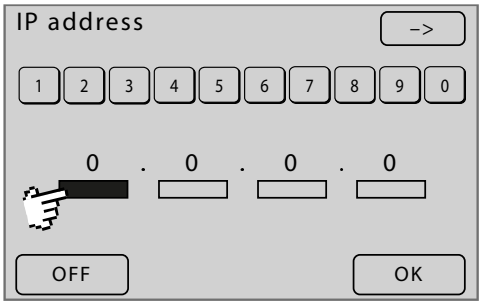
* UDP = User Datagram Protocol

8.2.7.1.5.1.1 Setting IP Address (UDP)



Menu UDP settings 8.2.7.1.5.1

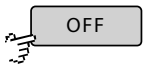
Here you can enter the IP address of the destination computer in the Internet, to which the measuring data is transmitted. The UDP protocol via port 14112 is used for the transmission. The current IP address is displayed.



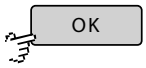
Enter the IP address using the numeric buttons in the marked block.

If an access to the BlueGate server has been ordered from GO Systemelektronik, the IP address is set to the standard address 212.51.30.18 on delivery of the BlueMon.

Selects the next block of the IP address.
Even works with ☞ on a block.



After confirmation, sets the setting to "0.0.0.0".



Saves the entry and switches back to the Network menu of the UDP settings.

3. BlueGate Settings:

IP Address	212.51.30.18
Password BlueGate	xxxxx

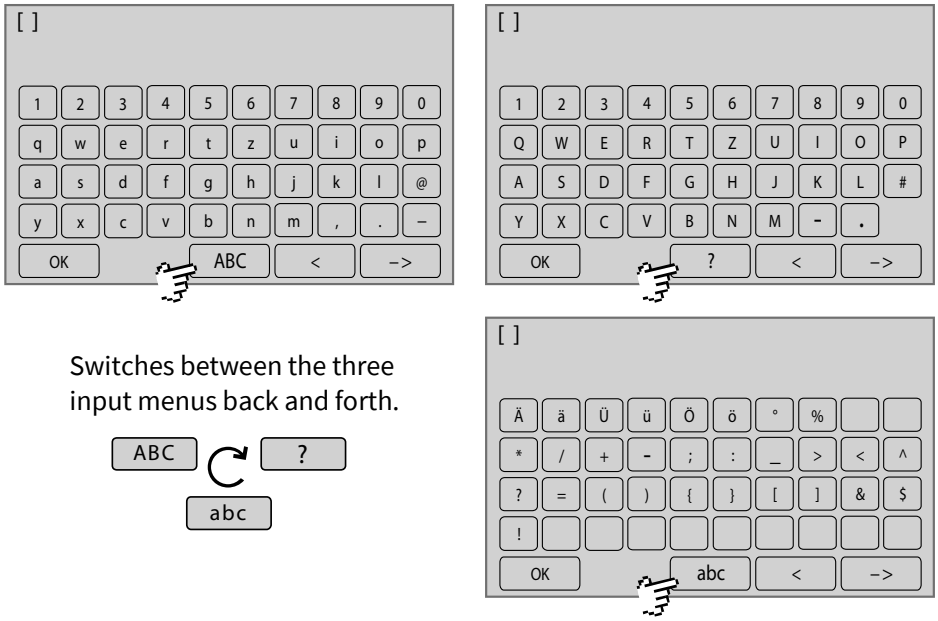
see *6 The Configuration Data Sheet*

see also *8.2.7.1.5.2 Gateway Settings (Internet)*

8.2.7.1.5.1.2 Setting Password of the Encryption

Password — Menu UDP settings 8.2.7.1.5.1

The current password is displayed in [ ].



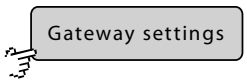
Switches between the three input menus back and forth.

OK — Saves the input and switches back to the UDP settings.

< — Deletes the last entered character.

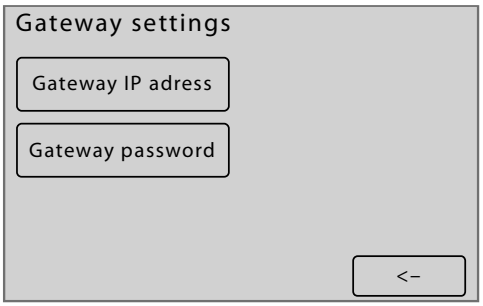
–> — Switches back to the UDP settings without saving the input.

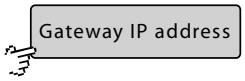
8.2.7.1.5.2 Gateway Settings (Internet)



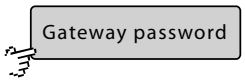
Menu Internet settings 8.2.7.1.5

If the BlueMon shall communicate bidirectional with a computer in the Internet, enter here the IP address of your BlueMon gateway and the associated password.
IP address and password you get from GO Systemelektronik (see *6 The Configuration Data Sheet*).

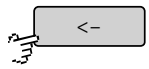




Input of the IP address of the gateway.



Input of the password of the gateway.



Switches back to the Internet Settings menu.

Example BlueGate-Gateway from GO Systemelektronik:

3. BlueGate Settings:

IP Address	212.51.30.18	Gateway IP
Password BlueGate	xxxxx	Gateway PW

see *6 The Configuration Data Sheet*

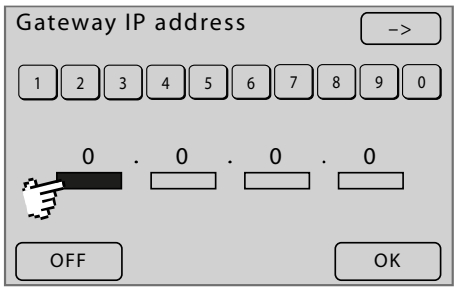
A gateway is necessary if any of those conditions is met:

1. The UMTS Internet connection has a provider assigned private IP address.
   -
   Private IP address space: 10.0.0.0 – 10.255.255.255
   172.16.0.0 – 172.31.255.255
   192.168.0.0 – 192.168.255.255
   -
2. Your provider blocks access from the Internet with a firewall.
3. More than one BlueMon is connected with the Internet via a UMTS modem.

8.2.7.1.5.2.1 Input Gateway IP-Address (Internet)

Gateway IP address — Gateway settings (Internet) 8.2.7.1.5.2

Input of the Gateway IP



Enter the Gateway IP using the numeric buttons in the marked block.

-> — Selects the next block of the IP address.
Even works with ☞ on a block.

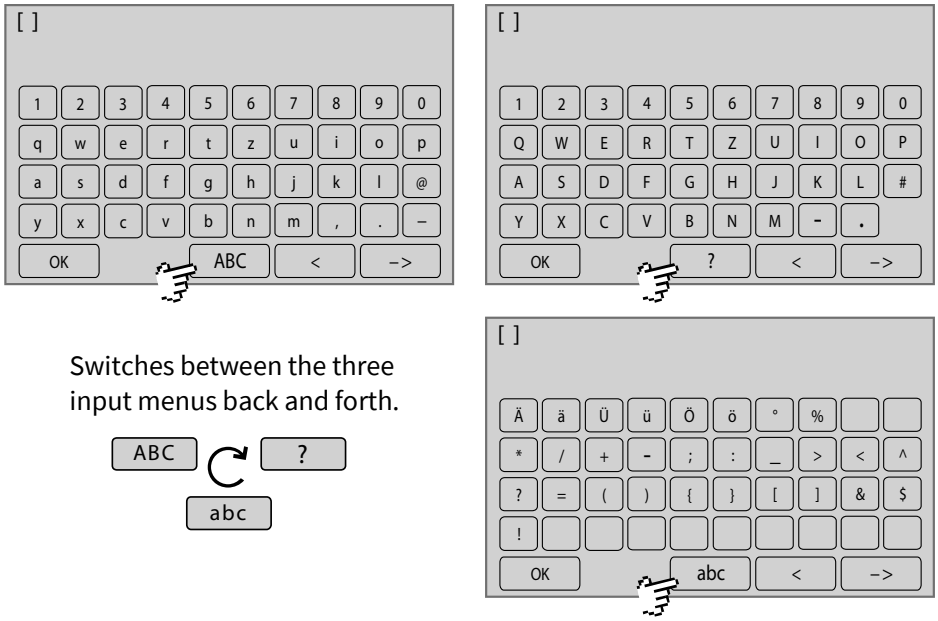
OFF — After confirmation, sets the setting to "0.0.0.0.0".

OK — Saves the entry and switches back to the Gateway Settings (Internet) menu.

8.2.7.1.5.2.2 Input Gateway Password (Internet)

Gateway password — Gateway Settings (Internet) 8.2.7.1.5.2

The current password is displayed in [ ].



Switches between the three input menus back and forth.

OK — Saves the input and switches back to the Gateway Settings (Internet) menu.

< — Deletes the last entered character.

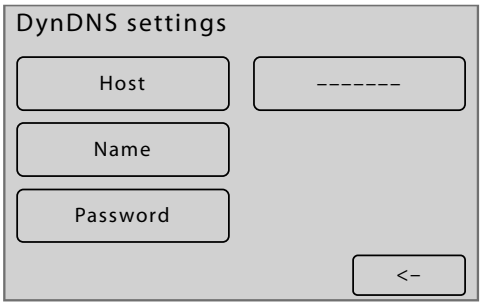
-> — Deletes the last entered character.

8.2.7.1.5.3 DynDns Settings

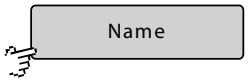
Menu Internet settings 8.2.7.1.5

Here you can enter the DynDNS settings.
For the correct entries: Contact your DynDNS provider.

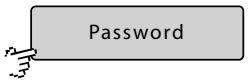
The use of a DynDNS service depends on the respective DynDNS provider, therefore GO Systemelektronik cannot guarantee the functionality of a DynDNS service.



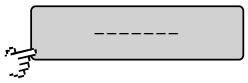
Enter of the name under which the BlueMon can be reached via DynDNS.



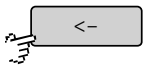
Enter of the login name of your DynDNS account.



Enter of the login password of your DynDNS account.



Opens a selection list of Internet addresses of DynDNS services.
If a DynDNS service is selected, its Internet address is displayed in the button.



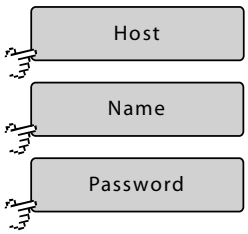
Switches back to the Internet Settings.

If you need no Internet gateway (see *8.2.7.1.5.2 Gateway Settings (Internet)*), you can access via a DynDNS service from the Internet on the BlueMon.

Precondition is : 1. Your GPRS / UMTS Internet connection has a public IP address.

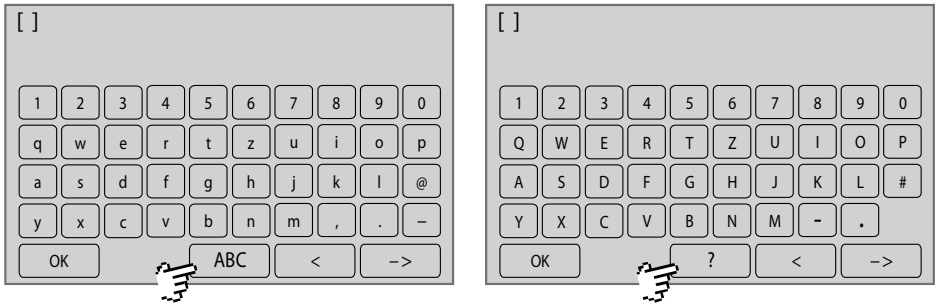
2. The access is not blocked by the provider.

8.2.7.1.5.3.1 DynDNS Settings Input

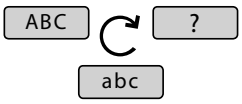


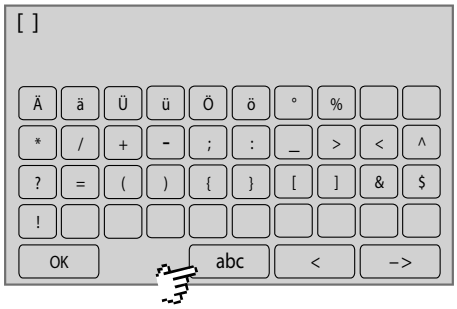
DynDNS settings 8.2.7.1.5.3

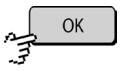
The current setting is displayed in [ ].



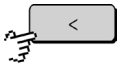
Switches between the three input menus back and forth.



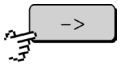




Saves the input and switches back to the DynDNS Settings menu.



Deletes the last entered character.

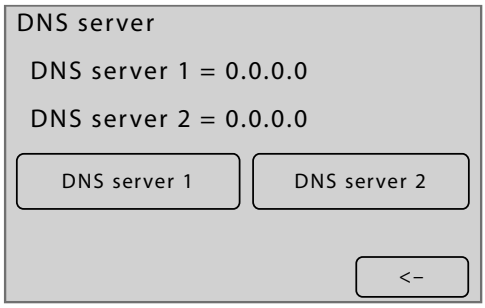


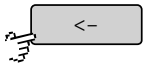
Switches back to the DynDNS Settings without saving the input.

8.2.7.1.6 DNS Server Input

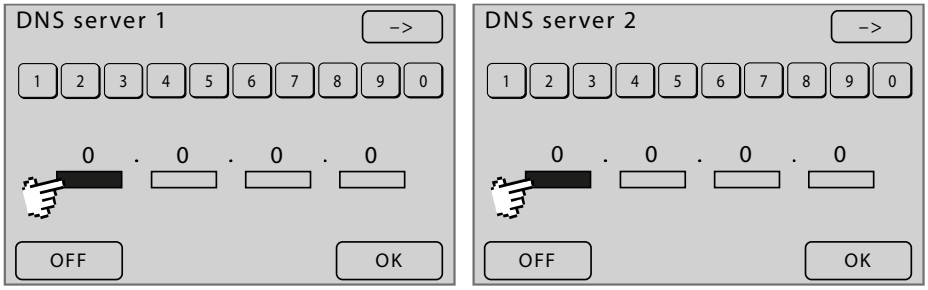
Network menu 8.2.7.1

If the BlueMon is connected to the Internet via a router or similar and not via an internal modem and if you use names and not IP addresses for Internet addresses, then a DNS server must be entered here in the BlueMon.



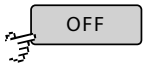


Switches back to the Network menu.

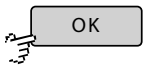


Enter the IP address using the numeric buttons in the marked block.

Selects the next block of the IP address.
Even works with ☜ on a block.

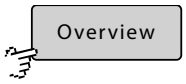


After confirmation, sets the setting to "0.0.0.0.0".



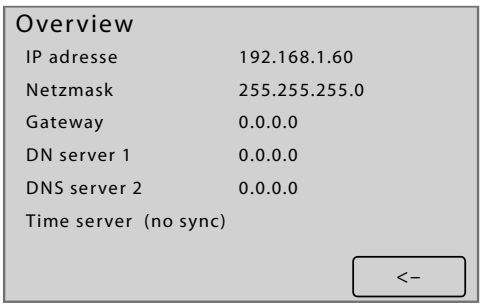
Saves the entry and switches back to the Network menu.

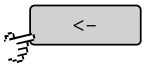
8.2.7.1.7 Info Network



Network menu 8.2.7.1

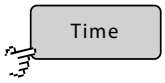
Here the current network settings are listed.



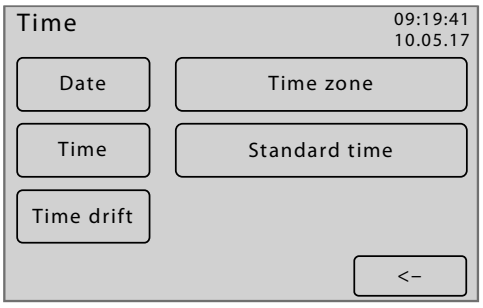


Switches back to the Network menu.

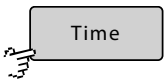
8.2.7.2 Time Menu



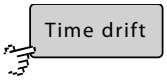
System menu 8.2.7



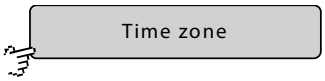
Switches to the input of the date.



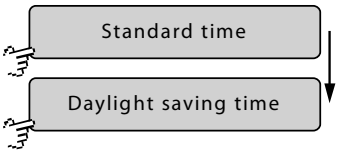
Switches to the input of the time.



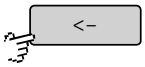
Switches to the input of the time drift



Switches to the input of the time zone.

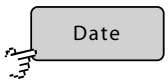


Switches between winter and summer time.
The button is also a status indicator.

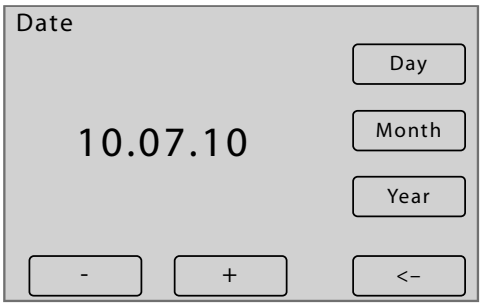


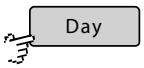
Switches back to the System menu.

8.2.7.2.1 Date Input



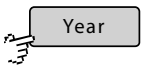
Time menu 8.2.7.2





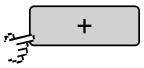
Selection of day setting

Selection of month setting

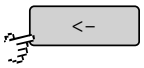


Selection of year setting

Selection -1

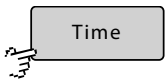


Selection +1

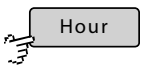


Switches back to the Time menu.

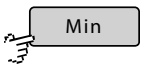
8.2.7.2.2 Time of the Day Input



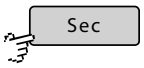
Time menu 8.2.7.2



Selection of hour setting

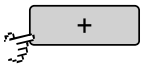


Selection of minute setting

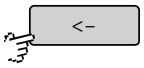


Selection of second setting

Selection -1



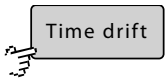
Selection +1



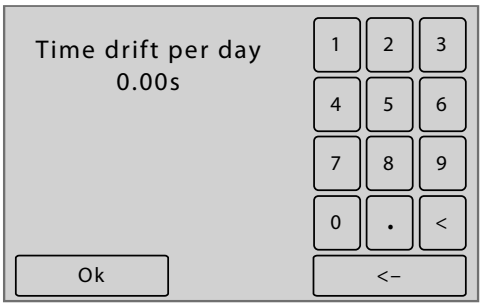
Switches back to the Time menu.

First set the time zone before you set the time!

8.2.7.2.3 Time Drift Input



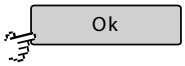
Time menu 8.2.7.2



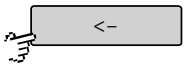
The entry here corrects the daily clock drift in seconds of the internal clock of the BlueMon.

positive values ⇨ The BlueMon clock runs faster.
negative values ⇨ The BlueMon clock runs slower.

Deletes the last entered character.

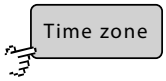


Saves the input and switches back to the Time menu.

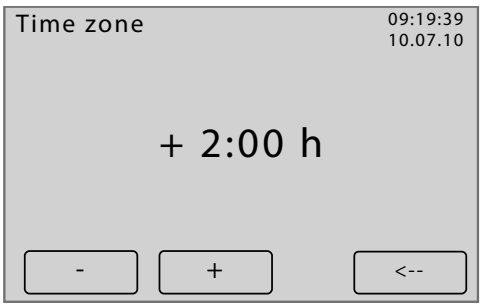


Switches back to the Time menu without saving the input.

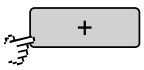
8.2.7.2.4 Time Zone Input



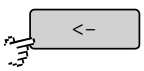
Time menu 8.2.7.2



Time zone -0,25



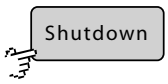
Time zone +0,25



Switches back to the Time menu.

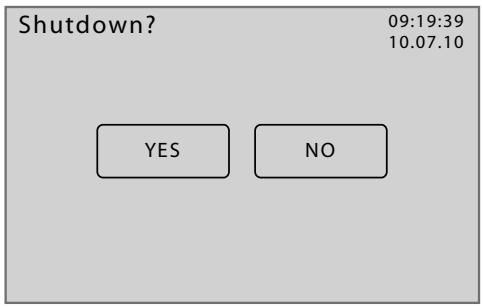
Please note that the setting described here only has impact on the displayed time zone and not on the data-bound time!

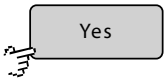
8.2.7.3 Shutdown



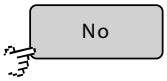
System menu 8.2.7

For a proper operation it is necessary to shut down the BlueMon before disconnecting the power supply.



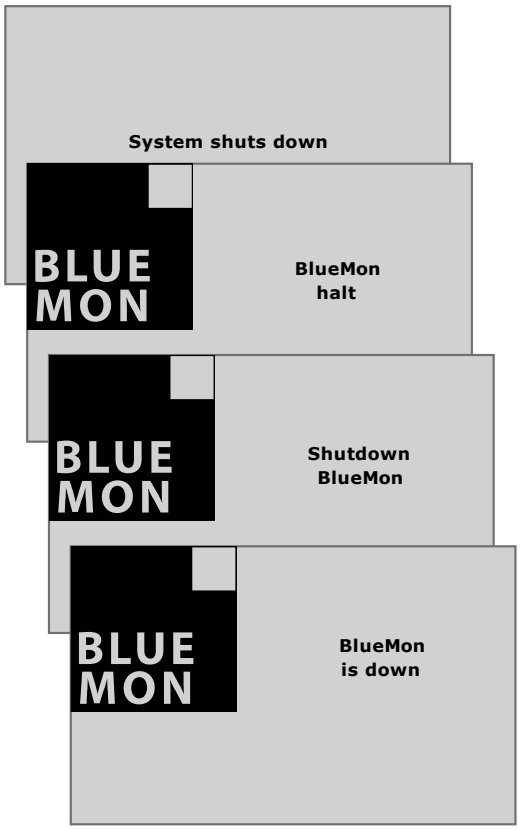


Shutdown of the BlueMon



Switches back to the System menu.

The shutdown status is displayed.



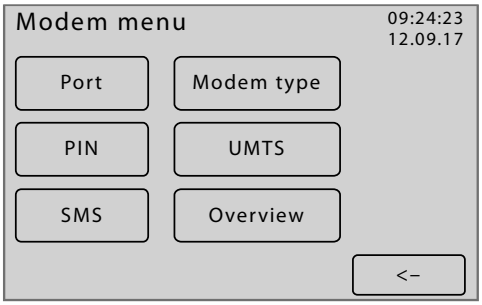
The shutdown is complete.
You can switch off the BlueMon by disconnecting the power supply.

If the BlueMon is not disconnected from the power supply after shutdown, it will automatically restart after 10 minutes.

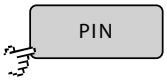
8.2.7.4 Modem menu/Modem Settings

System menu 8.2.7

The view varies depending on the selected modem type (see *8.2.7.4.3 Mode Type Settings*).

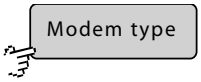


Switches to the Modem port setup.

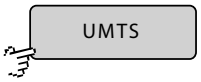


Switches to the input of the PIN number of the modem.
Only visible if modem type <GSM> or <GPRS/UMTS> is selected in the Modem type settings (see: *8.2.7.4.3 Modem Type Settings*).

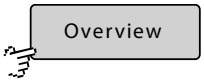
Is only visible if a SMS sending is possible.
Precondition: SMS-compatible modem



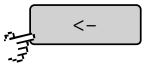
Switches to the modem type settings.



Switches to the UMTS settings.
Only visible if modem type <GPRS/UMTS> is selected in the Modem type settings (see: *8.2.7.4.3 Modem Type Settings*).



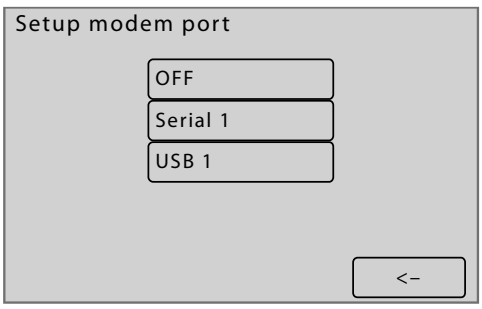
Switches to the Info menu of the modem settings.



Switches back to the System menu.

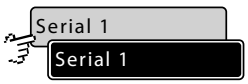
8.2.7.4.1 Modem Port Setup

Modem menu / Modem Settings 8.2.7.4

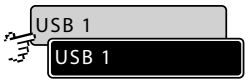


The buttons are also status indicators.

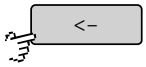
Enables or disables the modem connection.



If a factory-mounted modem is connected to the serial interface, then this interface is activated by the manufacturer.

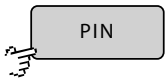


If a factory-mounted modem is connected to the USB interface, then the USB interface is activated for the modem by the manufacturer via this button.



Switches back to the Modem menu / Modem Settings.

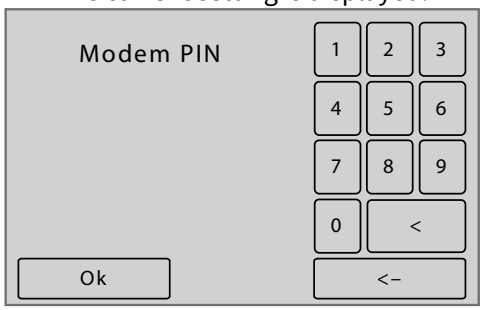
8.2.7.4.2 Input of the Modem PIN number



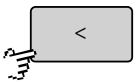
Modem menu 8.2.7.4

Note on a possible operation error: It is necessary to change the PIN number before installing or activating a new UMTS card, otherwise the UMTS card will be deactivated by repeated queries by default.

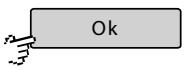
The current setting is displayed.



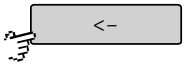
The PIN number is entered using the numeric keys.



Deletes the last entered character.

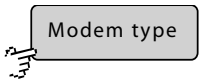


Saves the input and switches back to the Modem menu.



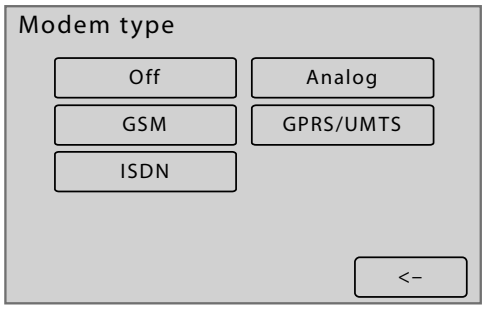
Switches back to the Modem menu without saving the input.

8.2.7.4.3 Mode Type Settings



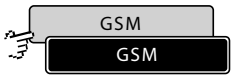
Modem menu 8.2.7.4

This menu is used to enter the modem type of a connected modem.



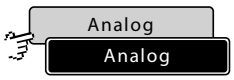
The buttons are also status indicators.

No modem is connected.



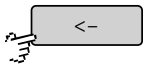
A GSM modem* is connected.

An ISDN modem is connected.



An Analogue modem is connected.

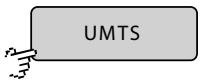
A GPRS modem* or a UMTS/LTE modem is connected.



Saves the input and switches back to the Modem menu.

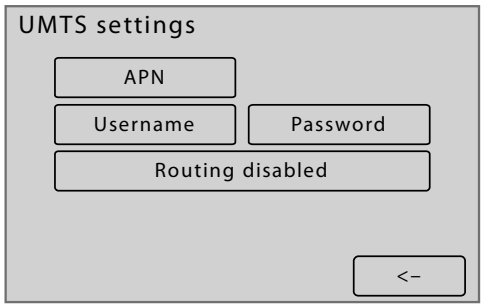
* optional extra equipment

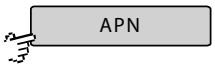
8.2.7.4.4 UMTS Settings



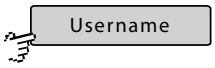
Modem menu 8.2.7.4

From this menu, you set up your UMTS connection. For APN, username and password, contact your UMTS provider.

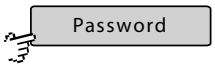




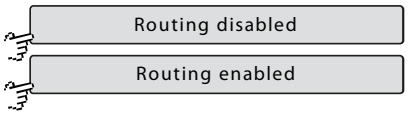
Input APN (Access Point Name)



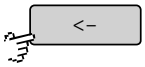
Input Username (Login name)



Input Password (Login password)



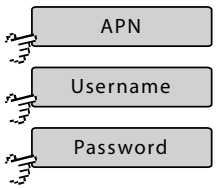
Switches the routing on and off.
The button is also a status indicator.
Factory default: routing off



Switches back to the Modem menu.

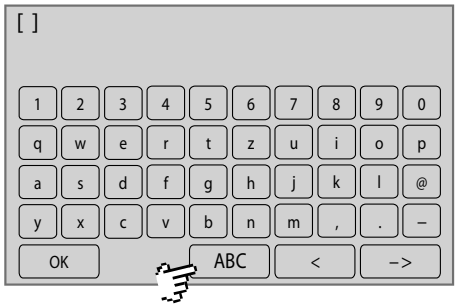
The routing must be switched on, if you use this BlueMon as an Internet router. This is for example the case, when via this BlueMon other BlueMon/BlueBox systems send measurement values.
Please note that the connected BlueMon/BlueBox systems must use the IP address of the routing BlueMon as the address of the default gateway (see *8.2.7.1.3 Gateway IP-Address Input (Default Gateway)*).

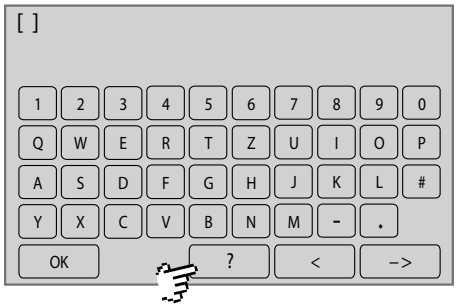
8.2.7.4.4.1 UMTS Settings Input



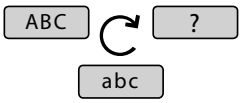
UMTS Settings 8.2.7.4.4

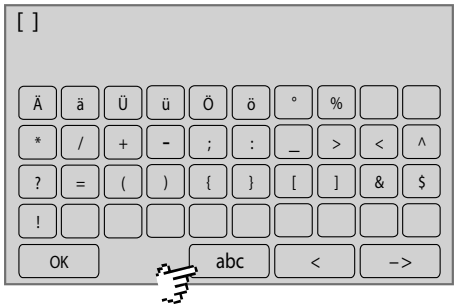
The current setting is displayed in [ ].



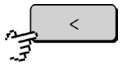


Switches between the three input menus back and forth.

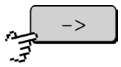




Saves the input and switches back to the UMTS Settings.

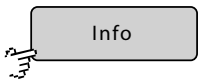


Deletes the last entered character.

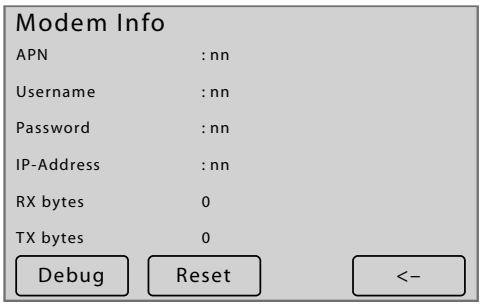


Switches back to the UMTS Settings without saving the input.

8.2.7.4.5 Modem Info (UMTS)

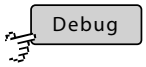


Modem menu 8.2.7.4

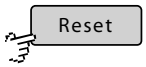


Display of the actual settings of the UMTS modem

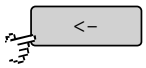
RX Bytes: received data since connection started
TX Bytes: transferred data since connection started



Display of dial-in information

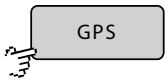


Modem reset

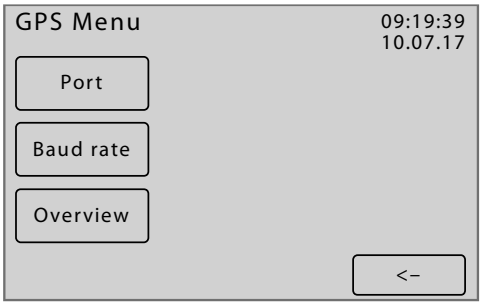


Switches back to the Modem menu.

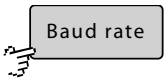
8.2.7.5 GPS Menu



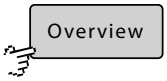
System menu 8.2.7



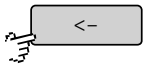
Switches to the settings of the connection of a GPS receiver.



Switches to a selection menu for seven baud rates between 2400 and 115200.



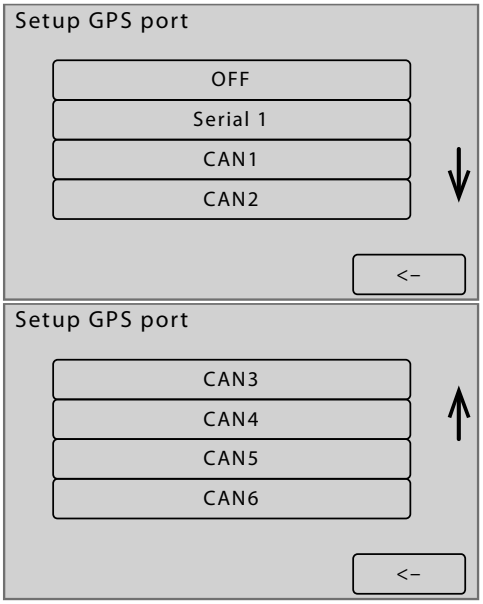
Switches to the information menu of the GPS connection, here the relevant GPS data are listed.



Switches back to the System menu.

8.2.7.5.1 GPS Port Setup

GPS Menu 8.2.7.5

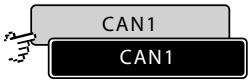


The buttons are also status indicators.

Disables the GPS connection.

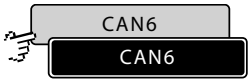
If a factory-mounted GPS receiver is connected to the internal serial interface of the PC 104, then this interface is activated by the manufacturer.

If a factory-mounted GPS receiver is connected to the USB interface, the USB interface for the GPS receiver is activated at the factory.
Only visible if a GPS receiver is connected to the USB port.

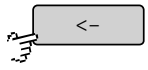


GPS module at serial interface via CAN-bus
Interface: CAN-bus serial 1

. . . . . .



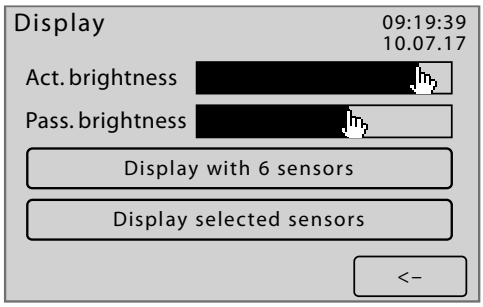
GPS module at serial interface via CAN-bus
Interface: CAN-bus serial 6



Switches back to the GPS menu.

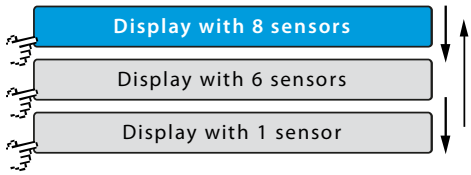
8.2.7.6 Display

System menu 8.2.7



Pressing a point on the *Active Brightness* or *Passive Brightness* bar sets the display backlight value accordingly. At user inactivity, the software switches the backlighting of the display after 150 seconds from the value set under *Active Brightness* to the value set under *Passive Brightness*. At user activity, the brightness switches back to the value set under *Active Brightness*.
At a high temperature of the CPU, the value set under *Passive Brightness* is ignored and the display backlighting is switched off.

Displaying type:

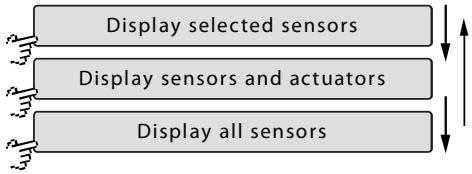


Switches back and forth between the

- Parameter display 8-way
- Parameter display 6-way
- Parameter display 1-way

see *8.1 Parameter Display*
The button is also a status indicator.

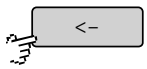
Selection type:



Defines which sensors/actuators* will be displayed in the multiple parameter display. see *8.1 Parameter Display*
The button is also a status indicator.

There are three selection types:

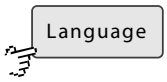
- Only in the measurement values menus 8.2.2.1 and actuator menu 8.2.3.1 selected sensors and actuators are displayed
- All sensors and all actuators are displayed.
- All sensors are displayed.



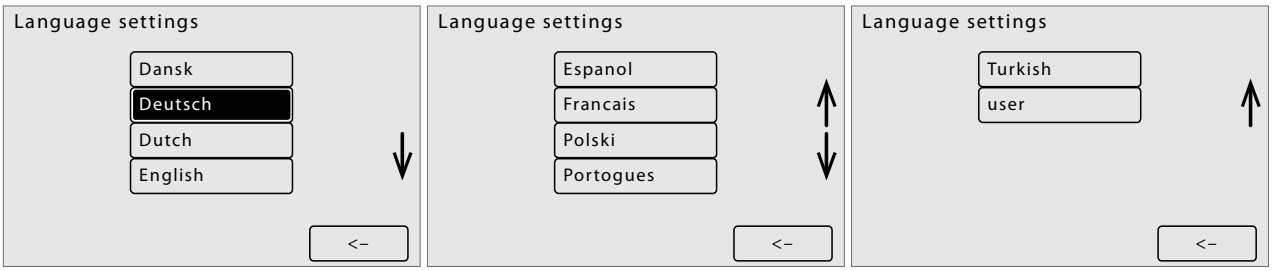
Switches back to the System menu.

* The status of an actuators can also be understood as a measurement value.

8.2.7.7 Language Settings

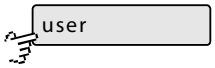


System menu 8.2.7

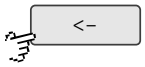


Here you can select a menu language, the buttons are also status indicators.

Scrolls the display.



Custom language, for more information please contact GO Systemelektronik.



Switches back to the system menu.

8.2.8 Help Menu

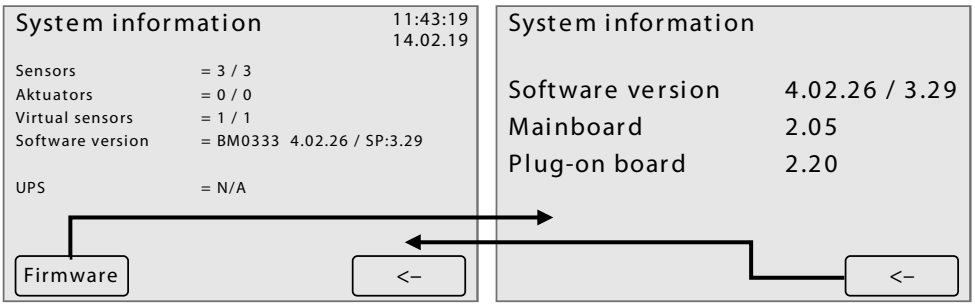
Help — Main menu 8.2

Information — Switches to the system information.

<– — Switches back to the main menu.

8.2.8.1 System Information

Information — Help menu 8.2.8



Sensors, Actuators, Virtual sensors — Number of connected sensors, actuators and virtual sensors

Software version — Serial number and firmware version and storage firmware version of the BlueMon

UPS — Display whether an uninterruptible power supply (UPS) is connected.
Here N/A = not applicable

Software version — Firmware version and storage firmware version of the BlueMon

Mainboard — Firmware version of the mainboard

Plug-on board — Firmware version of the plug-on board

<– — Switches back.

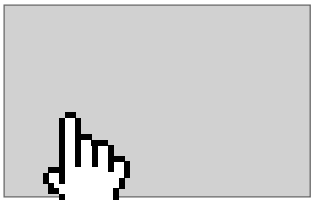
Appendix A – Adjustment of the Touch Display

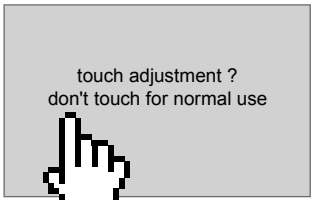
If the display does not respond correctly or only under high pressure, a display adjustment is necessary.

While switching on power, press display until the notice

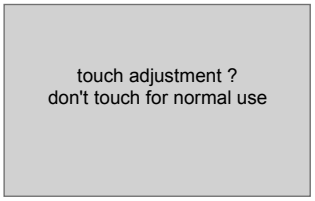
"touch adjustment ?
don't touch for normal use"

appears.

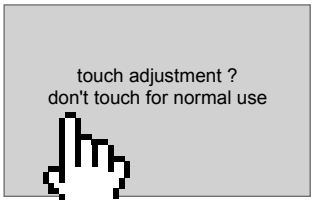




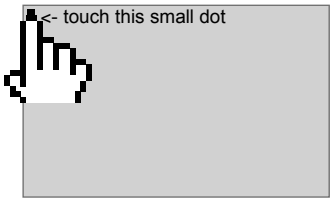
Left off the display immediately!



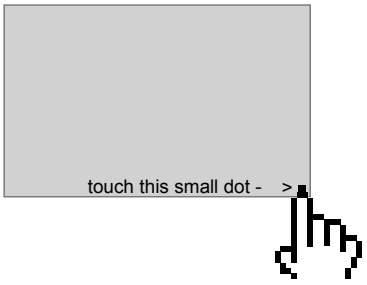
Press the display immediately again for more than one second.



A blinking dot appears at top left.
Press the blinking dot top left.



A blinking dot appears at bottom right.
Press the blinking dot bottom right.

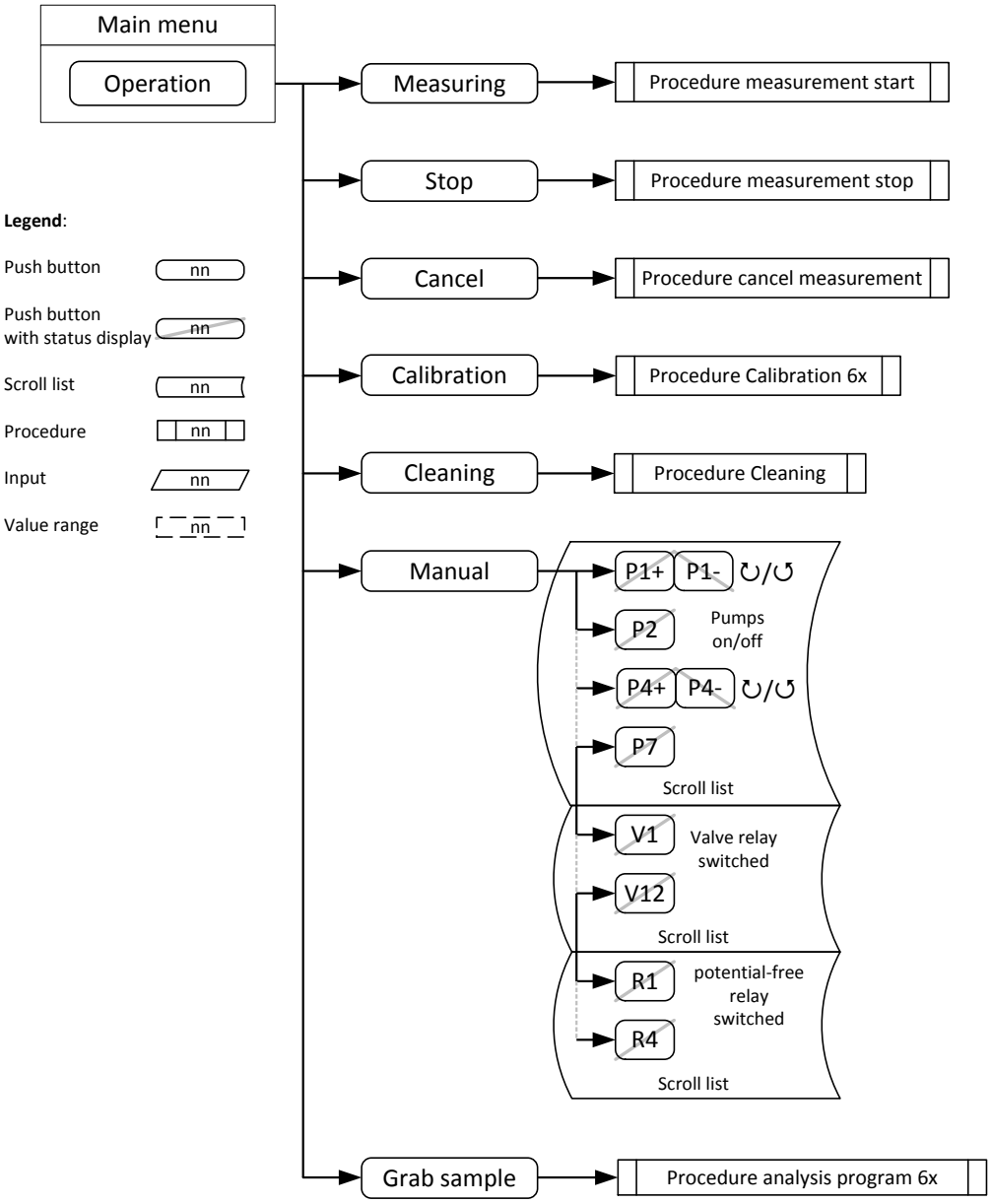


The adjustment is finished.

Appendix B – Menu structure Operation, Parameter, Application and Service

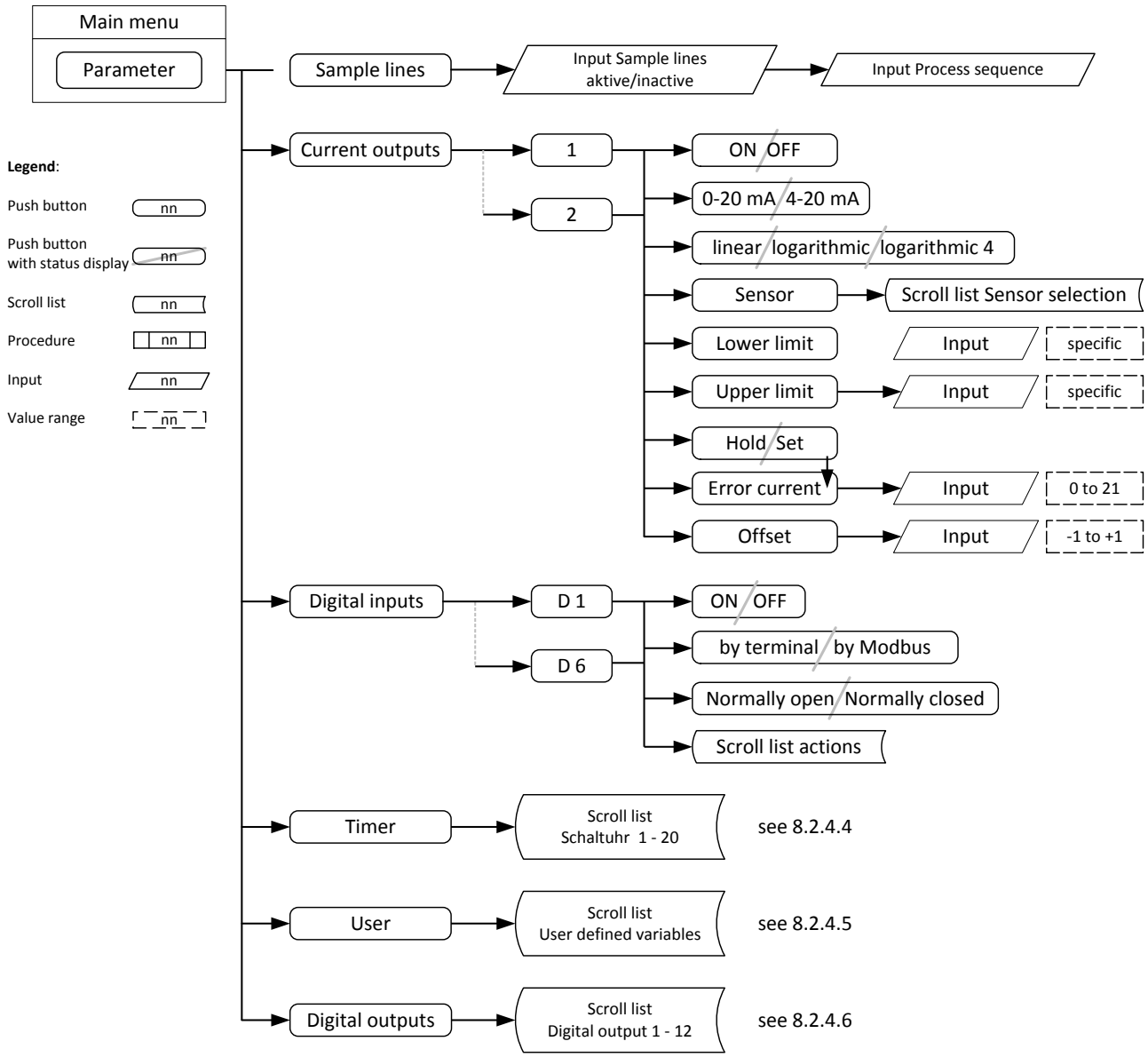
1 Menu structure Operation

see *8.2.1 Operation Modes*



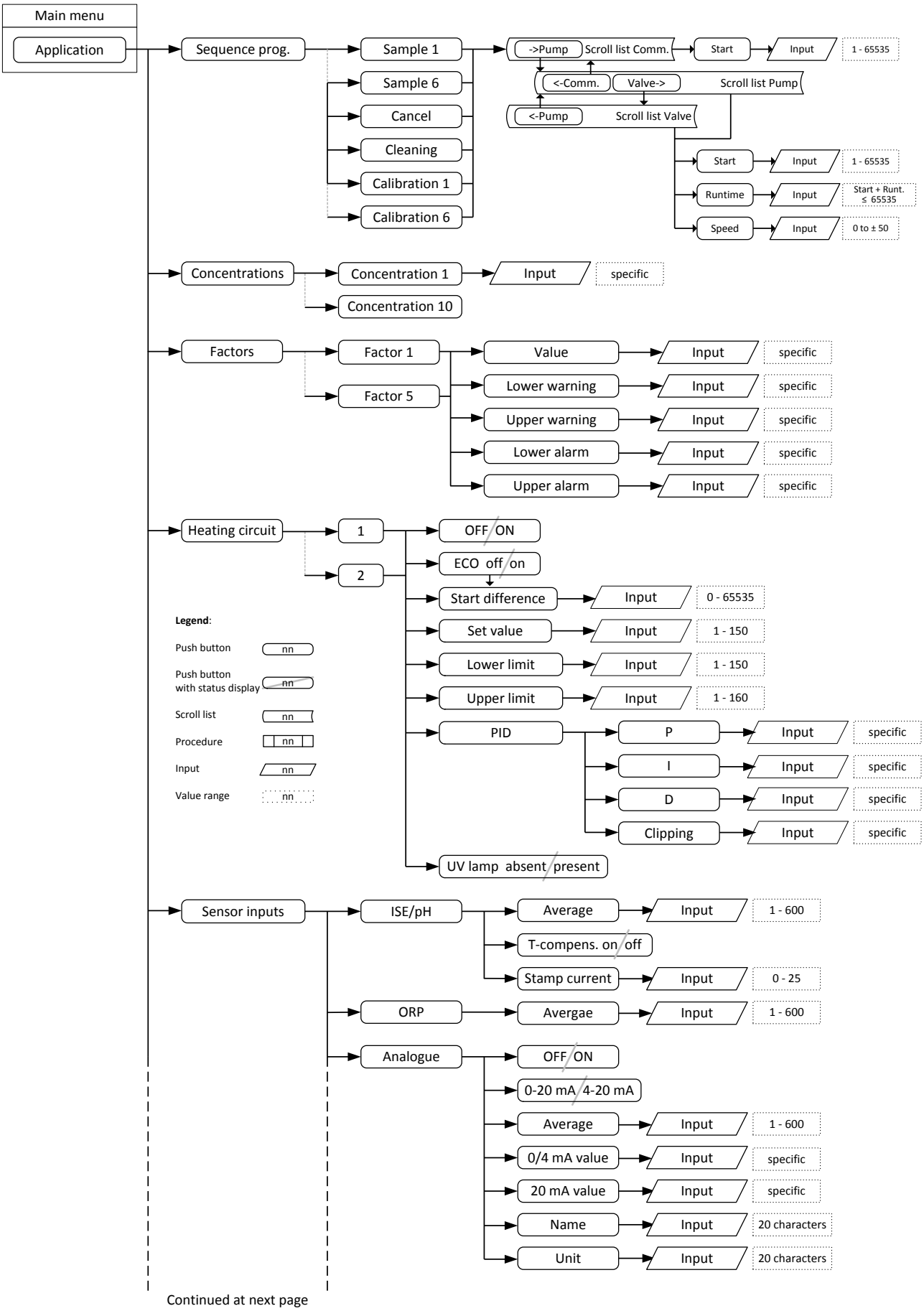
2 Menu structure Parameter

see *8.2.4 Parameter Menu*

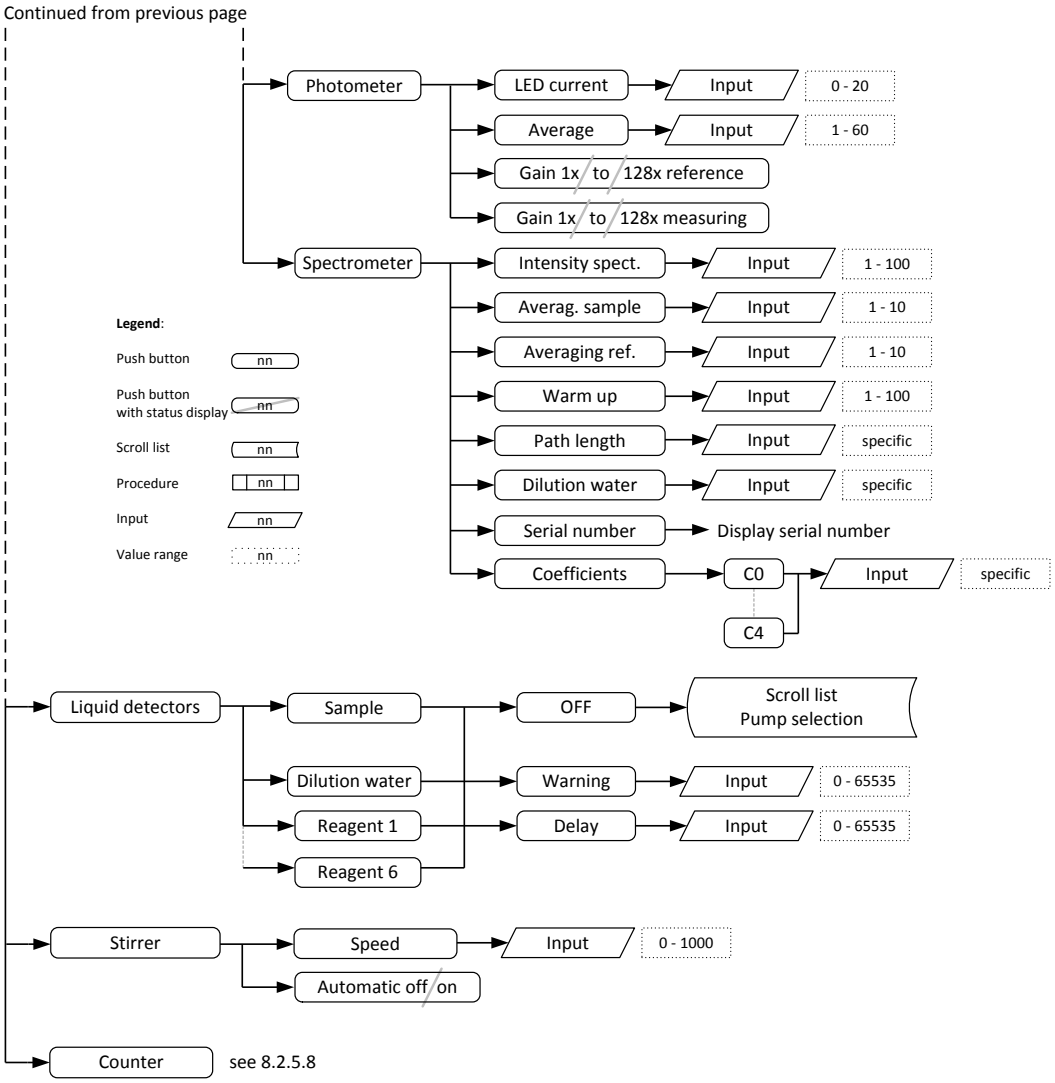


3 Menu structure Application

see *8.2.5 Application Menu*

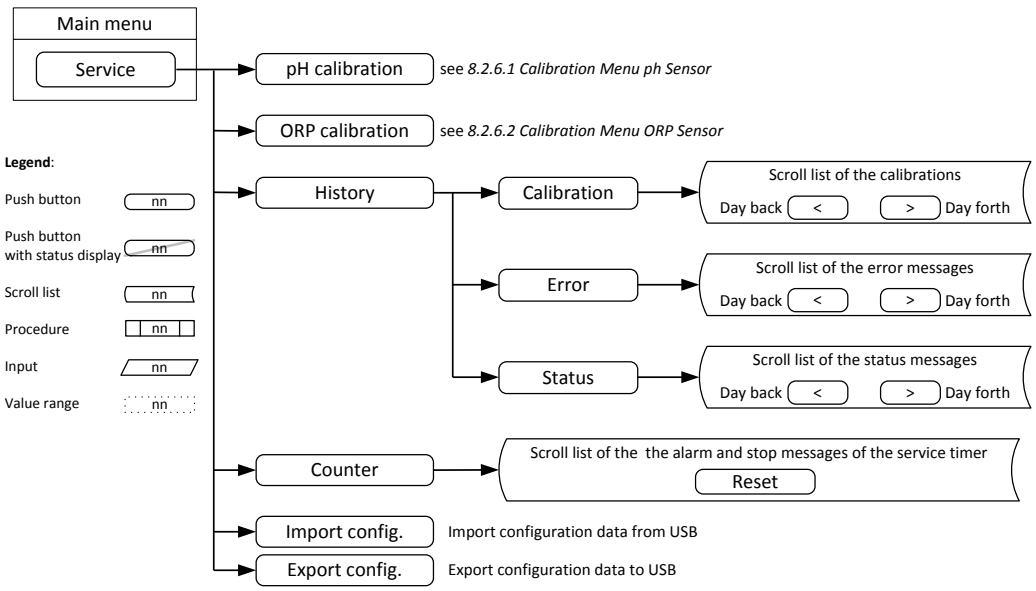


Continued at next page



4 Menu Structure Service

see *8.2.6 Service Menu*



Appendix C – Warning and Error Messages

There are warning messages and error messages. These are displayed in the menu of warning and error messages (see 8.1.5) and in the service history (see 8.2.6.3).

- In case of a **warning message**, the process sequence continues to run. If necessary, parts of the sequence programs are repeated (e.g. during a calibration) to ensure continuation.
  Standard behaviour: ⇨ Device continues to run
- An **error message** executes the **cancel program**, duration approx. one minute. The cancel program interrupts any running program and empties the BlueMon completely into the drain, thereafter the system enters the device status "Error".
  Standard behaviour: ⇨Cancel program ⇨Device status „Error“

Message type: W# = Warning message | F! = Error message

No.	Type	Message	• Cause for deviation from standard behaviour: ⇨ Action
00	F!	Configuration error	• BlueMon configuration not available or faulty
01	F!	CAN bus error	• CAN-bus communication is disturbed
02	F!	Memory error	• internal memory error
03	F!	Extension board communication error	• disturbed communication with the extension board Extension board = Plug-on Board
04	F!	Read program error	• Process sequence not found
05	F!	Photometer error reference beam	• Photometer reference value faulty
06	F!	Photometer error measuring beam	• Photometer measurement value faulty
07	F!	Photometer communication error	• Communication with the photometer is disturbed
08	W#	Heater 1 Safety stop	• Heating 1 – Temperature too long too low ⇨ see *8.2.5.4 Heating Circuits* there *Safety shutdown*
09	F!	Heater 1 Emergency stop	• Heating 1 – Temperature too long too high ⇨ see *8.2.5.4 Heating Circuits* there *Emergency shutdown*
10	W#	Heater 1 Temperature to high	• Heater 1 has exceeded the upper limit value
11	W#	Heater 1 Temperature to low	• Heating 1 has fallen below the lower limit value
12	F!	Heater 1 Sensor error	• Heating 1 is defect
13	W#	UV lamp 1 failed	• UV lamp of Digestor 1 is defect
14	W#	Heater 2 Safety stop	• Heating 2 – Temperature too long too low ⇨ see *8.2.5.4 Heating Circuits* there *Safety shutdown*
15	F!	Heater 2 Emergency stop	• Heating 2 – Temperature too long too high ⇨ see *8.2.5.4 Heating Circuits* there *Emergency shutdown*
16	W#	Heater 2 Temperature to high	• Heater 2 has exceeded the upper limit value
17	W#	Heater 2 Temperature to low	• Heating 2 has fallen below the lower limit value
18	F!	Heater 2 Sensor error	• Heating 2 is defect

19	W#	UV lamp 2 failed	• UV lamp of Digestor 2 is defect
20	F!	Leakage	• BlueMon has a leak ⇨ Emergency stop – Immediate termination of the running program
21	W#	Sample 1 error	• Liquid lack in sample line 1 during an Analysis program ⇨ see *8.2.5.6 Liquid Detectors* there *Liquid Detector 1*
22	W#	Sample 2 error	• Liquid lack in sample line 2 during an Analysis program ⇨ see *8.2.5.6 Liquid Detectors* there *Liquid Detector 1*
23	W#	Sample 3 error	• Liquid lack in sample line 3 during an Analysis program ⇨ see *8.2.5.6 Liquid Detectors* there *Liquid Detector 1*
24	W#	Sample 4 error	• Liquid lack in sample line 4 during an Analysis program ⇨ see *8.2.5.6 Liquid Detectors* there *Liquid Detector 1*
25	W#	Sample 5 error	• Liquid lack in sample line 5 during an Analysis program ⇨ see *8.2.5.6 Liquid Detectors* there *Liquid Detector 1*
26	W#	Sample 6 error	• Liquid lack in sample line 6 during an Analysis program ⇨ see *8.2.5.6 Liquid Detectors* there *Liquid Detector 1*
27	W#	Calibrant error	• Liquid lack in the calibration liquid ⇨ see *8.2.5.6 Liquid Detectors* there *Liquid Detector 1* ⇨ If error is not fixed: Error message 46
28	W#	Dilution water error	• Liquid lack in the dilution liquid see *8.2.5.6 Liquid Detectors* there *Liquid Detector 2*
29	F!	Reagent 1 error	• Liquid lack in the reagent liquid 1 ⇨ see *8.2.5.6 Liquid Detectors* there *Liquid Detector 3*
30	F!	Reagent 2 error	• Liquid lack in the reagent liquid 2 ⇨ see *8.2.5.6 Liquid Detectors* there *Liquid Detector 4*
34	W#	Alarm runtime 1	• Warning message triggered by counter 1
35	F!	Stop runtime 1	• Error message triggered by counter 1
36	W#	Alarm runtime 2	• Warning message triggered by counter 2
37	F!	Stop runtime 2	• Error message triggered by counter 2
38	W#	Alarm runtime 3	• Warning message triggered by counter 3
39	F!	Stop runtime 3	• Error message triggered by counter 4
40	W#	Alarm runtime 4	• Warning message triggered by counter 4
41	F!	Stop runtime 4	• V Error message triggered by counter 4
42	W#	Alarm runtime 5	• Warning message triggered by counter 5
43	F!	Stop runtime 5	• Error message triggered by counter 5
44	W#	Alarm runtime 6	• Warning message triggered by counter 6
45	F!	Stop runtime 6	• Error message triggered by counter 6

46	F!	Calibration fault	• General calibration error
47	W#	Calibration lower warning limit	• Calibration concentration has underrunned the lower warning limit ⇨ Calibration is repeated once If underruning persists ⇨ Warning message
48	W#	Calibration upper warning limit	• Calibration concentration has exceeded the upper warning limit ⇨ Calibration is repeated once If exceeding persists ⇨ Warning message
49	F!	Calibration lower operating limit	• Calibration concentration has underrunned the lower error limit ⇨ Calibration is repeated once If underruning persists ⇨ Error message
50	F!	Calibration upper operating limit	• Calibration concentration has exceeded the upper error limit ⇨ Calibration is repeated once If exceeding persists ⇨ Error message
51	F!	Spectrometer failed	• Spectrometer error
52	F!	Spectrometer AD values	• Spectrometer intensity to high
53	F!	Spectrometer self test	• Spectrometer self test failed
54	F!	Spectrum loading error	• Loading of a spectrum failed
55	F!	Spectrum saving error	• Saving of a spectrum failed
56	F!	Titration configuration error	• Titration configuration not existing
57	F!	Titration sensor error	• Titration sensor not connected or defective
58	W#	Titration error	• Titration fault - Equivalence point 1 not found ⇨ Device continues with the next measurement
59	W#	Titration error	• Titration fault - Equivalence point 2 not found ⇨ Device continues with the next measurement
60	W#	Titration error	• Titration fault - Equivalence point 3 not found ⇨ Device continues with the next measurement
61	W#	Titration error	• Titration fault - Equivalence point 4 not found ⇨ Device continues with the next measurement
62	W#	Maximum titration steps reached	• Maximum number of titration steps reached ⇨ Device continues with the next measurement
63	W#	Titration interpolation error	• Titration interpolation error ⇨ Device continues with the next measurement
64	F!	Liquid detector 1 error	• Liquid detector 1 defective ⇨ Device continues to run without the liquid detector

65	F!	Liquid detector 2 error	• Liquid detector 2 defective ⇨ Device continues to run without the liquid detector
66	F!	Liquid detector 3 error	• Liquid detector 3 defective ⇨ Device continues to run without the liquid detector
67	F!	Liquid detector 4 error	• Liquid detector 4 defective ⇨ Device continues to run without the liquid detector
70	W#	No active sample stream!	• All sample lines are disabled
73	F!	Main board: 5V fault	• The 5 V power supply on the main board is faulty

Appendix D – Display of the Device Activity and the Device Status

The device activity and the device status of the BlueMon are displayed in the menus: Parameter display 1-way, Parameter display 6-way, Measurement overview, Operating mode menu. There in each case in the middle in the top.

Abbreviations: ***ET*= elapsed time** ***TT*= total time**

Display of the sequence elements during the process sequence	**Meaning** Device status „Measuring“ „Calibration“ „Cleaning“
[R:Sample *1 to 6*: *ET*/*TT* **]**	The analysis program of a sample line(1 to 6) is running.
[R:Calibration: *ET*/*TT* **]**	The calibration program is running.
[R:Calibration F *1 to 4*: *ET*/*TT* **]**	The calibration program F1 to F4 is running.
[R:DI-water cal.: *ET*/*TT* **]**	The deionised water calibration program is running.
[R:Cleaning: *ET*/*TT* **]**	The cleaning program is running.
[R:Waiting time: *ET*/*TT* **]**	A waiting time elapses.

[R:] If the process sequence is running (see 8.2.4.1), **R** is displayed.

[T:] If a sequence element is triggered manually (see 8.2.1) or via the timer (see 8.2.4.4), **T** is displayed.

[TS:] If a sequence element is triggered via the timer (see 8.2.4.4) in device status "Standby", **TS** is displayed. After the end of the triggered device activity, the BlueMon returns to "Standby".

Definition: The BlueMon is in **measurement operation** as long as the process sequence or a separately started sequence program is running. This means: The BlueMon is in **measurement operation** when R, TS or TS is displayed.

[Cancel: *ET*/*TT* **]**	The cancel program is running, then device status "Standby".
[Standby]	Device status " Standby"
[S:*Program*: *ET*/*TT* **]** **[S:Waiting time:** *ET*/*TT* **]** **[Stop]**	The sequence stop function is executed. • *Program* = Name of the program that is being completed. • Waiting time for a sequence waiting stop, which is being completed. Then device status "Standby"
[Preheating]	Digestor/heating is preheated to the minimum temperature.
[Service]	The service menu of the BlueMon PC software is opened. Device status "Service”
[Error]	Device status "Error": Operation aborted after an error message

Appendix E – Sensor Status Messages

No.	Description	Display
0	Sensor sends data.	Measurement value
1	Sensor sends no data.	**No Data**
2	A new sensor is recognized. (temporary at sensor initialization)	**Wait...**
3	Sensor-ID assigning. (temporary at sensor initialization)	**Wait...**
4	Measurement value is unreliable. (currently only for spectrometers)	[*Measurement value*]
30	Formula error	**Error at line *n***
31	Unknown sensor is used in the formula.	**? Sensor**
33	Default calculation time in for and while loops is exceeded.	**Calc Timeout**
50	Minimal measurement value underrun (virtual sensor)	**< *minimal measurement value***
51	Maximal measurement value overrun (virtual sensor)	**> *maximal measurement value***
52	Internal communication error	**COM**
53	Underrun of the lower limit of the AD converter	**ADC min.**
54	Overrun of the upper limit of the AD converter	**ADC max.**
55	General device error	**Dev Error**
57	Clearwater calibration interval at Spectrometer exceeded The resetting is carried out after a clearwater calibration.	No message - Measured value is marked orange.

The entries in this column can be queried using AMS Formula*.

The entries in this column appear as status messages in the parameter display 1-way and 6-way.

In 6-way parameter display (see *8.1.2 Parameter Display 6-way*) status messages are displayed shortened.

In 8-way parameter display (see *8.1.3 Parameter display 8-way (Tiles)*) no status messages are displayed, but highlighted in colour:

yellow ⇨ Status no. 0 | orange ⇨ Status no. 4, 50, 51, 57 | red ⇨ all other

* AMS-Formula is part of the BlueMon PC Software.