



Operating Instructions

Exhaust Gas Analyzer for Combustion Engines
infralyt N

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NOTICE

- Read thoroughly before use!
- Keep for future reference!

I. Introduction

In this operating instruction we give you all the information you need for the stable and proper operation of the exhaust gas analyzer for combustion engines infralyt N.

Herein, the generic masculine is used. However, this refers to both male and female personnel.

If you have questions, you can reach our service on +49 340 5510 214.

II Purpose of this Operating Instruction

It contains general information, safety instructions, and a description of the function, commissioning, operation, maintenance / servicing, troubleshooting and communication data.

All instructions and descriptions are valid for the entire service life including termination of operation and disposal. The instructions must be followed. Technical changes and manipulations are prohibited.

SAXON Junkalor GmbH assumes no liability for damage resulting from non-observance of this operating instruction and especially the safety instructions.

This operating instruction also contains explanations of the intended use and the requirements of the device.

III. Delivery Contents

The standard delivery content includes the following components:

1. Exhaust gas analyzer for the combustion engines infralyt N
2. 1 Main cable with protective contact socket (Type C 15; max. 250 V/10 A)
3. 1 pair spare fuse (T1L250V)
4. 1 pair fine filter discs (100 St.)
5. 1 USB flash drive with the operating instruction

Optionally, it can be included

1. Sampling probe 280G (Art.-No.: 35913)
2. Oil temperature probe (Art.-No.: 32038)
3. Speed measuring instrument (Art.-No.: 34340)
4. Operating software (Art.-No.: 40023)
5. Exhaust hose (Art.-No.: 40066)



IMPORTANT

Check delivery for completeness according to the delivery contents.

Missing or damaged parts must be reported to the service immediately.

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1. Safety

1.1 Structure of the safety and warning instructions

The safety instructions in this operating instruction are structured as follows:

SIGNAL WORD	
Pictogram	Type of danger and its source. Consequences if the warning is disregarded. • Measures to avoid the danger.
1.1.1 Distinction of the hazard levels	
	DANGER Warns of imminent danger. Death or serious injury is the result. • Measures to avoid the danger.
	WARNING Warns of possible danger. Death or serious injury can result. • Measures to avoid the danger.
	CAUTION Warns of possible danger. Moderate or minor injuries may result. • Measures to avoid the danger.
	NOTICE Warns of property damage. Machine or objects in its environment can be damaged. • Measures to avoid the harmful situation.
	IMPORTANT Gives additional useful information that will facilitate the use of the device and contribute to understanding.

The following pictograms are used in this instruction:

Pictogram	Meaning
	This pictogram symbolizes a general, unspecified danger. It is used in situations where the graphical representation of a single specific hazard is not possible.
	This pictogram symbolizes danger from electricity.
	This pictogram symbolizes danger from toxic substances.

1.2 Intended use

The infralyt N is an exhaust gas analyzer for the mobile use. The proportions of the exhaust gases to be measured are analyzed and calculated by means of the non-dispersive infrared sensor and the electrochemical cells.

The measuring gas, that is leaving the device, must be routed outside via an exhaust hose (Art. No.: 40066)

The measuring system must be kept free from condensates. Remove any condensate from the condensate separator every day.

Do not expose the device permanently to direct sunlight.

Indications on the back of the device must be observed.

1.2.1 Reasonably foreseeable misuse

The reasonably foreseeable misuse described here is not complete. If necessary, the list must be extended by documented incidents.

Reasonably foreseeable misuse:

- improper or poor maintenance
- use of components not intended and/or approved by SAXON Junkalor GmbH
- non-compliance of safety instructions
- repeal of safety devices
- unauthorized attachments and conversions of the device
- operate the device in a technically objectionable condition

2 Technical Data

2.1 Operational conditions

Ambient temperature:	+ 5 °C ... + 40 °C
Relative humidity:	< 75 % in annual average 90 % at max. 30 days a year, condensation is not allowed
Air pressure:	860 ... 1060 hPa
Storage in the company:	Horizontal or tilt of max. 15 ° in all directions
Sound pressure level:	< 80 dB

2.2 Conditions for transport and storage

Ambient temperature:	- 25 °C ... + 65 °C
Relative humidity:	< 90 %

2.3 Measuring range

CO	0 – 2000 ppm vol or 0 – 10 % vol
CO ₂	0 – 20 % vol
C ₆ H ₁₄	0 – 2000 ppm vol
O ₂	0 – 22 % vol
NO	0 – 2500 ppm vol
NO ₂	0 – 500 ppm vol
Speed (optional)	400 – 8000 U/min
Oil temperature (optional)	0 – 170 °C

2.4 Measurement parameters

Zero drift:	$\leq 1 \%$ of the final value/24 h
Sensitivity drift:	$\leq 2 \%$ of the measured value/Month
Linearity deviation:	$\leq 2 \%$ of the final value
Display tolerance:	$\leq \pm 0.5 \%$ of the final value
Detection limit:	$\leq 0.5 \%$ of the final value
Supply voltage effect:	$\leq 0.2 \%$ of the final value in the permitted voltage range
Air pressure effect:	$\leq 0.2 \%$ of the final value in the permitted air pressure range
Temperature effect:	$\leq 0.1 \%$ / 1 K from the final value in the permitted gas temperature range
Measuring gas temperature:	5 °C to 500 °C at the measuring head when using the sampling probe HT 5 °C to 45 °C at the measuring gas input
Measuring gas throughput:	180 ... 240 l/h
Permitted gas pressure:	Without pump 20 hPa – 50 hPa

2.5 System times

Heating time:	10 min
Zero calibration (normal):	1 min
Zero calibration (O ₂):	1 min
Gas calibration	2 min

2.6 Mechanical connections

Withdrawal of gas:	Hose screw connection DN6/10 for hose DN6/10
Gas calibration:	Hose screw connection DN4/6 for hose DN4/6
Tightness connection:	Hose screw connection DN4/6 for hose DN4/6
Gas output:	Hose screw connection DN4/6 for hose DN4/6

2.7 Electrical connections

Operating voltage:	2-pole device socket (Type C15)
Digital interface 1:	USB socket Type B (serial)
Digital interface 2:	Radio module 2.4 GHz according to IEEE 802.15.1

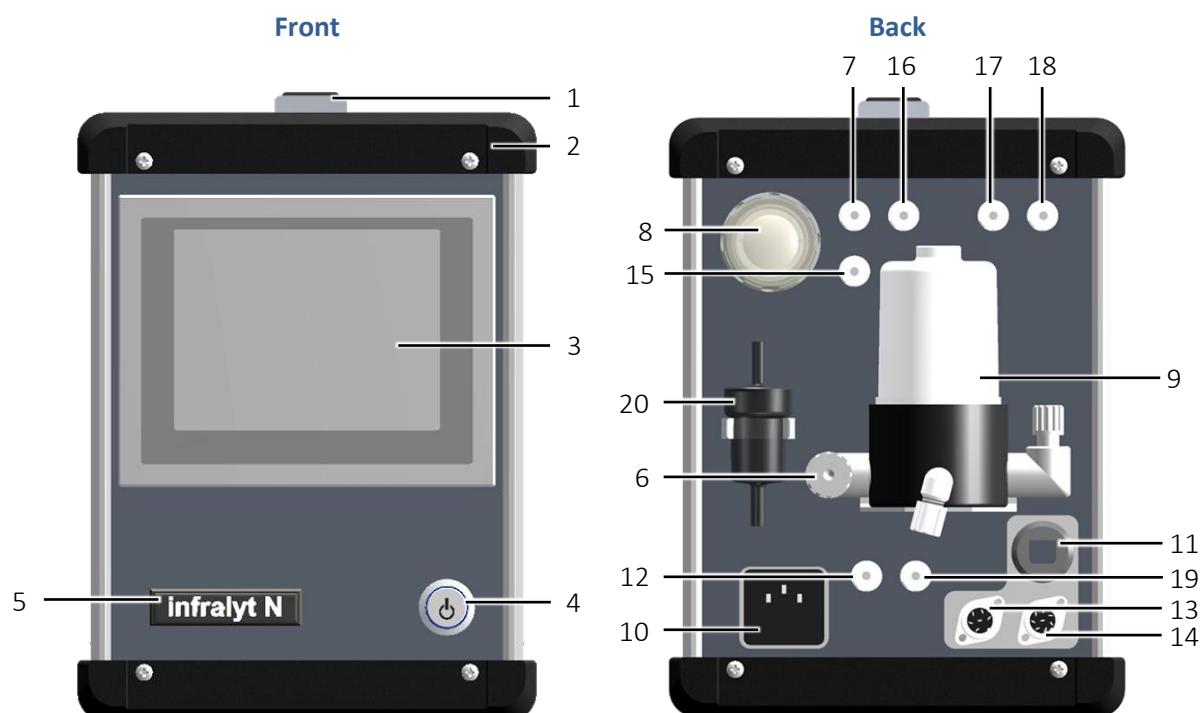
2.8 Construction and assembly

Construction:	Mobile measuring system
Housing material:	Aluminium
Housing dimension:	205 x 270 x 400 mm ³
Housing protection type:	IP 20 according to EN 60529, VDE 0470-1
Mass:	11 kg

2.9 Power supply

Voltage:	230 VAC + 10 %/- 15 %
Mains frequency:	50 Hz ± 2 %
Power consumption:	Max. 60 VA

3 Structure and Function



Pos.-No.	Name	Pos.-No.	Name
1	Handle	11	USB-2.0 Connection (Type B)
2	Rubber buffer	12	Condensate output
3	Touch display	13	Connection for oil temperature probe
4	Power switch	14	Connection for speed probe
5	Bluetooth®-Antenna (aperture)	15	Input HC-free zero gas
6	Measuring gas input	16	Leaktest connection
7	Gas output	17	Calibration gas input
8	Fine filter	18	Input prepared measuring gas
9	Type B condensate separator	19	Input condenser pump
10	Grid connection 230 V 50 Hz, max. 60 VA	20	Zero filter (HC filter)

[1] Handle

Do not attach any additional elements to the handle that can change the shape of the handle. Not suitable for longer transport routes.

[2] Rubber buffer

Rubber buffer protects the device and its footprint from damage.

[3] Touch display

All data and output are made via touch display. It is used to display the measured values, the parameters and the data of the infralyt N.

[4] Power switch

The infralyt N is switched on by a power switch. It contains an operating display.

[5] Bluetooth®-Antenna (aperture)

Behind the aperture a class 1 Bluetooth® antenna with a range up to 100 m is installed. This enables the transmission of device and measurement data via wireless data transmission in accordance with IEEE 802.15.1 to other Bluetooth®-compatible devices.

[6] Measuring gas input 1

The sampling probe is attached to the measuring gas input

[7] Gas output 4

The measuring gas is discharged via gas output. Harmful measuring gases leaving the device must be routed outside via an exhaust hose. The exhaust hose is not included (Order number: 40066).

WARNING



Measuring gas is not completely cleaned during the measurement and may contain harmful gases after the measurement.

If some gases are measured, they are harmful to health even when they are discharged from the device. If the operator inhales exhaust gases directly, it can lead to health problems.

- Do not inhale measuring gas directly.
- Conduct harmful measuring gases through the exhaust hose to the outside.
- Do not block the gas output.

[8] Fine filter

The fine filter is used for gas treatment; it filters dirt particles. The fine filter must be changed regularly, see 7.4 Changing the fine filter.

[9] Type B condensate separator

The Type B condensate separator is a multistage filter system. During the measurement, it collects dirt particles and contained water within the gas stream.

[10] Grid connection

The grid connection (230 V, 50 Hz, max 40 VA) can only be used with the supplied mains cable.

[11] USB-2.0 Connection (Type B)

This USB-2.0 Connection (Type B) is a serial interface for wired connection to a computer / laptop. For the connection and access data see 6 Communications.

[12] Condensate output

Condensate is discharged from the device via the condensate output.

[13] Connection for oil temperature probe

The oil temperature probe is plugged in this connection.

[14] Connection for speed probe

The speed probe is plugged in this connection. Only connect the speed measuring modules approved by SAXON Junkalor GmbH to the connection.

[15] Input HC-free zero gas

Via the HC free zero gas input, the purified ambient air for zero absorption is soaked in from the zero filter [20] into the device.

[16] Leaktest connection

This connection is plugged in a pressure sensor. To carry out the leaktest, see 7.2 Performing a leak-test.

[17] Calibration gas input

The test gas is connected to it in order to check the measuring accuracy, and to calibrate the device if necessary.

[18] Input prepared measuring gas

The prepared measuring gas from the type B Type B condensate separator [9] is fed through this input into the fine filter [8] and then into the measuring cell.

[19] Input condensate pump

The separated condensate is sucked to the condensate pump.

[20] Zero filter (HC filter)

The Zero filter is an activated carbon filter that filters hydrocarbon residues from the ambient air to allow a zero measurement.

3.1 Sampling probe 280G

The sampling probe incl. withdrawal hose are not included (order no.: 36102).

3.2 Oil temperature probe

The oil temperature probe is not included (order no.: 32038).

3.3 Speed probe

The speed probe is not included (order no.: 34340).

3.4 Measuring principle

3.4.1 NDIR measurement

NDIR measurement (non-dispersive infrared measurement) is a method for concentration determination of certain gases (e.g. CO₂) within a gas mixture.

The gases absorb heat at characteristic wavelengths of the infrared light spectrum. This property of the gases uses the non-dispersive infrared measurement to determine proportions of these gases in a gas mixture.

The gas mixture flows through a cuvette, which is illuminated from one side with an infrared heater. The light of the infrared heater hits the gas mixture and the sensor on the other side of the cuvette. The proportions of the gases are calculated by using the sensor signal.

NDIR measuring benches are non-invasive and have a long lifetime.

3.4.2 Electrochemical measurement

The electrochemical measurement takes place via an electrochemical cell. This works like a battery that requires a special gas to generate a voltage.

Due to the appropriate combination of chemical substances, electrochemical cells can be sensitized for different gases.

Electrochemical cells work invasively - the gas to be measured reacts with the reactants of the electrochemical cell to another gas, which does not occur in the gas mixture.

After consuming the reactants, the electrochemical cells must be replaced.

4 Commissioning

4.1 Installation location

For a flawless and low-maintenance operation of the hinfrahyt N, the installation location must fulfil the following conditions:

- dry environment
- stable and horizontal surface
- free from vibrations
- free and laminar gas flow
- curvatures and places, where stagnation pressure can occur, should be avoided
- operational conditions must be observed, see 2.1 Operational conditions.



NOTICE

Damage to components and impairment of function in case of excessive pressure differences.

Irreversible damage to the device and incorrect measurement results can occur.

- Avoid measuring points with pressure differences.

4.2 First use/Start-up

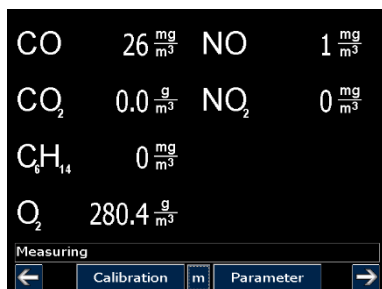
Read the operating instruction completely before first use.

1. Perform visual examination according to 7.1 Visual inspection.
2. Connect the hinfrahyt N to mains using the included power cable.
3. Connect the sampling probe to measuring gas input [6].
4. Place the tip of sampling probe at the selected point of discharge.
5. Attach the exhaust hose to the gas output [7] and direct it to the outside.
6. Connect the hinfrahyt N to the laptop / computer via USB 2.0 connection [11] or via Bluetooth® connection when using it.
7. Press power switch button [4].
 - The warm-up phase starts, which can take up to 10 minutes, depending on operational conditions.
 - After the warm-up phase is completed, a zeroing starts automatically.
 - After zeroing is completed, the continuous measuring operation starts automatically.

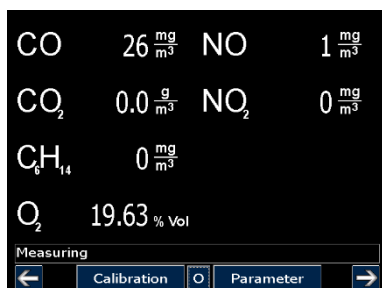
5 Operation

The infralyt N can be intuitively operated by the touch display or remotely controlled via computer/laptop. In measurement operation, the measurement data is continuously visualised on the touch display.

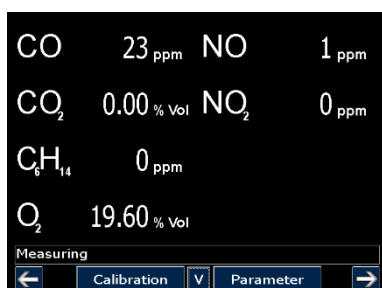
The measurement data can also be displayed in different formats tapping the small button down in the middle of the display.



This setting shows the measured values in mass / volume.



This setting shows the measured values in mass / volume except oxygen which is calculated using the “reference vale O2” according to 5.3 Parameter menu.



This setting shows the measured values either in % Vol or in ppm.

5.1 Menu structure

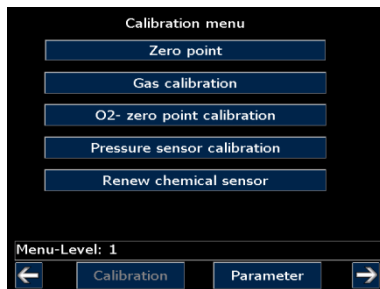
The menu consists of two main menus:

1. Calibration
2. Parameter

The main menus are divided as follows:

Calibration	Parameter
Zero point	Pump [Off]
Gas calibration	Display ADU values
O2 zero point calibration	Date and Time
Pressure sensor calibration	HC factor
Renew chemical sensor	Language
	Configuration
	Leaktest
	Device information
	Device settings
	Reference value O2
	NOx ON

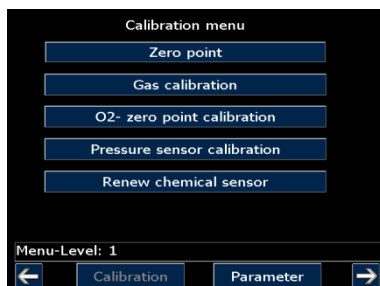
5.2 Calibration



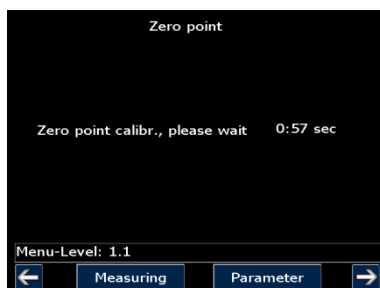
On the menu level “Calibration” the following submenus can be opened:

- Zero point, see 5.2.1 Zero Point,
- Gas calibration, see 5.2.2 Gas Calibration,
- O₂ zero point calibration, see 5.2.3 O₂ zero point calibration,
- Pressure sensor, see 5.2.4 Pressure sensor calibration,
- Change chemical cells, see 5.2.5 Renew chemical sensor.

5.2.1 Zero Point

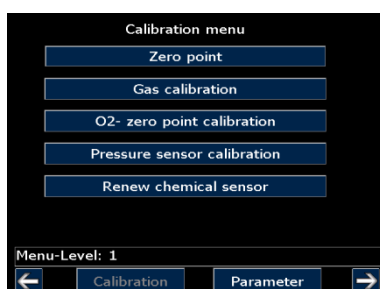


1. For Zero point, place the infralyt N so that normal ambient air is drawn into the device.
2. Switch on the infralyt N, see 4.2 First use/Start-up.
3. Tap on “Calibration menu” in the main menu.
4. Tap on “Zero point”.



- Zero point is calibrated.
- After zero point, the measuring operation starts automatically.

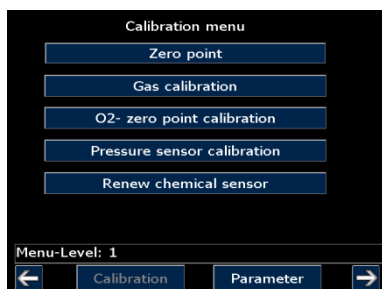
5.2.2 Gas Calibration



For a high accuracy of the measurements and a flawless operation of the device, a regular gas calibration is necessary.

For performing the gas calibration, see 7.7 Gas calibration.

5.2.3 O₂ zero point calibration



This function is for O₂ zero point calibration, which requires an oxygen-free gas (e.g. N₂). O₂ zero point calibration is performed after changing the cells.

For performing the O₂ zero point calibration, see 7.8 Perform O₂ zero point calibration.

WARNING

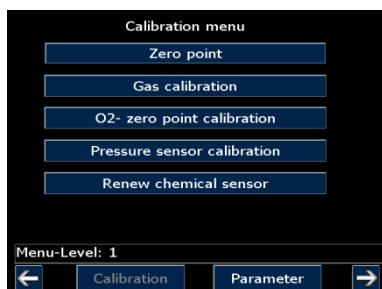


Measuring gas is not completely cleaned during the measurement and may contain harmful particles after the measurement.

If some gases are measured, they are harmful to health even when they are discharged from the device. If the operator inhales the exhaust gases directly, it can lead to health problems.

- Do not inhale the measuring gas.
- Guide harmful measuring gases through the exhaust hose to the outside.
- Do not close the gas output.

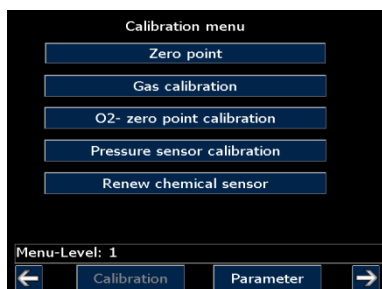
5.2.4 Pressure sensor calibration



This function is used to calibrate the pressure sensors.

The adjustment of the pressure sensors should only be carried out by service personnel.

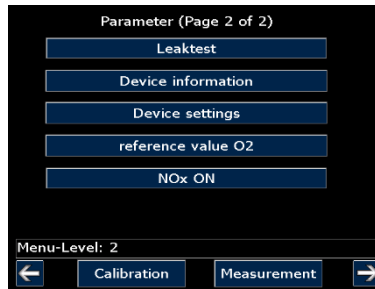
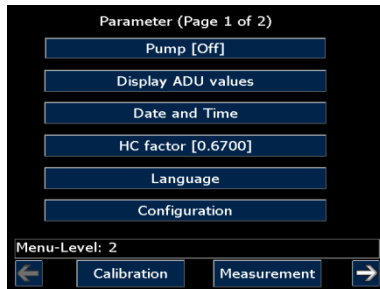
5.2.5 Renew chemical sensor



This function is used to configure the chemical sensor.

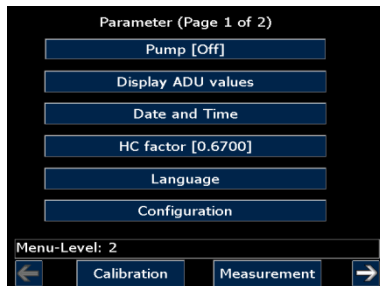
The configuration of the chemical sensor should only be carried out by service personnel.

5.3 Parameter menu



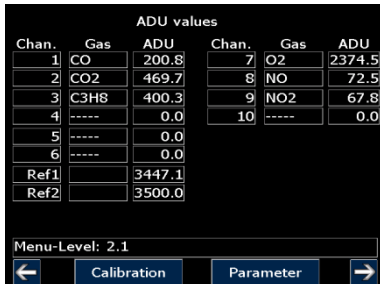
The following functions can be set via “Parameter menu”:

5.3.1 Pump [Off]



This function is used to switch the pump on or off. Auto mode automatically turns the pump on or off.

5.3.2 Display ADU values

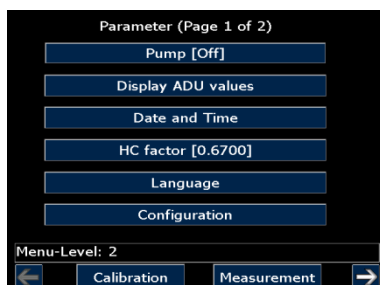


Chan.	Gas	ADU	Chan.	Gas	ADU
1	CO	200.8	7	O2	2374.5
2	CO2	469.7	8	NO	72.5
3	C3H8	400.3	9	NO2	67.8
4	----	0.0	10	----	0.0
5	----	0.0			
6	----	0.0			
Ref1		3447.1			
Ref2		3500.0			

This submenu displays the analog-digital values of the individual measuring channels.

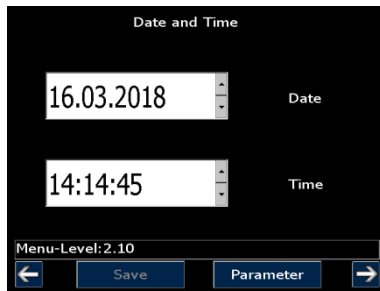
The function “Display ADU values” is used for the first diagnosis of the measuring bench.

5.3.3 HC factor



This submenu displays the conversion factor of propane/hexane.

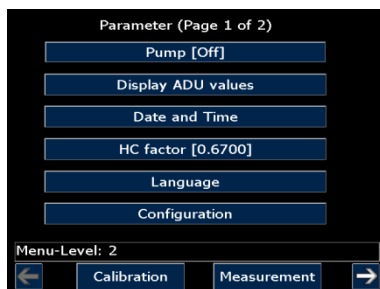
5.3.4 Date and time



Here the date and time can be set as follows:

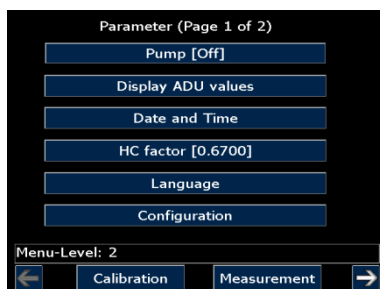
1. Tap on "Parameter" on the touch display.
3. Turn to page 2.
4. Tap on "Date and Time".
5. Tap on the value for the day and set the correct value with the arrows.
6. Tap on the value for the month and set the correct value with the arrows.
7. Tap on the value for the year and set the correct value with arrows.
8. Tap on "Save".
 - The settings for the date are saved.
9. Tap on the value for the hours and set the correct value with the arrows.
10. Tap on the value for the minutes and set the correct value with the arrows.
11. Tap on "Save".
 - The settings for the time are saved.

5.3.5 Language



German or English language can be set here.

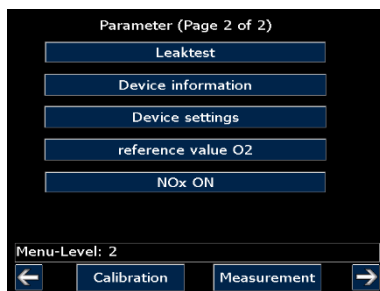
5.3.6 Configuration



Here parameters can be set in the device.

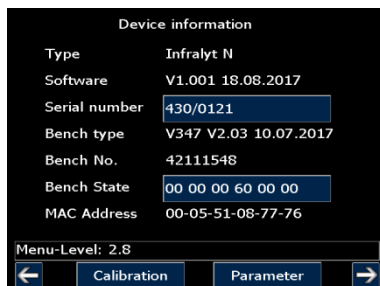
The settings can only be carried out by service personnel

5.3.7 Leaktest



In the “Leaktest” leak tightness of all gas paths is checked.
For performing the leaktest, see 7.2 Performing the leaktest.

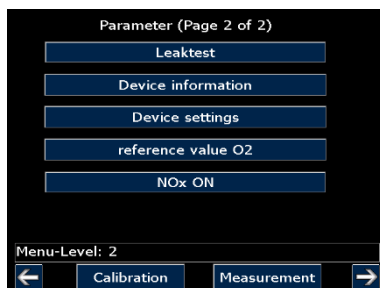
5.3.8 Device information



The submenu “Device information” displays the following information: type, software version, serial number, bench type, bench number, bench state, and MAC address.

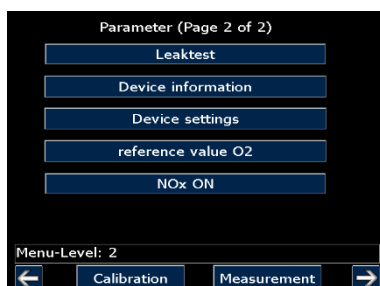
The device and optics number are required for telephone inquiries with our service team.

5.3.9 Device settings



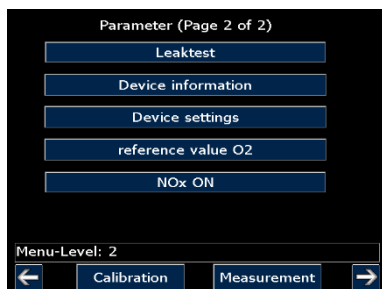
System-relevant settings can be made here.
The settings can only be carried out by service personnel.

5.3.10 Reference value O₂



In the submenu “Reference value O₂”, the oxygen reference value is set to compare or evaluate different measurements series.

5.3.11 NOx ON



In the submenu “NOx ON” the display value of NO₂ switches between NO₂ and NO_x.

6 Communication

The wired communication can be established by an USB version serial interface (RS-232) or wirelessly by the Bluetooth® interface (according to IEEE 802.15.1, class 1 to 100 m).

The password for the wireless connection is: **5510344**

To establish a wired communication connection with the device, use the appropriate communication protocol or log in to our website at www.saxon-junkalor.de. You can also download the appropriate communication protocol. If you have questions, please contact our service.

For a detailed description of the connections, the communication protocol and all commands, see Annex II - Communication (option).

A file is saved on the included flash drive, whereby all commands can be executed in the terminal program HTerm.



IMPORTANT

The data is only transmitted in measurement operation.

7 Maintenance and Servicing

The infralyt N is designed in the manner that all maintenance and service work can be done without tools.

For all maintenance and service work, the following instructions must be observed:

DANGER



Danger due to electricity.

When removing covers, live parts are be exposed.

- Disconnect the power plug before maintenance and servicing work.
- Maintenance and servicing work should only be carried out by qualified personnel.
- Qualified personnel only must carry out maintenance or service work on the opened device under voltage, if this is unavoidable.

NOTICE



Damage to components and impairment of function.

Device may be damaged.

- Use only supplied spare parts.
- When replacing the fuse, only use fuses of the specified type and with the same nominal current.

NOTICE



Damage to components and impairment of function.

Device may be damaged.

- Screw connections without tools, hand-tight.
- Do not use sharp or hard objects inside the device.

7.1 Visual Inspection

Check the infralyt N for visible defects or damage. If the following damages are found, please contact our service:

- visible damage to the infralyt N,
- deep scratches or damage to the touch display,
- cracks on the filters,
- loose or defective hoses.

NOTICE



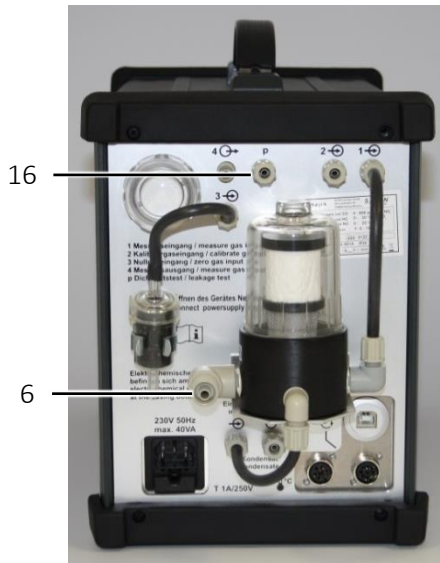
Operating the device in a technically objectionable condition.

Device may be damaged.

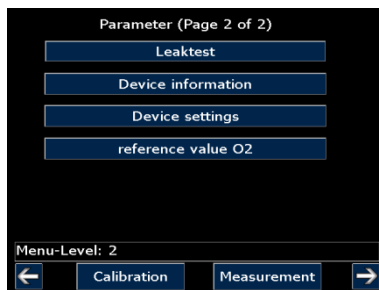
- Pull mains plug.
- Put the device out of operation and secure against unintentional commissioning.
- Contact service.

7.2 Performing the leaktest

The leaktest should be performed regularly after 3 months or after each maintenance:



1. Attach the sampling probe to the sample gas input [6].
2. Place the supplied hose piece on the tip of the sampling probe.
3. Attach the other end of the hose piece to the leaktest connection [16].



4. Tap "Parameter" on the touch display.
5. Turn to page 2.
6. Tap on "Leaktest".
7. Follow the on-screen instructions.
 - Leaktest is performed.
 - The result is shown on the touch display.

If the leaktest is unsuccessful:

1. Check all components for tightness and cracks.
2. Perform troubleshooting, see 9 Troubleshooting.

If the leaktest after troubleshooting still is unsuccessful, please contact our service.

7.3 Type B Type B condensate separator, change filter



DANGER

Danger due to electricity.

When removing covers, live parts may be exposed.

- Disconnect the mains plug before carrying out maintenance work.



NOTICE

Damage to components and impairment of function.

Device may be damaged.

- Use only spare parts approved by the manufacturer.
- Screw connections without tools, hand-tight.
- Do not use sharp or hard objects inside the device.

The glass fibre filter in the type B Type B condensate separator [9] must be replaced if there is a clear discolouration or at the latest after 1 month, to do this, follow the steps below:



1. Disconnect the device from the mains, switch off the gas supply.
2. Unscrew the transparent cap of the Type B condensate separator [9].
3. Remove the sealing ring between the transparent cover and the bottom.
4. Unscrew the knurled nut on the glass fibre filter.
5. Remove glass fibre filter (Art. No.: 35231).
6. Unscrew knurled nut on the stainless steel mesh filter.
7. Remove the stainless steel mesh filter (Art. No.: 35232), replace if heavily soiled.
8. Clean the transparent cover and the bottom with a neutral detergent.
9. Insert stainless steel mesh filter.
10. Hand-tighten the knurled nut on the stainless steel mesh filter.
11. Insert new glass fibre filter.

12. Hand-tighten the knurled nut on the glass fibre filter.

13. Place sealing ring on the bottom.

14. Hand-tighten clean transparent cap.

Perform leaktest, see 7.2 Performing the leaktest.

7.4 Change fine filter



DANGER

Danger due to electricity.

When removing covers, live parts may be exposed.

- Disconnect the mains plug before carrying out maintenance work.



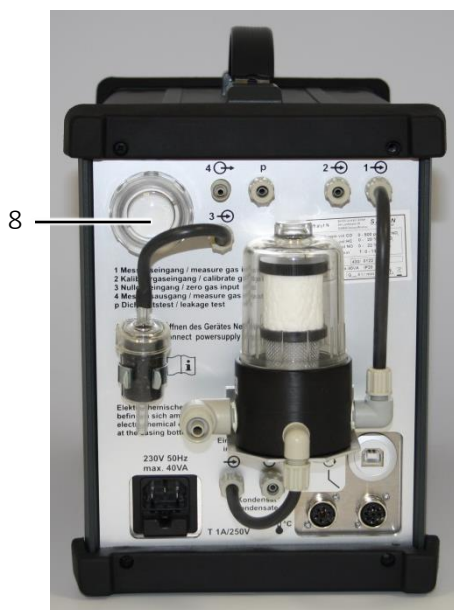
NOTICE

Damage to components and impairment of function.

Device may be damaged.

- Use only spare parts approved by the manufacturer.
- Screw connections without tools, hand-tight.
- Do not use sharp or hard objects inside the device.

The fine filter must be changed if the discolouration is grey or at the latest after 1 month, to do this, follow the steps below:



1. Disconnect the device from the mains, switch off the gas supply.
2. Unscrew the cap nut with the clamping ring of the fine filter [8].
3. Remove puck.
4. Remove fine filter.
5. Clean the fine filter with a dry, lint-free cloth.
6. Place new fine filter (Art. No.: 32073) in the filter.
7. Place puck.
8. Hand-tighten the cap nut with the clamping ring.
9. Perform leaktest, see 7.2 Performing the leaktest.

7.5 Change Zero Filter (HC filter)



DANGER

Danger due to electricity.

When removing covers, live parts may be exposed.

- Disconnect the mains plug before carrying out maintenance work.



NOTICE

Damage to components and impairment of function.

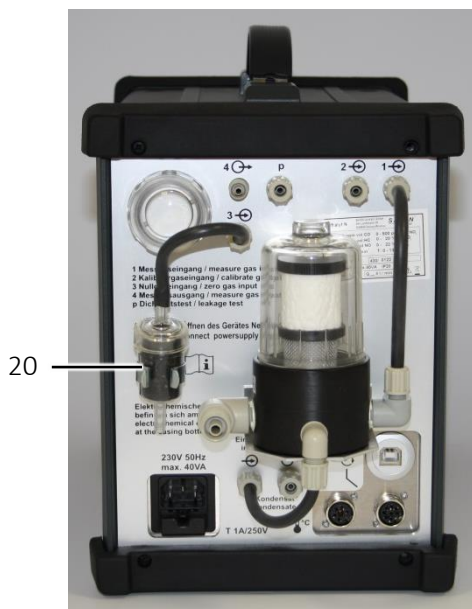
Device may be damaged.

- Use only spare parts approved by the manufacturer.
- Screw connections without tools, hand-tight.
- Do not use sharp or hard objects inside the device.

In rooms where exhaust gases are measured, hydrocarbon residues are present in the air. The zero filter filtrates these residues, thereby the filter is used up. When the filter is depleted, small amounts of hydrocarbon are constantly intrude the measuring system, which are detected by the device. If a measurement with ambient air takes place, it will be interrupted and the zeroing is started. With the complete depletion of the zero filter, the zeroing is carried out one after the other.

For flawless operation of the device, the zero filter must be changed at the latest after 12 months. If zeroing starts noticeably frequently, the zero filter must be changed immediately.

For the change of the zero filter the following steps have to be carried out:



1. Disconnect the device from the mains, switch off the gas supply.
2. Disconnect the hose from the zero filter [20].
3. Remove the zero filter [20] from the clips.
4. Clamp in the new zero filter (Art. no.: 32067) between the clips, aligning as shown.
5. Attach hose to the zero filter.
6. Perform leaktest, see 7.2 Performing the leaktest.

7.6 Change fuses



DANGER

Danger due to electricity.

When removing covers, live parts may be exposed.

- Disconnect the mains plug before carrying out maintenance work.

Replace the fuses (T1L250V, 1.0A slow blow) by following these steps:



1. Disconnect the unit from the mains, switch off the gas supply.
2. Open the slot for the fuses in the mains connection [10] by pressing down on the lug in the middle and pulling out the slot.
3. Pull defective fuses out of the holders.
4. Insert new fuses.
5. Insert the slot into the opening, making sure that the lug snaps into place.

7.7 Gas calibration

WARNING



During gas calibration, harmful gases are released from the device.

Inhaling the discharged gases may be harmful to health.

- Do not inhale discharged gases directly.
- Pass discharged gases through the exhaust hose to the outside.
- Do not close the gas output.

NOTICE



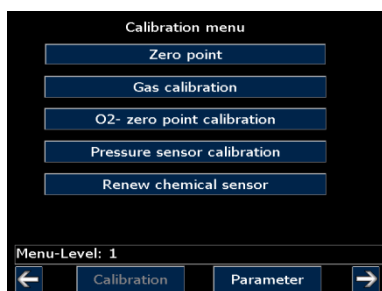
Damage to components and impairment of function.

Device may be damaged.

- Turn off the pump before starting gas calibration.
- Note overpressure from 20 hPa to max. 50 hPa when supplying the test gases.

The gas calibration of the measuring bench (CO, CO₂, C₃H₈) should be carried out 1 time in 3 months.

For gas calibration, perform the following steps:



1. Tap on "Calibration".
2. Tap on "Gas calibration" and follow the instructions on the touch display.
3. Connect the test gas to the calibration gas input [17].
4. Turn on the valve of the gas bottle.
5. Tap on "Continue".
6. Enter setpoints (gas).

- The adjustment is carried out automatically.
- If successful, the device will accept the newly calibrated values without additional messages.
- If unsuccessful, a corresponding message appears.

For gas calibration use test gas with the following composition and concentration (carrier gas is always N₂):

Gas	Concentration
CO	500 – 1600 ppm vol (only V100)
CO	4 – 8 % vol (only V101)
CO ₂	10 – 16 % vol
C ₃ H ₈	1000 – 3000 ppm vol

7.8 Perform O₂ zero point calibration



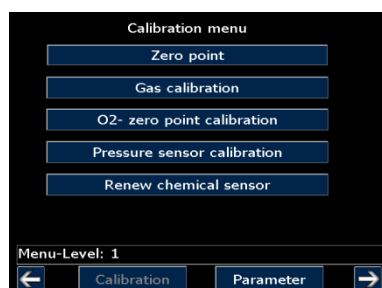
NOTICE

Damage to components and impairment of function.

Device may be damaged.

- Turn off the pump before starting O₂ zeroing.
- Note overpressure from 20 hPa to max. 50 hPa when supplying the test gases.

The O₂ zero point calibration shall be carried out with an oxygen-free gas (e.g. N₂) after every change of the oxygen cell as follows:



1. Tap on "Calibration".
2. Tap on "O₂ zero point calibration" and follow the instructions on the touch display.
3. Turn on the valve of the gas bottle.
4. Tap on "Continue".
 - The adjustment is carried out automatically.
 - If successful, the device will accept the newly calibrated values without additional messages.
 - If unsuccessful, a corresponding message appears.

8 Cleaning

8.1 Daily cleaning



DANGER

Danger due to electricity.

When removing covers, live parts may be exposed.

- Disconnect the mains plug before carrying out maintenance work.



NOTICE

Damage to components and impairment of function.

Device may be damaged.

- Do not use liquids for cleaning.
- Never clean the inside of the device with compressed air.

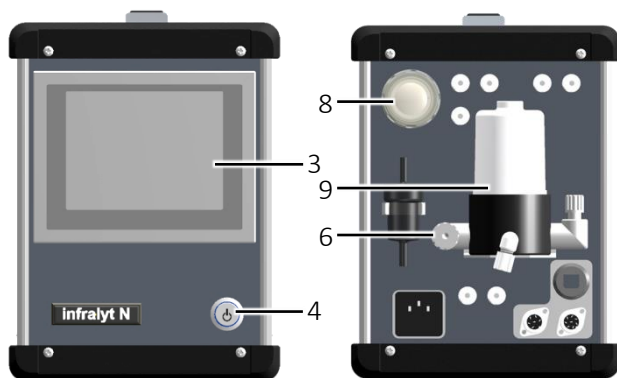


NOTICE

Damage to probe and impairment of function.

Probe may be damaged.

- Do not use liquids for cleaning.
- Clean with max. 5 bar compressed air.
- Clean the probe hose from the outside with a dry, lint-free cloth.



1. Switch off the device.
2. Pull out the mains plug.
3. Clean the touch display [3] with a dry, soft cloth.
4. Empty the B Type B condensate separator [9].
5. Check fine filter [8], replace if necessary, see 7.4 Change fine filter.
6. Unscrew the cap nut with the clamping ring at the sample gas input [6] and remove the probe hose.

7. Clean probe with 3 - 5 bar compressed air.
8. Attach measuring head to the probe.
9. Attach the probe hose to the sample gas input [6].
10. Hand-tighten the cap nut with the clamping ring.
11. Connect the infralyt N to the mains using the supplied mains cable.
12. Press the power button [4].
13. Perform a leaktest, see 7.2 Performing the leaktest.

8.2 Weekly cleaning

DANGER



Danger due to electricity.

When removing covers, live parts may be exposed.

- Disconnect the mains plug before carrying out maintenance work.

NOTICE



Damage to components and impairment of function.

Device may be damaged.

- Do not use liquids for cleaning.
- Never clean the inside of the device with compressed air.

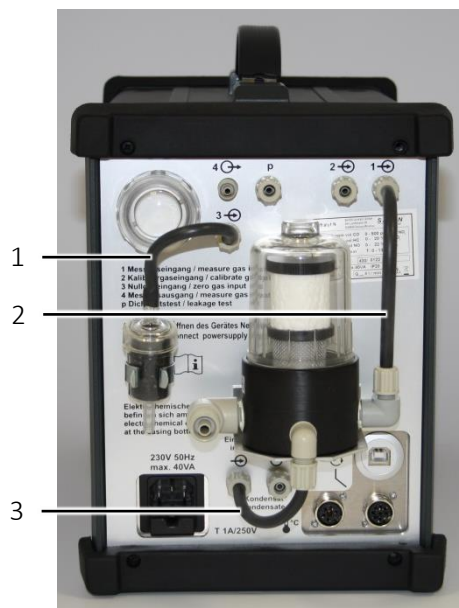
NOTICE



Damage to probe and impairment of function.

Probe may be damaged.

- Do not use liquids for cleaning.
- Clean the hoses with max. 5 bar compressed air.



1. Switch off the device.
2. Pull out the mains plug.
3. Unscrew all cap nuts with the clamping rings on the hoses [1, 2, 3].
4. Remove the hoses.
5. Clean the hoses with 3 – 5 bar compressed air.
6. Attach the hoses to the inputs and outputs and hand-tighten the cap nuts with the clamping rings.
7. Clean the probe with 3 – 5 bar compressed air.
8. Connect the infralyt N to the mains using the supplied mains cable.
9. Press the power button [4].
10. Perform a leaktest, see 7.2 Performing the leaktest.

9 Troubleshooting

The points described here are for troubleshooting and cannot represent all failure reasons. If the faults are not fixed despite the measures taken or if faults other than those described here occur, please contact our service:

Tel.: +49 340 5510 214

e-mail: service@saxon-junkalor.de

Fault	Possible causes	Indications/rectification
No display	No or incorrect operating voltage	1. Check main cable and power supply
	Fuse defective	Change fuse
	Fault in the device	Call service
Unclear or incorrect display	Initialization error	Switch off the device and switch it on again after 1 min
	Electronic fault	Call service
Implausible measured values	Electrochemical cells are consumed	Change electrochemical cells
	Miscalibration	Recalibrate the device
	Vibrations	Position the device vibration-free
	Error in the gas supply	Check the gas supply of the device
	Pump is not running/flow error	Switch on pump/check flow
	Device is leaking	Check tightness
	Error in the measuring bench	Call service
Zero not adjustable	Wrong zero gas	If possible, use nitrogen/normal ambient air
Gas calibration not possible	Wrong calibration	Check calibration gas
	Error in the gas supply	Check gas supply e.g. measure flow
	Electrochemical cells consumed	Change electrochemical cells
	Too high gas pressure	Reduce gas pressure
	Pump is not running	Switch on pump
	Error in the measuring bench	Call service
No or incorrect data from the data interface	Wrong settings of the transmission parameters	Check parameter: 115200bps; a stop bit, no parity, no flow control/hardware protocol
	Radio module defective	Call service

10 Warranty and Guarantee

In addition to the statutory warranty, we provide a voluntary guarantee of 12 months from the date of invoice for the proper functioning of the device. All wearing parts such as filters and filter elements are excluded from the warranty. The statutory warranty applies for gas or liquid pumps.

Guarantee claims will only be accepted if a guarantee registration with registration number is available at SAXON Junkalor GmbH and this number is stated at the time of invoicing.

The warranty covers free repair of the device in our house.

Warranty claims are only accepted after online registration in our service centre at www.saxon-junkalor.de.

Repair services are guaranteed for 6 months. This applies only to errors specified by the customer and corrected by us. The given warranty does not apply, if the device or the module fails during this time with another error.

Unauthorized interventions and destruction of the safety measures on the device void any warranty.

11 Return and Packing

Ship the infralyt N in the original packaging or in a suitable and secure packaging. Make sure that free areas in the dispatch box are filled with shock-absorbing material (e.g. foam). Include a completed contamination declaration on your return. Note that the device will not be accepted without a completed declaration of contamination.

The declaration of contamination can be found in Annex III - Contamination Declaration or here: <http://www.saxon-junkalor.de/cms/wp-content/uploads/2016/03/Kontaminationserklaerung.pdf>

IMPORTANT



Without a complete declaration of contamination the device will not be accepted.

- Enclose the completed declaration of contamination when returning the product
- Contamination declaration in Annex III - Contamination declaration

12 Decommissioning and Disposal

Switch off the supply voltage and disconnect the mains plug.



IMPORTANT

- The device must not be disposed of as household refuse.
- The local and currently valid legislation must be observed.

The device is made of materials that can be recycled. The components are easily separable.

If you have no opportunity to dispose the old device professionally, contact our service. It agrees with you a return and disposal from our house.

13 Supplies and Spare Parts

Supplies	Art.-No.
Sampling probe 280G, flexible incl. remove hose 7m	36102
Oil temperature probe	32038
Wireless speed and oil temperature module	40134
Wireless OBD module BT02	39596
Computer Software „infralyt N“	40133
Bluetooth USB flash drive for computer, class 1	36325

Supplies	Art.-No.
Zero filter (HC filter)	32067
Filter P for sampling probe	32081
Sealing set for fine filter	40130
Filter disc P for fine filter, 100 pieces	32073
Sensor O2 automotive	32078
Sensor NO	36408
Sensor NO2	36409
Hose clip for DN4/6, 4 pieces	40131
Filter cartridge MF for Type B Type B condensate separator	35231
Filter cartridge A4 for Type B Type B condensate separator	35232
Membrane pump set	32094
Cage of the membrane pump	32110
Pair of rod joints for the membrane pump	32112
Fuse, T1L250, 10 pieces	32065
Rubber buffer, 2 pieces	38548
Side plate, 1 set	40120
Base plate infralyt N	39994
Knurled nut for base plate, 2 pieces	38932

Annex I – EU Declaration of Conformity

Within the meaning of EU Directives:

- 2014/30/EU (Electromagnetic compatibility, EMC)
- 2014/35/EU (Low voltage, LV)
- 2014/53/EU (Radio Equipment Device, RED)
- 2011/65/EU (RoHS)

Applied harmonized standards:

- EN 61326-1:2013 (EMC)
- EN 61010-2-081:2002+A1:2003; EN 61010-1:2010 (LV)

SAXON Junkalor GmbH hereby declares that the measuring device described within this document complies with the essential requirements and other relevant provisions of the directives mentioned above. The complete EU Declaration of Conformity can be found at www.saxon-junkalor.de.

Annex II – Communication (Option)

The communication with the infralyt N can take place via the serial interface or wirelessly according to IEEE 802.15.1. The protocol structure and the commands are documented below.

Connections

1. Cable connections via USB-2.0 connection (Type B)
2. Bluetooth® connection, the password is **5510344**.

Communication protocol

The following parameters must be set for the connection:

115200 bps, 8 bit, 1 stop bit, no parity

A hardware-assisted flow control does not take place.

The data packages have the following structure:

STX Command Status Data Checksum ETX

STX	0x02
Command	2 Byte ASCII (from 1-byte command)
Status	2 Byte (see table)
Data	variable ASCII
Checksum	1 Byte EXOR about all previous data, converted to 2 Byte ASCII
ETX	0x03

Example for the calculation of the checksum:

Sent symbols:	02H 30H 31H 30H 30H ...
Checksum:	XOR (02H^30H^31H^30H^30H) = 03H
To be sent:	... 30H 33H 03H (incl. ETX)

In the case of letters, lowercase letters are sent.

Example:

Start Zero (command 40)

PC -> <i>infralyt N</i> :	STX	CMD	Status	Data	Checksum	ETX
	02H	34H 30H	30H 30H	-----	30H 36H	03H
<i>infralyt N</i> -> PC:	STX	CMD	Status	Data	Checksum	ETX
	02H	34H 30H	30H 31H	-----	30H 37H	03H

The format of a response block corresponds to that of a command block, whereby the number of data sent can be different and the current status is supplied at the same time.

For support, you will find a script file on the USB flash drive that contains all commands for use with the terminal program HTerm.

Commands

47 current calculated measured values (including speed and oil temp., if available)

	Cmd	Status	Data
from PC	47H	00H	-----
Response	47H	Status	58 Bytes

1. Value: CO in ppm Vol / or %Vol
2. Value: CO₂ in %Vol (2 decimal places)
3. Value: HC in ppm Vol
4. Value: O₂ in %Vol (2 decimal places)
5. Value: NO in ppm Vol
6. Value: NO₂ in ppm Vol
7. Value: Speed in rpm
8. Value: Oil temperature in °C (1 decimal places)
9. Value: not used

36 Status

In error-free operation, all status bits are set to 0. The meaning of an error can be found in the following tables.

	Cmd	Status	Data
From PC	36H	00H	-----
Response	36H	Status	12 Bytes; 2 Byte ASCII are 1 status byte

Status (general or main status)	
Bit	Meaning
0	-----
1	Failure system clock
2	Failure temperature
3	-----
4	Warm-up time is running
5	Failure ECST
6	Failure measuring bench
7	Gas calibration necessary

Status byte 1 (calibration status)	
Bit	Meaning
0	Calibration status CO (0 = ok / 1 = Calib. necessary)
1	Calibration status CO ₂ (0 = ok / 1 = Calib. necessary)
2	Calibration status HC (0 = ok / 1 = Calib. necessary)
3	Calibration status O ₂ (0 = ok / 1 = Calib. necessary)
4	Calibration status NO (0 = ok / 1 = Calib. necessary)
5	Calibration status NO ₂ (0 = ok / 1 = Calib. necessary)
6	-----
7	-----

Status byte 2 (calibration status)	
Bit	Meaning
0	-----
1	-----
2	-----
3	-----
4	-----
5	-----
6	-----
7	Monitoring on (1)/off (0)

Status byte 3 (status measuring bench)	
Bit	Meaning
0	Modulation error
1	Flow error
2	Failure device status
3	Failure HC residue
4	Warm-up time is running
5	Failure zero
6	Failure EEPROM or ZPRAM
7	-----

Status byte 4 (status chemical cells)	
Bit	Meaning
0	Change O ₂ cell
1	Change NO cell
2	Change NO ₂ cell
3	-----
4	O ₂ cell consumed
5	NO cell consumed
6	NO ₂ cell consumed
7	-----

Status byte 5 (control)	
Bit	Meaning
0	-----
1	-----
2	-----
3	-----
4	-----
5	-----
6	-----
7	Failure time

Status byte 6 (calibration status)	
Bit	Meaning
0	-----
1	-----
2	-----
3	-----
4	-----
5	-----
6	-----
7	-----

40 Trigger zero

This command triggers a zero. Make sure that the device is in clean ambient air.

	Cmd	Status	Data
From PC	40H	00H	-----
Response	40H	Status	-----

09 Query the serial number of the measuring bench

This command triggers a zero. Make sure that the device is in clean ambient air.

	Cmd	Status	Data
From PC	09H	00H	44H 00H
Response	09H	Status	8 Byte Serial number, 1 Byte amount IR-channels

Annex III – Declaration of Decontamination

SAXON JUNKALOR	Dekontaminationserklärung Declaration of Decontamination	FB 2.4-KS-06 Datum: 03.04.2018 / TK Revision: 0
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Empfänger der Rücksendung/ Recipient of return:

SAXON Junkalor GmbH Abteilung Service Alte Landebahn 29 06846 Dessau-Roßlau Germany	Tel.: +49340 5510 214 Fax: +49340 5510 201 e-Mail: service@saxon-junkalor.de
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Erklärung der Gefahrenfreiheit/ Declaration of risk elimination

Wir als Empfänger können zurückgesendete Geräte bzw. Baugruppen nur dann transportieren, prüfen, reparieren oder entsorgen, wenn dies ohne Risiken für Personal und Umwelt möglich ist. Ohne Kontaminationserklärung können wir Ihre Rücksendung leider nicht entgegennehmen. **Bitte bringen Sie die Erklärung gut sichtbar außen an der Verpackung an!**

Vielen Dank für Ihr Verständnis!

We as recipient can only transport, inspect, repair or dispose returned devices and assemblies if it is possible to do so without risk to personnel and the environment.

Without a declaration of contamination we will not accept your reshipment.

Please attach this declaration visibly outside the package!

Thank you for your understanding.

Eingesendetes Produkt/ returned product: _____

Werknummer/ serial number: _____

Grund der Einsendung/ reason for return: _____

Verwendetes Medium/ used substances: _____

Hinweis: Kontaminierte Produkte werden nur nach vorschriftsmäßiger Dekontaminierung angenommen!

Advice: Contaminated products will only be accepted after proper decontamination!

Einsatzbedingte Kontaminierung des Produktes/ Use-related contamination of the product

Toxisch/ toxic	☐ Nein/ No	☐ Ja/ Yes
Ätzend/ corrosive	☐ Nein/ No	☐ Ja/ Yes
Explosiv/ explosive	☐ Nein/ No	☐ Ja/ Yes
Biologisch/ biological	☐ Nein/ No	☐ Ja/ Yes
Radioaktiv/ radioactive	☐ Nein/ No	☐ Ja/ Yes
Sonstige Schadstoffe/ other pollutants	☐ Nein/ No	☐ Ja/ Yes

Rechtsverbindliche Erklärung/ legally binding statement

Hiermit versichern wir, dass die Angaben korrekt und vollständig gemacht wurden und wir akzeptieren eventuelle Folgekosten. Das Produkt ist frei von Rückständen in gefährdender Menge.

We hereby affirm that the information given are correct and complete and we accept consequential costs if necessary. The product is free of hazardous amounts of contaminated substances.

Firma/ company: _____

Abteilung/ department: _____ Name/ name: _____

Straße/ address: _____ PLZ, Ort/ postcode, city: _____

Tel.-Nr./ phone no.: _____ e-Mail: _____

Datum, Unterschrift/ date, signature: _____