s::can
Intelligent. Optical. Online.

Manual

oxi::lyser

September 2021 Release

Table of Contents

1 General

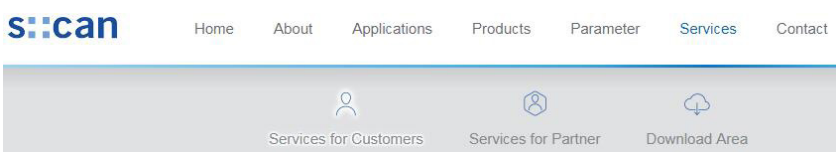
This manual contains, firstly, general information (chapter 1) and safety guidelines (chapter 2). The next chapter (chapter 3) provides a technical description of the s::can product itself as well as information regarding transport and storage of the product. In further chapters the installation (chapter 4) and the initial startup (chapter 5) are explained. Furthermore information regarding calibration of the device (chapter 6), data management (chapter 7), how to perform a functional check (chapter 8) and maintenance (chapter 9) can be found in this manual. Information regarding troubleshooting (chapter 10), the available accessories (chapter 11) and the technical specifications (chapter 12) complete the document.

Each term in this document that is marked *italic and underlined*, can be found on the display of your controller or as lettering on your s::can product.

In spite of careful elaboration this manual may contain errors or incompletion. s::can does not assume liability for errors or loss of data due to such faults in the manual. The original manual is published in English and German by s::can. This original manual serves as the reference in case discrepancies occur in versions of the manual after translation into third languages.

This manual, at the time of its publication (see release date printed on the top of this document), concerns the s::can products listed in chapter 3. Information and technical specifications regarding these items in s::can manuals from earlier release dates are herewith replaced by this manual.

The electronic version (pdf-document) of this manual is available on the s::can Customer Portal (Services for Customer) of the s::can webpage (www.s-can.at).



2 Safety Guidelines

Installation, electrical connection, initial startup, operation and maintenance of any s::can product as well as complete s::can measuring systems must only be performed by qualified personnel. This qualified personnel has to be trained and authorised by the plant operator or by s::can for these activities. The qualified personnel must have read and understood this manual and have to follow the instructions contained in this manual.

For proper initial startup of complete s::can measuring systems, the manuals for the controller and software used for operation (e.g. con::lyte, con::cube, con::nect, moni::tool), the connected probes and sensors as well as the used additional devices (e.g. compressor) have to be consulted.

The operator has to obtain the local operating permits and has to comply with the joint constraints associated with these. Additionally, the local legal requirements have to be observed (e.g. regarding safety of personnel and means of labour, disposal of products and materials, cleaning, environmental constraints). Before putting the measuring device into operation, the operator has to ensure that during mounting and initial startup – in case they are executed by the operator himself – the local legislation and requirements (e.g. regarding electrical connection) are observed.

All s::can products are leaving our factory in immaculate technical and safety conditions. Inappropriate or not intended use of the product, however, can cause danger! The manufacturer is not responsible for damage caused by incorrect or unauthorised use. Any kind of manipulation of the instrument is strictly prohibited - except for the activities described in this document.Conversions and changes to the device must not be made, otherwise all certifications and guarantee / warranty become invalid. For details regarding guarantee and warranty please refer to our general conditions of business.

2.1 Declaration of Conformity

This s::can product has been developed, tested and manufactured for electromagnetic compatibility (EMC) according to applicable European standards, as defined in the declaration of conformity.

A CE-mark is applied on the device. The declaration of conformity related to this marking can be requested from s::can or your local s::can sales partner or can be downloaded from the s::can Customer Portal.

2.2 Special Hazard Warning

Because the s::can measuring systems are frequently installed in industrial and communal waste water applications, one has to take care during mounting and demounting of the system, as parts of the device can be contaminated with dangerous chemicals or pathogenic germs. All necessary precautions should be taken to prevent endangering of one’s health during work with the measuring device.

3 Technical Description

3.1 Intended Use

The oxi::lyser is an optical sensor designed for the continuous monitoring of the concentration of dissolved oxygen (O_2) in the water. The value is expressed in mg/l or % saturation. The sensor provides the measured temperature as an additional parameter.

In all types of applications, the respective acceptable limits, which are provided in the technical specifications in the respective s::can manuals, have to be observed. All applications falling outside of these limits, and which are not authorised by s::can GmbH in written form, do not fall under the manufacturer's liability.

The device must only be used for the purpose described in this manual. Use in applications not described in this manual, or modification of the device without written agreement from s::can, is not allowed. s::can is not liable for claims following from such unauthorised use. In such a case, the risks are the sole responsibility of the operator.

3.2 Functional Principle

A very specific energy wavelength (λ = 475 nm) is transmitted to a ruthenium compound immobilised in a sol-gel matrix. The ruthenium compound will absorb this energy, changing the energy level of the outer electron of the ruthenium ion. After a brief delay, the electron will relax back to its original energy state while in the process emitting the excess energy as a photon. This photon has a different, longer, specific wavelength than the light used for the excitation of the ruthenium compounds. This process is called fluorescence.

When the intensity of the light is tightly controlled, the amount of fluorescence is both predictable and repeatable. When oxygen molecules are present, the amount of fluorescence is reduced, which is referred to as fluorescence quenching. Through measuring the amount of quenching it is possible to quantify the amount of oxygen present.

The measured temperature will be used to compensate the oxygen reading (see section 12).

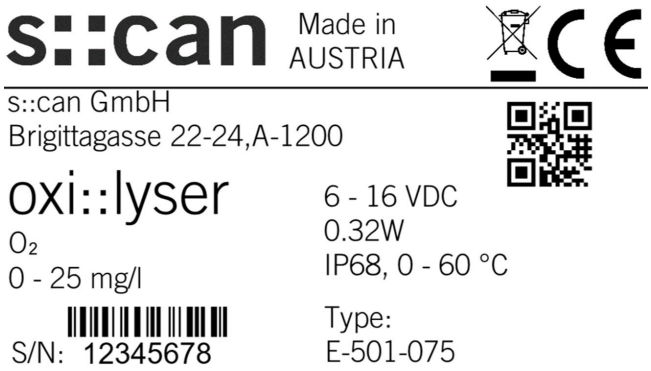
3.3 Product

The following device variants of the oxi::lyser are available. Regarding detailed information of the device variants please refer to the technical specifications located at the end of this manual.

Type	Specification	Range
E-501-075	oxi::lyser for dissolved oxygen (O_2) with 10 m fixed cable	0 - 25 mg/l 0 - 100 %

The device is typified by a type label, as shown below, that contains the following information:

- Manufacturer‘s name and country of origin
- Several certification marks
- Device name
- Measuring range
- Bar code
- Device serial number (S/N)
- Information on power supply
- Environment rating (IP)
- Acceptable temperature limits
- Item number (Type)
- QR code to s::can Support



1 Sensor housing

2 Connection thread for sensor mounting ($1^1/_2$ inch BSPT)

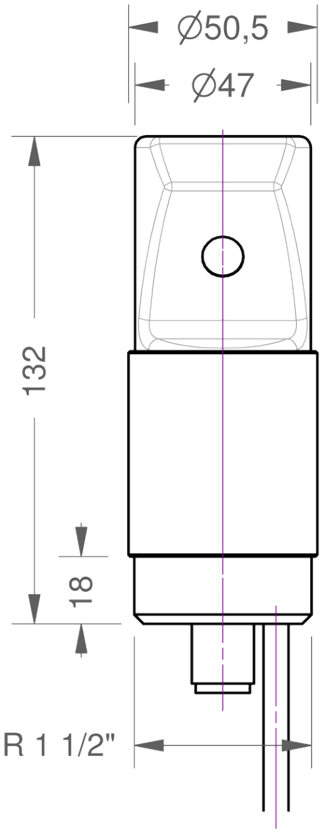
3 Sensor cable

4 Connection for automatic cleaning

5 Measuring element

6 Temperature sensor

7 Cleaning outlet for compressed air



Dimensions of oxi::lyser in mm

3.4 Storage and Transport

The temperature limits for device storage and transport, which are described in the section technical specifications, have to be observed at all times. The device shall not be exposed to strong impacts, mechanical loads or vibrations. The device should be kept free of corrosive or organic solvent vapours, nuclear radiation as well as strong electromagnetic radiation.

Transport should be done in a packaging that protects the device (original packaging or protective covering if possible).

This product is marked with the WEEE symbol to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EC. The symbol indicates that this product should not be treated as household waste. It must be disposed and recycled as electronic waste. Please assist to keep our environment clean.

3.5 Scope of Delivery

Immediately upon receipt, please check the received consignment for completeness on the basis of the delivery note and check for any possible damage incurred during shipping. Please inform the delivering dispatcher and s::can immediately in case of any damages in transit.

The following parts should be included in the delivery:

- s::can oxi::lyser (part-no. E-501-075)
- s::can manual oxi::lyser (part-no. S-22-M)

The following parts could be included in the delivery if ordered as an option:

- Extension cable (part-no. C-210-SENSOR, C-220-SENSOR or C-230-SENSOR)
- Carrier for oxi::lyser (part-no. F-11-OXI-AMMO)
- Fixing adapter for railing (part-no. F-15)
- Flow cell setup tap water for oxi::lyser (part-no. F-45-OXI)
- Flow cell setup waste water for oxi::lyser (part-no. F-48-OXI)
- Pressure connection for automatic cleaning (part-no. B-41)

In case of incompleteness please contact your s::can sales partner immediately!

3.6 Product Updates, Other

The manufacturer reserves the rights to implement, without prior notice, technical developments and modifications in the light of continuous product care.

4 Installation

4.1 Environment

The correct installation of measuring instruments is an important prerequisite for satisfactory operation. Therefore the following checklist for the installation can be used to ensure that all sources for potential operational problems can be ruled out to the greatest possible extent during the installation, allowing the monitoring system to operate properly.

- Favourable flow conditions (little turbulence, acceptable flow rate, etc.)
- Unadulterated, representative measuring medium
- Measuring medium is in equilibrium state (no gas release, no precipitation, etc.)
- No external interferences (no electric and electro-magnetic interferences by leakage current, earth fault of pumps, electric motors, electric power lines, etc.)
- Easy accessibility (mounting, sampling, functional check, demounting)
- Availability of sufficient space (probe / sensor, installation fitting, controller, etc.)
- Adherence to limit values (see technical specifications located at the end of this manual)

- Power supply for controller (operational reliability, voltage, power, peak free)
- Oil- and particle free compressed-air supply (optional for automatic probe / sensor cleaning)
- Best possible weather and splash water proof conditions
- Shortest possible distances between system components (probe / sensor – controller – compressed-air supply – energy supply)
- Correct dimensioning, mounting and protection of all cables and lines (non-buckling, no risk of stumbling, no damage etc.)

4.2 Connection of automatic Cleaning

The compressed air connection set (B-41) contains components necessary to connect the sensor cleaning located on top of the oxi::lyser to the cleaning valve. The compressed air connection is performed by the following steps (see figures on the right also):

- Remove dummy insert [1] from pressure connection on top of the sensor by pushing the ring and pulling out the dummy insert.

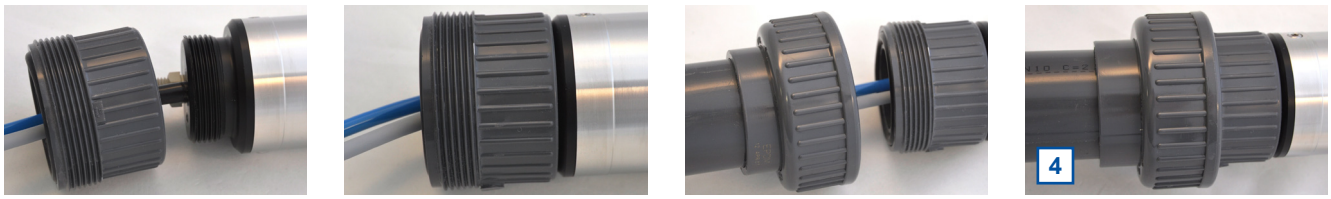
- Push the cleaning hose into the push-pull fitting.

4.3 Mounting with Sensor Carrier

This section explains how the oxi::lyser can be installed in the sensor carrier (part-no. F-11-OXI-AMMO). Regarding the dimensions of this installation accessories please refer to section 11.1.2.

The installation of the sensor with this carrier is performed by the following steps:

- Separate the sensor carrier into different parts by unscrewing the union nut [2].
- Fix the insert part of the sensor carrier without thread [1] to the extension pipe [4] (OD 50 mm or $1^1/_2$ inch - has to be provided by customer) firmly (e.g. using a PVC glue).
- Lead the sensor cable and the air hose for automatic sensor cleaning through the sensor carrier.
- The part of the sensor carrier with double thread [3] will be screwed on top of the sensor (cable side).
- Lead the sensor cable and the air hose for automatic sensor cleaning through the prepared extension pipe.
- Mount the oxi::lyser onto the sensor carrier with the extension pipe using the union nut [2].

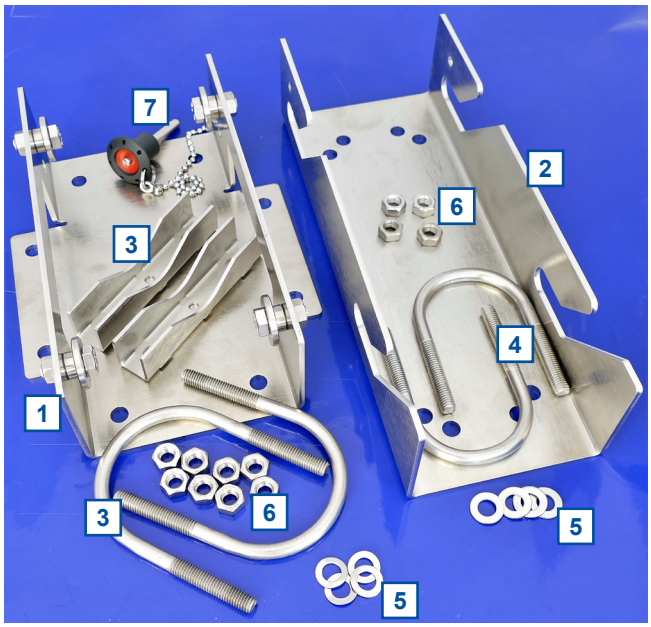


For submerged installation the distance to the water surface should be min. 60 cm and to lateral boundaries min. 90 cm. The vertical installation will avoid the accumulation of air bubbles on the measuring element.

4.4 Monting of Railing Bracket / Fixing Adapter

This section explains the mounting of the railing bracket (fixing adapter) with the extension pipe on the railing in case of a submersed installation.

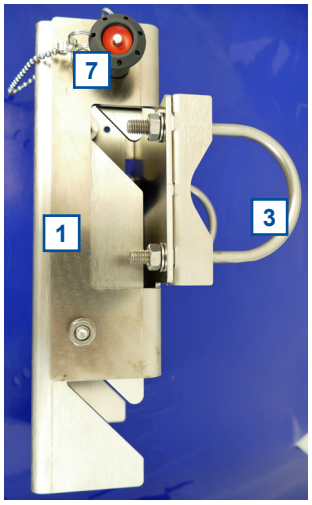
The following parts are included in the delivery of the railing bracket F-15:

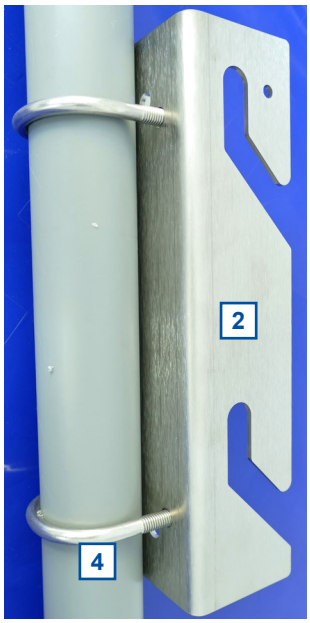


1. Fixing adapter for railing
2. Fixing adapter for extension pipe of sensor carrier
3. Fixing clamp for railing ($2^1/_2$ inch)
4. Fixing clamp for extension pipe of sensor carrier (50 mm)
5. Washers for fixing clamp
6. Screw nuts for fixing clamp
7. Safety pin for railing bracket

Once the sensor is installed in the sensor carrier with the extension pipe (see section 4.3) the mounting of the railing bracket is performed by the following steps:

- Fasten the fixing adapter for the railing [1] with the fixing clamp [3], the screw nuts and the washers, included in delivery, onto the railing.
- Fasten the other part of the fixing adapter [2] with the fixing clamp [4], the screw nuts and the washers, included in delivery, onto the extension pipe of the sensor carrier.
- Now insert the sensor with the extension pipe into the railing bracket from top.
- Secure the railing bracket with the locking pin [7] to prevent it from being pulled out unintenionally.
- If necessary, adjust the inclination of the extension pipe and the immersion depth of the sensor. To do this, loosen the corresponding screw nuts of the fixing clamps.





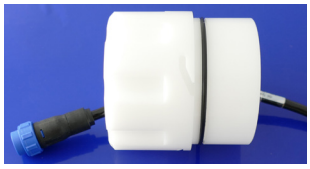
4.5 Mounting in Flow Cell

The following sections explain how the oxi::lyser can be installed in a flow cell. There are two types of flow cell available, one for tap water (part-no. F-45-OXI) and one for waste water (part-no. F-48-OXI). For both flow cells a specific adapter has to be mounted onto the oxi::lyser (see section 4.5.1). Regarding the dimensions of these flow cells please refer to section 11.1.3 and 11.1.4.

4.5.1 Mounting Adapter of Flow Cell

The mounting of the flow cell adapter on the sensor is performed by the following steps:

- Turn the sensor adapter to the left to unlock it and pull it out of the flow cell.
- Lead the sensor cable through the sensor adapter from bottom to top.
- Screw the sensor into the adapter until hand tight. Also ensure the correct fit of the o-ring sealing.



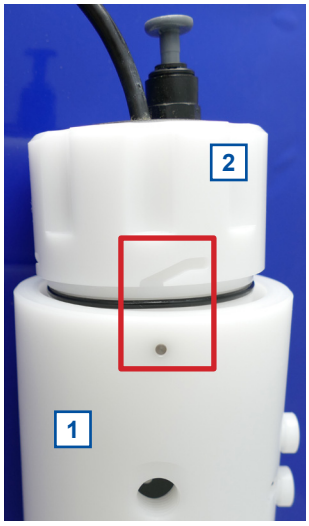
For easier handling put a little bit of grease onto the black o-rings. In case the flow cell will leak on top, the thread of the oxi::lser can be wrapped around with some teflon strip before the sensor is screwed into the adapter.

4.5.2 Mounting in Flow Cell for Tap Water

The following parts are included in the delivery of the flow cell F-45-OXI:

1. Flow cell for tap water
2. Sensoradapter for flow cell
3. 2 fixing holders for mounting of flow cell on a system panel (micro::station / nano::station) or a flat wall
4. Metal bracket to fix the flow cell on a system panel (micro::station / nano::station) or a flat wall

Once the flow cell adapter is fixed on the sensor (see section 4.3.1) the installation into the flow cell is performed by the following steps:



- Place the sensor in the opening of the flow cell in that way, the grooves of the flow cell adapter are aligned with the four metal pins of the flow cell (see red mark in the figure on the right).
- Now push the sensor down and turn it clockwise to fix it into the bayonet lock.
- The flow cell can be mounted onto an s::can panel or a flat wall using the 2 fixing holders and the metal bracket.

4.5.3 Mounting in Flow Cell for Waste Water

The following parts are included in the delivery of the flow cell F-48-OXI:

1 Flow cell for waste water

2 Sensoradapter for flow cell

3 O-ring sealing

Once the flow cell adapter is fixed onto the sensor (see section 4.5.1) the installation into the flow cell is performed by the following steps:

- Place the sensor in the opening of the flow cell in that way, the grooves of the flow cell adapter are aligned with the four metal pins of the flow cell (see red mark in the figure on the right).
- Now push the sensor down and turn it clockwise to fix it into the bayonet lock.

The measuring path has to be oriented parallel to flow direction.

5 Initial Startup

Once the assembling, mounting and installation of the sensor have been completed and checked (see chapter 4) the initial startup of the s::can monitoring system will require the following actions, in the order presented below:

- Connect the sensor to the controller used for operation (see section 5.1 and 5.2).
- Establish power supply to the controller (please refer to the manual of the controller) and wait until the operation software has started up.
- Perform initialisation of the sensor. Refer to section 5.3.1 in case of using a con::lyte D-31x, refer to section 5.3.2 in case of using con::lyte D-320 and refer to section 5.3.3 in case of using moni::tool.
- Perform parameterisation of the sensor. Refer to section 5.4.1 in case of using a con::lyte D-31x, refer to section 5.4.2 in case of using con::lyte D-320 and refer to section 5.4.3 in case of of using moni::tool.
- Configure the measuring interval; additional information can be found in the respective manual of the controller.
- Configure the settings for the automatic cleaning in case required (see section 12).
- In case required, configure the digital, analogue and fieldbus outputs of the controller.
- Check the readings obtained for plausibility after sufficient running-in time.
- If necessary calibrate the readings of the sensor in stable water quality (see chapter 6).

5.1 Controller for Operation

For proper operation of the sensor you will need one of the following controller and operating software respectively.

Controller	Type	Software
con::lyte	D-318, D-319	V5 or V6
con::lyte	D-320	V7
con::cube	D-315, D-330	moni::tool V3, V4

s::can recommends to use the most actual version of the operating software on the controller. For service operation with ana::pro please refer to section 10.3.4.

5.2 Connection to the Controller

The sensor will be delivered with fixed cable with plug. Ensure that the sensor plug and the connector are dry and clean. Otherwise communication errors and / or device damage might occur.

In case the controller does not supply enough sockets, the distribution box for sensors C-41-HUB can be used.

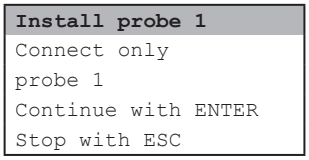
5.3 Probe Initialisation

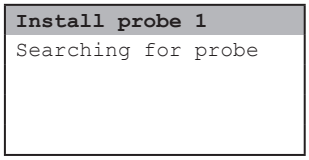
For operating one or several probes using one operation terminal it is necessary to allocate an individual address to every probe. This can be done during probe initialisation at which the probe has to be recongnized first by the controller for operation and then a modification of the actual (preset) probe address might be performed. The corresponding address will be stored on the respective probe. For s::can probes and sensors of the same type the same address is preset ex factory.

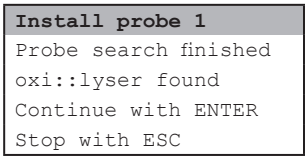
5.3.1 Probe Initialisation using con::lyte D-31x

The con::lyte should not be powered down or switched off during the initialisation process. In case of rebooting of the con::lyte during the initialisation process (e.g. caused by loss of power supply) the complete procedure of probe initialisation has to be repeated.

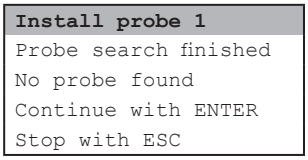
- Establish the power supply to the con::lyte and select entry *Settings / Parameter settings / Install Probes* in the main menu.
- Connect the probe to the con::lyte (see section 5.2).
- Push the button *Enter*, which starts the automatic search procedure for the connected probe. Once the probe is found, address 1 will be allocated. This procedure can last several seconds (see figures below).
- The successful completion of the initialisation will be displayed over a user message. If this message is displayed the initialisation procedure can be finished by pushing the button *Esc*.







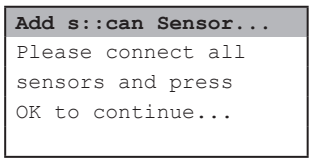
A user message will also be displayed when no probe is detected. In this case please check the following before repeating the procedure for probe initialisation:



- Is only one probe connected to the con::lyte?
- Is the probe connected properly?
- Are all wires of the con::lyte socket in the terminal compartment correctly tightened?

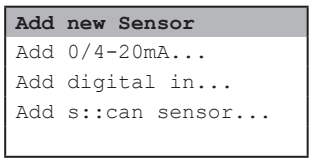
5.3.2 Probe Initialisation using con::lyte D-320

At the initial start-up the con::lyte D-320 provides an automatic probe and sensor initialisation procedure (see figures on the right). After connecting all probes and sensors to the appropriate plugs of the con::lyte (see section 5.2) and pushing the *OK* button, the probe and sensor initialisation starts.

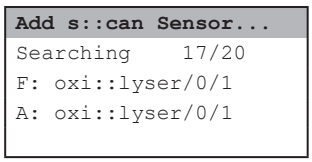


If sensor will be initialized at a later date, the following steps are needed:

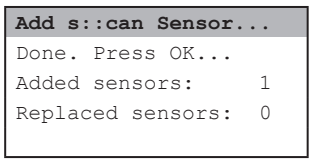
- Switch to Status display by using the *Left-* or *Right* button.
- Push *Function* button, select menu *Manage sensors...* and confirm with *OK*.
- Select menu *Add sensor ...* and confirm with *OK*.
- Connect sensor to the D-320 (see section 5.2).
- Select menu *Add s::can sensor ...* and confirm with *OK*.



As soon as the entry is confirmed by pushing the *OK* button, the con::lyte will automatically search the Modbus port for a new sensor and will add the new sensor to the sensor list.



After adding a new probe or sensor, the parameters can be added in the parameter screen manually (see section 5.4.2 and menu *Add parameters...*).



In case the installation failed, the message *Error adding!* will be displayed.

5.3.3 Probe Initialisation using moni::tool

1 Click the *Service* tab on the moni::tool screen.

2 Login as *Administrator* with Password *admin1* in the login window.

3 Click on an empty sensor icon (*Add new Sensor*) to initiate the initialisation process.

4 An automatic search procedure will start, searching for the connected sensor.

5 When the automatic search prodedure is finished, all connected probes and sensors will be displayed. Those sensors that are connected for the first time and not installed will have the Status *Found new sensor*. These sensors are listed as *New Sensors* below also.

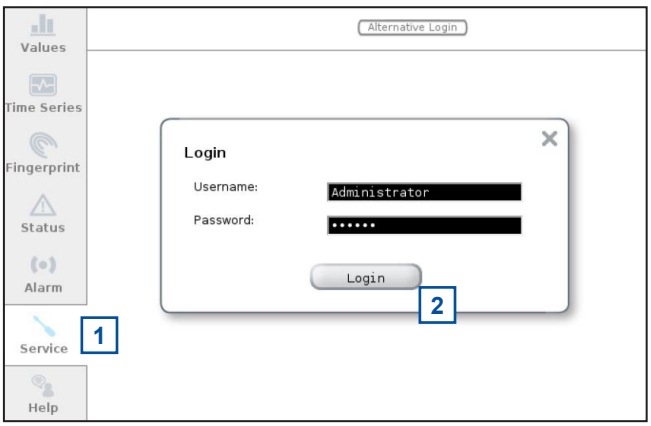
6 If needed the suggested *Sensor name* can be modified. This name will be used in the system overview of the *Status* and *Service* display also.

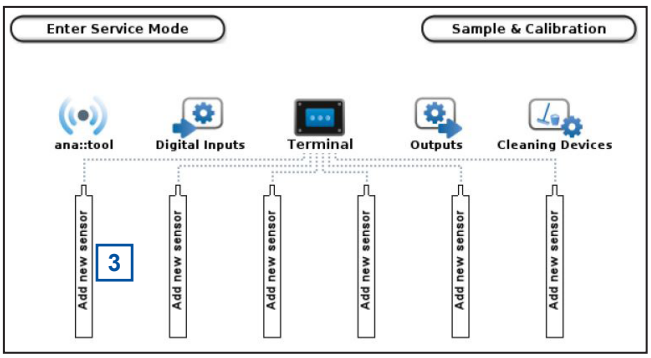
7 To install the new sensor click either on the blue + sign on the right side of the sensor or the button *Install All*.

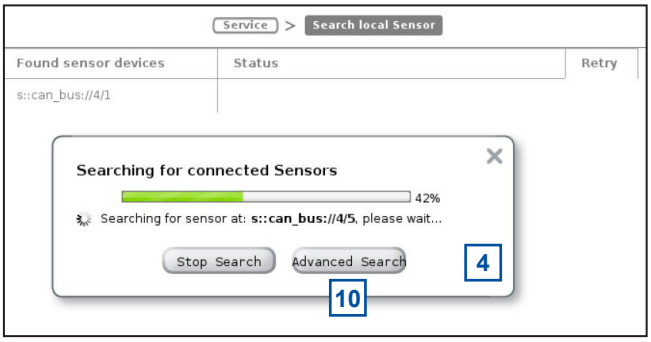
8 moni::tool will install the sensor and switch to the *Service* display. The new sensor is displayed in the system overview.

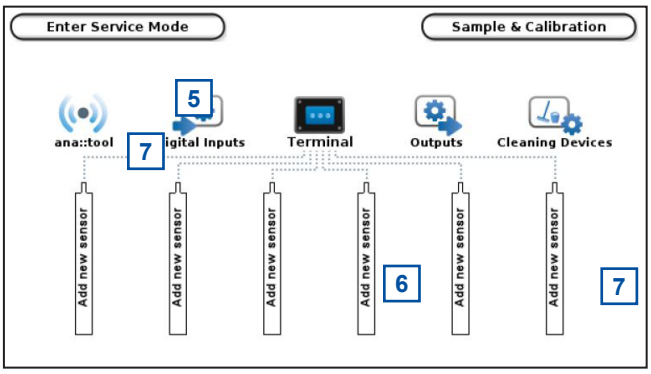
9 Push the button *Leave Service Mode* located on the upper left side to start the measuring process.

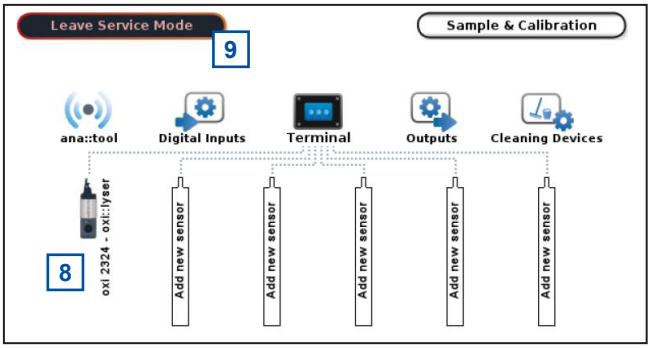
10 When pushing the button *Advanced Search* the method how the sensor is connected (*Connection methode)*, the used *COM-Port* and the *Address* can be defined exactly. This option shall be used by advanced users only.











5.4 Probe Parameterisation

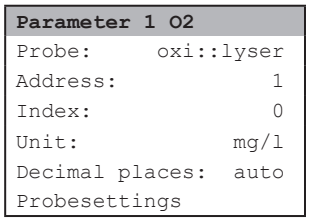
The following table is an overview of the parameters that can be measured with this sensor:

Sensor / Part-no.	Parameter	Parameter-index	Name [Unit]	Decimal places
oxi::lyser E-501-075	Oxygen	0	O2 [mg/l]	2
	Temperature	1	Temp. [°C]	1

5.4.1 Probe Parameterisation using con::lyte D-31x

After successful probe initialisation (see section 5.3.1) the measuring parameters of the sensor will be displayed on the display of the con::lyte automatically. If needed the measuring parameters can be configured individually using the menu item *Settings / Parameter settings / Parameter n* (*Settings / Parameterconfig / Parameter n* with older versions).

The name of the *Probe* or sensor used as a source of the parameter is displayed in the upper line (e.g. oxi::lyser). If several probes or sensors are installed the instrument from which a parameter needs to be displayed can be selected here. Under the entry Probe the *Address* that has been allocated to that probe is displayed as an additional information. The *Index* specifies the place of the corresponding parameter onto the allocated probe. The *Unit* of the selected parameter is displayed in the line below (*mg/l*, *SAT* or *ppm*). The item *Decimal places* enables settings of the number of displayed decimal places (between *0* and *4*). With the default setting *auto* the number of decimal places will be automatically set by the sensor.

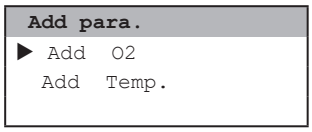


Finally the submenu *Probesettings* enables the configuration of the internal filter (*Filter*) depending on the local power supply (*50 Hz* or *60 Hz*).

5.4.2 Probe Parameterisation using con::lyte D-320

After successful probe initialisation (see section 5.3.2) the needed measuring parameters of the sensor have to be added to the parameter display. This is performed by the following steps:

- Switch to status display with *Left-* or *Right* button.
- Push *Function* button, select menu *Manage sensors...* and confirm with *OK*.
- Select *oxi::lyser/0/x* and confirm with *OK*.
- Select menu *Add parameters...* and confirm with *OK*.
- Select needed parameter and confirm with *OK*.



The selected parameter will be displayed now on the next free position of the parameter display. The default display configuration is used. Changing the display format is performed by the following steps:

- Select the parameter in der parameter display with *Up-* or *Down* button.
- Push *Function* button.
- Select menu *Display settings...* and confirm with *OK*.

In the displayed parameter configuration the following settings can be modified.

- *Name* Displays the actual name of the paramter.
- *Unit* Displays the actual unit of the paramter.

P1/O2	
Name:	O2
Unit:	mg/l
Disp.Format:	2
Load Defaults	

To change the name or unit of the parameter, select the entry with *Up-* and *Down* buttons and by pushing the *OK* button the name can be changed with *Up-*, *Down-*, *Left-* and *Right* buttons. Pushing the *OK* button confirms the new name.

Please note that change of parameter name or unit will not change the parameter configuration itself (e.g. if you change the parameter name NO_3-N to NO_3 the reading will still be NO_3-N).

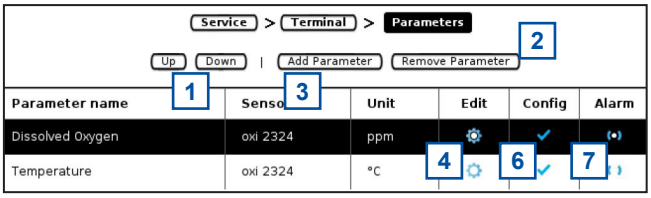
- *Disp.Format* Within this line the number of displayed decimal places (between 0 and 5) can be set. Please note that in case of too many digits high values can not be displayed and the parameter reading will switch to plus signs (++.+++++).
- *Load Defaults* Confirming this entry by pushing the *Ok* button will restore the default display settings from the sensor.

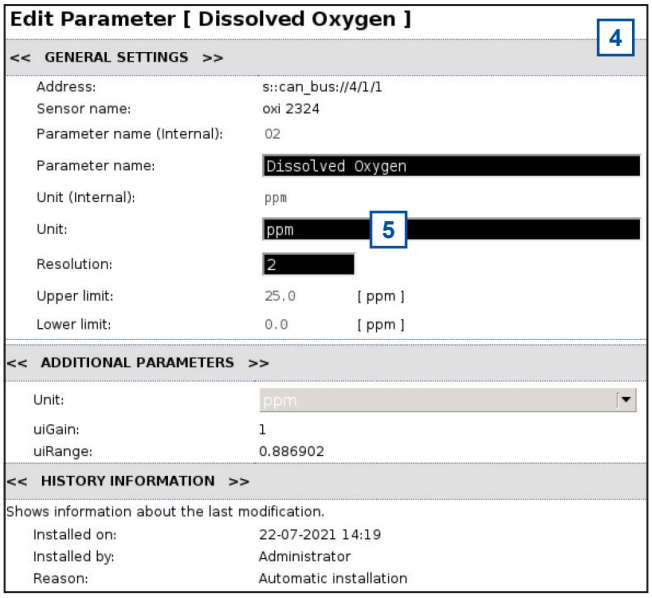
All modifications performed by the operator within these settings menu will be documented in the logfile of the con::lyte (see manual con::lyte D-320).

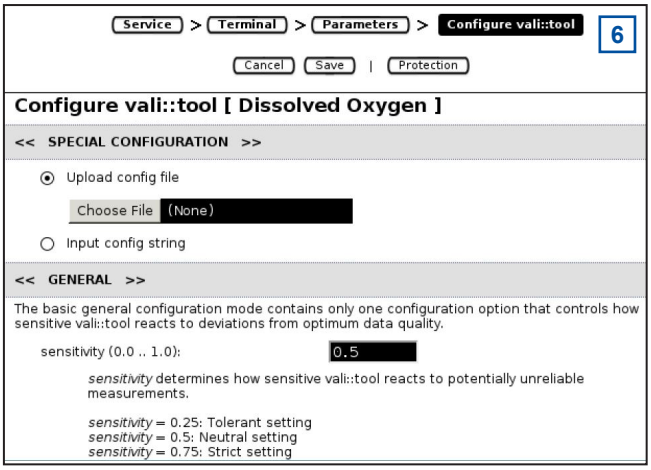
5.4.3 Probe Parameterisation using moni::tool

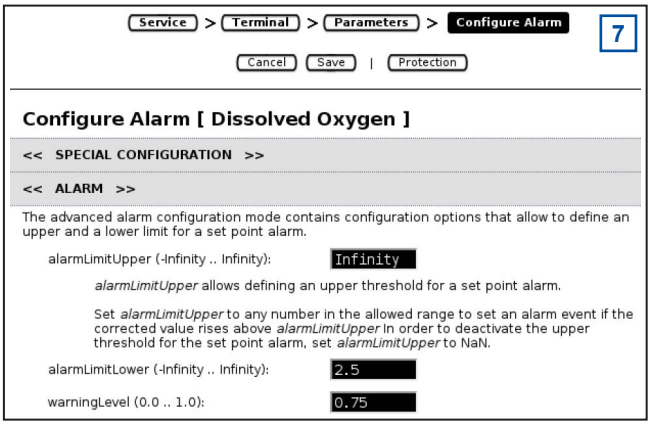
After successful probe initialisation (see section 5.3.3) all parameters available on the probe will be installed and automatically displayed on the *Value* screen of moni::tool. If not all new parameters are displayed, please check maximal number of parameters of your monit::tool license. If you want to configure the measuring parameters induvidually this can be done using the menu item *Service / Terminal / Parameter*.

After selecting that menu item a list of all installed parameters is displayed. After selecting one or several parameters by clicking on them the following activities can be performed:









1 Pushing the button *Up* or *Down* will move the selected parameter to a higher or lower position in the *Value* display.

2 Pushing the button *Remove Parameter* will delete the selected parameter from *Value* display.

3 A new parameter can be added to the *Value* display by pushing the entry *Add Parameter*.

4 A click on the blue wheel (*Edit*) on the right hand side of the parameter will display the actual parameter settings. Depending on the actual *Service Level* different settings (general, additional, history) are displayed.

5 The displayed *Parameter name*, the *Unit* and the number of digits (*Resolution*) can be modified.

6 A click on the blue *Config* icon on the right hand side of the parameter enables the check and modification of the vali::tool settings. In Service Level *Basic* the *sensitivity* can be set between 0 and 1. Please refer to manual moni::tool for further information.

7 A click on the blue *Alarm* icon on the right hand side of the parameter enables the check and modification of the ana::tool settings. An upper (*alarmLimitUpper*) and a lower (*alarmLimitLower*) threshold for the alarm can be defined. In addition a warning can be set between 0 (0%) and 1 (100%) of the alarm threshold. Please refer to manual moni::tool for further information.

6 Calibration

The oxi::lyser is precalibrated in the factory and as such can be used immediately after delivery. However, for the best possible results, s::can recommends to check the calibration in the specified application and subsequently perform a functional check for validity and correctness on a regular basis (see chapter 8).

6.1 General Notes for Calibration

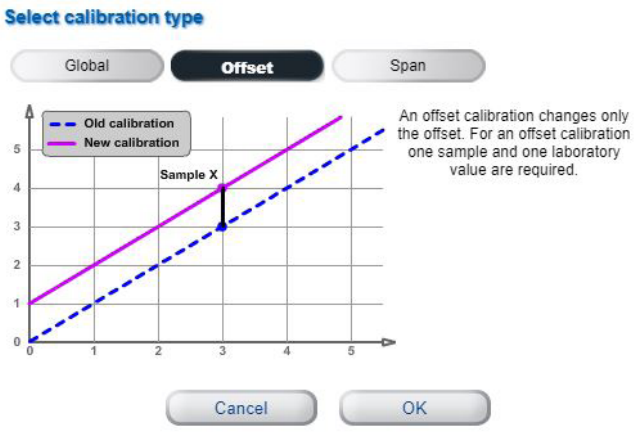
- Before performing any kind of calibration ensure appropriate conditioning time (at least 2 hour after initial operation).
- Before performing any kind of calibration the correct function of the sensor should be ensured (sensor is clean and properly mounted - see section 8 also).
- The oxi::lyser is equipped with a global calibration ex factory. You can switch back to this factory setting at any time.
- The local calibration shall either be performed directly in the medium or in a calibration standard. A local calibration in saturated air is not possible.
- A calibration standard should be at environment temperature to ensure most accurate calibration.
- The temperature value cannot be calibrated.

The calibration of the oxygen concentration can only be carried out on the actual reading, as neither the measured value nor the comparison value is stored on the senor.

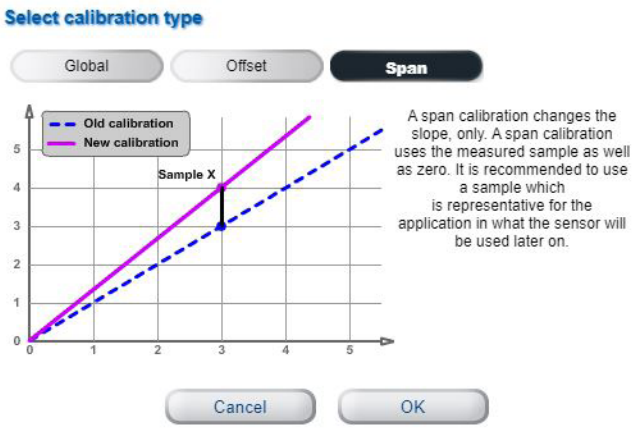
6.2 Notes for Offset (Zero Point) Calibration

It is recommended to perform local offset calibration of oxi::lyser at a oxygen concentration of 0 mg/l (zero point calibration). As comparison (laboratory) value the value 0.02 shall be used.

A solution standard for zero point calibration can be made with drinking water and sodium sulphite (Na_2SO_3) easily (approx. 1 teaspoon sodium sulphite for 0.2 l drinking water). When measuring in the aeration tank the oxygen concentration can be lowered to 0 mg/l through appropriate operational management and thus a zero point calibration can be carried out without removing the sensor.



6.3 Notes for Span Calibration



Calibration of the slope serves primarily to compensate for lamp ageing and is not necommended in the first years of operation. A slope calibration shall be performed only, if no sufficient accuracy can be reached over the measuring range with offset calibration.

When performing a slope calibration the following procedure must be followed step by step:

1. Activation of the global calibration.
2. Check of zero point by measuring in a medium free of oxygen (see section 6.2).
3. Perform offset calibration if deviation of reading is more than +/- 0.05 mg/l in the medium free of oxygen (see section 6.2).
4. Calibration of slope in a medium with an oxygen content as high as possible.

6.4 Performing a Calibration

6.4.1 Calibration using con::lyte D-31x

The *Calibration* entry in the con::lyte main menu leads you into the menu that enables the calibration of the oxi::lyser. When *Calibration* is selected a password must be entered (*Password 1: 1*) before the calibration can be started. The entry displayed now (*Parameter calib.*) has to be confirmed with the *Enter* button. The next step is the selection of the parameter to be calibrated (e.g. O2) in the selection field *Parameter Calib*.

Parameter Calib.	
Local cal.:	O2
Local cal.:	Temp

Now the menu for local calibration will appear as displayed on the right hand side.

As long as oxi::lyser is working with factory calibration (default) the entry *Calib.* shows *global* and no *Type* can be selected.

Local cal.:	O2
Calib.:	global
Type:	None
Calibrate!	

To perform a local calibration the entry *Calib.* has to be changed from *global* to *local*. Then below the entry *Type* will show *Offset* or *Span* as possible type of calibration.

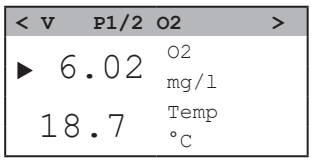
The display shows the actual parameter reading below (*Sample*). On the entry *Lab* the results corresponding to the real actual concentration can be entered.

Local cal.:	O2
Calib.:	local
Type:	Offset
Sample:	0.27
Lab:	0.02
Calibrate!	

When the entry *Calibrate!* is confirmed by pushing *Enter*, a calibration is performed. Successful calibration is shown in a user message *Local calib. saved*. If the calibration was not successful (user message *Local calib. Error!*) the calibration used up to now will be used further on.

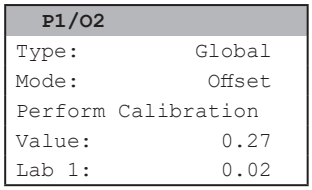
6.4.2 Calibration using con::lyte D-320

A local calibration is performed by following steps:



- Select the parameter in the parameter display with the *Up-* or *Down* button.
- Push the *Function* button to open the menu overview.
- Select the menu entry *Calibrate expert...* and confirm with the *OK* button.

Within the calibration menu the following entries are displayed:

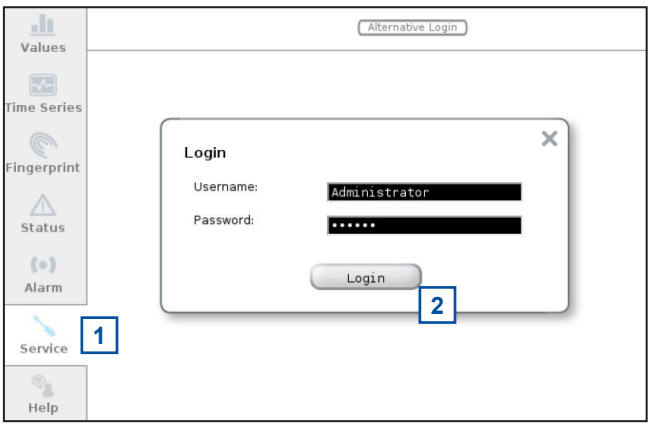


- *Type* Displays the calibration type, that is used by the sensor actually. In case *Global* is displayed, the sensor is using the default (factory) calibration. In case *Local* is displayed, the sensor is using the local calibration, that was performed by the operator most recentlyt time.

An activation of the local calibration performed recently is not possible because the oxi::lyser can be calibrated to the actual displayed reading only. That means when changing the entry from *Local* to *Global* and confirming with the *OK* button, the actual used local calibration will be deleted.

- *Mode* Within this entry the type of local calibration, that shall be performed, has to be selected. This type can be either *Offset* or *Span*.
- *Perform Calibration* Confirming this entry by pushing the *Ok* button will execute the local calibration. The local calibration will use the selected *Mode*, the actual reading (*Value*) and the entered comparison value (*Lab 1*).
- *Value* Displays the actual parameter reading. It is the same value as displayed on the parameter screen (i.e. using the actual calibration). The value will be updated permanently.
- *Lab 1* Within this entry the correct value for the actual reading has to be entered. The entered value can be either the laboratory result of the sample taken or the concentration of the standard solution, that is used for calibration.
  An entered *Lab* value can be deleted by selecting it and pushing the *Function* button. So it will not be used in the calibration.

6.4.3 Calibration using moni::tool

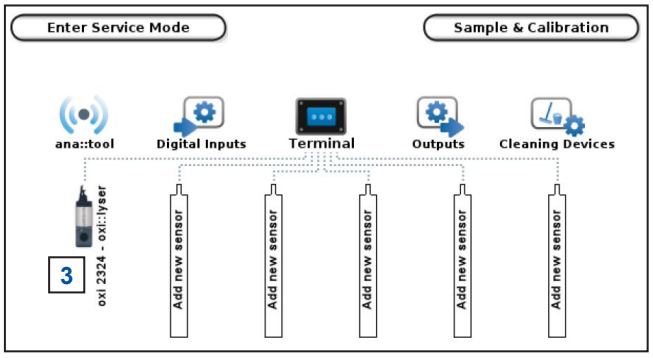


1 Click the *Service* tab on the moni::tool screen.

2 Login as *Administrator* with Password *admin1* in the login window.

3 Click the icon of the sensor you want to calibrate in the displayed system overview.

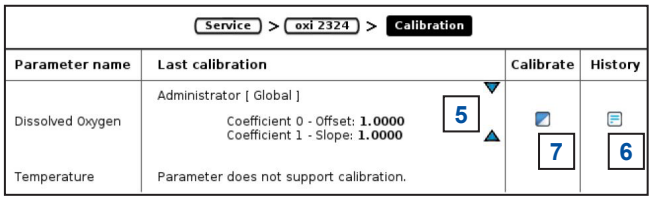
4 Click the icon *Calibrate sensor* in the next screen.



5 The next screen shows a list of all parameters being measured by this sensor. Clicking on the blue triangles will open more information about the actual calibration for this parameter (used *Offset* and *Slope*).

6 Further information will become available when clicking on the *History* icon rightmost. The screen will show all calibration procedures performed up to now with this con::cube.

7 Open the calibration screen by clicking on the *Calibrate* icon on the right hand side of the parameter you want to calibrate.

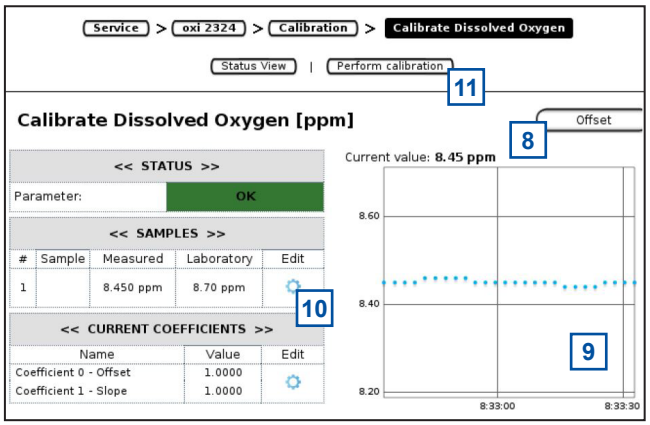


8 This button displays the actual used calibration (*Global*, *Offset* or *Span*). Push this button to select the type of calibration you want to perform (see section 6.1).

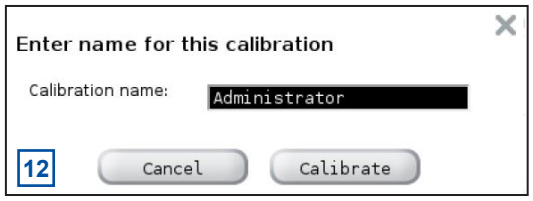
9 Watch the current readings being displayed numerically and graphically on the calibration screen. Wait until readings are stable.

10 Push the *Edit* icon to enter the result of the real value (comparison value).

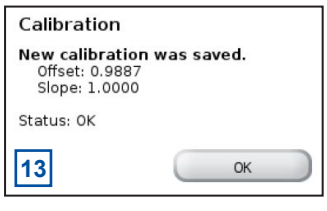
11 Push the button *Perform calibration* to start the calibration procedure.



12 An individual name for the calibration can be entered, before the calibration continues by pushing the button *Calibrate*.



13 After the calibration procedure is finished a user message will inform you, if the local calibration was successful. The new calibration coefficients will be displayed also. In case of an error the reason will be displayed as well as possible solutions and the detailed error code.



7 Data Management

7.1 Data Storage

The following information are stored directly on the sensor:

- Result of the actual usesd offset and slope calibration
- Default offset and slope
- Device information (e.g. type, serialnumber, address, please refer to section 10.3)

There is no possibility to store readings onto the sensor itself (no logger mode). Furthermore no sample readings can be stored.

7.2 Data Transfer

The measurements are performed on the sensor and the readings are transfered to the controller via the sensor cable using RS 485.

7.3 Data Visualisation

For visualisation of the sensor readings one of the following s::can controller can be used:

- con::lyte (D-319 or D-320)
- con::cube (D-315 or D-320)
- con::nect with PC (for s::can Service only)

8 Functional Check

A functional check might be required for one of the following reasons:

- Initial startup
- Routine functional check
- Suspicion of monitoring system malfunction
- Modification of monitoring system (e.g. integration of additional sensor or device)
- Change of measuring location

Depending on the application (water composition), the probes and the sensors connected and the environmental conditions a regular functional check (weekly to monthly) is recommended. The following sections provide an overview of all the actions that have to be performed to check the monitoring system quickly (see section 8.1), to check the plausibility of the collected readings (see section 8.2) and to check the integrity of a single probe or sensor (see section 8.3).

8.1 Check of System / Monitoring Station

Check	con::lyte	moni::tool / con::cube	Actions needed
Power supply controller	Green LED is on? Text is visible on the display?	LED on housing cover is on or at least flashing? moni::tool screen is displayed after touching the screen?	Check power supply of controller. Power off controller for 5 minutes and power on again.
System running (up-to-date)	Displayed system time is current and is updated every second?	Click on system clock at the bottom of the screen shows current time and last measurement. Both are current?	Check for displayed error messages. Check if Service mode is acitvated or automatic measurement is paused.
System status	No error messages or error symbols are displayed?	LED of con::cube is blue and *Status* icon of moni::tool is not blinking yellow?	See section 10 for Troubleshooting.
Reason for bad system status	Check logbook entries since last functional check.	Open *Status* tab and select symbol of affected sensor for more information.	See section 10 for Status- and Errorcodes.

Check	Remark
Function of automatic cleaning	Use function *Clean now* or wait for next cleaning cycle. Watch for air bubbles when cleaning is activated.
Compressed air supply for automatic cleaning	All tubes and fittings are tight?
Function of compressor and storage tank	Drain condensed water from storage tank of compressor (not necessary for s::can compressor B-32). Check pressure.
Monitoring station (by-pass)	All tubes and fittings are tight and all probes and sensors are supplied with medium? No air bubbles within the tubes?
Installation submersed (in-situ)	Mounting equipment of all devices is ok and all probes and sensors are submersed?
Data transfer	Check if displayed readings on local controller are equal with displayed readings on customer display system.

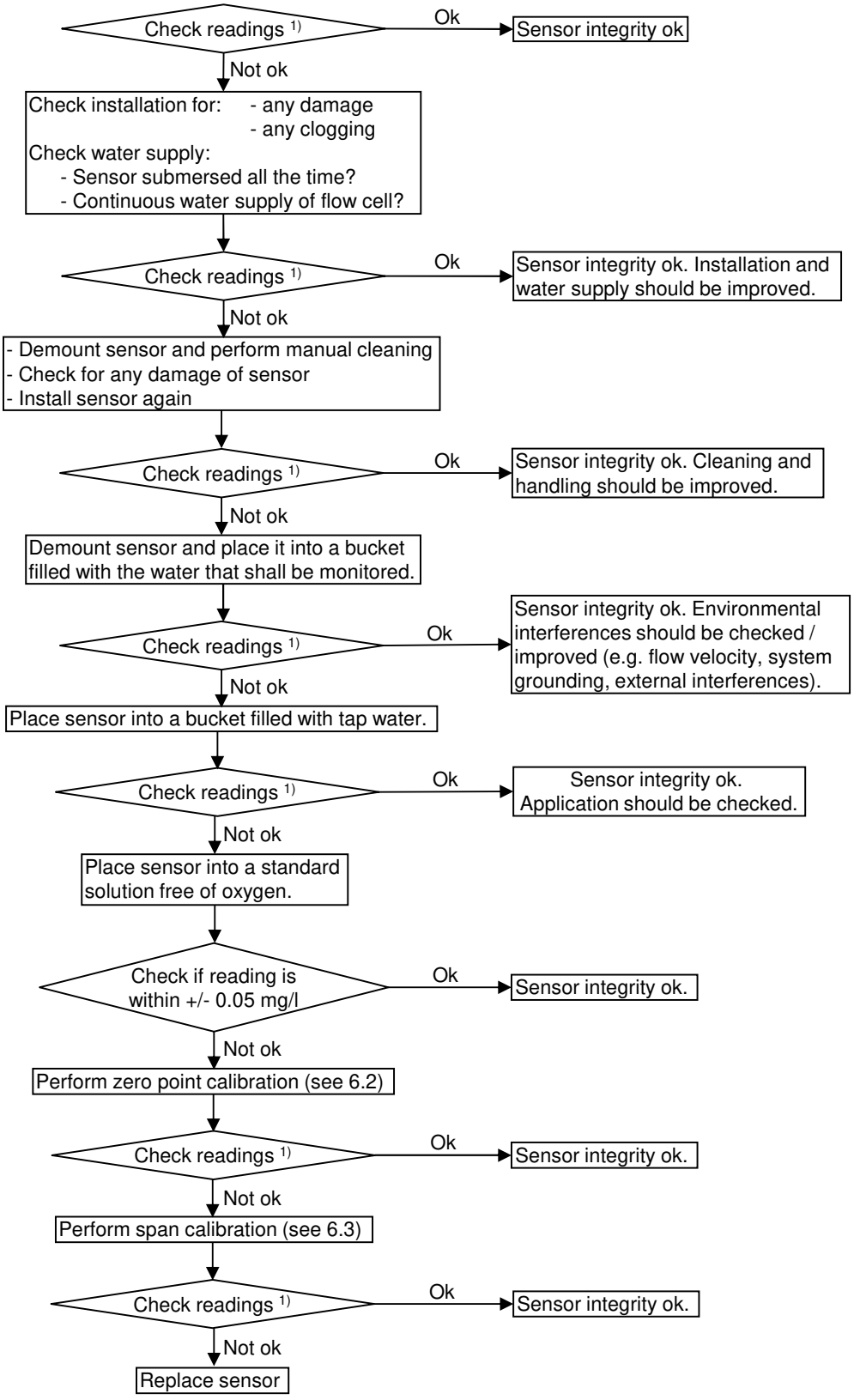
8.2 Check of Readings

Check	con::lyte	moni::tool / con::cube	Actions needed
Current readings displayed completely	No *NaN* and no dashes (- - - -,- -) or plus sign (++++,++) displayed. Use arrow buttons to scroll through all displayed parameters.	No *NaN* is displayed.	Check status and configuration of parameter.
Current parameter status of displayed readings	Check logbook entries since last functional check.	Red background for parameter indicates an error or alarm. Grey background indicates reading is not current.	Check sensor integrity.

Check	Reason	Remark
Up-to-date: Readings are updated regularly?	- Measuring interval is too long - Automatic measurement has been stopped manually	Consider measuring interval and smoothing.
Continuity: Check historical data (timeseries) for interruptions or discontinuities	- Change of medium - Local calibration - Maintenance of probe / sensor (cleaning, etc.) - Readings out of range - System failure (loss of power, communication error, etc.) - Unsteady flow through flow cell installation	Only possible if timeseries are availbale.
Plausibility: Timeseries look plausible with daily or seasonal fluctuation	- Drift of readings (can be caused by fouling) - Increasing noise (can be caused by flow conditions or fouling) - Fixed readings / no fluctuation	Check logbook of plant operator if possible.
Measuring range: Readings are within the specified and calibrated measuring range?		Quality of results might be reduced outside the specified range.
Accuracy: Difference between laboratory (comparison) values and readings of the s::can sensor	In case of significant difference an offset calibration has to be performed (please refer to section 6)	To verify the accuracy of the displayed readings only a reliable and validated comparison method has to be used.

8.3 Check of Probe / Sensor Integrity

When there is any doubt regarding the integrity of the sensor, please use the following flowchart to check sensor and installation:



1) Check if the sensor readings re plausible and stable (no jumps, no scattering, no drift) for at least 5 consecutive meaurements.

9 Maintenance

9.1 Automatic Cleaning

During routine operation the cleaning of the oxi::lyser, i.e. the measuring element of the sensor, is performed automatically via compressed air.

Before demounting the sensor be sure that automatic air cleaning is deactivated via operating software and air supply line is depressurised to avoid dirt and / or injury by suddenly escaping pressurized air.

9.2 Manual Cleaning

In many applications (drinking and surface water or aeration tanks) an automatic cleaning is not necessary. During the regular functional check (see section 8) a manual cleaning can be performed. To clean the sensor manually the following is recommended:

- Rinse sensor with hand-hot (lukewarm) drinking water to remove course deposits from the sensor housing. To clean the sensor housing (not the measuring element itself) a soft cleaning agent (e.g. dishwashing detergent) can be used.
- Put the sensor in a bucket of hand-hot drinking water for several minutes to remove deposits on the measuring element.
- The cleaning of the measuring element is performed by using a soft cloth (one that does not leave behind fibres), cotton swabs or a soft sponge.
- Alternatively a vinegar water solution (50/50) can be used for cleaning.

When cleaning the measuring element, care has to be taken that the window is not damaged (do not use abrasive materials such as scouring sponges or stiff brushes).

10 Troubleshooting

10.1 Typical Error Pattern

Error	Reason	Removal
Drift of readings	■ Change in the medium	■ Check measuring medium for plausibility (reference method)
	■ Fouling of the measuring element	■ Check sensor head for cleanliness
Periodical deviation of the readings (outliers of readings)	■ No continuous flow	■ Ensure stable flow conditions
	■ Influence of pressurized air cleaning	■ Enlarge waiting time after automatic cleaning
Unstable readings (scattering of readings)	■ No continuous flow	■ Ensure stable flow conditions
	■ External influence	■ Check installation environment
No response to changes in concentration	■ Fouling of the measuring element	■ Check sensor head for cleanliness
	■ Faulty span calibration	■ Switch back to global calibration
Negative readings displayed	■ Faulty local calibration	■ Switch back to global calibration
	■ Faulty zero point calibration	■ Check zero point and perform new zero point calibration
Readings higher 100% saturation	■ Measurement in oversaturated water (e.g. high photosynthesis in surface water)	■ Check monitored medium

10.2 Error Messages and Status Messages

During execution of a measurement the monitoring system (system status), the measuring device itself (device status) and the result (parameter status) will be checked for possible errors and for plausibility. In case of an error (status bit will be set from 0 to 1) a user message will be displayed to the operator.

Depending on the used operation controller these messages will be shown on the display (Menu *Logbook & data* in case of con::lyte D-31x, function *Monitor...* in case of con::lyte D-320, *Status* tab in case of moni::tool and *Show Context Help* and *System-Status* in case of ana::pro) and also stored within the result files or logfiles. Additional to the user message (general error reason and recommendations for removal) the detailled status code will be displayed either in binary form (0000, 0001, 0010, 0011, 0100, etc.) or as a hex number (0x0001, 0x0002, 0x0004, 0x0008, 0x0010, etc).

Up to 16 status bits are used for different errors. If several errors occur at the same time the con::lyte and moni::tool will add up all the status bits. This detailed information might be important if you request s::can support. Below you will find examples how to translate these combined hex codes:

Hex	Bin	Bits
0x8000	1000 0000 0000 0000	b15
0x8001	1000 0000 0000 0001	b0, b15
0x4011	0100 0000 0001 0001	b0, b4, b14

Within moni::tool the complete status code of a simple parameter has the following format:
0xTTTT.SSSS.PPPP.pppp.VVVV.vvvv.

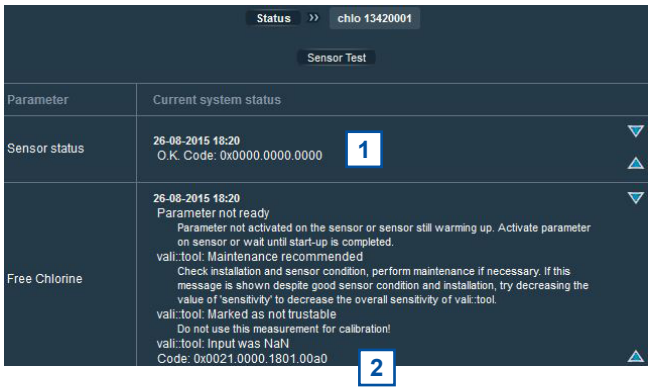
Code	Status Type	Remark
0xTTTT	System status sensor	visible in the second column of all moni::tool parameter result files (e.g. Error 0x0010 or Ok 0x0002)
0xSSSS	Sensor status general	valid for all sensors
0xssss	Sensor status private	valid for respective sensor
0xPPPP	Parameter status general	valid for all parameters
0xpppp	Parameter status private	valid for respective parameter
0xVVVV	vali::tool status general	valid for all clean values of vali::tool software
0xvvvv	vali::tool status private	valid for respective clean values of vali::tool software

1 Within the moni::tool *Status* tab of the sensor you will see the system status sensor and the sensor status as clear text and as status code (0xTTTT.SSSS.ssss).

2 Within the moni::tool *Status* tab of the parameter you will see the parameter status and in case of activated vali::tool the vali::tool status also (0xPPPP.pppp.VVVV.vvvv).

3 Within the moni::tool results file of the sensor parameter the status (0xTTTT.SSSS.PPPP.pppp) will be stored in the column beside the measured value.

4 If vali::tool is active, the result files contains also the vali::tool status (0xVVVV.vvvv) in the column beside the cleaned value.



Timestamp	Station 1	ammo::lyser	3 ammo::lyser	ammo::lyser	4 ammo::lyser
Measurement interval	Status	NH4-N - Measured value [ppm]	Status [NH4-N - Measured value]	NH4-N - Clean value [ppm]	Status [NH4-N - Clean value]
31.05.2019 12:32	Ok 0x0000	4.25	Ok 0x0000.0000.0000.0000	3.33	Ok 0x0000.0000
31.05.2019 12:34	Ok 0x0000	4.78	Ok 0x0000.0000.0000.0000	3.43	Ok 0x0000.0000
31.05.2019 12:36	Ok 0x0000	6.05	Ok 0x0000.0000.0000.0000	3.61	Ok 0x0000.0000
31.05.2019 12:38	Ok 0x0000	58.24	Ok 0x0000.0000.0000.0000	3.84	Ok 0x1001.0010
31.05.2019 12:40	Ok 0x0000	123.67	Ok 0x0000.0000.0000.0000	8.64	Ok 0x0000.0000
31.05.2019 12:42	Ok 0x0000	139.51	Ok 0x0000.0000.0000.0000	18.57	Ok 0x0000.0000
31.05.2019 12:44	Ok 0x0000	136.43	Ok 0x0000.0000.0000.0000	28.85	Ok 0x0000.0000

10.2.1 System Status

The table below shows all errors regarding the operation terminal (system status) incl. the user message, the reason of the error and notes for troubleshooting. If the error can't be removed although the suggested procedure was executed several times, please contact your s::can sales partner.

System Status Error 0xTTTT	Display con::lyte (D-31x / D-320)	Message moni::tool	Reason	Removal
0x0001 - b0	ES007 / COMM! Probe not detected. Check power-supply and connection cable.	No communication between sensor and terminal.	No communication between sensor and operation terminal. Replacement sensor was not installed correctly.	Check sensor cable and connector. Disconnect and reconnect sensor. Reinitialise sensor.
0x0002 - b1	0002	Invalid sensor	Sensor serial number has changed.	Connect the previously installed sensor or perform sensor replacement (moni::tool) or new sensor installation (con::lyte).

10.2.2 Sensor Status

The table below shows all errors regarding the used sensor incl. the user message, the reason of the error and notes for trouble shooting. If the error can't be removed although the suggested procedure was executed several times please contact your s::can sales partner.

Sensor Status Error 0xSSSS	Display con::lyte (D-31x / D-320)	Message moni::tool	Reason	Removal
0x0001 - b0	ES100 bzw. Unknown Sensor Status 01	Detector saturated	Detector or membrane are damaged	Contact s::can sales partner
0x0002 - b1	ES100 bzw. Unknown Sensor Status 02	Detector produces a negative signal	Negative signal of detector	Contact s::can sales partner
0x0003 - b2	ES100 bzw. Unknown Sensor Status 03	Reference photodiode saturated	Reference damaged	Contact s::can sales partner
0x0004 - b3	ES100 bzw. Unknown Sensor Status 04	Reference photodiode produces a negative signal	Negative signal of reference	Contact s::can sales partner
0x0008 - b4	ES100 bzw. Unknown Sensor Status 05	Temperature sensor defective	Temperature sensor defective	Contact s::can sales partner
0x0010 - b5	ES100 bzw. Unknown Sensor Status 06	PROBE MISUSE - Medium temperature. Take probe out of medium immediately	Temperature of medium too low or too high	Take sensor out of the medium
0x8000 - b15	ES115 / 8000 Device maintenance required Code 8000 0000	Sensor mainentance required	At least one internal sensor check reports a warning.	Perform function check of the sensor according the manual.

10.2.3 Parameter Status

The table below shows all errors regarding the measured parameters incl. the user message, the reason of the error and notes for trouble shooting. If the error can't be removed although the suggested procedure was executed several times please contact your s::can sales partner.

Parameter Status Error 0xPPPP	Display con::lyte (D-31x / D-320)	Message moni::tool	Reason	Removal
0x0001 - b0	EP 100 / 0001 Status error. Code: 0001.0000 Details in following log messages.	General parameter error	At least one internal parameter check failed.	Note additional status message below. If no further message is displayed, note the error code and contact your local s::can sales partner.
0x0002 - b1	EP 100 / 0002 Parameter failure, hardware failure	Parameter error, Hardware error	Electrode signal not ok. An electrode is missing, too old or defect.	Check the electrode or replace the electrode.
0x0004 - b2		Parameter error, configuration error	Parameter error, configuration error	Change the local calibration or swirch back to global calibration.
0x0008 - b3		Parameter error, Wrong medium	Sensor outside of the medium or in incorrect medium.	Check supply of medium and medium itself.
0x0010 - b4	EP 100 / 0010 Parameter failure, calibration failure	Parameter error, Incorrect calibration	Invalid sensor configuration. At least one calibration coefficient is invalid.	Check readings and lab values. Set back to factory settings. Repeat local calibration.
0x0020 - b5	EP 100 / 0020	Parameter not ready	Parameter not activated on the sensor or sensor still warming up.	Activate parameter or wait until sensor is fully operational.
0x8000 - b15	EP 115 / 8000 Out of range Code 8000 0000 The parameter is out of measurement range	Reading out of measuring range	Measured parameter is outside the defined measuring range.	Check if sensor is in the medium. Perform functional check.

10.2.4 Statusmessages from vali::tool

The table below shows all errors regarding clean parameters of the vali::tool software incl. the user message, the reason of the error and notes for trouble shooting. If the error can’t be removed although the suggested procedure was executed several times please contact your s::can sales partner.

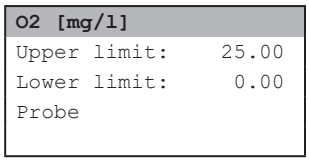
Parameter Status Error 0xVVVV	Message moni::tool	Reason	Removal
0x0001 - b0	vali::tool reports an error	At least one internal check reports a warning.	Check further status messages.
0x0800 - b11	Maintenance recommended	Parameter check reports a warning.	Check system and sensor, perform functional check.
0x1000 - b12	Marked as not trustable	Parameter check reports a warning.	Do not use this value for calibration.

10.3 Device Settings

In case detailed sensor information or configuration settings have to be checked, the following sections will explain how to find these information when operating the sensor with a s::can operation controller.

10.3.1 Check of Device Settings using con::lyte D-31x

The main menu entry *Information* of the con::lyte operation software enables you to check internal sensor settings. After selecting the parameter of your interest by pushing the *Enter* button the display will show the *upper limit* and the *lower limit* of the selected parameter.



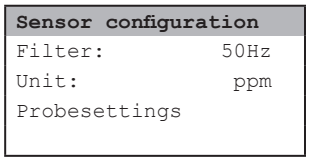
When confirming the lowest entry *Probe* with *Enter* all internal settings of the sensor will be displayed. The most important are:

- Serialnumber of the sensor (*S/N*)
- Sensor type (*Sensor type*)
- Software version of the sensor (*S/W-Version*)

10.3.2 Check of Device Settings using con::lyte D-320

Select the entry *Manage sensors...* in the main menu of the status screen. Select the name *oxi::lyser/0/x* in the list of installed sensors, in which the second number (*x*) indicates the address assigned to the sensor. After confirming the entry *Configure...* the following information of the sensor will be displayed:

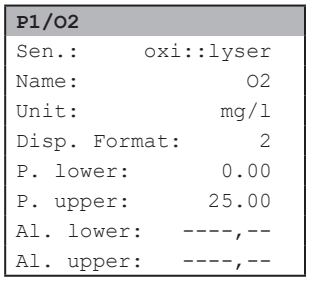
- *Filter* The filter can be changed from *50Hz* to *60Hz*, depending on the used power supply.
- *Unit* The unit of the parameter can be changed from *ppm* to *mg/l* or to saturation (*SAT*).



When selecting the last entry *Probesettings* and confirming with *Ok* further information of the sensor will be displayed:

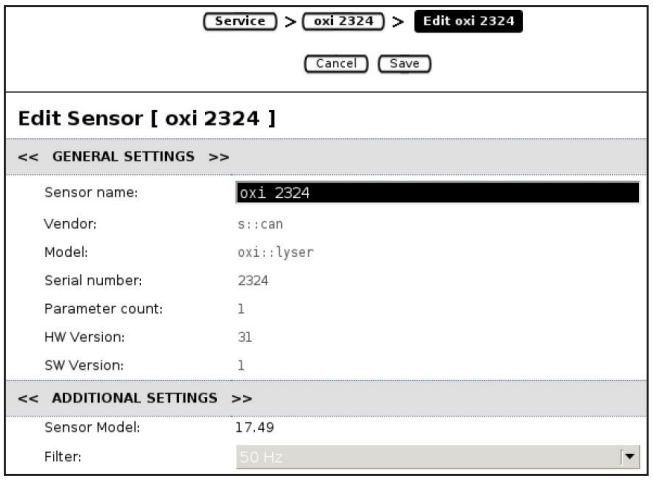
- Serialnumber of the sensor (*S/N*)
- Type of the sensor (*Sensor type*)
- Software version of the sensor (*S/W-Version*)

Information of the single measuring parameter can be retrieved via the entry *Parameter info...* from the main menu of the parameter display. In addition to parameter name (*Name*), unit of measurement (*Unit*) the number of decimal places (*Disp. Format*), also the lower and upper limit of the parameter range (*P. lower* / *P. upper*) and the adjusted alarm range (*Al. lower* / *Al. upper*) is displayed.



10.3.3 Check of Device Settings using moni::tool

Selecting *Service / oxi / Sensor Settings* will list up internal settings of the oxi::lyser. Depending on the actual used *Service Level* (the figure below displays Service Level *Advanced*) some or all of the following information will be displayed:

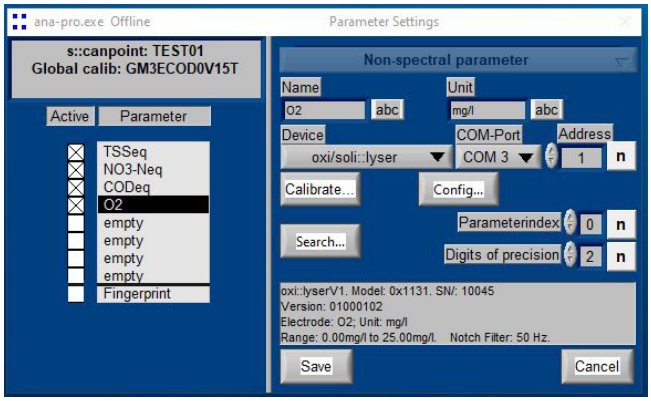


- Interface (COM-port, *Address*) of the sensor
- *Sensor name (Internal)* allocated to the device. Should not be changed by the operator.
- *Sensor name* for the display [1)]
- Manufacturer name of the sensor (*Vendor*)
- Type of the sensor (*Model*)
- Serial number of the sensor (*Serial number*)
- Number of internal parameters of the sensor (*Parameter count*)
- Information regarding the purchase (*Purchase date*, *Warranty expiry date*) [1)]
- Actual hardware and software version of the sensor (*HW Version* and *SW Version*)
- Information regarding cleaning (not available for the oxi::lyser)
- Internal type number of the sensor (*Sensor Model*) and information regarding filter settings (*Filter*)
- Information regarding the installation and last modification of the sensor (date, name and reason)

[1)] Will be allocated by operator during installation or later.

10.3.4 Check of Device Settings using ana::pro

In the operating - and service software ana::pro the oxi::lyser can be initialised over the menu item *Parameter / Settings*. In case the parameters of interest are not yet displayed by default in the Parameter Settings window, they can be selected as follows:

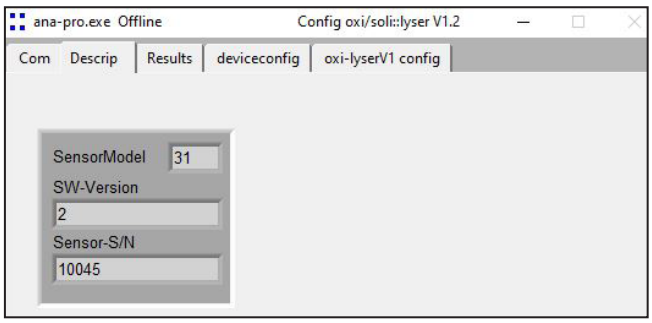


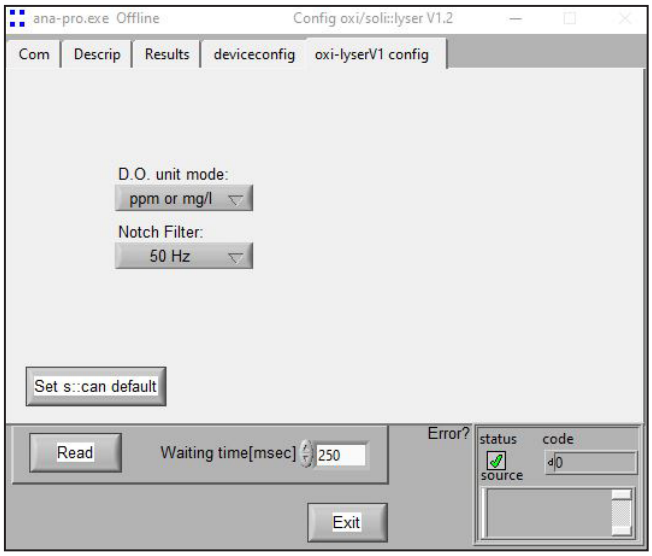
- Double click on the parameter field that you want to correspond with the parameter to be displayed.
- After double clicking, the window will enlarge and show detailed information belonging to this parameter.
- Select *Non-spectral parameter* in the upper selection bar.
- Select *oxi/soli::lyser* under *Device*.
- The *COM-Port* is the interface to which the oxi::lyser is connected (e.g. COM-Port of the con::nect).
- Enter the address allocated to the sensor in the RS 485 network (default setting = 1) in the entry *Address.*
- Push the button *Search…* (when an incorrect COM-Port and / or sensor address are selected, the *Search…* function will still find the sensor if only one instrument is connected).

As soon as the sensor has been detected, information will be shown in the grey text field in the lower part of the dialogue window (model and serial number, version, electrode, unit, measuring range and filter settings).

Now the internal settings of the oxi::lyser sensor can be checked. This should be done by s::can Service or after instruction from s::can only.

- Push button *Config...* in menu *Parameter / Settings*.
- Push button *Search...* in the register card *Com*. As soon as the sensor will be detected, the checkbox (*status source*) in the lower right corner switches to ok (green check mark) and further register cards become visible.
- In register card *Descrip* the sensor type (*Sensor-Model*), the software version (*SW-Version*) and the serial number (*Sensor-S/N*) are displayed.
- In register card *deviceconfig* the address (*Address*) and other Modbus configurations (*Baud rate*, *Parity*) are displayed.
- In the register card *oxi-lyserV1 config* the *unit* and the filter (*Notch-Filter*) can be selected.
- You can finish the configuration menu by pushing the button *Exit*.





10.4 Return Consignment (RMA - Return Material Authorization)

Return consignments of the s::can monitoring system, or parts of the system, shall be done in a packaging that protects the device (original packaging or protective covering if possible). Before returning a consignment, you have to contact your s::can sales partner or s::can customer support (support@s-can.at). An RMA number will be assigned for each device, independent if the reason of the return consignment is service, repair or demo equipment.

RMA numbers can be requested from the s::can Costomer Portal available on the s::can webpage directly. Return consignments without an RMA number will not be accepted. The customer always has to bear the costs for return consignment.

11 Accessories

11.1 Installation

11.1.1 Extension Cable

The cable of the oxi::lyser can be elongated when necessary with an extension cable (10 m or 20 m length). The extension cable is attached using the sensor cable connector plug.

Name	Specification	Remark
Part-no.	C-210-SENSOR C-220-SENSOR C-230-SENSOR	
Cable lenght	10 m 20 m 30 m	C-210-SENSOR C-220-SENSOR C-230-SENSOR
Assembling	ex works	
Dimensions plug	20 mm	outer diameter
Material	PU	Cable sheathing
Environment rating	IP68	
Interface connection	IP67, RS485, 12 VDC	to s::can sensors

11.1.2 Sensor Carrier

For proper and easy submersed installation of the oxi::lyser a separate sensor carrier is available. This part can be fixed to the sensor directly and can be extended by a pipe (to be provided by the customer).

Name	Specification	Remark
Part-no.	F-11-OXI-AMMO	
Material	PVC	
Dimensions	85 / 86 mm	Diameter / height
Weight	approx. 300 g	
Process connection	DN 50 inside	for extension pipe
Installation / mounting	submersed	

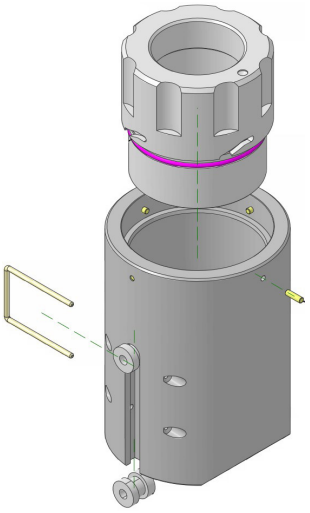
11.1.3 Railing Bracket / Fixing Adapter

For proper and easy mounting of installation pipes onto the railing a seperate fixing adapter carries is available.

Name	Specification	Remark
Part-no.	F-15	
Material	Stainless steel	
Dimensions	158 / 267 / 73 mm	W / H / D
Weight	approx. 2.8 kg	
Process connection	50 mm	OD extension pipe of sensor carrier F-11-OXI-AMMO
Installation / mounting	up to 64 mm (2.5 inch)	OD of railing

11.1.4 Flow Cell Setup Tap Water

For not submersed installation of oxi::lyser outside the medium (e.g. monitoring station) a seperate flow cell for drinking water / tap water is available.

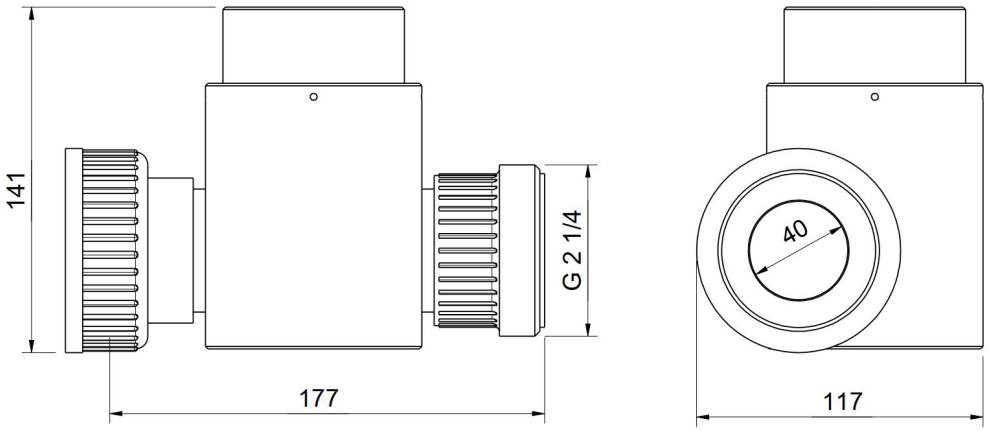


Name	Specification	Remark
Part-no.	F-45-OXI	
Housing material	POM-C	
Dimensions	90 / 152 mm	Diameter / height
Weight	approx. 710 g	
Process connection	$^1/_4$ inch inside	for inlet and outlet
Installation	flow-through	
Mounting	2 mounting holders	
Operating temperature	0 to 50 °C (32 to 122 °F)	
Operating pressure	0 to 6 bar (0 to 87 psi)	

11.1.5 Flow Cell Setup Waste Water

For not submersed installation of oxi::lyser outside the medium (e.g. monitoring station) a seperate flow cell for waste water / raw water is available.

Name	Specification	Remark
Part-no.	F-48-OXI	
Housing material	PVC	
Dimensions	177 / 117 / 141 mm	W / H / D
Weight	approx. 970 g	
Process connection	1 inch inside (G 1“) 40 mm ID	via F-48-PROCESS direct connection to G 1“
Installation	flow-through (by-pass)	
Discharge	< 40 l/min	recommended
Operating temperature	0 to 50 °C (32 to 122 °F)	
Operating pressure	0 to 6 bar (0 to 87 psi)	



Dimension of flow cell setup in mm (F-48-OXI)

11.1.6 System Panel micro::station / nano::station

For easy attachment of a complete s::can monitoring system (s::can operation terminal, flow cell setup, sensor) different types of separate system panels are available. The process connections of these panels can be ordered in DIN standard (EU) or in National Pipe Standard (US).

Name	Specification	Remark
Part-no.	F-501-ECO-xx F-506-PANEL-xx F-508-PANEL	Main paneel micro::-station Main panel nano::station Waste water panel
Material	PP PE	F-501, F-508 F-506
Dimensions W / H / D	450 / 750 / 10 mm 280 / 750 / 10 mm 375 / 690 / 10 mm (per part)	F-501-ECO F-506-PANEL F-508-PANEL (2 parts)
Weight	approx. 4.9 kg	

11.2 Automatic Cleaning

11.2.1 Pressure Connection Set

For connection of the automatic air cleaning system of the sensor a specific pressure connection set is available.

Name	Specification	Remark
Part-no.	B-41	
Pressure hose	3 m	ID 4 mm / AD 6 mm
Assembling	ex works	
Material	PU Nickel-plated brass	tube connection fitting
Process connection	$^{3}/_{8}$ inch	
Operating pressure	1 to 6 bar (14.5 to 87 psi)	

12 Technical Specifications

Name	Specification	Remark
Part-no.	E-501-075	
Measuring parameter	Oxygen O_2 Temperature	see section 5.4
Measuring principle	fluorescense	
Compensation	Temperature Salinity	on oxi::lyser itself up to 50°C possible with moni::tool free formula
Measuring range	0 - 25 mg/l (0 - 100 %) 0 - 50 °C	Oxygen Temperature
Resolution	0.01 mg/l mg/l 0.1 mg/l °C	Oxygen Temperature
Accuracy	+/- 0.05 mg/l or less than +/- 1% of reading	the greater of the two values is valid
Reference measurement	saturated sodium sulfite solution	check of zero point
Response time	< 60 s	(T_{90})
Installation	submersed or in flow cell	
Mounting	1 $^1/_2$ inch E (BSPT)	external screw thread on top of sensor
Environment rating	IP68	
Operating temperature	0 to 50 °C (32 to 122 °F)	
Operating pressure	0 to 7 bar (0 to 100 psi)	
Operating pH range	2 to 10	
Power supply	6 to 16 VDC	power supply and output signal galvanically isolated
Power consumption	0.32 W (max)	
Frequency power supply	50 Hz (default) or 60 Hz	can be adapted via notch filter
Dimension	50.5 / 132 mm 1.38 / 8.19 inch	Diameter / length (without cleaning connection, see section 3.3)
Weight	approx. 380 g approx. 840 g	without cable with cable
Material	PVC, epoxy, polyurethane, stainless steel 1.4404 (housing) and 316 SS (temperature sensor)	
Interface connection	sys plug (IP67), RS485	to s::can operation controller
Sensor cable lenght	10 m	
Sensor cable specification	PUR (polyurethane jacket), 22 AWG, 6.3 mm (outside diameter); -30 to 80 °C (-22 to 176 °F)	
Sensor cable assignment	Pin 1: Data - (green cable strand) Pin 2: Data + (white cable strand) Pin 3: +12 VDC (red cable strand) Pin 4: Ground (black cable strand) Pin 5: not used Pin 6: Shielding (blank cable strand)	

Name	Specification	Remark
Automatic cleaning medium	pressurized air or water	
Automatic cleaning connection	hose OD 6 mm	via push-pull fitting
Automatic cleaning specification	Pressure: 2 - 4.5 bar (29 - 65.3 psi) Duration: 2 - 6 s Delay: 30 - 120 s Frequency: 10 min. - 6 hours	higher pressure might destroy the membrane
Storage temperature	0 to 60 °C (32 to 140 °F)	store sensor dry
Typical lifespan	approx. 10 years	extended warranty 3 years
Selection of Chemicals and Gases that will destroy the sensor	■ Strong acids (pH<2) ■ Strong bases (pH>10) ■ Styrene ■ Ethanol ■ Toluene ■ Ethyl Acetate ■ Acetone ■ Acetonitrile ■ Xylene ■ Benzene ■ Isopropyl Acetate ■ Heptane ■ Hexane ■ Gasoline ■ Hydrogen Peroxide	
Selection of Chemicals and Gases that are harmless for the sensor	■ Methanol (50 %) ■ Ammonia ■ Sodium sulphide ■ Perfluorohexane ■ Perfluorodecalin ■ NaOH (1M) ■ Sodium hypohloride ■ Isopropyl alcohol (60 %)	

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