



OxiTop[®] -IDS (/B) Multi 3630/3620 IDS

WIRELESS OPERATION OF OXITOP[®] -IDS (/B) MEASURING HEADS



a xylem brand

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1 Overview

Meters of the series MultiLine Multi 3630/3620 IDS can be wirelessly connected to the OxiTop[®]-IDS measuring heads.

The OxiTop[®]-IDS measuring heads in conjunction with a Multi 3630/3620 IDS meter add the following functions to the OxiTop[®] measuring system:

- wireless operation of several OxiTop[®]-IDS measuring heads at the same time
- convenient examination of measurement data at the meter
- transmitting the measurement data to a PC
- BOD special functions that cannot be carried out using the operating elements of the OxiTop[®]-IDS measuring heads

Prerequisites

- Meter Multi 3630 IDS or Multi 3620 IDS with current firmware version
- Adapter IDS WLM-M for wireless connection to IDS sensors with current firmware version
- OxiTop[®]-IDS (/B)measuring heads with current firmware version

The current firmware versions for the meters are available on the Internet at www.wtw.com (to carry out the firmware update: see chapter 8 FIRMWARE UPDATE).



The connection is established according to the same principle as the wireless communication with sensors via the WLM adapters (for details on the WLM system, see operating manual of the WLM system).



Basic information on how to operate the meter is given in the operating manual of your meter.

Data exchange with the OxiTop[®]-IDS measuring heads

OxiTop[®]-IDS measuring heads transmit the following data to the meter:

- Data of the OxiTop[®]-IDS measuring head
 - ID
 - Type designation of the OxiTop[®]-IDS measuring head (e.g. OxiTop[®]-IDS)
 - Series number of the OxiTop[®]-IDS measuring head
- Calibration data
- Measurement data
- Measurement settings

2 Safety

2.1 Safety information

2.1.1 Safety information in the operating manual

This operating manual provides important information on the safe operation of the meter. Read this operating manual thoroughly and make yourself familiar with the meter before putting it into operation or working with it. The operating manual must be kept in the vicinity of the meter so you can always find the information you need.

Important safety instructions are highlighted in this operating manual. They are indicated by the warning symbol (triangle) in the left column. The signal word (e.g. "CAUTION") indicates the level of danger:

**Warning**

indicates a possibly dangerous situation that can lead to serious (irreversible) injury or death if the safety instruction is not followed.

**Caution**

indicates a possibly dangerous situation that can lead to slight (reversible) injury if the safety instruction is not followed.

NOTE

indicates a possibly dangerous situation where goods might be damaged if the actions mentioned are not taken.

2.1.2 Safety signs on the meter

Note all labels, information signs and safety symbols on the meter and in the battery compartment. A warning symbol (triangle) without text refers to safety information in this operating manual.

2.1.3 Further documents providing safety information

The following documents provide additional information, which you should observe for your safety when working with the measuring system:

- Operating manuals of measuring heads and other accessories
- Safety datasheets of calibration or maintenance accessories (such as buffer solutions, electrolyte solutions, etc.)

2.2 Safe operation

2.2.1 Authorized use

Authorized use of the meter in operation with OxiTop[®]-IDS measuring heads is exclusively the pressure measurement with OxiTop[®]-IDS measuring heads in a laboratory.

Only the operation and running of the analyzer according to the instructions and technical specifications given in this operating manual is authorized (see chapter 16 TECHNICAL DATA).

Any other use is considered unauthorized.

2.2.2 Requirements for safe operation

Note the following points for safe operation:

- The meter may only be operated according to the authorized use specified above.
- The meter may only be supplied with power by the energy sources mentioned in this operating manual.
- The meter may only be operated under the environmental conditions mentioned in this operating manual.
- The meter may only be opened if this is explicitly described in this operating manual (example: Inserting the batteries).

2.2.3 Unauthorized use

The meter must not be put into operation if:

- it is visibly damaged (e.g. after being transported)
- it was stored under adverse conditions for a lengthy period of time (storing conditions, see chapter 16 TECHNICAL DATA).

3 Commissioning



Information on how to put the Multi 3630/3620 IDS into operation is given in the operating manual of your meter.

Information on how to put the WLM-M adapter into operation is given in the operating manual of the WLM system.

To carry out measurements with the OxiTop[®]-IDS measuring heads, proceed as follows:

- If necessary, disconnect any other sensors from the meter (simultaneous operation with IDS sensors is not possible)
- Plug the WLM-M adapter to the Multi 3630/3620 IDS meter (see operating manual of the WLM system)
- Switch on the Multi 3630/3620 IDS meter (see operating manual of the Multi 3630/3620 IDS meter)
- For initial commissioning, press **<M_>** to switch the meter to operation with OxiTop[®]-IDS measuring heads.
- Switch on the OxiTop[®]-IDS measuring heads (see operating manual OxiTop[®]-IDS of the measuring head)
- Assign an extra ID to each OxiTop[®]-IDS measuring head (see operating manual OxiTop[®]-IDS of the measuring head)

4 Operation



The basic information and general operating principles are given in the operating manual of your meter, e.g. operation, navigation in the menu, setting the date, time and language.

The meter can either be operated with IDS sensors or OxiTop[®]-IDS measuring heads. Operation with OxiTop[®]-IDS measuring heads is possible only wireless. Using **<M_>** switch between operating with IDS sensors and operating with OxiTop[®]-IDS measuring heads.

On delivery, operation with IDS sensors is preset.

Prerequisites

Prerequisites for operation with OxiTop[®]-IDS measuring heads:

- Meter Multi 3630 IDS or Multi 3620 IDS with current firmware version
- Adapter WLM-M is connected to the meter Multi 3630/3620 IDS, with current firmware version
- OxiTop[®]-IDS (/B) measuring heads
- Undisturbed radio link between OxiTop[®]-IDS measuring head and meter
- The radio connection is active at the OxiTop[®]-IDS measuring head
- No IDS sensor is connected to the meter



The current firmware versions for the meters are available on the Internet at www.wtw.com (to carry out the firmware update: see chapter 8 FIRMWARE UPDATE) is displayed.

Communication between OxiTop[®]-IDS measuring head and meter

Communication between the meter and OxiTop[®]-IDS measuring head only starts after an OxiTop[®]-IDS measuring head was assigned to a sample.

This communication is used for the following purposes:

- Exchanging data and settings between meter and OxiTop[®]-IDS measuring head
- Identifying OxiTop[®]-IDS measuring heads using the meter (the LED at the measuring head indicates the communication)

Status LED at the OxiTop[®]-IDS measuring head

The status LED at the OxiTop[®]-IDS measuring head indicates the current state of a measurement. The LED flashes slowly (approx. every 5 seconds).

Color	Explanation
Magenta	Measurement is running. The measuring head can be reached via radio.
Blue	Measurement is running. The measuring head OxiTop [®] -IDS cannot be reached via radio.

Color	Explanation
Red	<p>Measurement is running. The measuring head is in a critical condition:</p> <ul style="list-style-type: none"> ● The battery is nearly discharged <p>or</p> <ul style="list-style-type: none"> ● The pressure in the sample bottles is too high. <p>Suitable actions, see operating manual of your measuring head.</p>
Green	<p>The measurement is finished. The status LED flashes green for approx. 24 hours. The measuring head OxiTop®-IDS can be reached via radio.</p>

4.1 Measuring modes while operating the OxiTop®-IDS measuring heads

Measuring mode	Explanation
BOD	<ul style="list-style-type: none"> ● Measurement of up to 12 parallel sample processes per overall sample for a BOD_x (x = 0.5h ... 180d) ● Automatic sample statistics with averaging ● The <i>AutoTemp</i> function can be switched on ● The <i>GLP</i> function can be switched on
<i>BOD standard</i>	<ul style="list-style-type: none"> ● The measuring range and sample volume can be selected from seven fixed combinations. ● The incubation temperature is 20 °C
<i>BOD special</i>	<ul style="list-style-type: none"> ● <i>Measuring range, Dilution 1 +, Sample volume and Bottle volume</i> can be freely adjusted ● The incubation temperature (5 °C to 40 °C) can be set up

<i>Measuring mode</i>		Explanation
Pres- sure p		<ul style="list-style-type: none"> ● Pure pressure measurement ● Measuring range: <ul style="list-style-type: none"> – 500 ... 1250 hPa (OxiTop[®] i/OxiTop[®]-IDS) – 500 ... 1500 hPa (OxiTop[®]-IDS /B) ● A <i>Alarm diff. pressure</i> can be set ● Up to 10 manually triggered measurements (momentary values) are saved with pressure value and point in time ● The <i>GLP</i> function can be switched on

4.2 OxiTop[®] set management

4.2.1 Overview

After switching to operation with the OxiTop[®]-IDS measuring heads with **<M_>**, the display of the meter shows the *OxiTop set management* (overview of all set/samples started).

Set A set can include several (max. 12) samples, for which the following joint settings are specified:

- *Measuring mode* (BOD [BOD standard / BOD special], Pressure p)
- *Duration*
- *Set name*
- Further settings depending on the selected *Measuring mode*



Example:

All samples started at the same time (e.g. on a common stirring platform) are included in a set with a common name.

The meter automatically creates an identifiable name for the set. The name consists of the date (format YYMMDD) and an index (-x), which is automatically incremented for sets started on the same day, e.g. 190422-1. The automatically created name can be changed manually (max. 8 characters [numerals / letters])

Sample To determine the BOD, one sample can be distributed to several (max. 12) measuring bottles (parallel determination), for which the following common settings are specified:

- *Sample name*
- Further settings depending on the selected *Measuring mode*

The meter automatically creates an identifiable name for the sample. The name consists of a letter (A) and an index (-x) that is automatically increased for further samples in the same set, e.g. A-1. The automatically created name can be changed manually (max. 8 characters [numerals / letters])

Meas. head Each measuring bottle is closed with an OxiTop[®]-IDS measuring head. The OxiTop[®]-IDS measuring heads are always assigned to a sample by the meter.

4.2.2 Overview of the sets (*OxiTop set management*)

In the *OxiTop set management*, you can

- create new sets (<F1>/[New]),
and within a set, new samples
 - max. 12 sets
 - per set up to 12 samples
 - per sample up to 12 OxiTop[®]-IDS measuring heads
(the maximum number of OxiTop[®]-IDS measuring heads for a meter is limited to 100)
- Delete sets (<F2>/[Delete])
- Show details of each set (<MENU/ENTER>)
e.g. overview of the samples in the set
- General settings (<MENU/ENTER_>)
system settings for the meter (e.g. language etc.)

Set name	Status	Status	Type (Measuring mode, Duration)	End date of the measurement
190216-1	✓	5/5	BOD5	21.05.2019
190216-2		360/360	BOD5	21.05.2019
190216-3		6/7	BOD7	23.05.2019
190217-1		4/4	BOD4h	17.05.2019
190220-1		4/20	BOD20	12.06.2019
190220-2		360/360	BOD5	21.05.2019
RED_F113-1		1/5	p5	25.05.2019
190223-1		137/360	BOD30m	23.05.2019

79 Free meas. heads

New 15.03.2020 08:00 Delete

- 1 Set name
- 2 Check mark (✓ = finished):
when the data of the measuring head have been transmitted to the meter at the end of the specified *Duration*
- 3 Status of the set
Number of measured values / maximum number of measured values
- 4 Type (Measuring mode, Duration)
- 5 End date of the measurement
- 6 <F1>/[New] (creates a new set)
- 7 <F2>/[Delete] (deletes the highlighted set)
- 8



Using <▲><▼>, select a set.

4.2.3 Overview of the samples of the set

The current measured values of all samples are automatically called up when the details of a set are queried (with **<MENU/ENTER>** in the *OxiTop set management*).

1 → Set 190216-1

2 → A-1 ✓ 4000 mg/l BOD5 1/1
A-2 357 mg/l BOD5 2/3

3 → 79 Free meas. heads

4 → **i** 15.03.2020 08:00 Delete ← 5

- 1 Set name
- 2 Sample name, measured value, type, OxiTop[®]-IDS measuring heads called up/number of OxiTop[®]-IDS measuring heads in the sample;
 - Check mark (✓ = finished) next to Sample name : when the data of the measuring head have been transmitted to the meter at the end of the specified Duration
 - Asterisk (* = Alarm diff. pressure exceeded) next to measured value: if the Alarm diff. pressure is exceeded in at least one OxiTop[®]-IDS measuring head of the sample (only for Measuring mode: Pressure p)
- 3 Status line (number of OxiTop[®]-IDS measuring heads that can yet be registered)
- 4 **<F1>/[i]**: the graphic evaluation of the OxiTop[®]-IDS measuring heads of the highlighted sample is displayed.
- 5 **<F2>/[Delete]** (deletes the highlighted sample)



Selecting a sample with **<▲><▼>** and confirming with **<MENU/ENTER>** causes the overview of the OxiTop[®]-IDS measuring heads of the highlighted sample to be displayed.

After selecting a sample with **<▲><▼>** you can output the measurement data of the highlighted sample to the USB interface with **<PRT_>** or **<PRT>**:

Key	Explanation
<PRT_>	Output of the data as a *.csv file to the USB-A interface, to a connected USB memory device.
<PRT>	Output of the data in ASCII or CSV format (setting in the system menu) to the interface USB-A or USB-B. The meter recognizes whether a printer or PC is connected.

4.2.4 Overview of the OxiTop®-IDS measuring heads in a sample

The details of the OxiTop®-IDS measuring heads registered for a sample are listed in the overview of samples in the set and can be viewed by selecting a sample with <▲><▼> and displaying it with <MENU/ENTER>.

2	3	4	5	6
12	✓	020190001	123 mg/l	GLP
13		020190015	125 mg/l	GLP
21		020190123	127 mg/l	GLP

79 Free meas. heads

15.03.2020 08:00

Delete

- 1 *Sample name*
- 2 Number of the OxiTop®-IDS measuring head (set at the OxiTop®-IDS measuring head)
- 3 Check mark (✓ = finished):
when the data of the measuring head have been transmitted to the meter at the end of the specified *Duration*
- 4 Series number of the OxiTop®-IDS measuring head
- 5 Measured value
(last value transmitted by the measuring head in the specified interval)
 - Asterisk (* = *Alarm diff. pressure* exceeded):
if the *Alarm diff. pressure* in the OxiTop®-IDS measuring head is exceeded (only for *Measuring mode: Pressure p*)
- 6 *GLP* (valid calibration available during start of measurement)
- 7 <F1>/[i]: the LED at the highlighted OxiTop®-IDS measuring head lights up red for a short time.
- 8 <F2>/[Delete]: deletes the highlighted OxiTop®-IDS measuring head from the sample

4.3 Settings

4.3.1 Measurement settings of the set

The measurement settings for a set are defined while the set is being established.

Default settings are printed in bold.

Menu item	Possible setting	Explanation
<i>Measuring mode</i>	BOD standard <i>BOD special</i> <i>Pressure p</i>	Depending on the selected measuring mode, some of the following settings are enabled or grayed out
<i>Set name</i>	max. 8 characters	The 8 characters can be freely selected. Preselected is a clear combination of numerals (date). An index is also assigned automatically.
<i>Duration</i>	30 min, 1 h ... 1 d... 5 d ... 180 d	Duration of the measurement
<i>Settings</i>	General settings for the set	
<i>GLP</i>	<i>on</i> off	Function to check whether the measuring heads have a valid calibration. When the sample is being registered, measuring heads without a valid calibration are rejected if the <i>GLP</i> function is active.
<i>AutoTemp</i>	on <i>off</i>	Function to control the temperature adjustment. Measurement is started automatically (at least 1 hour, at most 3 hours after the OxiTop®-IDS measuring head is started). Pre-tempering the samples to exactly 20°C is not required. The samples can be inserted with a temperature in the range of 15°C ... 21°C. The <i>AutoTemp</i> function takes over the temperature control.
<i>Alarm diff. pressure</i> (Only for <i>Measuring mode: Pressure p</i>)	50 ... 150 ... 500 hPa	Difference pressure (negative or positive pressure difference compared to the start pressure). If it is exceeded, the meter marks the sample with an asterisk (!). The warning when the specified <i>Alarm diff. pressure</i> is exceeded is triggered when: – the measurement data have been transmitted to the meter and – the measured value that was last stored by the OxiTop®-IDS measuring head exceeds the difference pressure
<i>Man. temperature</i> (for <i>BOD special</i>)	5 ... 20 ... 40 °C	Manual setting of the temperature at which the measurement takes place

Menu item	Possible setting	Explanation
<i>Number of measured values</i>	Standard <i>Max.</i>	1 measured value per day 360 measured values for the specified measuring duration
<i>LED</i>	on <i>off</i>	Switching on/off the LED indication of the operating statuses (at the OxiTop®-IDS measuring head). The LED (at the OxiTop®-IDS measuring head) can be switched off to save energy.
<i>Eco mode (radio)</i>	on <i>off</i>	Energy saving function to switch on or off the OxiTop®-IDS measuring heads.
Only for <i>Eco mode (radio) = on</i> : <ul style="list-style-type: none"> ● <i>Radio connection from</i> ● <i>Radio connection until</i> 	each 0.00 ... 23.00	Entry of the time (hours, begin and end) at which the measuring heads can be reached via radio every day (LED magenta). Outside the specified times, the radio connection of the measuring heads is switched off in order to save energy (LED blue). The restricted radio connection is only active during a measurement.

4.3.2 Measurement settings of the sample



The general settings for the set apply to the entire meter. All other settings always apply to all OxiTop®-IDS measuring heads in the current set.

The measurement settings for the sample are defined when the sample is registered within a set.

Default settings are printed in bold.

Menu item	Possible setting	Explanation
<i>Sample name</i>	max. 8 characters	The 8 characters can be freely selected Preselected is an A. An index is also assigned automatically.
<i>Measuring range (for BOD standard)</i>	0 ... 40 / 80 / 200 mg/l 0 ... 400 mg/l 0 ... 800 / 2000 / 4000 mg/l	The measuring range expected for the sample can be selected from 7 permanent ranges. Selecting the measuring range defines the <i>Sample volume</i> . The corresponding <i>Sample volume</i> is displayed as Info.
<i>Calculation (for BOD special)</i>	Measuring range <i>Sample volume</i> <i>Bottle volume</i>	Parameter to be calculated The parameters not calculated are set in the <i>Settings</i> menu.

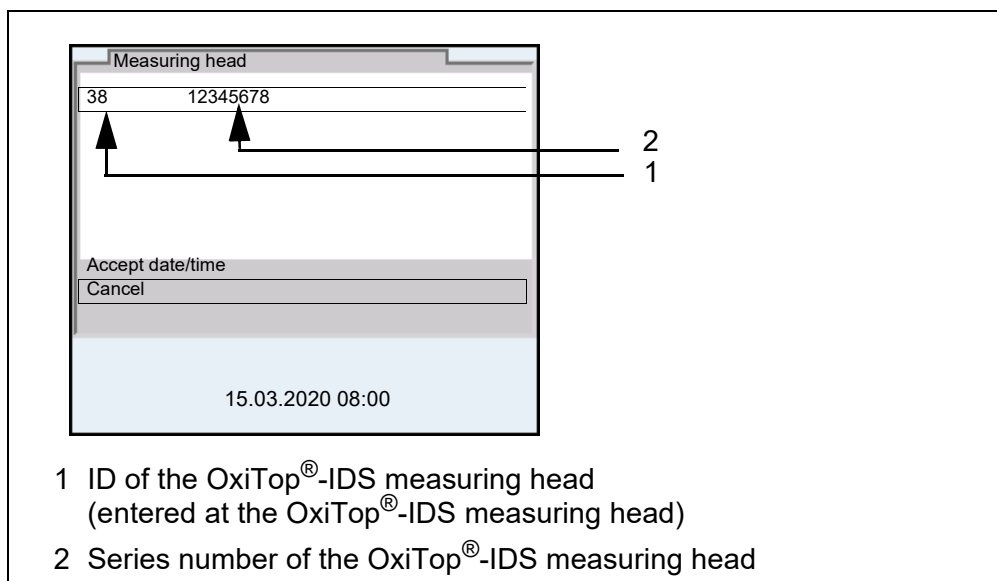
Menu item	Possible setting	Explanation
<i>Settings</i> (for <i>BOD special</i>)	The maximum setting ranges quoted here can be restricted by other settings. The setting selected in the <i>Calculation</i> menu is not available here.	
<i>Measuring range</i>	0 ... 400000 mg/l	Measuring range
<i>Sample volume</i>	10 ... [<i>Bottle volume</i> - 10] ml	Sample volume
<i>Bottle volume</i>	50 ... 9999 ml	Bottle volume
<i>Dilution 1 +</i>	0 ... 99	Dilution of the sample (1 part sample + x parts water)

4.3.3 Setting the date and time at the OxiTop®-IDS measuring head

Automatic setting The setting of the date and time for an OxiTop®-IDS measuring head is done automatically each time a measuring head is registered with a sample.

Manual setting After an exchange of the battery while measuring:
You can transmit the date and time from the meter to the OxiTop®-IDS measuring head.

- 1 Switch on the meter with **<On/Off>**.
- 2 Open the *System* menu with **<MENU/ENTER_>**.
- 3 Open the menu *System/Clock function/AutoClock (OxiTop)*.
- 4 Follow the instructions on the display.
Press the **<▲▼>** key of the OxiTop®-IDS measuring head (right-hand key) and keep it depressed until the LED flashes green.
When the OxiTop®-IDS measuring head has been identified by the meter, the following data of the head are displayed:
 - *ID* (assigned at the measuring head)
 - *Series number* of the OxiTop®-IDS measuring head



- 5 Using *Accept date/time*, confirm the date and time for the measuring head.
or
To not confirm the date and time for the measuring head, press *Cancel*.

5 Operation with OxiTop®-IDS measuring heads

5.1 Measuring

5.1.1 Preparing the measurement

Municipal wastewater does not normally contain any toxic or inhibiting substances. There are enough nutrient salts and suitable microorganisms present. Under these conditions, BOD determination in the undiluted sample using the OxiTop®-IDS measuring system is possible.

Prior to measuring, carry out the following preparatory activities:

- Keep ready the instruments and accessories required
 - OxiTop®-IDS measuring heads
 - Stirring platform
 - Thermostat cabinet/box (BOD standard: temperature $20\text{ °C} \pm 1\text{ °C}$)
 - Brown sample bottles (bottle volume 510 ml)
 - Magnetic stirring rods (1 stirring rod for each sample bottle)
 - Magnetic stirring rod remover
 - Suitable overflow volumetric flask
 - Rubber sleeves
 - Nitrification inhibitor ATH (NTH 600)
 - Sodium hydroxide tablets (NHP 600)
- Determine the sample volume
(see operating manual of the OxiTop®-IDS measuring head)
- Prepare the samples
(see e.g. operating manual of the OxiTop®-IDS measuring head or WTW application reports, chapter "Sample preparation")

Further documents on BOD determination

- Operating manual of your OxiTop®-IDS measuring head
- WTW application reports (see www.wtw.com)
- DIN EN 1899-2
Water quality - Determination of the biochemical oxygen demand after n days (BOD) - part 2: Procedure for undiluted samples (ISO 5815:1989, modified)

Risks during
determination of
biogas (OxiTop[®]-IDS
/B measuring head)

**Caution**

During the anaerobic degradation of organic material in sealed equipment, high pressure can develop due to biogas (main components: methane and carbon dioxide).

The following hazards can occur:

- Risk of bursting due to the high pressure and risk of injury caused by flying glass splinters.
- Risk of explosion due to development of flammable gas mixtures if high concentrations of methane escape.

Take the following precautionary measures for safe operation:

- Only use WTW measurement bottles of the MF/... series, which are especially designed for biogas determination (see WTW catalog).
- Only use measurement bottles that are not damaged (e.g. are not cracked, chipped or scratched).
- Determine the reaction conditions (temperature, quantity) under which no dangerous excess pressure develops by means of monitored preliminary tests (e.g. with diluted material).
- For unmonitored measurements, include a buffer for the developing pressure, as the composition of biological material can considerably vary. Therefore, a pressure that is higher than planned on can develop.
- Only use the corrosion resistant OxiTop[®]-IDS /B measuring heads. They were designed especially for biogas applications.
- OxiTop[®]-IDS /B measuring heads display measured values in the range 500 ... 1500 hPa. OFL (measuring range exceeded) is displayed if the pressure is higher.

CAUTION

The pressure sensor in the OxiTop[®]-IDS measuring head may be destroyed by a pressure of 2000 hPa or higher.

**Caution**

If an OxiTop[®]-IDS /B measuring head displays OFL (measuring range exceeded) despite all precautionary measures, the actual pressure can already be considerably higher than 1500 hPa.

Terminate the measurement immediately:

- Wear protective equipment (face shield, protective clothing, gloves).
- Wrap the bottle in a thick towel.
- Vent the bottle.

5.1.2 The course of the measurement

- 1 Carry out the preparatory activities (see section 5.1.1 PREPARING THE MEASUREMENT):
 - Keep ready the instruments and accessories required
 - Determine the sample volume
 - Prepare the samples
- 2 Switch on the meter with **<On/Off>**.
- 3 If necessary, use **<M_>** to switch to operation with the OxiTop®-IDS measuring heads.
The *OxiTop set management* (overview of the sets started) is displayed.

Preparation before starting the measurement

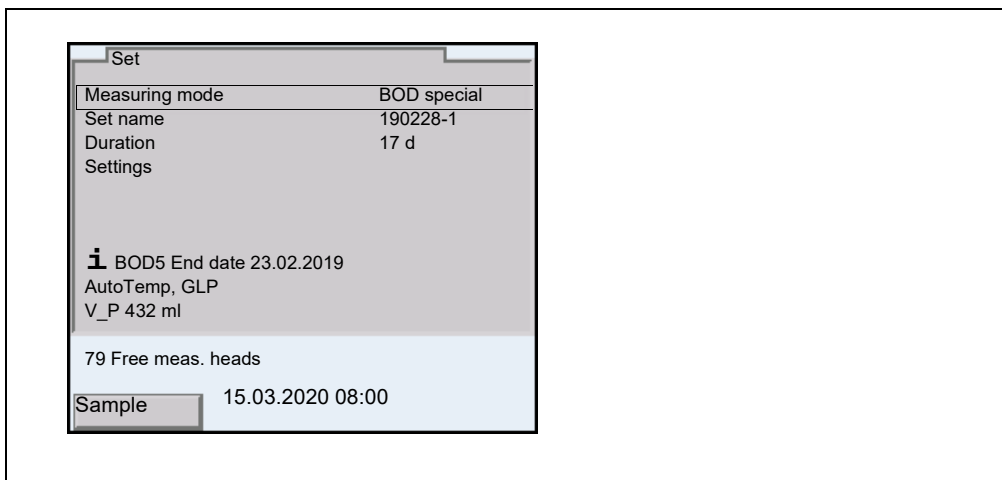
OxiTop set management				
190216-1	✓	5/5	BOD5	21.05.2019
190216-2		360/360	BOD5	21.05.2019
190216-3		6/7	BOD7	23.05.2019
190217-1		4/4	BOD4h	17.05.2019
190220-1		4/20	BOD20	12.06.2019
190220-2		360/360	BOD5	21.05.2019
RED_F113-1		1/5	p5	25.05.2019
190223-1		137/360	BOD30m	23.05.2019
79 Free meas. heads				
New		15.03.2020 08:00		Delete



During the initial commissioning the list *OxiTop set management* is empty.

The display shows *No data available!*.

- 4 In the *OxiTop set management*, use **<F1>/[New]** to create a new set of samples.
The *Set* menu opens.
- 5 Temper the test sample or measure the current temperature.



- 6 Check and, if necessary, change the settings in the *Set* menu.
 - *Measuring mode*
 - BOD measurement (*BOD standard / BOD special*) or
 - pressure measurement (*Pressure p*)
 Depending on the selected measuring mode, further special settings for the sample are possible.
 - *Set name*

The current date with an index (consecutive number) is automatically preselected as name for the set. The name can be changed freely (max. 8 characters [numerals / letters])
 - *Duration*

Make sure that the remaining lifetime of the battery of the measuring head is sufficient for the specified duration. You can insert a new battery or make use of the energy saving settings, e.g. switch off the LED or switch on the Eco mode (radio).
 - *Settings*
- 7 Open the *Settings /* menu.

The screenshot shows the 'Settings' menu with the following configuration:

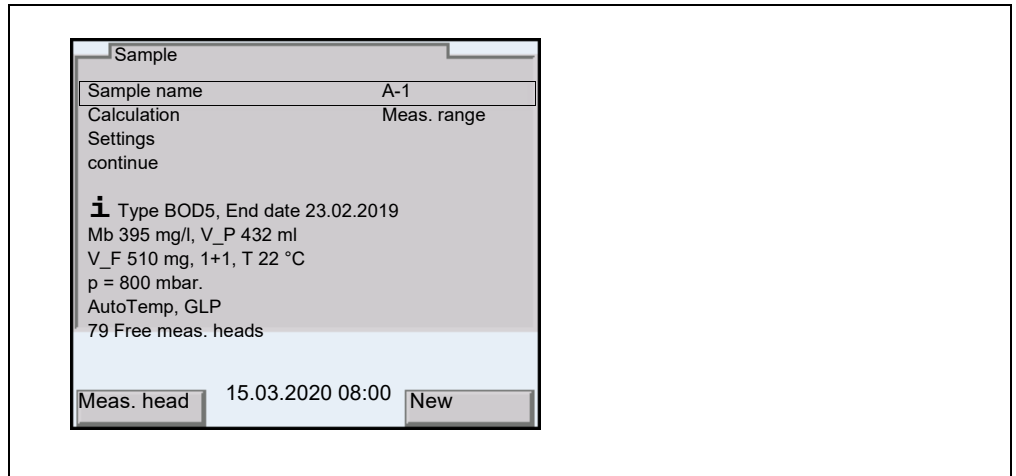
GLP	on
AutoTemp	on
Alarm diff. pressure	500 hPa
Man. temperature	22°C
LED	on
Number of measured values	Standard
Eco mode (radio)	on
Radio connection from	08:00
Radio connection until	12:00

At the bottom, it shows '79 Free meas. heads' and the date/time '15.03.2020 08:00'.

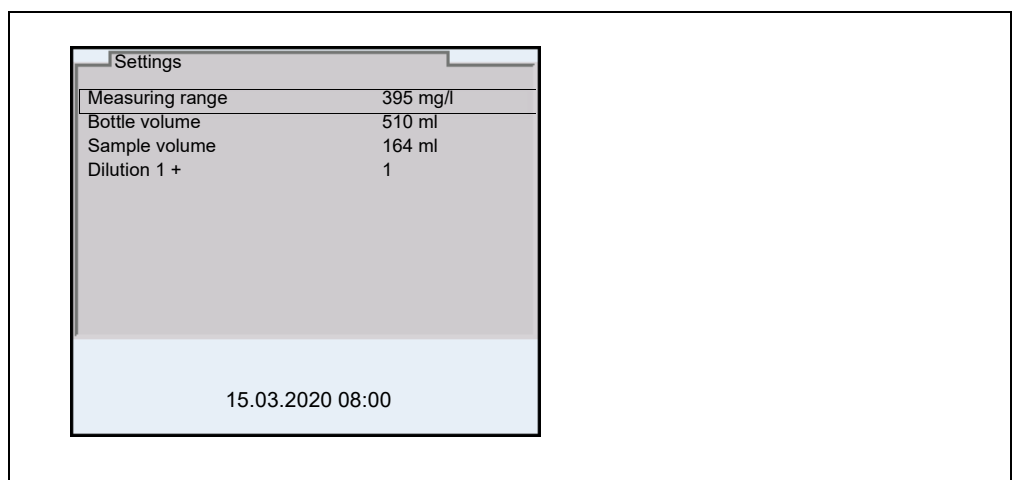
The settings available here depend on the specified *Type* of measurement (*Standard, BOD special, Pressure p*).

- 8 Check and, if necessary, change the settings for the set in the *Settings* menu (see section 4.3 SETTINGS).

- 9 Quit the *Settings* menu with **<ESC>**.
- 10 Using **<F1>/[Sample]**, open the settings for the individual samples in the current set.



- 11 Check and, if necessary, change the settings in the *Sample* menu.
 - *Sample name*
 An A with an index (consecutive number) is automatically preselected. The A can be changed freely (max. 8 characters [numerals / letters])
 - *Measuring range* (only with *Type = Standard*)
 - *Calculation* (only with *Type = BOD special*)
 - *Settings* (only with *Type = BOD special*)
- 12 Further information and settings of the sample are displayed as an Info message.
- 13 Only for *Measuring mode = BOD special*:
 Open the *Settings* menu.

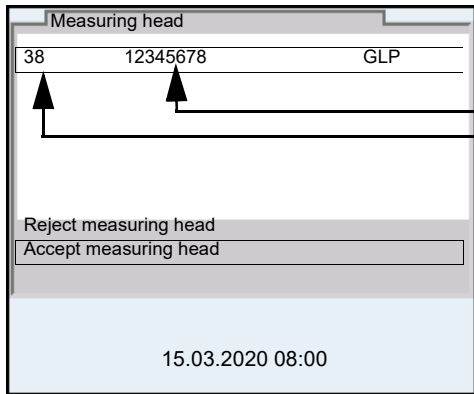


Check and, if necessary, change the settings in the *Settings* menu.

- *Measuring range*
- *Bottle volume*
- *Sample volume*
- *Dilution 1 +*

Quit the *Settings* menu with **<ESC>**.

- 14 Using **<F1>**/[Meas. head] start the assignment of a OxiTop®-IDS measuring head to the current sample.
- 15 Follow the instructions on the display.
Press the **<▲▼>** key of the OxiTop®-IDS measuring head (right-hand key) and keep it depressed until the LED flashes green.
When the OxiTop®-IDS measuring head has been identified by the meter, the following data of the head are displayed:
 - *ID* (assigned at the measuring head)
 - *Series number* of the OxiTop®-IDS measuring head
 - *GLP* (if there is a valid calibration).



1 ID of the OxiTop®-IDS measuring head (entered at the OxiTop®-IDS measuring head)

2 Series number of the OxiTop®-IDS measuring head

3 GLP (if there is a valid calibration).

- 16 Using *Accept measuring head*, confirm the assignment of the OxiTop®-IDS measuring head.
or
Using *Reject measuring head*, cancel the assignment of the OxiTop®-IDS measuring head.
The *Set* menu is open.



When the measuring head is accepted, the date and time of the meter are automatically transferred to the measuring head.

- 17 Assign further measuring heads of the current *Sample* in the *Set* (repeat steps 14-16).
- 18 If necessary, create another sample in the set with <F2>/[New]. As the name for the *Sample*, a new number is automatically selected. The name can be changed freely (max. 8 characters [numerals / letters])

Assign the OxiTop[®]-IDS measuring heads to the new sample (repeat steps 13-17).

Starting the measurement

- 19 Using <ESC>, or with the menu item *continue*, switch to the *Set* menu.
- 20 Using *Start measurement*, start measurement for all samples in the set at the same time.
 - The LEDs at the measuring head flash magenta for at least half an hour (if the signal LED on the measuring head is switched on).
 - The measuring heads can be reached via radio for at least half an hour.
 - *AutoTemp* is displayed on the display (when the *AutoTemp* function is switched on at the measuring heads).



The settings cannot be changed for a measurement once it is started.

Each OxiTop[®]-IDS measuring head connected to the meter can indicate the following data on the display:

- Name of the set
- Name of the sample
- Settings

For this press the <ENTER> key at the measuring head.

- 21 Keep the sample bottles (with the OxiTop[®]-IDS measuring heads screwed on) in a place that is controlled to 20°C (e.g. thermostat cabinet/box) for the specified number of days.
When the measuring temperature has been reached (function *AutoTemp*: after at least 1 hour, at most approx. 3 hours), the OxiTop[®]-IDS measuring head automatically starts measuring the oxygen consumption.
- 22 During the specified measuring duration, stir the sample continuously (stirring platform, magnetic stirring rods) and keep the temperature controlled.
The OxiTop[®]-IDS measuring head automatically stores the specified number of measured values each day during the selected measuring duration.



If there is a radio link with the measuring head (LED magenta), you can transfer and display the available measured values while a measurement is running.

Completing the measurement

When the measurement is finished, the status LED flashes green for approx. 24 hours and the OxiTop®-IDS measuring head can be reached via radio.

- 23 Using **<M>**, switch to the *OxiTop set management*.
- 24 Using **<▲><▼>**, select a set and open it with **<MENU/ENTER>**.
The data of the measuring heads are read out.
The reading out takes approx 5 seconds per OxiTop®-IDS measuring head, with many measurement data it may take longer.
In the *OxiTop set management*, the set is given a checkmark [✓] in the status field.
- 25 If necessary, edit the evaluation of the sample (e.g. if an OxiTop®-IDS measuring head is missing, or if there are obviously wrong values for an OxiTop®-IDS measuring head, see section 5.3 EVALUATING THE SAMPLES).
- 26 Using **<M>**, switch to the *OxiTop set management*.
- 27 Using **<▲><▼>**, select the finished and read-out set.
- 28 Using **<▲><▼>**, select the finished and read-out set and, if necessary, delete it with **<F2>/[Delete]**.
The measuring heads are released for new measurements.

5.2 Displaying and saving the momentary value

This function enables you to display the momentary pressure value of an active sample and to save up to 10 momentary values per sample during the runtime of the sample.

When 10 momentary values have been saved, no further momentary value can be displayed. In this case, the **<STO>** key is without function.

The saved momentary values are output as a block at the end of the output to the interfaces USB-A and USB-B or at the end of the csv file.

Displaying the momentary value

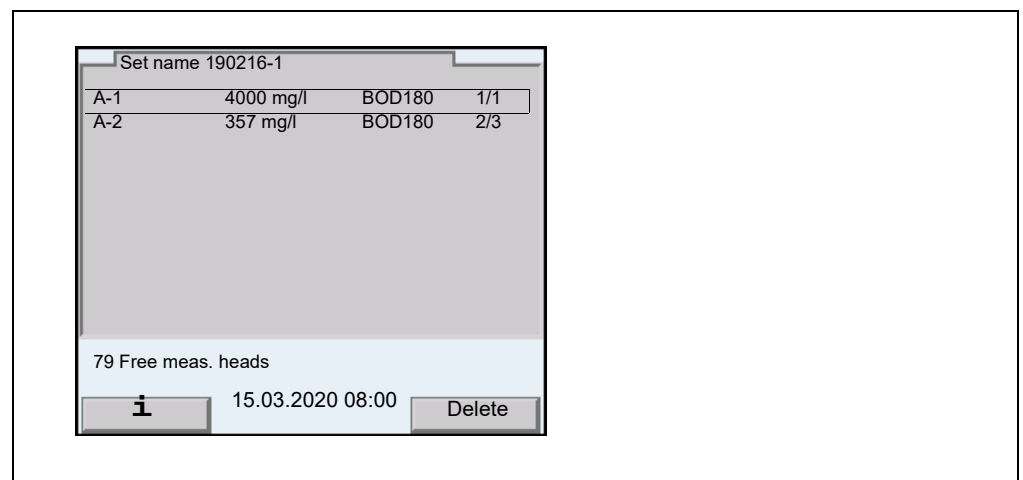
- 1 Using **<▲><▼>**, in the *OxiTop set management* highlight a *Set* with running pressure measurement (*Measuring mode Pressure p*).
- 2 Open the details of the selected set with **<MENU/ENTER>**.
The measuring heads automatically call up the current data of the set.
The reading out takes approx 5 seconds per OxiTop®-IDS measuring head, with many measurement data it may take longer.
- 3 Select a sample of the set.
- 4 Select a measuring head of the sample.

- 5 ● Display the momentary value with **<STO>**.
 - Save the momentary value with **<MENU/ENTER>**.
or
 - Exit the display without saving with **<ESC>**.
- Display any momentary values that were already saved with **<RCL>**.

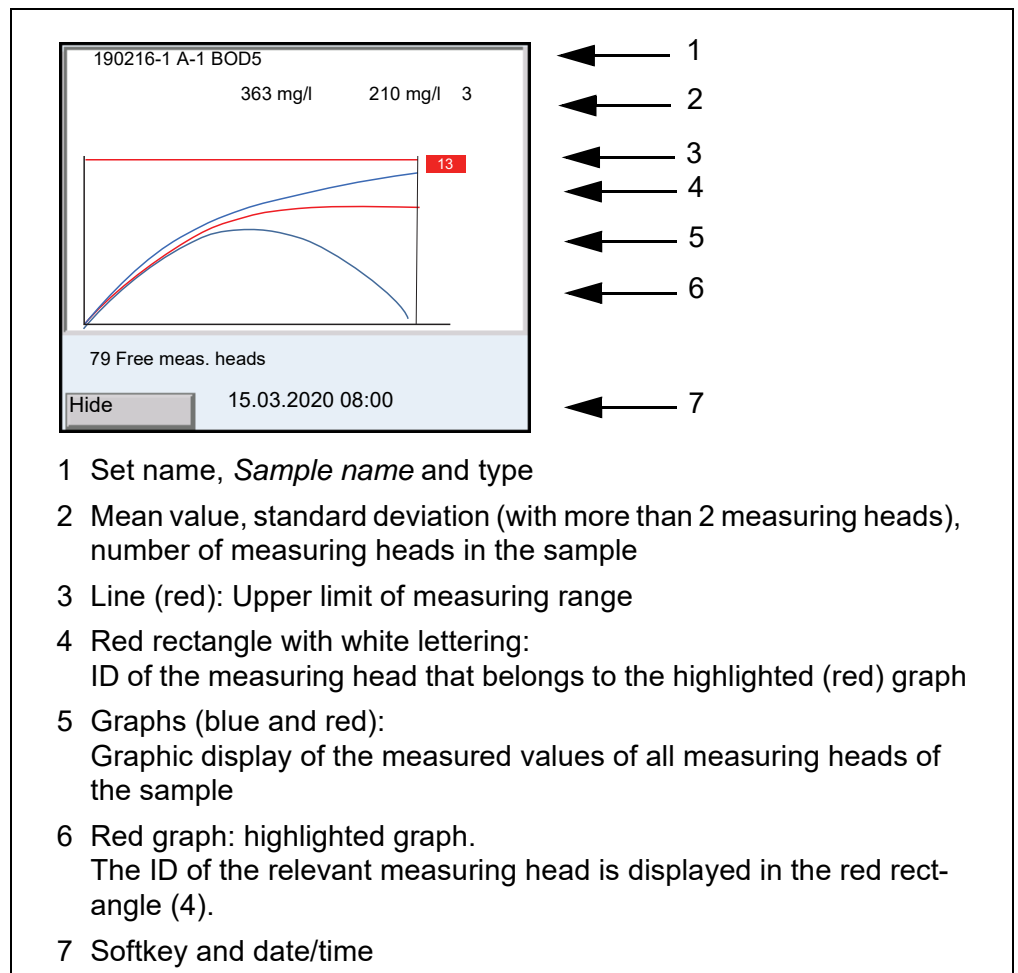
5.3 Evaluating the samples

You can view the current measurement data for each OxiTop[®]-IDS measuring head at any time (during or after the measurement).

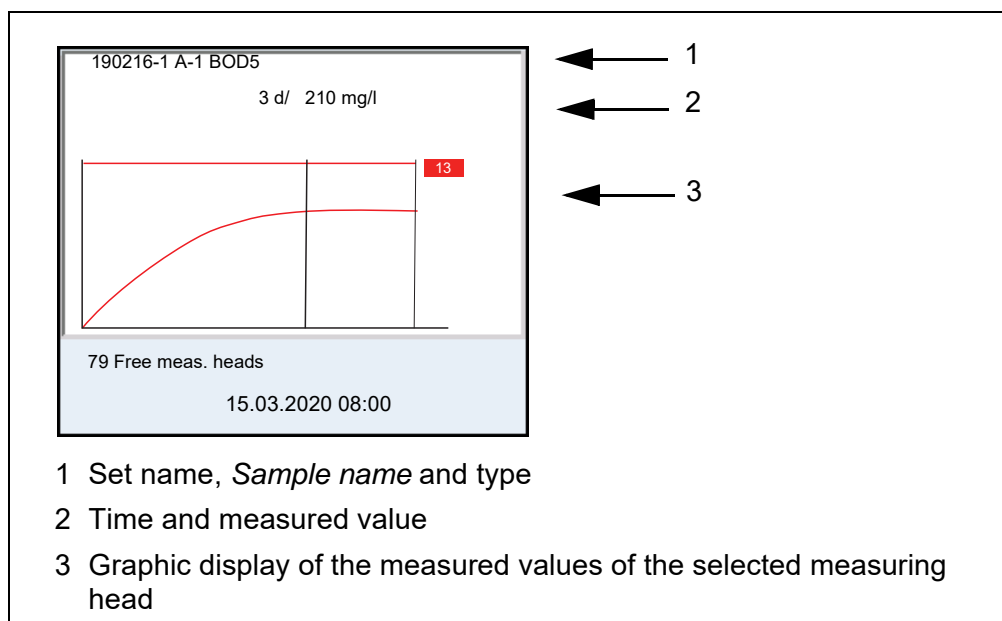
- 1 Using **<▲><▼>**, highlight a set in the *OxiTop set management Set*.
- 2 Open the details of the selected set with **<MENU/ENTER>**.
The measuring heads automatically call up the current data of the set.
The reading out takes approx 5 seconds per OxiTop[®]-IDS measuring head, with many measurement data it may take longer.
- 3 Select a sample of the set and open the details of the selected sample with **<MENU/ENTER>** or **<F1>/[i]**.



- 4 Carry out one of the following actions:
- Using **<MENU/ENTER>**, display the individual measuring heads of the selected sample. There you can
 - view the data of the individual measuring heads that were last stored
 - View *GLP* (if there is a valid calibration) and the remaining validity (in days)
 - Make the LED of the corresponding measuring head light up with **<F1>/[i]**
 - Delete individual measuring heads from the sample as necessary with **<F2>/[Delete]**
 - Using **<F1>/[i]**, display the graphic evaluation of the sample
 - Erase the highlighted sample with **<F2>/[Delete]**



- 5 Carry out one of the following actions:
- Using <▲><▼>, highlight a graph.
 - Using <MENU/ENTER>, load the graph as a single graph. There you can
 - view the individual measured values of the measuring head with <◀><▶>
 - return to the display of the graphs of all measuring heads with <ESC>
 - Hide the highlighted graph with <F1>/[Hide].



- 6 Carry out one of the following actions:
- view the individual measured values of the measuring head with <◀><▶>
 - return to the display of the graphs of all measuring heads with <ESC>
- 7 Using <M>, switch to the *OxiTop set management*.

5.4 Transmitting data (USB interfaces)



Basic information on data transmission to the USB interfaces and on the settings for the USB interfaces is given in the operating manual of your meter.

With the aid of the MultiLab Importer software, you can record and evaluate measurement data with a PC.

More detailed information can be found in the MultiLab Importer operating manual.

- 1 Connect the output device to a USB interface.
 - USB-A: USB printer, USB memory device
 - USB-B: PC
- 2 Using **<M>**, open the *OxiTop set management*.
- 3 Using **<▲><▼>**, highlight a *Set*.
- 4 Open the details of the selected set with **<MENU/ENTER>**.
The measuring heads automatically call up the current data of the set.
The reading out takes approx 5 seconds per OxiTop®-IDS measuring head, with many measurement data it may take longer.
- 5 Using **<▲><▼>**, select a sample.
- 6 Using **<PRT_>** or **<PRT>**, output the data to the USB interfaces.

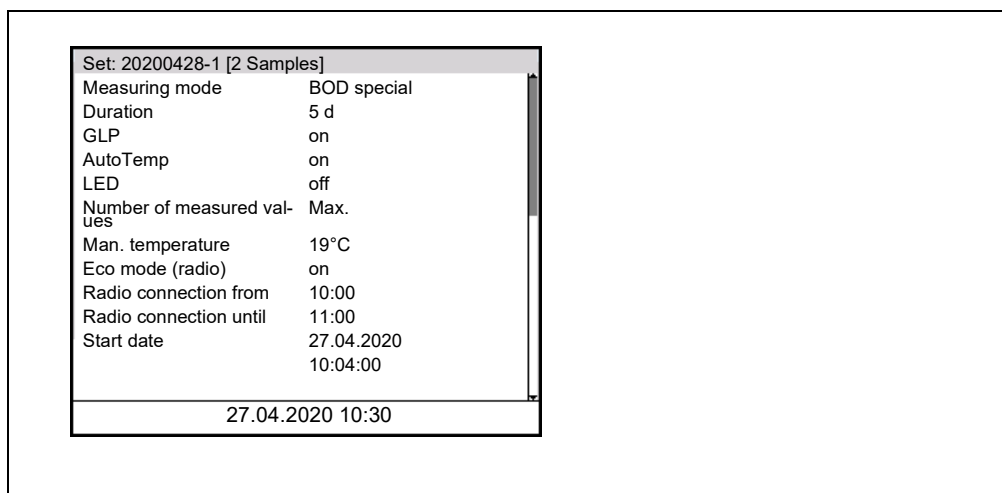
Key	Explanation
<PRT_>	Output of the data as a *.csv file to the USB-A interface, to a connected USB memory device.
<PRT>	Output of the data in ASCII or CSV format (setting in the system menu) to the interface USB-A or USB-B. The meter recognizes whether a printer or PC is connected.



The data transferred to the USB memory device are in the directory "OxiTop".

5.5 Displaying the settings for sets and samples

- 1 Using **<▲><▼>**, highlight a set in the *OxiTop set management Set*.
- 2 Open the settings of the selected set with **<◀>**.



3 Carry out one of the following actions:

- Display further settings (for the samples) with **<▼>**

```

End date      02.05.2020
              10:04:00
# Sample 1/3: A-1 (2 Measuring heads)
Meas. range          400 mg/
Bottle volume        510 ml
Sample vol.          160 ml
Dilution 1 +        0
* 1/6: ID=1   SN=20052537
* 2/6: ID=16  SN=19083484
...             ....

```

- Output the data to the USB interface with **<PRT>**: to a PC (via the MultiLab Importer) or a printer
- Quit the display of the settings with **<ESC>**

5.6 Calibration

5.6.1 Why calibrate?

OxiTop®-IDS measuring heads age. Therefore, the tightness of the OxiTop®-IDS measuring heads and the accuracy of the pressure measurement can change, for example. The condition of the measuring heads can be evaluated by checking their tightness and measuring accuracy (see BOD application report).

5.6.2 When do you have to calibrate?

Routinely within the framework of the company quality assurance

5.6.3 Calibration procedure

Creation of a defined negative pressure and balancing with the display (see

BOD application report).

In contrast to physical or chemical measuring methods, BOD systems do not provide standardized values, as the use of microorganisms has a great spectrum depending on their composition and food supply. With the aid of testing tools and suitable tests, errors due to defective pressure sensors or untight OxiTop®-IDS measuring head threads can be identified.

You can check the OxiTop®-IDS measuring heads with the following procedures.

- OxiTop®-PM (Cal-Test)
- OxiTop®-PT (pneumatic test)



Details on the tests are given in the operating manual of your OxiTop®-IDS measuring head.

The test OxiTop®-PT (pneumatic test) is operated exclusively at the OxiTop®-IDS measuring head. The meter is not required for this.

5.6.4 OxiTop® PM-Test (Cal test)

The test checks the tightness and calibration of the pressure measuring system with the aid of a chemically simulated BOD.

The OxiTop®-PM calibration tablet contains, among other, a defined amount of sodium sulfite. The oxygen in the sample bottle oxidizes the sodium sulfite to sodium sulfate. This process consumes the oxygen present in the sample bottle. The reduction of oxygen causes a defined negative pressure. The BOD value corresponding to this negative pressure is given in the packet.

The procedure is similar to a BOD5 measurement with

- specified sample volume (164 ml) and
- addition of the calibration tablet

Details on sample preparation and steps of the test: see operating manual of the OxiTop®-PM test resource.

The test is started in one of the following ways:

- OxiTop®-IDS measuring head without wirelessly connected meter: BOD5 measurement (with defined sample volume)
- OxiTop®-IDS measuring head with wirelessly connected meter: BOD5 measurement (with defined sample volume, menu-guided test)

Starting with the meter

- 1 Open the *OxiTop set management*.
- 2 Using **<CAL>**, start the OxiTop® PM test.
The calibration is stored as a BOD5 measurement among the other active sets.
"CAL" is used automatically as name for the *Set*.
"A" is used automatically as the name for the sample.

- 3 Assign an OxiTop®-IDS measuring head to the current sample. The assigning is done similar to creating a sample for measurement (see section 5.1.2 THE COURSE OF THE MEASUREMENT).
- 4 If necessary, assign further OxiTop®-IDS measuring heads to the sample (details: see section 5.1.2 THE COURSE OF THE MEASUREMENT) is displayed.
- 5 If necessary, create more samples with measuring heads in the set (details: see section 5.1.2 THE COURSE OF THE MEASUREMENT).
- 6 Start the calibration.
- 7 The measurement result is displayed after the BOD measurement is completed.

Calibration evaluation

After calibrating, the meter automatically evaluates the calibration. Evaluated is the deviation of the measurement result from the nominal value of the test (300 ± 30 mg/l).

Successful calibration	Calibration unsuccessful
The measurement result is within the tolerance of the nominal value	The measurement result is outside the tolerance of the nominal value
<ul style="list-style-type: none"> ● The calibration date and the validity (365 days) are stored in the IDS measuring head. ● The measuring head is approved for measurements with active GLP function. 	<ul style="list-style-type: none"> ● The measuring head is not approved for measurements with active GLP function.



If the GLP function is active, each IDS measuring head is checked for a valid calibration prior before the sample is assigned to a sample (GLP).

If there is a valid calibration the measuring head is accepted.
If there is no valid calibration the measuring head is rejected.

6 Technical data

The present operating manual only describes operating with a MultiLine Multi 3630/3620 IDS.

The technical data of the individual devices of the OxiTop[®] measuring system are given in the following documents:

- Meter (Multi 3630/3620 IDS),
- IDS-WLM-M adapter,
- OxiTop[®]-IDS measuring head.

Operation with OxiTop[®]-IDS measuring heads

Measuring ranges	<i>Measuring mode BOD standard</i>	0 ... 40 / 80 / 200 / 400 / 800 / 2000 / 4000 mg/l BOD
	<i>Measuring mode BOD special</i>	0 ... 400000 mg/l BOD
	<i>Measuring mode Pressure p</i>	500 ... 1250 hPa (OxiTop [®] i/OxiTop [®] -IDS) 500 ... 1500 hPa (OxiTop [®] -IDS /B)
Number of datasets per Oxi- Top[®]-IDS measur- ing head	<i>Standard</i>	1 measured value per day
	<i>Max.</i>	360 measured values for the specified measuring duration
Number of Oxi- Top[®]-IDS measuring heads per meter	Max. 100	

7 What to do if...

	Cause	Remedy
An OxiTop®-IDS measuring head cannot be registered for a sample	<ul style="list-style-type: none"> – The selected OxiTop®-IDS measuring head is already registered for a sample Example: A reset was carried out at an OxiTop®-IDS measuring head registered for a sample – The <i>GLP</i> function is switched on and the measuring head does not have a valid calibration. 	<ul style="list-style-type: none"> – Register a free OxiTop®-IDS measuring head – Release an OxiTop®-IDS measuring head <ul style="list-style-type: none"> – Delete the individual OxiTop®-IDS measuring head from the sample for which it is registered – Delete the set in which the OxiTop®-IDS measuring head is registered. – Use another OxiTop®-IDS measuring head – Calibrate the measuring head
No measurement graphs are displayed although the measurement has already been running for an extended period of time	<ul style="list-style-type: none"> – The <i>AutoTemp</i> phase is still running – An OxiTop®-IDS measuring head cannot be addressed 	<ul style="list-style-type: none"> – Wait for the end of the <i>AutoTemp</i> phase then start the evaluation – See error symptom, An OxiTop®-IDS measuring head cannot be addressed
An OxiTop®-IDS measuring head cannot be addressed	<ul style="list-style-type: none"> – The radio link was switched off at the OxiTop®-IDS measuring head, e.g. to save energy – The radio link of the OxiTop®-IDS measuring head is restricted (<i>Eco mode (radio) = on</i>). The LED at the OxiTop®-IDS measuring head flashes blue. – The batteries of the OxiTop®-IDS measuring head is empty – The radio links between OxiTop®-IDS measuring head and meter is interrupted – The OxiTop®-IDS measuring head is defective 	<ul style="list-style-type: none"> – If necessary, read out manually any measurement data available from the OxiTop®-IDS measuring head – Start the radio link to the OxiTop®-IDS measuring head during the specified time (<i>Eco mode (radio)/ Radio connection from ... Radio connection until</i>). The LED at the OxiTop®-IDS measuring head flashes magenta. – Exchange the battery (even during a measurement) – Remove any barriers and sources of interference from the radio link (see operating manual of the WLM system). Re-establish the connection – Exchange the defective OxiTop®-IDS measuring head – Contact the service department

	Cause	Remedy
The Multi 3630/ 3620 IDS meter does not react	<ul style="list-style-type: none"> – The batteries of the meter are empty – Operating condition undefined or EMC load unallowed – The meter is defective 	<ul style="list-style-type: none"> – Insert new batteries or connect the power pack – Carry out a reset at the meter (simultaneously press the keys <MENU/ENTER> and <On/Off>) – Contact the service department
Measured values (or graphics) are obviously wrong	<ul style="list-style-type: none"> – Erroneous data in the storage of the meter – Erroneous data transmission from the OxiTop[®]-IDS measuring head to the meter 	<ul style="list-style-type: none"> – Read out the storage of the meter once again with <RCL>. – Re-transfer to the meter the measurement data of all measuring heads in the set. The reading out takes approx 5 seconds per OxiTop[®]-IDS measuring head, with many measurement data it may take longer. <ul style="list-style-type: none"> – Using <▲><▼>, highlight a set in the <i>OxiTop set management Set</i>. – Start the transmission of the measurement data with <RCL_>. – Contact the service department
Error while starting any functions of the sample- or set man- agement	<ul style="list-style-type: none"> – Error of the sample- and set management 	<ul style="list-style-type: none"> – OxiTop[®] Reset the sample- and set management in the menu <i>System/Service information/Rücksetzen der OxiTop Setverwaltung</i> While doing this, all sample- and set data are erased.

8 Firmware update

8.1 Firmware update for the meter Multi 3630/3620 IDS

You can find available firmware update files for your meter on the Internet. With the "Firmware Update " program and a PC you can update the firmware of the Multi 3630/3620 IDS to the newest version.

For the update you have to connect the meter to a PC via the USB interface.

The update requires:

- a free USB interface (virtual COM port) on the PC
- the driver for the USB interface (on the enclosed CD-ROM)
- the USB cable (included in the scope of delivery of the Multi 3630/3620 IDS).

1. Install the downloaded firmware update on a PC.

An update folder is created in the Windows start menu.

If an update folder already exists for the meter (or meter type), the new data are displayed there.

2. In the windows start menu, open the update folder and start the firmware update program for the meter.

3. Using the USB interface cable, connect the Multi 3630/3620 IDS to a USB interface (virtual COM port) of the PC.

4. Switch on the Multi 3630/3620 IDS.

5. In the firmware update program, start the update process with OK.

6. Follow the instructions of the firmware update program.

During the programming process, a corresponding message and a progress bar (in %) are displayed.

The programming process takes up to 15 minutes. A terminatory message is displayed after a successful programming process. The firmware update is completed.

7. Disconnect the Multi 3630/3620 IDS from the PC.
The Multi 3630/3620 IDS is ready for operation again.

After switching the meter off and on you can check whether the meter has taken over the new software version

- Operation with OxiTop[®]-IDS measuring heads:
Menu **<MENU/ENTER_>** / *Service information*.
- When operating with IDS sensors:
Menu **<MENU/ENTER_>** / *System / Service information*.

8.2 Firmware update for the IDS WLM-M adapter

You can find available firmware update files for the IDS WLM-M adapter on the Internet. With the Firmware Update program and a PC you can update the firmware of an IDS WLM-M adapter to the newest version.

For updating, connect the IDS WLM-M adapter to the Multi 3630/3620 IDS with a cable, and the Multi 3630/3620 IDS to a PC via the USB-B interface.

The update requires:

- a free USB interface (virtual COM port) on the PC
- the driver for the USB interface (on the enclosed CD-ROM)
- the USB cable (included in the scope of delivery of the Multi 3630/3620 IDS).

1. Install the downloaded firmware update on a PC.

An update folder is created in the Windows start menu.

If an update folder already exists for the sensor (or sensor type), the new data are displayed there.

2. In the windows start menu, open the update folder and start the firmware update program for the IDS sensor
3. Connect the IDS WLM-M adapter to the meter.
Only the connector in the lower section of the socket field (channel 1) is suitable for the firmware update.
4. Using the USB interface cable, connect the Multi 3630/3620 IDS to a USB interface (virtual COM port) of the PC.
5. Switch on the Multi 3630/3620 IDS.
6. In the firmware update program, start the update process with OK.
7. Follow the instructions of the firmware update program.
During the programming process, a corresponding message and a progress bar (in %) are displayed.
The programming process takes up to 5 minutes. A terminatory message is displayed after a successful programming process. The firmware update is completed.
8. Disconnect the Multi 3630/3620 IDS from the PC.
The meter and IDS WLM-M adapter are ready to operate.

After switching the meter off and on you can check whether the IDS WLM-M adapter has taken over the new software version:

- Operation with OxiTop[®]-IDS measuring heads:
Menu **<MENU/ENTER_>** / *Service information*.
- When operating with IDS sensors:
Menu **<MENU/ENTER_>** / *System / Service information*.

8.3 Firmware update for OxiTop[®]-IDS measuring heads

Available firmware updates for OxiTop[®]-IDS measuring heads are provided on the Internet. With the "Firmware Update " program and a PC you can update the firmware of a OxiTop[®]-IDS measuring head to the newest version.

For the update you have to connect the Multi 3630/3620 IDS meter to a PC via the USB interface and start the update program at the PC.

The update requires:

- a free USB interface (virtual COM port) on the PC
- the driver for the USB interface (on the enclosed CD-ROM)
- the USB cable (included in the scope of delivery of the Multi 3630/3620 IDS).
- the current firmware for the WLM-M adapter (see section 8.2)
- the current firmware for the meter (see section 8.1)

Only ever start the update function at a single OxiTop[®]-IDS measuring head.

- 1 Install the downloaded firmware update on a PC.
An update folder is created in the Windows start menu.
If an update folder for the OxiTop[®]-IDS measuring head is already existing, the new data are displayed there.
- 2 In the windows start menu, open the update folder and start the firmware update program for the OxiTop[®]-IDS measuring head.
- 3 Using the USB interface cable, connect the Multi 3630/3620 IDS to a USB interface (virtual COM port) of the PC.
- 4 Switch on the Multi 3630/3620 IDS.
- 5 At the OxiTop[®]-IDS measuring head in the *Service / Update-Modus* menu, start the update (see operating manual of the OxiTop[®]-IDS measuring head).
- 6 In the firmware update program at the PC, start the update process with OK.
The firmware is loaded and automatically installed.
- 7 Follow the instructions of the firmware update program.
During the programming process, a corresponding message and a progress bar (in %) are displayed.
The programming process takes up to 5 minutes. A terminatory message is displayed after a successful programming process. The firmware update is completed.
- 8 The OxiTop[®]-IDS measuring head is ready to measure again.

OxiTop[®]-IDS You can check the installed firmware version at the (OxiTop[®]-IDS measuring head: Menu **<MENU/ENTER_>** / *System / Service Info...*).

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